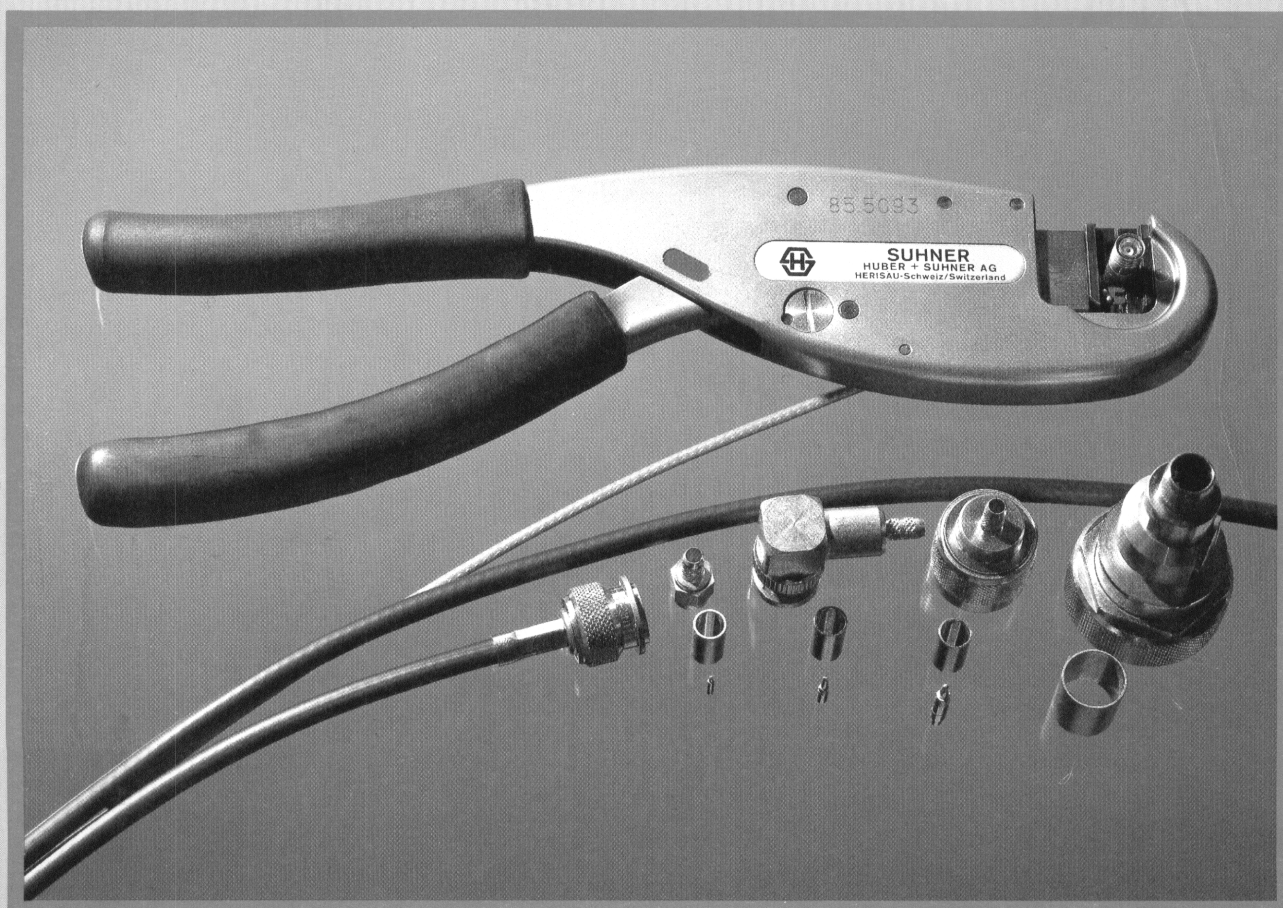


# SUHNER CRIMPING SYSTEM FOR RF CONNECTORS

HUBER+SUHNER AG, RF and Microwave Division, Herisau/Switzerland





# Crimp Technique

The SUHNER Crimp Technique is a reliable and economic connecting system for RF connectors.

The ever increasing need for RF coaxial connectors, constant shortage of qualified personnel and the need for higher reliability, demands a safe and rational connecting technique. Therefore RF connectors with crimp cable entry («Crimp Technique») gain more and more in importance.

With the crimp technique, conductors and contacts are connected to each other by a single application of defined force. The only accessory needed is a simple, easy to use tool.

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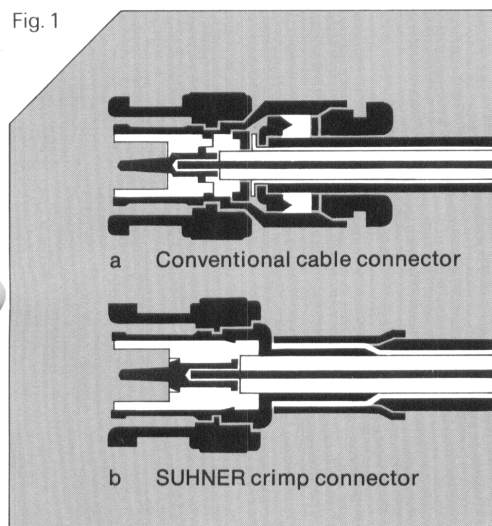
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Conventional connecting techniques require soldered inner connections, while the screen contact depends on a pressure joint (Fig. 1).

The soldering requires skill and practice. Excessive heat damages the cable dielectric and can cause eccentricity of the cable's inner conductor. Unacceptable reflections result. A satisfactory pressure joint of the cable's outer conductor is achieved with several components. This means complicated stripping, awkward assembly, and possibly assembly mistakes.

Fig. 1



The requirements for a better connecting technique are accordingly:

- simple assembly, shorter assembly time
- no heat effect
- less components
- increased reproducibility, i.e. quality independent of the skill of the assembly personnel

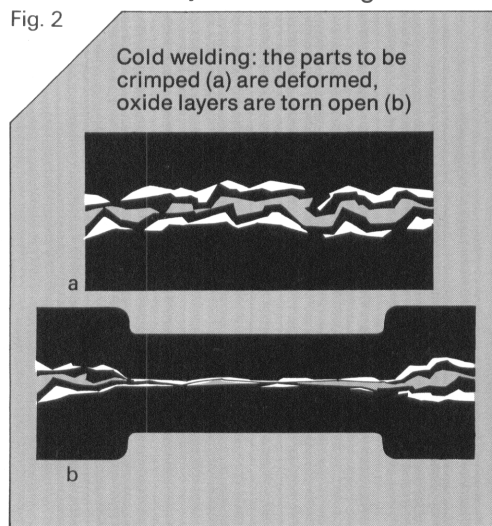
A reliable contact and sufficient mechanical strength must obviously be maintained.

Object of the crimping process is the achievement of a positive mechanical compression and cold welded connection. The effect of the force applied by the crimping tool on the contact components must be maintained after crimping.

This is the case when the originally soft connector parts harden during the crimping process and are thereby permanently deformed.

The crimp action should result in a high degree of cold welding between connector parts and cable. For this the metal parts to be connected must be brought within atomic spacing. They are then held by the occurring van der

Fig. 2



Waal forces (dispersion forces) and partly form a continuous metal structure.

An approach to the required spacing is only possible through deformation of the components. Thereby the surface is smoothed (Fig. 2) and the oxide and impurity layers are torn open.

Good cold welding and high contact pressure require accordingly:

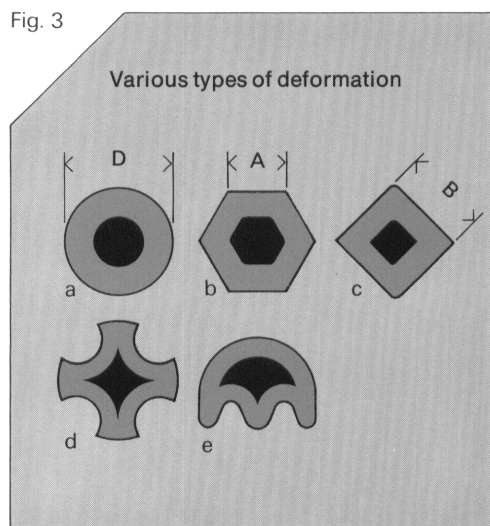
- largest possible deformation
- use of soft materials
- clean, oxide- and grease-free surfaces

Excessive deformation of the contact parts leads to a mechanical weakness, embrittlement and cracking of the crimped joint. With coaxial connectors the effect is aggravated, in that, for reasons of impedance matching, much deviation from the circular form is not possible.

Hence only type b and c of the deformations shown in Fig. 3 are suitable for RF connectors. Moreover, soft materials (e.g. copper) cannot be used for contact pins and contact sockets.

Tests made with square and hexagonal crimpings prove that unacceptable embrittlement or formation of cracks occurs, as soon as the circumference of

Fig. 3



the crimped part becomes smaller than that of the uncrimped part.

The basis for dimensioning crimp joints with maximum acceptable deformation is:  $D\pi = 6A = 4B$ .

Assuming this law of equal periphery, the cross-sectional area of a square is 78.6% of the original circle area (area deformation degree), but is still 90.5% for a hexagon.

The area reduction for square crimping is accordingly 2.25 times as large as for the hexagonal crimping!



## Crimping outer conductors

This means a considerably greater pressure effect on the conductor to be connected, a better cold welding and therefore a connection of higher reliability.

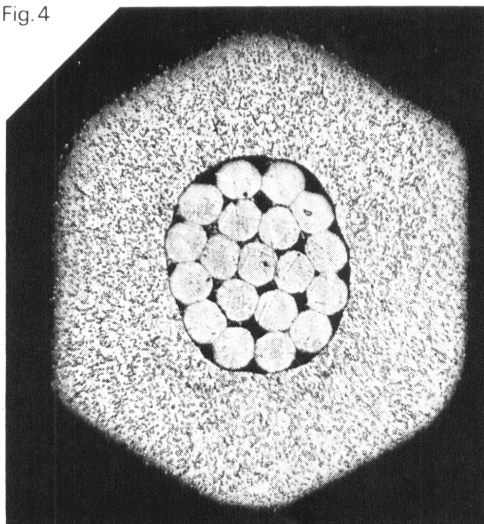
Fig. 4 shows microsections of hexagonal and square crimpings (RG 58 C/U, BNC) which were both dimensioned according to the law of equal periphery. The force necessary for crimping is in both cases 320 kp.

In Fig. 5 are shown the results of a series of tests on crimped inner conductors of series N connectors and RG 214/U cable. The relationship of crimp recesses to the uncrimped pin circumferences are given as percentages, and are shown relative to the pull out force. Optimum results are achieved with circumference ratios of 100% to 104%.

