

# RF Coaxial connectors

## General catalogue

Edition 2025







## **Advanced connectivity solutions tailored for the evolving needs of critical industries**

We provide customers worldwide with exceptional products and services designed to meet their electrical and optical connectivity needs.

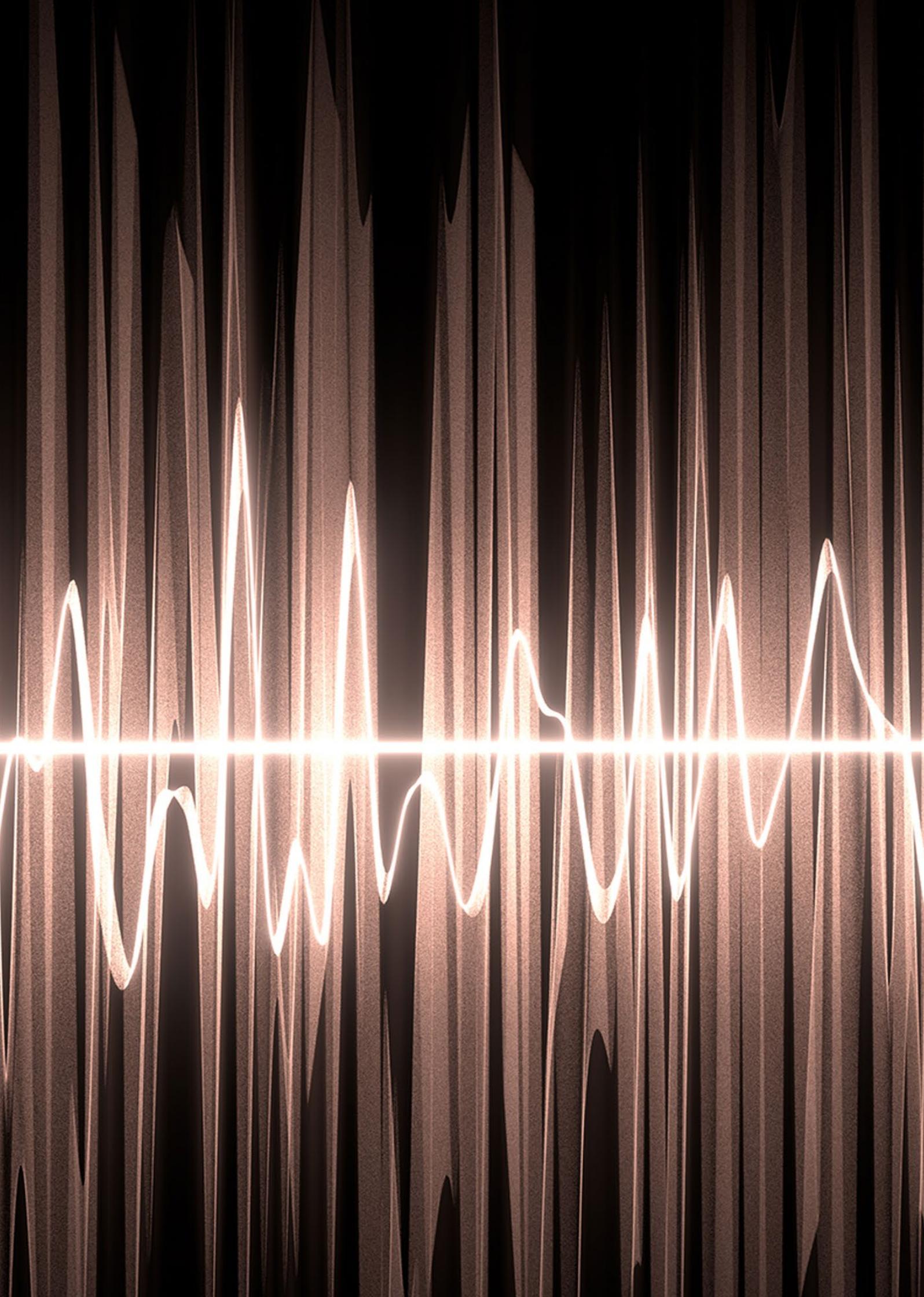
### **RF products**

At HUBER+SUHNER, we provide advanced solutions for the transmission of radio frequency (RF) and microwave (MW) signals across a wide range of industries including test & measurement, communication, medical, aerospace, defense, automotive, and railway. Our products range from MHz to THz frequency bands and include test leads, high-density interfaces, assemblies, attenuators, terminators, and electromagnetic pulse (EMP) protectors. Many of them are available in various configurations tailored for specific applications. They are effective in harsh environments, hermetically sealed, and with extended phase stability, along with designs for thermal vacuum and extreme temperatures.

### **RF coaxial connectors**

Offering a broad selection of RF coaxial connectors, HUBER+SUHNER delivers the latest high-frequency interfaces along with well-established industry standards. Our portfolio includes all standard interfaces, as well as proprietary designs that deliver enhanced technical advantages and superior electrical performance. HUBER+SUHNER connectors are exceptional and consistently outperform market standards, ensuring reliability and excellence in every application.

We continuously evolve our product range to meet emerging market trends and customer requirements. With dedicated technical support, simulation services and assistance from our expert application engineering team, we closely partner with our customers across the world, to ensure the success of their interconnectivity solutions.



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# General information

## Series not mentioned in this catalogue

For several reasons, only the most popular HUBER+SUHNER connector series and the appropriate connectors are mentioned in this catalogue. Connectors series such as C, UHF, PC 7 etc. belong to the extended product range. The selection within these series however is rather limited. For more information please go to our website [www.hubersuhner.com](http://www.hubersuhner.com) or contact our subsidiary or agent in your country.

| Series   | Coupling mechanism | Frequency range (GHz) | Interface standard             |
|--|--------------------|-----------------------|--------------------------------|
| PC 7 (sexless)<br>mid size precision coaxial connector | screw-on           | DC to 18              | – IEC 457-2<br>– IEEE Std. 287 |
| PC 2.4<br>subminiature precision coaxial connector     | screw-on           | DC to 50              | – IEC 61169-40                 |
| C<br>mid size coaxial connector                        | bayonet            | DC to 11              | – MIL-STD-348/302              |
| UHF<br>mid size coaxial connector                      | screw              | DC to 0.2             | – IEC 60169-12                 |

## Services and support

### Non standard connectors

Although our standard assortment is broad and miscellaneous, there are customer requirements which need a special solution. Thanks to capabilities and years of experience, HUBER+SUHNER is the ideal partner when customized solutions are demanded.

### 3D files

For the exchange of CAD models between various CAD systems, HUBER+SUHNER is providing the customers with 3D files in IGS or STEP data format.

### Simulations/PCB layouts

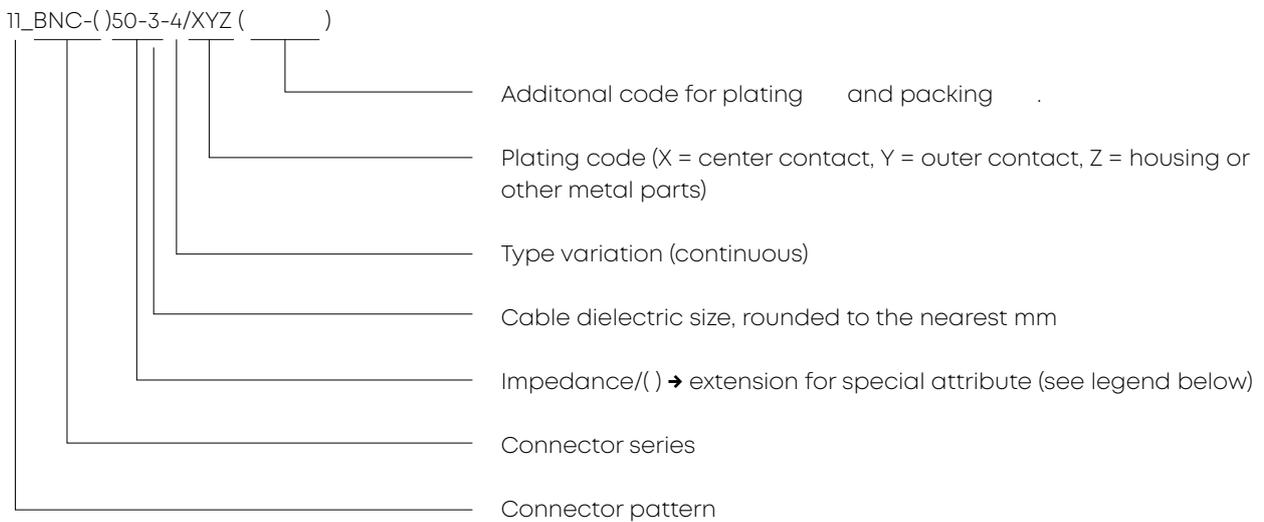
HUBER+SUHNER has the ability and the tools for computer simulation of customer specific printed circuit board layouts.

### Engineering notes, glossary, etc.

Since there is a RF connector guide available from HUBER+SUHNER, we deal with connector specific data only in this catalogue. We do not go into details regarding engineering notes or glossary etc. If you want to know more about RF connectors, please order the HUBER+SUHNER RF connector guide, english or german version available or refer to the webpage [hubersuhner.com](http://hubersuhner.com).

# Definition and type codes

## HUBER+SUHNER part number



### Examples:

82\_MM CX-S50-0-51/111\_NH

82\_MM CX-S50-0-51/111\_NY

S = SMT (surface mount)

N = nickel underplating

H = packing (bulk, 100 pcs.)

Y = variable industrial packing

(quantity depending on size of connector type)

## Legend

### Plating code (XYZ)

0 = silver

1 = gold or SUCOPRO®

2 = nickel

3 = SUCOPLATE®

4 = chromium

5 = tin plated

9 = stainless steel

### Additional code for plating

N = gold plating, nickel underplated

U = gold plating, not nickel underplated

### Additional code for packaging

E = single packaging

F = bulk with 50 pieces

G = tape and reel with 750 pieces

H = bulk with 100 pieces

L = tape and reel with 1500 pieces

M = tape and reel

(quantity depending on size of connector)

Y = variable industrial packing

### Extension for special attribute: ( )

L = left run thread

Q = quick-mate

R = reverse sex

S = surface mount (SMT)

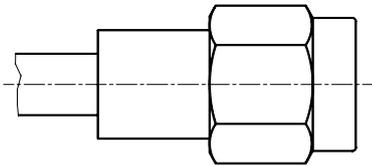
T = reverse sex surface mount (SMT)

U = unusual types (deviation from standard interface)

Z = zinc die casting

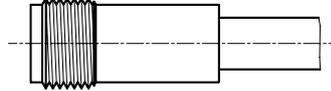
# Connector patterns

## Definition of plug and jack



### Plug

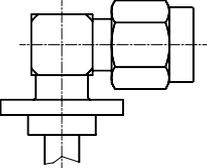
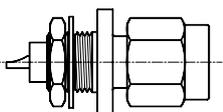
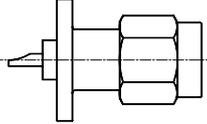
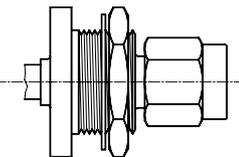
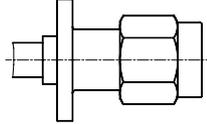
A plug is a connector featuring the active part of the coupling mechanism (for example coupling nut).



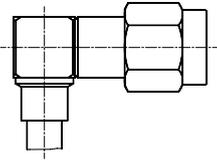
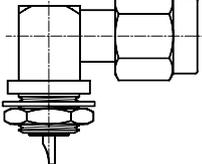
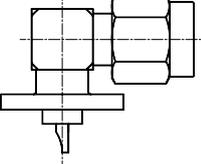
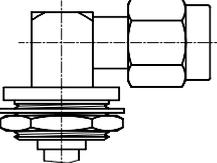
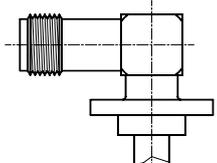
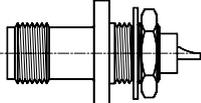
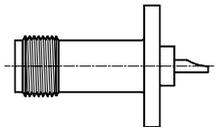
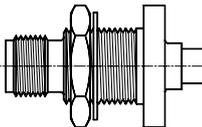
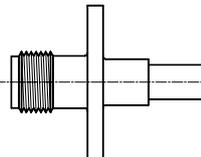
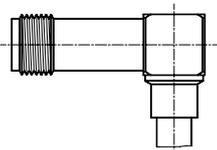
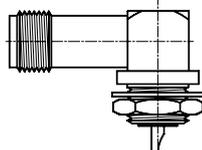
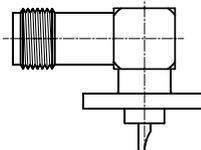
### Jack

A jack is a connector featuring the coupling mechanism complementary to the plug.

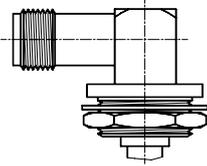
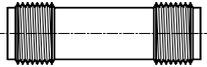
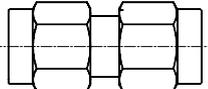
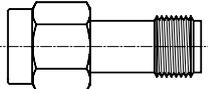
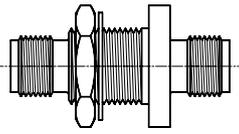
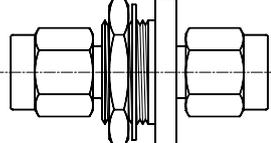
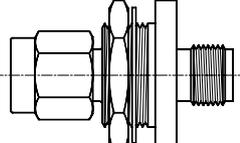
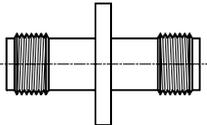
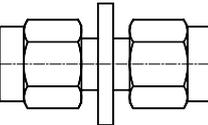
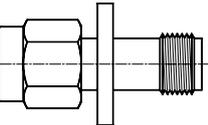
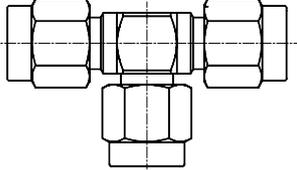
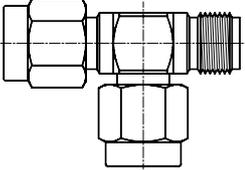
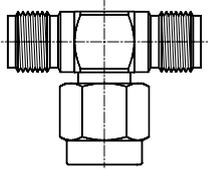
## Patterns

|       |   |       |   |       |   |
|-------|---|-------|---|-------|---|
| 10... | Right angle panel cable plug (male), flange mount                                   | 11... | Straight cable plug (male)  | 12... | Straight bulkhead receptacle, plug (male)   |
|       |  |       |  |       |  |
| 13... | Straight panel receptacle, plug (male), flange mount                                | 14... | Straight bulkhead cable plug (male)   | 15... | Straight panel cable plug (male)  |
|       |  |       |  |       |  |

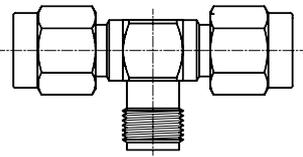
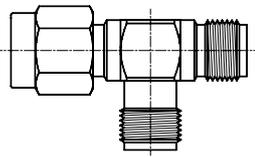
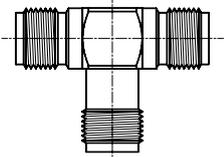
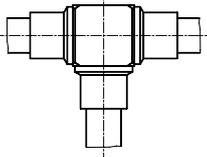
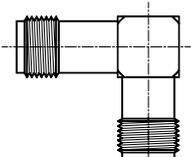
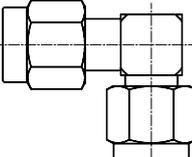
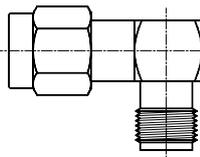
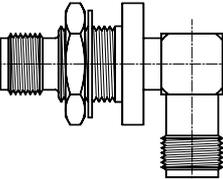
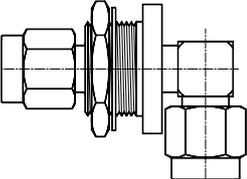
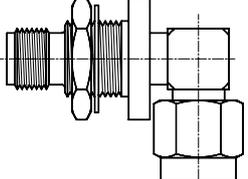
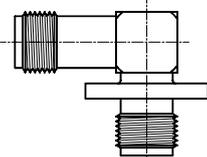
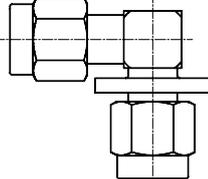
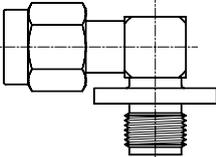
# Connector patterns

|       |   |       |   |       |   |
|-------|---|-------|---|-------|---|
| 16... | Right angle cable plug (male)   | 17... | Right angle bulkhead receptacle, plug (male)  | 18... | Right angle panel receptacle, plug (male), flange mount                               |
|       |    |       |    |       |    |
| 19... | Right angle bulkhead cable plug (male)  |       |   |       |   |
|       |    |       |   |       |   |
| 20... | Right angle panel cable jack (female), flange mount                                 | 21... | Straight cable jack (female)  | 22... | Straight bulkhead receptacle, jack (female)   |
|       |   |       |  |       |  |
| 23... | Straight panel receptacle, jack (female), flange mount                              | 24... | Straight panel bulkhead cable jack (female)   | 25... | Straight panel cable jack (female), flange mount                                      |
|       |  |       |  |       |  |
| 26... | Right angle cable jack (female)   | 27... | Right angle bulkhead receptacle, jack (female)                                      | 28... | Right angle panel receptacle, jack (female), flange mount                             |
|       |  |       |  |       |  |

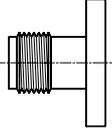
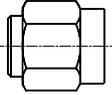
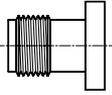
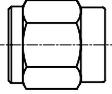
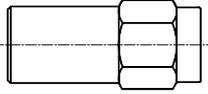
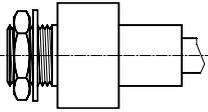
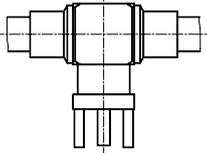
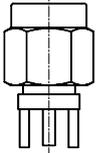
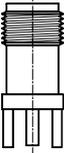
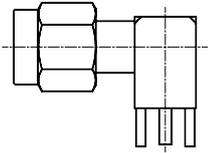
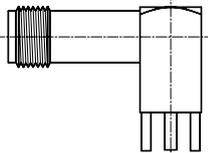
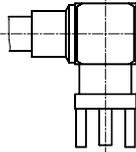
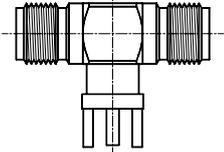
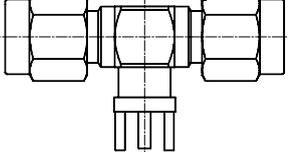
# Connector patterns

|       |   |       |   |       |   |
|-------|---|-------|---|-------|---|
| 29... | Right angle bulkhead cable jack (female)  |       |   |       |   |
|       |    |       |   |       |   |
| 31... | Adapter jack/jack (female/female)   | 32... | Adapter plug/plug (male/male)   | 33... | Adapter plug/jack (male/female)   |
|       |    |       |    |       |    |
| 34... | Bulkhead adapter jack/jack (female/female)  | 35... | Bulkhead adapter plug/plug (male/male)  | 36... | Bulkhead adapter plug/jack (male/female)  |
|       |   |       |   |       |   |
| 37... | Panel adapter jack/jack (female/ female), flange mount                              | 38... | Panel adapter plug/plug (male/male), flange mount                                   | 39... | Panel adapter plug/jack (male/female), flange mount                                   |
|       |  |       |  |       |  |
| 41... | T-adapter, 3 plugs (male)   | 42... | T-adapter, 2 plugs (male), 1 jack (female), asymmetric                              | 43... | T-adapter, 2 jacks (female), 1 plug (male)  |
|       |  |       |  |       |  |

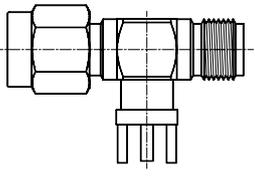
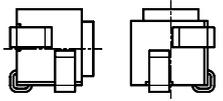
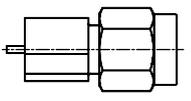
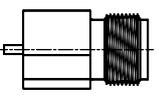
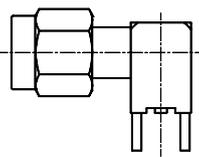
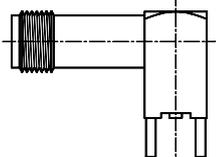
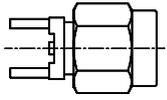
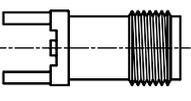
# Connector patterns

|       |   |       |   |       |   |
|-------|---|-------|---|-------|---|
| 44... | T-adapter, 2 plugs (male), 1 jack (female)  | 45... | T-adapter, 1 plug (male), 2 jacks (female), asymmetric                              | 46... | T-adapter, 3 jacks (female)   |
|       |    |       |    |       |    |
| 47... | T-cable junction  |       |   |       |   |
|       |    |       |   |       |   |
| 51... | L-adapter jack/jack (female/female)   | 52... | L-adapter plug/plug (male/male)   | 53..  | L-adapter plug/jack (male/female)   |
|       |   |       |   |       |   |
| 54... | Bulkhead-L-adapter jack/jack (female/female)  | 55... | Bulkhead-L-adapter plug/ plug (male/male)   | 56... | Bulkhead-L-adapter plug/jack (male/female)  |
|       |  |       |  |       |  |
| 57... | Panel L-adapter jack/jack (female/ female), flange mount                            | 58... | Panel L-adapter plug/plug (male/male), flange mount                                 | 59... | Panel L-adapter plug/jack (male/female), flange mount                                 |
|       |  |       |  |       |  |

# Connector patterns

|       |   |       |   |       |   |
|-------|---|-------|---|-------|---|
| 61... | Protective cap for plug (male)  | 62... | Protective cap for jack (female)  | 63... | Shorting jack (female)  |
|       |    |       |    |       |    |
| 64... | Shorting plug (male)  | 65... | Termination   | 71... | Straight bulkhead cable feed through  |
|       |    |       |    |       |    |
| 80... | PCB T-cable junction  | 81... | Straight PCB plug (male)  | 82... | Straight PCB jack (female)  |
|       |   |       |   |       |   |
| 83... | Straight PCB cable terminator   | 84... | Right angle PCB plug (male)   | 85... | Right angle PCB jack (female)   |
|       |  |       |  |       |  |
| 86... | Right angle PCB cable terminator  | 87... | PCB T-adapter jack/jack (female/female)   | 88... | PCB T-adapter plug/plug (male/male)   |
|       |  |       |  |       |  |

# Connector patterns

|       |   |       |  |       |   |
|-------|---|-------|--|-------|---|
| 89... | PCB T-adapter plug/jack<br>(male/female)  |       |  |       |   |
|       |    |       |  |       |   |
| 90... | Combi-print-connector   | 91... | Edge mount PCB plug (male)   | 92..  | Edge mount PCB jack (female)  |
|       |    |       |   |       |    |
| 93... | Right angle PCB plug with<br>ground pin in-hole and SMT<br>signal pin (male)        | 94... | Right angle PCB jack with<br>ground pin in-hole and SMT<br>signal pin (female)     | 95... | Straight PCB plug with ground<br>pin in-hole and SMT signal pin<br>(male)             |
|       |   |       |  |       |  |
| 96... | Straight PCB jack with ground<br>pin in-hole and SMT signal pin<br>(female)         |       |  |       |   |
|       |  |       |  |       |   |

# Selecting connector, plating and packaging

## How to select the suitable coaxial connector series

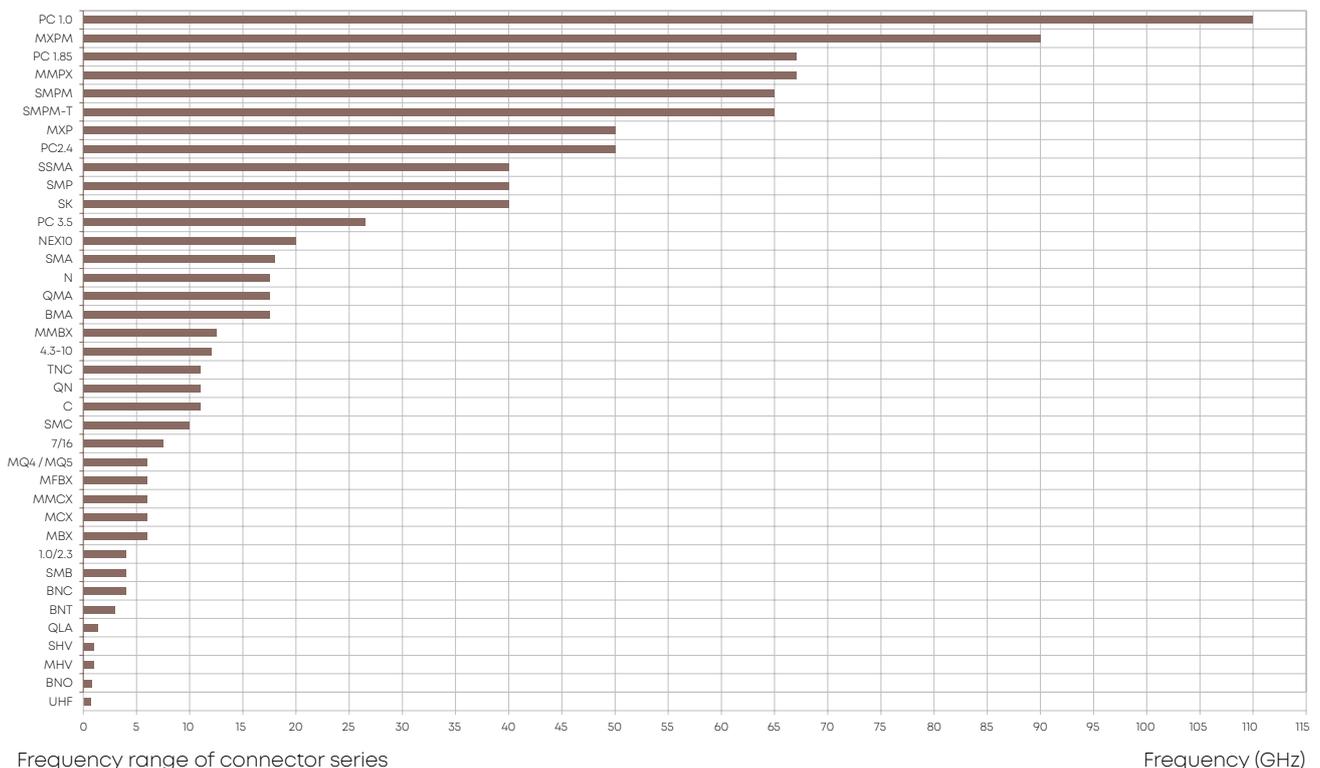
### Technical elements

Frequency, cable type, impedance and coupling mechanism are key factors to consider in selecting a coaxial connector series. Depending on the application, other factors such as sealing, temperature, working voltage, IM performance, vibration etc. also have to be taken into account. Connectors must, at a minimum, provide the same level of performance as the cable or the application to which they are attached. This means, before selecting a connector series the cable type or the application has to be known. Its structure, dimensions and frequency range restrain the connector series that can be used.

The table below shows the different cable structures and the suitable connector series.

| Cable structure               | Suitable connector series   |
|-------------------------------|---|
| Coaxial cables                | BMA, BNC, C, DIN 1.0/2.3, DIN 7/16, MBX, MCX, MMBX, MMCX, MMPX, MQ4/MQ5, MXP, MXPM, N, NEX10, PC 1.85, PC 2.4, PC 3.5, QLA, QMA, QN, SK, SMA, SMB, SMC, SMPM, SMPM-T, SMP, SSMA, TNC, UHF, 4.3-10 |
| High voltage (coaxial cables) | MHV (H4), SHV   |
| Board to board                | MBX, MFBX, MMBX   |

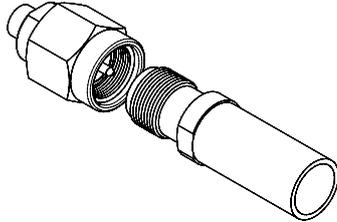
Cut-off frequency as well as coupling mechanism of a connector series limit the frequency range that a connector can operate. The following table shows the frequency range of different connector series within this catalogue.



# Coupling mechanisms

Coupling mechanisms make it possible to mate connector pairs and also determine whether or not the mated pair can meet the specified mechanical and electrical characteristics, such as operating frequency. The following four types of mechanisms are commonly used for the series described in this catalogue.

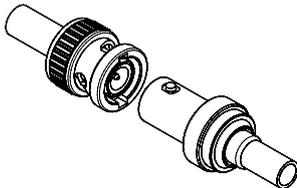
## Screwed coupling mechanism



**The coupling mechanism consists of a thread and a coupling nut. Special attention must be paid to the maximum torque permitted and the coupling nut captivation.**

The screwed connection is used in series like SMC, SSMA, SMA, TNC, N and 7/16 4.3–10 because the mechanism guarantees the most solid, stationary coupling suited for e.g. test and measurement, military and telecoms applications.

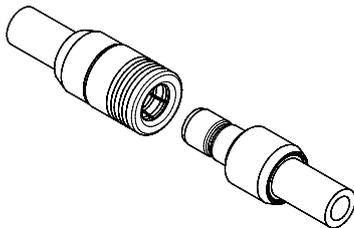
## Bayonet coupling mechanism



**The bayonet coupling is a twist -snap connection. The coupling mechanism is best known through the BNC.**

The bayonet connection often is chosen as coupling when it is important to have a sturdy mechanism and at the same time fast mating. Therefore, the mechanism is reliable for test and measurement applications as well as military systems. Used in the series BNC, SHV and MHV.

## Snap-on coupling mechanism

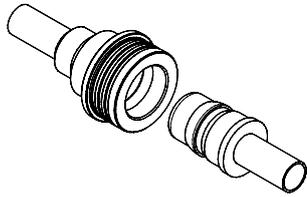


**The snap mechanism is commonly used for connectors with small mechanical dimensions and high packing density. Because this type of connection is easy to use, it is often designed into PCB applications.**

The main feature of the snap-on mechanism is that the engagement and disengagement action can be completed extremely quickly. This mechanism is very reliable when used for small connectors such as MMCX, MMPX, MCX and SMB series.

# Coupling mechanisms

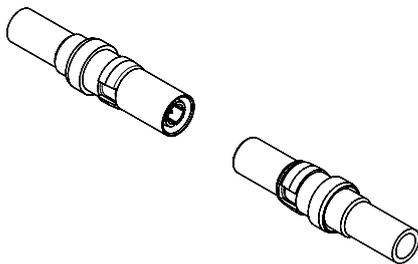
## Quick Lock coupling mechanism



**A Quick Lock coupling mechanism is basically a snap-on interface with additional self-locking. Demating is performed by retracting the unlock-sleeve of the male connector.**

Quick-Lock connectors prevent unintentional loosening of mated pairs and they provide a fast and reliable interconnection. The QMA and QN connector interface feature this time saving locking mechanism.

## Slide-on coupling mechanism



**The slide mechanism is used extensively where a high packing density and easy handling is needed. A typical application is the interconnection of daughter boards to mother boards.**

This mechanism is often used for various DIN-multiport connectors and also with connectors such as BMA, MMBX or DIN 1.0/2.3 which are commonly attached to PCBs.

| Coupling mechanism | Connector series   |
|--------------------|--|
| Bayonet            | BNC, MHV (H4), SHV   |
| Quick-Lock         | QMA, QN, 4.3-10, NEX10, MXPM   |
| Threaded           | DIN 4.1/9.5, DIN 7/16, 4.3-10, N, PC 1.85, PC 2.4, PC 3.5, MQ4/MQ5 SK (2.92 mm standard), SSMA, SMA, SMC, TNC, SMPM-T, NEX10 |
| Snap-on            | MCX, MMCX, MMPX, QLA, SMB, SMPX, SMP, SMPM   |
| Slide-on           | BMA, DIN 1.0/2.3, MBX, MMBX, MXP,  |

Overview coupling mechanisms

# Plating information

HUBER+SUHNER is your plating technology specialist and your competent partner for developing and applying proper coatings for specific uses and conditions. This section explains the metallic plating used for the different HUBER+SUHNER connectors.

## Plating is required for different reasons:

- Add conductive material to supply sufficient current carrying capacity (good electrical and thermal conductivity)
- Diminish or eliminate surface oxidation/corrosion and provide protective coating over conductors
- Ensure good contact between conductors
- Achieve a good solder or weld attachment surface
- Obtain a better wear resistance (abrasion resistance and hardness)

## Our main platings are

- Gold
- Silver
- SUCOPLATE® (HUBER+SUHNER plating)
- SUCOPRO® (HUBER+SUHNER plating)



# Plating information

## Gold

Gold is a precious metal available either as soft fine gold or as hard version. It is a good heat and electricity conductor and unaffected by air and most reagents, which makes it a superb material for electrical signal transmission. Gold can be deposited on nickel or copper. It is quite expensive compared to other plating materials.

### Application

The primary use of gold in RF applications is for plating. Inner conductors are frequently gold-plated when e.g. good conductivity, excellent oxidation resistance and continuous mating (repeatability) are required (e.g. in defence applications). Even in highly polluted atmospheres, a gold surface will be free of oxide. Gold plating is available according to MIL-DTL-45204 D or can be customer specific.

### Gold offers the following main advantages:

- Excellent wettability/solderability
- Excellent protection against corrosion
- Low contact resistance
- Good wear resistance

Colour: gold

# Plating information

## SUCOPRO® – the gold plating for the future

SUCOPRO is a thin gold plating developed by HUBER+SUHNER, featuring a nickel-phosphorus alloy (10.5 to 15 %) underlayer.

Below 300 °C the NiP is amorphous and non-magnetic. The gold layer – which is not subject to oxidation itself – protects the nickel-phosphorus underlayer against oxidation, thus allowing good wetting while soldering. It provides stable, low contact resistance and improved protection against oxidation and corrosion. As it contains only a thin layer of gold, the solder joints will not become brittle.

The nickel-phosphorus layer provides very good corrosion resistance, highwear resistance and hardness, and a diffusion barrier against gold, copper, tin and zinc. Between 300 °C and 500 °C, it changes its structure to micro-crystalline and its hardness increases, but no brittleness or weak adhesion occurs.

### Application

Initially, SUCOPRO was developed for piece parts which demand an excellent solderability and/or wear resistance, that is PCB connectors and adapters. But more and more customers select this plating also for cable connectors, adapters, on bodies and centre contacts. Meanwhile, SUCOPRO is an excellent plating for almost all subminiature connectors.

### SUCOPRO plating offers the following main advantages:

- Excellent wear resistance for more than 1000 mating cycles
- Non-magnetic
- Excellent corrosion resistance
- Excellent wettability/solderability
- Very high strength of soldered joints without embrittlement
- Low contact resistance
- Good passive intermodulation properties

Colour: gold



# Plating information

## **SUCOPLATE®**

As one of the leading RF connector manufacturers, HUBER+SUHNER has delivered several hundred million coaxial connectors with SUCOPLATE plating to demanding customers worldwide. These components, featuring unique mechanical and electrical properties, are used in a wide range of applications such as off-shore, airframes, space, test+measurement, telecommunications and wireless.

SUCOPLATE is a copper alloy composed of three components: copper, tin and zinc. Being non-magnetic and nonallergic (nickel-free), SUCOPLATE is an attractive alternative to nickel plating. It has a good electrical performance and corrosion resistance. The non-magnetic property in the contact area is also important for obtaining negligible passive intermodulation products (PIM) in communication systems such as base transceiver stations.

### **SUCOPLATE offers the following important performance highlights:**

- Superior electrical conductivity and low contact resistance
- Non-magnetic
- Excellent passive intermodulation properties
- Uniform plating thickness
- High wear resistance
- Low surface friction
- Excellent adhesion and ductility  
(no cracking when bending parts)
- Tarnish resistant
- High corrosion resistance
- Nonallergic

Colour: similar to stainless steel

# Plating information

## Silver

Silver has excellent electrical and thermal conductivity which makes it very suitable for plating. It is cheaper than gold. Having the best conductivity of all metals this metal can carry a high current load with the least loss. Silver is particularly advantageous when a low passive intermodulation product is desired.

Other features of silver are that it is easily shaped, provides very good heat conductivity, good corrosion resistance in air and water and the lowest contact resistance. A disadvantage is that silver tarnishes (sulfide film on the surface) when exposed to ozone, hydrogen sulfide and sulphur. Tarnishing influences the appearance but does not have any impact on the electrical performance.

## Application

Silver is the standard plating for connector bodies and center contact of 7/16 connectors. Traditionally, silver plating is well-known as a very good plating for low passive intermodulation components. Thanks to its good solderability, silver is used for soldering ferrules and cable entries.

## Silver offers the following main advantages:

- Excellent electrical conductivity
- Good corrosion resistance
- Low contact resistance
- Good solderability
- Excellent passive intermodulation properties

Colour: silver



# Packaging information

HUBER+SUHNER attaches great importance to high quality, economic packaging. This section will give you an overview of the types and packaging materials used. All our packagings have to fulfill the following functions:

- Protection of the connectors against mechanical stress, humidity and dust during storage transport and usage
- Identification and information about the product
- Easy handling for production
- Economic and useful recycling after use

All packagings fulfill the specification according to ISO 14000. For further information please contact your local HUBER+SUHNER representative.

## Single and bulk packaging

Plastic bags from HUBER+SUHNER are sealed by welding or provided with a mini-grip closure (bulk only) for reclosing after use. They are easy to handle and are marked for recycling with the material recycling symbol according to the recommended international DIN standard. For product identification and retraceability, they are labelled with the type version and the order, batch and assembly instruction numbers.

## Material

- LDPE or PP, transparent

## Attributes

- Electrostatically conductive,
- Air-tight
- Chemically resistant
- Chlorine free
- Halogen free



Single (sealed by welding)



Bulk (mini-grip)

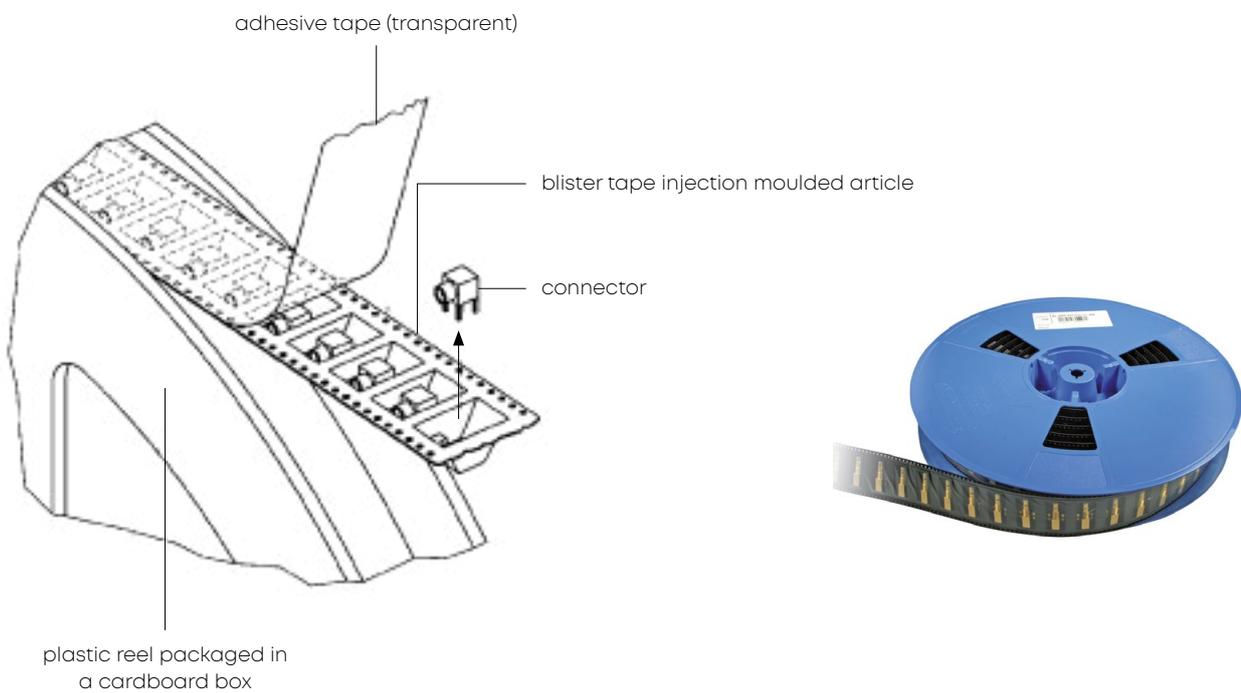
# Packaging information

## Tape and reel packaging

The main benefit of tape and reel packaging is the possibility of using an automatic PCB assembling process for the connector. This enables to reduce the cost of the whole manufacturing and protects the connectors during transportation and processing. Our tape and reel packaging meets the international standards EIA 481 and DIN IEC 286-3. The fully automated packaging machine provides perfect packaging quality.

### Material

- Reel polystyrene (PS) (anti-static)
- Carrier tape polystyrene (PS) or polycarbonate (PC) (anti-static)
- Carrier tape polystyrene (PS) or polyethylene terephthalate (PET) (anti-static)
- Box cardboard



| Type of packaging | Bulk | Single | Tape and reel | Notes   |
|-------------------|------|--------|---------------|---|
| Cable connectors  | x    | x      |               | <ul style="list-style-type: none"> <li>• Standard for high volumes</li> <li>• Standard depending on connector size</li> </ul>       |
| Flange connectors | x    | x      |               | <ul style="list-style-type: none"> <li>• Standard for high volumes</li> <li>• Standard depending on connector size</li> </ul>       |
| PCB connectors    | x    |        | x             | <ul style="list-style-type: none"> <li>• Small quantities</li> <li>• Standard for high volumes with automatic processing</li> </ul> |
| Adapters          |      | x      |               | <ul style="list-style-type: none"> <li>• Standard</li> <li>• Other packaging on request</li> </ul>                                  |

# Cable entry variants

## Cable entries for flexible cables

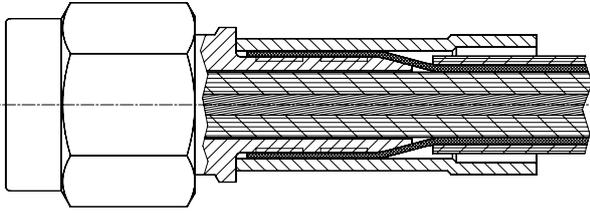
### HUBER+SUHNER full crimp

Full crimp connectors with crimped centre and outer contacts allow quick and simple assembly with high reliability. The example below shows the three steps which are necessary to crimp a subminiature SMC connector.

|  |  |
|--|--|
| <p>1</p>    | <p>Full crimp connectors are normally supplied in three parts: centre contact, body and crimp ferrule.</p>   |
| <p>2</p>   | <p>During crimping, the centre contact is accurately positioned in the crimp insert.</p>   |
| <p>3</p>  | <p>The pre-assembled cable is pushed into the body. Due to a snap mechanism between center contact and insulator, center contact is captivated and protected against axial displacement.</p> |
| <p>4</p>  | <p>The final operation is crimping of the crimp ferrule.</p>   |

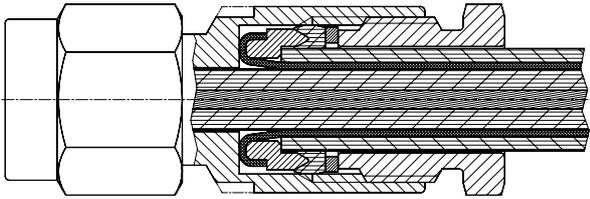
# Cable entry variants

## Cable entry crimp



The centre contact is soldered and the cable braid is crimped to the connector body. The crimp technique enables an economic assembling of high reliability. Suitable taper sleeves are available; see page 554.

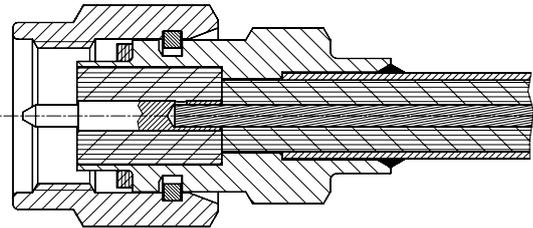
## Cable entry clamp



The clamp type cable entry is recommended for weather-exposed applications. The cable jacket is secured by a rubber gasket and the cable screen by an axially tightened press ring.

## Cable entries for semi-rigid cables

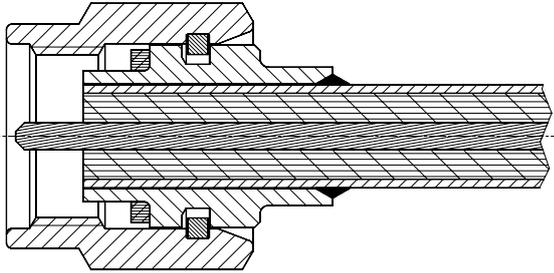
### Soldered, with pin and insulator



Centre contact and body of the connector are soldered onto the centre or outer conductor of the cable.

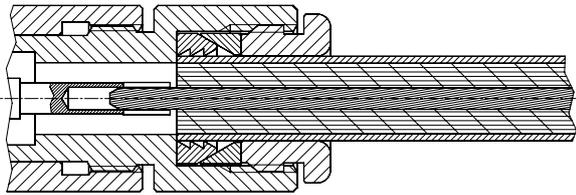
# Cable entry variants

## Soldered, without pin and insulator (SMA for semi-rigid cable 0.141")



Pin and insulator are formed directly by the cable. The body is soldered to the copper jacket. This design features a very low reflection coefficient, short length, low cost and ease of assembly. Recommended for connections which must not be undone frequently, moisture-sealed.

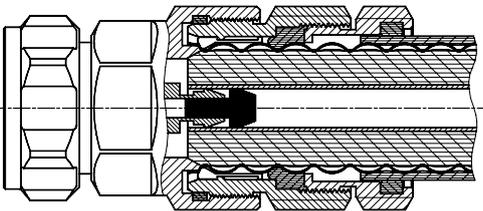
## Solderless cable entry, clamp cone



Specially for assembly of large size semi-rigid cables. The copper jacket of the cable is held by a clamp cone.

## Cable entry for corrugated copper tube cables

### HUBER+SUHNER Quick-Fit (e.g. for 7/8" cable)



Humidity-proof cable entry for RF cables with corrugated copper tube. The cable entries support standard foam dielectric cables 1/2", 7/8", 1\_1/4" and 1\_5/8" and 1/4", 3/8" and 1/2" highflex Sucofeed as well as the equivalent products of Andrew, RFS, NK cables.

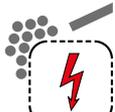
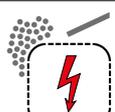
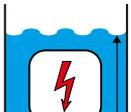
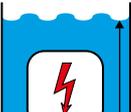
### Features

- Low, stable and reproducible PIM (Passive Intermodulation Product)
- Quick and easy assembly
- Competitive pricing
- IP rating (IP68 for Quick-Fit connector types)
- Cable multi-brand compatibility

# IP ratings

The IP rating system provides a means of classifying the degree of protection from dust and water afforded by electrical equipment and enclosures.

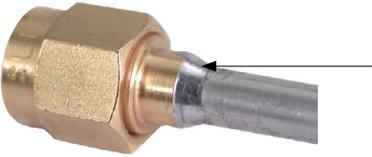
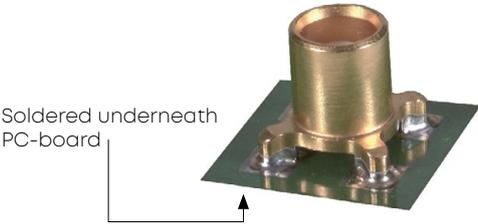
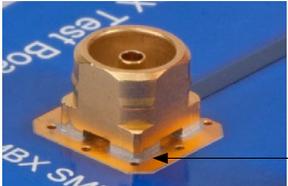
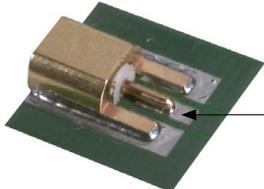
The system is recognised in most countries and is set out in a number of standards, including IEC 60529.

| 1st digit: protection against solid objects |   |  | 2nd digit: protection against liquids |  |   |
|---|---|--|---------------------------------------|--|---|
| IP x...                                     |   | Description/test   | IP ...y                               |  | Description/test  |
| 0   |    | No protection  | 0                                     |     | No protection   |
| 1   |    | Protected against solid objects over 50 mm, e.g. accidental touch by hands               | 1                                     |    | Protected against vertically falling drops of water   |
| 2   |    | Protected against solid objects over 12.5 mm, e.g. fingers                               | 2                                     |    | Protected against direct sprays of water up to 15° from the vertical                          |
| 3   |    | Protected against solid objects over 2.5 mm (tools/wires)                                | 3                                     |    | Protected against sprays to 60° from the vertical   |
| 4   |  | Protected against solid objects over 1 mm (tools/wires/small wires)                      | 4                                     |  | Protected against water sprayed from all directions – limited ingress permitted               |
| 5   |  | Protected against dust – limited ingress (no harmful deposit)                            | 5                                     |  | Protected against low pressure jets of water from all directions – limited ingress permitted  |
| 6   |  | No ingress of dust   | 6                                     |  | Protected against strong jets of water, e.g. for use on shipdecks – limited ingress permitted |
|   |   |  | 7                                     |  | Protected against the effects of immersion between 15 cm and 1 m                              |
| Example<br>IP67:                            |   | No ingress of dust and protected against the effects of immersion between 15 cm and 1 m. | 8                                     |  | Protected against long periods of immersion under pressure                                    |

# Soldering

Soldering is an important technique in the assembly of electronic products. It is the process of joining two metals by the use of a solder alloy, and it is one of the oldest known joining techniques.

Good soldering quality as a prerequisite for reliable joints can be achieved only through a soldering process in which a great many variables both with respect to materials and to techniques have been optimised in a integrated system. The various mass-soldering processes all have their own particular characteristics. They differ in the way in which the solder flux and the solder alloy are applied to the parts to be joined and in the manner by which the heat is supplied. The following information describes the soldering methods. This information should be considered as a recommendation. Depending on the specific application, it is up to the user to select the most suitable method.

| Item to be soldered   |  | Usual methods  |
|---|--|--|
| <p><b>Centre conductor of coaxial cable</b></p>                         |    | <ul style="list-style-type: none"> <li>• Soldering iron</li> <li>• Resistance heating</li> </ul>                           |
| <p><b>Outer conductor of semi-rigid cable</b></p>                       |   | <ul style="list-style-type: none"> <li>• Inductive (RF)</li> <li>• Soldering iron</li> <li>• Resistance heating</li> </ul> |
| <p><b>Connector for printed circuit board through-hole version</b></p>  | <p>Soldered underneath<br/>PC-board</p>  | <ul style="list-style-type: none"> <li>• Wave soldering</li> <li>• Reflow soldering</li> <li>• Soldering iron</li> </ul>   |
| <p><b>Connector for printed circuit board surface-mount version</b></p> |   | <ul style="list-style-type: none"> <li>• Reflow soldering</li> <li>• Soldering iron</li> </ul>                             |
| <p><b>Connector with solder tab</b></p>                                 |   | <ul style="list-style-type: none"> <li>• Soldering iron</li> <li>• Reflow soldering</li> </ul>                             |

# Soldering

## Commonly used solder

Depending on components, soldering temperature etc., the following solders are used:

|        |              |                        |
|--------|--------------|------------------------|
| SnPb   | 63/37        | 183 °C lead solder     |
| SnPb   | 60/40        | 188 °C lead solder     |
| SnPbAg | 62/36/2      | 179 °C lead solder     |
| SnAgCu | 96.5/3.0/0.5 | 217 °C leadfree solder |
| SnAg   | 96.5/3.5     | 221 °C leadfree solder |

The higher melting temperature during leadfree soldering is critical for the cable stripping dimensions during assembly. The expansion of the cable dielectric will be larger.

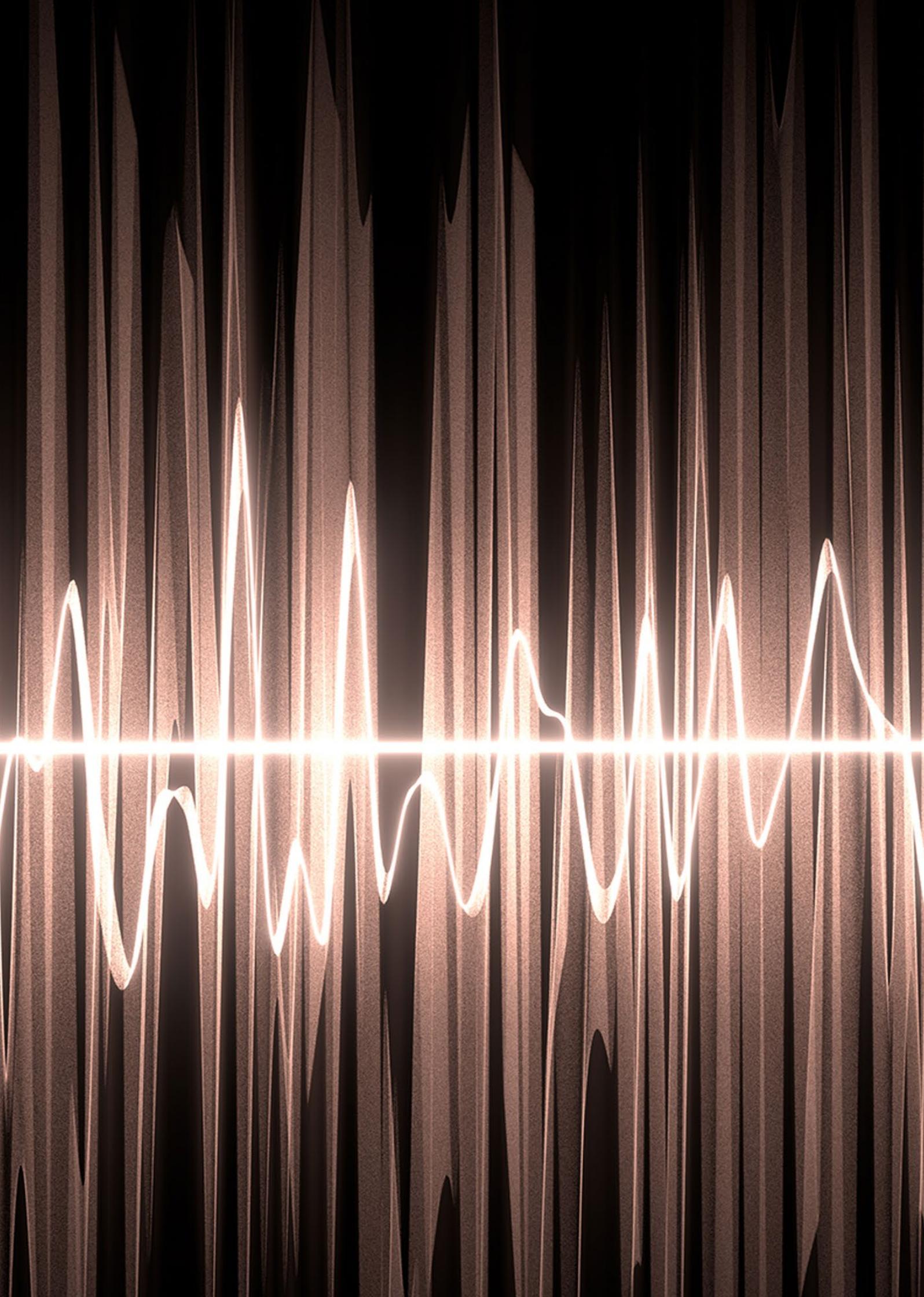
## How do you judge the quality of a solder joint?

A good (reliable) solder joint will, during the lifetime of the equipment in which the joint is situated, perform its mechanical and electrical functions without failures. Visual aspects of good soldered joints are:

1. Good wetting
2. Correct amount of solder
3. Sound and smooth surface

All soldered joints on a printed board should give a uniform impression regardless of their location on the printed board. Solder should flow evenly over the surfaces to be soldered and run out thinly towards the edges of the joint. The contact angle should be well under 30° if the surfaces are sufficiently large. Good wetting of both the component and the solder land with the correct amount of solder is so important that this is the major criterion in the assessment of soldered joints. The solder should wet the entire periphery of the termination to be soldered, and from the edge of the solder land the thickness of the solder coat should increase uniformly up to the termination. Leadfree solder joints have a different appearance from their tinlead counter parts.

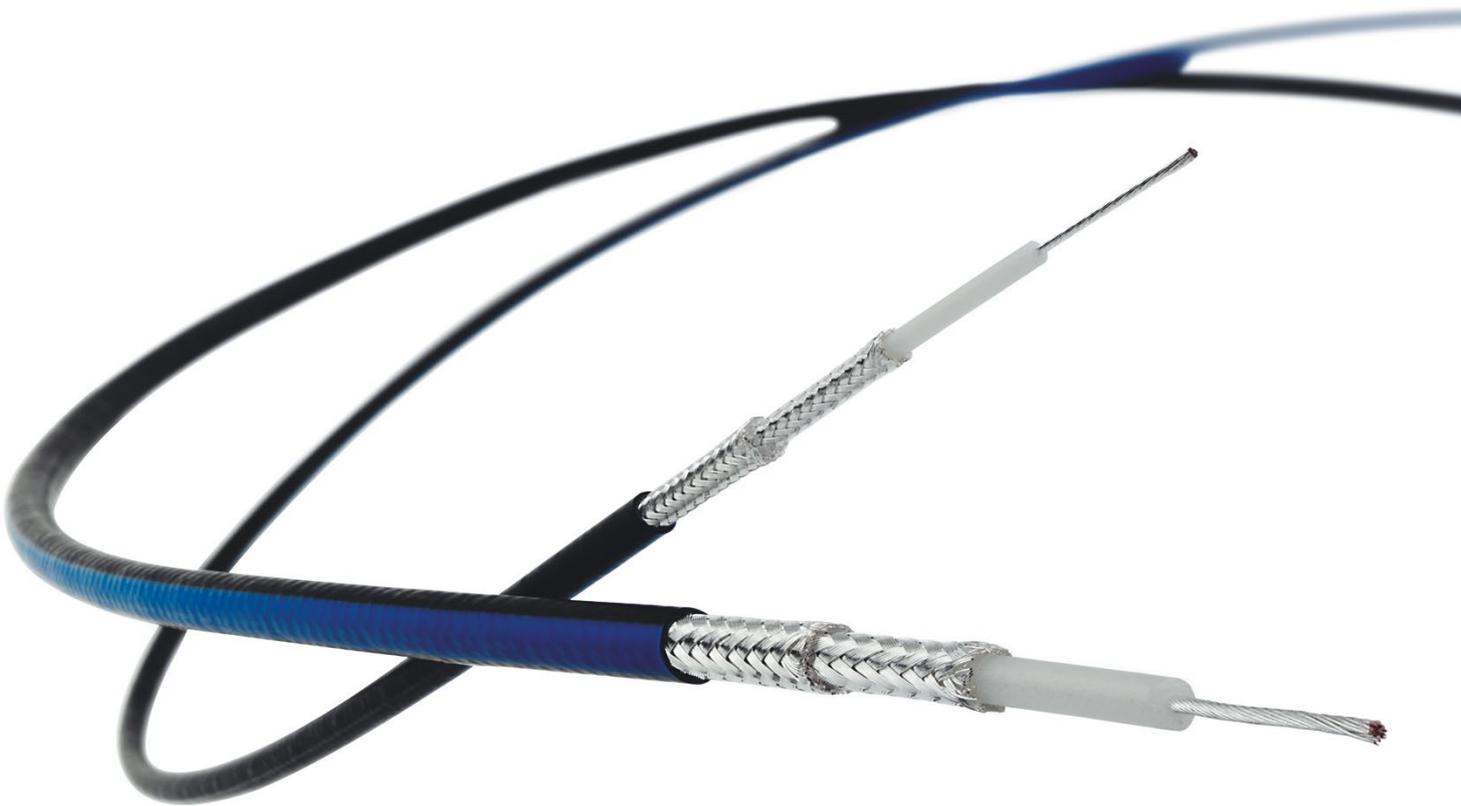
- Grainy and less bright
- Larger wetting angle



# Suitable cables

The HUBER+SUHNER coaxial connector portfolio covers a wide range of different cable types, such as flexible cables, semi-rigid cables, corrugated copper tube cables, etc.

Please find hereafter the dimensions and the material of all cables (cable groups) mentioned within this paper.



# Flexible RF cables

## Foam line 50 Ω

| Screen type     | Cable group | Item     | Cable type      | Centre conductor |      | Insulation |       |
|-----------------|-------------|----------|-----------------|------------------|------|------------|-------|
|                 |             |          |                 | Material         | Ø mm | Material   | Ø mm  |
| Double screen   | S9          | 22512310 | S_02162_B       | Cu               | 0.80 | SPE        | 2.10  |
| Double screen   | X27         | 84151727 | SPUMA_195       | Cu               | 2.83 | SPE        | 2.83  |
|                 |             | 85021562 | SPUMA_195-FR-01 | Cu               | 2.83 | SPE        | 2.83  |
| Double screen   | X9          | 84026748 | SX_04172_B-60   | CuAg             | 1.40 | SPE        | 3.83  |
| Double screen   | X28         | 84151737 | SPUMA_240       | Cu               | 1.42 | SPE        | 3.81  |
|                 |             | 85021563 | SPUMA_240-FR-01 | Cu               | 1.42 | SPE        | 3.81  |
| Double screen   | X34         | 85089188 | SPUMA_240-RS-FR | Cu               | 1.42 | SPE        | 3.81  |
| Double screen   | S16         | 84034611 | S_04262_D-09    | CuAg             | 1.40 | SPE        | 3.78  |
| Double screen   | S24         | 84061578 | S_06162_D-03    | Cu               | 2.05 | SPE        | 5.60  |
| Double screen   | U30         | 84102703 | SPUMA-400       | AlCu             | 2.74 | SPE        | 7.24  |
|                 |             | 84132035 | SPUMA-400-FR-01 | AlCu             | 2.74 | SPE        | 7.24  |
| Double screen   | X32         | 85089191 | SPUMA-400-RS-FR | Cu               | 2.74 | SPE        | 7.24  |
| Multiple screen | S32         | 22511767 | S_07262_BD      | CuAg             | 2.85 | SPE        | 7.35  |
| Double screen   | X31         | 85021564 | SPUMA_500-FR-01 | AlCu             | 9.43 | SPE        | 9.43  |
| Double screen   | S39         | 23002145 | S_10162_B-11    | AlCu             | 3.78 | SPE        | 9.75  |
|                 |             | 22512320 | S_10172_B-11    | AlCu             | 3.78 | SPE        | 9.75  |
| Double screen   | X29         | 84151738 | SPUMA_600       | AlCu             | 4.44 | SPE        | 11.56 |
|                 |             | 85240547 | SPUMA_600-RS-FR |                  |      |            |       |

## Foam line 75 Ω

| Screen type   | Cable group | Item     | Cable type      | Centre conductor |      | Insulation |      |
|---------------|-------------|----------|-----------------|------------------|------|------------|------|
|               |             |          |                 | Material         | Ø mm | Material   | Ø mm |
| Double screen | X33         | 85022187 | SPUMA_400-FR-75 | Cu               | 1.65 | SPE        | 7.24 |

### List of abbreviations

|        |                                   |        |                                 |
|--------|-----------------------------------|--------|---------------------------------|
| AL-PES | polyester aluminium               | LDPE   | low-density polyethylene        |
| Cu     | plain copper wire                 | LSFH   | low smoke free halogene         |
| CuAg   | silvered copper wire              | PE     | polyethylene                    |
| CuAl   | aluminium wire, copper plated     | PEX    | polyethylene, cross linked      |
| CuSn   | copper wire, tin plated           | PFA    | perfluoroalcoxy                 |
| StCu   | copper plated steel wire          | PTFE   | polytetrafluorethylene          |
| StCuAg | silvered copper plated steel wire | PVC    | polyvinylchloride               |
| FEP    | fluorethylenpropylene             | RADOX® | polyolefin, flame retardent     |
| HDPE   | high-density polyethylene         | SPE    | foam polyethylene               |
| HL     | semiconducting layer              | SPEX   | foam polyethylene, cross linked |

| Screen                      |                    | Jacket   |       | Cable retention force * |  | Operating frequency range | Notes |
|-----------------------------|--------------------|----------|-------|-------------------------|--|---------------------------|-------|
| Material                    | Ø mm               | Material | Ø mm  | N                       |  | GHz                       |       |
| AL-PES(foil)<br>CuSn(braid) | 2.15 – 2.65        | LSFH     | 3.15  | 56                      |  | 6                         |       |
| AL-PES(foil)<br>CuSn(braid) | 2.95 – 3.53        | PE       | 4.95  | 129                     |  | 8                         |       |
| AL-PES(foil)<br>CuSn(braid) | 2.95 – 3.53        | LSFH     | 4.95  | 129                     |  | 8                         |       |
| AL-PES(foil)<br>CuSn(braid) | 4.2 – 4.6          | RADOX®   | 5.5   | 128                     |  | 6                         |       |
| AL-PES(foil)<br>CuSn(braid) | 3.96 – 4.52        | PE       | 6.15  | 184                     |  | 6                         |       |
| AL-PES(foil)<br>CuSn(braid) | 3.96 – 4.52        | LSFH     | 6.15  | 184                     |  | 6                         |       |
| AL-PES(foil)<br>CuSn(braid) | 3.96 – 4.52        | TPU      | 6.17  | 184                     |  | 6                         |       |
| CuAg/CuAg                   | 4.2 – 4.7          | LSFH     | 5.70  | 228                     |  | 6                         |       |
| Cu/Cu                       | 6.1 – 6.75         | LSFH     | 7.90  | 441                     |  | 6                         |       |
| AL-PES(foil)<br>CuSn(braid) | 7.40 – 8.15        | PE       | 10.25 | 305                     |  | 8                         |       |
| AL-PES(foil)<br>CuSn(braid) | 7.40 – 8.15        | LSFH     | 10.25 | 305                     |  | 8                         |       |
| AL-PES(foil)<br>CuSn(braid) | 7.40 – 8.15        | TPU      | 10.25 | 305                     |  | 6                         |       |
| CuAg/Cu/CuSn                | 8.00 – 8.10 – 9.00 | LSFH     | 10.80 | 661                     |  | 3                         | *     |
| AL-PES(foil)<br>CuSn(braid) | 9.55 – 10.36       | LSFH     | 12.78 | 317                     |  | 8                         |       |
| Cu(foil)/Cu(braid)          | 9.85 – 10.70       | LSFH     | 12.90 | 317                     |  | 7.5                       |       |
| Cu(foil)/Cu(braid)          | 9.85 – 10.70       | PE       | 12.90 | 317                     |  | 7.5                       |       |
| AL-PES(foil)<br>CuSn(braid) | 11.56 – 12.55      | PE       | 14.99 | 317                     |  | 6                         |       |

| Screen                   |             | Jacket   |       | Cable retention force * |  | Operating frequency range | Notes |
|--------------------------|-------------|----------|-------|-------------------------|--|---------------------------|-------|
| Material                 | Ø mm        | Material | Ø mm  | N                       |  | GHz                       |       |
| AL-PES(foil) CuSn(braid) | 7.40 – 8.15 | LSFH     | 10.25 | 305                     |  | 3                         |       |

\* Value considers maximum load of the cables without irreversible variations of specifications.

# Flexible RF cables (continuing)

## Performance line 50 Ω

| Screen type   | Cable group | Item     | Cable type       | Centre conductor |      | Insulation |      |
|---------------|-------------|----------|------------------|------------------|------|------------|------|
|               |             |          |                  | Material         | Ø mm | Material   | Ø mm |
| Single screen | U0          | 22511192 | K_01152-07       | CuAg             | 0.19 | PFA        | 0.52 |
| Single screen | U1          | 22510043 | RG_178_B/U       | StCuAg           | 0.30 | PTFE       | 0.83 |
|               |             | 23010656 | Enviroflex_178   | StCuAg           | 0.30 | SPEX       | 0.82 |
|               |             | 22510049 | RG_196_A/U       | StCuAg           | 0.30 | PTFE       | 0.83 |
| Single screen | U2          | 22510079 | RG_316_/U        | StCuAg           | 0.54 | PTFE       | 1.54 |
|               |             | 23009565 | Enviroflex_316   | StCuAg           | 0.54 | SPEX       | 1.54 |
|               |             | 22510046 | RG_188_A/U       | StCuAg           | 0.54 | PTFE       | 1.55 |
| Double screen | U4          | 22510218 | K_02252_D*       | StCuAg           | 0.54 | PTFE       | 1.54 |
|               |             | 22512281 | Enviroflex_316_D | StCuAg           | 0.54 | SPEX       | 1.54 |
| Single screen | U7          | 22510078 | RG_303_/U        | StCuAg           | 0.95 | PTFE       | 2.95 |
| Double screen | U11         | 22510080 | RG_400_/U        | CuAg             | 1.00 | PTFE       | 2.95 |
|               |             | 22512280 | Enviroflex_400   | CuAg             | 1.00 | SPEX       | 3.03 |
| Double screen | U9          | 22510037 | RG_142_B/U       | StCuAg           | 0.95 | PTFE       | 2.95 |
|               |             | 22512168 | Enviroflex_142   | CuAg             | 0.95 | SPEX       | 2.95 |
| Double screen | U33         | 22511430 | RG_393_/U        | CuAg             | 2.37 | PFA        | 7.25 |
|               |             | 22512282 | Enviroflex_393   | CuAg             | 2.46 | SPEX       | 7.30 |

## Performance line 75 Ω

| Screen type   | Cable group | Item     | Cable type     | Centre conductor |      | Insulation |      |
|---------------|-------------|----------|----------------|------------------|------|------------|------|
|               |             |          |                | Material         | Ø mm | Material   | Ø mm |
| Single screen | U5          | 22510044 | RG_179_B/U     | StCuAg           | 0.30 | PTFE       | 1.55 |
|               |             | 23019104 | Enviroflex_179 | StCuAg           | 0.30 | SPEX       | 1.55 |
|               |             | 22510045 | RG_187_A/U     | StCuAg           | 0.30 | PTFE       | 1.55 |
| Double screen | R8          | 22511469 | K_02253_D-02   | StCuAg           | 0.30 | PTFE       | 1.55 |

### List of abbreviations

|        |                                   |        |                                 |
|--------|-----------------------------------|--------|---------------------------------|
| AL-PES | polyester aluminium               | LDPE   | low-density polyethylene        |
| Cu     | plain copper wire                 | LSFH   | low smoke free halogene         |
| CuAg   | silvered copper wire              | PE     | polyethylene                    |
| CuAl   | aluminium wire, copper plated     | PEX    | polyethylene, cross linked      |
| CuSn   | copper wire, tin plated           | PFA    | perfluoroalcoxy                 |
| StCu   | copper plated steel wire          | PTFE   | polytetrafluorethylene          |
| StCuAg | silvered copper plated steel wire | PVC    | polyvinylchloride               |
| FEP    | fluorethylenpropylene             | RADOX® | polyolefin, flame retardent     |
| HDPE   | high-density polyethylene         | SPE    | foam polyethylene               |
| HL     | semiconducting layer              | SPEX   | foam polyethylene, cross linked |

| Screen    |             | Jacket   |       | Cable retention force * |  | Operating frequency range | Notes                         |
|-----------|-------------|----------|-------|-------------------------|--|---------------------------|-------------------------------|
| Material  | Ø mm        | Material | Ø mm  | N                       |  | GHz                       |                               |
| CuAg      | 0.90        | PFA      | 1.25  | 14                      |  | 1                         |                               |
| CuAg      | 1.33        | FEP      | 1.80  | 33                      |  | 3                         |                               |
| CuAg      | 1.35        | RADOX®   | 1.84  | 33                      |  | 3                         |                               |
| CuAg      | 1.33        | PFA      | 1.83  | 33                      |  | 1                         |                               |
| CuAg      | 2.00        | FEP      | 2.50  | 54                      |  | 3                         |                               |
| CuAg      | 2.05        | RADOX®   | 2.52  | 54                      |  |                           |                               |
| CuAg      | 2.00        | PFA      | 2.60  | 54                      |  |                           |                               |
| CuAg/CuAg | 2.0 – 2.5   | FEP      | 3.00  | 109                     |  | 6                         | * equivalent cable:<br>RD 316 |
| CuAg/CuAg | 2.0 – 2.5   | RADOX®   | 3.16  | 109                     |  |                           |                               |
| CuAg      | 3.60        | FEP      | 4.3   | 135                     |  | 1                         |                               |
| CuAg/CuAg | 3.60 – 4.20 | FEP      | 4.95  | 258                     |  | 6                         |                               |
| CuAg/CuAg | 3.60 – 4.15 | RADOX®   | 5.10  | 258                     |  |                           |                               |
| CuAg/CuAg | 3.60 – 4.25 | FEP      | 4.95  | 258                     |  | 6                         |                               |
| CuAg/CuAg | 3.54 – 4.20 | RADOX®   | 5.00  | 258                     |  |                           |                               |
| CuAg/CuAg | 8.0 – 8.75  | FEP      | 19.90 | 478                     |  | 6                         |                               |
| CuAg/CuAg | 8.0 – 8.75  | RADOX®   | 10.05 | 478                     |  |                           |                               |

| Screen    |             | Jacket   |      | Cable retention force * |  | Operating frequency range | Notes |
|-----------|-------------|----------|------|-------------------------|--|---------------------------|-------|
| Material  | Ø mm        | Material | Ø mm | N                       |  | GHz                       |       |
| CuAg      | 2.00        | FEP      | 2.54 | 54                      |  | 3                         |       |
| CuAg      | 2.13        | RADOX®   | 2.54 | 54                      |  | 3                         |       |
| CuAg      | 2.00        | PFA      | 2.65 | 54                      |  | 1                         |       |
| CuAg/CuAg | 2.00 – 2.50 | FEP      | 3.00 | 130                     |  | 2                         |       |

\* Value considers maximum load of the cables without irreversible variations of specifications.

1) Double screened with helically wrapped foil

# Flexible RF cables (continuing)

## Standard line 50 Ω

| Screen type   | Cable group | Item                             | Cable type                                   | Centre conductor |              | Insulation |              |
|---------------|-------------|----------------------------------|--|------------------|--------------|------------|--------------|
|               |             |                                  |  | Material         | Ø mm         | Material   | Ø mm         |
| Single screen | U1          | 22511913                         | G_01132-06                                   | Cu               | 0.3          | PE         | 1.00         |
| Single screen | U2          | 22510040<br>22510110             | RG_174_/U<br>G_02232-09                      | CuSt<br>Cu       | 0.48<br>0.49 | PE<br>PE   | 1.48<br>1.50 |
| Double screen | U4          | 22510112<br>22511671             | G_02232_D<br>GX_02272_D-02                   | Cu<br>CuSn       | 0.49<br>0.48 | PE<br>PEX  | 1.50<br>1.50 |
| Single screen | U7          | 22510015<br>85023726             | RG_58_C/U<br>RADOX_RF_58                     | CuSn<br>CuSn     | 0.90<br>0.90 | PE<br>PEX  | 2.95<br>2.95 |
| Double screen | U9          | 22510072<br>85087022<br>22511592 | RG_223_U<br>ENVIROFLEX_B223<br>GX_03272_D-06 | CuAg<br>CuAg     | 0.88<br>0.88 | PE<br>PEX  | 2.95<br>2.95 |
| Single screen | U29         | 22510052                         | RG_213_/U                                    | Cu               | 2.25         | PE         | 7.25         |
| Double screen | U42         | 85023730                         | RADOX_RF_213                                 | Cu               | 2.25         | PEX        | 7.25         |
| Double screen | U32         | 22510057<br>22512156             | RG_214_/U<br>RG_214_HIFLEX                   | CuAg<br>CuAg     | 2.25<br>2.25 | PE<br>PE   | 7.28<br>7.30 |
| Double screen | U43         | 85023731                         | RADOX_RF_214                                 | CuAg             | 2.25         | PEX        | 7.28         |
| Double screen | U38         | 22510064                         | RG_217_/U                                    | Cu               | 2.70         | PE         | 9.40         |

## Standard line 75 Ω

| Screen type   | Cable group | Item                 | Cable type               | Centre conductor |              | Insulation |              |
|---------------|-------------|----------------------|--------------------------|------------------|--------------|------------|--------------|
|               |             |                      |                          | Material         | Ø mm         | Material   | Ø mm         |
| Single screen | U5          | 22510114             | G_02233-01               | StCu             | 0.24         | PE         | 1.50         |
| Single screen | U6          | 22511581             | GX_03173-01              | StCu             | 0.42         | PE         | 2.45         |
| Single screen | U12         | 22510135             | G_03233                  | Cu               | 0.48         | PE         | 2.95         |
| Double screen | U14         | 22510954             | G_03213_D                | Cu               | 0.49         | PE         | 2.95         |
| Single screen | U16         | 22510368<br>85023729 | RG_59_B/U<br>RADOX_RF_59 | StCu<br>CuSn     | 0.58<br>0.66 | PE<br>PEX  | 3.64<br>3.83 |
| Double screen | U18         | 22610079             | G_04133_D                | Cu               | 0.58         | PE         | 3.64         |
| Single screen | U34         | 22510004<br>22510641 | RG_11_A/U<br>GX_07273    | CuSn<br>Cu       | 1.20         | PE         | 7.25         |
| Double screen | U36         | 22510365             | G_07273_D                | CuSn             | 1.20         | PE         | 7.25         |

### List of abbreviations

|        |                                   |        |                                 |
|--------|-----------------------------------|--------|---------------------------------|
| AL-PES | polyester aluminium               | LDPE   | low-density polyethylene        |
| Cu     | plain copper wire                 | LSFH   | low smoke free halogene         |
| CuAg   | silvered copper wire              | PE     | polyethylene                    |
| CuAl   | aluminium wire, copper plated     | PEX    | polyethylene, cross linked      |
| CuSn   | copper wire, tin plated           | PFA    | perfluoroalcoxy                 |
| StCu   | copper plated steel wire          | PTFE   | polytetrafluorethylene          |
| StCuAg | silvered copper plated steel wire | PVC    | polyvinylchloride               |
| FEP    | fluorethylenepropylene            | RADOX® | polyolefin, flame retardant     |
| HDPE   | high-density polyethylene         | SPE    | foam polyethylene               |
| HL     | semiconducting layer              | SPEX   | foam polyethylene, cross linked |

| Screen    |               | Jacket   |       | Cable retention force * |  | Operating frequency range | Notes |
|-----------|---------------|----------|-------|-------------------------|--|---------------------------|-------|
| Material  | Ø mm          | Material | Ø mm  | N                       |  | GHz                       |       |
| CuSn      | 1.4           | PVC      | 1.80  | 28                      |  | 3                         |       |
| CuSn      | 2.00          | PVC      | 2.55  | 44                      |  | 1                         |       |
| Cu        | 2.00          | PVC      | 2.55  | 59                      |  |                           |       |
| Cu/Cu     | 2.0 – 2.5     | PVC      | 3.10  | 120                     |  | 6                         |       |
| CuSn/CuSn | 2.0 – 2.5     | RADOX®   | 3.20  | 120                     |  |                           |       |
| CuSn      | 3.60          | PVC      | 4.95  | 129                     |  | 1                         |       |
| CuSn      | 3.60          | RADOX®   | 5.10  | 129                     |  | 3                         |       |
| CuAg/CuAg | 3.60 – 4.20   | PVC      | 5.40  | 258                     |  | 6                         |       |
| CuAg/CuAg | 3.60 – 4.20   | RADOX®   | 5.40  | 258                     |  |                           |       |
| Cu        | 8.10          | PVC      | 10.3  | 423                     |  | 1                         |       |
| CuAg      | 8.09          | RADOX®   | 10.6  | 423                     |  | 2                         |       |
| CuAg/CuAg | 8.0 – 8.7     | PVC      | 10.8  | 478                     |  | 6                         |       |
| CuAg/CuAg | 8.0 – 8.7     | PVC      | 10.8  | 478                     |  |                           |       |
| CuAg/CuAg | 8.0 – 8.6     | RADOX®   | 11.1  | 354                     |  | 6                         |       |
| Cu/Cu     | 10.3 – 11.200 | PVC      | 13.85 | 952                     |  | 6                         |       |

| Screen    |             | Jacket   |       | Cable retention force * |  | Operating frequency range | Notes |
|-----------|-------------|----------|-------|-------------------------|--|---------------------------|-------|
| Material  | Ø mm        | Material | Ø mm  | N                       |  | GHz                       |       |
| Cu        | 2.0         | PVC      | 2.80  | 59                      |  | 1                         |       |
| CuSn      | 2.90        | RADOX®   | 3.70  | 120                     |  | 1                         |       |
| Cu        | 3.60        | PVC      | 5.00  | 129                     |  | 1                         |       |
| CuSn/CuSn | 3.60 – 4.20 | PUR      | 5.35  | 299                     |  | 2                         |       |
| Cu        | 4.50        | PVC      | 6.10  | 171                     |  | !                         |       |
| CuSn      | 4.42        | RADOX®   | 6.24  | 170                     |  |                           |       |
| Cu/Cu     | 4.40 – 5.00 | PVC      | 6.70  | 399                     |  | 2                         |       |
| Cu        | 8.15/0.321  | PVC      | 10.30 | 423                     |  | 1                         |       |
| Cu        | 8.0 – 8.70  | PE       | 10.80 | 757                     |  | 5                         |       |

\* Value considers maximum load of the cables without irreversible variations of specifications.

# Flexible RF cables (continuing)

## Specialites: Low noise

| Screen type    | Cable group | Item   | Cable type  | $\Omega$ | Centre conductor |                  | Insulation |                  |
|----------------|-------------|--|---|----------|------------------|------------------|------------|------------------|
|                |             |  |   |          | Material         | $\varnothing$ mm | Material   | $\varnothing$ mm |
| Single screen  | U3          | 22510085<br>22510086<br>22510088<br>22510732 | G_01130_HT<br>G_01130_HT-01<br>G_01130_HT-03<br>G_01130_HT-12 | 50       | Cu               | 0.40             | LDPE/HL    | 1.4 - 1.9        |
| Single screen  | U13         | 22510119<br>22510120<br>22511891             | G_03130_HT<br>G_03130_HT-01<br>G_03160_HG                     | 75       | Cu               | 0.50             | LDPE/HL    | 3.0 - 3.4        |
| Single screen  | U18         | 22511337                                     | G_04233_HT-01   | 75       | StCu             | 0.58             | LDPE/HL    | 3.64 - 4.20      |
| Triaxial cable | X5          | 22510116                                     | G_02330_HT  | 50       | Cu               | 0.50             | LDPE/HL    | 1.50<br>1.90     |
| Triaxial cable | U99         | 22511840                                     | G_01330_HT-23   | 50       | Cu               | 0.45             | LDPE/HL    | 1.40<br>1.90     |
| Triaxial cable | U99         | 22511103                                     | G_03330_HT-11   | 50       | Cu               | 0.5              | LDPE/HL    | 3.00<br>3.40     |

## Specialites: Various cables

| Screen type              | Cable group | Item     | Cable type | $\Omega$ | Centre conductor |                  | Insulation |                  |
|--------------------------|-------------|----------|------------|----------|------------------|------------------|------------|------------------|
|                          |             |          |            |          | Material         | $\varnothing$ mm | Material   | $\varnothing$ mm |
| Symmetric screened cable | V1          | 22510031 | RG_108_A/U | 78       | CuSn             | 2 x 0.96         | PE         | 2.0 - 4.0        |
| Triaxial cable           | W1          | 22510117 | G_02332    | 50       | Cu               | 0.48             | PE         | 1.50             |
| Triaxial cable           | W1          | 84016512 | G_02312-03 | 50       | Cu               | 0.49             | PE         | 1.50             |
| Triaxial cable           | W1          | 23023565 | G_02332-01 | 50       | Cu               | 0.49             | PE         | 1.50             |
| Triaxial cable           | W2          | 22510149 | G_03332    | 50       | Cu               | 0.93             | PE         | 2.95             |
| Triaxial cable           | W2          | 22510379 | G_03333    | 75       | Cu               | 0.48             | PE         | 2.95             |
| Triaxial cable           | W2          | 22511961 | G_03362-01 | 50       | Cu               | 0.9              | PE         | 2.95             |

### List of abbreviations

|        |                                   |        |                                 |
|--------|-----------------------------------|--------|---------------------------------|
| AL-PES | polyester aluminium               | LDPE   | low-density polyethylene        |
| Cu     | plain copper wire                 | LSFH   | low smoke free halogene         |
| CuAg   | silvered copper wire              | PE     | polyethylene                    |
| CuAl   | aluminium wire, copper plated     | PEX    | polyethylene, cross linked      |
| CuSn   | copper wire, tin plated           | PFA    | perfluoroalcoxy                 |
| StCu   | copper plated steel wire          | PTFE   | polytetrafluorethylene          |
| StCuAg | silvered copper plated steel wire | PVC    | polyvinylchloride               |
| FEP    | fluorethylenepropylene            | RADOX® | polyolefin, flame retardent     |
| HDPE   | high-density polyethylene         | SPE    | foam polyethylene               |
| HL     | semiconducting layer              | SPEX   | foam polyethylene, cross linked |

| Screen   |              | Jacket     |      | Cable retention force * | Operating frequency range | Notes  |
|----------|--------------|------------|------|-------------------------|---------------------------|--------|
| Material | Ø mm         | Material   | Ø mm | N                       | GHz                       |        |
| Cu       | 2.40         | PVC        | 3.15 | 54.4                    | 1                         |        |
| Cu       | 4.00         | PVC        | 5.00 | 128.7                   | 1                         |        |
| Cu       | 5.00         | PVC        | 6.10 | 141                     | 1                         |        |
| Cu<br>Cu | 2.40<br>3.85 | PVC<br>PVC | 5.30 | 199                     | 1                         | *Triax |
| Cu<br>Cu | 2.30<br>3.30 | PVC<br>PVC | 4.30 |                         | 1                         |        |
| Cu<br>Cu | 4.00<br>5.75 | PVC<br>PVC | 6.90 |                         | 1                         |        |

| Screen   |              | Jacket     |              | Cable retention force * | Operating frequency range | Notes |
|----------|--------------|------------|--------------|-------------------------|---------------------------|-------|
| Material | Ø mm         | Material   | Ø mm         | N                       | GHz                       |       |
| CuSn     | 4.70         | PVC        | 6.00         | 110.4                   | 1                         |       |
| Cu<br>Cu | 2.00<br>3.05 | PVC<br>PVC | 2.80<br>4.25 | 130.6                   | 1                         |       |
| Cu<br>Cu | 2.00<br>3.05 | PVC<br>PVC | 2.55<br>4.25 |                         | 2                         |       |
| Cu<br>Cu | 2.00<br>3.05 | PVC<br>PUR | 2.55<br>4.25 |                         | 2                         |       |
| Cu<br>Cu | 3.60<br>5.75 | PVC<br>PVC | 5.00<br>7.35 | 294.3                   | 1                         |       |
| Cu<br>Cu | 3.60<br>5.75 | PVC<br>PVC | 5.00<br>7.35 | 294.3                   | 1                         |       |
| Cu<br>Cu | 3.60<br>5.60 | PVC<br>PVC | 4.95<br>7.2  |                         | 2                         |       |

\* Value considers maximum load of the cables without irreversible variations of specifications.

# Microwave cables and corrugated RF cables

## Semi-rigid (SR), hand-formable (Sucoform) and flexible (Multiflex) microwave cables

| Cable group | Item     | Cable type      | $\Omega$ | Centre conductor |                         | Insulation |                         |
|-------------|----------|-----------------|----------|------------------|-------------------------|------------|-------------------------|
|             |          |                 |          | Material         | $\varnothing$ mm/inches | Material   | $\varnothing$ mm/inches |
| Y19         | 22820400 | SR_34_M17       | 50       | StCuAg           | 0.20/0.008              | PTFE       | 0.66/0.026              |
| Y15         | 22820504 | SR_47_TP_M17    | 50       | StCuAg           | 0.29/0.011              | PTFE       | 0.94/0.037              |
| Y2          | 23033515 | SUCOFORM_47_CU  | 50       | CuAg             | 0.31/0.012              | PTFE       | 0.94/0.037              |
| Y18         | 85006318 | MULTIFLEX_53-02 | 50       | CuAg             | 0.31/0.012              | PTFE       | 0.99/0.039              |
| Y3          | 22820173 | SR_86_M17       | 50       | StCuAg           | 0.51/0.020              | PTFE       | 1.68/0.066              |
| Y4          | 22820164 | SR_86_75_TP     | 75       | StCuAg           | 0.29/0.011              | PTFE       | 1.73/0.068              |
| Y10         | 22820073 | SR_118_TP       | 50       | CuAg             | 0.81/0.032              | PTFE       | 2.31/0.091              |
| Y5          | 22820043 | SR_141_TP_M17   | 50       | StCuAg           | 0.92/0.036              | PTFE       | 2.98/0.117              |
| Y6          | 22810034 | SR_141_75_TP    | 75       | StCuAg           | 0.51/0.020              | PTFE       | 2.98/0.117              |
| Y7          | 22820705 | SR_250_TP_M17   | 50       | CuAg             | 1.63/0.064              | PTFE       | 5.31/0.209              |
| Y16         | 22511613 | SUCOFORM_86     | 50       | StCuAg           | 0.53/0.021              | PTFE       | 1.65/0.065              |
| Y11         | 22511965 | MULTIFLEX_86    | 50       | CuAg             | 0.47/0.018              | PTFE       | 1.48/0.058              |
| Y12         | 22511925 | SUCOFORM_141    | 50       | StCuAg           | 0.94/0.037              | PTFE       | 2.95/0.116              |
| Y17         | 22511964 | MULTIFLEX_141   | 50       | CuAg             | 0.92/0.037              | PTFE       | 2.93/0.115              |
| Y14         | 84007938 | SUCOFORM_250-01 | 50       | CuAg             | 1.67/0.065              | PTFE       | 5.24/0.209              |

## Foam dielectric corrugated copper tube cables (SUCOFEED)

| Screen type                  | Item     | Cable group | Cable type      | $\Omega$ | Centre conductor |                         | Insulation |                         |
|------------------------------|----------|-------------|-----------------|----------|------------------|-------------------------|------------|-------------------------|
|                              |          |             |                 |          | Material         | $\varnothing$ mm/inches | Material   | $\varnothing$ mm/inches |
| Corrugated copper tube cable | 84020854 | M5          | SUCOFEED_1/4_HF | 50       | AlCu             | 1.90/0.074              | SPE        | 4.40/0.173              |
|                              | 84020856 | M7          | SUCOFEED_3/8_HF | 50       | AlCu             | 2.80/0.110              | SPE        | 6.90/0.272              |
|                              | 84099336 | M9          | SUCOFEED_1/2_HF | 50       | AlCu             | 3.60/0.142              | SPE        | 8.70/0.343              |
|                              | 84099352 | M12         | SUCOFEED_1/2    | 50       | AlCu             | 4.80/0.189              | SPE        | 11.90/0.469             |
|                              | 84020852 | M23         | SUCOFEED_7/8    | 50       | Cu               | 9.00/0.354              | SPE        | 22.00/0.866             |
|                              | 84020851 | M25         | SUCOFEED_7/8_LA | 50       | Cu               | 9.50/0.374              | SPE        | 22.70/0.894             |
|                              | 84020861 | M32         | SUCOFEED_1_1/4  | 50       | Cu               | 13.00/0.511             | SPE        | 32.00/1.259             |
|                              | 84020864 | M42         | SUCOFEED_1_5/8  | 50       | Cu               | 17.30/0.681             | SPE        | 42.00/1.654             |

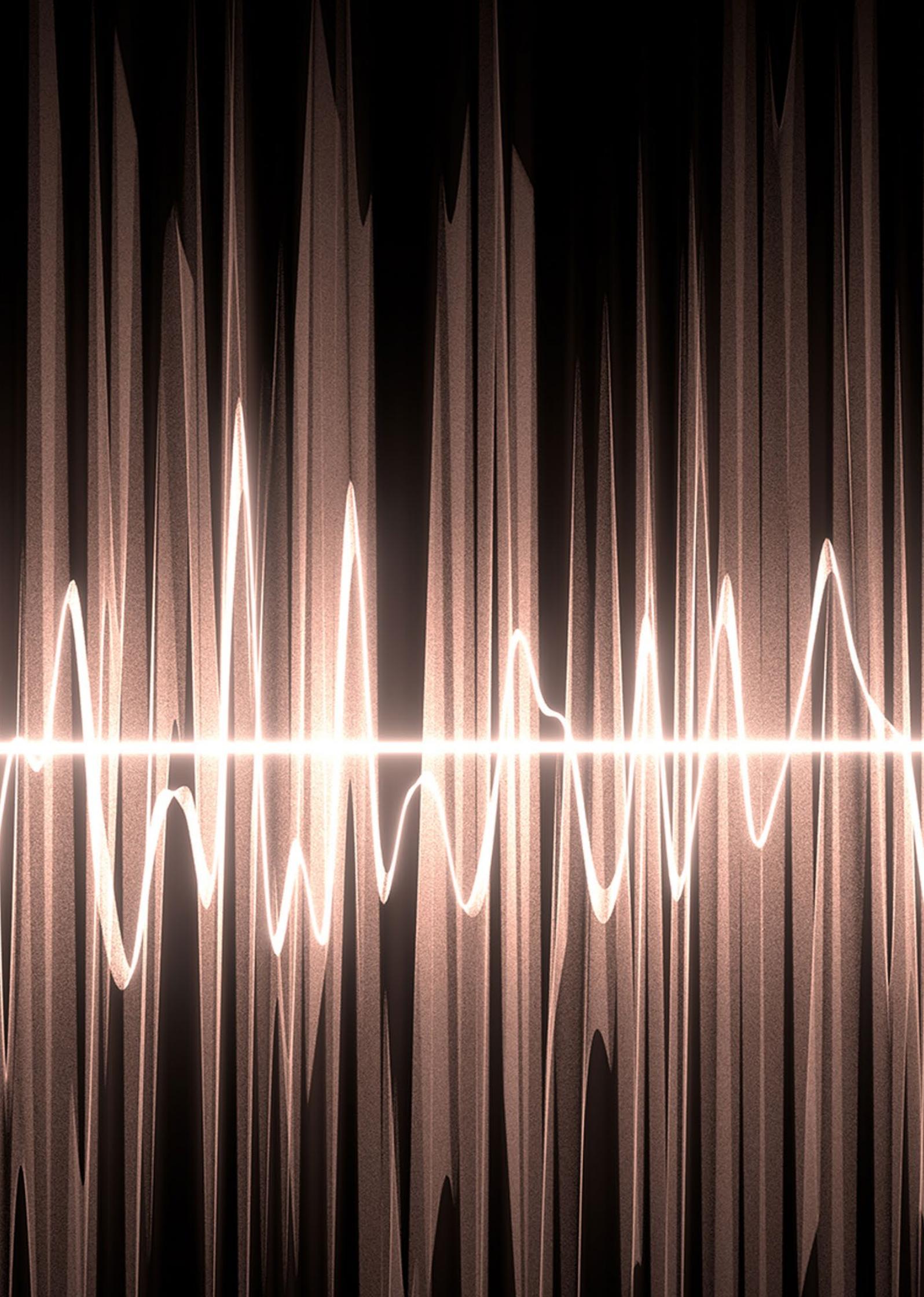
### List of abbreviations

|        |                                   |        |                                 |
|--------|-----------------------------------|--------|---------------------------------|
| AL-PES | polyester aluminium               | LDPE   | low-density polyethylene        |
| Cu     | plain copper wire                 | LSFH   | low smoke free halogene         |
| CuAg   | silvered copper wire              | PE     | polyethylene                    |
| CuAl   | aluminium wire, copper plated     | PEX    | polyethylene, cross linked      |
| CuSn   | copper wire, tin plated           | PFA    | perfluoroalcoxy                 |
| StCu   | copper plated steel wire          | PTFE   | polytetrafluorethylene          |
| StCuAg | silvered copper plated steel wire | PVC    | polyvinylchloride               |
| FEP    | fluorethylenepropylene            | RADOX® | polyolefin, flame retardent     |
| HDPE   | high-density polyethylene         | SPE    | foam polyethylene               |
| HL     | semiconducting layer              | SPEX   | foam polyethylene, cross linked |

| Screen   |             | Jacket   |             | Cable retention force * | Notes                      |
|----------|-------------|----------|-------------|-------------------------|----------------------------|
| Material | Ø mm/inches | Material | Ø mm/inches | N                       |                            |
| Cu       | 0.86/0.034  |          |             | 23.9                    |                            |
| CuSn     | 1.19/0.047  |          |             | 41.8                    |                            |
| CuSn     | 1.19/0.047  |          |             | 26.1                    |                            |
| CuAg     | 1.5/0.059   | FEP      | 1.74/0.069  |                         | available as assembly only |
| Cu       | 2.10/0.086  |          |             | 158.5                   |                            |
| CuSn     | 2.10/0.086  |          |             | 139.5                   |                            |
| CuSn     | 2.95/0.116  |          |             | 246.0                   |                            |
| CuSn     | 3.58/0.141  |          |             | 309.1                   |                            |
| CuSn     | 3.58/0.141  |          |             | 309.1                   |                            |
| CuSn     | 6.30/0.250  |          |             | 952.4                   |                            |
| CuSn     | 2.20/0.086  |          |             | 100.0                   |                            |
| CuSn     | 2.11/0.083  | FEP      | 2.650/0.104 | 160.0                   |                            |
| CuSn     | 3.58/0.141  |          |             | 100.0                   |                            |
| CuAg     | 3.53/0.139  | FEP      | 4.140/0.163 | 160.0                   |                            |
| CuSn     | 6.35/0.248  |          |             | 100.0                   |                            |

| Screen   |             | Jacket   |             | Cable retention force * | Notes |
|----------|-------------|----------|-------------|-------------------------|-------|
| Material | Ø mm/inches | Material | Ø mm/inches | N                       |       |
| Cu       | 6.40/0.252  | LDPE     | 7.70/0.303  | 100.0                   |       |
| Cu       | 9.50/0.374  | LDPE     | 10.80/0.425 | 150.0                   |       |
| Cu       | 12.10/0.476 | LDPE     | 13.40/0.528 | 200.0                   |       |
| Cu       | 13.70/0.539 | LDPE     | 16.00/0.630 | 200.0                   |       |
| Cu       | 24.70/0.972 | LDPE     | 27.75/1.093 | 700.0                   |       |
| Cu       | 25.40/1.000 | LDPE     | 27.90/1.098 | 700.0                   |       |
| Cu       | 35.70/1.406 | HDPE     | 39.50/1.550 | > 700.0                 |       |
| Cu       | 46.20/1.890 | HDPE     | 50.00/1.968 | > 700.0                 |       |

\* Value considers maximum load of the cables without irreversible variations of specifications.



# AS12

## AS12 according to MIL-C-39029/102 and /103

### Description

HUBER+SUHNER size 12 contacts are RF contacts designed for installation in MIL-DTL-38999 and similar circular/sub-D connectors. The AS12 contacts are fully compatible with MIL-C-39029/102 and /103 designs but have been internally redesigned to provide exceptional RF performance from DC to 12.4 GHz.

### Compatibility

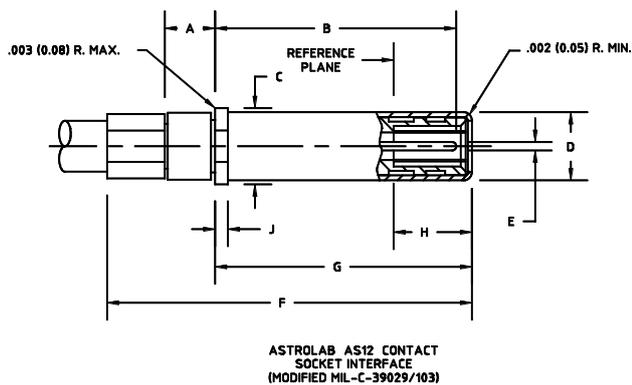
50 Ω AS12 size 12 contacts are intermateable to MIL-C-39029/102 and /103 contacts without restrictions.

### Content

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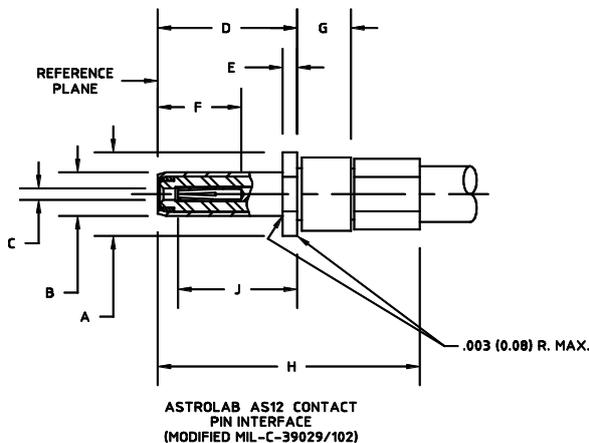
## Interface dimensions (mm/inches)

### Socket



|   | Socket       |              | Pin        |             |
|---|--------------|--------------|------------|-------------|
|   | min.         | max.         | min.       | max.        |
| A | 1.70/0.067   | –            | 4.55/0.179 | 4.62/0.182  |
| B | 15.31/0.603  | 15.57/0.613  | 2.36/0.093 | 2.41/0.095  |
| C | 4.55/0.179   | 4.62/0.182   | 0.64/0.025 | 0.68/0.027  |
| D | 4.01/0.158   | 4.06/0.160   | 7.49/0.295 | 7.62/0.300  |
| E | 0.495/0.0195 | 0.521/0.0205 | 0.74/0.029 | 0.84/0.033  |
| F | –            | 22.76/0.896  | 4.11/0.162 | –           |
| G | 15.74/0.620  | 15.89/0.626  | 1.70/0.067 | –           |
| H | 4.22/0.166   | –            | –          | 14.48/0.570 |
| J | 0.74/0.029   | 0.84/0.033   | 6.30/0.248 | –           |

### Pin



### Interface dimensions conformable to the following standards:

USA: MIL-C-39029  
Size 12 contact interface per MIL-C-39029/102 and /103

# AS12

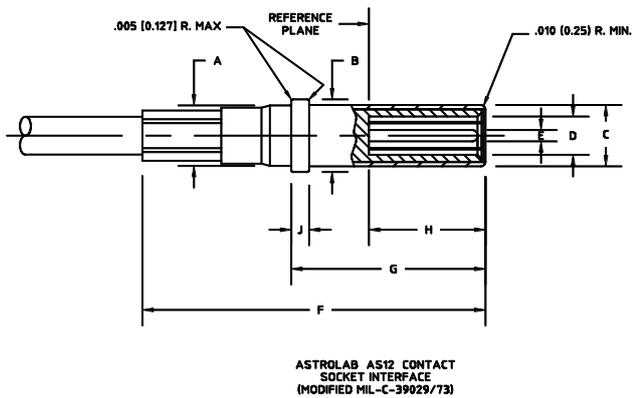
AS12 according to MIL-C-29029/73 BIN-396, -397 and -555 and MIL-C-39029/74

## Compatibility

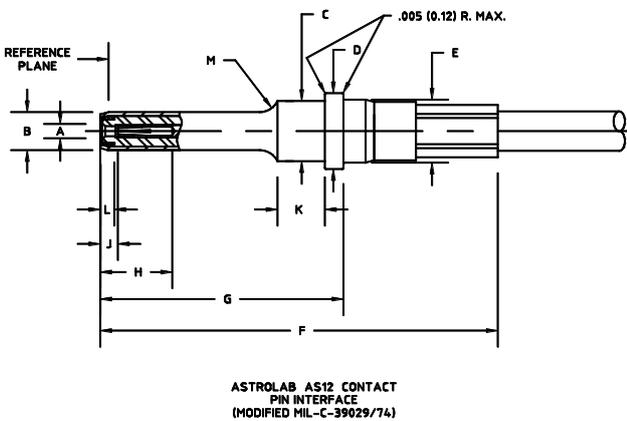
50 Ω AS12 size 12 contacts are intermateable to MIL-C-39029/102 and /103 contacts without restrictions.

## Interface dimensions, inches (mm)

### Socket



### Pin



|   | Socket      |             | Pin         |            |
|---|-------------|-------------|-------------|------------|
|   | min.        | max.        | min.        | max.       |
| A | 3.94/0.155  | 4.01/0.158  | 0.89/0.035  | –          |
| B | 4.75/0.187  | 4.85/0.190  | 2.36/0.093  | 2.41/0.095 |
| C | 4.01/0.158  | 4.09/0.161  | 3.76/0.148  | 3.84/0.151 |
| D | 2.46/0.097  | 2.54/0.100  | 4.75/0.187  | 4.83/0.190 |
| E | 0.71/0.028  | 0.749/0.295 | 3.94/0.155  | 4.01/0.158 |
| F | see table 1 | –           | 26.11/1.028 |            |
| G | see table 1 | 15.39/0.606 | 15.57/0.613 |            |
| H | 7.62/0.300  | –           | 7.62/0.300  | –          |
| J | 1.12/0.044  | 1.22/0.048  | 0.76/0.030  | 1.27/0.050 |
| K | –           | –           | 2.92/0.115  | 3.05/0.120 |
| L | –           | –           | –           | 0.76/0.030 |
| M | –           | –           | 1.14/0.045  | 1.40/0.055 |

Table 1

| BIN Code      | F                          | G                          |
|---------------|----------------------------|----------------------------|
| 396, 397, 398 | 23.24/0.915<br>23.03/0.907 | 12.70/0.500<br>12.50/0.492 |
| 555           | 28.70/1.13<br>28.44/1.12   | 17.91/0.715<br>17.90/0.705 |

### Interface dimensions conformable to the following standards:

USA: MIL-C-39029  
Size 12 contact interface per MIL-C-39029/73 BIN codes 396, 397, 398 and 555, and MIL-C-39029/74

# AS12 – technical data

| Electrical data       | Requirements  |
|-----------------------|---|
| Electrical data       | 50 $\Omega$   |
| Impedance             | MIL-C-39029/73 and /74: DC to 12.4 GHz<br>MIL-C-39029/102 and /103: DC to 2 GHz |
| Frequency range       | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max.       |
| Contact resistance    | 500 Vrms at sea level   |
| DWV                   | 5 000 megaohms min.   |
| Insulation resistance | 125 Vrms at 70 000 ft   |
| Corona levels         | 325 Vrms at 5 MHz   |
| RF high potential     | 80 dB max. at 2 GHz<br>60 dB max. at 2 to 12.4 GHz                              |
| RF leakage            | < 2 Mu  |
| Magnetic permeability | MIL-C-39029/73 and /74: 1.35:1 to 12.4 GHz                                      |
| VSWR                  | MIL-C-39029/102 and /103: 1.25:1 to 2 GHz                                       |
| Insertion loss        | 0.09 + 0.08 $\sqrt{f}$ in GHz   |

| Mechanical data    | Requirements  |
|--------------------|---|
| Durability         | 500 cycles min.   |
| Force to engage    | AS12 pin: 20 oz (5.560 N) max.<br>AS12 socket: 36 oz (10.008 N) max.  |
| Force to disengage | AS12 pin: 0.4 oz (0.111 N) min.<br>AS12 socket: 2.5 oz (0.695 N) min. |

| Environmental data  | Requirements                                   |
|---------------------|--|
| Temperature range   | -55 to +125 °C                                 |
| Thermal shock       | MIL-STD-202, method 107, condition B           |
| Moisture resistance | MIL-STD-202, method 106                        |
| Corrosion           | MIL-STD-202, method 101, condition B           |
| Sine vibration      | MIL-STD-202, method 204, condition D           |
| Random vibration    | MIL-STD-202, method 214, condition K-I, 46.3 g |
| Shock               | MIL-STD-202, method 213, condition I           |

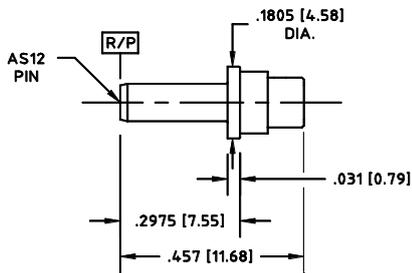
# AS12 – technical data

| <b>Material data</b>    |   |   |
|-------------------------|---|---|
| <b>Cable connectors</b> | <b>Material</b>   | <b>Plating</b>  |
| Body                    | brass per ASTM B-16 or beryllium copper per ASTM B-196                                  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| Contact                 | beryllium copper per ASTM B-196   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| Dielectric              | PTFE per ASTM D-1710, type I, grade 1   | –   |
| Ferrule                 | brass per ASTM B-135  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| <b>Adapters</b>         | <b>Material</b>   | <b>Plating</b>  |
| Body                    | brass per ASTM B-16   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 |
|                         | #303 SS per ASTM A- 582   | passivated per SAE-AMS-2700   |
| Nut                     | #303 SS per ASTM A- 582   | passivated per SAE-AMS-2700   |
| Contact                 | beryllium copper per ASTM B-196   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| Dielectric              | PTFE per ASTM D-1710, type I, grade 1 and Noryl® PPO modified polyphenylene oxide resin | –   |
| Retaining ring          | beryllium copper per ASTM B-197   | –   |
| Gasket                  | silicone rubber per SAE-AMS-3304  | –   |

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

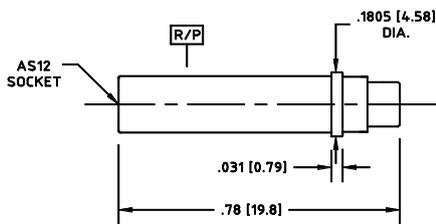
# AS12 – cable connectors

## AS12 pin contact (MIL-C-39029/102)



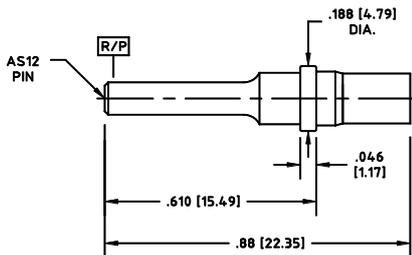
| HUBER+SUHNER type | Item no. | Cable group (example)              | Packaging |
|-------------------|----------|------------------------------------|-----------|
| 29930-2           | 85176526 | Y3, Y16, Y11 (0.086 in. (2.18 mm)) | single    |

## AS12 socket contact (MIL-C-39029/103)



| HUBER+SUHNER type | Item no. | Cable group (example)              | Packaging |
|-------------------|----------|------------------------------------|-----------|
| 29931-2           | 80368775 | Y3, Y16, Y11 (0.086 in. (2.18 mm)) | single    |

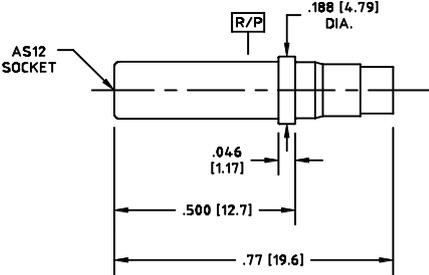
## AS12 pin contact (MIL-C-39029/74)



| HUBER+SUHNER type | Item no. | Cable group (example)              | Packaging |
|-------------------|----------|------------------------------------|-----------|
| 29933-2           | 85116427 | Y3, Y16, Y11 (0.086 in. (2.18 mm)) | single    |

# AS12 – cable connectors

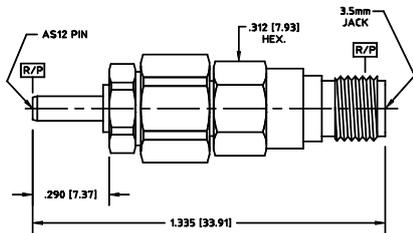
## AS12 socket contact (MIL-C-39029/73)



| HUBER+SUHNER type | Item no. | Cable group (example)              | Packaging |
|-------------------|----------|------------------------------------|-----------|
| 29934-2           | 85116469 | Y3, Y16, Y11 (0.086 in. (2.18 mm)) | single    |

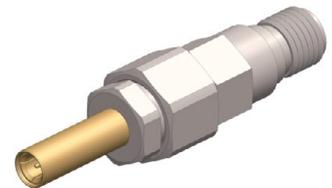
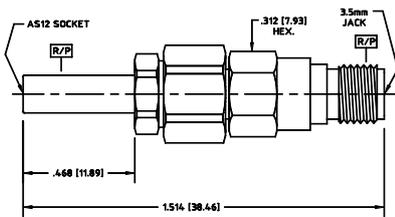
# AS12 – adapters

## AS12 pin contact (MIL-C-39029/102) – 3.5 mm jack



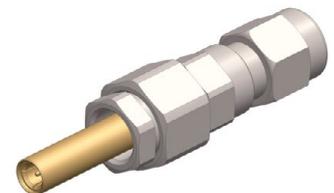
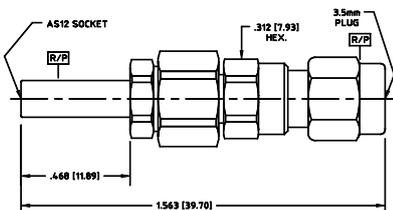
| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29932-1           | 80320105 | single    |

## AS12 socket contact (MIL-C-39029/103) – 3.5 mm jack



| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29932-2           | 80320106 | single    |

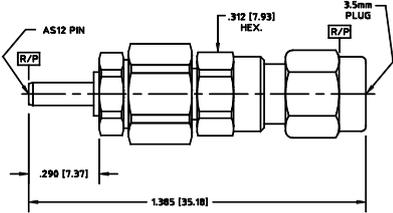
## AS12 socket contact (MIL-C-39029/103) – 3.5 mm plug



| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29932-3           | 80360204 | single    |

# AS12 – adapters

## AS12 pin contact (MIL-C-39029/102) – 3.5 mm plug



| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29932-4           | 80360205 | single    |

# AS16

## Description

HUBER+SUHNER size 16 contacts are RF contacts designed for installation in MIL-DTL-38999 and similar circular/sub-D connectors. The AS16 contacts are fully compatible with MIL-C-39029/102 and /103 designs but have been internally redesigned to provide exceptional RF performance from DC to 2 GHz. The AS16 contact is a smaller diameter RF blind mate solution than the AS12 interface.

## Compatibility

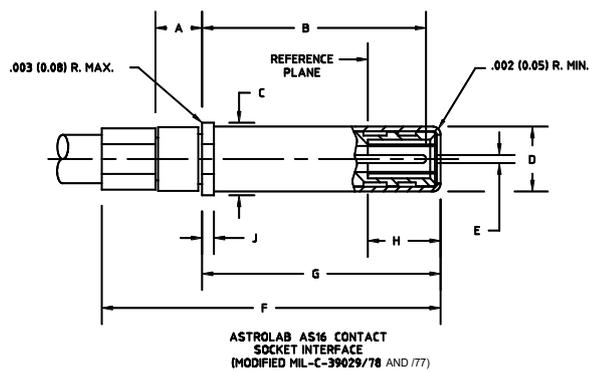
50 Ω AS16 size 16 contacts are intermateable to MIL-C-39029/76, /77 and /78 contacts without restrictions.

## Content

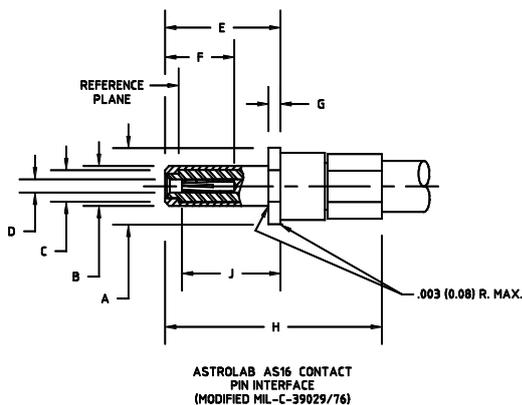
|                                   |    |
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| Description                       | 51 |
| Compatibility                     | 51 |
| Interface dimensions in mm/inches | 51 |
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| PCB mount connectors              | 54 |
| Adapters                          | 55 |

## Interface dimensions (mm/inches)

### Socket



### Pin



|   | Socket       |              | Pin          |             |
|---|--------------|--------------|--------------|-------------|
|   | min.         | max.         | min.         | max.        |
| A | 1.60/0.063   | –            | 3.23/0.127   | 3.30/0.130  |
| B | see table 1  | 1.562/0.0615 | 1.613/0.0635 |             |
| C | 3.23/0.127   | 3.30/0.130   | 0.97/0.038   | 1.04/0.041  |
| D | –            | 2.87/0.113   | 0.46/0.018   | 0.56/0.022  |
| E | 0.368/0.0145 | 0.394/0.0155 | 7.49/0.295   | 7.62/0.300  |
| F | see table 1  | 4.22/0.166   | –            |             |
| G | see table 1  | 0.74/0.029   | 0.84/0.033   |             |
| H | 4.22/0.166   | –            | –            | 14.48/0.570 |
| J | 0.74/0.029   | 0.84/0.033   | 6.65/0.262   | –           |

Table 1

|   | Socket         |             |                |             |
|---|----------------|-------------|----------------|-------------|
|   | MIL-C-39029/78 |             | MIL-C-39029/77 |             |
|   | min.           | max.        | min.           | max.        |
| B | 6.71/0.264     | 6.95/0.274  | 15.27/0.601    | 15.52/0.611 |
| F | –              | 14.22/0.560 | –              | 22.76/0.896 |
| G | 7.09/0.279     | 7.34/0.289  | 15.75/0.620    | 15.90/0.626 |

**Interface dimensions conformable to the following standards:**

USA: MIL-C-39029/76, /77, /78

# AS16 – technical data

| Electrical data       | Requirements  |
|-----------------------|---|
| Impedance             | 50 $\Omega$   |
| Frequency range       | DC to 2 GHz   |
| Contact resistance    | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max. |
| DWV                   | 375 Vrms at sea level   |
| Insulation resistance | 5000 megohms min.   |
| Corona levels         | 90 Vrms at 70 000 ft  |
| RF high potential     | 190 Vrms at 5 MHz   |
| RF leakage            | 80 dB max. at 2 GHz   |
| Magnetic permeability | < 2 $\mu$   |
| VSWR                  | 1.2:1 to 2 GHz  |
| Insertion loss        | 0.09 + 0.08 $\sqrt{f}$ in GHz   |

| Mechanical data    | Requirements  |
|--------------------|---|
| Durability         | 500 cycles min.   |
| Force to engage    | AS16 pin: 14 oz (3.892 N) max.<br>AS16 socket: 36 oz (10.008 N) max.  |
| Force to disengage | AS16 pin: 0.4 oz (0.111 N) min.<br>AS16 socket: 1.5 oz (0.417 N) min. |

| Environmental data  | Requirements                                   |
|---------------------|--|
| Temperature range   | -55 to +125 °C                                 |
| Thermal shock       | MIL-STD-202, method 107, condition B           |
| Moisture resistance | MIL-STD-202, method 106                        |
| Corrosion           | MIL-STD-202, method 101, condition B           |
| Sine vibration      | MIL-STD-202, method 204, condition D           |
| Random vibration    | MIL-STD-202, method 214, condition K-I, 46.3 g |
| Shock               | MIL-STD-202, method 213, condition I           |

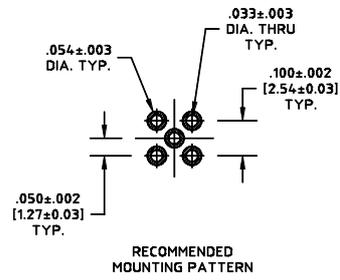
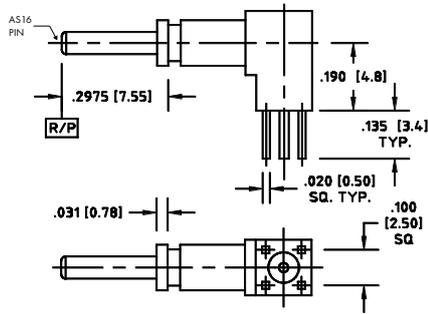
# AS16 – technical data

| <b>Material data</b>            |                                       |  |
|---------------------------------|---------------------------------------|--|
| <b>Cable and PCB connectors</b> | <b>Material</b>                       | <b>Plating</b>   |
| Body and contact                | beryllium copper per ASTM B-196       | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1                                |
| Dielectric                      | PTFE per ASTM D-1710, type I, grade 1 | –  |
| Ferrule                         | brass per ASTM B-135                  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1                                |
| <b>Adapters</b>                 | <b>Material</b>                       | <b>Plating</b>   |
| Body                            | #303 SS per ASTM A- 582               | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1 or passivated per SAE-AMS-2700 |
| Sheath                          | #303 SS per ASTM A- 582               | passivated per SAE-AMS-2700  |
| Contact                         | beryllium copper per ASTM B-196       | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1                                |
| Dielectric                      | PTFE per ASTM D-1710, type I, grade 1 | –  |

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

# AS16 – PCB mount connectors

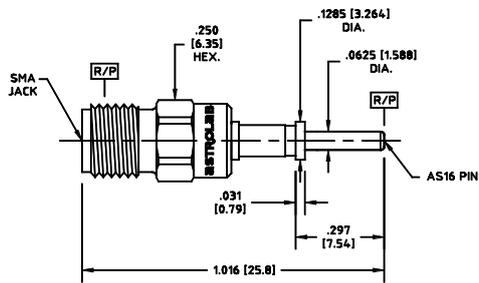
## AS16 pin contact (MIL-C-39029/76)



| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29556A-BM1        | 80318446 | single    |

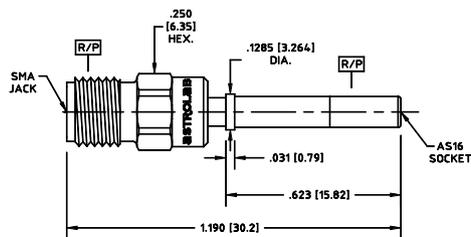
# AS16 – adapters

## AS16 pin contact (MIL-C-39029/76) – SMA jack

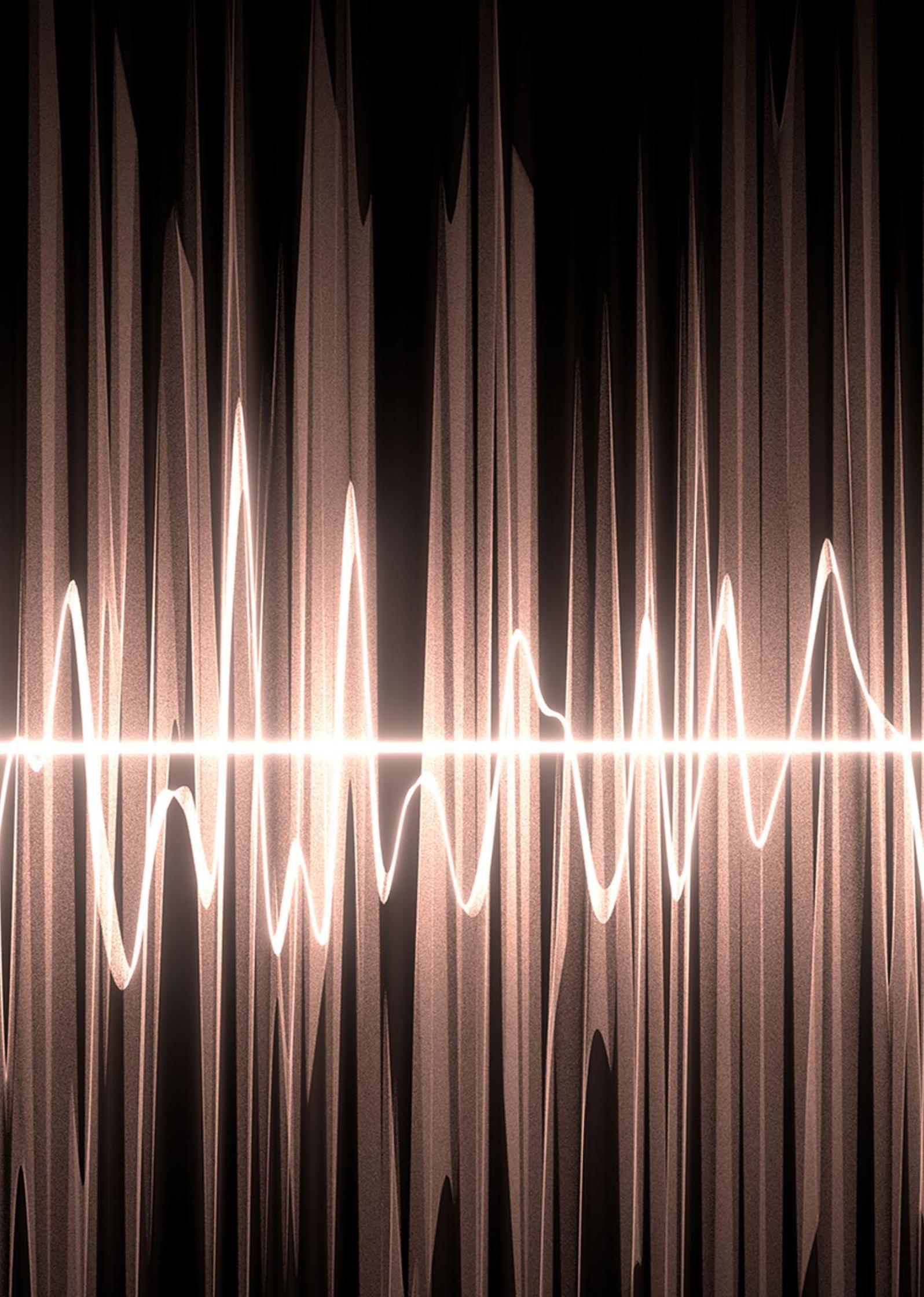


| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29557-4           | 80318451 | single    |

## AS16 socket contact (MIL-C-39029/77) – SMA jack



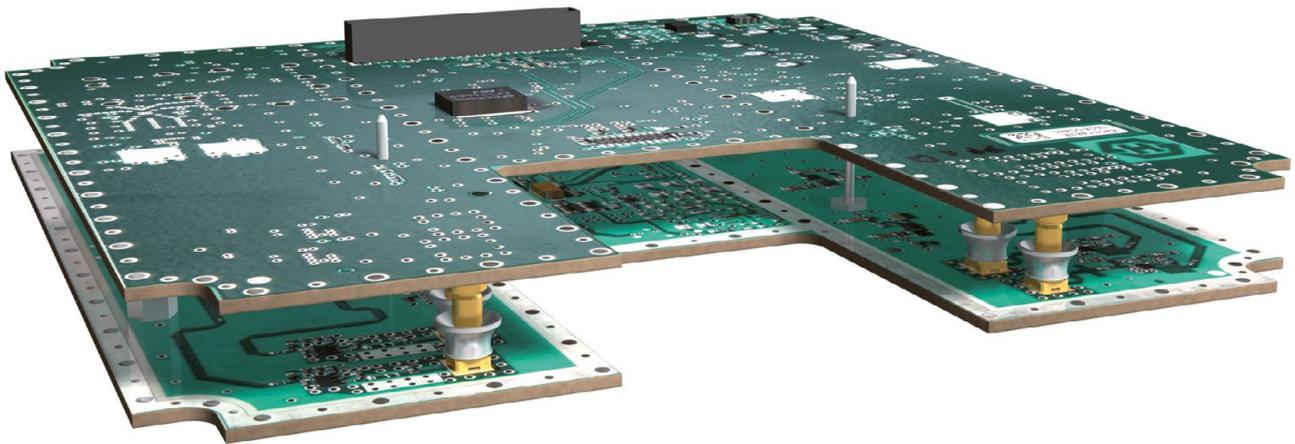
| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29557-5           | 80318453 | single    |



# Board-to-board

## Content

|             |    |
|-------------|----|
| Series MBX  | 59 |
| Series MFBX | 69 |
| Series MMBX | 75 |



## Benefits

### Lower total cost of ownership (TCO)

Total Cost of Ownership (TCO) is reduced thanks to the infinite number of design options made possible by the high tolerance compensation between boards (**axial float  $\pm 1.2$  mm**) that hold excellent electrical values.

### Excellent Radio Frequency (RF) performance

Achieve maximum performance and **excellent return loss (RL)** rates at higher frequencies. The high power handling (**260W**) allows to transmit high power in compact modules.

### Save space

Small **board-to-board solutions (6.7mm)** save space, which enable smaller radio designs with less weight.

### Easy to use and reliable connection

Save time during the assembly process with our **blind mateable** feature, which ensures a safe, **reliable and secure connection** between connectors without needing to see the physical connection made.

### Automated assembly process

Many of our parts are produced from our **automated assembly** plant using innovative production technologies like robotic assembly, stamp-bending and injection molding that allow for **high-quality** product produced in high quantities in very little time.

### Customisable:

The board-to-board solutions can be tailored to meet your specific needs.

# One product family covering all board-to-board applications

## MBX



- Very high axial float – best in class
- High output power
- Excellent return loss values
- Blind mateable

## MBX 2<sup>nd</sup> generation



- Very high axial float – best in class
- Excellent return loss values
- Blind mateable

## MFBX



- High axial float
- Very good shielding
- Blind mateable
- High volume production processes
- Price/Performance optimized

## MFBX Evo



- High axial float
- Excellent return loss values
- Very good shielding
- Blind mateable
- High volume production process
- Cost optimized

## MMBX



- Smallest board-to-board distance
- Very high frequencies
- Very good return loss values
- Blind mateable

| Characteristics                                      | MBX and MBX <sup>2nd</sup>  | MFBX and MFBX Evo   | MMBX  |
|--|---|---|---|
| Frequency  | DC to 6 GHz   | DC to 6 GHz   | DC to 12.4 GHz  |
| Axial float (misalignment)                           | ± 1.2 mm  | ± 0.8 mm  | ± 0.3 mm  |
| Radial float (misalignment)                          | ± 0.6 mm<br>(at 13 mm board-to-board distance)<br>± 1.0 mm<br>(≥ 18 mm board-to-board distance) | ± 0.8 mm  | ± 0.4 mm<br>(at 6.7 mm board-to-board distance)                     |
| Min. board-to-board distance                         | 13 mm ± 1.2 mm  | MFBX: 13 mm ± 0.8 mm<br>MFBX Evo: 23.4mm ± 0.8 mm                           | 6.7 mm ± 0.3 mm   |
| Power at room temperature, at 2.4 GHz <sup>(1)</sup> | typical 260W (MBX)<br>typical 240W (MBX 2 <sup>nd</sup> )                                       | typical 200W (machined adapter)<br>typical 150W (stamp and bending adapter) | typical 200 W   |
| Key features   | • Very high float<br>• High RF power  | • High float<br>• Cost optimized  | • Small b-t-b distances<br>• High frequencies                       |
| Use for Applications with                            | Very high axial misalignment and high performance (return loss, power)                          | Very high quantities and high axial misalignment                            | small board-to-board distance and high frequencies (RF performance) |

Note (1): Admissible power varies depending on the specific application, cooling device, boundary conditions and environment.

# Series MBX – miniature board connectors

## Description

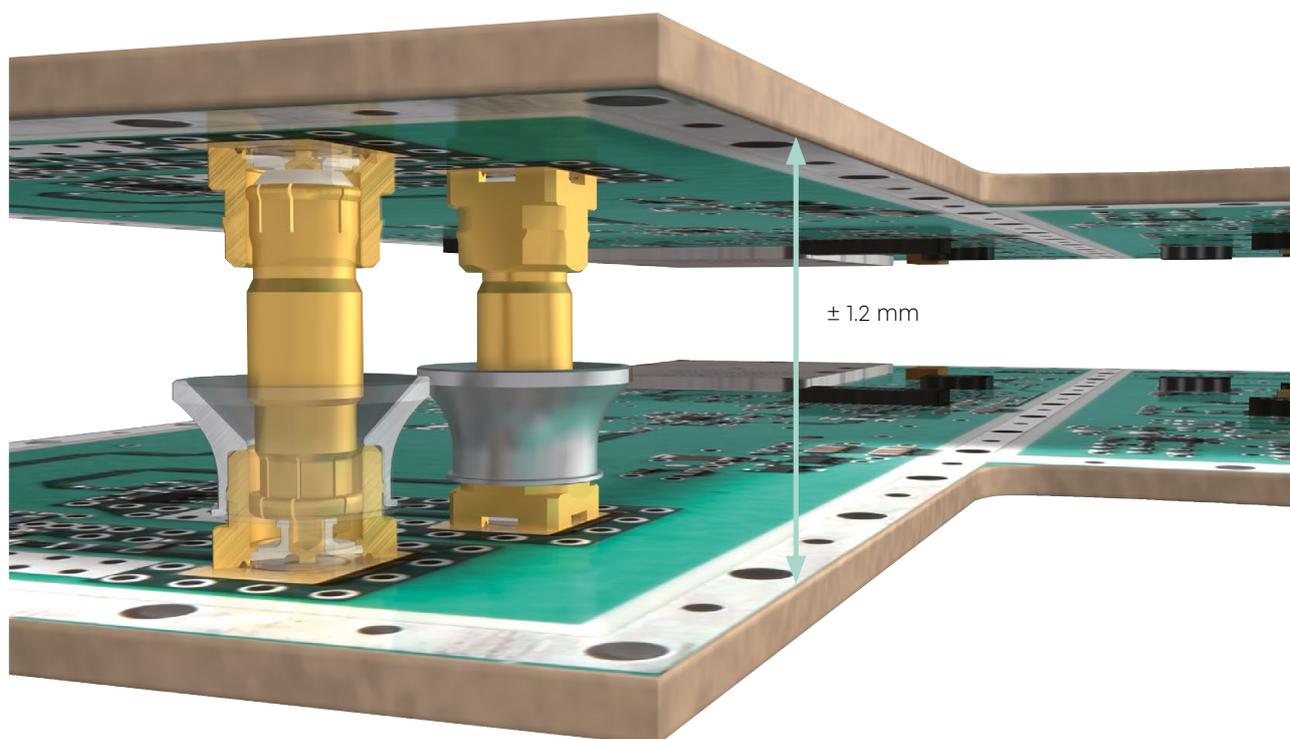
HUBER+SUHNER MBX and MBX 2nd generation connectors are especially developed for board-to-board and board-to-module RF interconnections. The mechanical design is outstanding, allowing the MBX to cope with mechanical misalignment in radial and axial directions and still hold an excellent electrical performance.

MBX fulfils higher requirements with best in class axial misalignment of  $\pm 1.2$  mm. MBX is the answer to higher integration and miniaturisation. It is the perfect solution for multiple connections from board-to-board/board-to-module and complex stack-ups in radio module applications.

## Content

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| Adapters within series        | 65 |
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| Assembly and disassembly tool | 67 |

| Characteristics                                      | MBX and MBX <sup>2nd</sup>  |
|--|---|
| Frequency  | DC to 6 GHz   |
| Axial float (misalignment)                           | $\pm 1.2$ mm  |
| Radial float (misalignment)                          | $\pm 0.6$ mm (at 13 mm board-to-board distance)<br>$\pm 1.0$ mm ( $\geq 18$ mm board-to-board distance) |
| Min. board-to-board distance                         | 13 mm   |
| Min. panel-to-board distance                         | < 13 mm depending on connector  |
| Min. panel-to-panel distance                         | < 13 mm depending on connector  |
| Power at room temperature, at 2.4 GHz <sup>(1)</sup> | typical 260 W (MBX)<br>typical 240 W (MBX <sup>2nd</sup> )  |



Note (1): Admissible power varies depending on the specific application, cooling device, boundary conditions and environment.

# Series MBX – design guideline

## Working range (axial and radial)

In mated condition, the two PCB connector have to be aligned within the dimension given for the axial and radial working range.

The axial working range is  $\pm 1.2$  mm, the radial working range is  $\pm 1.0$  mm.

In contradiction to the MMBX interface, the tilt of the adapter is limited with MBX. The great advantage of this feature is that there is a constant connecting range/radial working range for all adapter lengths and thus the same funnel (pull-in range) can be used.

## Connecting range

The two PCB connector have to be aligned within the dimension given for connecting range. The connecting range is  $\pm 1.0$  mm and is equivalent to the max. allowed misalignment between two PCB boards when mating.

In order to guarantee a blind mateable connection, the tilted adapter will be guided by the funnel of the opposite connector.

## Recommendation

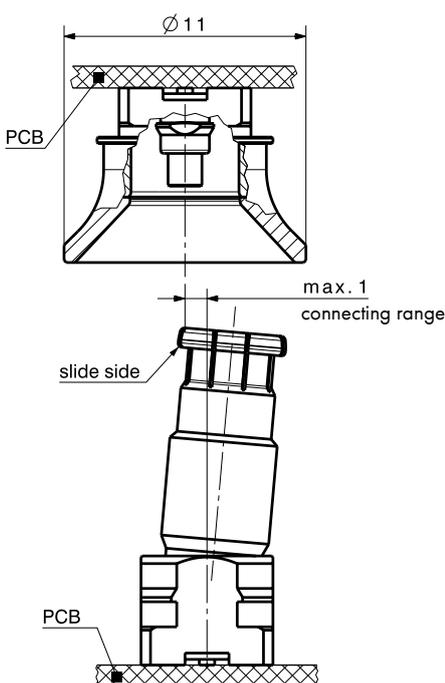
HUBER+SUHNER recommends using guiding pins to align the boards within the connecting range and working range. Distance holders to maintain the axial misalignment within working range are also of benefit.

HUBER+SUHNER provides outline drawings for every application with the relevant mechanical dimensions that need to be considered when designing-in MBX. 3D STEP files are available on [www.hubersuhner.com](http://www.hubersuhner.com).

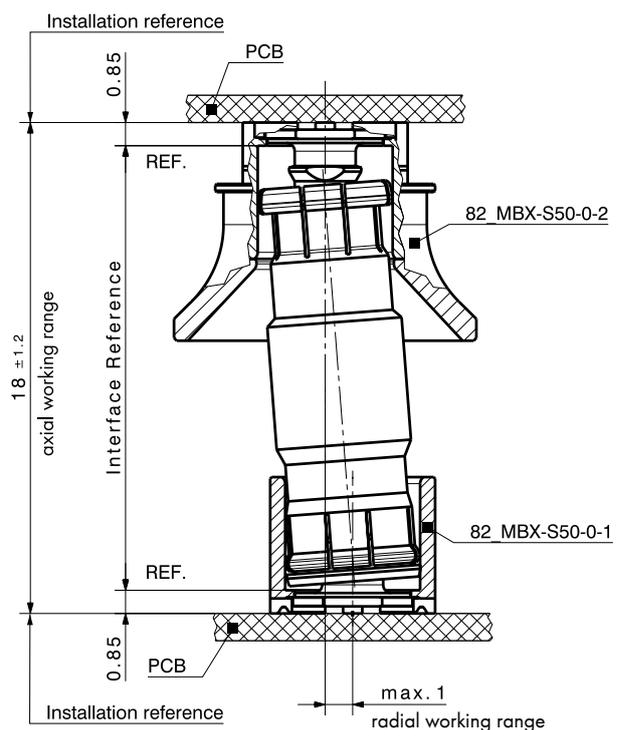
## MBX 2<sup>nd</sup> generation

An alternative, cost effective and reliable solution are the 2<sup>nd</sup> generation MBX connectors. By keeping best in class mechanical characteristics like working and connecting range these connectors are designed to meet today's requirements within the communication industry. Standard MBX and 2<sup>nd</sup> generation MBX are intermateable.

### Connecting range



### Working range



# Series MBX – technical data

## MBX PCB connectors – board-to-board/adapters within series

| Electrical data   | MBX  | MBX 2 <sup>nd</sup>                    |  |  |
|---|--|--|--|--|
| Impedance   | 50 Ω   |  |  |  |
| Frequency range   | DC to 6 GHz  |  |  |  |
| Dielectric withstanding voltage (at sea level)            | 1 kV rms, 50 Hz  |  |  |  |
| Working voltage (at sea level)                            | ≤ 330 V rms, 50 Hz   |  |  |  |
| Insulation resistance                                     | ≥ 1 GΩ   |  |  |  |
| Contact resistance<br>· Centre contact<br>· Outer contact | ≤ 5 mΩ<br>≤ 2.5 mΩ   | ≤ 5 mΩ<br>≤ 5 mΩ                       |  |  |
| Return loss/VSWR  | typical values for a board-to-board connection (measured on a board) |  |  |  |
|   | axial misalignment   | DC to 2.5 GHz                          | 2.5 to 4 GHz                           | 4 to 6 GHz                             |
|   | ± 1.2 mm<br>± 0.8 mm<br>± 0.4 mm                                     | 22 dB/1.17<br>23 dB/1.15<br>26 dB/1.11 | 19 dB/1.25<br>20 dB/1.22<br>21 dB/1.20 | 15 dB/1.43<br>16 dB/1.38<br>18 dB/1.29 |
| RF-leakage (interface only)                               | ≥ 70 dB (DC to 6 GHz)  |  |  |  |
| Power (room temperature)                                  | typical 260 W at 2.4 GHz   | typical 240 W at 2.4 GHz               |  |  |

| Mechanical data                  | MBX   | MBX 2 <sup>nd</sup> |  |  |
|----------------------------------|---|---------------------|--|--|
| Engagement force (slide-side)    | ≤ 15 N/3.4 lbs  |                     |  |  |
| Disengagement force (slide-side) | ≤ 15 N/3.4 lbs  |                     |  |  |
| Durability (matings)             | 100   | 50                  |  |  |
| Axial float (misalignment)       | ± 1.2 mm  |                     |  |  |
| Radial float (misalignment)      | depending on the adapter<br>± 0.6 mm (at 13 mm board-to-board distance)<br>± 1.0 mm (≥ 18 mm board-to-board distance) |                     |  |  |

| Environmental data  | MBX                                     | MBX 2 <sup>nd</sup> |  |   |
|---------------------|---|---------------------|--|---|
| Temperature range   | -55 to +155 °C/-67 to +311 °F           |                     |  |   |
| Climatic category   | 55/155/10                               |                     |  |   |
| Thermal shock       | MIL-STD-202, method 107 G, condition B1 |                     |  |   |
| Moisture resistance | MIL-STD-202, method 106 F               |                     |  |   |
| Vibration           | MIL-STD-202, method 204 D, condition A  |                     |  |   |
| Mechanical shock    | MIL-STD-202, method 213 B, condition B  |                     |  |   |
| Corrosion           | MIL-STD-202, method 101, condition B    |                     |  | - |

| Processing data  | MBX                                  | MBX 2 <sup>nd</sup> |  |  |
|--|--------------------------------------|---------------------|--|--|
| Adherent to the print<br>· Shearing<br>· Pulling (vertical to PCB) | ≥ 150 N/33.7 lbs<br>≥ 150 N/33.7 lbs |                     |  |  |

| Material data   |                                     |                                  |
|-----------------|-------------------------------------|----------------------------------|
| Connector parts | Material                            | Plating                          |
| Centre contact  | brass/bronze/copper-beryllium alloy | SUCOPRO® gold plating            |
| Outer contact   | brass/bronze                        | SUCOPRO® gold plating/SUCOPLATE® |
| Body            | brass                               | SUCOPRO® gold plating/SUCOPLATE® |
| Insulators      | LCP/PTFE/PFA                        |                                  |
| Funnel          | brass/PA                            | SUCOPLATE® /-                    |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MBX – technical data

## MBX cable connectors

| Electrical data                                       | Requirements   |
|---|--|
| Impedance   | 50 $\Omega$  |
| Frequency range                                       | DC to 6 GHz  |
| Dielectric withstanding voltage (at sea level)        | 750 V rms, 50 Hz   |
| Working voltage (at sea level)                        | 250 V rms, 50 Hz   |
| Insulation resistance                                 | $\geq 1 \text{ G}\Omega$   |
| Contact resistance<br>Centre contact<br>Outer contact | $\leq 5 \text{ m}\Omega$<br>$\leq 2.5 \text{ m}\Omega$                               |
| Return loss/VSWR<br>(typical values)                  | $\geq 30 \text{ dB}/1.07$ (DC to 2.5 GHz)<br>$\geq 25 \text{ dB}/1.12$ (2.5 – 6 GHz) |

| Mechanical data      | Requirements             |
|----------------------|--------------------------|
| Engagement force     | max. 30 N/max. 6.7 lbs   |
| Disengagement force  | 8 to 30 N/1.8 to 6.7 lbs |
| Durability (matings) | 100                      |

| Environmental data  | Test conditions                         |
|---------------------|---|
| Temperature range   | -55 to +155°C/-67 to +311°F             |
| Climatic category   | 55/155/10                               |
| Thermal shock       | MIL-STD-202, method 107 G, condition A1 |
| Moisture resistance | MIL-STD-202, method 106 F               |
| Corrosion           | MIL-STD-202, method 101, condition B    |
| Vibration           | MIL-STD-202, method 204 D, condition A  |
| Mechanical shock    | MIL-STD-202, method 213 B, condition B  |

| Material data   |                                     |                                  |
|-----------------|-------------------------------------|----------------------------------|
| Connector parts | Material                            | Plating                          |
| Centre contact  | brass/bronze/copper-beryllium alloy | SUCOPRO® gold plating            |
| Outer contact   | bronze/copper-beryllium alloy       | SUCOPRO® gold plating            |
| Body            | brass                               | SUCOPRO® gold plating/SUCOPLATE® |
| Crimp ferrules  | copper                              | gold/SUCOPLATE®                  |
| Insulators      | LCP/PTFE/PFA                        |                                  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MBX – PCB connectors

## Straight PCB jacks (female)

### Surface mount type SMT

- MBX

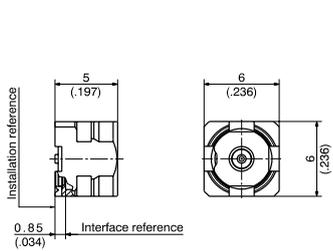


Fig. 1

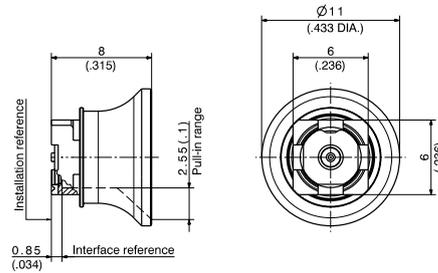


Fig. 2



| HUBER+SUHNER type   | Item no.                         | Packaging                                | Soldering pad | Fig. |
|---|----------------------------------|--|---------------|------|
| 82_MBX-S50-0-1/111_NE<br>82_MBX-S50-0-1/111_NH<br>82_MBX-S50-0-1/111_NM | 84104680<br>84094199<br>84094200 | single<br>bulk 100 pcs.<br>tape and reel | ML 173        | 1    |
| 82_MBX-S50-0-2/113_NE<br>82_MBX-S50-0-2/113_NH<br>82_MBX-S50-0-2/113_NM | 84104681<br>84094287<br>84094288 | single<br>bulk 100 pcs.<br>tape and reel |               | 2    |

### Surface mount type SMT

- MBX 2<sup>nd</sup> generation

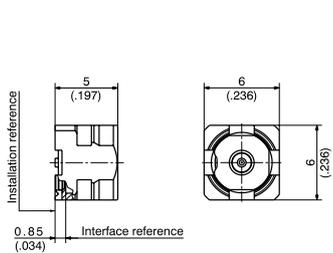


Fig. 1

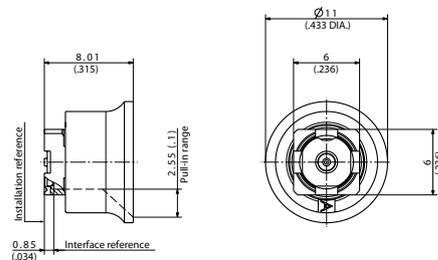


Fig. 2



| HUBER+SUHNER type  | Item no.                         | Packaging                                | Soldering pad | Fig. |
|--|----------------------------------|--|---------------|------|
| 82_MBX-S50-0-23/111_NE<br>82_MBX-S50-0-23/111_NH<br>82_MBX-S50-0-23/111_NM | 85018772<br>85018773<br>85015265 | single<br>bulk 100 pcs.<br>tape and reel | ML 173        | 1    |
| 82_MBX-S50-0-24/111_NE<br>82_MBX-S50-0-24/111_NH<br>82_MBX-S50-0-24/111_NM | 85018775<br>85018776<br>85018774 | single<br>bulk 100 pcs.<br>tape and reel |               | 2    |

# Series MBX – PCB connectors

## Straight PCB jacks (female)

### Through hole type THT

- MBX

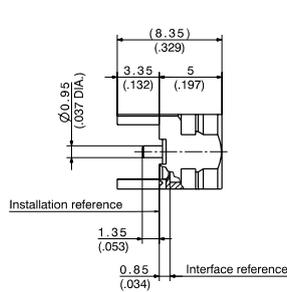


Fig. 1

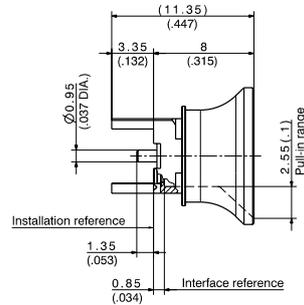
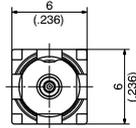
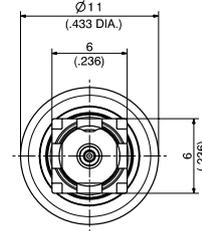


Fig. 2



| HUBER+SUHNER type    | Item no. | Packaging                                | Soldering pad | Fig. |
|----------------------|----------|--|---------------|------|
| 82_MBX-50-0-3/111_NE | 84104683 | single<br>bulk 100 pcs.<br>tape and reel | ML 174        | 1    |
| 82_MBX-50-0-3/111_NH | 84094366 |  |               |      |
| 82_MBX-50-0-3/111_NM | 84094369 |  |               |      |
| 82_MBX-50-0-4/113_NE | 84104684 | single<br>bulk 100 pcs.<br>tape and reel |               | 2    |
| 82_MBX-50-0-4/113_NH | 84094405 |  |               |      |
| 82_MBX-50-0-4/113_NM | 84094406 |  |               |      |

### Through hole type THT

- MBX 2<sup>nd</sup> generation

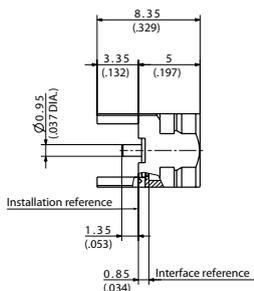
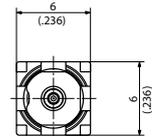


Fig. 1



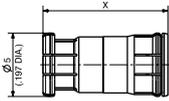
| HUBER+SUHNER type     | Item no. | Packaging                                | Soldering pad | Fig. |
|-----------------------|----------|--|---------------|------|
| 82_MBX-50-0-28/111_NE | 85018976 | single<br>bulk 100 pcs.<br>tape and reel | ML 174        | 1    |
| 82_MBX-50-0-28/111_NH | 85018972 |  |               |      |
| 82_MBX-50-0-28/111_NM | 85018970 |  |               |      |

# Series MBX – adapters within series

## Straight adapters

### Plug to plug (male)

- MBX



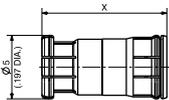
Black insulator: slide-side  
White insulator: snap-side

| HUBER+SUHNER type                            | Item no.             | Packaging               | Board-to-board distance | Adapter length X  |
|--|----------------------|-------------------------|-------------------------|-------------------|
| 32_MBX-50-0-1/111_NE<br>32_MBX-50-0-1/111_NH | 84104690<br>84142599 | single<br>bulk 100 pcs. | 13 mm/0.512 in.         | 9.7 mm/0.382 in.  |
| 32_MBX-50-0-2/111_NE<br>32_MBX-50-0-2/111_NH | 84104691<br>84094285 | single<br>bulk 100 pcs. | 18 mm/0.709 in.         | 14.7 mm/0.579 in. |
| 32_MBX-50-0-3/111_NE<br>32_MBX-50-0-3/111_NH | 84104692<br>84094387 | single<br>bulk 100 pcs. | 28 mm/1.102 in.         | 24.6 mm/0.969 in. |

Adapters with other lengths available upon request.

### Plug to plug (male)

- MBX 2<sup>nd</sup> generation



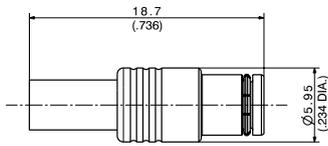
Black insulator: slide-side  
White insulator: snap-side

| HUBER+SUHNER type                            | Item no.             | Packaging               | Board-to-board distance | Adapter length X  |
|--|----------------------|-------------------------|-------------------------|-------------------|
| 32_MBX-50-0-1/133_NE<br>32_MBX-50-0-1/133_NH | 85001197<br>85001201 | single<br>bulk 100 pcs. | 13 mm/0.512 in.         | 9.7 mm/0.382 in.. |
| 32_MBX-50-0-2/133_NE                         | 85001211             | single                  | 18 mm/0.709 in.         | 14.7 mm/0.579 in. |

Adapters with other lengths available upon request.

# Series MBX – cable connectors

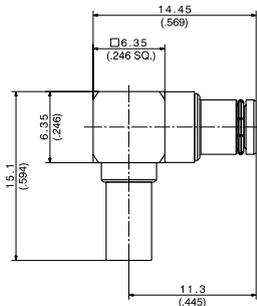
## Straight cable plugs (male)



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging     | Assembly instruction |
|----------------------|----------|-----------------------|---------------|----------------------|
| 11_MBX-50-2-1/113_NE | 84104694 | U4 (ENVIROFLEX_316_D) | single        | 0000333519           |
| 11_MBX-50-2-1/113_NH | 84093696 |                       | bulk 100 pcs. |                      |

## Right angle cable plugs (male)

### Through hole type THT



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction |
|----------------------|----------|-----------------------|-----------|----------------------|
| 16_MBX-50-2-1/113_NE | 84104696 | U4 (ENVIROFLEX_316_D) | single    | 0000326568           |

# Series MBX – receptacles with solder end

## Receptacles, jack (female)

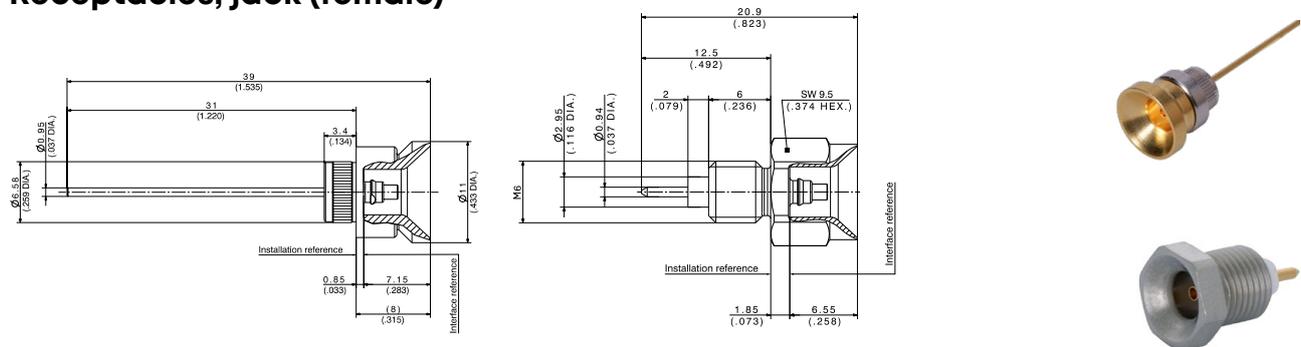


Fig. 1

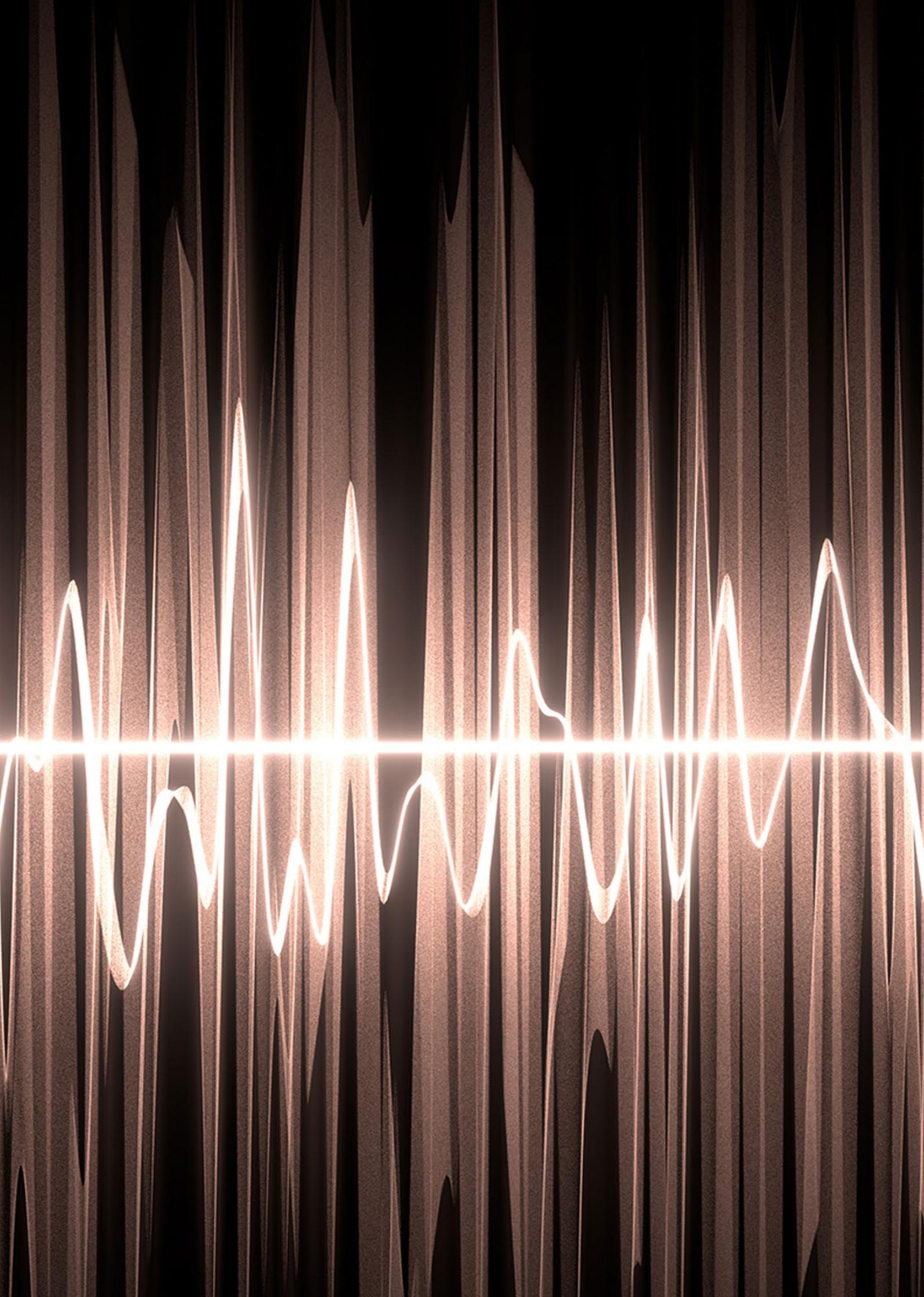
Fig. 2

| HUBER+SUHNER type     | Item no. | Packaging           | Assembly instruction | Fig. |
|-----------------------|----------|---------------------|----------------------|------|
| 22_MBX-50-0-1/113_NY  | 84097667 | industrial 100 pcs. | pressed-in           | 1    |
| 22_MBX-50-0-40/133_NY | 85106185 | Industrial 225 pcs. | screwed-in           | 2    |

# Series MBX – assembly and disassembly tool



| HUBER+SUHNER type | Item no. | Packaging | Operating instruction |
|-------------------|----------|-----------|-----------------------|
| 74_Z-0-0-488      | 84101887 | single    | –                     |



# Series MFBX – medium float board connectors

## Description

HUBER+SUHNER connectors are especially developed for board-to-board and board-to-module RF interconnections. The mechanical design is outstanding, allowing the MFBX to cope with mechanical misalignment in radial and axial directions and still hold an excellent electrical performance.

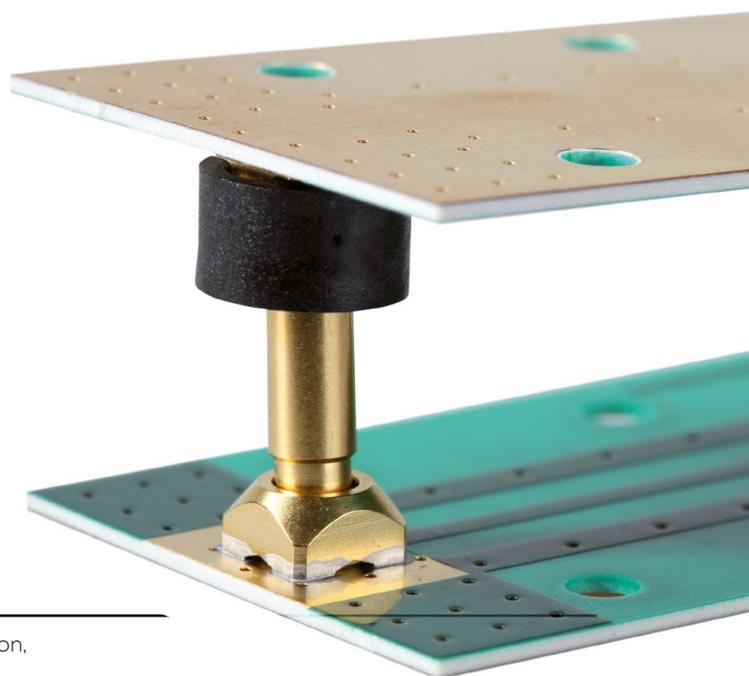
MFBX is a high float board-to-board connector series which allow besides very good board-to-board shielding values very small board-to-board distances.

MFBX Evo sets a new benchmark in cost effective and high performance board-to-board solutions. The modular design can achieve economies of scale in high quantity production. The Blind mateable feature saves time and ensures a secure connection between interfaces. The high tolerance compensation between boards creates multiple design options that can reduce Total Cost of Ownership (TCO).

## Content

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| Series MFBX Evo            | 74 |

| Characteristics                                      | Requirements  |
|--|---|
| Frequency  | DC to 6 GHz   |
| Axial float (misalignment)                           | ± 0.8 mm  |
| Radial float (misalignment)                          | ± 0.8 mm  |
| Min. board-to-board distance                         | MFBX: 13 mm ± 0.8 mm<br>MFBX Evo: 23.4mm ± 0.8 mm                           |
| Power at room temperature, at 2.4 GHz <sup>(1)</sup> | typical 200W (machined adapter)<br>typical 150W (stamp and bending adapter) |



Note (1): Admissible power varies depending on the specific application, cooling device, boundary conditions and environment.

# Series MFBX – design guideline

## Working range (axial and radial)

In mated condition, the two PCB connector have to be aligned within the dimension given for the axial and radial working range.

The axial working range is  $\pm 0.8$  mm, the radial working range is  $\pm 0.8$  mm and allows a sufficient electrical and mechanical connection.

## Connecting range

The two PCB connector have to be aligned within the dimension given for connecting range. The connecting range is  $\pm 0.8$  mm and is equivalent to the max. allowed misalignment between two PCB boards when mating.

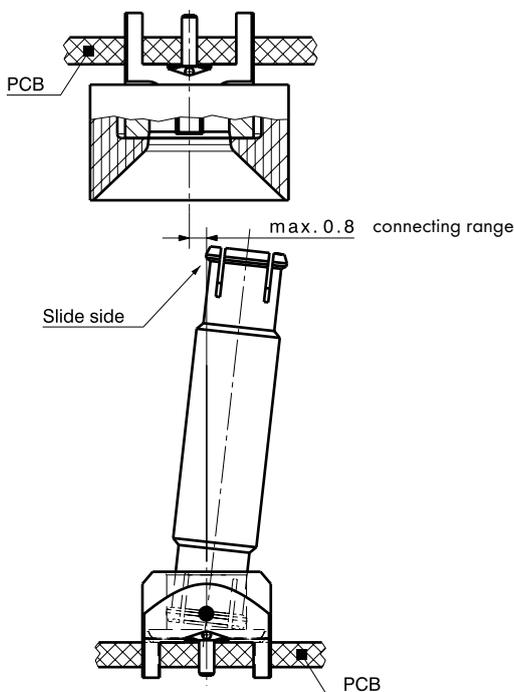
Blind mateability is given when keeping the misalignment of two boards within specified connecting range. Blind mateability depends on the funnel size, the barrel length and the angle of the barrel. The HUBER+SUHNER specified connecting range includes all these variables and guarantees therefore blind mateability.

## Recommendation

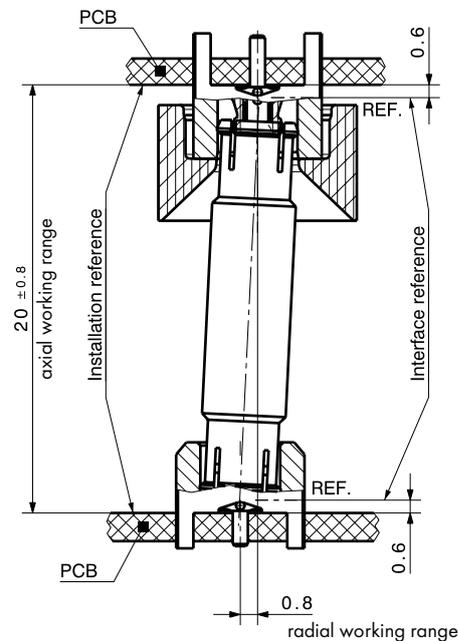
HUBER+SUHNER recommends using guiding pins to align the boards within the connecting range and working range. Distance holders to maintain the axial misalignment within working range are also of benefit.

HUBER+SUHNER provides outline drawings for every application with the relevant mechanical dimensions that need to be considered when designing-in MFBX. 3D STEP files are available on [www.hubersuhner.com](http://www.hubersuhner.com).

### Connecting range



### Working range



# Series MFBX – technical data

## MFBX PCB connectors – board-to-board/adapters within series

| Electrical data   | Requirements  |                |               |  |                |               |
|---|---|----------------|---------------|--|----------------|---------------|
|   | MFBX  |                |               | MFBX Evo   |                |               |
| Impedance   | 50 Ω  |                |               |  |                |               |
| Frequency range   | DC ... 6 GHz  |                |               |  |                |               |
| Dielectric withstanding voltage (at sea level)            | 1 kV rms, 50 Hz   |                |               |  |                |               |
| Working voltage (at sea level)                            | ≤ 330 V rms, 50 Hz  |                |               |  |                |               |
| Insulation resistance                                     | ≥ 1 GΩ  |                |               |  |                |               |
| Contact resistance<br>· Centre contact<br>· Outer contact | ≤ 5 mΩ<br>≤ 5 mΩ  |                |               |  |                |               |
| Return loss/VSWR*   | typical values for a connection (measured on a PCB) board-to-board  |                |               | typical values for a connection (measured on a PCB) board-to-board |                |               |
|   | axial misalignment  | DC ... 3.5 GHz | 3.5 ... 5 GHz | axial misalignment   | DC ... 3.5 GHz | 3.5 ... 5 GHz |
|   | ± 0.8mm   | 20 dB / 1.22   | 18 dB / 1.29  | ± 0.8mm  | 22 dB / 1.17   | 20 dB / 1.22  |
|   |   |                |               | board-to-filter  |                |               |
|   |   |                |               | axial misalignment   | DC ... 3.5 GHz | DC ... 6 GHz  |
|   |   |                | ± 0.8mm       | 24 dB / 1.13   | 20 dB / 1.22   |               |
| RF-leakage (interface only)                               | ≥60dB (DC to 3.5GHz)  |                |               |  |                |               |
| Power (room temperature)                                  | typical 200 W at 2.4 GHz with machined adapter<br>typical 150 W at 2.4 GHz with stamp and bending adapter |                |               |  |                |               |

| Mechanical data                  | Requirements     |         |
|----------------------------------|------------------|---------|
| Engagement force (slide-side)    | ≤ 15 N / 3.4 lbs |         |
| Disengagement force (slide-side) | ≤ 15 N / 3.4 lbs |         |
| Durability (matings)             | 50               |         |
| Minimum board-to-board distance  | 13 mm            | 23.4 mm |
| Axial float (misalignment)       | ± 0.8 mm         |         |
| Radial float (misalignment)      | ± 0.8 mm         |         |

| Environmental data          | Test conditions                     |
|-----------------------------|-------------------------------------|
| Temperature range           | -55°C ... +125°C / -67 ... + 257° F |
| High Temperature Endurance  | IEC 61169-1 §9.4.5                  |
| Rapid Change of Temperature | IEC 60068-2-14, Test Na             |
| Damp Heat Steady State      | IEC 60068-2-78, Test Ca             |
| Vibration                   | IEC 60068-2-64, Test Fc             |
| Mechanical shock            | IEC 60068-2-27, Test Ea             |

| Processing data  | Requirements                               |
|--|--|
| Adherent to the print<br>· shearing<br>· pulling (vertical to PCB) | ≥ 150 N / 33.7 lbs.<br>≥ 150 N / 33.7 lbs. |

| Material data   |                                   |  |
|-----------------|-----------------------------------|--|
| Connector parts | Material                          | Plating                                  |
| Centre contact  | brass / bronze / copper-beryllium | SUCOPRO® gold plating / Silver           |
| Outer contact   | brass / bronze                    | SUCOPRO® gold plating / SUCOPLATE®       |
| Body            | brass                             | SUCOPRO® gold plating / SUCOPLATE® / tin |
| Insulators      | LCP / PTFE / PEI                  |  |
| Funnel          | PA                                |  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MFBX – PCB connectors

## Straight PCB jacks (female)

### Surface mount type SMT

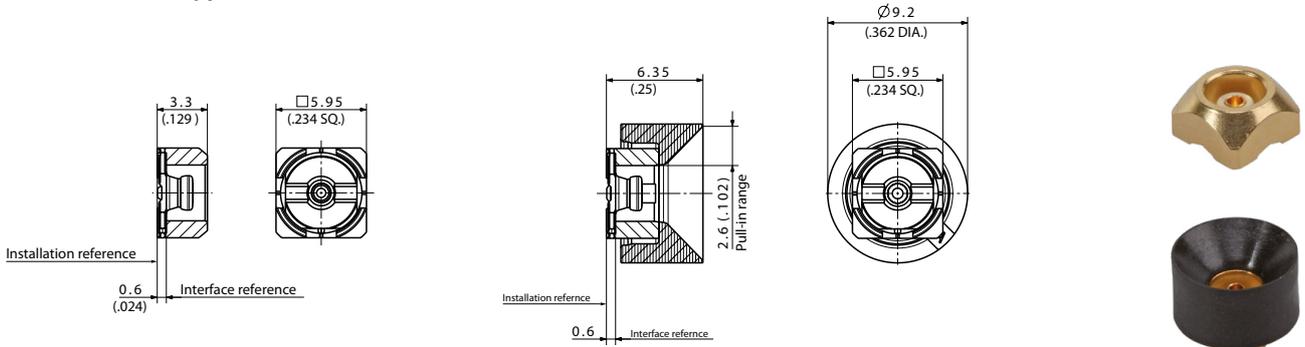


Fig. 1

Fig. 2

| HUBER+SUHNER type                                | Item no.             | Packaging               | Soldering pad | Fig. |
|--|----------------------|-------------------------|---------------|------|
| 82_MFBX-S50-0-8/111_NE<br>82_MFBX-S50-0-8/111_NM | 85025296<br>85025295 | single<br>tape and reel | ML 173        | 1    |
| 82_MFBX-S50-0-6/111_NE<br>82_MFBX-S50-0-6/111_NM | 85025293<br>85025282 | single<br>tape and reel |               | 2    |

### Through hole type THT

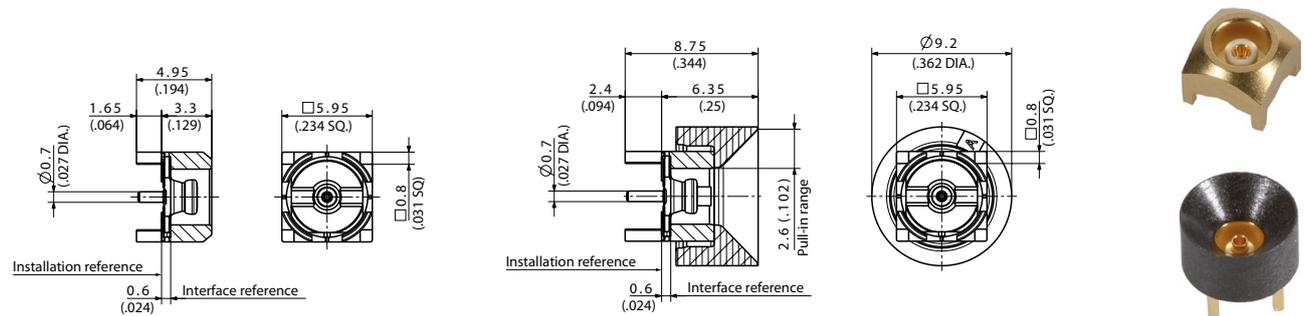


Fig. 1

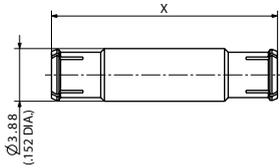
Fig. 2

| HUBER+SUHNER type     | Item no. | Packaging | Soldering pad | Fig. |
|-----------------------|----------|-----------|---------------|------|
| 82_MFBX-50-0-3/111_NE | 85025488 | single    | ML 182        | 1    |
| 82_MFBX-50-0-4/111_NE | 85025490 | single    |               | 2    |

# Series MFBX – adapters within series

## Straight adapters (machining)

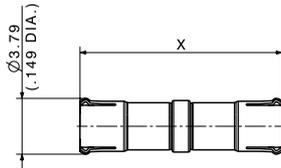
Plug to plug (male)



| HUBER+SUHNER type     | Item no. | Packaging | Board-to-board distance | Adapter length X  |
|-----------------------|----------|-----------|-------------------------|-------------------|
| 32_MFBX-50-0-1/111_NE | 85025361 | single    | 18.9 mm/0.74 in.        | 16.52 mm/0.65 in. |

## Straight adapters (stamp and bending)

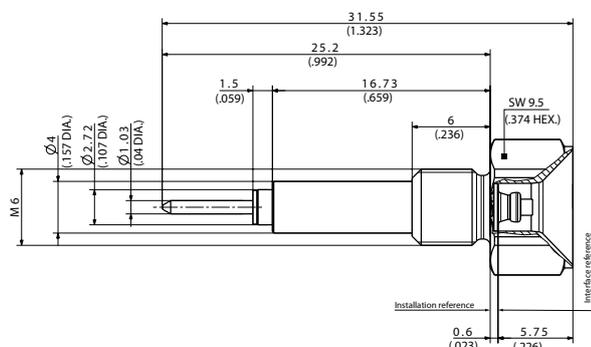
Plug to plug (male)



| HUBER+SUHNER type       | Item no. | Packaging    | Board-to-board distance | Adapter length X  |
|-------------------------|----------|--------------|-------------------------|-------------------|
| 32_MFBX-50-0-3/111_NH-2 | 85096448 | bulk 100 pcs | 16 mm/0.63 in.          | 13.62 mm/0.54 in. |
| 32_MFBX-50-0-4/111_NH-2 | 85096450 | bulk 100 pcs | 22.3 mm/0.88 in.        | 19.92 mm/0.78 in. |

# Series MFBX – receptacle with solder end

## Receptacle, jack (female)



| HUBER+SUHNER type     | Item no. | Packaging          | Assembly instruction |
|-----------------------|----------|--------------------|----------------------|
| 22_MFBX-50-0-3/133_NY | 85013940 | industrial 100 pcs | screwed-in           |

# Series MFBX Evo – PCB connectors

## Straight PCB jacks (female)

### Surface mount type SMT

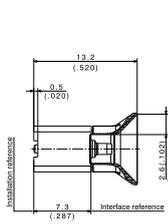


Fig. 1

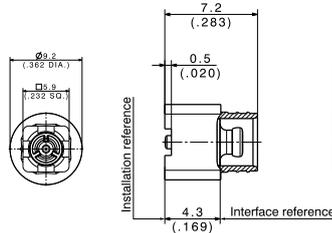


Fig. 2

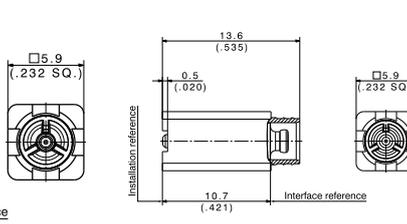


Fig. 3

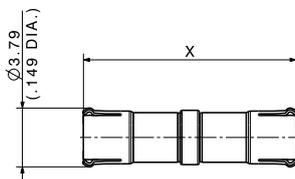


| HUBER+SUHNER type         | Item no. | Packaging     | Soldering pad | Fig. |
|---------------------------|----------|---------------|---------------|------|
| 82_MFBX-S50-0-30/115_NM-1 | 85208640 | tape and reel | ML 184        | 1    |
| 82_MFBX-S50-0-31/115_NM-1 | 85208652 | tape and reel | ML 184        | 2    |
| 82_MFBX-S50-0-32/115_NM-1 | 85208654 | tape and reel | ML 184        | 3    |

# Series MFBX Evo – adapters within series

## Straight adapters (stamp and bending)

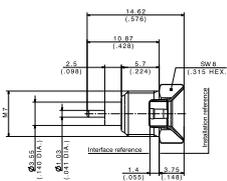
### Plug to plug (male)



| HUBER+SUHNER type      | Item no. | Packaging    | Board-to-board distance | Adapter length X   |
|------------------------|----------|--------------|-------------------------|--------------------|
| 32_MFBX-50-0-11/033_-H | 85208722 | bulk 100 pcs | 23.4mm / 0.92 in.       | 13.62 mm / 0.54 in |
| 32_MFBX-50-0-12/033_-H | 85208733 | bulk 100 pcs | 29.72mm / 1.17 in.      | 19.94 mm / 0.78 in |

# Series MFBX Evo – receptacle with solder end

## Receptacle, jack (female)



| HUBER+SUHNER type        | Item no. | Packaging          | Assembly instruction |
|--------------------------|----------|--------------------|----------------------|
| 22_MFBX-50-0-21/113_NY-1 | 85208720 | industrial 700 pcs | screwed-in           |

# Series MMBX – micro miniature board connectors

## Description

HUBER+SUHNER MMBX connectors are especially developed for board-to-board and board-to-module RF interconnections. Along with MBX and MFBX the board-to-board portfolio of HUBER+SUHNER provides highest flexibility for today's and future radio module applications.

MMBX connectors offer an operation frequency up to 12.4 GHz. The series contains of a wide range of board and cable connectors with a minimum board-to-board distance of only 6.7 mm.

## Content

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| Assembly and disassembly tools | 84 |

| Characteristics                           | Requirements   |
|---|--|
| Frequency                                 | DC to 12.4 GHz   |
| Axial float (misalignment)                | ± 0.3 mm   |
| Radial float (misalignment)               | depending on the adapter<br>± 0.4 mm (at 6.7 mm board-to-board distance) |
| Minimum board-to-board distance           | 6.7 mm   |
| Minimum panel-to-board distance           | 4.63 mm  |
| Minimum panel-to-panel distance           | 2.56 mm  |
| Power at room temperature, at 2.4 GHz (1) | typical 200 W  |



Note (1): Admissible power varies depending on the specific application, cooling device, boundary conditions and environment.

# Series MMBX – design guideline

## Working range (axial and radial)

In mated condition, the two PCB connector have to be aligned within the dimension given for the axial and radial working range.

The axial working range is  $\pm 0.3$  mm, the radial working range at a board-to-board distance of 8 mm is  $\pm 0.4$  mm. The radial working range depends on the length of the adapter: the longer the adapter, the higher the radial working range.

## Connecting range

The two PCB connector have to be aligned within the dimension given for connecting range when mating. In order to guarantee a blind mateable connection, the tilted adapter will be guided by the funnel of the opposite connector. The connecting range depends on the length of the adapter and the pull-in range (size of the funnel).

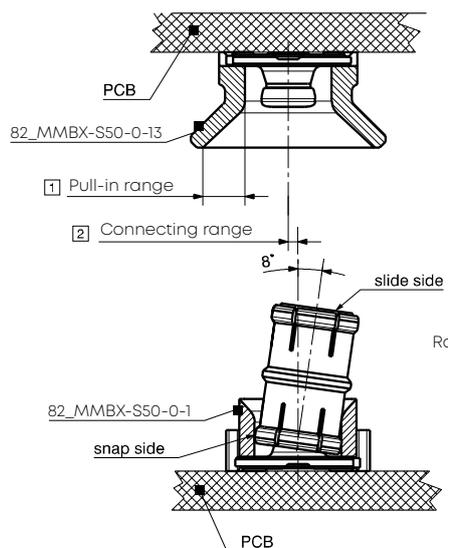
The connecting range in the example below is  $\pm 0.8$  mm for a pull-in range of 1.8 mm (see table below). If the funnel (pull-in range) is smaller than 0.95 mm, a blind mateable assembly process is not possible anymore. The radial working range (mated condition) can be different from the connecting range (mating process). The smaller value has to be considered for the design of the board-to-board connection (blind mateability).

## Recommendation

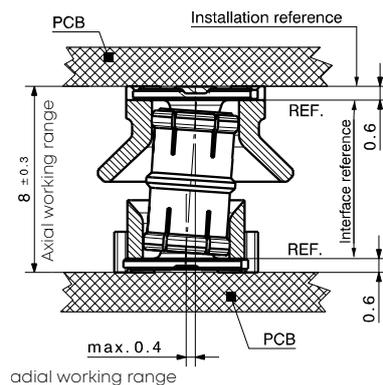
HUBER+SUHNER recommends using guiding pins to align the boards within the connecting range and working range. Distance holders to maintain the axial misalignment within working range are also of benefit.

HUBER+SUHNER provides outline drawings for every application with the relevant mechanical dimensions that need to be considered when designing-in MMBX. 3D STEP files are available on [www.hubersuhner.com](http://www.hubersuhner.com).

### Connecting range



### Working range



| Pull-in range on PCB connector [1] | Connecting range [2] | PCB connector with mentioned pull-in range (for example) |
|------------------------------------|----------------------|--|
| 1.8                                | max. 0.8             | 82 MMBX-S50-0-13   |
| 0.95                               | max. 0.15            | 82 MMBX-S50-0-3  |
| 0.65                               | not possible         | 82 MMBX-S50-0-1  |

# Series MMBX – technical data

## MMBX PCB connectors – board-to-board/adapters within series

| Electrical data   | Requirements   |                          |                          |
|---|--|--------------------------|--------------------------|
| Impedance   | 50 $\Omega$  |                          |                          |
| Frequency range   | DC to 12.4 GHz   |                          |                          |
| Dielectric withstanding voltage (at sea level)            | 1 kV rms, 50 Hz  |                          |                          |
| Working voltage (at sea level)                            | $\leq$ 330 V rms, 50 Hz                                    |                          |                          |
| Insulation resistance                                     | $\geq$ 1 G $\Omega$  |                          |                          |
| Contact resistance<br>· Centre contact<br>· Outer contact | $\leq$ 5 m $\Omega$<br>$\leq$ 1 m $\Omega$                 |                          |                          |
| Return loss/VSWR  | typical values for a board-to-board connection             |                          |                          |
|   | board-to-board distance                                    | DC to 2.5 GHz            | 2.5 to 6 GHz             |
|   | 6.7 mm   | 26 dB/1.11               | 25 dB/1.12               |
|   | 11.65 mm<br>20.0 mm  | 26 dB/1.11<br>26 dB/1.11 | 19 dB/1.25<br>19 dB/1.25 |
| RF-leakage (interface only)                               | $\geq$ 70 dB (DC to 6 GHz)<br>$\geq$ 60 dB (6 to 12.4 GHz) |                          |                          |
| Power   | typical 200W at 2.4 GHz at room temperature                |                          |                          |

| Mechanical data                  | Requirements  |  |  |
|----------------------------------|---|--|--|
| Engagement force (slide-side)    | $\leq$ 15 N/3.4 lbs   |  |  |
| Disengagement force (slide-side) | $\leq$ 15 N/3.4 lbs   |  |  |
| Durability (matings)             | 100   |  |  |
| Axial float (misalignment)       | $\pm$ 0.3 mm  |  |  |
| Radial float (misalignment)      | depending on the adapter length<br>$\pm$ 0.4 mm (at 6.7 mm board-to-board distance)<br>$\pm$ 0.8 mm (at 11.65 mm board-to-board distance) |  |  |

| Environmental data  | Test conditions                         |
|---------------------|---|
| Temperature range   | -55 to +155 °C/-67 to +311 °F           |
| Climatic category   | 55/155/21                               |
| Thermal shock       | MIL-STD-202, method 107 G, condition B1 |
| Moisture resistance | MIL-STD-202, method 106 F               |
| Corrosion           | MIL-STD-202, method 101, condition B    |
| Vibration           | MIL-STD-202, method 204 D, condition A  |

| Processing data  | Requirements                                   |
|--|--|
| Adherent to the print<br>· Shearing<br>· Pulling (vertical to PCB) | $\geq$ 150 N/33.7 lbs<br>$\geq$ 150 N/33.7 lbs |

| Material data   |                                     |                       |
|-----------------|-------------------------------------|-----------------------|
| Connector parts | Material                            | Plating               |
| Centre contact  | brass/bronze/copper-beryllium alloy | SUCOPRO® gold plating |
| Outer contact   | brass/bronze                        | SUCOPRO® gold plating |
| Body            | brass                               | SUCOPRO® gold plating |
| Insulators      | LCP/PTFE/PFA                        |                       |

# Series MMBX – technical data

## MMBX cable connectors

| Electrical data   | Requirements  |
|---|---|
| Impedance   | 50 $\Omega$   |
| Frequency range   | DC to 12.4 GHz  |
| Dielectric withstanding voltage (at sea level)            | 750 V rms, 50 Hz  |
| Working voltage (at sea level)                            | 250 V rms, 50 Hz  |
| Insulation resistance                                     | $\geq 1 \text{ G}\Omega$  |
| Contact resistance<br>· Centre contact<br>· Outer contact | $\leq 5 \text{ m}\Omega$<br>$\leq 1 \text{ m}\Omega$                                  |
| Return loss/VSWR<br>(typical values)                      | $\geq 30 \text{ dB}/1.07$ (DC to 2.5 GHz)<br>$\geq 25 \text{ dB}/1.12$ (2.5 to 6 GHz) |

| Mechanical data      | Requirements             |
|----------------------|--------------------------|
| Engagement force     | max. 30 N/max. 6.7 lbs   |
| Disengagement force  | 8 to 30 N/1.8 to 6.7 lbs |
| Durability (matings) | 100                      |

| Environmental data  | Test conditions                         |
|---------------------|---|
| Temperature range   | -55 to +155 °C/-67 to +311 °F           |
| Climatic category   | 55/155/10                               |
| Thermal shock       | MIL-STD-202, method 107 G, condition B1 |
| Moisture resistance | MIL-STD-202, method 106 F               |
| Corrosion           | MIL-STD-202, method 101, condition B    |
| Vibration           | MIL-STD-202, method 204 D, condition A  |

| Material data   |                               |   |
|-----------------|-------------------------------|---|
| Connector parts | Material                      | Plating                                   |
| Centre contact  | copper-beryllium alloy        | SUCOPRO® gold plating                     |
| Outer contact   | bronze/copper-beryllium alloy | SUCOPRO® gold plating                     |
| Body            | brass                         | SUCOPRO® gold plating/SUCOPLATE®          |
| Crimp ferrules  | E-copper                      | SUCOPRO® gold plating/gold/<br>SUCOPLATE® |
| Insulators      | PTFE/PFA                      |   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MMBX – PCB connectors

## Straight PCB jacks (female)

- Surface mount type SMT

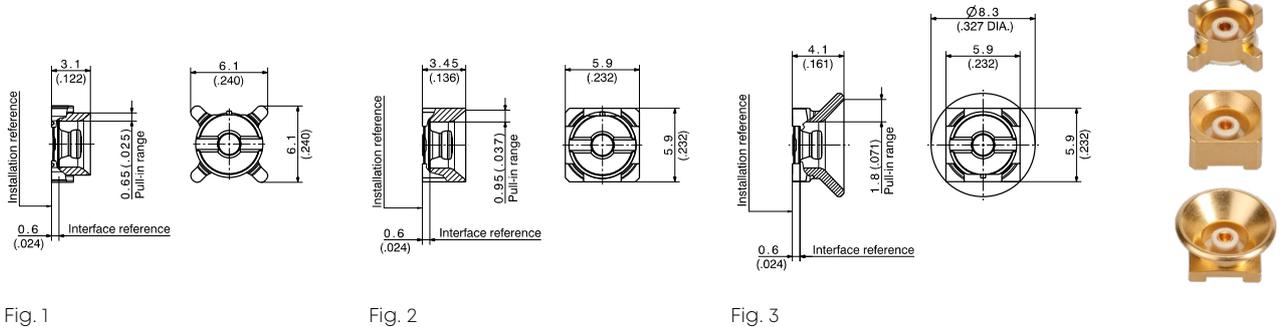


Fig. 1

Fig. 2

Fig. 3

| HUBER+SUHNER type   | Item no.                         | Packaging                                | Soldering pad | Notes                            | Fig. |
|---|----------------------------------|--|---------------|----------------------------------|------|
| 82_MMBX-S50-0-1/111_NE<br>82_MMBX-S50-0-1/111_NH<br>82_MMBX-S50-0-1/111_NM    | 23001785<br>23001784<br>23001783 | single<br>bulk 100 pcs.<br>tape and reel | ML 122        | pull-in range 0.65 mm/0.0256 in. | 1    |
| 82_MMBX-S50-0-3/111_NE<br>82_MMBX-S50-0-3/111_NH<br>82_MMBX-S50-0-3/111_NM    | 23015527<br>23011273<br>23031931 | single<br>bulk 100 pcs.<br>tape and reel |               | pull-in range 0.95 mm/0.0374 in. | 2    |
| 82_MMBX-S50-0-13/111_NE<br>82_MMBX-S50-0-13/111_NH<br>82_MMBX-S50-0-13/111_NM | 84032435<br>23036608<br>23041511 | single<br>bulk 100 pcs.<br>tape and reel |               | pull-in range 1.80 mm/0.0709 in. | 3    |

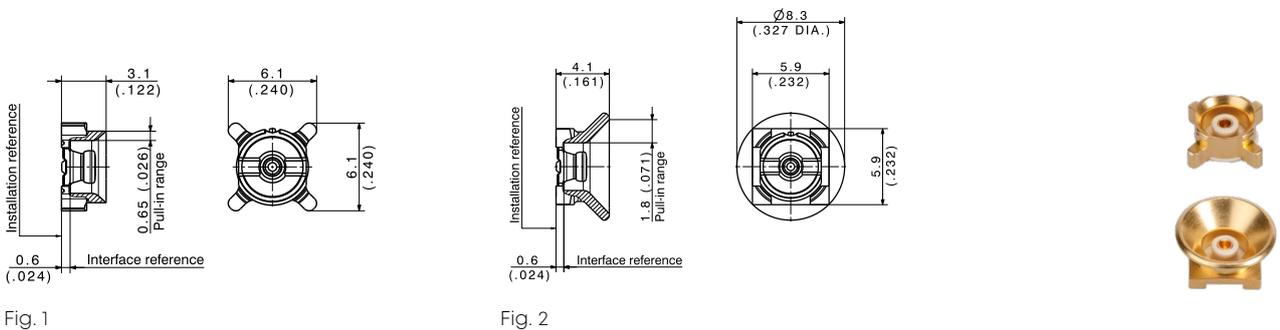


Fig. 1

Fig. 2

| HUBER+SUHNER type          | Item no. | Packaging     | Soldering pad | Notes                           | Fig. |
|----------------------------|----------|---------------|---------------|---------------------------------|------|
| 82_MMBX-S50-0-15/111_NE 1) | 84120607 | single        | ML 185        | pull-in range 0.65 / 0.0256 in. | 1    |
| 82_MMBX-S50-0-15/111_NH 1) | 84002089 | bulk 100 pcs. | ML 185        | pull-in range 0.65 / 0.0256 in. | 1    |
| 82_MMBX-S50-0-15/111_NM 1) | 84018367 | tape and reel | ML 185        | pull-in range 0.65 / 0.0256 in. | 1    |
| 82_MMBX-S50-0-20/111_NE 1) | 84120616 | single        | ML 185        | pull-in range 1.80 / 0.0709 in. | 2    |
| 82_MMBX-S50-0-20/111_NM 1) | 84047799 | tape and reel | ML 185        | pull-in range 1.80 / 0.0709 in. | 2    |

1) Return loss (RL) optimized connector

# Series MMBX – PCB connectors

## Straight PCB jacks (female)

- Through hole type THT

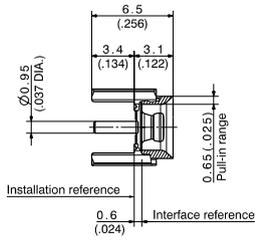


Fig. 1

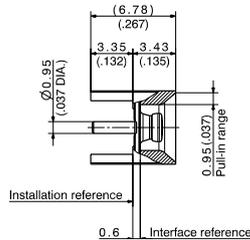
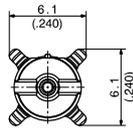


Fig. 2

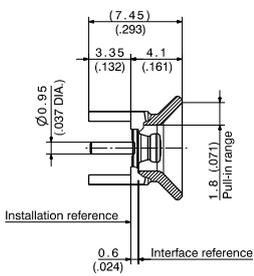
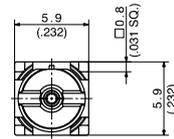
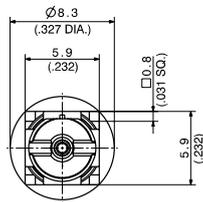
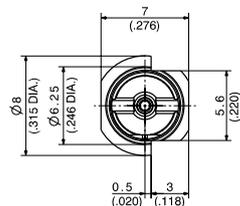
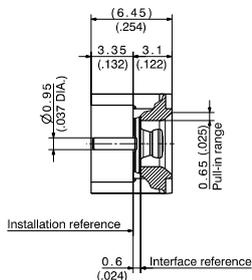


Fig. 3



| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole | Notes                             | Fig. |
|------------------------|----------|---------------|---------------|-----------------------------------|------|
| 82_MMBX-50-0-2/111_NE  | 23001788 | single        | ML 15         | pull-in range 0.65 mm/0.0256 in.  | 1    |
| 82_MMBX-50-0-2/111_NH  | 23001787 | bulk 100 pcs. |               |                                   |      |
| 82_MMBX-50-0-2/111_NM  | 23001786 | tape and reel |               |                                   |      |
| 82_MMBX-50-0-4/111_NH  | 23013667 | bulk 100 pcs. |               | pull-in range 0.95 mm/0.00374 in. | 2    |
| 82_MMBX-50-0-14/111_NE | 84032421 | single        |               | pull-in range 1.80 mm/0.0709 in.  | 3    |
| 82_MMBX-50-0-14/111_NH | 23038051 | bulk 100 pcs. |               |                                   |      |

## Straight PCB jacks (female), edge mount



| HUBER+SUHNER type       | Item no. | Packaging     | Mounting hole |
|-------------------------|----------|---------------|---------------|
| 92_MMBX-S50-0-12/111_NE | 84019159 | single        | ML 147        |
| 92_MMBX-S50-0-12/111_NM | 23038620 | tape and reel |               |

# Series MMBX – PCB connectors

## Straight PCB plugs (male)

- Surface mount type SMT

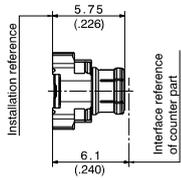


Fig. 1

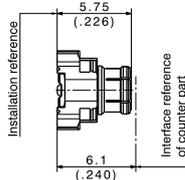


Fig. 2



| HUBER+SUHNER type  | Item no.                         | Packaging                                | Soldering pad | Fig. |
|--|----------------------------------|--|---------------|------|
| 81_MMBX-S50-0-1/111_NE<br>81_MMBX-S50-0-1/111_NH<br>81_MMBX-S50-0-1/111_NM | 23001782<br>23001781<br>23001780 | single<br>bulk 100 pcs.<br>tape and reel | ML 122        | 1    |
| 81_MMBX-S50-0-18/111_NE 1)<br>81_MMBX-S50-0-18/111_NM 1)                   | 84122199<br>84075488             | single<br>tape and reel                  | ML 185        | 2    |

- Through hole type THT

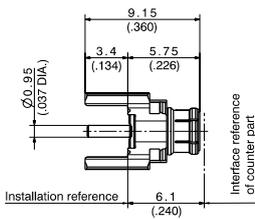


Fig. 1

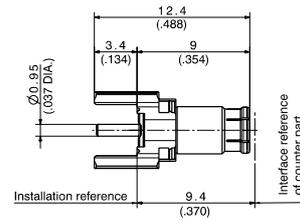


Fig. 2



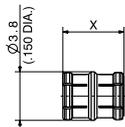
| HUBER+SUHNER type   | Item no.                         | Packaging                                | Mounting hole | Fig. |
|---|----------------------------------|--|---------------|------|
| 81_MMBX-50-0-2/111_NE<br>81_MMBX-50-0-2/111_NH<br>81_MMBX-50-0-2/111_NM | 23001779<br>23001778<br>23001776 | single<br>bulk 100 pcs.<br>tape and reel | ML 15         | 1    |
| 81_MMBX-50-0-11/111_NM  | 23028072                         | tape and reel                            |               | 2    |

1) Return loss (RL) optimized connector

# Series MMBX – adapters within series

## Straight adapters

- Plug to plug (male)



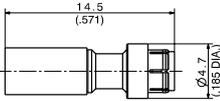
| HUBER+SUHNER type                              | Item no.             | Packaging                     | Board-to-board distance | Adapter length X  | Min. pull-in range              |
|--|----------------------|-------------------------------|-------------------------|-------------------|---------------------------------|
| 32_MMBX-50-0-1/111_NE<br>32_MMBX-50-0-1/111_NY | 23001749<br>84028418 | single<br>industrial 200 pcs. | 6.7 mm/0.264 in.        | 4.8 mm/0.189 in.  | 0.65 mm/0.026 in. <sup>1)</sup> |
| 32_MMBX-50-0-12/111_NH                         | 84004734             | bulk 100 pcs.                 | 8.0 mm/0.315 in.        | 6.0 mm/0.236 in.  | 0.95 mm/0.037 in.               |
| 32_MMBX-50-0-4/111_NE<br>32_MMBX-50-0-4/111_NY | 23010564<br>23038658 | single<br>industrial 300 pcs. | 10.0 mm/0.394 in.       | 8.0 mm/0.315 in.  | 1.80 mm/0.071 in.               |
| 32_MMBX-50-0-13/111_NE                         | 84031096             | single                        | 12.0 mm/0.472 in.       | 10.0 mm/0.417 in. | 1.80 mm/0.071 in.               |
| 32_MMBX-50-0-5/111_NE<br>32_MMBX-50-0-5/111_NY | 84026915<br>23011920 | single<br>industrial 200 pcs. | 14.0 mm/0.551 in.       | 12.0 mm/0.472 in. | 1.80 mm/0.071 in.               |
| 32_MMBX-50-0-10/111_NY                         | 23034946             | industrial 200 pcs.           | 15.0 mm/0.591 in.       | 13.0 mm/0.512 in. | 1.80 mm/0.071 in.               |

Adapters with other lengths available upon request.

<sup>1)</sup> Only suitable pull-in-range.

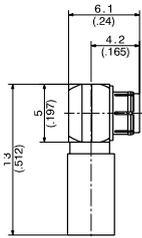
# Series MMBX – cable connectors

## Straight cable plugs (male)



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|-----------|----------------------|--------------|
| 11_MMBX-50-2-2/111_NE | 23001744 | U4 (ENVIROFLEX_316_D) | single    | 27351                | 1/A          |

## Right angle cable plugs (male)



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 16_MMBX-50-2-2/111_NE | 23001746 | U4 (ENVIROFLEX_316_D) | single        | 27352                | A            |
| 16_MMBX-50-2-2/111_NH | 84028931 |                       | bulk 100 pcs. |                      |              |

# Series MMBX – receptacles with solder end

## Receptacle, jack (female)

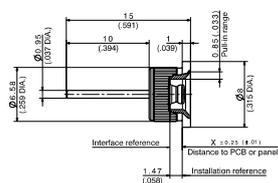
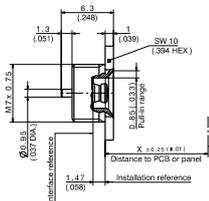


Fig. 1

Fig. 2

| HUBER+SUHNER type     | Item no. | Packaging           | Assembly instruction | Fig. |
|-----------------------|----------|---------------------|----------------------|------|
| 22_MMBX-50-0-1/111_NE | 23008312 | single              | screwed-in           | 1    |
| 22_MMBX-50-0-2/111_NY | 84005177 | industrial 100 pcs. | pressed-in           | 2    |

# Series MMBX – assembly and disassembly tools



Fig. 1



Fig. 2

| HUBER+SUHNER type | Item no. | Packaging | Operating instruction | Fig. |
|-------------------|----------|-----------|-----------------------|------|
| 74_Z-0-0-437      | 23023494 | single    | 0000189947            | 1    |
| 74_Z-0-0-557      | 84032418 |           | 0000246815            | 2    |

# SMP

## Description

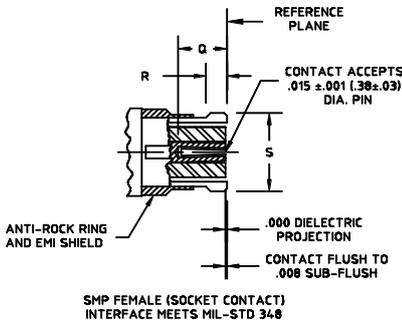
HUBER+SUHNER SMP connectors provide a robust plug-in solution for applications up to 40 GHz. HUBER+SUHNER SMP connectors have been MIL-SPEC qualified for defence and space flight hardware. The design of the interface and material treating provides true compatibility as well as guaranteed mechanical performance over the mating life of the connector with all MIL-STD-348 SMP connectors in the market.

## Content

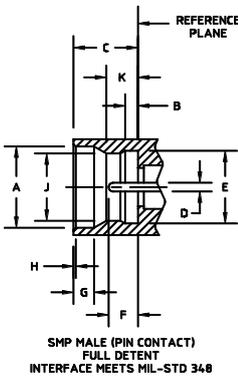
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| Description                       | 85 |
| Compatibility                     | 85 |
| Interface dimensions in mm/inches | 85 |
| Technical data                    | 86 |
| Cable connectors                  | 88 |
| Panel mount connectors            | 89 |
| Hermetic shrouds                  | 90 |
| PCB mount connectors              | 90 |
| Adapters                          | 92 |

## Interface dimensions (mm/inches)

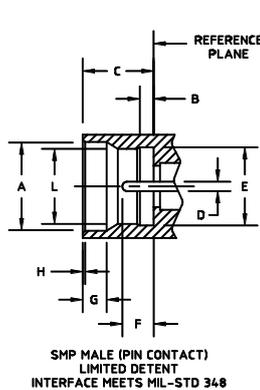
### SMP female



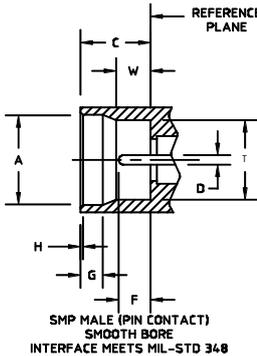
### SMP male, full detent



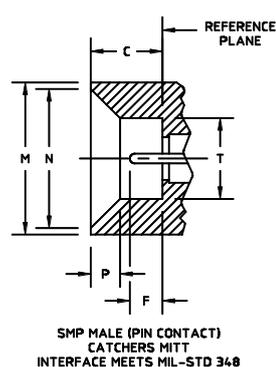
### SMP male, limited detent



### SMP male, smooth bore



### SMP male, catchers mitt



## Compatibility

50 Ω SMP connectors are intermateable without restrictions.

|   | min.         | max.                            |
|---|--------------|---------------------------------|
| A | 3.53/0.139   | 3.68/0.145                      |
| B | 0.521/0.0205 | 0.597/0.0235                    |
| C | 2.74/0.108   | 2.84/0.112                      |
| D | 0.36/0.014   | 0.41/0.016                      |
| E | 3.15/0.124   | 3.20/0.126                      |
| F | 1.14/0.045   | 1.40/0.055                      |
| G | 0.084/0.033  | 0.94/0.037                      |
| H | 0.08/0.003   | 0.20/0.008                      |
| J | 2.90/0.114   | 3.00/0.118                      |
| K | 1.30/0.051   | 1.45/0.057                      |
| L | 3.00/0.118   | 3.10/0.122                      |
| M | 5.84/0.230   | 6.10/0.240                      |
| N | 5.33/0.210   | 5.59/0.220                      |
| P | 1.09/0.043   | 1.19/0.047                      |
| Q | 1.77/0.070   | –                               |
| R | 0.63/0.025   | 0.88/0.035 (cabled connector)   |
|   | 0.45/0.018   | 0.63/0.025 (uncabled connector) |
| S | –            | 3.43/0.135                      |
| T | 3.12/0.123   | 3.22/0.127                      |
| W | 1.49/0.059   | 1.65/0.065                      |

## Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
SMP interface MIL-STD-348

# SMP – technical data

| Electrical data       | Requirements   |
|-----------------------|--|
| Impedance             | 50 $\Omega$  |
| Frequency range       | DC to 40 GHz   |
| Contact resistance    | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max.                        |
| DWV                   | 500 Vrms at sea level  |
| Insulation resistance | 5000 megaohms min.   |
| Corona levels         | 190 Vrms at 70 000 ft  |
| RF high potential     | 325 Vrms at 5 MHz  |
| RF leakage            | 80 dB max. at 3 GHz<br>65 dB max. at 3 to 26.5 GHz   |
| Magnetic permeability | < 2 $\mu$  |
| VSWR                  | Connector specific   |
| Insertion loss        | 0.06 $\sqrt{f}$ in GHz (non-hermetic connectors)<br>0.12 $\sqrt{f}$ in GHz (hermetic connectors) |

| Mechanical data          | Requirements  |
|--------------------------|---|
| Center contact retention | 1.5 lbs (6.672 N) min. (captivated designs)   |
| Durability               | 100 cycles min. into a full detent shroud<br>500 cycles min. into a limited detent shroud<br>1000 cycles min. into a smooth bore shroud |
| Force to engage          | SMP full detent – 15 lbs (66.723 N) max.<br>SMP limited detent – 10 lbs (44.482 N) max.<br>SMP smooth bore – 2 lbs (8.896 N) max.       |
| Force to disengage       | SMP full detent – 5 lbs (22.241 N) min.<br>SMP limited detent – 2 lbs (8.896 N) min.<br>SMP smooth bore – 0.5 lbs (2.224 N) min.        |
| Radial misalignment      | standard – $\pm$ 0.25 mm/0.010 in. min.<br>float mount – $\pm$ 0.76 mm /0.030 in. min.  |
| Axial misalignment       | standard – 0.25 mm/0.010 in. min.<br>float mount – 1.27 mm/0.050 in. min.   |

| Environmental data  | Requirements                                   |
|---------------------|--|
| Temperature range   | -65 to +165 $^{\circ}$ C                       |
| Thermal shock       | MIL-STD-202, method 107, condition B           |
| Moisture resistance | MIL-STD-202, method 106                        |
| Corrosion           | MIL-STD-202, method 101, condition B           |
| Sine vibration      | MIL-STD-202, method 204, 28 g peak             |
| Random vibration    | MIL-STD-202, method 214, condition K-I, 46.3 g |
| Shock               | MIL-STD-202, method 213, 12 000 g peak         |

# SMP – technical data

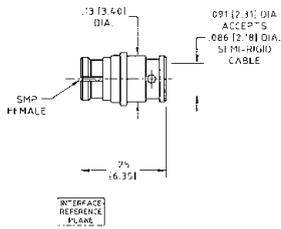
| <b>Material data</b>               |   |  |
|------------------------------------|---|--|
| <b>Cable and shroud connectors</b> | <b>Material</b>   | <b>Plating</b>   |
| Body                               | beryllium copper per ASTM B-196 or brass per QQ-B-626   | SUCOPRO gold plate   |
|                                    | #303 SS per ASTM A-582  | passivated per SAE-AMS-2700  |
| Contact                            | beryllium copper per ASTM B-196   | SUCOPRO gold plate   |
| Dielectric                         | PTFE per ASTM D-1710, type I, grade 1 or Torlon™ * per ASTM D-5204 or polyether ether ketone per MIL-P-46189, type I or polyetherimide (PEI) per ASTM D-5202                                | –  |
| Ferrule                            | brass per ASTM B-135 for cable connector only   | SUCOPRO gold plate   |
| <b>Hermetic shroud connectors</b>  | <b>Material</b>   | <b>Plating</b>   |
| Body and contact                   | iron nickel alloy IAW ASTM F-15 and F-1466 UNS K94610 per ASTM F-15, class 1, only for pin on glass seal contacts   | gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| Dielectric                         | Corning 7070 glass or equivalent  | –  |
| <b>Adapters</b>                    | <b>Material</b>   | <b>Plating</b>   |
| Body and nut                       | beryllium copper per ASTM B-196 or #303 SS per ASTM A-582   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, class 1 |
| Contact                            | beryllium copper per ASTM B-196   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1  |
| Dielectric                         | polytetrafluoroethylene (PTFE) per ASTM D-1710, or ASTM D-4894, type I, grade 1, or polyether ether ketone electrical grade per MIL-P-46189, type I or polyetherimide (PEI) per ASTM D-5202 | –  |

\* Note: Torlon™ is not used for space applications.

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

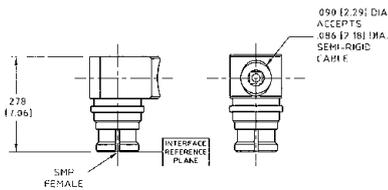
# SMP – cable connectors

## Straight cable jacks (female)



| HUBER+SUHNER type    | Item no. | Cable group (example)              | Typ. return loss   | Packaging |
|----------------------|----------|------------------------------------|--|-----------|
| 21_SMP-50-2-1/111_NE | 80377838 | Y3, Y16, Y11<br>(2.18 mm/0.086 in) | DC – 20 GHz: 29 dB<br>20 – 30 GHz: 27 dB<br>30 – 40 GHz: 20 dB | single    |

## Right angle cable jack (female)

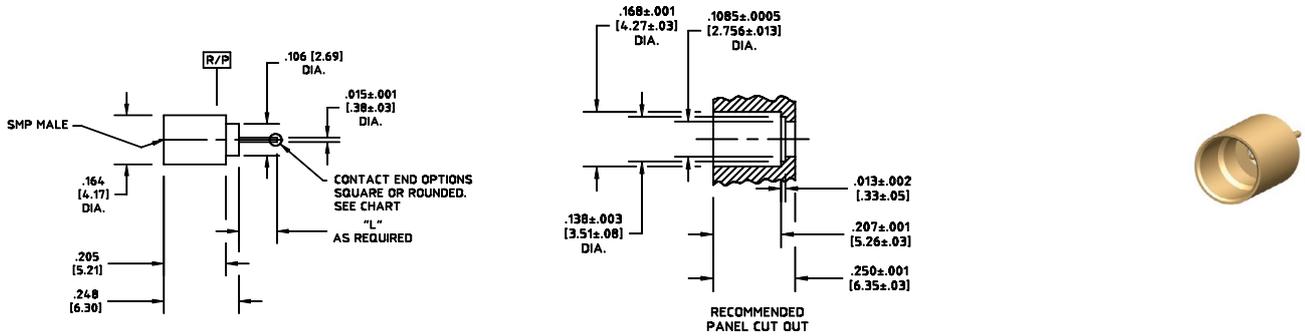


| HUBER+SUHNER type    | Item no. | Cable group (example)              | Typ. return loss   | Packaging |
|----------------------|----------|------------------------------------|--|-----------|
| 26_SMP-50-2-2/111_NE | 80377839 | Y3, Y16, Y11<br>(2.18 mm/0.086 in) | DC – 20 GHz: 25 dB<br>20 – 26.5 GHz: 20 dB<br>26.5 – 30 GHz: 15 dB<br>26.5 – 40 GHz: 10 dB | single    |



# SMP – hermetic shrouds

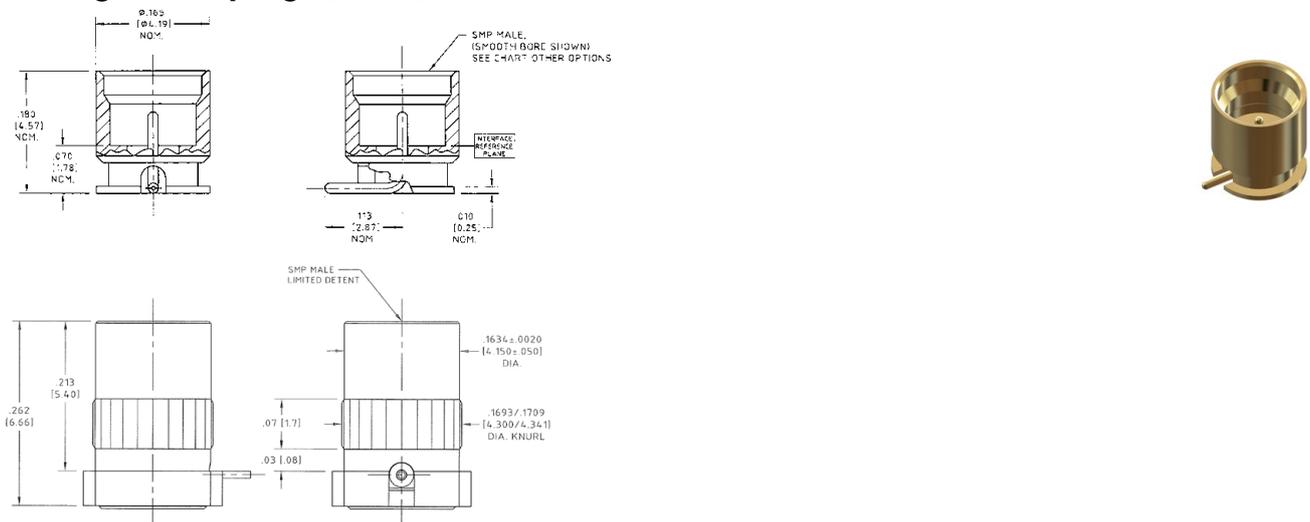
## Hermetically sealed, plugs (male)



| HUBER+SUHNER type | Item no. | "L"  | End option |
|-------------------|----------|--|------------|
|                   |          | mm/in                                      |            |
| 29474H-1S         | 80367958 | 1.25/0.050<br>additional length on request | square     |

# SMP – PCB mount connectors

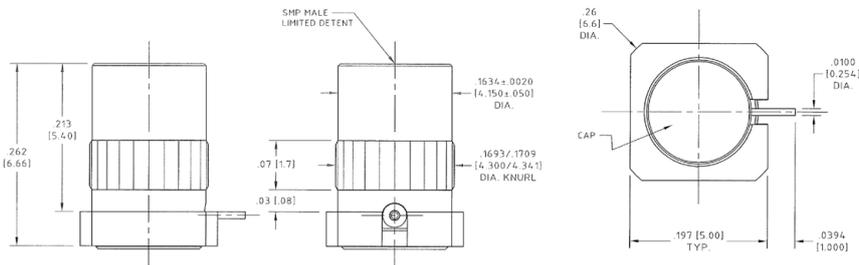
## Straight PCB plugs (male)



| HUBER+SUHNER type      | Item no. | Detent         | Operating frequency | Return loss                                   | Packaging |
|------------------------|----------|----------------|---------------------|---|-----------|
| 81_SMP-S50-0-L1/111_NE | 80377946 | limited detent | DC – 40GHz          | depends on PCB stack-up, contact HUBER+SUHNER | single    |
| 81_SMP-S50-0-S1/111_NE | 80377947 | smooth bore    | DC – 40GHz          | depends on PCB stack-up, contact HUBER+SUHNER | single    |

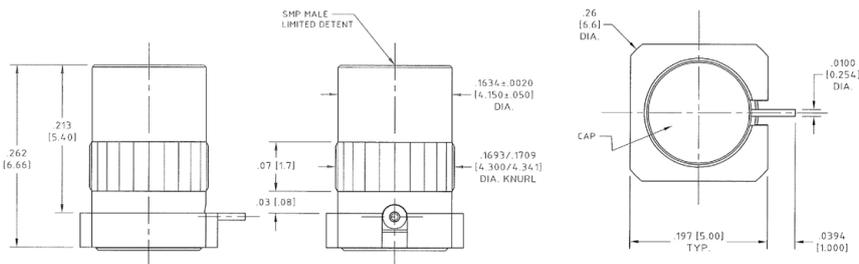
# SMP – PCB mount connectors

## Straight PCB plugs (male)



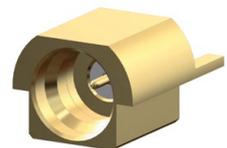
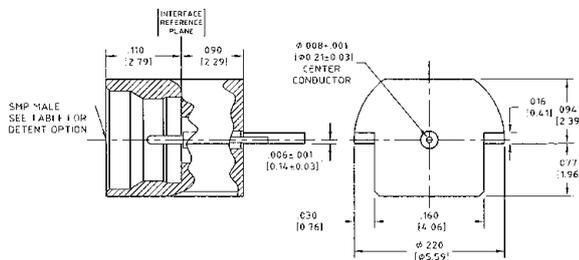
| HUBER+SUHNER type | Item no. | Detent  |
|-------------------|----------|---------|
| 29474RM-3-002     | 80370509 | Limited |

## Straight PCB plugs (male) / reverse mount



| HUBER+SUHNER type | Item no. | Detent  |
|-------------------|----------|---------|
| 29474RM-3-003     | 80370707 | limited |

## Edge mount PCB plugs (male)



| HUBER+SUHNER type     | Item no. | Detent         | Operating frequency | Return loss                                   | Packaging |
|-----------------------|----------|----------------|---------------------|---|-----------|
| 91_SMP-50-0-L1/111_NE | 80377833 | limited detent | DC – 40GHz          | depends on PCB stack-up, contact HUBER+SUHNER | single    |
| 91_SMP-50-0-S1/111_NE | 80377835 | smooth bore    | DC – 40GHz          | depends on PCB stack-up, contact HUBER+SUHNER | single    |

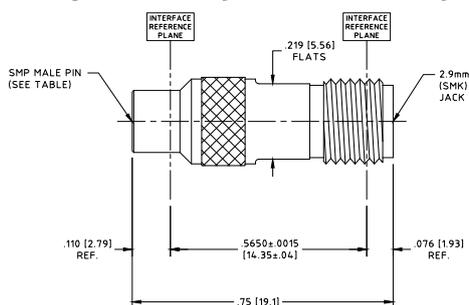
Cable groups see page 32

Assembly tools see page 551

Mounting holes/PCB layouts see page 579

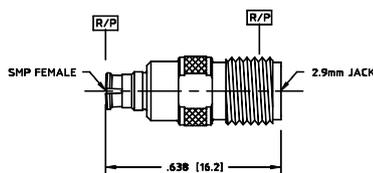
# SMP – adapters

## Adapter SMP jack - 2.9 mm jack (male/female)



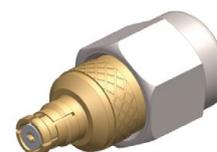
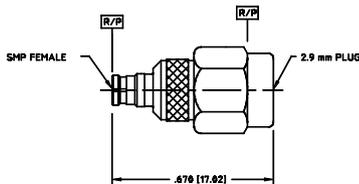
| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29487-2           | 80318038 | single    |

## Adapter SMP jack – 2.9 mm jack (female/female)



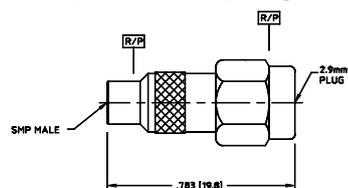
| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29487-3           | 80318039 | single    |

## Adapter SMP jack – 2.9 mm plug (female/male)



| HUBER+SUHNER type | Item no. | Packaging |
|-------------------|----------|-----------|
| 29487-4           | 80363059 | single    |

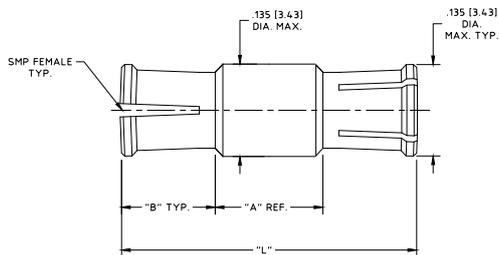
## Adapter SMP plug – 2.9 mm plug (male/male)



| HUBER+SUHNER type | Item no. | Packaging | Detent |
|-------------------|----------|-----------|--------|
| 29487-1           | 80318037 | single    | full   |

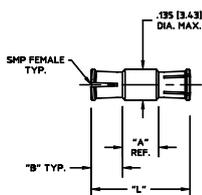
# SMP – adapters

## Adapter/Bullet (female/female)



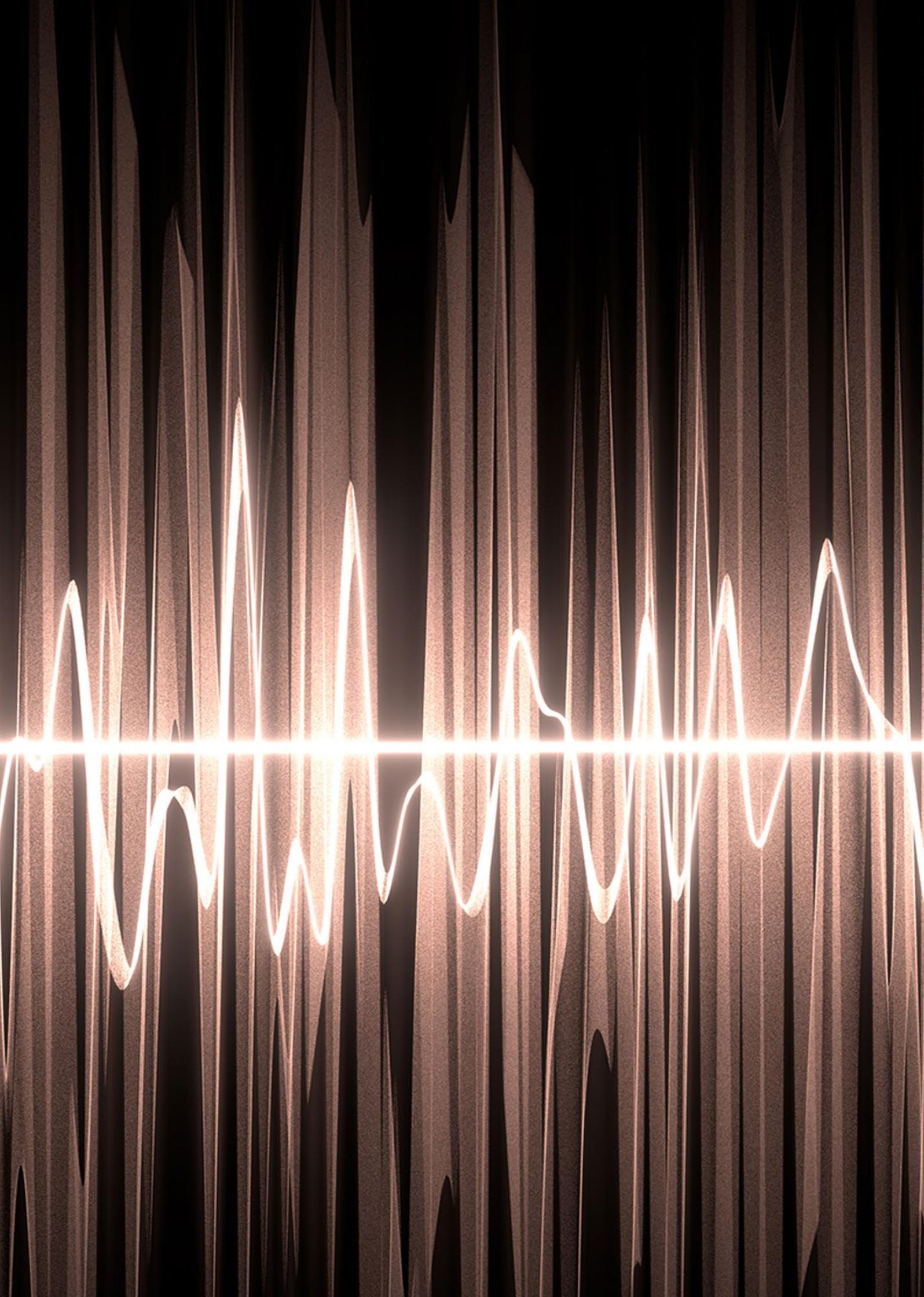
| HUBER+SUHNER type | Item no. | Packaging | "A"            | Adapter length X | "B"           |
|-------------------|----------|-----------|----------------|------------------|---------------|
| 29473-A2F1        | 80317920 | Single    | 1.91mm/0.075"  | 8.76mm/0.345"    | 3.43mm/0.135" |
| 29473-A2F7        | 80395837 | Single    | 7.29mm/0.287"  | 14.15mm/0.557"   | 3.43mm/0.135" |
| 29473-A2F8        | 80395850 | Single    | 5.74mm/0.226"  | 12.60mm/0.496"   | 3.43mm/0.135" |
| 29473-A2F9        | 80395851 | Single    | 12.45mm/0.490" | 19.30mm/0.760"   | 3.43mm/0.135" |

## Adapter/bullet jack/jack (female/female)



| HUBER+SUHNER type    | Item no. | Packaging | "A"             | Adapter length X | "B"            |
|----------------------|----------|-----------|-----------------|------------------|----------------|
| 31_SMP-50-0-5/111_NE | 80377837 | single    | 1.91 mm/0.075"  | 8.76 mm/0.345"   | 3.43 mm/0.135" |
| 31_SMP-50-0-6/111_NE | 80377836 | single    | 12.45 mm/0.190" | 19.30 mm/0.760"  | 3.43 mm/0.135" |

Adapter length available from 8.76 mm/0.345" up to 19.20 mm/0.760" up on request.



# SMMPM

## Description

HUBER+SUHNER SMMPM connectors offer remarkable miniaturisation and performance for RF applications up to 65 GHz. HUBER+SUHNER SMMPM connectors are MIL-SPEC qualified for defence and space flight applications.

HUBER+SUHNER also offers the unique bend-to-the-end microbend style cable connectors.

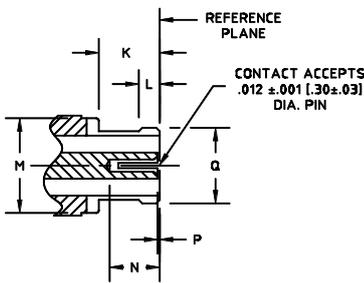
Along with a large portfolio of different SMMPM PCB mount connectors that have been designed with optimised PCB trace launch geometries to offer a complete interconnect design solution from «wire-to-trace».

## Compatibility

50 Ω SMMPM connectors are intermateable without restrictions.

## Interface dimensions (mm/inches)

### SMMPM female (socket contact)

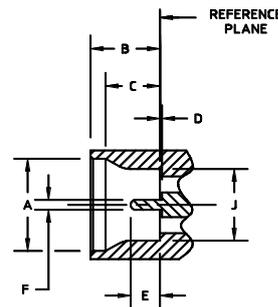


SMMPM FEMALE (SOCKET CONTACT)  
INTERFACE MEETS MIL-STD-348

## Content

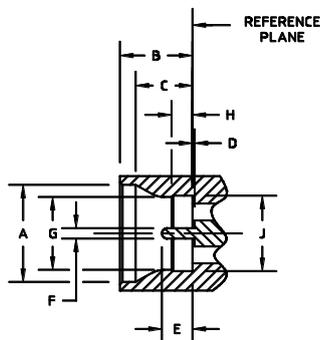
|                                   |     |
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### SMMPM male (pin contact), smooth bore



SMMPM MALE (PIN CONTACT)  
SMOOTH BORE  
INTERFACE MEETS MIL-STD-348

### SMMPM male (pin contact), full detent



SMMPM MALE (PIN CONTACT)  
FULL DETENT  
INTERFACE MEETS MIL-STD-348

|   | min.       | max.       |   | min.       | max.       |
|---|------------|------------|---|------------|------------|
| A | 2.82/0.111 | 2.92/0.115 | J | 2.18/0.086 | 2.24/0.088 |
| B | 2.08/0.082 | 2.13/0.084 | K | 1.73/0.068 | –          |
| C | 1.57/0.062 | 1.83/0.072 | L | –          | 0.58/0.023 |
| D | 0.00/0.000 | –          | M | –          | 2.79/0.110 |
| E | 0.76/0.030 | 1.14/0.045 | N | 1.27/0.050 | –          |
| F | 0.28/0.011 | 0.33/0.013 | P | 0.00/0.000 | 0.20/0.008 |
| G | 2.11/0.083 | 2.16/0.085 | Q | –          | 2.41/0.095 |
| H | 0.53/0.021 | 0.58/0.023 |   |            |            |

### Interface dimensions conformable to the following standards:

USA: MIL-PRF-31031  
SMMPM interface MIL-STD-348

# SMPM – technical data

| Electrical data       | Requirements  |
|-----------------------|---|
| Impedance             | 50 $\Omega$   |
| Frequency range       | DC to 65 GHz  |
| Contact resistance    | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max.                               |
| DWV                   | 335 Vrms at sea level   |
| Insulation resistance | 5000 megaohms min.  |
| Corona levels         | 125 Vrms at 70 000 ft   |
| RF high potential     | 200 Vrms at 5 MHz   |
| RF leakage            | 80 dB max. at 3 GHz<br>65 dB max. at 3 to 26.5 GHz  |
| Magnetic permeability | < 2 $\mu$   |
| VSWR                  | 1.1:1 to 26.5 GHz<br>1.3:1 to 65 GHz  |
| Insertion loss        | 0.05 + 0.04 $\sqrt{f}$ in GHz (non-hermetic connectors)<br>0.12 $\sqrt{f}$ in GHz (hermetic connectors) |

| Mechanical data          | Requirements  |
|--------------------------|---|
| Center contact retention | 1.5 lbs (6.672 N) min. (captivated designs)   |
| Durability               | 100 cycles min. into a full detent shroud<br>1000 cycles min. into a smooth bore shroud       |
| Force to engage          | SMPM full detent – 3.5 lbs (15.569 N) typical<br>SMPM smooth bore – 1.5 lbs (6.672 N) typical |
| Force to disengage       | SMPM full detent – 5 lbs (22.241 N) typical<br>SMPM smooth bore – 1.5 lbs (6.672 N) typical   |

| Environmental data  | Requirements                                   |
|---------------------|--|
| Temperature range   | -65 to +165 °C                                 |
| Thermal shock       | MIL-STD-202, method 107, condition B           |
| Moisture resistance | MIL-STD-202, method 106                        |
| Corrosion           | MIL-STD-202, method 101, condition B           |
| Sine vibration      | MIL-STD-202, method 204, 28 g peak             |
| Random vibration    | MIL-STD-202, method 214, condition K-I, 46.3 g |
| Shock               | MIL-STD-202, method 213, 12 000 g peak         |

# SMPM – technical data

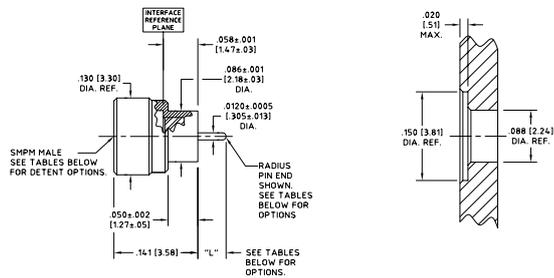
| <b>Material data</b>               |  |  |
|------------------------------------|--|--|
| <b>Cable and shroud connectors</b> | <b>Material</b>  | <b>Plating</b>   |
| Body and contact                   | beryllium copper per ASTM B-196  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1  |
| Dielectric                         | PTFE per ASTM D-1710, type I, grade 1 or Torlon™*per ASTM D-5204 or polyether ether ketone per MIL-P_46189, type I or polyetherimide (PEI) per ASTM D-5202 | –  |
| Shroud                             | #303 SS per ASTM A-582   | passivated per SAE-AMS-2700  |
| <b>Hermetic shroud connectors</b>  | <b>Material</b>  | <b>Plating</b>   |
| Body and contact                   | iron nickel alloy IAW ASTM F-15 and F-1466 UNS K94610 per ASTM F-15, class 1, only for pin on glass seal contacts  | gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type 1 |
| Dielectric                         | Corning 7070 glass or equivalent   | –  |
| <b>Adapters</b>                    | <b>Material</b>  | <b>Plating</b>   |
| Body                               | beryllium copper per ASTM B-196 or #303 SS per ASTM A-582  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1  |
| Contact                            | beryllium copper per ASTM B-196  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type 1  |
| Dielectric                         | PTFE per ASTM D-1710, type I, grade 1 or polyether ether ketone per MIL-P_46189, type I or polyetherimide (PEI) per ASTM D-5202                            | –  |

\* Note: Torlon™ is not used for space applications.

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

# SMPM – hermetic shrouds

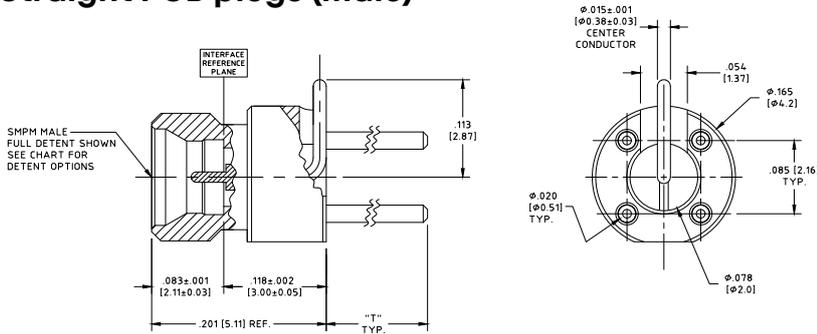
## Hermetically sealed, plugs (male)



| HUBER+SUHNER type | Item no. | "L"         | End option | Detent      |
|-------------------|----------|-------------|------------|-------------|
|                   |          | mm/in       |            |             |
| 29972H1-2-030S    | 80376464 | 0.762/0.030 | square     | full        |
| 29972H1-2-050S    | 80376465 | 1.270/0.050 | square     | full        |
| 29972H1-2-060S    | 80395460 | 1.524/0.060 | square     | full        |
| 29972H1-2-070S    | 80395461 | 1.778/0.070 | square     | full        |
| 29972H1-2-090S    | 80395462 | 2.286/0.090 | square     | full        |
| 29972H1-4-030S    | 80395463 | 0.762/0.030 | square     | smooth bore |
| 29972H1-4-050S    | 80395464 | 1.270/0.050 | square     | smooth bore |
| 29972H1-4-060S    | 80395465 | 1.524/0.060 | square     | smooth bore |
| 29972H1-4-070S    | 80395466 | 1.778/0.070 | square     | smooth bore |
| 29972H1-4-090S    | 80395467 | 2.286/0.090 | square     | smooth bore |

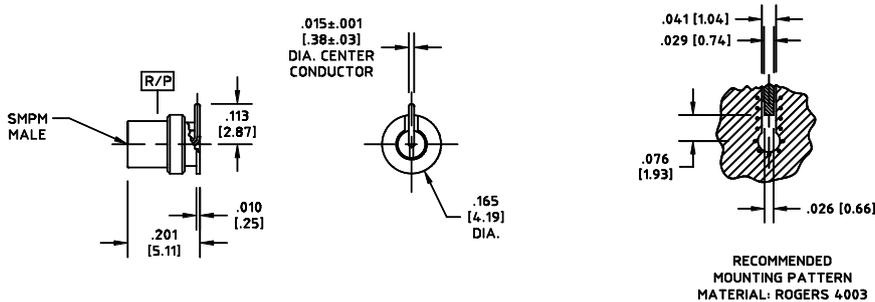
# SMPM – PCB mount connectors

## Straight PCB plugs (male)



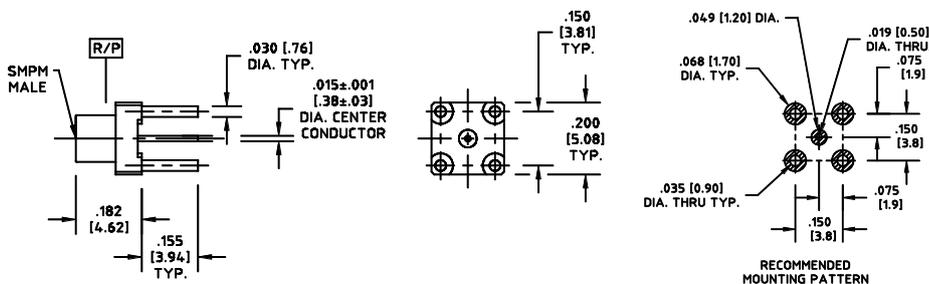
| HUBER+SUHNER type | Item no. | Detent      | T             |
|-------------------|----------|-------------|---------------|
| 29972S1-2-140     | 80378296 | full        | 3.55mm/0.140" |
| 29972S1-2-165     | 80391824 | full        | 4.19mm/0.165" |
| 29972S1-4-140     | 80392973 | smooth bore | 3.55mm/0.140" |

## Straight PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972SM-2-001     | 80367475 | full        |
| 29972SM-4-001     | 80367476 | smooth bore |

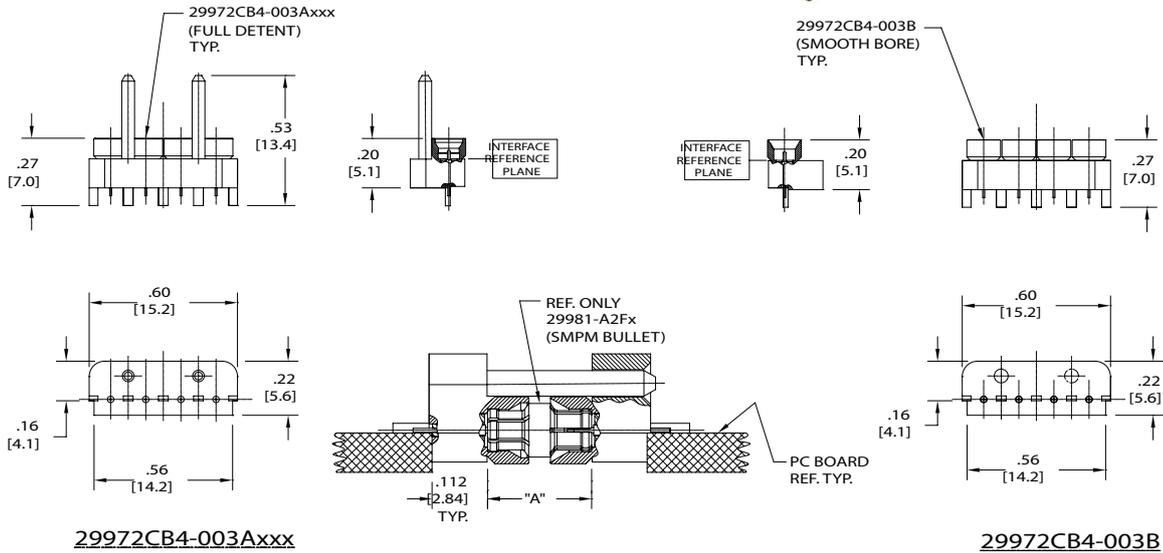
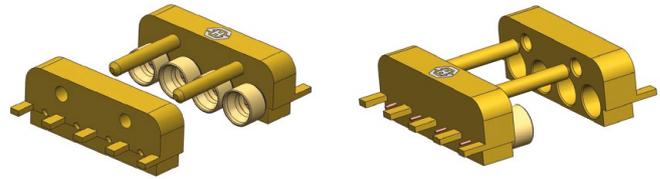
## Straight PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972T1-2-155     | 80395469 | full        |
| 29972T1-4-155     | 80395470 | smooth bore |

# SMPM – edge mount connectors

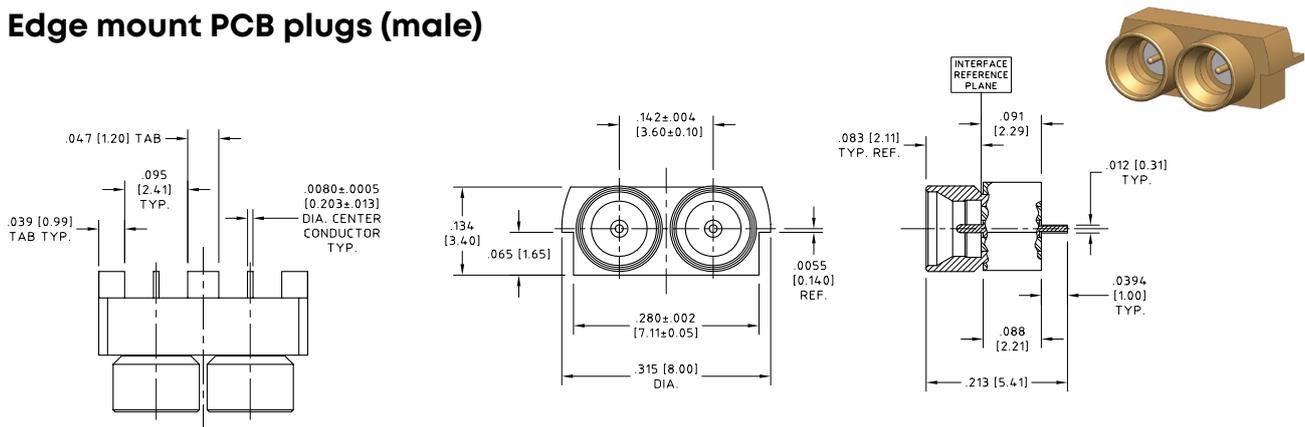
## 29972CB4-003A/B – edge mount



4 CHANNEL PC BOARD TO PC BOARD CONNECTOR BLOCKS WITH BULLET

| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972CB4-003A     | 80351053 | full        |
| 29972CB4-003B     | 80351054 | smooth bore |

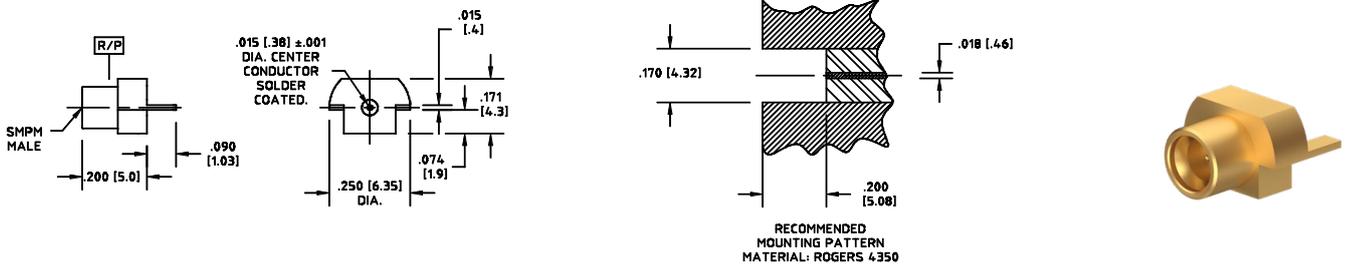
## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972CB2-2-002    | 85218765 | full        |
| 29972CB2-4-002    | 80376773 | smooth bore |

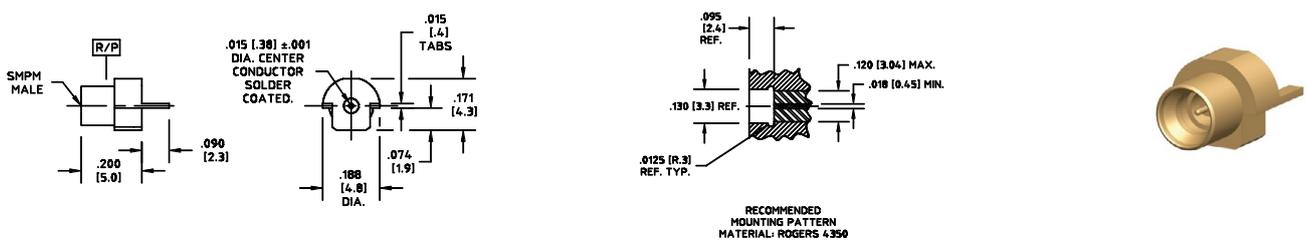
# SMPM – edge mount connectors

## Edge mount PCB plugs (male)



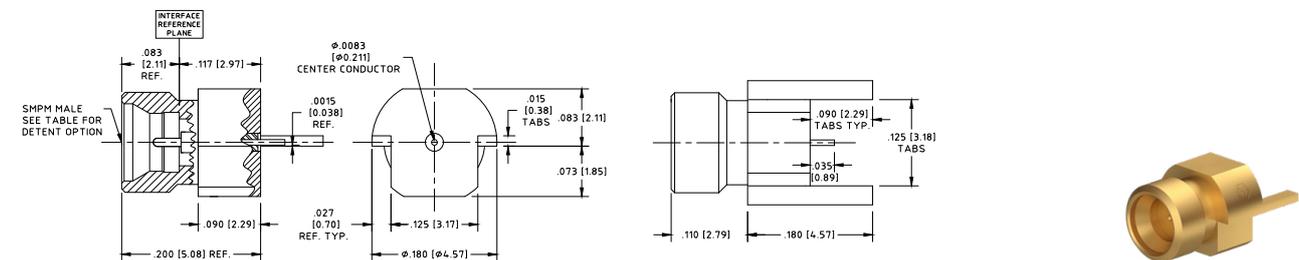
| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972BM-2-002     | 80395750 | full        |
| 29972BM-4-002     | 80362691 | smooth bore |

## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972BM-2-004     | 80395472 | full        |
| 29972BM-4-004     | 80395473 | smooth bore |

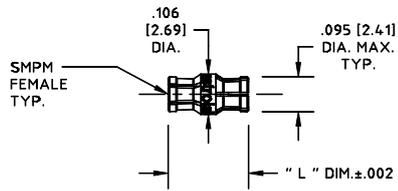
## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972BM-2-006     | 80391558 | Full        |
| 29972BM-4-006     | 85202088 | Smooth bore |

# SMPM – adapter

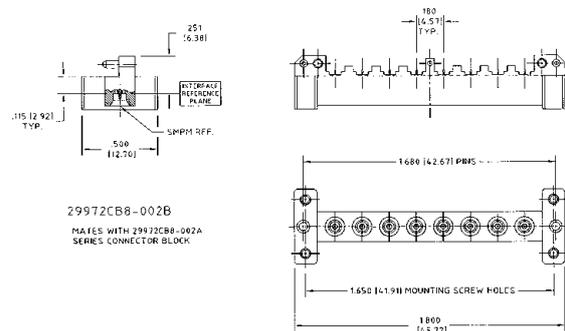
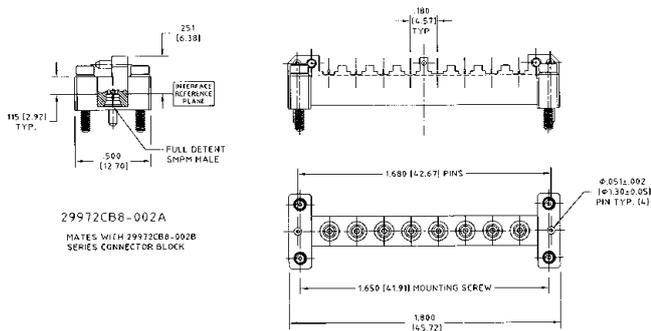
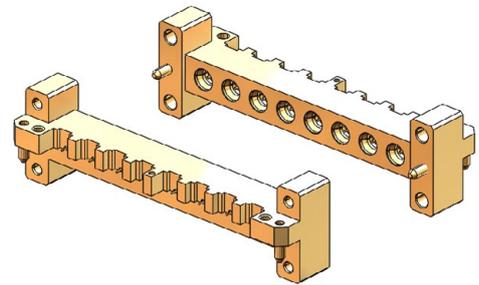
## Adapter jack/jack (female/female)



| HUBER+SUHNER type | Packaging  | Adapter length L |  |
|-------------------|------------|------------------|--|
|                   |            | mm/in            |  |
| 29981-A2F1        | individual | 5.33/0.210       |  |
| 29981-A2F2        | individual | 12.7/0.500       |  |
| 29981-A2F3        | individual | 6.45/0.254       |  |
| 29981-A2F5        | individual | 8.483/0.334      |  |
| 29981-A2F6        | individual | 15.367/0.605     |  |
| 29981-A2F8        | individual | 11.303/0.445     |  |
| 29981-A2F11       | individual | 5.359/0.211      |  |

# SMPPM – PSM mount connectors

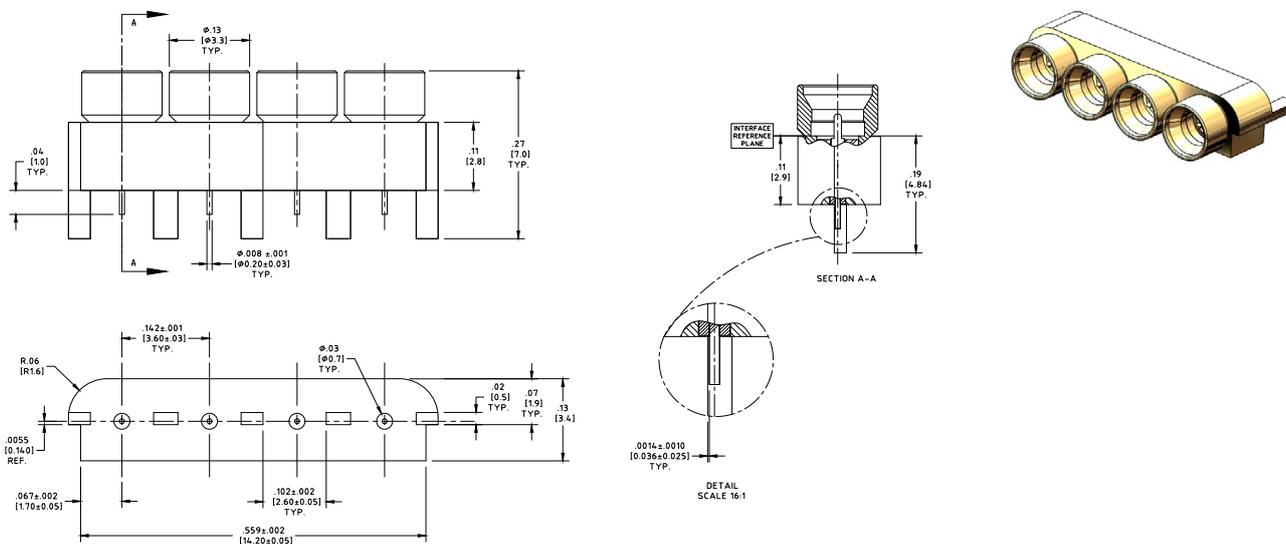
## 29972CB8-002A/B – edge mount



| HUBER+SUHNER type | Detent      |
|-------------------|-------------|
| 29972CB8-002A     | full        |
| 29972CB8-002B     | smooth bore |

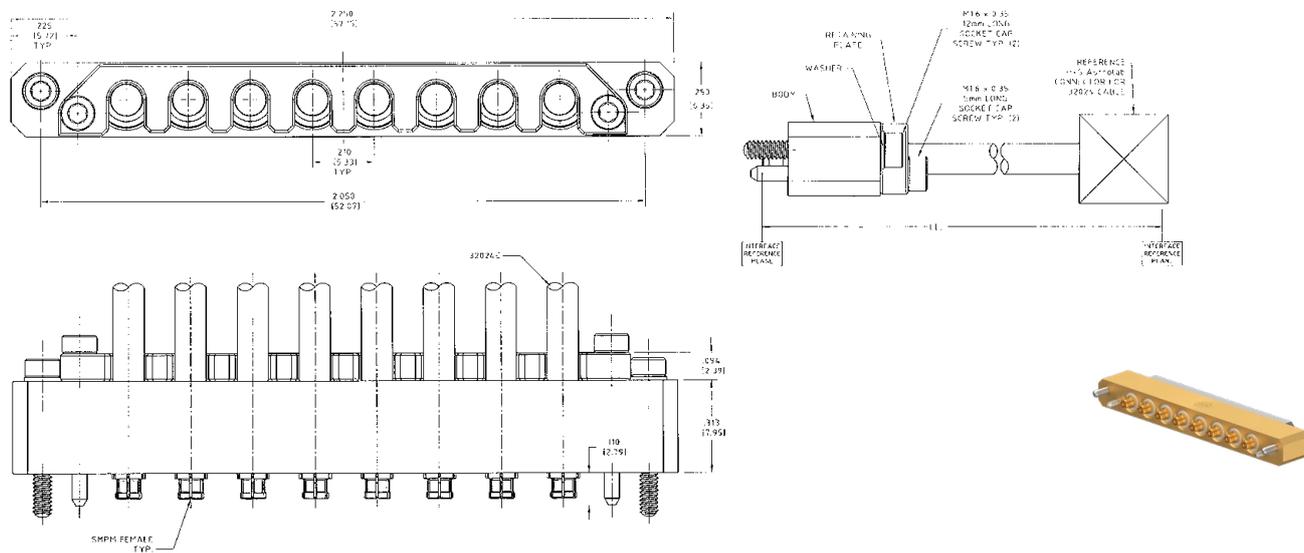
# SMPM – launchers

## Connector block, 4x1 male connector housing



| HUBER+SUHNER type | Item no. | Detent |
|-------------------|----------|--------|
| 29972CB4-004      | 80392618 | full   |

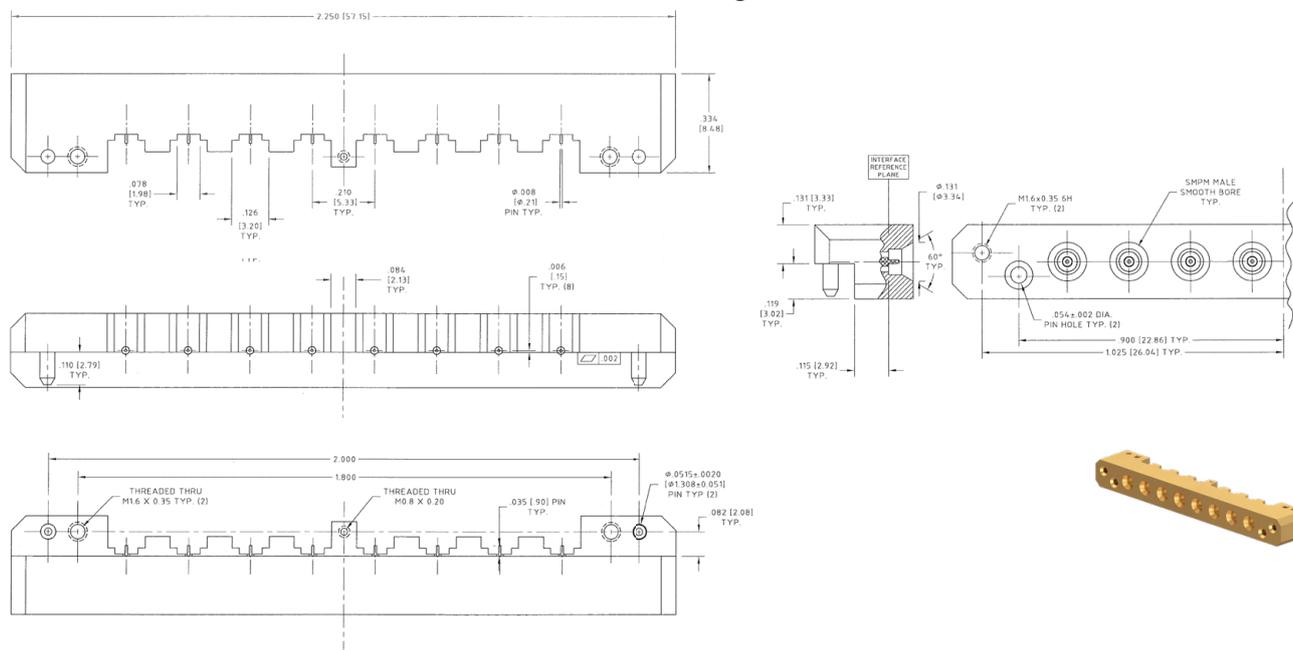
## Connector block, 8x1 female connector housing



| HUBER+SUHNER type | Item no. | Detent         |
|-------------------|----------|----------------|
| 29972CB8-003B-002 | 80396935 | 2.9mm SMK Plug |
| 29972CB8-003B-003 | 85127379 | 2.9mm SMK Jack |

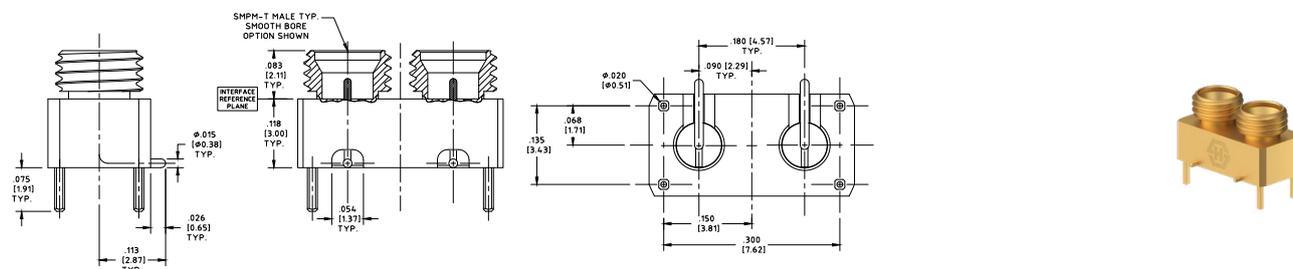
# SMPM – launchers

## Connector block, 8x1 male connector housing

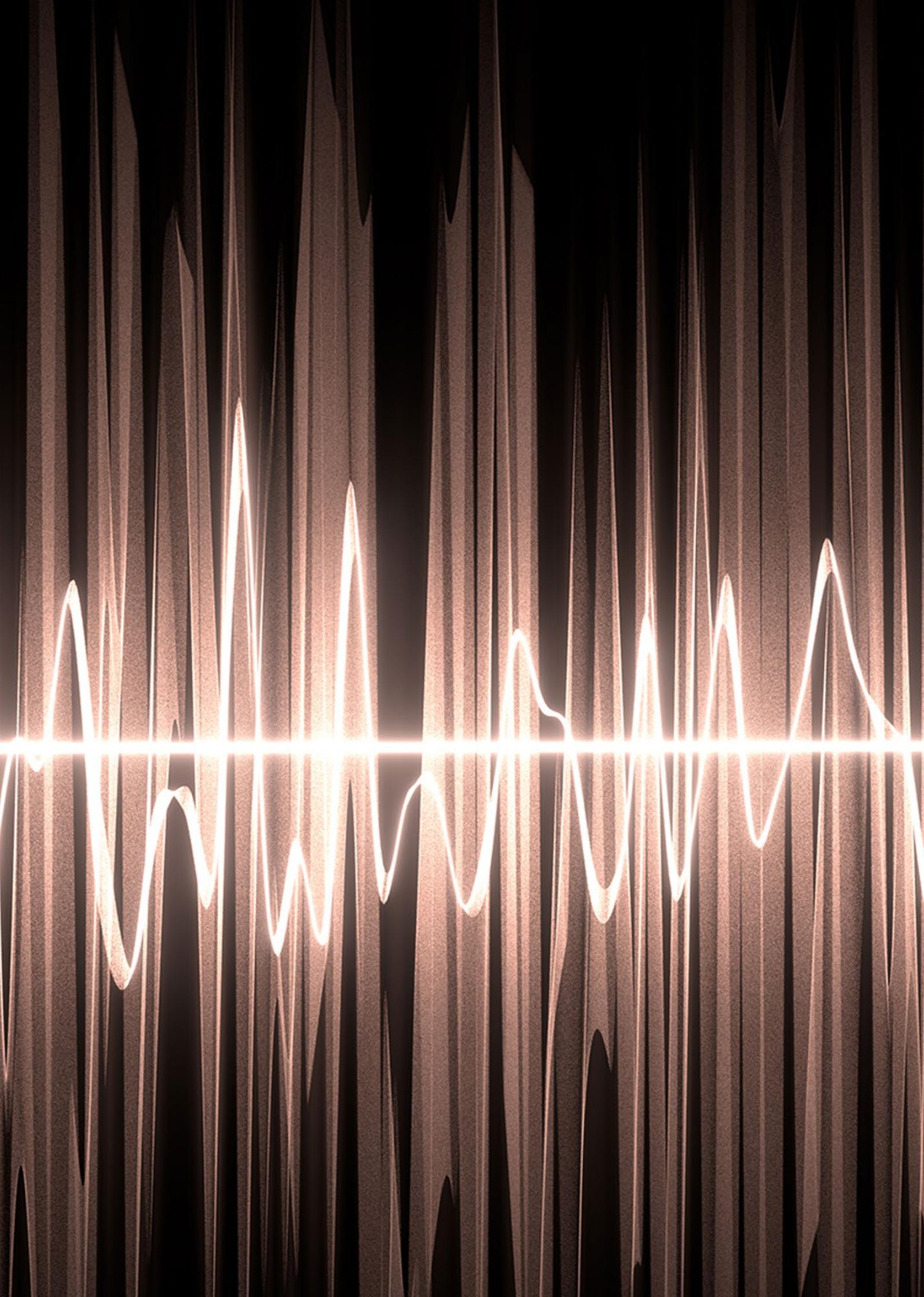


| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29972CBB-003A     | 80396343 | smooth bore |

## Connector block, 2x1 male connector housing



| HUBER+SUHNER type | Item no. | Detent |
|-------------------|----------|--------|
| 29976CB2-2-002    | 85125056 | full   |



# Series SMPM-T

## Description

The SMPM-T is the smallest threaded open source connector on the market. Its unique and innovative combination of a MIL-STD-348 SMPM female interface connector together with a retractable threaded nut provides an integrated solution offering unprecedented electrical and mechanical performance. The SMPM-T handles high density requirements with a connector centerline-to-centerline spacing of just 5 mm (0.20 in) while offering unmatched electrical stability at frequencies up to 65 GHz in even the harshest operating environments.

The SMPM-T connector is available along with HUBER+SUHNER's industry driving microbend «bend-to-the-end» technology that is already qualified for any aerospace application. The SMPM-T connector complies with the hi-rel material restrictions of NASA while still offering full compliance with RoHS and REACH legislation in the commercial market.

## Content

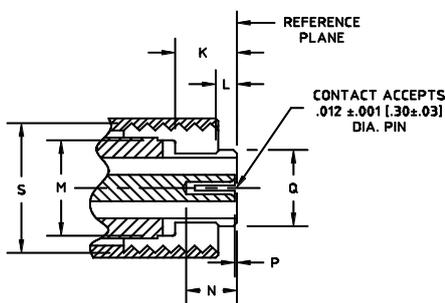
|                                   |     |
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| Description                       | 107 |
| Compatibility                     | 107 |
| Interface dimensions in mm/inches | 107 |
| Technical data                    | 108 |
| Cable connectors                  | 110 |
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| PCB mount connectors              | 113 |
| Edge mount connectors             | 115 |
| Adapters                          | 117 |

## Compatibility

50 Ω SMPM-T connectors are intermateable without restrictions.

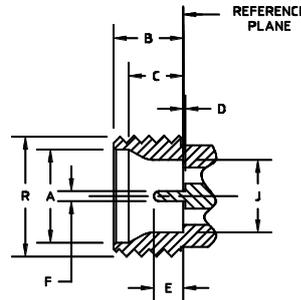
## Interface dimensions (mm/inches)

### SMPM-T female (socket contact)



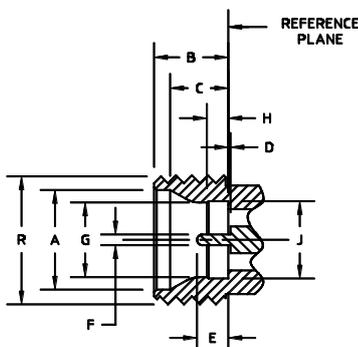
SMPM-T FEMALE (SOCKET CONTACT)  
INTERFACE MEETS MIL-STD-348

### SMPM-T male (pin contact), smooth bore



SMPM-T MALE (PIN CONTACT)  
SMOOTH BORE  
INTERFACE MEETS MIL-STD-348

### SMPM-T male (pin contact), full detent



SMPM-T MALE (PIN CONTACT)  
FULL DETENT  
INTERFACE MEETS MIL-STD-348

|   | min.         | max.         |   | min.         | max.         |
|---|--------------|--------------|---|--------------|--------------|
| A | 2.82 / 0.111 | 2.92 / 0.115 | K | 1.73 / 0.068 | –            |
| B | 2.08 / 0.082 | 2.13 / 0.084 | L | –            | 0.58 / 0.023 |
| C | 1.57 / 0.062 | 1.83 / 0.072 | M | –            | 2.79 / 0.110 |
| D | 0.00 / 0.000 | –            | N | 1.27 / 0.050 | –            |
| E | 0.76 / 0.030 | 1.14 / 0.045 | P | 0.00 / 0.000 | 0.20 / 0.008 |
| F | 0.28 / 0.011 | 0.33 / 0.013 | Q | –            | 2.41 / 0.095 |
| G | 2.11 / 0.083 | 2.16 / 0.085 | R | –            | 3.66 / 0.145 |
| H | 0.53 / 0.021 | 0.58 / 0.023 | S | 3.30 / 0.130 | –            |
| J | 2.18 / 0.086 | 2.24 / 0.088 |   |              |              |

### Interface dimensions conformable to the standards:

USA: MIL-PRF-31031  
SMPM interface MIL-STD-348

# SMPM-T – technical data

| Electrical data       | Requirements  |
|-----------------------|---|
| Impedance             | 50 $\Omega$   |
| Frequency range       | DC to 65 GHz  |
| Contact resistance    | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max.                               |
| DWV                   | 335 Vrms at sea level   |
| Insulation resistance | 5000 megaohms min.  |
| Corona levels         | 125 Vrms at 70 000 ft   |
| RF high potential     | 200 Vrms at 5 MHz   |
| RF leakage            | -80 dB max. at 3 GHz<br>-65 dB max. at 3 to 26.5 GHz  |
| Magnetic permeability | < 2 $\mu$   |
| VSWR                  | 1.1:1 to 26.5 GHz<br>1.3:1 to 65 GHz  |
| Insertion loss        | 0.05 + 0.04 $\sqrt{f}$ in GHz (non-hermetic connectors)<br>0.12 $\sqrt{f}$ in GHz (hermetic connectors) |

| Mechanical data          | Requirements   |
|--------------------------|--|
| Center contact retention | 1.5 lbs (0.68 kg) min. (captivated designs)  |
| Durability               | 100 cycles min. into a full detent shroud<br>1000 cycles min. into a smooth bore shroud      |
| Force to engage          | SMPM full detent – 3.5 lbs (1.59 kg) typical<br>SMPM smooth bore – 1.5 lbs (0.68 kg) typical |
| Force to disengage       | SMPM full detent – 5 lbs (2.27 kg) typical<br>SMPM smooth bore – 1.5 lbs (0.68 kg) typical   |
| Mating torque            | 22 $\pm$ 2 in-oz (0.016 $\pm$ 0.001 m-kg)  |

| Environmental data  | Requirements                                      |
|---------------------|---|
| Temperature range   | -65 to +165 $^{\circ}$ C                          |
| Thermal shock       | MIL-STD-202, method 107, condition B              |
| Moisture resistance | MIL-STD-202, method 106                           |
| Corrosion           | MIL-STD-202, method 101, condition B              |
| Sine vibration      | MIL-STD-202, method 204, 28g peak                 |
| Random vibration    | MIL-STD-202, method 214, condition K-1, 46.3 grms |
| Shock               | MIL-STD-202, method 213, 12 000 g peak            |

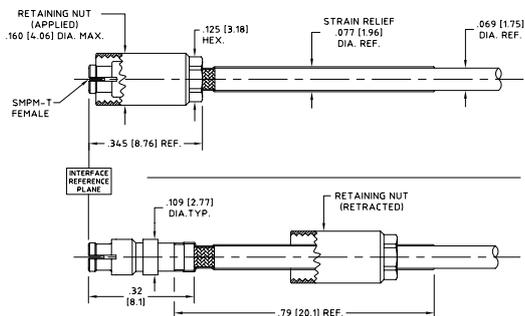
# SMPM-T – technical data

| <b>Material data</b>               |   |  |
|------------------------------------|---|--|
| <b>Cable and shroud connectors</b> | <b>Material</b>   | <b>Plating</b>   |
| Body and contact                   | beryllium copper per ASTM B-196   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type II, class 1  |
| Dielectric                         | PTFE per ASTM D-1710, type I, grade 1, polyamide-imide per ASTM D-5204 or polytherimide (PEI) per ASTM D-5205 or PEEK per MIL-P-46183, type I | –  |
| <b>Hermetic shroud connectors</b>  | <b>Material</b>   | <b>Plating</b>   |
| Body and contact                   | nickel-cobalt ferrous alloy per ASTM F-15, class 1  | gold plate per ASTM B-488, code A, type III over nickel plate per SAE-AMS-QQ-N-290, type II, class 1 |
| Dielectric                         | Corning 7070 glass or equivalent  | –  |
| <b>Adapters</b>                    | <b>Material</b>   | <b>Plating</b>   |
| Body and nut                       | #303 SS per ASTM A-582  | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type II, class 1  |
| Contact                            | beryllium copper per ASTM B-196   | gold plate per ASTM B-488, code C, type II over nickel plate per SAE-AMS-QQ-N-290, type II, class 1  |
| Dielectric                         | PTFE per ASTM D-1710, type I, grade 1 and polytherimide (PEI) per ASTM D-5205   | –  |

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

# SMPM-T – cable connectors

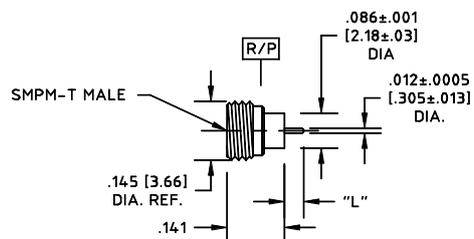
## Straight cable jacks (female)



| HUBER+SUHNER type | Item no. | Cable group (example)           | Packaging | Cable dia.<br>mm/in |
|-------------------|----------|---------------------------------|-----------|---------------------|
| 29971T-MF53       | 80376818 | Y3, Y16, Y11 (2.18 mm/0.086 in) | single    | 1.96/0.077          |

# SMPM-T – hermetic shrouds

## Hermetically sealed, plugs (male)

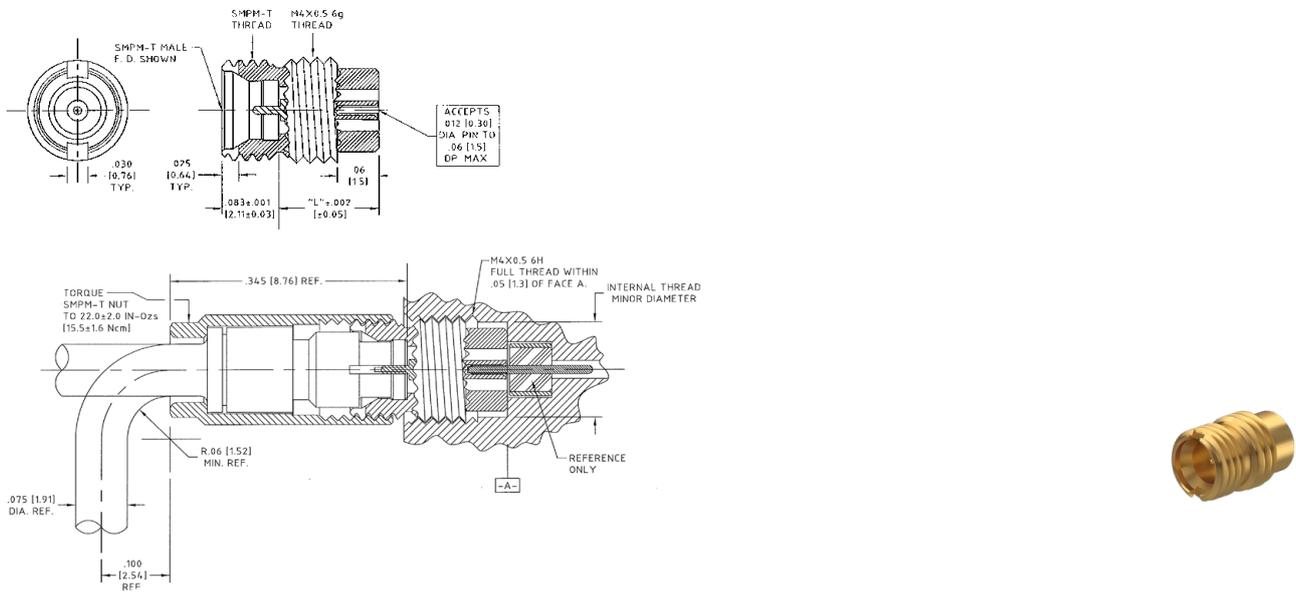


| HUBER+SUHNER type | Item no. | Contact length "L" | Detent      | End option |
|-------------------|----------|--------------------|-------------|------------|
| mm/in             |          |                    |             |            |
| 29976H1-2-060S    | 80362701 | 1.52/0.06          | full        | square     |
| 29976H1-2-090S    | 80362703 | 2.28/0.09          | full        | square     |
| 29976H1-4-060S    | 80362705 | 1.52/0.06          | smooth bore | square     |
| 29976H1-4-090S    | 80362707 | 2.28/0.09          | smooth bore | square     |



# SMPM-T – panel mount connectors

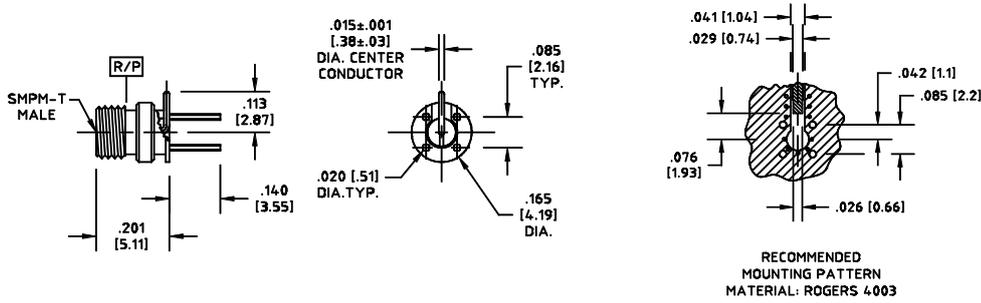
## Straight bulkhead receptacles, plug (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976TSP-4-009    | 85126507 | Smooth bore |

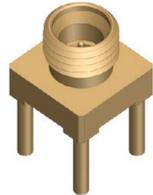
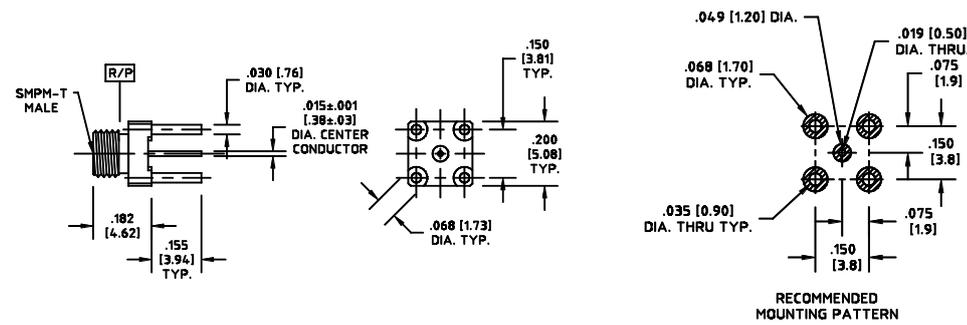
# SMPM-T – PCB mount connectors

## Straight PCB plugs (male)



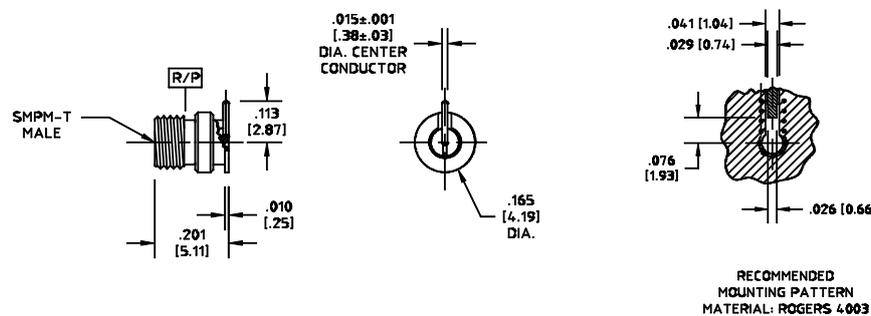
| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976S1-2-140     | 80362694 | full        |
| 29976S1-4-140     | 80362695 | smooth bore |

## Straight PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976T1-2-155     | 80366706 | full        |
| 29976T1-4-155     | 80370524 | smooth bore |

## Straight PCB plugs (male)

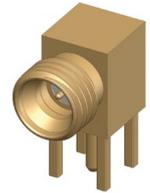
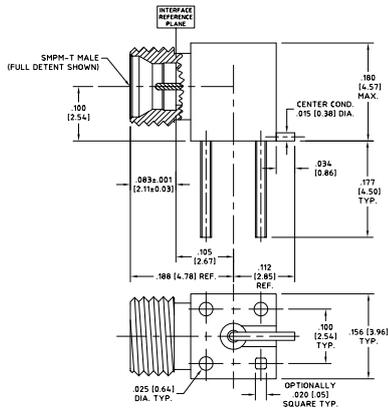


| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976SM-2-001     | 80362696 | full        |
| 29976SM-4-001     | 80362697 | smooth bore |



# SMPM-T – PCB mount connectors

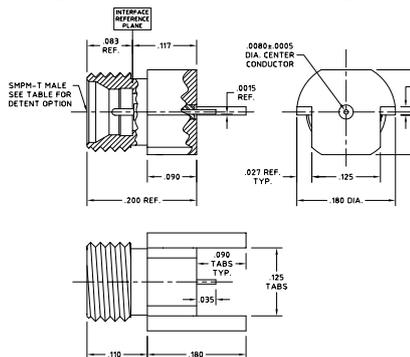
## Right angle PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976RA-2-003     | 80376679 | full        |
| 29976RA-4-003     | 80376680 | smooth bore |

# SMPM-T – edge mount connectors

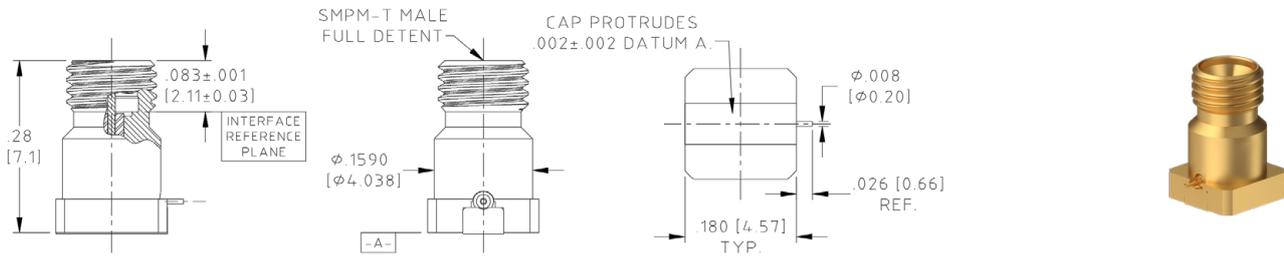
## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976BM-2-006     | 80367075 | full        |
| 29976BM-4-006     | 80367222 | smooth bore |

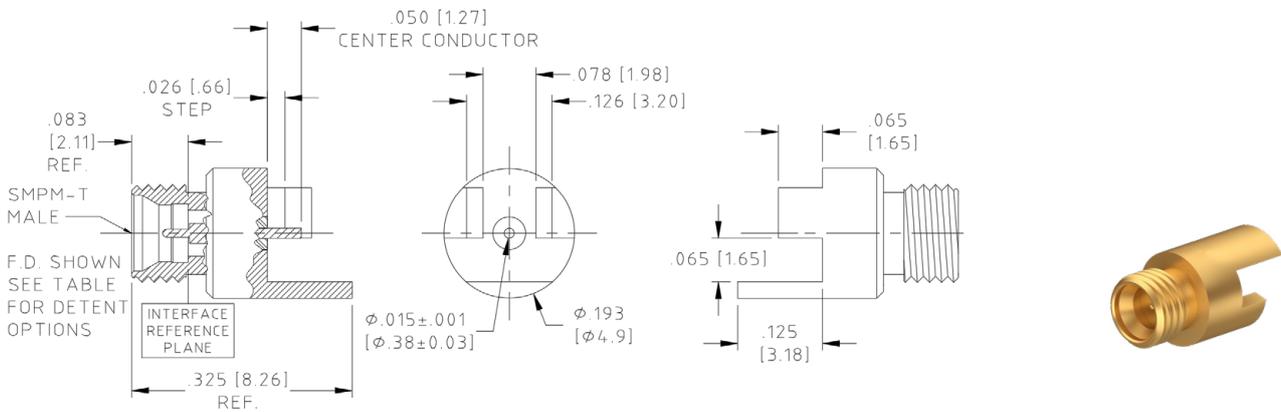
# SMPM-T – edge mount connectors

## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent |
|-------------------|----------|--------|
| 29976TRM-2-002    | 85154395 | full   |

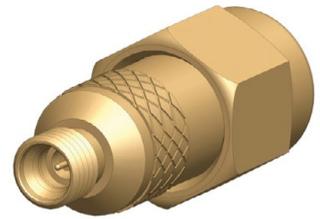
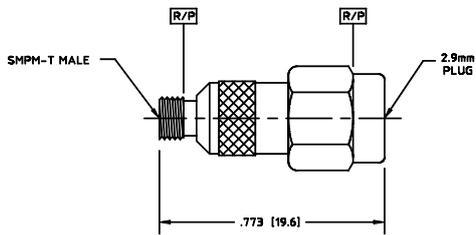
## Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 29976BM-2-001     | 80320230 | Full        |
| 29976BM-4-001     | 80320231 | Smooth bore |

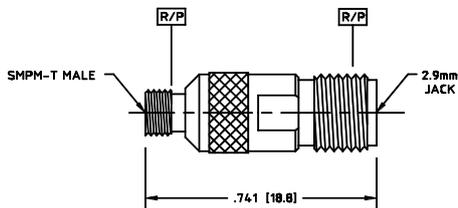
# SMPM-T – adapters

## Adapter SMPM-T plug – SK (2.92 mm standard) plug (male/male)

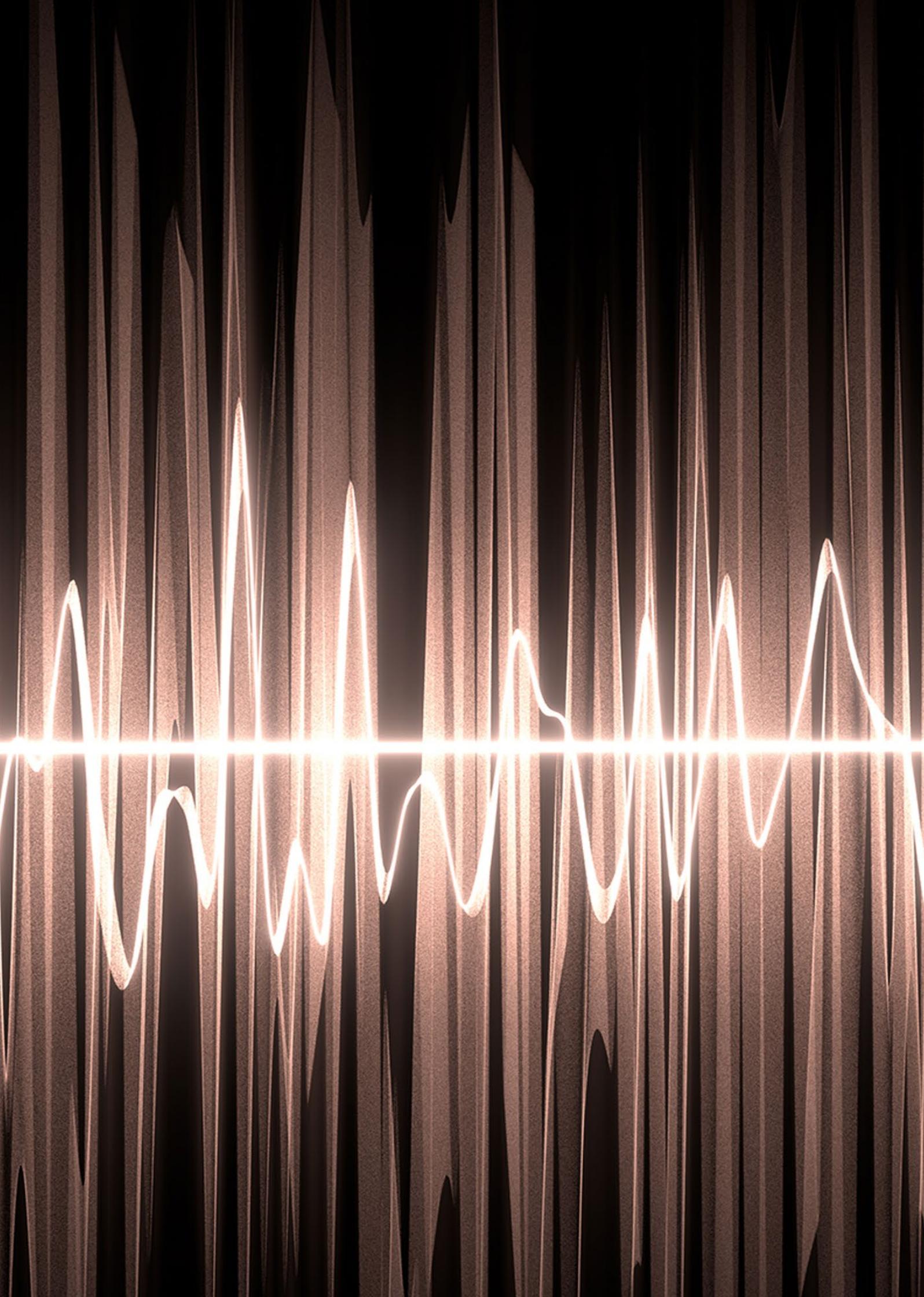


| HUBER+SUHNER type | Item no. | Packaging | Detent |
|-------------------|----------|-----------|--------|
| 29429-1T2         | 80317870 | single    | full   |

## Adapter SMPM-T plug – SK (2.92 mm standard) jack (male/female)



| HUBER+SUHNER type | Item no. | Packaging | Detent |
|-------------------|----------|-----------|--------|
| 29429-4T2         | 80362561 | single    | full   |



# SMP3

## Description

HUBER+SUHNER SMP3 connectors are 45% smaller than the existing SMP connectors and 30% smaller than the existing SMPM connector, making it ideal for dense packaging in multiport applications and high density stacked PCBs. HDI PCBs (High Density Interconnected Printed Circuit Boards) are used to meet market demand for complex designs in smaller form factors in most market segments, such as wireless, military, space, medical, semiconductors, testing, and more.

## Compatibility

50 Ω SMP3 connectors are intermateable without restrictions.

## Content

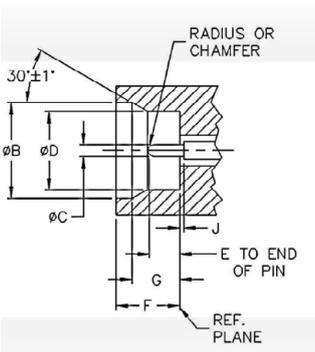
|                                   |     |
|-----------------------------------|-----|
| Description                       | 119 |
| Compatibility                     | 119 |
| Interface dimensions in mm/inches | 119 |
| Technical data                    | 120 |
| Edge mount connectors             | 122 |
| Surface mount connectors          | 123 |

## Interface dimensions conformable to the standards:

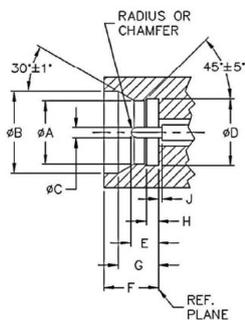
USA: MIL-PRF-31031

## Interface dimensions (mm/inches)

### SMP3 male, Smooth Bore



### SMP3 male, Full Detent



# SMP3 – technical data

| Electrical data       | Requirements  |
|-----------------------|---|
| Impedance             | 50 $\Omega$   |
| Frequency range       | DC to 100 GHz   |
| Contact Resistance    | center conductor 6.0 milliohms max.<br>outer conductor 2.0 milliohms max. |
| DWV                   | 250 Vrms at seallevel   |
| Insulation Resistance | 3500 Mohms  |
| Corona Levels         | 100 VRMS at 70,000 ft   |
| RF high potential     | 150 VRMS at 5 MHz   |
| RF leakage            | -80dB (typical mated pair)  |
| VSWR                  | 1.20:1 to 26.5 GHz, 1.35:1 to 40 GHz, 1.50 to 65 GHz, 1.70 to 100 GHz     |
| Insertion loss        | 0.05 + 0.05 $\sqrt{f}$ in GHz   |

| Mechanical data                     | Requirements   |
|-------------------------------------|--|
| Axial Misalignment                  | .010" max  |
| Radial Misalignment                 | +/- .010"  |
| Mating Cycles                       | Full Detent (FD) – 100 minimum; Smooth Bore (SB) – 500 minimum             |
| Typical Mating Engagement Forces    | Full Detent (FD), 11 N or 2.47 lbs.   Smooth Bore (SB), 5.3 N or 1.19 lbs. |
| Typical Mating Disengagement Forces | Full Detent (FD), 20 N or 4.5 lbs.   Smooth Bore (SB), 4.45 N or 1.0 lbs.  |

| Environmental data  | Requirements                              |
|---------------------|---|
| Temperature Range   | -55°C to 165°C                            |
| Thermal Shock       | MIL-STD-202, Method 107, Test Condition B |
| Moisture Resistance | MIL-STD-202, method 106                   |
| Corrosion           | MIL-STD-202, Method 101, Condition B      |
| Vibration           | MIL-STD-202, Method 204, Condition D      |
| Shock               | MIL-STD-202, Method 213, Condition I      |

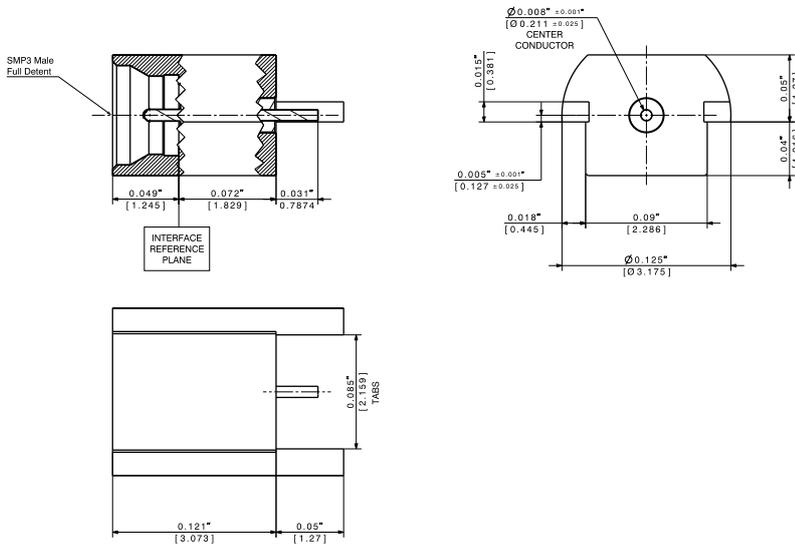
# SMP3 – technical data

| <b>Material data</b>    |                                 |  |
|-------------------------|---------------------------------|--|
| <b>Cable Connectors</b> | <b>Material</b>                 | <b>Plating</b>   |
| Body                    | Beryllium copper per ASTM-B-196 | Gold plate per ASTM B-488, code C, Type II over Nickel plate: SAE-AMS-QQ-N-290 Class 1 |
| Dielectric              | PTFE per ASTM D-1710            | -  |
| Contact                 | Beryllium copper per ASTM-B-196 | Gold plate per ASTM B-488, code C, Type II over Nickel plate: SAE-AMS-QQ-N-290 Class 1 |
| <b>Adapters</b>         | <b>Material</b>                 | <b>Plating</b>   |
| Body & Contact          | Beryllium copper per ASTM-B-196 | Gold plate per ASTM B-488, code C, Type II over Nickel plate: SAE-AMS-QQ-N-290 Class 1 |
| Dielectric              | PTFE per ASTM D-1710            | -  |

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

# SMP3 – edge mount connectors

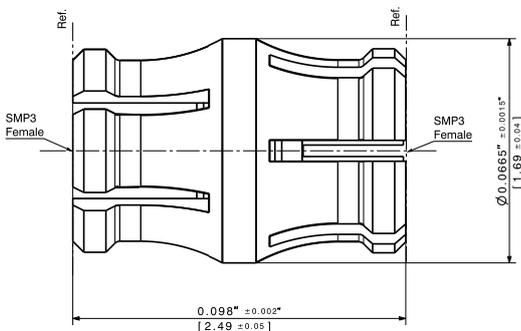
## SMP3 Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 91_SMP3-50-0-FD1  | 85190825 | full        |
| 91_SMP3-50-0-SB1  | 85190826 | Smooth bore |

# SMP3 – edge mount connectors

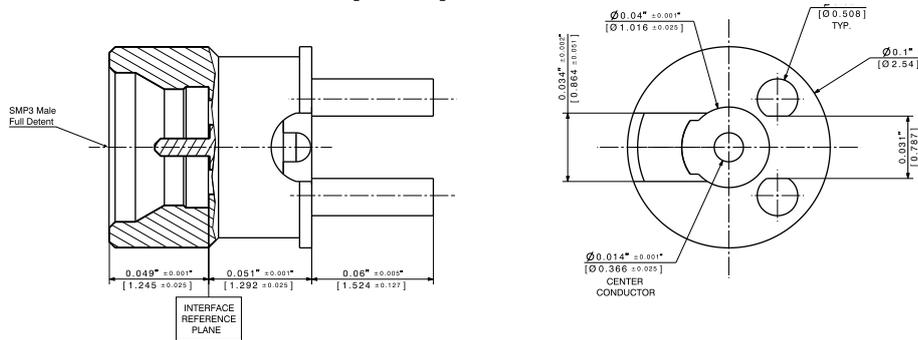
## Adaptor/Bullet (female/female)



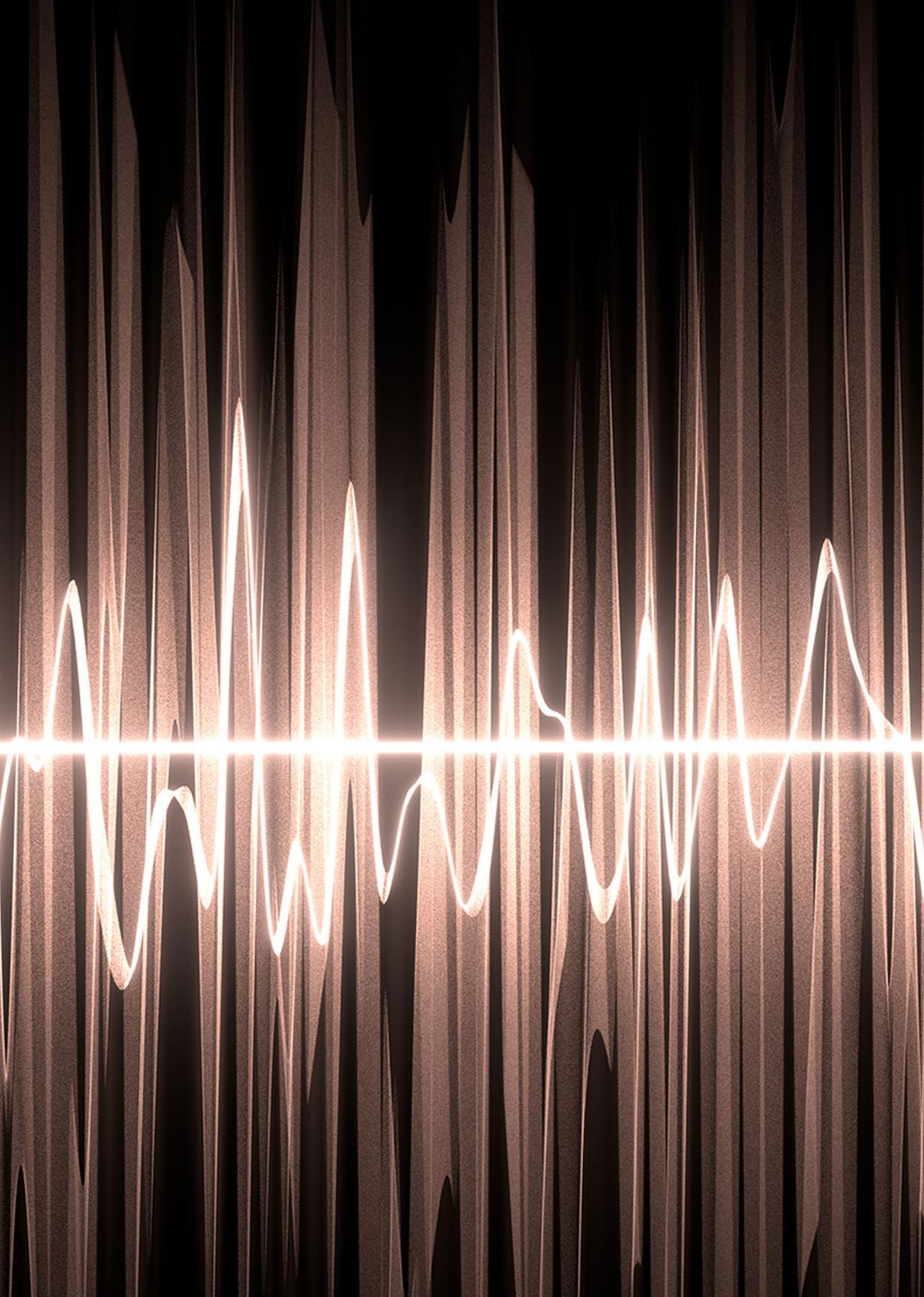
| HUBER+SUHNER type | Item no. | Packaging | Adapter Length L |
|-------------------|----------|-----------|------------------|
|                   |          |           | mm/in            |
| 31_SMP3-50-0-1    | 85164677 | Single    | 2.49/0.98        |

# SMP3 – surface mount connectors

## SMP3 Surface Mount (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 81_SMP3-S50-0-FD2 | 85199271 | Full        |
| 81_SMP3-S50-0-SB2 | 85199288 | Smooth bore |



# SMP3-T

## Description

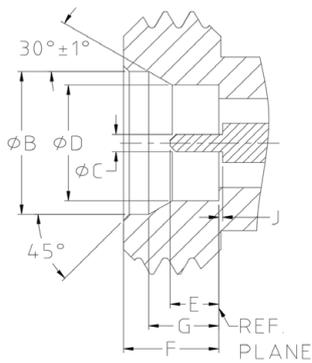
HUBER+SUHNER threaded SMP3-T connector enhances the durability of the standard SMP3 plug-in design, enabling it to withstand vibration and shock levels comparable to those of a traditional threaded connector. With the threaded nut providing mechanical retention, the SMP3-T connector is available exclusively in a smooth bore version to ensure maximum mating cycles.

## Compatibility

50  $\Omega$  SMP3-T connectors are intermateable without restrictions.

## Interface dimensions (mm/inches)

### SMP3-T male, Smooth Bore



## Content

|                                   |     |
|-----------------------------------|-----|
| Description                       | 125 |
| Compatibility                     | 125 |
| Interface dimensions in mm/inches | 125 |
| Technical data                    | 126 |
| Cable connectors                  | 128 |

### Interface dimensions conformable to the standards:

USA: MIL-PRF-31031

# SMP3-T – technical data

| Electrical data                    | Requirements  |
|------------------------------------|---|
| Impedance                          | 50 $\Omega$   |
| Frequency range                    | DC to 100 GHz   |
| Contact Resistance                 | center conductor 6.0 milliohms max.                                   |
| outer conductor 2.0 milliohms max. |   |
| DWV                                | 250 Vrms at seallevel   |
| Insulation Resistance              | 3500 Mohms  |
| Corona Levels                      | 100 VRMS at 70,000 ft   |
| RF high potential                  | 150 VRMS at 5 MHz   |
| RF leakage                         | -80dB (typical mated pair)  |
| VSWR                               | 1.20:1 to 26.5 GHz, 1.35:1 to 40 GHz, 1.50 to 65 GHz, 1.70 to 100 GHz |
| Insertion loss                     | 0.05 + 0.05 $\sqrt{f}$ in GHz   |

| Mechanical data                     | Requirements   |
|-------------------------------------|--|
| Axial Misalignment                  | .010" max  |
| Radial Misalignment                 | +/- .010"  |
| Mating Cycles                       | Full Detent (FD) – 100 minimum; Smooth Bore (SB) – 500 minimum             |
| Typical Mating Engagement Forces    | Full Detent (FD), 11 N or 2.47 lbs.   Smooth Bore (SB), 5.3 N or 1.19 lbs. |
| Typical Mating Disengagement Forces | Full Detent (FD), 20 N or 4.5 lbs.   Smooth Bore (SB), 4.45 N or 1.0 lbs.  |

| Environmental data  | Requirements                              |
|---------------------|---|
| Temperature Range   | -55°C to 165°C                            |
| Thermal Shock       | MIL-STD-202, Method 107, Test Condition B |
| Moisture Resistance | MIL-STD-202, method 106                   |
| Corrosion           | MIL-STD-202, Method 101, Condition B      |
| Vibration           | MIL-STD-202, Method 204, Condition D      |
| Shock               | MIL-STD-202, Method 213, Condition I      |

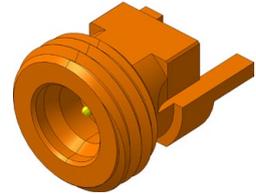
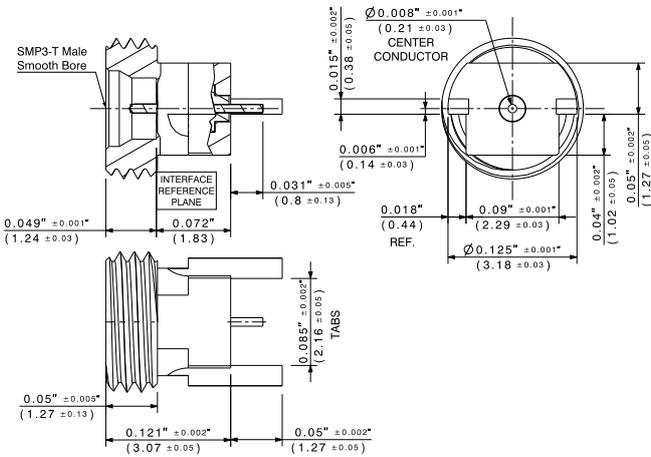
# SMP3-T – technical data

| Material data    |                                 |  |
|------------------|---------------------------------|--|
| Cable Connectors | Material                        | Plating  |
| Body and nut     | Beryllium copper per ASTM-B-196 | Gold plate per ASTM B-488, code C, Type II over Nickel plate: SAE-AMS-QQ-N-290 Class 1 |
| Dielectric       | PTFE per ASTM D-1710            | -  |
| Contact          | Beryllium copper per ASTM-B-196 | Gold plate per ASTM B-488, code C, Type II over Nickel plate: SAE-AMS-QQ-N-290 Class 1 |

Performance listed is typical. Individual part configuration may vary. Contact HUBER+SUHNER for more information and specifications by part number. Customer specific factors pertaining to recommended mounting patterns including transmission line topology, substrate thickness and material, board-stackup, operating frequency, etc. must be submitted to HUBER+SUHNER for analysis prior to release of final performance levels and mounting configurations.

# SMP3-T – edge mount connectors

## SMP3 Edge mount PCB plugs (male)



| HUBER+SUHNER type | Item no. | Detent      |
|-------------------|----------|-------------|
| 91_SMP3T-50-0-S   | 85204775 | Smooth bore |

# Series MMCX – micro miniature connectors

## Description

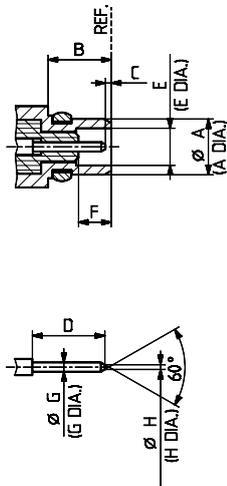
HUBER+SUHNER MMCX connectors are intended for use in applications where the smallest dimensions have to be achieved. These connectors can be used in applications from DC to 6 GHz.

The reliable „snap-on“ coupling mechanism ensures that the electrical parameters are consistently reproduced. Due to its non-slotted outer contact, the MMCX series provides a low RF leakage.

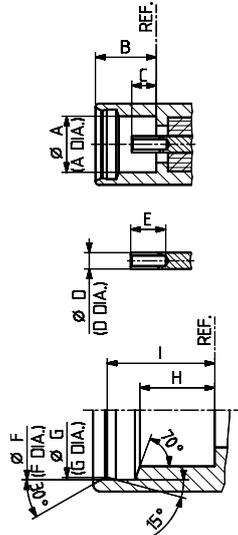
In addition, HUBER+SUHNER SMT MMCX connectors fully meet today's SMT (Surface Mount Technology) requirements with superior design, material selection and packaging. The HUBER+SUHNER SMT connectors are suitable to all reflow-soldered SMT-PCBs where impedance matching or screened signal transmission is necessary.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Content

|   |     |
|---|-----|
| Description                               | 129 |
| Interface dimensions in mm/inches         | 129 |
| Technical data                            | 130 |
| Cable connectors                          | 132 |
| Receptacles with solder end               | 137 |
| PCB connectors                            | 138 |
| edge mount connectors – packaging         | 140 |
| edge mount connectors – application notes | 140 |

|    | Plug       |            | Jack            |            |
|----|------------|------------|-----------------|------------|
|    | min.       | max.       | min.            | max.       |
| A  | –          | 2.40/0.094 | 2.41/0.095      | –          |
| B  | 2.70/0.106 | –          | –               | 2.65/0.104 |
| C  | 0.00/0.000 | 0.25/0.010 | 0.90/0.035      | 1.20/0.047 |
| D  | 1.23/0.048 | –          | 0.70/0.028 nom. |            |
| E  | 1.58/0.062 | 1.62/0.064 | 1.40/0.055      | –          |
| F  | 1.23/0.048 | –          | 3.00/0.118      | 3.04/0.120 |
| G* | 0.38/0.015 | 0.42/0.017 | 2.88/0.113      | 2.92/0.115 |
| H  | –          | 0.20/0.008 | 1.57/0.062      | 1.63/0.064 |

| Jack            |            |            |            |
|-----------------|------------|------------|------------|
| G <sup>1)</sup> | 2.88/0.113 | 2.90/0.114 | 2.92/0.115 |
| I               | 2.34/0.092 | 2.30/0.091 | 2.26/0.089 |

### Interface dimensions conformable to the standards:

International: IEC 61169-52

<sup>1)</sup> I is rated to G

# Series MMCX – technical data

| Electrical data  | CECC 22000     | Requirements  |
|--|----------------|---|
| Impedance  |                | 50 Ω  |
| Frequency range  |                | DC to 6 GHz   |
| Dielectric withstanding voltage (at sea level)   | 4.4.5          | 500 V rms, 50 Hz  |
| Working voltage (at sea level)   |                | ≥ 170 V rms, 50 Hz  |
| Insulation resistance  | 4.4.4          | ≥ 10 <sup>9</sup> MΩ/≥ 500 MΩ <sup>1)</sup>                                   |
| Contact resistance<br>· Centre contact<br>· Outer contact  | 4.4.2<br>4.4.3 | ≤ 5.0 mΩ/≥ 10 MΩ <sup>1)</sup><br>≤ 2.5 mΩ/≥ 5 MΩ <sup>1)</sup>               |
| VSWR (mated pair)<br>· Up to 4 GHz<br>· 4 up to 6 GHz  | 4.4.1          | (typical values)<br>≤ 1.15<br>≤ 1.40<br>for cable connectors, see table below |
| RF leakage (measured at 1 GHz)<br>· Connectors for flexible cables<br>· Connectors for semi-rigid cables | 4.4.8          | ≥ 60 dB<br>≥ 70 dB  |

<sup>1)</sup> valid for MMCX "cube" connectors only

| Typical VSWR           | Frequency range |         |       | Cable group |
|------------------------|-----------------|---------|-------|-------------|
|                        | 1 GHz           | 2.5 GHz | 6 GHz |             |
| Straight connectors    | 1.03            | 1.08    | 1.12  | Y3, Y11     |
|                        | 1.04            | 1.08    | 1.12  | U1          |
| Right angle connectors | 1.03            | 1.08    | 1.13  | Y3, Y11     |
|                        | 1.07            | 1.12    | 1.25  | U1          |

| Mechanical data                     | CECC 22000 | Requirements             |
|-------------------------------------|------------|--------------------------|
| Engagement force                    | 4.5.4      | ≤ 15 N/3.4 lbs           |
| Disengagement force                 | 4.5.4      | 6 to 15 N/1.4 to 3.4 lbs |
| Contact captivation                 | 4.5.2      | ≥ 10 N/2.3 lbs           |
| Cable retention force <sup>1)</sup> | 4.5.5      | see pages 32 – 41        |
| Durability (matings)                | 4.7.1      | ≥ 500                    |

<sup>1)</sup> value considers maximum load of the cables without irreversible variations of specifications

| Environmental data  | CECC 22000 test conditions | Equivalent MIL test conditions                              |
|---------------------|----------------------------|---|
| Temperature range   |                            | -55 to +155 °C/-67 to +311 °F                               |
| Climatic category   | 4.6.5 → 55/155/21          |   |
| Thermal shock       | 4.6.7 → IEC 68-2-14 Na     | MIL-STD-202, method 107, condition F                        |
| Moisture resistance | 4.6.6 → IEC 68-2-3 Ca      | MIL-STD-202, method 106                                     |
| Corrosion           | 4.6.10 → IEC 68-2-11 Ka    | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | 4.6.3 → IEC 68-2-6 Fc      | MIL-STD-202, method 204, condition C                        |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MMCX – technical data

| Environmental data for "cube" connectors only | CECC 22000 test conditions | Equivalent MIL test conditions   |
|---|----------------------------|--|
| Temperature range                             |                            | -40 to +90 °C/-40 to +194 °F   |
| Climatic category                             | 4.6.5 → 40/90/21           |  |
| Thermal shock                                 | 4.6.7                      | MIL-STD-202, method 107, -40 °C/40 °F and +90 °C/+194 °F, 30 min. each                                   |
| Moisture resistance                           | 4.6.6                      | MIL-STD-202, method 103, condition B   |
| Vibration                                     | 4.6.3                      | 3 cycles in 3 opposite directions<br>10 to 150 Hz, 10 to 60 Hz: 0.75 mm/0.030 in.,<br>60 to 150 Hz: 10 G |
| Mechanical shock                              | 4.6.4                      | MIL-STD-202, method 213, condition B   |

| Material data   |                                |                            |
|-----------------|--------------------------------|----------------------------|
| Connector parts | Material                       | Plating                    |
| Centre contact  | copper-beryllium alloy, bronze | gold/SUCOPRO® gold plating |
| Body            | brass                          | gold/SUCOPRO® gold plating |
| Crimp ferrules  | brass                          | gold/SUCOPRO® gold plating |
| Insulators      | PTFE or PFA                    |                            |

| Material data for "cube" connectors only |   |         |
|--|---|---------|
| Connector parts                          | Material                                  | Plating |
| Leads<br>Contact sockets                 | bronze                                    | gold    |
| Body                                     | LCP (liquid crystal polymer), brass       | gold    |
| Outer contact                            | brass                                     | gold    |
| Insulators                               | LCP (liquid crystal polymer), PTFE or PFA |         |

| Processing data  |                     |                               |
|--|---------------------|-------------------------------|
| for "cube" connectors only   | Test standard       | Requirement                   |
| Lead free reflow process   | IPC/JEDECJ-STD-020C | recommended                   |
| Adherent to the print<br>· Shearing<br>· Pulling (vertical to PCB) |                     | 25 N/5.6 lbs<br>50 N/11.2 lbs |

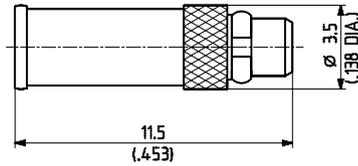
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MMCX – cable connectors

## Straight cable jacks (female)

### For semi-rigid cables

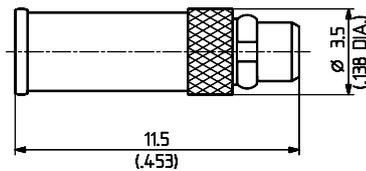
- Cable entry soldered
- Centre contact crimped



| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 11_MMCX-50-1-3/111_OE                          | 22648893             | Y2 (EZ_47)            | single                  | 9078                 | 1            |
| 11_MMCX-50-2-1/111_OE<br>11_MMCX-50-2-1/111_OH | 22645297<br>22649039 | Y3, Y11, Y16 (EZ_86)  | single<br>bulk 100 pcs. | 9170                 |              |

### For flexible cables

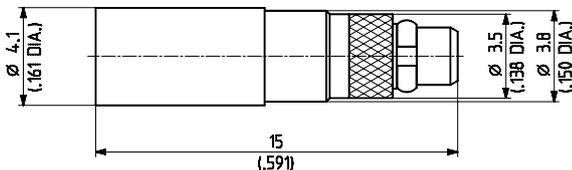
- HUBER+SUHNER full crimp



| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 11_MMCX-50-1-1/111_OE<br>11_MMCX-50-1-1/111_OH | 22645298<br>22651666 | U1 (ENVIROFLEX_178)   | single<br>bulk 100 pcs. | 9169                 | 1/2.67       |
| 11_MMCX-50-1-2/111_OE<br>11_MMCX-50-1-2/111_OH | 22645296<br>84027753 | U0 (K_01152-07)       | single<br>bulk 100 pcs. |                      |              |

### For flexible cables

- HUBER+SUHNER full crimp



| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 11_MMCX-50-2-3/111_OE<br>11_MMCX-50-2-3/111_OH | 22649899<br>23000258 | U2 (ENVIROFLEX_316)   | single<br>bulk 100 pcs. | 9110                 | 1 A          |
| 11_MMCX-50-2-4/111_OE                          | 22649901             | U4 (ENVIROFLEX_316_D) | single                  |                      |              |

# Series MMCX – cable connectors

## Right angle cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

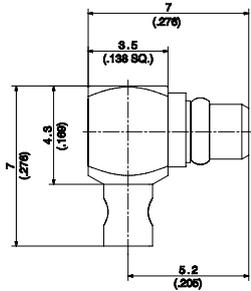


Fig. 1

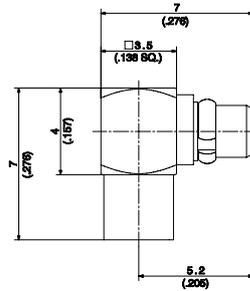


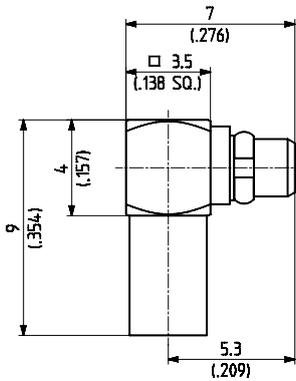
Fig. 2



| HUBER+SUHNER type                                | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Fig. |
|--|----------------------|-----------------------|-------------------------|----------------------|------|
| 16_MMCX-50-1-12/111_OE<br>16_MMCX-50-1-12/111_OH | 84030531<br>21000178 | Y2, Y15 (EZ_47)       | single<br>bulk 100 pcs. | 0000180777           | 1    |
| 16_MMCX-50-2-13/111_OE<br>16_MMCX-50-2-13/111_OH | 84032569<br>84007944 | Y3, Y11 (EZ_86)       | single<br>bulk 100 pcs. | 0000214734           | 2    |

### For flexible cables

- Cable entry crimp
- Centre contact soldered



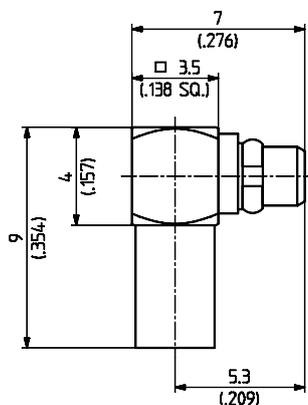
| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 16_MMCX-50-1-1/111_OE<br>16_MMCX-50-1-1/111_OH | 22645955<br>22648762 | U1 (ENVIROFLEX_178)   | single<br>bulk 100 pcs. | 9175                 | 2.67         |

# Series MMCX – cable connectors

## Right angle cable plugs (male)

### For flexible cables

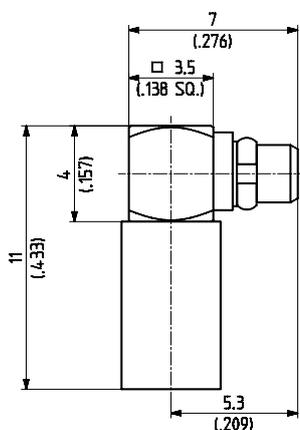
- Cable entry crimp
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 16_MMCX-50-1-2/111_OE | 22645956 | U0 (K_01152-07)       | single        | 9175                 | 2.67         |
| 16_MMCX-50-1-2/111_OH | 22649009 |                       | bulk 100 pcs. |                      |              |

### For flexible cables

- Cable entry crimp
- Centre contact soldered



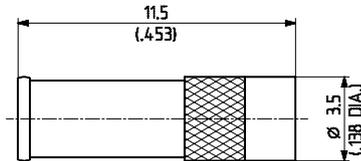
| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 16_MMCX-50-2-2/111_OE | 22649374 | U4 (ENVIROFLEX_316_D) | single        | 9128                 | A            |
| 16_MMCX-50-2-2/111_OH | 22651401 |                       | bulk 100 pcs. |                      |              |
| 16_MMCX-50-2-4/111_OE | 22649433 | U2 (ENVIROFLEX_316)   | single        |                      |              |
| 16_MMCX-50-2-4/111_OH | 22649635 |                       | bulk 100 pcs. |                      |              |

# Series MMCX – cable connectors

## Straight cable jacks (female)

### For semi-rigid cables

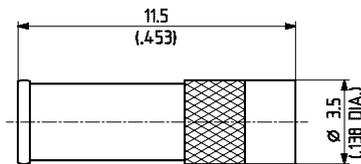
- Cable entry soldered
- Centre contact crimped



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|-----------|----------------------|--------------|
| 21_MMCX-50-2-1/111_OE | 22645290 | Y3, Y11, Y16 (EZ_86)  | single    | 9170                 | 1            |

### For flexible cables

- HUBER+SUHNER full crimp

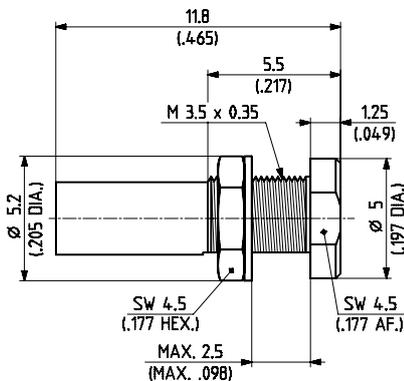


| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|-----------|----------------------|--------------|
| 21_MMCX-50-1-1/111_OE | 22645288 | U1 (ENVIROFLEX_178)   | single    | 9169                 | 1/2.67       |
| 21_MMCX-50-1-2/111_OE | 22645289 | U0 (K_01152-07)       |           |                      |              |

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact crimped
- Front mounting



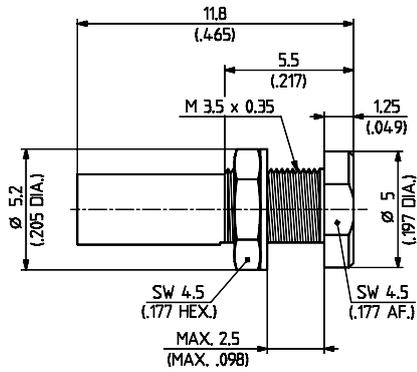
| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|-----------------------|----------|-----------------------|-----------|----------------------|---------------|--------------|
| 24_MMCX-50-2-1/111_OE | 22645954 | Y3, Y11, Y16 (EZ_86)  | single    | 9170                 | ML 68         | 1            |

# Series MMCX – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Front mounting

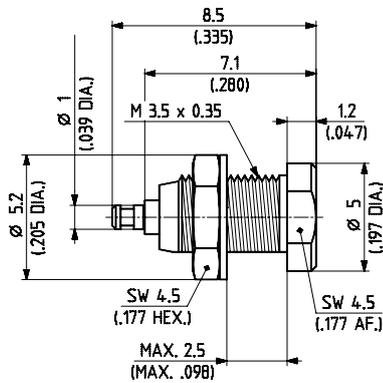


| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging               | Assembly instruction | Mounting hole | Crimp insert |
|-----------------------|----------|-----------------------|-------------------------|----------------------|---------------|--------------|
| 24_MMCX-50-1-1/111_OE | 22645952 | U1 (ENVIROFLEX_178)   | single<br>bulk 100 pcs. | 9169                 | ML 68         | 1/2.67       |

# Series MMCX – receptacles with solder end

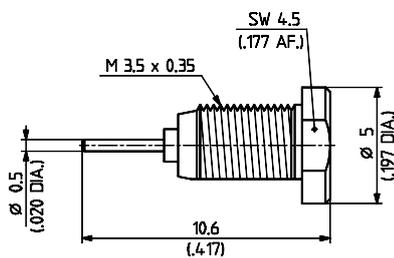
## Receptacles, jacks (female)

- Bulkhead mounted



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole |
|-----------------------|----------|---------------|---------------|
| 22_MMCX-50-0-1/111_OE | 22645951 | single        | ML 68         |
| 22_MMCX-50-0-1/111_OH | 22660126 | bulk 100 pcs. |               |

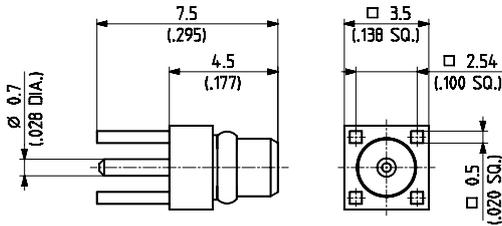
- Bulkhead mounted



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole |
|-----------------------|----------|---------------|---------------|
| 22_MMCX-50-0-4/111_OH | 22660282 | bulk 100 pcs. | M 3.5 × 0.35  |

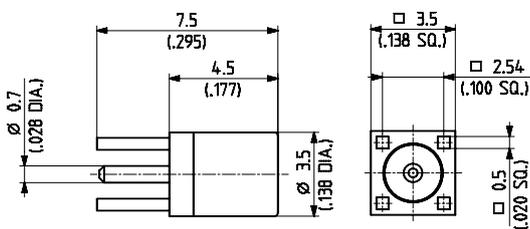
# Series MMCX – PCB connectors

## Straight PCB plugs (male)



| HUBER+SUHNER type     | Item no. | Packaging | Mounting hole | Notes             |
|-----------------------|----------|-----------|---------------|-------------------|
| 81_MMCX-50-0-1/111_OE | 22646298 | single    | ML 44         | without stand-off |

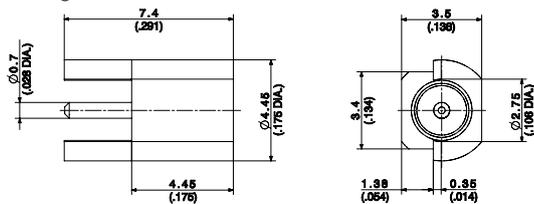
## Straight PCB jacks (female)



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole | Notes             |
|-----------------------|----------|---------------|---------------|-------------------|
| 82_MMCX-50-0-1/111_NE | 22645958 | single        | ML 44         | without stand-off |
| 82_MMCX-50-0-1/111_NH | 22648469 | bulk 100 pcs. |               |                   |

## Jacks for horizontal applications

- Edge mount



| HUBER+SUHNER type      | Item no. | Packaging     | PCB layout                        | Notes                            |
|------------------------|----------|---------------|-----------------------------------|----------------------------------|
| 82_MMCX-S50-0-2/111_KE | 22648789 | single        | see application notes on page 125 |                                  |
| 82_MMCX-S50-0-2/111_KH | 22649680 | bulk 100 pcs. |                                   |                                  |
| 82_MMCX-S50-0-2/111_KG | 22649679 | tape and reel | see application notes on page 125 | blister tape containing 750 pcs. |

# Series MMCX – PCB connectors

## Straight PCB jacks (female)

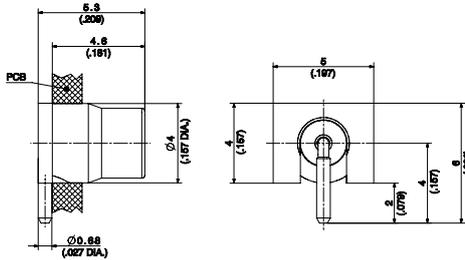


Fig. 1

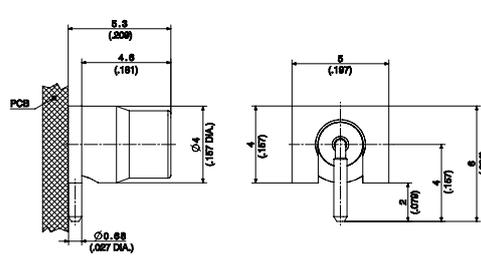
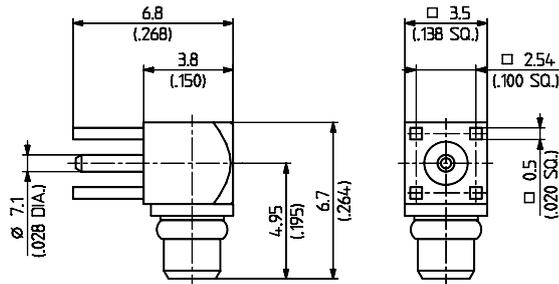


Fig. 2



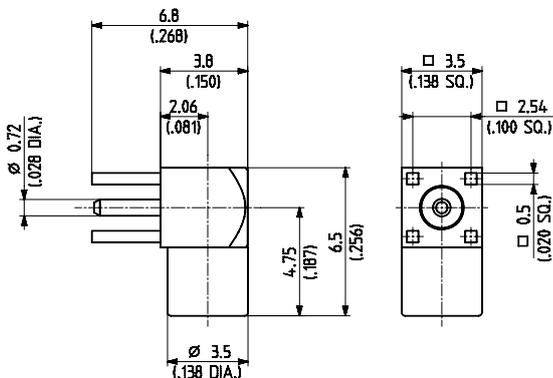
| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole | Notes                    |
|------------------------|----------|---------------|---------------|--------------------------|
| 82_MMCX-50-0-8/111_OE  | 22652153 | single        | ML 167        | through-hole mount       |
| 82_MMCX-50-0-8/111_OM  | 22660270 | tape and reel |               |                          |
| 82_MMCX-50-0-18/111_OM | 23023564 | tape and reel | ML 130        | surface mount technology |

## Right angle PCB plugs (male)



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole | Notes             |
|-----------------------|----------|---------------|---------------|-------------------|
| 84_MMCX-50-0-1/111_OH | 22658819 | bulk 100 pcs. | ML 44         | without stand-off |

## Right angle PCB jacks (female)



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole | Notes             |
|-----------------------|----------|---------------|---------------|-------------------|
| 85_MMCX-50-0-1/111_OE | 22645968 | single        | ML 44         | without stand-off |
| 85_MMCX-50-0-1/111_OH | 22646636 | bulk 100 pcs. |               |                   |

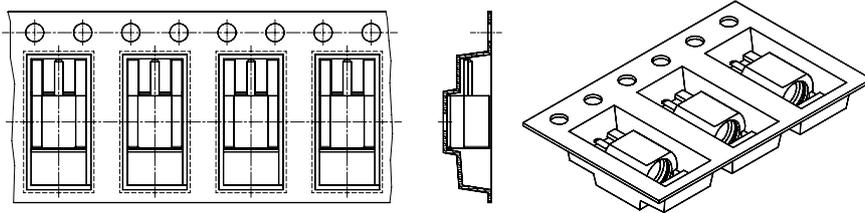
# Series MMCX – edge mount connectors – packaging

## Blister tape supply in accordance with IEC 286-3/EIA-481

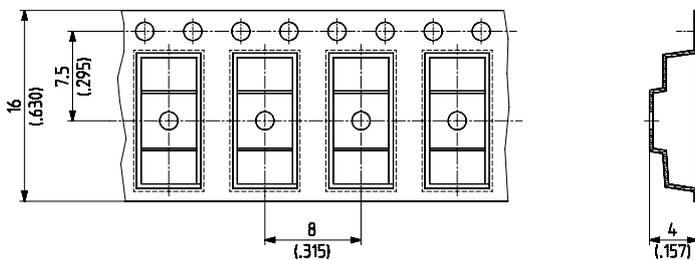
For automated placement the connectors can be supplied on industry standard type-and-reel.

## Bulk supply in bags of 100 pcs.

This delivery form is suitable for manual or automated tube fed pick-and-place assembly.



Straight (horizontal) application

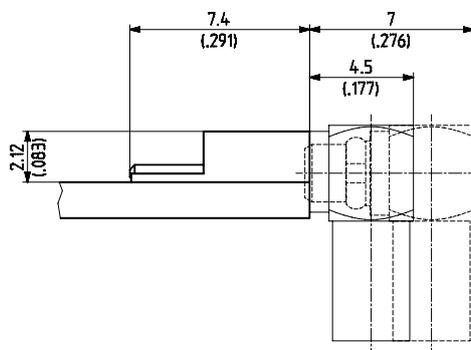


Dimensions of blister carrier tape

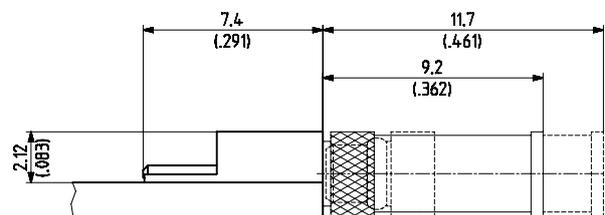
The 16 mm/0.630 in. blister tape is delivered on reels of 330 mm/13 in. diameter and in tough cardboard box.

# Series MMCX edge mount connectors – application notes

## Dimensions of mated pair and clearance for mating



Horizontal mounting together with a right angle cable connector.



Horizontal mounting together with a straight cable connector.

# Series MMCX – edge mount connectors – application notes

## Appropriate operation for MMCX edge mount

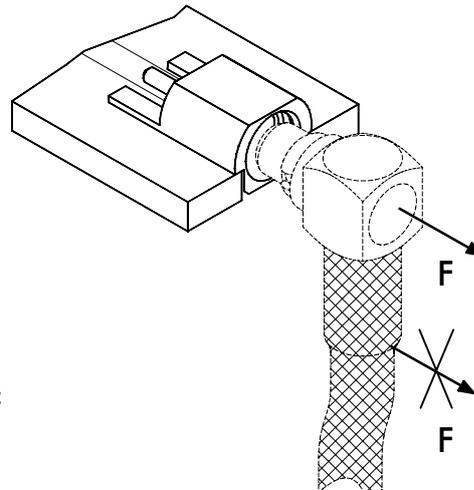
For appropriate operation the following has to be considered:

- Avoid forces from the cable of the mating connector to the surface mount connector.  
Fix the cable sufficiently and in several places.
- Apply only axial forces during the mating and demating of the connector parts.

Non-axial forces – such as improper pulling at the cable entry or the cable portion of a right angle mating connector – may cause excessive torque forces, which could result in damage to the solder joints.



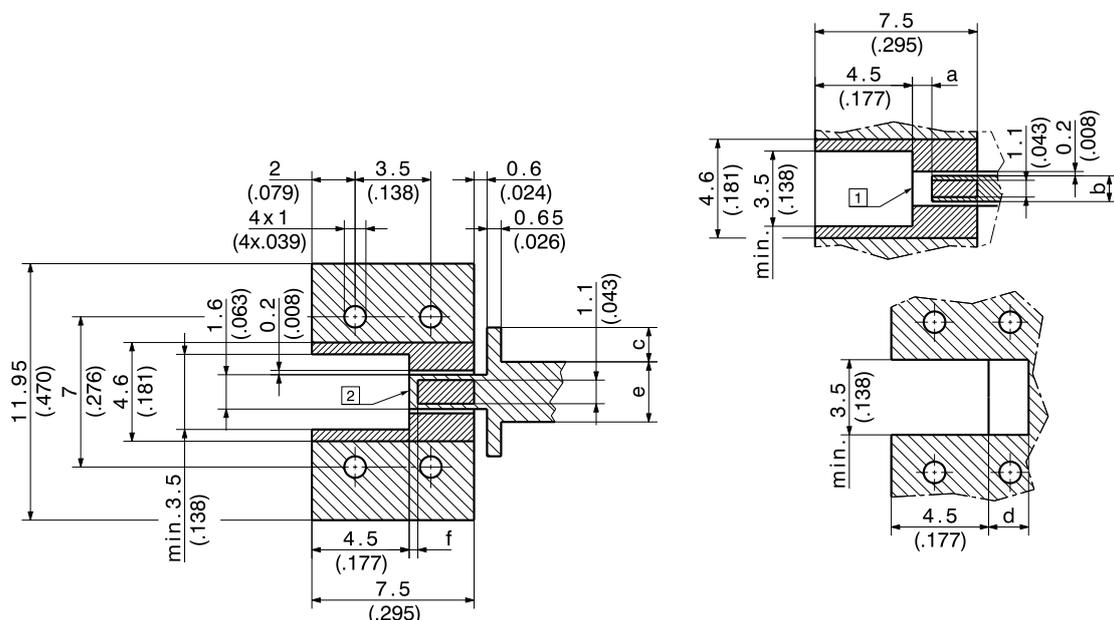
Warning:  
force must not be applied  
to this region.



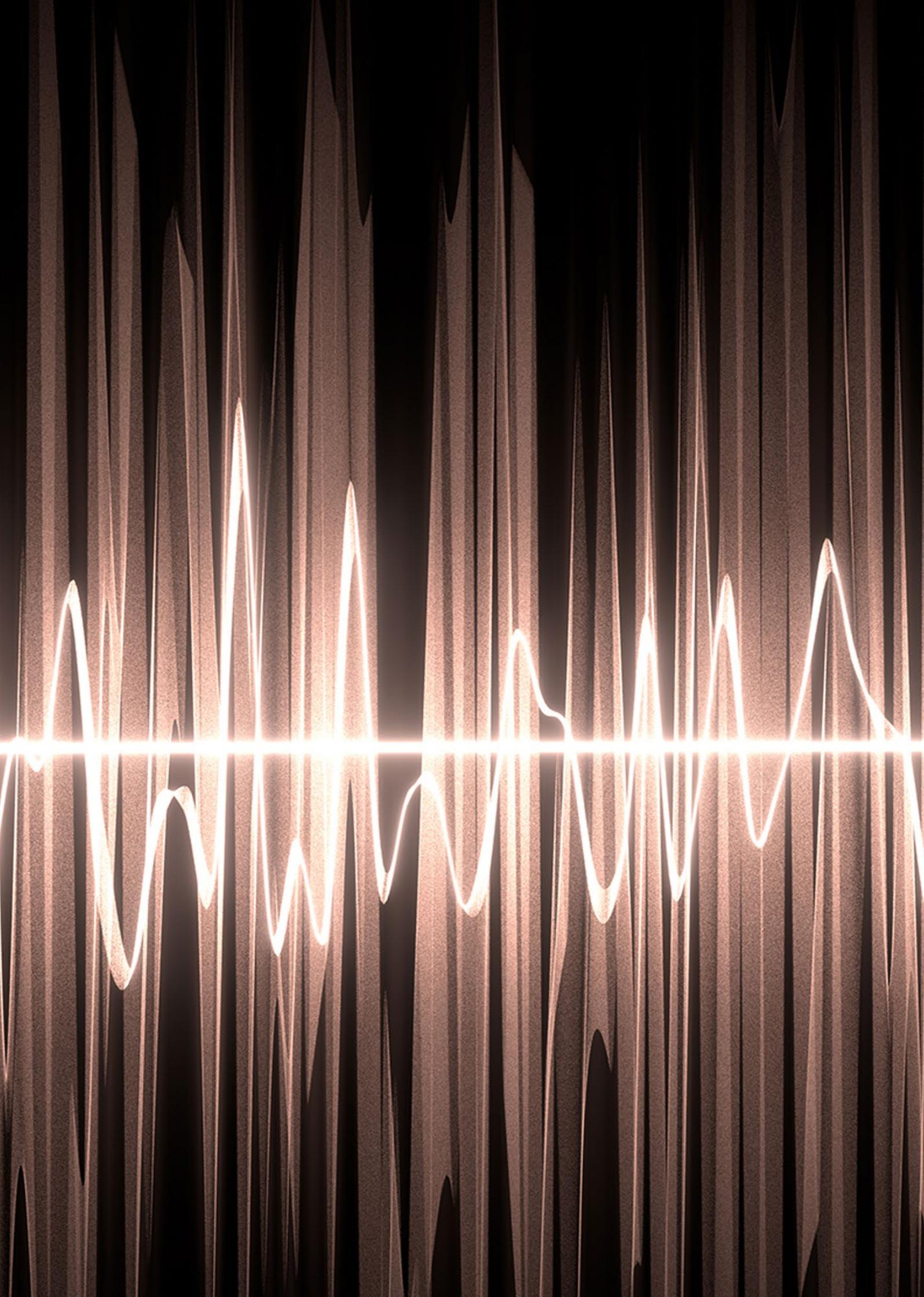
## Recommended mounting pattern for MMCX edge mount

Material FR 4 (εr= 4.6)

- ▨ Pattern
- ▨ Land (free of solder mask)



| PCB thickness    | a         | b          | c         | d         | e         | f         |
|------------------|-----------|------------|-----------|-----------|-----------|-----------|
| 0.8 mm/0.031 in. | 1.6/0.063 | 1.90/0.075 |           | 1.1/0.043 | 1.4/0.055 | 1.0/0.039 |
| 1.0 mm/0.039 in. | 1.4/0.055 | 1.75/0.069 | 0.3/0.012 | 1.2/0.047 | 1.8/0.071 | 0.9/0.035 |
| 1.6 mm/0.063 in. | 0.8/0.031 | 1.55/0.061 | 1.6/0.063 | 2.3/0.091 | 2.8/0.110 | 0.4/0.016 |



# Series MCX 50 Ω – micro miniature connectors

## Description

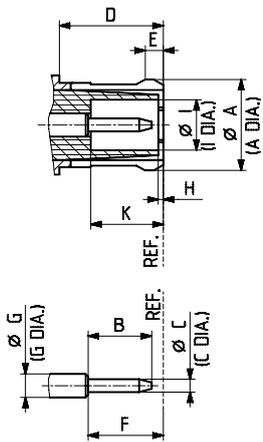
HUBER+SUHNER MCX micro miniature snap-on connectors offer you an excellent blend of size, weight, durability and performance for applications such as mobile and fixed telecommunications, in GPS applications and in test+measurement systems for testing instruments and apparatus. They are designed for frequencies up to 6 GHz and are tested according to the international standard CECC 22220. And they meet all the high requirements that micro coaxial connectors are expected to satisfy today.

## Content

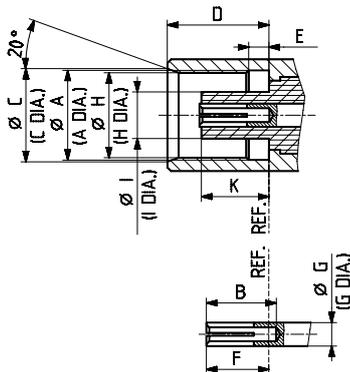
|                                   |     |
|-----------------------------------|-----|
| Description                       | 143 |
| Interface dimensions in mm/inches | 143 |
| Technical data                    | 144 |
| Cable connectors                  | 146 |
| Receptacles with solder end       | 150 |
| PCB connectors                    | 151 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug                     |             | Jack            |            |
|---|--------------------------|-------------|-----------------|------------|
|   | min.                     | max.        | min.            | max.       |
| A | 3.72/0.146 <sup>1)</sup> | 3.80/0.150* | 3.60/0.142      | 3.70/0.146 |
| B | 2.49/0.098               | 2.59/0.102  | 2.80/0.110      | –          |
| C | 0.48/0.019               | 0.53/0.021  | 3.75/0.148      | 3.85/0.152 |
| D | 4.15/0.163               | –           | 4.00/0.157      | 4.12/0.162 |
| E | 0.70/0.028               | 0.75/0.030  | 0.75/0.030      | 0.85/0.033 |
| F | 2.80/0.110               | 3.20/0.126  | 2.30/0.091      | 2.80/0.110 |
| G | 0.95/0.037 nom.          |             | 0.95/0.037 nom. |            |
| H | –                        | 0.30/0.012  | 3.42/0.135      | 3.48/0.137 |
| I | 2.00/0.079               | 2.07/0.081  | 1.80/0.071      | 1.98/0.078 |
| K | 2.80/0.110               | 3.20/0.126  | 2.60/0.102      | 2.80/0.110 |

### Interface dimensions conformable to the standards:

International IEC 60169-36  
Europe CECC 22220

<sup>1)</sup> prior to slotting

# Series MCX 50 Ω – technical data

| Electrical data  | CECC 22000     | Requirements                            |
|--|----------------|---|
| Impedance  |                | 50 Ω                                    |
| Frequency range  |                | DC to 6 GHz                             |
| Dielectric withstanding voltage (at sea level)   | 4.4.5          | ≥ 750 V rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)<br>· Unmated  |                | ≥ 170 V rms, 50 Hz (depending on cable) |
| Working voltage (at 21 000 m/70 000 ft)<br>Unmated   |                | ≥ 42 V rms, 50 Hz (depending on cable)  |
| Insulation resistance  | 4.4.4          | ≥10 <sup>6</sup> MΩ                     |
| Contact resistance<br>· Centre contact<br>· Outer contact  | 4.4.2<br>4.4.3 | ≤ 5.0 mΩ<br>≤ 1.0 mΩ                    |
| RF leakage (measured at 1 GHz)<br>· Connectors for flexible cables<br>· Connectors for semi-rigid cables | 4.4.8          | ≥ 60 dB<br>≥ 70 dB                      |

| Mechanical data                     | CECC 22000 | Requirements             |
|-------------------------------------|------------|--------------------------|
| Engagement force                    | 4.5.1      | ≤ 25 N/5.6 lbs           |
| Disengagement force                 | 4.5.1      | 8 to 20 N/1.8 to 4.5 lbs |
| Contact captivation                 | 4.5.2      | ≥ 10 N/2.3 lbs           |
| Cable retention force <sup>1)</sup> | 4.5.5      | see pages 32 – 41        |
| Durability (matings)                | 4.7.1      | ≥ 500                    |

| Environmental data              | CECC 22000 | Requirements  |
|---------------------------------|------------|---|
| Temperature range               |            | –55 to +155 °C/–67 to +311 °F                               |
| Climatic category               |            | IEC → 55/155/21   |
| Thermal shock                   | 4.6.7      | MIL-STD-202, method 107, condition F                        |
| High temperature endurance test | 4.7.2      | MIL-STD-202, method 108A, condition D                       |
| Moisture resistance             | 4.6.6      | MIL-STD-202, method 106                                     |
| Corrosion                       | 4.6.10     | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration                       | 4.6.3      | MIL-STD-202, method 204, condition D                        |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series MCX 50 Ω – technical data

| Material data                      |                                 |  |
|------------------------------------|---------------------------------|--|
| Connector parts                    | Material                        | Plating                                  |
| Bodies                             | brass                           | gold/SUCOPLATE®/SUCOPRO® gold plating    |
| Pin contacts                       | brass                           | gold/SUCOPRO® gold plating               |
| Socket contacts                    | copper-beryllium alloy          | gold/SUCOPRO® gold plating               |
| Outer contacts<br>· Plug<br>· Jack | copper-beryllium alloy<br>brass | gold/SUCOPRO® gold plating<br>SUCOPLATE® |
| Crimp ferrules                     | copper/brass                    | gold/SUCOPLATE®/SUCOPRO® gold plating    |
| Insulators                         | PTFE or PFA                     |  |

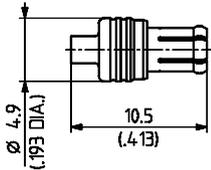
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series MCX 50 Ω – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables, Sucoform and Multiflex cables

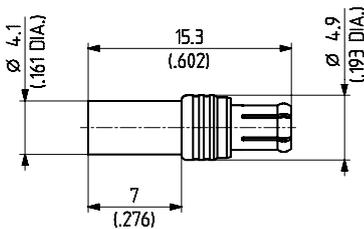
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type                              | Item no.             | Cable group (example)   | Packaging               | Assembly instruction |
|--|----------------------|-------------------------|-------------------------|----------------------|
| 11_MCX-50-1-14/111_NE                          | 23032081             | Y2, Y15 (EZ_47)         | single                  | 27413                |
| 11_MCX-50-2-19/111_NE<br>11_MCX-50-2-19/111_NH | 23024699<br>23032147 | Y3, Y11, Y16 (EZ_86)    | single<br>bulk 100 pcs. | 27496                |
| 11_MCX-50-3-1/111_NH                           | 84006763             | Y12, Y17 (SUCOFORM_141) | bulk 100 pcs.           | 0000200108           |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



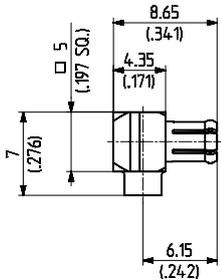
| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 11_MCX-50-1-13/133_NH                          | 22658307             | U1 (ENVIROFLEX_178)   | bulk 100 pcs.           | 27316                | 1 A          |
| 11_MCX-50-1-13/111_NH                          | 23002830             | U1 (ENVIROFLEX_178)   | bulk 100 pcs.           | 27316                |              |
| 11_MCX-50-2-15/111_NE<br>11_MCX-50-2-15/111_NH | 84018641<br>23000440 | U4 (ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 27306                |              |
| 11_MCX-50-2-15/133_NH                          | 23000566             | U4 (ENVIROFLEX_316_D) | bulk 100 pcs.           | 27306                |              |
| 11_MCX-50-2-16/111_NE<br>11_MCX-50-2-16/111_NH | 84022831<br>22658275 | U2 (ENVIROFLEX_316)   | single<br>bulk 100 pcs. | 27306                |              |
| 11_MCX-50-2-16/133_NH                          | 23000437             | U2 (ENVIROFLEX_316)   | bulk 100 pcs.           | 27306                |              |

# Series MCX 50 Ω – cable connectors

## Right angle cable plugs (male)

### For semi-rigid cables, Sucoform and Multiflex cables

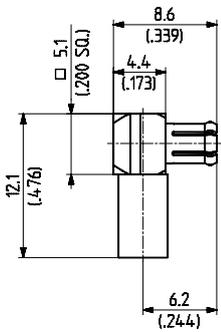
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction |
|--|----------------------|-----------------------|-------------------------|----------------------|
| 16_MCX-50-1-11/111_NE<br>16_MCX-50-1-11/111_NH | 23024700<br>23032063 | Y2, Y15 (EZ_47)       | single<br>bulk 100 pcs. | 27495                |
| 16_MCX-50-2-104/111_NH-1                       | 23032067             | Y3, Y11, Y16 (EZ_86)  | bulk 100 pcs.           | 27308                |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



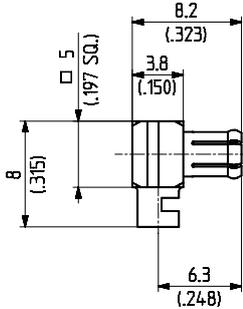
| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|
| 16_MCX-50-1-7/111_NH                           | 23000443             | U1 (ENVIROFLEX_178)   | bulk 100 pcs.           | 27319                | A            |
| 16_MCX-50-1-7/133_NH                           | 22658308             | U1 (ENVIROFLEX_178)   | bulk 100 pcs.           | 27319                |              |
| 16_MCX-50-2-11/133_NE<br>16_MCX-50-2-11/133_NH | 22660003<br>22650803 | U4 (ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 27102                |              |
| 16_MCX-50-2-11/111_NH-1                        | 23015358             | U4 (ENVIROFLEX_316_D) | bulk 100 pcs.           | 27102                |              |
| 16_MCX-50-2-14/133_NE<br>16_MCX-50-2-14/133_NH | 22660002<br>22660001 | U2 (ENVIROFLEX_316)   | single<br>bulk 100 pcs. | 27102                |              |
| 16_MCX-50-2-14/111_NH                          | 23000445             | U2 (ENVIROFLEX_316)   | bulk 100 pcs.           | 27102                |              |

# Series MCX 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Low profile
- Cable entry soldered
- Centre contact soldered

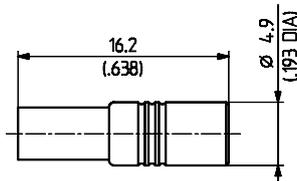


| HUBER+SUHNER type        | Item no. | Cable group (example) | Packaging     | Assembly instruction |
|--------------------------|----------|-----------------------|---------------|----------------------|
| 16_MCX-50-2-102/111_NH-1 | 23000454 | U2 (ENVIROFLEX_316)   | bulk 100 pcs. | 27307                |

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 21_MCX-50-1-11/111_NE | 84023972 | U1 (ENVIROFLEX_178)   | single        | 27317                | 1 A          |
| 21_MCX-50-2-12/111_NE | 23032052 | U4 (ENVIROFLEX_316_D) | single        | 27309                |              |
| 21_MCX-50-2-12/133_NH | 22658278 | U4 (ENVIROFLEX_316_D) | bulk 100 pcs. | 27309                |              |
| 21_MCX-50-2-13/111_NH | 23005298 | U2 (ENVIROFLEX_316)   | bulk 100 pcs. | 27309                |              |
| 21_MCX-50-2-13/133_NH | 22658279 | U2 (ENVIROFLEX_316)   | bulk 100 pcs. | 27309                |              |

# Series MCX 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered

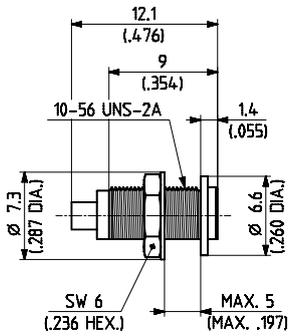


Fig. 1

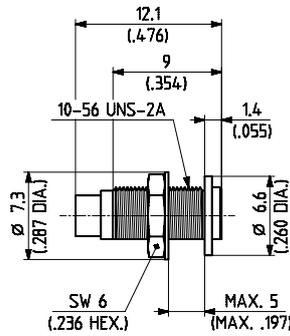


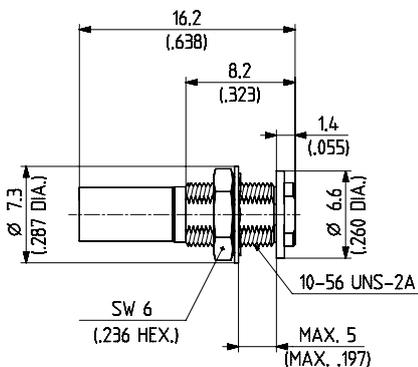
Fig. 2



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|----------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 24_MCX-50-1-3/111_NE | 22641648 | Y2, Y15 (EZ_47)       | single    | 3100                 | ML 11         | 1    |
| 24_MCX-50-2-3/111_NE | 22543580 | Y3, Y11 (EZ_86)       |           |                      |               | 2    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Mounting hole | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|---------------|--------------|
| 24_MCX-50-1-13/111_NH | 23005299 | U1 (ENVIROFLEX_178)   | bulk 100 pcs. | 27317                | ML 11         | 1 A          |
| 24_MCX-50-1-13/133_NH | 22658310 | U1 (ENVIROFLEX_178)   |               | 27317                |               |              |
| 24_MCX-50-2-6/111_NH  | 23005300 | U4 (ENVIROFLEX_316_D) |               | 27309                |               |              |
| 24_MCX-50-2-7/111_NH  | 23000468 | U2 (ENVIROFLEX_316)   |               | 27309                |               |              |

# Series MCX 50 Ω – receptacles with solder end

## Receptacles, jacks (female)

- Bulkhead mounted
- Front mounting

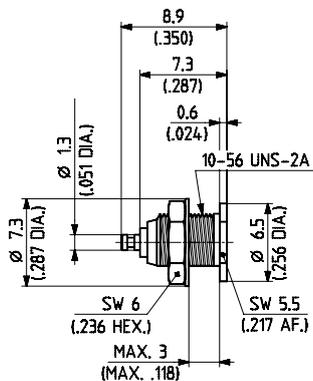


Fig. 1

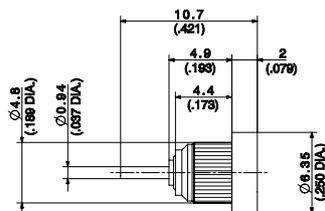


Fig. 2 (press-in)



| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole | Fig. |
|-----------------------|----------|---------------|---------------|------|
| 22_MCX-50-0-2/111_NE  | 22640171 | single        | ML 11         | 1    |
| 22_MCX-50-0-2/111_NH  | 22646960 | bulk 100 pcs. | ML 11         |      |
| 22_MCX-50-0-2/133_NH  | 22644433 | bulk 100 pcs. | ML 11         | 2    |
| 22_MCX-50-0-19/111_NH | 22652984 | bulk 100 pcs. | ML 103        |      |

# Series MCX 50 Ω – PCB connectors

## Straight PCB plugs (male)

- With stand-off
- 2.54 mm/0.100 in. grid

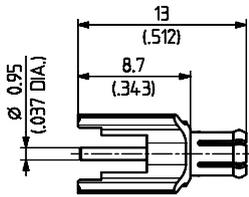


Fig. 1

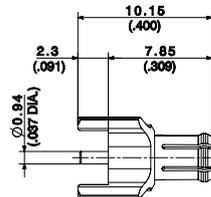
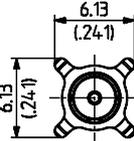
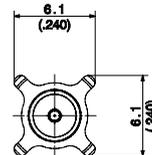


Fig. 2



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Fig. |
|----------------------|----------|---------------|---------------|------|
| 81_MCX-50-0-6/111_NE | 84023713 | single        | ML 15         | 1    |
| 81_MCX-50-0-6/111_NH | 23005296 | bulk 100 pcs. |               |      |
| 81_MCX-50-0-9/111_NH | 23026871 | bulk 100 pcs. |               | 2    |

## Straight PCB jacks (female)

- 2.54 mm/0.100 in. grid

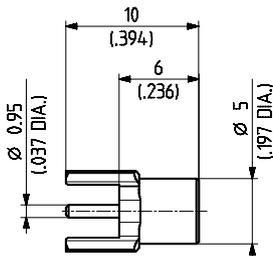


Fig. 1

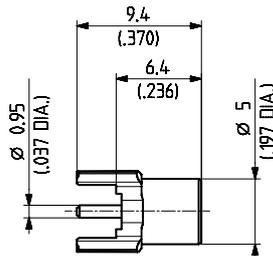
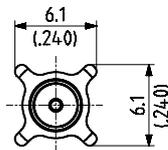
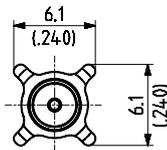


Fig. 2

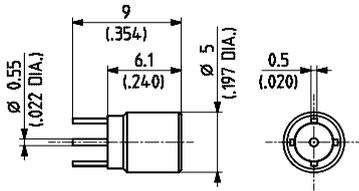


| HUBER+SUHNER type       | Item no. | Packaging     | Mounting hole | Notes             | Fig. |
|-------------------------|----------|---------------|---------------|-------------------|------|
| 82_MCX-50-0-17/111_NH-1 | 23006209 | bulk 100 pcs. | ML 15         | without stand-off | 1    |
| 82_MCX-50-0-19/111_NE   | 84018352 | single        |               | with stand-off    |      |
| 82_MCX-50-0-19/111_NH-1 | 22658305 | bulk 100 pcs. |               |                   | 2    |
| 82_MCX-50-0-19/111_NM-1 | 84114692 | tape and reel |               |                   |      |

# Series MCX 50 Ω – PCB connectors

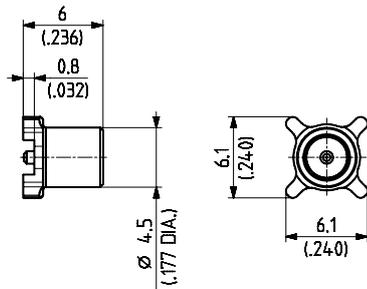
## Straight PCB jacks (female)

- 1.27 mm/0.050 in. grid
- Space saving version



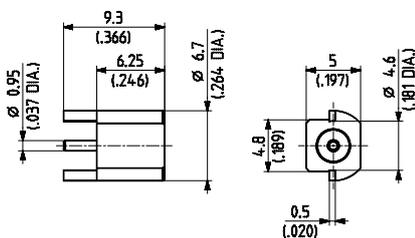
| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole | Notes             |
|-----------------------|----------|---------------|---------------|-------------------|
| 82_MCX-50-0-10/111_NE | 22641649 | single        | ML 44         | without stand-off |
| 82_MCX-50-0-10/111_NH | 22651980 | bulk 100 pcs. |               |                   |

- Surface mount type SMT



| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole |
|------------------------|----------|---------------|---------------|
| 82_MCX-S50-0-29/111_NE | 84018482 | single        | ML 120        |
| 82_MCX-S50-0-29/111_NH | 23001527 | bulk 100 pcs. |               |
| 82_MCX-S50-0-29/111_NM | 22658306 | tape and reel |               |

- Surface mount type SMT
- Edge mount

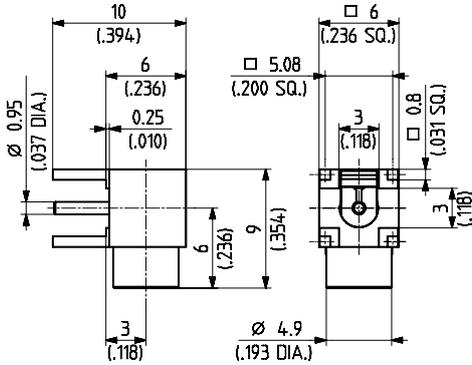


| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole |
|------------------------|----------|---------------|---------------|
| 82_MCX-S50-0-22/111_NE | 22651467 | single        | ML 121        |
| 82_MCX-S50-0-22/111_NM | 84011207 | tape and reel |               |

# Series MCX 50 Ω – PCB connectors

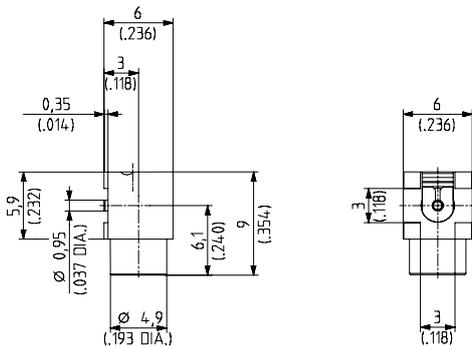
## Right angle PCB jacks (female)

- 2.54 mm/0.100 in. grid

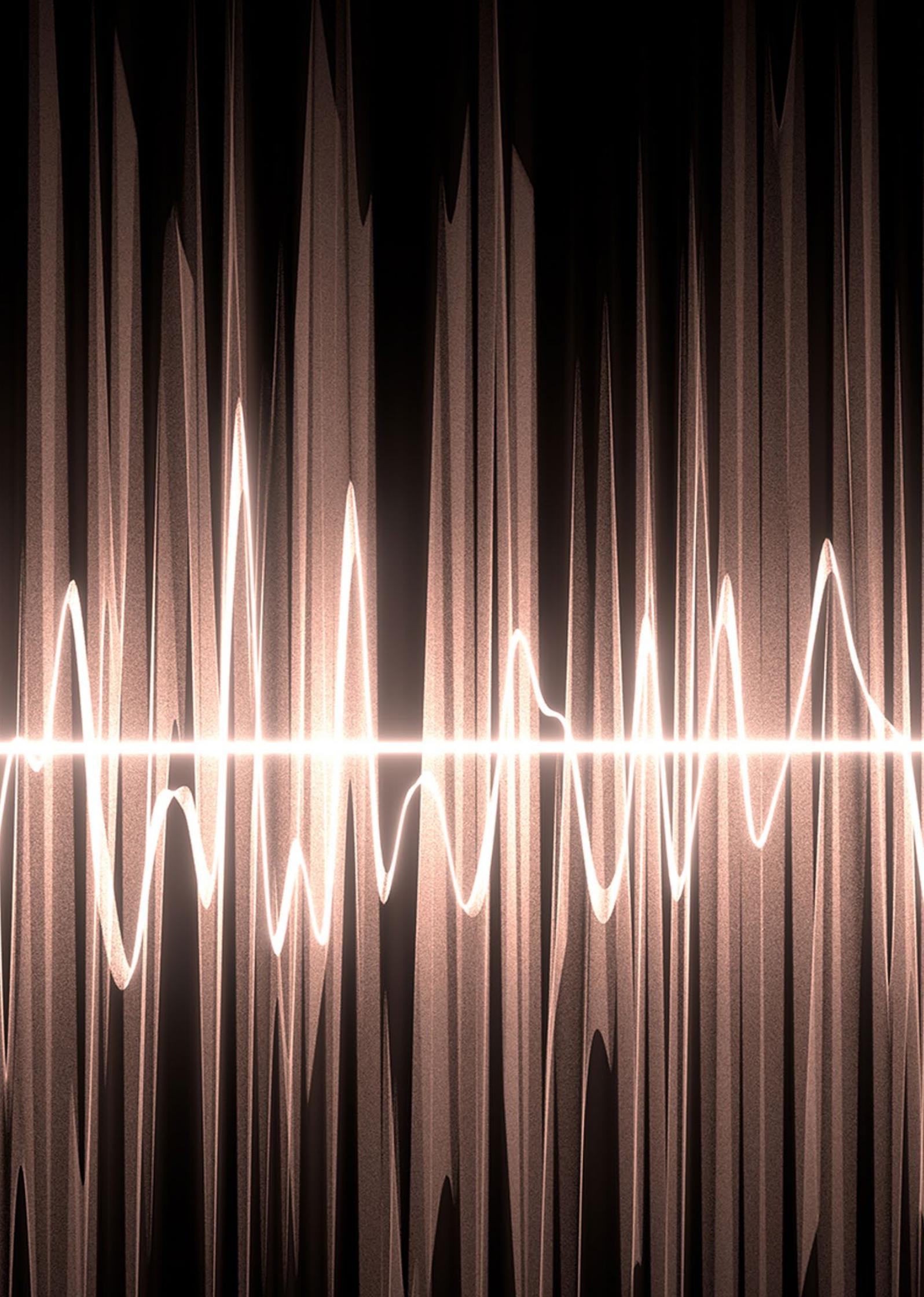


| HUBER+SUHNER type     | Item no. | Packaging     | Mounting hole |
|-----------------------|----------|---------------|---------------|
| 85_MCX-50-0-16/111_NE | 84018523 | single        | ML 15         |
| 85_MCX-50-0-16/111_NH | 23001545 | bulk 100 pcs. |               |
| 85_MCX-50-0-16/111_NM | 84030779 | tape and reel |               |

- Surface mount type SMT



| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole |
|------------------------|----------|---------------|---------------|
| 85_MCX-S50-0-25/111_NH | 23005091 | bulk 100 pcs. | ML 123        |
| 85_MCX-S50-0-25/111_NM | 84036471 | tape and reel |               |



# Series MCX 75 Ω – micro miniature connectors

## Description

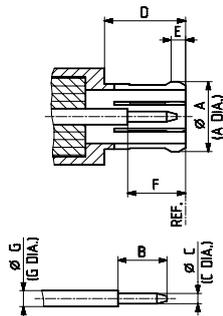
HUBER+SUHNER MCX 75 Ω connectors are derived from the MCX 50 Ω series but have a characteristic impedance of 75 Ω. They offer outstanding electrical properties up to 6 GHz and allow the transmission of digital signals with high bit rates.