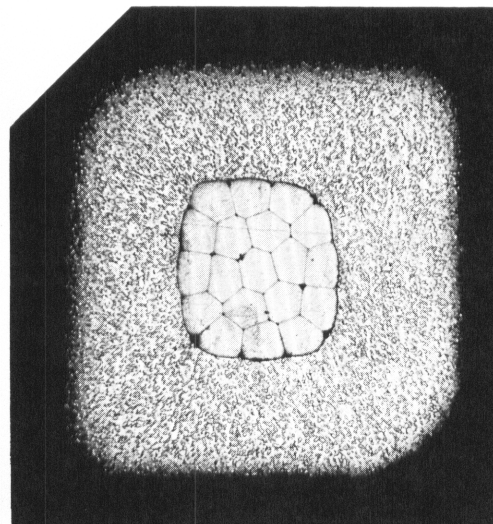
Here the same points of view apply. The wires of the cable screen are pressed on to the crimp spigot by means of an additional ferrule (Fig. 6). The crimp spigot must be of sufficient strength not to be deformed or flattened under the crimping pressure.

For obvious reasons, hexagonal crimping is used exclusively. The law of equal periphery is again valid for dimensioning. It is especially advantageous to provide the crimp spigot with a knurl in order to obtain an additional form of locking.

Fig. 4

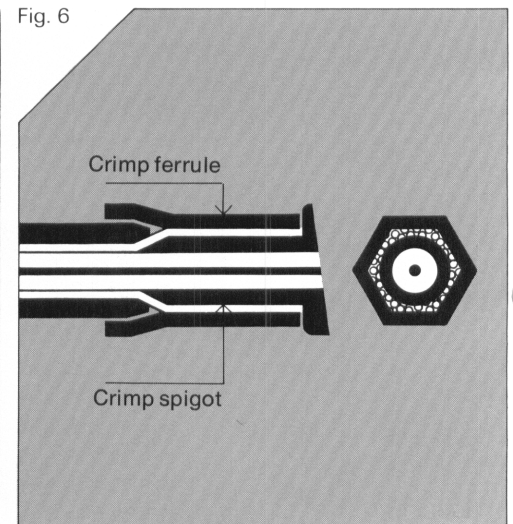


Crimping in accordance with MIL-C-39012, Category D, Pin 16–10  
Pull-out force: 7 kp



SUHNER square crimping  
Pull-out force: 12 kp

Fig. 6



Crimping outer conductor

Fig. 5

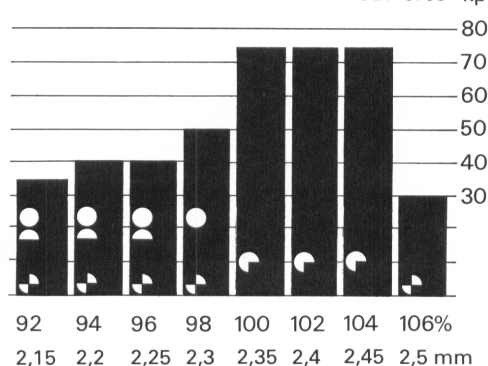
Results of crimping tests  
on Series N inner conductors  
and RG 214/U cable

Pull-out force kp

Formation of fins  
Formation of cracks  
Inner conductor is pulled out  
Inner conductor fractures

Crimp recess related to pin circumference

Dimension of square crimp recess





# High demands on material, dimensions and tools

Narrow tolerances and accurately controlled materials, together with connectors, cables and tools made to fit one another, are indispensable in achieving a reliable crimp connection. The requirements of the crimp inserts are:

- exact maintenance of size
- high strength and hardness
- fine surface finish

As can be seen in Fig. 5, the best results were obtained with square dimensions of 2.35–2.45 mm. Permissible tolerances of  $\pm 0.05$  mm can be derived therefrom. For smaller square dimensions (e.g. for subminiature connectors of the Series SMA, SMB, SMC, SMS) tolerances of  $\pm 0.03$  mm are in fact necessary.

The demands upon the crimp inserts are very high. With crimping forces of 300–700 kp (Fig. 10), surface pressures up to 70 kp/mm<sup>2</sup> occur. Oil or air-hardened steels must therefore be used, which are profile ground in the hard state. This process permits maintenance of size and high surface finish.

The most important requirements of the contact parts are:

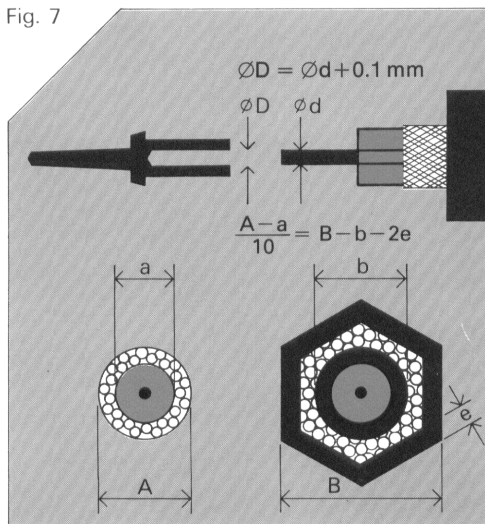
- matched exactly to the cable to be crimped
- close tolerances
- use of soft materials with controlled hardness

The dimensions of the crimping components must be individually adjusted to

the different RF cables. The formulas shown in fig. 7 are valid as a basis for dimensioning. In order to guarantee a constant quality of the crimped joint, the dimensions of the inner conductor must be maintained to 0.03 mm, those of the outer conductor to 0.05 mm.

- D = pin hole  
d = diameter of the inner conductor  
A = outside diameter of screen  
a = dielectric diameter  
B = hexagonal width of the crimp ferrule  
b = outside diameter of the crimp spigot  
e = wall thickness of crimp ferrule

Fig. 7



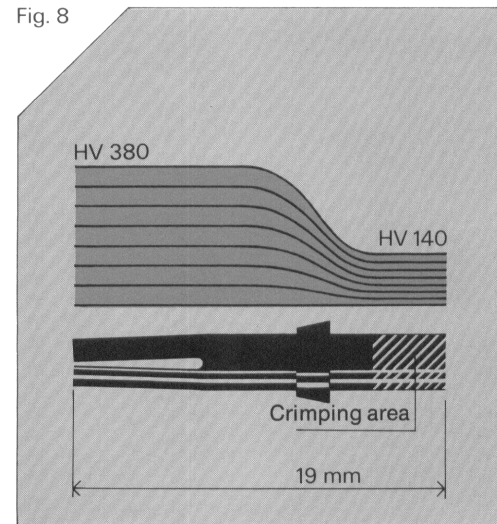
Basic rules for dimensioning crimp components

The components to be deformed should be made of the softest possible material. This allows a strong deformation without embrittlement or formation of cracks. Further, the necessary crimping forces can be kept low, which facilitates the construction of lighter and handier crimp tools.

Soft-annealed copper (HV 40–50) is specially suitable for crimp ferrules. The use of drawn tubes permits the maintenance of a diameter tolerance of  $\pm 0.025$  mm, which is difficult to achieve with free-cutting machining.

Centre contacts must be manufactured from a hard, non-abrasive material in order to provide a durable working life. Most coaxial connector specifications specify brass for contact pins and heat-treated beryllium copper (HV 380) for contact sockets. To make satisfactory crimping possible despite this, these parts are either made of different materials or partially annealed. This

Fig. 8



Hardness profile of a partially annealed contact socket

partial annealing involves complicated methods (e.g. RF induction heating), results however in contacts with greater conductivity and higher reliability than bonding various metals.



The following points should be noted concerning coaxial cables:

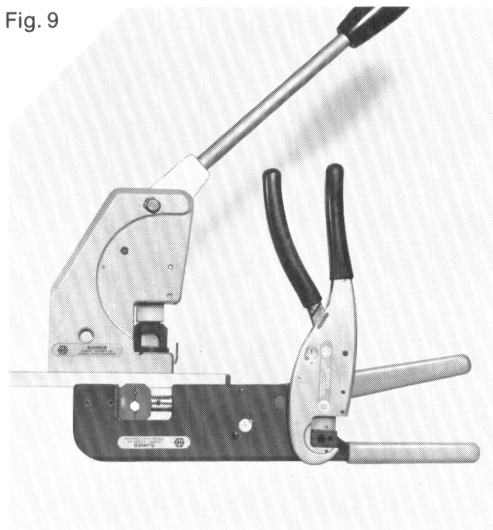
- Use only cables for which the appropriate crimp connector is specified
- Use only cables which correspond exactly to the respective standards

Crimp connectors for all standard cables (MIL, VDE, UR, CCTU, etc.) are available in proven designs today. The user should however verify in every case that the cable used corresponds to the given standard.

Should a crimp connector for a non-standard cable be required, it is advisable to contact the connector manufacturer.

With the dimensioning of connector components, crimp inserts, and the selection of materials and type of cable, the force necessary for crimping has been determined (Fig. 10). The crimp tools must be constructed to withstand this force without overstressing the tool frame. A small amount of flexing which results in an air gap between the inserts in some cases cannot be prevented. It must however be kept within controlled limits. It must be taken into account when dimensioning connector components and inserts.

Fig. 9



SUHNER crimp tools

Crimp tools should withstand a maximum crimp force of 1000 kp with a 1.5 safety margin. This dictates the use of high-tensile materials for practically all tool parts.

The exact alignment of the crimp inserts is of the utmost importance. Inserts that are mis-aligned in any plane cause formation of fins, cracks or insufficient crimping.

In order that the crimp process is concluded in every case, crimp tools must be provided with a ratchet, which permits the tool to be opened only after completion of the crimping cycle. If the crimping cannot be concluded (e.g. using a wrong connector component), an emergency release must be provided to make interruption possible. This interference must however be detectable afterwards (seal).

Crimp tools are precision instruments. They determine to a great extent the quality of the crimping. Therefore only tools clearly recommended by the connector supplier should be used.

# Severe tests demonstrate the reliability

Before SUHNER crimp connectors are released for manufacture and use by the customer, they are submitted to severe tests. Certain tests are repeated periodically on production batches.

## Crimping force

This measurement is made on a bench press with built-in force transducer. In addition the distance between the inserts is recorded in order to obtain a force/distance diagram (Fig. 10).

## Pull-out force (holding-force of cable)

This measurement is made on a tensile tester. This is one of the most important measurements. Besides the absolute

Fig. 10

| Cable  | Crimp force<br>Inner conductor | Crimp force<br>Outer conductor | Pull-out force<br>Inner conductor | Pull-out force<br>Outer conductor | Pull-out force of<br>complete connector |
|--------|--------------------------------|--------------------------------|-----------------------------------|-----------------------------------|---|
|        | kp                             | kp                             | kp                                | kp                                | kp                                      |
| RG 196 | 400                            | 400                            | 3                                 | 9                                 | 11                                      |
| RG 188 | 400                            | 400                            | 8                                 | 11                                | 18                                      |
| RG 58  | 370                            | 600                            | 12                                | 33                                | 40                                      |
| RG 223 | 370                            | 650                            | 14                                | 47                                | 55                                      |
| RG 59  | 425                            | 500                            | 14                                | 45                                | 50                                      |
| RG 213 | 320                            | 680                            | 75                                | 75                                | 100                                     |
| RG 214 | 320                            | 600                            | 75                                | 85                                | 100                                     |

magnitude of the force, the type of fracture is of interest. Where possible fracturing of the centre conductor or braid wires is aimed at. In the case of pulling-out from the connector, the pull-out force should be at least 80% of the tensile strength of the cable (Fig. 10).

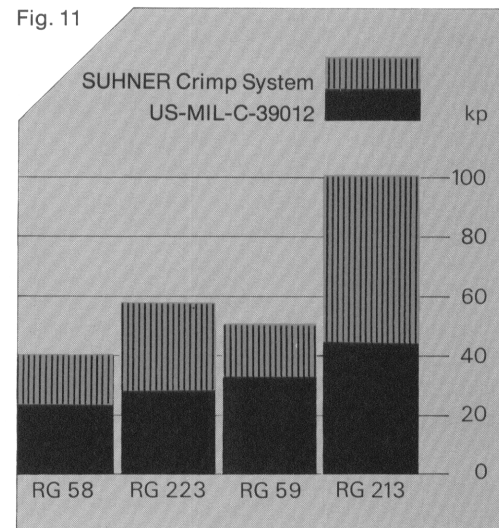
In Fig. 11 the values attained with optimum dimensioning are compared with those required by MIL.

## Resistance of the crimp joint

The resistance between the cable and the crimped contact is measured (inner or outer conductor). In order to exclude thermal voltages, the measurement is carried out at 1 kHz. The voltage applied across the crimp joint is 200 microvolts, the current is limited to 150 mA.

The measurement of the resistance is usually carried out after the temperature tests.

Fig. 11



## Microsection

A microsection of the crimp joint gives information on the degree of deformation and cold welding (Fig. 4).



Temperature shock  
(in accordance with MIL-STD-202C/107B)

The specimens are exposed several times to a temperature shock (– 55° to + 200°C). Cracks due to overstressing during crimping will come to light. After the test resistance and pull-out force are measured.

Temperature cycling  
(in accordance with MIL-STD-202C/102A)

This is an accelerated life test which includes several cycles – 55°C/18°C/125°C. Subsequently resistance and pull-out force are measured.

High temperature storage

This test also simulates aging of the crimp joint. The specimens are exposed for 1000 hours to a temperature of 125°C and continuously loaded to 1 A DC. After the test the resistance and pull-out force are measured.

Corrosion test

This test is to determine the degree of cold welding between connector parts and cable. The specimens are exposed to 0.5% concentrations of H<sub>2</sub>S and SO<sub>2</sub> (24 hours each). The resistance is then measured.

Results of tests on Series N inner conductors and RG 214/U cable

|  | Crimp force                         | Crimp joint resistance before            | Crimp joint resistance after             | Pull-out force before                      | Pull-out force after                       |
|--|-------------------------------------|--|--|--|--|
| Temperature cycling<br>Temperature shock<br>High temperature storage<br>Corrosion test | approx. 350 kp<br>for all specimens | 0.06 mΩ<br>0.03 mΩ<br>0.05 mΩ<br>0.05 mΩ | 0.03 mΩ<br>0.03 mΩ<br>0.02 mΩ<br>0.06 mΩ | Inner conductor fractures at approx. 75 kp | Inner conductor fractures at approx. 75 kp |

# SUHNER Crimp Technique: economical, reliable, simple

The SUHNER crimp technique completely fulfills the requirements for a better connecting technique as outlined at the beginning:

- The quality of the connection remains constant from connector to connector. It is almost independent of the skill of assembly personnel.
- Crimp connectors are simple in construction and therefore favourable in price. SUHNER crimp connectors are supplied as only 3 individual components! (Fig. 1b).
- Crimping means reduced assembly times, personnel training and inspection. On average the assembly time is 40–50% shorter than with conventional connectors. Even for small batches it is economical to purchase a crimping tool and use crimp connectors.
- The SUHNER crimp technique does not impose any heat effect on cable or connector. The assembly can be carried out anywhere, even where no power is available: in the open, on building sites, at sea, and places with explosion hazards.
- The SUHNER crimp technique requires only 5 different crimp inserts for the preferred cable and connectors series.

| SUHNER<br>Crimp<br>tool<br>size | Connector series                          | Cable types (e.g.)        |                  |                     |
|---------------------------------|---|---------------------------|------------------|---------------------|
|                                 |   | single<br>screen          | double<br>screen | Diel. Ø<br>of cable |
| 1/2 A                           | SMA, SMB, SMC,<br>SMS, BNC, MCX,<br>QLA   | RG 178, RG 196            | —                | 1 mm                |
|                                 |   | RG 174, RG 188<br>RG 316  | K02252-d         | 2 mm                |
| 2 B                             | SMA, BNC, TNC<br>C, N, UHF,<br>M, H4, SHV | RG 58<br>RG 141<br>RG 303 | RG 223<br>RG 142 | 3 mm                |
| 2 C                             | BNC, TNC, C,<br>N, UHF, M, H4, SHV        | RG 59                     | G04233-d         | 4 mm                |
| 2 D                             | N (75 Ohm)                                | RG 11                     | RG 216/U         | 7 mm                |
| 3 D                             | C, N, UHF, 7 – 16                         | RG 213                    | RG 214           | 7 mm                |

# Crimping Procedure

The following sequence of operations is valid for all tools (small crimp tool, large crimp tool, table press).

## Stripping the cable

For stripping the dimensions shown in the assembly instructions supplied with the connectors, are to be maintained exactly. Cut dielectric at right angles to the axis of the cable. Do not damage inner and outer conductors.

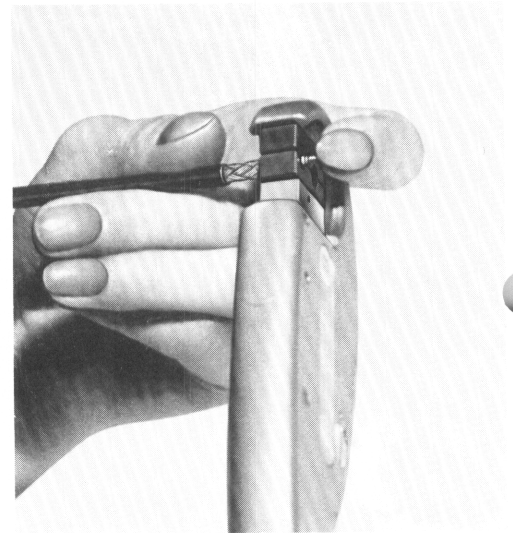
## Crimping centre contact

Contact pin to abut completely against dielectric.

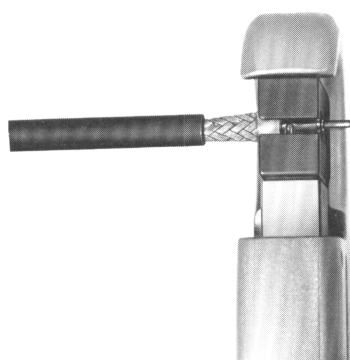
Crimp until the tool can be opened again.



Push dielectric into cylindrical insert of the small recess of the crimp die.



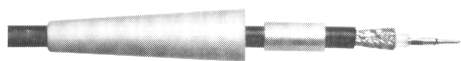
During the crimping, press contact pin against the dielectric and the latter against the crimp die. Emergency release if crimping cannot be completed (see page 11).



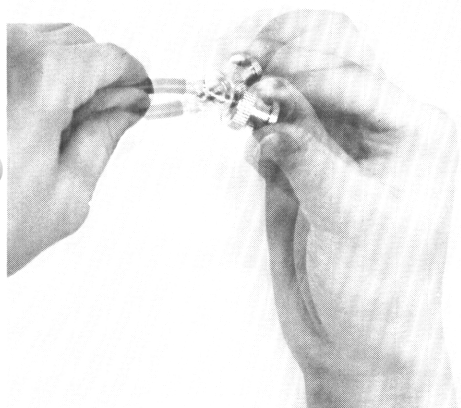


## Crimping outer conductor

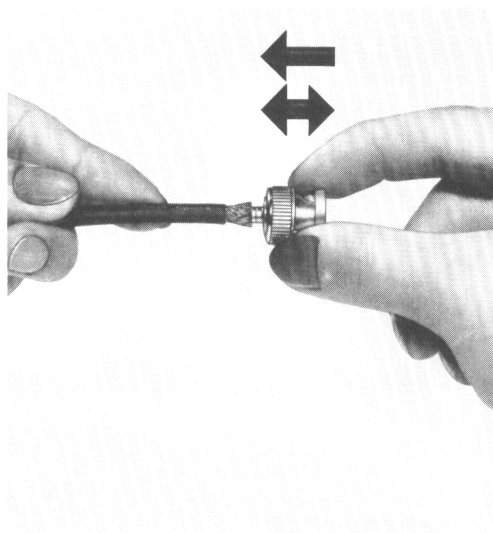
Push ferrule and coloured taper sleeve if used over the cable.



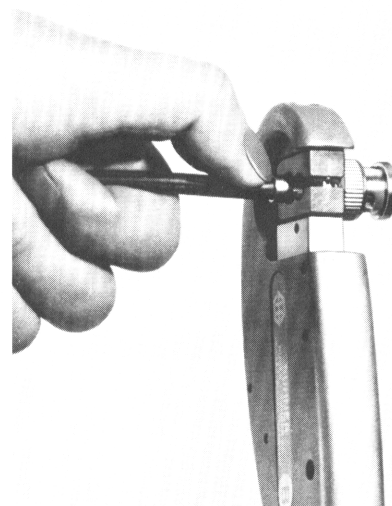
Spread out screen slightly by circling movement of the dielectric.



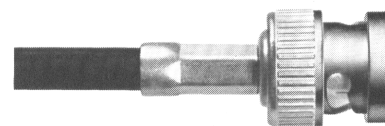
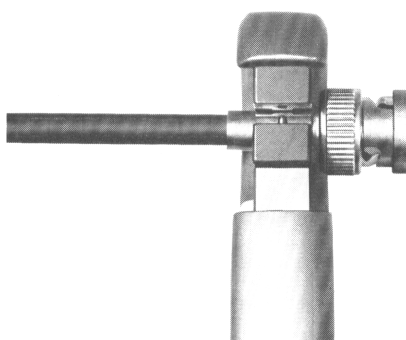
Push crimped contact pin through the crimp spigot into the connector body, until it can be felt to engage. To check, draw cable back slightly. Push ferrule over screen until it is flush against the connector body. Take care that there are no screen wires between body and ferrule.