## Content

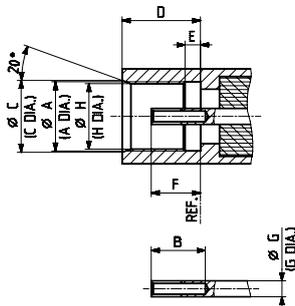
|                                   |     |
|-----------------------------------|-----|
| Description                       | 155 |
| Interface dimensions in mm/inches | 155 |
| Technical data                    | 156 |
| Cable connectors                  | 157 |
| PCB connectors                    | 158 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug                     |             | Jack            |            |
|---|--------------------------|-------------|-----------------|------------|
|   | min.                     | max.        | min.            | max.       |
| A | 3.72/0.146 <sup>1)</sup> | 3.80/0.150* | 3.60/0.142      | 3.70/0.146 |
| B | 2.49/0.098               | 2.59/0.102  | 2.80/0.110      | –          |
| C | 0.48/0.019               | 0.53/0.021  | 3.75/0.148      | 3.85/0.152 |
| D | 4.15/0.163               | –           | 4.00/0.157      | 4.12/0.162 |
| E | 0.70/0.028               | 0.75/0.030  | 0.75/0.030      | 0.85/0.033 |
| F | 2.80/0.110               | 3.20/0.126  | 2.30/0.091      | 2.80/0.110 |
| G | 0.83/0.033 nom.          |             | 0.83/0.033 nom. |            |
| H | 3.42/0.135               | 3.48/0.137  | –               | –          |

### Interface dimensions conformable to the standards:

Intermateable with MCX 50 Ω connectors acc. to CECC 22220.

<sup>1)</sup> prior to slotting

# Series MCX 75 Ω – technical data

| Electrical data   | Requirements                            |
|---|---|
| Impedance   | 75 Ω                                    |
| Frequency range   | DC to 6 GHz                             |
| Dielectric withstanding voltage (at sea level)            | ≥ 500 V rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)<br>· Unmated               | ≥ 170 V rms, 50 Hz (depending on cable) |
| Working voltage (at 21 000 m/70 000 ft.)<br>· Unmated     | ≥ 45 V rms, 50 Hz (depending on cable)  |
| Insulation resistance                                     | ≥103 MΩ                                 |
| Contact resistance<br>· Centre contact<br>· Outer contact | ≤ 5.0 mΩ<br>≤ 2.5 mΩ                    |

| Mechanical data                     | Requirements             |
|-------------------------------------|--------------------------|
| Engagement force                    | ≥ 25 N/5.6 lbs           |
| Disengagement force                 | 8 to 20 N/1.8 to 4.5 lbs |
| Contact captivation                 | ≥ 10 N/2.3 lbs           |
| Cable retention force <sup>1)</sup> | see pages 32 – 41        |
| Durability (matings)                | ≥ 500                    |

| Environmental data  | Requirements   |
|---------------------|--|
| Temperature range   | –65 to +165 °C/–85 to +329 °F                                |
| Climatic category   | IEC → 55/155/21  |
| Thermal shock       | MIL-STD-202, method 107, condition F                         |
| Moisture resistance | MIL-STD-202, method 106                                      |
| Corrosion           | salt spray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition D                         |

| Material data              |                        |                                       |
|----------------------------|------------------------|---------------------------------------|
| Connector parts            | Material               | Plating                               |
| Bodies                     | brass                  | gold/SUCOPLATE®/SUCOPRO® gold plating |
| Pin contacts               | brass                  | gold/SUCOPRO® gold plating            |
| Socket contacts            | copper-beryllium alloy | gold/SUCOPRO® gold plating            |
| Outer contacts (resilient) | copper-beryllium alloy | gold/SUCOPLATE®/SUCOPRO® gold plating |
| Crimp ferrules             | copper                 | SUCOPLATE®/SUCOPRO® gold plating      |
| Insulators                 | PTFE or PFA            |                                       |

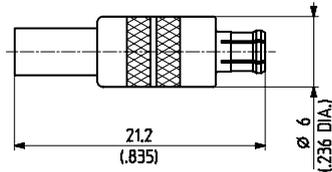
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series MCX 75 Ω – cable connectors

## Straight cable plugs (male)

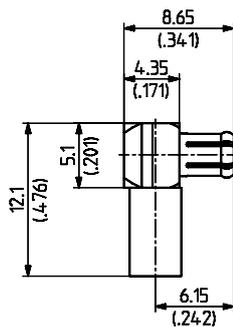
- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|---------------------------------|-----------|----------------------|--------------|
| 11_MCX-75-2-1/113_NE | 22646946 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 9196                 | 1 A          |

## Right angle cable plugs (male)

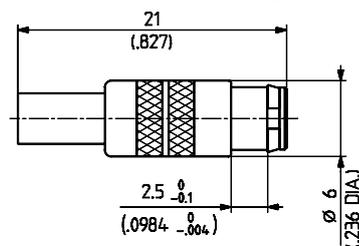
- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging     | Assembly instruction | Crimp insert |
|----------------------|----------|---------------------------------|---------------|----------------------|--------------|
| 16_MCX-75-2-5/133_NH | 23008072 | U5 (RG_179_B/U, ENVIROFLEX_179) | bulk 100 pcs. | 27383                | A            |

## Straight bulkhead cable jacks (female)

- HUBER+SUHNER full crimp
- „Snap-on“ panel mounting
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|---------------------------------|-----------|----------------------|---------------|--------------|
| 24_MCX-75-2-1/113_NE | 22646948 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 9196                 | ML 82         | 1 A          |

# Series MCX 75 Ω – PCB connectors

## Straight PCB jacks (female)

- 2.54 mm/0.100 in.

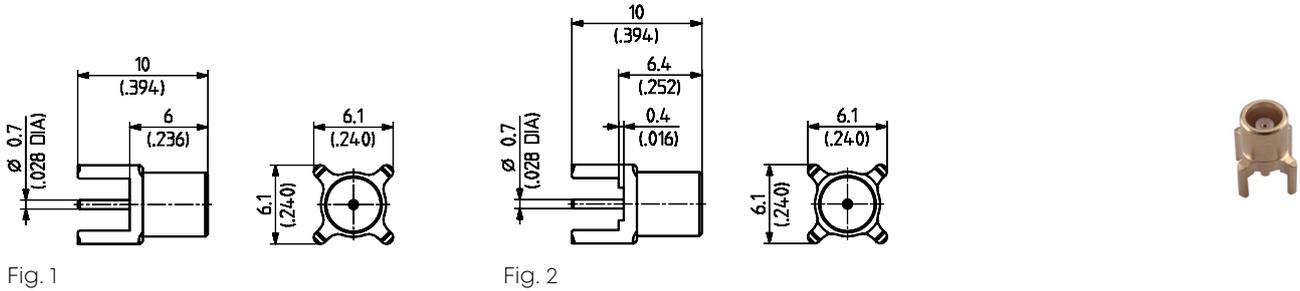


Fig. 1

Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Notes             | Fig. |
|----------------------|----------|---------------|---------------|-------------------|------|
| 82_MCX-75-0-4/111_NE | 84023729 | single        | ML 15         | without stand-off | 1    |
| 82_MCX-75-0-4/111_NH | 23004043 | bulk 100 pcs. |               |                   |      |
| 82_MCX-75-0-5/111_NH | 23004046 | bulk 100 pcs. |               | with stand-off    | 2    |

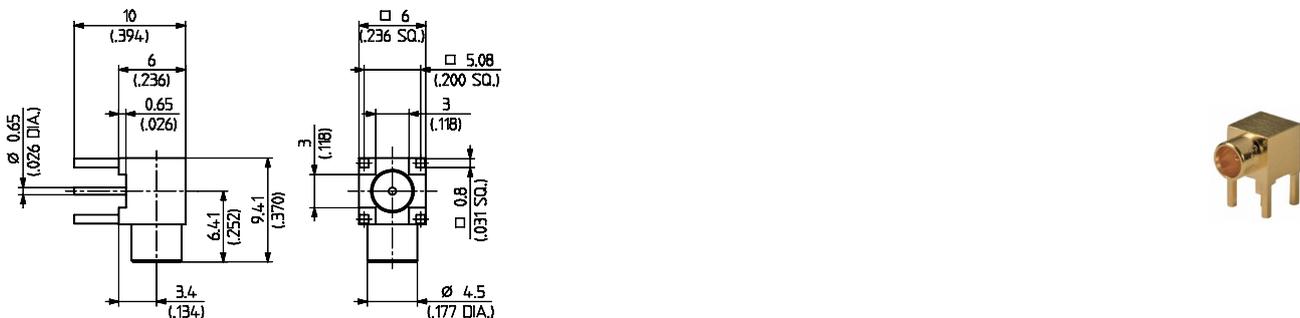
- Surface mount type SMT
- Edge mount



| HUBER+SUHNER type     | Item no. | Packaging               |
|-----------------------|----------|-------------------------|
| 82_MCX-S75-0-2/111_NE | 22651011 | single<br>bulk 100 pcs. |
| 82_MCX-S75-0-2/111_NH | 84020046 |                         |

## Right angle PCB jacks (female)

- 2.54 mm/0.100 in.



| HUBER+SUHNER type    | Item no. | Packaging               |
|----------------------|----------|-------------------------|
| 85_MCX-75-0-1/111_NE | 22649202 | single<br>bulk 100 pcs. |
| 85_MCX-75-0-1/111_NH | 22650766 |                         |

# Series MMPX – 67 GHz snap-on connectors

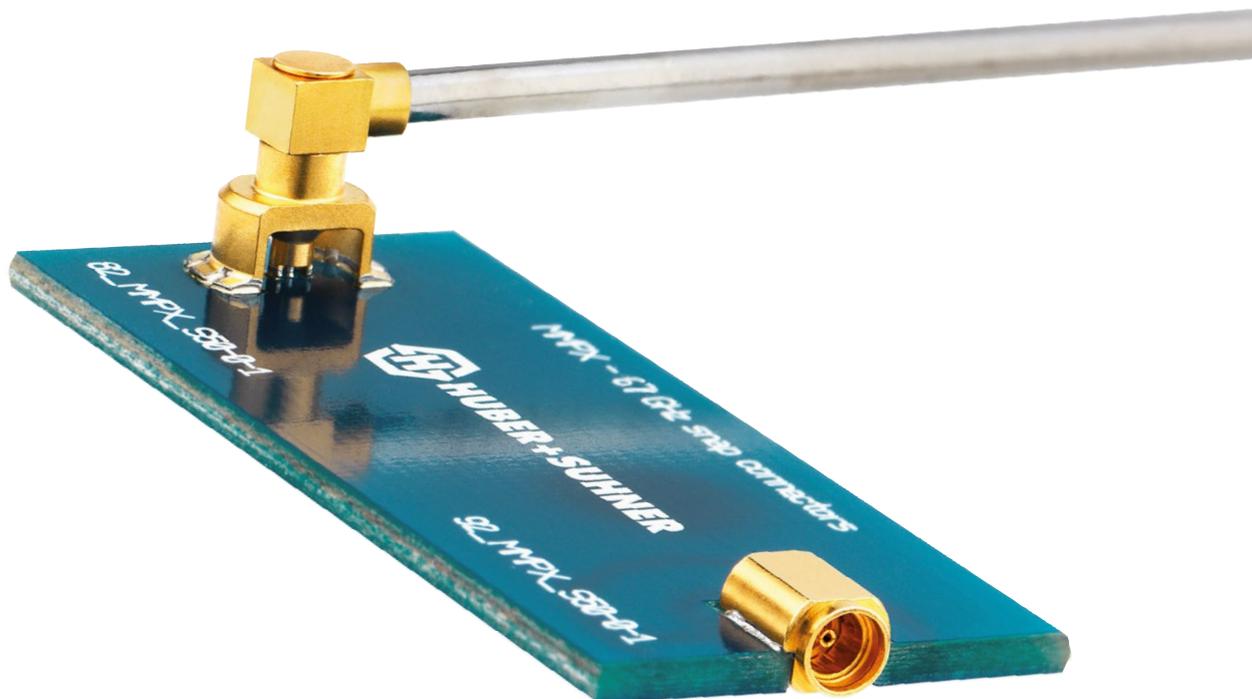
## Description

The snap-on connector family MMPX is the most ideal coaxial-to-PCB system solution for operating frequencies up to 67 GHz. The comprehensive product range consists of cable connectors and assemblies, PCB connectors and adapters to open standards. MMPX connectors feature excellent electrical performance at smallest mechanical dimensions. The broadband characteristics, the small size and the outstanding performance permit new solutions for applications in numerous markets such as high speed digital testing and radio frequency testing (60 GHz WPAN), industrial, mobile communication, space and defence.

## Content

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| Key features     | 160 |
| Benefits         | 160 |
| Technical data   | 161 |
| Cable connectors | 162 |
| PCB connectors   | 164 |
| Decoupling tools | 167 |

**Interface dimensions conformable to the standards:**  
HUBER+SUHNER proprietary interface standard



# Series MMPX – smallest dimensions and highest performance

## Key features

- True 67 GHz coaxial-to-PCB transition
- Broadband characteristics from DC to 67 GHz
- Excellent return loss
- Excellent shielding, low cross-talk
- Via-in-pad capable
- 5.08 mm pitch (0.2 inch)
- Mechanically robust design
- Extensive technical support

## Benefits

### • Future proof design

Thanks to the broadband characteristics, the excellent return loss and the true 67 GHz coaxial-to-PCB transition, MMPX helps in developing future proof RF systems.

### • Quick and reliable mating

The MMPX snap-on mechanism is completely decoupled from the electrical path and therefore specifically optimised for quick and reliable mating.

### • Space saving

The minimal pitch on boards of 5.08 mm (0.2 inch) saves expensive board material.

### • One connector for several applications

The unique electrical and mechanical performance as well as the compact form makes MMPX ideal for a variety of applications.

### • Overall cost saving

The attractive pricing, the extensive technical support including footprint service and the HUBER+SUHNER one-stop shop approach minimises the overall costs for design-ins and trade procedures.

## Comprehensive product range of standard products

- Various PCB connector and cable connector types
- Broad range of standard Multiflex 86 HE cable assemblies (MMPX to SMA, PC 3.5, SK (2.92 mm standard) and PC 1.85/phase match:  $\pm 1$  ps absolute)
- Customised assemblies with semi-rigid, Sucoform, Multiflex and Minibend L cables
- Adapters to SK (2.92 mm standard) and to PC 1.85
- Decoupling tools for easy and safe connector decoupling

# Series MMPX – technical data

| Electrical data                                      |   |                |                |              |
|--|---|----------------|----------------|--------------|
| Impedance  | 50 $\Omega$   |                |                |              |
| Frequency range                                      | DC to 67 GHz  |                |                |              |
| Return loss  | typical values for coaxial-to-PCB transition (measured) <sup>1)</sup> |                |                |              |
|  | configuration   | DC to 26,5 GHz | 26,5 to 50 GHz | 50 to 67 GHz |
|  | straight PCB jack mated with a straight cable plug                    | 25 dB          | 20 dB          | 10 dB        |
|  | straight PCB jack mated with a right angle cable plug                 | 25 dB          | 20 dB          | 10 dB        |
| edge mount PCB jack mated with a straight cable plug | 25 dB   | 20 dB          | 16 dB          |              |
| RF leakage (interface only)                          | -40 dB (DC to 67 GHz)   |                |                |              |
| Dielectric withstanding voltage (at sea level)       | 500 V rms, 50 Hz  |                |                |              |
| Working voltage (at sea level)                       | $\leq 170$ V rms, 50 Hz   |                |                |              |
| Insulation resistance                                | $\geq 1$ G $\Omega$   |                |                |              |
| Contact resistance                                   |   |                |                |              |
| · Centre contact                                     | $\leq 5$ m $\Omega$   |                |                |              |
| · Outer contact                                      | $\leq 2$ m $\Omega$   |                |                |              |

| Mechanical data      |  |
|----------------------|--|
| Engagement force     | max. 30 N/6.7 lbf (typical 20 N/4.4 lbf) |
| Disengagement force  | max. 30 N/6.7 lbf (typical 15 N/3.3 lbf) |
| Durability (matings) | 100 (adapters: 500)                      |

| Environmental data         | Testing conditions                       |
|----------------------------|--|
| Temperature range          | -65 to +155 °C/-85 to +31 °F             |
| Thermal shock              | MIL-STD-202, method 107 G, condition A/F |
| High temperature endurance | IEC-61-169-1                             |
| Corrosion                  | MIL-STD-202, method 101, condition B     |
| Vibration                  | MIL-STD-202, method 204 D, condition D   |
| Mechanical shock           | MIL-STD-202, method 213 B, condition I   |
| Solderability              | MIL-STD-883                              |

| Processing data                    |                            |                             |
|------------------------------------|----------------------------|-----------------------------|
| Typical values adherent to the PCB | straight PCB jack full SMT | edge mount PCB full SMT     |
| · Shearing                         | 90 N/20.2 lbf              | 70 N/15.7 lbf               |
| · Pulling (vertical to the PCB)    | 50 N/11.2 lbf              | no standard value available |

| Material data          |            |                       |
|------------------------|------------|-----------------------|
| Male connector parts   | Material   | Plating               |
| Centre contact         | CuBe/brass | SUCOPRO® gold plating |
| Outer contact          | brass      | SUCOPRO® gold plating |
| Body                   | brass      | SUCOPRO® gold plating |
| Insulators             | PTFE       |                       |
| Female connector parts |            |                       |
| Centre contact         | CuBe       | SUCOPRO® gold plating |
| Outer contact          | CuBe       | SUCOPRO® gold plating |
| Body                   | brass      | SUCOPRO® gold plating |
| Insulators             | PTFE       |                       |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

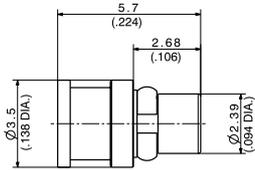
<sup>1)</sup> Valid for recommended PCB material/stacking only!

# Series MMPX – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

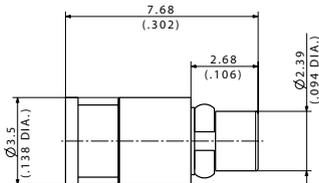
- Outer contact soldered
- Center contact soldered



| HUBER+SUHNER type     | Item no. | Cable        | Packaging | Notes                               |
|-----------------------|----------|--------------|-----------|-------------------------------------|
| 11_MMPX-50-2-1/111_NE | 84022225 | EZ_86, SR_86 | single    | precision interface, air dielectric |

### For semi-rigid, semi-flexible and flexible cables

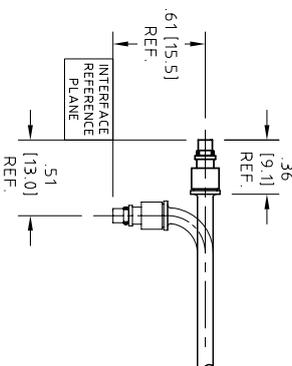
- Outer contact soldered
- Center contact plugged



| HUBER+SUHNER type     | Item no. | Cable                     | Packaging | Notes   |
|-----------------------|----------|---------------------------|-----------|---|
| 11_MMPX-50-1-4/111_NE | 84122130 | MULTIFLEX_53-02           | single    | for HUBER+SUHNER Multiflex 53-02 cable          |
| 11_MMPX-50-2-2/111_NE | 84022228 | EZ_86, SUCOFORM_86, SR_86 |           | for semi-rigid and HUBER+SUHNER Sucoform cables |
| 11_MMPX-50-2-3/111_NE | 84089228 | MULTIFLEX_86_HE           |           | for HUBER+SUHNER Multiflex 86 HE cables         |

### For minibend L assemblies

- Bend to the end cable entry
- Available as assembly only



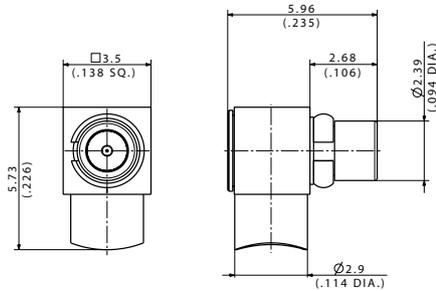
| HUBER+SUHNER type     | Item no. | Cable      | Packaging |
|-----------------------|----------|------------|-----------|
| 11_MMPX-50-0-1/19-_NE | 85021747 | Minibend L | single    |

# Series MMPX – cable connectors

## Right angle cable plugs (male)

For semi-rigid, semi-flexible and flexible cables

- Outer contact soldered
- Center contact plugged

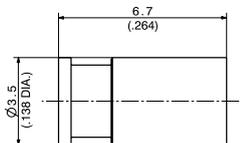


| HUBER+SUHNER type     | Item no. | Cable                     | Packaging | Notes   |
|-----------------------|----------|---------------------------|-----------|---|
| 16_MMPX-50-2-1/111_NE | 84022227 | EZ_86, SUCOFORM_86, SR_86 | single    | for semi-rigid and HUBER+SUHNER Sucoform cables |
| 16_MMPX-50-2-2/111_NE | 84067778 | MULTIFLEX_86_HE           |           | for HUBER+SUHNER Multiflex 86 HE cable          |

## Straight cable jack (female)

For semi-rigid and semi-flexible cables

- Outer contact soldered
- Center contact soldered

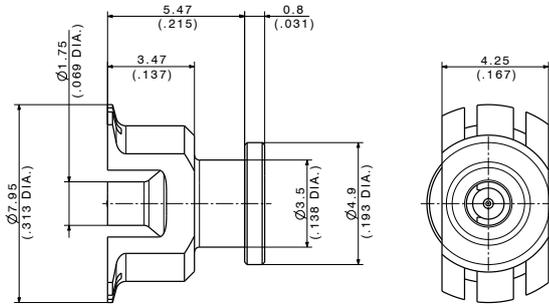


| HUBER+SUHNER type     | Item no. | Cable size                | Packaging |
|-----------------------|----------|---------------------------|-----------|
| 21_MMPX-50-2-1/111_NE | 84022226 | EZ_86, SUCOFORM_86, SR_86 | single    |

# Series MMPX – PCB connectors

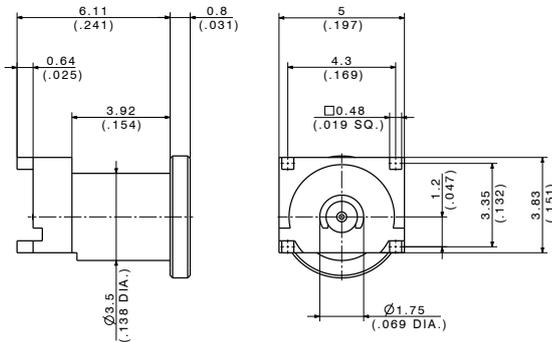
## Straight PCB jacks (female)

- Full surface mount (SMD)
- Decoupling tool 74\_Z-0-0-491 or 74\_Z-0-0-555 recommended



| HUBER+SUHNER type        | Item no. | Packaging     | Notes                                   |
|--------------------------|----------|---------------|---|
| 82_MMPX-S50-0-2/111_NM   | 84096711 | tape          | blister tape containing 10 pcs.         |
| 82_MMPX-S50-0-2/111_NM-1 | 84096752 | tape and reel | reeled blister tape containing 750 pcs. |

- Semi surface mount (semi-SMD)
- Short print legs
- Decoupling tool 74\_Z-0-0-491 or 74\_Z-0-0-555 recommended

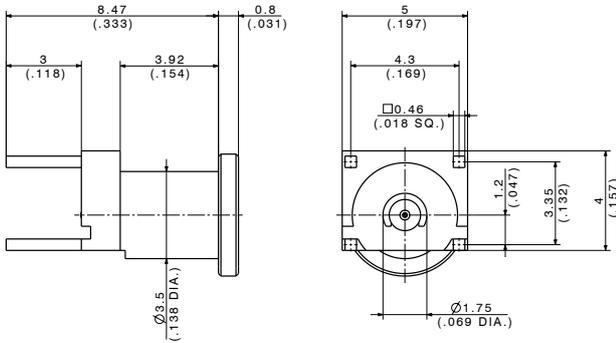


| HUBER+SUHNER type       | Item no. | Packaging | Notes                                   |
|-------------------------|----------|-----------|---|
| 96_MMPX-50-0-2/111_NM-1 | 84093961 | tape      | blister tape containing 10 pcs.         |
| 96_MMPX-50-0-2/111_NM   | 84093966 | tape/reel | reeled blister tape containing 750 pcs. |

# Series MMPX – PCB connectors

## Straight PCB jacks (female)

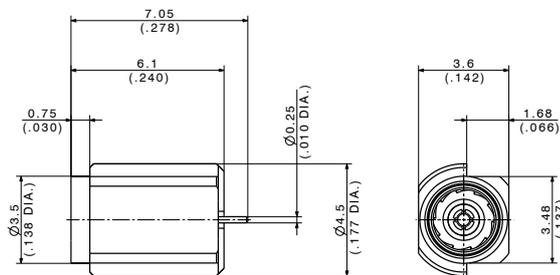
- Semi surface mount (semi-SMD)
- Long print legs



| HUBER+SUHNER type       | Item no. | Packaging     | Notes                                   |
|-------------------------|----------|---------------|---|
| 96_MMPX-50-0-3/111_NM-1 | 84099981 | tape          | blister tape containing 10 pcs.         |
| 96_MMPX-50-0-3/111_NM   | 84099988 | tape and reel | reeled blister tape containing 500 pcs. |

## Straight PCB jacks (female), edge-mount

- Full surface mount (SMD)
- PCB cut out required
- Decoupling tool 74\_Z-0-0-491 or 74\_Z-0-0-555 recommended

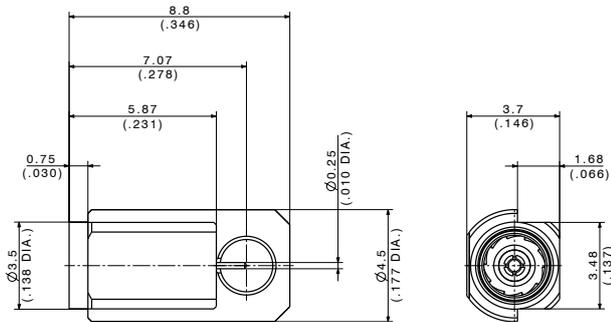


| HUBER+SUHNER type        | Item no. | Packaging     | Notes                                   |
|--------------------------|----------|---------------|---|
| 92_MMPX-S50-0-1/111_NM   | 84009138 | tape          | blister tape containing 10 pcs.         |
| 92_MMPX-S50-0-1/111_NM-1 | 84009140 | tape and reel | reeled blister tape containing 500 pcs. |

# Series MMPX – PCB connectors

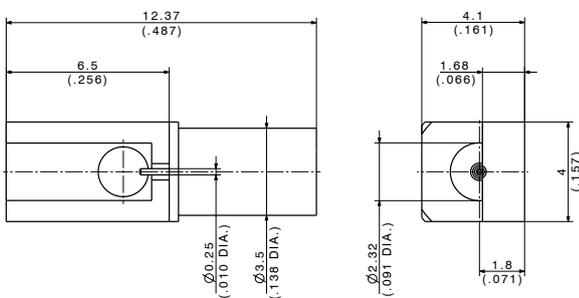
## Straight PCB jacks (female), edge-mount

- Full surface mount (SMD)
- PCB cut out required
- Extra shielded for EMF sensitive applications
- Operating range at up to 26.5 GHz
- Decoupling tool 74\_Z-0-0-491 or 74\_Z-0-0-555 recommended



| HUBER+SUHNER type      | Item no. | Packaging |
|------------------------|----------|-----------|
| 92_MMPX-S50-0-2/111_NE | 84016110 | single    |

- Full surface mount (SMD)
- No PCB cut-out required
- Operating range at up to 15 GHz
- Decoupling tool 74\_Z-0-0-491 or 74\_Z-0-0-555 recommended



| HUBER+SUHNER type        | Item no. | Packaging     | Notes                             |
|--------------------------|----------|---------------|-----------------------------------|
| 92_MMPX-S50-0-3/111_NM-1 | 84100614 | tape          | blister tape containing 10 pcs.   |
| 92_MMPX-S50-0-3/111_NM   | 84096563 | tape and reel | blister tape containing 1750 pcs. |

# Series MMPX – decoupling tools

## „All-round“ decoupling tool

This decoupling tool is suitable for all kind of MMPX combinations.

| HUBER+SUHNER type | Item no. |
|-------------------|----------|
| 74_Z-0-0-555      | 84020011 |



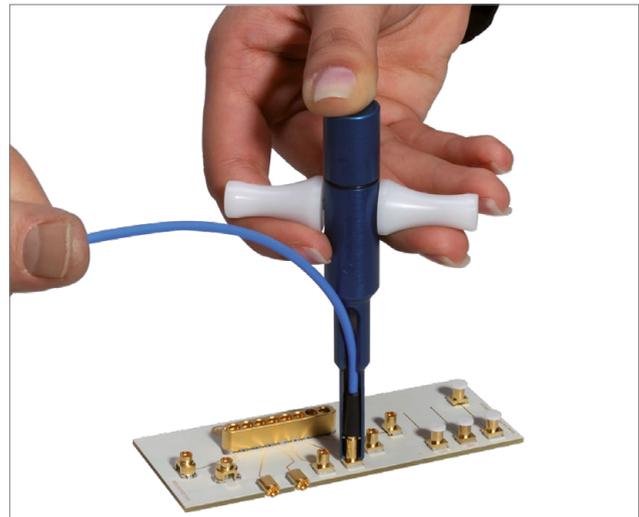
## „PCB“ decoupling tool

This high-end decoupling tool is especially suited for decoupling MMPX combinations when the PCB connectors are placed very close to each other. The anodized surface is non-conductive and helps to prevent short-cutting circuits on the PCB.

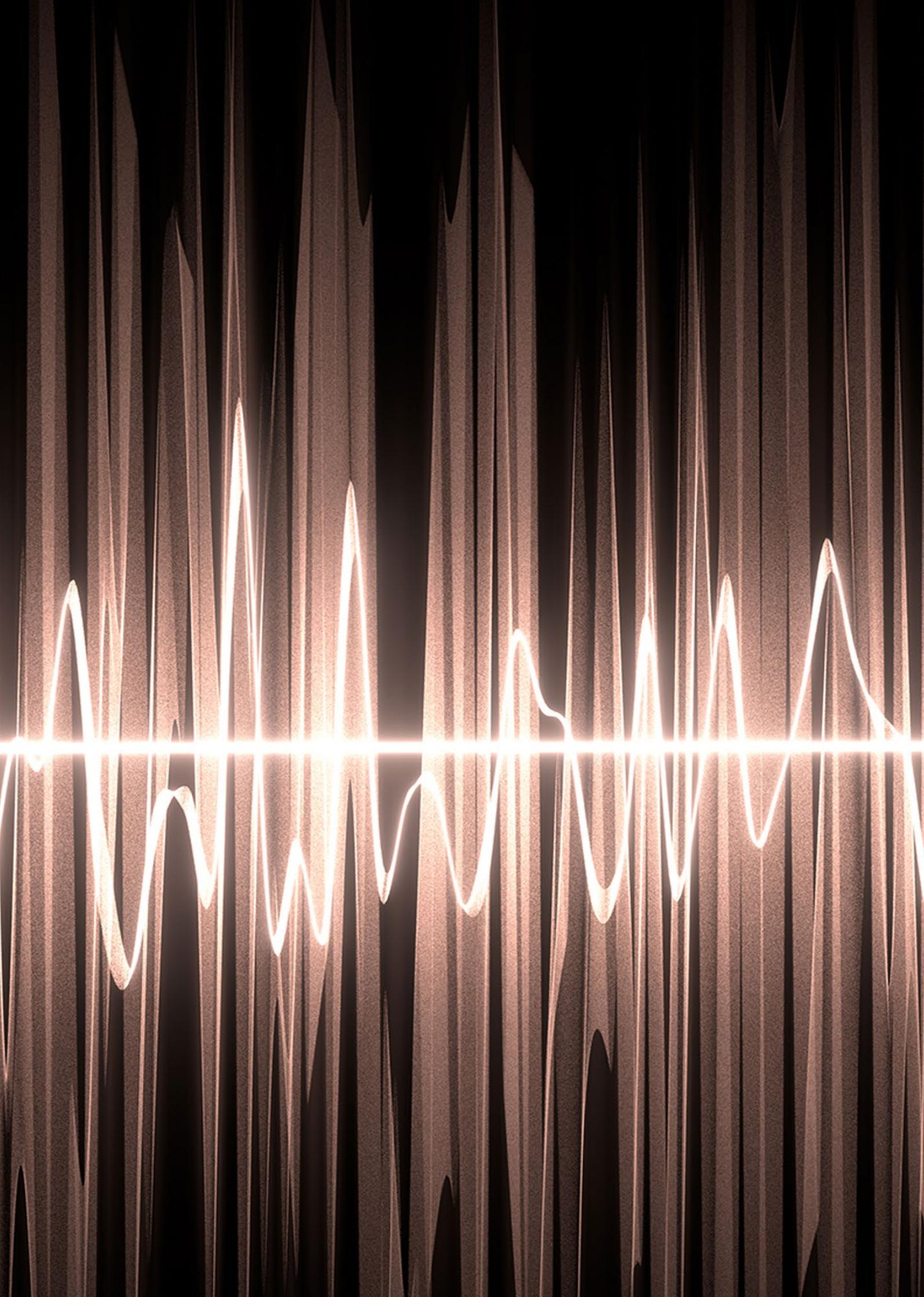
Note: Suitable for flexible cables only!

Possible combination of patterns

- 11\_MMPX/82\_MMPX
- 11\_MMPX/92\_MMPX
- 11\_MMPX/96\_MMPX
- 16\_MMPX/82\_MMPX
- 16\_MMPX/96\_MMPX



| HUBER+SUHNER type | Item no. |
|-------------------|----------|
| 74_Z-0-0-491      | 84114252 |



# Series SMB – subminiature connectors

## Description

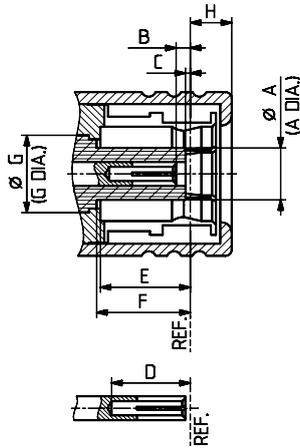
The HUBER+SUHNER subminiature connectors series SMB and SMC have the same basic design. They only differ with regard to their coupling mechanism. HUBER+SUHNER SMB subminiature connectors are suitable for applications from DC up to 4 GHz.

## Content

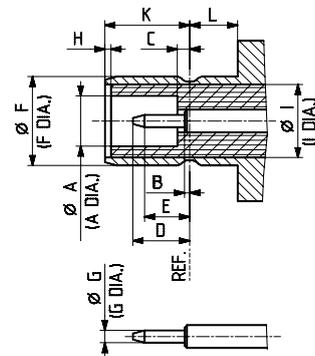
|                                   |     |
|-----------------------------------|-----|
| Description                       | 169 |
| Interface dimensions in mm/inches | 169 |
| Technical data                    | 170 |
| Cable connectors                  | 171 |
| Receptacles with solder end       | 175 |
| PCB connectors                    | 176 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug            |            | Jack            |            |
|---|-----------------|------------|-----------------|------------|
|   | min.            | max.       | min.            | max.       |
|   | –               | 2.06/0.081 | 2.08/0.082      | –          |
| B | 0.18/0.007      | 0.94/0.037 | –               | 0.18/0.007 |
| C | 0.18/0.007      | –          | –               | 0.18/0.007 |
| D | 2.97/0.117      | –          | –               | 2.97/0.117 |
| E | 3.58/0.141      | –          | 1.32/0.052      | –          |
| F | 3.58/0.141      | –          | 3.66/0.144      | 3.71/0.146 |
| G | 3.05/0.120 nom. |            | 0.48/0.019      | 0.53/0.021 |
| H | –               | 1.63/0.064 | 0.00/0.000      | –          |
| I | –               | –          | 3.05/0.120 nom. |            |
| K | –               | –          | 3.33/0.131      | 3.58/0.141 |
| L | –               | –          | 1.65/0.065      | –          |

### Interface dimensions conformable to the standards:

International: IEC 60169-10  
 Europe: CECC 22130  
 USA: MIL-PRF-39012  
 Interface MIL-STD-348/311

# Series SMB – technical data

| Electrical data                                | Requirements   |
|--|--|
| Impedance                                      | 50 $\Omega$  |
| Frequency range                                | DC to 4 GHz  |
| Dielectric withstanding voltage (at sea level) | 750 V rms, 50 Hz (depending on cable)  |
| Working voltage (at sea level)                 | 250 V rms for cables with 1 mm/0.039 in. dielectric<br>335 V rms for cables with 2 mm/0.078 in. dielectric |
| Insulation resistance                          | $\geq 10^4$ M $\Omega$   |
| Contact resistance                             |  |
| · Centre contact                               | $\leq 5$ m $\Omega$  |
| · Outer contact                                | $\leq 2.5$ m $\Omega$  |
| RF leakage (measured at 1 GHz)                 | $\geq 55$ dB   |

| Mechanical data                     | Requirements              |
|-------------------------------------|---------------------------|
| Engagement force                    | 8 to 63 N/1.8 to 14.2 lbs |
| Disengagement force                 | 8 to 63 N/1.8 to 14.2 lbs |
| Contact captivation                 | $\geq 18$ N/4.0 lbs       |
| Cable retention force <sup>1)</sup> | see pages 32 – 41         |
| Durability (matings)                | $\geq 500$                |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | -65 to +165 °C/-85 to +329 °F                               |
| Climatic category   | IEC $\rightarrow$ 55/155/21                                 |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |

| Material data       |                        |                    |
|---------------------|------------------------|--------------------|
| Connector parts     | Material               | Plating            |
| Bodies              | brass                  | gold or SUCOPLATE® |
| Pin contacts        | brass                  | gold               |
| Socket contacts     | copper-beryllium alloy | gold               |
| Crimp ferrules      | copper/brass           | gold or SUCOPLATE® |
| Springs and washers | copper-beryllium alloy | gold or SUCOPLATE® |
| Insulators          | PTFE or PFA            |                    |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

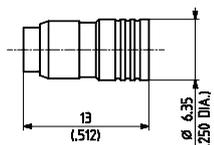
<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series SMB – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

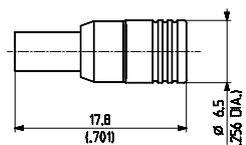
- Open entry
- Cable entry soldered
- Centre contact crimp or soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 11_SMB-50-2-13/111_NE | 22543362 | Y3, Y11, (EZ_86)      | single        | 9002                 | 1            |
| 11_SMB-50-2-13/111_NH | 22658765 |                       | bulk 100 pcs. |                      |              |

### For flexible cables

- Closed entry
- HUBER+SUHNER full crimp
- Taper sleeves see page 554



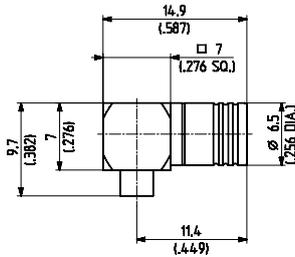
| HUBER+SUHNER type     | Item no. | Cable group (example)   | Packaging     | Assembly instruction | Crimp insert | Notes         |
|-----------------------|----------|-------------------------|---------------|----------------------|--------------|---------------|
| 11_SMB-50-1-40/111_NE | 22648050 | U1 (RG_178_B/U,         | single        | 3077                 | 1 A          | low retention |
| 11_SMB-50-1-40/111_NH | 22650186 | ENVIROFLEX_178)         | bulk 100 pcs. |                      |              |               |
| 11_SMB-50-2-40/111_NE | 22648051 | U2 (RG_316/U,           | single        |                      |              |               |
| 11_SMB-50-2-40/111_NH | 23014146 | ENVIROFLEX_316)         | bulk 100 pcs. |                      |              |               |
| 11_SMB-50-2-40/133_NE | 22648498 |                         | single        |                      |              |               |
| 11_SMB-50-2-40/133_NH | 22650179 |                         | bulk 100 pcs. |                      |              |               |
| 11_SMB-50-2-41/111_NE | 22648052 | U4 (K_02252_D, ENVIROF- | single        |                      |              |               |
| 11_SMB-50-2-41/111_NH | 22650536 | LEX_316_D)              | bulk 100 pcs. |                      |              |               |

# Series SMB – cable connectors

## Right angle cable plugs (male)

### For semi-rigid cables

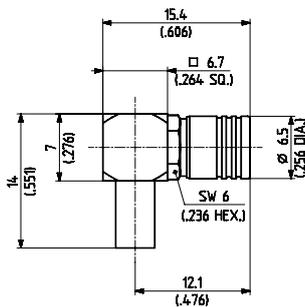
- Closed entry
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction |
|-----------------------|----------|-----------------------|-----------|----------------------|
| 16_SMB-50-2-23/111_NE | 22644079 | Y3, Y11 (EZ_86)       | single    | 9160                 |

### For flexible cables

- Closed entry
- HUBER+SUHNER full crimp
- Taper sleeves see page 554



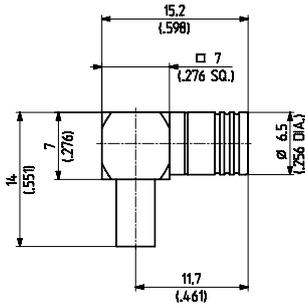
| HUBER+SUHNER type      | Item no. | Cable group (example)            | Packaging     | Assembly instruction | Crimp insert | Notes                      |
|------------------------|----------|----------------------------------|---------------|----------------------|--------------|----------------------------|
| 16_SMB-50-2-110/111_NE | 22659113 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 3096                 | 1 A          | high retention, open entry |
| 16_SMB-50-2-110/133_NH | 22659116 | U2 (RG_316_/U, ENVIROFLEX_316)   | bulk 100 pcs. |                      |              | high retention, open entry |
| 16_SMB-50-2-111/111_NH | 22659120 | U4 (K_02252_D, ENVIROFLEX_316_D) | bulk 100 pcs. |                      |              |                            |
| 16_SMB-50-1-40/111_NE  | 22648053 | U1 (RG_178_B/U, ENVIROFLEX_178)  | single        |                      |              |                            |
| 16_SMB-50-2-40/111_NE  | 22648054 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        |                      |              |                            |
| 16_SMB-50-2-40/111_NH  | 22650695 |                                  | bulk 100 pcs. |                      |              |                            |
| 16_SMB-50-2-41/111_NH  | 22660335 | U4 (K_02252_D, ENVIROFLEX_316_D) | bulk 100 pcs. |                      |              |                            |

# Series SMB – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Closed entry
- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554

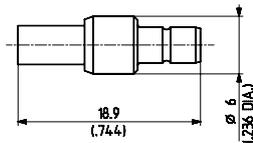


| HUBER+SUHNER type                              | Item no.             | Cable group (example)                | Packaging               | Assembly instruction | Crimp insert | Plating body |
|--|----------------------|--------------------------------------|-------------------------|----------------------|--------------|--------------|
| 16_SMB-50-2-50/111_NE<br>16_SMB-50-2-50/111_NH | 22648057<br>23011371 | U2(RG_316_/U,<br>ENVIROFLEX_316)     | single<br>bulk 100 pcs. | 9157                 | A            |              |
| 16_SMB-50-2-50/133_NH <sup>1)</sup>            | 22650181             | U2 (RG_316_/U,<br>ENVIROFLEX_316)    | bulk 100 pcs.           |                      |              | SUCOPLATE®   |
| 16_SMB-50-2-51/111_NE<br>16_SMB-50-2-51/111_NH | 22648058<br>22658985 | U 4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 9157                 | A            |              |
| 16_SMB-50-2-51/133_NH <sup>1)</sup>            | 22650182             | U 4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 100 pcs. |                      |              | SUCOPLATE®   |

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type                              | Item no.             | Cable group (example)                | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|--------------------------------------|-------------------------|----------------------|--------------|
| 21_SMB-50-1-10/111_NE <sup>2)</sup>            | 22543424             | U1 (RG_178_B/U,<br>ENVIROFLEX_178)   | single                  | 3077                 | 1 A          |
| 21_SMB-50-2-10/111_NE<br>21_SMB-50-2-10/111_NH | 22640205<br>22651810 | U2 (RG_316_/U,<br>ENVIROFLEX_316)    | single<br>bulk 100 pcs. |                      |              |
| 21_SMB-50-2-11/111_NE                          | 22642407             | U4, (K_02252_D,<br>ENVIROFLEX_316_D) | single                  |                      |              |

<sup>1)</sup> Cost effective

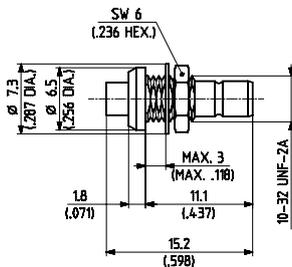
<sup>2)</sup> Centre contact not captivated

# Series SMB – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact crimp or soldered



| HUBER+SUHNER type  | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Mounting hole | Crimp insert |
|--|----------------------|-----------------------|-------------------------|----------------------|---------------|--------------|
| 24_SMB-50-2-13/111_NE <sup>1)</sup><br>24_SMB-50-2-13/111_NH <sup>1)</sup> | 22640822<br>84047710 | Y3, Y11, Y16 (EZ_86)  | single<br>bulk 100 pcs. | 9002                 | ML 11         | 1            |

### For flexible cables

- HUBER+SUHNER full crimp
- Rear mounting
- Mounting hole ML 11
- Taper sleeves see page 554

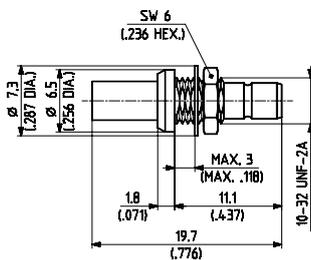


Fig. 1

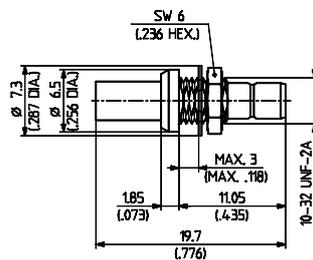


Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)              | Packaging               | Assembly instruction | Crimp insert | Plating body | Fig.       |
|--|----------------------|------------------------------------|-------------------------|----------------------|--------------|--------------|------------|
| 24_SMB-50-1-10/111_NE <sup>1)</sup><br>24_SMB-50-1-10/111_NH | 22543631<br>22645690 | U1 (RG_178_B/U,<br>ENVIROFLEX_178) | single<br>bulk 100 pcs. | 3077                 | 1 A          |              | 1          |
| 24_SMB-50-2-110/111_NE<br>24_SMB-50-2-110/111_NH             | 22658161<br>22659126 | U2 (RG_316_/U,<br>ENVIROFLEX_316)  | single<br>bulk 100 pcs. |                      |              |              | 2          |
| 24_SMB-50-2-110/133_NH <sup>2)</sup>                         | 22659128             | U2 (RG_316_/U,<br>ENVIROFLEX_316)  | bulk 100 pcs.           |                      |              |              | SUCOPLATE® |
| 24_SMB-50-2-111/111_NH                                       | 22659130             | U2 (RG_316_/U,<br>ENVIROFLEX_316)  | bulk 100 pcs.           |                      |              |              |            |

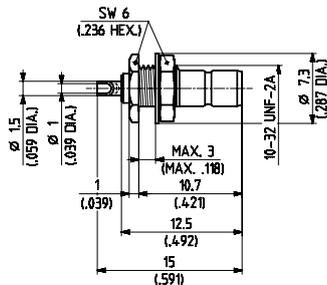
<sup>1)</sup> Cost effective

<sup>2)</sup> Centre contact not captivated

# Series SMB – receptacles with solder end

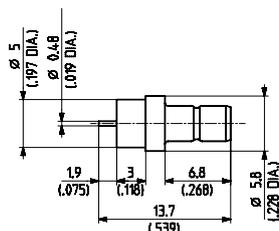
## Receptacle jack (female)

- Bulkhead mounted
- Rear mounting
- Insulating washers see page 556



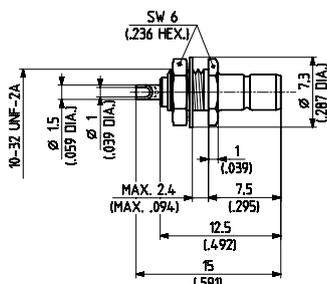
| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 22_SMB-50-0-3/111_NE | 22640207 | single    | ML 11         |

- Bulkhead mounted
- Hermetically sealed
- RoHS compliant alternative on request



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes   |
|----------------------|----------|-----------|---------------|---|
| 22_SMB-50-0-5/111_NE | 22640209 | single    | ML 90         | panel sealing: laser beam welding<br>leak rate $\leq 10^{-8}$ Torr l/s (atm cc/s) |

- Bulkhead mounted
- Front mounting
- Insulating washers see page 556

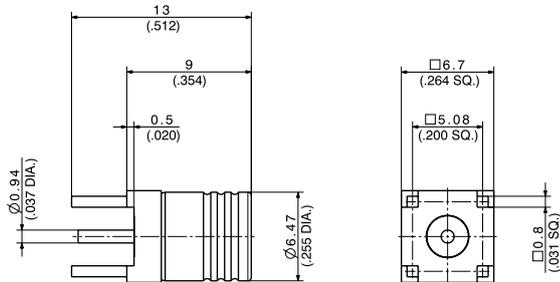


| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Plating body |
|----------------------|----------|---------------|---------------|--------------|
| 22_SMB-50-0-2/133_NH | 22651503 | bulk 100 pcs. | ML 11         | SUCOPLATE®   |

# Series SMB – PCB connectors

## Straight PCB plug (male)

- 2.54 mm/0.100 in. grid
- Open entry



| HUBER+SUHNER type     | Item no. | Mounting hole | Plating body | Notes          |
|-----------------------|----------|---------------|--------------|----------------|
| 81_SMB-50-0-41/111_NE | 22648059 | ML 15         | gold         | with stand-off |

## Straight PCB jacks (female)

- 2.54 mm/0.100 in. grid

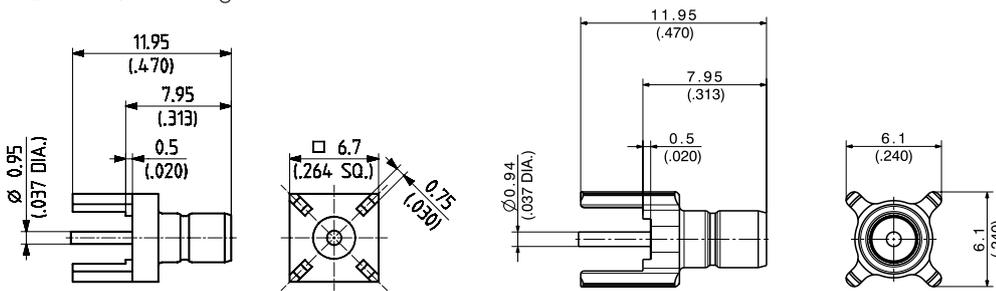


Fig. 1

Fig. 2

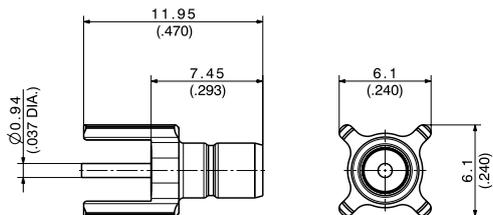


Fig. 3

| HUBER+SUHNER type      | Item no. | Packaging     | Mounting hole | Plating body          | Fig. | Notes             |
|------------------------|----------|---------------|---------------|-----------------------|------|-------------------|
| 82_SMB-50-0-1/133_NE   | 22641492 | single        | ML 15         | SUCOPLATE®            | 1    | with stand-off    |
| 82_SMB-50-0-1/111_NH-1 | 23017254 | bulk 100 pcs. |               | SUCOPRO® plating      | 1    | with stand-off    |
| 82_SMB-50-0-17/111_NH  | 23010991 | bulk 100 pcs. |               | SUCOPRO® gold plating | 2    | with stand-off    |
| 82_SMB-50-0-19/111_NH  | 23011018 | bulk 100 pcs. |               | SUCOPRO® gold plating | 3    | without stand-off |

# Series SMB – PCB connectors

## Right angle PCB jacks (female)

- 2.54 mm/0.100 in. grid
- With stand-off

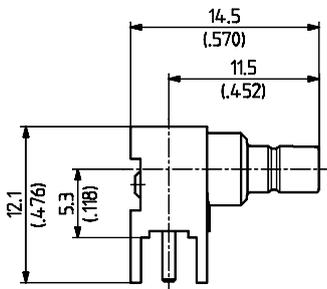


Fig. 1

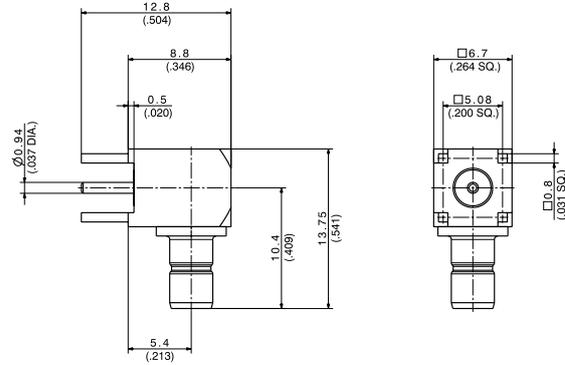
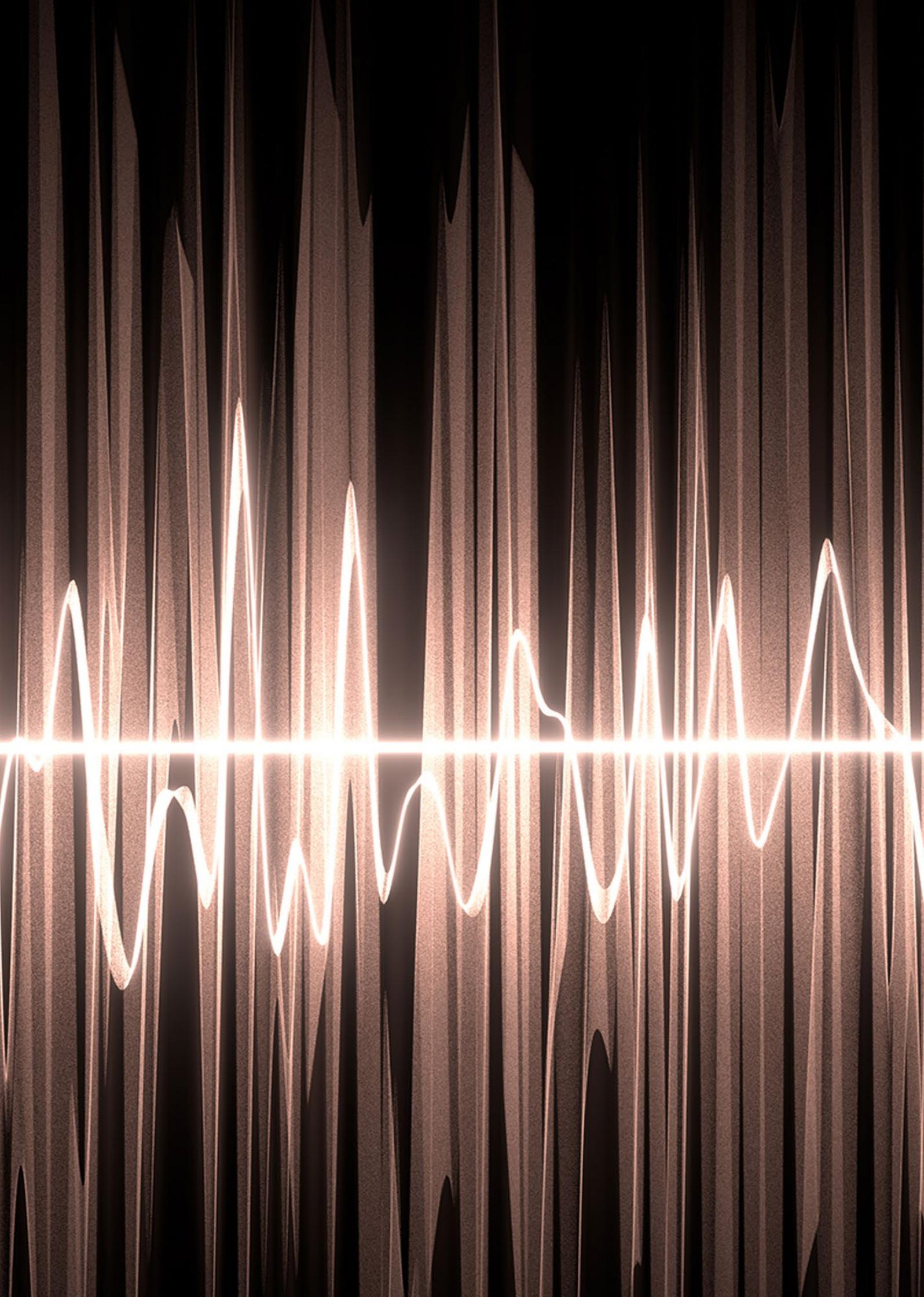


Fig. 2

| HUBER+SUHNER type                  | Item no. | Packaging     | Mounting hole | Plating body          | Fig. |
|------------------------------------|----------|---------------|---------------|-----------------------|------|
| 85_SMB-Z50-0-19/111_NE             | 84041359 | single        | ML 15         | SUCOPRO® gold plating | 1    |
| 85_SMB-Z50-0-19/111_NH             | 23010999 | bulk 100 pcs. |               | gold                  | 2    |
| 85_SMB-50-0-1/111_NE               | 22640235 | single        | ML 15         | SUCOPLATE®            |      |
| 85_SMB-50-0-1/111_NH               | 22645989 | bulk 100 pcs. |               |                       |      |
| 85_SMB-50-0-1/133_NE <sup>1)</sup> | 22641270 | single        | ML 15         | SUCOPLATE®            |      |
| 85_SMB-50-0-1/133_NH <sup>1)</sup> | 22644524 | bulk 100 pcs. |               |                       |      |

<sup>1)</sup> Cost effective



# Series SMC – subminiature connectors

## Description

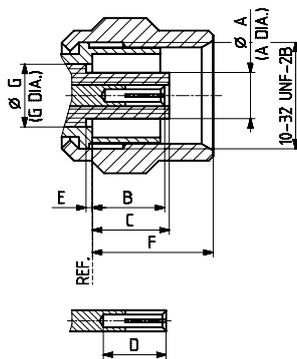
The HUBER+SUHNER SMC subminiature connector series is based on the same design as the SMB series. But due to its screw-on coupling mechanism, the HUBER+SUHNER SMC subminiature connectors are suitable for applications up to 10 GHz.

## Content

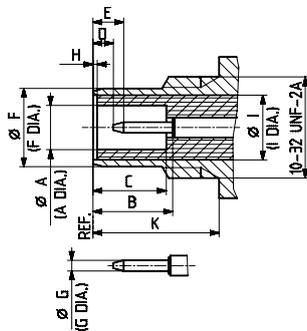
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| Interface dimensions in mm/inches | 179 |
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## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug            |            | Jack            |            |
|---|-----------------|------------|-----------------|------------|
|   | min.            | max.       | min.            | max.       |
| A | –               | 2.60/0.081 | 2.08/0.082      | –          |
| B | 2.85/0.112      | 3.40/0.134 | 3.40/0.134      | –          |
| C | –               | 3.40/0.134 | 3.40/0.134      | –          |
| D | 2.79/0.110      | –          | 0.61/0.024      | –          |
| E | 0.00/0.000      | –          | –               | 2.13/0.084 |
| F | –               | 5.92/0.233 | –               | 3.71/0.146 |
| G | 3.05/0.120 nom. |            | 0.48/0.019      | 0.53/0.021 |
| H | –               | –          | 0.00/0.000      | –          |
| I | –               | –          | 3.05/0.120 nom. |            |
| K | –               | –          | 5.94/0.234      | –          |

### Interface dimensions conformable to the standards:

International: IEC 60169-9  
 Europe: CECC 22140  
 USA: MIL-PRF-39012

# Series SMC – technical data

| Electrical data   | Requirements   |
|---|--|
| Impedance   | 50 $\Omega$  |
| Frequency range   | DC to 10 GHz   |
| Dielectric withstanding voltage (at sea level)  | 750 V rms, 50 Hz (depending on cable)  |
| Working voltage (at sea level)  | 250 V rms for cables with 1 mm/0.039 in. dielectric<br>335 V rms for cables with 2 mm/0.078 in. dielectric                                     |
| Insulation resistance   | $\geq 10^4$ M $\Omega$   |
| <ul style="list-style-type: none"> <li>· Contact resistance</li> <li>· Centre contact</li> <li>· Outer contact</li> </ul> | <ul style="list-style-type: none"> <li><math>\leq 5</math> m<math>\Omega</math></li> <li><math>\leq 2.5</math> m<math>\Omega</math></li> </ul> |
| RF leakage (measured at 1 GHz)  | $\geq 90$ dB   |

| Mechanical data   | Requirements                   |
|---|--------------------------------|
| Coupling nut torque <ul style="list-style-type: none"> <li>· Recommended</li> </ul> | 25 to 35 Ncm/2.2 to 3.1 in lbs |
| Coupling nut retention force  | $\geq 150$ N/33.72 lbs         |
| Contact captivation   | $\geq 10$ N/2.25 lbs           |
| Cable retention force <sup>1)</sup>   | see pages 32 – 41              |
| Durability (matings)  | $\geq 500$                     |

| Environmental data  | Requirements   |
|---------------------|--|
| Temperature range   | -65 to +165 °C/-85 to +329 °F                                |
| Climatic category   | IEC → 55/155/21  |
| Thermal shock       | MIL-STD-202, method 107, condition B                         |
| Moisture resistance | MIL-STD-202, method 106                                      |
| Corrosion           | salt spray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition D                         |

| Material data   |                        |  |
|-----------------|------------------------|--|
| Connector parts | Material               | Plating  |
| Bodies          | brass                  | SUCOPLATE <sup>®</sup> /SUCOPRO <sup>®</sup> gold plating/gold |
| Pin contacts    | brass                  | gold   |
| Socket contacts | copper-beryllium alloy | gold   |
| Crimp ferrules  | copper/brass           | SUCOPLATE <sup>®</sup> /SUCOPRO <sup>®</sup> gold plating/gold |
| Coupling nut    | brass                  | SUCOPLATE <sup>®</sup> /SUCOPRO <sup>®</sup> gold plating/gold |
| Insulators      | PTFE or PFA            |  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

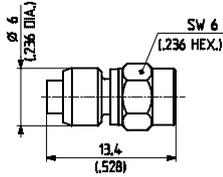
<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series SMC – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

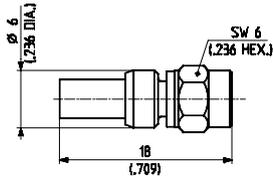
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction |
|-----------------------|----------|-----------------------|---------------|----------------------|
| 11_SMC-50-2-13/111_NH | 22650675 | Y3, Y11, Y15 (EZ_86)  | bulk 100 pcs. | 9002                 |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



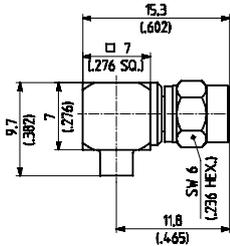
| HUBER+SUHNER type                              | Item no.             | Cable group (example)            | Packaging               | Plating body | Assembly instruction | Crimp insert |
|--|----------------------|----------------------------------|-------------------------|--------------|----------------------|--------------|
| 11_SMC-50-1-10/111_NH                          | 22648629             | U1 (RG_178_B/U, ENVIROFLEX_178)  | bulk 100 pcs.           | gold         | 3077                 | 1A           |
| 11_SMC-50-2-10/111_NE<br>11_SMC-50-2-10/111_NH | 22640811<br>22645841 | U2 (RG_316_/U, ENVIROFLEX_316)   | single<br>bulk 100 pcs. | gold         |                      |              |
| 11_SMC-50-2-10/133_NE                          | 22641528             | U2 (RG_316_/U, ENVIROFLEX_316)   | single                  | SUCOPLATE®   |                      |              |
| 11_SMC-50-2-11/111_NE                          | 22640251             | U4 (K_02252_D, ENVIROFLEX_316_D) | single                  | gold         |                      |              |

# Series SMC – cable connectors

## Right angle cable plugs (male)

### For semi-rigid cables

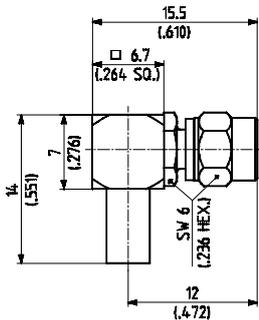
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Assembly instruction |
|-----------------------|----------|-----------------------|---------------|----------------------|
| 16_SMC-50-2-25/111_NE | 22644126 | Y3, Y11, Y15 (EZ_86)  | single        | 9160                 |
| 16_SMC-50-2-25/111_NH | 23003713 |                       | bulk 100 pcs. |                      |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



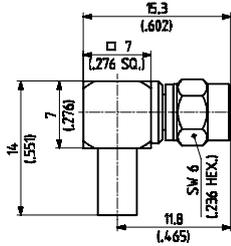
| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging     | Plating body | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------|---------------|--------------|----------------------|--------------|
| 16_SMC-50-1-10/111_NE | 22543364 | U1 (RG_178_B/U,       | single        | gold         | 3096                 | 1A           |
| 16_SMC-50-1-10/111_NH | 22648283 | ENVIROFLEX_178)       | bulk 100 pcs. |              |                      |              |
| 16_SMC-50-2-10/111_NE | 22640269 | U2 (RG_316_/U,        | single        | gold         | 3096                 | 1A           |
| 16_SMC-50-2-10/111_NH | 22645323 | ENVIROFLEX_316)       | bulk 100 pcs. |              |                      |              |
| 16_SMC-50-2-11/111_NE | 22543366 | U4 (K_02252_D,        | single        | gold         | 3096                 | 1A           |
|                       |          | ENVIROFLEX_316_D)     |               |              |                      |              |

# Series SMC – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554

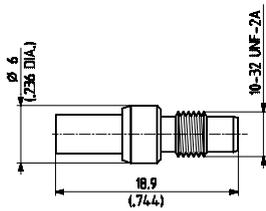


| HUBER+SUHNER type     | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|---------------------------------|-----------|----------------------|--------------|
| 16_SMC-50-1-20/111_NE | 22644083 | U1 (RG_178_B/U, ENVIROFLEX_178) | single    | 9157                 | A            |
| 16_SMC-50-2-20/111_NE | 22643949 | U2 (RG_316_/U, ENVIROFLEX_316)  |           |                      |              |

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

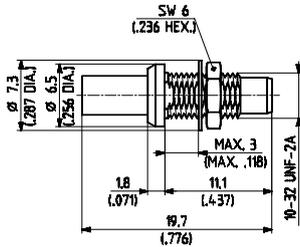


| HUBER+SUHNER type     | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|--------------------------------|-----------|----------------------|--------------|
| 21_SMC-50-2-10/111_NE | 22640279 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 3077                 | 1 A          |

# Series SMC – cable connectors

## For flexible cables

- HUBER+SUHNER full crimp
- Rear mounting
- Taper sleeves see page 554



| HUBER+SUHNER type                   | Item no. | Cable group (example)           | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|-------------------------------------|----------|---------------------------------|-----------|----------------------|---------------|--------------|
| 24_SMC-50-1-10/111_NE <sup>1)</sup> | 22640290 | U1 (RG_178_B/U, ENVIROFLEX_178) | single    | 3077                 | ML 11         | 1A           |
| 24_SMC-50-2-110/111_NE              | 22660133 | U2 (RG_316_/U, ENVIROFLEX_316)  | single    |                      |               |              |

# Series SMC – receptacles

## Straight bulkhead receptacles, jacks (female)

- Solder end
- Insulating washers see page 556

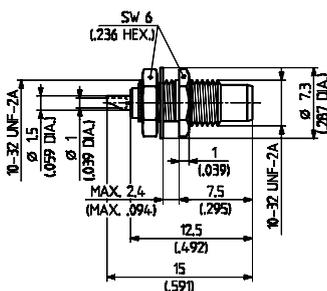


Fig. 1

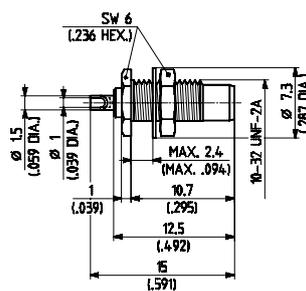


Fig. 2



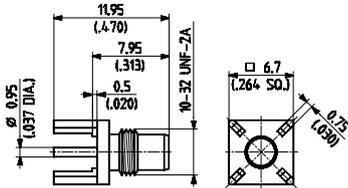
| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Fig. | Notes          |
|----------------------|----------|-----------|---------------|------|----------------|
| 22_SMC-50-0-2/111_NE | 22640281 | single    | ML 11         | 1    | front mounting |
| 22_SMC-50-0-3/111_NE | 22640282 |           |               | 2    | rear mounting  |

<sup>1)</sup> Centre contact NOT captivated

# Series SMC – PCB connectors

## Straight PCB jacks (female)

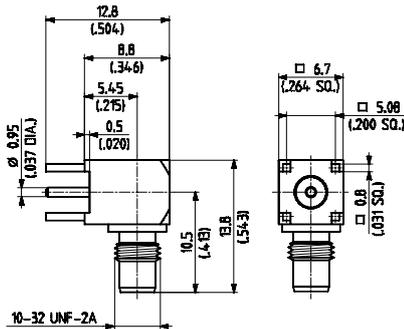
- 2.54 mm/0.100 in. grid
- With stand-off



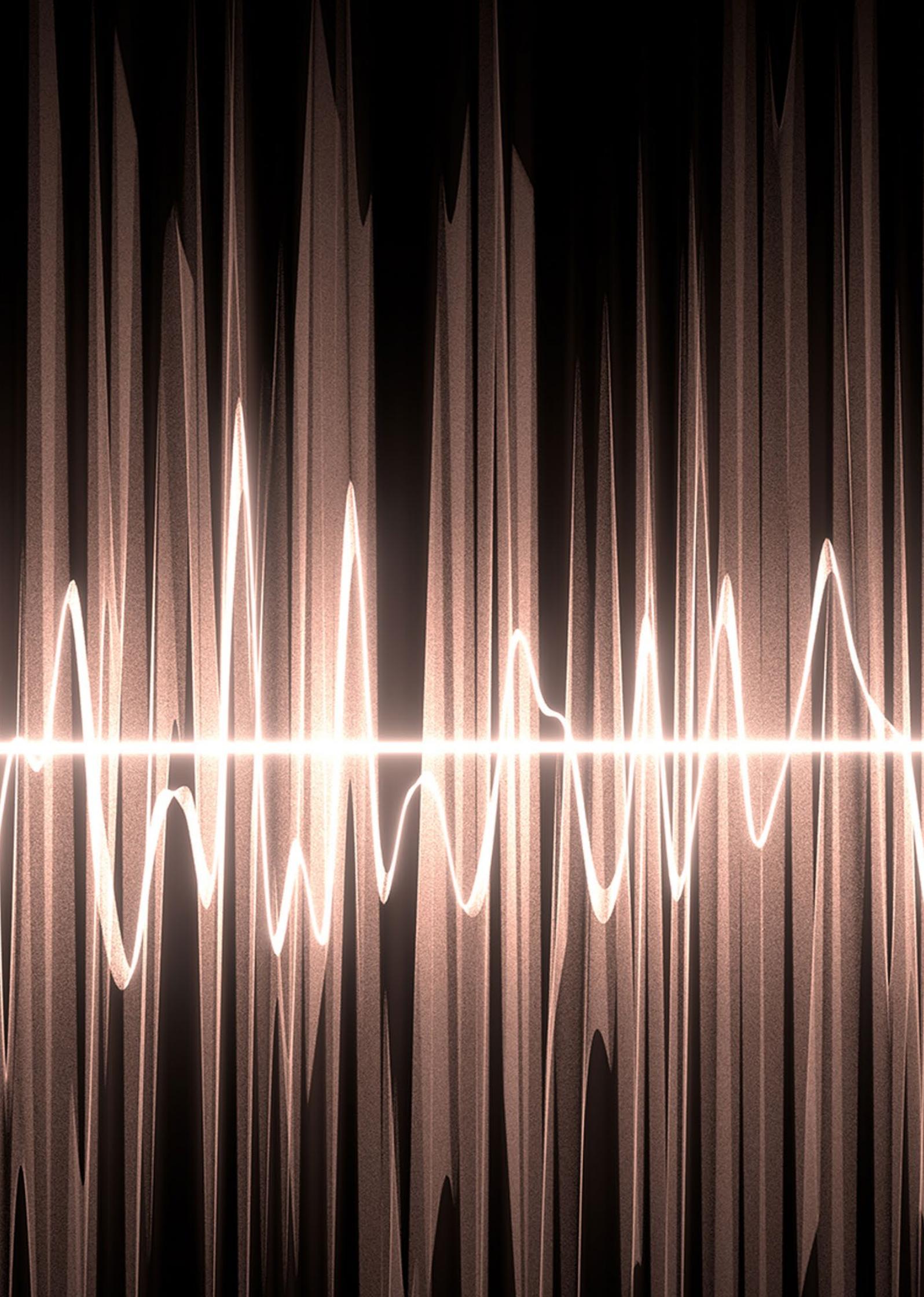
| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole |
|----------------------|----------|---------------|---------------|
| 82_SMC-50-0-1/111_NE | 22640313 | single        | ML 15         |
| 82_SMC-50-0-1/111_NH | 22646201 | bulk 100 pcs. |               |

## Right angle PCB jacks (female)

- 2.54 mm/0.100 in. grid
- With stand-off



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole |
|----------------------|----------|---------------|---------------|
| 85_SMC-50-0-1/111_NE | 22640326 | single        | ML 15         |
| 85_SMC-50-0-1/111_NH | 22652987 | bulk 100 pcs. |               |
| 85_SMC-50-0-1/133_NE | 22642472 | single        |               |



# Series NEX10<sup>®</sup> – low PIM performance connectors

## Description

NEX10 interface offers very low PIM performance together with a robust design and small size. Another key feature of NEX10 is the separation of the electrical contact from the mechanical contact area, which yields a low PIM and high return loss performance independent of the coupling mechanism or applied torque. This characteristic also gives the possibility of offering the connector plug with screw and quick-lock designs, thus simplifying the installation effort while guaranteeing a very high electrical performance for all coupling mechanisms.

## Applications

NEX10 is the ideal candidate for applications requiring PIM stability and robustness in a small size such as remote radios, distributed antenna systems (DAS), small cells and in-building architecture:

- In small cell applications,
- In low power base stations,
- In multi-operator/multiband DAS,
- Blind mate for panel-to-panel and test and measurement

## Features

- Radial contact
- Interface optimized for return loss
- Compact size
- Protection of electrical contact areas
- Multiple coupling mechanisms
- Rubber boot weather protection

## Content

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| Protective cap        | 192 |

## Benefits

- Low PIM, independent of coupling mechanism
- Reliable performance eliminating installation errors
- Compact and space saving modules
- Interface safe from installation damages
- Flexibility in installation
- Interface specific boot guaranteeing protection in extreme weather



# Series NEX10<sup>®</sup> – technical data

| Electrical data   |  |                    |             |              |
|---|--|--------------------|-------------|--------------|
| Frequency   | DC to 20 GHz   |                    |             |              |
| Impedance   | 50 Ω   |                    |             |              |
| PIM (Passive Intermodulation)   | -166 dBc, 2 × 43 dBm (static and dynamic)  |                    |             |              |
| Power   | 100 W @ 2 GHz @ 85 °C  |                    |             |              |
| Interface return loss (typical)   | DC to 4 GHz  | 4 to 6 GHz         | 6 to 10 GHz | 10 to 20 GHz |
|   | ≥ 36 dB  | ≥ 34 dB            | ≥ 30 dB     | ≥ 20 dB      |
| Working voltage   | 1000 V   |                    |             |              |
| Screening effectiveness<br>Screw<br>Quick lock                                    | DC to 6 GHz: ≥ 110 dB<br>DC to 3 GHz: ≥ 90 dB (typical)<br>3 to 6 GHz: ≥ 70 dB (typical) |                    |             |              |
| Mechanical data   |  |                    |             |              |
| Durability (mating cycles)  | 100 min.<br>500 for test and measurement adapters  |                    |             |              |
| Mating characteristics<br>Quick lock: engagement force<br>Screw type: rec. torque | 40 N typical<br>1.5 Nm   |                    |             |              |
| Interface retention force   | quick lock<br>150 N min.   | screw<br>500 N min |             |              |
| Bending force   | ≥ 5 Nm   |                    |             |              |
| Vibration   | 100 m/s <sup>2</sup> , 10 – 500 Hz (IEC 61169-189.3.3)                                   |                    |             |              |
| Flange height   | 12.7 mm  |                    |             |              |
| Environmental data  |  |                    |             |              |
| Temperature range   | -55 °C to +125 °C  |                    |             |              |
| Corrosion   | 48 h salt mist test (720 h on request)   |                    |             |              |
| Interface ingress protection  | IP68 (24 h, 1 m, room temp, mated pair)  |                    |             |              |
| RoHS  | compliant  |                    |             |              |

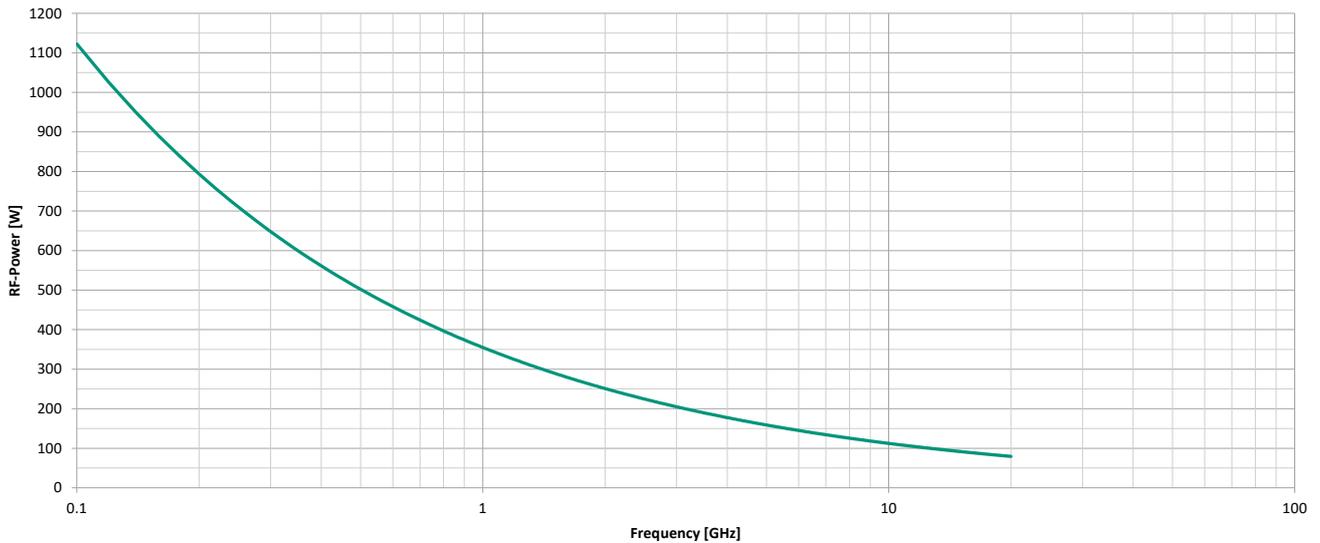
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series NEX10<sup>®</sup> – admissible RF power

The maximum temperature usually occurs on the connector inner conductor. When connectors are employed in a coaxial cable assembly, the connector should have a center conductor diameter that is equal to or larger than the cable center conductor diameter in order to maximise the power handling of the assembly.

The curves are the results of a typical application and are simulation results. Curves may vary depending on the connector. For specific questions please contact nearest HUBER+SUHNER sales office.

$T_{amb} = 25\text{ °C/sea level}$   
VSWR = 1.0



| Material data   |               |  |
|-----------------|---------------|--|
| Connector parts | Material      | Plating  |
| Bodies          | brass         | SUCOPLATE <sup>®</sup> , Tin-Nickel, silver, Nickel-Phosphorus |
| Outer contact   | spring bronze | silver   |
| Insulators      | PTFE          |  |
| Centre contact  | brass/CuBe    | silver   |
| Gaskets         | MVQ           |  |
| Coupling nut    | brass         | SUCOPLATE <sup>®</sup>   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series NEX10<sup>®</sup> – cable connectors

## Straight cable plugs (male)

- Cable entry soldered
- Centre contact soldered

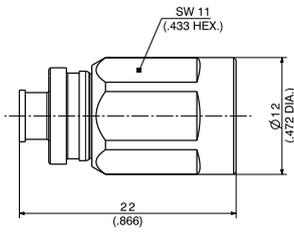


Fig. 1

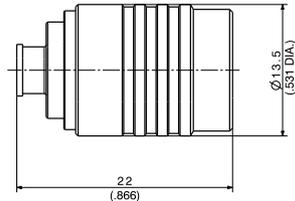


Fig. 2

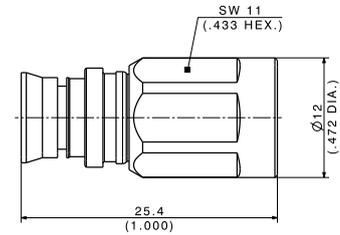


Fig. 3

| HUBER+SUHNER type       | Item no. | Cable group (example) | Packaging | Fig. |
|-------------------------|----------|-----------------------|-----------|------|
| 11_NEX10-50-3-X1/003_-H | 85091361 | Y12, (Sucoform_141)   | bulk      | 1    |
| 11_NEX10-50-3-Z2/003_-H | 85095347 | Y12, (Sucoform_141)   | bulk      | 2    |
| 11_NEX10-50-5-X1/000_-H | 85095631 | M5 (SUCOFEED_1/4_HF)  | bulk      | 3    |

## Right angle jacks (male)

- Cable entry soldered
- Centre contact soldered

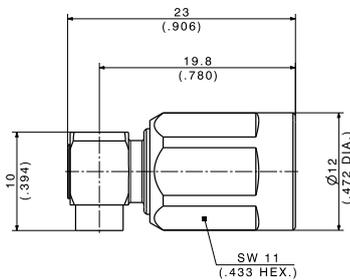


Fig. 1

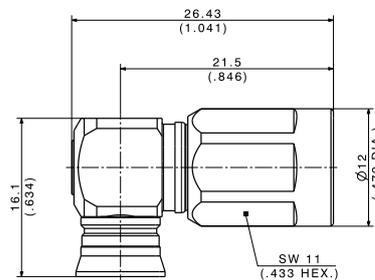


Fig. 2



| HUBER+SUHNER type       | Item no. | Cable group (example) | Packaging | Fig. |
|-------------------------|----------|-----------------------|-----------|------|
| 16_NEX10-50-3-X1/003_-H | 85102764 | Y12, (Sucoform_141)   | bulk      | 1    |
| 16_NEX10-50-5-X1/003_-H | 85095633 | M5 (SUCOFEED_1/4_HF)  | bulk      | 2    |

X: torque, Z: quick-lock

Cable groups see page 32

Assembly tools see page 551

Mounting holes/PCB layouts see page 579

# Series NEX10<sup>®</sup> – cable connectors

## Straight cable jacks (female)

For Sucoform, the hand formable cables

- Cable entry soldered
- Centre contact soldered

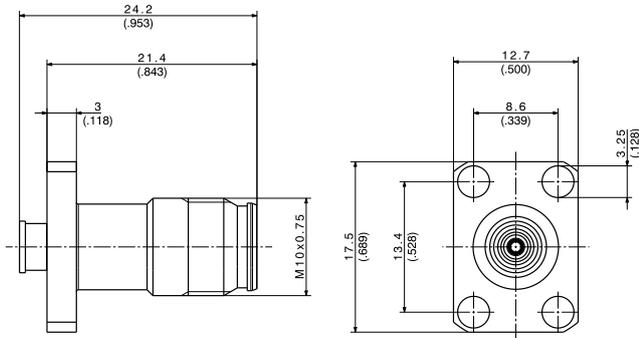


Fig. 1

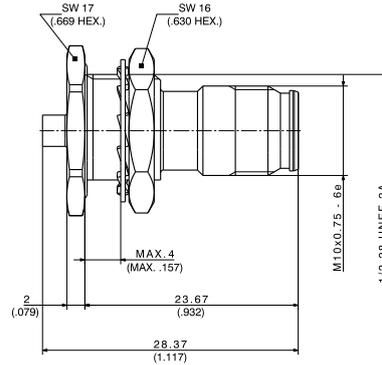


Fig. 2

| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Fig. |
|------------------------|----------|-----------------------|-----------|------|
| 25_NEX10-50-3-1/033_-E | 85091413 | Y12, (Sucoform_141)   | Bulk      | 1    |
| 24_NEX10-50-2-1/033_-Y | 85095339 | Y16, (Sucoform_86)    | Bulk      | 2    |

# Series NEX10<sup>®</sup> – receptacles

## Straight panel receptacle (jack)

With solder end

- 4 hole, 12.5 mm flange height
- M3 mounting screws

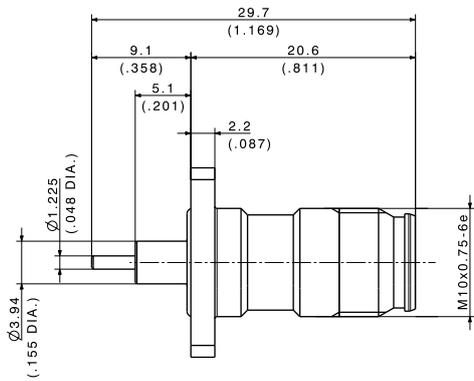


Fig. 1

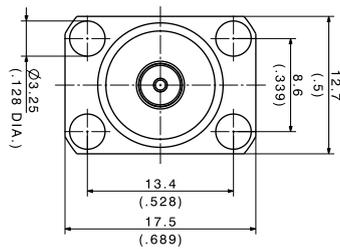


Fig. 2



| HUBER+SUHNER type      | Item no. | Packaging | Fig. |
|------------------------|----------|-----------|------|
| 23_NEX10-50-0-3/033_-Y | 85094630 | bulk      | 1    |

# Series NEX10<sup>®</sup> – protective cap

- Cap for NEX10 female (jack) interface
- Economical design



| HUBER+SUHNER type     | Item no. | Packaging | Notes                    |
|-----------------------|----------|-----------|--------------------------|
| 62_NEX10-0-0-1/---_-Z | 85095030 | bulk      | Ingress Protection IP X8 |

# MQ4/MQ5 Cluster Connectors

## Description

Rising numbers of connections on base stations lead to even lower available space on the antennas and lead to higher complexity to connect them in the field. Cluster connectors help to reduce the number of mating processes, avoid mismatching and simplifying the cable management.

The IEC standardized interface MQ4/MQ5 provides four or five PIM-stable connections on the footprint of a DIN 7/16 connector. Mechanical coding avoids any mismatching. The rugged and watertight design (IP68) guarantees reliable connection from radio to the antennas.

## Applications

- BTS antennas with multiple ports
- Antennas / Radios and filter output
- Applications requiring PIM stability
- Outdoor and indoor applications

## Features

- Multiple connections mated at the same time
- Mechanical coding for correct alignment
- Waterproof (IP 68)
- Space saving (same footprint as 7/16)
- Cable size ¼" HF for jumpers
- Standard Interface (IEC 63138)

## Content

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| Cable connectors      | 195 |
| Protective cap        | 196 |

## Benefits

- Fast and easy connection of multiple connections
- Correct channel alignment secured
- Easy to connect
- Increased density (channel per pitch)
- Lower total cost of ownership



# Series MQ4/MQ5 – Technical data

| Electrical data               |  |                               |
|-------------------------------|--|-------------------------------|
| Frequency                     | DC to 6 GHz  |                               |
| Impedance                     | 50 $\Omega$  |                               |
| PIM (Passive Intermodulation) | $\geq 160$ dBc, 0-2.7GHz, 2x20W & 2x40dBm (static and dynamic) |                               |
| Power                         | 150W @2GHz, CW   |                               |
| Interface return loss         | $\geq 26$ dB (DC to 3 GHz)                                     | $\geq 19$ dB (3 GHz to 6 GHz) |
| Proof voltage (at sea level)  | 1000 V   |                               |
| Screening effectiveness       | $\geq 90$ dB (up to 3 GHz)                                     | $\geq 70$ dB (3 GHz to 6 GHz) |
| Isolation                     | $\geq 90$ dB (0.05 to 6 GHz)                                   |                               |

| Mechanical data                 |                                     |                             |
|---------------------------------|-------------------------------------|-----------------------------|
| Durability (mating cycles)      | $\geq 100$                          |                             |
| Recommended torque (screw type) | 25 Nm                               |                             |
| Mating characteristics          | $\geq 30$ N (engagement)            | $\geq 30$ N (disengagement) |
| Coupling torque resistance      | $\geq 450$ N (Quick-lock)           |                             |
| Vibration                       | 100 m/s <sup>2</sup> , 10 – 2000 Hz |                             |

| Environmental data           |  |
|------------------------------|--|
| Temperature range            | -55°C – 125°C                                |
| Corrosion                    | 48h salt mist test (720h on request)         |
| Interface ingress protection | IP68 (24h, 1m, room temp, mated, IEC 60529)) |
| RoHS                         | compliant                                    |

Values meet connector standards ISO-63138-2 (MQ4) and ISO-63138-3 (MQ5)

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

| Material data   |            |  |
|-----------------|------------|--|
| Connector parts | Material   | Plating  |
| Bodies          | Brass      | Tin-Nickel , SUCOPLATE®, silver, Nickel-Phosphorus |
| Outer contact   | Brass/CuBe | Silver   |
| Insulator       | PTFE       |  |
| Center contact  | Brass/CuBe | Silver   |
| Gasket          | MVQ        |  |
| Coupling nut    | brass      | Tin-Nickel, SUCOPLATE®, silver, Nickel-Phosphorus  |

# Series MQ4/MQ5 – cable connectors

## Straight cable plugs (male)

- Available as Lisca Cluster jumpers
- For Cables SUCOFEED\_1/4\_HFX and SUCOFEED\_1/3\_HF

## Straight cable jacks female

- Cable entry soldered
- Centre contact soldered

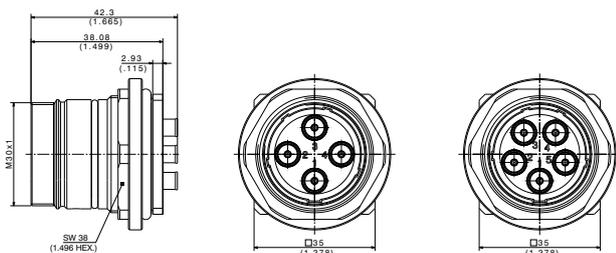


Fig. 1

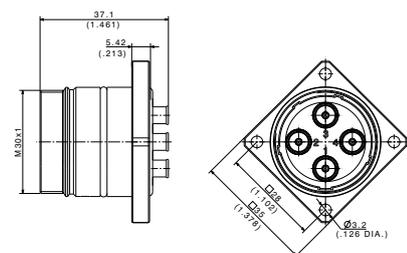


Fig. 2

| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging      | Mounting hole | Fig. |
|----------------------|----------|-----------------------|----------------|---------------|------|
| 24_MQ4-50-3-1/005_NY | 85117216 | Y12 (Sucoform_141)    | Box with 12pcs | ML 187        | 1    |
| 24_MQ5-50-3-1/005_NY | 85117202 | Y12 (Sucoform_141)    | Box with 12pcs | ML 187        | 1    |
| 25_MQ4-50-3-2/005_NY | 85197039 | Y12 (Sucoform_141)    | Box with 12pcs |               | 2    |

# Series MQ4/MQ5 – protective cap

- Cap for MQ4/MQ5 female (jack) interface
- Long time weather resistant
- Ingress protection IP68



| HUBER+SUHNER type    | Item no. | Packaging |
|----------------------|----------|-----------|
| 62_MQ4-0-0-X1/--3_-E | 85154396 | Single    |

# Series SSMA – subminiature precision connectors

## Description

HUBER+SUHNER SSMA connectors are subminiature pre-precision stainless steel connectors for microwave applications. The SSMA is 30 % smaller than SMA and its standard frequency range is DC to 40 GHz and the extended frequency version operates up to 60 GHz. There is a wide variety of applications for SSMA connectors in telecom, test and measurement, instruments, avionics and defense.

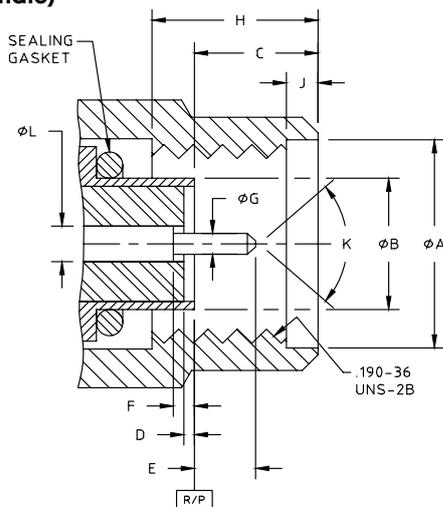
SSMA connectors conform to MIL-PRF-39012 and MIL-STD-348 requirements.

## Compatibility

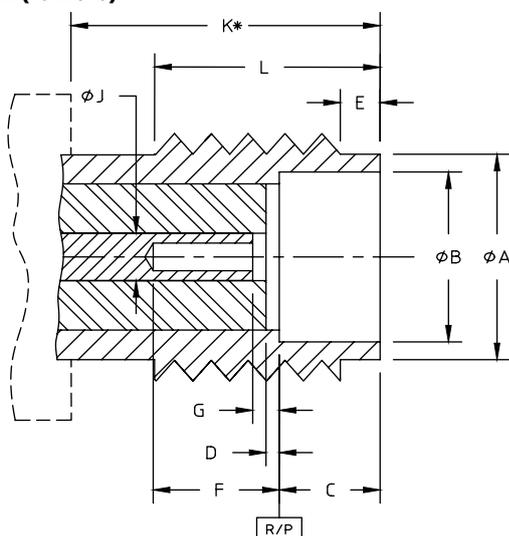
50 Ω SSMA connectors are intermateable without restrictions.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Content

|                                   |     |
|-----------------------------------|-----|
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| Interface dimensions in mm/inches | 197 |
| Technical data                    | 198 |
| Cable connectors                  | 200 |
| Receptacles                       | 205 |
| Adapters                          | 208 |

|   | Plug             |                  | Jack             |                  |
|---|------------------|------------------|------------------|------------------|
|   | min.             | max.             | min.             | max.             |
| A | 0.196/4.98       | 0.202/5.13       | 0.153/3.88       | 0.160/4.06       |
| B | 0.124/3.15       | 0.1268/<br>3.221 | 0.127/3.23       | 0.130/3.30       |
| C | 0.100/2.54       | 0.133/3.38       | 0-075/1.91       | 0.077/1.96       |
| D | –                | 0.005/0.13       | –                | 0.005/0.13       |
| E | 0.060/1.52       | 0.065/1.65       | 0.020/0.51       | 0.040/1.02       |
| F | –                | 0.010/0.25       | 0.075/1.91       | –                |
| G | 0.0195/<br>0.495 | 0.0208/<br>0.528 | –                | 0.010/0.25       |
| H | 0.130/3.30       | –                |                  |                  |
| J | 0.015/0.38       | 0.045/1.14       | 0.0335/<br>0.851 | 0.0348/<br>0.884 |
| K | 70°              | 95°              | 0.230/5.84       | –                |
| L | 0.335/<br>0.851  | 0.0348/<br>0.884 | 0.190/4.83       | 0.210/5.33       |

### Interface dimensions conformable to the standards:

International: IEC 60169-23  
 USA: MIL-PRF-39012  
 SSMA interface MIL-STD-348

# Series SSMA – technical data

| Electrical data  | MIL-PRF-39012 | Requirements                               |                 |                 |                   |                   |                   |
|--|---------------|--|-----------------|-----------------|-------------------|-------------------|-------------------|
| Impedance  |               | 50 $\Omega$                                |                 |                 |                   |                   |                   |
| Frequency range for interface                                    |               | DC to 40 GHz (extended range DC to 65 GHz) |                 |                 |                   |                   |                   |
| RL (typical value)   |               | for cable connectors refer to table below  |                 |                 |                   |                   |                   |
| Cable type   |               | semi-rigid                                 |                 |                 | flexible*         |                   |                   |
| Cable diameter (mm/in)   |               | 1.194/<br>0.047                            | 2.184/<br>0.086 | 3.581/<br>0.141 | 1.194/<br>0.047** | 2.184/<br>0.086** | 3.581/<br>0.141** |
| RF leakage measured at 3 GHz                                     | 3.26          | $\geq 100$ dB                              | $\geq 100$ dB   | $\geq 100$ dB   | $\geq 100$ dB     | $\geq 100$ dB     | $\geq 100$ dB     |
| Dielectric withstanding voltage (at sea level, in Vrms, 50 Hz)   | 3.17          | 500  | 750             | 750             | 350               | 500               | 500               |
| Corona extinction voltage (at 21000 m/70000 ft, in V rms, 50 Hz) | 3.22          | 125  | 190             | 190             | 110               | 125               | 125               |
| RF withstanding voltage at 5 MHz (V rms)                         | 3.23          | 190  | 250             | 250             | 125               | 190               | 190               |
| Insulation resistance  | 3.11          | $\geq 5 \cdot 10^3$ M $\Omega$             |                 |                 |                   |                   |                   |
| Contact resistance   | 3.16          |  |                 |                 |                   |                   |                   |
| Center contact   |               | $\geq 3$ m $\Omega$                        |                 |                 |                   |                   |                   |
| Outer contact  |               | $\geq 5$ m $\Omega$                        |                 |                 |                   |                   |                   |

\* Flexible highly shielded cables have RF leakage at 3 GHz  $\geq 120$  dB.

\*\* Flexible replacement cables for standard size diameters have larger outer diameter due to the jacket.

## Typical RL for HUBER+SUHNER standard SSMA cable connectors

Electrical data for extended frequency designs available upon request.

| Typical RL (dB)        | Frequency range |         |       |          |          |        |
|------------------------|-----------------|---------|-------|----------|----------|--------|
| Connector type         | 1 GHz           | 2.5 GHz | 5 GHz | 12.4 GHz | 26.5 GHz | 40 GHz |
| Straight connectors    | 37              | 37      | 30    | 28       | 25       | 22     |
| Right angle connectors | 37              | 32      | 28    | 25       | 23       |        |

# Series SSMA – technical data

| Mechanical data                     |                                      | MIL-PRF-39012              |
|-------------------------------------|--------------------------------------|----------------------------|
| Recommended coupling nut torque     |                                      | 0.8 to 0.9 Nm/7 to 8 inlbs |
| Coupling nut retention force        | 3.25                                 | ≥ 270 N/60.7 lbs           |
| Contact captivation                 | 3.12                                 | ≥ 27 N/6 lbs               |
| Cable retention force <sup>1)</sup> | see suitable cables on pages 32 – 41 |                            |
| Durability (matings)                |                                      | ≤ 500                      |

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

| Environmental data | Test conditions  |
|--------------------|--|
| Temperature rage   | -55 to +125 °C / -131 to +257 °F                         |
| Thermal shock      | MIL-STD-202, method 107, method B                        |
| Moister resistance | MIL-STD-202, method 106                                  |
| Corrosion          | saltspray test acc. to MIL-STD-202, method 101, method B |
| Vibration          | MIL-STD-202, method 204, method D                        |
| Shock              | MIL-STD-202, method 213, condition I                     |
| RoHS 6 complaint   | complaint designs available                              |

| Material data             |   |  |
|---------------------------|---|--|
| Connector part            | Material  | Plating  |
| Bodies and nut            | steel, corrosion resistant per ASTM A-582, UNS No. S30300, cond. A. Non-magnetic, passivated per SAE-AMS-2700. No dichromate solutions used   | nickel plated 100 µin (2.54 µm) min. thk per SAE-AMS-C-26074 or ASTM B-733 SC1, type II class 3  |
| Back nut and mounting nut | steel, corrosion resistant per ASTM A-582, UNS No. S30300, cond. A. Non-magnetic, passivated per SAE-AMS-2700. No dichromate solutions used   | nickel alloy per AMS-2433, class 1   |
| Center conductors         | beryllium copper alloy per ASTM B-196, UNS No. C17300, TEMPER TD04(H)   | gold plated 1.27 µM/50 µIN per ASTM B-488, code C, type II, class 1.27 over nickle plate, 1.27 µM/50 µIN thk per SAE-AMS-QQ-N-290, class 1 |
| Retainning ring           | beryllium copper, per ASTM B-197 UNS No. C17200 TEMPER TD04(H)  |  |
| Lockwasher                | copper alloy UNS No. C425xx series per ASTM B-591   | nickel plated 100 µIN min. thk (2.54 µM) per SAE-AMS-C-26074 or ASTM B-733   |
| Crimp ferrules            | seamlessbrass tubing per ASTM B-135, UNS alloy No. C26000   |  |
| Insulators                | Polytetrafluoroethylene (PTFE) per ASTM D-1710, or ASTM D-4894, type I, grade I   |  |
| Gaskets                   | silicone rubber per GSA CID A-A-59588-2B and SAE-AMS-3304 or low out gassing silicone rubber per GSA CID A-A-59588 or fluorosilicone polymer, fluoro-silicone filled with silver per MIL-DLT-83528 type F or other options available upon request |  |

#### Notes:

HUBER+SUHNER SSMA connectors satisfy in principle the above technical data.

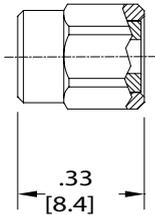
For detailed specifications refer to the published data sheets on our webpage [www.hubersuhner.com](http://www.hubersuhner.com) or contact your corresponding H+S representative.

Low outgassing alternatives that meet or exceed NASA low outgassing requirements available.

# Series SSMA – cable connectors

## SSMA plug (male)

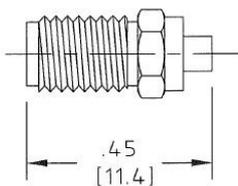
For semi-rigid cables



| HUBER+SUHNER type | Cable type | Cable group                         | Packaging |
|-------------------|------------|-------------------------------------|-----------|
| 29100             | semi-rigid | A92 – 0.086 semi-rigid (2.18/0.086) | single    |

## SSMA jack (female)

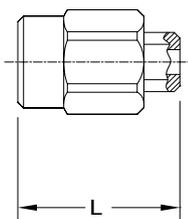
For semi-rigid cables



| HUBER+SUHNER type | Cable type | Cable group                         | Packaging |
|-------------------|------------|-------------------------------------|-----------|
| 29101             | semi-rigid | A92 – 0.086 semi-rigid (2.18/0.086) | single    |

## SSMA plug (male)

For semi-rigid cables



| HUBER+SUHNER type | Cable type       | Cable dia, mm/in | L, mm/in   |
|-------------------|------------------|------------------|------------|
| 29123             | 0.086 semi-rigid | 2.18/0.86        | 11.18/0.44 |
| 29123-1           | 0.047 semi-rigid | 1.19/0.47        | 12.95/0.51 |

# Series SSMA – cable connectors

## SSMA bulkhead jack (female)

For flexible cables

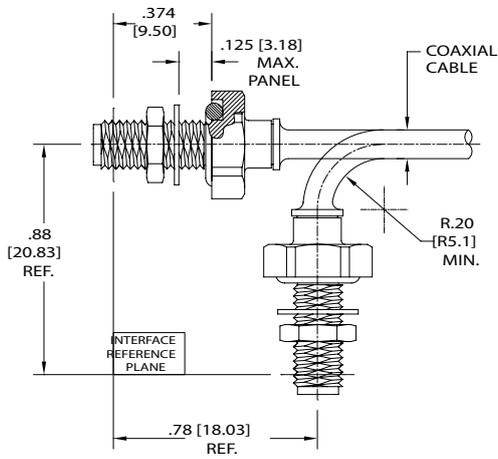


Fig. 1

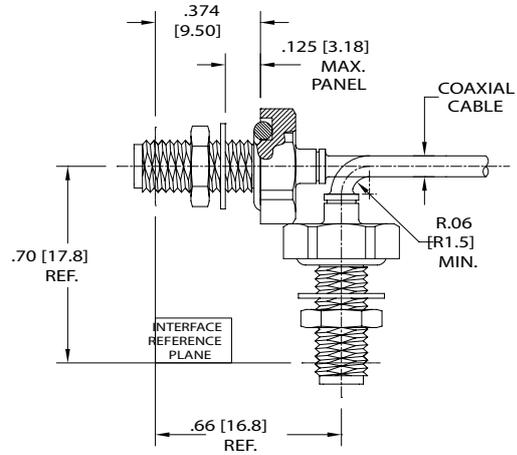


Fig. 2

| HUBER+SUHNER type | Cable group (mm/in) | Cable type | Cable                | Fig. |
|-------------------|---------------------|------------|----------------------|------|
| 29102CR-32-24     | A11- (1.70/0.067)   | flexible   | 32024E – Minibend L  | 1    |
| 29102CR-32-41     | A20 – (1.14 /0.045) | flexible   | 32041E – Microbend   | 2    |
| 29102CR-32-81     | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    | 1    |
| 29102CR-32-85     | A21 – (1.22 /0.048) | flexible   | 32085E – Microbend L | 1    |
| 29102CR-32-87     | A14 – (1.22 /0.048) | flexible   | 32087E – Minibend LH | 1    |
| 29102CR-32-91     | A13 – (1.14 /0.045) | flexible   | 32091E – Minibend H  | 1    |

Note: Sold on cable assemblies only.

# Series SSMA – cable connectors

## SSMA plug (male)

For flexible cables

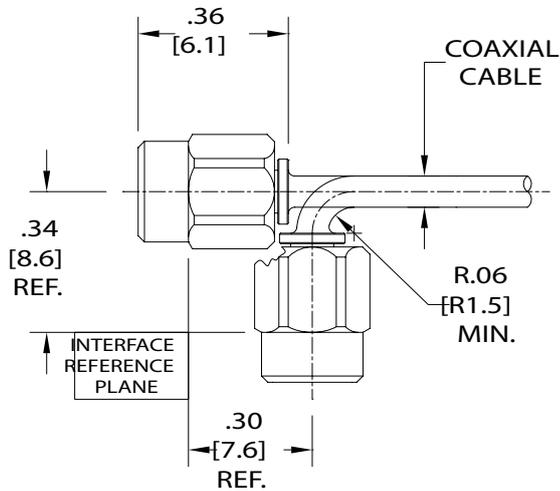


Fig. 1

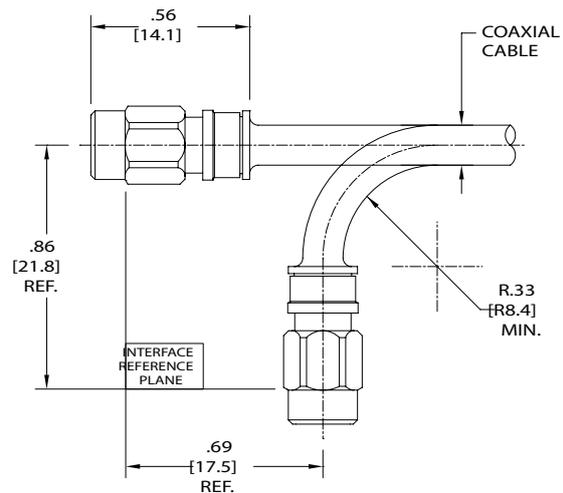
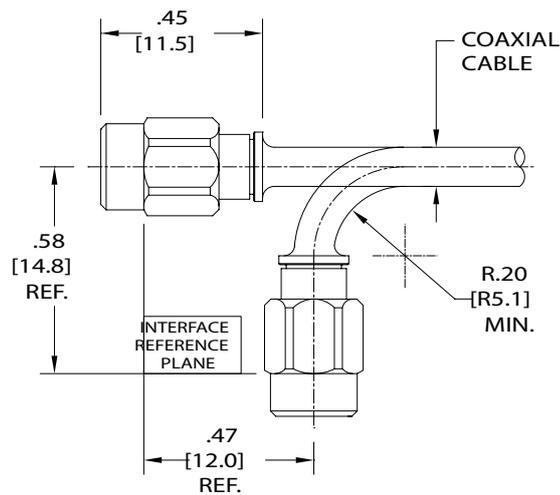


Fig. 2

Fig. 3

| HUBER+SUHNER type | Cable group (mm/in) | Cable type | Cable                | Fig. |
|-------------------|---------------------|------------|----------------------|------|
| 29112CR-32-41     | A20 – (1.14 /0.045) | flexible   | 32041E – Microbend   | 1    |
| 29112CR-32-81     | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    | 2    |
| 29112CR-32-85     | A21 – (1.22 /0.048) | flexible   | 32085E – Microbend L | 2    |
| 29112CR-32-87     | A14 – (1.22 /0.048) | flexible   | 32087E – Minibend LH | 2    |
| 29112CR-32-91     | A13 – (1.14 /0.045) | flexible   | 32091E – Minibend H  | 2    |
| 29112CR-32381     | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    | 2    |
| 29112CR-32-24     | A11- (1.70/0.067)   | flexible   | 32024E – Minibend L  | 2    |
| 29112CR-32-21     | A32 – (2.36 /0.093) | flexible   | 32021E – Mini141 H   | 3    |
| 29112CR-32-22     | A30 – (2.69 /0.106) | flexible   | 32022E – Mini141     | 3    |
| 29112CR-32322     | A31 – (2.59 /0.102) | flexible   | 32322E – Mini141 CT  | 3    |

Note: Sold on cable assemblies only.

# Series SSMA – cable connectors

## SSMA bulkhead jack (female)

For flexible cables

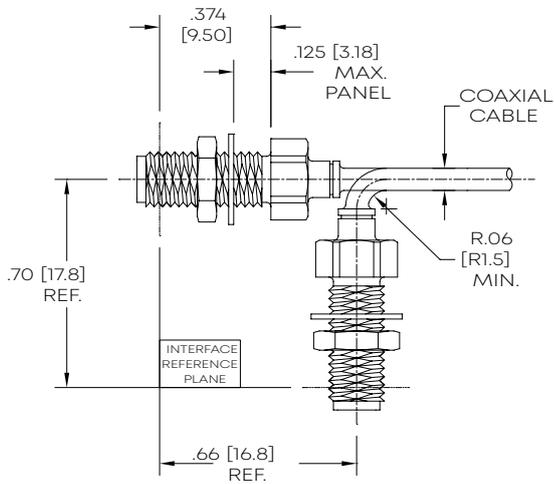


Fig. 1

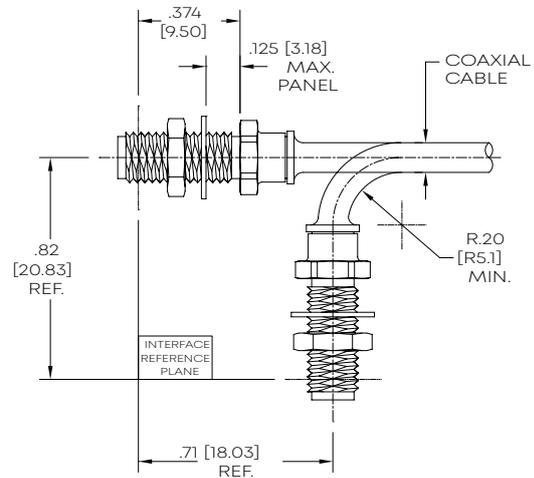


Fig. 2

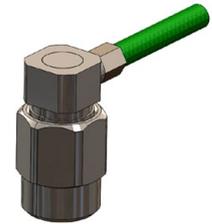
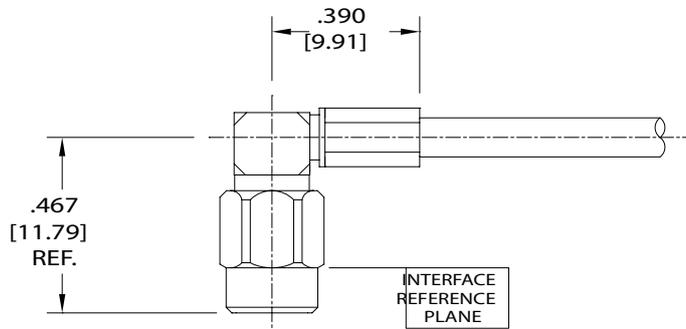
| HUBER+SUHNER type | Connectors             | Cable group (mm/in) | Cable type | Cable                | Fig. |
|-------------------|------------------------|---------------------|------------|----------------------|------|
| 29125CR-32-41     | SSMA jack (f) bulkhead | A20 – (1.14 /0.045) | flexible   | 32041E – Microbend   | 1    |
| 29125CR-32-24     | SSMA jack (f) bulkhead | A11- (1.70/0.067)   | flexible   | 32024E – Minibend L  | 2    |
| 29125CR-32-81     | SSMA jack (f) bulkhead | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    | 2    |
| 29125CR-32-85     | SSMA jack (f) bulkhead | A21 – (1.22 /0.048) | flexible   | 32085E – Microbend L | 2    |
| 29125CR-32-87     | SSMA jack (f) bulkhead | A14 – (1.22 /0.048) | flexible   | 32087E – Minibend LH | 2    |
| 29125CR-32-91     | SSMA jack (f) bulkhead | A13 – (1.14 /0.045) | flexible   | 32091E – Minibend H  | 2    |
| 29125CR-32381     | SSMA jack (f) bulkhead | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    | 2    |

Note: Sold on cable assemblies only.

# Series SSMA – cable connectors

## SSMA right angle plug (male)

For flexible cables



| HUBER+SUHNER type | Cable group (mm/in) | Cable type | Cable                |
|-------------------|---------------------|------------|----------------------|
| 29111CR-32-41     | A20 – (1.14 /0.045) | flexible   | 32041E – Microbend   |
| 29111CR-32-24     | A11- (1.70/0.067)   | flexible   | 32024E – Minibend L  |
| 29111CR-32-81     | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    |
| 29111CR-32-85     | A21 – (1.22 /0.048) | flexible   | 32085E – Microbend L |
| 29111CR-32-87     | A14 – (1.22 /0.048) | flexible   | 32087E – Minibend LH |
| 29111CR-32-91     | A13 – (1.14 /0.045) | flexible   | 32091E – Minibend H  |
| 29111CR-32381     | A10 – (2.18 /0.086) | flexible   | 32081E – Minibend    |

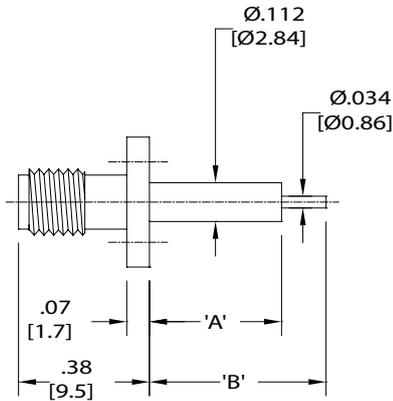
# Series SSMA – receptacles

## Straight bulkhead receptacles

## Straight panel receptacles

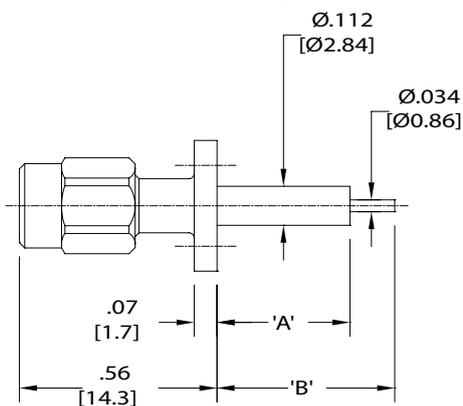
### Flanged and panel mount

- SSMA panel mount



| HUBER+SUHNER type | Contact type | A     |      | B     |       |
|-------------------|--------------|-------|------|-------|-------|
|                   |              | in    | mm   | in    | mm    |
| 29109-1C          | 1D           | 0.035 | 0.89 | 0.200 | 5.08  |
| 29109-2C          | 3F           | 0.375 | 9.53 | 0.500 | 12.70 |
| 29109-3C          | 4F           | 0.000 | 0.00 | 0.100 | 2.54  |
| 29109-4C          | 5F           | 0.000 | 0.00 | 0.100 | 2.54  |
| 29109-5C          | 3F           | 0.040 | 1.02 | 0.070 | 1.96  |

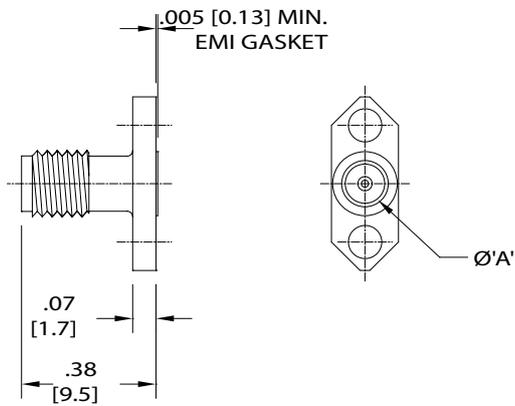
- SSMA panel mount plug (male)



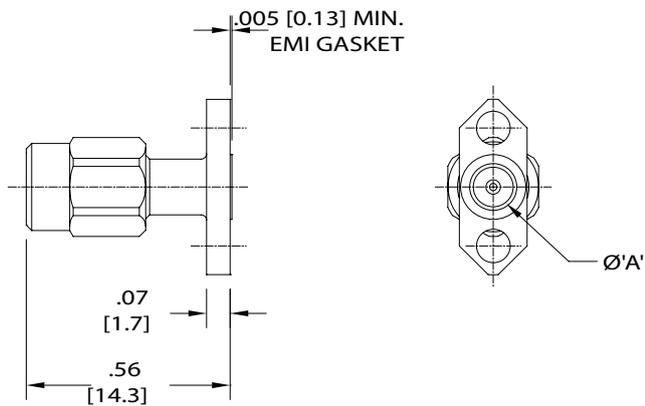
| HUBER+SUHNER type | Contact type | A     |      | B     |       |
|-------------------|--------------|-------|------|-------|-------|
|                   |              | in    | mm   | in    | mm    |
| 29126-1           | 1F           | 0.035 | 0.89 | 0.200 | 5.08  |
| 29126-2           | 3F           | 0.375 | 9.53 | 0.500 | 12.70 |
| 29126-3           | 4F           | 0.000 | 0.00 | 0.100 | 2.54  |
| 29126-4           | 5F           | 0.000 | 0.00 | 0.100 | 2.54  |

# Series SSMA – receptacles

- SSMA flanged mount jack (female)



| HUBER+SUHNER type | Connectors    | Accepts pin dia. mm/in          | Ø A mm/in  |
|-------------------|---------------|---------------------------------|------------|
| 29196             | SSMA jack (f) | $0.51 \pm 0.03/0.020 \pm 0.001$ | 2.79/0.110 |
| 29196-1           | SSMA jack (f) | $0.38 \pm 0.03/0.015 \pm 0.001$ | 2.79/0.110 |
| 29196-2           | SSMA jack (f) | $0.31 \pm 0.03/0.012 \pm 0.001$ | 2.11/0.083 |

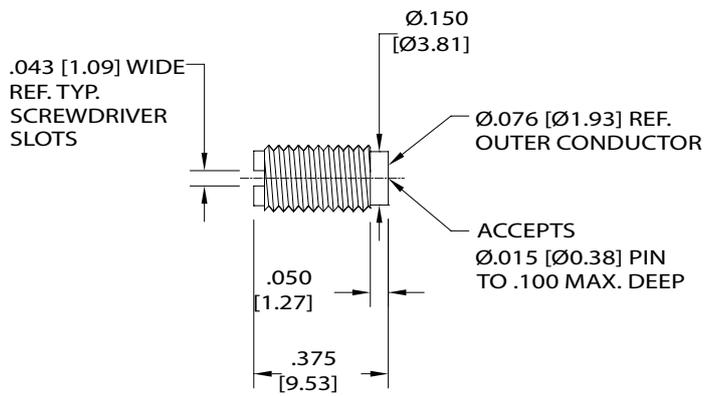


| HUBER+SUHNER type | Connectors    | Accepts pin dia. mm/in                                   | Ø A mm/in  |
|-------------------|---------------|--|------------|
| 29195             | SSMA plug (m) | $0.51 \pm 0.03 \times 1.65/0.020 \pm 0.001 \times 0.065$ | 2.79/0.110 |
| 29195-1           | SSMA plug (m) | $0.38 \pm 0.03 \times 1.27/0.015 \pm 0.001 \times 0.050$ | 2.79/0.110 |
| 29195-2           | SSMA plug (m) | $0.31 \pm 0.03 \times 1.02/0.012 \pm 0.001 \times 0.040$ | 2.11/0.083 |

Note: replacement gasket part number 632-2.

# Series SSMA – receptacles

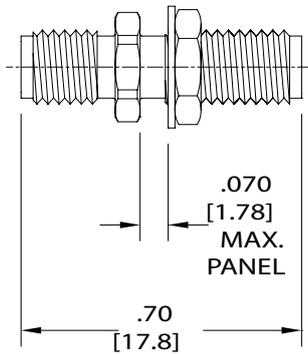
- Panel mount SSMA jack (f)



| HUBER+SUHNER type | Connectors    |
|-------------------|---------------|
| 29172-3           | SSMA jack (f) |

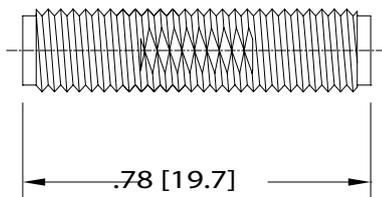
# Series SSMA – adapters

- Bulkhead adapter SSMA jack/jack (female/female)



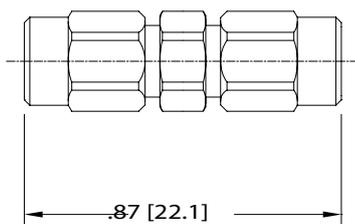
| HUBER+SUHNER type | Connectors                                 |
|-------------------|--|
| 29110             | adapter bulkhead SSMA jack (f) to jack (f) |

- Adapter SSMA jack/jack (female/female)



| HUBER+SUHNER type | Connectors                        |
|-------------------|-----------------------------------|
| 29105             | adapter SSMA jack (f) to jack (f) |

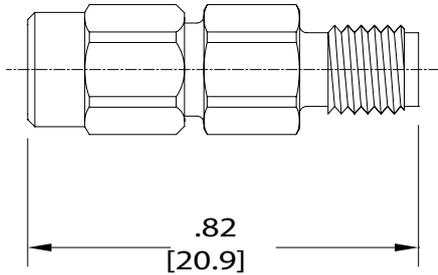
- Adapter SSMA plug/plug (male/male)



| HUBER+SUHNER type | Connectors                     |
|-------------------|--------------------------------|
| 29124             | adapter SSMA plug (m)/plug (m) |

# Series SSMA – adapters

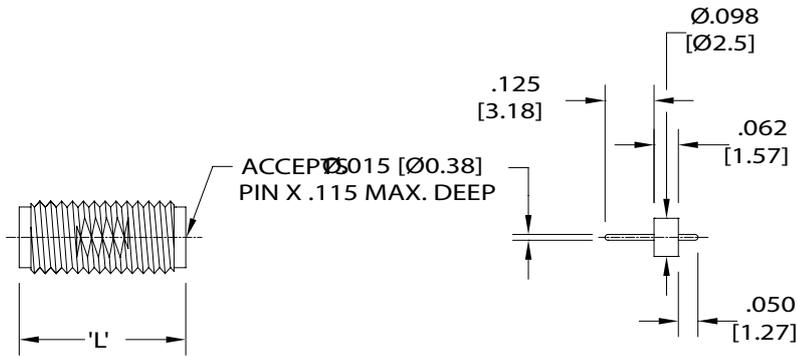
- Adapter SSMA plug/jack (male/female)



| HUBER+SUHNER type | Connectors                     |
|-------------------|--------------------------------|
| 29167             | adapter SSMA plug (m)/jack (f) |

## Hermetic Adapter

- Hermetic adapter SSMA jack/jack (female/female)



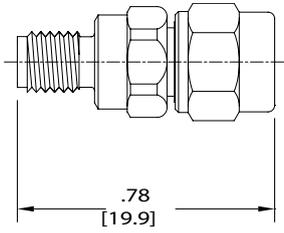
| HUBER+SUHNER type | Glass seal P/N | Length |       |
|-------------------|----------------|--------|-------|
|                   |                | mm     | in    |
| 29172             | 1805-2         | 10.80  | 0.425 |
| 29172-1           | 1805-3         | 13.94  | 0.549 |
| 29172-2           | 1805-3         | 10.80  | 0.425 |

Glass bead included with the adapter, additional glass bead can be purchased separately.

# Series SSMA – adapters

## Adapters in between series

- SSMA jack (f) to SK plug (m)



| HUBER+SUHNER type | Connectors                           |
|-------------------|--------------------------------------|
| 29264-3           | adapter SSMA jack (f) to SK plug (m) |

# Series SMA – coaxial connectors

## Description

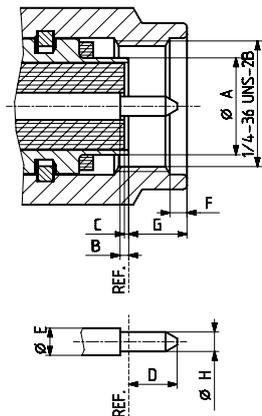
HUBER+SUHNER SMA connectors are precision connectors for microwave applications up to 18 GHz. The extended frequency version operates with excellent return loss performances up to 26.5 GHz. There is a huge variety of applications for HUBER+SUHNER SMA connectors, as in telecom, test+measurement, instruments, avionics, etc.

The HUBER+SUHNER series SMA is classified into two categories:

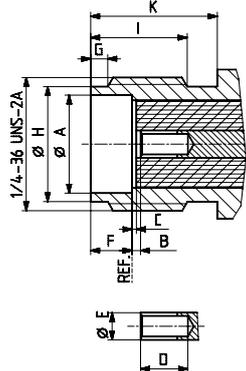
- HUBER+SUHNER standard SMA connectors for high end applications or applications subject to rough conditions.
- HUBER+SUHNER ECO SMA connectors for high volume applications.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Features

- Frequency range up to 18 GHz, extended frequency version up to 26.5 GHz
- Excellent return loss
- Intermateable with PC3.5 and SK
- The SMA (subminiature A) interface dimensions conform to the following standards:  
International: IEC 60169-15  
Europe: CECC 22110  
USA: MIL-PRF-39012 SMA  
Interface MIL-STD-348/310

## Content

|                                   |     |
|-----------------------------------|-----|
| Description                       | 211 |
| Interface dimensions in mm/inches | 211 |
| Features                          | 211 |
| Technical data                    | 212 |
| Cable connectors                  | 215 |
| Receptacles                       | 231 |
| PCB connectors                    | 239 |
| Protective caps and shorts        | 241 |

|   | Plug       |            | Jack       |            |
|---|------------|------------|------------|------------|
|   | min.       | max.       | min.       | max.       |
| A | –          | 4.59/1.81  | 4.59/0.181 | –          |
| B | 0.00/0.000 | 0.25/0.010 | 0.00/0.000 | 0.25/0.010 |
| C | 0.00/0.000 | 0.25/0.010 | 0.00/0.000 | 0.25/0.010 |
| D | –          | 2.54/0.100 | 2.67/0.105 | –          |
| E | 1.24/0.049 | 1.29/0.051 | 1.24/0.049 | 1.29/0.051 |
| F | 0.38/0.015 | 1.14/0.045 | 1.88/0.074 | 1.98/0.078 |
| G | –          | 3.43/0.135 | 0.38/0.015 | 1.14/0.045 |
| H | 0.90/0.036 | 0.94/0.037 | 5.28/0.208 | 5.49/0.216 |
| I | –          | –          | 4.32/0.170 | –          |
| K | –          | –          | 5.54/0.218 | –          |

# Series SMA – technical data

| Electrical data   |      | MIL-C-39012                                     |         |           |         |
|---|------|---|---------|-----------|---------|
| Impedance   |      | 50 Ω  |         |           |         |
| Frequency range for interface   |      | DC to 18 GHz<br>(extended range DC to 26.5 GHz) |         |           |         |
| RL (typical value)  |      | for cable connectors refer to table below       |         |           |         |
| Cable type  |      | semi-rigid                                      |         | flexible  |         |
| Cable dielectric diameter (mm/in)                                     |      | 1.5/0.066                                       | 3/0.117 | 1.5/0.066 | 3/0.117 |
| RF leakage measured at 3 GHz  | 3.26 | ≥ 100 dB-f (GHz)                                |         | ≥ 60 dB   |         |
| Dielectric withstanding voltage<br>(at sea level, in V rms, 50 Hz)    | 3.17 | 1000  | 1500    | 750       | 1000    |
| Working voltage<br>(at sea level, in V rms, 50 Hz)                    |      | 335   | 500     | 250       | 335     |
| Corona extinction voltage<br>(at 21 000 m/70 000 ft, in V rms, 50 Hz) | 3.22 | 250   | 375     | 190       | 250     |
| Working voltage<br>(at 21 000 m/70 000 ft, in V rms, 50 Hz)           |      | 85  | 125     | 65        | 85      |
| RF withstanding voltage at 5 MHz (V rms)                              | 3.23 | 670   | 1000    | 500       | 670     |
| Insulation resistance   | 3.11 | ≥ 5 · 10 <sup>3</sup> MΩ                        |         |           |         |
| Contact resistance<br>· Centre contact<br>· Outer contact             | 3.16 | ≤ 3 mΩ<br>≤ 2.5 mΩ                              |         |           |         |

## Typical RL for HUBER+SUHNER standard SMA cable connectors

| Typical RL (dB)        | Frequency range |         |       |          |        | Cable group |
|------------------------|-----------------|---------|-------|----------|--------|-------------|
| Connector type         | 1 GHz           | 2.5 GHz | 5 GHz | 12.4 GHz | 18 GHz |             |
| Straight connectors    | 37              | 37      | 37    | 29       | 28     | Y3, Y11     |
|                        | 37              | 37      | 34    | 29       | 23     | Y5, Y12     |
|                        | 32              | 29      | 28    |          |        | U2, U4      |
|                        | 34              | 32      | 29    |          |        | U7, U9      |
| Right angle connectors | 37              | 32      | 26    | 19       |        | Y3, Y11     |
|                        | 37              | 32      | 28    | 22       |        | Y5, Y12     |
|                        | 32              | 29      | 26    |          |        | U2, U4      |
|                        | 37              | 32      | 29    |          |        | U7, U9      |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series SMA – technical data

## Typical RL for HUBER+SUHNER ECO SMA cable connectors

| Typical RL (dB)        | Frequency range |         |       |       | Cable group |
|------------------------|-----------------|---------|-------|-------|-------------|
| Connector type         | 1 GHz           | 2.5 GHz | 5 GHz | 6 GHz |             |
| Straight connectors    | 36              | 36      | 35    | 30    | Y3, Y11     |
|                        | 36              | 36      | 35    | 30    | Y5, Y12     |
|                        | 32              | 29      | 26    | 25    | U2, U4      |
|                        | 34              | 32      | 27    | 25    | U7, U9      |
| Right angle connectors | 36              | 32      | 26    | 25    | Y3, Y11     |
|                        | 36              | 32      | 28    | 24    | Y5, Y12     |
|                        | 32              | 29      | 26    | 25    | U2, U4      |
|                        | 36              | 32      | 26    | 25    | U7, U9      |

| Mechanical data                     | MIL-C-39012 |                                    |                                   |
|-------------------------------------|-------------|------------------------------------|-----------------------------------|
| Recommended coupling nut torque     |             | HUBER+SUHNER standard SMA          | 0.8 to 1.1 Nm (7.1 to 9.7 in lbs) |
|                                     |             | HUBER+SUHNER ECO SMA               | 0.45 Nm (4.0 in lbs)              |
| Coupling nut retention force        | 3.25        |                                    | ≥ 270 N/60.7 lbs                  |
| Contact captivation<br>Axial        | 3.12        | HUBER+SUHNER standard SMA          | ≥ 27 N/6.1 lbs                    |
|                                     |             | HUBER+SUHNER ECO SMA               | ≥ 20 N/5.4 lbs                    |
| Cable retention force <sup>1)</sup> |             | see suitable cables, pages 32 – 41 |                                   |
| Durability (matings)                |             |                                    | ≤ 500                             |

| Environmental data  | Test conditions   |
|---|---|
| Temperature range   | –65 to +165 °C / –85 to +329 °F   |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock   | MIL-STD-202, method 107, condition B  |
| Moisture resistance   | MIL-STD-202, method 106   |
| Corrosion   | saltspray test acc. to MIL-STD-202, method 101, condition B                                   |
| Vibration   | MIL-STD-202, method 204, condition D  |
| Shock   | MIL-STD-202, method 213, condition I  |
|  | Except the hermetic sealed SMA connectors all other connector types satisfy RoHS compability. |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

1) Value considers maximum load of the cables without irreversible variations of specifications.

# Series SMA – technical data

| Material data               |                           |  |                                      |
|-----------------------------|---------------------------|--|--------------------------------------|
| Connector part              |                           | Material   | Plating                              |
| Bodies, outer contacts, nut | HUBER+SUHNER standard SMA | copper-beryllium alloy<br>stainless steel, spring bronze | gold, passivated                     |
|                             | HUBER+SUHNER ECO SMA      | brass, spring bronze                                     | SUCOPLATE®/<br>SUCOPRO® gold plating |
| Pin contacts                |                           | copper-beryllium alloy, brass                            | gold/SUCOPRO® gold plating           |
| Socket contacts             |                           | copper-beryllium alloy/spring<br>bronze                  | gold                                 |
| Crimp ferrules              |                           | copper, brass  | gold                                 |
| Insulators                  |                           | PTFE or PFA  |                                      |
| Gaskets                     |                           | silicone rubber  |                                      |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series SMA – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- With pin and insulator
- Cable entry soldered
- Centre contact soldered

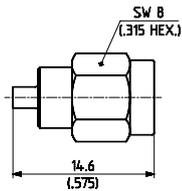


Fig. 1

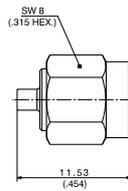


Fig. 2



| HUBER+SUHNER type                     | Item no. | Cable group (example)        | Packaging     | Assembly instruction | Plating body | Fig. | Notes                          |
|---------------------------------------|----------|------------------------------|---------------|----------------------|--------------|------|--------------------------------|
| 11_SMA-50-1-1/111_NE <sup>1) 2)</sup> | 22642387 | Y19 (EZ_34)                  | single        | 9118                 | gold         | 1    |                                |
| 11_SMA-50-1-2/111_NE <sup>1) 2)</sup> | 22642388 | Y2, Y15 (SUCOFORM_47, EZ_47) | single        | 9119                 |              | 1    |                                |
| 11_SMA-50-1-53/119_NH                 | 23013327 | Y2, Y15 (SUCOFORM_47, EZ_47) | bulk 100 pcs. | 150006               |              | 2    | nut passivated stainless steel |

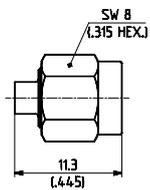


Fig. 1

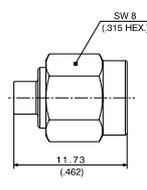
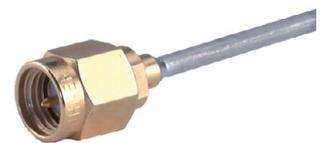


Fig. 2



| HUBER+SUHNER type                      | Item no. | Cable group (example)             | Packaging     | Assembly instruction | Plating body | Fig. | Notes                          |
|--|----------|-----------------------------------|---------------|----------------------|--------------|------|--------------------------------|
| 11_SMA-50-2-15/111_NE <sup>5)</sup>    | 22544545 | Y3, Y11, Y16 (SUCOFORM_86, EZ_86) | single        | 9056                 | gold         | 1    |                                |
| 11_SMA-50-2-15/111_NH                  | 22645898 | (SUCOFORM_86, EZ_86)              | bulk 100 pcs. |                      |              |      |                                |
| 11_SMA-50-2-65/119_NE <sup>3) 5)</sup> | 22642315 | Y3, Y11, Y16 (SUCOFORM_86, EZ_86) | single        | 9056                 | gold         | 1    | nut passivated stainless steel |
| 11_SMA-50-2-65/119_NH <sup>3)</sup>    | 22645366 | (SUCOFORM_86, EZ_86)              | bulk 100 pcs. |                      |              |      |                                |
| 11_SMA-50-2-110/133_NE <sup>4)</sup>   | 84130715 | Y3, Y11, Y16 (SUCOFORM_86, EZ_86) | single        | 0000349249           | SUCO-PLATE®  | 2    |                                |
| 11_SMA-50-2-110/133_NP <sup>4)</sup>   | 84117816 | (SUCOFORM_86, EZ_86)              | bulk 500 pcs. |                      |              |      |                                |

All highlighted types are HUBER+SUHNER ECO types.

<sup>1)</sup> VCompound 74\_Z-0-0-116 needed

<sup>2)</sup> SUCOPRO® (economical) version on request

<sup>3)</sup> Cable entry CuBe/gold

<sup>4)</sup> Use torque wrench 74\_Z-0-0-79

<sup>5)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- With pin and insulator
- Cable entry soldered
- Centre contact soldered

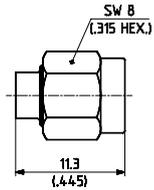


Fig. 1

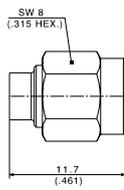


Fig. 2

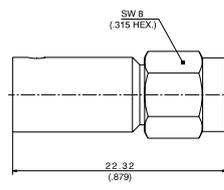


Fig. 3



| HUBER+SUHNER type  | Item no.             | Cable group (example)                  | Packaging               | Assembly instruction | Plating body | Fig. | Notes                          |
|--|----------------------|--|-------------------------|----------------------|--------------|------|--------------------------------|
| 11_SMA-50-3-15/111_NE <sup>2)</sup><br>11_SMA-50-3-15/111_NH                 | 22544547<br>22651601 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 9056                 | gold         | 1    |                                |
| 11_SMA-50-3-65/119_NE<br>11_SMA-50-3-65/119_NH                               | 22641643<br>22646570 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 9056                 | gold         | 1    | nut passivated stainless steel |
| 11_SMA-50-3-235/133_NE <sup>1)</sup><br>11_SMA-50-3-235/133_NP <sup>1)</sup> | 84130698<br>84104274 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 500 pcs. | 0000333508           | SUCO-PLATE®  | 2    |                                |
| 11_SMA-50-5-1/111_NE <sup>2)</sup>   | 22642399             | Y7, Y14<br>(SUCOFORM_250_01, EZ_250)   | single                  | 0000181414           | gold         | 3    |                                |

All highlighted types are HUBER+SUHNER ECO types.

## 26.5 GHz – straight cable plugs (male)

### For semi-rigid cables

- With pin and insulator
- Centre contact soldered

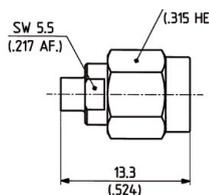


Fig. 1

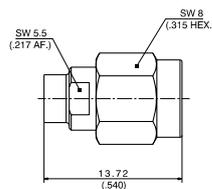


Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)                  | Packaging               | Assembly instruction | Fig. | Plating body |
|--|----------------------|--|-------------------------|----------------------|------|--------------|
| 11_SMA-50-2-100/111_NE <sup>2)</sup>                           | 22648717             | Y3, Y11,<br>(SUCOFORM_86, EZ_86)       | single                  | 0000181590           | 1    | gold         |
| 11_SMA-50-3-100/111_NE <sup>2)</sup><br>11_SMA-50-3-100/111_NH | 22648718<br>22658936 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. |                      | 2    |              |

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## 26.5 GHz – straight cable plugs (male)

### For semi-rigid cables

- Without pin and insulator

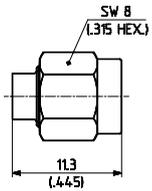


Fig. 1

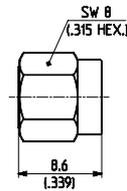
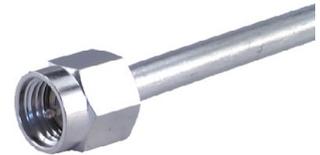


Fig. 2

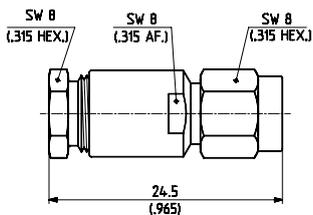


| HUBER+SUHNER type                              | Item no.             | Cable group (example) | Packaging               | Assembly instruction | Plating body | Fig. | Notes                          |
|--|----------------------|-----------------------|-------------------------|----------------------|--------------|------|--------------------------------|
| 11_SMA-50-3-14/-11_NH                          | 22644467             | Y5 (EZ_141)           | bulk 100 pcs.           | 9055                 | gold         | 1    |                                |
| 11_SMA-50-3-16/-11_NH                          | 22644470             |                       | bulk 100 pcs.           |                      | gold         | 2    |                                |
| 11_SMA-50-3-42/-33_NE                          | 22649222             |                       | single<br>bulk 100 pcs. |                      | SUCOPLATE®   | 2    |                                |
| 11_SMA-50-3-64/-19_NH                          | 22649224             |                       | bulk 100 pcs.           |                      | gold         | 1    | nut passivated stainless steel |
| 11_SMA-50-3-66/-19_NE<br>11_SMA-50-3-66/-19_NH | 22641644<br>22645207 |                       | single<br>bulk 100 pcs. |                      | gold         | 2    | nut passivated stainless steel |

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type                   | Item no. | Cable group (example)           | Packaging     | Assembly instruction | Plating body |
|-------------------------------------|----------|---------------------------------|---------------|----------------------|--------------|
| 11_SMA-50-3-7/111_NE <sup>1)</sup>  | 22640050 | U7 (RG_58_C/U, ENVIROFLEX_B58)  | single        | 3071                 | gold         |
| 11_SMA-50-3-8/111_NH <sup>1)</sup>  | 22648630 | U9 (RG_142_B/U, ENVIROFLEX_142) | bulk 100 pcs. |                      |              |
| 11_SMA-50-3-10/111_NE <sup>1)</sup> | 22640053 | U11 (RG_400_/U, ENVIROFLEX_400) | single        |                      |              |

<sup>1)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

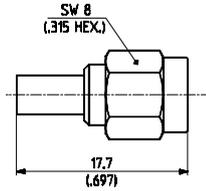


Fig. 1

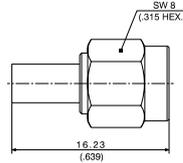


Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)            | Packaging               | Assembly instruction | Plating body               | Crimp insert | Fig. |
|--|----------------------|----------------------------------|-------------------------|----------------------|----------------------------|--------------|------|
| 11_SMA-50-1-4/111_NE <sup>3)</sup>   | 22645871             | U1 (RG_178_B/U, ENVIROFLEX_178)  | single                  | 27061                | gold                       | A            | 1    |
| 11_SMA-50-2-5/111_NE <sup>3)</sup><br>11_SMA-50-2-5/111_NH                     | 22640042<br>22646312 | U2 (RG_316_/U, ENVIROFLEX_316)   | single<br>bulk 100 pcs. | 27266                | gold                       | A            | 1    |
| 11_SMA-50-2-6/111_NE <sup>3)</sup><br>11_SMA-50-2-6/111_NH                     | 22640043<br>22650740 | U4 (K_02252_D, ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 27266                | gold                       | A            | 1    |
| 11_SMA-50-2-27/111_NE <sup>1), 3)</sup><br>11_SMA-50-2-27/111_NH <sup>1)</sup> | 84022967<br>22652923 | U2 (RG_316_/U, ENVIROFLEX_316)   | single<br>bulk 100 pcs. | 27164                | gold                       | 1 A          | 1    |
| 11_SMA-50-2-55/199_NE  | 22641377             | U2 (RG_316_/U, ENVIROFLEX_316)   | single                  | 3069                 | passivated stainless steel | A            | 1    |
| 11_SMA-50-2-56/199_NE<br>11_SMA-50-2-56/199_NH                                 | 22641376<br>22651486 | U4 (K_02252_D, ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 3069                 | passivated stainless steel | A            | 1    |
| 11_SMA-50-2-111/133_NE <sup>2)</sup><br>11_SMA-50-2-111/133_NP <sup>2)</sup>   | 84130699<br>84117820 | U2 (RG_316_/U, ENVIROFLEX_316_D) | single<br>bulk 500 pcs. | 0000348839           | SUCOPLATE®                 | A            | 2    |
| 11_SMA-50-2-112/133_NE <sup>2)</sup><br>11_SMA-50-2-112/133_NP <sup>2)</sup>   | 84130700<br>84115820 | U4 (K_02252_D, ENVIROFLEX_316_D) | single<br>bulk 500 pcs. | 0000347891           | SUCOPLATE®                 | A            | 2    |
| 11_SMA-50-2-116/111_NE   | 85199138             | U2 (RG_316_/U, ENVIROFLEX_316)   | single                  | 0001166880           | gold                       | A            | 2    |

All highlighted types are HUBER+SUHNER ECO types.

 The product is lead free.

<sup>1)</sup> HUBER+SUHNER full crimp

<sup>2)</sup> use torque wrench 74\_Z-0-0-79

<sup>3)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp

Centre contact soldered (11\_SMA-50-4-77 plugged center conductor)

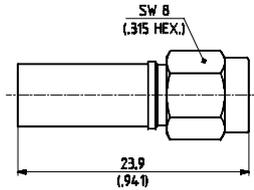


Fig. 1

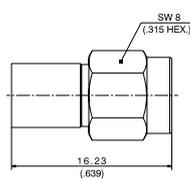


Fig. 2

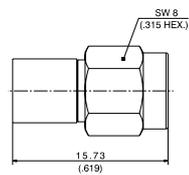


Fig. 3

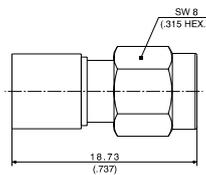


Fig. 4

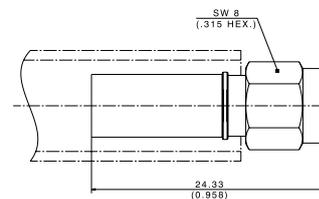


Fig. 5

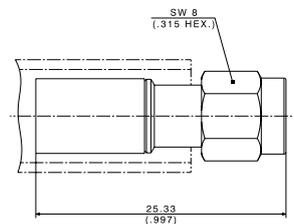


Fig. 6

| HUBER+SUHNER type  | Item no.             | Cable group (example)                       | Packaging               | Assembly instruction | Plating body                  | Crimp insert    | Fig. |
|--|----------------------|---|-------------------------|----------------------|-------------------------------|-----------------|------|
| 11_SMA-50-3-5/111_NE <sup>2)</sup><br>11_SMA-50-3-5/111_NH                   | 22640048<br>22644684 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)           | single<br>bulk 100 pcs. | 3069                 | gold                          | B               | 1    |
| 11_SMA-50-3-6/111_NE <sup>2)</sup><br>11_SMA-50-3-6/111_NH                   | 22640049<br>22650739 | U9, U11 (RG_400_/U,<br>ENVIROFLEX_400)      | single<br>bulk 100 pcs. | 3069                 | gold                          | B               | 1    |
| 11_SMA-50-3-55/199_NE  | 22641371             | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)           | single                  | 3069                 | passivated<br>stainless steel | B               | 1    |
| 11_SMA-50-3-56/199_NE<br>11_SMA-50-3-56/199_NH                               | 22543647<br>22648300 | U9, U11 (RG_400_/U,<br>ENVIROFLEX_400)      | single<br>bulk 100 pcs. | 3069                 | passivated<br>stainless steel | B               | 1    |
| 11_SMA-50-3-236/133_NE <sup>1)</sup><br>11_SMA-50-3-236/133_NP <sup>1)</sup> | 84130702<br>84117821 | U9, U11, U41 (RG_400_/U,<br>ENVIROFLEX_400) | single<br>bulk 500 pcs. | 0000349507           | SUCOPLATE®                    | 1 <sup>3)</sup> | 2    |
| 11_SMA-50-3-237/133_NE <sup>1)</sup><br>11_SMA-50-3-237/133_NP <sup>1)</sup> | 84130703<br>84117823 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)           | single<br>bulk 500 pcs. | 0000349571           | SUCOPLATE®                    | B               | 3    |
| 11_SMA-50-3-239/133_NF   | 85010668             | X27 (SPUMA_195,<br>SPUMA_195-FR-01)         | single                  | 0000417562           | SUCOPLATE®                    | B               | 5    |
| 11_SMA-50-4-50/133_NE <sup>1)</sup><br>11_SMA-50-4-50/133_NP <sup>1)</sup>   | 84130705<br>84112519 | S16, X9<br>(SX_04172_B-60)                  | single<br>bulk 500 pcs. | 0000347768           | SUCOPLATE®                    | 2 <sup>4)</sup> | 4    |
| 11_SMA-50-4-77/133_NE  | 85010193             | X28 (SPUMA_240,<br>SPUMA_240-FR-01)         | single                  | 0000416855           | SUCOPLATE®                    | C               | 6    |

All highlighted types are HUBER+SUHNER ECO types.

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

<sup>2)</sup> SUCOPRO® (economical) version on request

<sup>3)</sup> Crimp tool 76\_Z-0-0-57

<sup>4)</sup> Crimp tool 76\_Z-0-4-23

# Series SMA – cable connectors

## Right angle cable plugs (male)

### For semi-rigid cables

- With pin and insulator
- Cable entry soldered
- Centre contact soldered

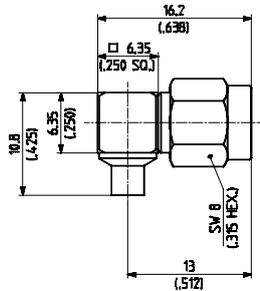


Fig. 1

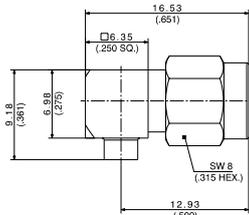


Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)                | Packaging               | Assembly instruction | Plating body | Fig. | Notes                          |
|--|----------------------|--------------------------------------|-------------------------|----------------------|--------------|------|--------------------------------|
| 16_SMA-50-2-53/119_NE<br>16_SMA-50-2-53/119_NH                               | 22644242<br>22646639 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86) | single<br>bulk 100 pcs. | 3068                 | gold         | 1    | nut passivated stainless steel |
| 16_SMA-50-2-103/111_NE <sup>2)</sup><br>16_SMA-50-2-103/111_NH               | 84018309<br>22652924 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86) | single<br>bulk 100 pcs. | 3068                 | gold         | 1    |                                |
| 16_SMA-50-2-110/133_NE <sup>1)</sup><br>16_SMA-50-2-110/133_NP <sup>1)</sup> | 84130706<br>84117807 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86) | single<br>bulk 500 pcs. | 0000335631           | SUCO-PLATE®  | 2    |                                |

All highlighted types are HUBER+SUHNER ECO types.

- With pin and insulator
- Cable entry soldered
- Centre contact soldered

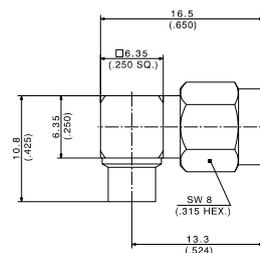


Fig. 1

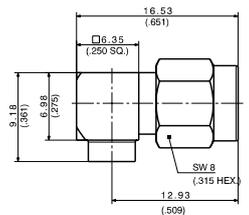


Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)                  | Packaging               | Assembly instruction | Plating body | Fig. | Notes                          |
|--|----------------------|--|-------------------------|----------------------|--------------|------|--------------------------------|
| 16_SMA-50-3-3/111_NE <sup>2)</sup><br>16_SMA-50-3-3/111_NH                 | 22640073<br>22646569 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 3068                 | gold         | 1    |                                |
| 16_SMA-50-3-13/133_NE <sup>1)</sup><br>16_SMA-50-3-13/133_NP <sup>1)</sup> | 84130707<br>84117810 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 500 pcs. | 0000335642           | SUCO-PLATE®  | 2    |                                |
| 16_SMA-50-3-53/119_NE<br>16_SMA-50-3-53/119_NH                             | 22644243<br>22646561 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 3068                 | gold         | 1    | nut passivated stainless steel |

All highlighted types are HUBER+SUHNER ECO types.

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## 26.5 GHz – right angle cable plugs (male)

### For semi-rigid cables

- With pin and insulator
- Cable entry soldered
- Centre contact plugged

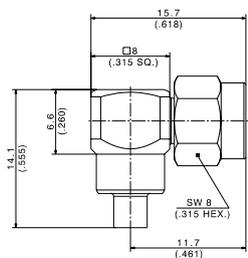


Fig. 1

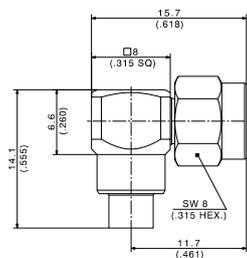


Fig. 2



| HUBER+SUHNER type      | Item no. | Cable group (example)                  | Packaging     | Assembly instruction | Plating body               | Fig. |
|------------------------|----------|--|---------------|----------------------|----------------------------|------|
| 16_SMA-50-2-100/199_NH | 23018813 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86)   | bulk 100 pcs. | 27055                | passivated stainless steel | 1    |
| 16_SMA-50-3-100/199_NE | 22648293 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single        |                      |                            | 2    |

# Series SMA – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

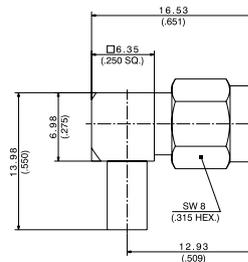
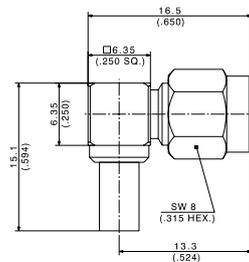
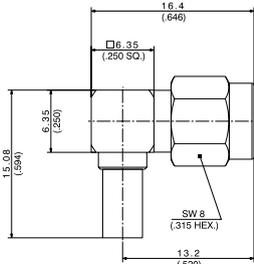


Fig. 1

Fig. 2

Fig. 3

| HUBER+SUHNER type  | Item no.             | Cable group (example)               | Packaging               | Assembly instruction | Plating body                     | Crimp insert | Fig. |
|--|----------------------|-------------------------------------|-------------------------|----------------------|----------------------------------|--------------|------|
| 16_SMA-50-1-1/111_NE <sup>2)</sup><br>16_SMA-50-1-1/111_NH                   | 22641805<br>22660358 | U1 (RG_178_B/U,<br>ENVIROFLEX_178)  | single<br>bulk 100 pcs. | 3070                 | gold                             | A            | 1    |
| 16_SMA-50-2-55/199_NE<br>16_SMA-50-2-55/199_NH                               | 22642661<br>84028953 | U2 (RG_316_U,<br>ENVIROFLEX_316)    | single<br>bulk 100 pcs. | 3070                 | passivated<br>stainless<br>steel |              | 2    |
| 16_SMA-50-2-56/199_NE<br>16_SMA-50-2-56/199_NH                               | 22642662<br>22658888 | U4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 3070                 | passivated<br>stainless<br>steel |              | 2    |
| 16_SMA-50-2-105/111_NE <sup>2)</sup><br>16_SMA-50-2-105/111_NH               | 22651455<br>22651456 | U2 (RG_316_U,<br>ENVIROFLEX_316)    | single<br>bulk 100 pcs. | 3070                 | gold                             |              | 1    |
| 16_SMA-50-2-106/111_NE <sup>2)</sup><br>16_SMA-50-2-106/111_NH               | 22651457<br>22651458 | U4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 3070                 | gold                             |              | 1    |
| 16_SMA-50-2-111/133_NE <sup>1)</sup><br>16_SMA-50-2-111/133_NP <sup>1)</sup> | 84130708<br>84117808 | U2 (RG_316_U,<br>ENVIROFLEX_316)    | single<br>bulk 500 pcs. | 0000335656           | SUCOPLATE®                       |              | 3    |
| 16_SMA-50-2-112/133_NE <sup>1)</sup><br>16_SMA-50-2-112/133_NP <sup>1)</sup> | 84130709<br>84117809 | U4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 500 pcs. | 0000335656           | SUCOPLATE®                       |              | 3    |
| 16_SMA-50-2-114/111_NE   | 85199312             | U2 (RG_316_U,<br>ENVIROFLEX_316)    | single                  | 0001167445           | gold                             |              | 2    |

All highlighted types are HUBER+SUHNER ECO types.

 The product is lead free.

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

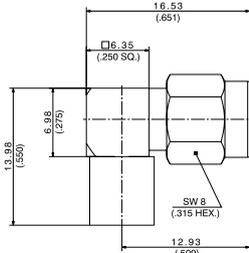


Fig. 1

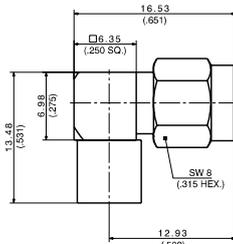


Fig. 2

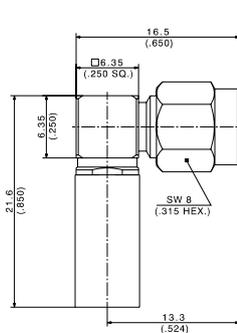


Fig. 3

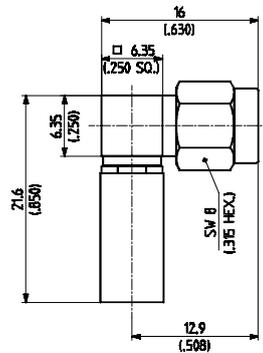


Fig. 4

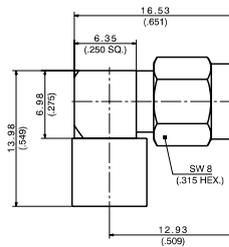


Fig. 5

| HUBER+SUHNER type  | Item no.             | Cable group (example)                    | Packaging               | Assembly instruction | Plating body               | Crimp insert | Fig. |
|--|----------------------|--|-------------------------|----------------------|----------------------------|--------------|------|
| 16_SMA-50-3-14/133_NE <sup>1)</sup><br>16_SMA-50-3-14/133_NP <sup>1)</sup> | 84130711<br>84117811 | U9, U11, U41 (RG_400_/U, ENVIROFLEX_400) | single<br>bulk 500 pcs. | 0000335678           | SUCOPLATE®                 | B            | 1    |
| 16_SMA-50-3-15/133_NE <sup>1)</sup>  | 84130712             | U7 (RG_58_C/U, ENVIROFLEX_B58)           | single                  | 0000335679           | SUCOPLATE®                 | B            | 2    |
| 16_SMA-50-3-56/199_NE  | 22642660             | U9, U11 (RG_400_/U, ENVIROFLEX_400)      | single                  | 3070                 | passivated stainless steel | B            | 3    |
| 16_SMA-50-3-105/111_NE <sup>2)</sup><br>16_SMA-50-3-105/111_NH             | 22651585<br>22651800 | U7 (RG_58_C/U, ENVIROFLEX_B58)           | single<br>bulk 100 pcs. | 3070                 | gold                       | B            | 4    |
| 16_SMA-50-3-106/111_NE <sup>2)</sup><br>16_SMA-50-3-106/111_NH             | 22650546<br>22650545 | U9, U11 (RG_400_/U, ENVIROFLEX_400)      | single<br>bulk 100 pcs. | 3070                 | gold                       | B            | 4    |
| 16_SMA-50-4-50/133_NE <sup>1)</sup><br>16_SMA-50-4-50/133_NP <sup>1)</sup> | 84130714<br>84117813 | S16, X9 (SX_04172_B-60)                  | single<br>bulk 500 pcs. | 0000335684           | SUCOPLATE®                 | C            | 5    |

All highlighted types are HUBER+SUHNER ECO types.

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

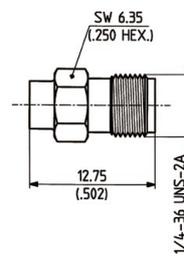
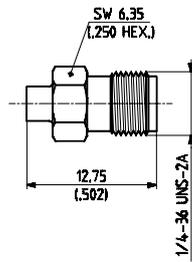
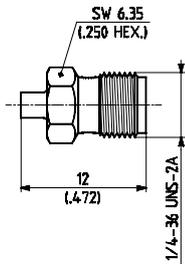


Fig. 1

Fig. 2

Fig. 3

| HUBER+SUHNER type  | Item no.             | Cable group (example)                  | Packaging               | Assembly instruction | Plating body | Fig. |
|--|----------------------|--|-------------------------|----------------------|--------------|------|
| 21_SMA-50-1-1/111_NE <sup>1)</sup>                           | 22642385             | Y19 (EZ_34)                            | single                  | 9118                 | gold         | 1    |
| 21_SMA-50-1-2/111_NE   | 22642386             | Y2, Y15<br>SUCOFORM_47, EZ_47)         | single                  | 9119                 |              | 1    |
| 21_SMA-50-2-15/111_NE <sup>1)</sup><br>21_SMA-50-2-15/111_NH | 22544549<br>22652141 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86)   | single<br>bulk 100 pcs. | 9057                 |              | 2    |
| 21_SMA-50-3-15/111_NE <sup>1)</sup><br>21_SMA-50-3-15/111_NH | 22544550<br>22645042 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 9057                 |              | 3    |

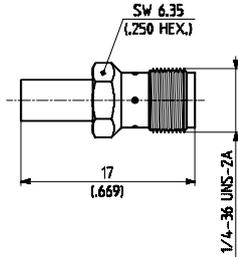
<sup>1)</sup> SUCOPRO\* (economical) version on request

# Series SMA – cable connectors

## Straight cable jacks (female)

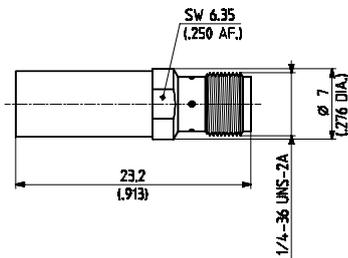
### For flexible cables

- Cable entry crimp
- Centre contact soldered



| HUBER+SUHNER type  | Item no.             | Cable group (example)            | Packaging               | Assembly instruction | Plating body | Crimp insert |
|--|----------------------|----------------------------------|-------------------------|----------------------|--------------|--------------|
| 21_SMA-50-2-5/111_NE <sup>1)</sup>                         | 22640077             | U2 (RG_316_/U, ENVIROFLEX_316)   | single                  | 3069                 | gold         | A            |
| 21_SMA-50-2-6/111_NE <sup>1)</sup><br>21_SMA-50-2-6/111_NH | 22640078<br>22651818 | U4 (K_02252_D, ENVIROFLEX_316_D) | single<br>bulk 100 pcs. |                      |              |              |

- Cable entry crimp
- Centre contact soldered



| HUBER+SUHNER type                  | Item no. | Cable group (example)                    | Packaging | Assembly instruction | Plating body | Crimp insert |
|------------------------------------|----------|--|-----------|----------------------|--------------|--------------|
| 21_SMA-50-3-5/111_NE <sup>1)</sup> | 22640081 | U7 (RG_58_C/U, ENVIROFLEX_B58)           | single    | 3069                 | gold         | B            |
| 21_SMA-50-3-6/111_NE <sup>1)</sup> | 22640082 | U9, U11, U39 (RG_400_/U, ENVIROFLEX_400) |           |                      |              |              |

<sup>1)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered
- With panel seal

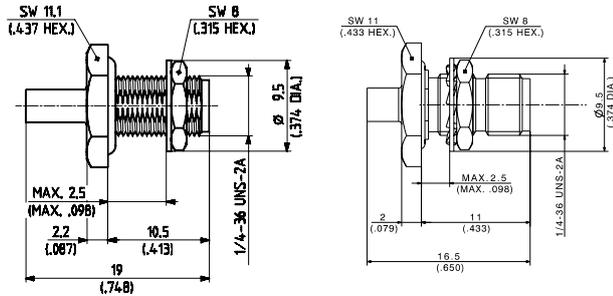


Fig. 1

Fig. 2



| HUBER+SUHNER type  | Item no.             | Cable group (example)         | Packaging               | Assembly instruction | Plating body | Mounting hole | Fig. |
|--|----------------------|-------------------------------|-------------------------|----------------------|--------------|---------------|------|
| 24_SMA-50-2-15/111_NE <sup>1)</sup><br>24_SMA-50-2-15/111_NH | 22544532<br>22645490 | Y3, Y11, Y16<br>(SUCOFORM_86) | single<br>bulk 100 pcs. | 9057                 | gold         | ML 35         | 1    |
| 24_SMA-50-2-41/133_NE<br>24_SMA-50-2-41/133_NH               | 22641381<br>22645368 | Y3, Y11, Y16<br>(SUCOFORM_86) | single<br>bulk 100 pcs. | 0000185051           | SUCOPLATE®   | ML 20         | 2    |

All highlighted types are HUBER+SUHNER ECO types.