Crimp until tool can be released.



Place connector into the large recess of the crimp die so that the ferrule is flush against the connector body and the latter is flush against the crimp die.



If crimped correctly, the crimped area will extend to the end of the ferrule adjacent to the connector body. Emergency release if crimping cannot be completed (see page 11).

# Tools Accessories

For code numbers, see page 13

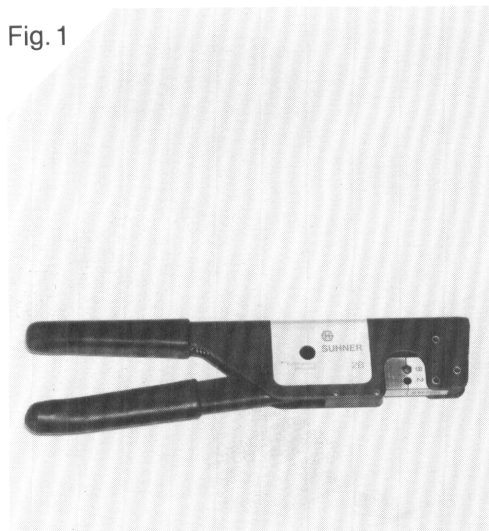
## Small crimp tool

## Small crimp tool

## Large crimp tool

Suitable for single assembly and small batch productions:  
Available with fixed (noninterchangeable) crimp dies of size 2B or 2C for cables with dielectric diameters of 3 mm or 4 mm.

Fig. 1



Colour black, weight 610 g, length 245 mm.  
The tool is provided with a locking device and can only be opened if the contact is satisfactorily crimped.  
Emergency release if crimping cannot be completed (see page 11).

Suitable for single assembly and small batch productions:  
Supplied with 3 different crimp inserts for cable with dielectric diameter up to 4 mm.  
Interchangeable crimp inserts.

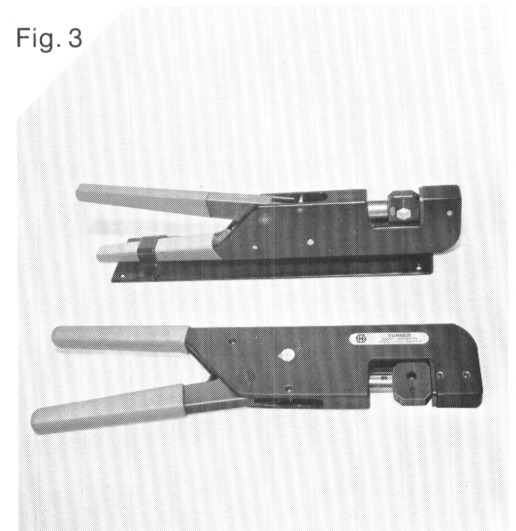
Fig. 2.



Colour silver, weight 560 g, length 232 mm.  
Handy grip, anatomically correctly shaped to reduce fatigue, specially suitable for women.  
The tool is provided with a locking device and can only be opened if the contact is satisfactorily crimped.  
Emergency release if crimping cannot be completed (see page 11).

Suitable for small to medium production batches.  
Supplied with 4 different crimp inserts for cable with dielectric diameter up to 7 mm.  
Interchangeable crimp inserts.

Fig. 3



Colour black, weight 820 g, length 320 mm.  
Accessories:  
Support plate for fixing the tool to bench.  
Cutting insert for cutting cables.  
The tool is provided with a locking device and can only be opened if the contact is satisfactorily crimped.  
Emergency release if crimping cannot be completed (see page 11).

## Stripping device

## Table press

## Emergency release

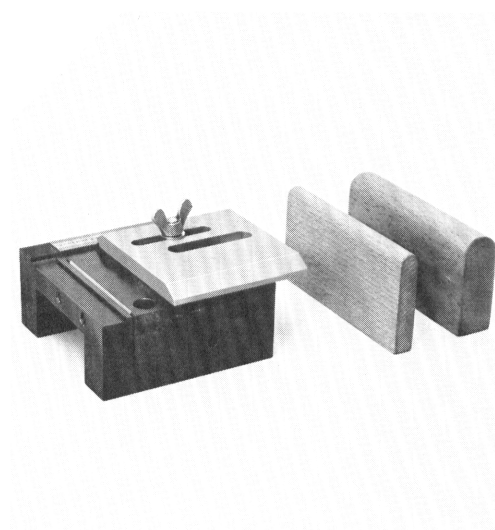
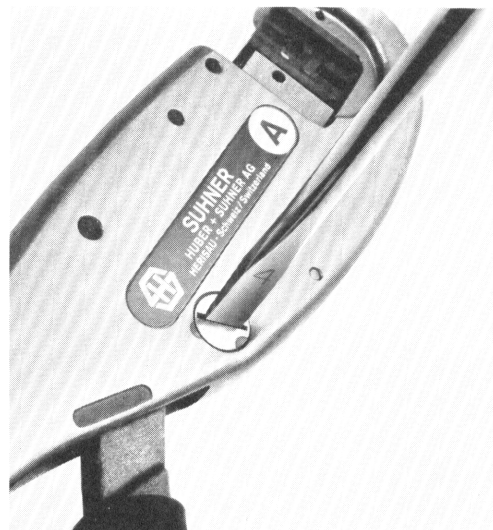
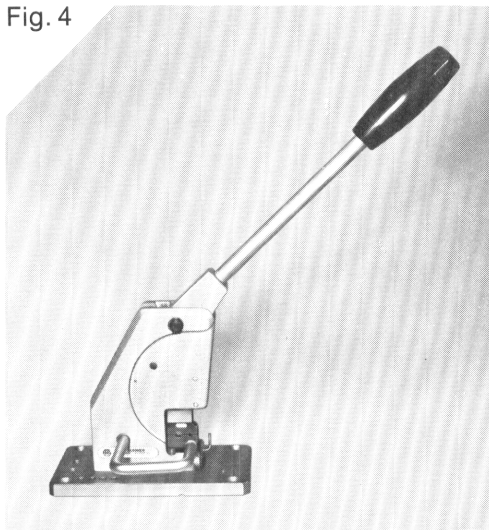
## Stripping device

Suitable for assembly of large production batches at fixed working position.  
Supplied with 4 different crimp inserts for cable with dielectric diameter up to 7 mm.  
Same interchangeable crimp inserts as for large crimp tool.

Emergency release if crimping cannot be completed (wrong crimp inserts, wrong individual components, etc.)

Blade height adjusted by means of 2 eccentrics and stripping length by adjustable top plate.

Fig. 4



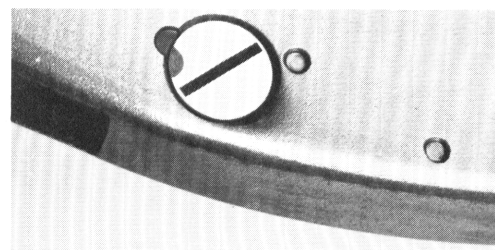
Colour hammer-forged grey, weight 5 kg, height 478 mm.  
Stop for positioning of inner conductor and crimp body, so that right hand is free, also used for cutting cables to desired length.

### Accessories:

Cutting insert for cutting cables.

The table press is provided with a locking device and can only be opened if the contact is satisfactorily crimped.

Emergency release if crimping cannot be completed (see page 11).



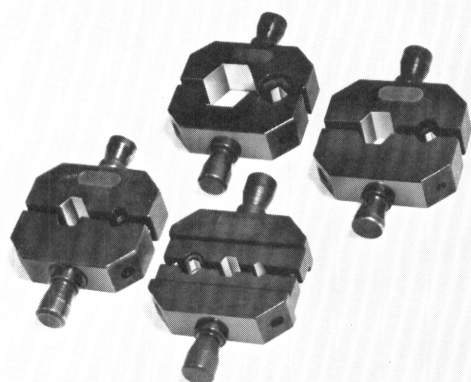
Remove cover-screw. Release spring catch with screwdriver. Replace screw. (This interference is subsequently detectable owing to the red colour seal).



## Crimp inserts

Material: Special tool steel alloy, hardened by heat treatment. Interchangeable lower and upper parts, therefore suitable for left and right handed operation. Tolerance max. 0.05 mm. Centring pins and guide slots ensure accurate alignment of the jaw halves during the crimping operation.

Fig.6

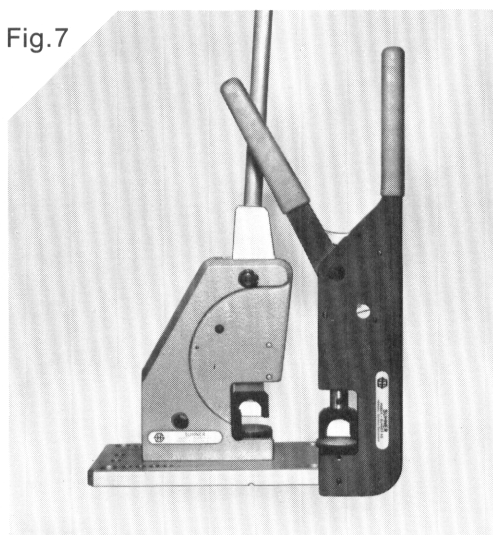


The crimp inserts are provided with different colour codes, corresponding to the respective cable diameter (see tool list, page 13).

## Cutting insert

Used with large crimp tool and table press. Suitable for cable up to 12 mm outer diameter.

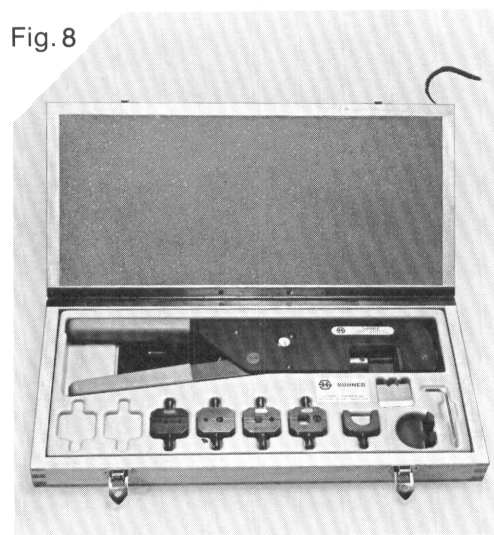
Fig.7



## Tool set for large crimp tool

Protected and clearly-arranged storage of tool and inserts. Cardboard box with vacuum formed plastic tray for tool and tool inserts. Wooden case with same contents.

Fig.8



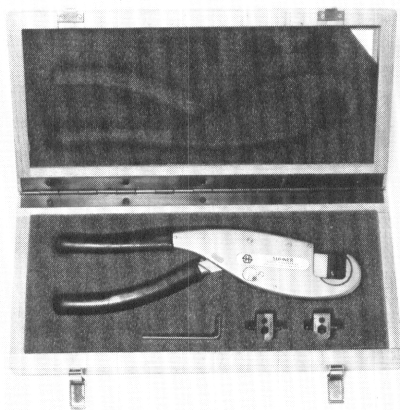
Contents:  
large crimp tool  
support plate for assembly bench  
crimp inserts 1/2 A, 2 B, 2 C, 3 D  
cutting insert  
10 spare blades for cutting insert  
Allen key

# Tool list and ordering codes

## Tool set for small crimp tool

Protected and clearly-arranged  
storage of tool and inserts.  
Wooden case with foam tray  
for tool and inserts.

Fig. 9



Contents:  
small crimp tool  
crimp inserts 1/2 A, 2 B, 2 C  
Allen key  
instruction sheet

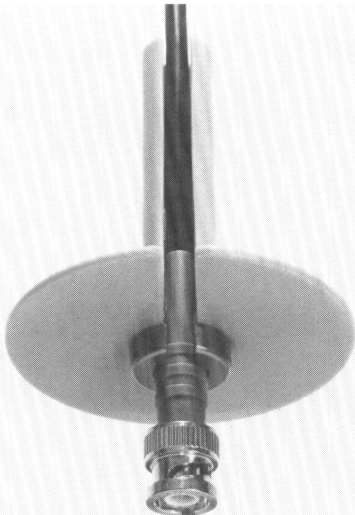
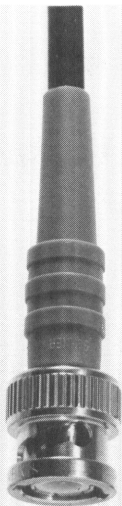
| Fig. (pages 10 – 12) | Article   | Ordering Codes     |
|----------------------|---|--------------------|
| 1                    | Small crimp tool with fixed insert<br>in cardboard box                              |                    |
|                      | 2 B for cable with dielectric Ø 3 mm  | <b>75 Z-0-3-4</b>  |
|                      | 2 C for cable with dielectric Ø 4 mm  | <b>75 Z-0-4-4</b>  |
| 2                    | Small crimp tool, for interchangeable inserts,<br>without inserts, in cardboard box | <b>75 Z-0-0-50</b> |
| 9                    | with all interchangeable inserts and foam tray,<br>in wooden box                    | <b>75 Z-0-0-51</b> |
|                      | Wooden box with foam tray, without tool   | <b>76 Z-0-0-51</b> |
|                      | Inserts, see fig. 6   |                    |
| 3                    | Large crimp tool for interchangeable inserts<br>without inserts                     | <b>75 Z-0-0-1</b>  |
|                      | with all interchangeable inserts<br>and support plate, in cardboard box             | <b>76 Z-0-0-14</b> |
| 8                    | with all interchangeable inserts<br>and support plate, in wooden box                | <b>76 Z-0-0-15</b> |
|                      | Wooden box with plastic tray, without tool  | <b>76 Z-0-0-11</b> |
|                      | Support plate for fixing to assembly bench  | <b>76 Z-0-0-3</b>  |
|                      | Inserts, see fig. 6   |                    |
| 4                    | Table press for interchangeable inserts,<br>without inserts                         | <b>75 Z-0-0-2</b>  |
|                      | Inserts, see fig. 6   |                    |
| 5                    | Stripping device  | <b>74 Z-0-0-11</b> |
| 6                    | Inserts for small crimp tool <b>75 Z-0-0-50</b>                                     |                    |
|                      | Crimp inserts   |                    |
|                      | for cable with dielectric Ø 1 and 2 mm<br>insert 1/2 A                              | <b>76 Z-0-2-51</b> |
|                      | for cable with dielectric Ø 3 mm<br>insert 2 B                                      | <b>76 Z-0-3-51</b> |
|                      | for cable with dielectric Ø 4 mm<br>insert 2 C                                      | <b>76 Z-0-4-51</b> |
|                      | Inserts for large crimp tool <b>75 Z-0-0-1</b><br>and table press <b>75 Z-0-0-2</b> |                    |
|                      | Crimp inserts   |                    |
|                      | for cable with dielectric Ø 1 and 2 mm<br>insert 1/2 A identity colour red          | <b>76 Z-0-2-1</b>  |
|                      | for cable with dielectric Ø 3 mm<br>insert 2 B identity colour orange               | <b>76 Z-0-3-1</b>  |
|                      | for cable with dielectric Ø 4 mm<br>insert 2 C identity colour yellow               | <b>76 Z-0-4-1</b>  |
|                      | for cable with dielectric Ø 7 mm<br>insert 3 D identity colour violet               | <b>76 Z-0-7-1</b>  |
| 7                    | Cutting insert for cable up to Ø 12 mm  | <b>76 Z-0-0-1</b>  |
|                      | Spare blades for cutting insert   | <b>76 Z-0-0-2</b>  |

# Coloured taper sleeves to reinforce cable entry

These sleeves also provide a colour coding in many applications.

Material PE  
Colours black, brown, red, orange, yellow, green, blue, violet, grey, white  
Suitable for crimp connectors for cables up to 7 mm Ø dielectric  
Heat-resistant up to 70° C

Assembly with simple tool



# Coaxial cable assemblies with crimp connectors

A satisfactory cable assembly is of great importance for all RF connections. SUHNER manufactures ready-for-use cables in any variation required by the customer. The purchase of cable assemblies with connectors offers many advantages:

- faultless assembly by trained specialists
- no stocking of connectors and cables
- no scrap
- no expenditure on assembly equipment
- electrically matched cables and connectors from the same supplier
- markings and colour codings
- tested in accordance with customers specifications, where required



| Colour        | for cable with outer Ø 2.2 mm | for cable with outer Ø 2.6 mm | for cable with outer Ø 3.0 mm | for cable with outer Ø 5.1 mm | for cable with outer Ø 5.4 mm | for cable with outer Ø 6.1 mm | for cable with outer Ø 6.7 mm |
|---------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| black         | 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                    |
| brown         | 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                    |
| red           | 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                    |
| orange        | 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                    |
| yellow        | 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                    |
| green         | 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                    |
| blue          | 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                    |
| violet        | 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                    |
| grey          | 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                    |
| white         | 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                    |
| Assembly tool | 74 Z-0-2-1                    | 74 Z-0-2-1                    | 74 Z-0-2-1                    | 74 Z-0-3-6                    | 74 Z-0-3-6                    | 74 Z-0-4-6                    | 74 Z-0-4-6                    |



# Crimp Connectors

## Key to connector code

SUHNER coaxial crimp connectors are available in the following series:

BNC, C, H4, M, MCX, N, QLA, SHV, SMA, SMB, SMC, SMS, TNC, UHF, 7 – 16

11 BNC – 50 – 3 – 26 c

Index «c» if inner conductor is captivated in both directions.

Type variant (continuous)

Dielectric diameter rounded to whole millimetres

Impedance 0 no matching  
50 matched to 50  $\Omega$   
75 matched to 75  $\Omega$

RF connector series

Functional type

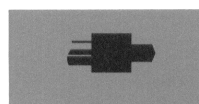
|  |  |
|--|--|
| for cable with<br>outer $\varnothing$<br>10.3 mm (RG213) | for cable with<br>outer $\varnothing$<br>10.8 mm (RG214) |
|--|--|

78 Z-0-7-1

78 Z-0-7-2

74 Z-0-7-2

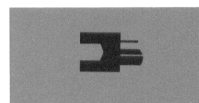
74 Z-0-7-3



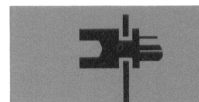
11  
straight cable plug



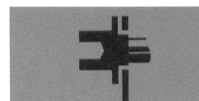
16  
angle cable plug



21  
straight cable jack



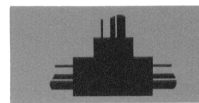
24  
straight bulkhead jack for single hole mounting



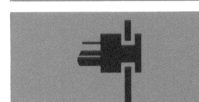
25  
straight panel jack with flange



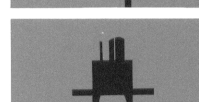
29  
bulkhead jack with angle cable entry for single hole mounting



47  
T adaptor



71  
cable feed-through



83  
straight cable receptacle for printed circuits



86  
angle cable receptacle for printed circuits

# Suitable cables

In our supply programme the most frequently used types of cable are quoted for each type of connector. The following table contains the important dimensions of these and other suitable cables.

You will find in the lists on pages 19–33 a suitable crimp connector if your cable corresponds to the dimensions of one of the cables quoted here.

**Important:**  
The permissible diameter tolerances for faultless crimping are small. Please ask us or our agents about the suitability of cables with dimensions similar to those listed here.