- Cable entry soldered
- Centre contact soldered
- With panel seal

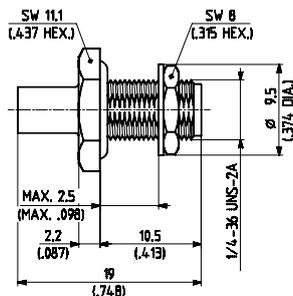


Fig. 1



| HUBER+SUHNER type  | Item no.             | Cable group (example)                     | Packaging               | Assembly instruction | Plating body | Mounting hole | Fig. |
|--|----------------------|---|-------------------------|----------------------|--------------|---------------|------|
| 24_SMA-50-3-15/111_NE <sup>1)</sup><br>24_SMA-50-3-15/111_NH | 22641153<br>22645259 | Y5, Y12, Y17<br>(SUCOFORM_141,<br>EZ_141) | single<br>bulk 100 pcs. | 9057                 | gold         | ML 35         | 1    |

<sup>1)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## 26.5 GHz – straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

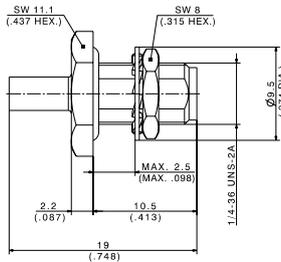


Fig. 1

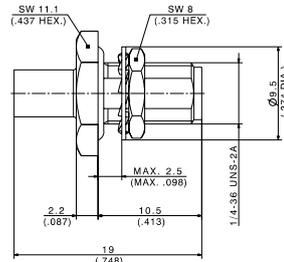


Fig. 2



| HUBER+SUHNER type                    | Item no. | Cable group (example)                  | Packaging | Assembly instruction | Plating body | Mounting hole | Fig. |
|--------------------------------------|----------|--|-----------|----------------------|--------------|---------------|------|
| 24_SMA-50-2-100/111_NE <sup>1)</sup> | 22648727 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86)   | single    | 27055                | gold         | ML 35         | 1    |
| 24_SMA-50-3-100/111_NE <sup>1)</sup> | 22648728 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single    |                      |              |               | 2    |

<sup>1)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

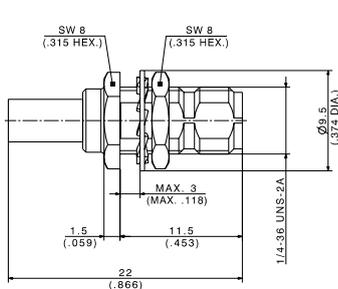


Fig. 1

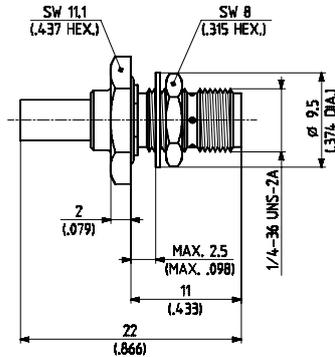


Fig. 2

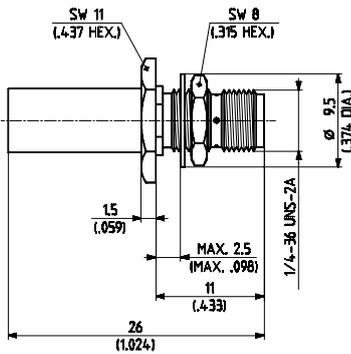


Fig. 4

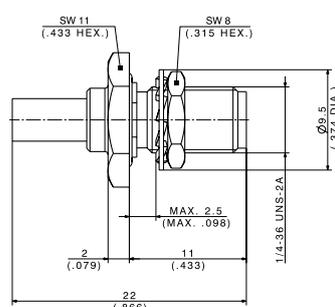


Fig. 5

| HUBER+SUHNER type                   | Item no. | Cable group (example)            | Packaging     | Assembly instruction | Plating body | Crimp insert | Mounting hole | Fig. |
|-------------------------------------|----------|----------------------------------|---------------|----------------------|--------------|--------------|---------------|------|
| 24_SMA-50-1-3/111_NE <sup>1)</sup>  | 22649873 | U1 (RG_178, ENVIROFLEX_178)      | single        | 27104                | gold         | A            | ML 35         | 1    |
| 24_SMA-50-2-13/111_NE <sup>1)</sup> | 22651767 | U4 (K_02252_D, ENVIROFLEX_316_D) | single        | 3069                 | gold         | A            | ML 20         | 2    |
| 24_SMA-50-2-13/111_NH               | 22651719 |                                  | bulk 100 pcs. |                      |              |              |               |      |
| 24_SMA-50-2-14/111_NE <sup>1)</sup> | 22651748 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 3069                 | gold         | A            | ML 20         | 2    |
| 24_SMA-50-2-14/111_NH               | 22651747 |                                  | bulk 100 pcs. |                      |              |              |               |      |
| 24_SMA-50-3-42/133_NE               | 85201112 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 0001171910           | gold         | A            | ML 20         | 2    |
| 24_SMA-50-2-37/133_NE               | 85013993 | U4 (K_02252_D, ENVIROFLEX_316_D) | single        | 3069                 | SUCOPLATE®   | A            | ML 20         | 4    |
| 24_SMA-50-2-46/133_NE               | 22644246 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 3069                 | SUCOPLATE®   | A            | ML 20         | 2    |
| 24_SMA-50-2-46/133_NH               | 22646565 |                                  | bulk 100 pcs. |                      |              |              |               |      |
| 24_SMA-50-3-42/133_NE               | 22641358 | U9 (RG_142_B/U, ENVIROFLEX_142)  | single        | 3072                 | SUCOPLATE®   | B            | ML 20         | 3    |
| 24_SMA-50-2-116/111_NE              | 85201112 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 0001171910           | gold         | A            | ML 20         | 2    |

All highlighted types are HUBER+SUHNER ECO types.

 The product is lead free.

<sup>1)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight panel cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

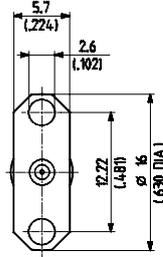
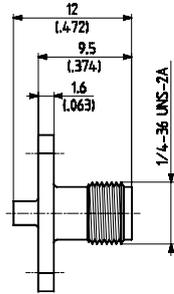
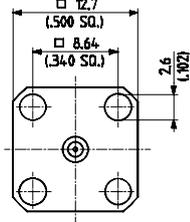
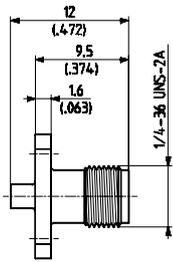


Fig. 1

Fig. 2

| HUBER+SUHNER type                      | Item no. | Cable group (example)             | Packaging               | Assembly instruction | Plating body | Mounting hole | Fig. |
|--|----------|-----------------------------------|-------------------------|----------------------|--------------|---------------|------|
| 25_SMA-50-1-2/111_NE <sup>2)</sup>     | 22642390 | Y2, Y15 (SUCOFORM_47, EZ_47)      | single                  | 9119                 | gold         | ML 19         | 1    |
| 25_SMA-50-1-4/111_NE <sup>2)</sup>     | 22642391 | Y2, Y15 (SUCOFORM_47, EZ_47)      | single<br>bulk 100 pcs. | 9119                 |              | –             | 2    |
| 25_SMA-50-2-15/111_NE <sup>1) 2)</sup> | 22544551 | Y3, Y11, Y16 (SUCOFORM_86, EZ_86) | single                  | 9057                 |              | ML 19         | 1    |
| 25_SMA-50-2-25/111_NE <sup>1) 2)</sup> | 22641493 | Y3, Y11, Y16 (SUCOFORM_86, EZ_86) | single                  | 9057                 |              | –             | 2    |

<sup>1)</sup> VCentre contact not captivated

<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – cable connectors

## Straight panel cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

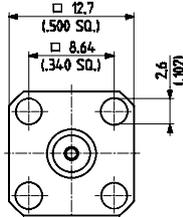
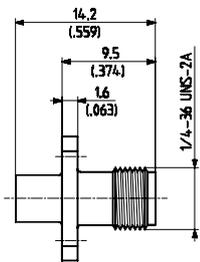


Fig. 1

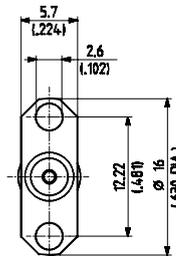
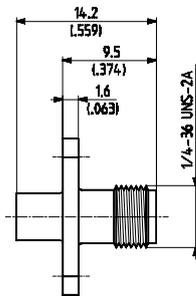


Fig. 2



| HUBER+SUHNER type                      | Item no. | Cable group (example)                | Packaging     | Assembly instruction | Plating body | Mounting hole | Fig. |
|--|----------|--------------------------------------|---------------|----------------------|--------------|---------------|------|
| 25_SMA-50-3-15/111_NE <sup>1) 2)</sup> | 22544552 | Y5, Y12, Y17 (SUCO-FORM_141, EZ_141) | single        | 9057                 | gold         | ML 19         | 1    |
| 25_SMA-50-3-15/111_NH <sup>1)</sup>    | 22644717 |                                      | bulk 100 pcs. |                      |              | -             | 2    |
| 25_SMA-50-3-25/111_NE <sup>1) 2)</sup> | 22641410 | Y5, Y12, Y17 (SUCO-FORM_141, EZ_141) | single        |                      |              |               |      |

- Cable entry crimp
- Centre contact soldered

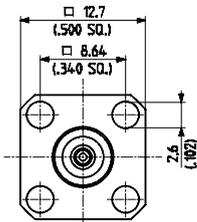
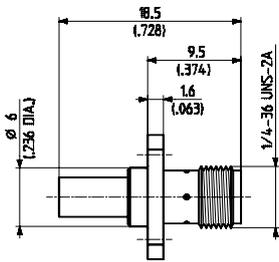


Fig. 1

Fig. 2



| HUBER+SUHNER type                  | Item no. | Cable group (example)          | Packaging     | Assembly instruction | Plating body | Mounting hole | Crimp insert |
|------------------------------------|----------|--------------------------------|---------------|----------------------|--------------|---------------|--------------|
| 25_SMA-50-2-5/111_NE <sup>2)</sup> | 22640112 | U2 (RG_316_/U, ENVIROFLEX_316) | single        | 3072                 | gold         | ML 19         | A            |
| 25_SMA-50-2-5/111_NH               | 22650755 |                                | bulk 100 pcs. |                      |              |               |              |
| 25_SMA-50-2-6/111_NE <sup>2)</sup> | 22640113 | U4 (K_02252, ENVIROFLEX_316_D) | single        |                      |              |               |              |
| 25_SMA-50-2-46/133_NE              | 22642246 | U4 (K_02252, ENVIROFLEX_316_D) | single        | 3072                 | SUCOPLATE®   | ML 19         | A            |

All highlighted types are HUBER+SUHNER ECO types.

<sup>1)</sup> Centre contact not captivated

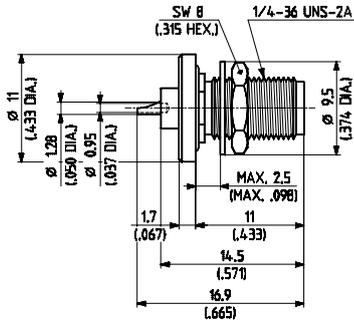
<sup>2)</sup> SUCOPRO® (economical) version on request

# Series SMA – receptacles

## Straight bulkhead receptacles

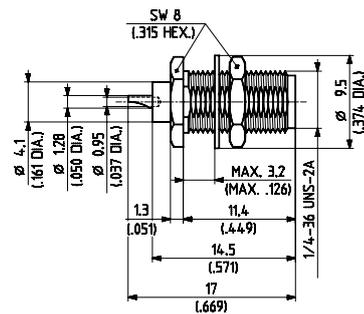
### With solder end, jacks (female)

- With panel seal



| HUBER+SUHNER type    | Item no. | Packaging | Plating body | Mounting hole | Mounting      |
|----------------------|----------|-----------|--------------|---------------|---------------|
| 22_SMA-50-0-1/111_NE | 22640087 | single    | gold         | ML 20         | rear mounting |

- Without panel seal



| HUBER+SUHNER type    | Item no. | Packaging     | Plating body | Mounting hole | Mounting      |
|----------------------|----------|---------------|--------------|---------------|---------------|
| 22_SMA-50-0-4/111_NE | 22640962 | single        | gold         | ML 35         | rear mounting |
| 22_SMA-50-0-4/111_NH | 22649418 | bulk 100 pcs. | gold         | ML 35         | rear mounting |

# Series SMA – receptacles

## Straight bulkhead receptacles

### With coaxial end, jacks (female)

- Without panel seal

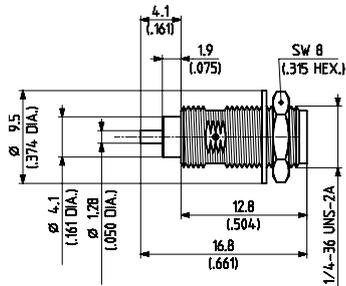


Fig. 1

| HUBER+SUHNER type     | Item no. | Packaging | Plating body               | Mounting hole | Mounting       | Fig. |
|-----------------------|----------|-----------|----------------------------|---------------|----------------|------|
| 22_SMA-50-0-3/111_NE  | 22640089 | single    | gold                       | ML 98         | front mounting | 1    |
| 22_SMA-50-0-53/199_NE | 22543498 | single    | passivated stainless steel |               |                |      |

# Series SMA – receptacles

## Straight bulkhead receptacles

### Hermetically sealed, jacks (female)

- RoHs compliant alternative on request
- Front mounting

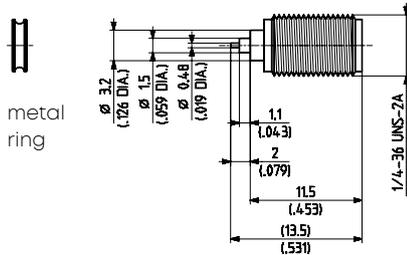


Fig. 1

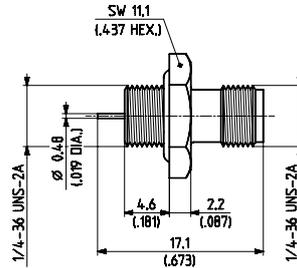


Fig. 2

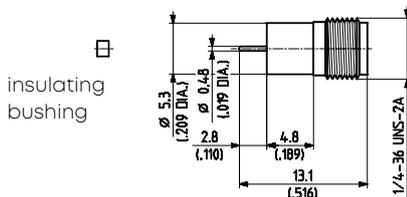


Fig. 3

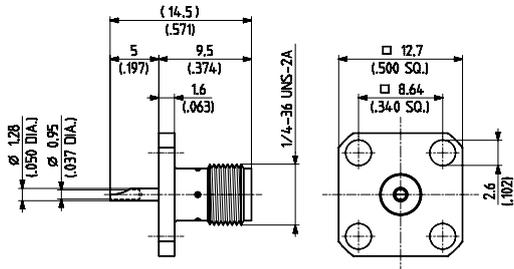
| HUBER+SUHNER type                              | Item no.             | Packaging              | Plating body | Mounting hole | Fig. | Notes   |
|--|----------------------|------------------------|--------------|---------------|------|---|
| 22_SMA-50-0-10/111_NE <sup>1)</sup>            | 22641291             | single                 | gold         | ML 42         | 1    | "Spark plug" with metal ring seal<br>leak rate ≤ 10 <sup>-8</sup> Torr l/s (atm cc/s)   |
| 22_SMA-50-0-12/111_NE<br>22_SMA-50-0-12/111_NY | 84042904<br>22641293 | single<br>tray 75 pcs. |              | ML 98         | 2    | with panel seal<br>leak rate ≤ 10 <sup>-6</sup> Torr l/s (atm cc/s)   |
| 22_SMA-50-0-15/111_NE                          | 22544588             | single                 |              | ML 96         | 3    | panel sealing: laser beam welding 1)<br>soldering temperature 250 °C/482 °F<br>leak rate ≤ 10 <sup>-8</sup> Torr l/s (atm cc/s) |

<sup>1)</sup> Use assembly tool 74\_Z-0-0-75 and torque wrench 74\_Z-0-0-80.

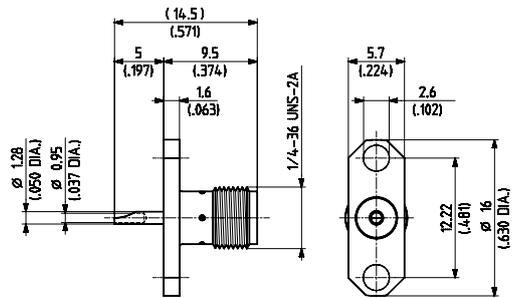
# Series SMA – receptacles

## Straight panel receptacles

With solder end, jacks (female)



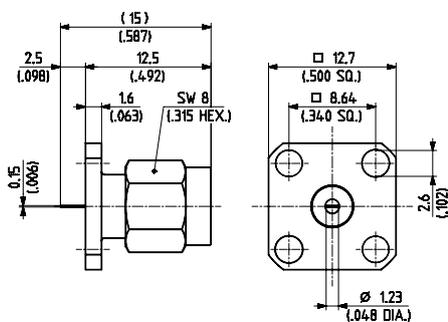
| HUBER+SUHNER type     | Item no. | Packaging               | Plating body               | Notes            |
|-----------------------|----------|-------------------------|----------------------------|------------------|
| 23_SMA-50-0-1/111_NE  | 22640090 | single<br>bulk 100 pcs. | gold                       | flush dielectric |
| 23_SMA-50-0-51/199_NE | 22543948 | single                  | passivated stainless steel |                  |



| HUBER+SUHNER type     | Item no. | Packaging     | Plating body               | Notes            |
|-----------------------|----------|---------------|----------------------------|------------------|
| 23_SMA-50-0-11/111_NE | 22640095 | single        | gold                       | flush dielectric |
| 23_SMA-50-0-41/133_NE | 22543984 | single        | SUCOPLATE®                 | flush dielectric |
| 23_SMA-50-0-41/133_NH | 22644383 | bulk 100 pcs. |                            |                  |
| 23_SMA-50-0-61/199_NE | 22544796 | single        | passivated stainless steel | flush dielectric |

All highlighted types are HUBER+SUHNER ECO types.

With tab end, plug (male)

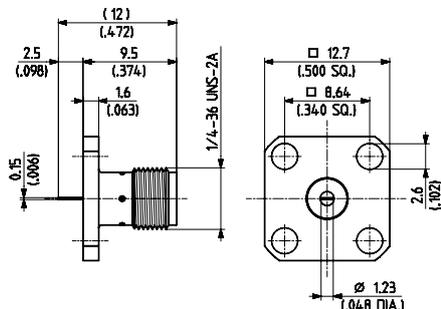


| HUBER+SUHNER type    | Item no. | Packaging | Plating body | Notes            |
|----------------------|----------|-----------|--------------|------------------|
| 13_SMA-50-0-2/111_NE | 22640056 | single    | gold         | flush dielectric |

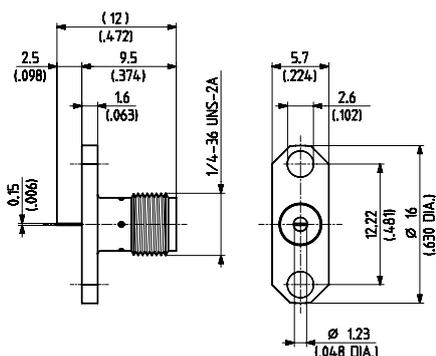
# Series SMA – receptacles

## Straight panel receptacles

With tab end, jacks (female)



| HUBER+SUHNER type     | Item no. | Packaging | Plating body               | Notes            |
|-----------------------|----------|-----------|----------------------------|------------------|
| 23_SMA-50-0-2/111_NE  | 22640091 | single    | gold                       | flush dielectric |
| 23_SMA-50-0-52/199_NE | 22543487 |           | passivated stainless steel |                  |



| HUBER+SUHNER type     | Item no. | Packaging | Plating body               | Notes            |
|-----------------------|----------|-----------|----------------------------|------------------|
| 23_SMA-50-0-12/111_NE | 22640096 | single    | gold                       | flush dielectric |
| 23_SMA-50-0-62/199_NE | 22544779 |           | passivated stainless steel |                  |

# Series SMA – receptacles

## Straight panel receptacles

With coaxial end, jacks (female)

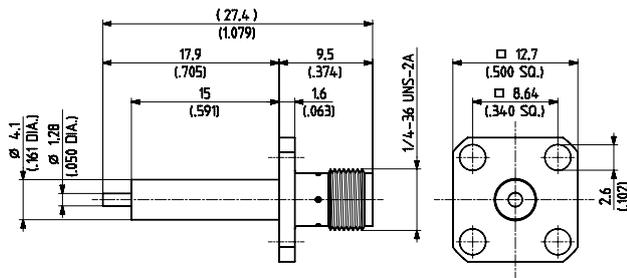


Fig. 1

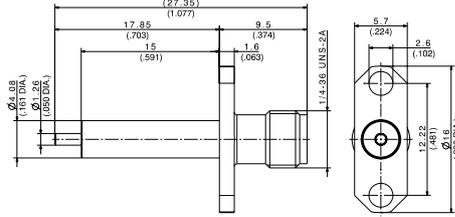


Fig. 2

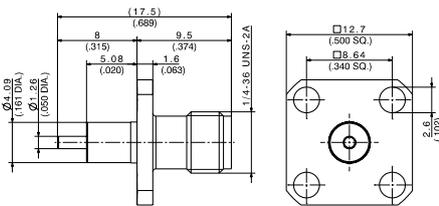


Fig. 3

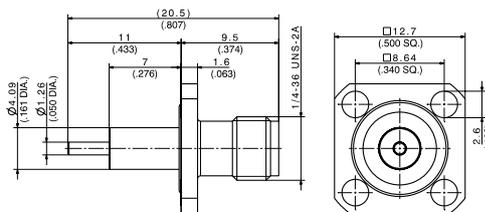


Fig. 4

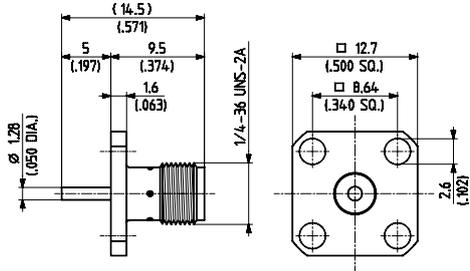
| HUBER+SUHNER type      | Item no. | Packaging     | Plating body               | Notes                                  | Fig. |
|------------------------|----------|---------------|----------------------------|--|------|
| 23_SMA-50-0-3/111_NE   | 22640092 | single        | gold                       | extended dielectric                    | 1    |
| 23_SMA-50-0-13/111_NE  | 22640097 | single        | gold                       | extended dielectric                    | 2    |
| 23_SMA-50-0-13/111_NH  | 22658873 | bulk 100 pcs. |                            |  |      |
| 23_SMA-50-0-53/199_NE  | 22641394 | single        | passivated stainless steel | extended dielectric                    | 1    |
| 23_SMA-50-0-53/199_NH  | 22649843 |               |                            |  |      |
| 23_SMA-50-0-272/133_NH | 23030310 | bulk 100 pcs  | SUCOPLATE®                 | extended dielectric                    | 3    |
| 23_SMA-50-0-324/111_NY | 84035778 | tray 100 pcs. | SUCOPRO® gold plating      | extended dielectric with panel sealing | 4    |

All highlighted types are HUBER+SUHNER ECO types.

# Series SMA – receptacles

## Straight panel receptacle

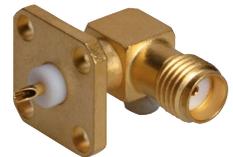
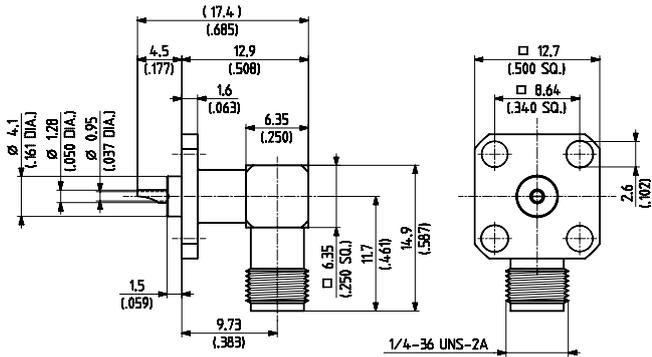
With coaxial end, jack (female)



| HUBER+SUHNER type     | Item no. | Packaging | Plating body | Notes            |
|-----------------------|----------|-----------|--------------|------------------|
| 23_SMA-50-0-21/111_NE | 22640101 | single    | gold         | flush dielectric |

## Right angle panel receptacle

With solder end, jack (female)

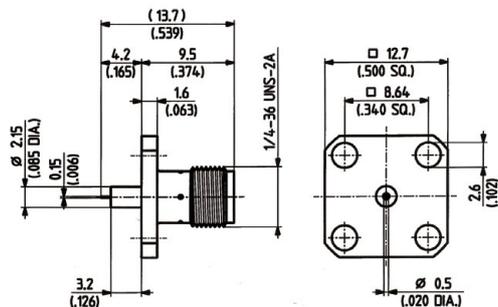


| HUBER+SUHNER type    | Item no. | Packaging | Plating body | Notes               |
|----------------------|----------|-----------|--------------|---------------------|
| 28_SMA-50-0-1/111_NE | 22641321 | single    | gold         | extended dielectric |

# Series SMA – receptacles

## 26.5 GHz – straight panel receptacle

With tab end, jack (female)



| HUBER+SUHNER type     | Item no. | Packaging | Plating body               | Mounting hole | Notes               |
|-----------------------|----------|-----------|----------------------------|---------------|---------------------|
| 23_SMA-50-0-94/199_NE | 22649049 | single    | passivated stainless steel | ML 93         | extended dielectric |

# Series SMA – PCB connectors

## Straight PCB jacks (female)

- Edge mount

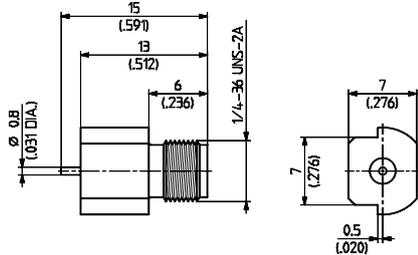


Fig. 1

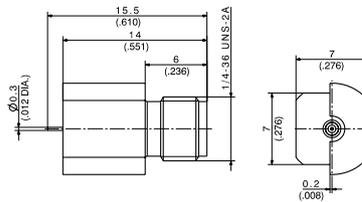


Fig. 2

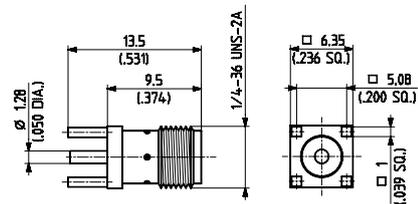


| HUBER+SUHNER type                                | Item no.             | Packaging                        | Plating body          | Mounting hole | Fig. |
|--|----------------------|----------------------------------|-----------------------|---------------|------|
| 82_SMA-S50-0-45/111_NE<br>82_SMA-S50-0-45/111_NM | 22652330<br>84037646 | single<br>tape and reel 500 pcs. | SUCOPRO® gold plating | ML 132        | 1    |
| 92_SMA-50-0-10/111_NE<br>92_SMA-50-0-10/111_NM   | 84120623<br>84036781 | single<br>tape and reel 500 pcs. | SUCOPRO® gold plating | ML 132        | 2    |

All highlighted types are HUBER+SUHNER ECO types.

## Straight PCB jacks (female)

- Without stand-off



| HUBER+SUHNER type                            | Item no.             | Packaging               | Plating body | Mounting hole |
|--|----------------------|-------------------------|--------------|---------------|
| 82_SMA-50-0-1/111_NE<br>82_SMA-50-0-1/111_NH | 22543359<br>22644334 | single<br>bulk 100 pcs. | gold         | ML 41         |
| 82_SMA-50-0-21/111_NE                        | 85201191             | single                  | gold         | ML 41         |

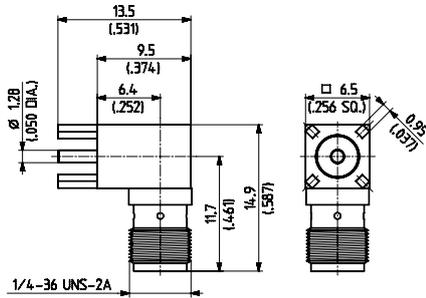


The product is lead free.

# Series SMA – PCB connectors

## Right angle PCB jacks (female)

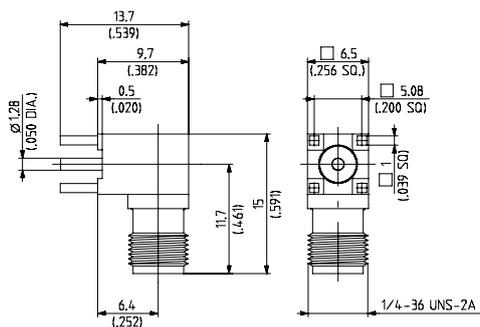
- Without stand-off



| HUBER+SUHNER type      | Item no. | Packaging     | Plating body | Mounting hole |
|------------------------|----------|---------------|--------------|---------------|
| 85_SMA-50-0-101/111_NE | 22658792 | single        | gold         | ML 41         |
| 85_SMA-50-0-101/111_NH | 22652140 | bulk 100 pcs. |              |               |
| 85_SMA-50-0-103/111_NE | 85201239 | single        | gold         | ML 41         |

The product is lead free.

- With stand-off



| HUBER+SUHNER type      | Item no. | Packaging     | Plating body | Mounting hole |
|------------------------|----------|---------------|--------------|---------------|
| 85_SMA-50-0-144/111_YH | 23000527 | bulk 100 pcs. | gold         | ML 41         |

# Series SMA – protective caps and shorts

## Caps for jacks

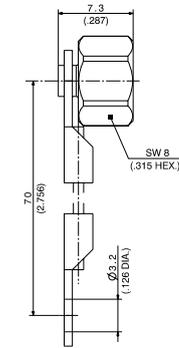
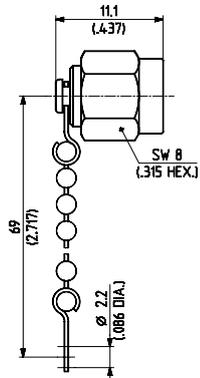


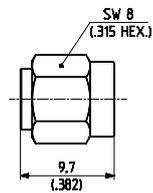
Fig. 1

Fig. 2

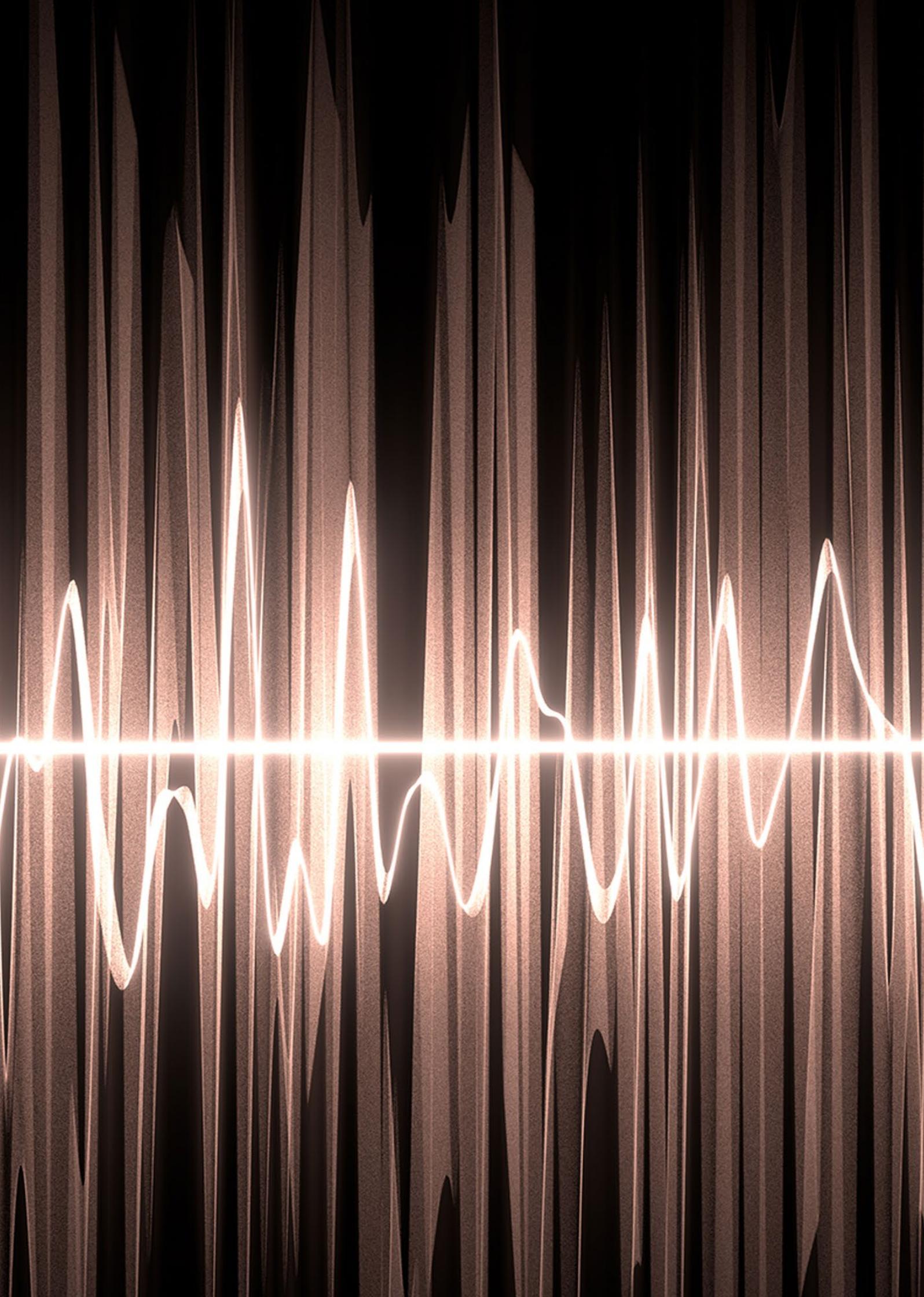
| HUBER+SUHNER type   | Item no. | Packaging | Plating body | Notes           | Fig. |
|---------------------|----------|-----------|--------------|-----------------|------|
| 62_SMA-0-0-1/-11_E  | 22640159 | single    | gold         | with chain      | 1    |
| 62_SMA-0-0-8/- -3_E | 84120887 | single    | SUCOPLATE®   | with wire, IP68 | 2    |

All highlighted types are HUBER+SUHNER ECO types.

## Shorting cap



| HUBER+SUHNER type    | Item no. | Packaging | Plating body |
|----------------------|----------|-----------|--------------|
| 64_SMA-50-0-1/111_NE | 22640161 | single    | gold         |



# Series PC 3.5 – precision subminiature connectors

## Description

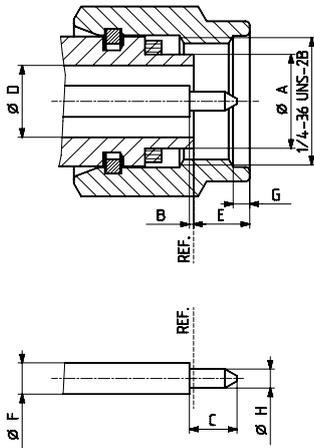
HUBER+SUHNER PC 3.5 connectors are precision connectors for use in microwave applications up to 26.5 GHz. They are especially suitable for use with semi-rigid cables and microwave components. They are intermateable with SMA and SK (2.92 mm) connectors. Due to an air dielectric interface and the more durable construction a superior repeatability further enhances the performance.

## Content

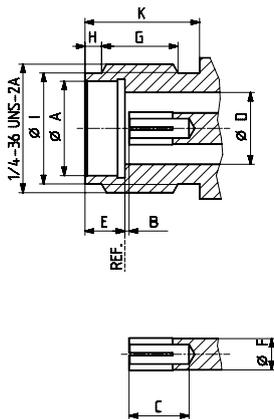
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| Description                       | 243 |
| Interface dimensions in mm/inches | 243 |
| Technical data                    | 244 |
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| Flange mount connectors           | 247 |
| Transition pins                   | 248 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug       |            | Jack       |            |
|---|------------|------------|------------|------------|
|   | min.       | max.       | min.       | max.       |
| A | 4.55/0.179 | 4.58/0.180 | 4.60/0.181 | 4.63/0.182 |
| B | 0.00/0.000 | 0.08/0.003 | 0.00/0.000 | 0.08/0.003 |
| C | 2.03/0.080 | 2.29/0.090 | 2.79/0.110 | 3.18/0.125 |
| D | 3.49/0.138 | 3.51/0.138 | 3.49/0.138 | 3.51/0.138 |
| E | 2.36/0.093 | 3.56/0.135 | 1.88/0.074 | 1.98/0.078 |
| F | 1.51/0.060 | 1.52/0.060 | 1.51/0.060 | 1.52/0.060 |
| G | 0.38/0.015 | 1.14/0.045 | 3.35/0.132 | 4.62/0.182 |
| H | 0.92/0.036 | 0.93/0.037 | 0.38/0.015 | 1.14/0.045 |
| I | –          | –          | 5.30/0.209 | 5.40/0.213 |
| K | –          | –          | 5.54/0.218 | –          |

### Interface dimensions conformable to the standards:

International: IEC 60169-23

# Series PC 3.5 – technical data

| Electrical data  | Requirements   |
|--|--|
| Impedance  | 50 $\Omega$  |
| Frequency range  | DC to 26.5 GHz   |
| Dielectric withstanding voltage (at sea level)<br>· RG 405/U<br>· RG 402/U | 750 V rms, 50 Hz<br>1000 V rms, 50 Hz  |
| Working voltage (at sea level)<br>· RG 405/U<br>· RG 402/U                 | $\leq 250$ V rms, 50 Hz<br>$\leq 335$ V rms, 50 Hz   |
| Insulation resistance  | $\geq 5 \cdot 10^3$ M $\Omega$   |
| Contact resistance<br>· Centre contact<br>· Outer contact                  | $\leq 3$ m $\Omega$<br>$\leq 2$ m $\Omega$   |
| RF leakage   | $\geq 100$ dB · f (GHz) dB   |
| VSWR (typical values)<br>· RG 405/U<br>· RG 402/U<br>· Adapters            | $\leq 1.13$ up to 26.5 GHz<br>$\leq 1.10$ up to 26.5 GHz<br>$\leq 1.08$ up to 18 GHz/ $\leq 1.15$ up to 26.5 GHz |

| Mechanical data                      | Requirements                       |
|--------------------------------------|------------------------------------|
| Coupling nut torque<br>· Recommended | 0.80 to 1.10 Nm/7.1 to 9.7 in. lbs |
| Coupling nut retention force         | $\geq 270$ N/60.7 lbs              |
| Contact captivation                  | $\geq 27$ N/6.1 lbs                |
| Cable retention force <sup>1)</sup>  | see pages 32 – 41                  |
| Durability (matings)                 | $\geq 500$                         |

| Environmental data  | Test conditions   |
|---------------------|---|
| Temperature range   | -60 to +100 C / -76 to +212 °F                              |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition D                        |
| Shock               | MIL-STD-202, method 213, condition I                        |

| Material data   |                          |            |
|-----------------|--------------------------|------------|
| Connector part  | Material                 | Plating    |
| Bodies          | stainless steel          | passivated |
| Cable entries   | brass                    | gold       |
| Centre contacts | copper-beryllium alloy   | gold       |
| Support beads   | polystyrene, crosslinked |            |
| Gaskets         | silicone rubber          |            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series PC 3.5 – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact plugged-in

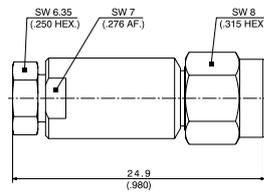
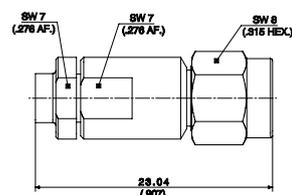
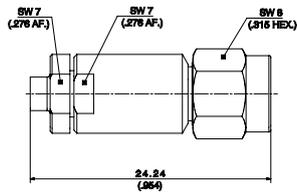


Fig. 1

Fig. 2

Fig. 3

| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|------|
| 11_PC35-50-2-4/199_UE | 84009440 | Y3, Y16 (EZ_86)       | single    | 0000215467           | 1    |
| 11_PC35-50-3-4/199_UE | 84009380 | Y5, Y12 (EZ_141)      |           | 0000215467           | 2    |
| 11_PC35-50-2-5/199_UE | 84139219 | Y11 (MULTIFLEX_86)    |           | 0000381973           | 3    |

## Straight cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact plugged-in

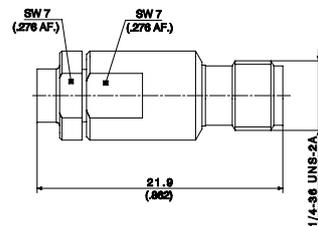
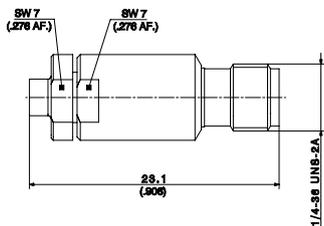


Fig. 1

Fig. 2

| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|------|
| 21_PC35-50-2-4/199_UE | 84009419 | Y3, Y16 (EZ_86)       | single    | 0000215467           | 1    |
| 21_PC35-50-3-3/199_UE | 84009382 | Y5, Y12 (EZ_141)      |           | 0000215467           | 2    |

# Series PC 3.5 – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Bulkhead mounted
- Cable entry soldered
- Centre contact plugged-in
- With panel seal

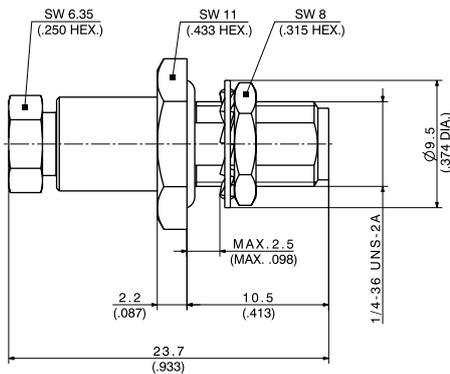


Fig. 1

| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 24_PC35-50-2-3/19-_UE | 84023357 | Y3, Y16 (EZ_86)       | single    | 0000238568           | ML 35         | 1    |

# Series PC 3.5 – flange mount connectors

## Flange mount, jacks (female)

- Panel mounted

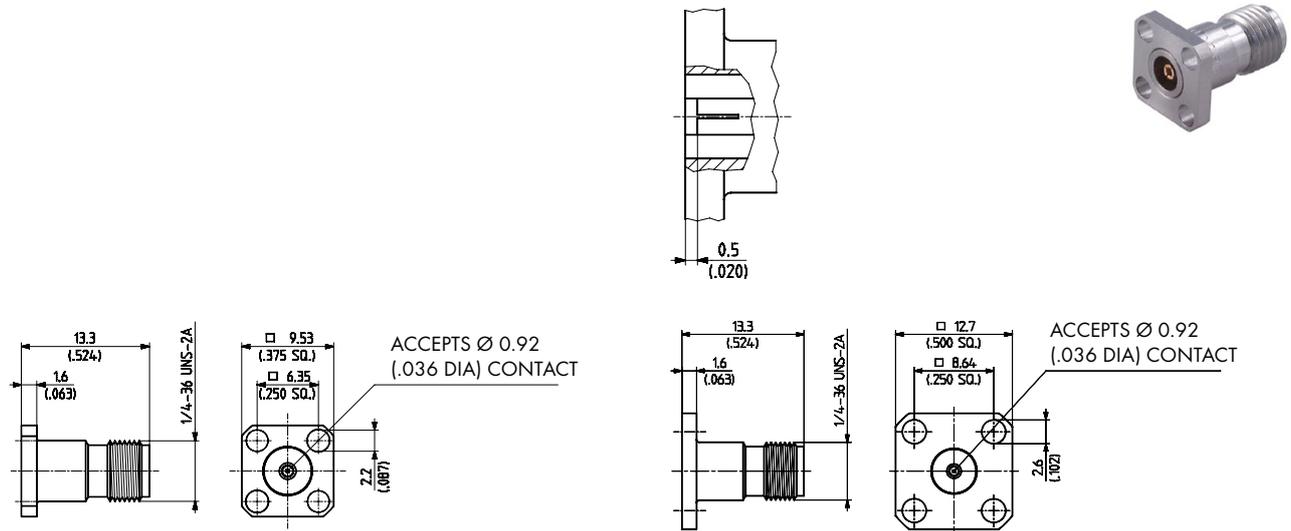


Fig. 1

Fig. 2

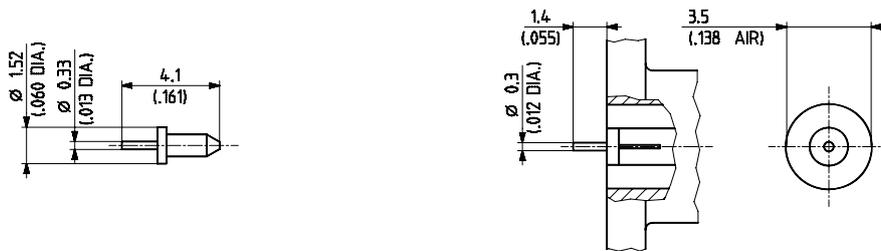
| HUBER+SUHNER type      | Item no. | Packaging | Flange type | Fig. |
|------------------------|----------|-----------|-------------|------|
| 23_PC35-50-0-51/199_UE | 22644918 | single    | square      | 1    |
| 23_PC35-50-0-53/199_UE | 22644910 |           |             | 2    |

# Series PC 3.5 – transition pins

## Transition pins

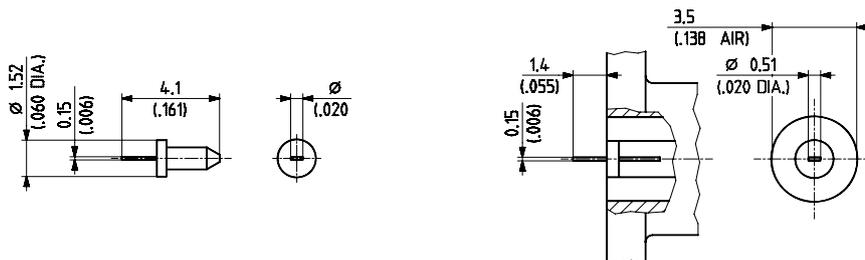
for PC 3.5 connectors with interchangeable contact pins

### Pin contact



| HUBER+SUHNER type | Item no. | Packaging | Plating |
|-------------------|----------|-----------|---------|
| 73_Z-0-0-168      | 22644927 | 10 pins   | gold    |

### Tab contact



| HUBER+SUHNER type | Item no. | Packaging | Plating |
|-------------------|----------|-----------|---------|
| 73_Z-0-0-169      | 22644931 | 10 pins   | gold    |

# Series SK (2.92 mm standard) – prec. submini. connectors

## Description

HUBER+SUHNER SK connectors are precision connectors for microwave applications up to 40 GHz.

They are intermateable with series SMA and PC 3.5. They have a high mechanical stability and an excellent repeatability. The shortened male pin ensures a non-destructive mating process. The glass beads, when used in conjunction with the SK launchers, enable the connectors to be replaced without disturbing the hermetic seal.

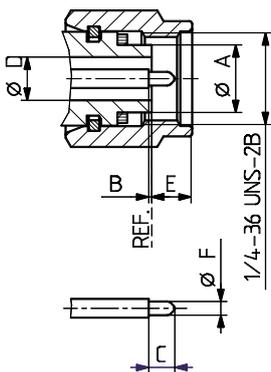
For a mechanical decoupling between glass bead and internal microwave circuit, stress relief contacts are available.

## Content

|                                   |     |
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| Accessories                       | 253 |

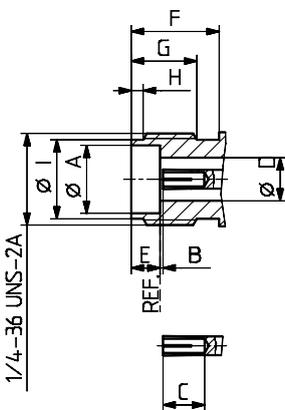
## Interface dimensions (mm/inches)

### Plug (male)



|   | Plug       |            | Jack       |            |
|---|------------|------------|------------|------------|
|   | min.       | max.       | min.       | max.       |
| A | 4.53/0.178 | 4.57/0.180 | 4.60/0.181 | 4.64/0.183 |
| B | 0.00/0.000 | 0.13/0.005 | 0.00/0.000 | 0.13/0.005 |
| C | 1.55/0.061 | 1.65/0.065 | 2.80/0.110 | –          |
| D | 2.89/0.114 | 2.95/0.116 | 2.89/0.114 | 2.95/0.116 |
| E | –          | 3.28/0.129 | 1.88/0.074 | 1.98/0.078 |
| F | 0.91/0.036 | 0.94/0.037 | 5.90/0.232 | –          |
| G | –          | –          | 4.40/0.173 | –          |
| H | –          | –          | 0.70/0.028 | 0.90/0.036 |
| I | –          | –          | 5.30/0.208 | 5.40/0.213 |

### Jack (female)



# Series SK (2.92 mm standard) – technical data

| Electrical data   | Requirements   |
|---|--|
| Impedance   | 50 $\Omega$  |
| Frequency range   | DC to 40 GHz   |
| Dielectric withstanding voltage (at sea level)  | 750 V rms, 50 Hz                                     |
| Working voltage (at sea level) mated/unmated  | $\leq$ 250 V rms, 50 Hz                              |
| Insulation resistance   | $\geq 5 \cdot 10^5$ M $\Omega$                       |
| Contact resistance<br>· Centre contact<br>· Outer contact                                     | $\leq 3$ m $\Omega$<br>$\leq 2$ m $\Omega$           |
| VSWR (typical values)<br>· Cable connectors (cable assembly with 2 connectors)<br>· Launchers | $\leq 1.37$ DC to 40 GHz<br>$\leq 1.43$ DC to 40 GHz |

| Mechanical data                    | Requirements         |
|------------------------------------|----------------------|
| Coupling nut torque<br>Recommended | 1.30 Nm/11.47 in lbs |
| Contact captivation                | $\geq 27$ N/4.9 lbs  |
| Durability (matings)               | $\geq 500$           |

| Environmental data | Requirements                         |
|--------------------|--------------------------------------|
| Temperature range  | -40 to +125 °C/-40 to +257 °F        |
| Thermal shock      | MIL-STD-202, method 107, condition B |
| Vibration          | MIL-STD-202, method 204, condition D |

| Material data                                   |  |                         |
|---|--|-------------------------|
| Connector parts                                 | Material   | Plating                 |
| Bodies, cable connectors<br>Bodies, receptacles | copper beryllium alloy/stainless steel<br>stainless steel/copper alloy | gold<br>passivated/gold |
| Centre contacts                                 | copper beryllium alloy   | gold                    |
| Support beads                                   | PPO (polyphenylene oxide)  |                         |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series SK (2.92 mm standard) – cable connectors

## Straight cable plugs (male)

For semi-rigid cables

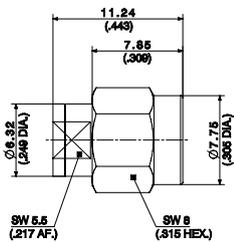


Fig. 1

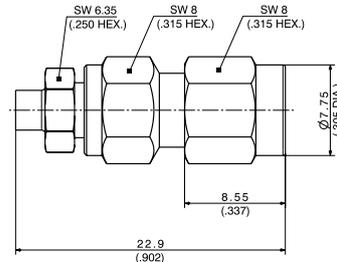


Fig. 2



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction | Fig. | Notes |
|----------------------|----------|-----------------------|-----------|----------------------|------|-------|
| 11_SK-50-2-56/119_NE | 84013230 | Y16 (EZ_86)           | single    | 27445                | 1    | plug  |
| 11_SK-50-2-60/199_NE | 84098644 | Y11 (MULTIFLEX_86)    |           | 0000331903           | 2    | plug  |

## Straight cable jacks (female)

For semi-rigid cables

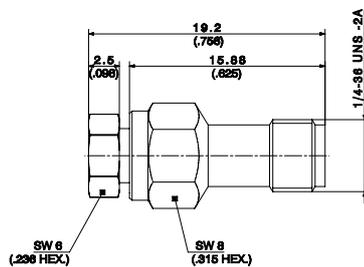


Fig. 1

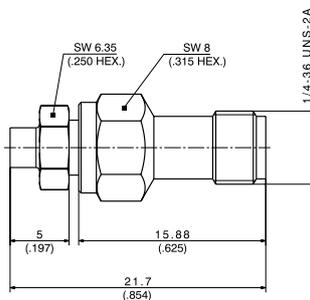


Fig. 2



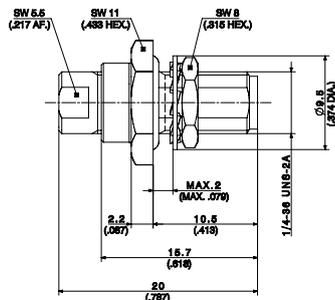
| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction | Fig. | Notes |
|----------------------|----------|-----------------------|-----------|----------------------|------|-------|
| 21_SK-50-2-58/199_NE | 84019664 | Y16 (EZ_86)           | single    | 0000234990           | 1    | jack  |
| 21_SK-50-2-61/199_NE | 84094378 | Y11 (MULTIFLEX_86)    |           | 0000326138           | 2    | jack  |

# Series SK (2.92 mm standard) – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- with panel seal



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|----------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 24_SK-50-2-55/1--_NE | 84016419 | Y10 (EZ_118-TP)       | single    | 0000229976           | ML 35         | 1    |

# Series SK (2.92 mm standard) – launchers

## „Spark plug“ launchers

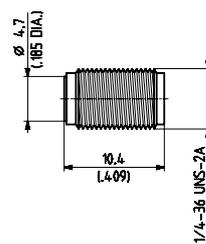
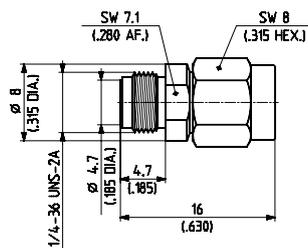


Fig. 1

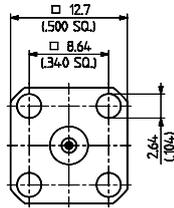
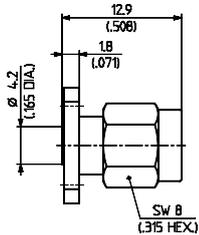
Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Suitable glass-bead        | Fig. |
|----------------------|----------|-----------|---------------|----------------------------|------|
| 12_SK-50-0-51/199_NE | 22645974 | single    | ML 75         | 73_Z-0-0-203 <sup>1)</sup> | 1    |
| 22_SK-50-0-51/199_NE | 22645975 | single    | ML 75         | 73_Z-0-0-203 <sup>1)</sup> | 2    |

<sup>1)</sup> For fixing hermetic seal while soldering, fixture 74\_Z-0-0-226 is recommended, see page 545.

# Series SK (2.92 mm standard) – launchers

## Panel launchers (male)



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Suitable glass-bead | Fig. |
|----------------------|----------|-----------|---------------|---------------------|------|
| 13_SK-50-0-51/199_NE | 22645978 | single    | ML 77         | 73_Z-0-0-203 1)     | 1    |

1) For fixing hermetic seal while soldering, fixture 74\_Z-0-0-227 is recommended, see page 545.

## Panel launchers (male)

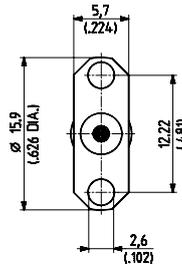
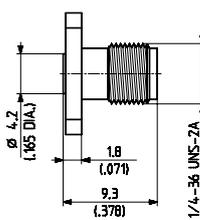
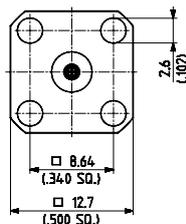
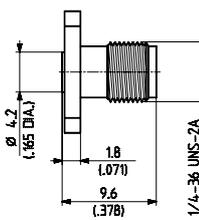


Fig. 1

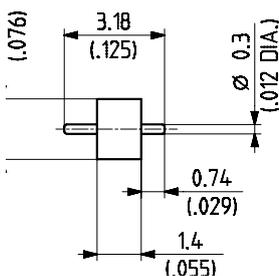
Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Suitable glass-bead | Fig. |
|----------------------|----------|-----------|---------------|---------------------|------|
| 23_SK-50-0-51/199_NE | 22645979 | single    | ML 77         | 73_Z-0-0-203 1)     | 1    |
| 23_SK-50-0-52/199_NE | 22645977 | single    | ML 78         | 73_Z-0-0-203 1)     | 2    |

1) For fixing hermetic seal while soldering, fixture 74\_Z-0-0-227 is recommended, see page 545.

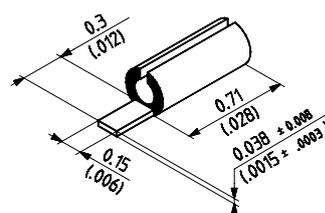
# Series SK (2.92 mm) – accessories

Glass bead for 12 SK, 13 SK, 22 SK, 23 SK launchers  
(package with 1 piece)

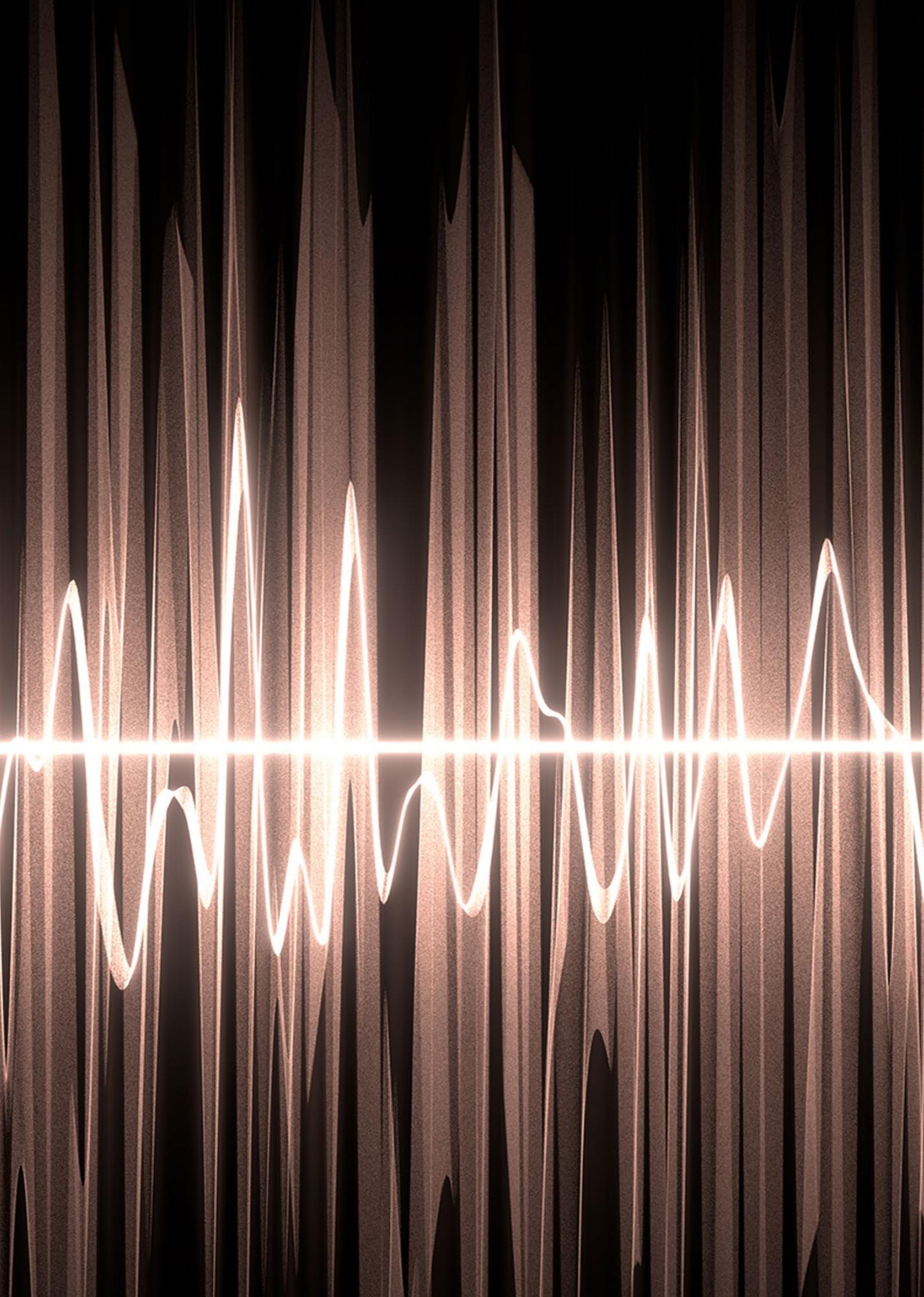


HUBER+SUHNER type  
73\_Z-0-0-203/11-\_E  
Item no. 22645983

Microstrip stress relief contacts  
(package with 100 pieces)



HUBER+SUHNER type  
73\_Z-0-0-204/1--\_NH  
Item no. 22645980



# Series PC 1.85 – precision subminiature connectors

## Description

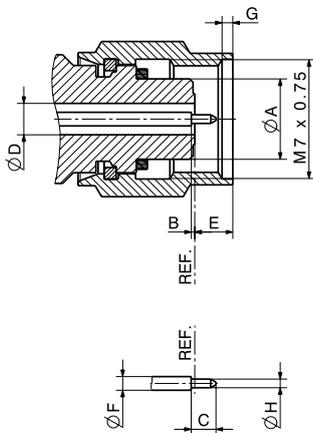
HUBER+SUHNER PC 1.85 connectors are precision connectors for use in microwave applications up to 67 GHz. The connectors features best electrical performance, excellent mechanical stability as well as extreme reliability. They are particularly well suited for semi-rigid, semi-flexible and flexible microwave cables. PC 1.85 is intermateable with PC 2.4.

## Content

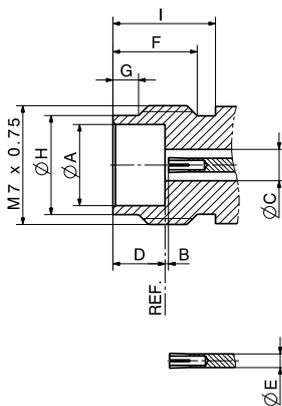
|                                   |     |
|-----------------------------------|-----|
| Description                       | 255 |
| Interface dimensions in mm/inches | 255 |
| Technical data                    | 256 |
| Cable connectors                  | 257 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug          |               | Jack         |              |
|---|---------------|---------------|--------------|--------------|
|   | min.          | max.          | min.         | max.         |
| A | 4.725/0.186   | 4.75/0.187    | 4.77/0.1878  | 4.795/0.1888 |
| B | 0.00/0.00     | 0.08/0.003    | 0.00/0.00    | 0.08/0.003   |
| C | 1.34/0.053    | 1.44/0.057    | 1.84/0.07233 | 1.86/0.07333 |
| D | 1.838/0.07233 | 1.862/0.07333 | 3.00/0.118   | 3.10/0.122   |
| E | 1.85/0.073    | 2.45/0.096    | 0.791/0.0311 | 0.816/0.0321 |
| F | 0.791/0.0311  | 0.816/0.0321  | 4.80/0.189   | 5.06/0.199   |
| G | 0.5/0.02      | 0.76/0.03     | 1.37/0.054   | 1.63/0.064   |
| H | 0.498/0.0196  | 0.523/0.0206  | 5.79/0.228   | 5.89/0.232   |
| I | –             | –             | 6.00/0.236   | –            |

### Interface dimensions conformable to the standards:

International: IEC 60169-32

# Series PC 1.85 – technical data

| Electrical data   | Requirements  |
|---|---|
| Impedance   | 50 $\Omega$   |
| Frequency range   | DC to 67 GHz  |
| Dielectric withstanding voltage (at sea level)  | 500 V rms, 50 Hz  |
| Working voltage (at sea level)  | 150 V rms, 50 Hz  |
| Insulation resistance   | $\geq 5 \cdot 10^5$ M $\Omega$  |
| Contact resistance<br>· Centre contact<br>· Outer contact   | $\leq 4$ m $\Omega$<br>$\leq 2.5$ m $\Omega$  |
| Return loss (typical values cable assemblies)<br>· Multiflex 86 HE<br>· Semi-rigid 86 (SR_86_LA)<br>· Sucoform 86 | $\leq 16$ dB up to 67 GHz<br>$\leq 15$ dB up to 67 GHz<br>$\leq 15$ dB up to 67 GHz |

| Mechanical data                      | Requirements                    |
|--------------------------------------|---------------------------------|
| Coupling nut torque<br>· Recommended | 0.8 to 1.1 Nm/7.1 to 9.7 in lbs |
| Contact captivation                  | $\geq 20$ N /4.5 lbs            |
| Durability (matings)                 | $\geq 500$                      |

| Environmental data     | Test conditions               |
|------------------------|-------------------------------|
| Temperature range      | -55 to +155 °C/-67 to +311 °F |
| Thermal shock          | IEC 60068-2-14                |
| Damp heat steady state | IEC 60068-2-78                |
| Vibration              | IEC 60068-2-6                 |
| Shock                  | IEC 60068-2-27                |

| Material data  |                        |                       |
|----------------|------------------------|-----------------------|
| Connector part | Material               | Plating               |
| Body/nut       | stainless steel        |                       |
| Cable entry    | BZ4                    | SUCOPRO®/gold plating |
| Centre contact | copper beryllium alloy | SUCOPRO®/gold plating |
| Support bead   | LCP                    |                       |
| Gaskets        | silicone rubber        |                       |

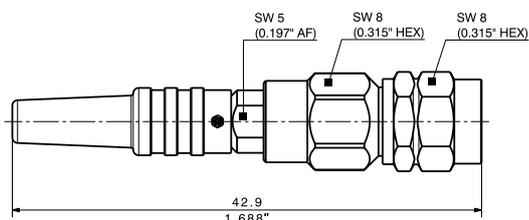
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series PC 1.85 – cable connectors

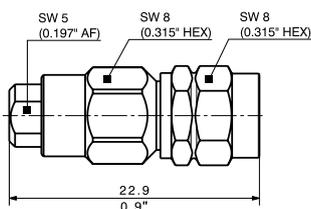
## Straight cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

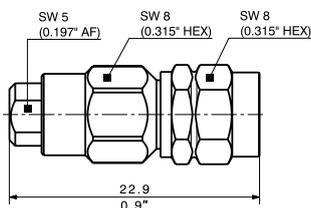
- Cable entry soldered
- Centre contact plugged-in



| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 11_PC185-50-2-4/19-_NE | 84144282 | Y11 (MULTIFLEX_86_HE) | single    | 0000373606           |



| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 11_PC185-50-2-5/19-_NE | 84152948 | U99 (SR_86_LA)        | single    | 0000373655           |



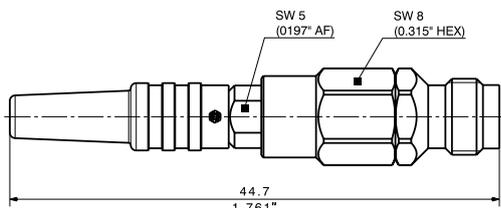
| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 11_PC185-50-2-6/19-_NE | 85001960 | Y16 (SUCOFORM_86)     | single    | 0000388588           |

# Series PC 1.85 – cable connectors

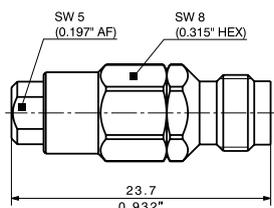
## Straight cable jacks (female)

### For semi-rigid, Sucoform and Multiflex cables

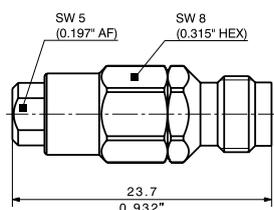
- Cable entry soldered
- Centre contact plugged-in



| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 21_PC185-50-2-4/19-_NE | 84144175 | Y11 (MULTIFLEX_86_HE) | single    | 0000397321           |



| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 21_PC185-50-2-5/19-_NE | 85001993 | U99 (SR_86_LA)        | single    | 0000397354           |



| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction |
|------------------------|----------|-----------------------|-----------|----------------------|
| 21_PC185-50-2-6/19-_NE | 85002004 | Y16 (SUCOFORM_86)     | single    | 0000397358           |

# Series 1.0/2.3 inserts according to DIN 41626/2

## Description

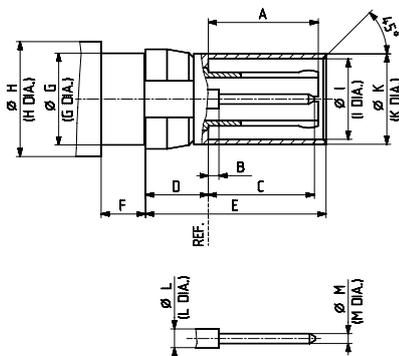
HUBER+SUHNER coaxial "inserts" 1.0/2.3 are suitable for the insertion of mixed layout connectors DIN 41612 (pattern M). These inserts feature a slide-on coupling mechanism, which ensures a short connect-disconnect time. Impedance accuracy, fast and easy assembly as well as high reproducibility due to the full crimp cable entry are typical characteristics of these HUBER+SUHNER connectors. The 1.0/2.3 inserts are suitable for applications up to 4 GHz.

## Contents

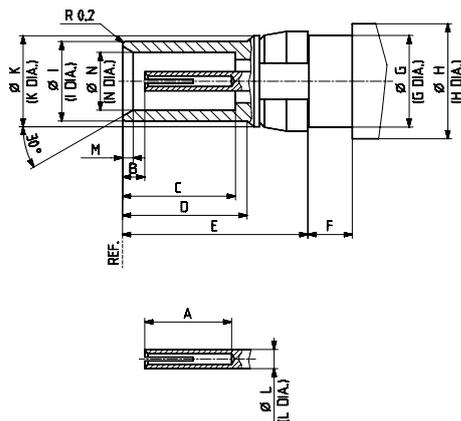
|                                   |     |
|-----------------------------------|-----|
| Description                       | 259 |
| Interface dimensions in mm/inches | 259 |
| Technical data                    | 260 |
| Cable connectors                  | 262 |
| PCB connectors                    | 263 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug            |            | Jack            |            |
|---|-----------------|------------|-----------------|------------|
|   | min.            | max.       | min.            | max.       |
| A | 5.40/0.213      | 5.70/0.224 | 4.50/0.177      | –          |
| B | –               | 1.15/0.045 | 1.15/0.045      | 1.45/0.057 |
| C | 5.20/0.205      | 5.50/0.217 | 5.80/0.228      | 5.90/0.232 |
| D | 3.05/0.120      | 3.20/0.126 | 6.40/0.252      | 6.50/0.256 |
| E | 9.25/0.364      | 9.35/0.368 | 9.50/0.374      | 9.60/0.378 |
| F | 2.22/0.087      | 2.40/0.094 | 2.22/0.087      | 2.40/0.094 |
| G | 4.76/0.187      | 4.79/0.189 | 4.76/0.187      | 4.79/0.189 |
| H | –               | 6.00/0.236 | –               | 6.00/0.236 |
| I | 4.20/0.165      | 4.28/0.169 | 4.03/0.159      | 4.15/0.163 |
| K | 4.66/0.183      | 4.78/0.188 | 4.72/0.186      | 4.75/0.187 |
| L | 1.00/0.039 nom. |            | 1.00/0.039 nom. |            |
| M | 0.48/0.019      | 0.52/0.020 | 0.50/0.020      | 0.60/0.024 |
| N | –               | –          | 3.00/0.118      | 3.06/0.120 |

### Interface dimensions conformable to the standards:

Germany: DIN 41626/2

# Series 1.0/2.3 – technical data

| Electrical data                                | Requirements                          |
|--|---------------------------------------|
| Impedance                                      | 50 $\Omega$                           |
| Frequency range (GHz)                          | DC to 4                               |
| Dielectric withstanding voltage (at sea level) | 750 V rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)                 | 250 V rms, 50 Hz (depending on cable) |
| Insulation resistance                          | $\geq 200 \text{ M}\Omega$            |
| Contact resistance                             |                                       |
| · Centre conductor                             | $\leq 10 \text{ m}\Omega$             |
| · Outer conductor                              | $\leq 3 \text{ m}\Omega$              |

| Mechanical data                     | Requirements                        |
|-------------------------------------|-------------------------------------|
| Engagement force                    | $\leq 10 \text{ N}/2.3 \text{ lbs}$ |
| Disengagement force                 | $\leq 10 \text{ N}/2.3 \text{ lbs}$ |
| Contact captivation                 | $\geq 10 \text{ N}$                 |
| Cable retention force <sup>1)</sup> | see pages 32 – 41                   |
| Durability (matings)                | $\geq 500$                          |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | $-55$ to $+125 \text{ }^\circ\text{C}/-67$ to $+257 \text{ }^\circ\text{F}$ |
| Climatic category   | IEC $\rightarrow$ 50/125/56   |
| Moisture resistance | MIL-STD-202, method 106   |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B                 |
| Vibration           | MIL-STD-202, method 204, condition A  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

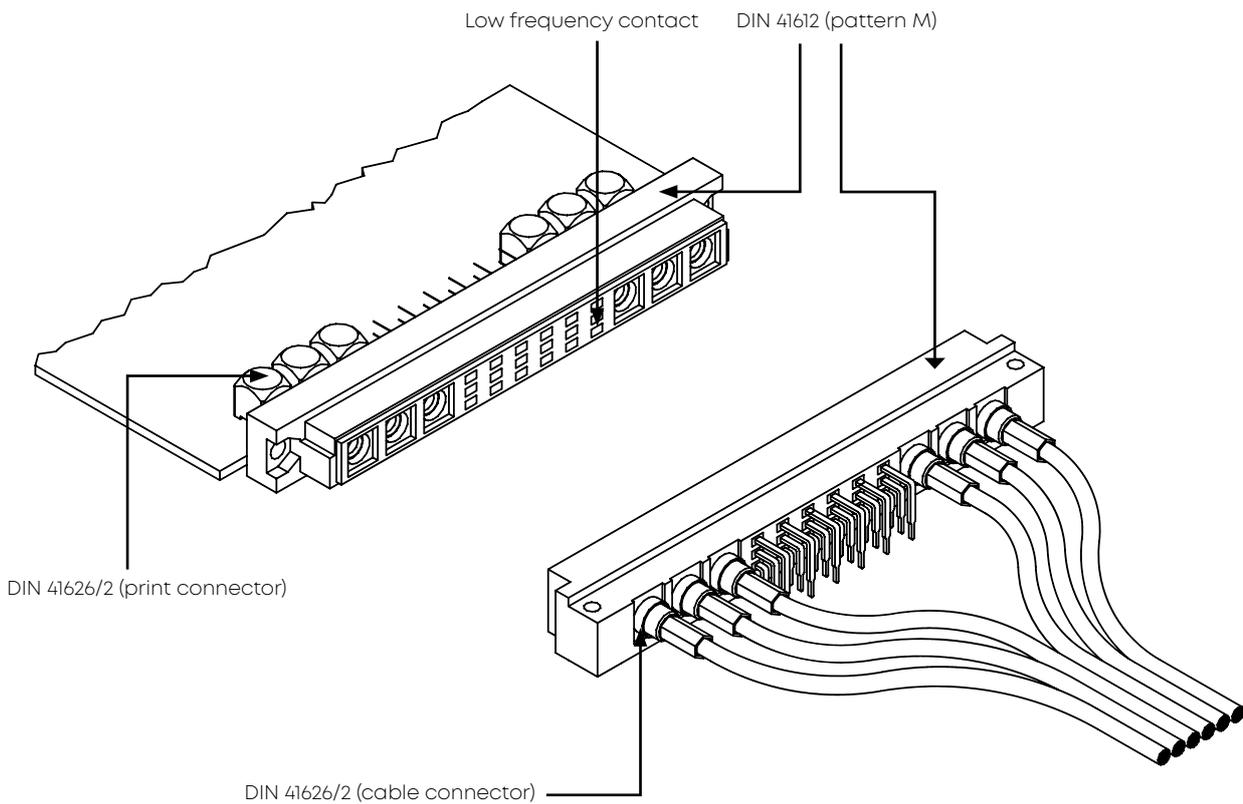
<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series 1.0/2.3 – technical data

| Material data   |                               |                            |
|-----------------|-------------------------------|----------------------------|
| Connector part  | Material                      | Plating                    |
| Bodies          | brass                         | gold/SUCOPRO® gold plating |
| Outer contacts  | copper-beryllium alloy, brass | gold/SUCOPRO® gold plating |
| Pin contacts    | brass                         | gold/SUCOPRO® gold plating |
| Socket contacts | copper-beryllium alloy        | gold/SUCOPRO® gold plating |
| Crimp ferrules  | copper                        | gold/SUCOPRO® gold plating |
| Insulators      | PTFE or PFA                   |                            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

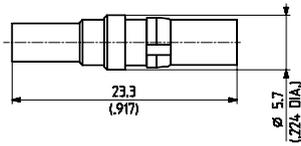
## Typical application



# Series 1.0/2.3 – cable connectors

## Straight cable plugs (male)

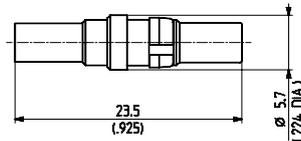
- HUBER+SUHNER full crimp
- Removal tool see page 546



| HUBER+SUHNER type                                | Item no.             | Cable group (example)            | Packaging               | Assembly instruction | Crimp insert | Plating                           |
|--|----------------------|----------------------------------|-------------------------|----------------------|--------------|-----------------------------------|
| 11_1023-C50-2-2/111_NE-1 <sup>1)</sup>           | 84148590             | U4 (K_02252_D, ENVIROFLEX_316_D) | single                  | 9191                 | 1 A          | SUCOPRO <sup>®</sup> gold plating |
| 11_1023-C50-2-2/111_NE<br>11_1023-C50-2-2/111_NH | 22648559<br>22649631 |                                  | single<br>bulk 100 pcs. |                      |              | gold                              |
| 11_1023-C50-2-3/111_NE<br>11_1023-C50-2-3/111_NH | 22648780<br>22649007 | U2 (RG_316_/U, ENVIROFLEX_316)   | single<br>bulk 100 pcs. |                      |              | gold                              |

## Straight cable jacks (female)

- HUBER+SUHNER full crimp
- Removal tool see page 546

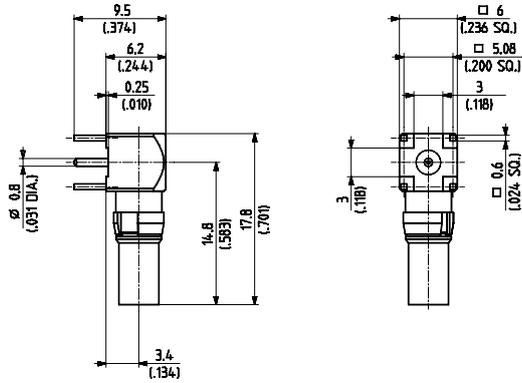


| HUBER+SUHNER type      | Item no. | Cable group (example)            | Packaging | Assembly instruction | Crimp insert | Plating |
|------------------------|----------|----------------------------------|-----------|----------------------|--------------|---------|
| 21_1023-C50-2-2/111_NE | 22648560 | U4 (K_02252_D, ENVIROFLEX_316_D) | single    | 9191                 | 1 A          | gold    |
| 21_1023-C50-2-3/111_NE | 22648790 | U2 (RG_316_/U, ENVIROFLEX_316)   |           |                      |              | gold    |

# Series 1.0/2.3 – PCB connectors

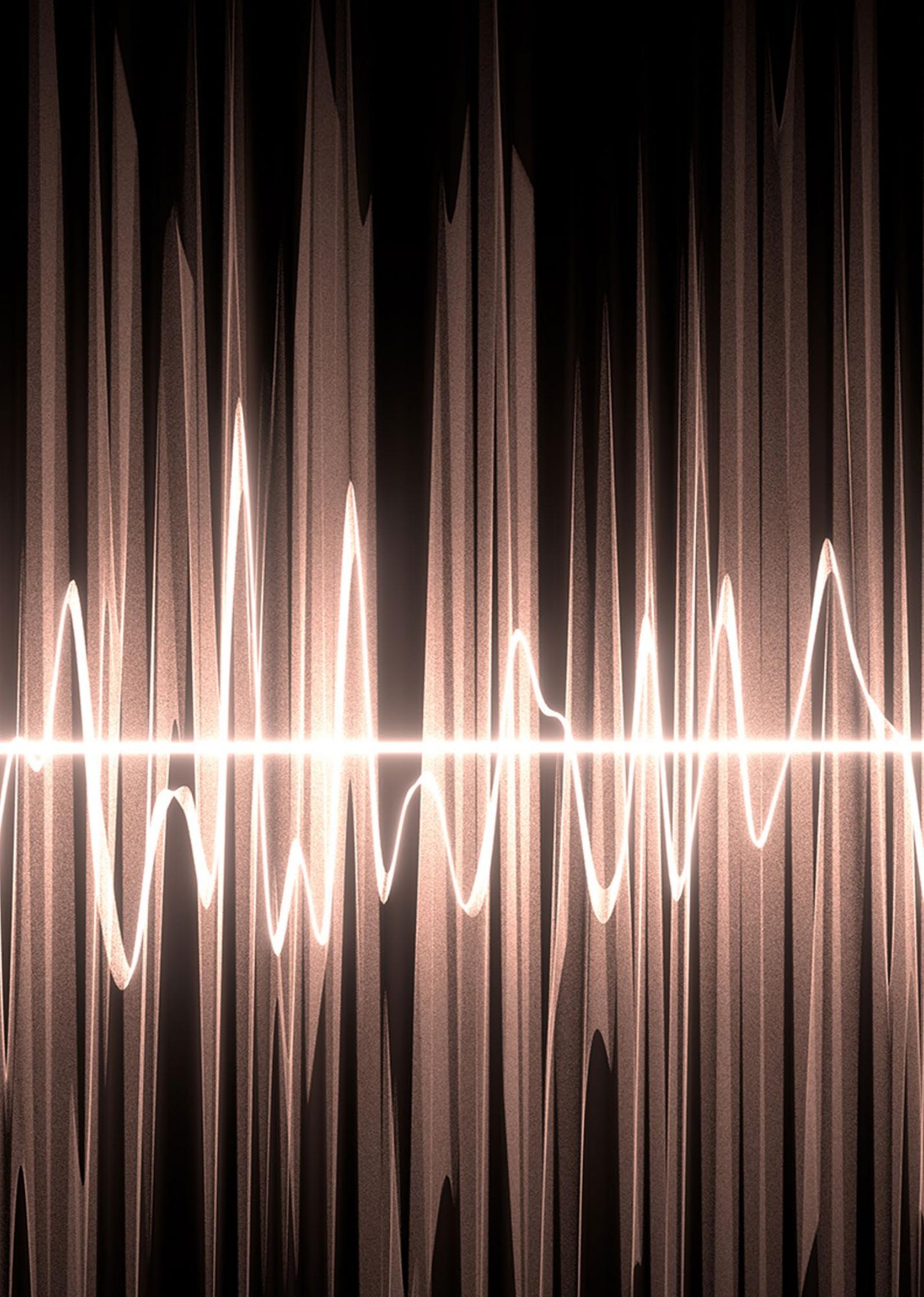
## Right angle PCB jacks (female)

- Removal tool see page 546



| HUBER+SUHNER type      | Item no. | Packaging | Mounting hole | Plating |
|------------------------|----------|-----------|---------------|---------|
| 85_1023-C50-0-1/111_NE | 22648561 | single    | ML 15         | gold    |

<sup>1)</sup> Preferred type



# Series QLA 00 – subminiature coaxial connectors

## Description

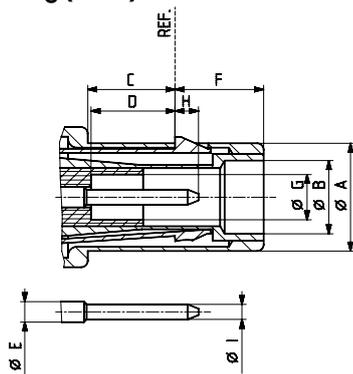
The QLA 00 series contains connectors with a quick latch coupling mechanism: connection is achieved by simply pushing the plug into the jack. Three latching springs automatically engage, thereby securing the mated connectors against axial forces. No twisting action is required. The connectors are easily released by slightly pulling back the outer sleeve of the plug. This coupling mechanism provides a fast and reliable connection for applications up to 1.4 GHz.

## Compatibility

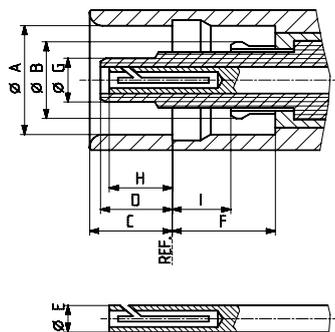
All connectors of the series QLA 00 are without any restrictions intermateable with Lemo series 00.250.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Content

|                                   |     |
|-----------------------------------|-----|
| Description                       | 265 |
| Compatibility                     | 265 |
| Interface dimensions in mm/inches | 265 |
| Technical data                    | 266 |
| Cable connectors                  | 267 |
| Receptacles with solder end       | 269 |
| PCB connectors                    | 270 |

|   | Plug            |            | Jack                     |                          |
|---|-----------------|------------|--------------------------|--------------------------|
|   | min.            | max.       | min.                     | max.                     |
| A | 4.96/0.195      | 5.03/0.198 | 5.05/0.199               | 5.11/0.201               |
| B | 3.38/0.133      | 3.44/0.135 | 3.50/0.138 <sup>1)</sup> | 3.55/0.140 <sup>1)</sup> |
| C | 3.93/0.155      | 4.08/0.161 | 3.73/0.147               | 3.86/0.152               |
| D | 3.55/0.140      | –          | –                        | 3.48/0.137               |
| E | 0.95/0.037 nom. |            | 1.24/0.049 nom.          |                          |
| F | 4.00/0.157      | 4.16/0.164 | 4.23/0.167               | 4.88/0.192               |
| G | 2.10/0.830      | 2.16/0.085 | 1.95/0.077               | 2.03/0.080               |
| H | –               | 1.32/0.052 | –                        | 3.30/0.130               |
| I | 0.69/0.027      | 0.72/0.028 | 2.35/0.093               | 2.90/0.114               |

### Interface dimensions conformable to the standards:

NIM-CAMAC-Standard CD/N549

<sup>1)</sup> Prior to slotting

# Series QLA 00 – technical data

| Electrical data  | Requirements              |
|--|---------------------------|
| Impedance  | 50 $\Omega$               |
| Frequency range  | DC to 1.4 GHz             |
| Dielectric withstanding voltage (at sea level)           | 1.5 kV, 50 Hz             |
| Working voltage (at sea level)                           |                           |
| Unmated  | $\leq 300$ V rms, 50 Hz   |
| Mated  | $\leq 500$ V rms, 50 Hz   |
| Insulation resistance                                    | $\geq 10^6$ M $\Omega$    |
| Contact resistance                                       |                           |
| · Centre contact   | $\leq 4$ m $\Omega$       |
| · Outer contact  | $\leq 2$ m $\Omega$       |
| VSWR   | DC to 300 MHz = 1.15      |
| typical value for mated connector pair: 11_QLA to 21_QLA | 300 MHz to 1.4 GHz = 1.20 |
| RF leakage (measured at 500 MHz)                         | $\geq 80$ dB              |

| Mechanical data                     | Requirements        |
|-------------------------------------|---------------------|
| Engagement force                    | typ. 2 N/0.45 lbs   |
| Disengagement force                 | typ. 5 N/1.1 lbs    |
| Contact captivation                 | $\geq 20$ N/4.5 lbs |
| Cable retention force <sup>1)</sup> | see pages 32 – 41   |
| Durability (matings)                | $\geq 10\,000$      |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | -55 to +150 °C / -67 to +302 °F                             |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition D                        |
| Shock               | MIL-STD-202, method 213, condition I                        |

| Material data   |                        |                            |
|-----------------|------------------------|----------------------------|
| Connector parts | Material               | Plating                    |
| Bodies          | brass, annealed        | nickel                     |
| Pin contacts    | brass, annealed        | gold/SUCOPRO® gold plating |
| Socket contacts | copper-beryllium alloy | gold/SUCOPRO® gold plating |
| Crimp ferrules  | copper                 | SUCOPLATE®                 |
| Insulators      | PTFE or PFA            |                            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

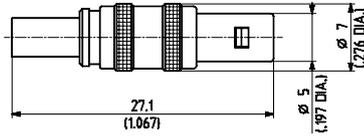
<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series QLA 00 – cable connectors

## Straight cable plugs (male)

### For flexible cables

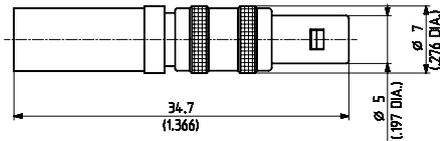
- HUBER+SUHNER full crimp



| HUBER+SUHNER type     | Item no. | Cable group (example)            | Packaging     | Assembly instruction | Crimp insert |
|-----------------------|----------|----------------------------------|---------------|----------------------|--------------|
| 11_QLA-01-1-8/122_NE  | 22641146 | U1 (RG_178_B/U, ENVIROFLEX_178)  | single        | 9007                 | 1 A          |
| 11_QLA-01-2-8/122_NE  | 22544043 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        |                      |              |
| 11_QLA-01-2-8/122_NH  | 22544042 |                                  | bulk 100 pcs. |                      |              |
| 11_QLA-01-2-9/122_NH  | 22648228 | U4 (K_02252_D, ENVIROFLEX_316_D) | bulk 100 pcs. |                      |              |
| 11_QLA-01-2-13/122_NH | 22644547 | U3 (G_01130_HT)                  | bulk 100 pcs. | 27020                |              |

### For flexible cables

- HUBER+SUHNER full crimp



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|---------------------------------|-----------|----------------------|--------------|
| 11_QLA-01-3-1/122_NE | 22641313 | U7 (RG_58_C/U, ENVIROFLEX_B58)  | single    | 3015                 | 2 B          |
| 11_QLA-01-3-2/122_NE | 22643326 | U9 (RG_223_/U, ENVIROFLEX_B223) |           |                      |              |

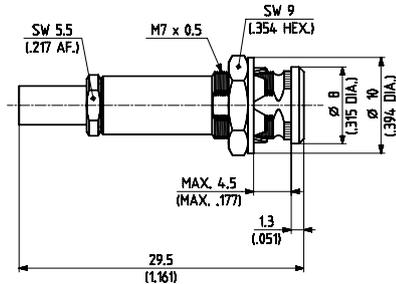


# Series QLA 00 – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry crimp
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)          | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|--------------------------------|-----------|----------------------|---------------|--------------|
| 24_QLA-01-2-1/112_NE | 22640026 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 3089                 | ML 99         | A            |

# Series QLA 00 – receptacles with solder end

## Receptacles, jacks (female)

- Bulkhead mounted

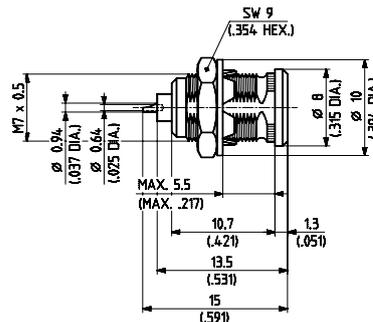
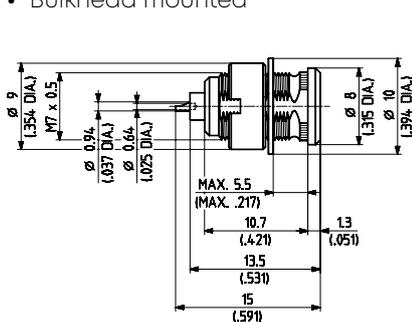


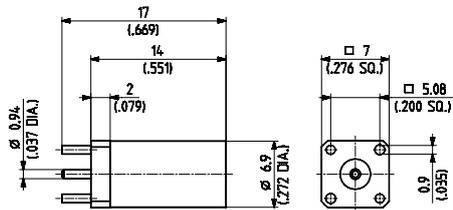
Fig. 1

Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging            | Mounting hole | Fig. | Notes                  |
|----------------------|----------|----------------------|---------------|------|------------------------|
| 22_QLA-01-0-1/112_NH | 22646308 | single bulk 100 pcs. | ML 23         | 1    |                        |
| 22_QLA-01-0-2/112_NE | 22640024 | single               | ML 99         | 2    | counter sunk from rear |

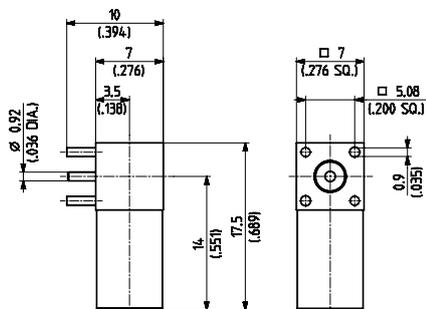
# Series QLA 00 – PCB connectors

## Straight PCB jack (female)



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes             |
|----------------------|----------|-----------|---------------|-------------------|
| 82_QLA-01-0-2/112_NE | 22543414 | single    | ML 97         | without stand-off |

## Right angle PCB jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Notes             |
|----------------------|----------|---------------|---------------|-------------------|
| 85_QLA-01-0-2/112_NE | 22640039 | single        | ML 97         | without stand-off |
| 85_QLA-01-0-2/110_NH | 22646483 | bulk 100 pcs. |               |                   |

# Series BMA – subminiature blind mate connectors

## Description

HUBER+SUHNER BMA blind mate connectors open up special dimensions in microwave applications up to 18 GHz. HUBER+SUHNER offers a range of "floating" connector configurations with certain axial or radial misalignment taken out by the outer contact of the jacks. The BMA series presents an outstanding range of products featuring high reliability and ease of assembly.

## Compatibility

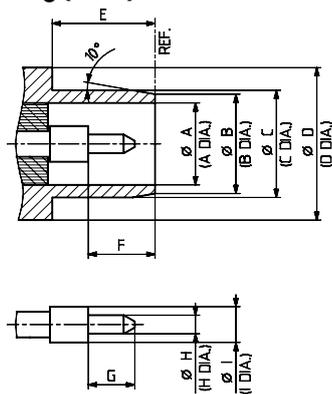
The HUBER+SUHNER range of BMA connectors is intermateable with the OSP connector series.

## Content

|   |     |
|---|-----|
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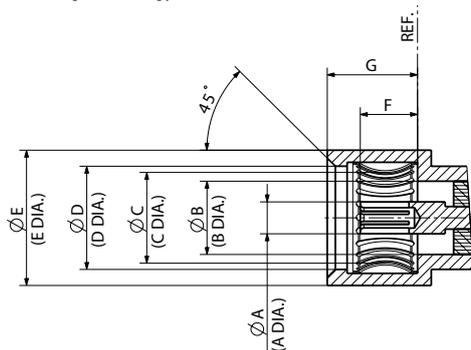
## Interface dimensions (mm/inches)

### Plug (male)



|   | Plug            |            | Jack           |            |
|---|-----------------|------------|----------------|------------|
|   | min.            | max.       | min.           | max.       |
| A | 4.09/0.161 nom. |            | 1.78/ 070 nom. |            |
| B | 4.88/0.192 nom. |            | 4.09/ 161 nom. |            |
| C | 5.31/0.209      | 5.35/0.211 | –              | 5.08/0.200 |
| D | 7.62/0.300 nom. |            | 5.71/0.225     | –          |
| E | 5.03/0.198      | –          | 7.37/0.290     | –          |
| F | 3.25/0.128      | –          | 3.05/0.120     | 3.23/0.127 |
| G | 2.29/0.090 nom. |            | –              | 5.03/0.198 |
| H | 0.90/0.035      | 0.94/0.037 |                |            |
| I | 1.78/0.070 nom. |            |                |            |

### Jack (female), N50 variant



### Interface dimensions conformable to the standards:

USA: MIL-STD-348/321

N50 variant is fully intermateable with MIL-STD-348/321.

# Series BMA – technical data

| Electrical data                                      | Requirements                   |                   |
|--|--------------------------------|-------------------|
| Cable type   | 0.086" semi-rigid              | 0.141" semi-rigid |
| Impedance  | 50 $\Omega$                    |                   |
| Frequency range                                      | DC to 18 GHz                   |                   |
| Dielectric withstanding voltage (at sea level)       | 1.0 kV rms, 50 Hz              | 1.5 kV rms, 50 Hz |
| Insulation resistance                                | $\geq 5 \cdot 10^5$ M $\Omega$ |                   |
| Contact resistance                                   |                                |                   |
| · Centre contact                                     | $\leq 2$ m $\Omega$            |                   |
| · Outer contact                                      | $\leq 2$ m $\Omega$            |                   |
| RF-testing voltage (at sea level)                    | 670 V rms, 5 MHz               | 1.0 kV rms, 5 MHz |
| Admissible power (at sea level and room temperature) | $\leq 300$ W at 3 GHz          |                   |

| Mechanical data                     | Requirements        |
|-------------------------------------|---------------------|
| Engagement force                    | $\leq 13.5$ N       |
| Disengagement force                 | $\geq 2$ N          |
| Contact captivation                 | $\geq 27$ N/6.1 lbs |
| Cable retention force <sup>1)</sup> | see pages 32 – 41   |
| Durability (matings)                | $\geq 1000$         |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | -65 to +125 °C/-85 to +257 °F                               |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition D                        |
| Shock               | MIL-STD-202, method 213, condition I                        |

| Material data                 |   |         |
|-------------------------------|---|---------|
| Connector parts               | Material                                  | Plating |
| Bodies                        | copper beryllium alloy<br>stainless steel | gold    |
| Pin contacts                  | copper beryllium alloy                    | gold    |
| Spring basket                 | copper beryllium alloy                    | gold    |
| Springs (floating connectors) | stainless steel                           |         |
| Insulators                    | PTFE or PFA                               |         |
| Gaskets                       | EPDM, 40 shore A                          |         |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series BMA – connector applications

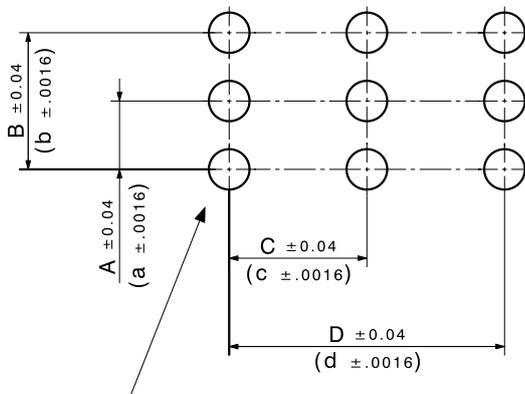
Quick and reliable engagement and disengagement of multiple microwave transmission lines, high packaging density of flexible coaxial lines and cable free connection of modules to motherboard are some needs of modern microwave systems.

HUBER+SUHNER BMA connectors offer an economical solution for the most demanding interconnector applications found today in civil and military microwave circuits. To help ensure a problem free, reliable long term operation the following guidelines should be used.

## Assembly hints

Radial and axial misalignments can be accommodated with the spring outer contacts of the HUBER+SUHNER BMA connector. These misalignments are due to the build-up of tolerances with the major contributions coming from: axial direction, mounting plate distances and plate distortions. Radial direction: mounting hole positions and concentricity, plate distortion and mis-alignment. For recommended mounting hole sizes see page 561p.

## Hole disposition



origin, single datum point

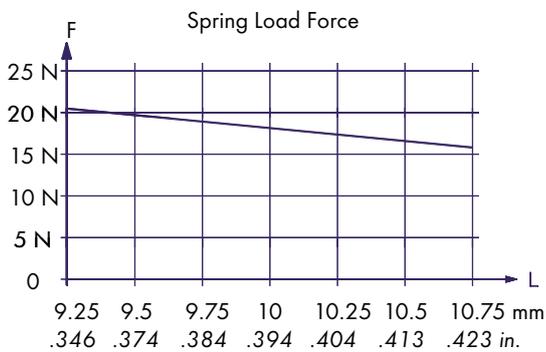
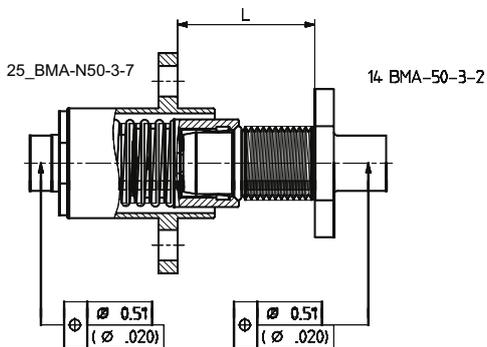
To avoid tolerances build-up all mounting holes shall be toleranced from a single datum point.

It is also important that both of the mounting plates are properly affixed and correctly positioned.

<sup>1)</sup> For applications with reduced return loss specifications 0.76 mm/0.030 in. is allowable.

# Series BMA – connector applications

## Float mounting (example)



To ensure optimum contact under extreme radial misalignment the following points must be considered:

A:

The maximum misalignment tolerances shall not be exceeded. Any possible bending of the mounting plate due to the spring preloading of the individual connectors shall be taken into account. If distortion occurs, the following steps should be taken to minimise the effect:

- Re-dimensioning,
- Bracing of the mounting plate,
- Reduction of maximum connector preloading force which will result in the limitation of length L.

The increased tolerance correction of the connector is achieved by using an extra spring system.

This allows the centre assembly of the connector to move freely within the flange body.

Recommended maximum tolerances:

Axial: 1.52 mm/0.060 in.

Radial: 0.51 mm/0.020 in.

The adjacent diagram shows the relationship between the connector preloading force and the separation distance „L“ between the mounting reference planes for a typical connector pair (25\_BMA-N50-3-7 and 14\_BMA-50-3-2).

B:

A minimum preloading force of 16 N shall be ensured for each connector pair so that the maximum engaging force will be exceeded. This represents the upper limit of separation.

For the example above this is a length L of maximum 10.65 mm/0.419 in.

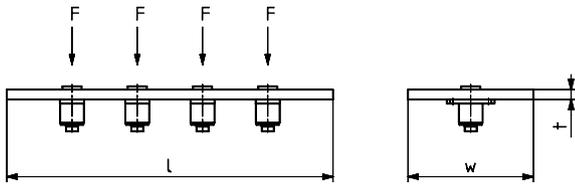
Data on other connector combinations available on request. For the dimensioning of the holes the same points must be considered as for the rigid mounting.

# Series BMA – connector applications

## Mounting plate bending

For an array of BMA connectors to be mounted on a chassis, the forces on the connectors must be taken into account and in the case of a floating assembly the preloading forces must be considered.

For a simplified calculation the mounting plate can be considered as a beam under deflection, thus the bending is:



Legend:

$$D = \frac{n \cdot F \cdot l^3}{384 E \cdot I}$$

E modulus of elasticity  
aluminium:  $E = 70\,000 \text{ N/mm}^2$   
steel:  $E = 210\,000 \text{ N/mm}^2$

F preloading force

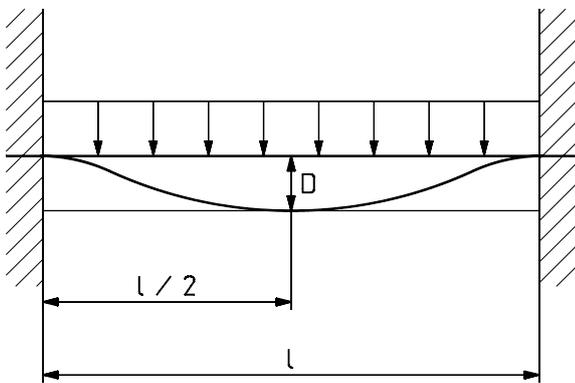
$$I = \frac{w \cdot t^3}{12}$$

l length of panel

n number of connectors

t thickness of panel

w width of panel



## Example:

4 connectors of type 25\_BMA-N50-3-7 (preloading force  $F = 20 \text{ N}$  each):

$E = 70\,000 \text{ N/mm}^2$  (aluminium chassis)

thickness of panel (t) 2 mm

width of panel (w) 20 mm

length of panel (l) 80 mm

$$I = \frac{20 \text{ mm} \cdot (2 \text{ mm})^3}{12} = 13.33 \text{ mm}^4$$

$$D = \frac{4 \cdot 20 \text{ N} \cdot (80 \text{ mm})^3}{384 \cdot 70'000 \frac{\text{N}}{\text{mm}^2} \cdot 13.33 \text{ mm}^4} = 0.11 \text{ mm}$$

# Series BMA – cable connectors

## Straight bulkhead cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Bulkhead mounted, rigid
- Body material: CuBe, gold plated

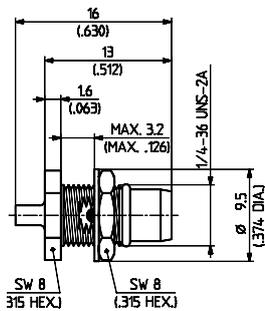


Fig. 1

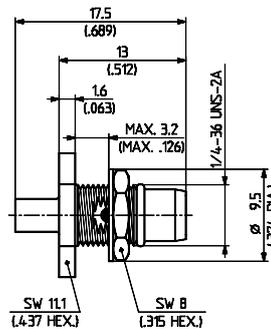


Fig. 2

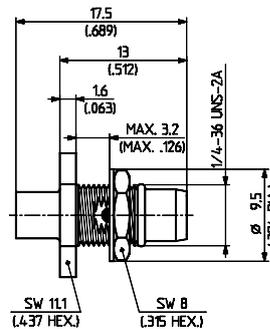


Fig. 3



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 14_BMA-50-1-15/111_NE | 22646663 | Y2, Y15 (EZ_47)       | single    | 27180                | ML 56         | 1    |
| 14_BMA-50-2-2/111_NE  | 22645600 | Y3, Y11, Y16 (EZ_86)  |           | 9171                 |               | 2    |
| 14_BMA-50-3-2/111_NE  | 22645601 | Y5, Y12, Y17 (EZ_141) |           | 9171                 |               | 3    |

### For flexible cables

- Cable entry crimp
- Bulkhead mounted, rigid
- Body material: stainless steel

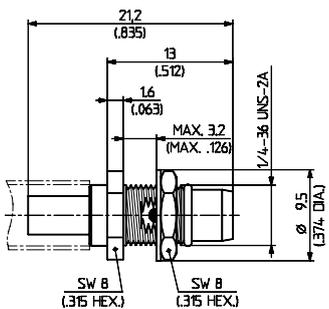


Fig. 1

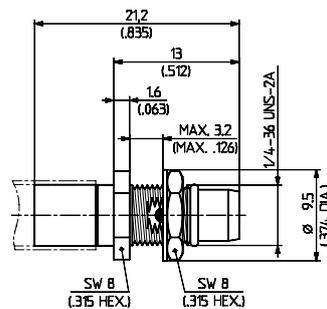


Fig. 2



| HUBER+SUHNER type    | Item no. | Cable group (example)               | Packaging | Assembly instruction | Mounting hole | Crimp insert    | Fig. |
|----------------------|----------|-------------------------------------|-----------|----------------------|---------------|-----------------|------|
| 14_BMA-50-2-3/199_NE | 22645614 | U2 (RG_316_/U, ENVIROFLEX_316)      | single    | 9172                 | ML 56         | A <sup>1)</sup> | 1    |
| 14_BMA-50-3-3/199_NE | 22645615 | U9, U11 (RG_400_/U, ENVIROFLEX_400) |           | 9173                 |               | B <sup>2)</sup> | 2    |

<sup>1)</sup> MIL insert M22520/5-03A can also be used

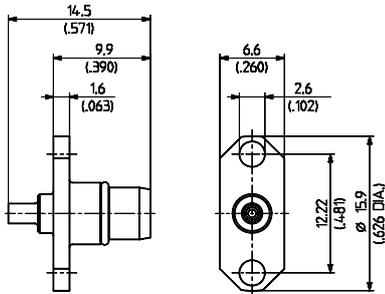
<sup>2)</sup> MIL insert M22520/5-05A can also be used

# Series BMA – cable connectors

## Straight panel cable plug (male)

### For semi-rigid cables

- Cable entry soldered
- 2-hole mounted
- Body material: CuBe, gold plated



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction |
|-----------------------|----------|-----------------------|-----------|----------------------|
| 15_BMA-50-1-15/111_NE | 22649704 | Y2, Y15 (EZ_47)       | single    | 27180                |

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Snap-in, floating
- Body material: CuBe, gold plated

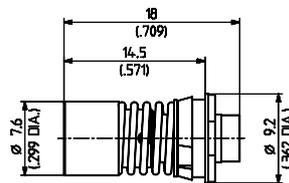
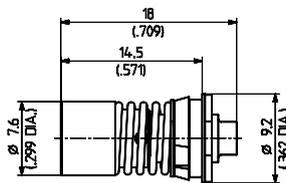


Fig. 1

Fig. 2

Connector fixed into mounting panel with snap-in mechanism. Recommended removal tool: 74\_Z-0-0-213

| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|------------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 24_BMA-N50-2-20/111_NE | 84097552 | Y3, Y11, Y16 (EZ_86)  | single    | 0000230377           | ML 66         | 1    |
| 24_BMA-N50-3-18/111_NE | 85018694 | Y5, Y12, Y17 (EZ_141) |           | 0000453501           |               | 2    |

It is recommended to use a service loop to facilitate the float features of the connector.

# Series BMA – cable connectors

## Straight panel cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Flange mount, floating

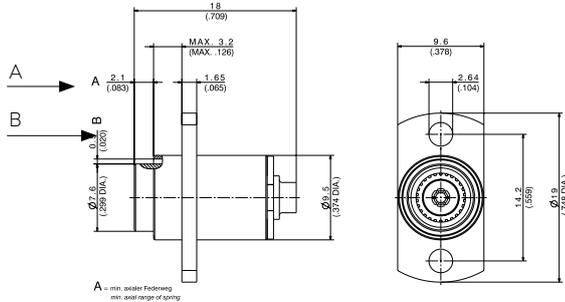


Fig. 1

A = min. 2.1 mm/0.083 in. axial range of spring  
 B = min. 0.5 mm/0.020 in. radial misalignment

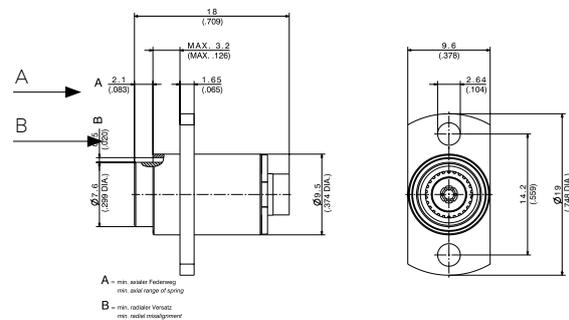


Fig. 2

Outer connector body and flange of stainless steel, inner floating part of gold plated CuBe

| HUBER+SUHNER type      | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|------------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 25_BMA-N50-2-13/119_NE | 84145709 | Y3, Y11, Y16 (EZ_86)  | single    | 0000230377           | ML 58         | 1    |
| 25_BMA-N50-3-7/119_NE  | 85018698 | Y5, Y12, Y17 (EZ_141) |           | 0000453517           |               | 2    |

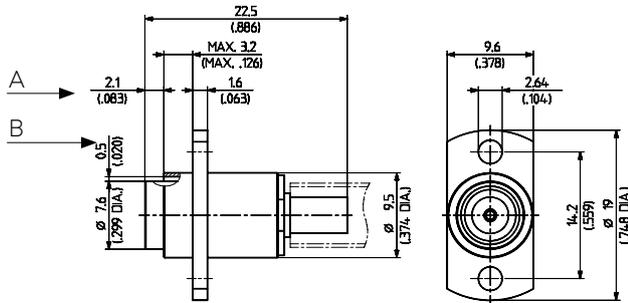
It is recommended to use a service loop to facilitate the float features of the connector.

# Series BMA – cable connectors

## Straight panel cable jacks (female)

### For flexible cables

- Cable entry crimp
- Flange mount, floating



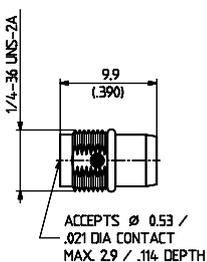
A = min. 2.1 mm/0.083 in. axial range of spring  
B = min. 0.5 mm/0.020 in. radial misalignment

| HUBER+SUHNER type      | Item no. | Cable group (example)          | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|------------------------|----------|--------------------------------|-----------|----------------------|---------------|--------------|
| 25_BMA-N50-2-14/119_NE | 85018785 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 0000291185           | ML 58         | A            |

# Series BMA – receptacles with solder-in hermetic seal

## Receptacle, plug (male)

- Bulkhead mounted
- Threaded installation
- Body material: stainless steel



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Suitable glass-bead        |
|----------------------|----------|-----------|---------------|----------------------------|
| 12_BMA-50-0-3/199_NE | 22645636 | single    | ML 61         | 73_Z-0-0-198 <sup>1)</sup> |

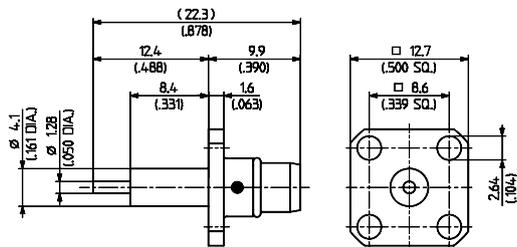
For mounting: recommended tool: collet chuck and torque wrench from Radiall R282.340.000, diam. 5.3 mm, 280 Ncm.  
For fixing hermetic seal while soldering, fixture 74\_Z-0-0-211 is recommended.

<sup>1)</sup> See page 559

# Series BMA – receptacles with solder end

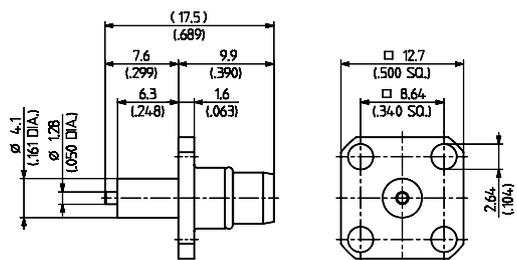
## Receptacles, plugs (male)

- Panel mounted
- Body material: stainless steel



| HUBER+SUHNER type    | Item no. | Packaging | Flange type | Notes                    |
|----------------------|----------|-----------|-------------|--------------------------|
| 13_BMA-50-0-1/199_NE | 22645622 | single    | square      | with extended dielectric |

- Panel mounted
- Body material: stainless steel

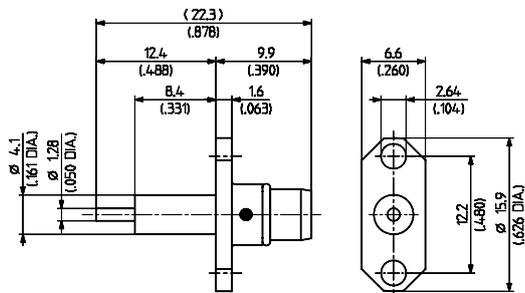


| HUBER+SUHNER type     | Item no. | Packaging | Flange type | Notes                    |
|-----------------------|----------|-----------|-------------|--------------------------|
| 13_BMA-50-0-13/199_NE | 22660107 | single    | square      | with extended dielectric |

# Series BMA – receptacles with solder end

## Receptacle, plug (male)

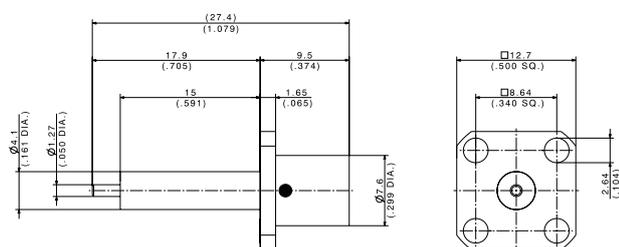
- Panel mounted
- Body material: stainless steel



| HUBER+SUHNER type    | Item no. | Packaging | Flange type | Notes                    |
|----------------------|----------|-----------|-------------|--------------------------|
| 13_BMA-50-0-2/199_NE | 22645623 | single    | 2-hole      | with extended dielectric |

## Receptacles, jack (female)

- Panel mounted
- Body material: stainless steel

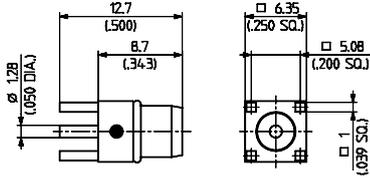


| HUBER+SUHNER type      | Item no. | Packaging | Flange type | Notes                    |
|------------------------|----------|-----------|-------------|--------------------------|
| 23_BMA-N50-0-16/119_NE | 85079352 | single    | square      | with extended dielectric |

# Series BMA – PCB connectors

## Straight PCB plug (male)

- Body material: CuBe, gold plated



| HUBER+SUHNER type    | Item no. | Packaging | Flange type |
|----------------------|----------|-----------|-------------|
| 81_BMA-50-0-1/111_NE | 22645630 | single    | ML 41       |

# Series QMA – subminiature connectors

## Description

HUBER+SUHNER QMA coaxial connectors are according to QLF standard and available with 50  $\Omega$  impedance. The frequency range extends to 18 GHz, depending on the connector and cable type. However most of the QMA connectors are return loss optimised for frequencies up to 6 GHz. The interface is based on the SMA dimension but instead of a threaded coupling mechanism a new snap-lock mechanism is used.

The QMA interface has a very similar performance to the SMA, but in addition it offers an easier, faster and safer coupling operation, helping customers to save significantly time during production. The packaging density of QMA is increased compared to SMA connectors thanks to the fact that no torque spanner is required to fasten the coupling nut.

QMA is not intermateable with SMA.

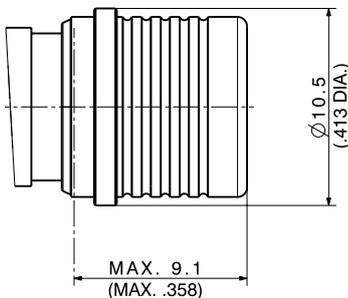
QMA connectors are also available as waterproof version (IP68) and are compatible with QLF standard.

## Content

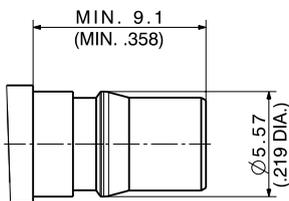
|                                   |     |
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## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Features

- Easy to mate
- 10 times faster than with threaded SMA
- Increased reliability
- No torque or tooling required
- 360° rotatable interface
- Easy routing of cable assembly without mechanical stress or electrical performance degradation
- Higher packing density
- Size equivalent to SMA, but space saving as there is no need for wrench clearance
- Excellent electrical performance
- Consistent VSWR performance enables to replace standard SMA
- Return loss optimised DC to 6 GHz

# Series QMA – technical data

| Electrical data   | Requirements   |
|---|--|
| Impedance   | 50 $\Omega$  |
| Frequency range   | DC to 18 GHz   |
| Dielectric withstanding voltage (at sea level)            | 1000 V rms, 50 Hz  |
| Working voltage (at sea level)                            | 480 V rms, 50 Hz   |
| Insulation resistance                                     | $\geq 5 \cdot 10^5$ M $\Omega$   |
| Contact resistance<br>· Centre contact<br>· Outer contact | $\leq 3.0$ m $\Omega$ max. (initial)<br>$\leq 2.5$ m $\Omega$ max. (initial) |
| Passive intermodulation                                   | -120 dBc static at 1.8 GHz, 2 x 20 W   |
| Screening effectiveness<br>· DC to 3 GHz<br>· 3 to 6 GHz  | -80 dB min.<br>-70 dB min.   |
| Return loss (typical)<br>· DC to 3 GHz<br>· 3 to 6 GHz    | $\geq 32$ dB<br>$\geq 25$ dB   |

| Mechanical data   | Requirements                 |
|---|------------------------------|
| Mating characteristics<br>· Engagement force<br>· Disengagement force | 25 N typical<br>20 N typical |
| Interface retention force   | 60 N min.                    |
| Durability  | 100 mating cycles min.       |
| Connector pitch   | 12.4 mm min center to center |

| Environmental data | Test conditions for standard QMA  |
|--------------------|---|
| Temperature range  | -40 to +85 °C   |
| Thermal shock      | IEC 60169-1 16.4 (-40 to +85 °C)  |
| Corrosion          | IEC 60169-1 16.7 (48 hrs)   |
| Damp heat          | IEC 60169-1 16.3 (96 hrs) steady state  |
| Vibration          | IEC 60068-2-64 random 5 to 20 Hz: 1.29 (m/s <sup>2</sup> ) <sup>2</sup> /Hz<br>20 to 500 Hz: -3 dB/octave |

| Environmental data | Test conditions for waterproof QMA   |
|--------------------|--------------------------------------|
| Temperature range  | -40 to +105 °C                       |
| Thermal shock      | MIL-STD-202, method 107, condition B |
| Corrosion          | MIL-STD-202, method 101, condition B |
| Damp heat          | MIL-STD-202, method 106 F            |
| Vibration          | MIL-STD-202, method 204, condition D |
| Ingress protection | IP68 IEC 60529, mated condition      |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series QMA – technical data

| Material data         |                                      |                                  |
|-----------------------|--------------------------------------|----------------------------------|
| Connector parts       | Material                             | Plating                          |
| Bodies, outer contact | brass/spring bronze                  | SUCOPLATE®/SUCOPRO® gold plating |
| Pin contacts          | brass                                | SUCOPRO® gold plating            |
| Socket contacts       | spring bronze/copper-beryllium alloy | SUCOPRO® gold plating            |
| Insulators            | PTFE or PFA                          |                                  |
| Crimp ferrules        | copper                               | SUCOPLATE®                       |
| Gaskets               | silicone rubber                      |                                  |

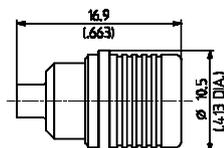
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series QMA – cable connectors

## Straight cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

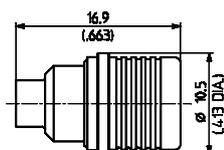
- Cable entry soldered
- Centre contact plugged-in



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging     | Assembly instruction |
|----------------------|----------|-----------------------|---------------|----------------------|
| 11_QMA-50-2-3/133_NE | 23017704 | Y3, Y11, Y16          | single        | 27428                |
| 11_QMA-50-2-3/133_NH | 23017705 | (SUCOFORM_86, EZ_86)  | bulk 100 pcs. |                      |

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact plugged-in



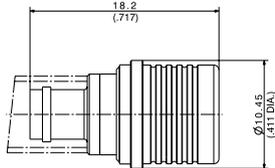
| HUBER+SUHNER type    | Item no. | Cable group (example)        | Packaging     | Assembly instruction | Notes                          |
|----------------------|----------|------------------------------|---------------|----------------------|--------------------------------|
| 11_QMA-50-3-3/133_NE | 23017695 | Y5, Y12, Y17 (SUCOFORM_141), | single        | 27428                | body: SUCOPRO®<br>gold plating |
| 11_QMA-50-3-3/133_NH | 23017696 | EZ_141                       | bulk 100 pcs. |                      |                                |

# Series QMA – cable connectors

## Straight cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

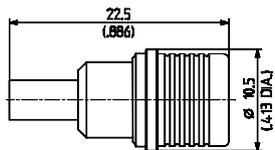
- Waterproof
- Cable entry soldered
- Centre contact plugged or soldered



| HUBER+SUHNER type     | Item no. | Cable group (example)                  | Packaging | Assembly instruction | Notes |
|-----------------------|----------|--|-----------|----------------------|-------|
| 11_QMA-W50-3-7/113_NE | 84075868 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single    | 0000263762           |       |

### For flexible cables

- HUBER+SUHNER full crimp



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 11_QMA-50-2-1/133_NE | 23017700 | U4 (K_02252_D,        | single        | 27427                | 1 A          |
| 11_QMA-50-2-1/133_NH | 23017701 | ENVIROFLEX_316_D)     | bulk 100 pcs. |                      |              |
| 11_QMA-50-2-2/133_NE | 23017720 | U2 (RG_316_/U,        | single        | 27427                | 1 A          |
| 11_QMA-50-2-2/133_NH | 23017721 | ENVIROFLEX_316)       | bulk 100 pcs. |                      |              |

# Series QMA – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact plugged or soldered

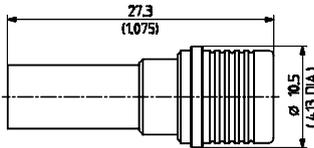


Fig. 1

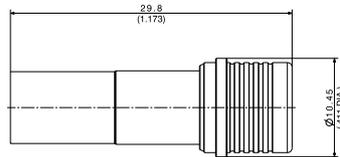


Fig. 2



| HUBER+SUHNER type                            | Item no.             | Cable group (example)  | Packaging               | Assembly instruction | Crimp insert | Fig. |
|--|----------------------|--|-------------------------|----------------------|--------------|------|
| 11_QMA-50-3-1/133_NE<br>11_QMA-50-3-1/133_NH | 23017697<br>23017698 | U9, U11 (RG_400_/U,<br>ENVIROFLEX_400)                         | single<br>bulk 100 pcs. | 27429                | B            | 1    |
| 11_QMA-50-3-2/133_NE<br>11_QMA-50-3-2/133_NH | 23017702<br>23017703 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)                              | single<br>bulk 100 pcs. |                      |              |      |
| 11_QMA-50-4-2/133_NH                         | 84000234             | S16, X9, X28 (SX_04172_B-60,<br>SPUMA_240,<br>SPUMA_240-FR-01) | bulk 100 pcs.           | 0000231592           | C            | 2    |

### For flexible cables

- Waterproof
- Cable entry crimp
- Centre contact plugged or soldered

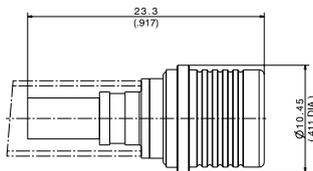


Fig. 1

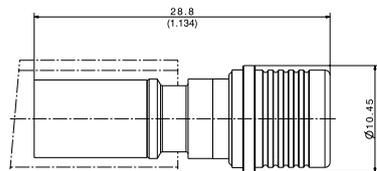


Fig. 2



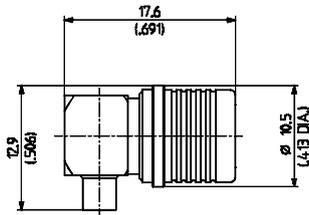
| HUBER+SUHNER type                              | Item no.             | Cable group (example)   | Packaging               | Assembly instruction | Crimp insert | Fig. |
|--|----------------------|---|-------------------------|----------------------|--------------|------|
| 11_QMA-W50-2-8/133_NH                          | 84104479             | U2 (RG_316_/U,<br>ENVIROFLEX_316)   | bulk 100 pcs.           | 0000312675           | A            | 1    |
| 11_QMA-W50-4-3/133_NE<br>11_QMA-W50-4-3/133_NH | 84075865<br>84023153 | S16, X9, X28, X34<br>(SX_04172_B-60, SPUMA_240,<br>SPUMA_240-FR-01,<br>SPUMA_240-RS-FR) | single<br>bulk 100 pcs. | 0000239799           | C            | 2    |

# Series QMA – cable connectors

## Right angle cable plugs (male)

For semi-rigid, Sucoform and Multiflex cables

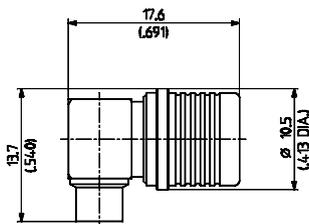
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)                | Packaging     | Assembly instruction |
|----------------------|----------|--------------------------------------|---------------|----------------------|
| 16_QMA-50-2-3/133_NH | 23017667 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86) | bulk 100 pcs. | 27444                |

For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)  | Packaging     | Assembly instruction |
|----------------------|----------|------------------------|---------------|----------------------|
| 16_QMA-50-3-3/133_NE | 23017693 | Y5, Y12, Y17           | single        | 27444                |
| 16_QMA-50-3-3/133_NH | 23017694 | (SUCOFORM_141, EZ_141) | bulk 100 pcs. |                      |

# Series QMA – cable connectors

## Right angle cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

- Waterproof
- Cable entry soldered
- Centre contact soldered

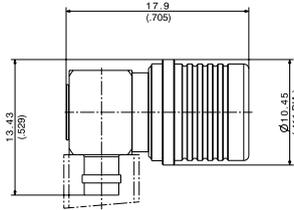


Fig. 1

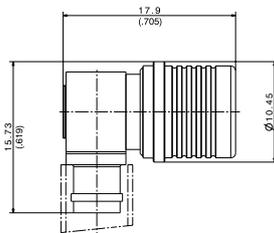


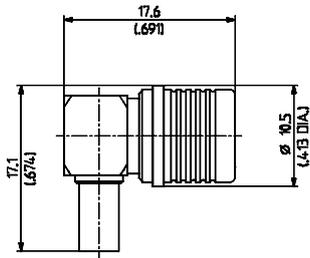
Fig. 2



| HUBER+SUHNER type                              | Item no.             | Cable group (example)       | Packaging               | Assembly instruction | Fig. | Notes                          |
|--|----------------------|-----------------------------|-------------------------|----------------------|------|--------------------------------|
| 16_QMA-W50-2-9/113_NE<br>16_QMA-W50-2-9/113_NH | 84068219<br>84075867 | Y3, Y11, Y16 (SUCOFORM_86)  | single<br>bulk 100 pcs. | 0000263789           | 1    | body: SUCOPRO®<br>gold plating |
| 16_QMA-W50-3-5/113_NE                          | 84075863             | Y5, Y12, Y17 (SUCOFORM_141) | single                  | 0000263850           | 2    | body: SUCOPRO®<br>gold plating |

### For flexible cables

- Cable entry crimp
- Centre contact soldered



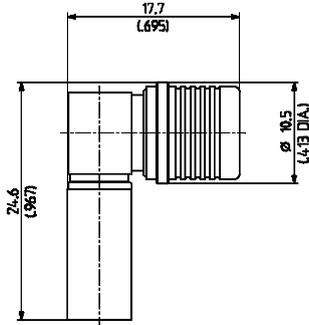
| HUBER+SUHNER type                            | Item no.             | Cable group (example)             | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|-----------------------------------|-------------------------|----------------------|--------------|
| 16_QMA-50-2-1/133_NE<br>16_QMA-50-2-1/133_NH | 23017654<br>23017644 | U4 (K_02252_D, ENVIROF-LEX_316_D) | single<br>bulk 100 pcs. | 27443                | A            |
| 16_QMA-50-2-2/133_NE<br>16_QMA-50-2-2/133_NH | 23017657<br>23017658 | U2 (RG_316_/U, ENVIROFLEX_316)    | single<br>bulk 100 pcs. |                      |              |

# Series QMA – cable connectors

## Right angle cable plugs (male)

### For flexible cables

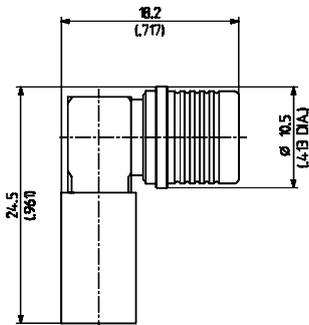
- Cable entry crimp
- Centre contact soldered



| HUBER+SUHNER type                            | Item no.             | Cable group (example)                       | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|---|-------------------------|----------------------|--------------|
| 16_QMA-50-3-1/133_NE<br>16_QMA-50-3-1/133_NH | 23017686<br>23017687 | U9, U11, U39 (RG_400_/U,<br>ENVIROFLEX_400) | single<br>bulk 100 pcs. | 27443                | B            |
| 16_QMA-50-3-2/133_NE<br>16_QMA-50-3-2/133_NH | 23017691<br>23017692 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)           | single<br>bulk 100 pcs. |                      |              |

### For flexible cables

- Cable entry crimp
- Centre contact soldered



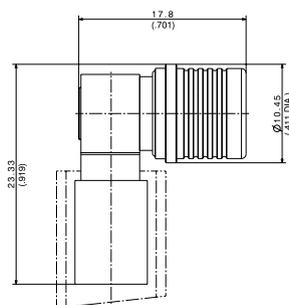
| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging     | Assembly instruction | Crimp insert |
|----------------------|----------|-----------------------|---------------|----------------------|--------------|
| 16_QMA-50-4-1/133_NH | 23012849 | S16 (SX_04172_B-60)   | bulk 100 pcs. | 27405                | C            |

# Series QMA – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Waterproof
- Cable entry crimp
- Centre contact soldered

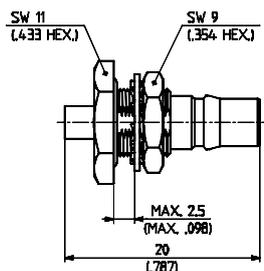


| HUBER+SUHNER type                              | Item no.             | Cable group (example)   | Packaging               | Assembly instruction | Crimp insert |
|--|----------------------|---|-------------------------|----------------------|--------------|
| 16_QMA-W50-4-5/133_NE<br>16_QMA-W50-4-5/133_NH | 84075864<br>84023140 | X9, X28, X34<br>(SX_04172_B-60,<br>SPUMA_240,<br>SPUMA_240-FR-01,<br>SPUMA_240-RS-FR) | single<br>bulk 100 pcs. | 0000241978           | C            |

## Straight bulkhead cable jacks (female)

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact plugged-in
- With panel seal



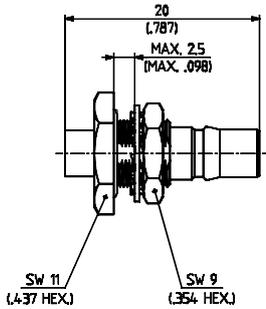
| HUBER+SUHNER type                            | Item no.             | Cable group (example)                | Packaging               | Assembly instruction | Mounting hole |
|--|----------------------|--------------------------------------|-------------------------|----------------------|---------------|
| 24_QMA-50-2-1/111_NE<br>24_QMA-50-2-1/111_NH | 23017742<br>23017743 | Y3, Y11, Y16<br>(SUCOFORM_86, EZ_86) | single<br>bulk 100 pcs. | 27428                | ML 20         |

# Series QMA – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid, Sucoform and Multiflex cables

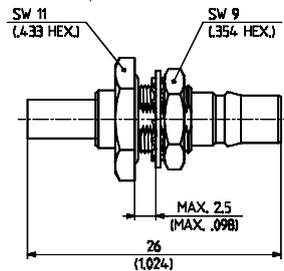
- Cable entry soldered
- Centre contact plugged-in
- With panel seal



| HUBER+SUHNER type                            | Item no.             | Cable group (example)                  | Packaging               | Assembly instruction | Mounting hole |
|--|----------------------|--|-------------------------|----------------------|---------------|
| 24_QMA-50-3-3/111_NE<br>24_QMA-50-3-3/111_NH | 23017683<br>23017684 | Y5, Y12, Y17<br>(SUCOFORM_141, EZ_141) | single<br>bulk 100 pcs. | 27428                | ML 20         |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- With panel seal



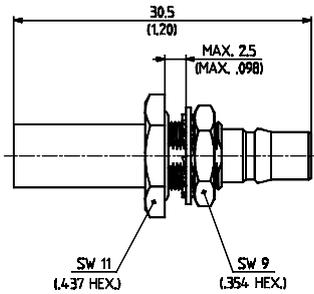
| HUBER+SUHNER type                            | Item no.             | Cable group (example)               | Packaging               | Assembly instruction | Mounting hole | Crimp insert |
|--|----------------------|-------------------------------------|-------------------------|----------------------|---------------|--------------|
| 24_QMA-50-2-2/133_NE<br>24_QMA-50-2-2/133_NH | 23017829<br>23017830 | U4 (K_02252_D,<br>ENVIROFLEX_316_D) | single<br>bulk 100 pcs. | 27429                | ML 20         | A            |
| 24_QMA-50-2-3/133_NE<br>24_QMA-50-2-3/133_NH | 23017837<br>23017838 | U2 (RG_316_/U,<br>ENVIROFLEX_316)   | single<br>bulk 100 pcs. |                      |               |              |

# Series QMA – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- With panel seal

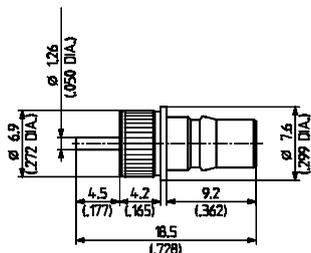


| HUBER+SUHNER type    | Item no. | Cable group (example)              | Packaging     | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|------------------------------------|---------------|----------------------|---------------|--------------|
| 24_QMA-50-3-1/133_NE | 23017822 | U9, 11 (RG_400_/U, ENVIROFLEX_400) | single        | 27429                | ML 20         | B            |
| 24_QMA-50-3-1/133_NH | 23017823 |                                    | bulk 100 pcs. |                      |               |              |
| 24_QMA-50-3-2/133_NE | 23017795 | U7 (RG_58_C/U, ENVIROFLEX_B58)     | single        |                      |               |              |

# Series QMA – receptacles

## Straight bulkhead receptacles, jacks (female)

- Coaxial end
- Press-in chassis mount



| HUBER+SUHNER type    | Item no. | Packaging    | Mounting hole | Notes    |
|----------------------|----------|--------------|---------------|----------|
| 22_QMA-50-0-7/133_NF | 84001926 | bulk 50 pcs. | ML 143        | press-in |

- Coaxial end
- Screw-in chassis mount

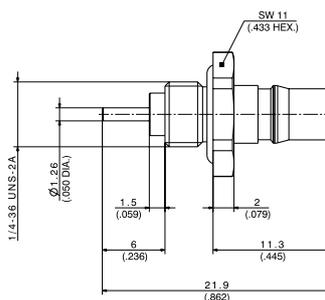
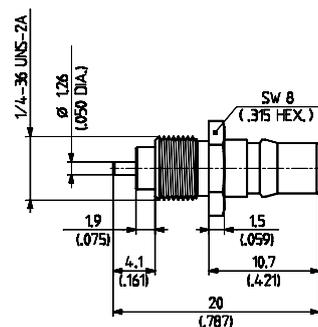


Fig. 1

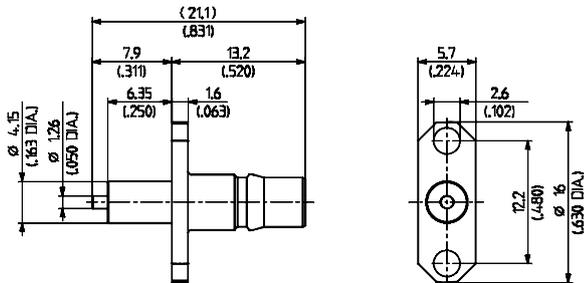
Fig. 2

| HUBER+SUHNER type     | Item no. | Packaging     | Fig. | Notes                                   |
|-----------------------|----------|---------------|------|---|
| 22_QMA-50-0-4/133_NH  | 23022628 | bulk 100 pcs. | 1    | extended dielectric, without panel seal |
| 22_QMA-50-0-34/133_NH | 84061333 |               | 2    | extended dielectric, with panel seal    |

# Series QMA – receptacles

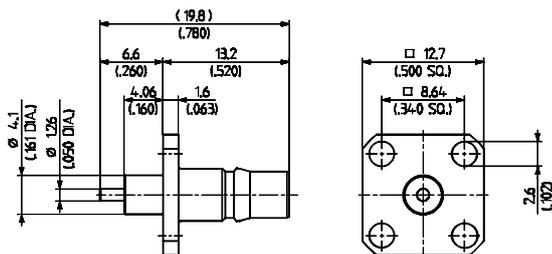
## Straight panel receptacle, jack (female)

- 2-hole flange
- Without panel seal
- With coaxial end



| HUBER+SUHNER type    | Item no. | Packaging     | Notes               |
|----------------------|----------|---------------|---------------------|
| 23_QMA-50-0-2/111_NH | 23024985 | bulk 100 pcs. | extended dielectric |

- 4-hole flange
- Without panel seal
- With coaxial end

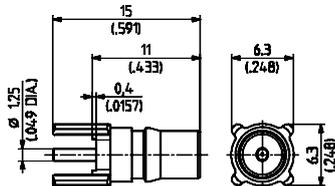


| HUBER+SUHNER type    | Item no. | Packaging     | Notes               |
|----------------------|----------|---------------|---------------------|
| 23_QMA-50-0-3/111_NH | 23025007 | bulk 100 pcs. | extended dielectric |

# Series QMA – PCB connectors

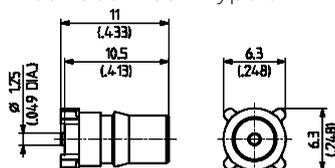
## Straight PCB jacks (female)

- With stand-off



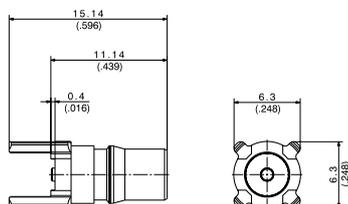
| HUBER+SUHNER type    | Item no. | Packaging     | PCB layout |
|----------------------|----------|---------------|------------|
| 82_QMA-50-0-3/111_NH | 23017656 | bulk 100 pcs. | ML 41      |

- Surface mount type SMT



| HUBER+SUHNER type     | Item no. | Packaging     | PCB layout |
|-----------------------|----------|---------------|------------|
| 82_QMA-S50-0-2/111_NH | 23017631 | bulk 100 pcs. | ML 136     |

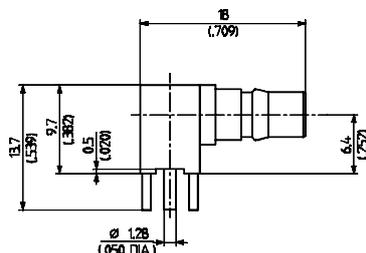
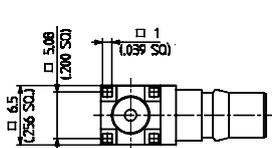
- With ground pins through-hole and SMT signal pin



| HUBER+SUHNER type    | Item no. | Packaging     | PCB layout |
|----------------------|----------|---------------|------------|
| 96_QMA-50-0-1/111_NH | 84003328 | bulk 100 pcs. | ML 155     |

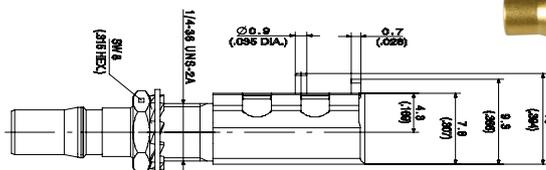
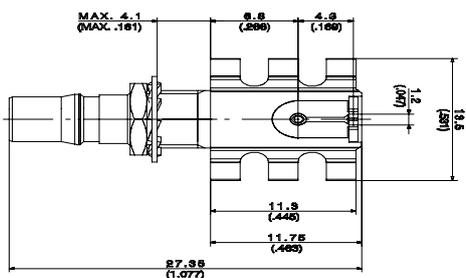
# Series QMA – PCB connectors

## Right angle PCB jacks (female)



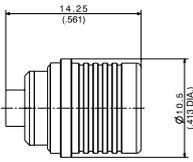
| HUBER+SUHNER type    | Item no. | Packaging     | PCB layout |
|----------------------|----------|---------------|------------|
| 85_QMA-50-0-3/111_NH | 23021463 | bulk 100 pcs. | ML 41      |

- Surface mount type SMT
- Bulkhead mounted



| HUBER+SUHNER type     | Item no. | Packaging     | PCB layout |
|-----------------------|----------|---------------|------------|
| 85_QMA-S50-0-5/111_NH | 23037099 | bulk 100 pcs. | ML 137     |

# Series QMA – Protection caps



| HUBER+SUHNER type    | Item no. | Packaging | Notes      |
|----------------------|----------|-----------|------------|
| 62_QMA-W0-0-4/-33_-E | 84068119 | single    | waterproof |

# QMA eXtreme – XQMA

## Description

QMA eXtreme is the advanced version of the waterproof QMA, combining the quick lock mechanism and waterproof properties also in rough environmental conditions. The coupling mechanism is completely waterproof and not only the RF signal path, thus protecting the connector from corrosion in a salty atmosphere and from freezing in case of high humidity and low temperature.

## Key features

- IP68 sealing on the complete connection including coupling mechanism
- High corrosion resistance
- Freezing protection

## Benefits

- Compact modules design
- Easy connection with outdoor protection
- All benefits of the quick lock connection



For more product information please contact our offices.

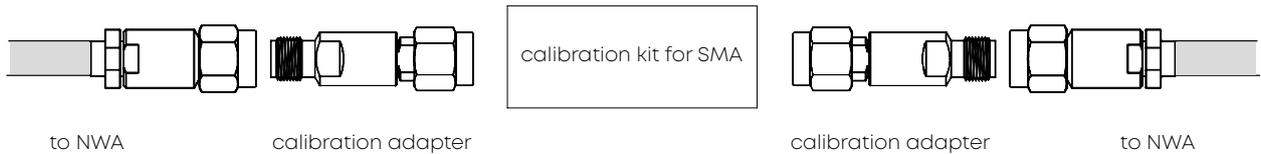


# Series QMA – calibration with adapter swapping method

For return loss/VSWR measurement of QMA connectors, HUBER+SUHNER recommends the following calibration method:

## Calibration with PC3.5 to PC3.5 calibration adapters (SMA calibration)

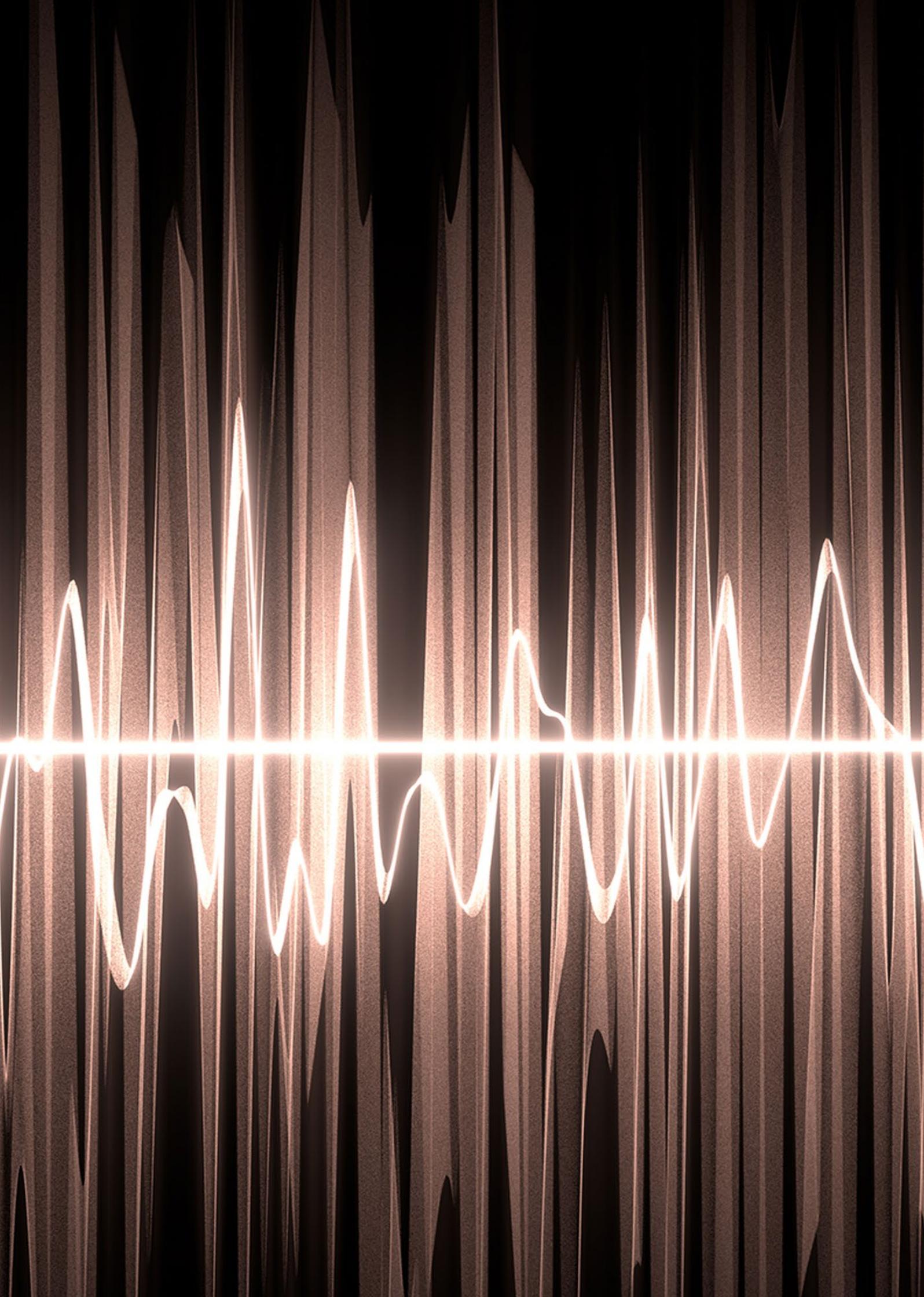
Adapters: 31\_PC35-50-0-2/199\_NE (item no. 23020456) or  
32\_PC35-50-0-2/199\_NE (item no. 23020457) or  
33\_PC35-50-0-2/199\_NE (item no. 23020453) see all three adapters on page 518 - 520



## Exchanging of the calibration adapters with the required QMA adapters

31\_PC35-QMA-50-1/199\_NE (Item no. 23017468) see page 519 or  
33\_PC35-QMA-50-1/199\_NE (Item no. 23017467) see page 520 or  
33\_QMA-PC35-50-1/1--\_NE (Item no. 23017488) see page 520





# Series QN – coaxial connectors

## Description

HUBER+SUHNER QN coaxial connectors are available with 50  $\Omega$  impedance. The frequency range extends to 11 GHz, depending on the connector and cable type, however most of the QN connectors are return loss optimised for frequencies up to 6 GHz. The interface is based on the inner dimensions of the N connector but instead of a threaded coupling mechanism a snap-lock mechanism is used.

The QN interface has a very similar performance to N, but in addition it offers an easier, faster and safe coupling operation, helping the customers to save significantly time during production of their systems.

The packaging density of QN increased compared to N thanks to the fact that no torque spanner is required to fasten the coupling nut. Additionally the outer dimensions of QN are smaller than N, leading to the advantage that even TNC-size flanges can be used at QN connectors.

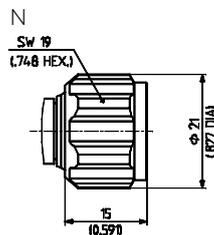
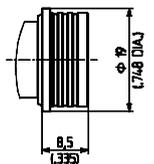
## Content

|                                   |     |
|-----------------------------------|-----|
| Description                       | 303 |
| Interface dimensions in mm/inches | 303 |
| Features                          | 303 |
| Technical data                    | 304 |
| Cable connectors                  | 305 |
| Receptacles with solder end       | 309 |
| QN eXtreme – XQN                  | 310 |
| QN calibration                    | 311 |

## Interface dimensions compared to N

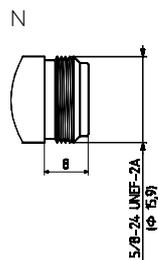
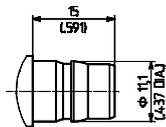
### Plug (male)

QN



### Jack (female)

QN



## Features of QN connectors

- Cycle time improvement for making RF connections (10 times faster to mount than threaded connectors)
- No torque required
- Higher packaging density
- Free-rotating connection when mated (cable torsion relief)
- Eliminates loosening problems associated with threaded connectors
- Same performance as N
- Best intermodulation performance thanks to the unique interface design

**HUBER+SUHNER QN – the cost effective solution for advanced RF interconnections!**

**IP rating (interface, mated) IP68**

# Series QN – technical data

| Electrical data   | Requirements  |
|---|---|
| Impedance   | 50 $\Omega$   |
| Frequency range   | DC to 6 GHz (optimised)      DC to 11 GHz (working range)                   |
| Dielectric withstanding voltage (at sea level)            | 2500 V rms, 50 Hz   |
| Working voltage (at sea level)                            | $\leq 1000$ V rms, 50 Hz  |
| Insulation resistance                                     | $\geq 5 \cdot 10^5$ M $\Omega$  |
| Contact resistance<br>· Centre contact<br>· Outer contact | $\leq 1.5$ m $\Omega$<br>$\leq 1.5$ m $\Omega$                              |
| RF leakage  | 100 MHz to 3 GHz $\geq 90$ dB   |
| Return loss (typical)                                     | DC to 3 GHz $\geq 32$ dB; 3 to 6 GHz $\geq 25$ dB; 6 to 11 GHz $\geq 20$ dB |
| Intermodulation   | better $-155$ dBc (2 $\times$ 43 dBm carrier)                               |

| Mechanical data                       | Requirements |
|---------------------------------------|--------------|
| Engagement force (typical)            | 30 N         |
| Disengagement force (typical)         | 30 N         |
| Retention force for interface         | $\geq 450$ N |
| Bending moment admissible (interface) | $\leq 10$ Nm |
| Contact captivation                   | $\geq 28$ N  |
| Durability (matings)                  | $\geq 100$   |

| Environmental data          | Requirements  |
|-----------------------------|---|
| Temperature range           | $-40$ to $+125$ °C / $-40$ to $+257$ °F                       |
| Climatic category           | 40/125/21 (IEC 60169_1 16.2)                                  |
| Moisture resistance         | MIL-STD-202, method 106 F                                     |
| Corrosion                   | saltspray test acc. to MIL-STD-202, method 101 D, condition B |
| Vibration                   | IEC-1169-1 paragraph 9.3.3. (10 to 500 Hz; 5 g)               |
| Shock                       | MIL-STD-202, method 213, condition 1                          |
| Rapid change of temperature | IEC 60169-1 16.4 ( $-40$ to $+125$ °C / $-40$ to $+257$ °F )  |

| Material data   |                                   |                       |
|-----------------|-----------------------------------|-----------------------|
| Connector parts | Material                          | Plating               |
| Bodies          | brass                             | SUCOPLATE®            |
| Pin contacts    | brass                             | SUCOPRO® gold plating |
| Socket contacts | spring bronze                     | SUCOPRO® gold plating |
| Insulators      | PTFE or PFA                       |                       |
| Contact washer  | spring bronze or copper-beryllium | SUCOPRO® gold plating |

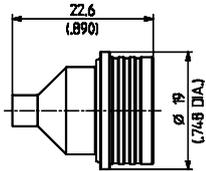
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series QN – cable connectors

## Straight cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

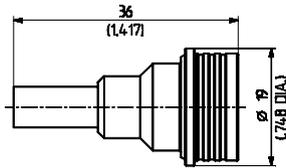
- Cable entry soldered
- Centre contact plugged-in



| HUBER+SUHNER type   | Item no. | Cable group (example)  | Packaging | Assembly instruction |
|---------------------|----------|------------------------|-----------|----------------------|
| 11_QN-50-3-3/113_NE | 23033393 | Y5, Y12 (SUCOFORM_141) | single    | 27502                |

### For flexible cables

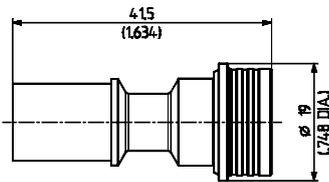
- HUBER+SUHNER full crimp



| HUBER+SUHNER type   | Item no. | Cable group (example)                | Packaging | Assembly instruction | Crimp insert |
|---------------------|----------|--------------------------------------|-----------|----------------------|--------------|
| 11_QN-50-3-1/133_NE | 23033391 | U9 (RG_142_B/U, ENVIROFLEX_142)      | single    | 27500                | 2 B          |
| 11_QN-50-3-2/133_NE | 23033392 | U7 (RG_58_C/U, ENVIROFLEX_B58)       |           | 27501                |              |
| 11_QN-50-3-4/133_NE | 84016563 | U11, U41 (RG_400_/U, ENVIROFLEX_400) |           | 230235               |              |

### For flexible cables

- HUBER+SUHNER full crimp



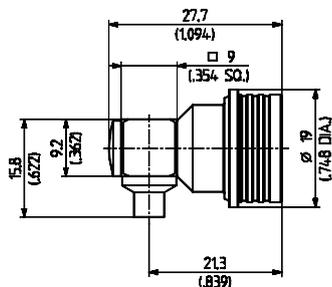
| HUBER+SUHNER type   | Item no. | Cable group (example)                 | Packaging | Assembly instruction | Crimp insert |
|---------------------|----------|---------------------------------------|-----------|----------------------|--------------|
| 11_QN-50-7-1/133_NE | 23033394 | U32, U43 (RG_214_/U, ENVIROFLEX_B214) | single    | 27503                | 3 D          |
| 11_QN-50-7-2/133_NE | 23033395 | U33 (RG_393_/U, ENVIROFLEX_393)       |           | 27504                | 2.5 D        |
| 11_QN-50-7-3/133_NE | 23033396 | U29, U42 (RG_213_/U, RADOX_RF_213)    |           | 27505                | 3 D          |

# Series QN – cable connectors

## Right angle cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

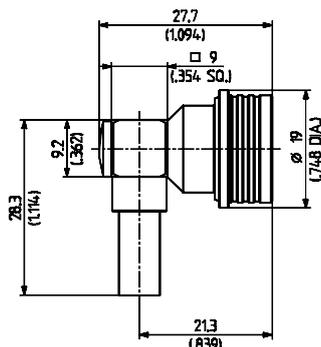
- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type   | Item no. | Cable group (example)         | Packaging | Assembly instruction |
|---------------------|----------|-------------------------------|-----------|----------------------|
| 16_QN-50-3-3/13-_NE | 23033268 | Y5, Y12, Y1<br>(SUCOFORM_141) | single    | 27508                |

### For flexible cables

- Cable entry crimp
- Centre contact soldered



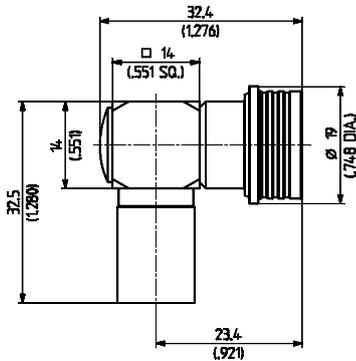
| HUBER+SUHNER type   | Item no. | Cable group (example)                       | Packaging | Assembly instruction | Crimp insert |
|---------------------|----------|---|-----------|----------------------|--------------|
| 16_QN-50-3-1/133_NE | 23033267 | U9, U11, U39 (RG_400_/U,<br>ENVIROFLEX_400) | single    | 27506                | B            |
| 16_QN-50-3-2/133_NE | 23033398 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)           |           | 27507                | B            |
| 16_QN-50-4-1/133_NE | 23033078 | S16 (SX_04172_B-60)                         |           | 27509                | C            |

# Series QN – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

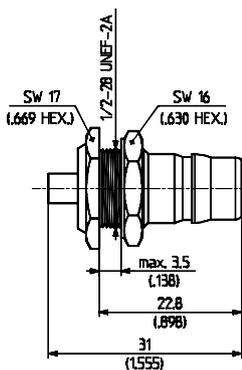


| HUBER+SUHNER type   | Item no. | Cable group (example)                                  | Packaging | Assembly instruction | Crimp insert |
|---------------------|----------|--|-----------|----------------------|--------------|
| 16_QN-50-7-1/133_NE | 23032410 | U32, U33 (RG_393_/U, ENVIROFLEX_393)                   | single    | 27510                | D            |
| 16_QN-50-7-2/133_NE | 23033399 | U29 (RG_213_/U, RADOX_RF_213)                          |           | 27511                |              |
| 16_QN-50-7-5/133_NE | 84078879 | U30, X32 (SPUMA_400, SPUMA_400-FR-01, SPUMA_400-RS-FR) | 27511     |                      |              |

## Straight bulkhead cable jacks (female)

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact plugged-in



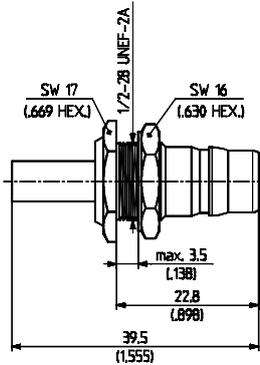
| HUBER+SUHNER type   | Item no. | Cable group (example)       | Packaging | Assembly instruction | Mounting hole |
|---------------------|----------|-----------------------------|-----------|----------------------|---------------|
| 24_QN-50-3-3/13-_NE | 23033423 | Y5, Y12, Y17 (SUCOFORM_141) | single    | 27514                | ML 112        |

# Series QN – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

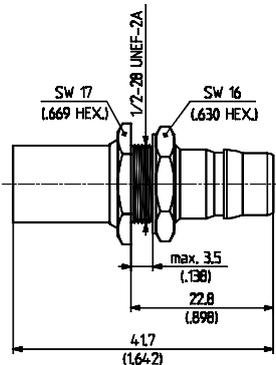
- HUBER+SUHNER full crimp



| HUBER+SUHNER type   | Item no. | Cable group (example)           | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|---------------------|----------|---------------------------------|-----------|----------------------|---------------|--------------|
| 24_QN-50-3-1/133_NE | 23033400 | U9 (RG_142_B/U, ENVIROFLEX_142) | single    | 27512                | ML 112        | 2 B          |
| 24_QN-50-3-2/133_NE | 23033402 | U7 (RG_58_C/U, ENVIROFLEX_B58)  |           | 27513                |               |              |

### For flexible cables

- HUBER+SUHNER full crimp



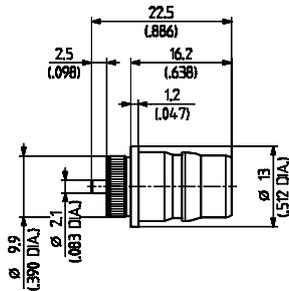
| HUBER+SUHNER type   | Item no. | Cable group (example)                                  | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|---------------------|----------|--|-----------|----------------------|---------------|--------------|
| 24_QN-50-7-1/133_NE | 23033403 | U33 (RG_393_/U, ENVIROFLEX_393)                        | single    | 27515                | ML 112        | 2.5 D        |
| 24_QN-50-7-2/133_NE | 23033404 | U32, U43 (RG_214_/U, ENVIROFLEX_B214)                  |           | 27516                |               | 3 D          |
| 24_QN-50-7-5/133_NE | 84039869 | U30, X32 (SPUMA_400, SPUMA_400-FR-01, SPUMA_400-RS-FR) |           | 253545               |               | 4 D          |

# Series QN – receptacles with solder end

## Receptacles, jacks (female)

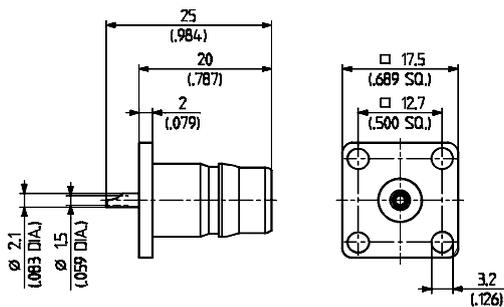
### For flexible cables

- Bulkhead mounted
- Press-in chassis mount



| HUBER+SUHNER type   | Item no. | Packaging     | Notes    |
|---------------------|----------|---------------|----------|
| 22_QN-50-0-1/133_NY | 23033904 | bulk 100 pcs. | press-in |

- Panel mounted



| HUBER+SUHNER type   | Item no. | Packaging     | Notes                              |
|---------------------|----------|---------------|------------------------------------|
| 23_QN-50-0-1/133_NE | 23033251 | single        | flange with same dimensions as TNC |
| 23_QN-50-0-1/133_NY | 23033252 | bulk 150 pcs. |                                    |

# QN eXtreme – XQN

## Description

Besides the outstanding characteristics of the quick lock connector QN, this advanced version has some extra features. The coupling mechanism is completely waterproof and not only the RF signal path, thus protecting the complete connector from corrosion in a salty atmosphere and from freezing in case of high humidity and low temperatures.

This extra features besides the excellent PIM performance (typical  $-162$  dBc) and the optimum power performance ( $\approx 350$  W by 2 GHz) makes this connector the ideal solution for antenna connections.

## Key features

- IP67 sealing for the complete connection including coupling mechanism
- High corrosion resistance
- Freezing protection

## Benefits

- Compactness (X-QN size is smaller than DIN716 and DIN 4.1/9.5)
- Easy to install (tool-less, quick-lock)
- No taping required (secure mating with outdoor protection)
- Overall lower costs of ownership
- Excellent PIM performance



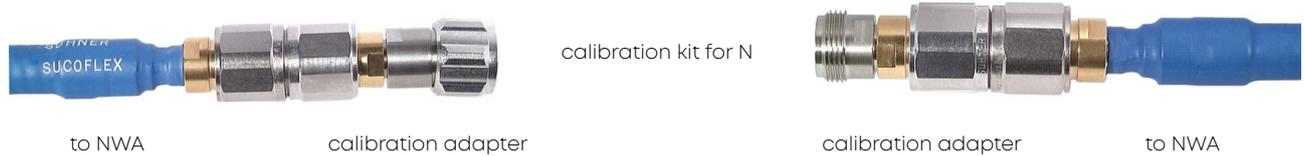
For more product information please contact our offices.



# Series QN – calibration with adapter swapping method

## 1. Calibration with N to PC7 calibration adapters (N calibration)

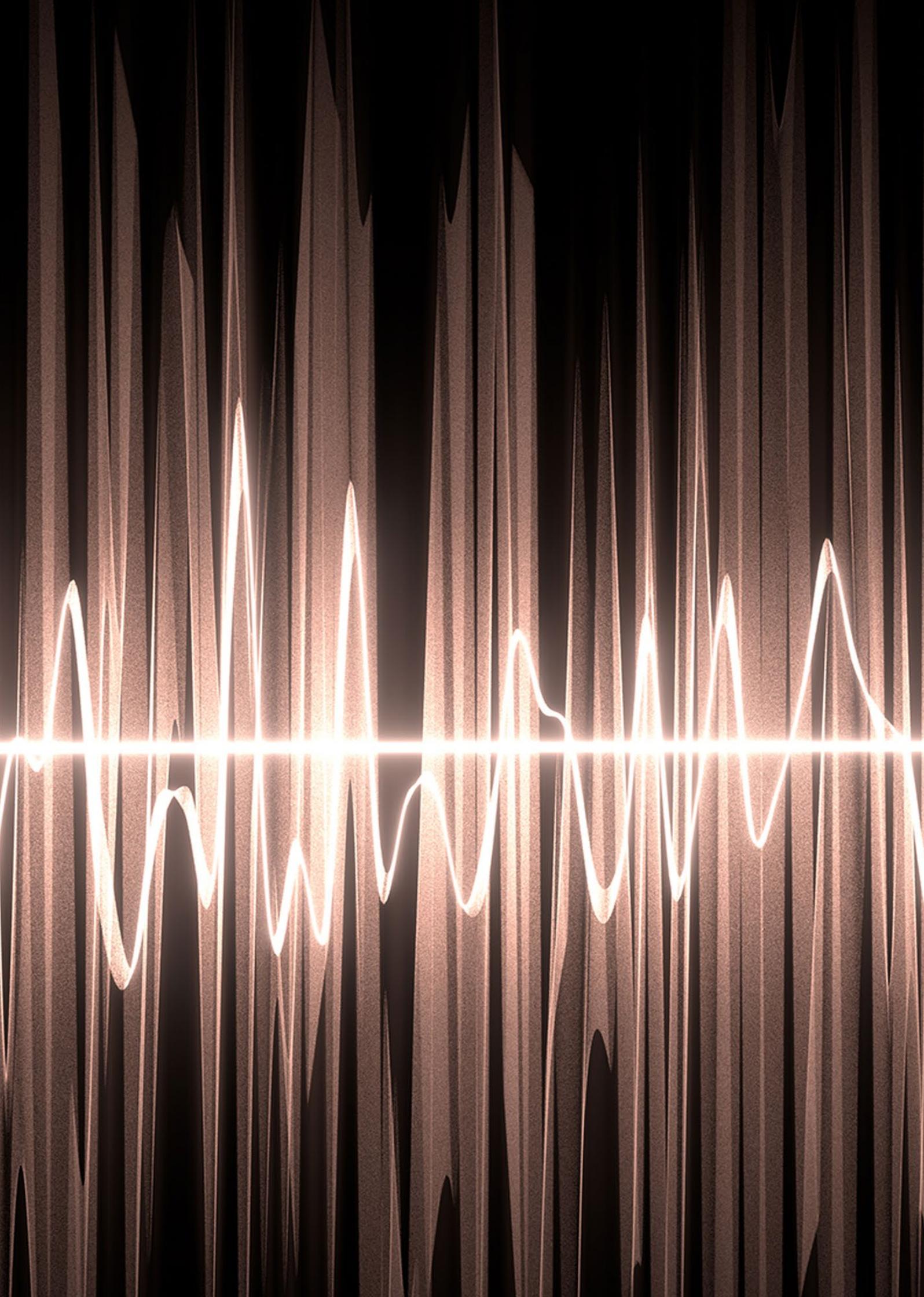
Adapters: 32\_N-PC7-50-6/1--\_NE (item no. 23032917) see page 506



## 2. Exchanging of the calibration adapters with the required QN adapters

32\_PC7-QN-50-1/1--\_NE (item no. 23032720) see page 520





# Series BNC 50 Ω – coaxial miniature connectors

## Description

HUBER+SUHNER BNC is still a popular connector series, featuring a two stud bayonet coupling mechanism, which is particularly useful for frequently coupled and uncoupled RF connections with frequencies up to 4 GHz.

## Compatibility

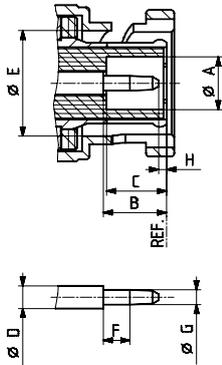
50 Ω BNC connectors and 75 Ω BNC connectors are intermateable without any restrictions.

## Content

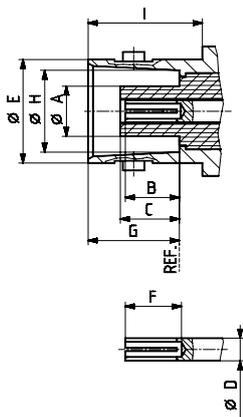
|                                   |     |
|-----------------------------------|-----|
| Description                       | 313 |
| Compatibility                     | 313 |
| Interface dimensions in mm/inches | 313 |
| Technical data                    | 314 |
| Cable connectors                  | 315 |
| Receptacles with solder end       | 324 |
| PCB connectors                    | 329 |
| Protective caps and shorts        | 330 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug       |            | Jack        |            |
|---|------------|------------|-------------|------------|
|   | min.       | max.       | min.        | max.       |
| A | 4.83/0.190 | –          | –           | 4.72/0.186 |
| B | 5.33/0.210 | 5.84/0.230 | 4.72/0.186  | 5.23/0.206 |
| C | 5.28/0.208 | 5.79/0.228 | 4.78/0.188  | 5.28/0.208 |
| D | 2.06/0.081 | 2.21/0.087 | 2.06/0.081  | 2.21/0.087 |
| E | 9.78/0.385 | 9.91/0.390 | 9.60/0.378  | 9.70/0.382 |
| F | 1.98/0.078 | –          | 4.95/0.195  | –          |
| G | 1.32/0.052 | 1.37/0.054 | 8.31/0.327  | 8.51/0.335 |
| H | 0.08/0.003 | –          | 8.10/0.319  | 8.15/0.321 |
| I | –          | –          | 10.52/0.414 | –          |

### Interface dimensions conformable to the standards:

|                |                               |
|----------------|-------------------------------|
| International: | IEC 61169-8                   |
| Europe:        | CECC 22120                    |
| USA:           | MIL-PRF-39012                 |
|                | BNC Interface MIL-STD-348/301 |
| Great Britain: | BS 9210 N 004                 |

# Series BNC 50 Ω – technical data

| Electrical data                                | Requirements                           |
|--|--|
| Impedance                                      | 50 Ω                                   |
| Frequency range                                | DC to 4 GHz                            |
| Dielectric withstanding voltage (at sea level) | 1.5 kV rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)                 | 500 V rms, 50 Hz (depending on cable)  |
| Insulation resistance                          | ≥ 5 · 10 <sup>5</sup> MΩ               |
| Contact resistance                             |  |
| · Centre contact                               | ≤ 1.5 mΩ                               |
| · Outer contact                                | ≤ 1 mΩ                                 |
| RF leakage (between 2 to 3 GHz)                | ≥ 55 dB                                |

| Mechanical data                     | Requirements                  |
|-------------------------------------|-------------------------------|
| Coupling nut torque                 | 7 to 28 Ncm/0.6 to 2.5 in lbs |
| Coupling nut retention force        | ≥ 450 N/101.2 lbs             |
| Contact captivation                 | ≥ 27 N/6.1 lbs                |
| Cable retention force <sup>1)</sup> | see pages 32 – 41             |
| Durability (matings)                | ≥ 500                         |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | –65 to +165 °C/–85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |
| Shock               | MIL-STD-202, method 213, condition G                        |

| Material data   |  |                                  |
|-----------------|--|----------------------------------|
| Connector parts | Material                               | Plating                          |
| Bodies          | brass                                  | SUCOPLATE®/SUCOPRO® gold plating |
| Pin contacts    | brass                                  | gold/SUCOPRO® gold plating       |
| Socket contacts | copper-beryllium alloy<br>copper alloy | gold/SUCOPRO® gold plating       |
| Crimp ferrules  | copper/brass                           | SUCOPLATE®                       |
| Insulators      | PTFE or PFA                            |                                  |
| Gaskets         | silicone rubber                        |                                  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series BNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

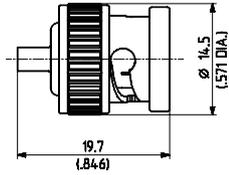


Fig. 1

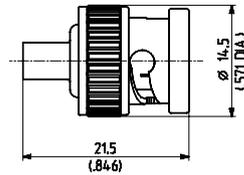


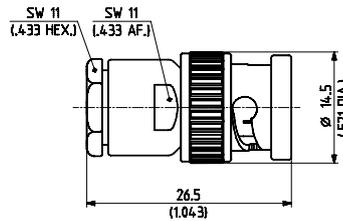
Fig. 2



| HUBER+SUHNER type                   | Item no. | Cable group (example) | Packaging | Assembly instruction | Fig. |
|-------------------------------------|----------|-----------------------|-----------|----------------------|------|
| 11_BNC-50-2-20/103_NE <sup>1)</sup> | 22641778 | Y3, Y11, Y16 (EZ_86)  | single    | 9100                 | 1    |
| 11_BNC-50-3-54/103_NE <sup>1)</sup> | 22540108 | Y5, Y12, Y17 (EZ_141) |           | 9106                 | 2    |

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type                  | Item no. | Cable group (example)              | Packaging | Assembly instruction |
|------------------------------------|----------|------------------------------------|-----------|----------------------|
| 11_BNC-50-1-1/133_NE               | 22540021 | U1 (RG_178_B/U, ENVIROFLEX_178)    | single    | 3005                 |
| 11_BNC-50-2-1/133_NE               | 22540029 | U2 (RG_316_/U, ENVIROFLEX_316)     |           |                      |
| 11_BNC-50-3-1/133_NE <sup>1)</sup> | 22540045 | U7, U9 (RG_58_C/U, ENVIROFLEX_B58) |           | 3004                 |
| 11_BNC-50-3-5/133_NE               | 22540054 |                                    |           | 3005                 |

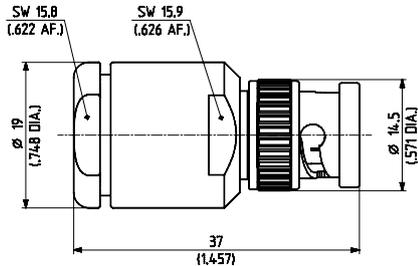
<sup>1)</sup> Centre contact NOT captivated.

# Series BNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)          | Packaging | Assembly instruction |
|----------------------|----------|--------------------------------|-----------|----------------------|
| 11_BNC-50-7-1/133_NE | 22540145 | U29 (RG_213/U, RADOX_RF_213)   | single    | 3008                 |
| 11_BNC-50-7-2/133_NE | 22540149 | U32 (RG_214/U ENVIROFLEX_B214) |           |                      |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

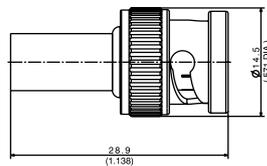
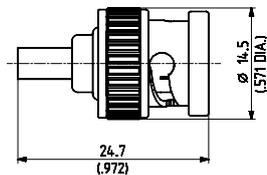


Fig. 1

Fig. 2



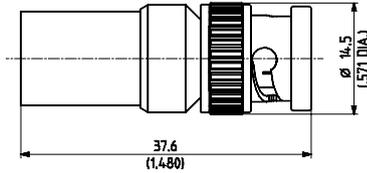
| HUBER+SUHNER type     | Item no. | Cable group (example)                | Packaging     | Assembly instruction | Crimp insert | Fig. |
|-----------------------|----------|--------------------------------------|---------------|----------------------|--------------|------|
| 11_BNC-50-1-5/133_NE  | 22641759 | U1 (RG_178_B/U, ENVIROFLEX_178)      | single        | 9068                 | 1 A          | 1    |
| 11_BNC-50-2-13/133_NE | 22543749 | U2 (RG_316_/U, ENVIROFLEX_316)       | single        |                      |              |      |
| 11_BNC-50-2-13/133_NH | 22644716 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-2-14/133_NE | 22641683 | U4 (K_02252_D, ENVIROFLEX_316_D)     | single        | 3015                 | 2 B          | 2    |
| 11_BNC-50-2-14/133_NH | 22649839 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-2-16/133_NE | 22544026 | U3 (G_01130_HT)                      | single        |                      |              |      |
| 11_BNC-50-2-16/133_NH | 22648466 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-3-87/133_NE | 84057578 | U7 (RG_58_C/U, ENVIROFLEX_B58)       | single        | 3015                 | 2 B          | 2    |
| 11_BNC-50-3-87/133_NH | 84057579 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-3-86/133_NE | 84057576 | U9 (RG_223_/U, ENVIROFLEX_B223)      | single        | 27057                | 2 C          |      |
| 11_BNC-50-3-86/133_NH | 84057577 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-3-36/133_NE | 22540089 | U13 (G_03130_HT)                     | single        |                      |              |      |
| 11_BNC-50-3-88/133_NE | 84057580 | U11, U41 (RG_400_/U, ENVIROFLEX_400) | single        | 3015                 | 2 B          |      |
| 11_BNC-50-3-88/133_NH | 84057581 |                                      | bulk 100 pcs. |                      |              |      |
| 11_BNC-50-4-4/133_NE  | 22540115 | U16 (RG_59_B/U, RADOX_RF_59)         | single        | 27057                | 2 C          |      |
| 11_BNC-50-4-4/133_NH  | 22648238 |                                      | bulk 100 pcs. |                      |              |      |

# Series BNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

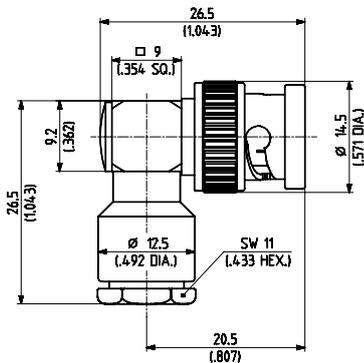


| HUBER+SUHNER type    | Item no. | Cable group (example)                | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|--------------------------------------|-----------|----------------------|--------------|
| 11_BNC-50-7-6/133_NE | 22640863 | U32, U43 (RG_214/U, ENVIROFLEX_B214) | single    | 3061                 | 3 D          |
| 11_BNC-50-7-7/133_NE | 22543766 | U29, U42 (RG_213/U, RADOX_RF_213)    |           |                      |              |

## Right angle cable plugs (male)

### For flexible cables

- Cable entry clamp



| HUBER+SUHNER type     | Item no. | Cable group (example)              | Packaging | Assembly instruction |
|-----------------------|----------|------------------------------------|-----------|----------------------|
| 16_BNC-50-2-9/133_NE  | 84013192 | U2 (RG_316_/U, ENVIROFLEX_316)     | single    | 3024                 |
| 16_BNC-50-3-25/133_NE | 84013233 | U7, U9 (RG_58_C/U, ENVIROFLEX_B58) |           |                      |

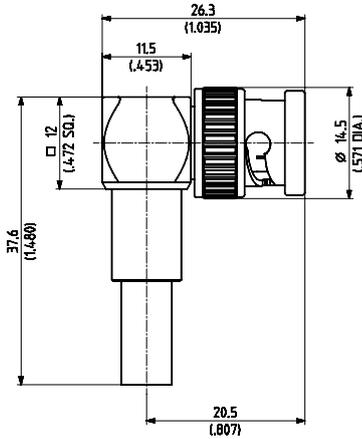


# Series BNC 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

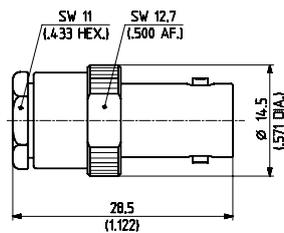


| HUBER+SUHNER type     | Item no. | Cable group (example)             | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|-----------------------------------|-----------|----------------------|--------------|
| 16_BNC-50-3-13/133_NE | 22540198 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58) | single    | 3015                 | 2 B          |

## Straight cable jacks (female)

### For flexible cables

- Cable entry clamp



| HUBER+SUHNER type     | Item no. | Cable group (example)                 | Packaging | Assembly instruction |
|-----------------------|----------|---------------------------------------|-----------|----------------------|
| 21_BNC-50-2-1/133_NE  | 22540228 | U2 (RG_316_/U,<br>ENVIROFLEX_316)     | single    | 3005                 |
| 21_BNC-50-3-12/133_NE | 22540263 | U7, U9 (RG_58_C/U,<br>ENVIROFLEX_B58) |           |                      |

# Series BNC 50 Ω – cable connectors

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

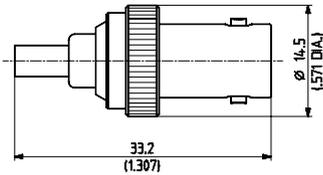


Fig. 1

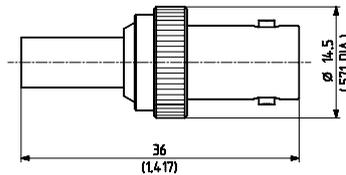


Fig. 2



| HUBER+SUHNER type     | Item no. | Cable group (example)            | Packaging | Assembly instruction | Crimp insert | Fig. |
|-----------------------|----------|----------------------------------|-----------|----------------------|--------------|------|
| 21_BNC-50-1-4/133_NE  | 22641777 | U1 (RG_178_B/U, ENVIROFLEX_178)  | single    | 9068                 | 1 A          | 1    |
| 21_BNC-50-2-9/133_NE  | 22641732 | U2 (RG_316_/U, ENVIROFLEX_316)   |           |                      |              |      |
| 21_BNC-50-2-10/133_NE | 22641779 | U4 (K_02252_D, ENVIROFLEX_316_D) |           |                      |              |      |
| 21_BNC-50-3-27/133_NE | 84057699 | U7 (RG_58_C/U, ENVIROFLEX_B58)   | single    | 0000231215           | 2 B          | 2    |
| 21_BNC-50-3-28/133_NE | 84057722 | U9, U39 (RG_223_/U)              |           | 0000231453           |              |      |

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Insulating washers see page 556
- With panel seal

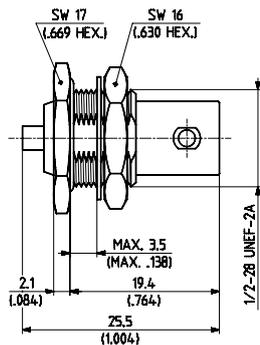


Fig. 1

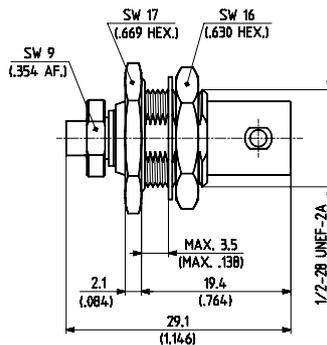


Fig. 2



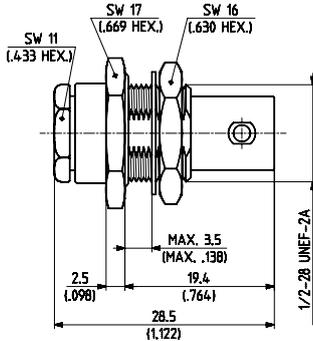
| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Mounting hole | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|---------------|------|
| 24_BNC-50-2-20/133_NE | 22641886 | Y3, Y11, Y16 (EZ_86)  | single    | 9100                 | ML 4          | 1    |
| 24_BNC-50-3-33/133_NE | 22641923 | Y5, Y12, Y17 (EZ_141) |           | 9005                 |               |      |

# Series BNC 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry clamp
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type    | Item no. | Cable group (example)              | Packaging | Assembly instruction | Mounting hole |
|----------------------|----------|------------------------------------|-----------|----------------------|---------------|
| 24_BNC-50-1-1/133_NE | 22540362 | U1 (RG_178_B/U, ENVIROFLEX_178)    | single    | 3005                 | ML 4          |
| 24_BNC-50-2-1/133_NE | 22540365 | U2 (RG_316_/U, ENVIROFLEX_316)     |           |                      |               |
| 24_BNC-50-3-5/133_NE | 22540385 | U7, U9 (RG_58_C/U, ENVIROFLEX_B58) |           |                      |               |

### For flexible cables

- HUBER+SUHNER full crimp
- With panel seal
- Insulating washers see page 556
- Taper sleeves see page 554

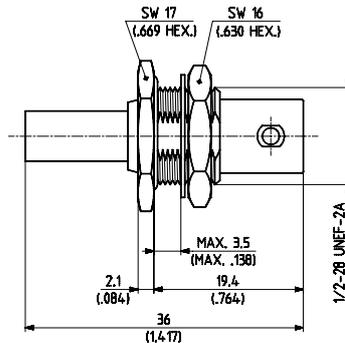
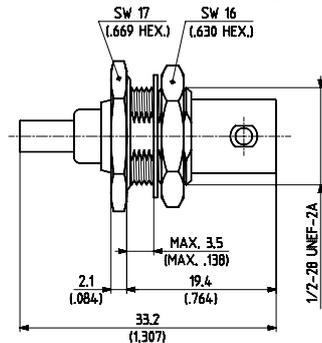


Fig. 1

Fig. 2



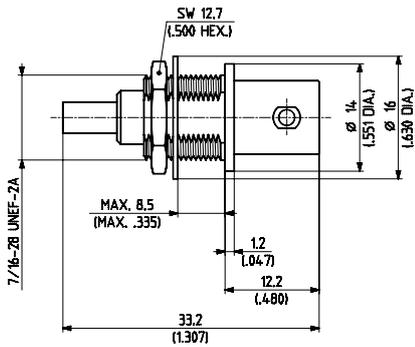
| HUBER+SUHNER type     | Item no. | Cable group (example)            | Packaging     | Assembly instruction/<br>Mounting hole | Crimp insert | Fig. |
|-----------------------|----------|----------------------------------|---------------|--|--------------|------|
| 24_BNC-50-1-6/133_NE  | 22641781 | U1 (RG_178_B/U, ENVIROFLEX_178)  | single        | 9068/ML 4                              | 1 A          | 1    |
| 24_BNC-50-1-6/133_NH  | 84011438 |                                  | bulk 100 pcs. |  |              |      |
| 24_BNC-50-2-45/133_NE | 84057863 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 3015/ML 4                              | 2 B          | 2    |
| 24_BNC-50-2-45/133_NH | 84057864 |                                  | bulk 100 pcs. |  |              |      |
| 24_BNC-50-2-46/133_NE | 84057872 | U4 (K_02252_D, ENVIROFLEX_316_D) | single        | 3015/ML 4                              | 2 B          | 2    |
| 24_BNC-50-2-46/133_NH | 84057873 |                                  | bulk 100 pcs. |  |              |      |
| 24_BNC-50-3-1/133_NE  | 22540378 | U7 (RG_58_C/U, ENVIROFLEX_B58)   | single        | 3015/ML 4                              | 2 B          | 2    |
| 24_BNC-50-3-8/133_NE  | 22540389 | U9 (RG_223_/U, ENVIROFLEX_B223)  | single        |  |              |      |
| 24_BNC-50-3-25/133_NE | 22658913 | U11 (RG_400_/U, ENVIROFLEX_400)  | single        | 3015/ML 4                              | 2 B          | 2    |
| 24_BNC-50-3-25/133_NH | 22660362 |                                  | bulk 100 pcs. |  |              |      |

# Series BNC 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

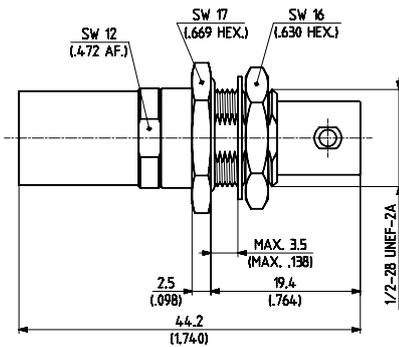
- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Front mounting
- Without panel seal



| HUBER+SUHNER type     | Item no. | Cable group (example)          | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|-----------------------|----------|--------------------------------|-----------|----------------------|---------------|--------------|
| 24_BNC-50-2-29/133_NE | 22648682 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 9068                 | ML 3          | 1 A          |

### For flexible cables

- HUBER+SUHNER full crimp
- With panel seal
- Insulating washers see page 556
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)              | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|------------------------------------|-----------|----------------------|---------------|--------------|
| 24_BNC-50-7-3/133_NE | 22540415 | U29, U42 (RG_213_/U, RADOX_RF_213) | single    | 9121                 | ML 4          | 3 D          |

# Series BNC 50 Ω – cable connectors

## Straight panel cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

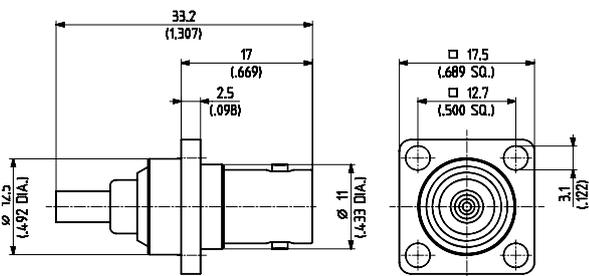


Fig. 1

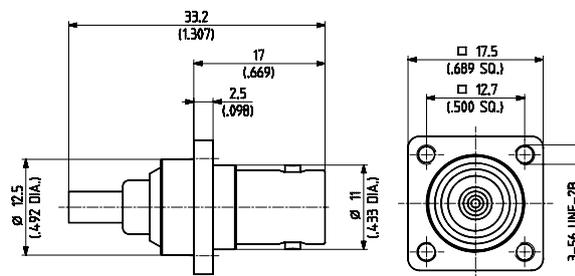


Fig. 2

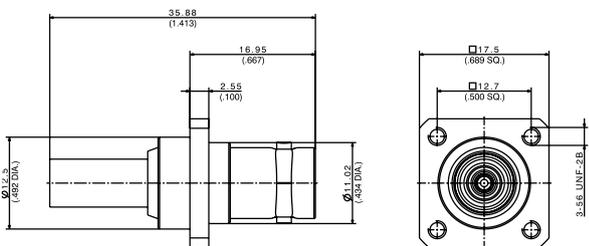


Fig. 3



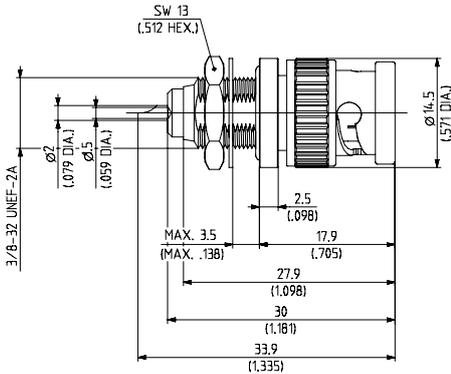
| HUBER+SUHNER type     | Item no. | Cable group (example)               | Packaging | Assembly instruction | Mounting hole | Crimp insert | Fig.            |
|-----------------------|----------|-------------------------------------|-----------|----------------------|---------------|--------------|-----------------|
| 25_BNC-50-2-13/133_NE | 22641919 | U2 (RG_316_/U,<br>ENVIROFLEX_316)   | single    | 9068                 | ML 8          | 1 A          | 2 <sup>1)</sup> |
| 25_BNC-50-2-14/133_NE | 22641924 |                                     |           |                      |               |              | 1               |
| 25_BNC-50-2-16/133_NE | 22641795 | U4 (K_02252_D,<br>ENVIROFLEX_316_D) |           |                      |               |              |                 |
| 25_BNC-50-3-39/133_NE | 84057974 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)   |           | 0000231565           |               | 2 B          | 3               |

<sup>1)</sup> Mounting also possible with screws ISO M 2.5.

# Series BNC 50 Ω – receptacles with solder end

## Receptacles, plugs (male)

- Bulkhead mounted
- Insulating washers see page 556
- Solder tags see page 557



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Panel thickness | Notes           |
|----------------------|----------|-----------|---------------|-----------------|-----------------|
| 12_BNC-50-0-1/133_NE | 22540154 | single    | ML 2          | max. 3.5 mm     | with panel seal |

## Receptacles, jacks (female)

- Bulkhead mounted
- Insulating washers see page 556
- Solder tags see page 557

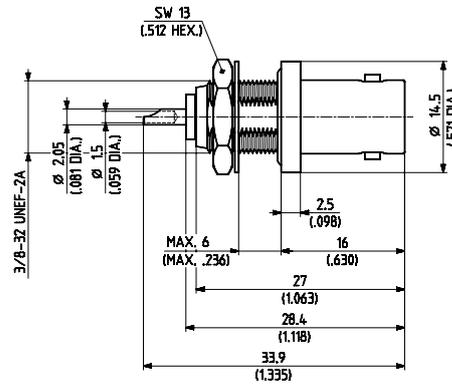
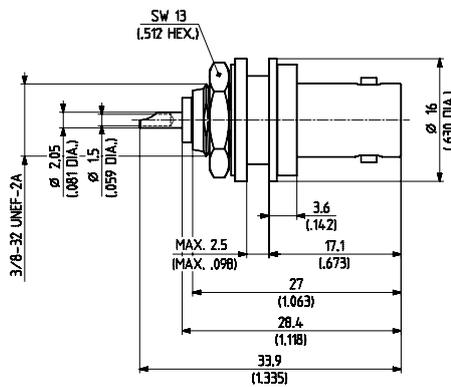


Fig. 1

Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Fig. | Notes                            |
|----------------------|----------|---------------|---------------|------|----------------------------------|
| 22_BNC-50-0-2/133_NE | 22540293 | single        | ML 102        | 1    | insulated mounting <sup>1)</sup> |
| 22_BNC-50-0-3/133_NE | 22540301 | single        | ML 1          | 2    | with panel seal                  |
| 22_BNC-50-0-3/133_NH | 22645500 | bulk 100 pcs. |               |      |                                  |

<sup>1)</sup> equipped with insulating washers 77\_Z-0-0-2 (not protected against rotation)

# Series BNC 50 Ω – receptacles with solder end

## Receptacles, jacks (female)

- Bulkhead mounted
- Insulating washers see page 556
- Solder tags see page 557

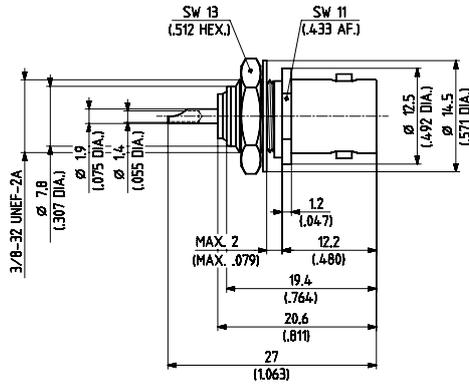


Fig. 1

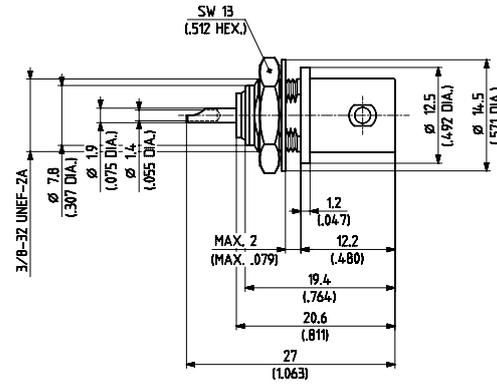


Fig. 2



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Fig. | Notes                               |
|----------------------|----------|---------------|---------------|------|-------------------------------------|
| 22_BNC-50-0-4/133_NE | 22540303 | single        | ML 3          | 1    | not suitable for insulated mounting |
| 22_BNC-50-0-5/133_NE | 22540308 | single        | ML 2          | 2    | suitable for insulated mounting     |
| 22_BNC-50-0-5/133_NH | 22650242 | bulk 100 pcs. |               |      |                                     |

- Bulkhead mounted
- Insulating washers see page 556
- Solder tags see page 557

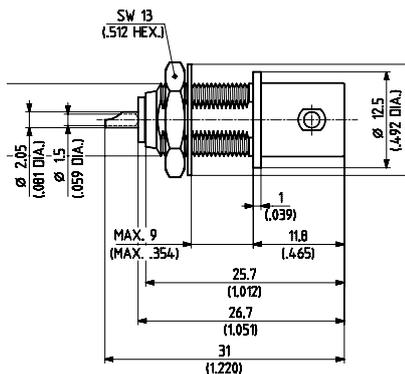


Fig. 1

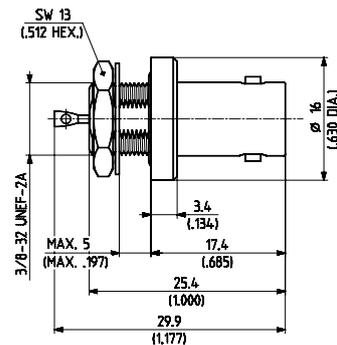


Fig. 2



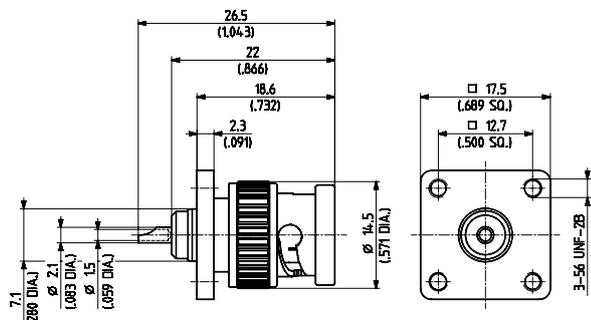
| HUBER+SUHNER type                   | Item no. | Packaging | Mounting hole | Fig. | Notes  |
|-------------------------------------|----------|-----------|---------------|------|--|
| 22_BNC-50-0-16/133_NE               | 22540314 | single    | ML 2          | 1    | suitable for insulated mounting  |
| 22_BNC-50-0-24/100_NE <sup>1)</sup> | 22540321 |           |               | 2    | hermetically sealed/body silver plated<br>leak rate $\leq 10^{-6}$ Torr l/sec.(atm cc/s) |

<sup>1)</sup> RoHS compliant alternative on request.

# Series BNC 50 Ω – receptacles with solder end

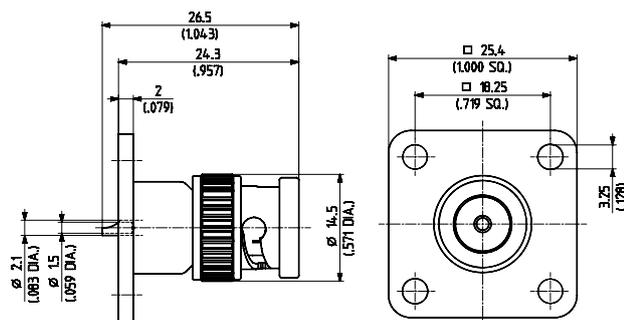
## Receptacles, plugs (male)

- Panel mounted



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes  |
|----------------------|----------|-----------|---------------|--|
| 13_BNC-50-0-1/133_NE | 22543470 | single    | ML 6          | mounting also possible with screws ISO M 2.5 |

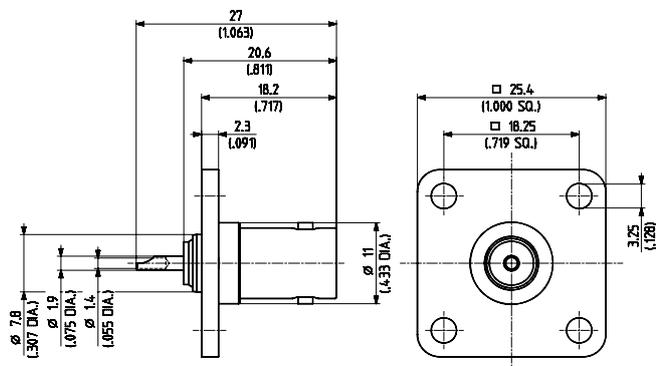
- Panel mounted



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes   |
|----------------------|----------|-----------|---------------|---|
| 13_BNC-50-0-2/133_NE | 22540160 | single    | ML 5          | suitable for Sucobox applications, see page 558 |

## Receptacles, jacks (female)

- Panel mounted

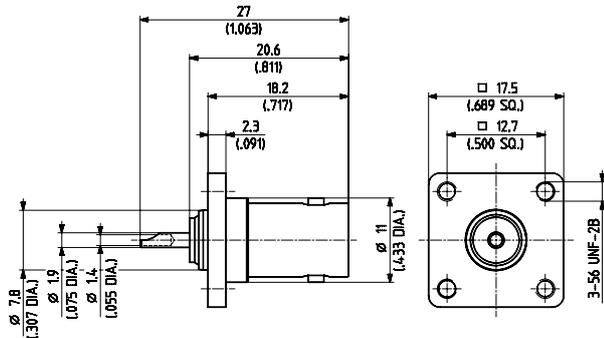


| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes   |
|----------------------|----------|-----------|---------------|---|
| 23_BNC-50-0-2/133_NE | 22540333 | single    | ML 5          | suitable for Sucobox applications, see page 558 |

# Series BNC 50 Ω – receptacles with solder end

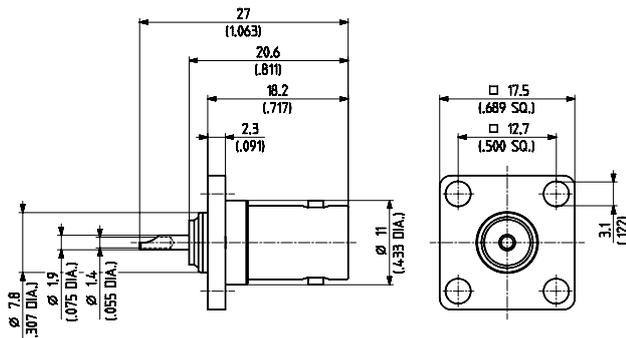
## Receptacles, jacks (female)

- Panel mounted



| HUBER+SUHNER type     | Item no. | Packaging | Mounting hole | Notes  |
|-----------------------|----------|-----------|---------------|--|
| 23_BNC-50-0-12/133_NE | 22540349 | single    | ML 6          | mounting also possible with screws ISO M 2.5 |

- Panel mounted

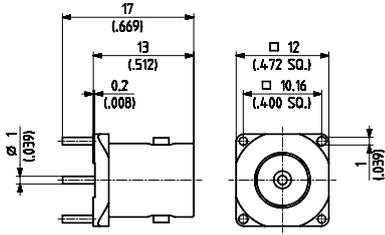


| HUBER+SUHNER type     | Item no. | Packaging | Mounting hole |
|-----------------------|----------|-----------|---------------|
| 23_BNC-50-0-16/133_NE | 22540355 | single    | ML 6          |



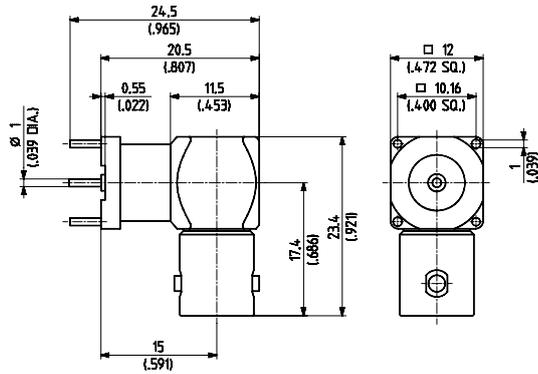
# Series BNC 50 Ω – PCB connectors

## Straight PCB jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Notes                               |
|----------------------|----------|---------------|---------------|-------------------------------------|
| 82_BNC-50-0-1/133_NE | 22645779 | single        | ML 49         | plating body: SUCOPLATE®            |
| 82_BNC-50-0-1/133_NH | 22543974 | bulk 100 pcs. |               |                                     |
| 82_BNC-50-0-1/111_NH | 23012124 | bulk 100 pcs. |               | plating body: SUCOPRO® gold plating |

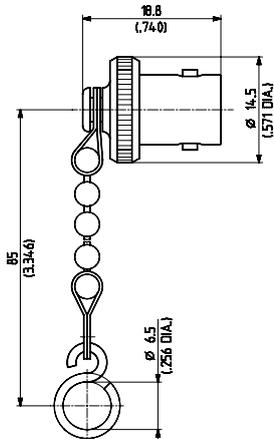
## Right angle PCB jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes                    |
|----------------------|----------|-----------|---------------|--------------------------|
| 85_BNC-50-0-1/133_NE | 22540736 | single    | ML 49         | plating body: SUCOPLATE® |

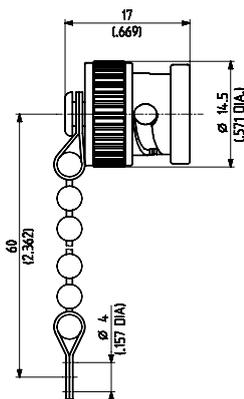
# Series BNC 50 Ω – protective caps and shorts

## Protective cap for plugs (male)



| HUBER+SUHNER type   | Item no. | Packaging | Notes               |
|---------------------|----------|-----------|---------------------|
| 61_BNC-0-0-1/-33_-E | 22540660 | single    | with chain and loop |

## Protective caps for jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging | Notes                     |
|----------------------|----------|-----------|---------------------------|
| 62_BNC-0-0-1/-33_-E  | 22540666 | single    | protective cap with chain |
| 64_BNC-50-0-1/133_NE | 22540681 |           | short circuit with chain  |

## Protective caps for jacks (female)

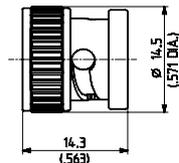
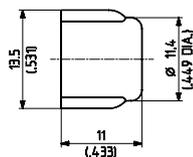


Fig. 1

Fig. 2

| HUBER+SUHNER type   | Item no. | Packaging     | Fig. | Notes           |
|---------------------|----------|---------------|------|-----------------|
| 62_BNC-0-0-2/---_H  | 22540667 | bulk 100 pcs. | 1    | made of plastic |
| 62_BNC-0-0-3/-33_-E | 22540669 | single        | 2    |                 |

# Series BNC 75 Ω – coaxial miniature connectors

## Description

HUBER+SUHNER BNC 75 Ω featuring a two stud bayonet coupling mechanism which is particularly useful for frequently coupled and uncoupled RF connections. At frequencies up to 1 GHz the small impedance deviation is negligible for most applications.

## Compatibility

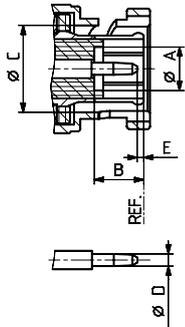
75 Ω BNC connectors and 50 Ω BNC connectors are intermateable without any restrictions.

## Contents

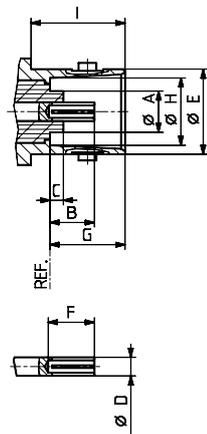
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## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug       |            | Jack            |            |
|---|------------|------------|-----------------|------------|
|   | min.       | max.       | min.            | max.       |
| A | 4.83/0.190 | 4.97/0.196 | –               | 4.72/0.186 |
| B | 5.28/0.208 | 5.79/0.228 | 4.72/0.186      | 5.23/0.206 |
| C | 9.78/0.385 | 9.91/0.390 | 1.50/0.059 nom. |            |
| D | 1.32/0.052 | 1.37/0.054 | 2.10/0.827 nom. |            |
| E | 0.08/0.003 | 1.02/0.040 | 9.60/0.378      | 9.70/0.382 |
| F | –          | 4.95/0.195 | –               | –          |
| G | –          | 8.35/0.328 | 8.48/0.334      | –          |
| H | –          | –          | 8.10/0.319      | 8.15/0.321 |
| I | –          | –          | 10.60/0.417     | –          |

### Interface dimensions conformable to the standards:

International: IEC 61169-8

# Series BNC 75 Ω – technical data

| Electrical data                                | Requirements                           |
|--|--|
| Impedance                                      | 75 Ω                                   |
| Frequency range                                | DC to 1 GHz                            |
| Dielectric withstanding voltage (at sea level) | 1.5 kV rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)                 | 500 V rms, 50 Hz (depending on cable)  |
| Insulation resistance                          | ≥ 5 · 10 <sup>5</sup> MΩ               |
| Contact resistance                             |  |
| · Centre contact                               | ≤ 1.5 mΩ                               |
| · Outer contact                                | ≤ 1 mΩ                                 |
| RF leakage (measured at 1 GHz)                 | ≥ 55 dB                                |

| Mechanical data                     | Requirements                  |
|-------------------------------------|-------------------------------|
| Coupling nut torque                 | 7 to 28 Ncm/0.6 to 2.5 in lbs |
| Coupling nut retention force        | ≥ 450 N/101.2 lbs             |
| Contact captivation                 | ≥ 27 N/6.1 lbs                |
| Cable retention force <sup>1)</sup> | see pages 32 – 41             |
| Durability (matings)                | ≥ 500                         |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | –65 to +165 °C/–85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |
| Shock               | MIL-STD-202, method 213, condition G                        |

| Material data   |  |                                  |
|-----------------|--|----------------------------------|
| Connector parts | Material                               | Plating                          |
| Bodies          | brass                                  | SUCOPLATE®/SUCOPRO® gold plating |
| Pin contacts    | brass                                  | gold/SUCOPRO® gold plating       |
| Socket contacts | copper-beryllium alloy<br>copper alloy | gold/SUCOPRO® gold plating       |
| Crimp ferrules  | copper/brass                           | SUCOPLATE®                       |
| Insulators      | PTFE or PFA                            |                                  |
| Gaskets         | silicone rubber                        |                                  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

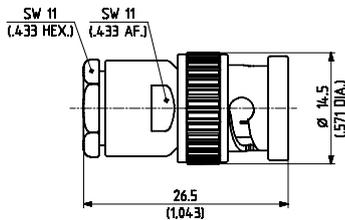
<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series BNC 75 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction |
|----------------------|----------|---------------------------------|-----------|----------------------|
| 11_BNC-75-2-1/133_NE | 22543768 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 3005                 |
| 11_BNC-75-4-3/133_NE | 22540758 | U6 (RG_59_B/U, RADOX_RF_59)     |           |                      |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

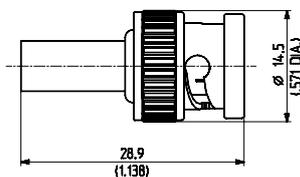
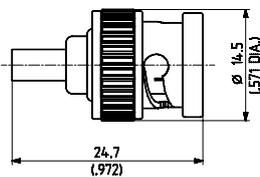


Fig. 1

Fig. 2

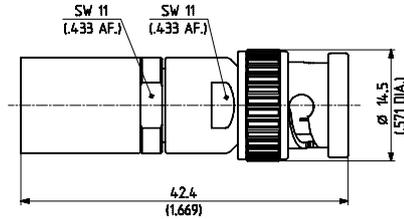
| HUBER+SUHNER type     | Item no. | Cable group (example)           | Packaging     | Assembly instruction | Crimp insert | Fig. |
|-----------------------|----------|---------------------------------|---------------|----------------------|--------------|------|
| 11_BNC-75-2-15/133_NE | 22641685 | U5 (RG_179_B/U, ENVIROFLEX_179) | single        | 9068                 | 1 A          | 1    |
| 11_BNC-75-2-15/133_NH | 22644586 |                                 | bulk 100 pcs. |                      |              |      |
| 11_BNC-75-3-8/133_NE  | 22540707 | U12 (G_03233)                   | single        | 3015                 | 2 B          | 2    |
| 11_BNC-75-3-9/133_NE  | 22540709 | U14 (G_03213_D)                 | single        |                      |              |      |
| 11_BNC-75-4-4/133_NE  | 22540761 | U16 (RG_59_B/U, RADOX_RF_59)    | single        |                      |              |      |
| 11_BNC-75-4-4/133_NH  | 22544846 |                                 | bulk 100 pcs. |                      |              |      |
| 11_BNC-75-4-6/133_NE  | 22540765 | U18 (G_04133_D)                 | single        |                      |              |      |
| 11_BNC-75-4-6/133_NH  | 22540766 |                                 | bulk 100 pcs. |                      |              |      |
| 11_BNC-75-4-30/133_NE | 22544636 | U17 (S_04233)                   | single        |                      |              |      |

# Series BNC 75 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|-----------------------|-----------|----------------------|--------------|
| 11_BNC-75-7-5/133_NE | 22540811 | U34 (RG_11_A/U)       | single    | 9120                 | 2D           |
| 11_BNC-75-7-6/133_NE | 22543960 | U36 (G_07273_D)       |           |                      |              |

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554

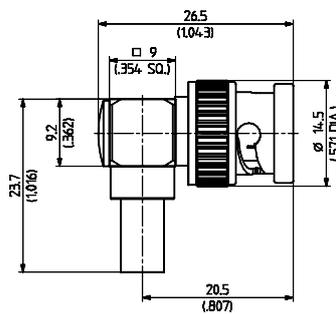
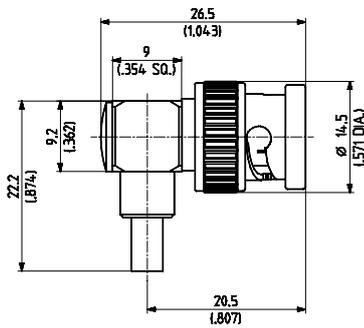


Fig. 1

Fig. 2

| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert | Fig. |
|----------------------|----------|---------------------------------|-----------|----------------------|--------------|------|
| 16_BNC-75-2-3/133_NE | 22540820 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 3079                 | A            | 1    |
| 16_BNC-75-4-4/133_NE | 22540840 | U16 (RG_59_B/U, RADOX_RF_59)    |           | 3058                 | C            | 2    |

# Series BNC 75 Ω – cable connectors

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

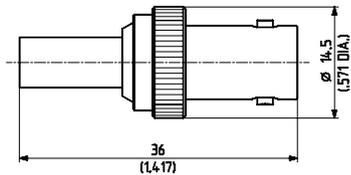


Fig. 1

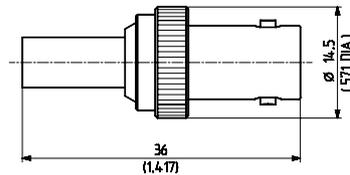


Fig. 2

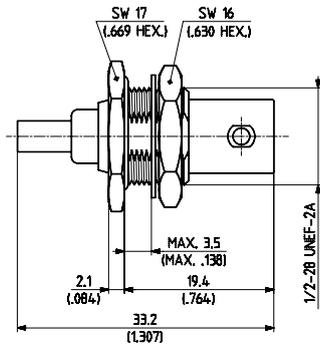


| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert | Fig. |
|----------------------|----------|---------------------------------|-----------|----------------------|--------------|------|
| 21_BNC-75-2-5/133_NE | 22641780 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 9068                 | 1A           | 1    |
| 21_BNC-75-4-4/133_NE | 22540872 | U16 (RG_59_B/U, RADOX_RF_59)    | single    | 3015                 | 2 C          | 2    |

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- With panel seal
- Insulating washers see page 556
- Taper sleeves see page 554



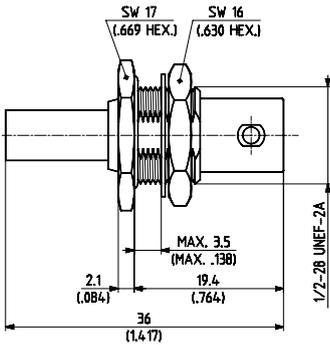
| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging     | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|---------------------------------|---------------|----------------------|---------------|--------------|
| 24_BNC-75-2-6/133_NE | 22641786 | U5 (RG_179_B/U, ENVIROFLEX_179) | single        | 9068                 | ML 4          | 1A           |
| 24_BNC-75-2-6/133_NH | 22644569 | U5 (RG_179_B/U, ENVIROFLEX_179) | bulk 100 pcs. |                      |               |              |

# Series BNC 75 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- With panel seal
- Insulating washers see page 556
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)        | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|------------------------------|-----------|----------------------|---------------|--------------|
| 24_BNC-75-4-3/133_NE | 22540930 | U16 (RG_59_B/U, RADOX_RF_59) | single    | 3015                 | ML 4          | 2 C          |

## Straight panel cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

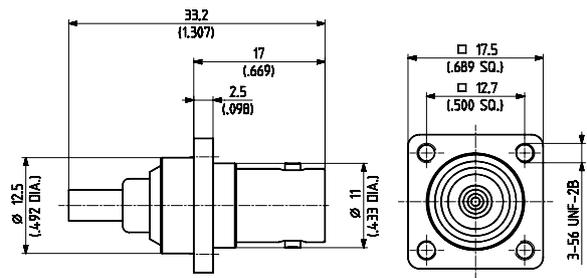
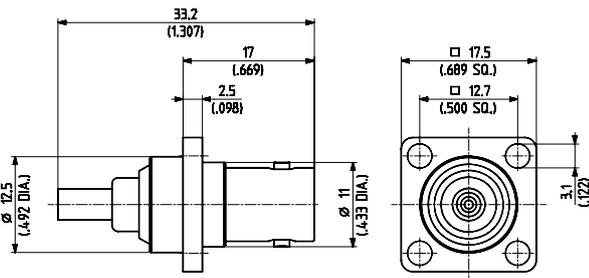


Fig. 1

Fig. 2

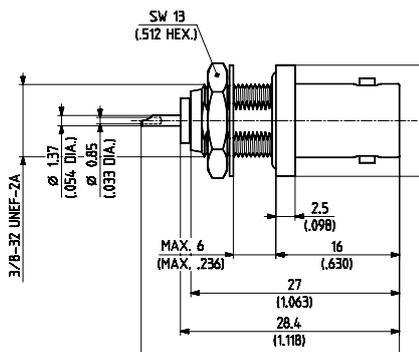
| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert | Fig.            |
|----------------------|----------|---------------------------------|-----------|----------------------|--------------|-----------------|
| 25_BNC-75-2-7/133_NE | 22641790 | U5 (RG_179_B/U, ENVIROFLEX_179) | single    | 9068                 | 1 A          | 1               |
| 25_BNC-75-2-8/133_NE | 22641791 |                                 |           |                      |              | 2 <sup>1)</sup> |

<sup>1)</sup> mounting also possible with screws ISO M 2.5

# Series BNC 75 Ω – receptacles with solder end

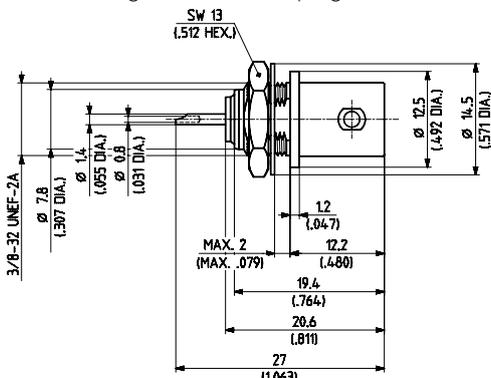
## Receptacles, jacks (female)

- Bulkhead mounted
- With panel seal
- Solder tags see page 557
- Insulating washers see page 556



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 22_BNC-75-0-1/133_NE | 22540883 | single    | ML 1          |

- Bulkhead mounted
- Solder tags see page 557
- Insulating washers see page 556

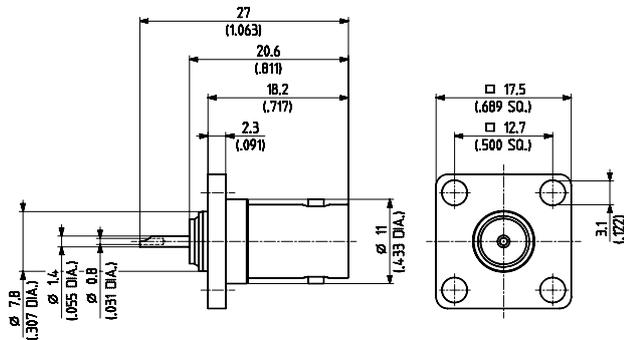


| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes              |
|----------------------|----------|-----------|---------------|--------------------|
| 22_BNC-75-0-4/133_NE | 22540889 | single    | ML 2          | without panel seal |

# Series BNC 75 Ω – receptacles with solder end

## Receptacles, jacks (female)

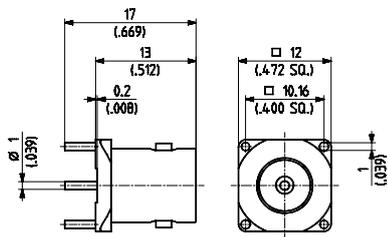
- Panel mounted



| HUBER+SUHNER type     | Item no. | Packaging | Mounting hole |
|-----------------------|----------|-----------|---------------|
| 23_BNC-75-0-10/133_NE | 22540906 | single    | ML 6          |

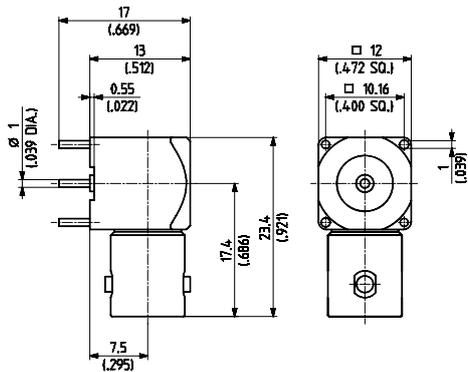
# Series BNC 75 Ω – PCB connectors

## Straight PCB jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole | Plating body |
|----------------------|----------|---------------|---------------|--------------|
| 82_BNC-75-0-2/122_NE | 22643586 | single        | ML 49         | nickel       |
| 82_BNC-75-0-2/122_NH | 22646624 | bulk 100 pcs. |               |              |

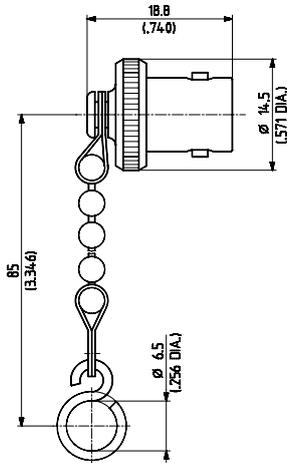
## Right angle PCB jacks (female)



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 85_BNC-75-0-1/133_NE | 22641623 | single    | ML 49         |

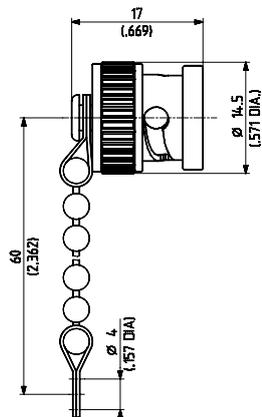
# Series BNC 75 Ω – protective caps and shorts

## Protective cap for plugs (male)



| HUBER+SUHNER type   | Item no. | Packaging | Notes               |
|---------------------|----------|-----------|---------------------|
| 61_BNC-0-0-1/-33_-E | 22540660 | single    | with chain and loop |

## Protective cap for jacks (female)



| HUBER+SUHNER type   | Item no. | Packaging | Notes      |
|---------------------|----------|-----------|------------|
| 62_BNC-0-0-1/-33_-E | 22540666 | single    | with chain |

# Series BNC 75 Ω – protective caps and shorts

## Protective caps for jacks (female)

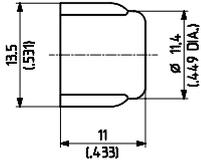


Fig. 1

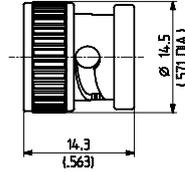
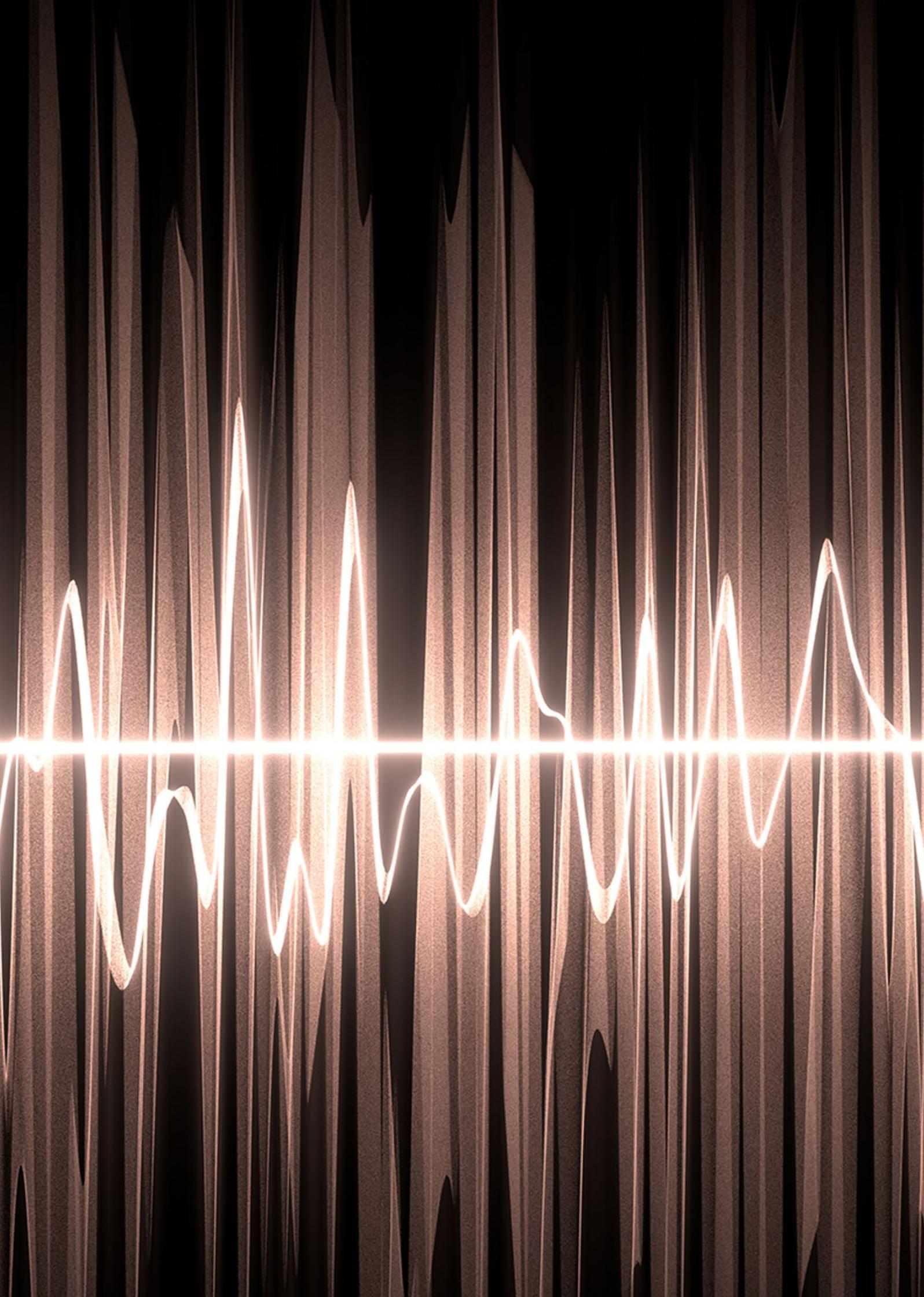


Fig. 2



| HUBER+SUHNER type  | Item no. | Packaging     | Fig. | Notes           |
|--------------------|----------|---------------|------|-----------------|
| 62_BNC-0-0-2/--_H  | 22540667 | bulk 100 pcs. | 1    | made of plastic |
| 62_BNC-0-0-3/-33_E | 22540669 | single        | 2    |                 |



# Series BNC "real" 75 $\Omega$ connectors

## Description

"Real" 75  $\Omega$  BNC connectors are suitable for applications up to 3 GHz, contrary to the conventional 75  $\Omega$  BNC connector types, which are applicable up to 1 GHz only. With our HUBER+SUHNER full crimp technique, they can be assembled quick and easy to all convenient cable types. Thanks to good electrical properties they are suitable for different applications, such as broadcast, telecommunication, etc.

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## Compatibility

Mechanically they are mateable with all conventional BNC connectors (50  $\Omega$  and 75  $\Omega$ ).

## Properties

- True 75  $\Omega$  impedance
- DC to 3 GHz
- Good return loss properties

## Benefits

- Fast and easy mounting (HUBER+SUHNER full crimp)
- Intermateable with standard BNC 50  $\Omega$  and BNC 75  $\Omega$  connectors



# Series BNC "real" 75 Ω – technical data

| Electrical data   | Requirements                           |
|---|--|
| Impedance   | 75 Ω                                   |
| Frequency range   | DC to 3 GHz                            |
| Return loss   | see table below                        |
| Dielectric withstanding voltage (at sea level)                | 1.5 kV rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)                                | 500 V rms, 50 Hz (depending on cable)  |
| Insulation resistance   | ≥ 5 · 10 <sup>3</sup> MΩ               |
| Contact resistance<br>· Centre conductor<br>· Outer conductor | ≤ 1.5 mΩ<br>≤ 1.0 mΩ                   |

| Connector type                               | Typical RL (dB) values |       |       | Cable                   |
|--|------------------------|-------|-------|-------------------------|
|  | 1 GHz                  | 2 GHz | 3 GHz |                         |
| Straight cable plugs (11_BNC-75-..)          | 30                     | 28    | 24    | Draka 0.6/2.8           |
|  | 30                     | 28    | 24    | Draka 0.8/3.7 AF        |
|  | 30                     | 28    | –     | G_04233_D <sup>1)</sup> |
|  | 30                     | 28    | 24    | Draka 1.0/4.8 AF        |
| Right angle cable plug (16_BNC-75-..)        | 28                     | 21    | –     | G_04233_D <sup>1)</sup> |
| Straight bulkhead cable jacks (24_BNC-75-..) | 35                     | 24    | 24    | Draka 0.8/3.7 AF        |
|  | 30                     | 25    | –     | G_04233_D <sup>1)</sup> |
|  | 35                     | 26    | 24    | Draka 1.0/4.8 AF        |

| Mechanical data              | Requirements                  |
|------------------------------|-------------------------------|
| Coupling nut torque          | 7 to 28 Ncm/0.6 to 2.5 in lbs |
| Coupling nut retention force | ≥ 450 N/101.2 lbs             |
| Contact captivation          | ≥ 27 N/6.1 lbs                |
| Durability (matings)         | 500                           |

| Environmental data    | Requirements  |
|-----------------------|---|
| Temperature range     | –65 to +165 °C/–85 to +329 °F                               |
| Climatic category IEC | 55/155/21   |
| Thermal shock         | MIL-STD-202, method 107, condition B                        |
| Moisture resistance   | MIL-STD-202, method 106                                     |
| Corrosion             | Saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration             | MIL-STD-202, method 204, condition B                        |
| Shock                 | MIL-STD-202, method 213, condition G                        |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> For applications up to 2 GHz

# Series BNC "real" 75 Ω – technical data

| Material data   |                        |                            |
|-----------------|------------------------|----------------------------|
| Connector part  | Material               | Plating                    |
| Bodies          | brass/spring bronze    | SUCOPLATE®                 |
| Pin contacts    | brass                  | gold/SUCOPRO® gold plating |
| Socket contacts | copper-beryllium alloy | gold/SUCOPRO® gold plating |
| Crimp ferrules  | copper                 | SUCOPLATE®                 |
| Insulators      | PTFE or PFA            |                            |
| Gaskets         | silicon rubber         |                            |

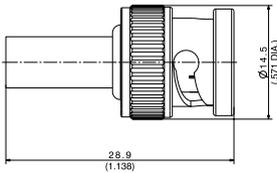
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# Series BNC "real" 75 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- HUBER+SUHNER full crimp



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert <sup>1)</sup> |
|-----------------------|----------|-----------------------|-----------|----------------------|----------------------------|
| 11_BNC-75-3-38/133_NE | 84070521 | Draka 0.6/2.8         | single    | 0000270344           | 76_Z-0-3-26                |
| 11_BNC-75-4-40/133_NE | 84112535 | U18 (G_04133_D)       |           | 0000270231           | 76_Z-0-4-24                |

<sup>1)</sup> Suitable for the large HUBER+SUHNER crimping tool

# Series BNC "real" 75 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Mounting hole ML 4
- Panel thickness max. 3.5 mm

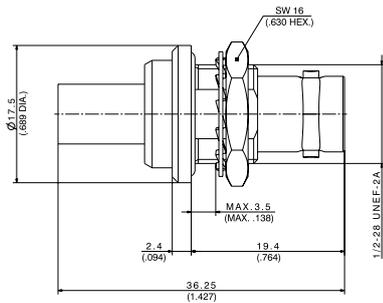


Fig. 1

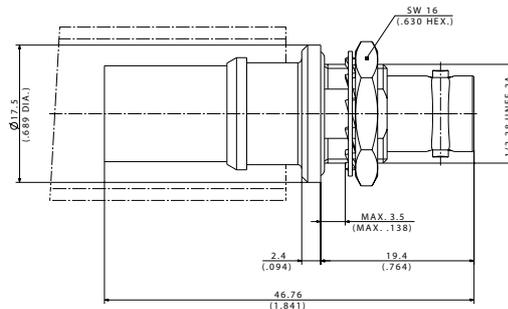
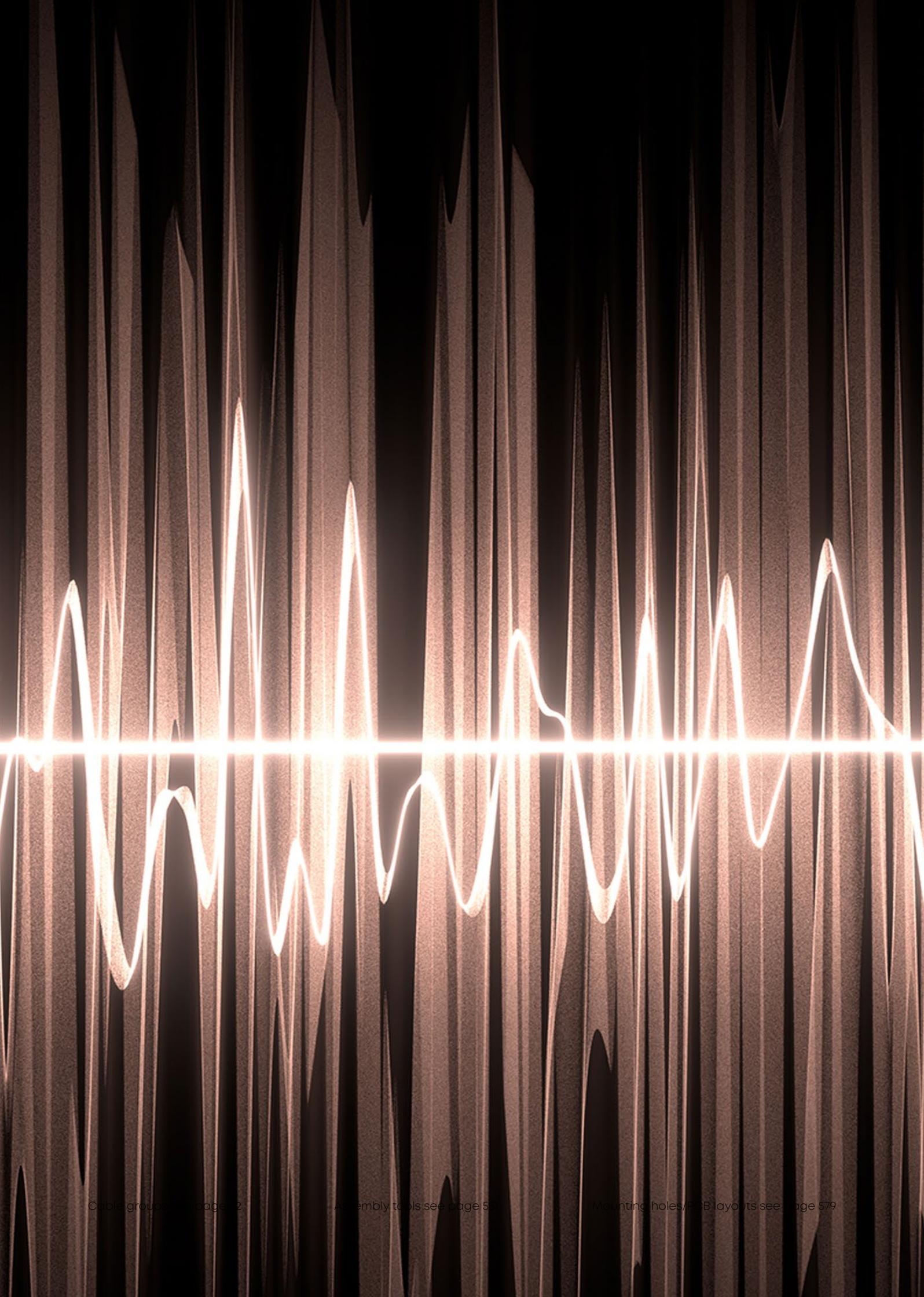


Fig. 2



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging | Assembly instruction | Crimp insert <sup>1)</sup> | Fig. |
|-----------------------|----------|-----------------------|-----------|----------------------|----------------------------|------|
| 24_BNC-75-4-18/133_NE | 84135127 | Draka 0.8/3.7 AF      | single    | 0000365601           | 76_Z-0-4-24                | 1    |
| 24_BNC-75-7-5/133_NE  | 85025799 | X33 (SPUMA_400-FR-75) |           | 0000468773           | 76_Z-0-7-1                 | 2    |

<sup>1)</sup> Suitable for the large HUBER+SUHNER crimping tool



# Series TNC 50 Ω – coaxial miniature connectors

## Description

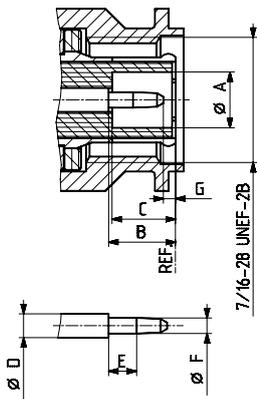
HUBER+SUHNER TNC connectors are threaded RF connectors applicable from DC up to 11 GHz. The threaded coupling mechanism improves control over the interface dimensions and allows them to be used under a higher environmental load than BNC, especially under a high vibration load.

## Compatibility

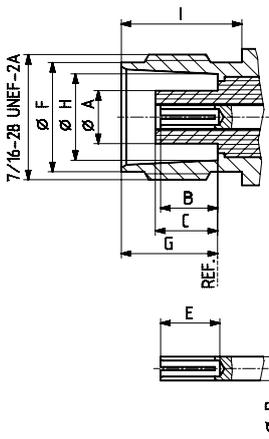
50 Ω TNC connectors and 75 Ω TNC connectors are intermateable without restrictions.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Content

|                                   |     |
|-----------------------------------|-----|
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| Interface dimensions in mm/inches | 349 |
| Technical data                    | 350 |
| Cable connectors                  | 351 |
| Receptacles with solder end       | 360 |
| Protective caps and shorts        | 363 |

|   | Plug       |            | Jack        |            |
|---|------------|------------|-------------|------------|
|   | min.       | max.       | min.        | max.       |
| A | 4.83/0.190 | –          | –           | 4.72/0.186 |
| B | 5.33/0.210 | 5.84/0.230 | 4.72/0.186  | 5.23/0.206 |
| C | 5.28/0.208 | 5.79/0.228 | 4.78/0.188  | 5.28/0.208 |
| D | 2.06/0.081 | 2.21/0.087 | 2.06/0.081  | 2.21/0.087 |
| E | 1.98/0.078 | –          | 4.95/0.195  | –          |
| F | 1.32/0.052 | 1.37/0.054 | 9.60/0.378  | 9.70/0.382 |
| G | 0.08/0.003 | –          | 8.31/0.327  | 8.51/0.335 |
| H | –          | –          | 8.10/0.319  | 8.15/0.321 |
| I | –          | –          | 10.52/0.414 | –          |

### Interface dimensions conformable to the standards:

|                |                               |
|----------------|-------------------------------|
| International: | IEC 60169-17                  |
| Europe:        | CECC 22 200                   |
| USA:           | MIL-PRF-39012                 |
|                | TNC-Interface MIL-STD-348/313 |

# Series TNC 50 Ω – technical data

| Electrical data   | Requirements                           |
|---|--|
| Impedance   | 50 Ω                                   |
| Frequency range   | DC to 11 GHz                           |
| Dielectric withstanding voltage (at sea level)            | 1.5 kV rms, 50 Hz (depending on cable) |
| Working voltage (at sea level)<br>· Unmated               | 500 V rms, 50 Hz (depending on cable)  |
| Insulation resistance                                     | ≥ 5 · 10 <sup>5</sup> MΩ               |
| Contact resistance<br>· Centre contact<br>· Outer contact | ≤ 1.5 mΩ<br>≤ 1 mΩ                     |
| RF leakage (between 2 and 3 GHz)                          | ≥ 60 dB                                |

| Mechanical data                      | Requirements                   |
|--------------------------------------|--------------------------------|
| Coupling nut torque<br>· Recommended | 46 to 69 Ncm/4.1 to 6.1 in lbs |
| Coupling nut retention force         | ≥ 450 N/101.2 lbs              |
| Contact captivation                  | ≥ 27 N/6.1 lbs                 |
| Cable retention force <sup>1)</sup>  | see pages 32 – 41              |
| Durability (matings)                 | ≥ 500                          |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | -65 to +165 °C/-85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |
| Shock               | MIL-STD-202, method 213, condition G                        |

| Material data   |  |                            |
|-----------------|--|----------------------------|
| Connector parts | Material                               | Plating                    |
| Bodies          | brass                                  | SUCOPLATE®                 |
| Pin contacts    | brass                                  | gold/SUCOPRO® gold plating |
| Socket contacts | copper beryllium alloy<br>copper alloy | gold/SUCOPRO® gold plating |
| Crimp ferrules  | copper/brass                           | SUCOPLATE®                 |
| Insulators      | PTFE or PFA                            |                            |
| Gaskets         | silicone rubber                        |                            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.  
Cable groups see page 32

Assembly tools see page 551

Mounting holes/PCB layouts see page 579

# Series TNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

1 security holes Ø 1/.039 DIA

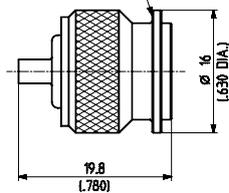


Fig. 1

3 security holes Ø 1/.039 DIA

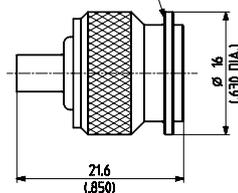


Fig. 2

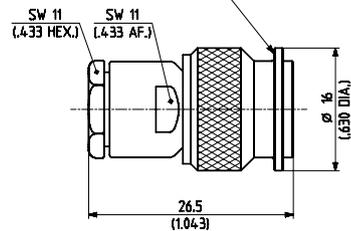


| HUBER+SUHNER type  | Item no.             | Cable group (example) | Packaging | Assembly instruction | Fig. | Notes                                      |
|--|----------------------|-----------------------|-----------|----------------------|------|--|
| 11_TNC-50-2-20/103_NE <sup>1)</sup>  | 22642519             | Y3, Y11, Y16 (EZ_86)  | single    | 9100                 | 1    |  |
| 11_TNC-50-3-29/103_NE <sup>1)</sup><br>11_TNC-50-3-29/113_NE <sup>1)</sup> | 22641997<br>22544841 | Y5, Y12 (EZ_141)      |           | 9106                 | 2    | outer contact silver<br>outer contact gold |

### For flexible cables

- Cable entry clamp
- Centre contact soldered

3 security holes Ø 1/.039 DIA.



| HUBER+SUHNER type                  | Item no. | Cable group (example)                      | Packaging | Assembly instruction |
|------------------------------------|----------|--|-----------|----------------------|
| 11_TNC-50-2-1/133_NE               | 22640783 | U2 (RG_316_/U,<br>ENVIROFLEX_316)          | single    | 3005                 |
| 11_TNC-50-3-5/133_NE               | 22640798 | U7, U9, U11 (RG_58_C/U,<br>ENVIROFLEX_B58) |           | 3005                 |
| 11_TNC-50-3-6/133_NE <sup>1)</sup> | 22543475 | U7, U9, U11 (RG_58_C/U,<br>ENVIROFLEX_B58) |           | 3004                 |

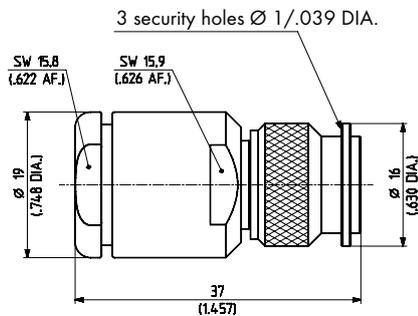
<sup>1)</sup> Centre contact NOT captivated

# Series TNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

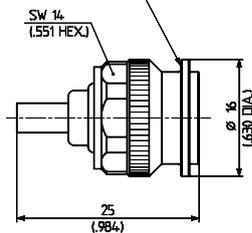


| HUBER+SUHNER type    | Item no. | Cable group (example)   | Packaging | Assembly instruction |
|----------------------|----------|---|-----------|----------------------|
| 11_TNC-50-7-2/133_NE | 22640466 | U29 (RG_213_/U,<br>RADOX_RF_213)<br>U32 (RG_214_/U,<br>ENVIROFLEX_B214) | single    | 3008                 |

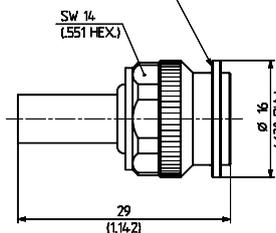
### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

3 security holes Ø 1/0.039 DIA.



3 security holes Ø 1/0.039 DIA.



3 security holes Ø 1/0.039 DIA.

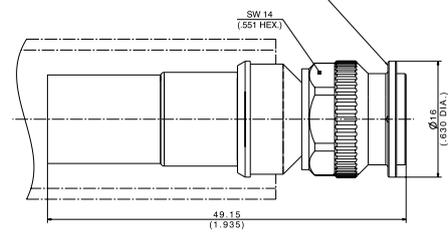


Fig. 1

Fig. 2

Fig. 3

| HUBER+SUHNER type                                | Item no.             | Cable group (example)  | Packaging               | Assembly instruction | Crimp insert | Fig. |
|--|----------------------|--|-------------------------|----------------------|--------------|------|
| 11_TNC-50-2-112/133_NE                           | 23001710             | U2 (RG_316_/U,<br>ENVIROFLEX_316)                            | single                  | 27215                | 1 A          | 1    |
| 11_TNC-50-2-113/133_NE                           | 23001711             | U4 (K_02252_D,<br>ENVIROFLEX_316_D)                          | single                  |                      |              |      |
| 11_TNC-50-3-115/133_NE<br>11_TNC-50-3-115/133_NH | 23001712<br>23001713 | U9, U39 (RG_223_/U,<br>ENVIROFLEX_B223)                      | single<br>bulk 100 pcs. | 3015                 | 2 B          | 2    |
| 11_TNC-50-3-116/133_NE<br>11_TNC-50-3-116/133_NH | 23001714<br>23001715 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)                            | single<br>bulk 100 pcs. |                      |              |      |
| 11_TNC-50-3-117/133_NE                           | 23010015             | U11, U41 (RG_400_/U,<br>ENVIROFLEX_400)                      | single                  | 0000184567           | 4 D          | 3    |
| 11_TNC-50-7-18/133_NE                            | 84077868             | U30, X32 (SPUMA_400,<br>SPUMA_400-FR-01,<br>SPUMA_400-RS-FR) | single                  |                      |              |      |

# Series TNC 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact plugged

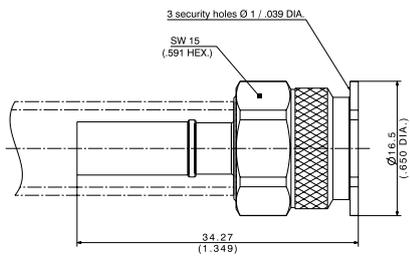


Fig. 1

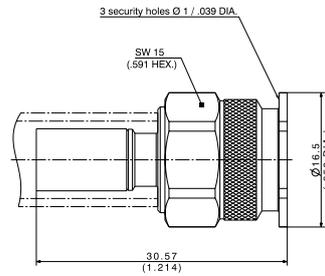


Fig. 2



| HUBER+SUHNER type      | Item no. | Cable group (example)               | Packaging | Assembly instruction | Crimp insert | Fig. |
|------------------------|----------|-------------------------------------|-----------|----------------------|--------------|------|
| 11_TNC-50-3-120/133_NE | 84010745 | X27 (SPUMA_195,<br>SPUMA_195-FR-01) | single    | 0000417754           | B            | 1    |
| 11_TNC-50-4-77/133_NE  | 85010169 | X28 (SPUMA_240,<br>SPUMA_240-FR-01) |           | 0000416857           | C            | 2    |

# Series TNC 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

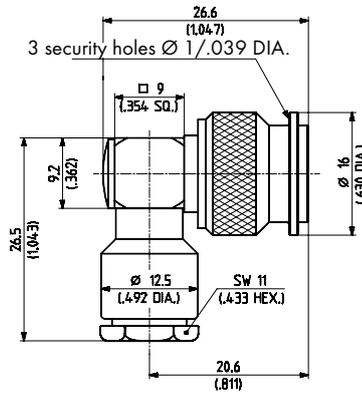


Fig. 1

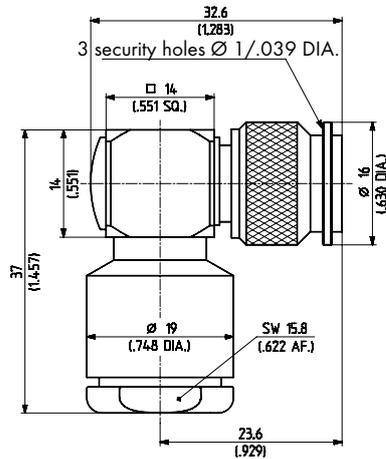


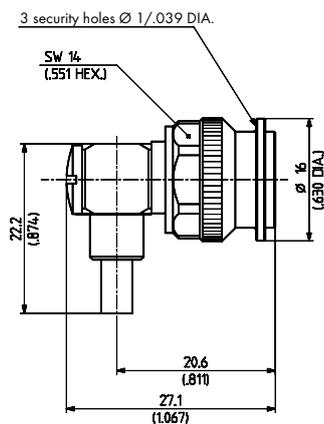
Fig. 2



| HUBER+SUHNER type     | Item no. | Cable group (example)  | Packaging | Assembly instruction | Fig. |
|-----------------------|----------|--|-----------|----------------------|------|
| 16_TNC-50-3-28/133_NE | 84012481 | U7, U9, U11 (RG 58_C/U, ENVIROFLEX_B58)                        | single    | 3024                 | 1    |
| 16_TNC-50-7-4/133_NE  | 22651587 | U29 (RG_213_/U, RADOX_RF_213) U32 (RG 214_/U, ENVIROFLEX_B214) | single    | 3003                 | 2    |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



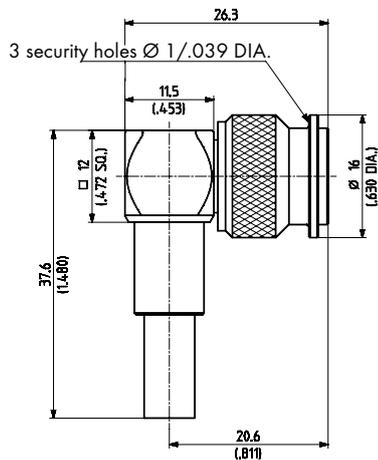
| HUBER+SUHNER type      | Item no. | Cable group (example)            | Packaging | Assembly instruction | Crimp insert |
|------------------------|----------|----------------------------------|-----------|----------------------|--------------|
| 16_TNC-50-2-119/133_NE | 23010087 | U2 (RG_316_/U, ENVIROFLEX_316)   | single    | 27216                | A            |
| 16_TNC-50-2-7/133_NE   | 23001716 | U4 (K_02252_D, ENVIROFLEX_316_D) |           |                      |              |

# Series TNC 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

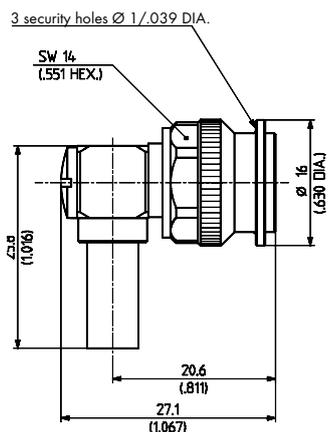
- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type     | Item no. | Cable group (example)                   | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|---|-----------|----------------------|--------------|
| 16_TNC-50-3-13/133_NE | 22640492 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)       | single    | 0000335265           | 2 B          |
| 16_TNC-50-3-18/133_NE | 22543606 | U9, U39 (RG_223_/U,<br>ENVIROFLEX_B223) |           |                      |              |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



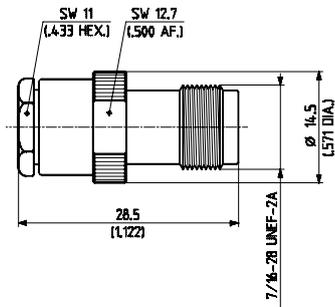
| HUBER+SUHNER type      | Item no. | Cable group (example)              | Packaging | Assembly instruction | Crimp insert |
|------------------------|----------|------------------------------------|-----------|----------------------|--------------|
| 16_TNC-50-3-111/133_NE | 23001717 | U9 (RG_223_/U,<br>ENVIROFLEX_B223) | single    | 27218                | B            |
| 16_TNC-50-3-112/133_NE | 23010115 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58)  | single    |                      |              |

# Series TNC 50 Ω – cable connectors

## Straight cable jacks (female)

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)              | Packaging | Assembly instruction |
|----------------------|----------|------------------------------------|-----------|----------------------|
| 21_TNC-50-2-2/133_NE | 22640515 | U2 (RG_316_/U, ENVIROFLEX_316)     | single    | 3005                 |
| 21_TNC-50-3-4/133_NE | 22640523 | U7, U9 (RG_58_C/U, ENVIROFLEX_B58) |           |                      |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

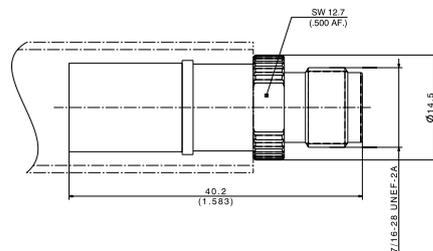
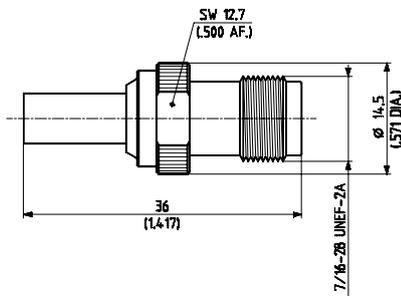


Fig. 1

Fig. 2

| HUBER+SUHNER type     | Item no. | Cable group (example)                                  | Packaging | Assembly instruction | Crimp insert | Fig. |
|-----------------------|----------|--|-----------|----------------------|--------------|------|
| 21_TNC-50-3-31/133_NE | 84016544 | U7 (RG_58_C/U, ENVIROFLEX_B58)                         | single    | 0000231215           | 2 B          | 1    |
| 21_TNC-50-3-32/133_NE | 84016601 | U9, U39 (RG_223_/U, ENVIROFLEX_B223)                   |           | 0000231453           |              |      |
| 21_TNC-50-7-1/133_NE  | 84128527 | U30, X32 (SPUMA_400, SPUMA_400-FR-01, SPUMA_400-RS-FR) | single    | 0000345941           | 4 D          | 2    |

# Series TNC 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- With panel seal
- Insulating washers see page 556

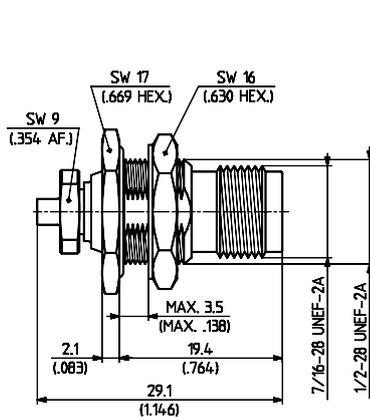


Fig. 1

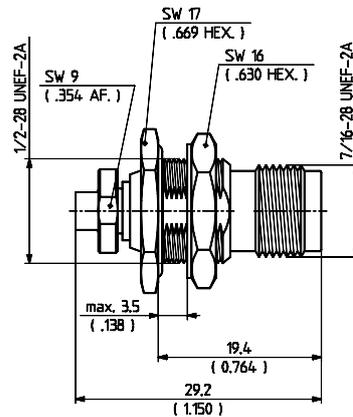


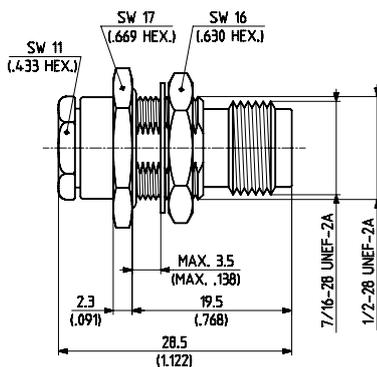
Fig. 2



| HUBER+SUHNER type                   | Item no. | Cable group (example) | Packaging     | Assembly instruction | Mounting hole | Fig. |
|-------------------------------------|----------|-----------------------|---------------|----------------------|---------------|------|
| 24_TNC-50-2-31/133_NE <sup>1)</sup> | 23001721 | Y3, Y11 (EZ_86)       | single        | 27269                | ML 4          | 1    |
| 24_TNC-50-3-30/133_NH <sup>1)</sup> | 23001723 | Y5, Y12 (EZ_141)      | bulk 100 pcs. | 27220                |               | 2    |

### For flexible cables

- Cable entry clamp
- Centre contact soldered
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type    | Item no. | Cable group (example)             | Packaging | Assembly instruction | Mounting hole |
|----------------------|----------|-----------------------------------|-----------|----------------------|---------------|
| 24_TNC-50-2-1/133_NE | 22543398 | U2 (RG_316_/U,<br>ENVIROFLEX_316) | single    | 3005                 | ML 4          |

<sup>1)</sup> Centre contact NOT captivated.

# Series TNC 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- With panel seal
- Taper sleeves see page 554
- Insulating washers see page 556

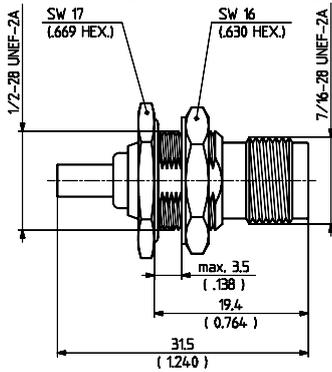


Fig. 1

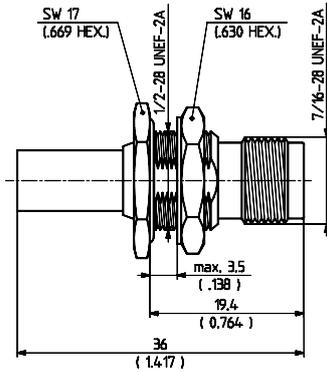


Fig. 2



| HUBER+SUHNER type     | Item no. | Cable group (example)            | Packaging     | Assembly instruction | Mounting hole | Crimp insert | Fig. |
|-----------------------|----------|----------------------------------|---------------|----------------------|---------------|--------------|------|
| 24_TNC-50-2-27/133_NE | 23001719 | U2 (RG_316_/U, ENVIROFLEX_316)   | single        | 9068                 | ML 4          | 1 A          | 1    |
| 24_TNC-50-2-29/133_NH | 23001720 | U4 (K_02252_D, ENVIROFLEX_316_D) | bulk 100 pcs. |                      |               |              |      |
| 24_TNC-50-3-21/133_NE | 23001722 | U9 (RG_223_/U, ENVIROFLEX_B223)  | single        | 27221                | ML 4          | 2 B          | 2    |
| 24_TNC-50-3-23/133_NE | 23010150 | U7 (RG_58_C/U, ENVIROFLEX_B58)   | single        |                      |               |              |      |

### For flexible cables

- Cable entry crimp
- Center contact plugged
- With panel seal
- Taper sleeves see page 554
- Insulating washers see page 556

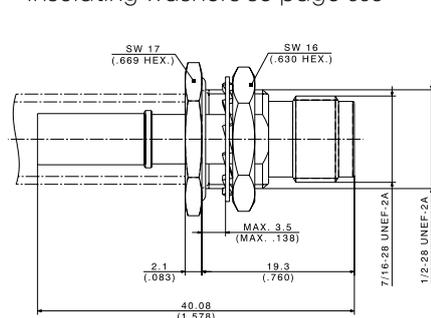


Fig. 1

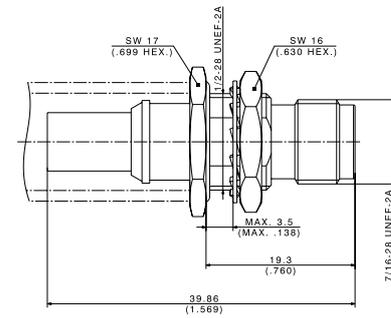


Fig. 2



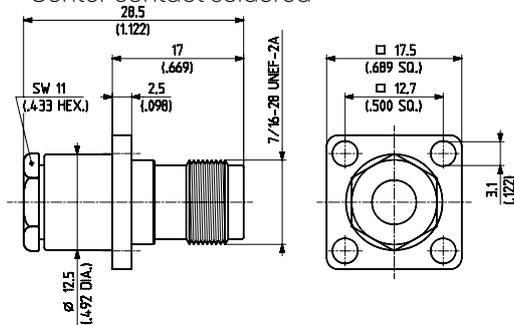
| HUBER+SUHNER type     | Item no. | Cable group (example)            | Packaging | Assembly instruction | Mounting hole | Crimp insert | Fig. |
|-----------------------|----------|----------------------------------|-----------|----------------------|---------------|--------------|------|
| 24_TNC-50-3-54/133_NE | 84010762 | X27 (SPUMA_195, SPUMA_195-FR-01) | single    | 0000417644           | ML 4          | B            | 1    |
| 24_TNC-50-4-77/133_NE | 85010236 | X28 (SPUMA_240, SPUMA_240-FR-01) |           | 0000416856           |               |              |      |

# Series TNC 50 Ω – cable connectors

## Straight panel cable jacks (female)

### For flexible cables

- Cable entry clamp
- Center contact soldered



| HUBER+SUHNER type    | Item no. | Cable group (example)              | Packaging | Assembly instruction | Mounting hole |
|----------------------|----------|------------------------------------|-----------|----------------------|---------------|
| 25_TNC-50-2-1/133_NE | 22640578 | U2 (RG_316_/U, ENVIROFLEX_316)     | single    | 3005                 | ML 8          |
| 25_TNC-50-3-9/133_NE | 22643707 | U7, U9 (RG_58_C/U, ENVIROFLEX_B58) |           |                      |               |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

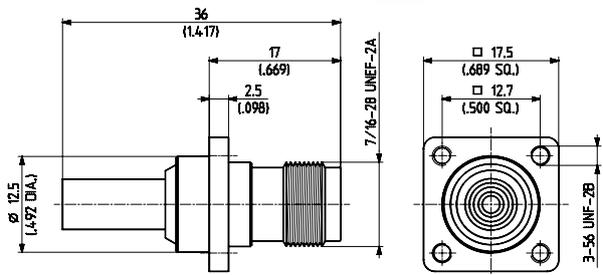
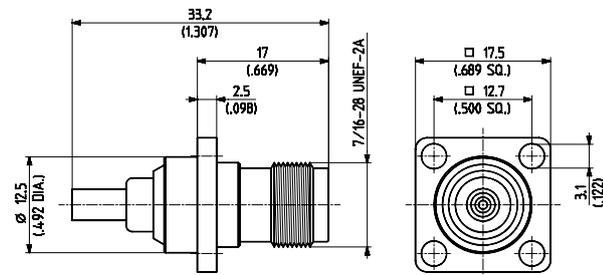


Fig. 1

Fig. 2

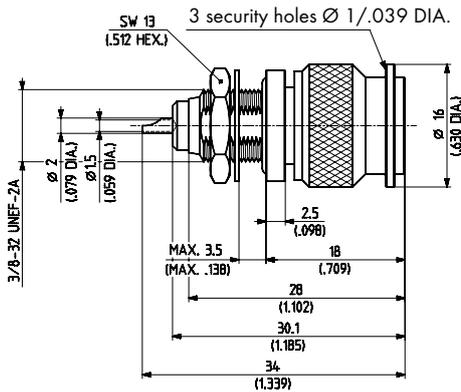
| HUBER+SUHNER type     | Item no. | Cable group (example)          | Packaging | Mounting hole | Crimp insert | Fig.            |
|-----------------------|----------|--------------------------------|-----------|---------------|--------------|-----------------|
| 25_TNC-50-2-19/133_NE | 84016723 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | ML 8          | 1 A          | 1               |
| 25_TNC-50-3-19/133_NE | 84016722 | U7 (RG_58_C/U, ENVIROFLEX_B58) |           |               | 2 B          | 2 <sup>1)</sup> |

<sup>1)</sup> Mounting also possible with screws ISO M 2.5 –

# Series TNC 50 Ω – receptacles with solder end

## Receptacles, plugs (male)

- Bulkhead mounted
- With panel seal
- Insulating washers see page 556
- Solder tags see page 557



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 12_TNC-50-0-1/133_NE | 22640467 | single    | ML 2          |

## Receptacles, jacks (female)

- Bulkhead mounted
- Insulating washers see page 556
- Solder tags see page 557

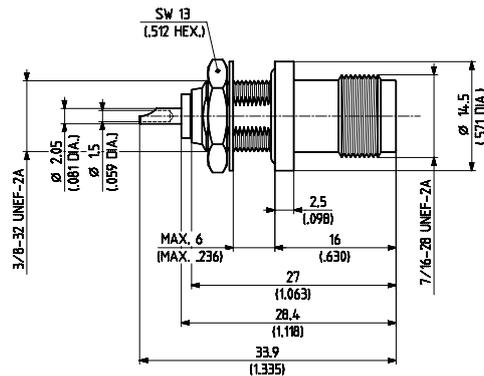


Fig. 1

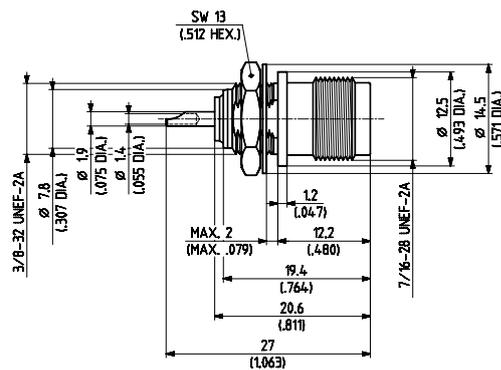
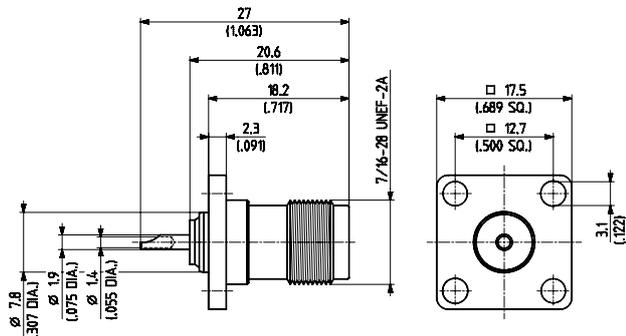


Fig. 2

| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Fig. | Notes           |
|----------------------|----------|-----------|---------------|------|-----------------|
| 22_TNC-50-0-1/133_NE | 22640537 | single    | ML 1          | 1    | with panel seal |
| 22_TNC-50-0-2/133_NE | 22640539 |           | ML 2          | 2    |                 |

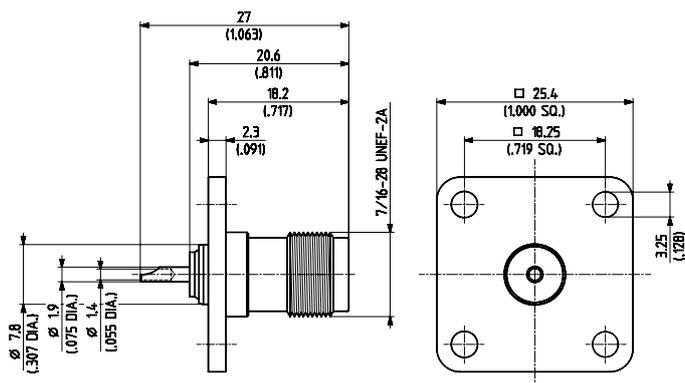
# Series TNC 50 Ω – receptacles with solder end

- Panel mounted



| HUBER+SUHNER type    | Item no. | Packaging     | Mounting hole |
|----------------------|----------|---------------|---------------|
| 23_TNC-50-0-2/133_NE | 22640549 | single        | ML 6          |
| 23_TNC-50-0-2/133_NH | 22644322 | bulk 100 pcs. |               |

- Panel mounted

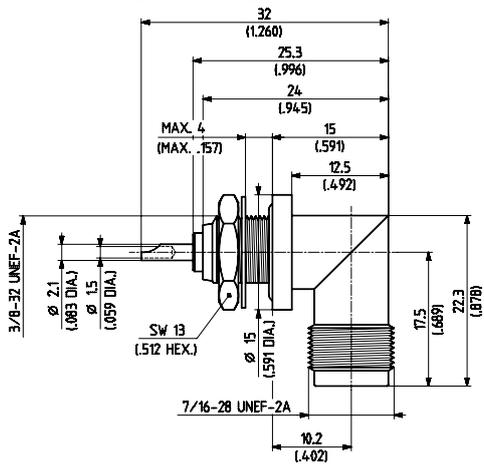


| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes   |
|----------------------|----------|-----------|---------------|---|
| 23_TNC-50-0-6/133_NE | 22640551 | single    | ML 5          | suitable for Sucobox applications, see page 558 |

# Series TNC 50 Ω – receptacles with solder end

## Right angle receptacle, jack (female)

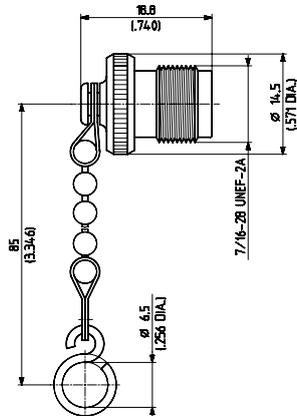
- Bulkhead mounted
- With panel seal
- Insulating washers see page 556
- Solder tags see page 557



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 27_TNC-50-0-1/133 NE | 22543405 | single    | ML 2          |

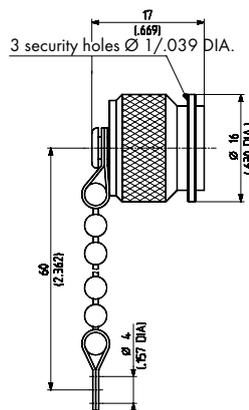
# Series TNC 50 Ω – protective caps and shorts

## Protective cap for plugs

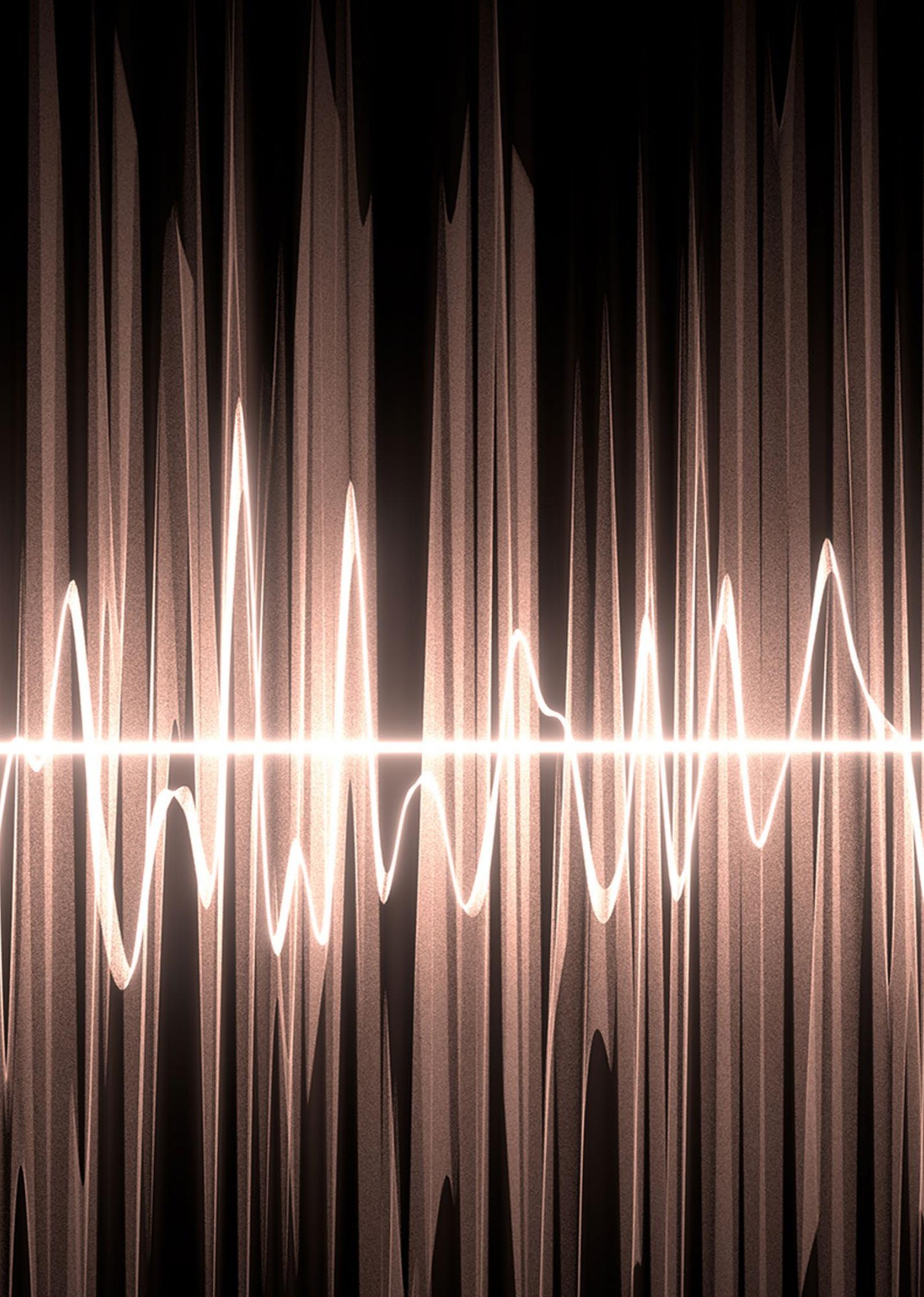


| HUBER+SUHNER type   | Item no. | Packaging | Notes      |
|---------------------|----------|-----------|------------|
| 61_TNC-0-0-1/-33_-E | 22640661 | single    | with chain |

## Protective cap for jacks



| HUBER+SUHNER type   | Item no. | Packaging | Notes      |
|---------------------|----------|-----------|------------|
| 62_TNC-0-0-1/-33_-E | 22640665 | single    | with chain |



# Series TNC 75 Ω – coaxial miniature connectors

## Description

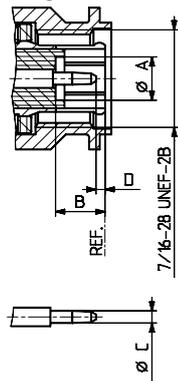
Within the internationally standardised TNC mating face dimensions a perfect 75 Ω characteristic impedance cannot be realised. However, at frequencies up to 1 GHz the small impedance deviation is negligible for practical applications. The threaded coupling mechanism allows them to be used under higher environmental load than BNC.

## Compatibility

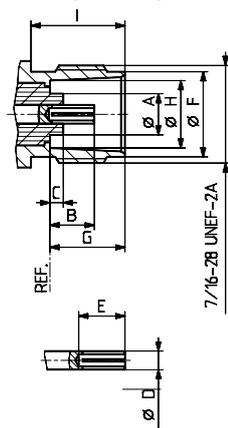
75 Ω TNC connectors and 50 Ω TNC connectors are intermateable without restrictions.

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



## Content

|                                   |     |
|-----------------------------------|-----|
| Description                       | 365 |
| Compatibility                     | 365 |
| Interface dimensions in mm/inches | 365 |
| Technical data                    | 366 |
| Cable connectors                  | 367 |
| Protective caps                   | 369 |

|   | Plug       |            | Jack             |            |
|---|------------|------------|------------------|------------|
|   | min.       | max.       | min.             | max.       |
| A | 4.83/0.190 | 4.97/0.196 | –                | 4.72/0.186 |
| B | 5.28/0.208 | 5.79/0.228 | 4.72/0.186       | 5.23/0.206 |
| C | 1.32/0.052 | 1.37/0.054 | 1.50 /0.059 nom. |            |
| D | 0.08/0.003 | 1.02/0.040 | 2.10/0.827 nom.  |            |
| E | –          | –          | 4.95/0.195       | –          |
| F | –          | –          | 9.60/0.378       | 9.70/0.382 |
| G | –          | –          | 8.35/0.328       | 8.48/0.334 |
| H | –          | –          | 8.10/0.319       | 8.15/0.321 |
| I | –          | –          | 10.60/0.417      | –          |

### Interface dimensions conformable to the standards:

Based on IEC 60169-17 and IEC 60169-8, annex A



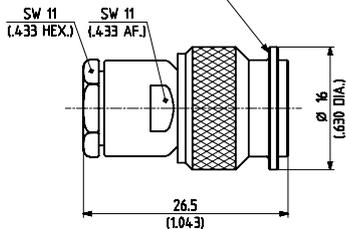
# Series TNC 75 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

3 security holes  $\varnothing 1/.039$  DIA.

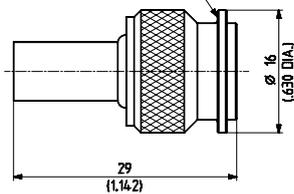


| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction |
|----------------------|----------|---------------------------------|-----------|----------------------|
| 11_TNC-75-4-2/133_NE | 22543477 | U16 (RG_59_B/U,<br>RADOX_RF_59) | single    | 3005                 |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

3 security holes  $\varnothing 1/.039$  DIA.



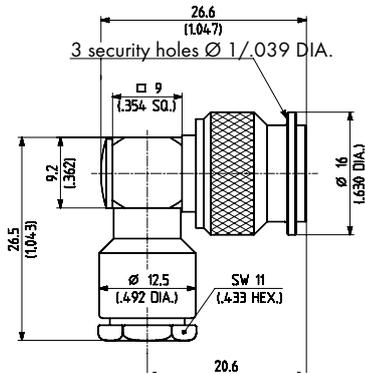
| HUBER+SUHNER type     | Item no. | Cable group (example)           | Packaging | Assembly instruction | Crimp insert |
|-----------------------|----------|---------------------------------|-----------|----------------------|--------------|
| 11_TNC-75-4-4/133_NE  | 22543478 | U16 (RG_59_B/U,<br>RADOX_RF_59) | single    | 3015                 | 2 C          |
| 11_TNC-75-4-30/133_NE | 22642503 | U17 (S_04233)                   |           |                      |              |

# Series TNC 75 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

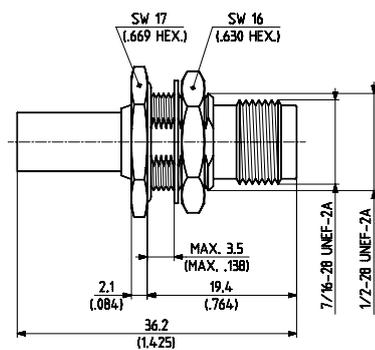


| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction |
|----------------------|----------|---------------------------------|-----------|----------------------|
| 16_TNC-75-4-2/133_NE | 22641402 | U16 (RG_59_B/U,<br>RADOX_RF_59) | single    | 3024                 |

## Straight bulkhead cable jacks (female)

### For flexible cables

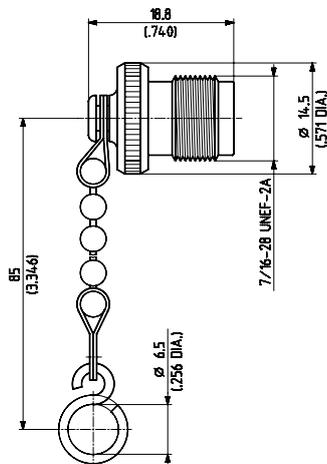
- HUBER+SUHNER full crimp
- With panel seal
- Taper sleeves see page 554
- Insulating washers see page 556



| HUBER+SUHNER type    | Item no. | Cable group (example)           | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|---------------------------------|-----------|----------------------|---------------|--------------|
| 24_TNC-75-4-8/133_NE | 22544140 | U16 (RG_59_B/U,<br>RADOX_RF_59) | single    | 3015                 | ML 4          | 2 C          |

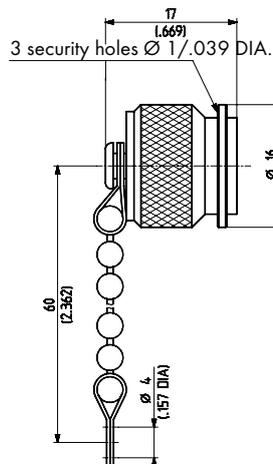
# Series TNC 75 Ω – protective caps

## Protective cap for plugs

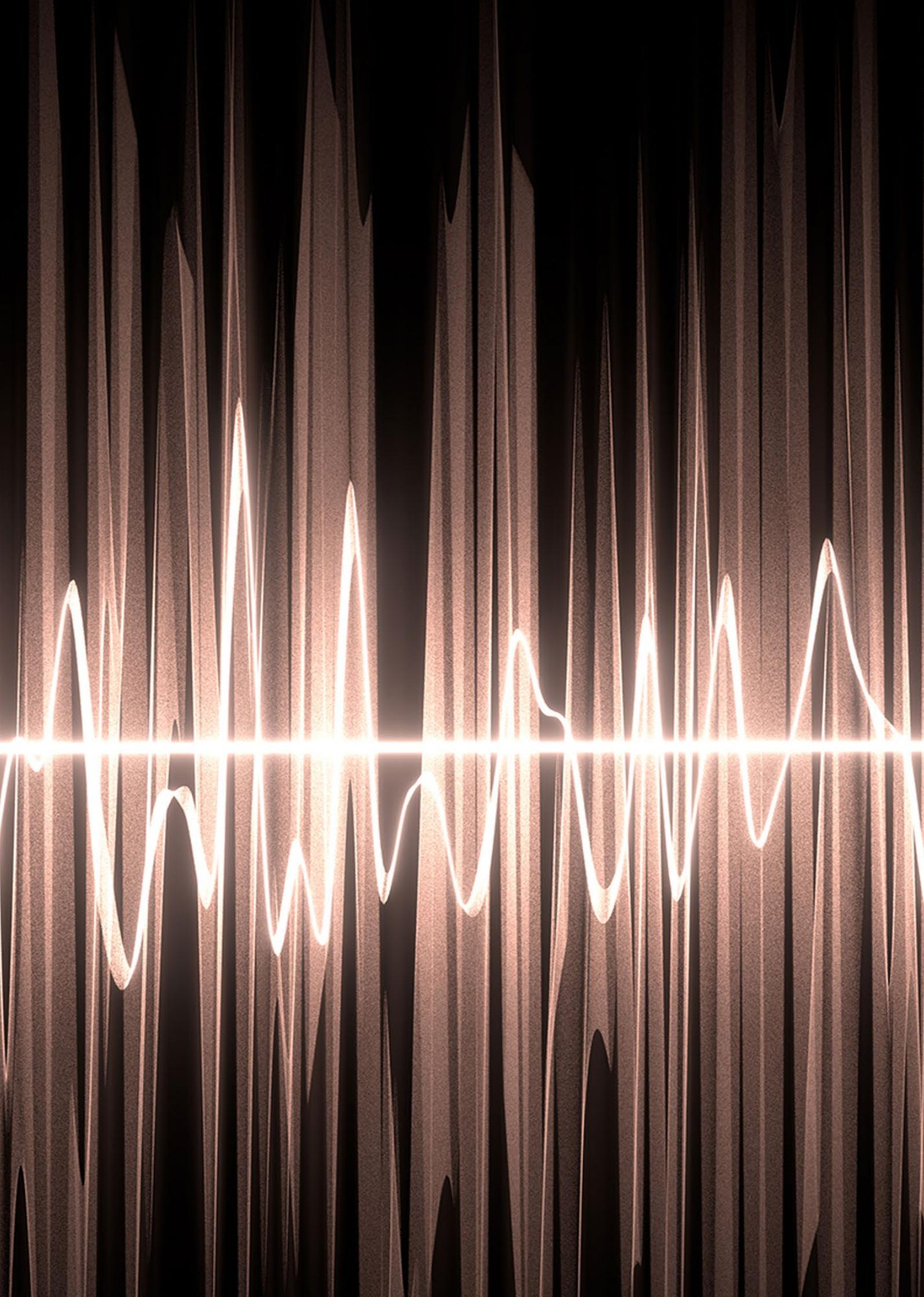


| HUBER+SUHNER type   | Item no. | Packaging | Notes      |
|---------------------|----------|-----------|------------|
| 61_TNC-0-0-1/-33_-E | 22640661 | single    | with chain |

## Protective cap for jacks



| HUBER+SUHNER type   | Item no. | Packaging | Notes      |
|---------------------|----------|-----------|------------|
| 62_TNC-0-0-1/-33_-E | 22640665 | single    | with chain |



# Series SHV – high voltage connectors

## Description

HUBER+SUHNER SHV (Safe High Voltage) connectors provide more secure handling: centre contacts are well recessed to prevent shock hazards in unmated condition. When mating a connector pair the outer conductor contact is made prior to the inner conductor contacts.

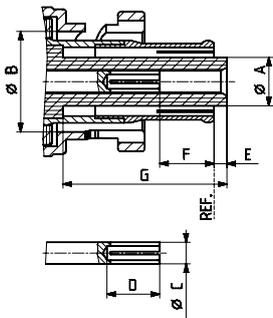
SHV connectors are suitable for all high voltage applications up to 5 kV DC or 3.5 kV rms. These connectors are typically used in nuclear instruments or test and measurement equipment. Voltages are valid for both, the mated and the unmated condition.

## Content

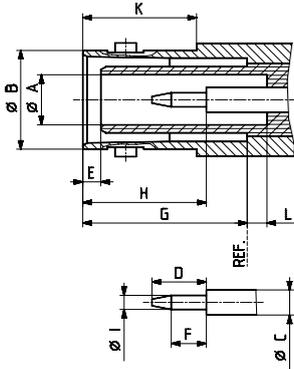
|                                   |     |
|-----------------------------------|-----|
| Description                       | 371 |
| Interface dimensions in mm/inches | 371 |
| Technical data                    | 372 |
| Cable connectors                  | 373 |
| Receptacles with solder end       | 375 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug        |             | Jack        |             |
|---|-------------|-------------|-------------|-------------|
|   | min.        | max.        | min.        | max.        |
| A | 4.57/0.180  | 4.72/0.186  | 4.83/0.190  | 4.98/0.196  |
| B | 9.78/0.385  | 9.91/0.390  | 9.60/0.378  | 9.70/0.382  |
| C | 2.06/0.081  | –           | 2.06/0.081  | –           |
| D | 5.44/0.214  | –           | 5.26/0.207  | 5.44/0.214  |
| E | 1.17/0.046  | 1.63/0.064  | 1.55/0.061  | 1.98/0.078  |
| F | 4.42/0.174  | –           | 3.30/0.130  | –           |
| G | 15.90/0.626 | 16.10/0.634 | 15.90/0.626 | 16.00/0.630 |
| H | –           | –           | 11.59/0.456 | 12.70/0.500 |
| I | –           | –           | 1.32/0.052  | 1.37/0.054  |
| K | –           | –           | 10.85/0.427 | –           |
| L | –           | –           | 1.63/0.064  | 2.18/0.086  |

### Interface dimensions conformable to the standards:

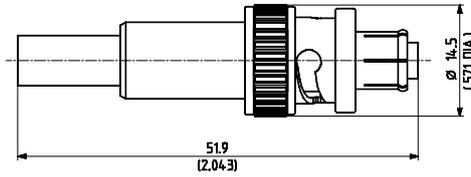
International: IEC 60498, NIM ND-545  
 USA: MIL-STD-348/314  
 ANSI N 24.4



# Series SHV – cable connectors

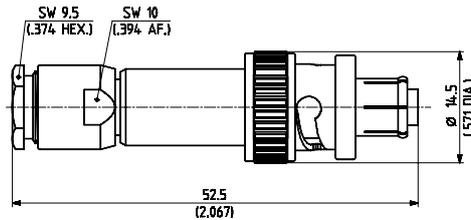
## Straight cable plugs (male)

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type    | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|--------------------------------|-----------|----------------------|--------------|
| 11_SHV-50-3-1/133_NE | 22541987 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3092                 | 2 B          |
| 11_SHV-50-4-1/133_NE | 22541992 | U16 (RG_59_B/U, RADOX_RF_59)   |           |                      | 2 C          |

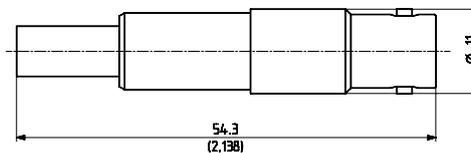
- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example)          | Packaging | Assembly instruction |
|-----------------------|----------|--------------------------------|-----------|----------------------|
| 11_SHV-50-3-10/133_NE | 22541990 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3094                 |
| 11_SHV-50-4-10/133_NE | 22541996 | U16 (RG_59_B/U, RADOX_RF_59)   |           |                      |

## Straight cable jacks (female)

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

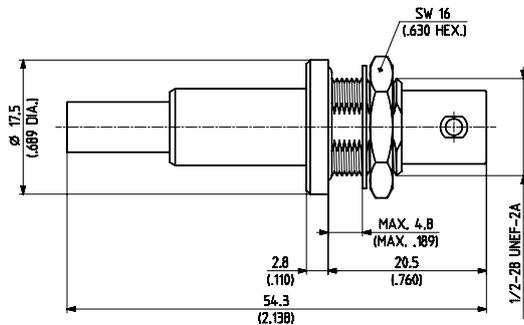


| HUBER+SUHNER type    | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert |
|----------------------|----------|--------------------------------|-----------|----------------------|--------------|
| 21_SHV-50-3-1/133_NE | 22541998 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3092                 | 2 B          |
| 21_SHV-50-4-1/133_NE | 22542001 | U16 (RG_59_B/U, RADOX_RF_59)   |           |                      | 2 C          |

# Series SHV – cable connectors

## Straight bulkhead cable jacks (female)

- HUBER+SUHNER full crimp
- With panel seal
- Taper sleeves see page 554

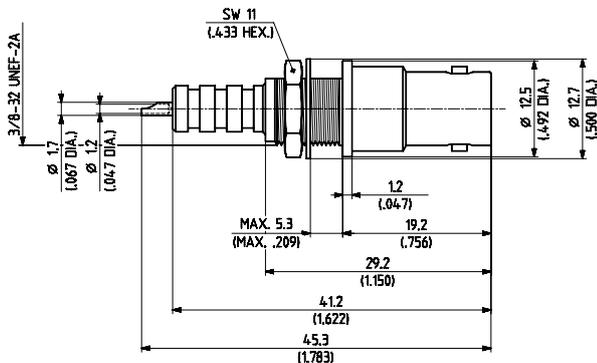


| HUBER+SUHNER type    | Item no. | Cable group (example)             | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|-----------------------------------|-----------|----------------------|---------------|--------------|
| 24_SHV-50-3-1/133_NE | 22641281 | U7 (RG_58_C/U,<br>ENVIROFLEX_B58) | single    | 3092                 | ML 4          | 2 B          |
| 24_SHV-50-4-1/133_NE | 22544592 | U16 (RG_59_B/U,<br>RADOX_RF_59)   |           |                      |               | 2 C          |

# Series SHV – receptacles with solder end

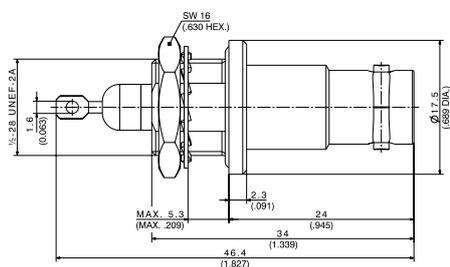
## Receptacles, jacks (female)

- Bulkhead mounted
- Without panel seal



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Insulator  | Notes               |
|----------------------|----------|-----------|---------------|------------|---------------------|
| 22_SHV-50-0-2/133_NE | 22544054 | single    | ML 2          | PTFE       |                     |
| 22_SHV-50-0-6/133_NE | 22542007 |           |               | polystyrol | radiation resistant |

- Bulkhead mounted
- Hermetically sealed



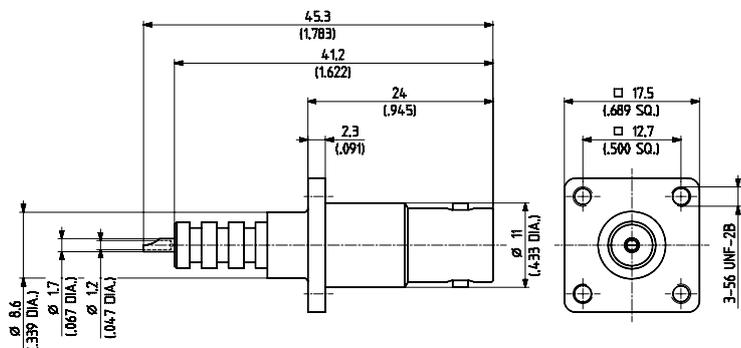
| HUBER+SUHNER type                  | Item no. | Packaging | Mounting hole | Plating body | Notes  |
|------------------------------------|----------|-----------|---------------|--------------|--|
| 22_SHV-50-0-3/100_NE <sup>1)</sup> | 22543968 | single    | ML 4          | silver       | leak rate 10 <sup>-6</sup> Torr l/s (atm cc/s) |

<sup>1)</sup> RoHS compliant alternative on request

# Series SHV – receptacles with solder end

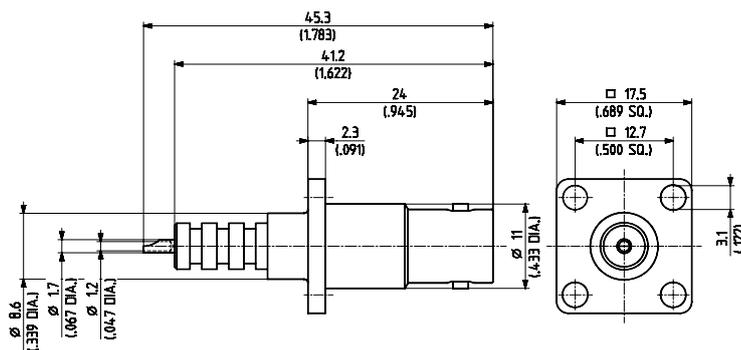
## Receptacles, jacks (female)

- Panel mounted



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Notes  |
|----------------------|----------|-----------|---------------|--|
| 23_SHV-50-0-1/133_NE | 22542008 | single    | ML106         | mounting also possible with screws ISO M 2.5 |

- Panel mounted



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole |
|----------------------|----------|-----------|---------------|
| 23_SHV-50-0-2/133_NE | 22542010 | single    | ML106         |

# Series MHV (H4) – high voltage connectors

## Description

HUBER+SUHNER MHV (Miniature High Voltage) are coaxial miniature high voltage connectors with 5 kV rms test voltage (mated pairs). The MHV connectors have a working voltage up to 1.6 kV rms in mated condition and are suitable for applications up to 300 MHz. MHV connectors are of similar design to BNC connectors but the insulators protrude over the outer contacts to give a degree of contact-voltage proof when unmated.

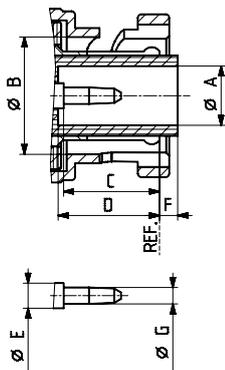
However, if a high degree of protection in the unmated condition is required, use of series SHV is recommended.

## Content

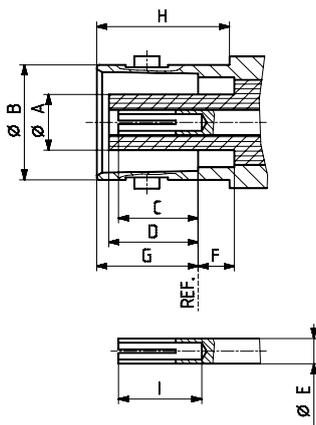
|                                   |     |
|-----------------------------------|-----|
| Description                       | 377 |
| Interface dimensions in mm/inches | 377 |
| Technical data                    | 378 |
| Cable connectors                  | 379 |
| Receptacles with solder end       | 380 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug       |            | Jack        |            |
|---|------------|------------|-------------|------------|
|   | min.       | max.       | min.        | max.       |
| A | 4.83/0.190 | –          | –           | 4.72/0.186 |
| B | 9.78/0.385 | 9.91/0.390 | 9.60/0.378  | 9.70/0.382 |
| C | 7.18/0.283 | –          | –           | 7.11/0.280 |
| D | 8.10/0.319 | –          | –           | 8.05/0.317 |
| E | –          | 2.31/0.091 | 2.06/0.081  | 2.31/0.091 |
| F | –          | 2.18/0.086 | 2.18/0.086  | –          |
| G | 1.32/0.052 | 1.37/0.054 | 8.31/0.327  | 8.51/0.335 |
| H | –          | –          | 10.52/0.414 | –          |
| I | –          | –          | 6.86/0.270  | –          |

# Series MHV – technical data

| Electrical data                                | Requirements  |
|--|---|
| Impedance                                      | 50 $\Omega$   |
| Frequency range                                | DC to 300 MHz   |
| Dielectric withstanding voltage (at sea level) | 5.0 kV rms, 50 Hz (depending on cable)                |
| Working voltage (at sea level)                 | 1.6 kV rms, 50 Hz (depending on cable)                |
| Insulation resistance                          | $\geq 5 \text{ G}\Omega$                              |
| Contact resistance                             |   |
| · Centre contact                               | $\leq 2 \text{ m}\Omega$                              |
| · Outer contact                                | $\leq 1 \text{ m}\Omega$                              |
| Corona extinction voltage (at 21 000 m)        | $\geq 300 \text{ V rms}$ , 50 Hz (depending on cable) |
| Current rating, continuous                     | $\leq 10 \text{ A}$                                   |

| Mechanical data                     | Requirements                    |
|-------------------------------------|---------------------------------|
| Coupling nut torque                 | 7 to 28 Ncm/0.6 to 2.5 in lbs   |
| Coupling nut retention force        | $\geq 450 \text{ N}$ /101.2 lbs |
| Contact captivation                 | $\geq 15 \text{ N}$ /6.1 lbs    |
| Cable retention force <sup>1)</sup> | see pages 32 – 41               |
| Durability (matings)                | $\geq 500$                      |

| Environmental data  | Test conditions   |
|---------------------|---|
| Temperature range   | -65 to +165 °C/-85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |

| Material data   |                        |            |
|-----------------|------------------------|------------|
| Connector parts | Material               | Plating    |
| Bodies          | brass                  | SUCOPLATE® |
| Pin contacts    | brass                  | gold       |
| Socket contacts | copper-beryllium alloy | gold       |
| Crimp ferrules  | copper                 | SUCOPLATE® |
| Insulators      | PTFE or PFA            |            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.  
Cable groups see page 32

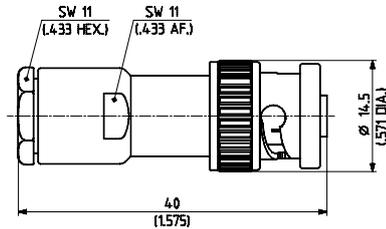
Assembly tools see page 551

Mounting holes/PCB layouts see page 579

# Series MHV – cable connectors

## Straight cable plugs (male)

- Cable entry clamp
- Center contact soldered



| HUBER+SUHNER type                 | Item no. | Cable group (example)          | Packaging | Assembly instruction |
|-----------------------------------|----------|--------------------------------|-----------|----------------------|
| 11_H4-50-3-1/133_NE <sup>1)</sup> | 22541732 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3012                 |
| 11_H4-50-4-1/133_NE <sup>1)</sup> | 22541742 | U16 (RG_59_B/U, RADOX_RF_59)   |           |                      |

- Cable entry crimp
- Taper sleeves see page 554

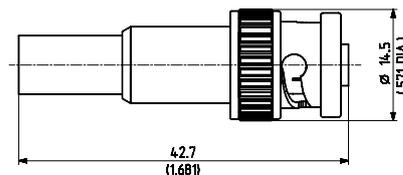
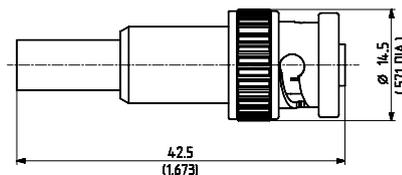


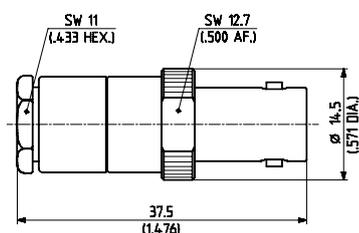
Fig. 1

Fig. 2

| HUBER+SUHNER type                 | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert | Fig. |
|-----------------------------------|----------|--------------------------------|-----------|----------------------|--------------|------|
| 11_H4-50-3-3/133_NE <sup>1)</sup> | 22541737 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3078                 | B            | 1    |
| 11_H4-50-4-4/133_NE <sup>1)</sup> | 22543809 | U16 (RG_59_B/U, RADOX_RF_59)   |           |                      | C            | 2    |

## Straight cable jacks (female)

- Cable entry clamp
- Center contact soldered



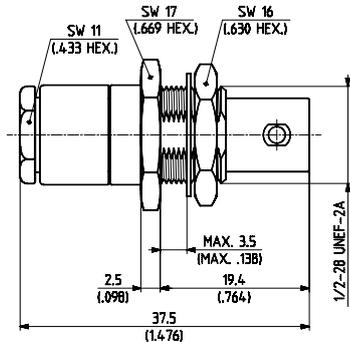
| HUBER+SUHNER type                 | Item no. | Cable group (example)          | Packaging | Assembly instruction |
|-----------------------------------|----------|--------------------------------|-----------|----------------------|
| 21_H4-50-3-1/133_NE <sup>1)</sup> | 22541756 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3012                 |

<sup>1)</sup> Centre contact NOT captivated

# Series MHV – cable connectors

## Straight bulkhead cable jacks (female)

- Cable entry clamp
- Center contact soldered
- With panel seal

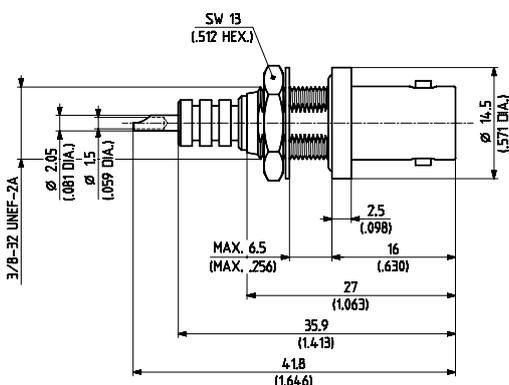


| HUBER+SUHNER type                 | Item no. | Cable group (example)          | Packaging | Assembly instruction | Mounting hole |
|-----------------------------------|----------|--------------------------------|-----------|----------------------|---------------|
| 24_H4-50-3-1/133_NE <sup>1)</sup> | 22541784 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 3012                 | ML 4          |

# Series MHV – receptacles with solder end

## Receptacles, jacks (female)

- Bulkhead mounted
- With panel seal



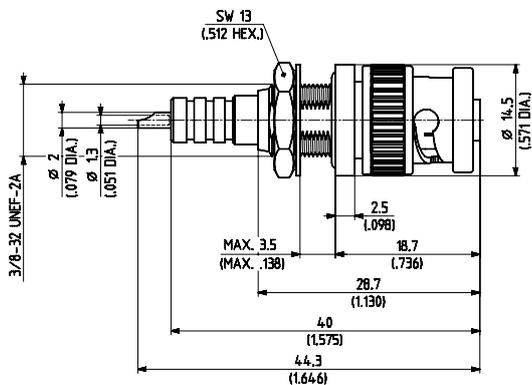
| HUBER+SUHNER type   | Item no. | Packaging | Mounting hole |
|---------------------|----------|-----------|---------------|
| 22_H4-50-0-1/133_NE | 22652095 | single    | ML 1          |

<sup>1)</sup> VCentre contact NOT captivated

# Series MHV – receptacles with solder end

## Receptacles, plugs (male)

- Bulkhead mounted



| HUBER+SUHNER type   | Item no. | Packaging | Mounting hole | Notes           |
|---------------------|----------|-----------|---------------|-----------------|
| 12_H4-50-0-1/133_NE | 22543467 | single    | ML 2          | with panel seal |

## Flange mount, jacks (female)

- Panel mounted

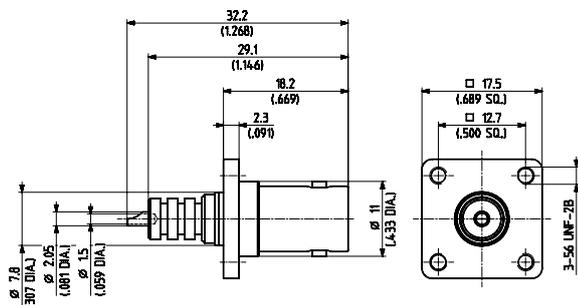
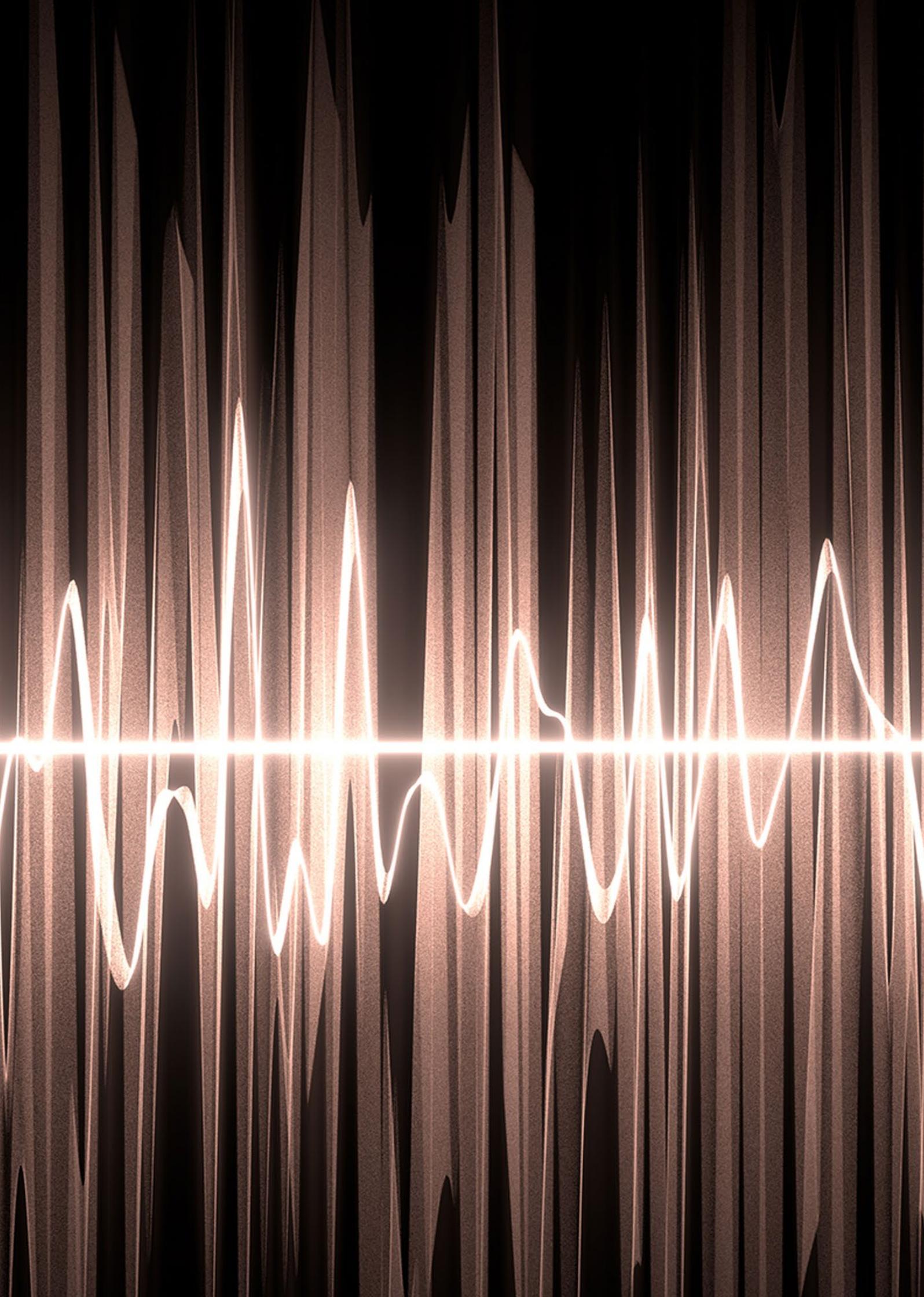


Fig. 1

Fig. 2



| HUBER+SUHNER type   | Item no. | Packaging | Mounting hole | Notes  | Fig. |
|---------------------|----------|-----------|---------------|--|------|
| 23_H4-50-0-7/133_NE | 22541776 | single    | ML 6          | mounting also possible with screws ISO M 2.5 | 1    |
| 23_H4-50-0-8/133_NE | 22541779 |           |               |  | 2    |



# Series N 50 Ω – coaxial connectors

## Description

HUBER+SUHNER N connectors are available with 50 Ω and 75 Ω impedance. The frequency range extends to 18 GHz, depending on the connector and cable type. The screw-type coupling mechanism provides a sturdy and reliable connection.

HUBER+SUHNER N connectors are available for flexible cables, for semi-rigid cables and for corrugated copper tube cables.

Cable entries: clamp, crimp and solder types available, as well as HUBER+SUHNER Quick-Fit for corrugated copper tube cables.

## Compatibility

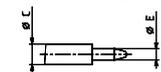
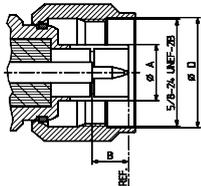
Inner conductors of N 75 Ω connectors have a smaller diameter than those of the 50 Ω version. Therefore 50 Ω and 75 Ω connectors must not be mated with each other.

## Content

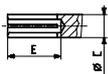
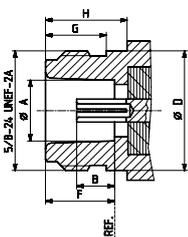
|                                   |     |
|-----------------------------------|-----|
| Description                       | 383 |
| Compatibility                     | 383 |
| Interface dimensions in mm/inches | 383 |
| Technical data                    | 384 |
| Cable connectors                  | 387 |
| Receptacles with solder end       | 406 |
| Stripline launchers               | 410 |
| Protective caps                   | 411 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug        |            | Jack        |             |
|---|-------------|------------|-------------|-------------|
|   | min.        | max.       | min.        | max.        |
| A | –           | 8.38/0.330 | 8.03/0.316  | 8.13/0.320  |
| B | 5.33/0.210  | 5.84/0.230 | 4.75/0.187  | 5.26/0.207  |
| C | –           | 3.15/0.124 | –           | 3.15/0.124  |
| D | 16.00/0.630 | –          | –           | 15.93/0.627 |
| E | 1.60/0.063  | 1.68/0.066 | 5.33/0.210  | –           |
| F | –           | –          | 9.04/0.356  | 9.19/0.362  |
| G | –           | –          | 6.76/0.266  | –           |
| H | –           | –          | 10.72/0.422 | –           |

### Interface dimensions conformable to the standards:

International: IEC 61169-16  
 Europe: CECC 22 210  
 USA: MIL-STD-348/304

### IP rating (interface, mated) IP68

# Series N 50 Ω – technical data

| Electrical data   | Requirements                 |
|---|------------------------------|
| Impedance   | 50 Ω                         |
| Frequency range<br>· Flexible cables<br>· Semi-rigid cables | DC to 11 GHz<br>DC to 18 GHz |
| Dielectric withstanding voltage (at sea level)              | 2.5 kV rms, 50 Hz            |
| Working voltage (at sea level)                              | ≤ 1.0 kV rms, 50 Hz          |
| Insulation resistance                                       | ≥ 5 · 10 <sup>5</sup> MΩ     |
| Contact resistance<br>· Centre contact<br>· Outer contact   | ≤ 1.0 mΩ<br>≤ 1.0 mΩ         |
| RF leakage (between 2 and 3 GHz)                            | ≥ 90 dB                      |
| VSWR  | see table below              |

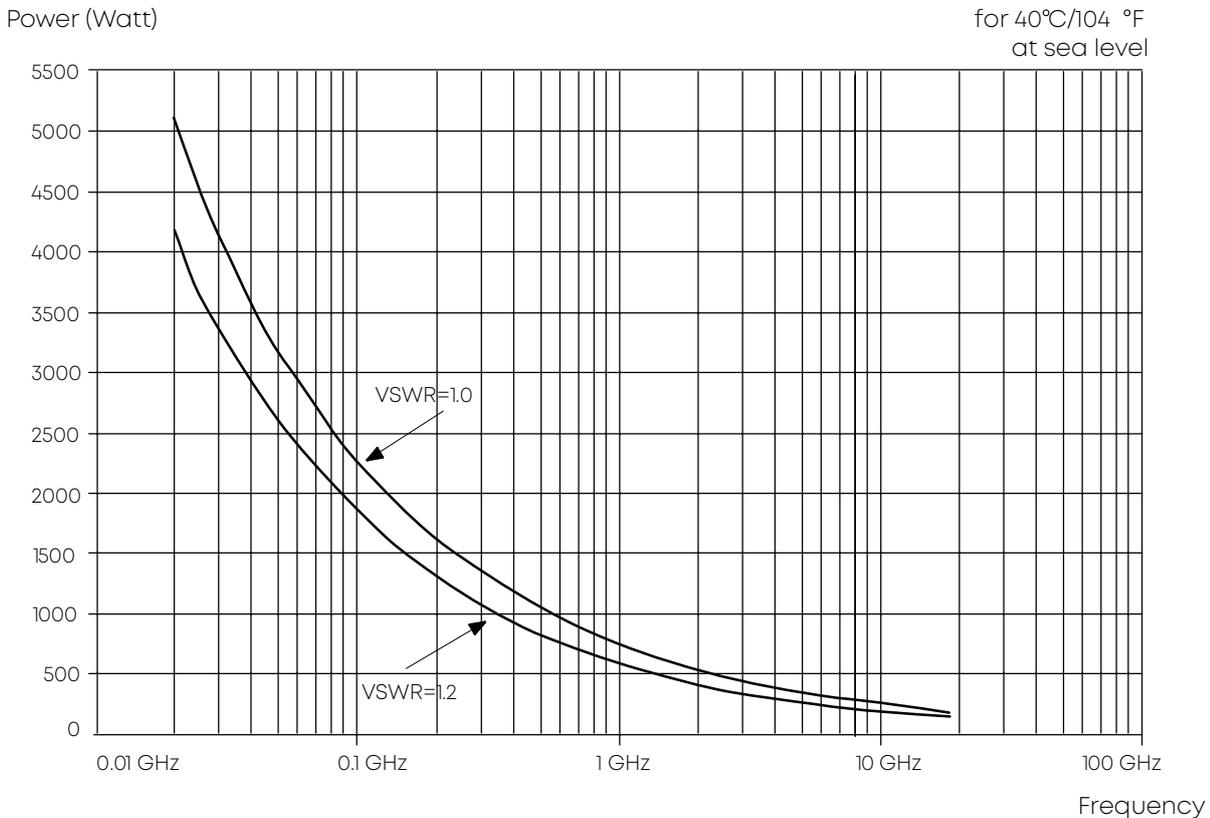
| Typical VSWR <sup>1)</sup> | Frequency range |         |       |          |        | Cable group        |
|----------------------------|-----------------|---------|-------|----------|--------|--------------------|
|                            | 1 GHz           | 2.5 GHz | 5 GHz | 12.4 GHz | 18 GHz |                    |
| Straight connectors        | 1.04            | 1.05    | 1.08  |          |        | M6                 |
|                            | 1.03            | 1.04    | 1.06  | 1.12     |        | Y5, Y12            |
|                            | 1.03            | 1.04    | 1.05  | 1.07     | 1.09   | Y5, Y12            |
|                            | 1.03            | 1.04    | 1.05  | 1.08     | 1.12   | Y7                 |
|                            | 1.05            | 1.09    | 1.17  |          |        | U7, U9             |
|                            | 1.04            | 1.06    | 1.12  |          |        | U28, U29, U32, U33 |
|                            | 1.03            | 1.05    | 1.14  |          |        | S24                |
| Right angle connectors     | 1.03            | 1.05    | 1.10  |          |        | S39                |
|                            | 1.04            | 1.05    | 1.08  |          |        | M6                 |
|                            | 1.04            | 1.05    | 1.06  | 1.12     |        | Y5, Y12            |
|                            | 1.05            | 1.10    | 1.20  |          |        | U7, U9             |
|                            | 1.08            | 1.10    | 1.12  |          |        | U28, U29, U32, U33 |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Values which can be achieved when connectors are perfectly fixed onto cable.

# Series N 50 Ω – technical data

## Admissible power of N connectors



| Mechanical data                      | Requirements                       |
|--------------------------------------|------------------------------------|
| Coupling nut torque<br>· Recommended | 0.68 to 1.13 Nm/6.0 to 10.0 in lbs |
| Coupling nut retention force         | ≥ 450 N/101.2 lbs                  |
| Contact captivation                  | ≥ 28 N/6.3 lbs                     |
| Cable retention force <sup>1)</sup>  | see pages 32 – 41                  |
| Durability (matings)                 | ≥ 500                              |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series N 50 Ω – technical data

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | –65 to +165 °C/–85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |
| Shock               | MIL-STD-202, method 213, condition G                        |

| Material data                |                                       |                            |
|------------------------------|---------------------------------------|----------------------------|
| Connector parts              | Material                              | Plating                    |
| Bodies                       | brass                                 | SUCOPLATE®                 |
| Pin contacts                 | brass                                 | gold/SUCOPRO® gold plating |
| Outer contact, slotted       | spring bronze                         | SUCOPLATE®                 |
| Female contacts              | copper beryllium alloy, spring bronze | gold/SUCOPRO® gold plating |
| Crimp ferrules               | copper                                | SUCOPLATE®                 |
| Insulators, standard version | PTFE or PFA                           |                            |
| Gaskets                      | silicone rubber                       |                            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series N 50 Ω – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered

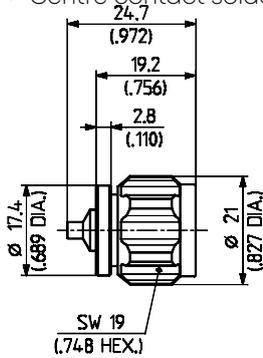


Fig. 1

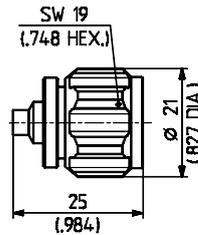


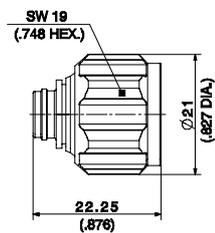
Fig. 2



| HUBER+SUHNER type   | Item no. | Cable group           | Packaging | Assembly instruction | Weight          | Fig. |
|---------------------|----------|-----------------------|-----------|----------------------|-----------------|------|
| 11_N-50-2-15/113_UE | 22660315 | Y3, Y11, Y16 (EZ_86)  | single    | 3095                 | 25.6 g/0.90 oz. | 1    |
| 11_N-50-3-13/113_NE | 22542083 | Y5, Y12, Y17 (EZ_141) |           |                      | 29.0 g/1.02 oz. | 2    |

### For Sucoform cables

- Cable entry soldered
- Centre contact soldered



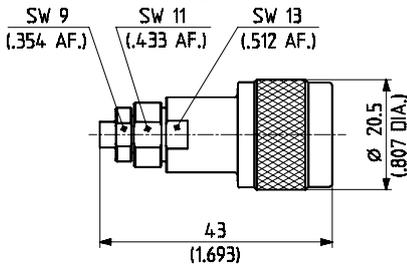
| HUBER+SUHNER type   | Item no. | Cable group                  | Packaging     | Assembly instruction | Weight          | Fig. |
|---------------------|----------|------------------------------|---------------|----------------------|-----------------|------|
| 11_N-50-5-18/103_NH | 84008445 | Y7, Y13, Y14 (SUFORM_250-01) | bulk 100 pcs. | 0000215552           | 21.9 g/0.77 oz. | 1    |

# Series N 50 Ω – cable connectors

## Straight cable plugs (male)

### For semi-rigid cables

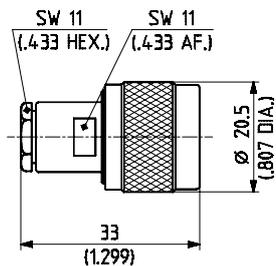
- Cable entry soldered
- Centre contact plugged-in
- Frequency range: DC to 18 GHz



| HUBER+SUHNER type   | Item no. | Cable group     | Packaging | Assembly instruction | Weight                        |
|---------------------|----------|-----------------|-----------|----------------------|-------------------------------|
| 11_N-50-3-51/133_NE | 22543919 | Y5, 12 (EZ_14t) | single    | 9006                 | 43.0 g/1.51 oz. <sup>1)</sup> |

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type  | Item no. | Cable group                                  | Packaging | Assembly instruction | Weight          |
|--------------------|----------|--|-----------|----------------------|-----------------|
| 11_N-50-2-1/133_NE | 22544030 | U2 (RG_316_/U, ENVIROFLEX_316)               | single    | 3017                 | 38.0 g/1.33 oz. |
| 11_N-50-2-2/133_NE | 22643807 | U4 (K_02252_D, ENVIROFLEX_316_D)             |           |                      | 38.0 g/1.33 oz. |
| 11_N-50-3-5/133_NE | 22542073 | U7, U9, U11, X25 (RG_58_C/U, ENVIROFLEX_B58) |           |                      | 36.0 g/1.26 oz. |

<sup>1)</sup> Stainless steel

# Series N 50 Ω – cable connectors

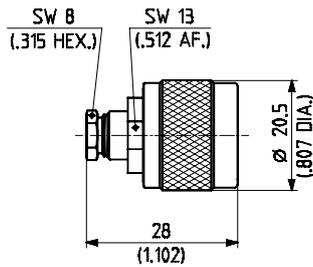
## Straight cable plugs (male)

### Precision connector – low VSWR

#### For flexible cables

- Cable entry clamp
- Centre contact soldered
- VSWR:
 

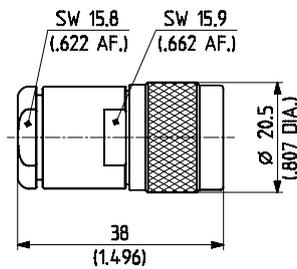
|             |             |                |
|-------------|-------------|----------------|
| DC to 4 GHz | 4 to 10 GHz | 10 to 12.4 GHz |
| ≤ 1.10      | ≤ 1.20      | ≤ 1.25         |



| HUBER+SUHNER type   | Item no. | Cable group                               | Packaging | Assembly instruction | Weight          |
|---------------------|----------|---|-----------|----------------------|-----------------|
| 11_N-50-3-54/133_NE | 22642009 | U9, U11, X25 (RG_223_/U, ENVIROFLEX_B223) | single    | 9099                 | 32.0 g/1.12 oz. |

#### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type                 | Item no. | Cable group                                | Packaging | Assembly instruction | Weight          |
|-----------------------------------|----------|--|-----------|----------------------|-----------------|
| 11_N-50-7-5/133_NE <sup>1)</sup>  | 22542117 | U29, U32, X11 (RG_214_/U, ENVIROFLEX_B214) | single    | 3007                 | 51.0 g/1.79 oz. |
| 11_N-50-7-6/133_NE                | 22542120 |  |           | 3008                 | 51.0 g/1.79 oz. |
| 11_N-50-7-82/133_NE <sup>2)</sup> | 84081597 | U30 (SPUMA_400, SPUMA_400-FR-01)           |           | 253737               | 55.0 g/1.94 oz. |

<sup>1)</sup> Centre contact NOT captivated

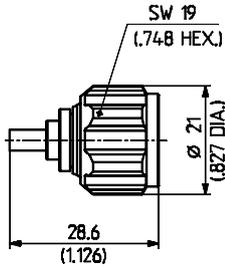
<sup>2)</sup> Centre contact plugged

# Series N 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

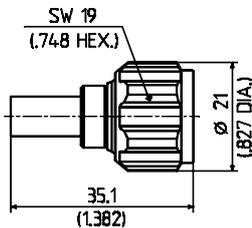
- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type   | Item no. | Cable group                      | Packaging     | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|----------------------------------|---------------|----------------------|--------------|-----------------|
| 11_N-50-2-11/133_NH | 22658813 | U2 (RG_316_/U, ENVIROFLEX_316_D) | bulk 100 pcs. | 9068                 | 1 A          | 26.5 g/0.93 oz. |
| 11_N-50-2-16/133_NE | 23014128 | U4 (K_02252_D, ENVIROFLEX_316_D) | single        |                      |              | 25.4 g/0.89 oz. |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



| HUBER+SUHNER type   | Item no. | Cable group                          | Packaging     | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|--------------------------------------|---------------|----------------------|--------------|-----------------|
| 11_N-50-3-28/133_NE | 22642842 | U7 (RG_58_C/U, ENVIROFLEX_B58)       | single        | 3015                 | 2 B          | 23.0 g/0.81 oz. |
| 11_N-50-3-29/133_NE | 22642843 | U9, U39 (RG_223_/U, ENVIROFLEX_B223) | single        | 3015                 | 2 B          | 23.0 g/0.81 oz. |
| 11_N-50-3-31/133_NE | 22648829 | U11, U41 (RG_400_/U, ENVIROFLEX_400) | single        | 3015                 | 2 B          | 28.0 g/0.98 oz. |
| 11_N-50-3-31/133_NH | 22650658 |                                      | bulk 100 pcs. |                      |              |                 |
| 11_N-50-4-63/133_NE | 22652069 | S16 (SX_04172_B-60)                  | single        | 3015                 | 2 C          | 27.3 g/0.96 oz. |

# Series N 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Taper sleeves see page 554

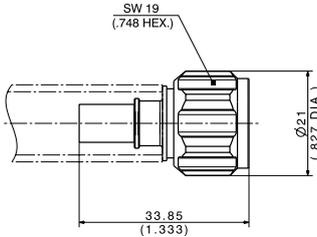


Fig. 1

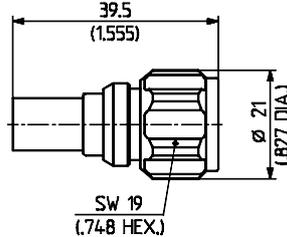


Fig. 2

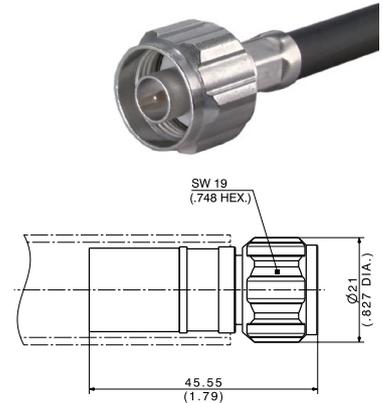


Fig. 3

| HUBER+SUHNER type    | Item no.  | Cable group                      | Packaging     | Assembly instruction | Crimp insert | Weight          | Fig. |
|----------------------|-----------|----------------------------------|---------------|----------------------|--------------|-----------------|------|
| 11_N-50-4-11/133_NH  | 84110 888 | X28 (SPUMA_240, SPUMA_240-FR-01) | bulk 100 pcs. | 291824               | 6.50         | 24.3 g/0.86 oz. | 1    |
| 11_N-50-6-10/133_NH  | 22660330  | S24 (S_06162_D-03)               | bulk 100 pcs. | 270891               | 8.65         | 29.5 g/1.03 oz. | 2    |
| 11_N-50-12-20/033_-E | 85009711  | X29 (SPUMA_600)                  | single        | 420913               | 14.5         | 39.0 g/1.37 oz. | 3    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

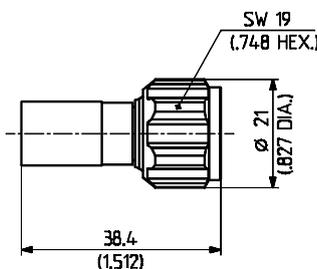


Fig. 1

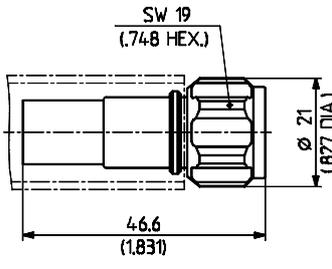


Fig. 2



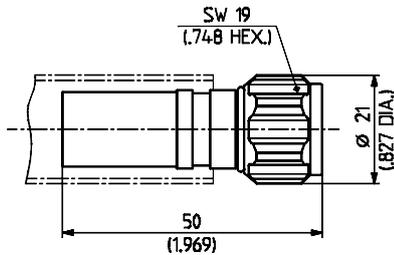
| HUBER+SUHNER type   | Item no. | Cable group                                  | Packaging | Assembly instruction | Crimp insert | Weight          | Fig. |
|---------------------|----------|--|-----------|----------------------|--------------|-----------------|------|
| 11_N-50-7-43/133_NE | 22642844 | U29, U42 (RG_213_/U, RADOX_RF_213)           | single    | 3061                 | 3 D          | 28.0 g/0.98 oz. | 1    |
| 11_N-50-7-44/133_NE | 22642845 | U32, U43 (RG_214_/U, ENVIROFLEX_B214)        |           | 3061                 | 3 D          | 28.0 g/0.98 oz. | 1    |
| 11_N-50-7-49/133_NE | 22652111 | S32 (S_07262_BD)                             |           | 9067                 | 4 D          | 40.0 g/1.40 oz. | 2    |
| 11_N-50-7-61/133_NE | 22651793 | U33 (RG_393_/U, ENVIROFLEX_393)              |           | 27070                | 2.5 D        | 28.5 g/1.00 oz. | 1    |
| 11_N-50-7-69/133_NE | 22660143 | U30, X32 (SPUMA_400 -FR-01, SPUMA_400-RS-FR) |           | 311731               | 4 D          | 35.0 g/1.23 oz. | 2    |

# Series N 50 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Degree of protection IP67

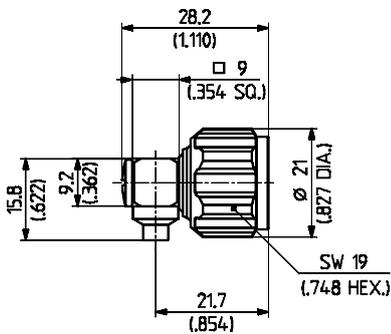


| HUBER+SUHNER type   | Item no. | Cable group        | Packaging    | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|--------------------|--------------|----------------------|--------------|-----------------|
| 11_N-50-10-5/103_UV | 23002543 | S39 (S_10162_B-11) | bulk 20 pcs. | 27356                | 12.4         | 37.8 g/1.32 oz. |

## Right angle cable plugs (male)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type   | Item no. | Cable group           | Packaging | Assembly instruction | Weight          |
|---------------------|----------|-----------------------|-----------|----------------------|-----------------|
| 16_N-50-3-15/133_NE | 22648832 | Y5, Y12, Y17 (EZ_141) | single    | 9200                 | 29.1 g/1.02 oz. |

# Series N 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

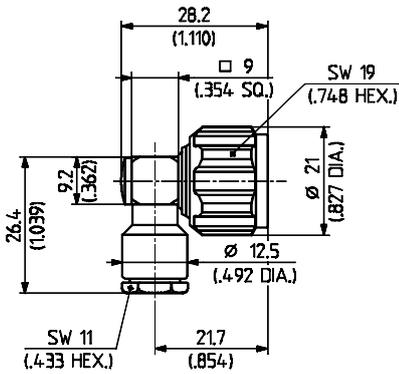


Fig. 1

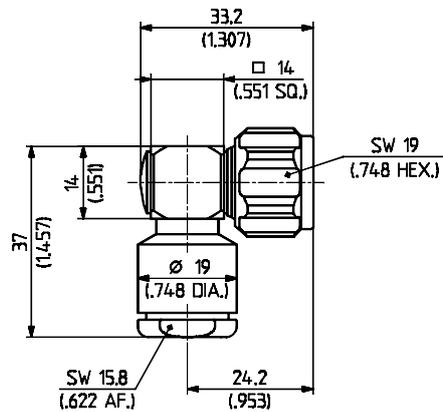


Fig. 2

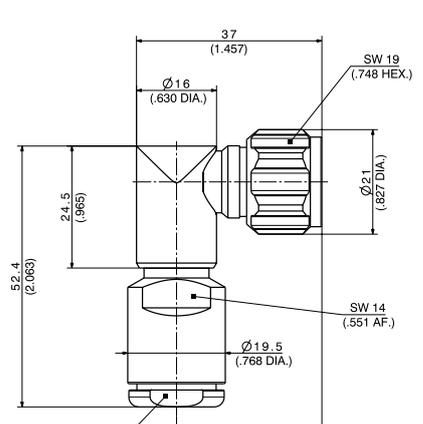


Fig. 3

| HUBER+SUHNER type                 | Item no. | Cable group                              | Packaging | Assembly instruction | Weight          | Fig. |
|-----------------------------------|----------|--|-----------|----------------------|-----------------|------|
| 16_N-50-3-103/133_NE              | 22651610 | U7, U9, U11 (RG_223_/U, ENVIROFLEX_B223) | single    | 27060                | 37.0 g/1.30 oz. | 1    |
| 16_N-50-7-26/133_NE               | 22650825 | U29, U32 (RG_214_/U, ENVIROFLEX_B214)    |           | 27121                | 65.0 g/2.28 oz. | 2    |
| 16_N-50-7-50/133_NE <sup>1)</sup> | 84082125 | U30 (SPUMA_400, SPUMA_400-FR-01)         |           | 253737               | 87.0 g/3.07 oz. | 3    |

<sup>1)</sup> Centre contact plugged

# Series N 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554

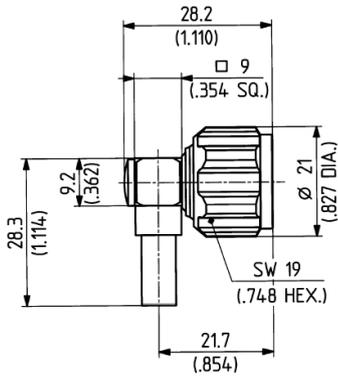


Fig. 1

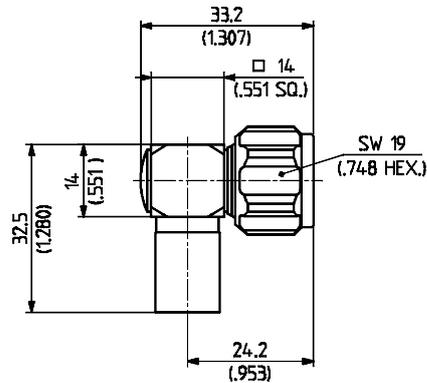


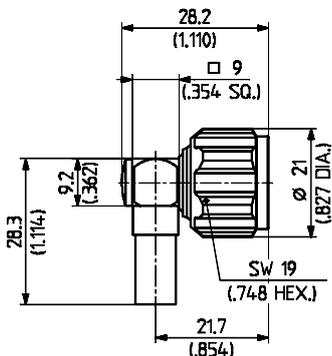
Fig. 2



| HUBER+SUHNER type                          | Item no.             | Cable group                               | Packaging               | Assembly instruction | Crimp insert | Weight          | Fig. |
|--|----------------------|---|-------------------------|----------------------|--------------|-----------------|------|
| 16_N-50-3-26/133_NE                        | 22642846             | U7 (RG_58_C/U, ENVIROFLEX_B58)            | single                  | 3058                 | B            | 27.0 g/0.95 oz. | 1    |
| 16_N-50-3-27/133_NE<br>16_N-50-3-27/133_NH | 22642847<br>22650168 | U9, U11, U39 (RG_223_/U, ENVIROFLEX_B223) | single<br>bulk 100 pcs. | 3058                 | B            | 27.0 g/0.95 oz. |      |
| 16_N-50-7-30/133_NE                        | 22642848             | U29 (RG_213_/U, RADOX_RF_213)             | single                  | 3076                 | D            | 42.0 g/1.47 oz. | 2    |
| 16_N-50-7-31/133_NE                        | 22642849             | U32 (RG_214_/U, ENVIROFLEX_B214)          |                         | 3076                 | D            | 42.0 g/1.47 oz. |      |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



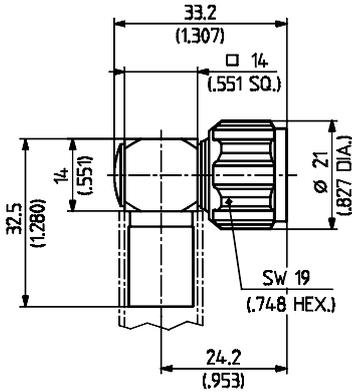
| HUBER+SUHNER type   | Item no. | Cable group        | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|--------------------|-----------|----------------------|--------------|-----------------|
| 16_N-50-4-14/133_NE | 23015067 | S16 (S_04262_D-09) | single    | 3058                 | C            | 31.7 g/1.11 oz. |

# Series N 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

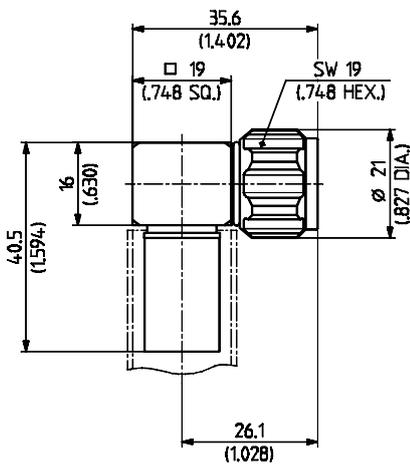
- Cable entry crimp
- Centre contact soldered
- Taper sleeves see page 554



| HUBER+SUHNER type   | Item no. | Cable group      | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|------------------|-----------|----------------------|--------------|-----------------|
| 16_N-50-7-22/133_NE | 22651794 | S32 (S_07262_BD) | single    | 9094                 | D            | 50.0 g/1.75 oz. |

### For flexible cables

- Cable entry crimp
- Centre contact soldered
- Degree of protection IP67
- Taper sleeves see page 554



| HUBER+SUHNER type   | Item no. | Cable group        | Packaging    | Assembly instruction | Crimp insert | Weight                        |
|---------------------|----------|--------------------|--------------|----------------------|--------------|-------------------------------|
| 16_N-50-10-1/103_UV | 23002552 | S39 (S_10162_B-11) | bulk 20 pcs. | 27357                | 12.4         | 50.0 g/1.75 oz. <sup>1)</sup> |

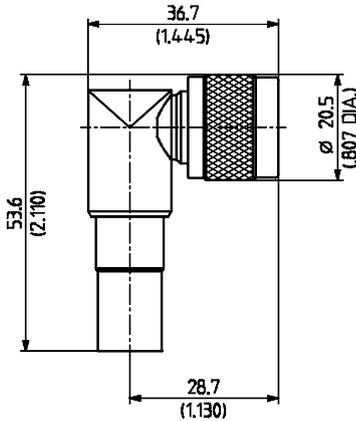
<sup>1)</sup> Centre contact not nickel underplated

# Series N 50 Ω – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

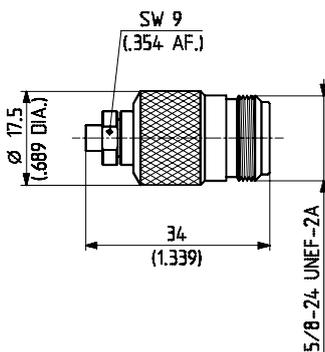


| HUBER+SUHNER type   | Item no. | Cable group                           | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|---------------------------------------|-----------|----------------------|--------------|-----------------|
| 16_N-50-7-28/133_NE | 22652040 | U33 (RG_393_/U, ENVIROFLEX_B393)      | single    | 27064                | 4 D          | 63.6 g/2.23 oz. |
| 16_N-50-7-29/133_NE | 22651494 | U29, U42 (RG_213_/U, RADOX_RF_213)    |           | 9009                 | 3 D          | 65.0 g/2.28 oz. |
| 16_N-50-7-36/133_NE | 22651495 | U32, U43 (RG_214_/U, ENVIROFLEX_B214) |           | 9009                 | 3 D          | 66.0 g/2.31 oz. |

## Straight cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type                 | Item no. | Cable group           | Packaging | Assembly instruction | Frequency range (GHz) | Weight          |
|-----------------------------------|----------|-----------------------|-----------|----------------------|-----------------------|-----------------|
| 21_N-50-2-14/133_NE <sup>1)</sup> | 22642666 | Y3, Y11, Y16 (EZ_86)  | single    | 9073                 | DC to 18              | 38.0 g/1.33 oz. |
| 21_N-50-3-11/133_NE <sup>1)</sup> | 22543921 | Y5, Y12, Y17 (EZ_141) |           | 9005                 | DC to 18              | 38.0 g/1.33 oz. |

<sup>1)</sup> Centre contact not nickel underplated

# Series N 50 Ω – cable connectors

## Straight cable jacks (female)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

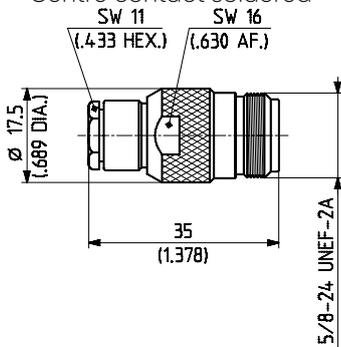


Fig. 1

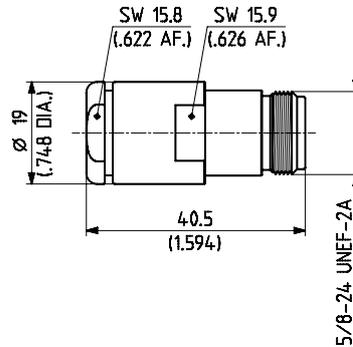


Fig. 2



| HUBER+SUHNER type  | Item no. | Cable group                              | Packaging | Assembly instruction | Weight          | Fig. |
|--------------------|----------|--|-----------|----------------------|-----------------|------|
| 21_N-50-3-5/133_NE | 22543504 | U7, U9, U11 (RG_223_/U, ENVIROFLEX_B223) | single    | 3017                 | 38.0 g/1.33 oz. | 1    |
| 21_N-50-7-8/133_NE | 22542254 | U29, U32, X11 (RG_213_/U, RADOX_RF_213)  |           | 3008                 | 50.0 g/1.75 oz. | 2    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

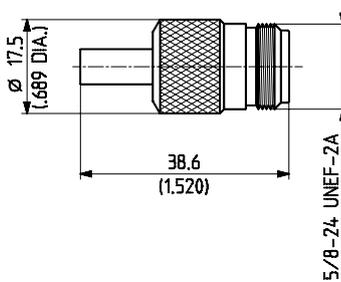


Fig. 1

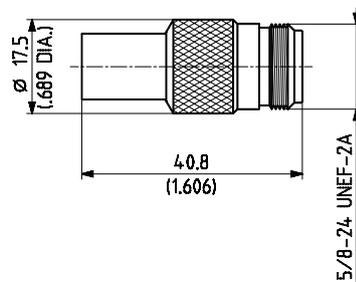


Fig. 2

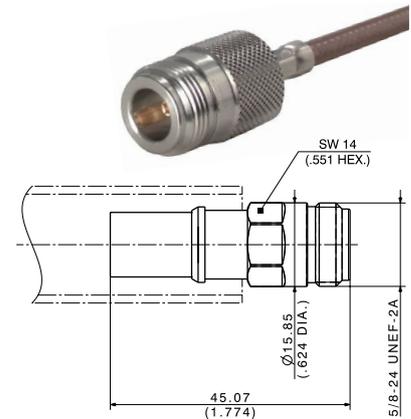


Fig. 3

| HUBER+SUHNER type   | Item no. | Cable group  | Packaging | Assembly instruction | Crimp insert | Weight          | Fig. |
|---------------------|----------|--|-----------|----------------------|--------------|-----------------|------|
| 21_N-50-3-7/133_NE  | 22542229 | U7 (RG_58_C/U, ENVIROFLEX_B58)                         | single    | 3063                 | 2 B          | 36.0 g/1.26 oz. | 1    |
| 21_N-50-3-8/133_NE  | 22542231 | U9, U39 (RG_223_/U, ENVIROFLEX_B223)                   |           | 3063                 | 2 B          | 36.0 g/1.26 oz. | 1    |
| 21_N-50-3-12/133_NE | 22651795 | U11, U41 (RG_400_/U, ENVIROFLEX_400)                   |           | 3063                 | 2 B          | 35.0 g/1.23 oz. | 1    |
| 21_N-50-7-13/133_NE | 22542257 | U29, U42 (RG_213_/U, RADOX_RF_213)                     |           | 3061                 | 3 D          | 38.0 g/1.33 oz. | 2    |
| 21_N-50-7-14/133_NE | 22542258 | U32, U43 (RG_214_/U, ENVIROFLEX_B214)                  |           | 3061                 | 3 D          | 37.0 g/1.30 oz. | 2    |
| 21_N-50-7-32/133_NE | 84119763 | U30, X32 (SPUMA_400, SPUMA_400-FR-01, SPUMA_400-RS-FR) |           | 344575               | 4 D          | 31.5 g/1.11 oz. | 3    |

# Series N 50 Ω – cable connectors

## For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Degree of protection IP67

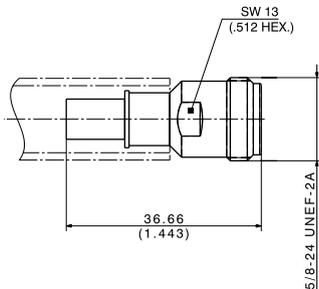


Fig. 1

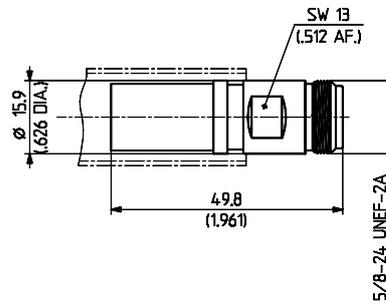


Fig. 2

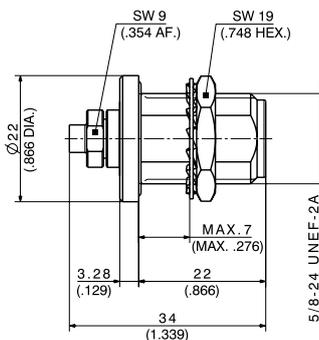


| HUBER+SUHNER type                 | Item no. | Cable group        | Packaging     | Assembly instruction | Crimp insert | Weight          | Fig. |
|-----------------------------------|----------|--------------------|---------------|----------------------|--------------|-----------------|------|
| 21_N-50-4-6/133_NH                | 84110983 | S28 (SPUMA_240)    | bulk 100 pcs. | 291867               | 6.5          | 22.8 g/0.8 oz.  | 1    |
| 21_N-50-10-1/133_UF <sup>1)</sup> | 23003072 | S39 (S_10162_B-11) | bulk 50 pcs.  | 27356                | 12.4         | 38.1 g/1.33 oz. | 2    |

## Straight bulkhead cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered
- Mounting hole ML 12
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type   | Item no. | Cable group           | Packaging | Assembly instruction | Frequency range (GHz) | Weight          |
|---------------------|----------|-----------------------|-----------|----------------------|-----------------------|-----------------|
| 24_N-50-2-14/133_NE | 22544637 | Y3, Y11, Y16 (EZ_86)  | single    | 9073                 | DC to 12.4            | 39.0 g/1.37 oz. |
| 24_N-50-3-14/133_NE | 22542300 | Y5, Y12, Y17 (EZ_141) |           | 9005                 | DC to 12.4            | 39.0 g/1.37 oz. |

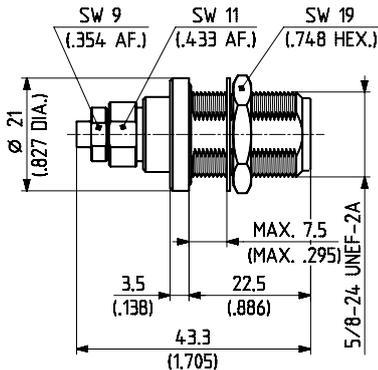
<sup>1)</sup> Centre contact not nickel underplated

# Series N 50 Ω – cable connectors

## Straight cable jacks (female)

### For semi-rigid cables

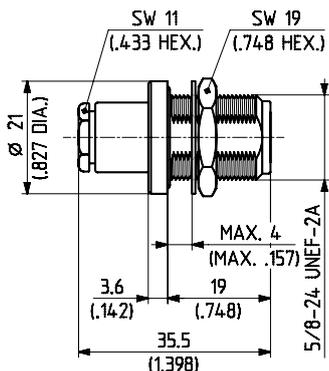
- Cable entry soldered
- Centre contact plugged-in
- Body material: stainless steel
- Mounting hole ML 12
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type   | Item no. | Cable group      | Packaging | Assembly instruction | Frequency range (GHz) | Weight          |
|---------------------|----------|------------------|-----------|----------------------|-----------------------|-----------------|
| 24_N-50-3-51/19-_NE | 22642344 | Y5, Y12 (EZ_141) | single    | 9006                 | DC to 18              | 45.0 g/1.58 oz. |

### For flexible cables

- Cable entry clamp
- Centre contact soldered
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type  | Item no. | Cable group                    | Packaging | Assembly instruction | Mounting hole | Weight          |
|--------------------|----------|--------------------------------|-----------|----------------------|---------------|-----------------|
| 24_N-50-2-1/133_NE | 22641239 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 9150                 | ML 12         | 42.0 g/1.47 oz. |

# Series N 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry clamp
- Centre contact soldered
- With panel seal
- Insulating washers see page 556

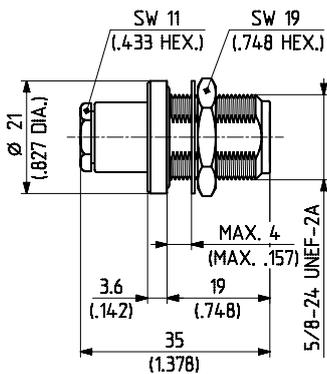


Fig. 1

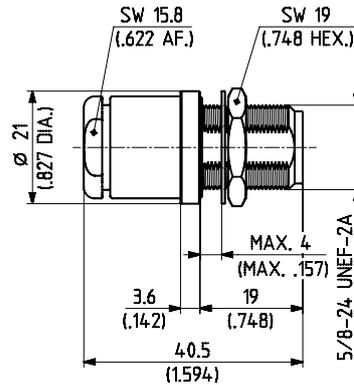


Fig. 2



| HUBER+SUHNER type   | Item no. | Cable group                             | Packaging | Assembly instruction | Mounting hole | Weight          | Fig. |
|---------------------|----------|---|-----------|----------------------|---------------|-----------------|------|
| 24_N-50-3-10/133_NE | 22542295 | U7, U9, U11 (RG_58_C/U, ENVIROFLEX_B58) | single    | 9150                 | ML 12         | 41.0 g/1.44 oz. | 1    |
| 24_N-50-7-8/133_NE  | 22542323 | U29, U32 (RG_214_/U, ENVIROFLEX_B214)   |           | 3008                 | ML 12         | 53.0 g/1.86 oz. | 2    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Insulating washers see page 556
- Mounting hole ML 12

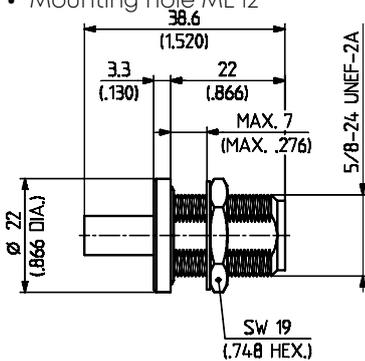


Fig. 1

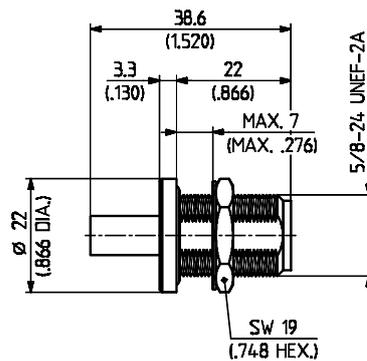


Fig. 2



| HUBER+SUHNER type    | Item no. | Cable group                      | Packaging | Assembly instruction | Crimp insert | Weight          | Fig.            |
|----------------------|----------|----------------------------------|-----------|----------------------|--------------|-----------------|-----------------|
| 24_N-50-2-4/133_NE   | 22650170 | U2 (RG_316_/U, ENVIROFLEX_316)   | single    | 9068                 | 1 A          | 35.2 g/1.23 oz. | 1               |
| 24_N-50-2-117/133_NE | 22660124 | U4 (K_02252_D, ENVIROFLEX_316_D) |           | 9068                 | 1 A          | 36.1 g/1.26 oz. | 1               |
| 24_N-50-4-17/133_UE  | 22651789 | S16 (S_04262_D-09)               |           | 3063                 | 2 C          | 37.3 g/1.31 oz. | 2 <sup>1)</sup> |

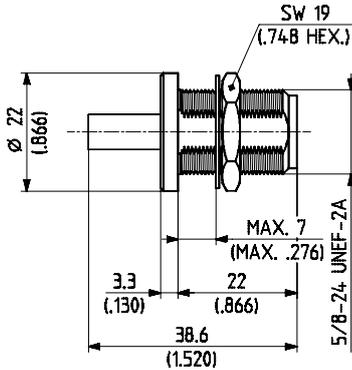
\* Has to be crimped with large crimp tool or table press! Centre contact not nickel underplated

# Series N 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Insulating washers see page 556
- Mounting hole ML 12

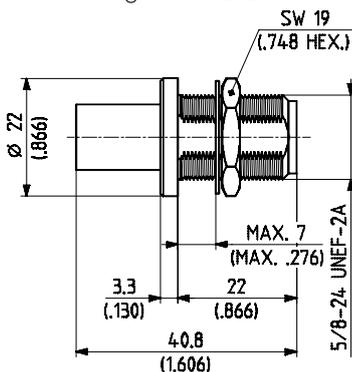


| HUBER+SUHNER type   | Item no. | Cable group                     | Packaging | Assembly instruction | Crimp insert | Weight            |
|---------------------|----------|---------------------------------|-----------|----------------------|--------------|-------------------|
| 24_N-50-3-11/133_NE | 22542296 | U7 (RG_58_C/U, ENVIROFLEX_B58)  | single    | 3063                 | 2 B          | 38.0 g/1.33 oz. * |
| 24_N-50-3-12/133_NE | 22542297 | U9 (RG_223_/U, ENVIROFLEX_B223) |           |                      |              |                   |

\* Has to be crimped with large crimp tool or table press!