|        |   |
|--------|---|
| Cu     | plain copper                                |
| CuSt   | Copper-plated steel wire                    |
| CuStAg | silvered copper-plated steel wire           |
| Sn     | tinned copper wire                          |
| Ag     | silvered copper wire                        |
| AgAg   | double screening, silvered copper           |
| PVC I  | flexible polyvinylchloride                  |
| PVC II | non-migrating polyvinylchloride             |
| PE     | Polyethylene                                |
| PTFE   | Polytetrafluorethylene                      |
| FEP    | Fluorethylenepropylene                      |
| GSi    | Fibreglass braided and silicone impregnated |
| HT     | Semi-conductor compound                     |

| Nominal impedance | Popular types of cable | Specification to | Inner Conductor |            |      | Dielectric |      | Screen |          |      | Sheath   |      |
|-------------------|------------------------|------------------|-----------------|------------|------|------------|------|--------|----------|------|----------|------|
|                   |                        |                  | Material        | Construct. | Ø mm | Material   | Ø mm | Number | Material | Ø mm | Material | Ø mm |
| 50 Ω              | RG 196 A/U             | MIL              | CuStAg          | 7×0.1      | 0.3  | PTFE       | 0.87 | 1      | Ag       | 1.37 | PTFE     | 2.05 |
|                   | RG 178 B/U             | MIL              | CuStAg          | 7×0.1      | 0.3  | PTFE       | 0.87 | 1      | Ag       | 1.37 | FEP      | 1.8  |
|                   | G 01122                | SUHNER           | CuSt            | Wire       | 0.3  | PE         | 1.05 | 1      | Cu       | 1.4  | Nylon    | 1.7  |
|                   | RG 174/U               | MIL              | CuSt            | 7×0.16     | 0.48 | PE         | 1.5  | 1      | Sn       | 2.0  | PVC I    | 2.6  |
|                   | RG 188 A/U             | MIL              | CuStAg          | 7×0.17     | 0.51 | PTFE       | 1.5  | 1      | Ag       | 2.0  | PTFE     | 2.6  |
|                   | RG 316/U               | MIL              | CuStAg          | 7×0.17     | 0.51 | PTFE       | 1.5  | 1      | Ag       | 2.0  | FEP      | 2.5  |
|                   | K 02252-d              | SUHNER           | CuStAg          | 7×0.17     | 0.51 | PTFE       | 1.5  | 2      | AgAg     | 2.5  | FEP      | 3.0  |
|                   | RG 303/U               | MIL              | CuStAg          | Wire       | 0.95 | PTFE       | 2.95 | 1      | Ag       | 3.6  | FEP      | 4.3  |
|                   | RG 141 A/U             | MIL              | CuStAg          | Wire       | 0.95 | PTFE       | 2.95 | 1      | Ag       | 3.6  | PTFE+GSi | 4.3  |
|                   | RG 58 C/U              | MIL              | Sn              | 19×0.18    | 0.9  | PE         | 2.95 | 1      | Sn       | 3.6  | PVC II   | 4.95 |
|                   | RG 223/U               | MIL              | Ag              | Wire       | 0.89 | PE         | 2.95 | 2      | AgAg     | 4.2  | PVC II   | 5.3  |
|                   | RG 142 B/U             | MIL              | CuStAg          | Wire       | 0.95 | PTFE       | 2.95 | 2      | AgAg     | 4.2  | FEP      | 4.95 |
|                   | RG 213/U               | MIL              | Cu              | 7×0.75     | 2.25 | PE         | 7.25 | 1      | Cu       | 8.1  | PVC II   | 10.3 |
|                   | RG 214/U               | MIL              | Ag              | 7×0.75     | 2.25 | PE         | 7.25 | 2      | AgAg     | 8.7  | PVC II   | 10.8 |
| 75 Ω              | G 03233                | SUHNER           | Cu              | 7×0.16     | 0.48 | PE         | 2.95 | 1      | Cu       | 3.6  | PVC II   | 5.0  |
|                   | G 03233-d              | SUHNER           | Sn              | Wire       | 0.47 | PE         | 2.95 | 2      | AgAg     | 4.2  | PVC II   | 5.3  |
|                   | RG 59 B/U              | MIL              | CuSt            | Wire       | 0.6  | PE         | 3.7  | 1      | Cu       | 4.5  | PVC II   | 6.1  |
|                   | G 04233-d              | SUHNER           | CuSt            | Wire       | 0.6  | PE         | 3.7  | 2      | AgAg     | 5.3  | PVC II   | 6.7  |
|                   | RG 11 A/U              | MIL              | Sn              | 7×0.4      | 1.2  | PE         | 7.25 | 1      | Cu       | 8.15 | PVC II   | 10.3 |
|                   | RG 216/U               | MIL              | Sn              | 7×0.4      | 1.2  | PE         | 7.25 | 2      | CuCu     | 8.7  | PVC II   | 10.8 |
| —                 | G 03130-HT             | SUHNER           | Cu              | Wire       | 0.5  | PE         | 3.0  | 1      | Cu       | 4.0  | PVC I    | 5.0  |

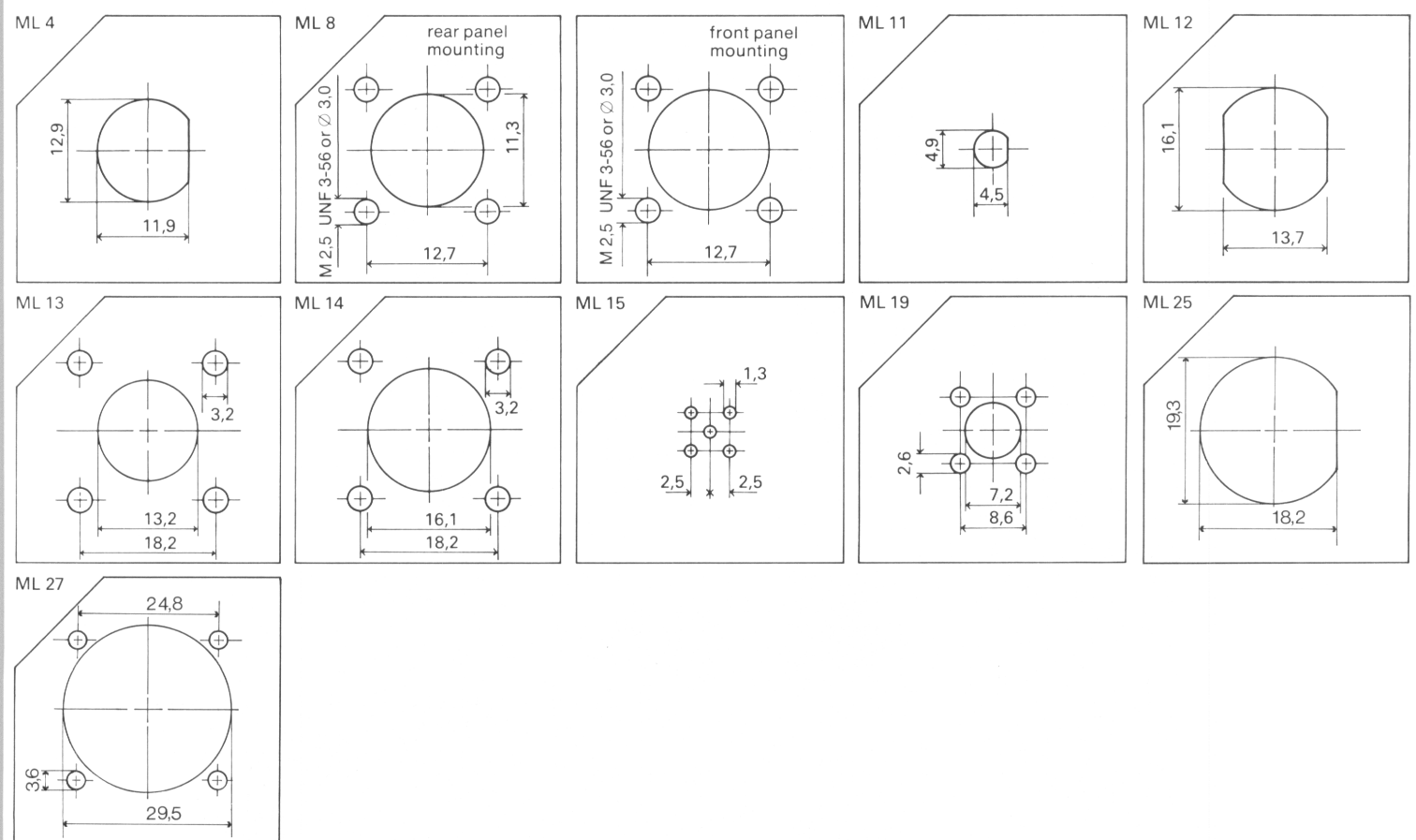
# Cross reference list

\* With the SUHNER types the inner conductor is captivated (Improvement compared with US-MIL types).

| Type according to<br>US-MIL-C-39012, Category B | SUHNER type      | Type according to<br>US-MIL-C-39012, Category B | SUHNER type     |
|---|------------------|---|-----------------|
| 39012/01-0007                                   | 11 N-50-7-43c    | 39012/55-3014                                   | 11 SMA-50-3-55c |
| /01-0008  | 11 N-50-7-44c    | /55-3016  | 11 SMA-50-3-56c |
| /02-0008  | 21 N-50-7-13c    | /55-3019  | 11 SMA-50-2-55c |
| /02-0009  | 21 N-50-7-14c    | /55-4019  | 11 SMA-50-2-5c  |
| /02-0016  | 25 N-50-7-13c    | /55-4021  | 11 SMA-50-3-5c  |
| /02-0017  | 25 N-50-7-14c    | /55-4022  | 11 SMA-50-3-6c  |
| /03-0004  | 24 N-50-7-14c    | /55-4023  | 11 SMA-50-3-6c  |
| /03-0005  | 24 N-50-7-15c    | /55-4024  | 11 SMA-50-3-5c  |
| /05-0002  | 16 N-50-7-12c    | /56-4019  | 16 SMA-50-2-5c  |
| /05-0003  | 16 N-50-7-13c    | /56-4021  | 16 SMA-50-3-5c  |
|   |                  | /56-4022  | 16 SMA-50-3-6c  |
| /06-0022  | 11 C-50-7-14c    | /56-4023  | 16 SMA-50-3-6c  |
| /06-0023  | 11 C-50-7-15c    | /56-4024  | 16 SMA-50-3-5c  |
|   |                  | /57-4019  | 21 SMA-50-2-5c  |
| /16-0004  | 11 BNC-50-3-4c   | /57-4021  | 21 SMA-50-3-5c  |
| /16-0005  | 11 BNC-50-3-16c  | /57-4022  | 21 SMA-50-3-6c  |
| /16-0008  | 11 BNC-50-4-4c   | /57-4023  | 21 SMA-50-3-6c  |
| /17-0004  | 21 BNC-50-3-2c   | /57-4024  | 21 SMA-50-3-5c  |
| /17-0005  | 21 BNC-50-3-9c   |   |                 |
| /17-0008  | 21 BNC-50-4-1c   | /67-0005  | 11 SMB-50-1-10  |
| /18-0004  | 25 BNC-50-3-13c  | /67-0009  | 11 SMB-50-2-10c |
| /18-0005  | 25 BNC-50-3-17c  | /68-0005  | 21 SMB-50-1-10  |
| /18-0008  | 25 BNC-50-4-1c   | /68-0009  | 21 SMB-50-2-10c |
| /19-0003  | 24 BNC-50-3-1c   | /69-0008  | 16 SMB-50-1-3c  |
| /19-0004  | 24 BNC-50-3-8c   | /69-0009  | 16 SMB-50-2-4c  |
| /19-0007  | 24 BNC-50-4-1c   |   |                 |
| /20-0002  | 16 BNC-50-3-13c  | /73-0005  | 11 SMC-50-1-10  |
| /20-0003  | 16 BNC-50-3-18c  | /73-0009  | 11 SMC-50-2-10c |
|   |                  | /74-0005  | 21 SMC-50-1-10  |
| /26-0005  | 11 TNC-50-3-9    | /74-0009  | 21 SMC-50-2-10c |
| /26-0006  | 11 TNC-50-3-25   | /75-0008  | 16 SMC-50-1-3c  |
| /26-0007  | 11 TNC-50-4-7    | /75-0009  | 16 SMC-50-2-4c  |
| /26-0015  | 11 TNC-50-3-24   |   |                 |
| /26-0016  | 11 TNC-50-3-14   |   |                 |
| /26-0020  | 11 TNC-50-2-5c   |   |                 |
| /27-0005  | 21 TNC-50-3-7c * |   |                 |
| /27-0007  | 21 TNC-50-4-6c * |   |                 |
| /27-0016  | 21 TNC-50-3-9c * |   |                 |
| /28-0005  | 24 TNC-50-3-6c * |   |                 |
| /28-0007  | 24 TNC-50-4-5c * |   |                 |
| /28-0016  | 24 TNC-50-3-8c * |   |                 |
| /28-0020  | 24 TNC-50-2-3c * |   |                 |
| /29-0005  | 25 TNC-50-3-14c* |   |                 |
| /29-0007  | 25 TNC-50-4-11c* |   |                 |
| /29-0016  | 25 TNC-50-3-22c* |   |                 |
| /30-0005  | 16 TNC-50-3-13c* |   |                 |
| /30-0006  | 16 TNC-50-3-21c* |   |                 |
| /30-0007  | 16 TNC-50-4-10c* |   |                 |
| /30-0016  | 16 TNC-50-3-18c* |   |                 |



# Mounting holes



# Type Range

In addition to the standard programme of crimp connectors presented on the following pages, we supply special types for a certain minimum demand, on request.