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Insulating washers see page 556
- Mounting hole ML 12



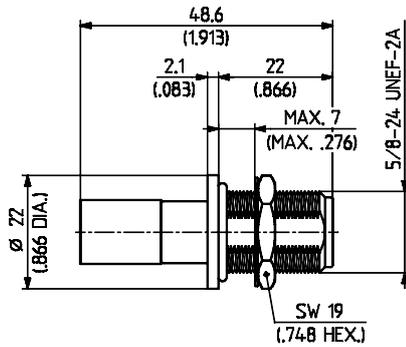
| HUBER+SUHNER type   | Item no. | Cable group                        | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|------------------------------------|-----------|----------------------|--------------|-----------------|
| 24_N-50-7-14/133_NE | 22542326 | U29, U42 (RG_213_/U, RADOX_RF_213) | single    | 3061                 | 3 D          | 40.0 g/1.40 oz. |
| 24_N-50-7-15/133_NE | 22542327 | U32 (RG_214_/U, ENVIROFLEX_B214)   |           |                      |              |                 |

# Series N 50 Ω – cable connectors

## Straight bulkhead cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Insulating washers see page 556
- Mounting hole ML 12



| HUBER+SUHNER type   | Item no. | Cable group                        | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|------------------------------------|-----------|----------------------|--------------|-----------------|
| 24_N-50-7-24/133_NE | 22649912 | U33 (RG_393_/U,<br>ENVIROFLEX_393) | single    | 27064                | 4 D          | 39.3 g/1.38 oz. |

# Series N 50 Ω – cable connectors

## Straight panel cable jacks (female)

### For semi-rigid cables

- Cable entry soldered
- Centre contact soldered
- Mounting hole ML 14

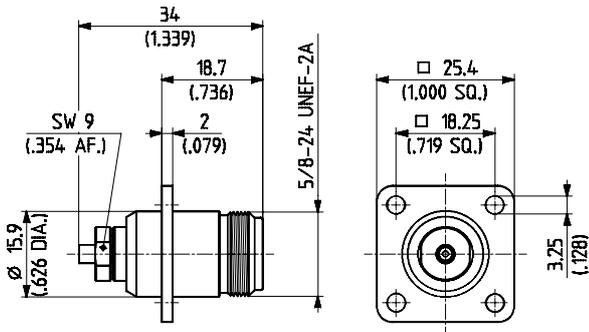


Fig. 1

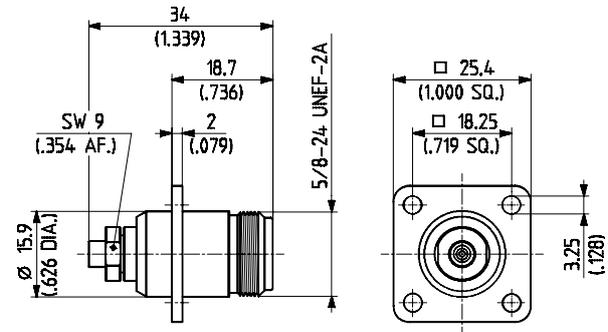
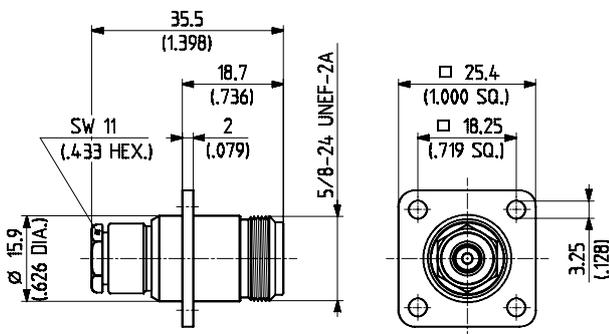


Fig. 2

| HUBER+SUHNER type                 | Item no. | Cable group           | Packaging | Assembly instruction | Frequency range (GHz) | Weight        | Fig. |
|-----------------------------------|----------|-----------------------|-----------|----------------------|-----------------------|---------------|------|
| 25_N-50-2-14/133_NE <sup>1)</sup> | 22641303 | Y3, Y11, Y16 (EZ_86)  | single    | 9073                 | DC to 12.4            | 42 g/1.47 oz. | 1    |
| 25_N-50-3-9/133_NE <sup>1)</sup>  | 22543952 | Y5, Y12, Y17 (EZ_141) |           | 9005                 |                       |               | 2    |

### For flexible cables



- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type  | Item no. | Cable group                             | Packaging | Assembly instruction | Mounting hole | Weight          |
|--------------------|----------|---|-----------|----------------------|---------------|-----------------|
| 25_N-50-2-2/133_NE | 22542332 | U2 (RG_316_U, ENVIROFLEX_316)           | single    | 3017                 | ML 14         | 45.0 g/1.58 oz. |
| 25_N-50-3-4/133_NE | 22542342 | U7, U9, U11 (RG_58_C/U, ENVIROFLEX_B58) |           |                      |               | 44.0 g/1.54 oz. |

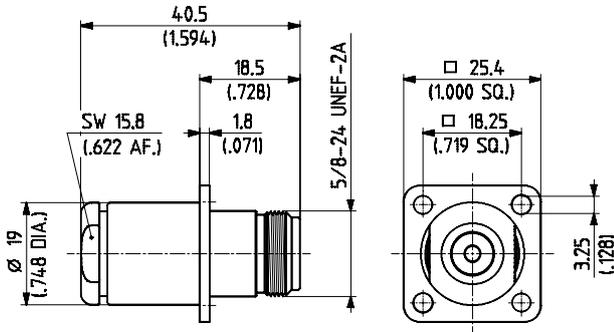
<sup>1)</sup> Centre contact NOT captivated

# Series N 50 Ω – cable connectors

## Straight panel cable jacks (female)

### For flexible cables

- Cable entry clamp
- Centre contact soldered



| HUBER+SUHNER type  | Item no. | Cable group                           | Packaging | Assembly instruction | Mounting hole | Weight          |
|--------------------|----------|---------------------------------------|-----------|----------------------|---------------|-----------------|
| 25_N-50-7-8/133_NE | 22542366 | U29, U32 (RG_214_/U, ENVIROFLEX_B214) | single    | 3008                 | ML 18         | 55.0 g/1.93 oz. |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Mounting hole ML 14

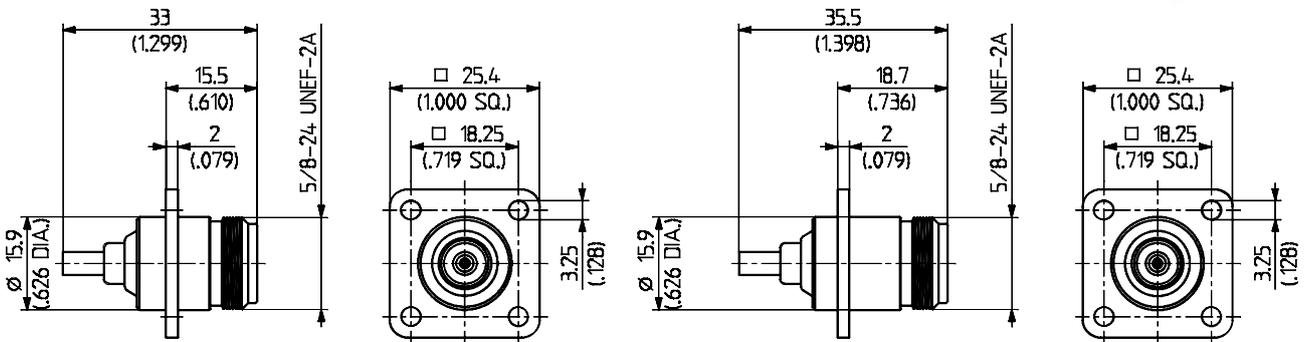


Fig. 1

Fig. 2

| HUBER+SUHNER type   | Item no. | Cable group                      | Packaging | Assembly instruction | Crimp insert | Weight          | Fig. |
|---------------------|----------|----------------------------------|-----------|----------------------|--------------|-----------------|------|
| 25_N-50-2-9/133_NE  | 22651072 | U2 (RG_316_/U, ENVIROFLEX_316)   | single    | 9068                 | 1 A          | 34.5 g/1.21 oz. | 1    |
| 25_N-50-2-10/133_NE | 22651054 | U4 (K_02252_D, ENVIROFLEX_316_D) |           |                      |              | 38.6 g/1.35 oz. | 2    |

# Series N 50 Ω – cable connectors

## Straight panel cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Mounting hole ML 14

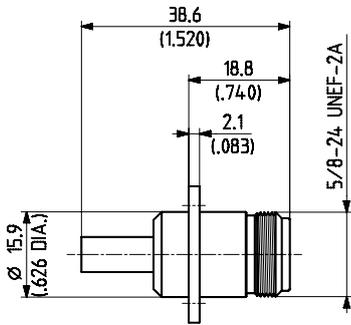


Fig. 1

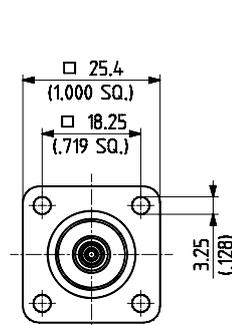
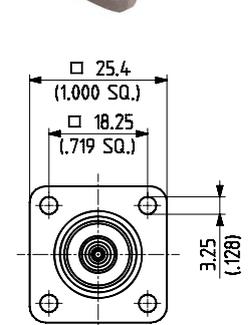
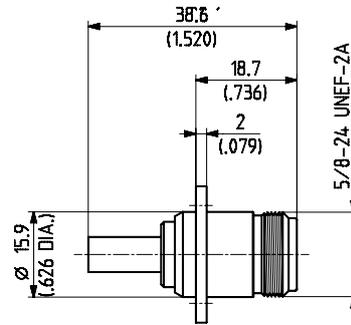


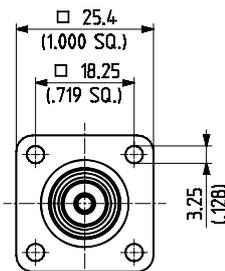
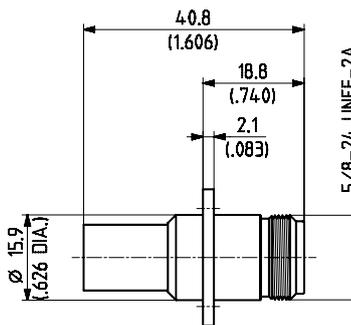
Fig. 2



| HUBER+SUHNER type   | Item no. | Cable group                     | Packaging | Assembly instruction | Crimp insert | Weight          | Fig. |
|---------------------|----------|---------------------------------|-----------|----------------------|--------------|-----------------|------|
| 25_N-50-3-6/133_NE  | 22542346 | U7 (RG_58_C/U, ENVIROFLEX_B58)  | single    | 3063                 | 2 B          | 39.0 g/1.37 oz. | 1    |
| 25_N-50-3-7/133_NE  | 22542348 | U9 (RG_223_/U, ENVIROFLEX_B223) |           |                      |              | 39.0 g/1.37 oz. | 1    |
| 25_N-50-3-20/133_NE | 22649913 | U11 (RG_400_/U, ENVIROFLEX_400) |           |                      |              | 37.0 g/1.30 oz. | 2    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554
- Mounting hole ML 14

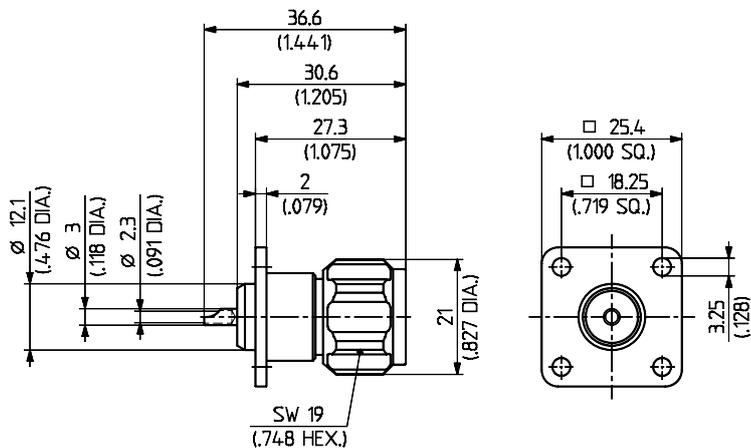


| HUBER+SUHNER type   | Item no. | Cable group                      | Packaging | Assembly instruction | Crimp insert | Weight          |
|---------------------|----------|----------------------------------|-----------|----------------------|--------------|-----------------|
| 25_N-50-7-13/133_NE | 22542369 | U29 (RG_213_/U, RADOX_RF_213)    | single    | 3061                 | 3 D          | 42.0 g/1.47 oz. |
| 25_N-50-7-14/133_NE | 22542370 | U32 (RG_214_/U, ENVIROFLEX_B214) |           |                      |              |                 |

# Series N 50 Ω – receptacles with solder end

## Receptacles, plug (male)

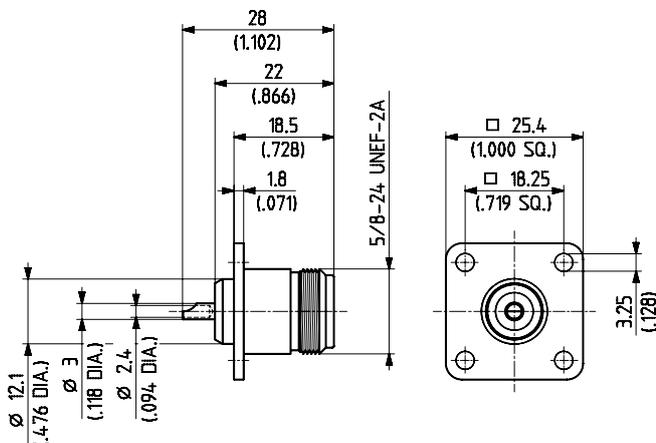
- Panel mounted



| HUBER+SUHNER type  | Item no. | Packaging | Mounting hole | Weight          |
|--------------------|----------|-----------|---------------|-----------------|
| 13_N-50-0-1/133_NE | 22542173 | single    | ML 16         | 46.0 g/1.61 oz. |

## Receptacles, jacks (female)

- Panel mounted

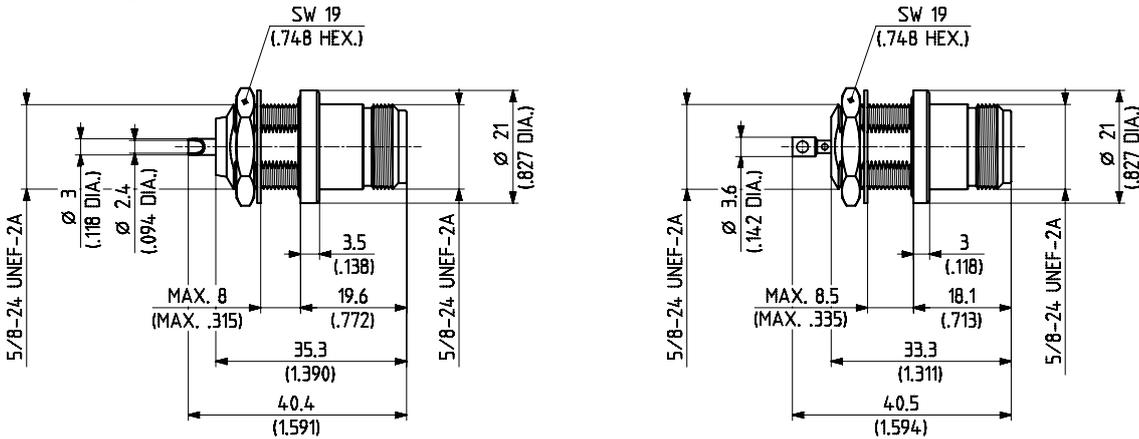


| HUBER+SUHNER type  | Item no. | Packaging | Mounting hole | Weight          |
|--------------------|----------|-----------|---------------|-----------------|
| 23_N-50-0-1/133_NE | 22542272 | single    | ML 17         | 31.0 g/1.09 oz. |

# Series N 50 Ω – receptacles with solder end

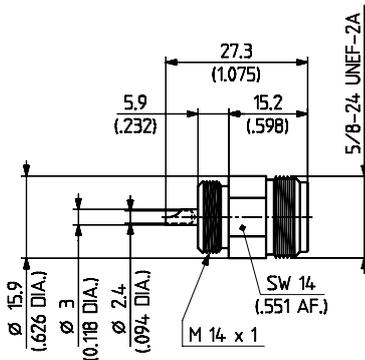
## Receptacles, jacks (female)

- Bulkhead mounted
- Solder tags see page 557
- With panel seal
- Insulating washers see page 556



| HUBER+SUHNER type  | Item no. | Packaging | Mounting hole | Weight          | Notes   | Fig. |
|--------------------|----------|-----------|---------------|-----------------|---|------|
| 22_N-50-0-2/133_NE | 22542265 | single    | ML12          | 47.0 g/1.65 oz. |   | 1    |
| 22_N-50-0-3/133_NE | 22644425 |           |               |                 | hermetically sealed<br>leak rate $\leq 10^{-6}$ Torr l/s (atm cc/s) <sup>1)</sup> | 2    |

- Bulkhead mounted



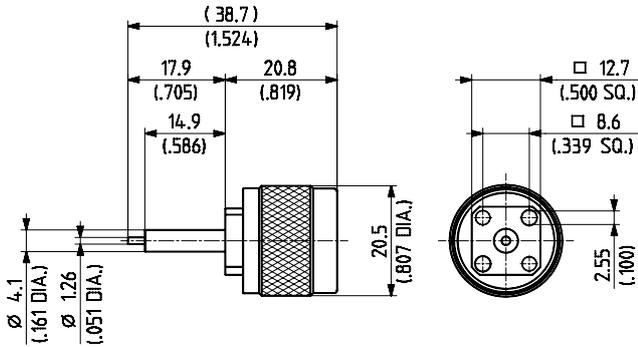
| HUBER+SUHNER type   | Item no. | Packaging    | Weight          | Notes  |
|---------------------|----------|--------------|-----------------|--|
| 22_N-50-0-23/133_NF | 22651448 | bulk 50 pcs. | 20.8 g/0.73 oz. | without nut and washer<br>(direct screw into panel, thread M 14 × 1) |

<sup>1)</sup> RoHs compliant – alternative on request

# Series N 50 Ω – receptacles with solder end

## Receptacles, plugs (male)

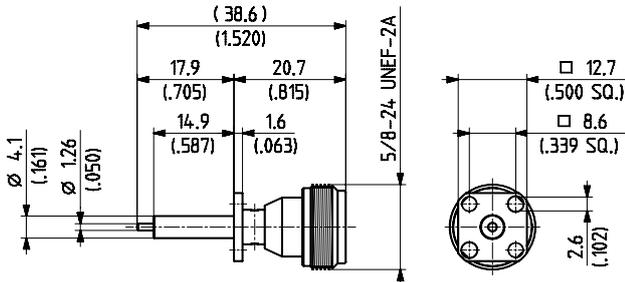
- Panel mounted
- Extended dielectric



| HUBER+SUHNER type   | Item no. | Packaging | Weight          | Notes           |
|---------------------|----------|-----------|-----------------|-----------------|
| 13_N-50-0-30/133_NE | 22642831 | single    | 30.0 g/1.05 oz. | SMA flange size |

## Receptacles, jacks (female)

- Panel mounted
- Extended dielectric

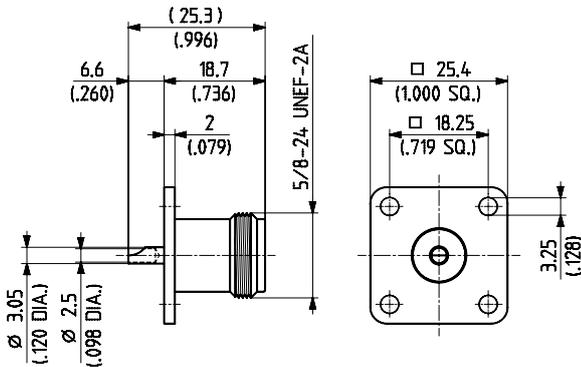


| HUBER+SUHNER type   | Item no. | Packaging | Weight          | Notes           |
|---------------------|----------|-----------|-----------------|-----------------|
| 23_N-50-0-30/133_NE | 22642835 | single    | 14.0 g/0.49 oz. | SMA flange size |

# Series N 50 Ω – receptacles with solder end

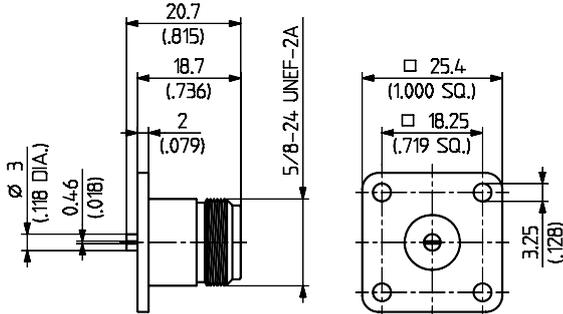
## Receptacles, jacks (female)

- Panel mounted
- Solder pot terminal
- Flush dielectric



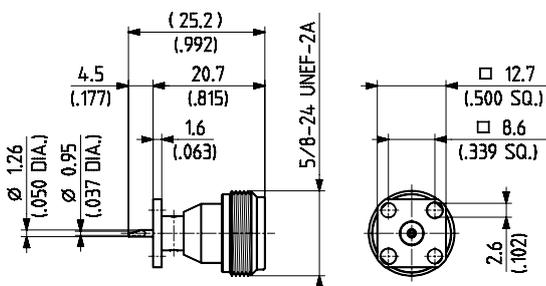
| HUBER+SUHNER type   | Item no. | Packaging | Weight          |
|---------------------|----------|-----------|-----------------|
| 23_N-50-0-23/133_NE | 22544751 | single    | 24.0 g/0.84 oz. |

- End of centre pin slotted
- Panel mounted
- Flush dielectric



| HUBER+SUHNER type   | Item no. | Packaging     | Weight          |
|---------------------|----------|---------------|-----------------|
| 23_N-50-0-69/133_NX | 22648797 | bulk 150 pcs. | 27.9 g/0.89 oz. |

- Panel mounted
- Solder pot terminal
- Flush dielectric

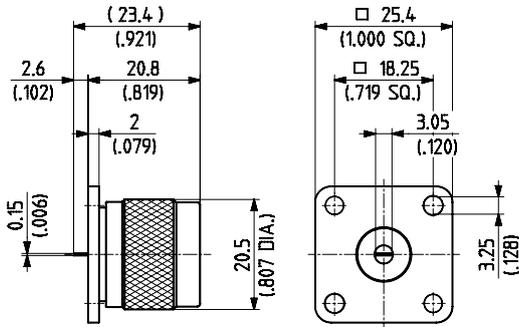


| HUBER+SUHNER type   | Item no. | Packaging | Weight          | Notes           |
|---------------------|----------|-----------|-----------------|-----------------|
| 23_N-50-0-31/133_NE | 22642836 | single    | 13.6 g/0.48 oz. | SMA flange size |

# Series N 50 Ω – stripline launchers

## Receptacles, plugs (male)

- Panel mounted
- Tab contact
- Flush dielectric



| HUBER+SUHNER type   | Item no. | Packaging | Weight          |
|---------------------|----------|-----------|-----------------|
| 13_N-50-0-33/133_NE | 22642834 | single    | 36.0 g/1.26 oz. |

## Receptacles, jacks (female)

- Panel mounted
- Tab contact
- Flush dielectric

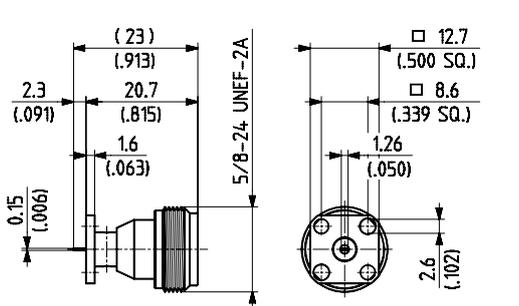


Fig. 1

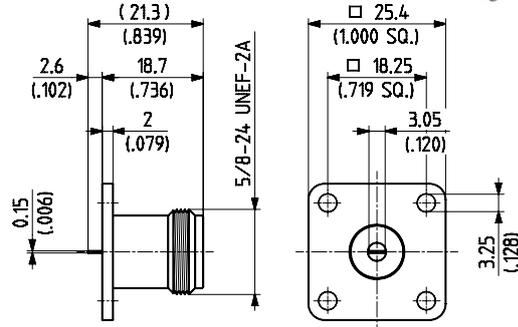


Fig. 2



| HUBER+SUHNER type   | Item no. | Packaging | Weight          | Notes           | Fig. |
|---------------------|----------|-----------|-----------------|-----------------|------|
| 23_N-50-0-16/133_NE | 22641166 | single    | 13.5 g/0.47 oz. | SMA flange size | 1    |
| 23_N-50-0-33/133_NE | 22642837 |           | 24.5 g/0.86 oz. |                 | 2    |

# Series N 50 Ω – protective caps

- Suitable for N 50 Ω and N 75 Ω
- With chain

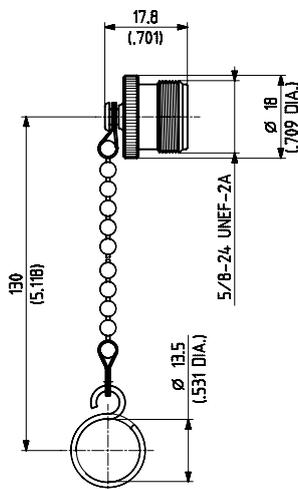


Fig. 1

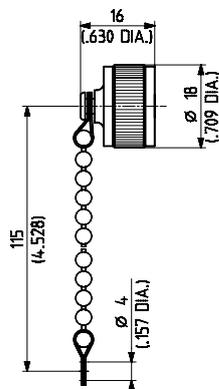
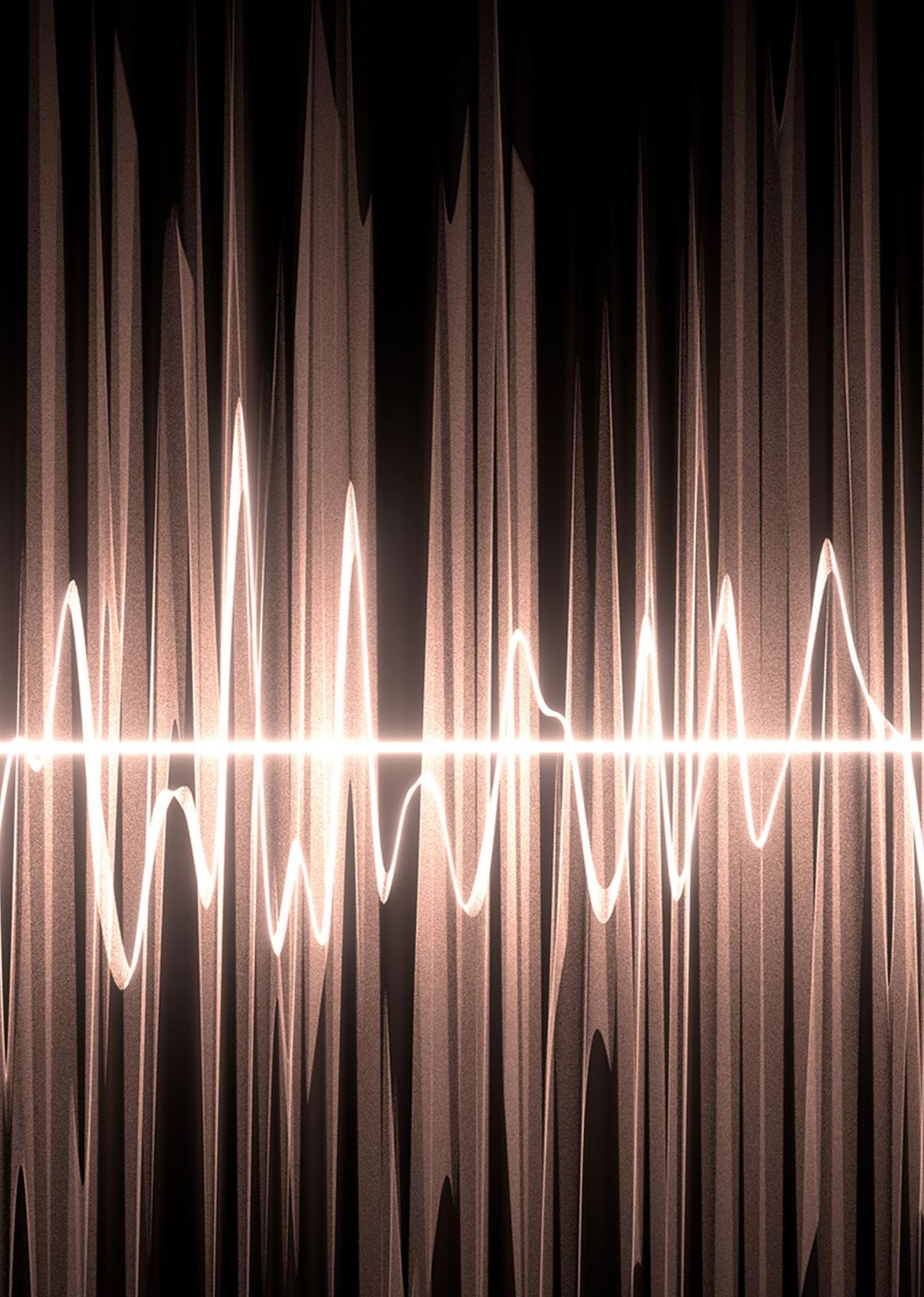


Fig. 2



| HUBER+SUHNER type | Item no. | Packaging | Weight          | Notes     | Fig. |
|-------------------|----------|-----------|-----------------|-----------|------|
| 61_N-0-0-1/--3_-E | 22542452 | single    | 16.0 g/0.56 oz. | for plugs | 1    |
| 62_N-0-0-1/--3_-E | 22543433 |           | 15.0 g/0.53 oz. | for jacks | 2    |



# Series N 75 Ω – coaxial connectors

## Description

HUBER+SUHNER N connectors are available with 50 Ω and 75 Ω impedance. The screw-type coupling mechanism provides a sturdy and reliable connection.

## Compatibility

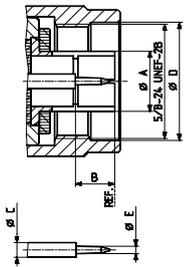
Center conductors of N 75 Ω connectors have a smaller diameter than those of the 50 Ω version. Therefore 50 Ω and 75 Ω connectors must not be mated with each other.

## Content

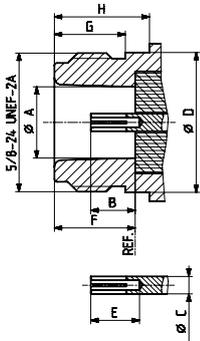
|                                   |     |
|-----------------------------------|-----|
| Description                       | 413 |
| Compatibility                     | 413 |
| Interface dimensions in mm/inches | 413 |
| Technical data                    | 414 |
| Cable connectors                  | 415 |
| Receptacles with solder end       | 417 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug        |            | Jack        |             |
|---|-------------|------------|-------------|-------------|
|   | min.        | max.       | min.        | max.        |
| A | –           | 8.38/0.330 | 8.03/0.316  | 8.13/0.320  |
| B | 5.33/0.210  | 5.84/0.230 | 4.75/0.187  | 5.26/0.207  |
| C | –           | 2.00/0.079 | –           | 2.00/0.079  |
| D | 16.00/0.630 | –          | –           | 15.93/0.627 |
| E | 1.00/0.039  | 1.05/0.041 | 5.33/0.210  | –           |
| F | –           | –          | 9.04/0.356  | 9.19/0.362  |
| G | –           | –          | 6.76/0.266  | –           |
| H | –           | –          | 10.72/0.422 | –           |

### IP rating (interface, mated) IP68

# Series N 75 Ω – technical data

| Electrical data   | Requirements             |
|---|--------------------------|
| Impedance   | 75 Ω                     |
| Frequency range   | DC – 1.5 GHz             |
| Dielectric withstanding voltage (at sea level)            | 2.5 kV rms, 50 Hz        |
| Working voltage (at sea level)                            | ≤ 1.0 kV rms, 50 Hz      |
| Insulation resistance                                     | ≥ 5 · 10 <sup>5</sup> MΩ |
| Contact resistance<br>· Centre contact<br>· Outer contact | ≤ 1.0 mΩ<br>≤ 1.0 mΩ     |
| RF leakage (measured at 1 GHz)                            | ≥ 90 dB                  |

| Mechanical data                      | Requirements                       |
|--------------------------------------|------------------------------------|
| Coupling nut torque<br>· Recommended | 0.68 to 1.13 Nm/6.0 to 10.0 in lbs |
| Coupling nut retention force         | ≥ 450 N/101.2 lbs                  |
| Contact captivation                  | ≥ 28 N/6.3 lbs                     |
| Cable retention force <sup>1)</sup>  | see pages 32 – 41                  |
| Durability (matings)                 | ≥ 500                              |

| Environmental data  | Requirements  |
|---------------------|---|
| Temperature range   | –65 to +165 °C/–85 to +329 °F                               |
| Climatic category   | IEC → 55/155/21   |
| Thermal shock       | MIL-STD-202, method 107, condition B                        |
| Moisture resistance | MIL-STD-202, method 106                                     |
| Corrosion           | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration           | MIL-STD-202, method 204, condition B                        |
| Shock               | MIL-STD-202, method 213, condition G                        |

| Material data                |   |                            |
|------------------------------|---|----------------------------|
| Connector parts              | Material                                | Plating                    |
| Bodies                       | brass                                   | SUCOPLATE®                 |
| Pin contacts                 | brass                                   | gold/SUCOPRO® gold plating |
| Outer contact, slotted       | spring bronze                           | SUCOPLATE®                 |
| Female contacts              | copper-beryllium alloy<br>spring bronze | gold/SUCOPRO® gold plating |
| Crimp ferrules               | copper                                  | SUCOPLATE®                 |
| Insulators, standard version | PTFE or PFA                             |                            |
| Gaskets                      | silicone rubber                         |                            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series N 75 Ω – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry clamp
- Centre contact soldered

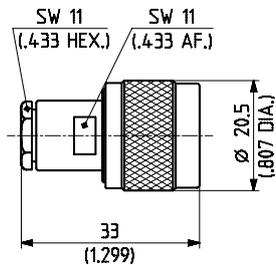


Fig. 1

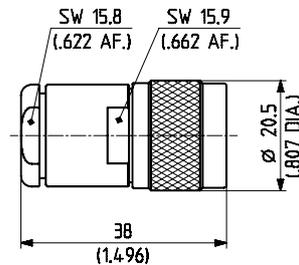


Fig. 2



| HUBER+SUHNER type  | Item no. | Cable group                  | Packaging | Assembly instruction | Weight          | Fig. |
|--------------------|----------|------------------------------|-----------|----------------------|-----------------|------|
| 11_N-75-4-3/133_NE | 22542467 | U16 (RG_59_B/U, RADOX_RF_59) | single    | 27042                | 34.0 g/1.19 oz  | 1    |
| 11_N-75-4-6/133_NE | 22542475 | U18 (G_04133_D)              |           | 27042                | 34.0 g/1.19 oz  | 1    |
| 11_N-75-7-4/133_NE | 22542497 | U34, U36 (G_07273_D)         |           | 3008                 | 48.0 g/1.68 oz. | 2    |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

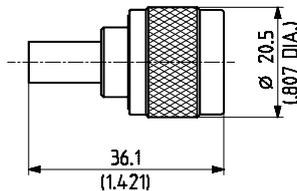


Fig. 1

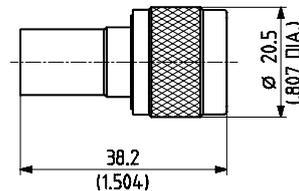


Fig. 2



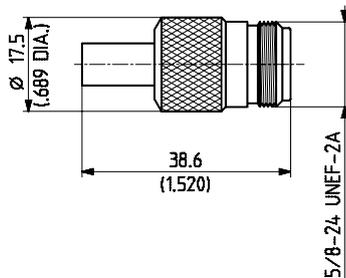
| HUBER+SUHNER type   | Item no. | Cable group                  | Packaging | Assembly instruction | Crimp insert | Weight          | Fig. |
|---------------------|----------|------------------------------|-----------|----------------------|--------------|-----------------|------|
| 11_N-75-4-8/133_NE  | 22542477 | U16 (RG_59_B/U, RADOX_RF_59) | single    | 3063                 | 2 C          | 30.0 g/1.05 oz. | 1    |
| 11_N-75-4-9/133_NE  | 22542478 | U18 (G_04133_D)              |           | 3063                 | 2 C          | 30.0 g/1.05 oz. | 1    |
| 11_N-75-7-16/133_NE | 22542511 | U34 (RG_11_A/U)              |           | 3061                 | 2 D          | 32.0 g/1.12 oz. | 2    |
| 11_N-75-7-18/133_NE | 22542512 | U36 (G_07273_D)              |           | 3061                 | 2 D          | 32.0 g/1.12 oz. | 2    |

# Series N 75 Ω – cable connectors

## Straight cable jacks (female)

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

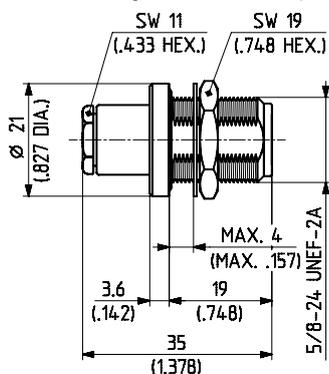


| HUBER+SUHNER type  | Item no. | Cable group                  | Packaging | Assembly instruction | Crimp insert | Weight          |
|--------------------|----------|------------------------------|-----------|----------------------|--------------|-----------------|
| 21_N-75-4-8/133_NE | 22640810 | U16 (RG_59_B/U, RADOX_RF_59) | single    | 3063                 | 2 C          | 34.0 g/1.19 oz. |

## Straight bulkhead cable jacks (female)

### For flexible cables

- Cable entry clamp
- Centre contact soldered
- With panel seal
- Insulating washers see page 556

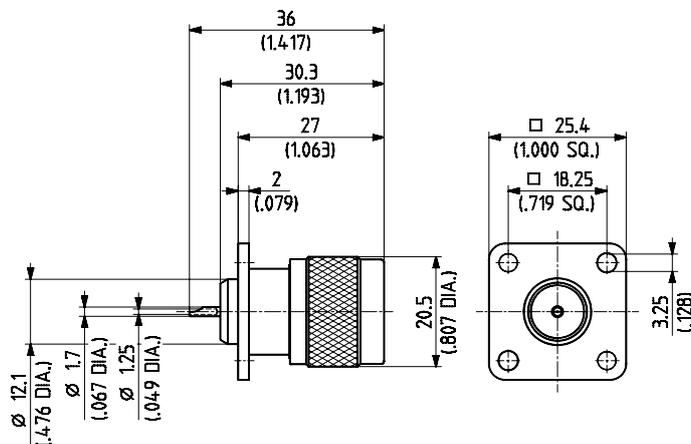


| HUBER+SUHNER type  | Item no. | Cable group                  | Packaging | Assembly instruction | Mounting hole | Weight          |
|--------------------|----------|------------------------------|-----------|----------------------|---------------|-----------------|
| 24_N-75-4-2/133_NE | 22543628 | U16 (RG_59_B/U, RADOX_RF_59) | single    | 27042                | ML 12         | 40.0 g/1.40 oz. |

# Series N 75 Ω – receptacles with solder end

## Flange mount, plug (male)

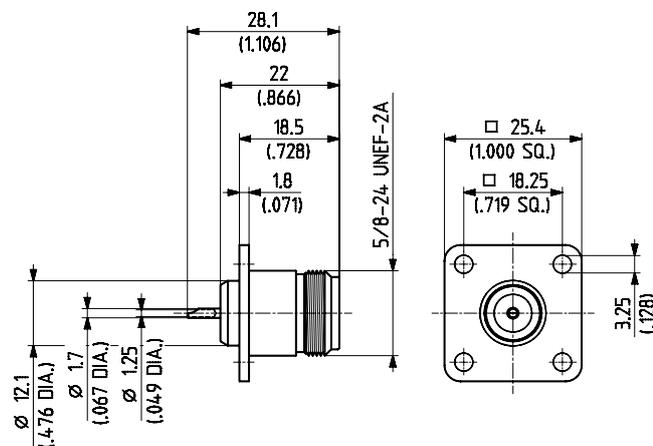
- Panel mounted



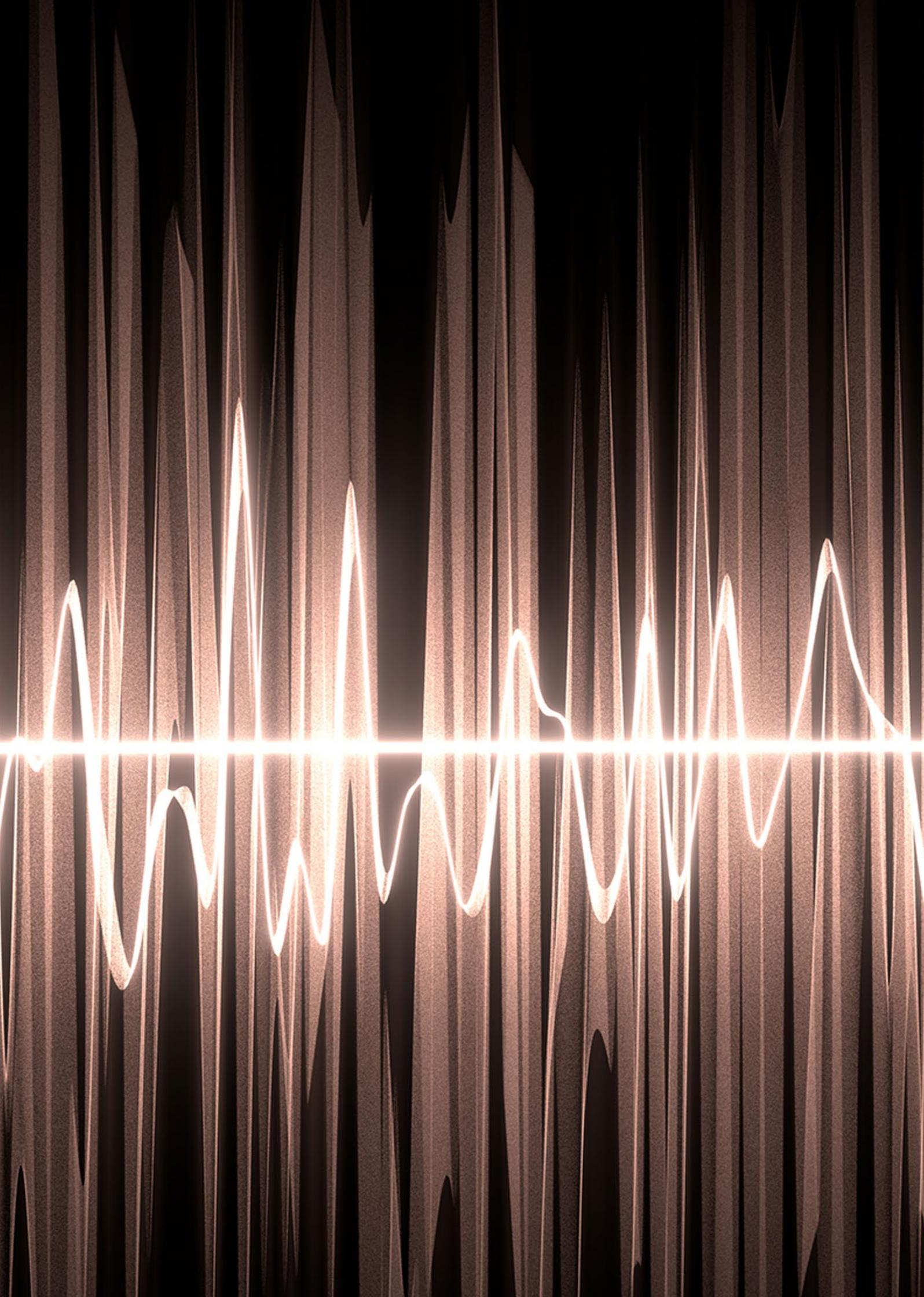
| HUBER+SUHNER type  | Item no. | Packaging | Mounting hole | Weight          |
|--------------------|----------|-----------|---------------|-----------------|
| 13_N-75-0-1/133_NE | 22542522 | single    | ML 16         | 45.0 g/1.58 oz. |

## Flange mount, jack (female)

- Panel mounted



| HUBER+SUHNER type  | Item no. | Packaging | Mounting hole | Weight          |
|--------------------|----------|-----------|---------------|-----------------|
| 23_N-75-0-1/133_NE | 22542575 | single    | ML 17         | 30.0 g/1.05 oz. |



# Series 4.3-10

## Description

HUBER+SUHNER 4.3-10 connectors offer very low PIM performance together with weight and compactness advantages. A key feature of this connector is the separation of the electrical and mechanical plane, which results in a lower coupling torque and the possibility of offering the connector with screw, handscrew and quick-lock design, thus simplifying the installation effort and offering for all mechanisms a very high and reliable electrical performance independently from the torque applied.

## Applications

Superior electrical and mechanical features of 4.3-10 make it an ideal interface for base stations, distributed antenna systems (DAS), in-building architecture and small cell applications.

## Features

- Radial contact
- Compact size (25.4 mm flange)
- 40 % lower weight than 7/16
- Multiple coupling options
- Ease of installation
- Protection of electrical contact points

## Content

|                                     |     |
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| Receptacles                         | 425 |
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| 4.3-10 Plus                         | 427 |
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## Benefits

- Excellent PIM and RL independent of torque
- Space saving
- Lightweight antennas and radios
- Flexible installation
- Lower cost of ownership
- No performance degradation due to infield damages



# Series 4.3-10 – technical data

The 4.3-10 interface dimensions conform to the international standards IEC 61169-54.

| Electrical data   |             | IEC 61169-1  |
|---|-------------|--|
| Nominal impedance   |             | 50 $\Omega$  |
| Frequency range   |             | up to 12 GHz   |
| Reflection factor (interface only)  | 9.2.1.      | 0.015 max. DC to 4 GHz (RL $\geq$ 36 dB)<br>0.025 max. 4 – 6 GHz (RL $\geq$ 32 dB) |
| Centre and outer contact resistance                                       | 9.2.3.      | initial $\leq$ 1.0 m $\Omega$<br>after conditioning $\leq$ 1.5 m $\Omega$          |
| Insulation resistance   | 9.2.5.      | initial $\geq$ 5 G $\Omega$<br>after conditioning $\geq$ 200 M $\Omega$            |
| Proof voltage at sea level<br>r.m.s. values at 40 Hz to 60 Hz             | 9.2.6.      | 2500 V   |
| Screening effectiveness<br>Torque/screw type<br>Hand screw and quick-lock | 9.2.8.      | DC to 6 GHz: $\geq$ 120 dB<br>DC to 3 GHz: $\geq$ 90 dB; 3 to 6 GHz: $\geq$ 70 dB  |
| Intermodulation<br>2 $\times$ 20 W<br>2 $\times$ 40 W                     | IEC 62037-3 | -166 dBc (0.4 to 4 GHz)<br>-160 dBc (0.4 to 4 GHz)                                 |

| Mechanical data                                    |         | IEC 61169-1   |
|--|---------|---|
| Mechanical operations/matings                      | 9.3.15  | > 100 operations                                      |
| Centre contact captivation (axial force)           | 9.3.5.  | 30 N  |
| Coupling torque (screw)                            | 9.3.6.  | 5 Nm  |
| Engagement force (quick-lock)                      | 9.3.6.  | typ. 100 N  |
| Separation force (quick-lock)                      | 9.3.6.  | typ. 80 N   |
| Coupling mechanism retention force<br>(quick-lock) | 9.3.11. | $\geq$ 450 N  |
| Vibration  | 9.3.3.  | 100 m/s <sup>2</sup> , 10 g acceleration, 2 – 200 Hz  |
| Shock  | 9.3.14. | 981 m/s <sup>2</sup> , 100 g acceleration, ½ sin 6 ms |

| Environmental data              |           | IEC 61169-1                                  |
|---------------------------------|-----------|--|
| Temperature range               |           | -55 to +90 °C                                |
| Climatic category <sup>1)</sup> |           | 40/85/21                                     |
| Sealing                         | IEC 60529 | IP68 2.5 bar, 1 h, 25 °C                     |
| Salt mist                       | 9.4.6.    | duration of spraying 48 h (720 h on request) |
| High temperature endurance      | 9.6.      | 250 h at 85 °C                               |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

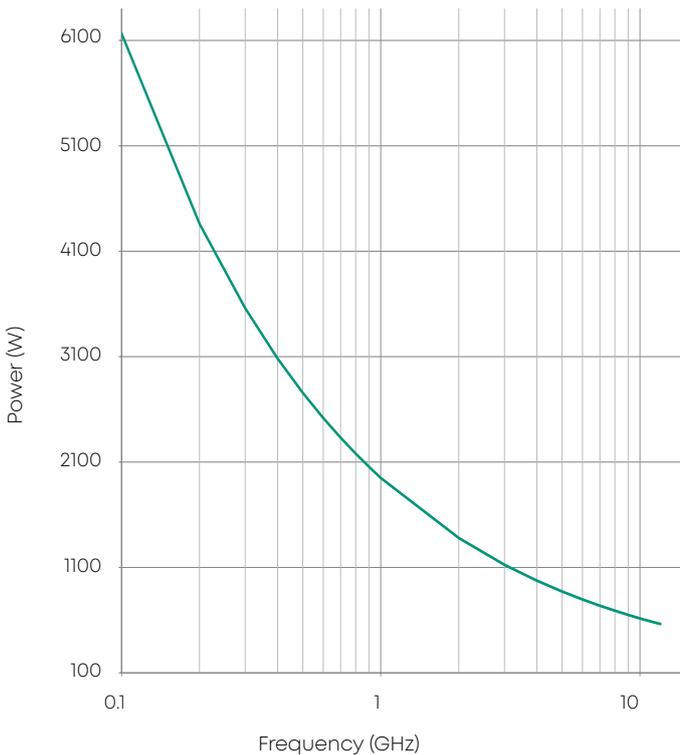
<sup>1)</sup> For certain connectors the upper temperature limit is restricted by the cable characteristics. Reference should be made to the relevant cable specification.

# Series 4.3-10 – admissible RF power

The maximum temperature usually occurs on the connector inner conductor. When connectors are employed in a coaxial cable assembly, the connector should have a center conductor diameter that is equal to or larger than the cable center conductor diameter in order to maximise the power handling of the assembly.

The curves are the results of a typical application and are simulation results. Curves may vary depending on the connector. For specific questions please ask our offices.

$T_{amb} = 25\text{ °C/sea level}$   
 $VSWR = 1.0$



| Material data   |                           |  |
|-----------------|---------------------------|--|
| Connector parts | Material                  | Plating  |
| Bodies          | brass                     | SUCOPLATE®, Tin-Nickel , silver, Nickel-Phosphorus |
| Outer contact   | spring bronze             | silver   |
| Insulators      | PTFE                      |  |
| Centre contact  | CuBe/spring bronze, brass | silver   |
| Gaskets         | MVQ                       |  |
| Coupling nut    | brass                     | SUCOPLATE®   |

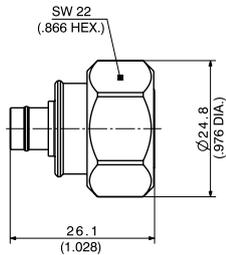
Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series 4.3-10 – cable connectors

## Straight cable plugs (male)

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered

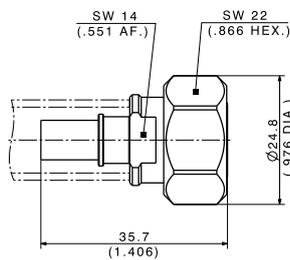


| HUBER+SUHNER type      | Item no. | Cable group (example)    | Packaging     |
|------------------------|----------|--------------------------|---------------|
| 11_4310-50-3-X2/033_-H | 85089256 | Y12<br>(SUCOFORM_141_Cu) | bulk 100 pcs. |

X: torque

### Flexible cable

- Center contact plugged
- Outer contact: Crimped



| HUBER+SUHNER type      | Item no. | Cable group (example)   | Packaging |
|------------------------|----------|-------------------------|-----------|
| 11_4310-50-4-X1/033_-H | 85078855 | X28 (Spuma_240, LMR240) | bulk      |

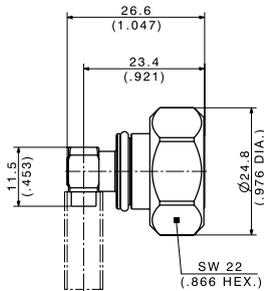
X: torque

# Series 4.3-10 – cable connectors

## Right angle cable plugs (male)

For semi-rigid cables, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered



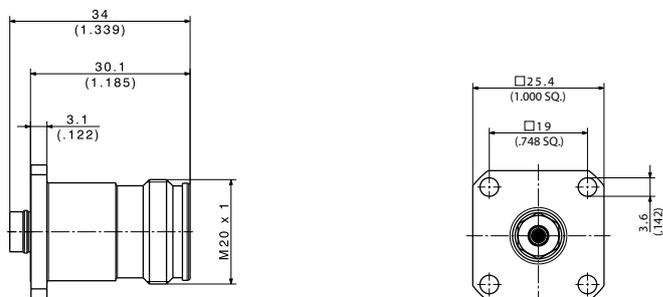
| HUBER+SUHNER type                   | Item no. | Cable group (example) | Packaging |
|-------------------------------------|----------|-----------------------|-----------|
| 16_4310-50-3-X1/003_-H<br>X: torque | 85064160 | Y12 (SUCOFORM_141)    |           |

# Series 4.3-10 – cable connectors

## Straight cable jacks (female)

### For semi-rigid cables, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered



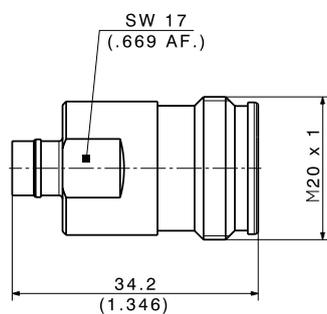
Flange size



| HUBER+SUHNER type     | Item no. | Cable group (example)     | Packaging | Notes                | Fig. |
|-----------------------|----------|---------------------------|-----------|----------------------|------|
| 25_4310-50-3-6/003_-Y | 85116109 | Y5, Y12 (Sucoform/EZ 141) | tray      | for cable type 0.141 | 1    |

### For semi-rigid, Sucoform and Multiflex cables

- Cable entry soldered
- Centre contact soldered



| HUBER+SUHNER type     | Item no. | Cable group (example) | Packaging    | Fig. |
|-----------------------|----------|-----------------------|--------------|------|
| 21_4310-50-3-1/003_-Y | 85068552 | Y12 (SUCOFORM_141_Cu) | tray 50 pcs. | 1    |

# Series 4.3-10 – receptacles

## Straight panel receptacle (jack)

### With coaxial end

- 4 hole, 1 inch flange

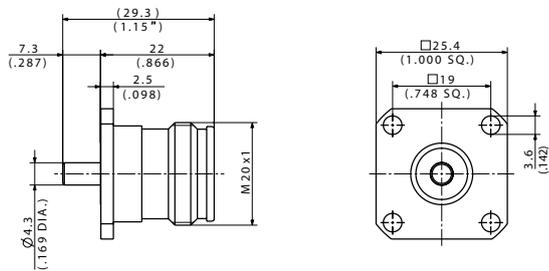


Fig. 1

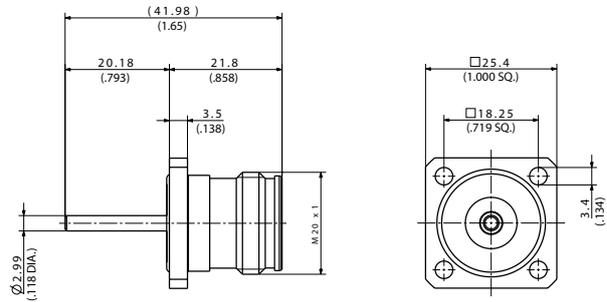


Fig. 2

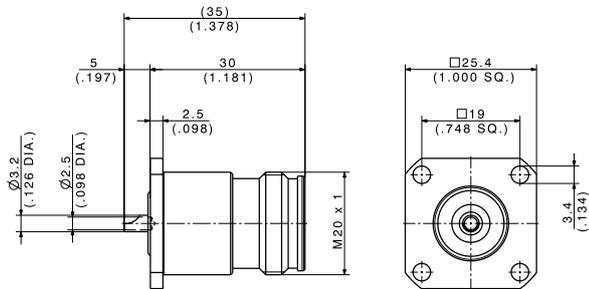


Fig. 3



| HUBER+SUHNER type      | Item no. | Packaging   | Notes           | Fig. |
|------------------------|----------|-------------|-----------------|------|
| 23_4310-50-0-2/003_-Y  | 85020599 | tray 60 pcs |                 | 1    |
| 23_4310-50-0-5/003_-Y  | 85021011 | tray 60 pcs | with panel seal | 2    |
| 23_4310-50-0-5/003_-E  | 85020470 | single      |                 |      |
| 23_4310-50-0-16/003_-Y | 85064166 | tray 50 pcs |                 | 3    |

# Series 4.3-10 – protective caps

## Protective cap for 4.3-10 female (jack) interface

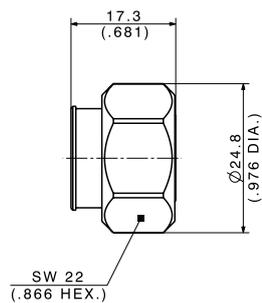
- Economical design
- Snap on silicon material design



| HUBER+SUHNER type   | Item no. | Packaging | Notes                    |
|---------------------|----------|-----------|--------------------------|
| 62_4310-0-0-1/---_H | 85092602 | each      | Ingress Protection IP X8 |

## Protective cap for 4.3-10 jack

- Water protection, IP68



| HUBER+SUHNER type                  | Item no. | Packaging | Notes              |
|------------------------------------|----------|-----------|--------------------|
| 62_4310-0-0-X3/-33_-E<br>X: torque | 85083632 | each      | 4.3-10 torque type |

# 4.3-10 Plus

## Eliminating the 4.1-9.5 mating problem

- Patented solution, US 9,831,619 B2
- IEC compatible design
- Extended dielectric prevents damage from 4.1-9.5 (mini-Din) male connectors
- Antenna and filter connectors per customer requests

Extended dielectric



4.3-10 plus



4.3-10

Comparison between 4.3-10 plus and 4.3-10 standard interface.

| HUBER+SUHNER type       | Item no. | Packaging      | Fig. |
|-------------------------|----------|----------------|------|
| 23_4310-U50-0-58/003_-Y | 85105910 | tray packaging | 1    |

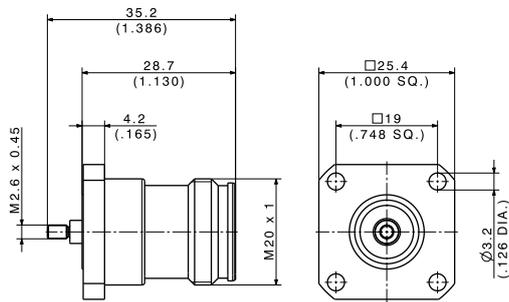


Fig. 1

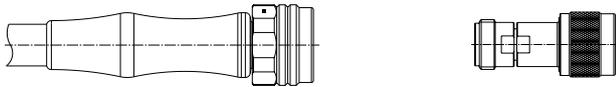
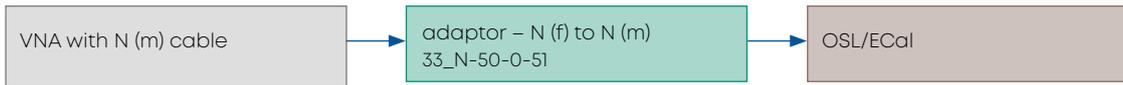
# Series 4.3-10 – calibration with precision adaptors (swapping method)

For return loss/VSWR measurements of 4.3-10 connectors, HUBER+SUHNER recommends the following calibration method. Depending on the 4.3-10 side (male or female) or ports on the test leads, different configurations are possible. Four different configurations with PC3.5 calibration kits or precision N calibration kits are listed below:

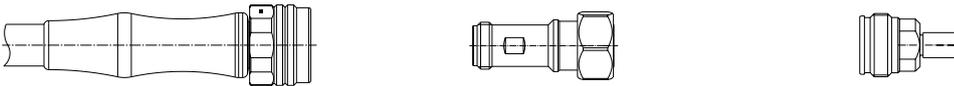
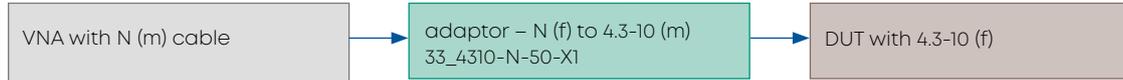
## Configuration 1

DUT type: 4.3-10 female, test port/cable: N male

Step 1, calibrate with precision adaptor



Step 2, replace the 33\_N-50-0-51 adaptor with matching 4.3-10 adaptor and connect with DUT



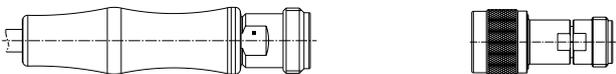
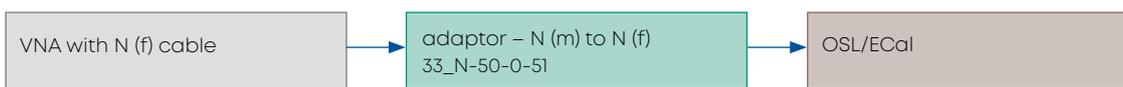
### Note:

For VNA measurement cable with PC 3.5 (m) instead of N (m), replace the 33\_N-50-51 adaptor with matching 33\_PC35-50-0-2 for calibration and 33\_4310-PC35-50-X1 for measurement.

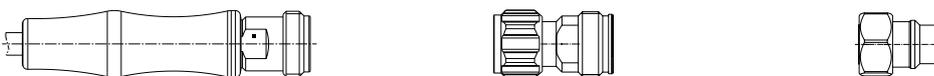
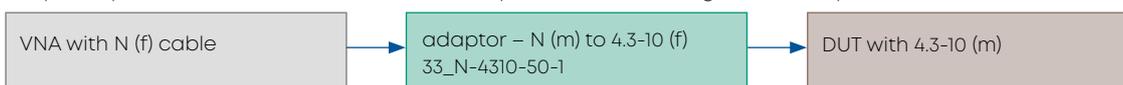
## Configuration 2

DUT type: 4.3-10 male; test port/cable: N female

Step 1, calibrate with measuring adaptor



Step 2, replace the 33\_N-50-0-51/193 NE adaptor with matching 4.3-10 adaptor and connect with DUT



### Note:

For VNA measurement cable with PC 3.5 (f) instead of N (f), replace the 33\_N-50-51 adaptor with matching 33\_PC35-50-0-2 for calibration and 33\_PC35-4310-50-1 for measurement.

# Series 7/16 – coaxial connectors

## Description

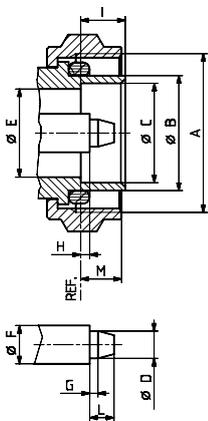
HUBER+SUHNER 7/16 connectors are mechanically very rugged coaxial connectors with screw lock. They have a characteristic impedance of 50 Ω and are applicable with excellent electrical properties up to 7.5 GHz. Transmission of medium to high power with radio transmitters and low PIM transmission of received signals such as in mobile phone base stations are typical applications.

## Content

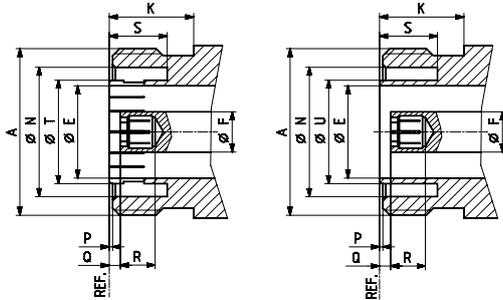
|                                   |     |
|-----------------------------------|-----|
| Description                       | 429 |
| Interface dimensions in mm/inches | 429 |
| Technical data                    | 430 |
| Cable connectors                  | 433 |
| Combination system                | 441 |
| Receptacles with solder end       | 444 |
| Protective cap                    | 445 |

## Interface dimensions (mm/inches)

### Plug (male)



### Jack (female)



|   | Plug            |             | Jack            |                           |
|---|-----------------|-------------|-----------------|---------------------------|
|   | min.            | max.        | min.            | max.                      |
| A | M29 × 1.5       |             | M29 × 1.5       |                           |
| B | 20.60/0.811     | 21.40/0.843 | –               | –                         |
| C | 18.03/0.710     | 18.21/0.717 | –               | –                         |
| D | 4.96/0.195      | 5.04/0.198  | –               | –                         |
| E | 15.85/0.624     | 16.25/0.640 | 15.85/0.624     | 16.25/0.640               |
| F | 7.00/0.276 nom. |             | 7.00/0.276 nom. |                           |
| G | 1.40/0.055      | 1.60/0.063  | –               | –                         |
| H | 1.47/0.058      | 1.77/0.070  | –               | –                         |
| I | 7.00/0.276      | 8.00/0.315  | –               | –                         |
| K | –               | –           | 10.00/0.394     | –                         |
| L | –               | 4.50/0.177  | –               | –                         |
| M | 7.00/0.276      | 9.00/0.354  | –               | –                         |
| N | –               | –           | 22.10/0.870     | 22.90/0.902               |
| P | –               | –           | 0.50/0.020      | 0.70/0.028                |
| Q | –               | –           | 1.77/0.070      | 2.07/0.082                |
| R | –               | –           | 5.00/0.197      | –                         |
| S | –               | –           | 8.10/0.319      | –                         |
| T | –               | –           | –               | 18.50/0.728 <sup>1)</sup> |
| U | –               | –           | –               | 18.50/0.709               |

### Interface dimensions conformable to the standards:

|               |             |
|---------------|-------------|
| International | IEC 61169-4 |
| Europe        | CECC 22 190 |
| Germany       | DIN 47223   |

### Degree of protection (interface, mated) IP68

<sup>1)</sup> Prior to slotting

# Series 7/16 – technical data

| Electrical data  | Requirements   |
|--|--|
| Impedance  | 50 $\Omega$  |
| Frequency range  | DC to 7.5 GHz      combination types: DC to 1 GHz    |
| Dielectric withstanding voltage (at sea level)<br>Combination system | 4.0 kV rms, 50 Hz<br>2.5 kV rms, 50 Hz               |
| Working voltage (at sea level)<br>Combination system                 | $\leq 2.5$ kV rms, 50 Hz<br>$\leq 1.0$ kV rms, 50 Hz |
| Insulation resistance  | $\geq 10^6$ M $\Omega$                               |
| Contact resistance<br>Centre contact<br>Outer contact                | $\leq 0.4$ m $\Omega$<br>$\leq 1.5$ m $\Omega$       |
| RF-leakage (at 1 GHz)  | $\geq 110$ dB  |
| VSWR   | see table below                                      |

| Typical VSWR <sup>1)</sup> | Frequency range |         |       | Cable group |
|----------------------------|-----------------|---------|-------|-------------|
|                            | 1 GHz           | 2.5 GHz | 5 GHz |             |
| Straight connectors        | 1.04            | 1.05    | 1.12  | M5, M7      |
|                            | 1.05            | 1.07    | 1.10  | U29, U32    |
|                            | 1.03            | 1.05    | 1.10  | S39         |
| Right angle connectors     | 1.04            | 1.05    | 1.12  | M5; M7      |

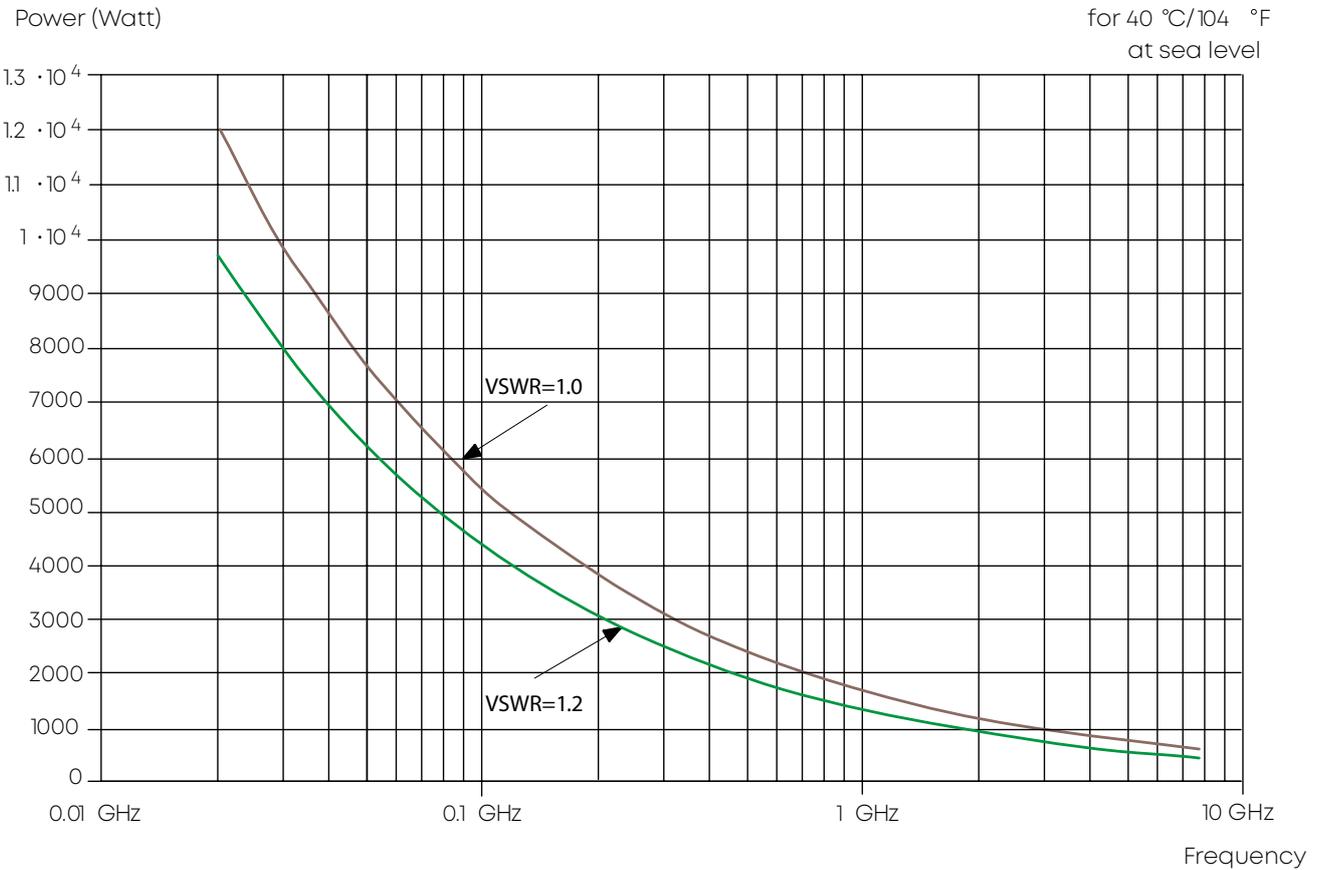
Other connections and cables on request.

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Values which can be achieved when connectors are perfectly fixed onto cable.

# Series 7/16 – technical data

## Admissible power of 7/16 connectors



| Mechanical data                      | Requirements                  |
|--------------------------------------|-------------------------------|
| Coupling nut torque<br>· Recommended | 25 to 30 Nm/221 to 260 in lbs |
| Coupling nut retention force         | ≥ 1000 N/225.0 lbs            |
| Contact captivation                  | ≥ 200 N/45.0 lbs              |
| Cable retention force <sup>1)</sup>  | see pages 32 – 41             |
| Durability (matings)                 | ≥ 500                         |

| Environmental data           | CECC 22190 test conditions | Equivalent MIL test conditions                              |
|------------------------------|----------------------------|---|
| Temperature range            |                            | -65 to +165 °C/-85 to +329 °F                               |
| Climatic category            | 4.6.5 → 55/155/56          |   |
| Corrosion (mated connectors) | 4.6.10 → IEC 68-2-11 Ka    | saltspray test acc. to MIL-STD-202, method 101, condition B |
| Vibration                    | 4.6.3 → IEC 68-2-6 Fc      |   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

<sup>1)</sup> Value considers maximum load of the cables without irreversible variations of specifications.

# Series 7/16 – technical data

| <b>Material data</b>                   |                 |                |
|--|-----------------|----------------|
| <b>Connector parts</b>                 | <b>Material</b> | <b>Plating</b> |
| Bodies                                 | brass           | SUCOPLATE®     |
| Pin contacts                           | brass           | silver         |
| Outer contact, jacks<br>Socket contact | spring bronze   | silver         |
| Crimp ferrules                         | copper          | SUCOPLATE®     |
| Insulators, standard version           | PTFE or PFA     |                |
| Gaskets                                | silicone rubber |                |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series 7/16 – cable connectors

## Straight cable plugs (male)

### For Sucoform cables

- Cable entry soldered
- Centre contact soldered

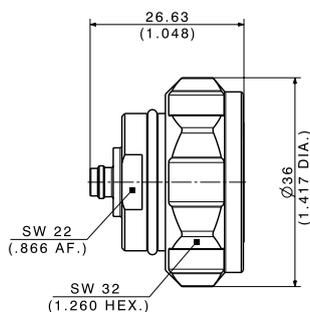


Fig. 1

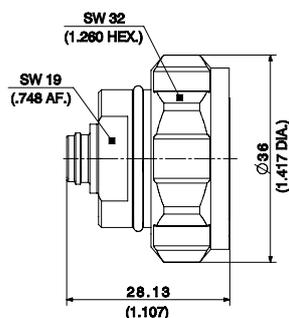


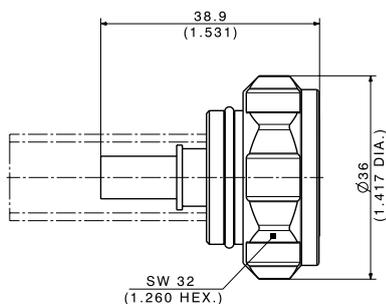
Fig. 2



| HUBER+SUHNER type    | Item no. | Cable group           | Packaging    | Assembly instruction | Weight          | Fig. |
|----------------------|----------|-----------------------|--------------|----------------------|-----------------|------|
| 11_716-50-3-3/003_-Y | 23031257 | Y12 (SUCOFORM_141)    | bulk 30 pcs. | 196279               | 82.8 g/2.92 oz. | 1    |
| 11_716-50-5-6/003_-Y | 84008435 | Y14 (SUCOFORM_250-01) | bulk 10 pcs. | 215393               | 75.0 g/2.65 oz. | 2    |

### For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Degree of protection IP67



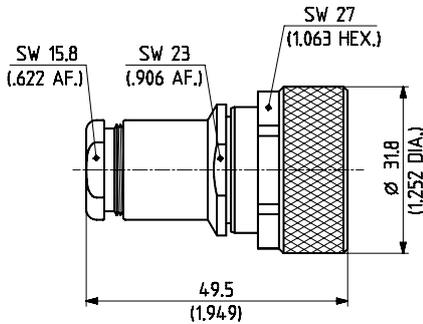
| HUBER+SUHNER type    | Item no. | Cable group   | Packaging    | Assembly instruction | Weight           |
|----------------------|----------|---|--------------|----------------------|------------------|
| 11_716-50-4-5/033_-Y | 84098543 | X9, X28 (SX_04172_B-60, SPUMA_240, SPUMA_240-FR-01) | tray 20 pcs. | 327739               | 74.47 g/2.62 oz. |

# Series 7/16 – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry HUBER+SUHNER pressure-sleeve
- Centre contact soldered



| HUBER+SUHNER type    | Item no. | Cable group                         | Packaging | Assembly instruction | Weight           |
|----------------------|----------|-------------------------------------|-----------|----------------------|------------------|
| 11_716-50-7-3/003_-E | 22544075 | U29 (RG_213_/U,<br>RADOX_RF_213)    | single    | 9018                 | 105.0 g/3.68 oz. |
| 11_716-50-7-4/003_-E | 22544076 | U32 (RG_214_/U,<br>ENVIROFLEX_B214) |           |                      | 100.0 g/3.50 oz. |

### For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554

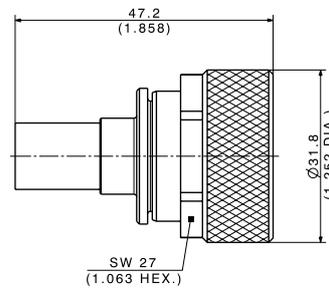
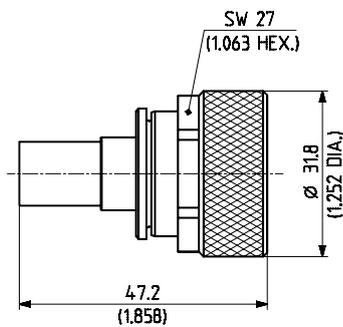


Fig. 1

Fig. 2

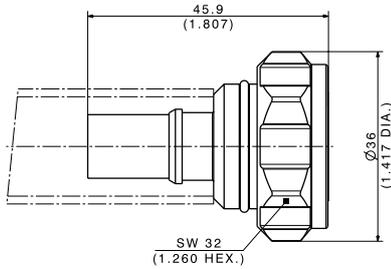
| HUBER+SUHNER type     | Item no. | Cable group                         | Packaging | Assembly instruction | Crimp insert | Weight           | Fig. |
|-----------------------|----------|-------------------------------------|-----------|----------------------|--------------|------------------|------|
| 11_716-50-7-1/003_-E  | 22544073 | U29 (RG_213_/U,<br>RADOX_RF_213)    | single    | 9017                 | 3 D          | 85.0 g/2.98 oz.  | 1    |
| 11_716-50-7-2/003_-E  | 22544074 | U32 (RG_214_/U,<br>ENVIROFLEX_B214) |           |                      |              | 85.0 g/2.98 oz.  | 1    |
| 11_716-50-7-18/003_-E | 22651493 | U33 (RG_393_/U,<br>ENVIROFLEX_393)  |           |                      |              | 87.65 g/3.09 oz. | 2    |

# Series 7/16 – cable connectors

## Straight cable plugs (male)

### For flexible cables

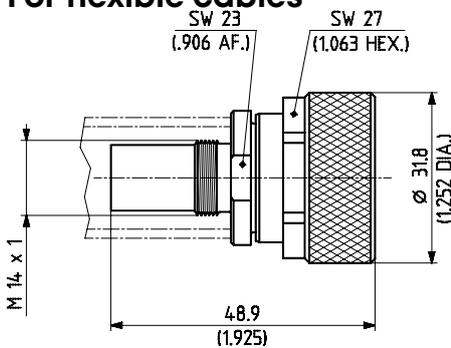
- Cable entry crimp



- Centre contact plugged-in
- Degree of protection IP67

| HUBER+SUHNER type     | Item no. | Cable group                      | Packaging    | Assembly instruction | Crimp insert | Weight          |
|-----------------------|----------|----------------------------------|--------------|----------------------|--------------|-----------------|
| 11_716-50-7-31/033_-Y | 85010777 | U30 (SPUMA_400, SPUMA_400-FR-01) | tray 10 pcs. | 418807               | D            | 89.5 g/3.16 oz. |

### For flexible cables



- Cable entry crimp
- Centre contact soldered

| HUBER+SUHNER type     | Item no. | Cable group      | Packaging | Assembly instruction | Crimp insert | Weight                        |
|-----------------------|----------|------------------|-----------|----------------------|--------------|-------------------------------|
| 11_716-50-7-14/003_-E | 22646908 | S32 (S_07262_BD) | single    | 27003                | D            | 91.0 g/3.19 oz. <sup>1)</sup> |

<sup>1)</sup> Type available with additional sealing ferrule (IP67)

# Series 7/16 – cable connectors

## Straight cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Degree of protection IP67

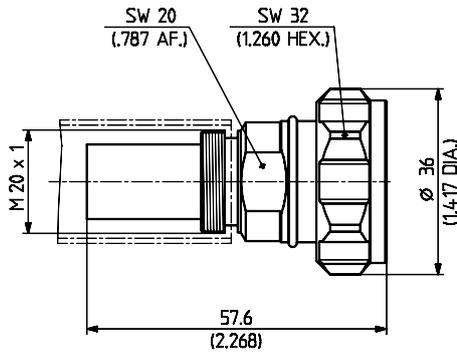


Fig. 1

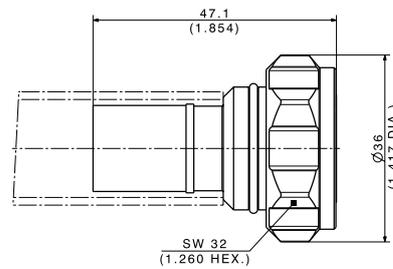


Fig. 2



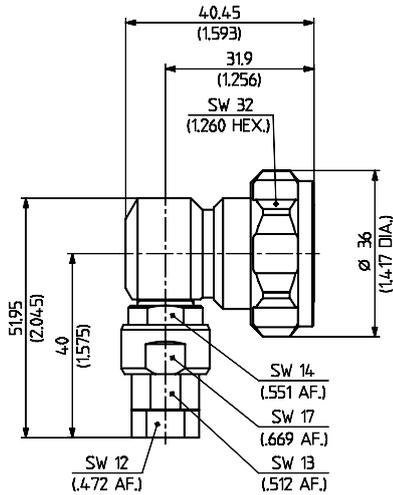
| HUBER+SUHNER type     | Item no. | Cable group        | Packaging    | Assembly instruction | Crimp insert | Weight           | Fig. |
|-----------------------|----------|--------------------|--------------|----------------------|--------------|------------------|------|
| 11_716-50-10-3/003_-Z | 23002520 | S39 (S_10162_B-11) | bulk 10 pcs. | 27354                | 12.4         | 100.0 g/3.52 oz. | 1    |
| 11_716-50-12-8/033_-Y | 85018507 | X29 (SPUMA_600)    |              | 444947               | 14.5         | 46.5 g/1.64 oz.  | 2    |

# Series 7/16 – cable connectors

## Right angle cable plugs (male)

### For corrugated cables

- Cable entry clamp
- Centre contact soldered
- Degree of protection IP68



| HUBER+SUHNER type    | Item no. | Cable group           | Packaging    | Assembly instruction | Crimp insert | Weight           |
|----------------------|----------|-----------------------|--------------|----------------------|--------------|------------------|
| 16_716-50-5-2/003_-Z | 23016774 | M5 (SUCCOFEED_1/4_HF) | bulk 10 pcs. | 273569               | 12.4         | 150.0 g/5.25 oz. |

# Series 7/16 – cable connectors

## Right angle cable plugs (male)

### For flexible cables

- Cable entry crimp
- Centre contact soldered

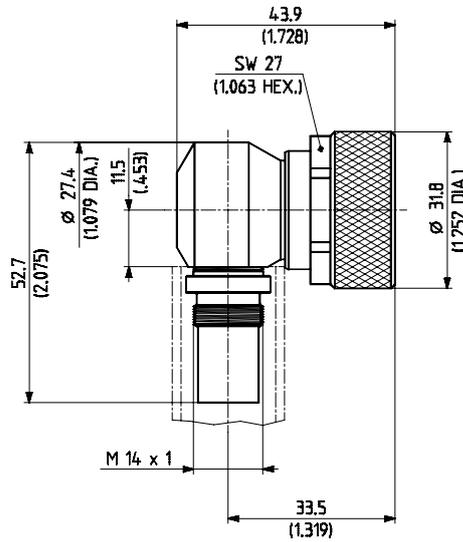
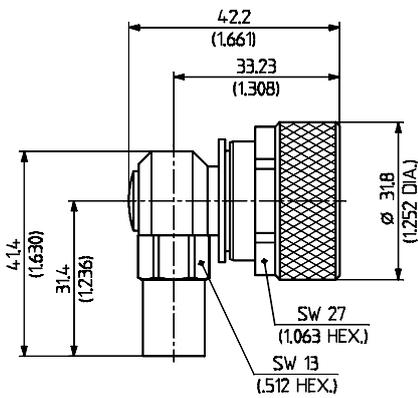


Fig. 1

Fig. 2

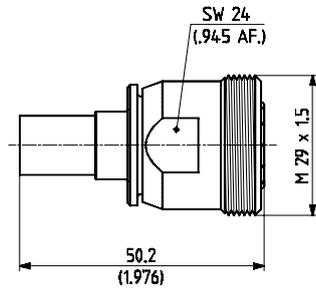
| HUBER+SUHNER type     | Item no. | Cable group   | Packaging | Assembly instruction | Crimp insert | Weight           | Fig.            |
|-----------------------|----------|---|-----------|----------------------|--------------|------------------|-----------------|
| 16_716-50-7-10/003_-E | 22658839 | U33 (RG_393_/U,<br>ENVIROFLEX_393)<br>U32 (RG_214_/U,<br>ENVIROFLEX_B214) | single    | 9087                 | D            | 103.0 g/3.61 oz. | 1               |
| 16_716-50-7-11/003_-E | 22649421 | S32 (S_07262_BD)  |           | 9094                 |              | 154.0 g/5.39 oz. | 2 <sup>1)</sup> |

<sup>1)</sup> Types available with additional sealing ferrule (IP67)

# Series 7/16 – cable connectors

## For flexible cables

- HUBER+SUHNER full crimp
- Taper sleeves see page 554



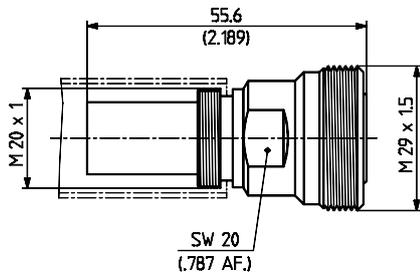
| HUBER+SUHNER type    | Item no. | Cable group                         | Packaging | Assembly instruction | Crimp insert | Weight          |
|----------------------|----------|-------------------------------------|-----------|----------------------|--------------|-----------------|
| 21_716-50-7-1/003_-E | 22544092 | U29 (RG_213_/U,<br>RADOX_RF_213)    | single    | 9017                 | 3 D          | 90.0 g/3.15 oz. |
| 21_716-50-7-2/003_-E | 22544093 | U32 (RG_214_/U,<br>ENVIROFLEX_B214) |           |                      |              |                 |

# Series 7/16 – cable connectors

## Straight cable jacks (female)

### For flexible cables

- Cable entry crimp
- Centre contact plugged-in
- Degree of protection IP67



| HUBER+SUHNER type     | Item no. | Cable group        | Packaging    | Assembly instruction | Crimp insert | Weight          |
|-----------------------|----------|--------------------|--------------|----------------------|--------------|-----------------|
| 21_716-50-10-1/003_-Z | 23002535 | S39 (S_10162_B-11) | bulk 10 pcs. | 27354                | 12.4         | 85.0 g/2.99 oz. |

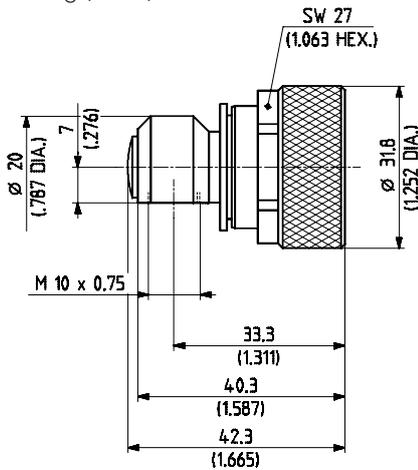
# Series 7/16 – combination system

The HUBER+SUHNER 7/16 combination system enables efficient, lowcost and flexible stocking of 7/16 cable connectors. The 11 basic parts can be combined to obtain 48 different cable connector types for almost all coaxial cables with 2.95 mm (0.116 in.), 4.7 mm (0.185 in.) or 7.25 mm (0.285 in.) dielectric diameter. The cable entries are available with both crimp type or pressure-sleeve (no special tools) cable attachment.

Centre conductors are soldered. All cable entries can be used together with any of the combi-heads. Taper sleeves can be supplied for the crimp type cable entries. Straight or right angle configurations are possible with the same sub-assemblies. All types have 50 Ω impedance and are suitable for frequencies up to 1 GHz. The working voltage is limited to 1.0 kV rms.

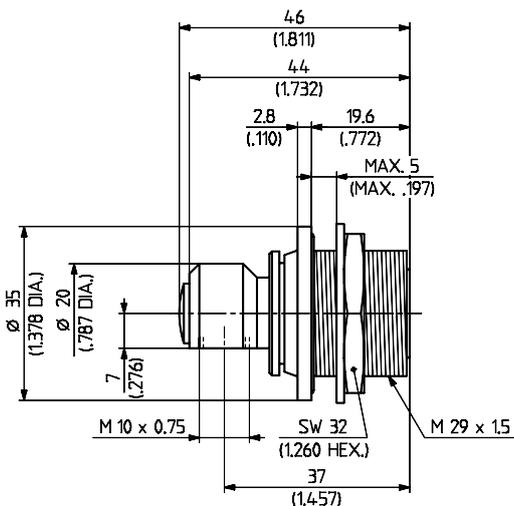
## Combi-heads

- Plug (male)



| HUBER+SUHNER type    | Item no. | Packaging | Weight           | Notes                             |
|----------------------|----------|-----------|------------------|-----------------------------------|
| 11_716-50-0-2/003_-E | 22641432 | single    | 100.0 g/3.50 oz. | cable entries see following pages |

- Bulkhead jack (female)

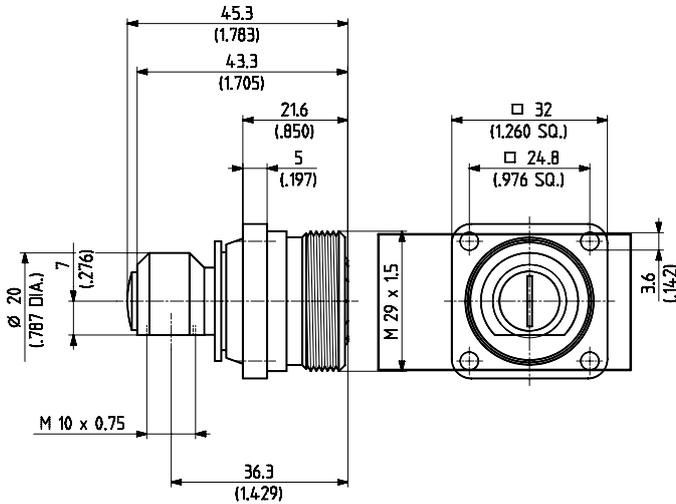


| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Weight           | Notes                             |
|----------------------|----------|-----------|---------------|------------------|-----------------------------------|
| 24_716-50-0-1/003_-E | 22650517 | single    | ML 110        | 126.0 g/4.44 oz. | cable entries see following pages |

# Series 7/16 – combination system

## Combi-heads

- Panel jack (female)



| HUBER+SUHNER type    | Item no. | Packaging | Mounting hole | Weight           | Notes                   |
|----------------------|----------|-----------|---------------|------------------|-------------------------|
| 25_716-50-0-2/003_-E | 22641434 | single    | ML 27         | 124.0 g/4.34 oz. | cable entries see below |

## Cable entries (for use with all combi-heads)

- Cable entry crimp
- Taper sleeves see page 554

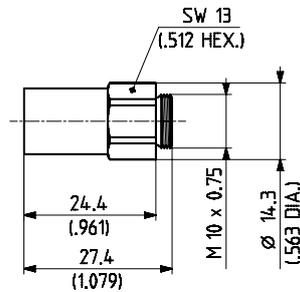
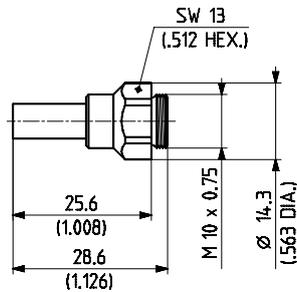


Fig. 1

Fig. 2

| HUBER+SUHNER type  | Item no. | Cable group (example)            | Packaging | Assembly instruction | Crimp insert | Fig. |
|--------------------|----------|----------------------------------|-----------|----------------------|--------------|------|
| 71_Z-0-3-22/-33_-E | 22641436 | U9 (RG_223_/U, ENVIROFLEX_B223)  | single    | 9084                 | B            | 1    |
| 71_Z-0-7-21/-33_-E | 22641440 | U29 (RG_213_/U, RADOX_RF_213)    |           | 9087                 | D            | 2    |
| 71_Z-0-7-22/-33_-E | 22641441 | U32 (RG_214_/U, ENVIROFLEX_B214) |           |                      |              |      |

# Series 7/16 – combination system

## Cable entries (for use with all combi-heads)

- Cable entry pressure-sleeve

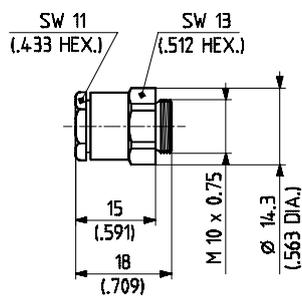


Fig. 1

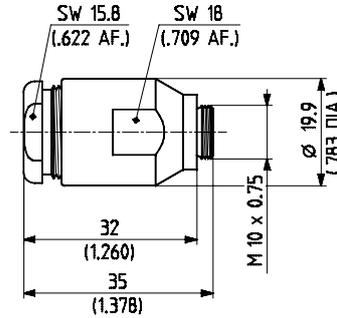


Fig. 2

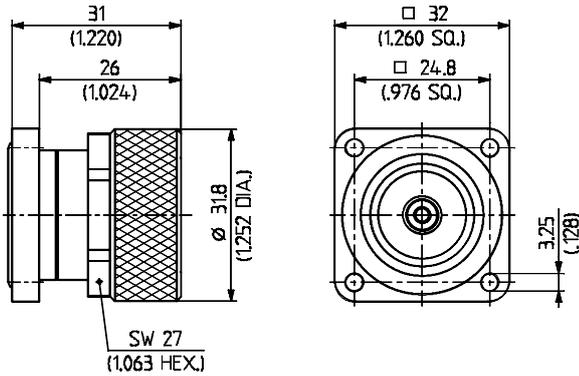


| HUBER+SUHNER type  | Item no. | Cable group (example)                 | Packaging | Assembly instruction | Fig. |
|--------------------|----------|---------------------------------------|-----------|----------------------|------|
| 71_Z-0-3-24/-33_-E | 22641438 | U7, U9 (RG_58_C/U,<br>ENVIROFLEX_B58) | single    | 9085                 | 1    |
| 71_Z-0-7-24/-33_-E | 22641443 | U32 (RG_214_/U,<br>ENVIROFLEX_B214)   |           | 9088                 | 2    |

# Series 7/16 – receptacles with solder end

## Receptacle, plug (male)

- Panel mounted
- Flange with O-ring
- Centre contact captivated for torque



| HUBER+SUHNER type    | Item no. | Packaging    | Weight          | Notes                                  |
|----------------------|----------|--------------|-----------------|--|
| 13_716-50-0-4/003_-V | 22658959 | bulk 20 pcs. | 98.0 g/6.00 oz. | centre conductor with threaded stud M3 |

## Receptacles, jacks (female)

- Panel mounted

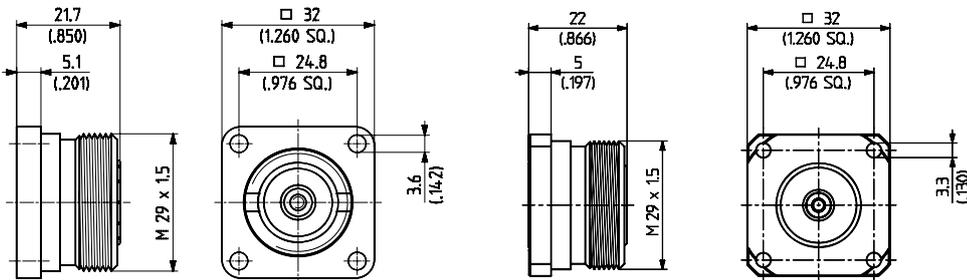


Fig. 1

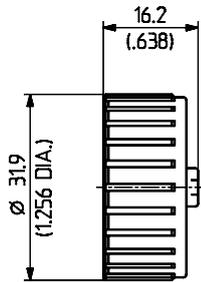
Fig. 2



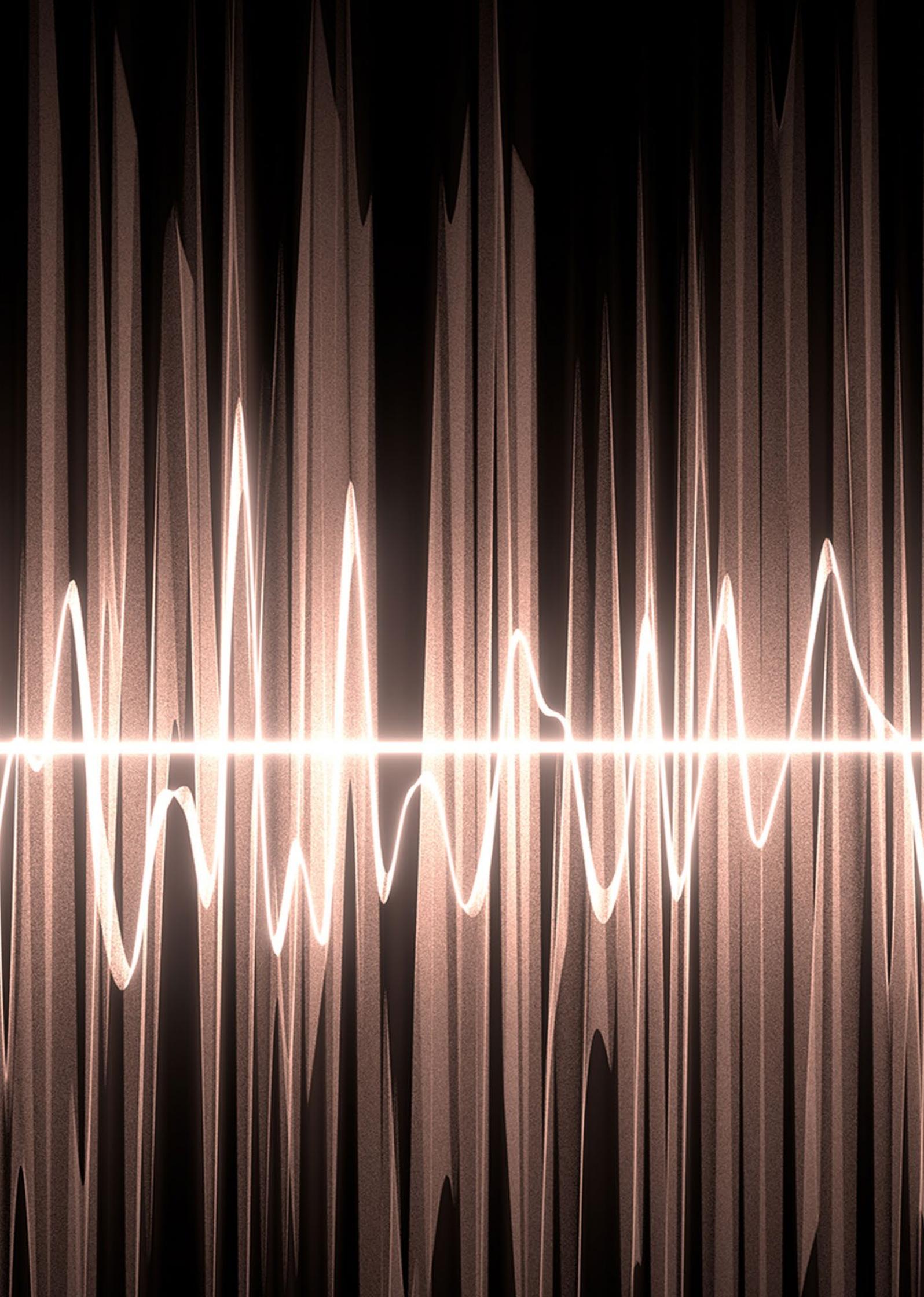
| HUBER+SUHNER type     | Item no. | Packaging    | Mounting hole | Weight          | Notes                                  | Fig. |
|-----------------------|----------|--------------|---------------|-----------------|--|------|
| 23_716-50-0-1/003_-E  | 22544102 | single       | ML 27         | 75.0 g/2.65 oz. | centre conductor with threaded stud M3 | 1    |
| 23_716-50-0-57/003_-V | 23015661 | bulk 20 pcs. |               | 80.0 g/2.80 oz. |  | 2    |

# Series 7/16 – protective cap

- Protective cap for jack
- Made of plastic



| HUBER+SUHNER type  | Item no. | Packaging     | Notes                              |
|--------------------|----------|---------------|------------------------------------|
| 62_716-0-0-4/---_H | 23005877 | bulk 100 pcs. | water protection according to IP68 |



# Series Quick-Fit plus – field terminated coaxial connectors

## Description

Thanks to their one-piece design, the new Quick-Fit plus connectors eliminate loose parts such as O-rings and washers. This allows extremely easy and fast assembling and removes the need for additional steps such as the application of grease on sealings. The innovative cable entry design allows the connectors to be mounted using standard wrenches, eliminating the need for expensive tools or calibrated torque wrenches.

## Clean cable preparing process

To achieve best performance of a field terminated connector, the cable-preparing process of a corrugated cable is as important as the use of a reliable connector system. Minor mistakes in the cable preparing can cause significant performance issues such as bad PIM or water ingress into the system. The unique all-in-one assembly tool allows the installer to prepare the cable through a fully controlled process, eliminating operator errors and resulting in perfect cable preparation with no swarf or burrs. This perfectly designed cable preparation process, along with the one-piece connector design, removes the risk of passive intermodulation caused by connectors in the overall system or network.

## Key characteristics

- Extraordinary PIM stability
- Fast and easy cable preparing process
- Reliable «one click/positive stop» connector assembling
- One piece connector design
- Multi-brand cable compatibility
- High quality materials and platings

## Content

|                           |     |
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| Benefits                  | 447 |
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| Connector portfolio       | 449 |
| MaxTool                   | 455 |
| Preparing tools           | 456 |
| Spare parts               | 457 |

## Benefits

- Very low level of interference with adjacent channels
- Stable system performance over time
- Quick and easy connector assembling
- Simplified logistics and easy on-site handling
- Wide-ranging of applications
- Reliable, also in harsh environments



# Series Quick-Fit plus – technical data connectors

## General data

|                 |  |
|-----------------|--|
| Cable size/type | corrugated ½" annular                          |
| Interfaces      | N, 4.1/9.5 <sup>1)</sup> , 4.3-10, 7/16, NEX10 |

<sup>1)</sup> on request

## Electrical data (typical)

|                                       |   |
|---------------------------------------|---|
| Impedance                             | 50 Ω  |
| Frequency range                       | DC to 6 GHz   |
| Return loss (gated measurement)       | straight version: ≥ 30 dB up to 3.7 GHz<br>right angle version: ≥ 28 dB up to 3.7 GHz |
| Passive intermodulation <sup>2)</sup> | typical -160 dBc, minimum -155 dBc  |

<sup>2)</sup> Carrier to 3<sup>rd</sup> order intermodulation product ratio with 2 x 20 W (43 dBm) carrier power

## Mechanical data (typical)

|                                 |  |
|---------------------------------|--|
| Durability                      | ≥ 100 matings  |
| Recommended coupling nut torque | 4.3-10: ≥ 5 Nm/3.61 ft lb, IEC 61169-1<br>NEX10: ≥ 5Nm |

## Environmental data (typical)

|                                    |                               |
|------------------------------------|-------------------------------|
| Temperature range (connector only) | -55 to +85 °C/-67 to 185 °F   |
| IP rating                          | IP68 (according to IEC 60529) |

| Material data (main parts) | Material   | Plating    |
|----------------------------|------------|------------|
| Cable entry                | brass      | SUCOPLATE* |
| Connector head             | brass      | SUCOPLATE* |
| Outer contact              | brass      | SUCOPLATE* |
| Centre contact             | brass/CuBe | silver     |
| Insulators                 | PTFE/PEI   |            |
| Gaskets                    | silicon    |            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series Quick-Fit plus – connector portfolio N

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50
- Type e: ANDREW/COMMSCOPE AL4RPV-50

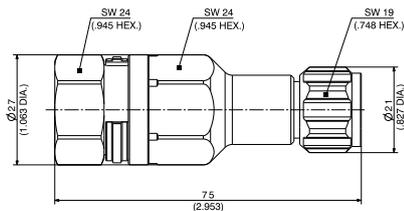


Fig. 1

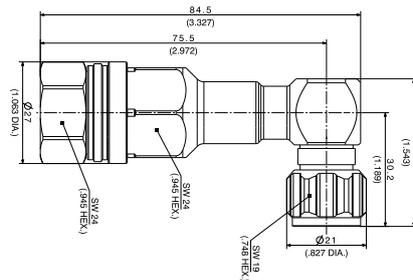


Fig. 2

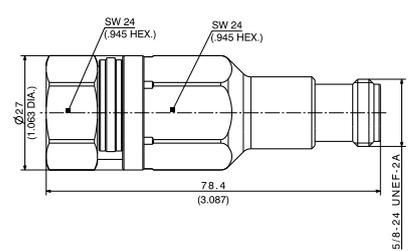


Fig. 3

| Connector style    | Type description | Item number | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|--------------------|------------------|-------------|-----------------------------------|------------|--------------------------------------|------|
| N male straight    | 11_N-50-12-60    | 85074817    | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| N male right angle | 16_N-50-12-60    | 85074824    |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| N female straight  | 21_N-50-12-60    | 85074835    |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 3    |
| N male straight    | 11_N-50-12-61    | 85074818    |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 1    |
| N male right angle | 16_N-50-12-61    | 85074825    |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 2    |
| N female straight  | 21_N-50-12-61    | 85074836    |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 3    |
| N male right angle | 11_N-50-12-62    | 85091142    |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| N male right angle | 16_N-50-12-62    | 85092145    |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| N female straight  | 21_N-50-12-62    | 85092237    |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 3    |

# Series Quick-Fit plus – connector portfolio 4.3-10 screw

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50
- Type e: ANDREW/COMMSCOPE AL4RPV-50

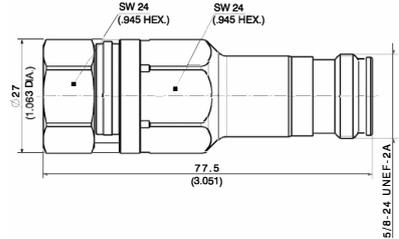
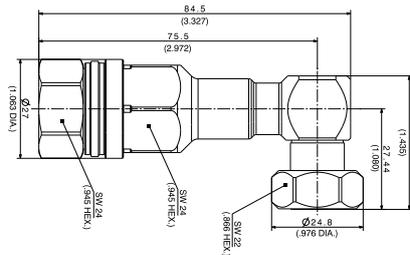
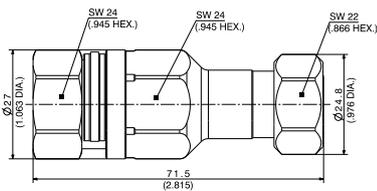


Fig. 1

Fig. 2

Fig. 3

| Connector style         | Type description  | Item number                               | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|-------------------------|-------------------|---|-----------------------------------|------------|--------------------------------------|------|
| 4.3-10 male straight    | 11_4310-50-12-X60 | 85067026                                  | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| 4.3-10 male right angle | 16_4310-50-12-X60 | 85067267                                  |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| 4.3-10 female straight  | 21_4310-50-12-60  | 85067226<br>(fits all locking mechanisms) |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 3    |
| 4.3-10 male straight    | 11_4310-50-12-X61 | 85067072                                  |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 1    |
| 4.3-10 male right angle | 16_4310-50-12-X61 | 85067268                                  |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 2    |
| 4.3-10 female straight  | 21_4310-50-12-61  | 85067228<br>(fits all locking mechanisms) |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 3    |
| 4.3-10 male straight    | 11_4310-50-12-X62 | 85086308                                  |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| 4.3-10 male right angle | 16_4310-50-12-X62 | 85092655                                  |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| 4.3-10 female straight  | 21_4310-50-12-62  | 85092653                                  |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 3    |

# Series Quick-Fit plus – connector portfolio 4.3-10 hand screw

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50

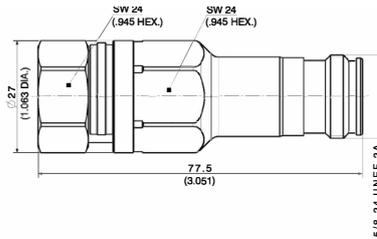
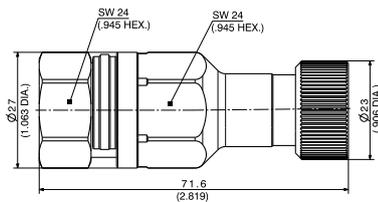


Fig. 1

Fig. 2

| Connector style        | Type description  | Item number                               | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|------------------------|-------------------|---|-----------------------------------|------------|--------------------------------------|------|
| 4.3-10 male straight   | 11_4310-50-12-Y60 | 85074839                                  | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| 4.3-10 female straight | 21_4310-50-12-60  | 85067226<br>(fits all locking mechanisms) |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| 4.3-10 male straight   | 11_4310-50-12-Y61 | 85074840                                  |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 1    |
| 4.3-10 female straight | 21_4310-50-12-61  | 85067228<br>(fits all locking mechanisms) |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 2    |

# Series Quick-Fit plus – connector portfolio 4.3-10 push-pull

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50

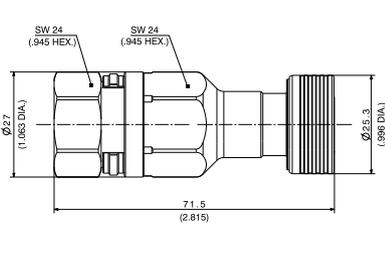


Fig. 1

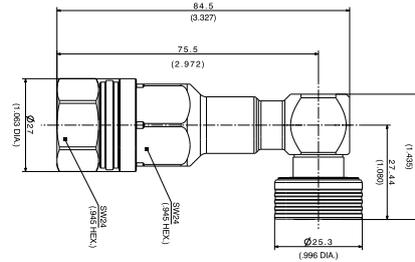


Fig. 2

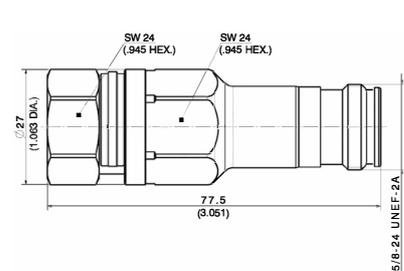


Fig. 3

| Connector style           | Type description  | Item number                               | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|---------------------------|-------------------|---|-----------------------------------|------------|--------------------------------------|------|
| 4.3-10 male right angle   | 16_4310-50-12-Z60 | 85074830                                  | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| 4.3-10 female straight    | 21_4310-50-12-60  | 85067226<br>(fits all locking mechanisms) |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 3    |
| 4.3-10 male straight      | 11_4310-50-12-Z61 | 85074829                                  |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 1    |
| 4.3-10 female right angle | 16_4310-50-12-Z61 | 85074831                                  |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 2    |
| 4.3-10 female straight    | 21_4310-50-12-61  | 85067228<br>(fits all locking mechanisms) |                                   | c          | yellow,<br>74_Z-0-12-20,<br>85069095 | 3    |

# Series Quick-Fit plus – connector portfolio NEX10

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50
- Type e: ANDREW/COMMSCOPE AL4RPV-50

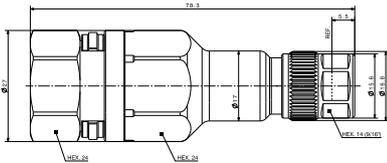


Fig. 1

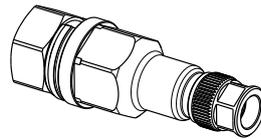


Fig. 2

| Connector style     | Type description   | Item number | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|---------------------|--------------------|-------------|-----------------------------------|------------|--------------------------------------|------|
| NEX10 male straight | 11_NEX10-50-12-X60 | 85154617    | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| NEX10 male straight | 11_NEX10-50-12-X62 | 85154913    |                                   | e          | yellow,<br>74_Z-0-12-20,<br>85069095 | 1    |

# Series Quick-Fit plus – connector portfolio 7/16

## Cable compatibility

- Type a: HUBER+SUHNER Sucofeed\_1/2, \_1/2\_LW, \_1/2\_FR, \_1/2\_PW
- Type b: RFS CELLFLEX LCF-50JFN, ICA12-50JPL, ICA12-50JPLW, ICA12-50JPLLW
- Type c: ANDREW/COMMSCOPE LDF4-50A
- Type d: ANDREW/COMMSCOPE HL4RPV-50
- Type e: ANDREW/COMMSCOPE AL4RPV-50

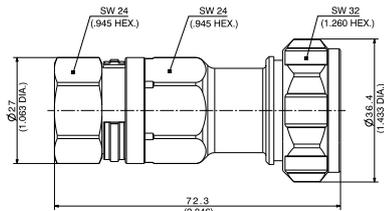


Fig. 1

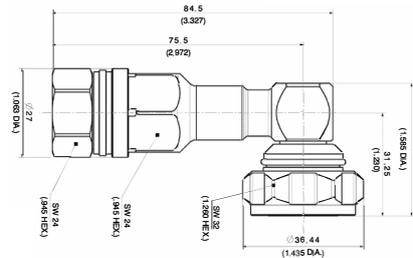


Fig. 2

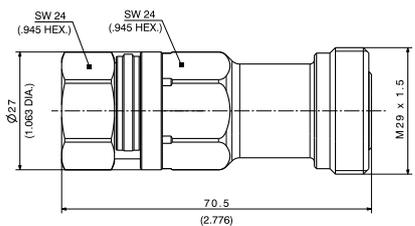


Fig. 3

| Connector style       | Type description | Item number | Assembly instruction              | Cable type | Blade unit for tool 74_Z-0-12-18     | Fig. |
|-----------------------|------------------|-------------|-----------------------------------|------------|--------------------------------------|------|
| 7/16 male straight    | 11_716-50-12-60  | 85074815    | DOC-0000736630,<br>DOC-0000799919 | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 1    |
| 7/16 male right angle | 16_716-50-12-60  | 85074821    |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 2    |
| 7/16 female straight  | 21_716-50-12-60  | 85074832    |                                   | a, b, c    | green,<br>74_Z-0-12-21,<br>85068959  | 3    |
| 7/16 female straight  | 21_716-50-12-61  | 85074833    |                                   | d          | yellow,<br>74_Z-0-12-20,<br>85069095 | 3    |
| 7/16 female straight  | 21_716-50-12-62  | 85092603    |                                   | e          | green,<br>74_Z-0-12-21,<br>85068959  | 3    |

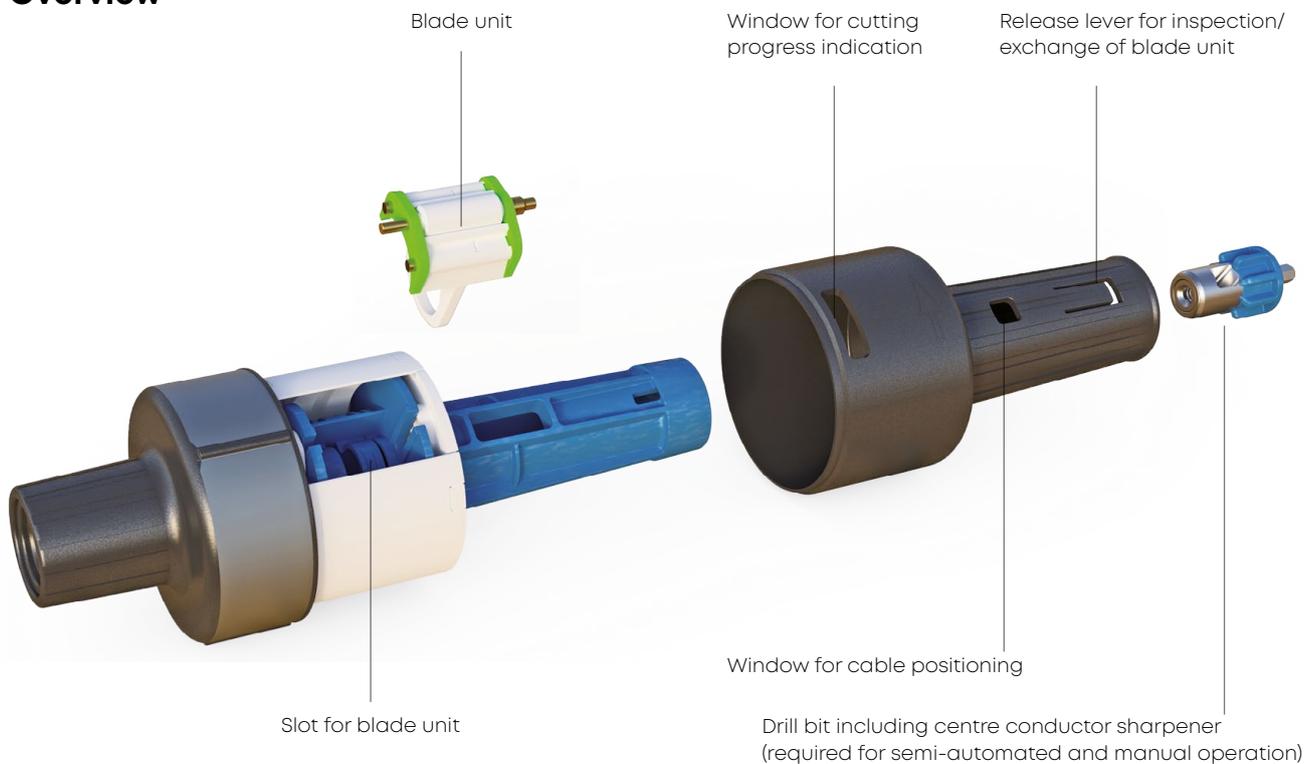
# Series Quick-Fit plus – MaxTool

## All-in-one cable preparing tool

- Fully controlled/zero defect cable preparing
- Perfect cutting process – no swarf – no PIM
- Easy-to-handle – easy-to-carry
- Ergonomic design
- Semi-automated and manual operation



## Overview



# Series Quick-Fit plus – preparing tools



Fig. 1



Fig. 2

| Tools          | Content  | Type description | Item number | Instructions   | Fig. |
|----------------|--|------------------|-------------|--|------|
| Starter kit    | Cable preparing tool<br>Drill bit/sharpener<br>Blade unit (gn. yl)<br>Jacket/diel. removers<br>Fixed wrenches<br>Screw driver<br>Holster | 74_Z-0-12-19     | 85069097    | DOC-0000736630,<br>DOC-0000799919,<br>DOC-0000721673 | 1    |
| Preparing tool | Cable preparing tool<br>Drill bit/sharpener<br>Blade unit (gn. yl)<br>Jacket/diel. removers  | 74_Z-0-12-18     | 85066880    |  | 2    |

# Series Quick-Fit plus – spare parts

Fig. 1.



Fig. 2.



Fig. 3



Fig. 4



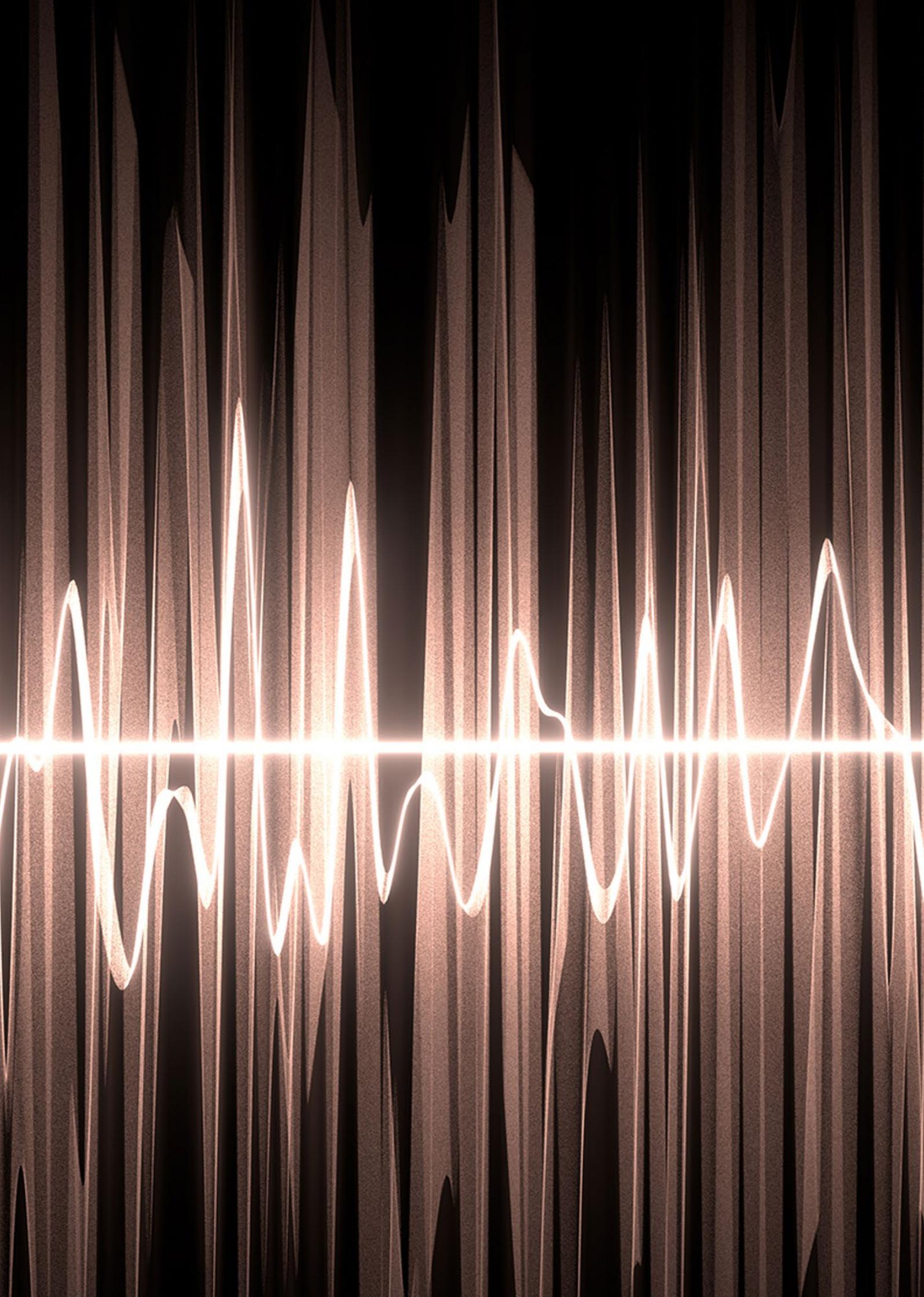
Fig. 5



Fig. 6



| Tools  | Note                                 | Cable compatibility          | Type description | Item number | Instructions   | Fig. |
|--|--------------------------------------|------------------------------|------------------|-------------|--|------|
| Box including blade unit green and remover     | 2 blade units and 2 removers per box | View Page 7, 8, 9, 10, 11,12 | 74_Z-0-12-21     | 85068959    | DOC-0000736630,<br>DOC-0000799919,<br>DOC-0000721673 | 1    |
| Box including blade unit yellow and remover    | 2 blade units and 2 removers per box | ANDREW/COMM-SCOPE HL4RPV-50  | 74_Z-0-12-20     | 85069095    |  | 2    |
| Drill bit/centre conductor sharpener           | 1 pce per packet                     | n/a                          | 74_Z-0-12-23     | 85069100    |  | 3    |
| Jacket/dielectric remover (plenum cables only) | 5 pcs per packet                     | n/a                          | 74_Z-0-12-22     | 85069099    |  | 4    |
| Jacket/dielectric remover "nutcracker"         | 3 pcs per packet                     | n/a                          | 74_Z-0-12-24     | 85089069    |  | 5    |
| Holster including belt                         | without content                      | n/a                          | 74_Z-0-0-637     | 85069101    |  | 6    |



# Series Quick-Fit – field terminated coaxial connectors

## General description

HUBER+SUHNER Quick-Fit connectors are worldwide approved N, 4.3-10 and 7/16 connectors for foam dielectric corrugated copper tube cables. They offer a greatly simplified and economic approach to cable preparation and assembly. The product line meets the requirements of multi-carrier, high-channel-count transceivers such as base stations of today's mobile communication infrastructure networks.

## Application

- Rugged connectors for easy outdoor and indoor (DAS) termination of corrugated feeder and jumper cables
- Meeting also the special requirements of BTS and small cell applications

## Features

- Excellent RF performance
- Low, stable and reproducible PIM (Passive Intermodulation Product), typically  $-165$  dBc
- Safe assembly process, in-field termination with reproducible electrical performance
- Quick and easy assembly, 2 main connector parts, 4 steps in less than 4 minutes
- High IP rating, IP68
- Multi-brand, multi-design and multi-material cable compatibility
- Backward compatibility
- Reusability

## Benefits

- Easy field installation
- Time saving
- Simplified logistics
- Low cost of ownership
- Support quality of a proven connector house
- Compatible for copper and aluminium cables

## Content

|                                    |     |
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| Description                        | 459 |
| Application                        | 459 |
| Features                           | 459 |
| Benefits                           | 459 |
| Technical data                     | 460 |
| Cable connectors – preparing tools | 461 |



# Series Quick-Fit – technical data

| General data    |   |
|-----------------|---|
| Cable size/type | corrugated 1/2" annular, 1/2" helical, 7/8" annular, 1 1/4" annular, 1 5/8" annular |
| Interfaces      | N, 4.3-10, 7/16   |

| Electrical data (typical)             |  |
|---------------------------------------|--|
| Impedance                             | 50 $\Omega$  |
| Frequency range (interface only)      | N: DC to 11 GHz<br>4.3-10: DC to 12 GHz<br>7/16: DC to 7.5 GHz |
| Passive intermodulation <sup>1)</sup> | better than -155 dBc   |

<sup>1)</sup> Carrier to 3rd order intermodulation product ratio with 2 x 20 W (43 dBm) carrier power

| Mechanical data (typical)       |   |
|---------------------------------|---|
| Durability                      | $\geq 100$ matings  |
| Recommended coupling nut torque | N: 0.68 to 1.13 Nm/0.49 to 0.82 ft lb, IEC 61169-16<br>4.3-10: $\geq 5$ Nm/3.61 ft lb, IEC 61169-1<br>7/16: 25 to 30 Nm/18.05 to 21.66 ft lb, IEC 61169-4 |

| Environmental data (typical)       |                               |
|------------------------------------|-------------------------------|
| Temperature range (connector only) | -40 to +85 °C/-40 to +185 °F  |
| IP rating                          | IP68 (according to IEC 60529) |

| Material data (main parts) | Material            | Plating    |
|----------------------------|---------------------|------------|
| Cable entry                | brass               | SUCOPLATE* |
| Connector head             | brass               | SUCOPLATE* |
| Outer contact              | brass               | SUCOPLATE* |
| Centre contact             | spring bronze/brass | silver     |
| Insulators                 | PTFE or PFA         |            |
| Gaskets                    | rubber              |            |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# Series Quick-Fit – connector portfolio

For cable size 1/2" \_HF; 1/2" \_HF\_FR and 1/2" \_HF\_FR\_UL

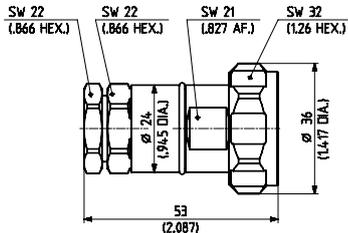


Fig. 1

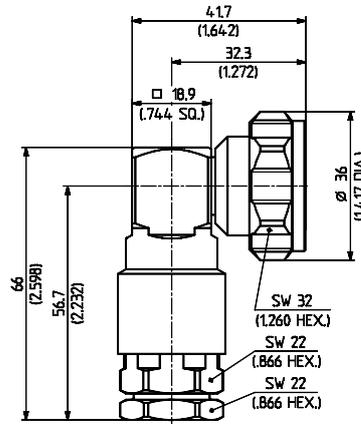


Fig. 2

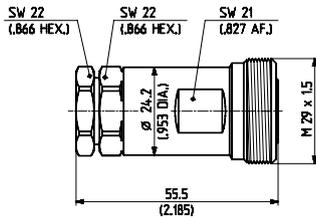


Fig. 3

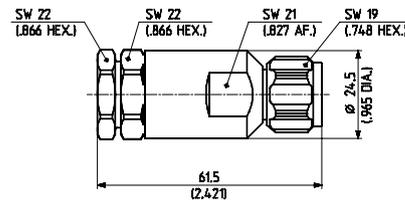


Fig. 4

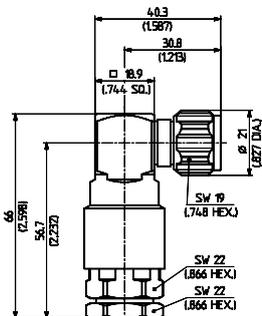


Fig. 5

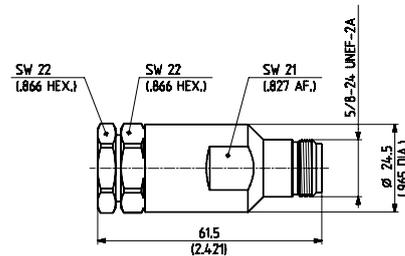


Fig. 6

| Type no.      | Connector style           | Item no. | Assembly instruction | Fig. |
|---------------|---------------------------|----------|----------------------|------|
| 11_716-50-9-9 | DIN 7/16 male             | 22660309 | DOC-0000179418       | 1    |
| 16_716-50-9-5 | DIN 7/16 male right angle | 23007298 |                      | 2    |
| 21_716-50-9-9 | DIN 7/16 female           | 22660310 |                      | 3    |
| 11_N-50-9-9   | N male                    | 22660311 |                      | 4    |
| 16_N-50-9-6   | N male right angle        | 23007299 |                      | 5    |
| 21_N-50-9-9   | N female                  | 22660312 |                      | 6    |

Cable compatibility list on request

# Series Quick-Fit – preparing tools

For cable size 1/2" \_HF; 1/2" \_HF\_FR and 1/2" \_HF\_FR\_UL



Fig. 1



Fig. 2

| Tools                             | Type description | Item number | Fig. |
|-----------------------------------|------------------|-------------|------|
| Stripping tool                    | 74_Z-0-9-15      | 23001006    | 1    |
| Stripping tool, guillotine        | 74_Z-0-9-100     | 85073086    | 2    |
| Blade jacket for 74_Z-0-9-15      | 74_Z-0-0-346     | 23000936    |      |
| Triangle knife for 74_Z-0-9-15    | 74_Z-0-0-348     | 23000938    |      |
| Blade copper tube for 74_Z-0-9-15 | 74_Z-0-0-349     | 23001008    |      |

# Series Quick-Fit – connector portfolio

For cable size 1/2"; 1/2"\_FR and 1/2"\_FR\_UL

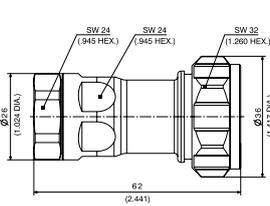


Fig. 1

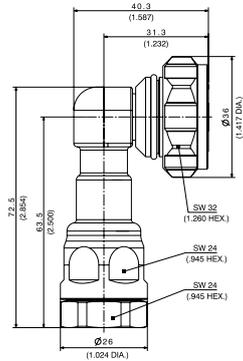


Fig. 2

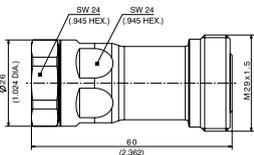


Fig. 3

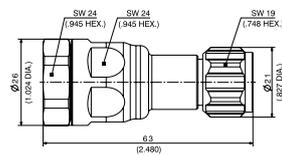


Fig. 4

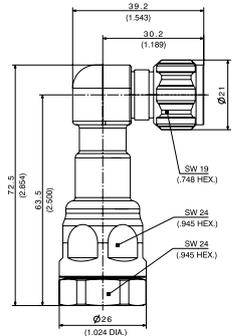


Fig. 5

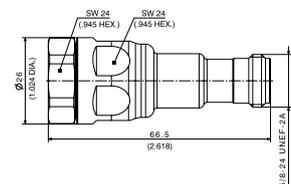


Fig. 6

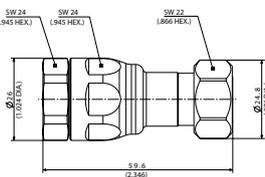


Fig. 7

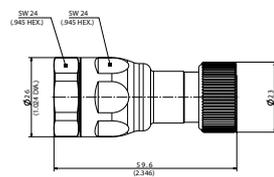


Fig. 8

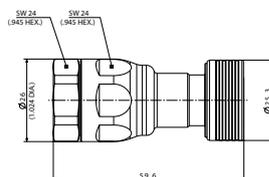


Fig. 9

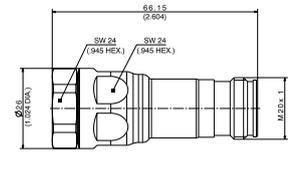


Fig. 10

| Type no.                | Connector style           | Item no. | Assembly instruction | Fig. |
|-------------------------|---------------------------|----------|----------------------|------|
| 11_716-50-12-50/033_-E  | DIN 7/16 male             | 84201175 | DOC-0000386367       | 1    |
| 16_716-50-12-50/033_-E  | DIN 7/16 male right angle | 84201179 |                      | 2    |
| 21_716-50-12-50/033_-E  | DIN 7/16 female           | 84201177 |                      | 3    |
| 11_N-50-12-50/033_-E    | N male                    | 84201169 |                      | 4    |
| 16_N-50-12-50/033_-E    | N male right angle        | 84201181 |                      | 5    |
| 21_N-50-12-50/033_-E    | N female                  | 84201173 |                      | 6    |
| 11_4310-50-12-X2/003_-E | 4.3-10 male, screw        | 85020537 |                      | 7    |
| 11_4310-50-12-Y2/003_-E | 4.3-10 male, hand screw   | 85021551 |                      | 8    |
| 11_4310-50-12-Z2/003_-E | 4.3-10 male, quick-lock   | 85021552 |                      | 9    |
| 21_4310-50-12-1/033_-E  | 4.3-10 female             | 85029736 |                      | 10   |

Cable compatibility list on request.

# Series Quick-Fit – preparing tools

For cable size 1/2", 1/2"\_FR and 1/2"\_FR\_UL



Fig. 1



Fig. 2

| Tools                              | Type description | Item number | Fig. |
|------------------------------------|------------------|-------------|------|
| Stripping tool                     | 74_Z-0-12-25     | 85091563    | 1    |
| Flaring tool                       | 74_Z-0-12-8      | 85006446    | 2    |
| Blade jacket for 74_Z-0-12-25      | 74_Z-0-0-346     | 23000936    |      |
| Triangle knife for 74_Z-0-12-25    | 74_Z-0-0-348     | 23000938    |      |
| Blade copper tube for 74_Z-0-12-25 | 74_Z-0-0-655     | 85093583    |      |

# Series Quick-Fit – connector portfolio

For cable size 7/8"; 7/8"\_FR; 7/8"\_LA; 7/8"\_LA\_FR and 7/8"\_HF

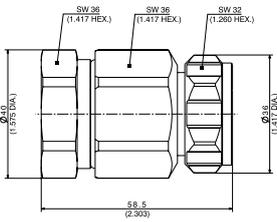


Fig. 1

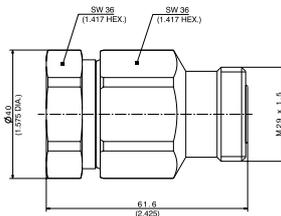


Fig. 2

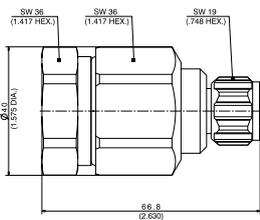


Fig. 3

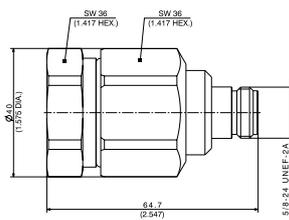


Fig. 4

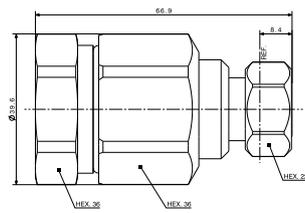


Fig. 5

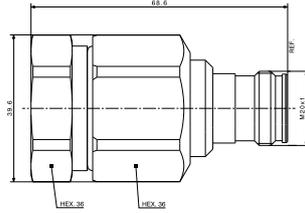


Fig. 6

| Type no.                | Connector style | Item no. | Assembly instruction | Fig. |
|-------------------------|-----------------|----------|----------------------|------|
| 11_716-50-23-44         | DIN 7/16 male   | 84069135 | DOC-0000295365       | 1    |
| 21_716-50-23-44         | DIN 7/16 female | 84069194 |                      | 2    |
| 11_N-50-23-43           | N male          | 84124063 |                      | 3    |
| 21_N-50-23-43           | N female        | 84124062 |                      | 4    |
| 11_4310-50-23-X1/033_-E | 4,3-10 male     | 85076926 |                      | 5    |
| 21_4310-50-23-1/003_-E  | 4,3-10 female   | 85076927 |                      | 6    |

Cable compatibility list on request

# Series Quick-Fit – preparing tools

For cable size 7/8"; 7/8" \_FR; 7/8" \_LA; 7/8" \_LA\_FR and 7/8" \_HF



Fig. 1



Fig. 2



Fig. 3

| Tools   | Type description | Item number | Fig. |
|---|------------------|-------------|------|
| Stripping tool (STD, FR, HF)  | 74_Z-0-23-21     | 85002265    | 1    |
| Stripping tool (LA, LA_FR)  | 74_Z-0-23-22     | 84147229    | 2    |
| Stripping tool, guillotine, all cable types                         | 74_Z-0-23-100    | 84133924    | 3    |
| Blade copper tube, dielectric, centre conductor for 74_Z-0-23-21/22 | 74_Z-0-0-297     | 22650531    |      |
| Blade jacket for 74_Z-0-23-21/22                                    | 74_Z-0-0-355     | 23008264    |      |
| Counter sink  | 74_Z-0-0-415     | 22652206    |      |

# Series Quick-Fit – connector portfolio

For cable size 1\_1/4" and 1\_1/4"\_FR

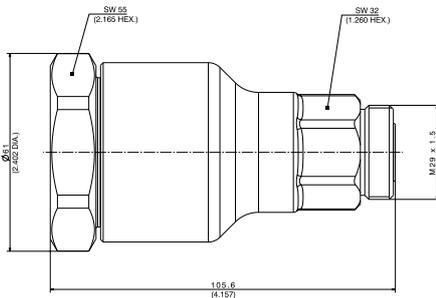


Fig. 1

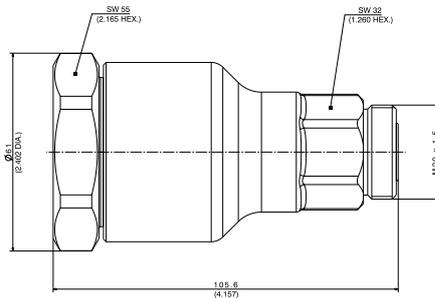


Fig. 2



| Type no.       | Connector style | Item no. | Assembly instruction | Fig. |
|----------------|-----------------|----------|----------------------|------|
| 11_716-50-32-4 | DIN 7/16 male   | 84116088 | DOC-0000341341       | 1    |
| 21_716-50-32-4 | DIN 7/16 female | 84116150 |                      | 2    |

Cable compatibility list on request

For cable size 1\_5/8" and 1\_5/8"\_LA

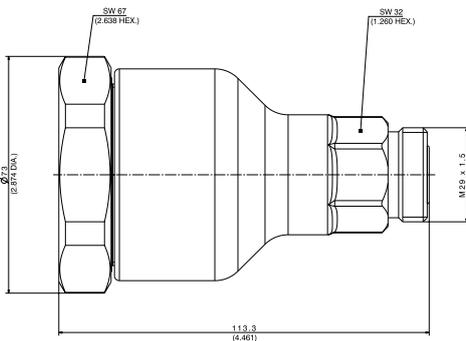


Fig. 1

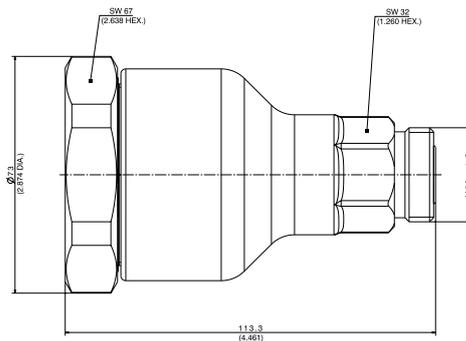


Fig. 2



| Type no.       | Connector style | Item no. | Assembly instruction | Fig. |
|----------------|-----------------|----------|----------------------|------|
| 11_716-50-42-4 | DIN 7/16 male   | 84079343 | DOC-0000299051       | 1    |
| 21_716-50-42-4 | DIN 7/16 female | 84079305 |                      | 2    |

Cable compatibility list on request

# Series Quick-Fit – preparing tools

For cable size 1 ¼" and 1 ¼"\_FR



Fig. 1



Fig. 2

| Tools                         | Type description | Item number | Fig. |
|-------------------------------|------------------|-------------|------|
| Stripping tool (jacket only!) | 74_Z-0-32-14     | 23010533    | 1    |
| Flaring tool                  | 74_Z-0-32-15     | 84120843    | 2    |
| Blade jacket for 74_Z-0-32-14 | 74_Z-0-0-355     | 23008264    |      |

For cable size 1 5/8" and 1 5/8"\_LA



Fig. 1



Fig. 2

| Tools                         | Type description | Item number | Fig. |
|-------------------------------|------------------|-------------|------|
| Stripping tool (jacket only!) | 74_Z-0-42-14     | 23010534    | 1    |
| Flaring tool                  | 74_Z-0-42-15     | 84085074    | 2    |
| Blade jacket for 74_Z-0-42-14 | 74_Z-0-0-356     | 23010537    |      |

# Reverse polarity connectors

## Description

According UL FCC (part 15.203) regulations, wireless radio equipment with removable antenna must not have a standardised interface. This to avoid the connection of antenna equipment which is not WLAN approved.

An established solution are the so called reverse polarity connectors. That means, the male connector is fitted with female centre contact and insulator, whereas the female side is fitted with male centre contact and insulator. For identification of reverse connectors the letter R (for reverse) is used in the type description. Example: 11\_TNC-R50-3-42.

## Content

|  |     |
|--|-----|
| Description                            | 469 |
| Reverse polarity connectors TNC        | 470 |
| Reverse polarity connectors SMA        | 472 |
| Reverse polarity connectors – adaptors | 475 |



# Reverse polarity connectors TNC

## Straight cable plugs (reverse)

### For flexible cables

- Cable attachment: HUBER+SUHNER full crimp

3 security holes  $\varnothing 1/.039$  DIA.

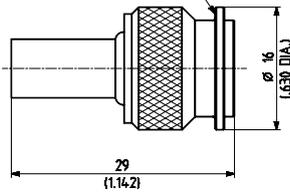


Fig. 1

3 SECURITY HOLES .039 DIA.

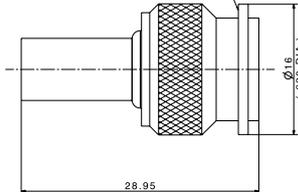


Fig. 2

3 SECURITY HOLES .039 DIA.

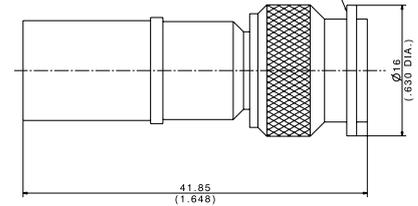


Fig. 3

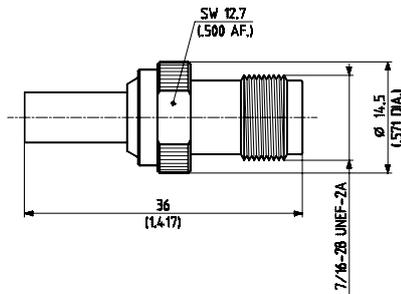


| HUBER+SUHNER type      | Item no. | Cable group (example)                | Packaging | Assembly instruction | Crimp insert | Fig. |
|------------------------|----------|--------------------------------------|-----------|----------------------|--------------|------|
| 11_TNC-R50-3-42/133_NE | 22658965 | U7 (RG_58_C/U, ENVIROFLEX_B58)       | single    | 3015                 | 2 B          | 1    |
| 11_TNC-R50-3-43/133_NE | 22659046 | U9, U39 (RG_223_/U, ENVIROFLEX_B223) |           | 3015                 | 2 B          | 1    |
| 11_TNC-R50-4-76/133_NE | 84031534 | X28 (SPUMA_240)                      |           | 0000246324           | 2 C          | 2    |
| 11_TNC-R50-7-13/133_NE | 84031806 | U30 (SPUMA_400)                      |           | 27288                | 4 D          | 3    |

## Straight cable jacks (reverse)

### For flexible cables

- Cable attachment: HUBER+SUHNER full crimp



| HUBER+SUHNER type      | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert |
|------------------------|----------|--------------------------------|-----------|----------------------|--------------|
| 21_TNC-R50-3-14/133_NE | 23003716 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 27221                | 2 B          |

# Reverse polarity connectors TNC

## Straight bulkhead cable jacks (reverse)

### For flexible cables

- Cable attachment: HUBER+SUHNER full crimp
- With panel seal
- Mounting hole ML 4

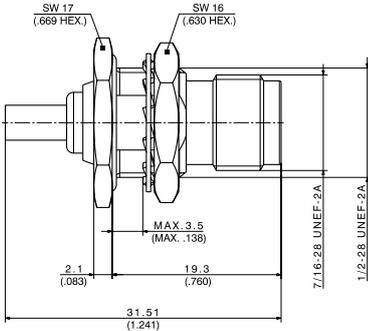


Fig. 1

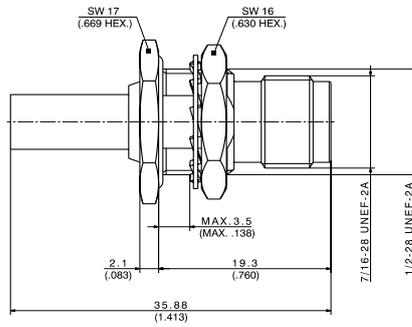


Fig. 2

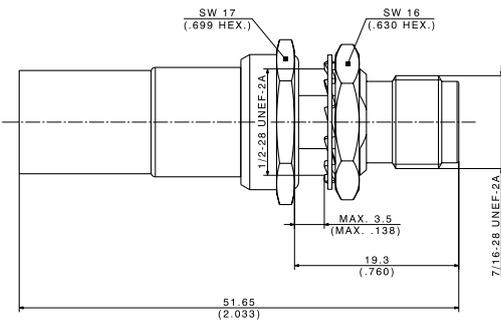


Fig. 3

| HUBER+SUHNER type      | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert | Fig. |
|------------------------|----------|--------------------------------|-----------|----------------------|--------------|------|
| 24_TNC-R50-2-44/133_NE | 84064623 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 0000179123           | 1 A          | 1    |
| 24_TNC-R50-4-60/133_NE | 84032154 | X28 (SPUMA_240)                |           | 0000246324           | 2 C          | 2    |
| 24_TNC-R50-7-4/133_NE  | 84032531 | U30 (SPUMA_400)                |           | 27288                | 4 D          | 3    |

# Reverse polarity connectors SMA

## Straight cable plugs (reverse)

### For flexible cables

- Cable attachment: centre contact soldered/outer contact crimp

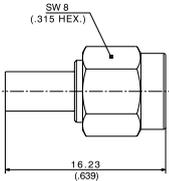


Fig. 1

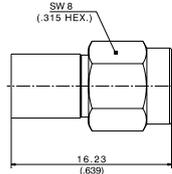


Fig. 2

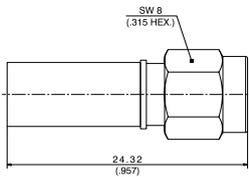


Fig. 3

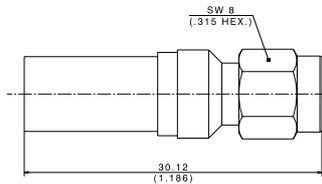


Fig. 4

| HUBER+SUHNER type                     | Item no. | Cable group (example)  | Packaging     | Assembly instruction | Crimp insert | Fig. |
|---------------------------------------|----------|--|---------------|----------------------|--------------|------|
| 11_SMA-R50-2-113/133_NE <sup>1)</sup> | 84130701 | U4 (K_02252_D, ENVIROFLEX_316_D)   | single        | 0000360393           | A            | 1    |
| 11_SMA-R50-3-238/133_NE <sup>1)</sup> | 84130704 | U9, U11, U41 (RG_223_/U, ENVIROFLEX_B223)                                      | single        | 0000360525           | B            | 2    |
| 11_SMA-R50-3-48/133_NE <sup>1)</sup>  | 22658747 | U7 (RG_58_C/U, ENVIROFLEX_B58)   | single        | M27192               | B            | 3    |
| 11_SMA-R50-4-97/133_NH <sup>1)</sup>  | 84027004 | S16, X9, X28, X34 (SX_04172_B-60, SPUMA_240, SPUMA_240-FR-01, SPUMA_240-RS-FR) | bulk 100 pcs. | 0000241878           | C            | 4    |

<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

# Reverse polarity connectors SMA

## Right angle cable plugs (reverse)

### For flexible cables

- Cable attachment: centre contact soldered/outer contact crimp

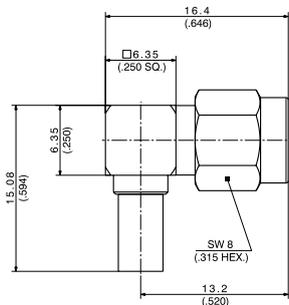


Fig. 1

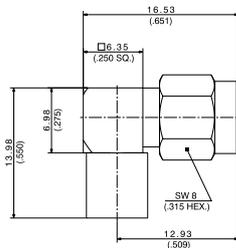


Fig. 2



| HUBER+SUHNER type                     | Item no. | Cable group (example)    | Packaging     | Assembly instruction | Crimp insert | Fig. |
|---------------------------------------|----------|--------------------------|---------------|----------------------|--------------|------|
| 16_SMA-R50-2-149/133_NH <sup>1)</sup> | 23039493 | U2 (RG_316_/U)           | bulk 100 pcs. | 27543                | A            | 1    |
| 16_SMA-R50-3-16/133_NE <sup>1)</sup>  | 84130713 | U9, U11, U41 (RG_223_/U) | single        | 0000368978           | B            | 2    |

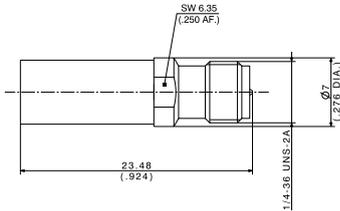
<sup>1)</sup> Use torque wrench 74\_Z-0-0-79

# Reverse polarity connectors SMA

## Straight cable jacks (reverse)

### For flexible cables

- Cable attachment: centre contact soldered/outer contact crimp

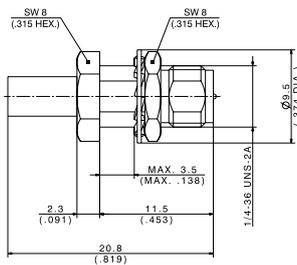


| HUBER+SUHNER type      | Item no. | Cable group (example)          | Packaging | Assembly instruction | Crimp insert |
|------------------------|----------|--------------------------------|-----------|----------------------|--------------|
| 21_SMA-R50-3-51/133_NE | 84032514 | U7 (RG_58_C/U, ENVIROFLEX_B58) | single    | 0000246751           | B            |

## Straight bulkhead cable jacks (reverse)

### For flexible cables

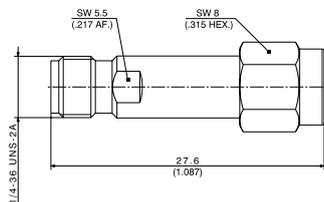
- Cable attachment: centre contact soldered/outer contact crimp
- With panel seal



| HUBER+SUHNER type      | Item no. | Cable group (example)          | Packaging | Assembly instruction | Mounting hole | Crimp insert |
|------------------------|----------|--------------------------------|-----------|----------------------|---------------|--------------|
| 24_SMA-R50-2-51/133_NE | 23011465 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | 0000292354           | ML 35         | A            |

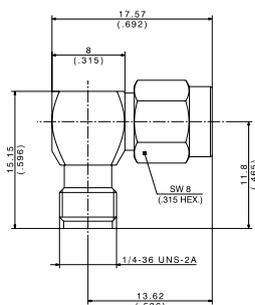
# Reverse polarity connectors – adaptors

- Straight
- Plug (reverse) to jack (standard)

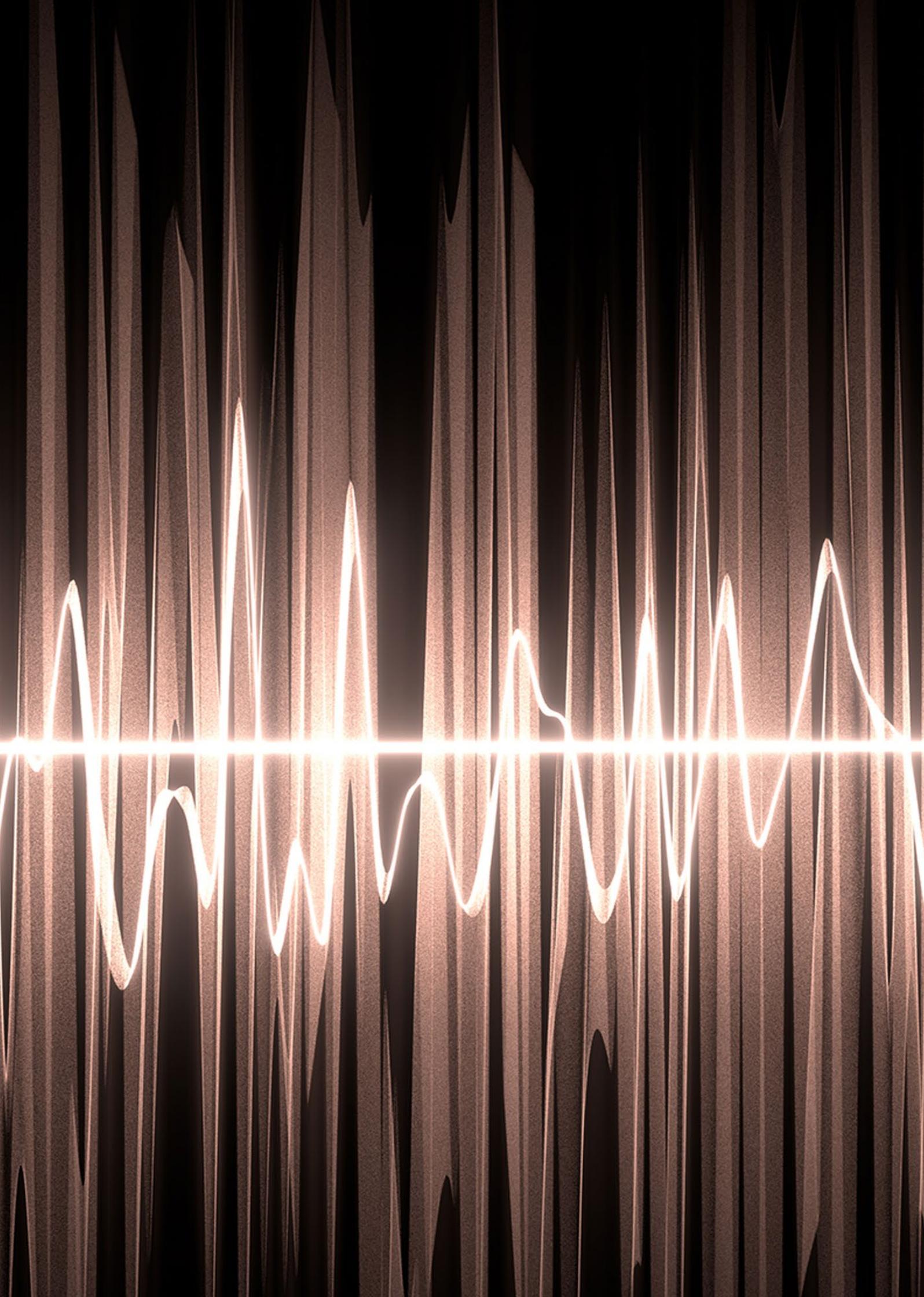


| HUBER+SUHNER type     | Item no. | Packaging | Side 1 (male) | Side 2 (female) |
|-----------------------|----------|-----------|---------------|-----------------|
| 33_SMA-R50-0-5/111_NE | 23003618 | single    | SMA reverse   | SMA standard    |

- Angle
- Plug (reverse) to jack (standard)



| HUBER+SUHNER type     | Item no. | Packaging | Side 1 (male) | Side 2 (female) |
|-----------------------|----------|-----------|---------------|-----------------|
| 53_SMA-R50-0-3/111_NE | 23029833 | single    | SMA reverse   | SMA standard    |



# Precision multicoax lines (MXPM, MXP)

## Description

The HUBER+SUHNER MXPM and MXP connector lines are the perfect fit in a world where performance, speed and density matter.

Both lines are excellent solutions for bench-top testing, system testing as well as for internal cabling in automated test equipment.

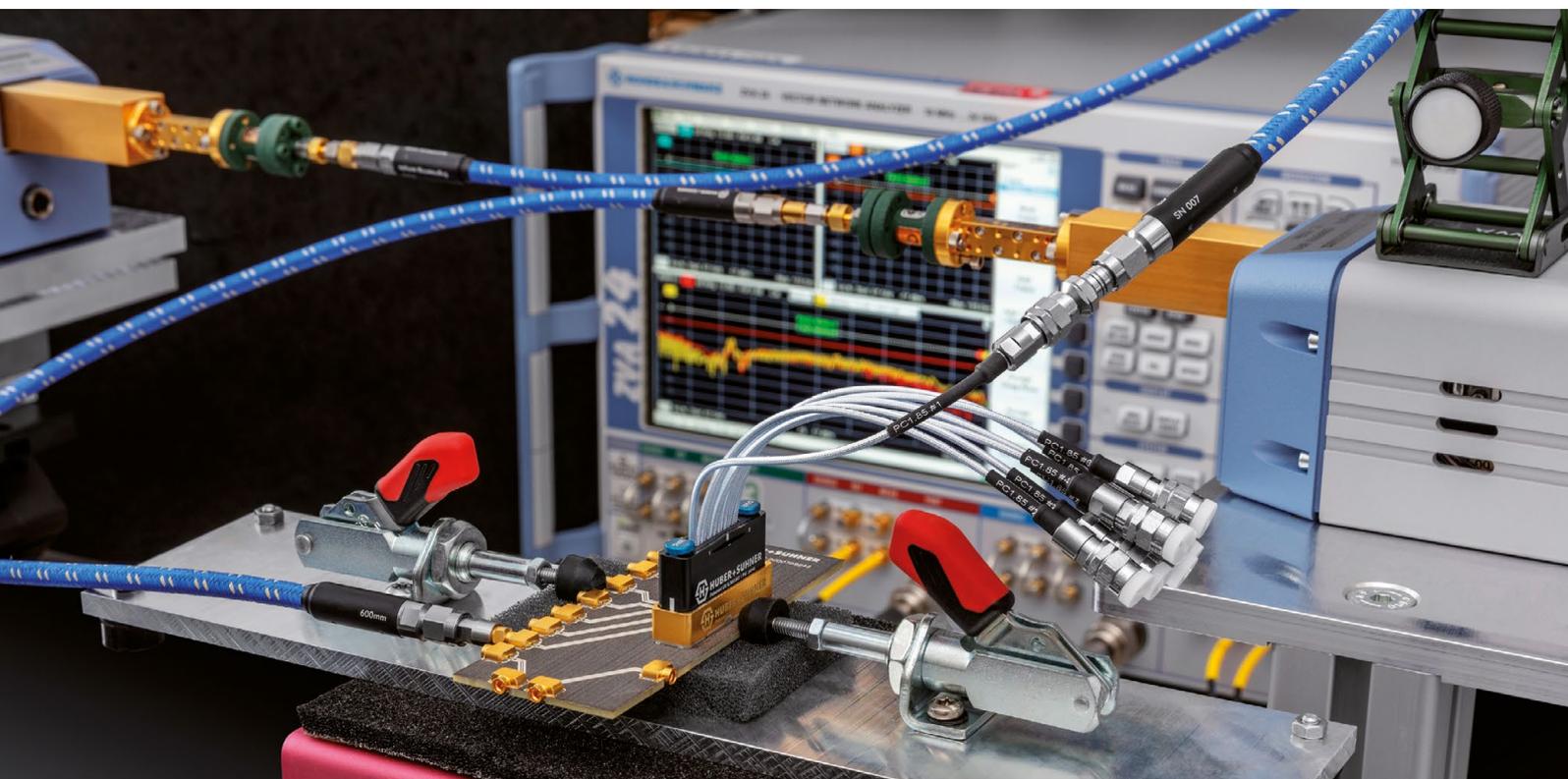
The entire MXPM and MXP assembly assortment comes with the highly flexible and ultra-stable Multiflex cable as a standard.

- MXPM90 and MXPM70 are pioneering multicoax solutions that support up to 90 GHz, respectively up to 70 GHz. By offering a high density pitch (2.54 mm, 0.1 inch), the MXPM line guarantees a satisfying experience with its user-friendly magnet mount connection, making performance and reliability affordable.
- MXP50 – is the perfect multicoax solution for high-level testing up to 50 GHz. MXP50, MXP40 and MXP18 come with a 4 mm (0.157 inch) pitch centre-to-centre and a convenient slide-on mounting. MXP50 is mechanically compatible with MXP18 and MXP40.
- MXP40 – the state-of-the-art multicoax solution for testing up to 40 GHz. MXP40 is mechanically compatible with MXP18 and MXP50.
- MXP18 – best value for money. MXP18 allows accurate testing up to 18 GHz. MXP18 is mechanically compatible with MXP40 and MXP50.

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**Interface dimensions conformable to the standards:**  
HUBER+SUHNER proprietary interface standard



# MXPM90/70 – 90 GHz/70 GHz multicoax solution

## Features

- Operating range at up to 90 GHz
- Broadband characteristic
- 2.54 mm (0.1 in.) pitch centre-to-centre
- Standard phase matching down to +/- 1 ps
- Magnetic locking mechanism
- Automatic interface protection
- Cost-efficient PCB structure
- Highly flexible and ultra-stable Multiflex cable

## Benefits

- **Pioneering design**

The pioneering and advantageous design allows ultra-precise and highly repeatable

- S-parameter measurements of up to 90 GHz with minimal impedance variation at the PCB transition

- **Data analysis of up to 224 Gbps and beyond**

The broadband return loss and insertion loss characteristics over the entire bandwidth and the tight phase matching of the single assemblies guarantee best in class signal integrity for data analysis of up to 224 Gbps and beyond.

- **Shortest traces on board**

The ultra-compact design with its 2.54 mm (0.1 in.) pitch centre-to-centre makes MXPM as closely positioned as possible to the DUT/chip to keep traces short and losses low

- **Fail-safe connecting mechanism**

The integrated magnetic locking mechanism prevents inappropriately mated counterparts and ensures that the electrical connecting reference is defined as exactly as possible at any time

- **Interface protection in disconnected condition**

The automatic interface protection safeguards every single channel from mechanical damage when disconnected.

- **Reduced expenses for PCB architecture**

The cost-efficient PCB structure protects expensive and sensitive PCB material, eliminates imprecise and rough surfaces and greatly reduces architecture expenses, especially since there is no mandatory requirement for hard-gold plating.

## Range of standard products (1×8 and 2×8 ganged systems)

- 1x8 and 2x8 straight PCB supports (semi-SMD)
- 1x8 and 2x8 breakout assemblies MXPM-to-PC 1.0 (90 GHz) or MXPM-to-PC 1.85 (70 GHz)
- 1x8 and 2x8 jumper assemblies MXPM-to-MXPM (90 GHz)
- Customised assemblies on request

# MXPM90 – technical data

| Electrical data (typical)     | Testing condition  | Performance  |
|-------------------------------|--|--|
| Impedance                     |  | 50 $\Omega$  |
| Interface frequency max.      |  | 90 GHz   |
| Return loss                   | gated measurement: cable connector/<br>PCB transition<br>PCB: Neltec NY9217ST/NX9240BP<br>cable: Multiflex 53-02 | $\geq 20$ dB up to 50 GHz<br>$\geq 15$ dB up to 90 GHz |
| Insertion loss                |  | according Multiflex 53-02                              |
| Phase match single assemblies |  | +/- 1 ps   |

| Mechanical data (typical) | Testing condition | Performance       |
|---------------------------|-------------------|-------------------|
| Number of matings         |                   | $\geq 500$        |
| Pitch centre-to-centre    |                   | 2.54 mm (0.1 in.) |

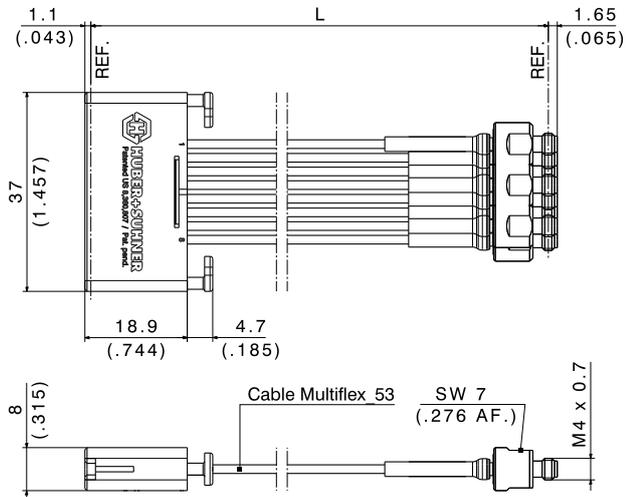
| Environmental data (typical) | Testing condition | Performance                      |
|------------------------------|-------------------|----------------------------------|
| Temperature range            |                   | 0 °C ... +85 °C/32 °F ... 185 °F |
| 2011/65/EU (RoHS)            |                   | compliant                        |
| 2006/1907/EC (REACH)         |                   | compliant                        |

| Material data cable connector | Material               | Surface plating      |
|-------------------------------|------------------------|----------------------|
| Centre contact                | copper beryllium alloy | SUCOPRO gold plating |
| Outer contact                 | copper beryllium alloy | SUCOPRO gold plating |
| Body                          | aluminium              | black/blue anodised  |
| Isolator                      | PEEK                   | n/a                  |
| Other parts                   | neodym (magnets)       | n/a                  |

| Material data PCB socket | Material        | Surface plating      |
|--------------------------|-----------------|----------------------|
| Body                     | brass           | SUCOPRO gold plating |
| Outer contact            | brass           | SUCOPRO gold plating |
| Other parts              | stainless steel | n/a                  |

# MXPM90 – breakouts to PC 1.0

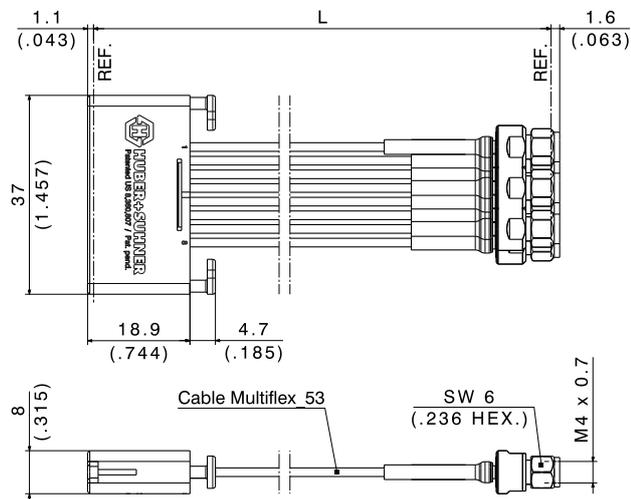
- 1x8 ganged versions
- Breakouts to female PC 1.0



## Ordering information

| Type 1x8 ganged            | Item number | Length         | Notes                    |
|----------------------------|-------------|----------------|--------------------------|
| MF53/1x8A_11MXPM/21PC1/102 | 85147064    | 102 mm (4 in.) | Single channels numbered |
| MF53/1x8A_11MXPM/21PC1/152 | 85147065    | 152 mm (6 in.) |                          |

- 1x8 ganged versions
- Breakouts to male PC 1.0

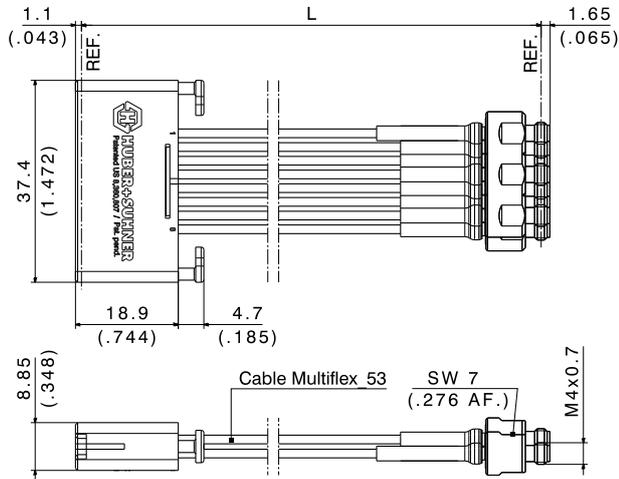


## Ordering information

| Type 1x8 ganged            | Item number | Length         | Notes                    |
|----------------------------|-------------|----------------|--------------------------|
| MF53/1x8A_11MXPM/21PC1/102 | 85147056    | 102 mm (4 in.) | Single channels numbered |
| MF53/1x8A_11MXPM/21PC1/152 | 85147062    | 152 mm (6 in.) |                          |

# MXPM90 – breakouts to PC 1.0

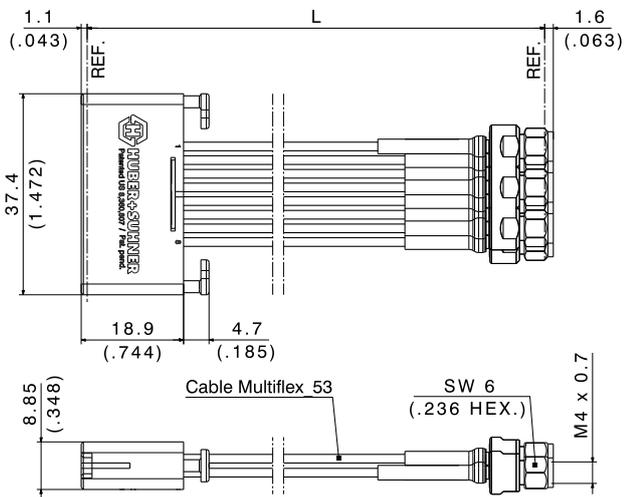
- 2x8 ganged versions
- Breakouts to female PC 1.0



## Ordering information

| Type 2x8 ganged            | Item number | Length         | Notes                    |
|----------------------------|-------------|----------------|--------------------------|
| MF53/2x8A_11MXPM/21PC1/102 | 85147071    | 102 mm (4 in.) | Single channels numbered |
| MF53/2x8A_11MXPM/21PC1/152 | 85147072    | 152 mm (6 in.) |                          |

- 2x8 ganged versions
- Breakouts to male PC 1.0

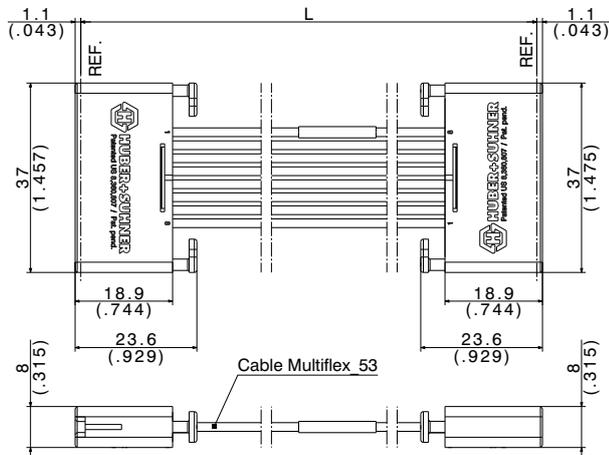


## Ordering information

| Type 2x8 ganged            | Item number | Length         | Notes                    |
|----------------------------|-------------|----------------|--------------------------|
| MF53/2x8A_11MXPM/11PC1/102 | 85147067    | 102 mm (4 in.) | Single channels numbered |
| MF53/2x8A_11MXPM/11PC1/152 | 85147069    | 152 mm (6 in.) |                          |

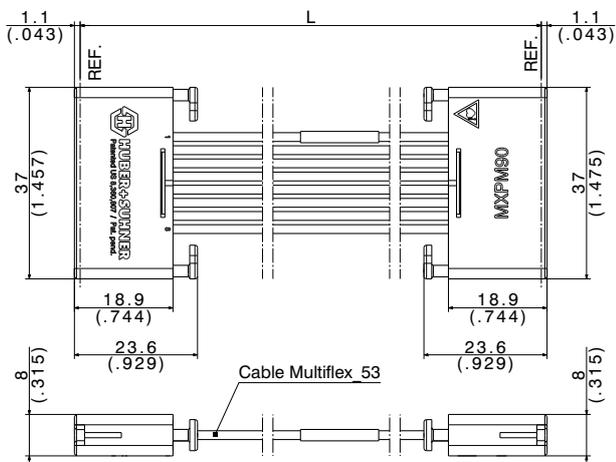
# MXPM90 – Jumpers

- 1x8 ganged versions
- Pin map: 1-to-8 or 1-to-1



## Ordering information

| Type 1x8 ganged             | Item number | Length          | Characteristics |
|-----------------------------|-------------|-----------------|-----------------|
| MF53/1x8A_11MXPM/11MXPM/152 | 85101230    | 152 mm (6 in.)  | Pin map: 1-to-8 |
| MF53/1x8A_11MXPM/11MXPM/305 | 85107418    | 305 mm (12 in.) |                 |

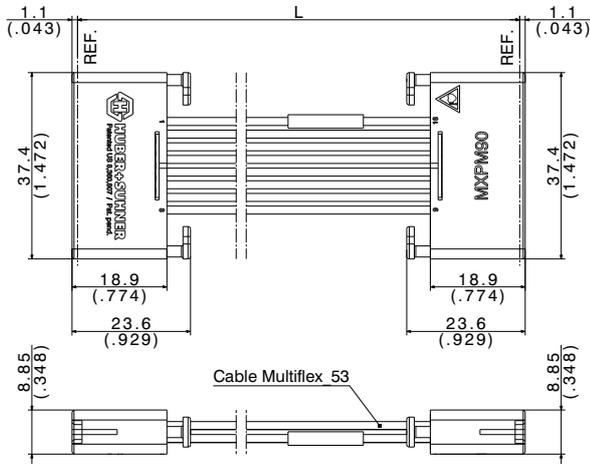


## Ordering information

| Type 1x8 ganged               | Item number | Length          | Characteristics |
|-------------------------------|-------------|-----------------|-----------------|
| MF53/1x8A_11MXPM/11MXPM/152_1 | 85107423    | 152 mm (6 in.)  | Pin map: 1-to-1 |
| MF53/1x8A_11MXPM/11MXPM/305_1 | 85107424    | 305 mm (12 in.) |                 |

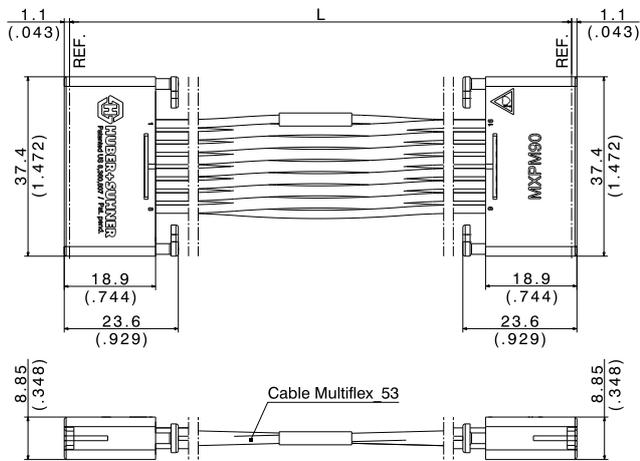
# MXPM90 – Jumpers

- 2x8 ganged versions
- Pin map: 1-to-16 or 1-to-1



## Ordering information

| Type 2x8 ganged             | Item number | Length          | Characteristics  |
|-----------------------------|-------------|-----------------|------------------|
| MF53/2x8A_11MXPM/11MXPM/152 | 85107419    | 152 mm (6 in.)  | Pin map: 1-to-16 |
| MF53/2x8A_11MXPM/11MXPM/305 | 85107420    | 305 mm (12 in.) |                  |



## Ordering information

| Type 2x8 ganged               | Item number | Length          | Characteristics |
|-------------------------------|-------------|-----------------|-----------------|
| MF53/2x8A_11MXPM/11MXPM/152_1 | 85107421    | 152 mm (6 in.)  | Pin map: 1-to-1 |
| MF53/2x8A_11MXPM/11MXPM/305_1 | 85107422    | 305 mm (12 in.) |                 |

# MXPM70 – technical data

| Electrical data (typical)     | Testing condition   | Performance                                  |
|-------------------------------|---|--|
| Impedance                     |   | 50 Ω   |
| Interface frequency max.      |   | 70 GHz                                       |
| Return loss                   | Gated measurement: cable connector/<br>PCB transition<br>PCB: Rogers RO3003<br>Cable: Multiflex 53-02 | ≥ 20 dB up to 50 GHz<br>≥ 17 dB up to 70 GHz |
| Insertion loss                |   | according Multiflex 53-02                    |
| Phase match single assemblies |   | +/- 1 ps                                     |

| Mechanical data (typical) | Testing condition | Performance       |
|---------------------------|-------------------|-------------------|
| Number of matings         |                   | ≥ 500             |
| Pitch centre-to-centre    |                   | 2.54 mm (0.1 in.) |

| Environmental data (typical) | Testing condition | Performance                      |
|------------------------------|-------------------|----------------------------------|
| Temperature range            |                   | 0 °C ... +85 °C/32 °F ... 185 °F |
| 2011/65/EU (RoHS)            |                   | compliant                        |
| 2006/1907/EC (REACH)         |                   | compliant                        |

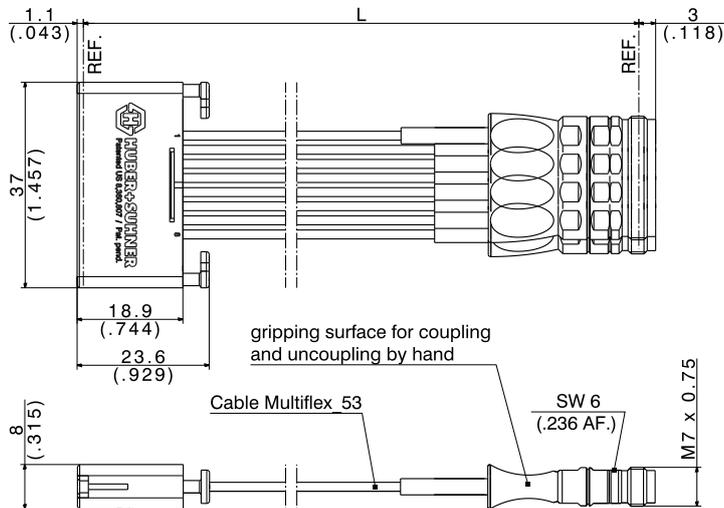
| Material data cable connector | Material               | Surface plating      |
|-------------------------------|------------------------|----------------------|
| Centre contact                | copper beryllium alloy | SUCOPRO gold plating |
| Outer contact                 | copper beryllium alloy | SUCOPRO gold plating |
| Body                          | aluminium              | black/blue anodised  |
| Isolator                      | PEEK                   | n/a                  |
| Other parts                   | neodym (magnets)       | n/a                  |

| Material data PCB socket | Material        | Surface plating      |
|--------------------------|-----------------|----------------------|
| Body                     | brass           | SUCOPRO gold plating |
| Outer contact            | brass           | SUCOPRO gold plating |
| Other parts              | stainless steel | n/a                  |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# MXPM70 – breakouts to PC 1.85

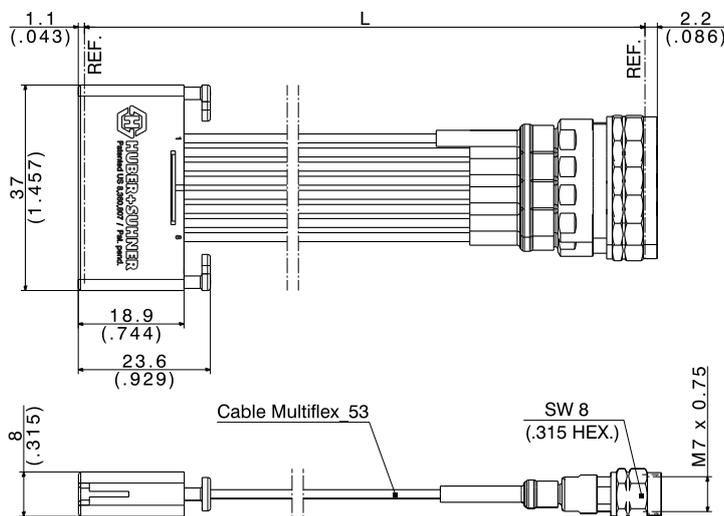
- 1x8 ganged versions
- Breakouts to female PC 1.



## Ordering information

| Type 1x8 ganged                | Item number | Length          | Characteristics                                    |
|--------------------------------|-------------|-----------------|--|
| MF53/1x8A_11MXPM/21PC185_e/152 | 85098172    | 152 mm (6 in.)  | Single channels numbered with ergo grip on PC 1.85 |
| MF53/1x8A_11MXPM/21PC185_e/305 | 85113861    | 305 mm (12 in.) |  |

- 1x8 ganged versions
- Breakouts to male PC 1.85

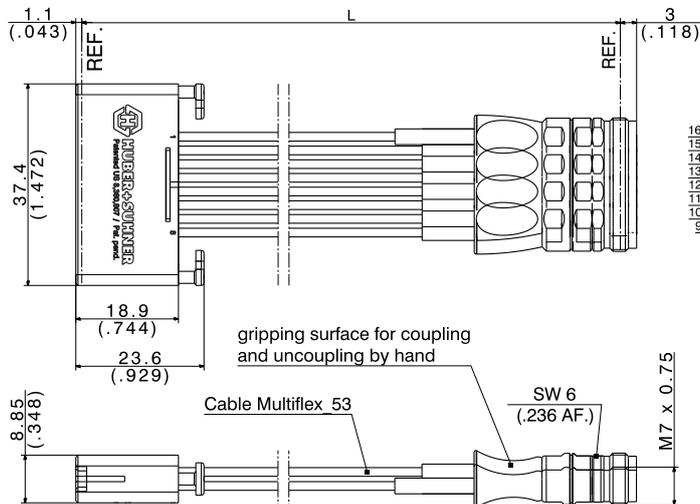


## Ordering information

| Type 1x8 ganged              | Item number | Length          | Characteristics          |
|------------------------------|-------------|-----------------|--------------------------|
| MF53/1x8A_11MXPM/11PC185/152 | 85085482    | 152 mm (6 in.)  | Single channels numbered |
| MF53/1x8A_11MXPM/11PC185/305 | 85120286    | 305 mm (12 in.) |                          |

# MXPM70 – breakouts to PC 1.85

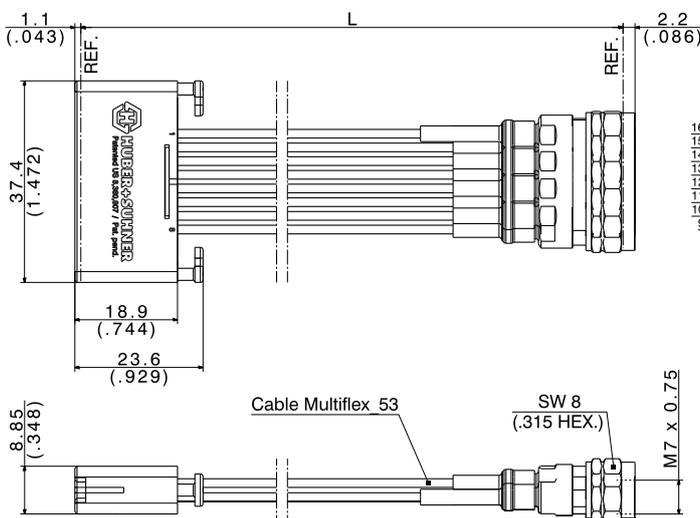
- 2x8 ganged versions
- Breakouts to female PC 1.85



## Ordering information

| Type 2x8 ganged                | Item number | Length          | Notes  |
|--------------------------------|-------------|-----------------|--|
| MF53/2x8A_11MXPM/21PC185_e/152 | 85096261    | 152 mm (6 in.)  | Single channels numbered with ergo grip on PC 1.85 |
| MF53/2x8A_11MXPM/21PC185_e/305 | 85111452    | 305 mm (12 in.) |  |

- 2x8 ganged versions
- Breakouts to male PC 1.85

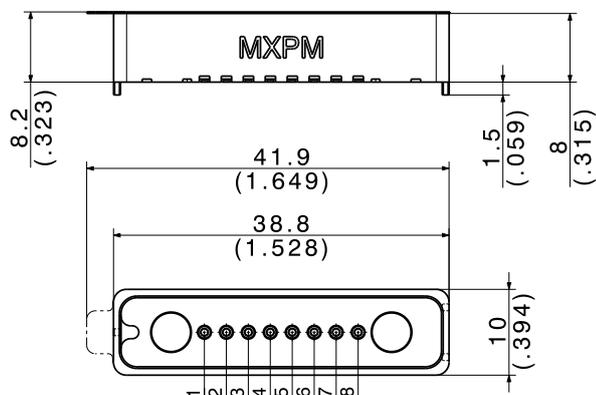


## Ordering information

| Type 2x8 ganged              | Item number | Length          | Notes                    |
|------------------------------|-------------|-----------------|--------------------------|
| MF53/2x8A_11MXPM/11PC185/152 | 85091160    | 152 mm (6 in.)  | Single channels numbered |
| MF53/2x8A_11MXPM/11PC185/305 | 85102802    | 305 mm (12 in.) |                          |

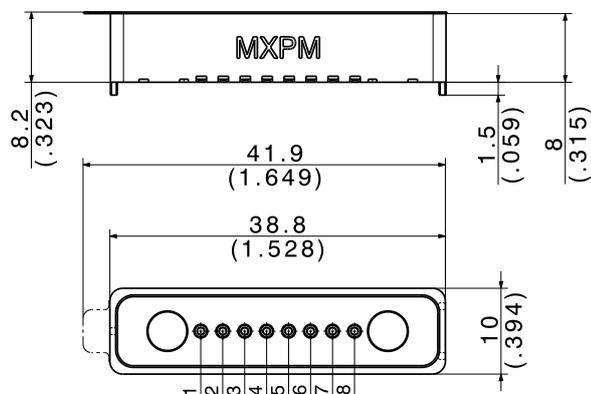
# MXPM – PCB sockets

- 1x8 ganged versions
- Compatible with MXPM70 and MXPM90 assemblies
- Via-in-pad capable
- Semi-SMD technology – guide pins for better mechanical stability of solder joint



## Ordering information

| Type 2x8 ganged             | Item number | Packaging       | Characteristics           |
|-----------------------------|-------------|-----------------|---------------------------|
| 1x8A_82_MXPM-S50-0-1/-11_NE | 85091041    | single          | asymmetric design (keyed) |
| 1x8A_82_MXPM-S50-0-1/-11_NM | 85104380    | tape + reel 100 |                           |

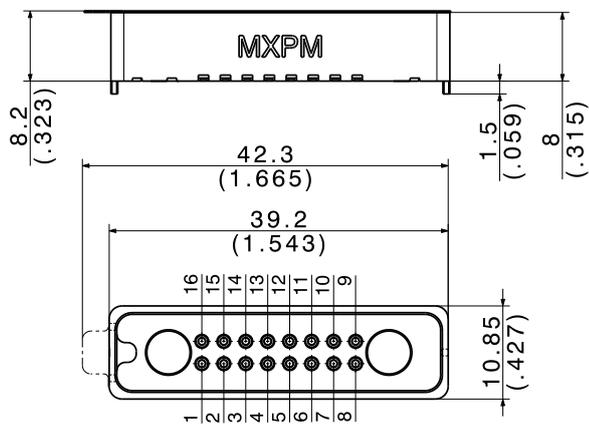


## Ordering information

| Type 2x8 ganged             | Item number | Packaging       | Characteristics           |
|-----------------------------|-------------|-----------------|---------------------------|
| 1x8A_82_MXPM-S50-0-2/-11_NE | 85085226    | single          | asymmetric design (keyed) |
| 1x8A_82_MXPM-S50-0-2/-11_NM | 85104409    | tape + reel 100 |                           |

# MXPM – PCB sockets

- 2x8 ganged versions
- Compatible with MXPM70 and MXPM90 assemblies
- Via-in-pad capable
- Semi-SMD technology – guide pins for better mechanical stability of solder joint



## Ordering information

| Type 2x8 ganged             | Item number | Packaging       | Characteristics           |
|-----------------------------|-------------|-----------------|---------------------------|
| 2x8A_82_MXPM-S50-0-1/-11_NE | 85091060    | single          | asymmetric design (keyed) |
| 2x8A_82_MXPM-S50-0-1/-11_NM | 85104412    | tape + reel 100 |                           |

# MXP50 – 50 GHz multicoax solution

## Features

- Operating range at up to 50 GHz
- Broadband characteristic
- 4 mm (0.157 in.) pitch centre-to-centre
- Standard phase matching down to +/- 2 ps
- Slide-on mounting – no threading
- Highly flexible and ultra-stable Multiflex cable

## Benefits

### • Testing at a high level

The broadband characteristic and the true 50 GHz coaxial-to-PCB transition allows testing of the latest generations of semiconductor standards.

### • Space saving

As a result of the dense interface pitch, the PCB connectors takes up less space on PCBs in comparison to single interfaces. This is advantageous, as expensive high-performance board material is essential for good signal integrity at high frequencies/data rates.

### • Short transmission lines

The compact design of the entire system allows it to be positioned directly adjacent to the DUT/chip. This helps to keep the transmission lines on the board short and the losses low.

### • Reliable push-on mating

Thanks to the robust slide-on interface design, assemblies can be replugged quickly and easily, while guaranteeing stable electrical values even after numerous mating cycles.

## Range of standard products (1×8 and 2×8 ganged systems)

- 1×8 and 2×8 straight PCB supports (semi-SMD)
- 1×8 and 2×8 breakout assemblies MXP-to-PC 2.4
- 1×8 and 2×8 jumper assemblies MXP-to-MXP
- Loop back assembly
- 2×8 MXP-to-MXP board-to-board adapter
- Customised assemblies on request

# MXP50 – technical data

| Electrical data (typical) | Testing condition   | Performance                                    |
|---------------------------|---|--|
| Impedance                 |   | 50 Ω   |
| Interface frequency max.  |   | 50 GHz   |
| Return loss               | gated measurement: cable connector/<br>PCB transition<br>PCB: Rogers RO3003<br>cable: Multiflex 53-02 | ≥ 20 dB up to 22.5 GHz<br>≥ 15 dB up to 50 GHz |
| Insertion loss            |   | according Multiflex 53-02                      |
| Phase match               |   | +/- 2 ps                                       |

| Mechanical data (typical)           | Testing condition               | Requirements               |
|-------------------------------------|---------------------------------|----------------------------|
| Mating force (per single channel)   |                                 | max. 3.4 N (typical 1.1 N) |
| Demating force (per single channel) |                                 | max. 3.4 N (typical 1.1 N) |
| Number of matings                   | MIL-PRF-39012, paragraph 4.7.12 | ≥ 500                      |
| Pitch centre-to-centre              |                                 | 4 mm (0.157 in.)           |

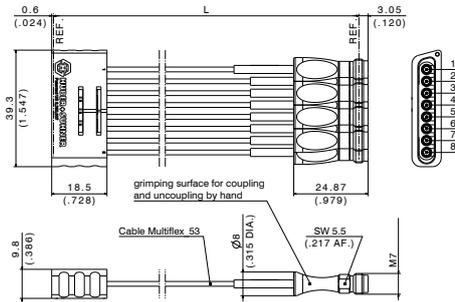
| Environmental data (typical)    | Testing condition                    | Requirements  |
|---------------------------------|--------------------------------------|---|
| Temperature range               |                                      | -55 °C ... 85 °C / -67 °F ... 185 °F  |
| Thermal aging (mated condition) | IEC 60068-2-2, test B                | 120 °C/260 h  |
| Change of temperature           | IEC 60068-2-14, test na              | assembly: -55 °C ... 85 °C / -67 °F ... 185 °F<br>PCB: -55 °C ... 85 °C / -67 °F ... 185 °F |
| Vibration                       | IEC 60068-2-6                        | on request  |
| Mechanical shock (transport)    | MIL-STD-202, method 213, condition I | 100 g/6 ms  |
| Damp heat steady state          | IEC 60068-2-78, test ca              | 40 °C (104 °F)/humidity 93%/96 h  |
| 2011/65/EU (RoHS)               |                                      | compliant   |
| 2006/1907/EC (REACH)            |                                      | compliant   |

| Material data cable connector | Material         | Coating               |
|-------------------------------|------------------|-----------------------|
| Center contact                | copper beryllium | SUCOPRO® gold plating |
| Outer contact                 | brass            | SUCOPRO® gold plating |
| Body                          | aluminium        | gold anodised         |
| Insulator                     | PEEK             | n/a                   |

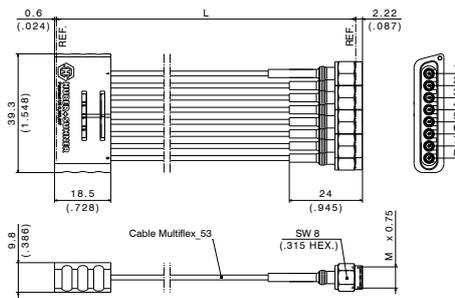
| Material data PCB connector | Material         | Coating               |
|-----------------------------|------------------|-----------------------|
| Center contact              | copper beryllium | SUCOPRO® gold plating |
| Outer contact               | BZ4              | SUCOPRO® gold plating |
| Body                        | brass            | SUCOPRO® gold plating |
| Insulator                   | PEEK             | n/a                   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# MXP50 – breakout to PC 2.4

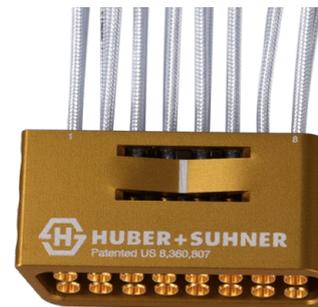
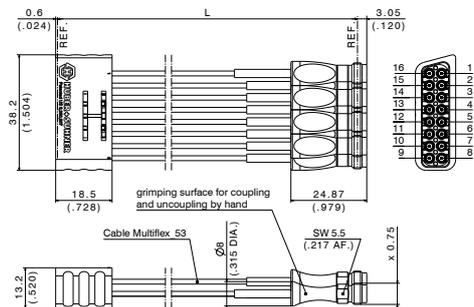


| Type 1×8 ganged                | Item no. | Length       | Notes  |
|--------------------------------|----------|--------------|--|
| MF53/1×8A_21MXP/21PC24_erg/152 | 85024118 | 152 mm (6")  | single channels numbered with ergo grip on PC 2.4 side |
| MF53/1×8A_21MXP/21PC24_erg/229 | 85024116 | 229 mm (9")  |  |
| MF53/1×8A_21MXP/21PC24_erg/305 | 85024113 | 305 mm (12") |  |

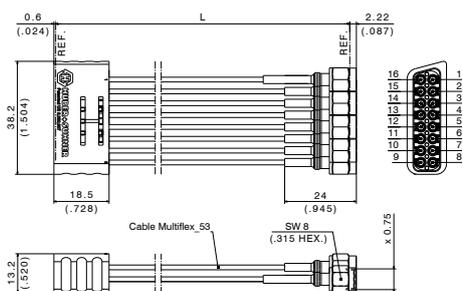


| Type 1×8 ganged            | Item no. | Length       | Notes                    |
|----------------------------|----------|--------------|--------------------------|
| MF53/1×8A_21MXP/11PC24/152 | 85025933 | 152 mm (6")  | single channels numbered |
| MF53/1×8A_21MXP/11PC24/229 | 85025934 | 229 mm (9")  |                          |
| MF53/1×8A_21MXP/11PC24/305 | 85025935 | 305 mm (12") |                          |

# MXP50 – breakout to PC 2.4

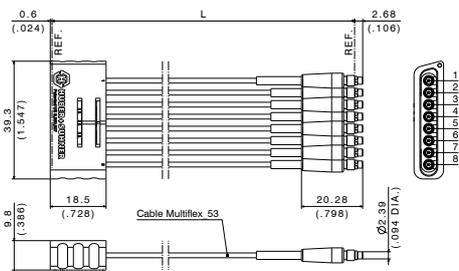


| Type 2×8 ganged                | Item no. | Length       | Notes  |
|--------------------------------|----------|--------------|--|
| MF53/2×8A_21MXP/21PC24_erg/152 | 85023135 | 152 mm (6")  | single channels numbered with ergo grip on PC 2.4 side |
| MF53/2×8A_21MXP/21PC24_erg/229 | 85023167 | 229 mm (9")  |  |
| MF53/2×8A_21MXP/21PC24_erg/305 | 85023168 | 305 mm (12") |  |

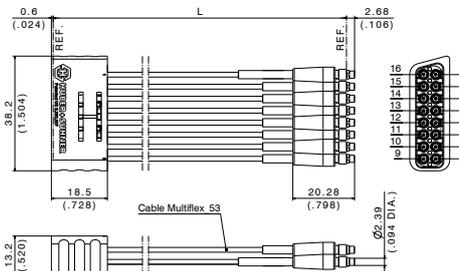


| Type 2×8 ganged            | Item no. | Length       | Notes                    |
|----------------------------|----------|--------------|--------------------------|
| MF53/2×8A_21MXP/11PC24/152 | 85025930 | 152 mm (6")  | single channels numbered |
| MF53/2×8A_21MXP/11PC24/229 | 85025932 | 229 mm (9")  |                          |
| MF53/2×8A_21MXP/11PC24/305 | 85025931 | 305 mm (12") |                          |

# MXP50 – breakout to MMPX

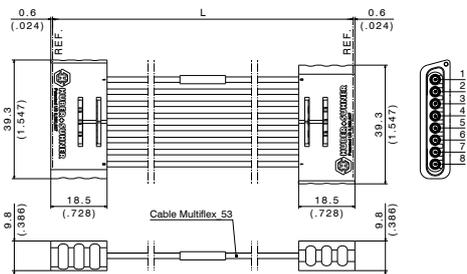


| Type 1x8 ganged            | Item no. | Length       | Notes                    |
|----------------------------|----------|--------------|--------------------------|
| MF53/1x8A_21MXP/11MMPX/152 | 85021537 | 152 mm (6")  | single channels numbered |
| MF53/1x8A_21MXP/11MMPX/229 | 85018173 | 229 mm (9")  |                          |
| MF53/1x8A_21MXP/11MMPX/305 | 85025640 | 305 mm (12") |                          |
| MF53/1x8A_21MXP/11MMPX/610 | 85025641 | 610 mm (24") |                          |

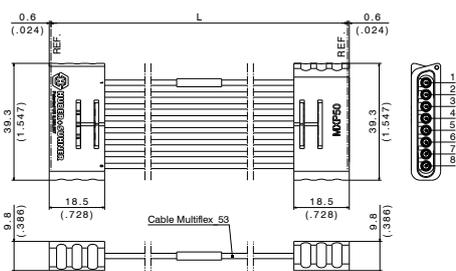


| Type 2x8 ganged            | Item no. | Length       | Notes                    |
|----------------------------|----------|--------------|--------------------------|
| MF53/2x8A_21MXP/11MMPX/152 | 85025642 | 152 mm (6")  | single channels numbered |
| MF53/2x8A_21MXP/11MMPX/229 | 85024572 | 229 mm (9")  |                          |
| MF53/2x8A_21MXP/11MMPX/305 | 85025643 | 305 mm (12") |                          |
| MF53/2x8A_21MXP/11MMPX/610 | 85006750 | 610 mm (24") |                          |

# MXP50 – jumper

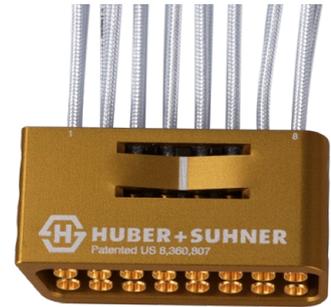
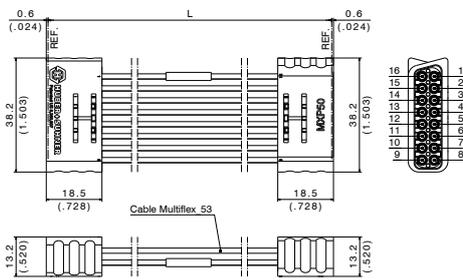


| Type 1×8 ganged           | Item no. | Length       | Notes           |
|---------------------------|----------|--------------|-----------------|
| MF53/1×8A_21MXP/21MXP/152 | 84129711 | 152 mm (6")  | pin map: 1 to 8 |
| MF53/1×8A_21MXP/21MXP/229 | 85009276 | 229 mm (9")  |                 |
| MF53/1×8A_21MXP/21MXP/305 | 84099960 | 305 mm (12") |                 |
| MF53/1×8A_21MXP/21MXP/610 | 84100060 | 610 mm (24") |                 |

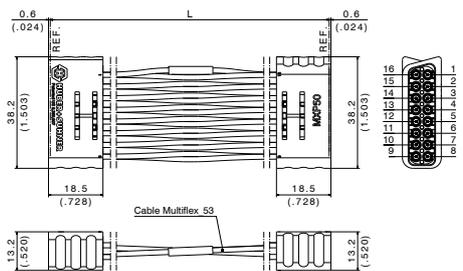


| Type 1×8 ganged             | Item no. | Length       | Notes           |
|-----------------------------|----------|--------------|-----------------|
| MF53/1×8A_21MXP/21MXP/152_1 | 84129722 | 152 mm (6")  | pin map: 1 to 1 |
| MF53/1×8A_21MXP/21MXP/229_1 | 85009284 | 229 mm (9")  |                 |
| MF53/1×8A_21MXP/21MXP/305_1 | 84099634 | 305 mm (12") |                 |
| MF53/1×8A_21MXP/21MXP/610_1 | 84099914 | 610 mm (24") |                 |

# MXP50 – jumper



| Type 2×8 ganged           | Item no. | Length       | Notes            |
|---------------------------|----------|--------------|------------------|
| MF53/2×8A_21MXP/21MXP/152 | 85009288 | 152 mm (6")  | pin map: 1 to 16 |
| MF53/2×8A_21MXP/21MXP/229 | 85009287 | 229 mm (9")  |                  |
| MF53/2×8A_21MXP/21MXP/305 | 84099955 | 305 mm (12") |                  |
| MF53/2×8A_21MXP/21MXP/457 | 84131766 | 457 mm (18") |                  |
| MF53/2×8A_21MXP/21MXP/610 | 84099957 | 610 mm (24") |                  |

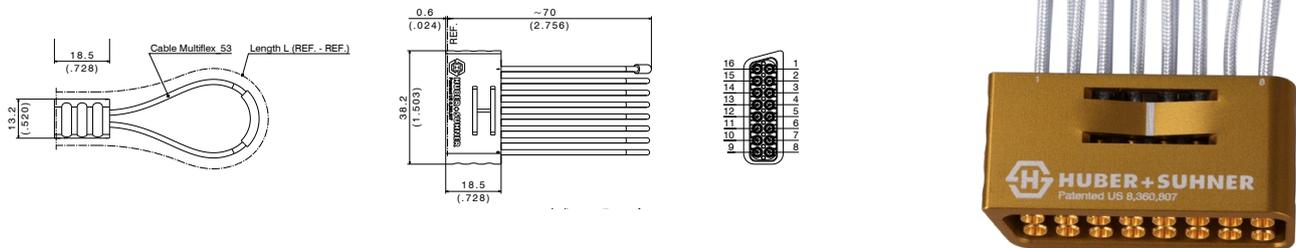


| Type 2×8 ganged             | Item no. | Length       | Notes           |
|-----------------------------|----------|--------------|-----------------|
| MF53/2×8A_21MXP/21MXP/152_1 | 84116942 | 152 mm (6")  | pin map: 1 to 1 |
| MF53/2×8A_21MXP/21MXP/229_1 | 85009289 | 229 mm (9")  |                 |
| MF53/2×8A_21MXP/21MXP/305_1 | 84099487 | 305 mm (12") |                 |
| MF53/2×8A_21MXP/21MXP/457_1 | 84150019 | 457 mm (18") |                 |
| MF53/2×8A_21MXP/21MXP/610_1 | 84099511 | 610 mm (24") |                 |

# MXP50 – loop back

## Typical application

### Channel bridging



| Type 2×8 ganged     | Item no. | Length      | Notes                                       |
|---------------------|----------|-------------|---|
| MF53/2×8A_21MXP/152 | 84095097 | 152 mm (6") | loop back configuration<br>pin map: 1 to 16 |

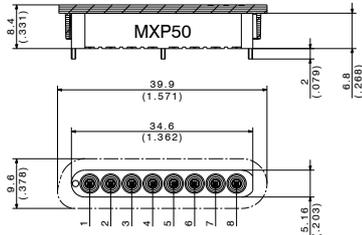
# MXP – board-to-board adapter



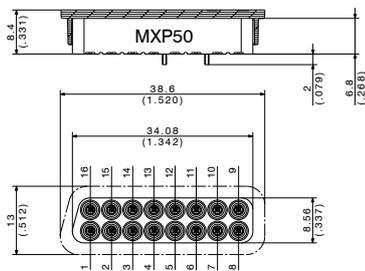
| Type 2×8 ganged    | Item no. | Height | Notes                             |
|--------------------|----------|--------|-----------------------------------|
| 2×8A_31_MXP-50-0-1 | 85022967 | 40 mm  | limited misalignment<br>tolerance |

# MXP50 – PCB connectors

- 1×8 and 2×8 ganged versions
- Via-in-pad capable
- Semi-SMD technology – guide pins for better mechanical stability of solder joint



| Type 1×8 ganged            | Item no. | Packaging | Notes                        |
|----------------------------|----------|-----------|------------------------------|
| 1×8A_81_MXP-S50-0-3/111_NE | 85022694 | tape      | symmetric design (non keyed) |



| Type 2×8 ganged            | Item no. | Packaging | Notes  |
|----------------------------|----------|-----------|--|
| 2×8A_81_MXP-S50-0-4/111_NE | 85023106 | tape      | assymmetric design (keyed)<br>optimised grounding pin layout for differential pair routing |

# MXP40 – 40 GHz multicoax solution

## Features

- Operating range at up to 40 GHz
- Broadband characteristic
- 4 mm (0.157 in.) pitch centre-to-centre
- Standard phase matching down to +/- 2 ps
- Slide-on mounting – no threading
- Highly flexible and ultra-stable Multiflex cable

## Benefits

### • State-of-the-art-testing

The broadband characteristic and the true 40 GHz coaxial-to-PCB transition allows testing of most of the existing semiconductor standards.

### • Space saving

As a result of the dense interface pitch, the PCB connector take up less space on PCBs in comparison to single interfaces. This is advantageous, as expensive high-performance board material is essential for good signal integrity at high frequencies/data rates.

### • Short transmission lines

The compact design of the entire system allows it to be positioned directly adjacent to the DUT/chip. This helps to keep the transmission lines on the board short and the losses low.

### • Reliable push-on mating

Thanks to the robust slide-on interface design, assemblies can be replugged quickly and easily, while guaranteeing stable electrical values even after numerous mating cycles.

## Range of standard products (1×8 and 2×8 ganged systems)

- 1×8 and 2×8 straight PCB supports (semi-SMD)
- 1×8 and 2×8 breakout assemblies MXP-to-SK (2.92 mm standard)
- Customised assemblies on request

# MXP40 – technical data

| Electrical data (typical) | Testing condition   | Performance                                    |
|---------------------------|---|--|
| Impedance                 |   | 50 Ω   |
| Interface frequency max.  |   | 40 GHz   |
| Return loss               | gated measurement: cable connector/<br>PCB transition<br>PCB: Rogers RO3003<br>cable: Multiflex 53-02 | ≥ 20 dB up to 22.5 GHz<br>≥ 12 dB up to 40 GHz |
| Insertion loss            |   | according Multiflex 53-02                      |
| Phase match               |   | +/- 2 ps                                       |

| Mechanical data (typical)           | Testing condition              | Requirements               |
|-------------------------------------|--------------------------------|----------------------------|
| Mating force (per single channel)   |                                | max. 3.4 N (typical 1.1 N) |
| Demating force (per single channel) |                                | max. 3.4 N (typical 1.1 N) |
| Number of matings                   | MIL-PRF-39012, paragraph 4.712 | ≥ 500                      |
| Pitch centre-to-centre              |                                | 4 mm (0.157 in.)           |

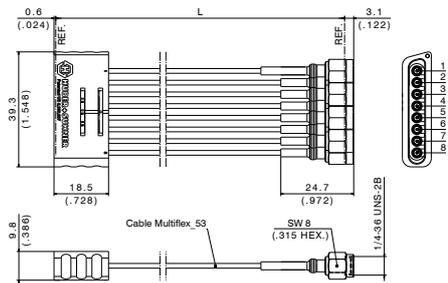
| Environmental data (typical)    | Testing condition                    | Requirements  |
|---------------------------------|--------------------------------------|---|
| Temperature range               |                                      | -55 °C ... 85 °C / -67 °F ... 185 °F  |
| Thermal aging (mated condition) | IEC 60068-2-2, test B                | 120 °C/260 h  |
| Change of temperature           | IEC 60068-2-14, test na              | assembly: -55°C ... 85°C / -67°F ... 185 °F<br>PCB: -55°C ... 85°C / -67°F ... 185 °F |
| Vibration                       | IEC 60068-2-6                        | on request  |
| Mechanical shock (transport)    | MIL-STD-202, method 213, condition I | 100 g/6 ms  |
| Damp heat steady state          | IEC 60068-2-78, test ca              | 40 °C (104 °F)/humidity 93%/96 h  |
| 2011/65/EU (RoHS)               |                                      | compliant   |
| 2006/1907/EC (REACH)            |                                      | compliant   |

| Material data cable connector | Material         | Coating               |
|-------------------------------|------------------|-----------------------|
| Center contact                | copper beryllium | SUCOPRO® gold plating |
| Outer contact                 | brass            | SUCOPRO® gold plating |
| Body                          | aluminium        | black anodised        |
| Insulator                     | PEEK             | n/a                   |

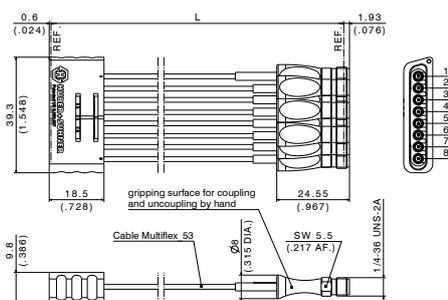
| Material data PCB connector | Material         | Coating               |
|-----------------------------|------------------|-----------------------|
| Center contact              | copper beryllium | SUCOPRO® gold plating |
| Outer contact               | BZ4              | SUCOPRO® gold plating |
| Body                        | brass            | SUCOPRO® gold plating |
| Insulator                   | PEEK             | n/a                   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

# MXP40 – breakout to SK

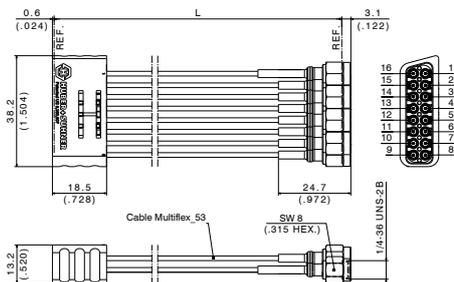


| Type 1×8 ganged          | Item no. | Length       | Notes                    |
|--------------------------|----------|--------------|--------------------------|
| MF53/1×8A_21MXP/11SK/152 | 84097196 | 152 mm (6")  | single channels numbered |
| MF53/1×8A_21MXP/11SK/229 | 84099600 | 229 mm (9")  |                          |
| MF53/1×8A_21MXP/11SK/305 | 84099607 | 305 mm (12") |                          |
| MF53/1×8A_21MXP/11SK/610 | 84123646 | 610 mm (24") |                          |

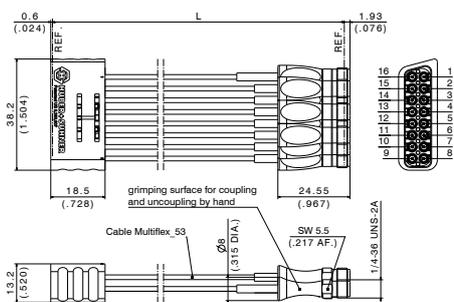


| Type 1×8 ganged               | Item no. | Length       | Notes   |
|-------------------------------|----------|--------------|---|
| MF53/1×8A_21MXP/21SK_ergo/152 | 84093980 | 152 mm (6")  | single channels numbered with ergo grip on SK (2.92 mm standard) side |
| MF53/1×8A_21MXP/21SK_ergo/229 | 84098899 | 229 mm (9")  |   |
| MF53/1×8A_21MXP/21SK_ergo/305 | 84098900 | 305 mm (12") |   |
| MF53/1×8A_21MXP/21SK_ergo/610 | 85009273 | 610 mm (24") |   |

# MXP40 – breakout to SK



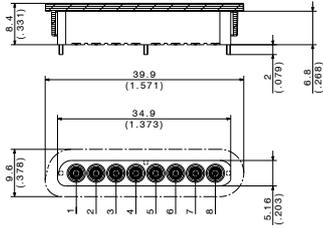
| Type 2×8 ganged          | Item no. | Length       | Notes                    |
|--------------------------|----------|--------------|--------------------------|
| MF53/2×8A_21MXP/11SK/152 | 84088950 | 152 mm (6")  | single channels numbered |
| MF53/2×8A_21MXP/11SK/229 | 84098901 | 229 mm (9")  |                          |
| MF53/2×8A_21MXP/11SK/305 | 84088954 | 305 mm (12") |                          |
| MF53/2×8A_21MXP/11SK/610 | 84089090 | 610 mm (24") |                          |



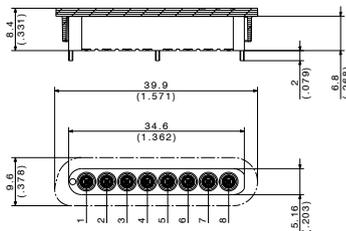
| Type 2×8 ganged               | Item no. | Length       | Notes   |
|-------------------------------|----------|--------------|---|
| MF53/2×8A_21MXP/21SK_ergo/152 | 84093901 | 152 mm (6")  | single channels numbered with ergo grip on SK (2.92 mm standard) side |
| MF53/2×8A_21MXP/21SK_ergo/229 | 84098908 | 229 mm (9")  |   |
| MF53/2×8A_21MXP/21SK_ergo/305 | 84098902 | 305 mm (12") |   |
| MF53/2×8A_21MXP/21SK_ergo/610 | 85009286 | 610 mm (24") |   |

# MXP40 – PCB connectors

- 1×8 and 2×8 ganged versions
- Via-in-pad capable
- Semi-SMD technology – guide pins for better mechanical stability of solder joint



| Type 1×8 ganged            | Item no. | Packaging | Notes                     |
|----------------------------|----------|-----------|---------------------------|
| 1×8A_81_MXP-S50-0-1/111_NE | 84091435 | tape      | asymmetric design (keyed) |



| Type 1×8 ganged            | Item no. | Packaging | Notes                        |
|----------------------------|----------|-----------|------------------------------|
| 1×8A_81_MXP-S50-0-2/111_NE | 84091436 | tape      | symmetric design (non keyed) |

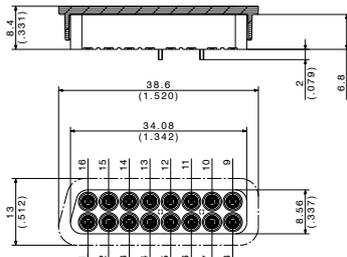
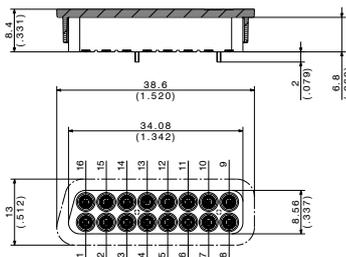


Fig. 1

Fig. 2

| Type 2×8 ganged            | Item no. | Packaging | Notes   | Fig. |
|----------------------------|----------|-----------|---|------|
| 2×8A_81_MXP-S50-0-1/111_NE | 84072058 | tape      | asymmetric design (keyed)   | 1    |
| 2×8A_81_MXP-S50-0-3/111_NE | 85013397 | tape      | asymmetric design (keyed)<br>optimised grounding pin layout for differential pair routing | 2    |

# MXP18 – 18 GHz multicoax solution

## Features

- Operating range at up to 18 GHz
- Broadband characteristic
- 4 mm (0.157 in.) pitch centre-to-centre
- Standard phase matching down to +/- 2 ps
- Slide-on mounting – no threading
- Highly flexible and ultra-stable Multiflex cable

## Benefits

- **Best value for money**

MXP18 allows accurate testing up to 18 GHz.

- **Space saving**

As a result of the dense interface pitch, the PCB connector take up less space on PCBs in comparison to single interfaces. This is advantageous, as expensive high-performance board material is essential for good signal integrity at high frequencies/data rates.

- **Short transmission lines**

The compact design of the entire system allows it to be positioned directly adjacent to the DUT/chip. This helps to keep the transmission lines on the board short and the losses low.

- **Reliable push-on mating**

Thanks to the robust slide-on interface design, assemblies can be replugged quickly and easily, while guaranteeing stable electrical values even after numerous mating cycles.

### Range of standard products (1×8 and 2×8 ganged systems)

- 1×8 and 2×8 breakout assemblies MXP-to-SMA
- Customised assemblies on request

# MXP18 – technical data

| Electrical data (typical) | Testing condition   | Performance               |
|---------------------------|---|---------------------------|
| Impedance                 |   | 50 Ω                      |
| Interface frequency max.  |   | 18 GHz                    |
| Return loss               | gated measurement: cable connector/<br>PCB transition<br>PCB: Rogers RO3003<br>cable: Multiflex 53-02 | ≥ 20 dB up to 18 GHz      |
| Insertion loss            |   | according Multiflex 53-02 |
| Phase match               |   | +/- 2 ps                  |

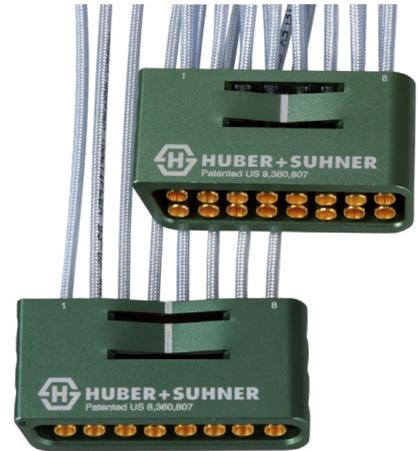
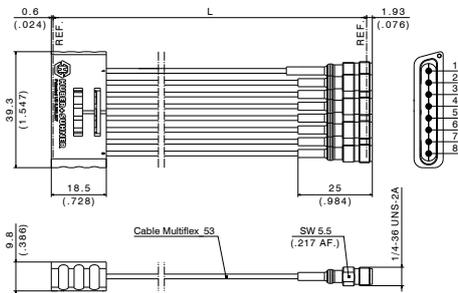
| Mechanical data (typical)           | Testing condition               | Requirements               |
|-------------------------------------|---------------------------------|----------------------------|
| Mating force (per single channel)   |                                 | max. 3.4 N (typical 1.1 N) |
| Demating force (per single channel) |                                 | max. 3.4 N (typical 1.1 N) |
| Number of matings                   | MIL-PRF-39012, paragraph 4.7.12 | ≥ 500                      |
| Pitch centre-to-centre              |                                 | 4 mm (0.157 in.)           |

| Environmental data (typical)    | Testing condition                    | Requirements  |
|---------------------------------|--------------------------------------|---|
| Temperature range               |                                      | -55 °C ... 85 °C / -67 °F ... 185 °F  |
| Thermal aging (mated condition) | IEC 60068-2-2, test B                | 120 °C/260 h  |
| Change of temperature           | IEC 60068-2-14, test na              | assembly: -55 °C ... 85 °C / -67 °F ... 185 °F<br>PCB: -55 °C ... 85 °C / -67 °F ... 185 °F |
| Vibration                       | IEC 60068-2-6                        | on request  |
| Mechanical shock (transport)    | MIL-STD-202, method 213, condition I | 100 g/6 ms  |
| Damp heat steady state          | IEC 60068-2-78, test ca              | 40 °C (104 °F)/humidity 93%/96 h  |
| 2011/65/EU (RoHS)               |                                      | compliant   |
| 2006/1907/EC (REACH)            |                                      | compliant   |

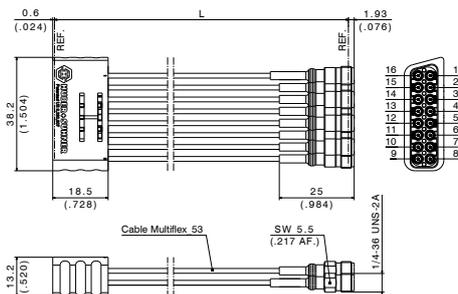
| Material data cable connector | Material         | Coating               |
|-------------------------------|------------------|-----------------------|
| Center contact                | copper beryllium | SUCOPRO® gold plating |
| Outer contact                 | brass            | SUCOPRO® gold plating |
| Body                          | aluminium        | black anodised        |
| Insulator                     | PEEK             | n/a                   |

Performance values are typical for the connector interface. Individual component or connector performance may vary depending on the connector design, attachment (e.g. cable, PCB) or application. For detailed specifications please refer to the specific data sheets on our website [www.hubersuhner.com](http://www.hubersuhner.com).

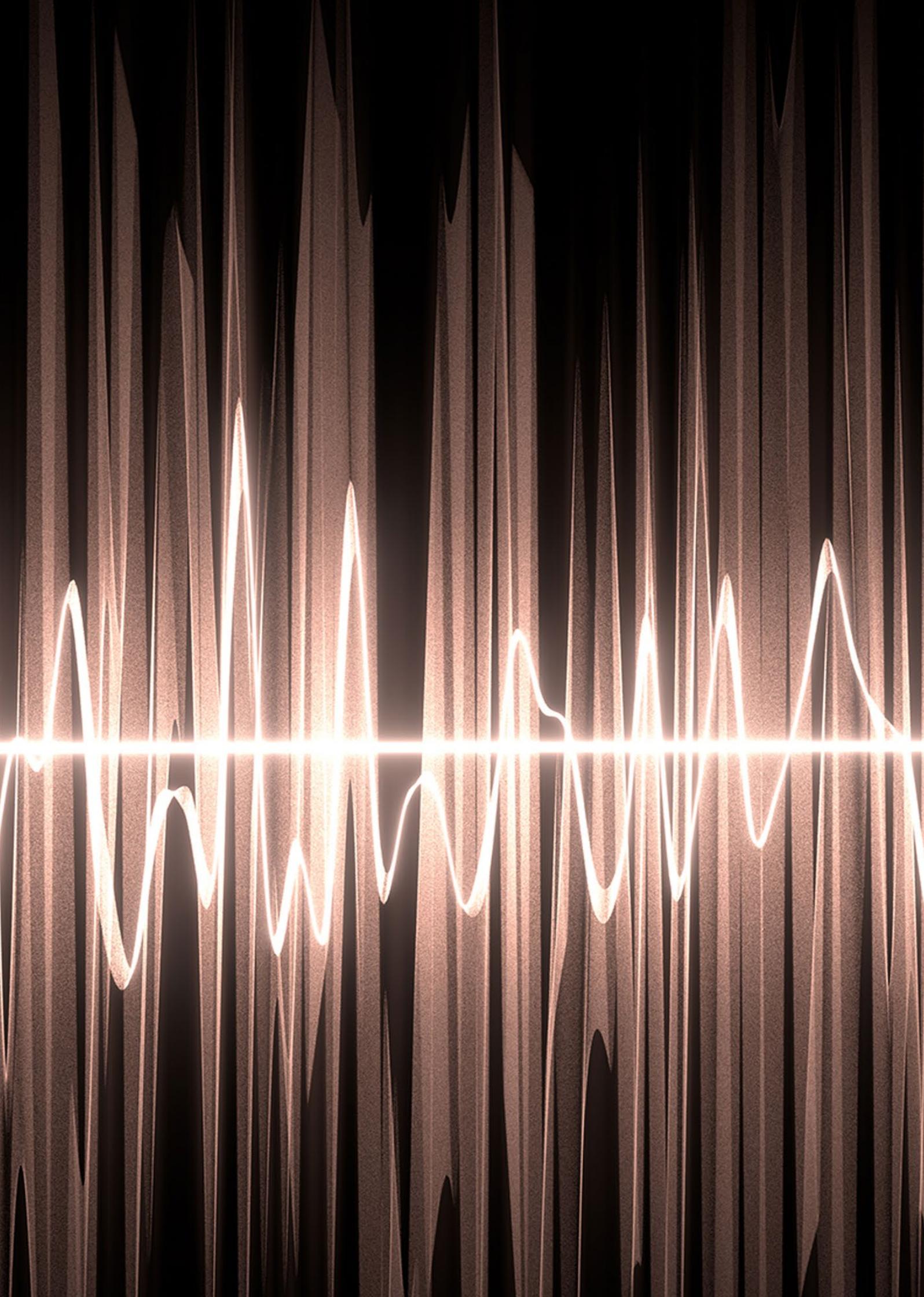
# MXP18 – breakout to SMA



| Type 1x8 ganged           | Item no. | Length      | Notes |
|---------------------------|----------|-------------|-------|
| MF53/1x8A_21MXP/21SMA/152 | 85014420 | 152 mm (6") |       |



| Type 2x8 ganged           | Item no. | Length      | Notes |
|---------------------------|----------|-------------|-------|
| MF53/2x8A_21MXP/21SMA/152 | 85022735 | 152 mm (6") |       |



# Adapters

HUBER+SUHNER is manufacturing a wide range of adapters in various configurations like within series or between series, straight or angled designs and some with panel mount features. They are classified according to its typical intended applications of which each require its specific properties. There are four major groups which are identified by means of a color code in this catalogue: standard, precision, low passive intermodulation (PIM) and quick-mate adapters.

## Standard adapters

### Features

- Wide range of different configurations
- Appropriate materials

### Benefits

- Most common interfaces available
- Accurate transitions
- Effective and reliable interconnection solutions

## Precision adapters

### Features

- Precision interfaces
- Excellent electrical performance
- Premium base materials and platings

### Benefits

- For precision laboratory measurements
- High repeatability and accuracy

## PIM adapters

### Features

- Outstanding low intermodulation performance
- Excellent electrical contacts
- Non-magnetic materials

### Benefits

- High reliability
- Repeatable intermodulation measurements

## Quick-mate adapters

### Features

- Adapters with slide-on coupling mechanism
- High abrasion resistance thanks SUCOPRO® gold plating

### Benefits

- Easy coupling and decoupling
- Fast and reliable measurements
- Longest lifetime

# Adapter connector matching matrix

|           | AS12 | AS16 | BMA | BNC | MBX | MCX | MFBX | MMBX | MMCX | MMPX | N   | NEX10 | PC1.0 | PC1.85 | PC2.4 | SK (2.92) | PC3.5 |
|-----------|------|------|-----|-----|-----|-----|------|------|------|------|-----|-------|-------|--------|-------|-----------|-------|
| AS12      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           | 17    |
| AS16      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| BMA       |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| BNC       |      |      |     | 94  |     | 96  |      |      | 99   |      | 101 |       |       |        |       |           |       |
| MBX       |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| MCX       |      |      |     | 96  |     | 151 |      |      |      |      | 156 |       |       |        |       |           | 162   |
| MFBX      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| MMBX      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| MMCX      |      |      |     | 99  |     |     |      |      | 229  |      |     |       |       |        |       |           |       |
| MMPX      |      |      |     |     |     |     |      |      |      |      |     |       | 256   | 257    |       | 259       |       |
| N         |      |      |     | 101 |     | 156 |      |      |      |      | 276 | 277   |       |        | 280   |           | 282   |
| NEX10     |      |      |     |     |     |     |      |      |      |      | 277 |       |       |        |       |           | 303   |
| PC1.0     |      |      |     |     |     |     |      |      |      | 256  |     |       | 319   |        |       |           |       |
| PC1.85    |      |      |     |     |     |     |      |      |      | 257  |     |       |       | 339    |       |           |       |
| PC2.4     |      |      |     |     |     |     |      |      |      |      | 280 |       |       |        |       |           |       |
| SK (2.92) |      |      |     |     |     |     |      |      |      | 259  |     |       |       |        | 359   | 376       |       |
| PC3.5     | 17   |      |     |     |     | 162 |      |      |      |      | 282 | 303   |       |        |       |           | 393   |
| PC7       |      |      |     |     |     |     |      |      |      |      | 283 |       |       |        |       |           | 394   |
| QLA       |      |      |     | 109 |     |     |      |      |      |      | 284 |       |       |        |       |           |       |
| QMA       |      |      |     |     |     |     |      |      |      |      | 285 |       |       |        |       |           | 396   |
| QN        |      |      |     |     |     |     |      |      |      |      | 286 |       |       |        |       |           |       |
| SMA       |      | 53   | 83  | 112 | 140 | 167 | 193  | 218  | 242  |      | 287 |       |       |        |       |           |       |
| SMB       |      |      |     | 113 |     |     |      |      |      |      | 288 |       |       |        |       |           |       |
| SMC       |      |      |     | 114 |     |     |      |      |      |      | 289 |       |       |        |       |           |       |
| SMP       |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       | 385       |       |
| SMPM      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       | 386       |       |
| SMPM-T    |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       | 387       |       |
| SSMA      |      |      |     |     |     |     |      |      |      |      |     |       |       |        |       |           |       |
| TNC       |      |      |     | 119 |     |     |      | 225  |      |      | 294 |       |       |        |       |           |       |
| 4.1/9.5   |      |      |     |     |     |     |      |      |      |      | 295 |       |       |        |       |           |       |
| 4.3-10    |      |      |     |     |     |     |      |      |      |      | 296 | 317   |       |        |       |           | 407   |
| 7/16      |      |      |     |     |     |     |      |      |      |      | 297 | 318   |       |        |       |           |       |
| MQ4       |      |      |     |     |     |     |      |      |      |      | 529 |       |       |        |       |           |       |
| MQ5       |      |      |     |     |     |     |      |      |      |      | 530 |       |       |        |       |           |       |

## How to find an adapter

The interface pairing of an adapter can be found in the matrix above. The various interface services are listed in the first column and row. The matrix number is the intercept point of two interfaces (e.g. 25 for BNC to BNC). The matrix number can be found in the upper left corner of the detail adapters information in the following pages. The adapters are sorted by this matrix number in ascending order. Consequently all BNC to BNC adapters have the matrix number 25 and are in immediate succession. If the adapter consists of two different interfaces the matrix number can be found either by following the row and then the column or vice versa. For example row MCX and column BNC leads to 27 as well as row BNC and column MCX.

If there is no number in an intercept point there are no adapters for this connector pairing available.

## Tracking examples

Interface pairing

matrix number

BNC to BNC

25

BNC to MCX and MCX to BNC

27

|     | BMA | BNC | MBX | MCX |
|-----|-----|-----|-----|-----|
| BMA |     |     |     |     |
| BNC |     | 25  |     |     |
| MBX |     |     |     |     |
| MCX |     |     |     | 70  |

| PC7 | QLA | QMA | QN  | SMA | SMB | SMC | SMP | SMPM | SMPM-T | SSMA | TNC | 4.1/9.5 | 4.3-10 | 7/16 | MQ4 | MQ5  |           |
|-----|-----|-----|-----|-----|-----|-----|-----|------|--------|------|-----|---------|--------|------|-----|------|-----------|
|     |     |     |     | 53  |     |     |     |      |        |      |     |         |        |      |     | AS12 |           |
|     |     |     |     | 83  |     |     |     |      |        |      |     |         |        |      |     | AS16 |           |
|     |     |     |     | 112 | 113 | 114 |     |      |        |      | 119 |         |        |      |     | BMA  |           |
|     | 109 |     |     | 140 |     |     |     |      |        |      |     |         |        |      |     | BNC  |           |
|     |     |     |     | 167 |     |     |     |      |        |      |     |         |        |      |     | MBX  |           |
|     |     |     |     | 193 |     |     |     |      |        |      |     |         |        |      |     | MCX  |           |
|     |     |     |     | 218 |     |     |     |      |        |      | 225 |         |        |      |     | MFBX |           |
|     |     |     |     | 242 |     |     |     |      |        |      |     |         |        |      |     | MMBX |           |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     | MMCX |           |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     | MMPX |           |
|     | 283 | 284 | 285 | 286 | 287 | 288 | 289 |      |        |      | 294 | 295     | 296    | 297  | 529 | 530  | N         |
|     |     |     |     |     |     |     |     |      |        |      |     |         | 317    | 318  |     |      | NEX10     |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | PC1.0     |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | PC1.85    |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | PC2.4     |
|     |     |     |     |     |     |     | 385 | 386  | 387    |      |     |         |        |      |     |      | SK (2.92) |
|     | 394 |     | 396 | 397 |     |     |     |      |        |      |     |         | 407    |      |     |      | PC3.5     |
|     |     |     | 412 | 413 |     |     |     |      |        |      | 420 |         |        |      |     |      | PC7       |
|     |     | 424 |     |     |     |     |     |      |        |      |     |         |        |      |     |      | QLA       |
|     |     |     | 438 |     | 440 |     |     |      |        |      |     |         |        |      |     |      | QMA       |
|     | 412 |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | QN        |
|     | 413 |     | 440 |     | 463 | 464 |     |      |        | 469  | 470 |         |        |      |     |      | SMA       |
|     |     |     |     |     | 464 | 474 |     |      |        |      |     |         |        |      |     |      | SMB       |
|     |     |     |     |     |     | 484 |     |      |        |      |     |         |        |      |     |      | SMC       |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | SMP       |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | SMPM      |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | SMPM-T    |
|     |     |     |     |     | 469 |     |     |      |        |      |     |         |        |      |     |      | SSMA      |
|     | 420 |     |     |     | 470 |     |     |      |        |      | 519 |         |        |      |     |      | TNC       |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        | 525  |     |      | 4.1/9.5   |
|     |     |     |     |     |     |     |     |      |        |      |     |         | 527    | 528  |     |      | 4.3-10    |
|     |     |     | 462 |     |     |     |     |      |        |      |     | 525     | 527    | 528  |     |      | 7/16      |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | MQ4       |
|     |     |     |     |     |     |     |     |      |        |      |     |         |        |      |     |      | MQ5       |

### Examples of detailed product information of specific adapters

Header with colore code:

Standard (grey)

Precision (red)

PIM (blue)

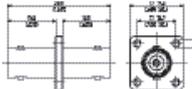
Quick-mate (green)

Matrix number and specific product ID

|    |                      |                                 |
|----|----------------------|---------------------------------|
| 25 | H+S type<br>Item no. | 37_BNC-75-0-V133_NE<br>22541045 |
|----|----------------------|---------------------------------|

#### Details

- Interface series and gender
- Various characteristics
- Material/mechanical\*
- VSWR

|               |              |  |
|---------------|--------------|--|
| BNC           | jack (f) 2 x |  |
| Material      | brass/SUCO   |  |
| Mounting hole | ML10         |  |
| Flange        | 4 threads    |  |

#### Notes

\* Material and plating descriptions refer to the connector body or outer contact.

Used abbreviations: ML mounting hole dimensions, see appendix  
 SUCO SUCOPLATE® plating  
 SUPR SUCOPRO®, gold plating  
 CuBe copper beryllium alloy

# Adapters

| 17                        | H+S type<br>Item no.                            | 29932-1<br>80320105 |
|---------------------------|---|---------------------|
| AS12<br>PC3.5             | plug (m)<br>jack (f)                            |                     |
| Material<br>AS12<br>PC3.5 | brass/nickel<br>stainless steel<br>(passivated) |                     |
| VSWR                      | DC to 12.4 GHz                                  | ≤ 1.20              |

| 17                        | H+S type<br>Item no.                            | 29932-2<br>80320106 |
|---------------------------|---|---------------------|
| AS12<br>PC3.5             | jack (f)<br>jack (f)                            |                     |
| Material<br>AS12<br>PC3.5 | brass/nickel<br>stainless steel<br>(passivated) |                     |
| VSWR                      | DC to 12.4 GHz                                  | ≤ 1.20              |

| 17                        | H+S type<br>Item no.                            | 29932-3<br>80360204 |
|---------------------------|---|---------------------|
| AS12<br>PC3.5             | jack (f)<br>plug (m)                            |                     |
| Material<br>AS12<br>PC3.5 | brass/nickel<br>stainless steel<br>(passivated) |                     |
| VSWR                      | DC to 12.4 GHz                                  | ≤ 1.20              |

| 17                        | H+S type<br>Item no.                            | 29932-4<br>80360205 |
|---------------------------|---|---------------------|
| AS12<br>PC3.5             | plug (m)<br>plug (m)                            |                     |
| Material<br>AS12<br>PC3.5 | brass/nickel<br>stainless steel<br>(passivated) |                     |
| VSWR                      | DC to 12.4 GHz                                  | ≤ 1.20              |

| 53                      | H+S type<br>Item no.                         | 29557-4<br>80318451 |
|-------------------------|--|---------------------|
| SMA<br>AS16             | jack (f)<br>plug (m)                         |                     |
| Material<br>SMA<br>AS16 | stainless steel<br>(passivated)<br>CuBe/gold |                     |
| VSWR                    | DC to 2 GHz                                  | ≤ 1.22              |

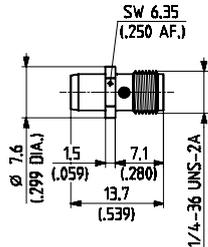
| 53                      | H+S type<br>Item no.                         | 29557-5<br>80318453 |
|-------------------------|--|---------------------|
| SMA<br>AS16             | jack (f)<br>jack (f)                         |                     |
| Material<br>SMA<br>AS16 | stainless steel<br>(passivated)<br>CuBe/gold |                     |
| VSWR                    | DC to 2 GHz                                  | ≤ 1.22              |

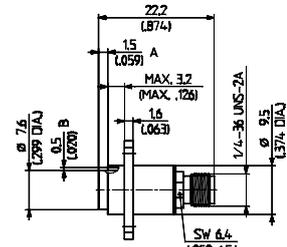
| 83         | H+S type<br>Item no.       | 31_BMA-SMA_50-1/1-9_UE<br>22645642 |
|------------|----------------------------|------------------------------------|
| BMA<br>SMA | jack (f)<br>jack (f)       |                                    |
| Material   | stainless steel            |                                    |
| VSWR       | DC to 9 GHz<br>9 to 18 GHz | ≤ 1.04 + 0.02 · f (GHz)<br>≤ 1.22  |

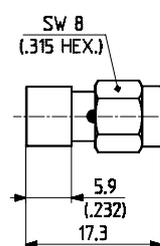
| 83         | H+S type<br>Item no.       | 32_BMA-SMA-50-1/199_UE<br>22645643 |
|------------|----------------------------|------------------------------------|
| BMA<br>SMA | plug (m)<br>plug (m)       |                                    |
| Material   | stainless steel            |                                    |
| VSWR       | DC to 9 GHz<br>9 to 18 GHz | ≤ 1.04 + 0.02 · f (GHz)<br>≤ 1.22  |

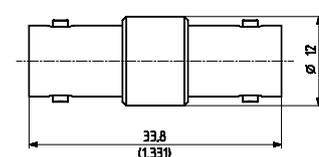
Introduction and general information on page 507 and 508/509.

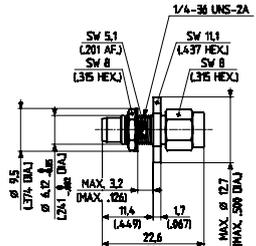
# Adapters

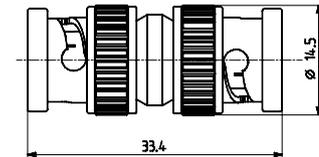
| 83         | H+S type<br>Item no. | 33_BMA-SMA-50-1/199_UE<br>22645644  |
|------------|----------------------|---|
| BMA<br>SMA | plug (m)<br>jack (f) |   |
| Material   | stainless steel      |  |
| VSWR       | DC to 18 GHz         | $\leq 1.06 + 0.009 \cdot f$ (GHz)   |

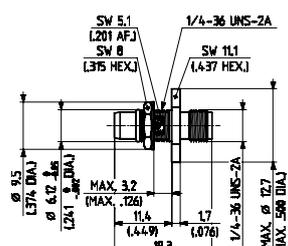
| 83                           | H+S type<br>Item no.       | 37_BMA-SMA-50-1/1--_UE<br>22645649  |
|------------------------------|----------------------------|---|
| BMA<br>SMA                   | jack (f)<br>jack (f)       |   |
| Material<br>Mounting<br>hole | stainless steel<br>ML 58   |  |
| VSWR                         | DC to 9 GHz<br>9 to 18 GHz | $\leq 1.07 + 0.017 \cdot f$ (GHz)<br>$\leq 1.22$                                    |

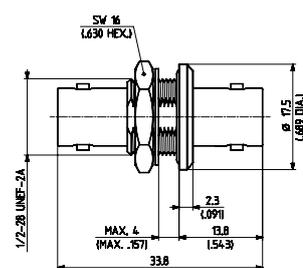
| 83         | H+S type<br>Item no. | 33_SMA-BMA-50-1/1-9_UE<br>22645645   |
|------------|----------------------|--|
| SMA<br>BMA | plug (m)<br>jack (f) |  |
| Material   | stainless steel      |  |
| VSWR       | DC to 18 GHz         | $\leq 1.06 + 0.009 \cdot f$ (GHz)  |

| 94       | H+S type<br>Item no. | 31_BNC-50-0-1/133_NE<br>22540540  |
|----------|----------------------|---|
| BNC      | jack (f) 2 ×         |   |
| Material | brass/SUCO           |  |
| VSWR     | DC to 4 GHz          | $\leq 1.06 + 0.04 \cdot f$ (GHz)  |

| 83                           | H+S type<br>Item no.     | 35_BMA-SMA-50-1/193_UE<br>22645647  |
|------------------------------|--------------------------|---|
| BMA<br>SMA                   | plug (m)<br>plug (m)     |   |
| Material<br>Mounting<br>hole | stainless steel<br>ML 56 |  |
| VSWR                         | DC to 18 GHz             | $\leq 1.07 + 0.02 \cdot f$ (GHz)  |

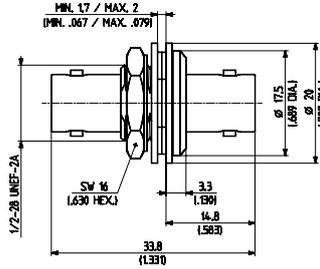
| 94       | H+S type<br>Item no. | 32_BNC-50-0-1/133_NE<br>22540565  |
|----------|----------------------|---|
| BNC      | plug (m) 2 ×         |   |
| Material | brass/SUCO           |  |
| VSWR     | DC to 4 GHz          | $\leq 1.06 + 0.04 \cdot f$ (GHz)  |

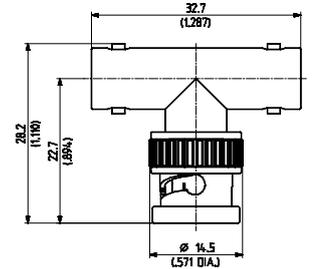
| 83                           | H+S type<br>Item no.     | 36_BMA-SMA-50-1/199_UE<br>22645651  |
|------------------------------|--------------------------|---|
| BMA<br>SMA                   | plug (m)<br>jack (f)     |   |
| Material<br>Mounting<br>hole | stainless steel<br>ML 56 |  |
| VSWR                         | DC to 18 GHz             | $\leq 1.03 + 0.015 \cdot f$ (GHz)   |

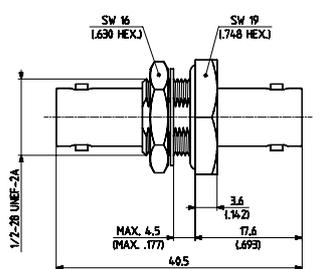
| 94                           | H+S type<br>Item no.          | 34_BNC-50-0-1/133_NE<br>22540627  |
|------------------------------|-------------------------------|---|
| BNC                          | jack (f) 2 ×                  |   |
| Material<br>Mounting<br>hole | brass/SUCO<br>ML 4            |  |
| VSWR                         | DC to 1.5 GHz<br>1.5 to 4 GHz | $\leq 1.04$<br>$\leq 1.08 + 0.10 \cdot f$ (GHz)                                       |

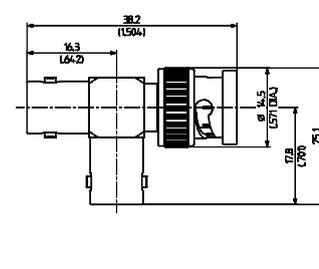
Introduction and general information on page 507 and 508/509.

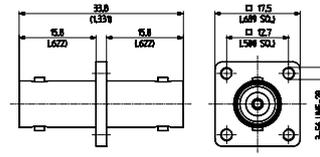
# Adapters

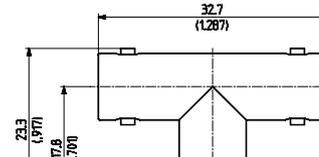
| 94                     | H+S type<br>Item no. | 34_BNC-50-0-2/133_NE<br>22540629  |
|------------------------|----------------------|---|
| BNC                    | jack (f) 2 ×         |   |
| For insulated mounting |                      |  |
| Material               | brass/SUCO           |   |
| Mounting hole          | ML 22                |   |
| VSWR                   | DC to 1.5 GHz        | ≤ 1.04  |
|                        | 1.5 to 4 GHz         | ≤ 1.08 + 0.10 · f (GHz)   |

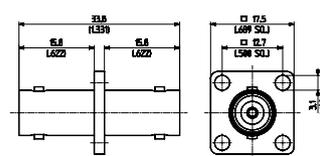
| 94       | H+S type<br>Item no.         | 43_BNC-50-0-1/133_NE<br>22540644  |
|----------|------------------------------|---|
| BNC      | jack (f) 2 ×<br>plug (m) 1 × |  |
| Material | brass/SUCO                   |   |

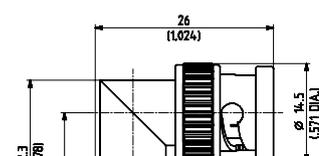
| 94              | H+S type<br>Item no. | 34_BNC-50-0-6/100_NE<br>22540631   |
|-----------------|----------------------|--|
| BNC             | jack (f) 2 ×         |  |
| Hermetic sealed |                      |  |
| Material        | CuBe/silver          |  |
| Mounting hole   | ML 4                 |  |
| VSWR            | DC to 4 GHz          | ≤ 1.43   |

| 94       | H+S type<br>Item no.         | 45_BNC-50-0-2/133_NE<br>22652370   |
|----------|------------------------------|--|
| BNC      | jack (f) 2 ×<br>plug (m) 1 × |  |
| Material | brass/SUCO                   |  |

| 94            | H+S type<br>Item no. | 37_BNC-50-0-1/133_NE<br>22540635  |
|---------------|----------------------|---|
| BNC           | jack (f) 2 ×         |  |
| Material      | brass/SUCO           |   |
| Mounting hole | ML 10                |   |
| VSWR          | DC to 4 GHz          | ≤ 1.06 + 0.04 · f (GHz)   |

| 94       | H+S type<br>Item no. | 46_BNC-50-0-1/133_NE<br>22540649  |
|----------|----------------------|---|
| BNC      | jack (f) 3 ×         |  |
| Material | brass/SUCO           |   |

| 94            | H+S type<br>Item no. | 37_BNC-50-0-2/133_NE<br>22540638  |
|---------------|----------------------|---|
| BNC           | jack (f) 2 ×         |  |
| Material      | brass/SUCO           |   |
| Mounting hole | ML 10                |   |
| VSWR          | DC to 4 GHz          | ≤ 1.06 + 0.04 · f (GHz)   |

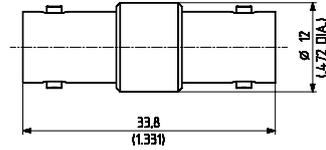
| 94       | H+S type<br>Item no.         | 53_BNC-50-0-1/133_NE<br>22540657  |
|----------|------------------------------|---|
| BNC      | plug (m) 1 ×<br>jack (f) 1 × |  |
| Material | brass/SUCO                   |   |
| VSWR     | DC to 4 GHz                  | ≤ 1.06 + 0.04 · f (GHz)   |

Introduction and general information on page 507 and 508/509.

# Adapters

| 94 | H+S type<br>Item no. | 31_BNC-75-0-1/133_NE<br>22541003 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC jack (f) 2 ×



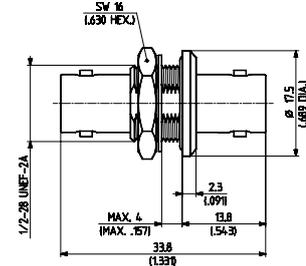
Material brass/SUCO

| 94 | H+S type<br>Item no. | 34_BNC-75-0-2/133_NE<br>22541042 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC jack (f) 2 ×

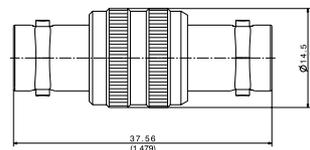
For insulated mounting

Material brass/SUCO  
Mounting hole ML 22



| 94 | H+S type<br>Item no. | 31_BNC-75-0-2/133_NE<br>84119590 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC jack (f) 2 ×

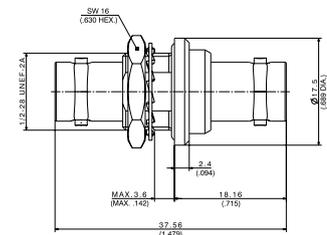


Material brass/SUCO

| 94 | H+S type<br>Item no. | 34_BNC-75-0-5/133_NE<br>84095130 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

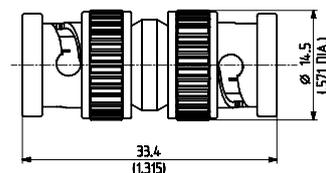
BNC jack (f) 2 ×

Material brass/SUCO  
Mounting hole ML 4



| 94 | H+S type<br>Item no. | 32_BNC-75-0-1/133_NE<br>22541016 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC plug (m) 2 ×

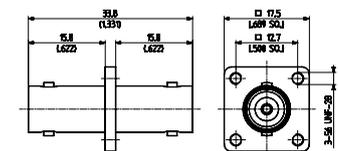


Material brass/SUCO

| 94 | H+S type<br>Item no. | 37_BNC-75-0-1/133_NE<br>22541045 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

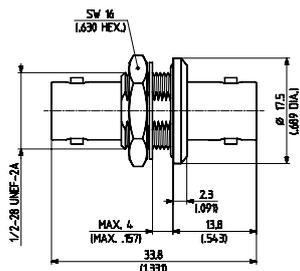
BNC jack (f) 2 ×

Material brass/SUCO  
Mounting hole ML 10  
4 threads  
Flange



| 94 | H+S type<br>Item no. | 34_BNC-75-0-1/133_NE<br>22541040 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC jack (f) 2 ×

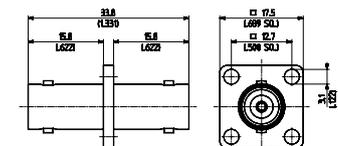


Material brass/SUCO  
Mounting hole ML 4

| 94 | H+S type<br>Item no. | 37_BNC-75-0-2/133_NE<br>22541047 |
|----|----------------------|----------------------------------|
|----|----------------------|----------------------------------|

BNC jack (f) 2 ×

Material brass/SUCO  
Mounting hole ML 10  
4 holes  
Flange

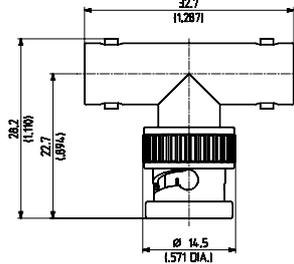


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# Adapters

|           |                 |                             |
|-----------|-----------------|-----------------------------|
| <b>94</b> | <b>H+S type</b> | <b>43_BNC-75-0-1/133_NE</b> |
|           | <b>Item no.</b> | <b>22541049</b>             |

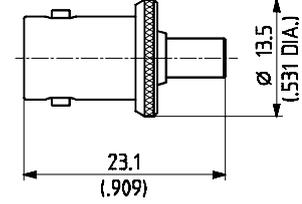
BNC jack (f) 2 ×  
plug (m) 1 ×



Material brass/SUCO

|           |                 |                               |
|-----------|-----------------|-------------------------------|
| <b>96</b> | <b>H+S type</b> | <b>31_BNC-MCX-50-1/1--_UE</b> |
|           | <b>Item no.</b> | <b>22543639</b>               |

BNC jack (f)  
MCX jack (f)

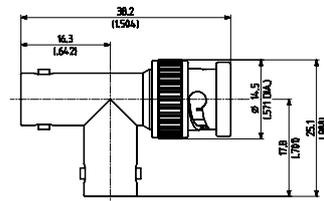


Material BNC brass/SUCO  
MCX brass/gold

VSWR DC to 2 GHz  $\leq 1.03 + 0.13 \cdot f$  (GHz)  
2 to 4 GHz  $\leq 1.29$

|           |                 |                             |
|-----------|-----------------|-----------------------------|
| <b>94</b> | <b>H+S type</b> | <b>45_BNC-75-0-1/133_NE</b> |
|           | <b>Item no.</b> | <b>22541050</b>             |

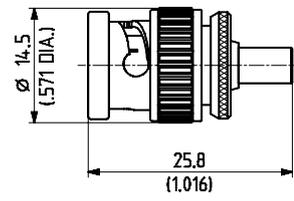
BNC jack (f) 2 ×  
plug (m) 1 ×



Material brass/SUCO

|           |                 |                               |
|-----------|-----------------|-------------------------------|
| <b>96</b> | <b>H+S type</b> | <b>33_BNC-MCX-50-1/1--_UE</b> |
|           | <b>Item no.</b> | <b>22543829</b>               |

BNC plug (m)  
MCX jack (f)

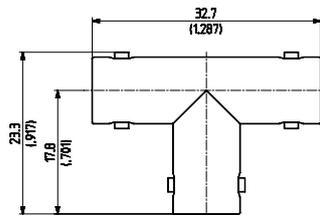


Material BNC brass/SUCO  
MCX brass/gold

VSWR DC to 4 GHz  $\leq 1.20$

|           |                 |                             |
|-----------|-----------------|-----------------------------|
| <b>94</b> | <b>H+S type</b> | <b>46_BNC-75-0-1/133_NE</b> |
|           | <b>Item no.</b> | <b>22541053</b>             |

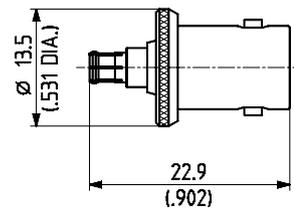
BNC jack (f) 3 ×



Material brass/SUCO

|           |                 |                               |
|-----------|-----------------|-------------------------------|
| <b>96</b> | <b>H+S type</b> | <b>33_MCX-BNC-50-1/1--_UE</b> |
|           | <b>Item no.</b> | <b>22543585</b>               |

MCX plug (m)  
BNC jack (f)

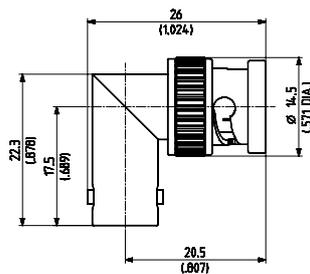


Material MCX CuBe/gold  
BNC brass/SUCO

VSWR: DC to 1 GHz  $\leq 1.04$   
1 to 4 GHz  $\leq 1.29$

|           |                 |                             |
|-----------|-----------------|-----------------------------|
| <b>94</b> | <b>H+S type</b> | <b>53_BNC-75-0-1/133_NE</b> |
|           | <b>Item no.</b> | <b>22541055</b>             |

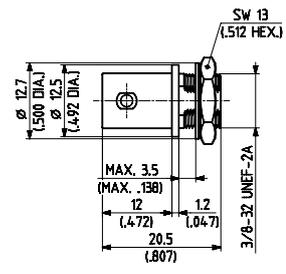
BNC plug (m)  
jack (f)



Material brass/SUCO

|           |                 |                               |
|-----------|-----------------|-------------------------------|
| <b>96</b> | <b>H+S type</b> | <b>34_BNC-MCX-50-2/133_UE</b> |
|           | <b>Item no.</b> | <b>22644912</b>               |

BNC jack (f)  
MCX jack (f)



Material brass/SUCO  
Mounting hole ML 2

VSWR DC to 4 GHz  $\leq 1.03 + 0.04 \cdot f$  (GHz)

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# Adapters

| 99                      | H+S type<br>Item no.     | 31_BNC-MMCX-50-1/1--_UE<br>22645963      |
|-------------------------|--------------------------|--|
| BNC<br>MMCX             | jack (f)<br>jack (f)     |  |
| Material<br>BNC<br>MMCX | brass/SUCO<br>brass/gold |  |
| VSWR                    | DC to 4 GHz              | $\leq 1.05 + 0.04 \cdot f \text{ (GHz)}$ |

| 101      | H+S type<br>Item no. | 31_BNC-N-50-51/1--_UE<br>22544049        |
|----------|----------------------|--|
| BNC<br>N | jack (f)<br>jack (f) |  |
| Material | stainless steel      |  |
| VSWR     | DC to 4 GHz          | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$ |

| 99                      | H+S type<br>Item no.     | 33_BNC-MMCX-50-1/1--_NE<br>22652907      |
|-------------------------|--------------------------|--|
| BNC<br>MMCX             | plug (m)<br>jack (f)     |  |
| Material<br>BNC<br>MMCX | brass/SUCO<br>brass/gold |  |
| VSWR                    | DC to 4 GHz              | $\leq 1.03 + 0.05 \cdot f \text{ (GHz)}$ |

| 101      | H+S type<br>Item no. | 32_BNC-N-50-1/133_UE<br>22540571        |
|----------|----------------------|---|
| BNC<br>N | plug (m)<br>plug (m) |   |
| Material | brass/SUCO           |   |
| VSWR     | DC to 4 GHz          | $\leq 1.06 + 0.4 \cdot f \text{ (GHz)}$ |

| 99                      | H+S type<br>Item no.     | 33_MMCX-BNC-50-1/111_UE<br>22645966      |
|-------------------------|--------------------------|--|
| MMCX<br>BNC             | plug (m)<br>jack (f)     |  |
| Material<br>MMCX<br>BNC | brass/gold<br>brass/SUCO |  |
| VSWR                    | DC to 4 GHz              | $\leq 1.05 + 0.04 \cdot f \text{ (GHz)}$ |

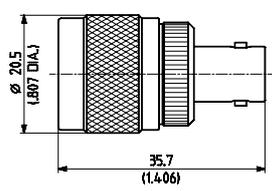
| 101      | H+S type<br>Item no. | 32_BNC-N-50-51/1--_UE<br>22544051        |
|----------|----------------------|--|
| BNC<br>N | plug (m)<br>plug (m) |  |
| Material | stainless steel      |  |
| VSWR     | DC to 4 GHz          | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$ |

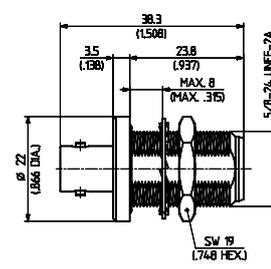
| 101      | H+S type<br>Item no. | 31_BNC-N-50-1/133_UE<br>22540549 |
|----------|----------------------|----------------------------------|
| BNC<br>N | jack (f)<br>jack (f) |                                  |
| Material | brass/SUCO           |                                  |
| VSWR     | DC to 4 GHz          | $\leq 1.22$                      |

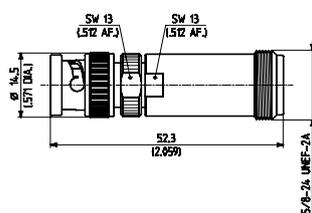
| 101      | H+S type<br>Item no. | 33_BNC-N-50-1/133_NE<br>22540608          |
|----------|----------------------|---|
| BNC<br>N | plug (m)<br>jack (f) |   |
| Material | brass/SUCO           |   |
| VSWR     | DC to 4 GHz          | $\leq 1.04 + 0.025 \cdot f \text{ (GHz)}$ |

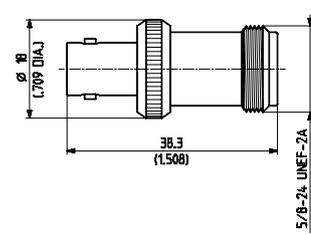
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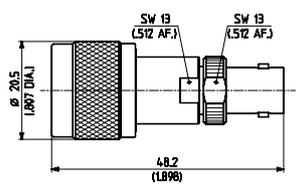
# Adapters

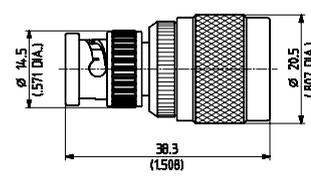
| 101      | H+S type<br>Item no. | 33_N-BNC-50-1/133_UE<br>22542414  |
|----------|----------------------|---|
| N<br>BNC | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 4 GHz          | ≤ 1.22  |

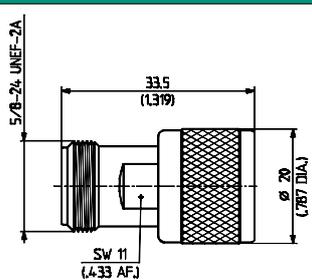
| 101                       | H+S type<br>Item no. | 34_BNC-N-50-1/133_UE<br>22651055  |
|---------------------------|----------------------|---|
| BNC<br>N                  | jack (f)<br>jack (f) |  |
| Material<br>Mounting hole | brass/SUCO<br>ML 12  |   |
| VSWR                      | DC to 4 GHz          | ≤ 1.22  |

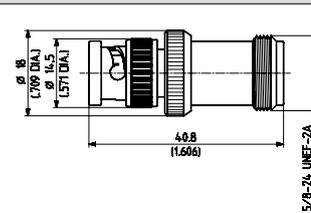
| 101      | H+S type<br>Item no. | 33_BNC-N-50-51/---_UE<br>22544052  |
|----------|----------------------|--|
| BNC<br>N | plug (m)<br>jack (f) |  |
| Material | stainless steel      |  |
| VSWR     | DC to 4 GHz          | ≤ 1.05 + 0.01 · f (GHz)  |

| 101      | H+S type<br>Item no. | 31_BNC-N-75-1/133_UE<br>22543640   |
|----------|----------------------|--|
| BNC<br>N | jack (f)<br>jack (f) |  |
| Material | brass/SUCO           |  |
| VSWR     | DC to 4 GHz          | ≤ 1.05 + 0.01 · f (GHz)  |

| 101      | H+S type<br>Item no. | 33_N-BNC-50-51/1--_UE<br>22544050   |
|----------|----------------------|---|
| N<br>BNC | plug (m)<br>jack (f) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 4 GHz          | ≤ 1.05 + 0.01 · f (GHz)   |

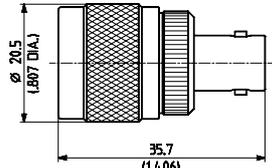
| 101      | H+S type<br>Item no. | 32_BNC-N-75-1/133_UE<br>22541022  |
|----------|----------------------|---|
| BNC<br>N | plug (m)<br>plug (m) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 4 GHz          | ≤ 1.05 + 0.01 · f (GHz)   |

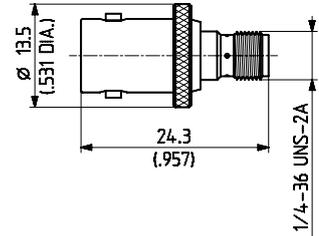
| 101      | H+S type<br>Item no.               | 33_BNC-N-Q50-4/133_NE<br>23003163   |
|----------|------------------------------------|---|
| BNC<br>N | plug (m)<br>quick-mate<br>jack (f) |  |
| Material | brass/SUCO                         |   |
| VSWR     | DC to 4 GHz                        | ≤ 1.07  |

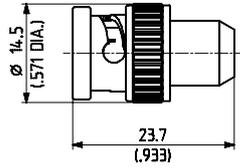
| 101      | H+S type<br>Item no. | 33_BNC-N-75-1/133_UE<br>22541034  |
|----------|----------------------|---|
| BNC<br>N | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 4 GHz          | ≤ 1.07  |

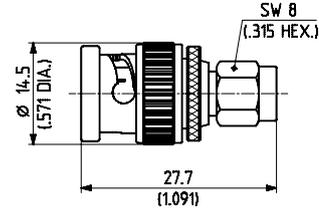
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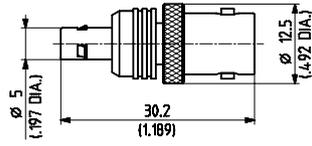
# Adapters

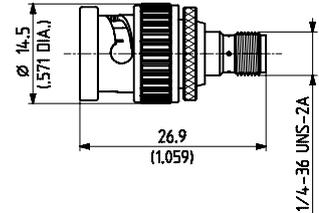
| 101      | H+S type<br>Item no. | 33_N-BNC-75-1/133_UE<br>22542622  |
|----------|----------------------|---|
| N<br>BNC | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |

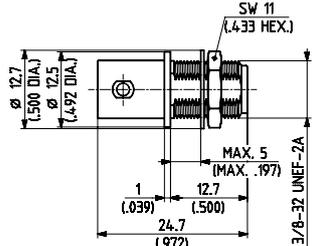
| 112        | H+S type<br>Item no.    | 31_BNC-SMA-50-1/1--_UE<br>22540551  |
|------------|-------------------------|---|
| BNC<br>SMA | jack (f)<br>jack (f)    |  |
| Material   | brass/SUCO<br>CuBe/gold |   |
| VSWR       | DC to 4 GHz             | $\leq 1.06 + 0.04 \cdot f$ (GHz)  |

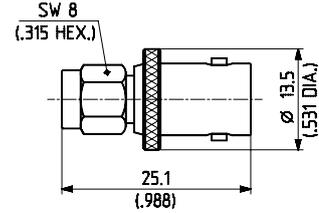
| 109        | H+S type<br>Item no.       | 33_BNC-QLA-01-1/1--_NE<br>22540624  |
|------------|----------------------------|---|
| BNC<br>QLA | plug (m)<br>jack (f)       |  |
| Material   | brass/SUCO<br>brass/nickel |   |

| 112        | H+S type<br>Item no.    | 32_BNC-SMA-50-1/1--_UE<br>22540572   |
|------------|-------------------------|--|
| BNC<br>SMA | plug (m)<br>plug (m)    |  |
| Material   | brass/SUCO<br>CuBe/gold |  |
| VSWR       | DC to 4 GHz             | $\leq 1.03 + 0.03 \cdot f$ (GHz)   |

| 109        | H+S type<br>Item no.       | 33_QLA-BNC-01-1/1--_NE<br>22640029  |
|------------|----------------------------|---|
| QLA<br>BNC | plug (m)<br>jack (f)       |  |
| Material   | brass/nickel<br>brass/SUCO |   |

| 112        | H+S type<br>Item no.    | 33_BNC-SMA-50-1/1--_UE<br>22540610  |
|------------|-------------------------|---|
| BNC<br>SMA | plug (m)<br>jack (f)    |  |
| Material   | brass/SUCO<br>CuBe/gold |   |
| VSWR       | DC to 4 GHz             | $\leq 1.03 + 0.03 \cdot f$ (GHz)  |

| 109           | H+S type<br>Item no. | 34_BNC-QLA-01-1/1--_UE<br>22640971  |
|---------------|----------------------|---|
| BNC<br>QLA    | jack (f)<br>jack (f) |  |
| Material      | brass/SUCO           |   |
| Mounting hole | ML 2                 |   |

| 112        | H+S type<br>Item no.    | 33_SMA-BNC-50-1/1--_NE<br>22640153  |
|------------|-------------------------|---|
| SMA<br>BNC | plug (m)<br>jack (f)    |  |
| Material   | CuBe/gold<br>brass/SUCO |   |
| VSWR       | DC to 4 GHz             | $\leq 1.05 - 0.037 \cdot f$ (GHz)   |

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| 112  | H+S type<br>Item no.            | 34_BNC-SMA-50-2/1--_UE<br>22651028 |
|--|---------------------------------|------------------------------------|
| BNC<br>SMA                                 | jack (f)<br>jack (f)            |                                    |
| Material<br>BNC<br>SMA<br>Mounting<br>hole | brass/SUCO<br>CuBe/gold<br>ML 4 |                                    |
| VSWR                                       | DC to 4 GHz                     | $\leq 1.06 - 0.03 \cdot f$ (GHz)   |

| 113                          | H+S type<br>Item no.       | 34_BNC-SMB-50-1/133_NE<br>22659005 |
|------------------------------|----------------------------|------------------------------------|
| BNC<br>SMB                   | jack (f)<br>jack (f)       |                                    |
| Material<br>Mounting<br>hole | brass/SUCO<br>ML 4         |                                    |
| VSWR                         | DC to 2 GHz<br>2 to 4 GHz: | $\leq 1.065$<br>$\leq 1.33$        |

| 113                    | H+S type<br>Item no.       | 31_BNC-SMB-50-2/1--_UE<br>22540553               |
|------------------------|----------------------------|--|
| BNC<br>SMB             | jack (f)<br>jack (f)       |  |
| Material<br>BNC<br>SMB | brass/SUCO<br>brass/gold   |  |
| VSWR                   | DC to 2 GHz<br>2 to 4 GHz: | $\leq 1.03 + 0.095 \cdot f$ (GHz)<br>$\leq 1.22$ |

| 114                    | H+S type<br>Item no.     | 33_BNC-SMC-50-2/1--_NE<br>22540616 |
|------------------------|--------------------------|------------------------------------|
| BNC<br>SMC             | plug (m)<br>jack (f)     |                                    |
| Material<br>BNC<br>SMC | brass/SUCO<br>brass/gold |                                    |
| VSWR                   | DC to 4 GHz              | $\leq 1.22$                        |

| 113                    | H+S type<br>Item no.     | 33_BNC-SMB-50-2/1--_UE<br>22540612 |
|------------------------|--------------------------|------------------------------------|
| BNC<br>SMB             | plug (m)<br>jack (f)     |                                    |
| Material<br>BNC<br>SMB | brass/SUCO<br>brass/gold |                                    |
| VSWR                   | DC to 4 GHz              | $\leq 1.06 + 0.04 \cdot f$ (GHz)   |

| 114                    | H+S type<br>Item no.      | 33_SMC-BNC-50-2/1--_NE<br>22640405               |
|------------------------|---------------------------|--|
| SMC<br>BNC             | plug (m)<br>jack (f)      |  |
| Material<br>SMC<br>BNC | brass/gold<br>brass/SUCO  |  |
| VSWR                   | DC to 2 GHz<br>2 to 4 GHz | $\leq 1.03 + 0.095 \cdot f$ (GHz)<br>$\leq 1.22$ |

| 113                    | H+S type<br>Item no.     | 33_SMB-BNC-50-2/1--_UE<br>22640396 |
|------------------------|--------------------------|------------------------------------|
| SMB<br>BNC             | plug (m)<br>jack (f)     |                                    |
| Material<br>SMB<br>BNC | brass/gold<br>brass/SUCO |                                    |
| VSWR                   | DC to 4 GHz              | $\leq 1.05 + 0.075 \cdot f$ (GHz)  |

| 119        | H+S type<br>Item no. | 31_BNC-TNC-50-1/133_UE<br>22540559 |
|------------|----------------------|------------------------------------|
| BNC<br>TNC | jack (f)<br>jack (f) |                                    |
| Material   | brass/SUCO           |                                    |
| VSWR       | DC to 4 GHz          | $\leq 1.22$                        |

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| 119        | H+S type<br>Item no. | 32_BNC-TNC-50-1/133_NE<br>22540582 |
|------------|----------------------|------------------------------------|
| BNC<br>TNC | plug (m)<br>plug (m) |                                    |
| Material   | brass/SUCO           |                                    |
| VSWR       | DC to 4 GHz          | ≤ 1.22                             |

| 140        | H+S type<br>Item no. | 31_MBX-SMA-50-1/111_NE<br>84093625 |
|------------|----------------------|------------------------------------|
| MBX<br>SMA | jack (f)<br>jack (f) |                                    |
| Material   | brass/SUPR           |                                    |
| VSWR       | DC to 6 GHz          | ≤ 1.083                            |

| 119        | H+S type<br>Item no. | 33_BNC-TNC-50-1/133_NE<br>22540614 |
|------------|----------------------|------------------------------------|
| BNC<br>TNC | plug (m)<br>jack (f) |                                    |
| Material   | brass/SUCO           |                                    |
| VSWR       | DC to 4 GHz          | ≤ 1.22                             |

| 140        | H+S type<br>Item no. | 32_MBX-SMA-50-1/11-_NE<br>84093642 |
|------------|----------------------|------------------------------------|
| MBX<br>SMA | plug (m)<br>plug (m) |                                    |
| Material   | brass/SUPR           |                                    |
| VSWR       | DC to 6 GHz          | ≤ 1.083                            |

| 119        | H+S type<br>Item no. | 33_TNC-BNC-50-1/133_NE<br>22640631 |
|------------|----------------------|------------------------------------|
| TNC<br>BNC | plug (m)<br>jack (f) |                                    |
| Material   | brass/SUCO           |                                    |
| VSWR       | DC to 4 GHz          | ≤ 1.22                             |

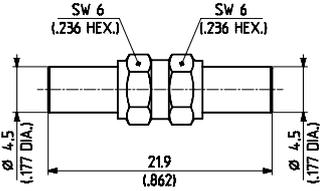
| 140t       | H+S type<br>Item no. | 33_MBX-SMA-50-1/111_NE<br>84093656 |
|------------|----------------------|------------------------------------|
| MBX<br>SMA | plug (m)<br>jack (f) |                                    |
| Material   | brass/SUPR           |                                    |
| VSWR       | DC to 6 GHz          | ≤ 1.083                            |

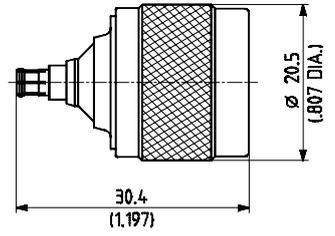
| 119                          | H+S type<br>Item no. | 37_BNC-TNC-50-1/133_UE<br>22540639 |
|------------------------------|----------------------|------------------------------------|
| BNC<br>TNC                   | jack (f)<br>jack (f) |                                    |
| Material<br>Mounting<br>hole | brass/SUCO<br>ML 10  |                                    |
| VSWR                         | DC to 4 GHz          | ≤ 1.22                             |

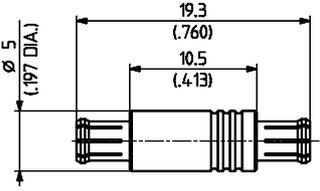
| 140        | H+S type<br>Item no. | 33_SMA-MBX-50-1/11-_NE<br>84093662 |
|------------|----------------------|------------------------------------|
| SMA<br>MBX | plug (m)<br>jack (f) |                                    |
| Material   | brass/SUPR           |                                    |
| VSWR       | DC to 6 GHz          | ≤ 1.083                            |

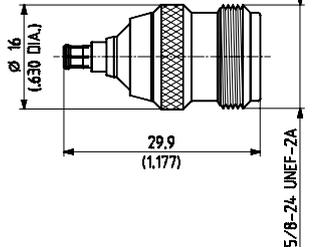
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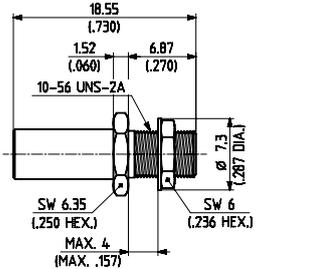
# Adapters

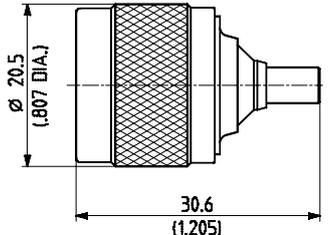
| 151      | H+S type<br>Item no.      | 31_MCX-50-0-1/111_NE<br>22543558  |
|----------|---------------------------|---|
| MCX      | jack (f) 2 ×              |  |
| Material | brass/gold                |   |
| VSWR     | DC to 1 GHz<br>1 to 6 GHz | ≤ 1.05<br>≤ 1.22  |

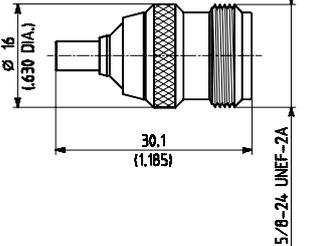
| 156      | H+S type<br>Item no. | 32_MCX-N-50-1/1--_UE<br>22543584  |
|----------|----------------------|---|
| MCX<br>N | plug (m)<br>plug (m) |  |
| Material | MCX<br>N             | CuBe/gold<br>brass/SUCO   |
| VSWR     | DC to 6 GHz          | ≤ 1.03 + 0.05 · f (GHz)   |

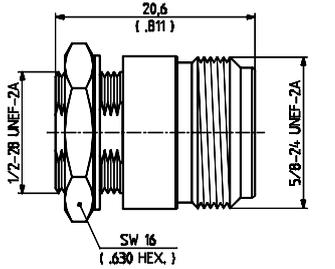
| 151      | H+S type<br>Item no.          | 32_MCX-50-0-3/111_NE<br>22653002   |
|----------|-------------------------------|--|
| MCX      | plug (m) 2 ×                  |  |
| Material | brass/gold                    |  |
| VSWR     | DC to 1.5 GHz<br>1.5 to 6 GHz | ≤ 1.06<br>≤ 1.22   |

| 156      | H+S type<br>Item no. | 33_MCX-N-50-1/1--_UE<br>22543586   |
|----------|----------------------|--|
| MCX<br>N | plug (m)<br>jack (f) |  |
| Material | MCX<br>N             | CuBe/gold<br>brass/SUCO  |
| VSWR     | DC to 6 GHz          | ≤ 1.03 + 0.035 · f (GHz)   |

| 151      | H+S type<br>Item no.          | 34_MCX-50-0-2/111_NE<br>22649868  |
|----------|-------------------------------|---|
| MCX      | jack (f) 2 ×                  |  |
| Material | brass/gold<br>Mounting hole   | ML 35   |
| VSWR     | DC to 1.5 GHz<br>1.5 to 6 GHz | ≤ 1.06<br>≤ 1.22  |

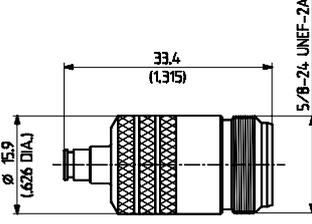
| 156      | H+S type<br>Item no. | 33_N-MCX-50-1/1--_UE<br>22543796  |
|----------|----------------------|---|
| N<br>MCX | plug (m)<br>jack (f) |  |
| Material | N<br>MCX             | brass/SUCO<br>brass/gold  |
| VSWR     | DC to 6 GHz          | ≤ 1.03 + 0.03 · f (GHz)   |

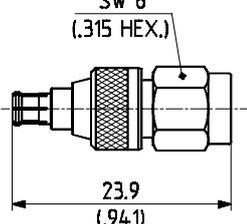
| 156      | H+S type<br>Item no. | 31_MCX-N-50-1/1--_UE<br>22640172  |
|----------|----------------------|---|
| MCX<br>N | jack (f)<br>jack (f) |  |
| Material | MCX<br>N             | brass/gold<br>brass/SUCO  |
| VSWR     | DC to 6 GHz          | ≤ 1.03 + 0.05 · f (GHz)   |

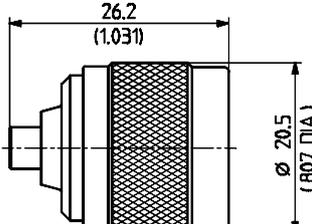
| 156      | H+S type<br>Item no. | 34_MCX-N-50-1/133_UE<br>22646217  |
|----------|----------------------|---|
| MCX<br>N | jack (f)<br>jack (f) |  |
| Material | Mounting hole        | brass/SUCO<br>ML 4  |
| VSWR     | DC to 6 GHz          | ≤ 1.08 + 0.02 · f (GHz)   |

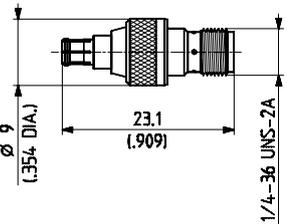
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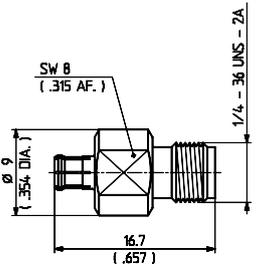
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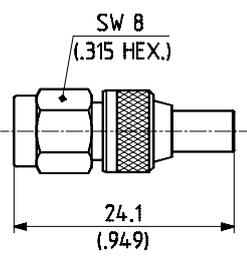
| 156                  | H+S type<br>Item no.    | 31_MCX-N-75-10/133_NE<br>22651488   |
|----------------------|-------------------------|---|
| MCX<br>N             | jack (f)<br>jack (f)    |   |
| Material<br>MCX<br>N | CuBe/SUCO<br>brass/SUCO |  |
| VSWR                 | DC to 3 GHz             | ≤ 1.07  |

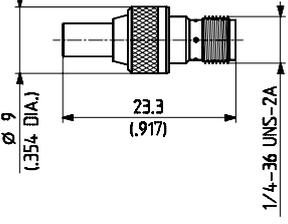
| 167                    | H+S type<br>Item no.    | 32_MCX-SMA-50-1/111_NE<br>22645486  |
|------------------------|-------------------------|---|
| MCX<br>SMA             | plug (m)<br>plug (m)    |   |
| Material<br>MCX<br>SMA | brass/gold<br>CuBe/gold |  |
| VSWR                   | DC to 6 GHz             | ≤ 1.03 + 0.03 · f (GHz)   |

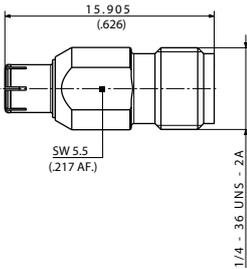
| 156                  | H+S type<br>Item no.     | 33_N-MCX-75-1/1--_NE<br>22649214   |
|----------------------|--------------------------|--|
| N<br>MCX             | plug (m)<br>jack (f)     |  |
| Material<br>N<br>MCX | brass/SUCO<br>brass/gold |  |
| VSWR                 | DC to 6 GHz              | ≤ 1.03 + 0.03 · f (GHz)  |

| 167        | H+S type<br>Item no. | 33_MCX-SMA-50-1/111_NE<br>22645487   |
|------------|----------------------|--|
| MCX<br>SMA | plug (m)<br>jack (f) |  |
| Material   | CuBe/gold            |  |
| VSWR       | DC to 6 GHz          | ≤ 1.03 + 0.03 · f (GHz)  |

| 162          | H+S type<br>Item no.          | 33_MCX-PC35-50-1/111_NE<br>22651594   |
|--------------|-------------------------------|---|
| MCX<br>PC3.5 | plug (m)<br>jack (f)          |   |
| Material     | CuBe/SUPR                     |  |
| VSWR         | DC to 3.5 GHz<br>3.5 to 6 GHz | ≤ 1.065<br>≤ 1.094  |

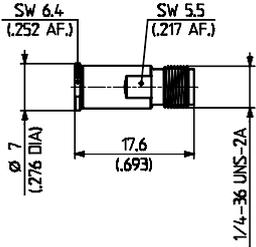
| 167                    | H+S type<br>Item no.    | 33_SMA-MCX-50-1/111_NE<br>22645488  |
|------------------------|-------------------------|---|
| SMA<br>MCX             | plug (m)<br>jack (f)    |   |
| Material<br>SMA<br>MCX | CuBe/gold<br>brass/gold |  |
| VSWR                   | DC to 6 GHz             | ≤ 1.03 + 0.03 · f (GHz)   |

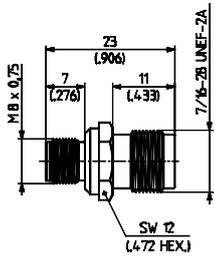
| 167                    | H+S type<br>Item no.    | 31_MCX-SMA-50-1/111_NE<br>22645485  |
|------------------------|-------------------------|---|
| MCX<br>SMA             | jack (f)<br>jack (f)    |   |
| Material<br>MCX<br>SMA | brass/gold<br>CuBe/gold |  |
| VSWR                   | DC to 6 GHz             | ≤ 1.03 + 0.03 · f (GHz)   |

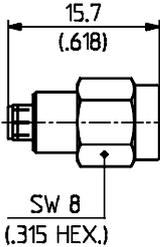
| 193                     | H+S type<br>Item no.   | 33_MFBX-SMA-50-1/111_NE<br>85008501   |
|-------------------------|------------------------|---|
| MFBX<br>SMA             | plug (m)<br>jack (f)   |   |
| Material<br>MFBX<br>SMA | CuBe/SUPR<br>CuBe/SUPR |  |
| VSWR                    | DC to 3.5 GHz          | ≤ 1.07  |

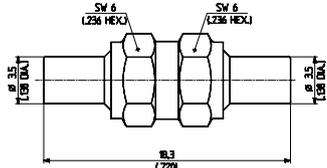
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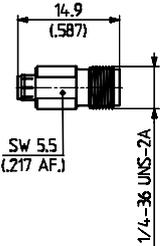
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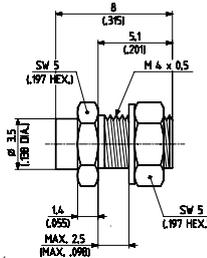
| 218         | H+S type<br>Item no.                           | 31_MMBX-SMA-50-1/111_NE<br>23004933   |
|-------------|--|---|
| MMBX<br>SMA | jack (f)<br>jack (f)                           |  |
| Material    | brass/SUPR<br>CuBe/SUPR                        |   |
| VSWR        | DC to 2.5 GHz<br>2.5 to 6 GHz<br>6 to 12.4 GHz | ≤ 1.05<br>≤ 1.06<br>≤ 1.35  |

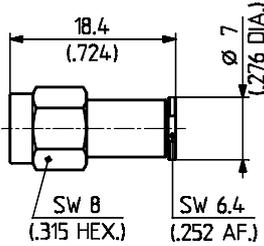
| 225         | H+S type<br>Item no. | 34_MMBX-TNC-50-1/1-3_NE<br>23014297   |
|-------------|----------------------|---|
| MMBX<br>TNC | jack (f)<br>jack (f) |  |
| Material    | brass/SUCO           |   |
| VSWR        | DC to 5 GHz          | ≤ 1.3   |

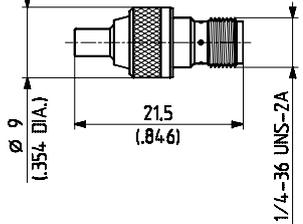
| 218         | H+S type<br>Item no.                           | 32_MMBX-SMA-50-1/119_NE<br>23004934  |
|-------------|--|--|
| MMBX<br>SMA | plug (m)<br>plug (m)                           |  |
| Material    | CuBe/SUPR                                      |  |
| VSWR        | DC to 2.5 GHz<br>2.5 to 6 GHz<br>6 to 12.4 GHz | ≤ 1.05<br>≤ 1.06<br>≤ 1.35   |

| 229      | H+S type<br>Item no.      | 31_MMCX-50-0-1/111_OE<br>22645960   |
|----------|---------------------------|---|
| MMCX     | jack (f) 2 ×              |  |
| Material | brass/gold                |   |
| VSWR     | DC to 3 GHz<br>3 to 6 GHz | ≤ 1.10<br>≤ 1.28  |

| 218         | H+S type<br>Item no.                           | 33_MMBX-SMA-50-1/111_NE<br>23004937   |
|-------------|--|---|
| MMBX<br>SMA | plug (m)<br>jack (f)                           |  |
| Material    | CuBe/SUPR                                      |   |
| VSWR        | DC to 2.5 GHz<br>2.5 to 6 GHz<br>6 to 12.4 GHz | ≤ 1.05<br>≤ 1.06<br>≤ 1.35  |

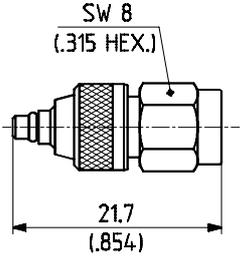
| 229      | H+S type<br>Item no.                 | 34_MMCX-50-0-1/111_OE<br>22650516   |
|----------|--------------------------------------|---|
| MMCX     | jack (f) 2 ×                         |  |
| Material | brass/gold<br>Mounting hole<br>ML 88 |   |
| VSWR     | DC to 1.5 GHz:<br>1.5 to 6 GHz       | ≤ 1.06<br>≤ 1.22  |

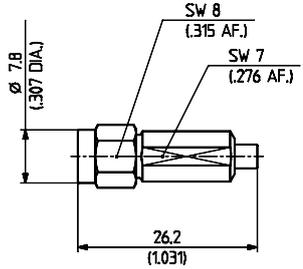
| 218         | H+S type<br>Item no.                           | 33_SMA-MMBX-50-1/119_NE<br>23004935   |
|-------------|--|---|
| SMA<br>MMBX | plug (m)<br>jack (f)                           |  |
| Material    | CuBe/SUPR<br>brass/SUPR                        |   |
| VSWR        | DC to 2.5 GHz<br>2.5 to 6 GHz<br>6 to 12.4 GHz | ≤ 1.05<br>≤ 1.06<br>≤ 1.35  |

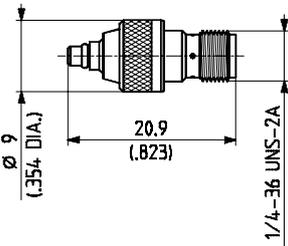
| 242         | H+S type<br>Item no.          | 31_MMCX-SMA-50-1/111_OE<br>22645961   |
|-------------|-------------------------------|---|
| MMCX<br>SMA | jack (f)<br>jack (f)          |  |
| Material    | brass/gold<br>CuBe/SUPR       |   |
| VSWR        | DC to 2.5 GHz<br>2.5 to 6 GHz | ≤ 1.10<br>≤ 1.18  |

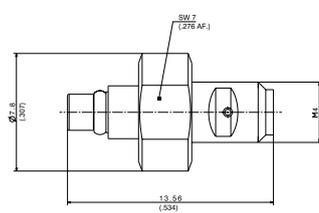
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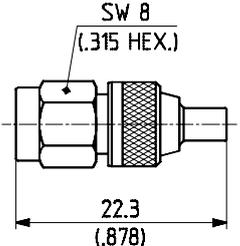
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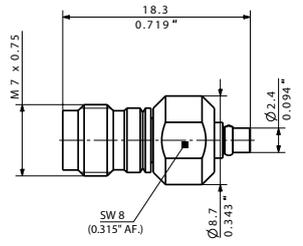
| 242                     | H+S type<br>Item no.          | 32_MMCX-SMA-50-1/111_OE<br>22645967   |
|-------------------------|-------------------------------|---|
| MMCX<br>SMA             | plug (m)<br>plug (m)          |  |
| Material<br>MMCX<br>SMA | brass/gold<br>CuBe/gold       |   |
| VSWR                    | DC to 2.5 GHz<br>2.5 to 6 GHz | ≤ 1.10<br>≤ 1.18  |

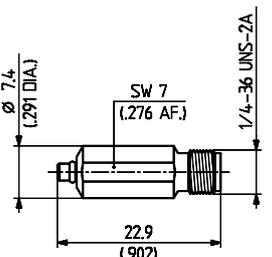
| 242         | H+S type<br>Item no.          | 33_SMA-MMCX-50-2/111_NE<br>22658204   |
|-------------|-------------------------------|---|
| SMA<br>MMCX | plug (m)<br>jack (f)          |  |
| Material    | CuBe/SUPR                     |   |
| VSWR        | DC to 3.5 GHz<br>3.5 to 6 GHz | ≤ 1.065<br>≤ 1.094  |

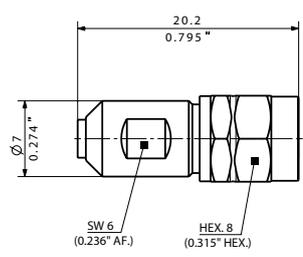
| 242                     | H+S type<br>Item no.          | 33_MMCX-SMA-50-1/111_UE<br>22645970  |
|-------------------------|-------------------------------|--|
| MMCX<br>SMA             | plug (m)<br>jack (f)          |  |
| Material<br>MMCX<br>SMA | brass/gold<br>CuBe/gold       |  |
| VSWR                    | DC to 2.5 GHz<br>2.5 to 6 GHz | ≤ 1.10<br>≤ 1.18   |

| 256           | H+S type<br>Item no.                         | 33_MMPX-PC1-50-1/111_NE<br>85031764  |
|---------------|--|--|
| MMPX<br>PC1.0 | plug (m)<br>jack (f)                         |  |
| Material      | CuBe/gold                                    |  |
| VSWR          | DC to 20 GHz<br>20 to 50 GHz<br>50 to 80 GHz | ≤ 1.119<br>≤ 1.222<br>≤ 1.671  |

| 242                     | H+S type<br>Item no.          | 33_SMA-MMCX-50-1/111_NE<br>22645969   |
|-------------------------|-------------------------------|---|
| SMA<br>MMCX             | plug (m)<br>jack (f)          |  |
| Material<br>SMA<br>MMCX | CuBe/gold<br>brass/gold       |   |
| VSWR                    | DC to 2.5 GHz<br>2.5 to 6 GHz | ≤ 1.10<br>≤ 1.18  |

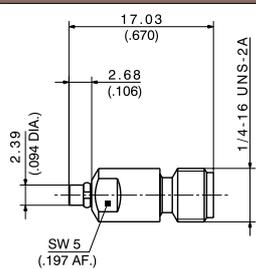
| 257                        | H+S type<br>Item no.         | 33_MMPX-PC185-50-2/1--_NE<br>84132754   |
|----------------------------|------------------------------|---|
| MMPX<br>PC1.85             | plug (m)<br>jack (f)         |  |
| Material<br>MMPX<br>PC1.85 | CuBe/SUPR<br>stainless steel |   |
| VSWR                       | DC to 15 GHz<br>15 to 67 GHz | ≤ 1.106<br>≤ 1.173  |

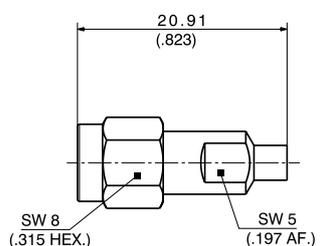
| 242         | H+S type<br>Item no.          | 33_MMCX-SMA-50-2/111_NE<br>22658203   |
|-------------|-------------------------------|---|
| MMCX<br>SMA | plug (m)<br>jack (f)          |  |
| Material    | CuBe/SUPR                     |   |
| VSWR        | DC to 3.5 GHz<br>3.5 to 6 GHz | ≤ 1.065<br>≤ 1.094  |

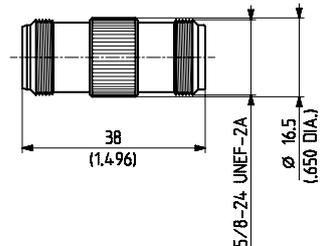
| 257            | H+S type<br>Item no.         | 33_PC185-MMPX-50-2/199_NE<br>84132750   |
|----------------|------------------------------|---|
| PC1.85<br>MMPX | plug (m)<br>jack (f)         |  |
| Material       | stainless steel              |   |
| VSWR           | DC to 15 GHz<br>15 to 67 GHz | ≤ 1.106<br>≤ 1.173  |

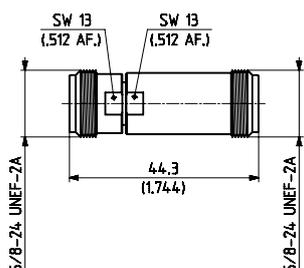
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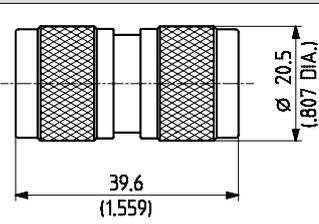
# Adapters

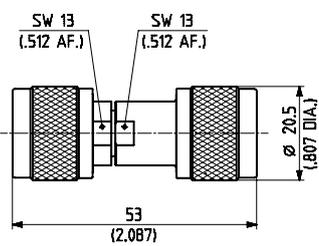
| 259                 | H+S type<br>Item no.  | 33_MMPX-SK-50-1/199_NE<br>84071648  |
|---------------------|---|---|
| MMPX<br>SK (292 mm) | plug (m)<br>jack (f)  |  |
| El. length          | 16.1 mm   |   |
| Material            | stainless steel   |   |
| VSWR                | DC to 15 GHz: ≤ 1.105<br>15 to 30 GHz: ≤ 1.152<br>30 to 40 GHz: ≤ 1.222 |   |

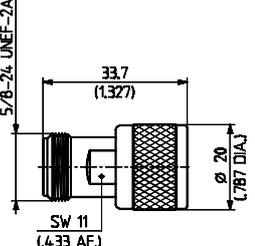
| 259                 | H+S type<br>Item no.  | 33_SK-MMPX-50-1/199_NE<br>84071696   |
|---------------------|---|--|
| SK (292 mm)<br>MMPX | plug (m)<br>jack (f)  |  |
| El. length          | 16.1 mm   |  |
| Material            | stainless steel   |  |
| VSWR                | DC to 15 GHz: ≤ 1.105<br>15 to 30 GHz: ≤ 1.152<br>30 to 40 GHz: ≤ 1.222 |  |

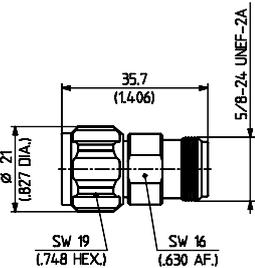
| 276      | H+S type<br>Item no.   | 31_N-50-0-2/133_NE<br>22542382  |
|----------|--|---|
| N        | jack (f) 2 ×   |  |
| Material | brass/SUCO   |   |
| VSWR     | DC to 2 GHz: ≤ 1.07<br>2 to 8 GHz: ≤ 1.43<br>8 to 12.4 GHz: ≤ 1.92 |   |

| 276      | H+S type<br>Item no.                  | 31_N-50-0-51/199_NE<br>22652112   |
|----------|---------------------------------------|---|
| N        | jack (f) 2 ×                          |  |
| Material | stainless steel                       |   |
| VSWR     | DC to 18 GHz: ≤ 1.03 + 0.01 · f (GHz) |   |

| 276      | H+S type<br>Item no.  | 32_N-50-0-1/133_NE<br>22542398  |
|----------|---|---|
| N        | plug (m) 2 ×  |  |
| Material | brass/SUCO  |   |
| VSWR     | DC to 9 GHz: ≤ 1.06 + 0.04 · f (GHz)<br>9 to 12 GHz: ≤ 1.40 |   |

| 276      | H+S type<br>Item no.                  | 32_N-50-0-51/193_NE<br>22652113  |
|----------|---------------------------------------|--|
| N        | plug (m) 2 ×                          |  |
| Material | stainless steel                       |  |
| VSWR     | DC to 18 GHz: ≤ 1.03 + 0.01 · f (GHz) |  |

| 276      | H+S type<br>Item no.   | 33_N-Q50-0-4/133_NE<br>22660297   |
|----------|--|---|
| N        | plug (m)<br>quick-mate<br>jack (f)                               |  |
| Material | brass/SUCO   |   |
| VSWR     | DC to 5 GHz: ≤ 1.07<br>5 to 8 GHz: ≤ 1.22<br>8 to 11 GHz: ≤ 1.28 |   |

| 276      | H+S type<br>Item no.                  | 33_N-50-0-7/133_NE<br>23014355  |
|----------|---------------------------------------|---|
| N        | plug (m) 1 ×<br>jack (f) 1 ×          |  |
| Material | brass/SUCO                            |   |
| VSWR     | DC to 18 GHz: ≤ 1.03 + 0.05 · f (GHz) |   |

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| 276      | H+S type<br>Item no.               | 33_N-Q50-0-14/13_NE<br>23003160 |
|----------|------------------------------------|---------------------------------|
| N        | plug (m)<br>quick-mate<br>jack (f) |                                 |
| Material | brass/SUCO                         |                                 |
| VSWR     | DC to 4 GHz<br>4 to 8 GHz          | ≤ 1.12<br>≤ 1.22                |

| 276           | H+S type<br>Item no. | 34_N-50-0-3/133_NE<br>22642946 |
|---------------|----------------------|--------------------------------|
| N             | jack (f) 2 ×         |                                |
| Material      | brass/SUCO           |                                |
| Mounting hole | ML 12                |                                |
| VSWR          | DC to 11 GHz         | ≤ 1.08 + 0.13 · f (GHz)        |

| 276      | H+S type<br>Item no. | 33_N-50-0-51/193_NE<br>22652114 |
|----------|----------------------|---------------------------------|
| N        | plug (m)<br>jack (f) |                                 |
| Material | stainless steel      |                                 |
| VSWR     | DC to 18 GHz         | ≤ 1.03 + 0.01 · f (GHz)         |

| 276           | H+S type<br>Item no. | 34_N-50-0-51/193_NE<br>22544593 |
|---------------|----------------------|---------------------------------|
| N             | jack (f) 2 ×         |                                 |
| Material      | stainless steel      |                                 |
| Mounting hole | ML 12                |                                 |
| VSWR          | DC to 18 GHz         | ≤ 1.03 + 0.01 · f (GHz)         |

| 276                     | H+S type<br>Item no. | 33_N-50-0-52/199_UE<br>22648921 |
|-------------------------|----------------------|---------------------------------|
| N                       | plug (m)<br>jack (f) |                                 |
| Quick-screw (male side) |                      |                                 |
| Material                | stainless steel      |                                 |
| VSWR                    | DC to 18 GHz         | ≤ 1.03 + 0.01 · f (GHz)         |

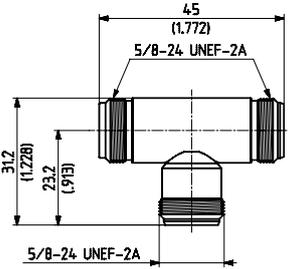
| 276           | H+S type<br>Item no. | 37_N-50-0-1/133_NE<br>22542437 |
|---------------|----------------------|--------------------------------|
| N             | jack (f) 2 ×         |                                |
| Material      | brass/SUCO           |                                |
| Mounting hole | ML 14                |                                |
| VSWR          | DC to 12.4 GHz       | ≤ 1.19 + 0.06 · f (GHz)        |

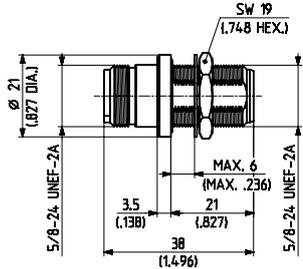
| 276           | H+S type<br>Item no. | 34_N-50-0-1/133_NE<br>22542435 |
|---------------|----------------------|--------------------------------|
| N             | jack (f) 2 ×         |                                |
| Material      | brass/SUCO           |                                |
| Mounting hole | ML 12                |                                |
| VSWR          | DC to 12.4 GHz       | ≤ 1.06 + 0.17 · f (GHz)        |

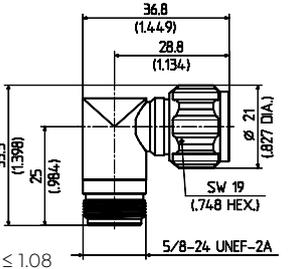
| 276      | H+S type<br>Item no.         | 43_N-50-0-1/133_NE<br>22542442 |
|----------|------------------------------|--------------------------------|
| N        | jack (f) 2 ×<br>plug (m) 1 × |                                |
| Material | brass/SUCO                   |                                |

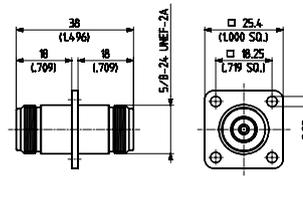
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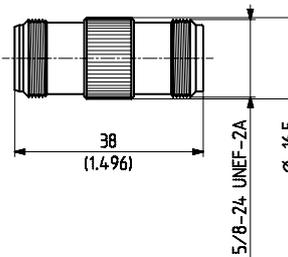
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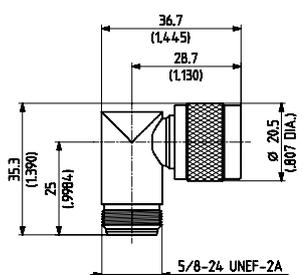
| 276      | H+S type<br>Item no. | 46_N-50-0-1/133_NE<br>22542445  |
|----------|----------------------|---|
| N        | jack (f) 3 ×         |  |
| Material | brass/SUCO           |   |

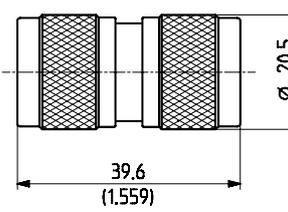
| 276           | H+S type<br>Item no. | 34_N-75-0-1/133_NE<br>22542631  |
|---------------|----------------------|---|
| N             | jack (f) 2 ×         |  |
| Material      | brass/SUCO           |   |
| Mounting hole | ML 12                |   |

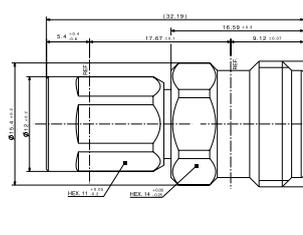
| 276      | H+S type<br>Item no.                    | 53_N-50-0-4/133_NE<br>22651447   |
|----------|---|--|
| N        | plug (m)<br>jack (f)                    |  |
| Material | brass/SUCO                              |  |
| VSWR     | DC to 2 GHz<br>2 to 6 GHz<br>6 to 8 GHz | ≤ 1.08<br>≤ 1.22<br>≤ 1.29   |

| 276           | H+S type<br>Item no. | 37_N-75-0-1/133_NE<br>22542633   |
|---------------|----------------------|--|
| N             | jack (f) 2 ×         |  |
| Material      | brass/SUCO           |  |
| Mounting hole | ML 14                |  |

| 276      | H+S type<br>Item no. | 31_N-75-0-2/133_NE<br>22542612  |
|----------|----------------------|---|
| N        | jack (f) 2 ×         |  |
| Material | brass/SUCO           |   |

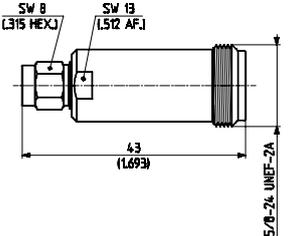
| 276      | H+S type<br>Item no. | 53_N-75-0-4/133_NE<br>22651799  |
|----------|----------------------|---|
| N        | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |

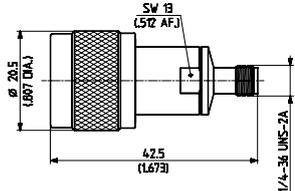
| 276      | H+S type<br>Item no. | 32_N-75-0-1/133_NE<br>22542618  |
|----------|----------------------|---|
| N        | plug (m) 2 ×         |  |
| Material | brass/SUCO           |   |

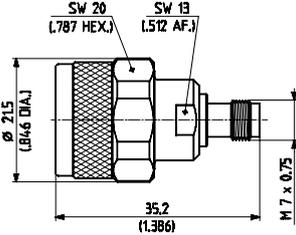
| 277        | H+S type<br>Item no.         | 33_NEX10-N-50-X1/1-3_NE<br>85095344   |
|------------|------------------------------|---|
| NEX10<br>N | plug (male)<br>jack (female) |  |
| Material   | brass/SUCO<br>brass/SUCO     |   |

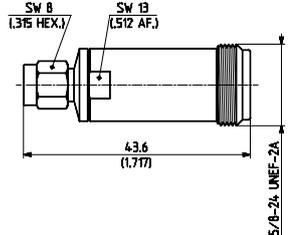
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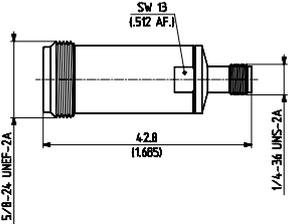
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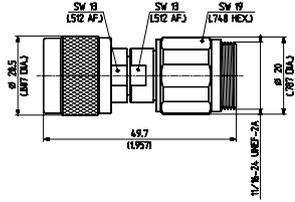
| 280        | H+S type<br>Item no.         | 33_PC24-N-50-1/199_UE<br>22650021   |
|------------|------------------------------|---|
| PC2.4<br>N | plug (m)<br>jack (f)         |  |
| Material   | stainless steel              |   |
| VSWR       | DC to 10 GHz<br>10 to 18 GHz | ≤ 1.05<br>≤ 1.08  |

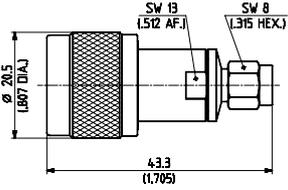
| 282        | H+S type<br>Item no.             | 33_N-PC35-50-1/1--_UE<br>22643959   |
|------------|----------------------------------|---|
| N<br>PC3.5 | plug (m)<br>jack (f)             |  |
| Material   | stainless steel                  |   |
| VSWR       | DC to 12.4 GHz<br>12.4 to 18 GHz | ≤ 1.10<br>≤ 1.15  |

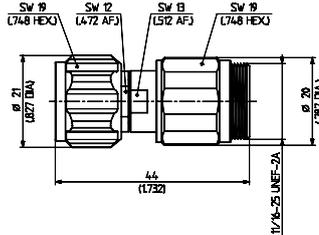
| 280        | H+S type<br>Item no.         | 33_N-PC24-50-1/199_UE<br>22649932  |
|------------|------------------------------|--|
| N<br>PC2.4 | plug (m)<br>jack (f)         |  |
| Material   | stainless steel              |  |
| VSWR       | DC to 10 GHz<br>10 to 18 GHz | ≤ 1.05<br>≤ 1.08   |

| 282        | H+S type<br>Item no.             | 33_PC35-N-50-1/1--_UE<br>22643958  |
|------------|----------------------------------|--|
| PC3.5<br>N | plug (m)<br>jack (f)             |  |
| Material   | stainless steel                  |  |
| VSWR       | DC to 12.4 GHz<br>12.4 to 18 GHz | ≤ 1.10<br>≤ 1.15   |

| 282        | H+S type<br>Item no.             | 31_N-PC35-50-1/1--_UE<br>22643960   |
|------------|----------------------------------|---|
| N<br>PC3.5 | jack (f)<br>jack (f)             |  |
| Material   | stainless steel                  |   |
| VSWR       | DC to 12.4 GHz<br>12.4 to 18 GHz | ≤ 1.10<br>≤ 1.15  |

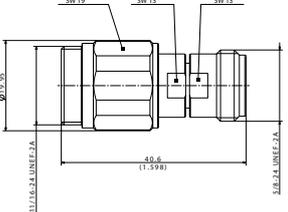
| 283      | H+S type<br>Item no. | 32_N-PC7-50-1/1--_UE<br>22543571  |
|----------|----------------------|---|
| N<br>PC7 | plug (m)             |  |
| Material | N<br>PC7             | stainless steel<br>brass/gold   |
| VSWR     | DC to 18 GHz         | ≤ 1.02 + 0.002 · f (GHz)  |

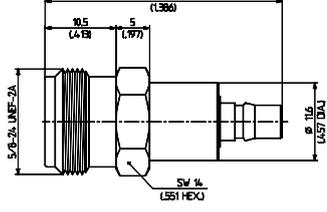
| 282        | H+S type<br>Item no.             | 32_N-PC35-50-1/1--_UE<br>22643957   |
|------------|----------------------------------|---|
| N<br>PC3.5 | plug (m)<br>plug (m)             |  |
| Material   | stainless steel                  |   |
| VSWR       | DC to 12.4 GHz<br>12.4 to 18 GHz | ≤ 1.10<br>≤ 1.15  |

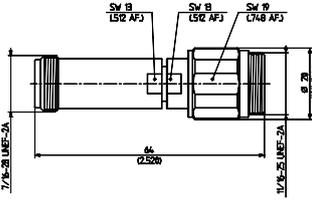
| 283        | H+S type<br>Item no.                     | 32_N-PC7-50-6/1--_NE<br>23032917  |
|------------|--|---|
| N<br>PC7   | plug (m)                                 |  |
| El. length | 41.85 mm                                 |   |
| Material   | N<br>PC7                                 | stainless steel<br>brass/gold   |
| VSWR       | DC to 3 GHz<br>3 to 6 GHz<br>6 to 11 GHz | ≤ 1.03<br>≤ 1.05<br>≤ typ. 1.12   |

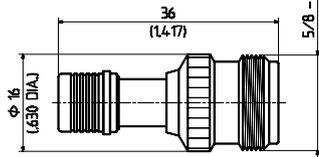
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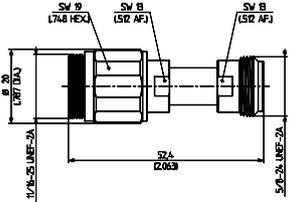
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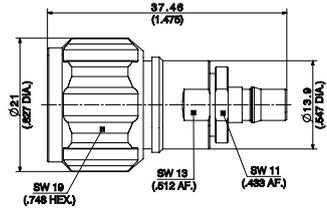
| 293                  | H+S type<br>Item no.          | 33_PC7-N-50-1/1--_UE<br>22543547  |
|----------------------|-------------------------------|---|
| PC7<br>N             | jack (f)                      |  |
| Material<br>PC7<br>N | brass/gold<br>stainless steel |   |
| VSWR                 | DC to 18 GHz                  | $\leq 1.02 + 0.002 \cdot f$ (GHz)   |

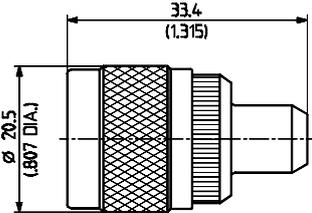
| 285      | H+S type<br>Item no.          | 31_N-QMA-50-1/1--_NE<br>23027960  |
|----------|-------------------------------|---|
| N<br>QMA | jack (f)<br>jack (f)          |  |
| Material | stainless steel               |   |
| VSWR     | DC to 2.5 GHz<br>2.5 to 6 GHz | $\leq 1.036$<br>$\leq 1.135$  |

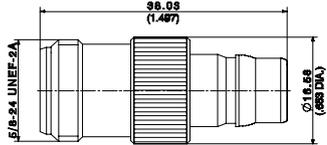
| 283                  | H+S type<br>Item no.          | 33_PC7-N-50-5/-33_NE<br>23004036   |
|----------------------|-------------------------------|--|
| PC7<br>N             | jack (f)                      |  |
| Material<br>PC7<br>N | brass/gold<br>stainless steel |  |
| VSWR                 | DC to 18 GHz                  | $\leq 1.03 + 0.002 \cdot f$ (GHz)  |

| 285      | H+S type<br>Item no. | 33_QMA-N-50-1/133_NE<br>23023143   |
|----------|----------------------|--|
| QMA<br>N | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |  |
| VSWR     | DC to 6 GHz          | $\leq 1.04$  |

| 283                  | H+S type<br>Item no.                     | 33_PC7-N-50-6/1--_NE<br>23032916  |
|----------------------|--|---|
| PC7<br>N             | jack (f)                                 |  |
| El. length           | 41.85 mm                                 |   |
| Material<br>PC7<br>N | brass/gold<br>stainless steel            |   |
| VSWR                 | DC to 3 GHz<br>3 to 6 GHz<br>6 to 11 GHz | $\leq 1.03$<br>$\leq 1.05$<br>$\leq \text{typ. } 1.12$                              |

| 285      | H+S type<br>Item no. | 33_N-QMA-50-1/133_NE<br>23024265  |
|----------|----------------------|---|
| N<br>QMA | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 6 GHz          | $\leq 1.04$   |

| 284                  | H+S type<br>Item no.       | 33_N-QLA-01-1/1--_NE<br>22542431  |
|----------------------|----------------------------|---|
| N<br>QLA             | plug (m)<br>jack (f)       |  |
| Material<br>N<br>QLA | brass/SUCO<br>brass/nickel |   |

| 286      | H+S type<br>Item no.                     | 31_N-QN-50-1/133_NE<br>84016830   |
|----------|--|---|
| N<br>QN  | jack (f)<br>jack (f)                     |  |
| Material | brass/SUCO                               |   |
| VSWR     | DC to 2 GHz<br>2 to 6 GHz<br>6 to 11 GHz | $\leq 1.05$<br>$\leq 1.3$<br>$\leq 1.5$   |

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| 286      | H+S type<br>Item no.                     | 32_N-QN-50-1/133_NE<br>23033962 |
|----------|--|---------------------------------|
| N<br>QN  | plug (m)<br>plug (m)                     |                                 |
| Material | brass/SUCO                               |                                 |
| VSWR     | DC to 4 GHz<br>4 to 8 GHz<br>8 to 10 GHz | ≤ 1.035<br>≤ 1.06<br>≤ 1.22     |

| 287      | H+S type<br>Item no. | 32_N-SMA-50-1/11-_NE<br>22542399 |
|----------|----------------------|----------------------------------|
| N<br>SMA | plug (m)<br>plug (m) |                                  |
| Material | N<br>SMA             | brass/SUCO<br>CuBe/gold*         |
| VSWR     | DC to 12.4 GHz       | ≤ 1.05 + 0.017 · f (GHz)         |

| 286      | H+S type<br>Item no. | 33_QN-N-50-1/133_NE<br>23036033 |
|----------|----------------------|---------------------------------|
| QN<br>N  | plug (m)<br>jack (f) |                                 |
| Material | brass/SUCO           |                                 |

| 287      | H+S type<br>Item no. | 32_N-SMA-50-51/1--_UE<br>22543916 |
|----------|----------------------|-----------------------------------|
| N<br>SMA | plug (m)<br>plug (m) |                                   |
| Material | N<br>SMA             | stainless steel<br>CuBe/gold      |
| VSWR     | DC to 18 GHz         | ≤ 1.025 + 0.007 · f (GHz)         |

| 287      | H+S type<br>Item no. | 31_N-SMA-50-1/1--_UE<br>22542386 |
|----------|----------------------|----------------------------------|
| N<br>SMA | jack (f)<br>jack (f) |                                  |
| Material | N<br>SMA             | brass/SUCO<br>CuBe/gold*         |
| VSWR     | DC to 12.4 GHz       | ≤ 1.05 + 0.015 · f (GHz)         |

| 287      | H+S type<br>Item no. | 33_N-SMA-50-1/113_UE<br>22542421 |
|----------|----------------------|----------------------------------|
| N<br>SMA | plug (m)<br>jack (f) |                                  |
| Material | N<br>SMA             | brass/SUCO<br>CuBe/gold*         |
| VSWR     | DC to 12.4 GHz       | ≤ 1.05 + 0.015 · f (GHz)         |

| 287      | H+S type<br>Item no. | 31_N-SMA-50-51/1--_NE<br>22660178 |
|----------|----------------------|-----------------------------------|
| N<br>SMA | jack (f)<br>jack (f) |                                   |
| Material | N<br>SMA             | stainless steel<br>CuBe/gold      |
| VSWR     | DC to 18 GHz         | ≤ 1.025 + 0.007 · f (GHz)         |

| 287      | H+S type<br>Item no. | 33_SMA-N-50-1/1--_UE<br>22640154 |
|----------|----------------------|----------------------------------|
| SMA<br>N | plug (m)<br>jack (f) |                                  |
| Material | SMA<br>N             | CuBe/gold<br>brass/SUCO          |
| VSWR     | DC to 12.4 GHz       | ≤ 1.05 + 0.015 · f (GHz)         |

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# Adapters

| 287                  | H+S type<br>Item no.               | 33_SMA-N-Q50-4/1-3_NE<br>22660211 |
|----------------------|------------------------------------|-----------------------------------|
| SMA<br>N             | plug (m)<br>quick-mate<br>jack (f) |                                   |
| Material<br>SMA<br>N | CuBe/SUPR<br>brass/SUCO            |                                   |
| VSWR                 | DC to 6 GHz<br>6 to 12.4 GHz       | ≤ 1.07<br>≤ 1.18                  |

| 287                  | H+S type<br>Item no.         | 33_N-SMA-50-51/1--_NE<br>22660180 |
|----------------------|------------------------------|-----------------------------------|
| N<br>SMA             | plug (m)<br>jack (f)         |                                   |
| Material<br>N<br>SMA | stainless steel<br>CuBe/gold |                                   |
| VSWR                 | DC to 18 GHz                 | ≤ 1.025 + 0.007 · f (GHz)         |

| 287                  | H+S type<br>Item no.         | 33_SMA-N-50-51/1--_NE<br>22660181 |
|----------------------|------------------------------|-----------------------------------|
| SMA<br>N             | plug (m)<br>jack (f)         |                                   |
| Material<br>SMA<br>N | CuBe/gold<br>stainless steel |                                   |
| VSWR                 | DC to 18 GHz                 | ≤ 1.025 + 0.007 · f (GHz)         |

| 287                          | H+S type<br>Item no.     | 34_N-SMA-50-1/193_UE<br>22642820 |
|------------------------------|--------------------------|----------------------------------|
| N<br>SMA                     | jack (f)<br>jack (f)     |                                  |
| Material<br>Mounting<br>hole | stainless steel<br>ML 12 |                                  |
| VSWR                         | DC to 12.4 GHz           | ≤ 1.05 + 0.017 · f (GHz)         |

| 287                                      | H+S type<br>Item no.                | 37_N-SMA-50-1/1--_UE<br>22543458 |
|--|-------------------------------------|----------------------------------|
| N<br>SMA                                 | jack (f)<br>jack (f)                |                                  |
| Material<br>N<br>SMA<br>Mounting<br>hole | brass/SUCO<br>CuBe/gold<br>ML 13/14 |                                  |
| VSWR                                     | DC to 12.4 GHz                      | ≤ 1.05 + 0.015 · f (GHz)         |

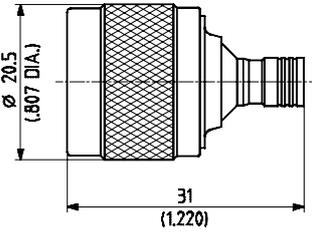
| 287                  | H+S type<br>Item no.         | 37_N-SMA-50-51/1--_NE<br>22645162 |
|----------------------|------------------------------|-----------------------------------|
| N<br>SMA             | jack (f)<br>jack (f)         |                                   |
| Material<br>N<br>SMA | stainless steel<br>CuBe/gold |                                   |
| VSWR                 | DC to 18 GHz                 | ≤ 1.025 + 0.007 · f (GHz)         |

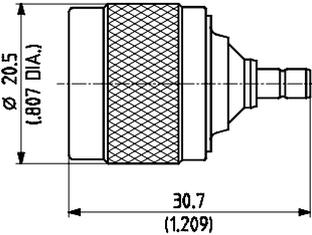
| 287                                      | H+S type<br>Item no.                | 39_SMA-N-50-1/1--_NE<br>22640156 |
|--|-------------------------------------|----------------------------------|
| SMA<br>N                                 | plug (m)<br>jack (f)                |                                  |
| Material<br>SMA<br>N<br>Mounting<br>hole | CuBe/gold<br>brass/SUCO<br>ML 13/14 |                                  |
| VSWR                                     | DC to 12.4 GHz                      | ≤ 1.05 + 0.015 · f (GHz)         |

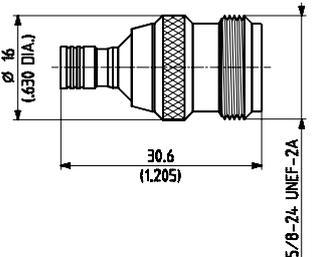
| 288                  | H+S type<br>Item no.      | 31_N-SMB-50-1/1--_UE<br>22542387 |
|----------------------|---------------------------|----------------------------------|
| N<br>SMB             | jack (f)<br>jack (f)      |                                  |
| Material<br>N<br>SMB | brass/SUCO<br>brass/gold  |                                  |
| VSWR                 | DC to 3 GHz<br>3 to 4 GHz | ≤ 1.03 + 0.08 · f (GHz) ≤ 1.27   |

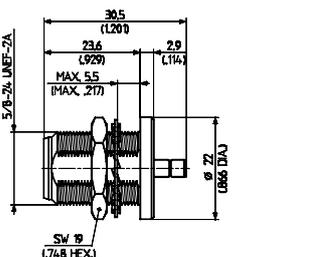
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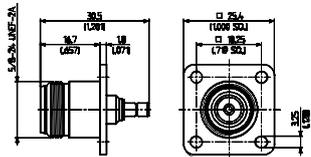
# Adapters

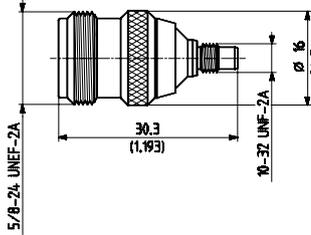
| 288                  | H+S type<br>Item no.      | 32_N-SMB-50-1/1--_UE<br>22542400  |
|----------------------|---------------------------|---|
| N<br>SMB             | plug (m)<br>plug (m)      |  |
| Material<br>N<br>SMB | brass/SUCO<br>brass/gold  |   |
| VSWR                 | DC to 3 GHz<br>3 to 4 GHz | $\leq 1.03 + 0.08 \cdot f$ (GHz)<br>$\leq 1.27$                                   |

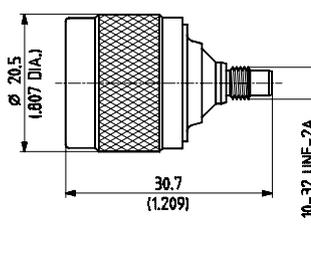
| 288                  | H+S type<br>Item no.      | 33_N-SMB-50-1/1--_UE<br>22542422   |
|----------------------|---------------------------|--|
| N<br>SMB             | plug (m)<br>jack (f)      |  |
| Material<br>N<br>SMB | brass/SUCO<br>brass/gold  |  |
| VSWR                 | DC to 3 GHz<br>3 to 4 GHz | $\leq 1.03 + 0.08 \cdot f$ (GHz) $\leq 1.27$                                       |

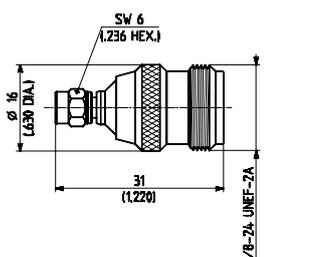
| 288                  | H+S type<br>Item no.      | 33_SMB-N-50-1/1--_UE<br>22640394  |
|----------------------|---------------------------|---|
| SMB<br>N             | plug (m)<br>jack (f)      |  |
| Material<br>SMB<br>N | brass/gold<br>brass/SUCO  |   |
| VSWR                 | DC to 3 GHz<br>3 to 4 GHz | $\leq 1.03 + 0.08 \cdot f$ (GHz)<br>$\leq 1.27$                                     |

| 288                                      | H+S type<br>Item no.              | 34_N-SMB-50-1/1--_UE<br>22642272  |
|--|-----------------------------------|---|
| N<br>SMB                                 | jack (f)<br>jack (f)              |  |
| Material<br>N<br>SMB<br>Mounting<br>hole | brass/SUCO<br>brass/gold<br>ML 12 |   |
| VSWR                                     | DC to 4 GHz                       | $\leq 1.22$   |

| 288                                      | H+S type<br>Item no.              | 37_N-SMB-50-1/1--_UE<br>22641514  |
|--|-----------------------------------|---|
| N<br>SMB                                 | jack (f)<br>jack (f)              |  |
| Material<br>N<br>SMB<br>Mounting<br>hole | brass/SUCO<br>brass/gold<br>ML 14 |   |
| VSWR                                     | DC to 4 GHz                       | $\leq 1.06 + 0.08 \cdot f$ (GHz)  |

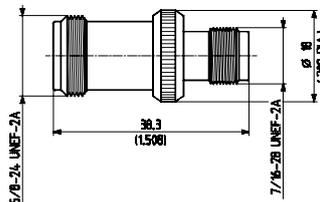
| 289                  | H+S type<br>Item no.                     | 31_N-SMC-50-1/1--_NE<br>22542389   |
|----------------------|--|--|
| N<br>SMC             | jack (f)<br>jack (f)                     |  |
| Material<br>N<br>SMC | brass/SUCO<br>brass/gold                 |  |
| VSWR                 | DC to 2 GHz<br>2 to 4 GHz<br>4 to 10 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.40$  |

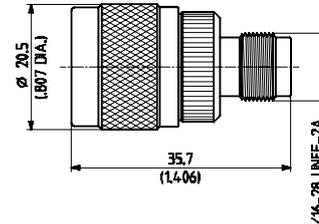
| 289                  | H+S type<br>Item no.                     | 33_N-SMC-50-1/1--_NE<br>22542423  |
|----------------------|--|---|
| N<br>SMC             | plug (m)<br>jack (f)                     |  |
| Material<br>N<br>SMC | brass/SUCO<br>brass/SUCO                 |   |
| VSWR                 | DC to 2 GHz<br>2 to 4 GHz<br>4 to 10 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.40$   |

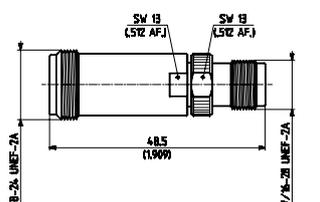
| 289                  | H+S type<br>Item no.                     | 33_SMC-N-50-1/1--_NE<br>22640406  |
|----------------------|--|---|
| SMC<br>N             | plug (m)<br>jack (f)                     |  |
| Material<br>SMC<br>N | brass/gold<br>brass/SUCO                 |   |
| VSWR                 | DC to 2 GHz<br>2 to 4 GHz<br>4 to 10 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.40$   |

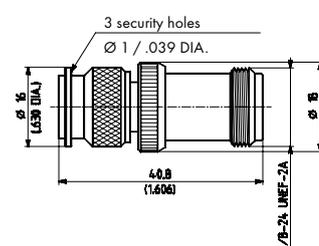
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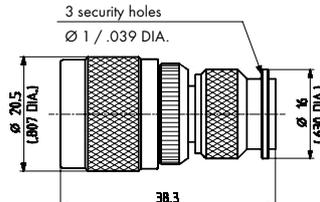
# Adapters

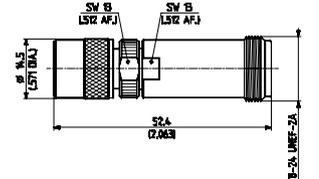
| 294      | H+S type<br>Item no.       | 31_N-TNC-50-1/133_UE<br>22542392  |
|----------|----------------------------|---|
| N<br>TNC | jack (f)<br>jack (f)       |  |
| Material | brass/SUCO                 |   |
| VSWR     | DC to 7 GHz<br>7 to 11 GHz | $\leq 1.06 + 0.12 \cdot f \text{ (GHz)} \leq 1.90$                                |

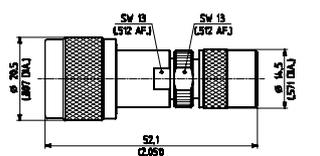
| 294      | H+S type<br>Item no. | 33_N-TNC-50-1/133_NE<br>22542427  |
|----------|----------------------|---|
| N<br>TNC | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 11 GHz         | $\leq 1.13 + 0.02 \cdot f \text{ (GHz)}$  |

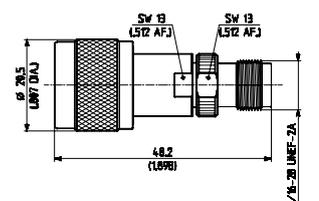
| 294      | H+S type<br>Item no. | 31_N-TNC-50-51/1--_UE<br>22543954  |
|----------|----------------------|--|
| N<br>TNC | jack (f)<br>jack (f) |  |
| Material | stainless steel      |  |
| VSWR     | DC to 12.4 GHz       | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$   |

| 294      | H+S type<br>Item no.                         | 33_TNC-N-50-1/133_UE<br>22640637   |
|----------|--|--|
| TNC<br>N | plug (m)<br>jack (f)                         |  |
| Material | brass/SUCO                                   |  |
| VSWR     | DC to 3 GHz<br>3 to 5.5 GHz<br>5.5 to 11 GHz | $\leq 1.05$<br>$\leq 1.18$<br>$\leq 2.00$  |

| 294      | H+S type<br>Item no. | 32_N-TNC-50-1/---_UE<br>22542406  |
|----------|----------------------|---|
| N<br>TNC | plug (m)<br>plug (m) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 11 GHz         | $\leq 1.06 + 0.11 \cdot f \text{ (GHz)}$  |

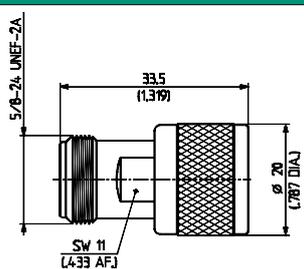
| 294      | H+S type<br>Item no. | 33_TNC-N-50-51/---_UE<br>22544046   |
|----------|----------------------|---|
| TNC<br>N | plug (m)<br>jack (f) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 12.4 GHz       | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$  |

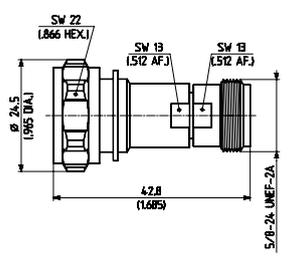
| 294      | H+S type<br>Item no. | 32_N-TNC-50-51/1--_UE<br>22543953   |
|----------|----------------------|---|
| N<br>TNC | plug (m)<br>plug (m) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 12.4 GHz       | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$  |

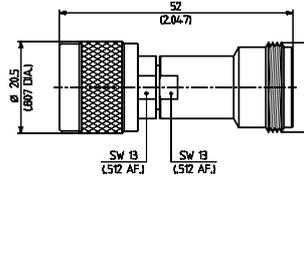
| 294      | H+S type<br>Item no. | 33_N-TNC-50-51/1--_UE<br>22543955   |
|----------|----------------------|---|
| N<br>TNC | plug (m)<br>jack (f) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 12.4 GHz       | $\leq 1.05 + 0.01 \cdot f \text{ (GHz)}$  |

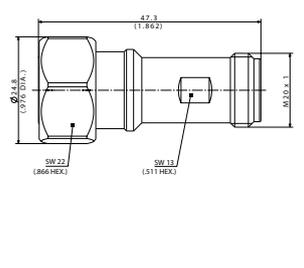
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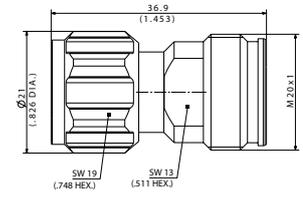
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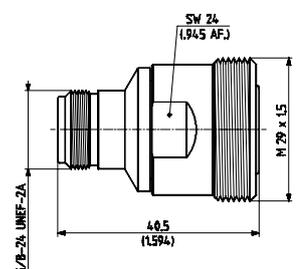
| 294      | H+S type<br>Item no.                     | 33_TNC-N-Q50-4/133_NE<br>22660360   |
|----------|--|---|
| TNC<br>N | plug (m)<br>quick-mate<br>jack (f)       |  |
| Material | brass/SUCO                               |   |
| VSWR     | DC to 4 GHz<br>4 to 8 GHz<br>8 to 11 GHz | ≤ 1.065<br>≤ 1.12<br>≤ 1.28   |

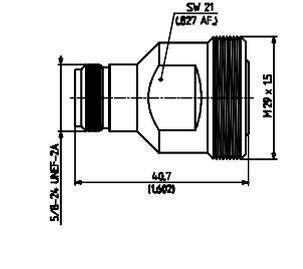
| 295          | H+S type<br>Item no.          | 33_4195-N-50-1/---_UE<br>22646154  |
|--------------|-------------------------------|--|
| 4.1/9.5<br>N | plug (m)<br>jack (f)          |  |
| Material     | brass/SUCO<br>stainless steel |  |
| VSWR         | DC to 6 GHz<br>6 to 14 GHz    | ≤ 1.05<br>≤ 1.12   |

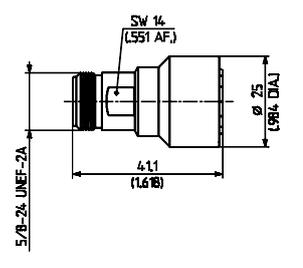
| 294          | H+S type<br>Item no.          | 33_N-4195-50-51/1-3_UE<br>22648618  |
|--------------|-------------------------------|---|
| N<br>4.1/9.5 | plug (m)<br>jack (f)          |  |
| Material     | stainless steel<br>brass/SUCO |   |
| VSWR         | DC to 6 GHz<br>6 to 14 GHz    | ≤ 1.05<br>≤ 1.12  |

| 296         | H+S type<br>Item no.      | 33_4310-N-50-X1/133_NE<br>85017229  |
|-------------|---------------------------|---|
| 4.3-10<br>N | plug (m)<br>jack (f)      |  |
| Material    | brass                     |   |
| VSWR        | DC to 4 GHz<br>4 to 6 GHz | ≤ 1.032<br>≤ 1.052  |

| 296         | H+S type<br>Item no.      | 33_N-4310-50-1/133_NE<br>85017232   |
|-------------|---------------------------|---|
| N<br>4.3-10 | plug (m)<br>jack (f)      |  |
| Material    | brass                     |   |
| VSWR        | DC to 4 GHz<br>4 to 6 GHz | ≤ 1.032<br>≤ 1.052  |

| 297       | H+S type<br>Item no. | 31_N-716-50-1/---_UE<br>22640869   |
|-----------|----------------------|--|
| N<br>7/16 | jack (f)<br>jack (f) |  |
| Material  | brass/SUCO           |  |
| VSWR      | DC to 7.5 GHz        | ≤ 1.03 + 0.02  |

| 297       | H+S type<br>Item no. | 31_N-716-50-2/133_WE<br>22658137  |
|-----------|----------------------|---|
| N<br>7/16 | jack (f)<br>jack (f) |  |
| Material  | brass/SUCO           |   |
| PIM:      |                      | ≤ -165 dBc  |

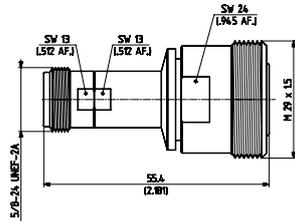
| 297       | H+S type<br>Item no.               | 31_716-N-Q50-1/1-3_NE<br>23008294   |
|-----------|------------------------------------|---|
| 7/16<br>N | jack (f)<br>quick-mate<br>jack (f) |  |
| Material  | brass/SUCO                         |   |
| VSWR      | DC to 6 GHz                        | ≤ 1.02 + 0.04 · f (GHz)   |

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| 297 | H+S type | 31_N-716-50-51/-33_NE |
|-----|----------|-----------------------|
|     | Item no. | 22544129              |

N jack (f)  
7/16 jack (f)

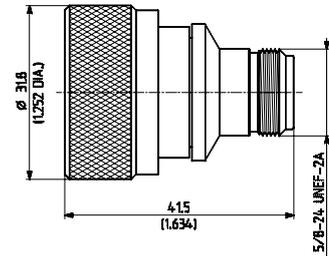


Material brass/SUCO

VSWR DC to 7.5 GHz  $\leq 1.03 + 0.004 \cdot f$  (GHz)

| 297 | H+S type | 33_716-N-50-1/---_UE |
|-----|----------|----------------------|
|     | Item no. | 22544119             |

7/16 plug (m)  
N jack (f)

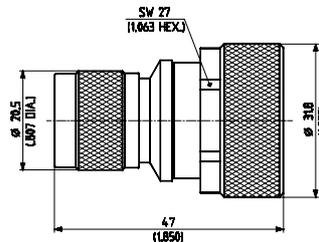


Material 7/16 brass/silver  
N brass/SUCO

VSWR DC to 7.5 GHz:  $\leq 1.03 + 0.02 \cdot f$  (GHz)

| 297 | H+S type | 32_N-716-50-1/---_NE |
|-----|----------|----------------------|
|     | Item no. | 22544576             |

N plug (m)  
7/16 plug (m)

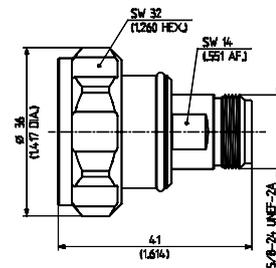


Material N brass/SUCO  
7/16 brass/silver

VSWR DC to 7.5 GHz  $\leq 1.03 + 0.02 \cdot f$  (GHz)

| 297 | H+S type | 33_716-N-50-3/133_WE |
|-----|----------|----------------------|
|     | Item no. | 22658823             |

7/16 male (m)  
N jack (f)

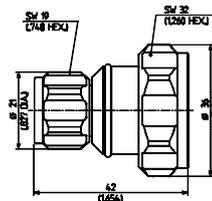


Material brass/SUCO

PIM:  $\leq -165$  dBc

| 297 | H+S type | 32_N-716-50-2/133_WE |
|-----|----------|----------------------|
|     | Item no. | 22658140             |

N plug (m)  
7/16 plug (m)

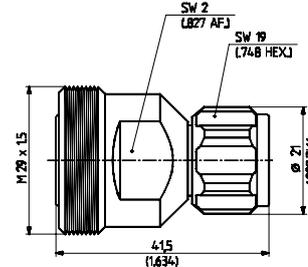


Material brass/SUCO

PIM:  $\leq -165$  dBc

| 297 | H+S type | 33_N-716-50-3/133_WE |
|-----|----------|----------------------|
|     | Item no. | 22658217             |

N plug (m)  
7/16 jack (f)

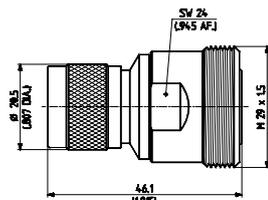


Material brass/SUCO

PIM:  $\leq -165$  dBc

| 297 | H+S type | 33_N-716-50-1/---_UE |
|-----|----------|----------------------|
|     | Item no. | 22641229             |

N plug (m)  
7/16 jack (f)

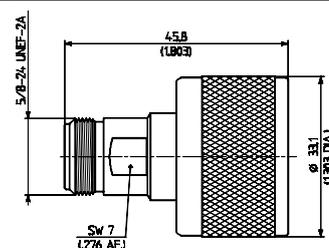


Material N brass/SUCO  
7/16 brass/silver

VSWR DC to 7.5 GHz  $\leq 1.03 + 0.02 \cdot f$  (GHz)

| 297 | H+S type | 33_716-N-Q50-4/133_UE |
|-----|----------|-----------------------|
|     | Item no. | 23000487              |

7/16 plug (m)  
N quick-mate jack (f)



Material brass/SUCO

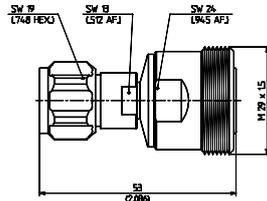
VSWR DC to 4 GHz  $\leq 1.05$   
4 to 7.5 GHz  $\leq 1.15$

# Adapters

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>297</b> | <b>H+S type</b> | <b>33_N-716-50-51/-33_NE</b> |
|            | <b>Item no.</b> | <b>22544123</b>              |

N  
7/16

plug (m)  
jack (f)



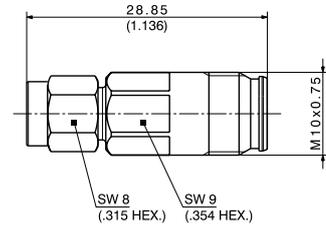
Material brass/SUCO

VSWR DC to 7.5 GHz:  $\leq 1.03 + 0.004 \cdot f$  (GHz)

|            |                 |                                  |
|------------|-----------------|----------------------------------|
| <b>303</b> | <b>H+S type</b> | <b>33_PC35-NEX10-50-1/199_NE</b> |
|            | <b>Item no.</b> | <b>85092475</b>                  |

PC 3.5  
NEX10

plug (male)  
jack (female)

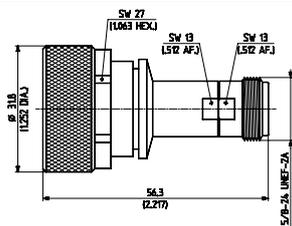


Material  
PC 3.5 stainless steel  
NEX10 stainless steel

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>297</b> | <b>H+S type</b> | <b>33_716-N-50-51/-33 NE</b> |
|            | <b>Item no.</b> | <b>22544125</b>              |

7/16  
N

plug (m)  
jack (f)



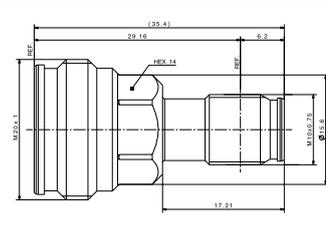
Material brass/SUCO

VSWR DC to 7.5 GHz:  $\leq 1.03 + 0.004 \cdot f$  (GHz)

|            |                 |                                 |
|------------|-----------------|---------------------------------|
| <b>317</b> | <b>H+S type</b> | <b>31_NEX10-4310-50-1/003_E</b> |
|            | <b>Item no.</b> | <b>85137126</b>                 |

NEX10  
4.3-10

jack (female)  
jack (female)

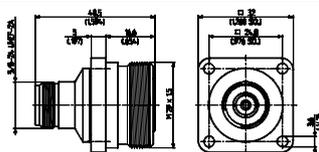


Material  
NEX10 brass/SUCO  
4.3-10 brass/SUCO

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>297</b> | <b>H+S type</b> | <b>37_N-716-50-1/003_E</b> |
|            | <b>Item no.</b> | <b>23001317</b>            |

N  
7/16

jack (f)  
jack (f)



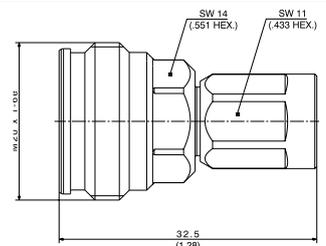
Material brass/silver  
Mounting ML 27  
hole

VSWR DC to 7.5 GHz:  $\leq 1.03 + 0.02 \cdot f$  (GHz)

|            |                 |                                  |
|------------|-----------------|----------------------------------|
| <b>317</b> | <b>H+S type</b> | <b>33_NEX10-4310-50-X1/003_E</b> |
|            | <b>Item no.</b> | <b>85095346</b>                  |

NEX10  
4.3-10

plug (male)  
jack (female)

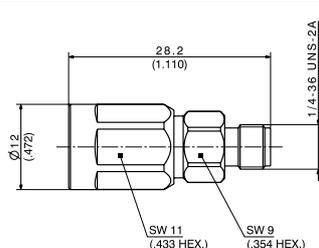


Material  
NEX10 brass/SUCO  
4.3-10 brass/SUCO

|            |                 |                                   |
|------------|-----------------|-----------------------------------|
| <b>303</b> | <b>H+S type</b> | <b>33_NEX10-PC35-50-X1/1-9_NE</b> |
|            | <b>Item no.</b> | <b>85092467</b>                   |

NEX10  
PC 3.5

plug (male)  
jack (female)

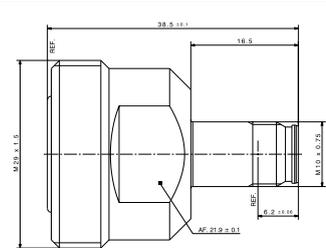


Material  
NEX10 stainless steel  
PC 3.5 stainless steel

|            |                 |                                 |
|------------|-----------------|---------------------------------|
| <b>318</b> | <b>H+S type</b> | <b>31_NEX10-716-50-1/133_WE</b> |
|            | <b>Item no.</b> | <b>85137125</b>                 |

7/16  
NEX10

jack (female)  
jack (female)



Material  
7/16 brass/SUCO  
NEX10 brass/SUCO

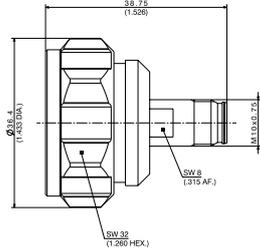
VSWR DC to 3 GHz  $\leq 1.052$   
3 to 6 GHz  $\leq 1.152$

Introduction and general information on page 507 and 508/509.