There are separate data sheets for RF connectors with soldered inner conductors, screwed cable entry, bulkhead receptacles, adaptors and between series adaptors for all series. Please request further details.

## Cable feed-throughs



Crimp insert

Braiding

No. of screens

Insulation dia. mm.

Suitable cable

**50 Ω** Cable

Assembly instructions

Mounting hole  
(see page 18)

Type



Remarks

|                   |      |   |             |       |      |   |                            |
|-------------------|------|---|-------------|-------|------|---|----------------------------|
| RG 196 A/U        | 0.87 | 1 | 71 Z-0-1-3  | ML 11 | 3052 | A | with round flange          |
| RG 188 A/U        | 1.5  | 1 | 71 Z-0-2-2  | ML 11 | 3052 | A | with round flange          |
| K 02252-d         | 1.5  | 2 | 71 Z-0-2-7  | ML 11 | 3052 | A | with hexagonal flange SW 6 |
| RG 58 C/U         | 2.95 | 1 | 71 Z-0-3-13 | ML 13 | 3081 | B | with square 1"-flange      |
| RG 223/U          | 2.95 | 2 | 71 Z-0-3-14 | ML 13 | 3081 | B | with square 1"-flange      |
| RG 213/U          | 7.25 | 1 | 71 Z-0-7-7  | ML 14 | 3081 | D | with square 1"-flange      |
| RG 214/U          | 7.25 | 2 | 71 Z-0-7-8  | ML 14 | 3081 | D | with square 1"-flange      |
| <b>75 Ω</b> Cable |      |   |             |       |      |   |                            |
| RG 59 B/U         | 3.7  | 1 | 71 Z-0-4-8  | ML 13 | 3081 | C | with square 1"-flange      |
| G 04233-d         | 3.7  | 2 | 71 Z-0-4-9  | ML 13 | 3081 | C | with square 1"-flange      |

# Series BNC



Practical cable connector, bayonet coupling mechanism, corrosion-resistant, for sheath diameters between 2.0 and 11.0 mm.

|                             |   |
|-----------------------------|---|
| Impedance                   | 50 and 75 ohms*   |
| Recommended frequency range | DC - 4000 MHz   |
| Working voltage             | max. 1 kV RMS/50 Hz   |
| Inner contact               | type with index c = captive<br>others = secured against pull from cable end |
| Insulation                  | PTFE  |
| Surface finish              | inner contact gold-plated<br>other parts Sucoplate®                         |
| Temperature range           | -55... +165°C   |

\* BNC connectors are dimensionally designed for 50 ohm systems. Mateability with BNC 75 ohm connectors is nevertheless guaranteed. The 75 ohm type does not ensure a good matching.

| No. of screens         |      | Insulation dia. mm. |                                  | Assembly instructions |                                  | Assembly instructions |  |
|------------------------|------|---------------------|----------------------------------|-----------------------|----------------------------------|-----------------------|--|
| Suitable cable example |      | Straight cable plug |                                  | Angle cable plug      |                                  |                       |  |
| <b>50 Ω Cable</b>      |      |                     |                                  |                       |                                  |                       |  |
| RG 196 A/U             | 0.87 | 1                   | 11 BNC-50-1-5c                   | 9068                  | 16 BNC-50-1-2c                   | 3079                  |  |
| G 01122                | 1.05 | 1                   |                                  |                       |                                  |                       |  |
| RG 174/U               | 1.5  | 1                   | 11 BNC-50-2-13c                  | 9068                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-50-2-3c                   | 3079                  |  |
| RG 188 A/U             | 1.5  | 1                   | 11 BNC-50-2-13c                  | 9068                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-50-2-3c                   | 3079                  |  |
| K 02252-d              | 1.5  | 2                   | 11 BNC-50-2-14c                  | 9068                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-50-2-5c                   | 3079                  |  |
| RG 58 C/U              | 2.95 | 1                   |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-50-3-4c<br>33012/16-0004  | 3015                  | 16 BNC-50-3-13c<br>39012/20-0002 | 3015                  |  |
|                        |      |                     |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-50-3-25c                  | 3015                  |                                  |                       |  |
|                        |      |                     | 11 BNC-50-3-41c                  | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-50-3-5c                   | 3058                  |  |
| RG 223/U               | 2.95 | 2                   | 11 BNC-50-3-16c<br>39012/16-0005 | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-50-3-7c                   | 3058                  |  |
|                        |      |                     |                                  |                       | 16 BNC-50-3-18c<br>39012/20-0003 | 3015                  |  |
|                        |      |                     |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-50-3-42c                  | 3015                  |                                  |                       |  |
| <b>75 Ω Cable</b>      |      |                     |                                  |                       |                                  |                       |  |
| G 03233                | 2,95 | 1                   | 11 BNC-75-3-8c                   | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-75-3-3c                   | 3058                  |  |
| G 03233-d              | 2.95 | 2                   |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-75-3-9c                   | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-75-3-4c                   | 3058                  |  |
| RG 59 B/U              | 3.7  | 1                   |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-50-4-4c<br>39012/16-0008  | 3015                  | 16 BNC-50-4-10c                  | 3015                  |  |
|                        |      |                     |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-75-4-4c                   | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-75-4-4c                   | 3058                  |  |
|                        |      |                     | 11 BNC-75-4-16c                  | 3015                  |                                  |                       |  |
| G 04233-d              | 3.7  | 2                   |                                  |                       |                                  |                       |  |
|                        |      |                     |                                  |                       |                                  |                       |  |
|                        |      |                     | 11 BNC-75-4-6c                   | 3015                  |                                  |                       |  |
|                        |      |                     | 11 BNC-75-4-17c                  | 3015                  |                                  |                       |  |
|                        |      |                     |                                  |                       | 16 BNC-75-4-5c                   | 3058                  |  |
| <b>Other Cables</b>    |      |                     |                                  |                       |                                  |                       |  |
| G 03130 HT (low-noise) | 3,0  | 1                   | 11 BNC-50-3-36c                  | 3015                  |                                  |                       |  |

Italics: Type to US-MIL-C-39012, category B.

# Series M



Simple miniature coaxial connector, screw-on coupling mechanism, corrosion-resistant, for cable sheath diameters 2.8–6.8 mm.

|                             |                      |
|-----------------------------|----------------------|
| Impedance                   | 50 and 75 ohms       |
| Recommended frequency range | DC-4000 MHz          |
| Working voltage             | max. 500 V RMS/50 Hz |
| Inner contact               | captive              |
| Insulation                  | PTFE                 |
| Surface finish              | silver-plating       |
| Temperature range           | – 55 ... + 165°C     |

\*M connectors are dimensionally designed for 50 ohm systems. They are, however interchangeable with 75 ohm connectors. The 75-ohm type does not ensure a good matching.

Crimp insert

Braiding

Inner contact

No. of screens

Insulation dia. mm.

Suitable cable example

**50 Ω** Cable

Assembly instructions

**Straight cable plug**

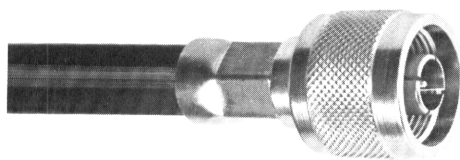


Remarks

|                   |      |   |              |      |   |                        |
|-------------------|------|---|--------------|------|---|------------------------|
| RG 58 C/U         | 2.95 | 1 | 11 M-50-3-1c | 3018 | B | Inner contact soldered |
| RG 223/U          | 2.95 | 2 | 11 M-50-3-6c | 3018 | B | Inner contact soldered |
| <b>75 Ω</b> Cable |      |   |              |      |   |                        |
| G 03233           | 2.95 | 1 | 11 M-75-3-1c | 3018 | B | Inner contact soldered |
| G 03233-d         | 2.95 | 2 | 11 M-75-3-3c | 3018 | B | Inner contact soldered |
| RG 59 B/U         | 3.7  | 1 | 11 M-75-4-1c | 3018 | B | Inner contact soldered |
| G 04233-d         | 3.7  | 2 | 11 M-75-4-3c | 3018 | C | Inner contact soldered |



# Series N



Sturdy precision type coaxial connector, with screw-on coupling mechanism, corrosion-resistant, for sheath diameters 4.8–11.4 mm.

|                             |   |
|-----------------------------|---|
| Impedance                   | 50 ohms   |
| Recommended frequency range | DC - 10000 MHz  |
| Working voltage             | max. 1 kV RMS/50 Hz                                   |
| Inner contact               | captive   |
| Insulation                  | PTFE  |
| Surface finish              | Inner contact gold-plated, remaining parts Sucoplate® |
| Temperature range           | –55... +165°C   |

No. of screens

Insulation dia. mm.