# Adapters

|            |                 |                                 |
|------------|-----------------|---------------------------------|
| <b>318</b> | <b>H+S type</b> | <b>33_716-NEX10-50-1/133_WE</b> |
|            | <b>Item no.</b> | <b>85092476</b>                 |

7/16 NEX10 plug (male)  
jack (female)

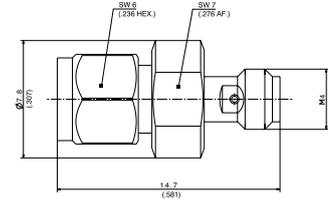


Material 7/16 NEX10 brass/SUCO  
brass/SUCO

VSWR DC to 2 GHz ≤ 1.065  
2 to 6 GHz ≤ 1.119

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>319</b> | <b>H+S type</b> | <b>33_PC1-50-0-1/11_UE</b> |
|            | <b>Item no.</b> | <b>85031288</b>            |

PC1.0 plug (m)  
jack (f)

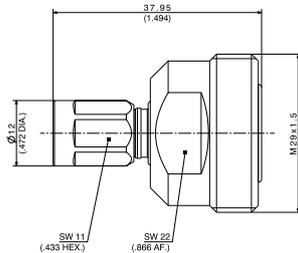


Material CuBe/gold

VSWR DC to 50 GHz ≤ 1.222  
50 to 75 GHz ≤ 1.308  
75 to 110 GHz ≤ 1.377

|            |                 |                                  |
|------------|-----------------|----------------------------------|
| <b>318</b> | <b>H+S type</b> | <b>33_NEX10-716-50-X1/133_WE</b> |
|            | <b>Item no.</b> | <b>85092478</b>                  |

NEX10 7/16 plug (male)  
jack (female)

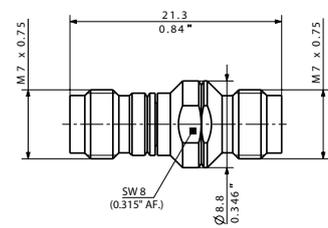


Material NEX10 7/16 brass/SUCO  
brass/SUCO

VSWR DC to 2 GHz ≤ 1.065  
2 to 6 GHz ≤ 1.119

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>339</b> | <b>H+S type</b> | <b>31_PC185-50-0-1/199_NE</b> |
|            | <b>Item no.</b> | <b>84132746</b>               |

PC1.85 jack (f) 2 ×

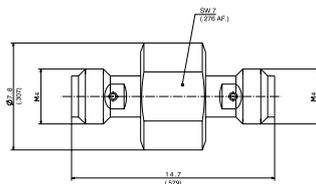


Material stainless steel

VSWR DC to 30 GHz ≤ 1.083  
30 to 50 GHz ≤ 1.119  
50 to 67 GHz ≤ 1.152

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>319</b> | <b>H+S type</b> | <b>31_PC1-50-0-1/111_UE</b> |
|            | <b>Item no.</b> | <b>85031727</b>             |

PC1.0 jack (f) 2 ×

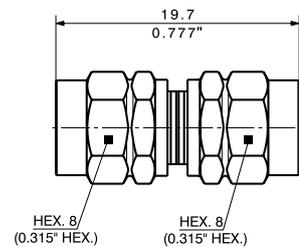


Material CuBe/gold

VSWR DC to 50 GHz ≤ 1.222  
50 to 75 GHz ≤ 1.308  
75 to 110 GHz ≤ 1.377

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>339</b> | <b>H+S type</b> | <b>32_PC185-50-0-1/19_UE</b> |
|            | <b>Item no.</b> | <b>84132748</b>              |

PC1.85 plug (m) 2 ×

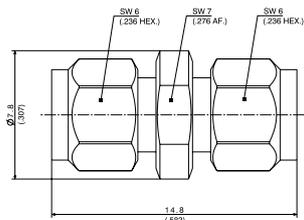


Material stainless steel

VSWR DC to 35 GHz ≤ 1.052  
35 to 55 GHz ≤ 1.065  
55 to 67 GHz ≤ 1.106

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>319</b> | <b>H+S type</b> | <b>32_PC1-50-0-1/11_UE</b> |
|            | <b>Item no.</b> | <b>85031743</b>            |

PC1.0 plug (m) 2 ×

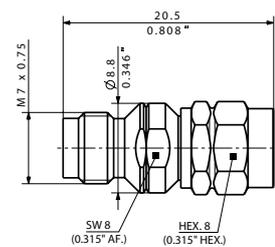


Material CuBe/gold

VSWR DC to 50 GHz ≤ 1.222  
50 to 75 GHz ≤ 1.308  
75 to 110 GHz ≤ 1.377

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>339</b> | <b>H+S type</b> | <b>33_PC185-50-0-1/199_NE</b> |
|            | <b>Item no.</b> | <b>84019546</b>               |

PC1.85 plug (m)  
jack (f)



Material stainless steel

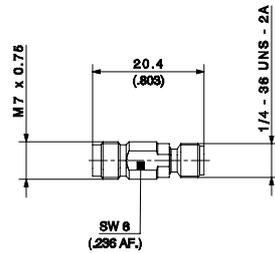
VSWR DC to 25 GHz ≤ 1.052  
25 to 45 GHz ≤ 1.065  
45 to 67 GHz ≤ 1.106

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# Adapters

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>359</b> | <b>H+S type</b> | <b>31_PC24-SK-50-1/199_NE</b> |
|            | <b>Item no.</b> | <b>84008075</b>               |

PC2.4 jack (f)  
SK (2.92 mm) jack (f)

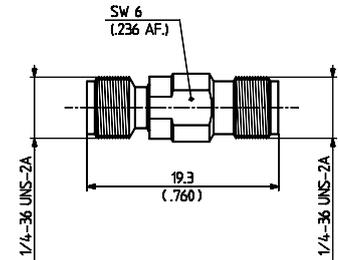


Material stainless steel

VSWR DC to 40 GHz  $\leq 1.12$

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>376</b> | <b>H+S type</b> | <b>31_SK-50-0-1/199_NE</b> |
|            | <b>Item no.</b> | <b>23004726</b>            |

SK (2.92 mm) jack (f) 2 ×



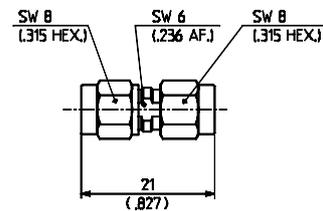
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.20$

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>359</b> | <b>H+S type</b> | <b>32_PC24-SK-50-1/199_NE</b> |
|            | <b>Item no.</b> | <b>23004729</b>               |

PC2.4 plug (m)  
SK (2.92 mm) plug (m)



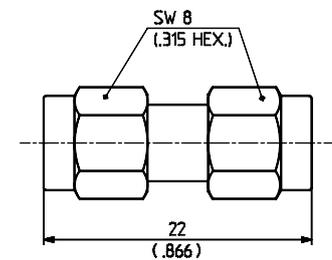
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.12$

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>376</b> | <b>H+S type</b> | <b>32_SK-50-0-1/199_NE</b> |
|            | <b>Item no.</b> | <b>23004727</b>            |

SK (2.92 mm) plug (m) 2 ×



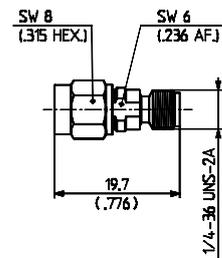
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.20$

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>359</b> | <b>H+S type</b> | <b>33_PC24-SK-50-2/199_NE</b> |
|            | <b>Item no.</b> | <b>23004730</b>               |

PC2.4 plug (m)  
SK (2.92 mm) jack (f)



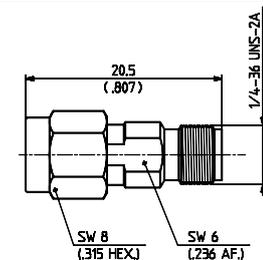
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.12$

|            |                 |                            |
|------------|-----------------|----------------------------|
| <b>376</b> | <b>H+S type</b> | <b>33_SK-50-0-1/199_NE</b> |
|            | <b>Item no.</b> | <b>23004728</b>            |

SK (2.92 mm) plug (m)  
jack (f)



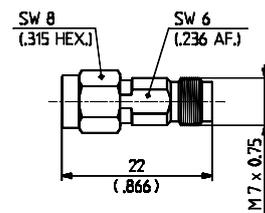
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.20$

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>359</b> | <b>H+S type</b> | <b>33_SK-PC24-50-1/199_NE</b> |
|            | <b>Item no.</b> | <b>23004731</b>               |

SK (2.92 mm) plug (m)  
PC2.4 jack (f)



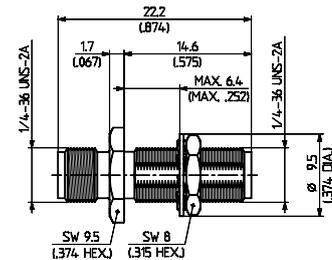
El. length 16.1 mm

Material stainless steel

VSWR DC to 40 GHz  $\leq 1.12$

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>376</b> | <b>H+S type</b> | <b>34_SK-50-0-51/199_NE</b> |
|            | <b>Item no.</b> | <b>22658969</b>             |

SK (2.92 mm) jack (f) 2 ×

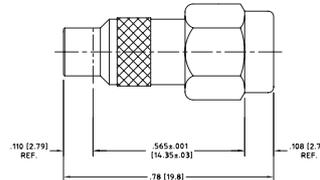


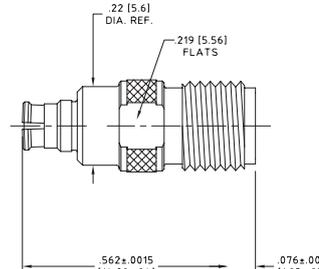
Material stainless steel  
Mounting hole ML 35

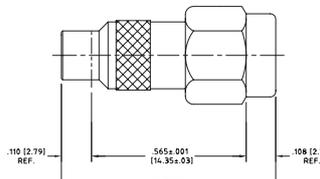
VSWR DC to 40 GHz  $\leq 1.02 + 0.01 \cdot f$  (GHz)

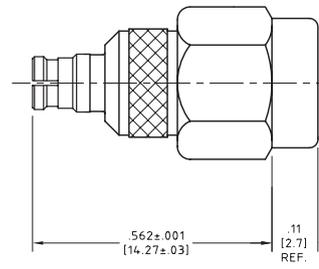
Introduction and general information on page 507 and 508/509.

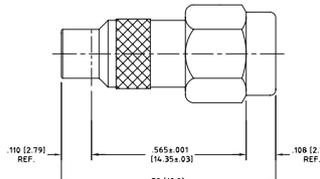
# Adapters

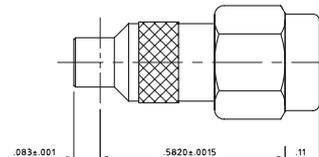
| 385                 | H+S type<br>Item no.            | 29487-1<br>80318037   |
|---------------------|---------------------------------|---|
| SMP<br>SK (2.92 mm) | male<br>full detent<br>plug (m) |  |
| Material            | stainless steel<br>(passivated) |   |
| VSWR                | DC to 40 GHz                    | ≤ 1.35  |

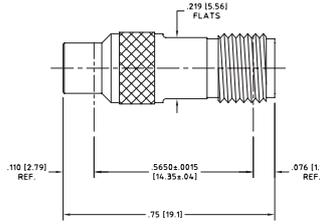
| 385                 | H+S type<br>Item no. | 29487-3<br>80318039   |
|---------------------|----------------------|---|
| SMP<br>SK (2.92 mm) | female<br>jack (f)   |  |
| Material            | CuBe/gold            |   |
| VSWR                | DC to 40 GHz         | ≤ 1.35  |

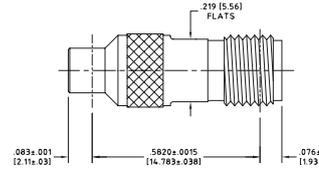
| 385                 | H+S type<br>Item no.               | 29487-1-3<br>80367952   |
|---------------------|------------------------------------|---|
| SMP<br>SK (2.92 mm) | male<br>limited detent<br>plug (m) |  |
| Material            | stainless steel<br>(passivated)    |   |
| VSWR                | DC to 40 GHz                       | ≤ 1.35  |

| 385                 | H+S type<br>Item no. | 29487-4<br>80363059  |
|---------------------|----------------------|--|
| SMP<br>SK (2.92 mm) | female<br>plug (m)   |  |
| Material            | CuBe/gold            |  |
| VSWR                | DC to 40 GHz         | ≤ 1.35   |

| 385                 | H+S type<br>Item no.            | 29487-1-4<br>80370562   |
|---------------------|---------------------------------|---|
| SMP<br>SK (2.92 mm) | male<br>smooth bore<br>plug (m) |  |
| Material            | stainless steel<br>(passivated) |   |
| VSWR                | DC to 40 GHz                    | ≤ 1.35  |

| 386                  | H+S type<br>Item no.            | 29429-1<br>80317861   |
|----------------------|---------------------------------|---|
| SMPM<br>SK (2.92 mm) | male<br>full detent<br>plug (m) |  |
| Material             | CuBe/gold                       |   |
| VSWR                 | DC to 40 GHz                    | ≤ 1.35  |

| 385                 | H+S type<br>Item no.            | 29487-2<br>80318038   |
|---------------------|---------------------------------|---|
| SMP<br>SK (2.92 mm) | male<br>full detent<br>jack (f) |  |
| Material            | stainless steel                 |   |
| VSWR                | DC to 40 GHz                    | ≤ 1.35  |

| 386                  | H+S type<br>Item no.            | 29429-4<br>80362544   |
|----------------------|---------------------------------|---|
| SMPM<br>SK (2.92 mm) | male<br>full detent<br>jack (f) |  |
| Material             | CuBe/gold                       |   |
| VSWR                 | DC to 40 GHz                    | ≤ 1.35  |

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# Adapters

| 387                    | H+S type<br>Item no.            | 29429-1T2<br>80317870 |
|------------------------|---------------------------------|-----------------------|
| SMPM-T<br>SK (2.92 mm) | male<br>full detent<br>plug (m) |                       |
| Material               | CuBe/gold                       |                       |
| VSWR                   | DC to 40 GHz                    | ≤ 1.35                |

| 387                    | H+S type<br>Item no.            | 29429-4T2<br>80362561 |
|------------------------|---------------------------------|-----------------------|
| SMPM-T<br>SK (2.92 mm) | male<br>full detent<br>jack (f) |                       |
| Material               | CuBe/gold                       |                       |
| VSWR                   | DC to 40 GHz                    | ≤ 1.35                |

| 393        | H+S type<br>Item no.           | 31_PC35-50-0-1/199_UE<br>22644360 |
|------------|--------------------------------|-----------------------------------|
| PC3.5      | jack (f) 2 ×                   |                                   |
| El. length | 14.1 mm                        |                                   |
| Material   | stainless steel                |                                   |
| VSWR       | DC to 18 GHz<br>18 to 26.5 GHz | ≤ 1.08<br>≤ 1.15                  |

| 393        | H+S type<br>Item no.                         | 31_PC35-50-0-2/199_NE<br>23020456 |
|------------|--|-----------------------------------|
| PC3.5      | jack (f) 2 ×                                 |                                   |
| El. length | 25.5 mm                                      |                                   |
| Material   | stainless steel                              |                                   |
| VSWR       | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22      |

| 393        | H+S type<br>Item no.           | 32_PC35-50-0-1/199_UE<br>22644361 |
|------------|--------------------------------|-----------------------------------|
| PC3.5      | plug (m) 2 ×                   |                                   |
| El. length | 14.1 mm                        |                                   |
| Material   | stainless steel                |                                   |
| VSWR       | DC to 18 GHz<br>18 to 26.5 GHz | ≤ 1.08<br>≤ 1.15                  |

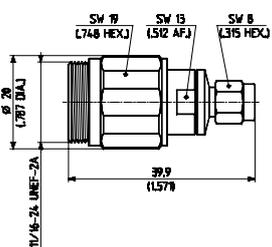
| 393        | H+S type<br>Item no.                         | 32_PC35-50-0-2/199_NE<br>23020457 |
|------------|--|-----------------------------------|
| PC3.5      | plug (m) 2 ×                                 |                                   |
| El. length | 25.5 mm                                      |                                   |
| Material   | stainless steel                              |                                   |
| VSWR       | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22      |

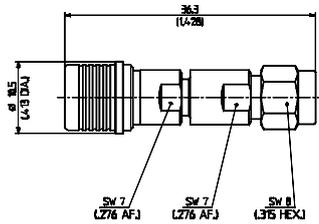
| 393        | H+S type<br>Item no.           | 33_PC35-50-0-1/199_UE<br>22644362 |
|------------|--------------------------------|-----------------------------------|
| PC3.5      | plug (m)<br>jack (f)           |                                   |
| El. length | 14.1 mm                        |                                   |
| Material   | stainless steel                |                                   |
| VSWR       | DC to 18 GHz<br>18 to 26.5 GHz | ≤ 1.08<br>≤ 1.15                  |

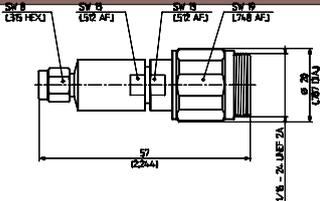
| 393        | H+S type<br>Item no.                         | 33_PC35-50-0-2/199_NE<br>23020453 |
|------------|--|-----------------------------------|
| PC3.5      | plug (m)<br>jack (f)                         |                                   |
| El. length | 25.5 mm                                      |                                   |
| Material   | stainless steel                              |                                   |
| VSWR       | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22      |

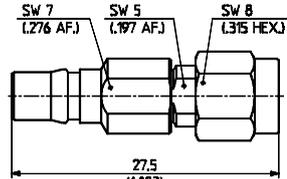
Introduction and general information on page 507 and 508/509.

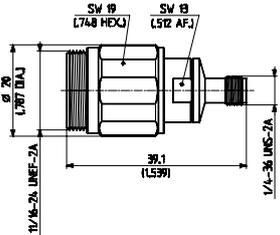
# Adapters

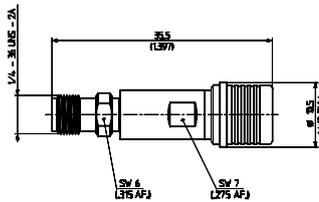
|              |                               |   |
|--------------|-------------------------------|---|
| <b>394</b>   | <b>H+S type</b>               | <b>32_PC7-PC35-50-1/1--_UE</b>  |
|              | <b>Item no.</b>               | <b>22644230</b>   |
| PC7<br>PC3.5 | plug (m)                      |  |
| Material     | brass/gold<br>stainless steel |   |
| PC7<br>PC3.5 |                               |   |
| VSWR         | DC to 15 GHz<br>15 to 18 GHz  | ≤ 1.05<br>≤ 1.09  |

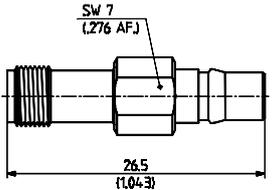
|              |  |   |
|--------------|--|---|
| <b>396</b>   | <b>H+S type</b>                              | <b>32_PC35-QMA-50-1/1--_NE</b>  |
|              | <b>Item no.</b>                              | <b>23017489</b>   |
| PC3.5<br>QMA | plug (m)<br>plug (m)                         |  |
| El. length   | 25.5 mm                                      |   |
| Material     | stainless steel                              |   |
| VSWR         | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22  |

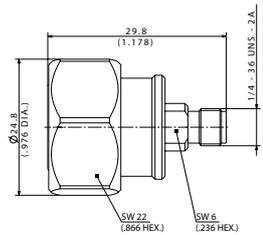
|              |                          |   |
|--------------|--------------------------|---|
| <b>394</b>   | <b>H+S type</b>          | <b>32_PC35-PC7-50-3/-33_NE</b>  |
|              | <b>Item no.</b>          | <b>23003902</b>   |
| PC3.5<br>PC7 | plug (m)                 |  |
| Material     | brass/SUCO<br>brass/gold |   |
| PC3.5<br>PC7 |                          |   |
| VSWR         | DC to 18 GHz             | ≤ 1.06  |

|              |  |   |
|--------------|--|---|
| <b>396</b>   | <b>H+S type</b>                              | <b>33_PC35-QMA-50-1/199_NE</b>  |
|              | <b>Item no.</b>                              | <b>23017467</b>   |
| PC3.5<br>QMA | plug (m)<br>jack (f)                         |  |
| El. length   | 25.5 mm                                      |   |
| Material     | stainless steel                              |   |
| VSWR         | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22  |

|              |                               |   |
|--------------|-------------------------------|---|
| <b>394</b>   | <b>H+S type</b>               | <b>33_PC7-PC35-50-1/1--_UE</b>  |
|              | <b>Item no.</b>               | <b>22644231</b>   |
| PC7<br>PC3.5 | jack (f)                      |  |
| Material     | brass/gold<br>stainless steel |   |
| PC7<br>PC3.5 |                               |   |
| VSWR         | DC to 15 GHz<br>15 to 18 GHz  | ≤ 1.05<br>≤ 1.09  |

|              |  |   |
|--------------|--|---|
| <b>396</b>   | <b>H+S type</b>                              | <b>33_QMA-PC35-50-1/1--_NE</b>  |
|              | <b>Item no.</b>                              | <b>23017488</b>   |
| QMA<br>PC3.5 | plug (m)<br>jack (f)                         |  |
| El. length   | 25.5 mm                                      |   |
| Material     | stainless steel                              |   |
| VSWR         | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22  |

|              |  |   |
|--------------|--|---|
| <b>396</b>   | <b>H+S type</b>                              | <b>31_PC35-QMA-50-1/199_NE</b>  |
|              | <b>Item no.</b>                              | <b>23017468</b>   |
| PC3.5<br>QMA | jack (f)<br>jack (f)                         |  |
| El. length   | 25.5 mm                                      |   |
| Material     | stainless steel                              |   |
| VSWR         | DC to 1.5 GHz<br>1.5 to 6 GHz<br>6 to 18 GHz | ≤ 1.036<br>≤ 1.065<br>≤ 1.22  |

|                 |                           |   |
|-----------------|---------------------------|---|
| <b>407</b>      | <b>H+S type</b>           | <b>33_4310-PC35-50-X1/133_NE</b>  |
|                 | <b>Item no.</b>           | <b>85017252</b>   |
| 4.3-10<br>PC3.5 | plug (m)<br>jack (f)      |  |
| Material        | brass                     |   |
| VSWR            | DC to 4 GHz<br>4 to 6 GHz | ≤ 1.032<br>≤ 1.052  |

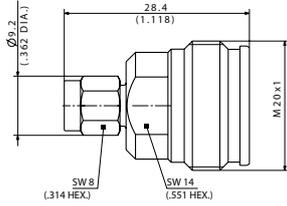
Introduction and general information on page 507 and 508/509.

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|            |                 |                                 |
|------------|-----------------|---------------------------------|
| <b>407</b> | <b>H+S type</b> | <b>33_PC35-4310-50-1/1-9_NE</b> |
|            | <b>Item no.</b> | <b>85017256</b>                 |

PC3.5  
4.3-10

plug (m)  
jack (f)

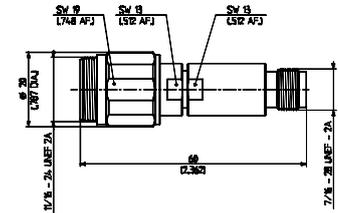


Material brass

|            |                 |                                |
|------------|-----------------|--------------------------------|
| <b>420</b> | <b>H+S type</b> | <b>33_PC7-TNC-50-52/-33_NE</b> |
|            | <b>Item no.</b> | <b>23003920</b>                |

PC7  
TNC

jack (f)



Material PC7  
TNC

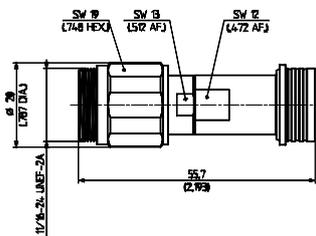
brass/gold  
stainless steel

VSWR DC to 18 GHz  $\leq 1.03 + 0.009 \cdot f$  (GHz)

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>412</b> | <b>H+S type</b> | <b>32_PC7-QN-50-1/1--_NE</b> |
|            | <b>Item no.</b> | <b>23032720</b>              |

PC7  
QN

plug (m)



El. length 41.85 mm

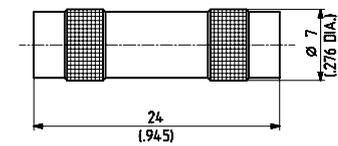
Material brass/gold

VSWR DC to 3 GHz  $\leq 1.03$   
3 to 6 GHz  $\leq 1.05$   
6 to 11 GHz  $\leq$  typ. 1.12

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>424</b> | <b>H+S type</b> | <b>31_QLA-01-0-1/112_NE</b> |
|            | <b>Item no.</b> | <b>22640028</b>             |

QLA

jack (f) 2 x

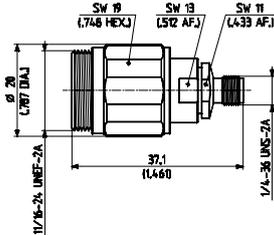


Material brass/nickel

|            |                 |                               |
|------------|-----------------|-------------------------------|
| <b>413</b> | <b>H+S type</b> | <b>33_PC7-SMA-50-1/1--_UE</b> |
|            | <b>Item no.</b> | <b>22543548</b>               |

PC7  
SMA

jack (f)



Material PC7  
SMA

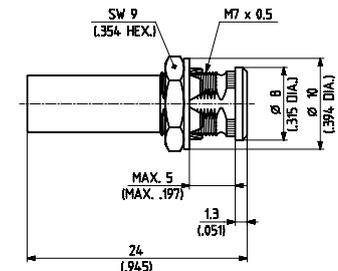
brass/gold  
CuBe/gold

VSWR DC to 18 GHz  $\leq 1.025 + 0.002 \cdot f$  (GHz)

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>424</b> | <b>H+S type</b> | <b>34_QLA-01-0-2/112_NE</b> |
|            | <b>Item no.</b> | <b>22640031</b>             |

QLA

jack (f) 2 x

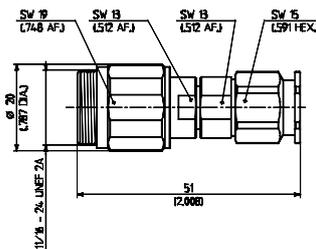


Material brass/nickel  
Mounting ML 99  
hole

|            |                 |                                |
|------------|-----------------|--------------------------------|
| <b>420</b> | <b>H+S type</b> | <b>32_PC7-TNC-50-52/-33_NE</b> |
|            | <b>Item no.</b> | <b>23003983</b>                |

PC7  
TNC

plug (m)



Material PC7  
TNC

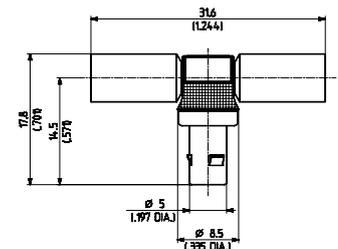
brass/gold  
stainless steel

VSWR DC to 18 GHz  $\leq 1.03 + 0.009 \cdot f$  (GHz)

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>424</b> | <b>H+S type</b> | <b>43_QLA-01-0-1/112_NE</b> |
|            | <b>Item no.</b> | <b>22640032</b>             |

QLA

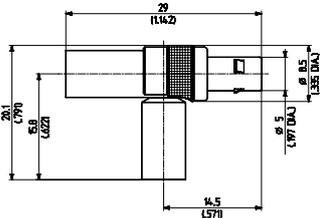
jack (f) 2 x  
plug (m) 1 x

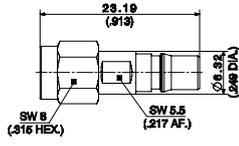


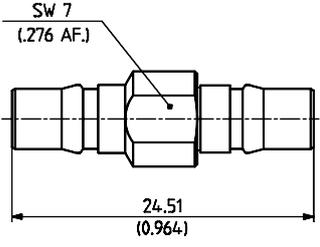
Material brass/nickel

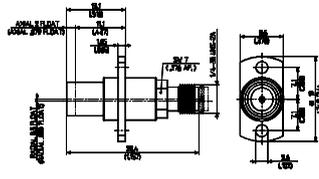
Introduction and general information on page 507 and 508/509.

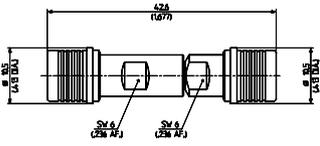
# Adapters

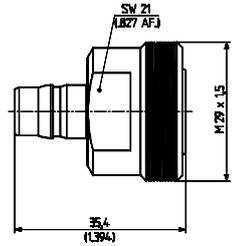
|            |                                    |   |
|------------|------------------------------------|---|
| <b>424</b> | <b>H+S type</b><br><b>Item no.</b> | <b>45_QLA-01-0-1/112_NE</b><br><b>22640033</b>                                    |
| QLA        | jack (f) 2 ×<br>plug (m) 1 ×       |  |
| Material   | brass/nickel                       |   |

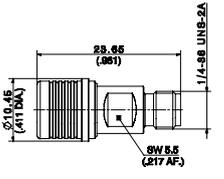
|            |                                    |   |
|------------|------------------------------------|---|
| <b>440</b> | <b>H+S type</b><br><b>Item no.</b> | <b>33_SMA-QMA-50-1/133_NE</b><br><b>84012204</b>                                    |
| SMA<br>QMA | plug (m)<br>jack (f)               |  |
| Material   | brass/SUCO                         |   |
| VSWR       | DC to 4 GHz                        | ≤ 1.05  |
|            | 4 to 6 GHz                         | ≤ 1.17  |

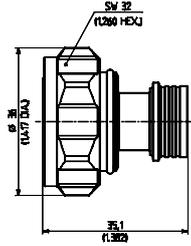
|            |                                    |  |
|------------|------------------------------------|--|
| <b>438</b> | <b>H+S type</b><br><b>Item no.</b> | <b>31_QMA-50-0-1/199_NE</b><br><b>23023171</b>                                     |
| QMA        | jack (f) 2 ×                       |  |
| Material   | stainless steel                    |  |
| VSWR       | DC to 1.5 GHz                      | ≤ 1.036  |
|            | 1.5 to 6 GHz                       | ≤ 1.065  |

|               |                                    |   |
|---------------|------------------------------------|---|
| <b>440</b>    | <b>H+S type</b><br><b>Item no.</b> | <b>39_QMA-SMA-U50-1/11-_NE</b><br><b>23022741</b>                                   |
| QMA<br>SMA    | plug (m)<br>jack (f)               |  |
| Material      | stainless steel                    |   |
| QMA           | CuBe/SUPR                          |   |
| Mounting hole | ML 58                              |   |
| VSWR          | DC to 2 GHz                        | ≤ 1.04  |
|               | 1.2 to 4 GHz                       | ≤ 1.05  |
|               | 4 to 6 GHz                         | ≤ 1.08  |

|            |                                    |   |
|------------|------------------------------------|---|
| <b>438</b> | <b>H+S type</b><br><b>Item no.</b> | <b>32_QMA-50-0-1/1--_NE</b><br><b>23023199</b>                                      |
| QMA        | plug (m) 2 ×                       |  |
| Material   | stainless steel                    |   |
| VSWR       | DC to 1.5 GHz                      | ≤ 1.036   |
|            | 1.5 to 6 GHz                       | ≤ 1.065   |

|            |                                    |   |
|------------|------------------------------------|---|
| <b>462</b> | <b>H+S type</b><br><b>Item no.</b> | <b>31_QN-716-50-1/113_WE</b><br><b>23033269</b>                                       |
| QN<br>7/16 | jack (f)<br>jack (f)               |  |
| Material   | brass/SUCO                         |   |
| PIM:       | ≤ -155 dBc                         |   |

|            |                                    |   |
|------------|------------------------------------|---|
| <b>440</b> | <b>H+S type</b><br><b>Item no.</b> | <b>33_QMA-SMA-50-1/133_NE</b><br><b>84014876</b>                                    |
| QMA<br>SMA | plug (m)<br>jack (f)               |  |
| Material   | brass/SUCO                         |   |
| VSWR       | DC to 4 GHz                        | ≤ 1.05  |
|            | 4 to 6 GHz                         | ≤ 1.17  |

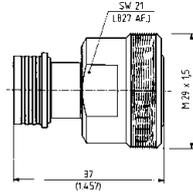
|            |                                    |   |
|------------|------------------------------------|---|
| <b>462</b> | <b>H+S type</b><br><b>Item no.</b> | <b>32_QN-716-50-1/113_WE</b><br><b>23033643</b>                                       |
| QN<br>7/16 | plug (m)<br>plug (m)               |  |
| Material   | brass/SUCO                         |   |
| PIM        | ≤ -155 dBc                         |   |

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|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>462</b> | <b>H+S type</b> | <b>33_QN-716-50-1/113_WE</b> |
|            | <b>Item no.</b> | <b>23033550</b>              |

QN 7/16 plug (m)  
jack (f)

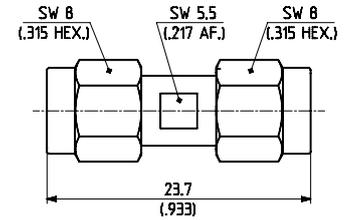


Material brass/SUCO

PIM ≤ -155 dBc

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>463</b> | <b>H+S type</b> | <b>32_SMA-50-0-1/111_NE</b> |
|            | <b>Item no.</b> | <b>22640151</b>             |

SMA plug (m) 2 ×

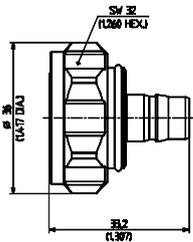


Material CuBe/gold

VSWR DC to 18 GHz ≤ 1.05 + 0.005 · f (GHz)

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>462</b> | <b>H+S type</b> | <b>33_716-QN-50-1/113_WE</b> |
|            | <b>Item no.</b> | <b>23033644</b>              |

7/16 QN plug (m)  
jack (f)

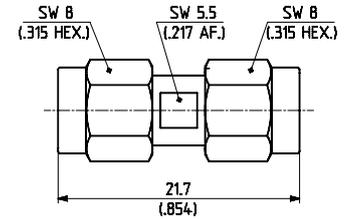


Material brass/SUCO

PIM: ≤ -155 dBc

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>463</b> | <b>H+S type</b> | <b>32_SMA-50-0-52/199_NE</b> |
|            | <b>Item no.</b> | <b>22643689</b>              |

SMA plug (m) 2 ×

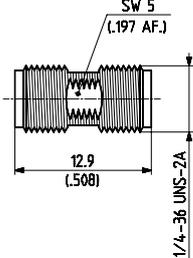


Material stainless steel

VSWR DC to 18 GHz ≤ 1.05 + 0.005 · f (GHz)

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>463</b> | <b>H+S type</b> | <b>31_SMA-50-0-1/111_NE</b> |
|            | <b>Item no.</b> | <b>22640150</b>             |

SMA jack (f) 2 ×

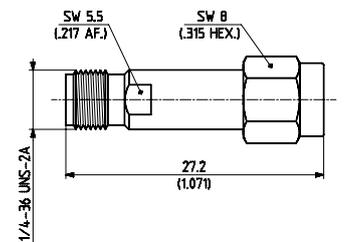


Material CuBe/gold

VSWR DC to 18 GHz ≤ 1.05 + 0.01 · f (GHz)

|            |                 |                             |
|------------|-----------------|-----------------------------|
| <b>463</b> | <b>H+S type</b> | <b>33_SMA-50-0-1/111_NE</b> |
|            | <b>Item no.</b> | <b>22641119</b>             |

SMA plug (m)  
jack (f)

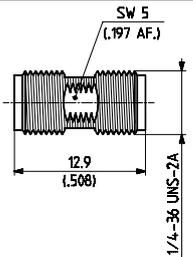


Material CuBe/gold

VSWR DC to 18 GHz ≤ 1.05 + 0.008 · f (GHz)

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>463</b> | <b>H+S type</b> | <b>31_SMA-50-0-51/199_NE</b> |
|            | <b>Item no.</b> | <b>22641486</b>              |

SMA jack (f) 2 ×

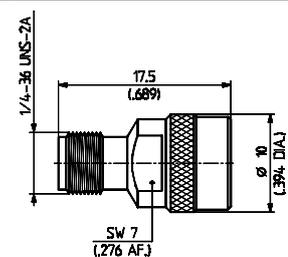


Material stainless steel

VSWR DC to 18 GHz ≤ 1.05 + 0.01 · f (GHz)

|            |                 |                              |
|------------|-----------------|------------------------------|
| <b>463</b> | <b>H+S type</b> | <b>33_SMA-Q50-0-4/1-9_NE</b> |
|            | <b>Item no.</b> | <b>22660213</b>              |

SMA plug (m)  
quick-mate  
jack (f)

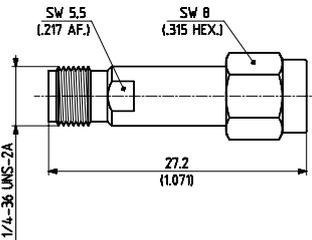


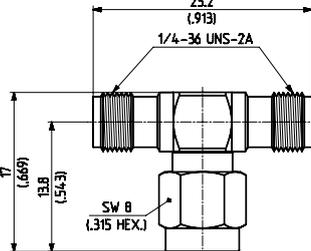
Material CuBe/SUPR

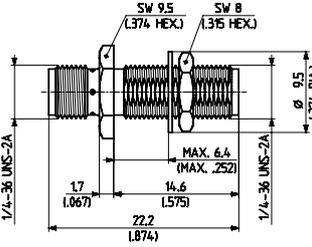
VSWR DC to 5 GHz ≤ 1.07  
5 to 16 GHz ≤ 1.22  
16 to 18 GHz ≤ 1.28

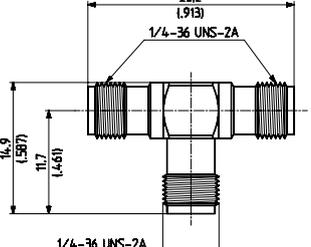
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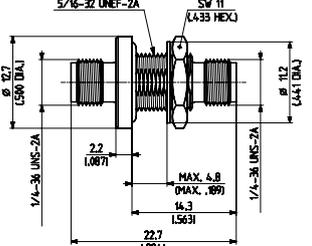
# Adapters

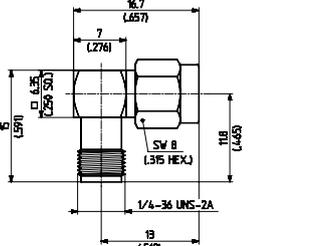
| 463      | H+S type<br>Item no. | 33_SMA-50-0-51/199_NE<br>22644253   |
|----------|----------------------|---|
| SMA      | plug (m)<br>jack (f) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 18 GHz         | $\leq 1.05 + 0.008 \cdot f$ (GHz)   |

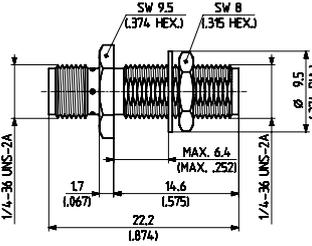
| 463      | H+S type<br>Item no.         | 43_SMA-50-0-1/111_NE<br>22543356  |
|----------|------------------------------|---|
| SMA      | plug (m) 1 ×<br>jack (f) 2 × |  |
| Material | CuBe/gold                    |   |

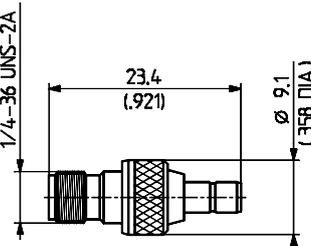
| 463           | H+S type<br>Item no. | 34_SMA-50-0-1/111_NE<br>23009027   |
|---------------|----------------------|--|
| SMA           | jack (f) 2 ×         |  |
| Material      | CuBe/gold            |  |
| Mounting hole | ML 35                |  |
| VSWR          | DC to 18 GHz         | $\leq 1.05 + 0.005 \cdot f$ (GHz)  |

| 463      | H+S type<br>Item no. | 46_SMA-50-0-1/111_NE<br>22543357   |
|----------|----------------------|--|
| SMA      | jack (f) 3 ×         |  |
| Material | CuBe/gold            |  |

| 463             | H+S type<br>Item no.                     | 34_SMA-50-0-3/111_NE<br>22641297  |
|-----------------|--|---|
| SMA             | jack (f) 2 ×                             |  |
| Hermetic sealed |  |   |
| Material        | CuBe/gold                                |   |
| Mounting hole   | ML 38                                    |   |
| VSWR            | DC to 3 GHz<br>3 to 7 GHz<br>7 to 18 GHz | $\leq 1.1$<br>$\leq 1.2$<br>$\leq 1.3$  |

| 463      | H+S type<br>Item no. | 53_SMA-50-0-51/199_NE<br>22642655   |
|----------|----------------------|---|
| SMA      | plug (m)<br>jack (f) |  |
| Material | stainless steel      |   |
| VSWR     | DC to 14 GHz         | $\leq 1.02 + 0.03 \cdot f$ (GHz)  |

| 463           | H+S type<br>Item no. | 34_SMA-50-0-51/199_NE<br>22544823   |
|---------------|----------------------|---|
| SMA           | jack (f) 2 ×         |  |
| Material      | stainless steel      |   |
| Mounting hole | ML 35                |   |
| VSWR          | DC to 18 GHz         | $\leq 1.05 + 0.005 \cdot f$ (GHz)   |

| 464        | H+S type<br>Item no.    | 31_SMA-SMB-50-1/111_UE<br>22641728  |
|------------|-------------------------|---|
| SMA<br>SMB | jack (f)<br>jack (f)    |  |
| Material   | CuBe/gold<br>brass/gold |   |
| VSWR       | DC to 4 GHz             | $\leq 1.05 + 0.04 \cdot f$ (GHz)  |

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| 464        | H+S type<br>Item no.      | 33_SMA-SMB-50-1/111_NE<br>22658917              |
|------------|---------------------------|---|
| SMA<br>SMB | plug (m)<br>jack (f)      |   |
| Material   | brass/gold                |   |
| VSWR       | DC to 4 GHz<br>4 to 7 GHz | $\leq 1.05 + 0.04 \cdot f$ (GHz)<br>$\leq 1.21$ |

| 464        | H+S type<br>Item no.    | 33_SMB-SMA-50-1/111_UE<br>22641727 |
|------------|-------------------------|------------------------------------|
| SMB<br>SMA | plug (m)<br>jack (f)    |                                    |
| Material   | brass/gold<br>CuBe/gold |                                    |
| VSWR       | DC to 4 GHz             | $\leq 1.05 + 0.04 \cdot f$ (GHz)   |

| 469         | H+S type<br>Item no.            | 29120<br>80310705 |
|-------------|---------------------------------|-------------------|
| SSMA<br>SMA | plug (m)<br>jack (f)            |                   |
| Material    | stainless steel<br>(passivated) |                   |
| VSWR        | DC to 18 GHz                    | $\leq 1.15$       |

| 469         | H+S type<br>Item no.            | 29121<br>80310706 |
|-------------|---------------------------------|-------------------|
| SSMA<br>SMA | plug (m)<br>plug (m)            |                   |
| Material    | stainless steel<br>(passivated) |                   |
| VSWR        | DC to 18 GHz                    | $\leq 1.15$       |

| 470        | H+S type<br>Item no.                     | 31_SMA-TNC-50-1/1--_UE<br>22640941        |
|------------|--|---|
| SMA<br>TNC | jack (f)<br>jack (f)                     |   |
| Material   | CuBe/gold<br>brass/SUCO                  |   |
| VSWR       | DC to 2 GHz<br>2 to 6 GHz<br>6 to 11 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.30$ |

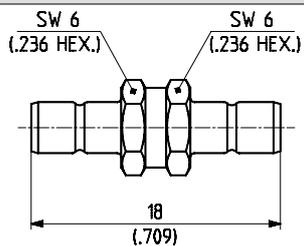
| 470        | H+S type<br>Item no.                     | 32_SMA-TNC-50-1/1--_UE<br>22640938        |
|------------|--|---|
| SMA<br>TNC | plug (m)<br>plug (m)                     |   |
| Material   | CuBe/gold<br>brass/SUCO                  |   |
| VSWR       | DC to 4 GHz<br>4 to 8 GHz<br>8 to 11 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.30$ |

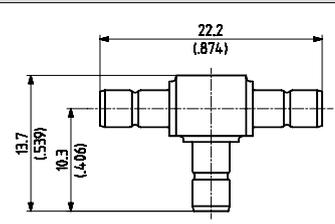
| 470        | H+S type<br>Item no.       | 33_SMA-TNC-50-1/1--_NE<br>22640939              |
|------------|----------------------------|---|
| SMA<br>TNC | plug (m)<br>jack (f)       |   |
| Material   | CuBe/gold<br>brass/SUCO    |   |
| VSWR       | DC to 6 GHz<br>6 to 11 GHz | $\leq 1.03 + 0.05 \cdot f$ (GHz)<br>$\leq 1.33$ |

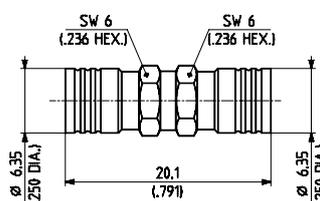
| 470        | H+S type<br>Item no.                     | 33_TNC-SMA-50-1/1--_UE<br>22640940        |
|------------|--|---|
| TNC<br>SMA | plug (m)<br>jack (f)                     |   |
| Material   | brass/SUCO<br>CuBe/gold                  |   |
| VSWR       | DC to 4 GHz<br>4 to 8 GHz<br>8 to 11 GHz | $\leq 1.10$<br>$\leq 1.20$<br>$\leq 1.30$ |

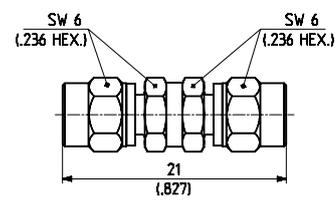
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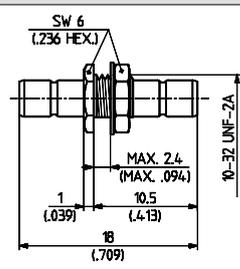
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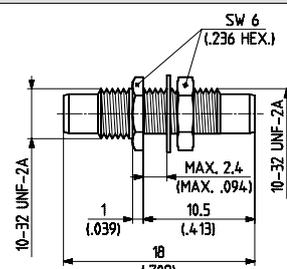
| 474      | H+S type<br>Item no. | 31_SMB-50-0-1/111_NE<br>22640221  |
|----------|----------------------|---|
| SMB      | jack (f) 2 ×         |  |
| Material | brass/gold           |   |
| VSWR     | DC to 4 GHz          | $\leq 1.03 + 0.08 \cdot f$ (GHz)  |

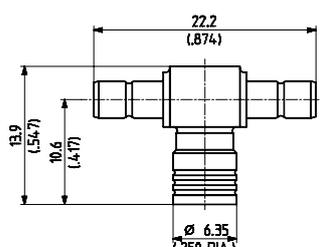
| 474      | H+S type<br>Item no. | 46_SMB-50-0-2/111_NE<br>22640228  |
|----------|----------------------|---|
| SMB      | jack (f) 3 ×         |  |
| Material | brass/gold           |   |

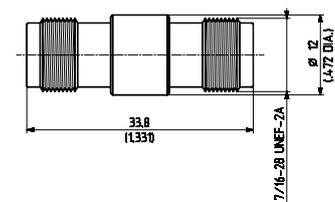
| 474          | H+S type<br>Item no.          | 32_SMB-50-0-1/111_NE<br>22640222  |
|--------------|-------------------------------|---|
| SMB          | plug (m) 2 ×                  |  |
| "open entry" |                               |   |
| Material     | brass/gold                    |   |
| VSWR         | DC to 1.5 GHz<br>1.5 to 4 GHz | $\leq 1.03 + 0.18 \cdot f$ (GHz)<br>$\leq 1.30$                                   |

| 484      | H+S type<br>Item no. | 32_SMC-50-0-1/111_NE<br>22543822  |
|----------|----------------------|---|
| SMC      | plug (m) 2 ×         |  |
| Material | brass/gold           |   |
| VSWR     | DC to 10 GHz         | $\leq 1.08 + 0.10 \cdot f$ (GHz)  |

| 474           | H+S type<br>Item no.      | 34_SMB-50-0-2/111_NE<br>22640224  |
|---------------|---------------------------|---|
| SMB           | jack (f) 2 ×              |  |
| Material      | brass/gold                |   |
| Mounting hole | ML 11                     |   |
| VSWR          | DC to 2 GHz<br>2 to 4 GHz | $\leq 1.04 + 0.1 \cdot f$ (GHz)<br>$\leq 1.24$                                      |

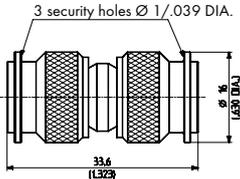
| 484           | H+S type<br>Item no. | 34_SMC-50-0-2/111_NE<br>22640302  |
|---------------|----------------------|---|
| SMC           | jack (f) 2 ×         |  |
| Material      | brass/gold           |   |
| Mounting hole | ML 11                |   |
| VSWR          | DC to 10 GHz         | $\leq 1.03 + 0.08 \cdot f$ (GHz)  |

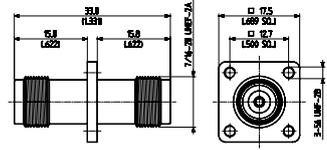
| 474          | H+S type<br>Item no.         | 43_SMB-50-0-2/111_NE<br>22640226  |
|--------------|------------------------------|---|
| SMB          | plug (m) 1 ×<br>jack (f) 2 × |  |
| "open entry" |                              |   |
| Material     | brass/gold                   |   |

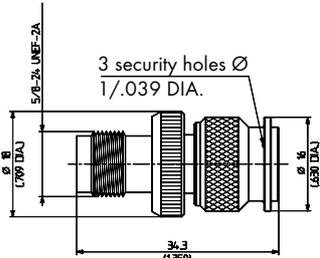
| 519      | H+S type<br>Item no. | 31_TNC-50-0-1/133_NE<br>22640623  |
|----------|----------------------|---|
| TNC      | jack (f) 2 ×         |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 11 GHz         | $\leq 1.06 + 0.15 \cdot f$ (GHz)  |

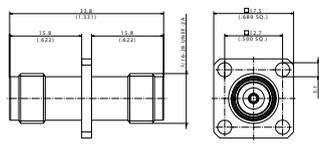
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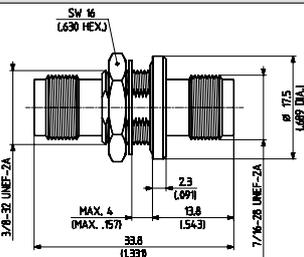
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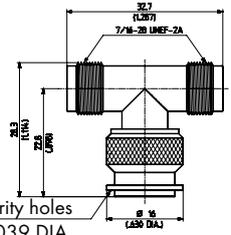
| 519      | H+S type<br>Item no. | 32_TNC-50-0-1/133_NE<br>22543407  |
|----------|----------------------|---|
| TNC      | plug (m) 2 ×         |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 11 GHz         | $\leq 1.03 + 0.025 \cdot f$ (GHz)   |

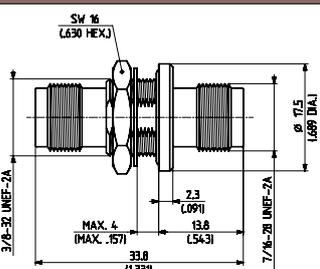
| 519           | H+S type<br>Item no.       | 37_TNC-50-0-1/133_NE<br>22640646  |
|---------------|----------------------------|---|
| TNC           | jack (f) 2 ×               |  |
| Material      | brass/SUCO                 |   |
| Mounting hole | ML 8                       |   |
| Flange        | 4 threads                  |   |
| VSWR          | DC to 9 GHz<br>9 to 11 GHz | $\leq 1.09 + 0.16 \cdot f$ (GHz)<br>$\leq 2.53$                                     |

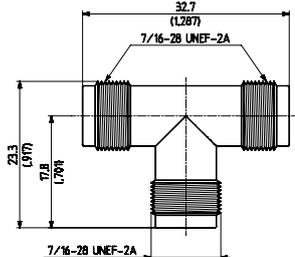
| 519      | H+S type<br>Item no. | 33_TNC-50-0-1/133_NE<br>22543649   |
|----------|----------------------|--|
| TNC      | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |  |
| VSWR     | DC to 11 GHz:        | $\leq 1.10 + 0.027 \cdot f$ (GHz)  |

| 519           | H+S type<br>Item no.       | 37_TNC-50-0-2/133_NE<br>22640648  |
|---------------|----------------------------|---|
| TNC           | jack (f) 2 ×               |  |
| Material      | brass/SUCO                 |   |
| Mounting hole | ML 8                       |   |
| Flange        | 4 holes                    |   |
| VSWR          | DC to 9 GHz<br>9 to 11 GHz | $\leq 1.09 + 0.16 \cdot f$ (GHz)<br>$\leq 2.53$                                     |

| 519           | H+S type<br>Item no.                     | 34_TNC-50-0-1/133_NE<br>22640643  |
|---------------|--|---|
| TNC           | jack (f) 2 ×                             |  |
| Material      | brass/SUCO                               |   |
| Mounting hole | ML 4                                     |   |
| VSWR          | DC to 2 GHz<br>2 to 8 GHz<br>8 to 11 GHz | $\leq 1.11$<br>$\leq 1.50$<br>$\leq 1.90$   |

| 519      | H+S type<br>Item no.                     | 43_TNC-50-0-1/133_NE<br>22640651  |
|----------|--|---|
| TNC      | jack (f) 2 ×<br>plug (m) 1 ×             |  |
| Material | brass/SUCO                               |   |
| VSWR     | DC to 2 GHz<br>2 to 8 GHz<br>8 to 11 GHz | $\leq 1.11$<br>$\leq 1.50$<br>$\leq 1.90$   |

| 519           | H+S type<br>Item no. | 34_TNC-50-0-4/133_NE<br>22658794  |
|---------------|----------------------|---|
| TNC           | jack (f) 2 ×         |  |
| Material      | brass/SUCO           |   |
| Mounting hole | ML 4                 |   |
| VSWR          | DC to 8 GHz          | $\leq 1.07 + 0.01 \cdot f$ (GHz)  |

| 519      | H+S type<br>Item no. | 46_TNC-50-0-1/133_NE<br>22640655  |
|----------|----------------------|---|
| TNC      | jack (f) 3 ×         |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 8 GHz          | $\leq 1.07 + 0.01 \cdot f$ (GHz)  |

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|            |                              |   |
|------------|------------------------------|---|
| <b>519</b> | <b>H+S type<br/>Item no.</b> | <b>53_TNC-50-0-1/133_NE<br/>22640659</b>                    |
| TNC        | plug (m)<br>jack (f)         | <p>3 security holes <math>\varnothing 7.039</math> DIA.</p> |
| Material   | brass/SUCO                   |   |
| VSWR       | DC to 5 GHz<br>5 to 11 GHz   | $\leq 1.03 + 0.11 \cdot f$ (GHz)<br>$\leq 1.58$             |

|                |                              |  |
|----------------|------------------------------|--|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>33_4310-716-50-X1/133_WE<br/>85017237</b> |
| 4.3-10<br>7/16 | plug (m)<br>jack (f)         |  |
| Material       | brass/SUCO                   |  |
| PIM            |                              | $\leq -166$ dBc                              |

|                 |                              |   |
|-----------------|------------------------------|---|
| <b>525</b>      | <b>H+S type<br/>Item no.</b> | <b>31_4195-716-50-1/133_WE<br/>22658138</b> |
| 4.1/9.5<br>7/16 | jack (f)<br>jack (f)         |   |
| Material        | brass/SUCO                   |   |
| PIM             |                              | $\leq -165$ dBc                             |

|                |                              |  |
|----------------|------------------------------|--|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>32_4310-716-50-X2/133_WE<br/>85031321</b> |
| 4.3-10<br>7/16 | plug (m)<br>plug (m)         |  |
| Material       | brass/SUCO                   |  |
| PIM            |                              | $\leq -155$ dBc, typ. $-160$ dBc             |

|                |                              |  |
|----------------|------------------------------|--|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>32_4310-716-50-X1/133_WE<br/>85017233</b> |
| 4.3-10<br>7/16 | plug (m)<br>plug (m)         |  |
| Material       | brass/SUCO                   |  |
| PIM            |                              | $\leq -166$ dBc                              |

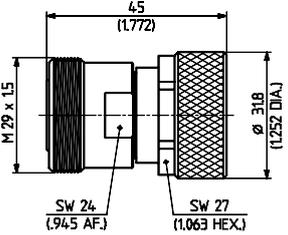
|                |                              |  |
|----------------|------------------------------|--|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>33_4310-716-50-X2/133_WE<br/>85031408</b> |
| 4.3-10<br>7/16 | plug (m)<br>jack (f)         |  |
| Material       | brass/SUCO                   |  |
| PIM            |                              | $\leq -155$ dBc, typ. $-160$ dBc             |

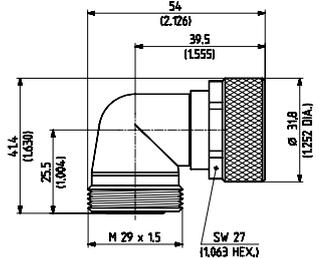
|                |                              |   |
|----------------|------------------------------|---|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>33_716_4310-50-1/133_WE<br/>85017213</b> |
| 7/16<br>4.3-10 | plug (m)<br>jack (f)         |   |
| Material       | brass/SUCO                   |   |
| PIM            |                              | $\leq -166$ dBc                             |

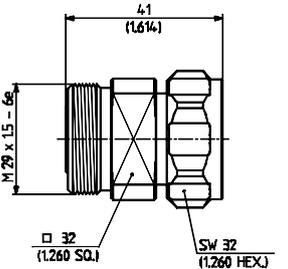
|                |                              |   |
|----------------|------------------------------|---|
| <b>527</b>     | <b>H+S type<br/>Item no.</b> | <b>33_716-4310-50-2/133_WE<br/>85031552</b> |
| 7/16<br>4.3-10 | plug (m)<br>jack (f)         |   |
| Material       | brass/SUCO                   |   |
| PIM            |                              | $\leq -155$ dBc, typ. $-160$ dBc            |

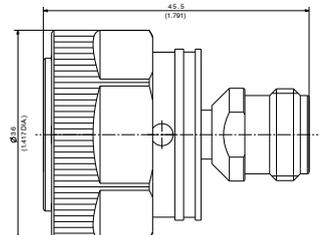
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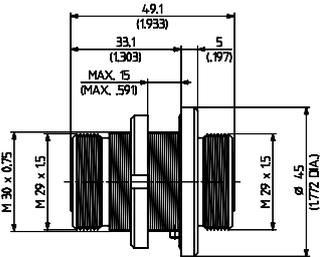
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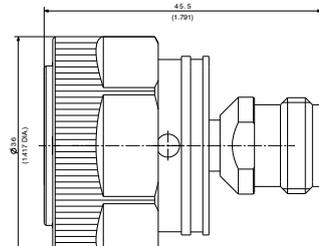
| 528      | H+S type<br>Item no.                    | 33_716-50-0-1/003_-E<br>22651577  |
|----------|---|---|
| 7/16     | plug (m)<br>jack (f)                    |  |
| Material | brass/silver                            |   |
| VSWR     | DC to 2 GHz<br>2 to 4 GHz<br>4 to 6 GHz | ≤ 1.02<br>≤ 1.03<br>≤ 1.04  |

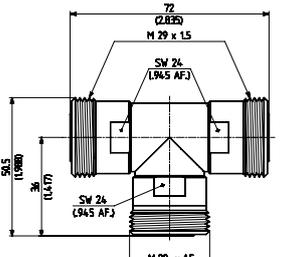
| 528      | H+S type<br>Item no. | 53_716-50-0-1/003_-E<br>22641259  |
|----------|----------------------|---|
| 7/16     | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |   |
| VSWR     | DC to 7.5 GHz        | ≤ 1.02 + 0.025 · f (GHz)  |

| 528      | H+S type<br>Item no. | 33_716-50-0-2/133_WE<br>22658193   |
|----------|----------------------|--|
| 7/16     | plug (m)<br>jack (f) |  |
| Material | brass/SUCO           |  |
| PIM      | ≤ -165 dBc           |  |

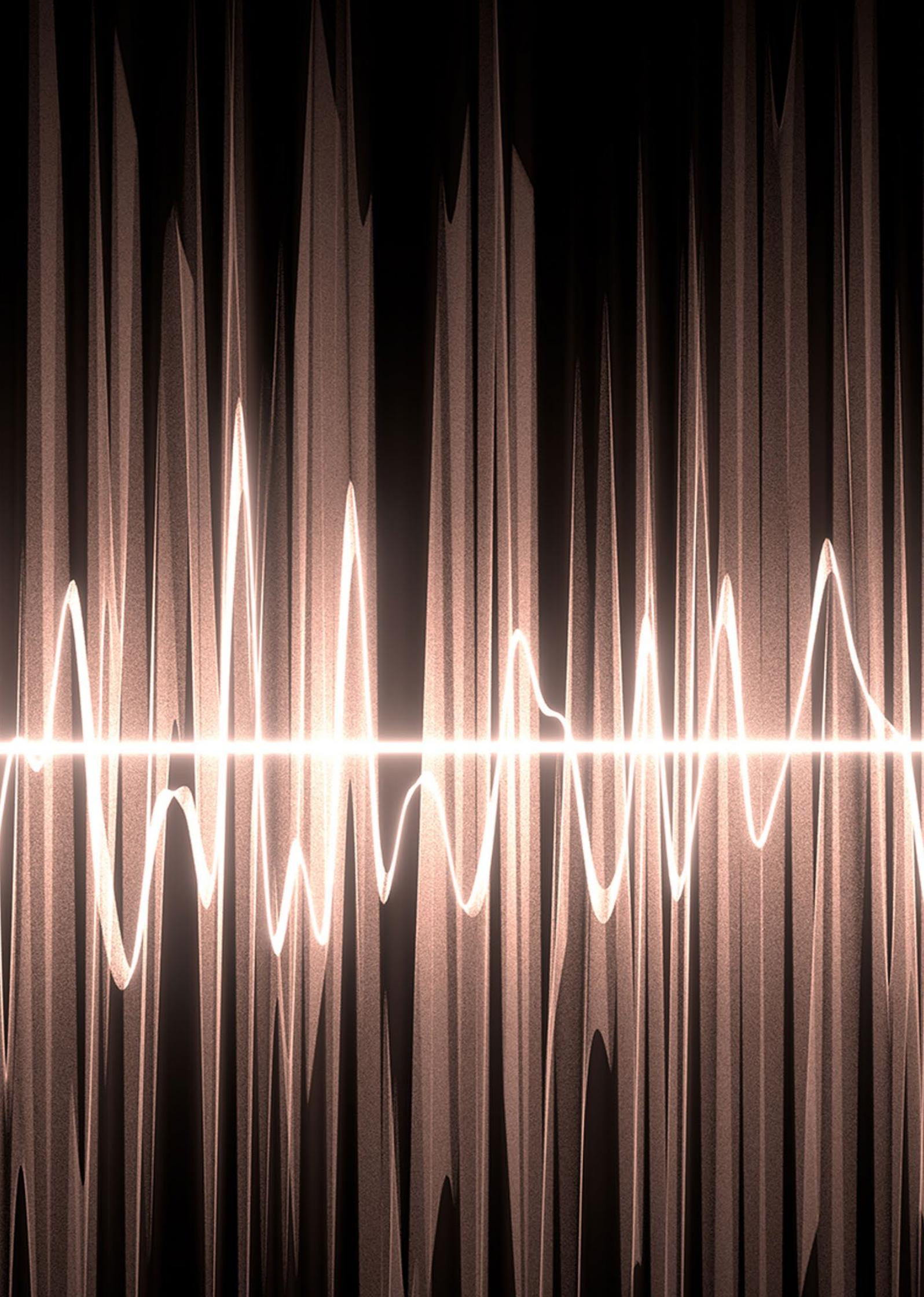
| 529      | H+S type<br>Item no.           | 33_MQ4-N-50-1/105_NE<br>85180450   |
|----------|--------------------------------|--|
| MQ5<br>N | plug (m)<br>jack (f)           |  |
| Material | brass/Tin-Nickel<br>brass/SUCO |  |
| VSWR     | DC to 6 GHz                    | ≤ 1.09   |

| 528           | H+S type<br>Item no.        | 34_716-50-0-1/003_-E<br>22544120  |
|---------------|-----------------------------|---|
| 7/16          | jack (f) 2 ×                |  |
| Material      | brass/SUCO                  |   |
| Mounting hole | ML 29                       |   |
| VSWR          | DC to 4 GHz<br>4 to 7.5 GHz | ≤ 1.02 + 0.05 · f (GHz)<br>≤ 1.22   |

| 530            | H+S type<br>Item no.           | 33_MQ5-N-50-1/105_NE<br>85180485  |
|----------------|--------------------------------|---|
| 7/16<br>4.3-10 | plug (m)<br>jack (f)           |  |
| Material       | brass/Tin-Nickel<br>brass/SUCO |   |
| VSWR           | DC to 6 GHz                    | ≤ 1.09  |

| 528      | H+S type<br>Item no. | 46_716-50-0-1/003_-E<br>22643266  |
|----------|----------------------|---|
| 7/16     | jack (f) 3 ×         |  |
| Material | brass/SUCO           |   |

Introduction and general information on page 507 and 508/509.



# Assembly tools

|  |     |
|--|-----|
| Crimping tools and inserts for flexible cables             | 552 |
| SMA tool set for semi-rigid cable assembling               | 555 |
| N, PC7, BNC, TNC, tool set for semi-rigid cable assembling | 557 |
| SMA tool set for semi-rigid cable assembling               | 559 |
| Soldering tool and soldering support                       | 561 |
| Selection of common and helpful assembly tools             | 562 |
| Torque wrenches  | 568 |

# Crimping tools and inserts for flexible cables

## Large crimp tool, «G» with interchangeable inserts 1/2/A, 2/B, 2/C, 3/D



Fig. 1



Fig. 2

| HUBER+SUHNER type | Item no. | Description   | Fig. |
|-------------------|----------|---|------|
| 75_Z-0-0-1        | 22543157 | tool without inserts  | 1    |
| 76_Z-0-0-15       | 22543177 | tool with various inserts 1/2/A, 2/B, 2/C, 3/D and cutting insert in wooden box | 2    |

## Tool boxes



| HUBER+SUHNER type | Item no. | Description  |
|-------------------|----------|--|
| 76_Z-0-0-9        | 22644671 | large tool box (empty)   |
| 76_Z-0-0-11       | 22543175 | large tool box without tooling but including foam insert for tools and allen key |

## Table press with interchangeable inserts



| HUBER+SUHNER type | Item no. | Description                                      |
|-------------------|----------|--|
| 75_Z-0-0-2        | 22543158 | press without inserts (for inserts see page 534) |

# Crimping tools and inserts for flexible cables

Interchangeable inserts fitting large crimp tool and table press



| HUBER +SUHNER type | Item no. | Cavity ID   | Square cavity size for centre contact mm | Hexagonal cavity size for outer contact mm |
|--------------------|----------|-------------|--|--|
| 76_Z-0-1-2         | 23000885 | 0.54/A      | 0.51                                     | 3.3  |
| 76_Z-0-2-1         | 22543181 | 1/2/A       | 0.74/1.58                                | 3.3  |
| 76_Z-0-2-8         | 22544191 | 1/4.95      | 0.7                                      | 4.95                                       |
| 76_Z-0-3-1         | 22543185 | 2/B         | 1.58                                     | 5.5  |
| 76_Z-0-3-9         | 22641133 | 1.22/1.22/B | 1.20/1.20                                | 5.5  |
| 76_Z-0-4-1         | 22543189 | 2/C         | 1.58                                     | 6.5  |
| 76_Z-0-4-8         | 22543190 | 1.22/1.22/C | 1.20/1.20                                | 6.5  |
| 76_Z-0-5-8         | 22543192 | 1.22/1.22/8 | 1.20/1.20                                | 8  |
| 76_Z-0-5-21        | 22543193 | 2/8.0       | 1.58                                     | 8  |
| 76_Z-0-6-1         | 22649051 | 3/8.65      | 2.38                                     | 8.65                                       |
| 76_Z-0-7-1         | 22543195 | 3/D         | 2.38                                     | 10.7                                       |
| 76_Z-0-7-7         | 22543196 | 2/D         | 1.58                                     | 10.7                                       |
| 76_Z-0-7-8         | 22660322 | 2.5/D       | 2.48                                     | 10.7                                       |
| 76_Z-0-7-14        | 22544524 | 4/D         | 3.28                                     | 10.7                                       |
| 76_Z-0-10-14       | 23002630 | 12.4        |  | 12.4                                       |
| 76_Z-0-0-26        | 22645880 | 1/2.67      | 0.8                                      | 2.73                                       |
| 76_Z-0-3-26        | 84077169 | 1.22/B      | 1.2                                      | 5.5  |
| 76_Z-0-4-24        | 84077171 | 1.22/6.5    | 1.2                                      | 6.5  |
| 76_Z-0-5-22        | 84077161 | 1.22/8.0    | 1.2                                      | 8  |
| 76_Z-0-0-57        | 85008389 | 5.5         |  | 5.5  |
| 76_Z-0-4-23        | 84074473 | C           |  | 6.5  |
| 76_Z-0-12-1        | 85009833 | 14.5        |  | 14.5                                       |

# Crimping tools and inserts for flexible cables

## Special insert and tools for large crimp tool and table press



| HUBER+SUHNER type | Item no. | Description   |
|-------------------|----------|---|
| 76_Z-0-0-1        | 22543170 | cutting insert for cables up to 12 mm/4.720 in outer diameter |
| 76_Z-0-0-2        | 22543172 | spare blades for cutting insert (10 pieces per package)       |
| 76_Z-0-0-3        | 22543173 | support plate for bench mounting of large crimp tool          |

# SMA tool set for semi-rigid cable assembling

This tool set includes all tools required for assembling of SMA connectors.

The following additional tools are required for assembling of N and PC7 connectors to cables semi-rigid 0.141 and 0.086:

74\_Z-0-3-29, 74\_Z-0-0-35, 74\_Z-0-0-66, 74\_Z-0-0-67, 74\_Z-0-3-4.

All tools and replacement parts can be ordered individually.

The individual tools can also be used with the large soldering fixture W442, HUBER+SUHNER type 74\_Z-0-0-442, to be ordered separately.



| HUBER+SUHNER type | Item no. | Description  | Packaging                | Weight  |
|-------------------|----------|--|--------------------------|---------|
| 74_Z-0-0-70       | 22544725 | large tool set for SMA semi-rigid cable assembling | wooden box 366x188x51 mm | 1,41 kg |

Small tool set see 74\_Z-0-0-72.

## Content of set

| HUBER+SUHNER type | Item no. | W-no. * | Description   | Qty |
|-------------------|----------|---------|---|-----|
| 74_Z-0-3-2        | 22543148 | W3-2    | stripping gauge for insulation semi-rigid 0.0141      | 1   |
| 74_Z-0-0-14       | 22543124 | W14     | locator tool, male and female                         | 1   |
| 74_Z-0-0-21       | 22543130 | W21     | torque wrench Ncm 100                                 | 1   |
| 74_Z-0-0-52       | 22544553 | W52     | dielectric insertion tool, for plugs                  | 1   |
| 74_Z-0-0-53       | 22544554 | W53     | dielectric insertion tool, for jacks                  | 1   |
| 74_Z-0-0-54       | 22544555 | W54     | contact holder for pins and sockets                   | 1   |
| 74_Z-0-0-55       | 22544516 | W55     | soldering gauge 0.25mm                                | 1   |
| 74_Z-0-0-56       | 22544517 | W56     | soldering gauge 0.4mm                                 | 1   |
| 74_Z-0-0-58       | 22544557 | W58     | soldering fixture                                     | 1   |
| 74_Z-0-0-59       | 22544558 | W59     | clamping inserts for semi-rigid 0.141, used with W58  | 2   |
| 74_Z-0-0-60       | 22544559 | W60     | clamping inserts for semi-rigid 0.086, used with W58  | 2   |
| 74_Z-0-0-63       | 22544562 | W63     | trim tool, for plugs without pin                      | 1   |
| 74_Z-0-0-68       | 22544715 | W68     | 1 set of blades with protector                        | 1   |
| 74_Z-0-0-81       | 22641423 | W81     | positioner for W164 assembling of coupling nuts (SMA) | 1   |
| 74_Z-0-0-142      | 22643462 | W142    | trim tool for removal of extended dielectric          | 1   |
| 74_Z-0-0-157      | 22643029 | W157    | cable stripping tool                                  | 1   |
| 74_Z-0-0-164      | 22643028 | W164    | trim tool for centre contact                          | 1   |
| 74_Z-0-0-368      | 23021264 | W368    | locator tool, used with W58                           | 1   |
| 74_Z-0-0-369      | 23021266 | W369    | locator tool, used with W58                           | 1   |

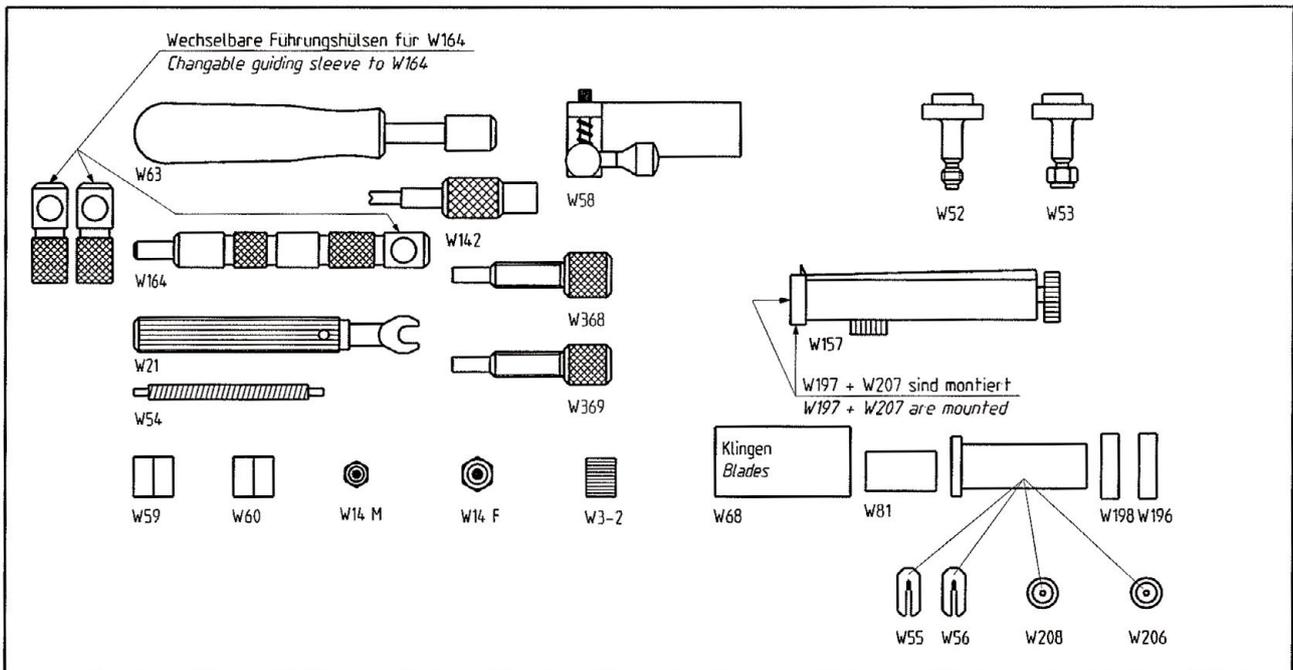
\* Identification marked on tool and referenced in assembling instruction, abbreviated notation derived from the HUBER+SUHNER type e.g. W58 from 74\_Z-0-0-58.

# SMA tool set for semi-rigid cable assembling

## Assembly instruction for semi-rigid cables and SMA connectors

DOC-0000178687 for female connectors

DOC-0000179086 for male connectors



# N, PC7, BNC, TNC, tool set for semi-rigid cable assembling

This tool set includes all tools required for assembling of N, PC7, BNC, TNC connectors.

All tools and replacement parts can be ordered individually.

The individual tools can also be used with the large soldering fixture W442 HUBER+SUHNER type 74\_Z-0-0-442, to be ordered separately.



| HUBER+SUHNER type | Item no. | Description  | Packaging                | Weight  |
|-------------------|----------|--|--------------------------|---------|
| 74_Z-0-0-71       | 22641350 | N, PC7, BNC, TNC, tool set for semi-rigid cable assembling | wooden box 366×188×51 mm | 1.22 kg |

## Content of set

| HUBER+SUHNER type | Item no. | W-no. * | Description   | Qty |
|-------------------|----------|---------|---|-----|
| 74_Z-0-3-2        | 22543148 | W3-2    | stripping gauge for insulation semi-rigid 0.141             | 1   |
| 74_Z-0-3-4        | 22543150 | W3-4    | trim tool for remove protruding dielectric semi-rigid 0.141 | 1   |
| 74_Z-0-0-29       | 22543138 | W29     | dielectric insertion tool for insulators                    | 1   |
| 74_Z-0-0-35       | 22544282 | W35     | soldering gauge 0.45 mm/0.018 in                            | 1   |
| 74_Z-0-0-58       | 22544557 | W58     | soldering fixture   | 1   |
| 74_Z-0-0-59       | 22544558 | W59     | clamping inserts for semi-rigid 0.141, used with W58        | 2   |
| 74_Z-0-0-60       | 22544559 | W60     | clamping inserts for semi-rigid 0.086, used with W58        | 2   |
| 74_Z-0-0-66       | 22544616 | W66     | locator tool  | 1   |
| 74_Z-0-0-67       | 22544640 | W67     | contact holder for pins and sockets                         | 1   |
| 74_Z-0-0-68       | 22544715 | W68     | 1 set of blades with protector                              | 1   |
| 74_Z-0-0-81       | 22641423 | W81     | positioner for assembly of coupling nuts                    | 1   |
| 74_Z-0-0-157      | 22643029 | W157    | cable stripping tool  | 1   |
| 74_Z-0-0-164      | 22643028 | W164    | trim tool for centre contact                                | 1   |

\* Identification marked on tool and referenced in assembling instruction, abbreviated notation derived from the HUBER+SUHNER type e.g. W58 from 74\_Z-0-0-58.

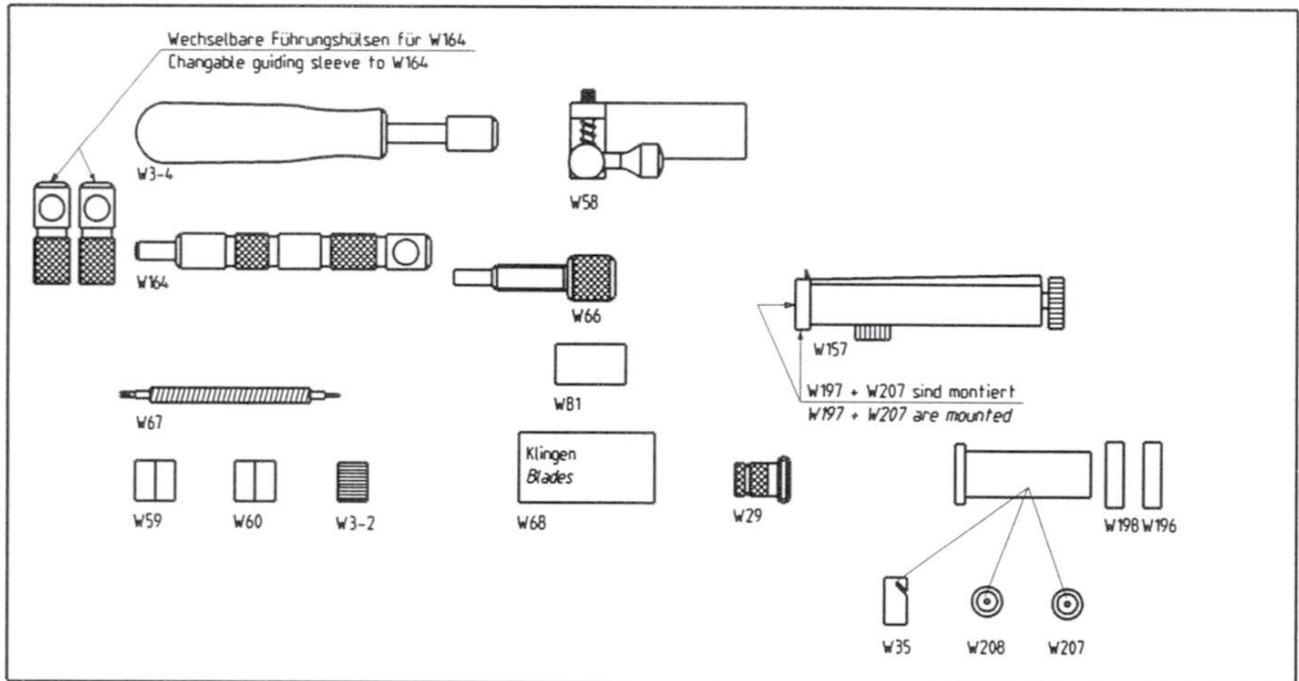
# N, PC7, BNC, TNC, tool set for semi-rigid cable assembling

## Assembly instruction for semi-rigid cables and N, BNC,TNC, PC7 connectors

DOC-0000180866 for series N connectors

DOC-0000179121 for series BNC – TNC connectors

DOC-0000180866 for series N – PC7 connectors



# SMA tool set for semi-rigid cable assembling

This tool set includes all tools required for assembling of SMA connectors.

The following additional tools are required for assembling of N and PC7 connectors to semi-rigid cables 0.141 and 0.086: 74\_Z-0-3-2, 74\_Z-0-3-4, 74\_Z-0-0-29, 74\_Z-0-0-35, 74\_Z-0-0-66, 74\_Z-0-0-67.

All tools and replacement parts can be ordered individually. The individual tools can also be used with the large soldering fixture W442, HUBER+SUHNER type 74\_Z-0-0-442, to be ordered separately.



| HUBER+SUHNER type | Item no. | Description  | Packaging                | Weight  |
|-------------------|----------|--|--------------------------|---------|
| 74_Z-0-0-72       | 22544747 | small tool set for SMA semi-rigid cable assembling | wooden box 366x188x51 mm | 1.13 kg |

Large tool set see 74\_Z-0-0-70.

## Content of set

| HUBER+SUHNER type | Item no. | W-no. * | Description  | Qty |
|-------------------|----------|---------|--|-----|
| 74_Z-0-0-14       | 22543124 | W14     | locator tool, male and female                        | 1   |
| 74_Z-0-0-52       | 22544553 | W52     | dielectric insertion tool, for plugs                 | 1   |
| 74_Z-0-0-53       | 22544554 | W53     | dielectric insertion tool, for jacks                 | 1   |
| 74_Z-0-0-54       | 22544555 | W54     | contact holder for pins and sockets                  | 1   |
| 74_Z-0-0-55       | 22544516 | W55     | soldering gauge 0.25mm                               | 1   |
| 74_Z-0-0-56       | 22544517 | W56     | soldering gauge 0.4mm                                | 1   |
| 74_Z-0-0-58       | 22544557 | W58     | soldering fixture                                    | 1   |
| 74_Z-0-0-59       | 22544558 | W59     | clamping Inserts for semi-rigid 0.141, used with W58 | 2   |
| 74_Z-0-0-60       | 22544559 | W60     | clamping Inserts for semi-rigid 0.086, used with W58 | 2   |
| 74_Z-0-0-68       | 22544715 | W68     | 1 set of blades with protector                       | 1   |
| 74_Z-0-0-142      | 22643462 | W142    | trim tool for removal of extended dielectric         | 1   |
| 74_Z-0-0-157      | 22643029 | W157    | cable stripping tool                                 | 1   |
| 74_Z-0-0-368      | 23021264 | W368    | locator tool, used with W58                          | 1   |
| 74_Z-0-0-369      | 23021266 | W369    | locator tool, used with W58                          | 1   |

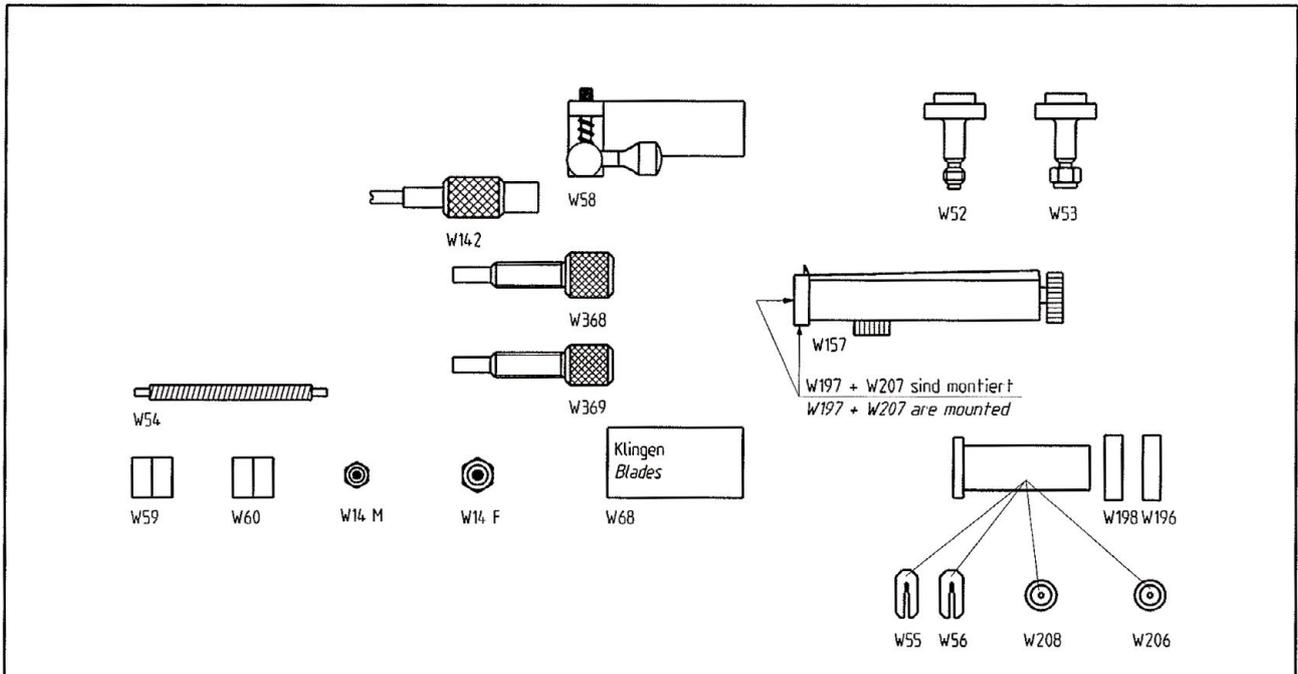
\* Identification marked on tool and referenced in assembling instruction, abbreviated notation derived from the HUBER+SUHNER type e.g. W58 from 74\_Z-0-0-58.

# SMA tool set for semi-rigid cable assembling

## Assembly instruction for semi-rigid cables and SMA connectors

DOC-0000178687 for female connectors

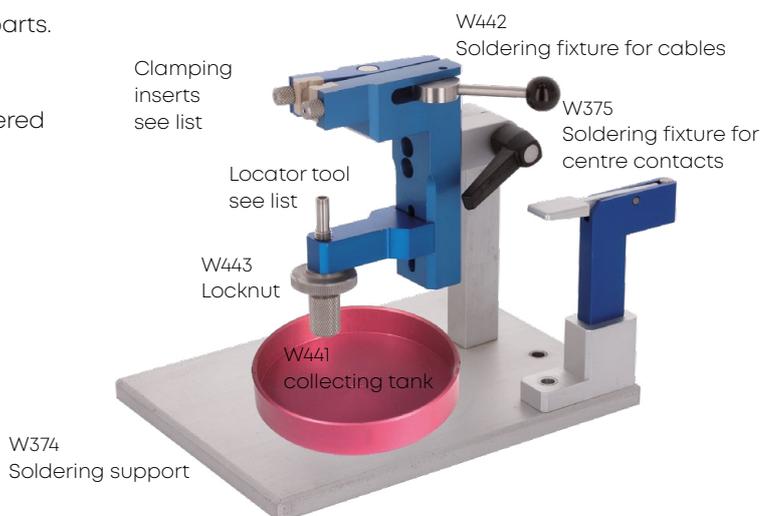
DOC-0000179086 for male connectors



# Soldering tool and soldering support

The soldering tool consist of several different parts.

Depending on the requirement, the individual items can be combined. The parts can be ordered separately.



## Basic equipment

### Large soldering fixture W442

Alternative see small fixture W58

| HUBER+SUHNER type | Item no. | W-no.* | Description                           | Comments   |
|-------------------|----------|--------|---------------------------------------|--|
| 74_Z-0-0-442      | 23024588 | W442   | soldering fixture                     | can also be used without soldering support W374, e.g. mounted/assembling on a table                              |
| 74_Z-0-0-374      | 23022146 | W374   | support for soldering fixture         | can be used with the new version of the soldering fixture W58, the new version contains two additional scrwholes |
| 74_Z-0-0-443      | 23024584 | W443   | positioning locator tool              | for a positioning of the locator tool- free from backflash   |
| 74_Z-0-0-441      | 23024586 | W441   | collecting tank for coolant or flux   | collecting tank for coolant or flux  |
| 74_Z-0-0-375      | 23022145 | W375   | soldering fixture for centre contacts | supporting tool, to solder the cable into the centre contact   |

## Additional components

### Locator tool, adapted for W442/W58

for the appropriate connector-interface see list

| HUBER+SUHNER type | Item no. | W-no. * | For series |
|-------------------|----------|---------|------------|
| 74_Z-0-0-62       | 22544561 | W62     | SMA        |
| 74_Z-0-0-66       | 22544616 | W66     | N          |
| 74_Z-0-0-209      | 22645585 | W209    | BMA plug   |
| 74_Z-0-0-210      | 22645586 | W210    | BMA jack   |
| 74_Z-0-0-231      | 22646131 | W231    | SK plug    |
| 74_Z-0-0-232      | 22646132 | W232    | SK jack    |
| 74_Z-0-0-368      | 23021264 | W368    | SMA female |
| 74_Z-0-0-369      | 23021266 | W369    | SMA male   |
| 74_Z-0-0-390      | 23035218 | W390    | QN         |
| 74_Z-0-0-391      | 23035220 | W391    | QN         |

### Clamping inserts, adapted for W442/W58

for the appropriate connector-interface see list

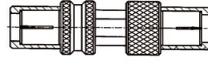
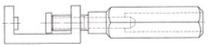
| HUBER+SUHNER type | Item no. | W-no. * | For series                    |
|-------------------|----------|---------|-------------------------------|
| 74_Z-0-0-59       | 22544558 | W59     | BMA, N, SMA, semi-rigid 0.141 |
| 74_Z-0-0-60       | 22544559 | W60     | BMA, N, SMA, semi-rigid 0.086 |
| 74_Z-0-0-133      | 22643022 | W133    | BMA, N, SMA, semi-rigid 0.047 |
| 74_Z-0-0-233      | 22646133 | W233    | SK, semi-rigid 0.118          |
| 74_Z-0-0-364      | 23019268 | W364    | MULTIFLEX_86                  |
| 74_Z-0-0-365      | 23019269 | W365    | MULTIFLEX_141, SUCOFORM_141   |

\* Identification marked on tool and referenced in assembling instruction, abbreviated notation derived from the HUBER+SUHNER type e.g. W58 from 74\_Z-0-0-58.

# Selection of common and helpful assembly tools

| HUBER+SUHNER type          | Item no.             | W-no. *    | For series and cables         | Description  | Works with tool of W-no. | Picture   |
|----------------------------|----------------------|------------|-------------------------------|--|--------------------------|---|
| 74_Z-0-0-12                | 22642718             |            |                               | small hand saw   |                          |    |
| 74_Z-0-0-13                | 22644241             |            |                               | replacement saw blade for 74_Z-0-0-12                                    |                          |    |
| 74_Z-0-0-14                | 22543124             | W14        | SMA                           | locator tools for contact and insulators                                 |                          |    |
| 74_Z-0-0-21                | 22543130             | W21        | SMA, PC3.5                    | torque wrench 100 Ncm  |                          |    |
| 74_Z-0-0-24                | 22543133             |            | SMA                           | tap drill for SMA (1/4-36 UNS-2B thread)                                 |                          |    |
| 74_Z-0-0-29                | 22543138             | W29        | N                             | dielectric insertion tool for insulators                                 |                          |    |
| 74_Z-0-0-30                | 22543139             |            | MCX, MMBX                     | assembly tool for right angle connectors for decoupling and cap mounting |                          |   |
| 74_Z-0-0-35                | 22544282             | W35        | N                             | soldering gauge 0.45 mm/0.018 in   |                          |  |
| 74_Z-0-0-52                | 22544553             | W52        | SMA plugs                     | dielectric insertion tool  |                          |  |
| 74_Z-0-0-53                | 22544554             | W53        | SMA jacks                     | dielectric insertion tool  |                          |  |
| 74_Z-0-0-54                | 22544555             | W54        | SMA                           | contact holder for pins and sockets                                      |                          |  |
| 74_Z-0-0-55<br>74_Z-0-0-56 | 22544516<br>22544517 | W55<br>W56 | SMA<br>SMA                    | soldering gauge 0.20 mm<br>soldering gauge 0.40 mm                       | W58/W442<br>W58/W442     |  |
| 74_Z-0-0-58                | 22544557             | W58        | BMA, SK, N, SMA               | soldering fixture  | W374/W55/<br>W56         |  |
| 74_Z-0-0-59                | 22544558             | W59        | BMA, N, SMA, semi-rigid 0.141 | clamping inserts   | W58/W442                 |  |
| 74_Z-0-0-60                | 22544559             | W60        | BMA, N, SMA, semi-rigid 0.086 | clamping inserts   | W58/W442                 |  |

# Selection of common and helpful assembly tools

| HUBER+SUHNER type | Item no. | W-no. * | For series and cables   | Description   | Works with tool of W-no. | Picture   |
|-------------------|----------|---------|---|---|--------------------------|---|
| 74_Z-0-0-62       | 22544561 | W62     | SMA   | locator tool for SMA plugs without pin                  | W58/W442                 |    |
| 74_Z-0-0-63       | 22544562 | W63     | SMA   | trim tool for SMA plugs without pin                     |                          |    |
| 74_Z-0-0-66       | 22544616 | W66     | N   | locator tool  | W58/W442                 |    |
| 74_Z-0-0-67       | 22544640 | W67     | N   | contact holder for pins and sockets                     |                          |    |
| 74_Z-0-0-68       | 22544715 | W68     | BMA, SK, N, SMA   | 1 set of blades with protector                          |                          |    |
| 74_Z-0-0-75       | 22544807 | W75     | SK, SMA   | assembly tool for hermetic jacks                        |                          |    |
| 74_Z-0-0-81       | 22641423 |         | SK, SMA   | positioner for assembly of coupling nuts                |                          |   |
| 74_Z-0-0-89       | 22644721 | W89     | 716   | screwdriver for female centre contacts                  | W79                      |  |
| 74_Z-0-0-115      | 22642492 |         |   | syringe for casting compound capacity 3.5 ccm           |                          |  |
| 74_Z-0-0-116      | 22642493 |         |   | casting compound (set of two tubes: resin and hardener) |                          |  |
| 74_Z-0-0-133      | 22643022 | W133    | BMA, N, SMA, semi-rigid 0.047   | clamping inserts  | W58/W442                 |  |
| 74_Z-0-0-142      | 22643462 | W142    | SMA   | trim tool for removal of extended dielectric            |                          |  |
| 74_Z-0-0-157      | 22643029 | W157    | BMA, SK, N, SMA, semi-rigid 0.047, 0.186, 0.141, SUCO-FORM_86 and 141 | cable stripping tool                                    |                          |  |
| 74_Z-0-0-160      | 22643514 |         | semi-rigid 0.047, 0.086, 0.141  | replacement cutting wheels set                          | W157                     |  |
| 74_Z-0-0-164      | 22643028 | W164    | BMA, N, SMA, semi-rigid 0.086, 0.141                                  | trim tool for centre contacts                           | W245                     |  |
| 74_Z-0-0-177      | 22644541 | W177    | 16 SMB, C, S  | tool for cap mounting                                   |                          |  |

# Selection of common and helpful assembly tools

| HUBER+SUHNER type  | Item no.                                     | W-no. * | For series and cables  | Description   | Works with tool of W-no. | Picture   |
|--|--|---------|--|---|--------------------------|---|
| 74_Z-0-0-196<br>74_Z-0-0-197<br>74_Z-0-0-198<br>74_Z-0-0-397 | 22645359<br>22645360<br>22645361<br>84005300 |         | semi-rigid 0.047<br>semi-rigid 0.086<br>semi-rigid 0.141<br>semi-rigid 0.118 | replacement support cover                           | W157                     |    |
| 74_Z-0-0-206<br>74_Z-0-0-207<br>74_Z-0-0-208                 | 22645364<br>22645363<br>22645362             |         | semi-rigid 0.047<br>semi-rigid 0.086<br>semi-rigid 0.141                     | replacement cutting wheels                          | W157                     |    |
| 74_Z-0-0-209   | 22645585                                     | W209    | BMA plug   | locator tool  | W58/W442                 |    |
| 74_Z-0-0-210   | 22645586                                     | W210    | BMA jack   | locator tool  | W58/W442                 |    |
| 74_Z-0-0-211   | 22645591                                     |         | BMA hermetic seal  | soldering fixture for hermetic seal                 |                          |    |
| 74_Z-0-0-213   | 22645593                                     | W213    | BMA  | removal tool for receptacles with snap-in mechanism |                          |    |
| 74_Z-0-0-214   | 22645579                                     |         | BMA hermetic seal  | torque wrench 200 Ncm                               |                          |   |
| 74_Z-0-0-225   | 22645861                                     |         | MMCX   | decoupling and cap mounting                         |                          |  |
| 74_Z-0-0-226   | 22646136                                     | W226    | SK   | soldering fixture for glass bead                    |                          |  |
| 74_Z-0-0-227   | 22646137                                     | W227    | SK   | soldering fixture for glass bead                    |                          |  |
| 74_Z-0-0-228   | 22646138                                     | W228    | SK   | assembling tool for dielectric bead                 |                          |  |
| 74_Z-0-0-229   | 22646139                                     | W229    |  | tap drill (thread 1/4-36 UNS for blind hole thread) |                          |  |
| 74_Z-0-0-230   | 22646130                                     | W230    | SK   | step drill (only if sliding contacts are not used)  |                          |  |
| 74_Z-0-0-231   | 22646131                                     | W231    | SK plug  | locator tool  | W58/W442                 |  |
| 74_Z-0-0-232   | 22646132                                     | W232    | SK jack  | locator tool  | W58/W442                 |  |
| 74_Z-0-0-233   | 22646133                                     | W233    | SK, semi-rigid 0.118   | clamping inserts                                    | W58/W442                 |  |
| 74_Z-0-0-234   | 22646134                                     | W234    | SK, semi-rigid 0.118   | replacement cutting wheels                          | W157                     |  |

# Selection of common and helpful assembly tools

| HUBER+SUHNER type | Item no. | W-no. * | For series and cables       | Description  | Works with tool of W-no. | Picture   |
|-------------------|----------|---------|-----------------------------|--|--------------------------|---|
| 74_Z-0-0-235      | 22646135 | W235    | SK                          | step drill (only if sliding contacts are not used)                                     |                          |    |
| 74_Z-0-0-238      | 22646071 |         |                             | tap drill (thread 5/8-24 UNEF)   |                          |    |
| 74_Z-0-0-246      | 22646873 | W246    | SMA                         | jacket remover for semi-rigid and Sucoform cables, after cutting and braking of jacket | W157/W246                |    |
| 74_Z-0-0-264      | 22646290 | W264    | SK, semi-rigid 0.118        | trim tool for centre conductor   |                          |    |
| 74_Z-0-0-265      | 22646291 | W265    | SK                          | spare blade for W264   |                          |    |
| 74_Z-0-0-270      | 22648901 | W270    | 1.0/2.3                     | removal tool for 1.0/2.3 inserts   |                          |   |
| 74_Z-0-0-272      | 22648614 |         | MMCX                        | decoupling and cap mounting for 11_MMCX,16_MMCX connectors                             |                          |  |
| 74_Z-0-0-350      | 23004135 |         | MMCX                        | removal tool   |                          |  |
| 74_Z-0-0-360      | 23023444 | W360    | QMA                         | locator tool   |                          |  |
| 74_Z-0-0-364      | 23019268 | W364    | MULTIFLEX_86                | clamping inserts   | W58/W442                 |  |
| 74_Z-0-0-365      | 23019269 | W365    | MULTIFLEX_141, SUCOFORM_141 | clamping inserts   | W58/W442                 |   |
| 74_Z-0-0-368      | 23021264 | W368    | SMA female                  | locator tool   | W58/W442                 |  |
| 74_Z-0-0-369      | 23021266 | W369    | SMA male                    | locator tool   | W58/W442                 |  |
| 74_Z-0-0-374      | 23022146 | W374    | BMA, SK, SMA, N             | support for soldering fixture  | W58/W442                 |  |

# Selection of common and helpful assembly tools

| HUBER+SUHNER type | Item no. | W-no. * | For series and cables          | Description                                  | Works with tool of W-no. | Picture   |
|-------------------|----------|---------|--------------------------------|--|--------------------------|---|
| 74_Z-0-0-375      | 23022145 | W375    | BMA, SK, SMA, N                | soldering fixture for centre contacts        | W442                     |    |
| 74_Z-0-0-390      | 23035218 | W390    | QN                             | locator tool for 11_QN, 16_QN                | W58/W442                 |    |
| 74_Z-0-0-391      | 23035220 | W391    | QN                             | locator tool for 24_QN                       | W58/W442                 |    |
| 74_Z-0-0-437      | 23023494 |         | MMBX 32_adapters within series | assembly tool                                |                          |    |
| 74_Z-0-0-441      | 23024586 | W441    | BMA, SK, SMA, N                | collecting tank for coolant or flux          | W374                     |   |
| 74_Z-0-0-442      | 23024588 | W442    | BMA, SK, SMA, N                | soldering fixture                            | W374                     |  |
| 74_Z-0-0-443      | 23024584 | W443    | BMA, SK, SMA, N                | positioning locator tool                     | W442                     |  |
| 74_Z-0-0-459      | 84032400 | W459    | QMA, QN                        | decoupling tool for high density application |                          |  |
| 74_Z-0-0-461      | 84029787 | W461    | QMA waterproof                 | suitable for semi-rigid cables               |                          |  |
| 74_Z-0-0-488      | 84101887 | W488    | MBX 32- adapters within series | assembly and disassembly tool                |                          |  |
| 74_Z-0-0-555      | 84020011 | W555    | MMPX                           | decoupling tool (distance washers included)  |                          |  |
| 74_Z-0-0-556      | 84031617 | W556    | MMPX                           | distance washers (for replacement)           |                          |  |

# Selection of common and helpful assembly tools

| HUBER+SUHNER type | Item no. | W-no. * | For series and cables    | Description                                | Works with tool of W-no. | Picture   |
|-------------------|----------|---------|--------------------------|--|--------------------------|---|
| 74_Z-0-0-557      | 84032418 |         | MMBX                     | decoupling tool                            |                          |  |
| 74_Z-0-0-622      | 85022707 | W622    | MFBX                     | coupling tool                              |                          |  |
| 74_Z-0-3-2        | 22543148 | W3-2    | SMA, N, semi-rigid 0.141 | stripping gauge for insulation             |                          |  |
| 74_Z-0-3-4        | 22543150 | W3-4    | N, semi-rigid 0.0141     | trim tool for remove protruding dielectric |                          |  |

\* Identification marked on tool and referenced in assembling instruction, abbreviated notation derived from the HUBER+SUHNER type e.g. W58 from 74\_Z-0-0-58.

# Torque wrenches



Box-spanner



Torque wrench (standard style)

| HUBER+SUHNER type | Item no. | Suitable for series | Torque Ncm | Opening WAF mm | Notes             |
|-------------------|----------|---------------------|------------|----------------|-------------------|
| 74_Z-0-0-504      | 85020152 | 4.3-10              | 500        | 22.0           | standard style    |
| 74_Z-0-0-321      | 22651994 | N                   | 100        | 19.0           | standard style    |
| 74_Z-0-0-193      | 22645085 | N                   | 100        | 20.0           | standard style    |
| 74_Z-0-0-330      | 22658130 | N                   | 100        | 18.0           | standard style    |
| 74_Z-0-0-663      | 85101096 | NEX10               | 150        | 11.0           | standard style    |
| 74_Z-0-0-688      | 85153022 | NEX10               | 500        | 14.0           | standard style    |
| 74_Z-0-0-174      | 22643898 | SK                  | 130        | 8.0            | standard style    |
| 74_Z-0-0-189      | 22644368 | SK hermetic         | 200        | 8.0            | standard style    |
| 74_Z-0-0-77       | 22544820 | SMA                 | 100        | 8.0            | box spanner style |
| 74_Z-0-0-21       | 22543130 | SMA/PC3.5           | 100        | 8.0            | standard style    |
| 74_Z-0-0-79       | 22642374 | SMA economic        | 45         | 8.0            | standard style    |
| 74_Z-0-0-80       | 22544821 | SMA hermetic        | 195        | 7.0            | standard style    |
| 74_Z-0-0-45       | 22544232 | SMC                 | 30         | 6.0            | standard style    |
| 74_Z-0-0-192      | 22645084 | TNC                 | 100        | 15.0           | standard style    |
| 74_Z-0-0-373      | 23021864 | TNC                 | 100        | 14.0           | standard style    |
| 74_Z-0-0-511      | 84151106 | TNC                 | 260        | 14.0           | standard style    |

## Precision torque wrench

- In plastic box
- With calibration certificate



| HUBER+SUHNER type | Item no. | For series     | Torque Ncm | Opening WAF mm | Notes                      |
|-------------------|----------|----------------|------------|----------------|----------------------------|
| 74_Z-0-0-492      | 84104509 | SMA, PC3.5, SK | 90         | 8.0            | precision (standard style) |

# Accessories

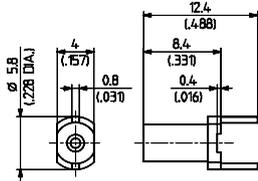
|   |     |
|---|-----|
| Cable terminators                         | 570 |
| Taper sleeves and suitable assembly tools | 572 |
| Insulating washers                        | 574 |
| Solder tags                               | 575 |
| Component container "Sucobox"             | 576 |
| Accessories for SK connectors             | 577 |
| Accessories for BMA connectors            | 577 |

# Cable terminators

## Straight PCB cable terminators

### For flexible cables

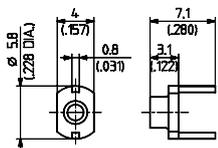
- Cable entry crimp
- 2.54 mm/0.100 in grid



| HUBER+SUHNER type    | Item no. | Cable group (example)            | Packaging | Plating body | Assembly instruction | Mounting hole | Crimp insert |
|----------------------|----------|----------------------------------|-----------|--------------|----------------------|---------------|--------------|
| 83_CT-0-1-1/-11_NE-1 | 23013158 | U1 (RG_178_B/U, ENVIROFLEX_178)  | single    | gold         | 27408                | ML 45         | A            |
| 83_CT-0-2-1/-11_NE   | 23013159 | U2 (RG_316_/U, ENVIROFLEX_316)   |           |              |                      |               |              |
| 83_CT-0-2-2/-11_NE   | 23013161 | U4 (K_02252_D, ENVIROFLEX_316_D) |           |              |                      |               |              |

### For Semi-rigid cables

- Cable entry soldered
- 2.54 mm/0.100 in grid



| HUBER+SUHNER type    | Item no. | Cable group (example) | Packaging     | Plating body | Assembly instruction | Mounting hole |
|----------------------|----------|-----------------------|---------------|--------------|----------------------|---------------|
| 83_CT-0-2-4/-11_NE-1 | 23013176 | Y3, Y16 (EZ_86)       | single        | gold         | 27410                | ML 45         |
| 83_CT-0-2-4/-11_NH-1 | 23013177 |                       | bulk 100 pcs. |              |                      |               |

# Cable terminators

## For flexible cables

- Cable entry soldered

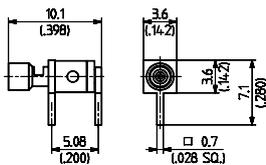


Fig. 1

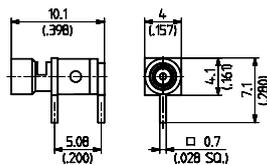


Fig. 2

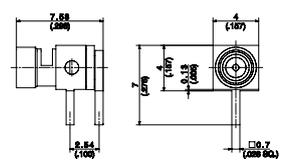


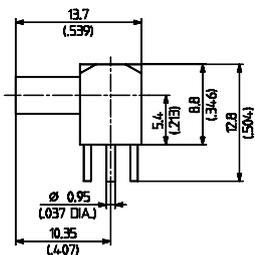
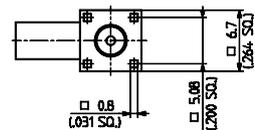
Fig. 3



| HUBER+SUHNER type  | Item no. | Cable group (example)           | Packaging     | Plating body | Assembly instruction | Mounting hole | Fig. |
|--------------------|----------|---------------------------------|---------------|--------------|----------------------|---------------|------|
| 86_CT-0-1-1/111_NE | 23013202 | U1 (RG_178_B/U, ENVIROFLEX_178) | single        | gold         | 27411                | ML 100        | 1    |
| 86_CT-0-2-1/111_NH | 23013216 | U2 (RG_316_/U, ENVIROFLEX_316)  | bulk 100 pcs. |              | 27411                | ML 100        | 2    |
| 86_CT-0-2-5/111_NH | 23016926 | U2 (RG_316_/U, ENVIROFLEX_316)  | bulk 100 pcs. |              | 27432                | ML 164        | 3    |

## For flexible cables

- Cable entry crimp
- 5.08 mm/0.200 in grid



| HUBER+SUHNER type  | Item no. | Cable group (example)          | Packaging | Plating body | Assembly instruction | Mounting hole | Crimp insert |
|--------------------|----------|--------------------------------|-----------|--------------|----------------------|---------------|--------------|
| 86_CT-0-2-2/111_NE | 23013227 | U2 (RG_316_/U, ENVIROFLEX_316) | single    | gold         | 27412                | ML 15         | A            |

# Taper sleeves and suitable assembly tools

Installation recommendation: silicone-containing release agent in spray form to improve the separating and lubricating effect, e.g. ACMOS 70-2406.

- For connectors with cable entry crimp
- Made of EVA (ethylenevinylacetat)
- Temperature resistant  $-40$  to  $+70$  °C/ $-40$  to  $+158$  °F
- Free of halogen
- Recyclable



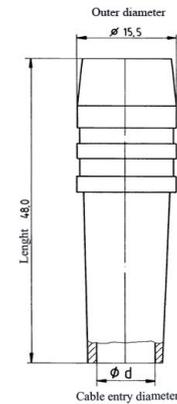
| Cable size examples            | RG_196_A/U | RG_188_A/U,<br>RG_179_B/U | G_02232_D,<br>K_02252_D | RG_58_C/U,<br>RG_142_B/U | RG_223_/U,<br>G_03213_D | RG_59_B/U  | G_04233_D  |
|--------------------------------|------------|---------------------------|-------------------------|--------------------------|-------------------------|------------|------------|
| Cable group                    | U1         | U2, U5                    | U4, R8                  | U7, U11, U12,<br>U13, U9 | U14                     | U16, U17   | U18        |
| <b>Taper sleeve dimensions</b> |            |                           |                         |                          |                         |            |            |
| Cable entry diameter mm        | 1.8        | 2.5                       | 2.9                     | 4.8                      | 5.3                     | 6.0        | 6.6        |
| Outer diameter mm              | 6.2        | 6.2                       | 6.2                     | 10.0                     | 10.0                    | 11.0       | 11.0       |
| Length mm                      | 20         | 20                        | 20                      | 38                       | 38                      | 38         | 38         |
| <b>Colour black</b>            |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-0-1-1 | 78_Z-0-2-1                | 78_Z-0-2-3              | 78_Z-0-3-4               | 78_Z-0-3-5              | 78_Z-0-4-4 | 78_Z-0-4-5 |
| Item no.                       | 2641162    | 22544467                  | 22544457                | 22544408                 | 22641890                | 22544427   | 22641673   |
| <b>Colour brown</b>            |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-1-1-1 | 78_Z-1-2-1                | 78_Z-1-2-3              | 78_Z-1-3-4               | 78_Z-1-3-5              | 78_Z-1-4-4 | 78_Z-1-4-5 |
| Item no.                       | 22544448   | 22544468                  | 22544458                | 22544416                 | 22641664                | 22544436   | 22641674   |
| <b>Colour red</b>              |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-2-1-1 | 78_Z-2-2-1                | 78_Z-2-2-3              | 78_Z-2-3-4               | 78_Z-2-3-5              | 78_Z-2-4-4 | 78_Z-2-4-5 |
| Item no.                       | 22544449   | 22544469                  | 22544459                | 22544415                 | 22641665                | 22544435   | 22641675   |
| <b>Colour orange</b>           |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-3-1-1 | 78_Z-3-2-1                | 78_Z-3-2-3              | 78_Z-3-3-4               | 78_Z-3-3-5              | 78_Z-3-4-4 | 78_Z-3-4-5 |
| Item no.                       | 22544450   | 22544470                  | 22544460                | 22544414                 | 22641166                | 22544434   | 22641676   |
| <b>Colour yellow</b>           |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-4-1-1 | 78_Z-4-2-1                | 78_Z-4-2-3              | 78_Z-4-3-4               | 78_Z-4-3-5              | 78_Z-4-4-4 | 78_Z-4-4-5 |
| Item no.                       | 22544451   | 22544471                  | 22544461                | 22544413                 | 22641667                | 22544433   | 22641677   |
| <b>Colour green</b>            |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-5-1-1 | 78_Z-5-2-1                | 78_Z-5-2-3              | 78_Z-5-3-4               | 78_Z-5-3-5              | 78_Z-5-4-4 | 78_Z-5-4-5 |
| Item no.                       | 22544452   | 22544472                  | 22544462                | 22544412                 | 22641668                | 22544432   | 22641678   |
| <b>Colour blue</b>             |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-6-1-1 | 78_Z-6-2-1                | 78_Z-6-2-3              | 78_Z-6-3-4               | 78_Z-6-3-5              | 78_Z-6-4-4 | 78_Z-6-4-5 |
| Item no.                       | 22544453   | 22544473                  | 22544463                | 22544411                 | 22641669                | 22544431   | 22641679   |
| <b>Colour violet</b>           |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-7-1-1 | 78_Z-7-2-1                | 78_Z-7-2-3              | 78_Z-7-3-4               | 78_Z-7-3-5              | 78_Z-7-4-4 | 78_Z-7-4-5 |
| Item no.                       | 22544454   | 22544474                  | 22544464                | 22544410                 | 22641670                | 22544430   | 22641680   |
| <b>Colour grey</b>             |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-8-1-1 | 78_Z-8-2-1                | 78_Z-8-2-3              | 78_Z-8-3-4               | 78_Z-8-3-5              | 78_Z-8-4-4 | 78_Z-8-4-5 |
| Item no.                       | 22544455   | 22544475                  | 22544465                | 22544409                 | 22641671                | 22544429   | 22641681   |
| <b>Colour White</b>            |            |                           |                         |                          |                         |            |            |
| H+S type                       | 78_Z-9-1-1 | 78_Z-9-2-1                | 78_Z-9-2-3              | 78_Z-9-3-4               | 78_Z-9-3-5              | 78_Z-9-4-4 | 78_Z-9-4-5 |
| Item no.                       | 22544456   | 22544476                  | 22544466                | 22544508                 | 22641672                | 22544428   | 22641682   |
| <b>Assembly tools</b>          |            |                           |                         |                          |                         |            |            |
| H+S type                       | 74_Z-0-2-1 |                           |                         | 74_Z-0-3-6               |                         | 74_Z-0-4-6 |            |
| Tool colour                    | blue       |                           |                         | red                      |                         | gold       |            |

For more details see: operating instruction DOC-0000270949

# Taper sleeves and suitable assembly tools

The two types below are available in black only

|                                |                      |                  |
|--------------------------------|----------------------|------------------|
| <b>Cable size examples</b>     | <b>RG_213_/U</b>     | <b>RG_214_/U</b> |
| <b>Cable group</b>             | <b>U29, U30, U34</b> | <b>U32, U36</b>  |
| <b>Taper sleeve dimensions</b> |                      |                  |
| <b>Cable entry diameter mm</b> | <b>10.1</b>          | <b>10.7</b>      |
| <b>Outer diameter mm</b>       | <b>15.5</b>          | <b>15.5</b>      |
| <b>Length mm</b>               | <b>48</b>            | <b>48</b>        |
| <b>Colour black</b>            |                      |                  |
| H+S type                       | 78_Z-0-7-1           | 78_Z-0-7-2       |
| Item no.                       | 2641162              | 22544467         |
| <b>Assembly tool</b>           |                      |                  |
| H+S type                       | 74_Z-0-7-2           | 74_Z-0-7-3       |
| Tool colour                    | grey                 | black            |



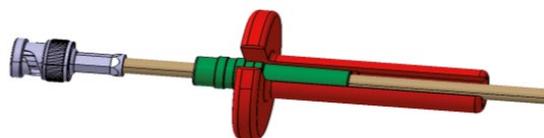
For more details see: operating instruction DOC-0000270949

## Assembly tools

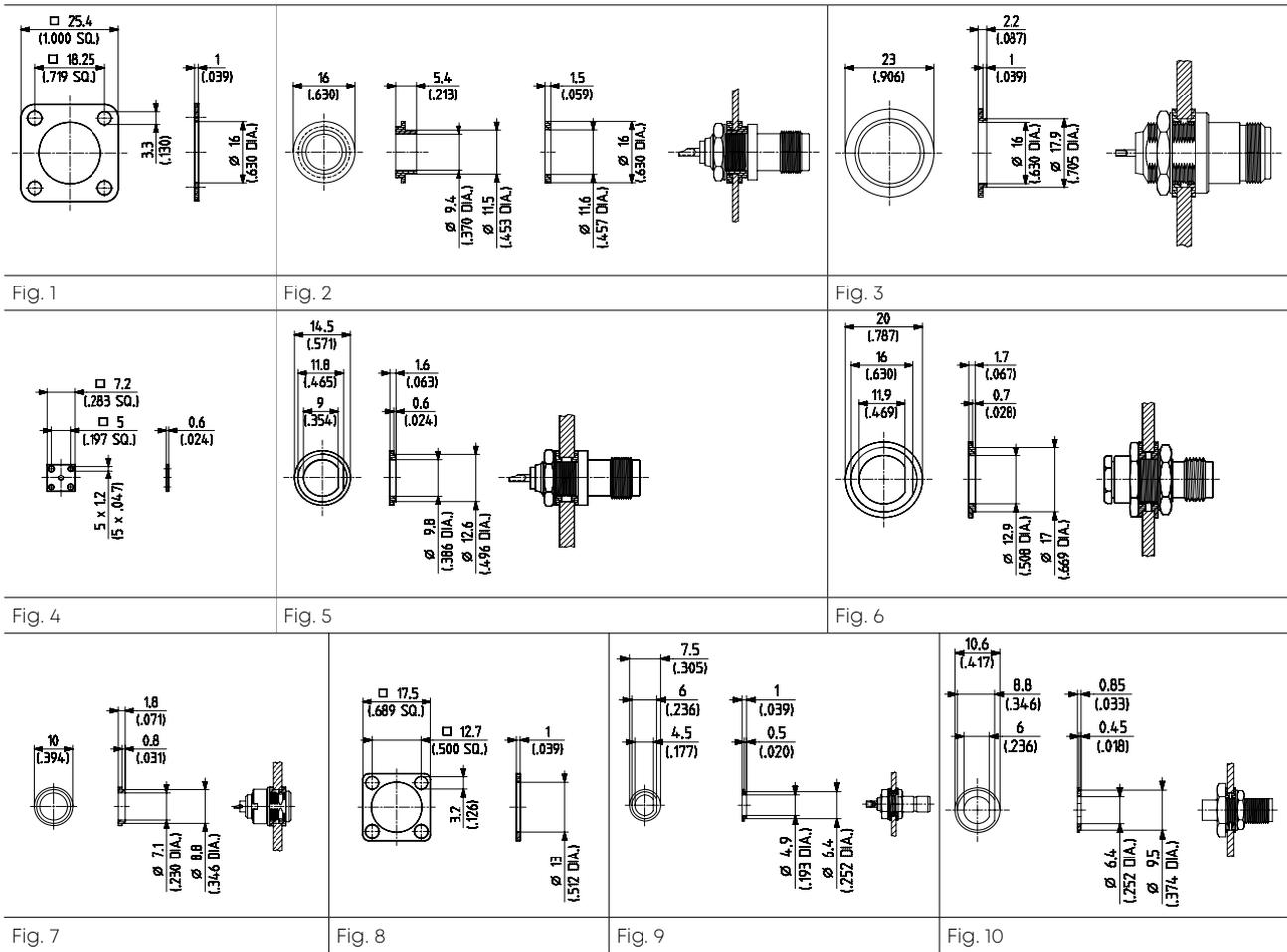
| H+S type              | 74_Z-0-2-1                             | 74_Z-0-3-6               | 74_Z-0-4-6               | 74_Z-0-7-2 | 74_Z-0-7-3 |
|-----------------------|--|--------------------------|--------------------------|------------|------------|
| Item no.              | 22543144                               | 22544544                 | 22544543                 | 22641165   | 22641164   |
| Tool colour           | blue                                   | red                      | gold                     | grey       | black      |
| Suitable taper sleeve | 78_Z-X-1-1<br>78_Z-X-2-1<br>78_Z-X-2-3 | 78_Z-X-3-4<br>78_Z-X-3-5 | 78_Z-X-4-4<br>78_Z-X-4-5 | 78_Z-0-7-1 | 78_Z-0-7-2 |



For more details see: operating instruction DOC-0000270949



# Insulating washers



| HUBER+SUHNER type | Item no. | Suitable for       |                          |  | Mounting hole | Material      | Fig. | Notes                                   |
|-------------------|----------|--------------------|--------------------------|--|---------------|---------------|------|---|
|                   |          | Connector pattern* | Connector series         |  |               |               |      |   |
| 77_Z-0-0-1/---_H  | 22543199 | 23, 25             | N                        |  | ML 14         | polyamide     | 1    | 100 pcs.                                |
| 77_Z-0-0-2/---_H  | 22543200 | 12, 22             | BNC, TNC                 |  | ML 102        | polyamide     | 2    | **/100 pairs                            |
| 77_Z-0-0-4/---_Z  | 22543202 | 12,22,24,34        | N                        |  | ML 113        | polyamide     | 3    | **/10 pairs                             |
| 77_Z-0-0-8/---_H  | 22543204 | 82, 85             | SMB/C/S,MCX, QLA 00, SMA |  | ML 41         | PTFE          | 4    | 100 pcs.                                |
| 77_Z-0-0-9/---_Z  | 22543205 | 12, 22             | BNC, TNC                 |  | ML 4          | polycarbonate | 5    | 10 pairs                                |
| 77_Z-0-0-12/---_H | 22543209 | 24, 34             | BNC, TNC                 |  | ML 22         | polycarbonate | 6    | 100 pairs                               |
| 77_Z-0-0-14/---_Z | 22543211 | 22, 24, 34         | QLA 00                   |  | ML 114        | polyamide     | 7    | **/10 pairs                             |
| 77_Z-0-0-15/---_H | 22641429 | 23, 25             | BNC, TNC                 |  | ML 8          | polyethylene  | 8    | 100 pcs.                                |
| 77_Z-0-0-21/---_Z | 22645782 | 22, 24, 34         | SMB/C/S                  |  | ML 35         | polycarbonate | 9    | 10 pairs                                |
| 77_Z-0-0-23/---_Z | 22652083 | 22, 34***          | SMA                      |  | ML 2          | polycarbonate | 10   | for connectors with ML 35 only/10 pairs |

\* See connector pattern on page 8p  
 \*\* Without rotation protection  
 \*\*\* Not all types of pattern 34 are suitable for insulated mounting

# Solder tags

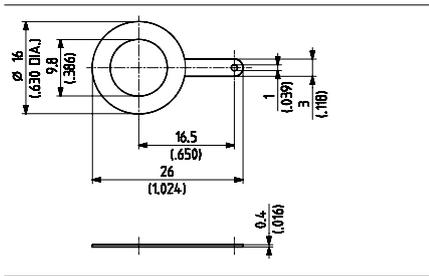


Fig. 1

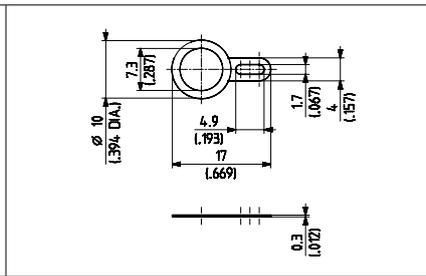


Fig. 2

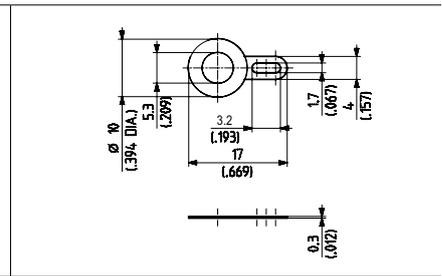


Fig. 3

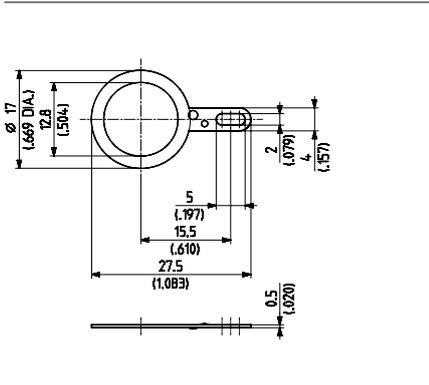


Fig. 4

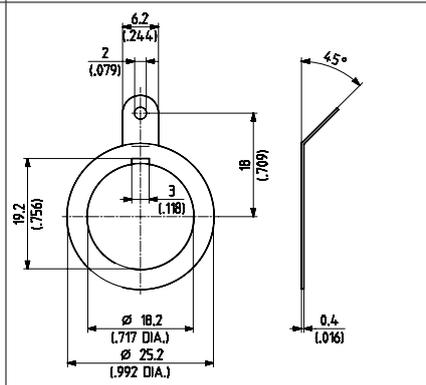


Fig. 5

| HUBER+SUHNER type  | Item no. | Suitable for       |                    | Packaging     | Fig. | Notes        |
|--------------------|----------|--------------------|--------------------|---------------|------|--------------|
|                    |          | Connector pattern* | Connector series   |               |      |              |
| 72_Z-0-0-1/--5_-H  | 22543029 | 12, 22             | BNC, SHV, MHV, TNC | bulk 100 pcs. | 1    | single ended |
| 72_Z-0-0-8/--5_-H  | 22543038 | 22, 24             | QLA 00             |               | 2    |              |
| 72_Z-0-0-9/--5_-H  | 22543039 | 12, 22, 24, 34     | SMB/SMC, MCX       |               | 3    |              |
| 72_Z-0-0-11/--5_-H | 22641496 | 24, 34             | BNC, SHV, MHV, TNC |               | 4    |              |
| 72_Z-0-0-13/--5_-H | 22642507 | 22, 24, 34         | N                  |               | 5    |              |

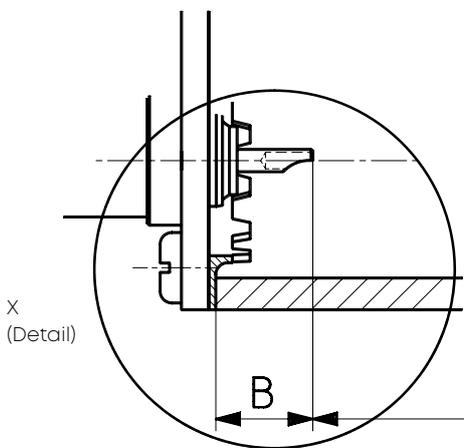
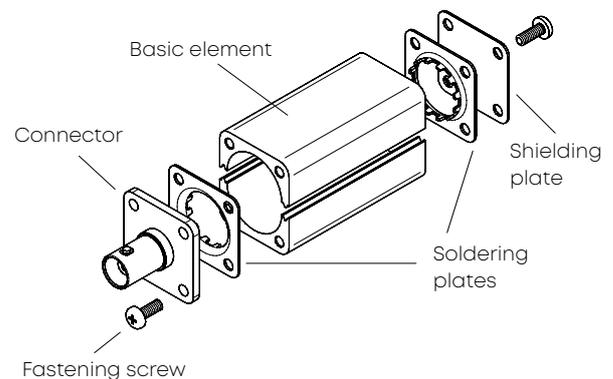
\* See connector pattern on page 8p

# Component container "Sucobox"

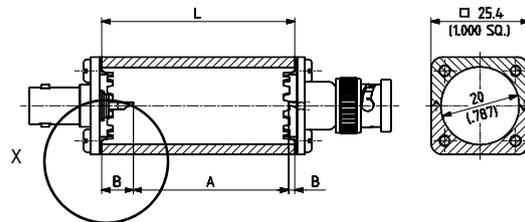
The HUBER+SUHNER "Sucobox" is a versatile component container with coaxial input and output connectors or cable entries.

## Sucobox

The basic element consists of two similar container parts, two soldering plates for easy soldering of the earthing and 8 tightening screws.



X  
(Detail)



B  
Distance between pin end and soldering plate

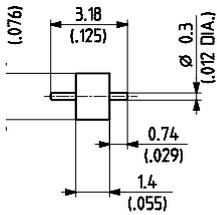
| HUBER+SUHNER type  | Item no. | Description               | Length L        | Material                  | Packaging     |
|--------------------|----------|---------------------------|-----------------|---------------------------|---------------|
| 66_CB-35-0-1/---_E | 22541510 | basic element             | 35.0 mm/1.38 in | aluminium, anodised, blue | single        |
| 66_CB-50-0-1/---_E | 22541514 | basic element             | 50.0 mm/1.97 in | aluminium, anodised, blue | single        |
| 72_Z-0-0-5/---_OH  | 22543035 | soldering plate, separate | —               | brass, silver plated      | bulk 100 pcs. |
| 73_Z-0-0-9/---_H   | 22543056 | shielding plate, separate | —               | brass, silver plated      | bulk 100 pcs. |

## Suitable connectors

| HUBER+SUHNER type    | Item no. | Connector | Dimension B (see drawing top left) | Packaging |
|----------------------|----------|-----------|------------------------------------|-----------|
| 13_BNC-50-0-2/133_NE | 22540160 | plug      | 1.5 mm/0.06 in                     | single    |
| 23_BNC-50-0-2/133_NE | 22540333 | jack      | 8.0 mm/0.31 in                     |           |
| 13_N-50-0-1/133_NE   | 22542173 | plug      | 9.0 mm/0.35 in                     |           |
| 23_N-50-0-1/133_NE   | 22542272 | jack      | 9.0 mm/0.35 in                     |           |

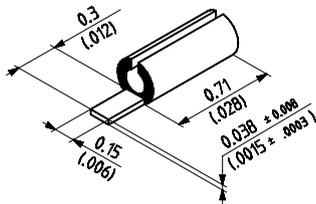
# Accessories for SK connectors

Glass bead for 12\_SK-, 13\_SK-, 22\_SK-, 23\_SK-50-0-51 launchers (package with 1 piece).



| HUBER+SUHNER type | Item no. |
|-------------------|----------|
| 73_Z-0-0-203      | 22645983 |

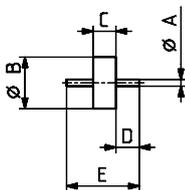
Microstrip stress relief contacts (package with 100 pieces).



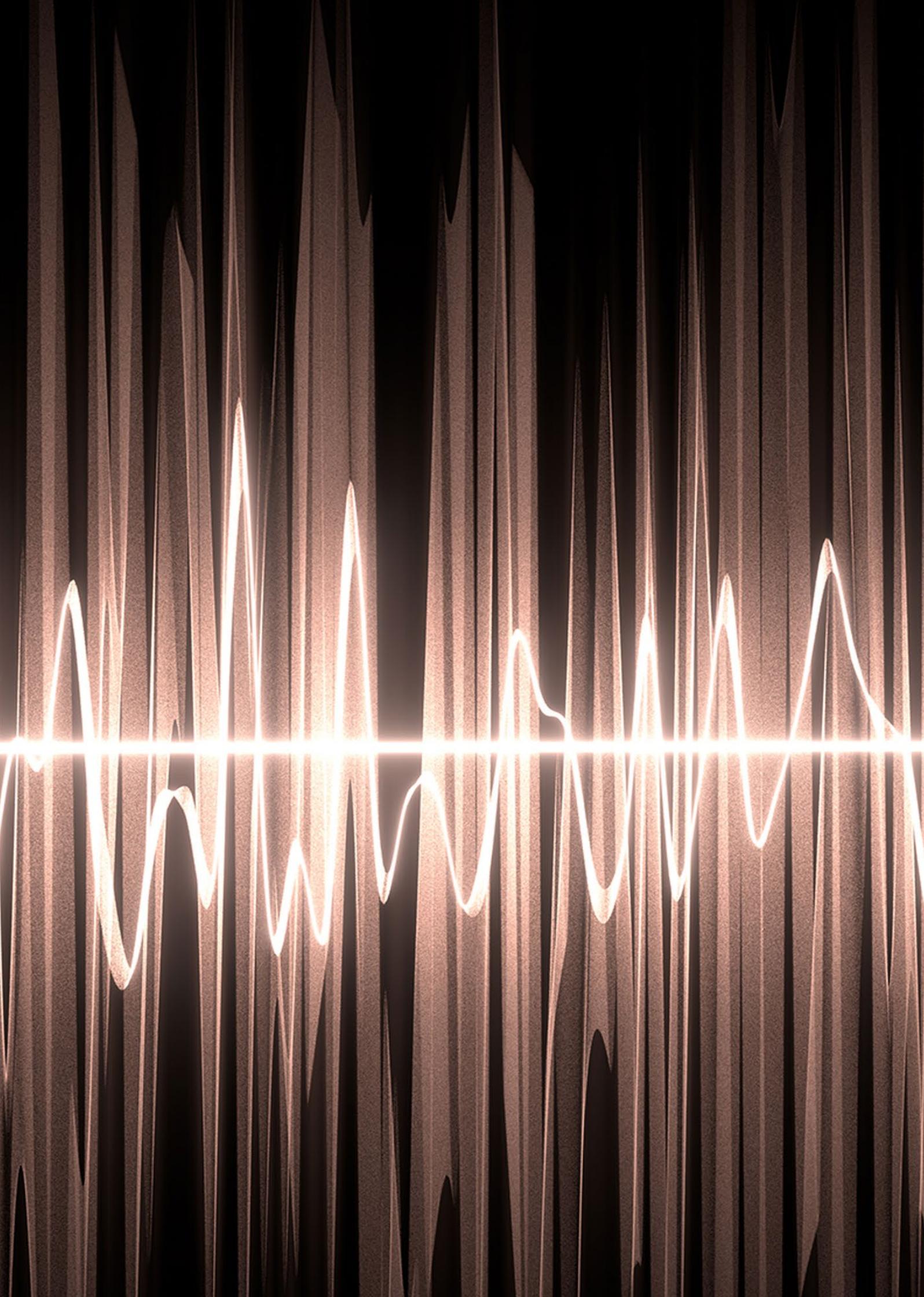
| HUBER+SUHNER type | Assembly instruction (M09183) | Item no. |
|-------------------|-------------------------------|----------|
| 73_Z-0-0-204      | DOC-0000191296                | 22645980 |

# Accessories for BMA connectors

Glass bead for 12\_BMA-50-0-3 and 22\_BMA-50-0-3.

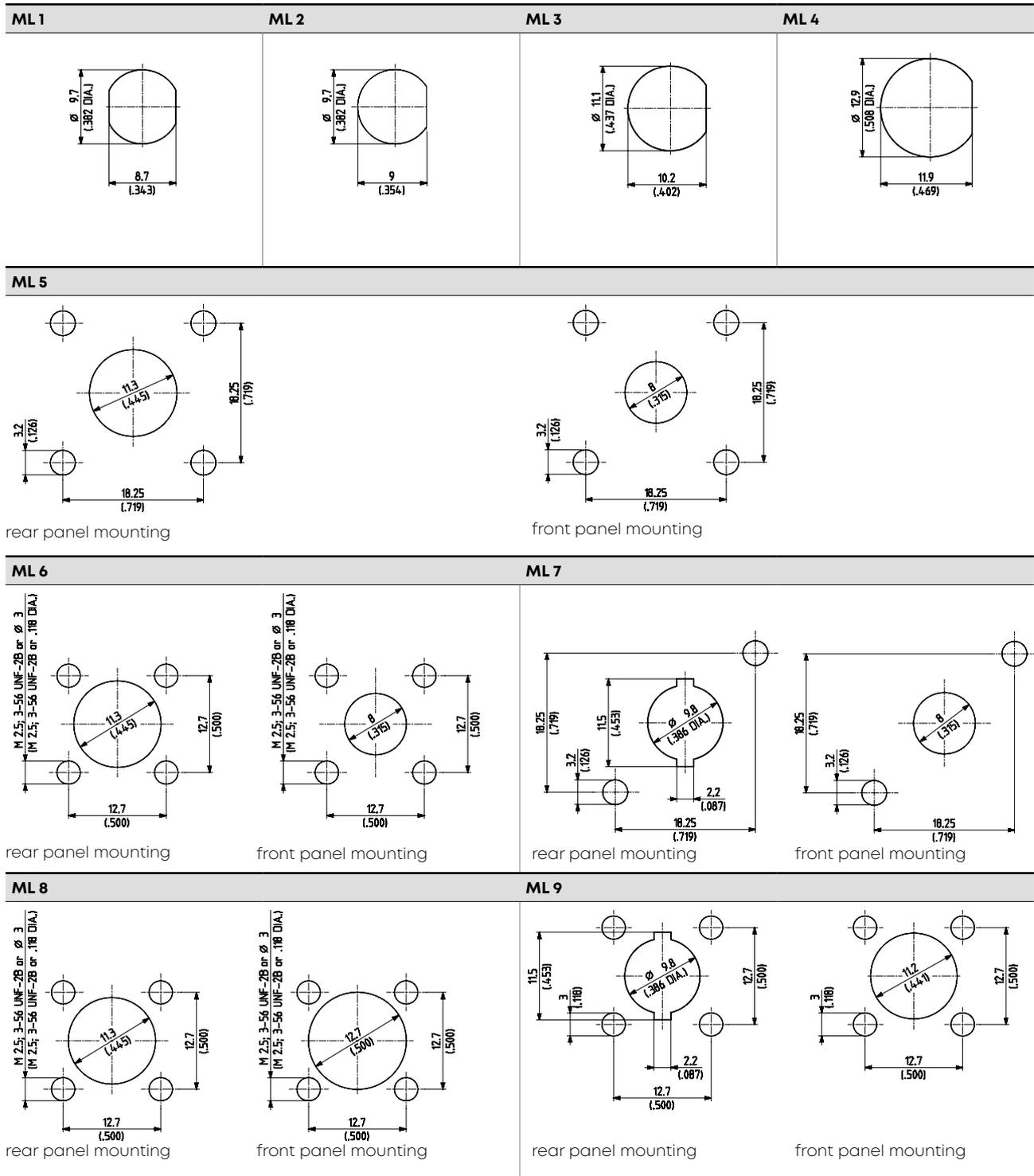


| HUBER+SUHNER type | Item no. | A               | B               | C                | D               | E               |
|-------------------|----------|-----------------|-----------------|------------------|-----------------|-----------------|
| 73_Z-0-0-198      | 22645655 | 0.5 mm/0.020 in | 4.0 mm/0.157 in | 1.75 mm/0.069 in | 1.8 mm/0.071 in | 5.6 mm/0.220 in |



# Mounting holes and PCB layouts

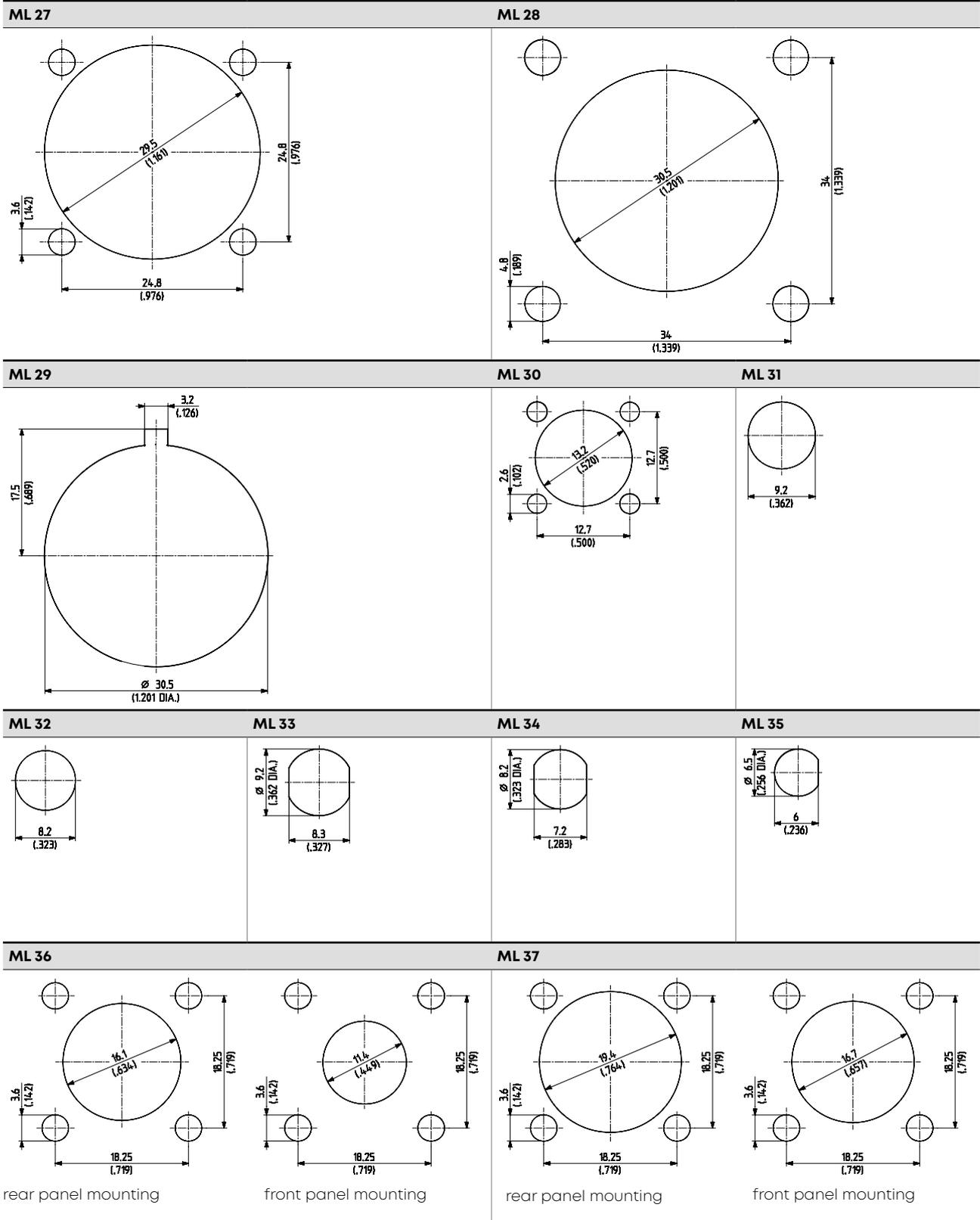
## Dimensions of mounting holes



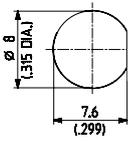
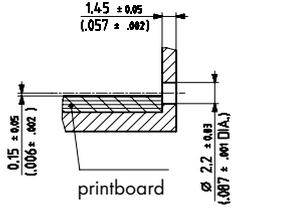
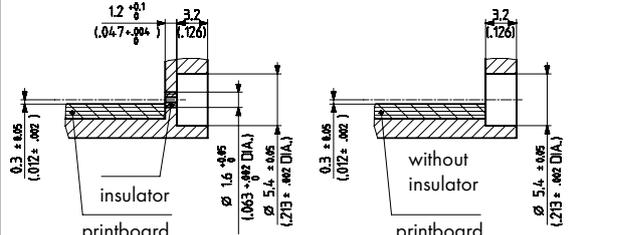
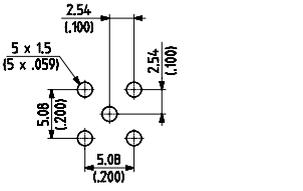
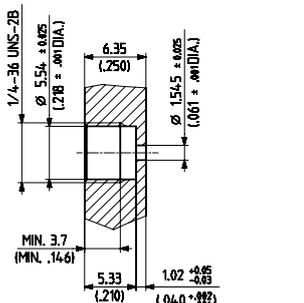
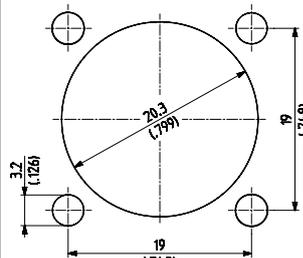
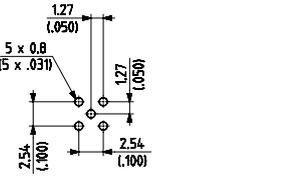
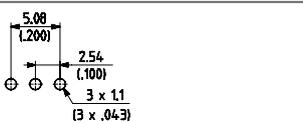
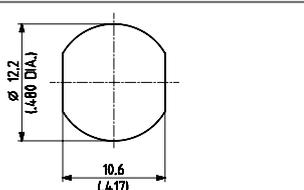
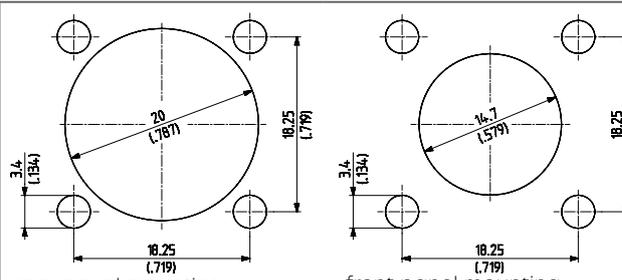
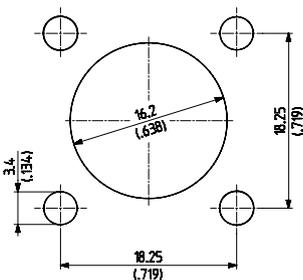
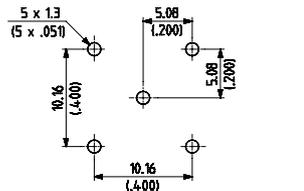
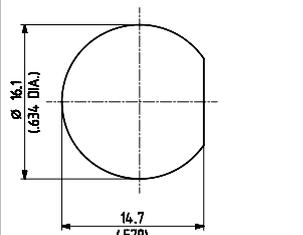
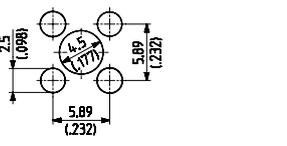
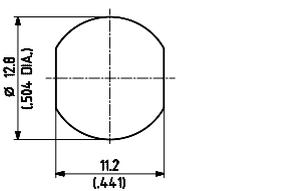
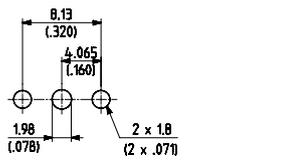
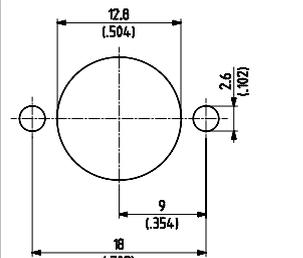
# Mounting holes and PCB layouts

| ML 10   | ML 11                       | ML 12                      | ML 13                       |
|---|-----------------------------|----------------------------|-----------------------------|
| <p>M 2.5; 3-56 UNF-28 or <math>\varnothing</math> 3<br/> M 2.5; 3-56 UNF-28 or .118 DIA.)</p> |                             |                            |                             |
| ML 14   | ML 15                       | ML 16                      |                             |
|   |                             | <p>rear panel mounting</p> | <p>front panel mounting</p> |
| ML 17   | ML 18                       |                            |                             |
| <p>rear panel mounting</p>  | <p>front panel mounting</p> | <p>rear panel mounting</p> | <p>front panel mounting</p> |
| ML 19   | ML 20                       | ML 21                      | ML 22                       |
|   |                             |                            |                             |
| ML 23   | ML 24                       | ML 25                      | ML 26                       |
|   |                             |                            |                             |

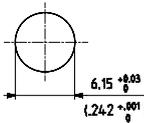
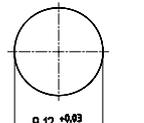
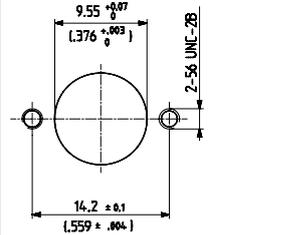
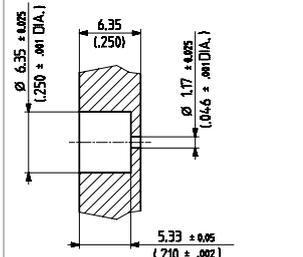
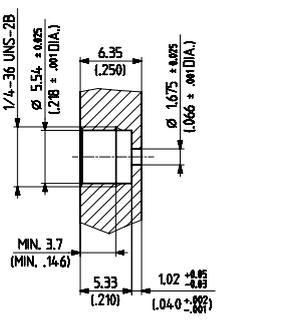
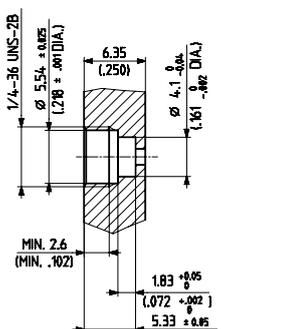
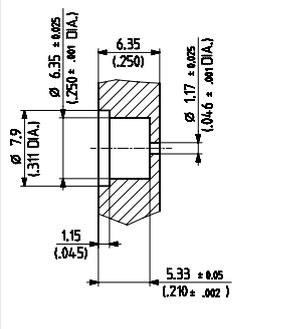
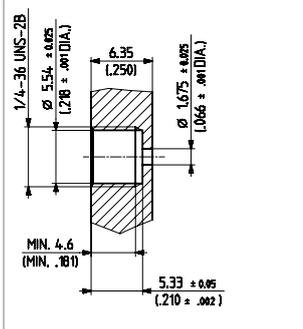
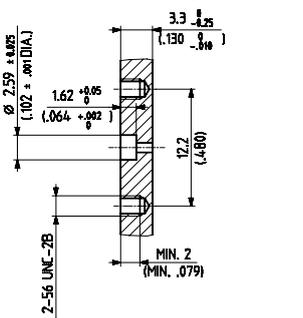
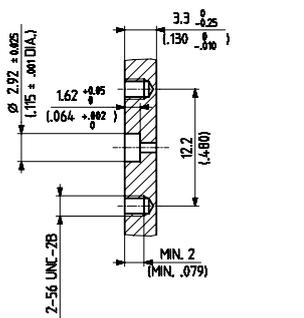
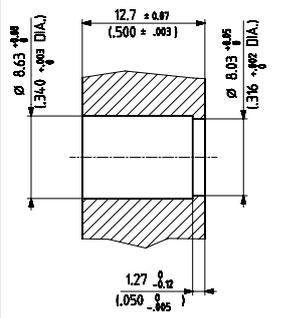
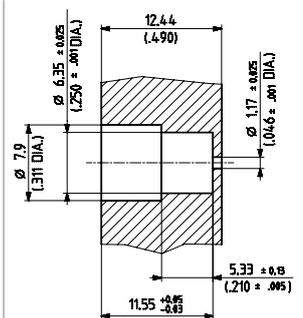
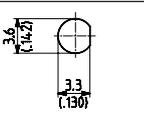
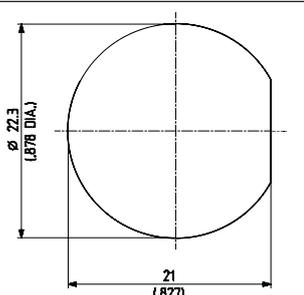
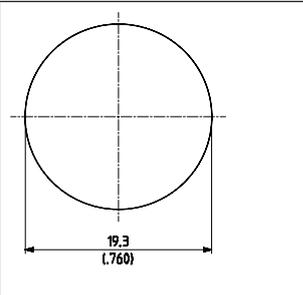
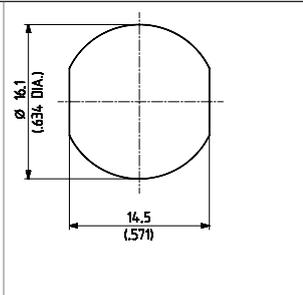
# Mounting holes and PCB layouts



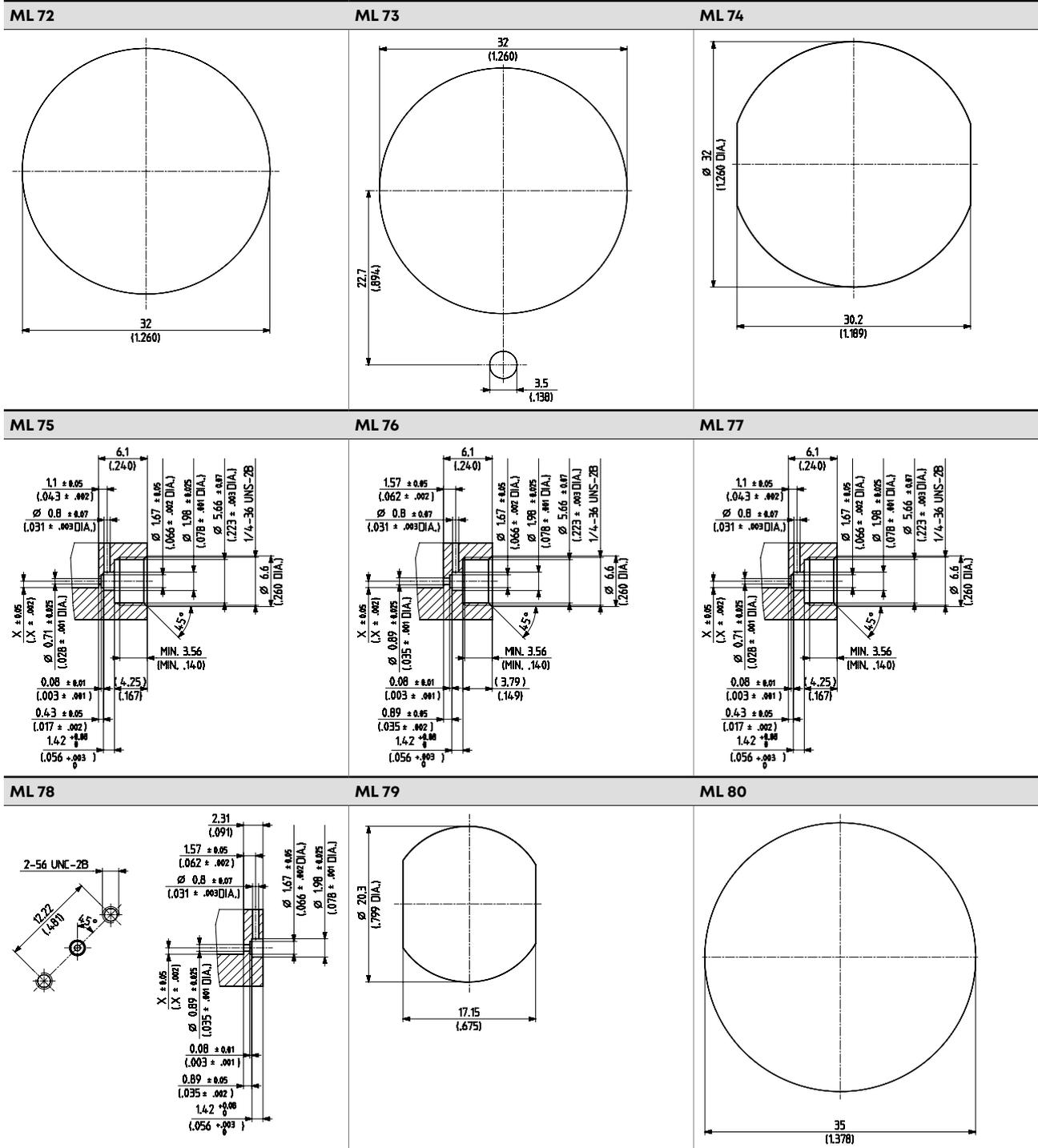
# Mounting holes and PCB layouts

| ML 38   | ML 39   | ML 40   |   |
|---|---|---|---|
|    |  <p>printboard</p> |  <p>insulator<br/>printboard<br/>without insulator<br/>printboard</p> |   |
| ML 41   | ML 42   | ML 43   | ML 44   |
|    |                    |   |    |
| ML 45   | ML 46   | ML 47   |   |
|  |                  |  <p>rear panel mounting<br/>front panel mounting</p>                |   |
| ML 48   | ML 49   | ML 50   | ML 51   |
|  |                  |   |  |
| ML 52   | ML 53   | ML 54   | ML 55   |
|  |                  |   |  |

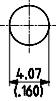
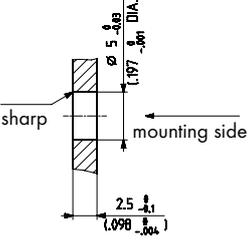
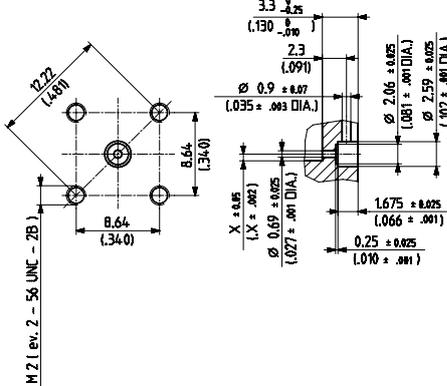
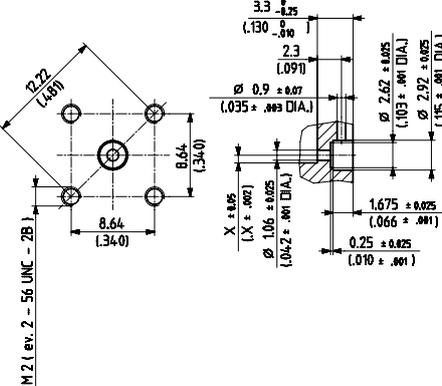
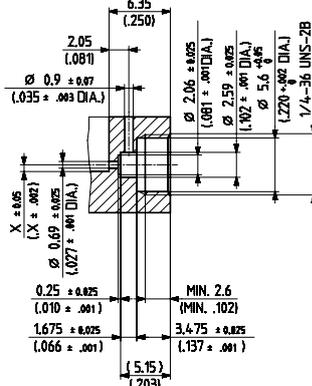
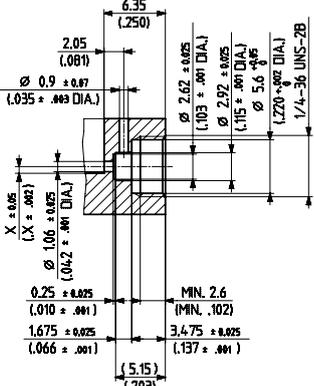
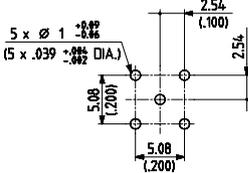
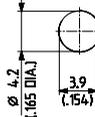
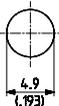
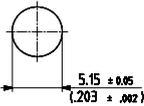
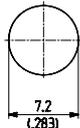
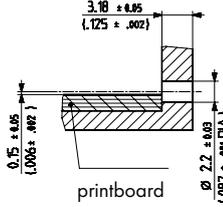
# Mounting holes and PCB layouts

| ML 56   | ML 57   | ML 58  | ML 59   |
|---|---|--|---|
|    |    |    |    |
| ML 60   | ML 61   | ML 62  | ML 63   |
|    |    |    |    |
| ML 64   | ML 65   | ML 66  | ML 67   |
|  |  |  |  |
| ML 68   | ML 69   | ML 70  | ML 71   |
|  |  |  |  |

# Mounting holes and PCB layouts



# Mounting holes and PCB layouts

| ML 81   | ML 82   | ML 83   |   |
|---|---|---|---|
|  <p>4.07<br/>(1.60)</p>  |  <p>sharp</p> <p>mounting side</p> <p>5.0<br/>(1.97 DIA.)</p> <p>2.5<br/>(0.98)</p> <p>0.1<br/>(0.04)</p>  |  <p>12.72<br/>(5.01)</p> <p>8.64<br/>(3.40)</p> <p>8.64<br/>(3.40)</p> <p>3.3<br/>(1.30)</p> <p>2.3<br/>(0.91)</p> <p>0.9<br/>(0.35 DIA.)</p> <p>2.06 ± 0.025<br/>(0.81 ± .001 DIA.)</p> <p>1.675 ± 0.025<br/>(0.66 ± .001)</p> <p>0.25 ± 0.025<br/>(0.10 ± .001)</p> <p>M 2 (lev. 2 - 56 UNC - 2B)</p> <p>X ± 0.05<br/>(X ± .002)</p> <p>0.69 ± 0.025<br/>(0.27 ± .001 DIA.)</p> |   |
| ML 84   | ML 85   |   |   |
|  <p>12.72<br/>(5.01)</p> <p>8.64<br/>(3.40)</p> <p>8.64<br/>(3.40)</p> <p>3.3<br/>(1.30)</p> <p>2.3<br/>(0.91)</p> <p>0.9<br/>(0.35 DIA.)</p> <p>2.62 ± 0.025<br/>(1.03 ± .001 DIA.)</p> <p>2.92 ± 0.025<br/>(1.15 ± .001 DIA.)</p> <p>1.675 ± 0.025<br/>(0.66 ± .001)</p> <p>0.25 ± 0.025<br/>(0.10 ± .001)</p> <p>M 2 (lev. 2 - 56 UNC - 2B)</p> <p>X ± 0.05<br/>(X ± .002)</p> <p>1.06 ± 0.025<br/>(0.42 ± .001 DIA.)</p>  |  <p>6.35<br/>(2.50)</p> <p>2.05<br/>(0.81)</p> <p>0.9<br/>(0.35 DIA.)</p> <p>2.06 ± 0.025<br/>(0.81 ± .001 DIA.)</p> <p>2.59 ± 0.025<br/>(1.02 ± .001 DIA.)</p> <p>5.6 ± 0.05<br/>(2.20 ± .002 DIA.)</p> <p>1/4-36 UNS-2B</p> <p>X ± 0.05<br/>(X ± .002)</p> <p>0.69 ± 0.025<br/>(0.27 ± .001 DIA.)</p> <p>0.25 ± 0.025<br/>(0.10 ± .001)</p> <p>MIN. 2.6<br/>(MIN. .102)</p> <p>1.675 ± 0.025<br/>(0.66 ± .001)</p> <p>3.475 ± 0.025<br/>(1.37 ± .001)</p> <p>(5.15)<br/>(.203)</p> |   |   |
| ML 86   | ML 87   | ML 88   |   |
|  <p>6.35<br/>(2.50)</p> <p>2.05<br/>(0.81)</p> <p>0.9<br/>(0.35 DIA.)</p> <p>2.62 ± 0.025<br/>(1.03 ± .001 DIA.)</p> <p>2.92 ± 0.025<br/>(1.15 ± .001 DIA.)</p> <p>5.6 ± 0.05<br/>(2.20 ± .002 DIA.)</p> <p>1/4-36 UNS-2B</p> <p>X ± 0.05<br/>(X ± .002)</p> <p>1.06 ± 0.025<br/>(0.42 ± .001 DIA.)</p> <p>0.25 ± 0.025<br/>(0.10 ± .001)</p> <p>MIN. 2.6<br/>(MIN. .102)</p> <p>1.675 ± 0.025<br/>(0.66 ± .001)</p> <p>3.475 ± 0.025<br/>(1.37 ± .001)</p> <p>(5.15)<br/>(.203)</p> |  <p>5 x 1</p> <p>0.39 ± 0.01<br/>(0.154 DIA.)</p> <p>2.54<br/>(0.100)</p> <p>2.54<br/>(0.100)</p> <p>5.08<br/>(0.200)</p> <p>5.08<br/>(0.200)</p>   |  <p>4.2<br/>(1.65 DIA.)</p> <p>3.9<br/>(1.54)</p>  |   |
| ML 89   | ML 90   | ML 91   | ML 92   |
|  <p>4.9<br/>(1.93)</p>   |  <p>5.15 ± 0.05<br/>(2.03 ± .002)</p>  |  <p>7.2<br/>(2.83)</p>   |  <p>3.18 ± 0.05<br/>(1.25 ± .002)</p> <p>2.2 ± 0.03<br/>(0.87 ± .001 DIA.)</p> <p>0.15 ± 0.05<br/>(0.006 ± .002)</p> <p>printboard</p> |

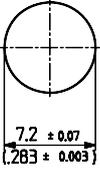
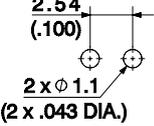
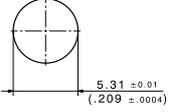
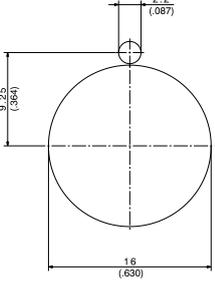
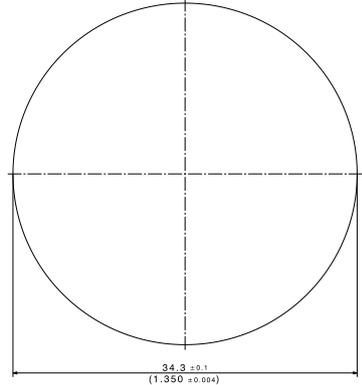
# Mounting holes and PCB layouts

| ML 93                           | ML 94                                   | ML 95                           |   |
|---------------------------------|---|---------------------------------|---|
| <p>printboard</p>               | <p>printboard</p>                       | <p>insulator<br/>printboard</p> | <p>without insulator<br/>printboard</p> |
| ML 96                           | ML 97                                   |                                 | ML 98                                   |
| <p>insulator<br/>printboard</p> | <p>without insulator<br/>printboard</p> |                                 |   |
| ML 99                           | ML 100                                  | ML 101                          |   |
| <p>counter sunk from rear</p>   |   |                                 |   |
| ML 102                          | ML 103                                  | ML 104                          | ML 105                                  |
|                                 |   |                                 |   |

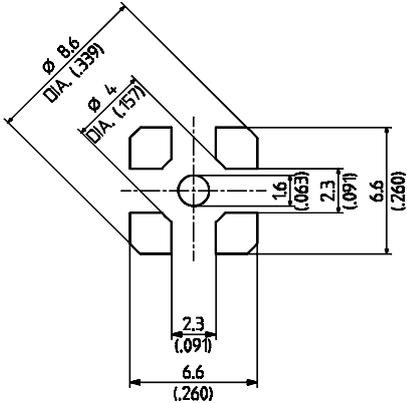
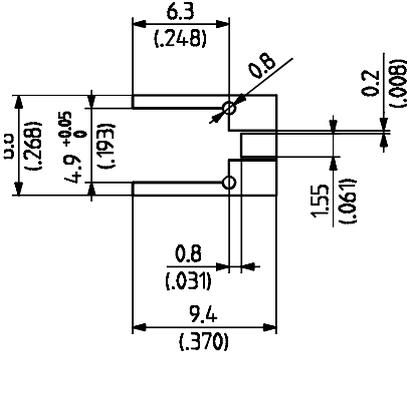
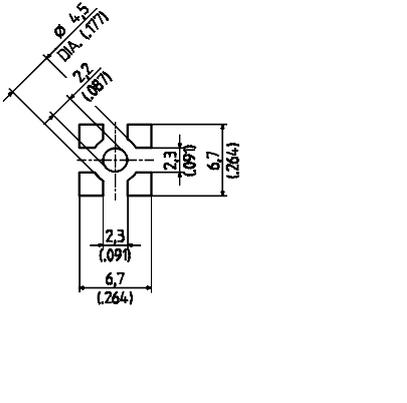
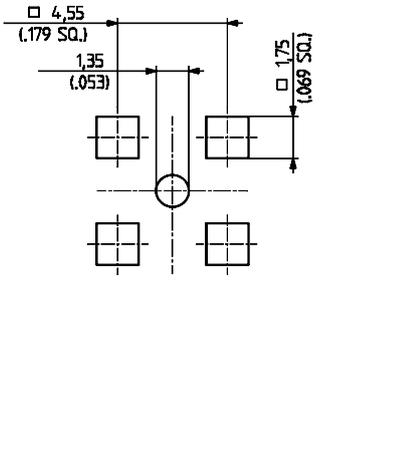
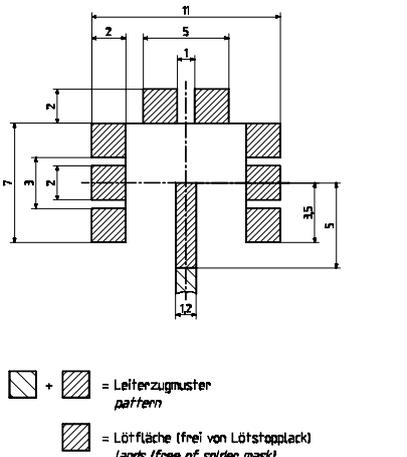
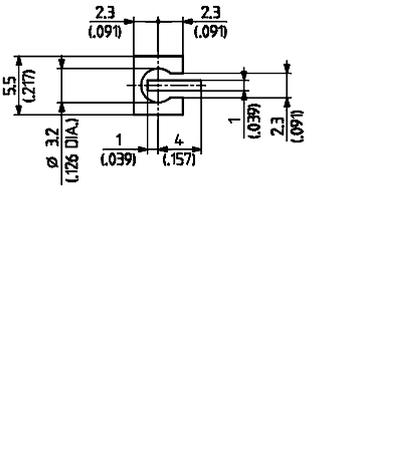
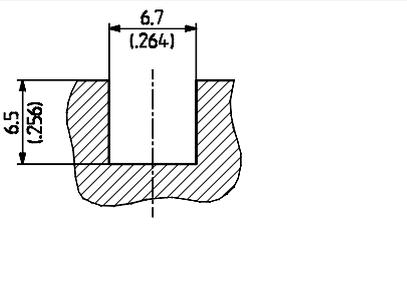
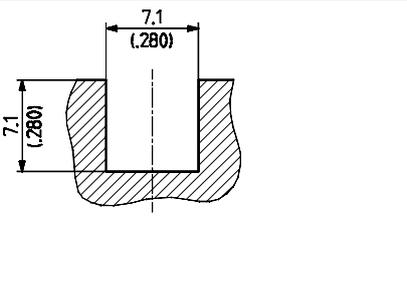
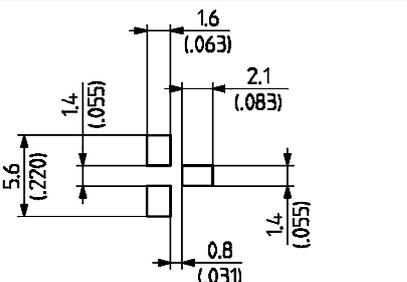
# Mounting holes and PCB layouts

|  |  |                      |  |
|--|--|----------------------|--|
| <p><b>ML 106</b></p> <p>M 2.5; 3-56 UNF-28 or <math>\varnothing</math> 3<br/>(M 2.5; 3-56 UNF-28 or .118 DIA.)</p> | <p><b>ML 107</b></p> <p>M 2.5; 3-56 UNF-28 or <math>\varnothing</math> 3<br/>(M 2.5; 3-56 UNF-28 or .118 DIA.)</p> |                      |  |
| <p><b>ML 108</b></p>   | <p><b>ML 109</b></p>   | <p><b>ML 110</b></p> | <p><b>ML 111</b></p>   |
| <p><b>ML 112</b></p>   | <p><b>ML 113</b></p>   | <p><b>ML 114</b></p> | <p><b>ML 115</b></p> <p>5 x 1.3<br/>(5 x .197)</p> <p>1.8<br/>(.071)</p> <p>1.8<br/>(.071)</p> <p>3.6<br/>(.142)</p> <p>3.6<br/>(.142)</p> |
| <p><b>ML 118</b></p>   | <p><b>ML 119</b></p>   | <p><b>ML 128</b></p> | <p><b>ML 143</b></p>   |

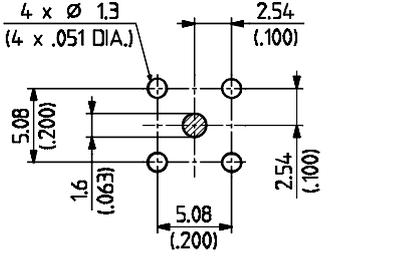
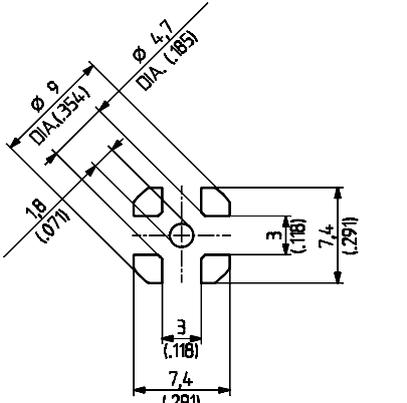
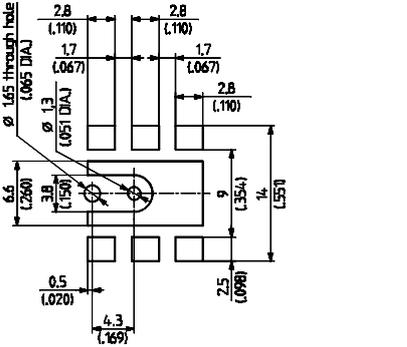
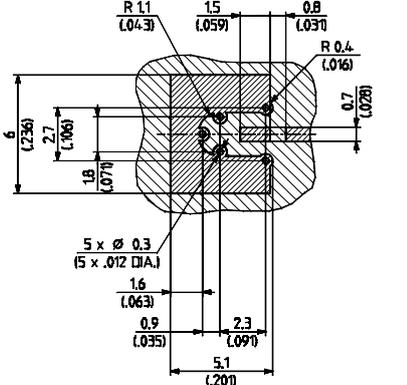
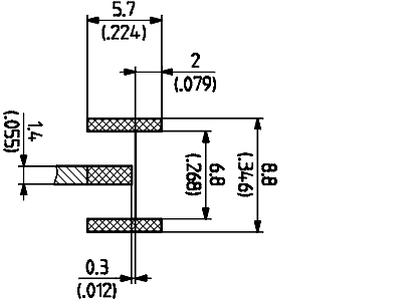
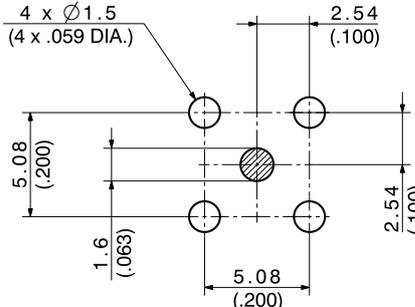
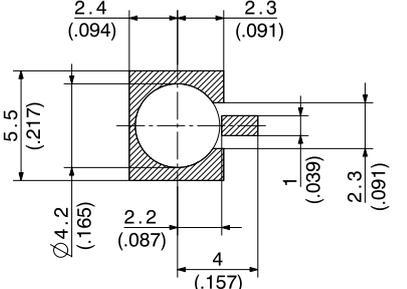
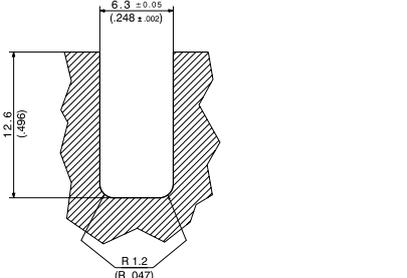
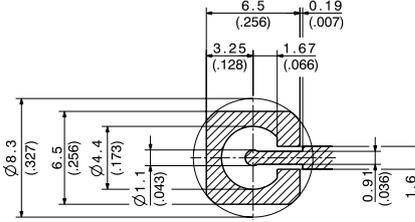
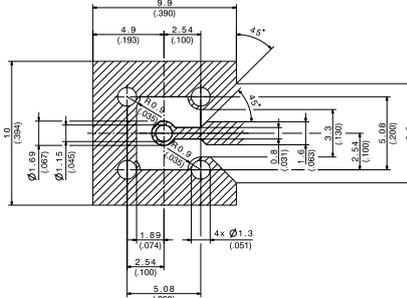
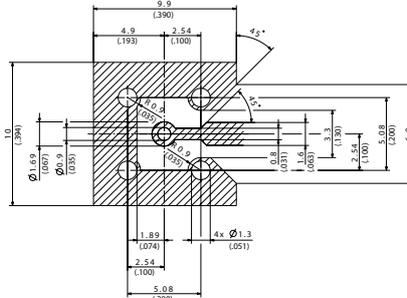
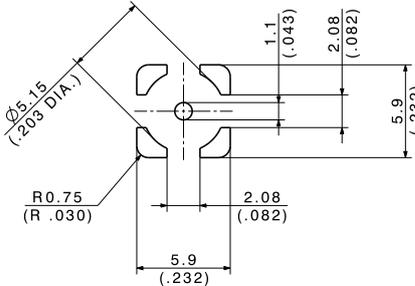
# Mounting holes and PCB layouts

| ML 146   | ML 164   | ML 177  |
|--|--|---|
|  <p>7.2 ± 0.07<br/>(283 ± 0.003)</p>                        |  <p>2.54<br/>(.100)<br/>2 x Ø 1.1<br/>(2 x .043 DIA.)</p> |  <p>5.31 ± 0.01<br/>(.209 ± 0.004)</p> |
| ML 178   | ML 187   |   |
|  <p>2.2<br/>(.087)<br/>9.25<br/>(.364)<br/>16<br/>(630)</p> |  <p>34.3 ± 0.1<br/>(1.350 ± 0.004)</p>                   |   |

# Dimensions of PCB layouts (ML)

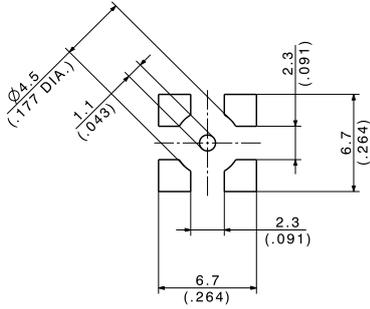
| ML 120  | ML 121  | ML 122  |
|---|---|---|
|    |    |    |
| ML 123  | ML 126  | ML 130  |
|   |   |   |
| ML 131  | ML 132  | ML 134  |
|  |  |  |

# Dimensions of PCB layouts (ML)

| ML 135  | ML 136  | ML 137  |
|---|---|---|
|    |    |    |
| ML 138  | ML 147  | ML 155  |
|   |   |   |
| ML 167  | ML 169  | ML 173  |
|  |  |  |
| ML 174  | ML 182  | ML 184  |
|  |  |  |

# Dimensions of PCB layouts (ML)

ML 185



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