Suitable cable example

**50 Ω** Cable

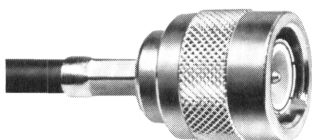
|           |      |   | Straight cable plug                          | Angle cable plug                             |
|-----------|------|---|--|--|
| RG 58 C/U | 2.95 | 1 | <b>11 N-50-3-28c</b>                         | <b>16 N-50-3-26c</b>                         |
| RG 223/U  | 2.95 | 2 | <b>11 N-50-3-29c</b>                         | <b>16 N-50-3-27c</b>                         |
| RG 213/U  | 7.25 | 1 | <b>11 N-50-7-43c</b><br><i>39012/01-0007</i> | <b>16 N-50-7-12c</b><br><i>39012/05-0002</i> |
| RG 214/U  | 7.25 | 2 | <b>11 N-50-7-44c</b><br><i>39012/01-0008</i> | <b>16 N-50-7-30c</b><br><i>39012/05-0003</i> |
|           |      |   |  | <b>16 N-50-7-31c</b>                         |

**75 Ω** Cable

|           |      |   |                      |                     |
|-----------|------|---|----------------------|---------------------|
| G 03233   | 2.95 | 1 | <b>11 N-75-3-8c</b>  |                     |
| G 03233-d | 2.95 | 2 | <b>11 N-75-3-9c</b>  |                     |
| RG 59 B/U | 3.7  | 1 | <b>11 N-75-4-8c</b>  | <b>16 N-50-4-2c</b> |
| G 04233-d | 3.7  | 2 | <b>11 N-75-4-9c</b>  | <b>16 N-50-4-3c</b> |
| RG 11 A/U | 7.25 | 1 | <b>11 N-75-7-16c</b> |                     |
| RG 216/U  | 7.25 | 2 | <b>11 N-75-7-18c</b> |                     |

*Italics: Type to US-MIL-C-39012, category B.*

# Series C



Precision coaxial connector, bayonet coupling mechanism, corrosion-resistant, for cable sheath diameters 4.9–11.4 mm.

|                             |   |
|-----------------------------|---|
| Impedance                   | 50 ohms   |
| Recommended frequency range | DC - 10000 MHz                                    |
| Working voltage             | max. 1.5 kV RMS/50 Hz                             |
| Inner contact               | captive   |
| Insulation                  | PTFE  |
| Surface finish              | Inner contact gold-plated, other parts Sucoplate® |
| Temperature range           | –55... +165°C                                     |

No. of screens

Insulation dia. mm.

Suitable cable example

**50 Ω** Cable

|           |      |   | Straight cable plug                          | Angle cable plug |
|-----------|------|---|--|------------------|
| RG 58 C/U | 2.95 | 1 | <b>11 C-50-3-7c</b>                          |                  |
| RG 223/U  | 2.95 | 2 | <b>11 C-50-3-8c</b>                          |                  |
| RG 213/U  | 7.25 | 1 | <b>11 C-50-7-14c</b><br><i>39012/06-0022</i> |                  |
| RG 214/U  | 7.25 | 2 | <b>11 C-50-7-15c</b><br><i>39012/06-0023</i> |                  |

*Italics: Type to US-MIL-C-39012, category B.*

Mounting hole ML 12  
(see page 18)  
max. panel  
thickness 6.4 mm

Crimp insert

Braiding

Inner contact

Assembly instructions

Mounting hole  
ML 14  
(see page 18)

Remarks

Straight cable  
jack



Bulkhead jack  
1-hole mounting



Panel jack  
with flange



21 N-50-3-7c

24 N-50-3-11c

25 N-50-3-6c

4 holes, 3.4 mm. dia.

3063

2

B

21 N-50-3-8c

24 N-50-3-12c

25 N-50-3-7c

4 holes, 3.4 mm. dia.

3063

2

B

21 N-50-7-13c  
39012/02-0008

24 N-50-7-14c  
39012/03-0004

25 N-50-7-13c  
39012/02-0016

4 holes, 3.4 mm. dia.

3061

3

D

21 N-50-7-14c  
39012/02-0009

24 N-50-7-15c  
39012/03-0005

25 N-50-7-14c  
39012/02-0017

4 holes, 3.4 mm. dia.

3061

3

D

3076

D

Inner contact soldered, partly air-insulated

3076

D

Inner contact soldered, partly air-insulated

21 N-75-3-8c

21 N-75-3-9c

21 N-75-4-8c

25 N-75-4-8c

4 holes, 3.4 mm. dia.

3063

2

C

Inner contact soldered, partly air-insulated  
Connector not matched to 75 ohms

21 N-75-4-9c

24 N-75-4-9c

25 N-75-4-9c

4 holes, 3.4 mm. dia.

3063

2

C

3080

C

Inner contact soldered, partly air-insulated  
Connector not matched to 75 ohms

21 N-75-7-16c

25 N-75-7-16c

4 holes, 3.4 mm. dia.

3061

2

D

21 N-75-7-18c

25 N-75-7-18c

4 holes, 3.4 mm. dia.

3061

2

D

Mounting hole ML 25  
(see page 18)  
max. panel  
thickness 3.5 mm.

Crimp insert

Braiding

Inner contact

Assembly instructions

Mounting hole  
ML 14  
(see page 18)

Remarks

Straight cable  
jack



Bulkhead jack,  
1-hole mounting



Panel jack,  
with flange



21 C-50-3-6c

3063

2

B

3015

2

B

3063

2

B

3015

2

B

21 C-50-3-7c

21 C-50-7-12c

24 C-50-7-12c

25 C-50-7-15c

4 holes, 3.4 mm. dia.

3061

3

D

21 C-50-7-13c

24 C-50-7-13c

25 C-50-7-16c

4 holes, 3.4 mm. dia.

3061

3

D

Precision subminiature coaxial connector  
in 3 types  
SMB Snap-on  
SMC Screw-on  
SMS Slide-on

Impedance 50 ohms  
Recommended frequency range DC - 10000MHz for SMC  
DC - 4000 MHz for SMB, SMS  
Inner contact captive  
Insulation PTFE  
Surface finish inner contact sockets  
SMB, SMC, SMS and  
outer spring contact SMB:  
hard gold-plated  
(HV 380...450)  
other metal parts:  
gold-plated  
Temperature range -55... +165°C



# Series

No. of screens

Insulation dia. mm.

Suitable cable example

**SMB**

RG 178 B/U }  
RG 196 A/U }

RG 174/U }  
RG 188 A/U }

K 02252-d

**SMC**

RG 178 B/U }  
RG 196 A/U }

RG 174/U }  
RG 188 A/U }

K 02252-d

**SMS**

RG 178 B/U }  
RG 196 A/U }

RG 174/U }  
RG 188 A/U }

K 02252-d

Assembly instructions

**Straight cable plug**



**11 SMB-50-1-10**  
39012/67-0005 3077

**11 SMB-50-2-10c**  
39012/67-0009 3077

**11 SMB-50-2-11c** 3077

**11 SMC-50-1-10**  
39012/73-0005 3077

**11 SMC-50-2-10c**  
39012/73-0009 3077

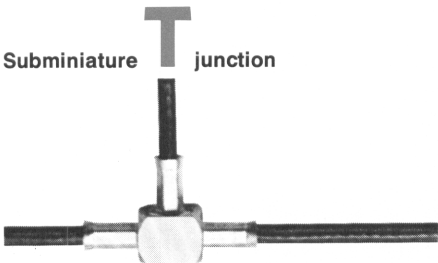
**11 SMC-50-2-11c** 3077

**11 SMS-50-1-10** 3077

**11 SMS-50-2-10c** 3077

**11 SMS-50-2-11c** 3077

*Italics: Type to US-MIL-C-39012, category B.*



Subminiature junction

No. of screens

Insulation dia. mm.

Suitable cable example

Crimp insert

Braiding





Assembly instructions

**Type**



Remarks

|                          |      |   |                   |      |   |                        |
|--------------------------|------|---|-------------------|------|---|------------------------|
| RG 178 B/U<br>RG 196 A/U | 0.87 | 1 | <b>47 S-0-1-1</b> | 3048 | A | Inner contact soldered |
| RG 174/U<br>RG 188 A/U   | 1.5  | 1 | <b>47 S-0-2-1</b> | 3048 | A | Inner contact soldered |
| K 02252-d                | 1.5  | 2 | <b>47 S-0-2-7</b> | 3048 | A | Inner contact soldered |



| Assembly instructions  |      | Assembly instructions   |      | Assembly instructions   |      | Assembly instructions  |      | Remarks |                        |
|--|------|---|------|---|------|--|------|---------|------------------------|
| Angle cable plug   |      | Straight cable jack   |      | Bulkhead jack, 1-hole mounting  |      | Angle bulkhead jack, max. panel thickness 2.4 mm                                   |      |         |                        |
|  |      |  |      |  |      |  |      |         |                        |
| 16 SMB-50-1-10   | 3096 | 21 SMB-50-1-10<br>39012/68-0005   | 3077 | 24 SMB-50-1-10  | 3077 |  |      | A       |                        |
| 16 SMB-50-2-10c  | 3096 | 21 SMB-50-2-10c<br>39012/68-0009  | 3077 | 24 SMB-50-2-10c   | 3077 |  |      | A       |                        |
| 16 SMB-50-2-11c  | 3096 | 21 SMB-50-2-11c   | 3077 | 24 SMB-50-2-11c   | 3077 |  |      | A       |                        |
|  |      |   |      |   |      |  |      | A       |                        |
| 16 SMC-50-1-10   | 3096 | 21 SMC-50-1-10<br>39012/74-0005   | 3077 | 24 SMC-50-1-10<br>39012/76-0005   |      |  |      | A       |                        |
| 16 SMC-50-2-10c  | 3096 | 21 SMC-50-2-10c<br>39012/74-0009  | 3077 | 24 SMC-50-2-10c<br>39012/76-0009  |      |  |      | A       |                        |
| 16 SMC-50-2-11c  | 3096 | 21 SMC-50-2-11c   | 3077 | 24 SMC-50-2-11c   | 3077 |  |      | A       |                        |
|  |      |   |      |   |      |  |      | A       |                        |
| 16 SMS-50-1-10   | 3096 | 21 SMS-50-1-10  | 3077 | 24 SMS-50-1-10  | 3077 | 29 SMS-50-1-4c   | 3038 | A       | Inner contact soldered |
| 16 SMS-50-2-10c  | 3096 | 21 SMS-50-2-10c   | 3077 | 24 SMS-50-2-10c   | 3077 | 29 SMS-50-2-4c   | 3038 | A       | Inner contact soldered |
| 16 SMS-50-2-11c  | 3096 | 21 SMS-50-2-11c   | 3077 | 24 SMS-50-2-11c   | 3077 | 29 SMS-50-2-7c   | 3038 | A       | Inner contact soldered |

Subminiature

## Printed Circuit

cable entries



| No. of screens |      | Insulation dia. mm |               | Suitable cable example |                | Straight   |   | Angle   |  |
|----------------|------|--------------------|---------------|------------------------|----------------|--|---|---|--|
|                |      |                    |               |                        |                | Assembly instructions  |   | Assembly instructions   |  |
|                |      |                    |               |                        |                |  |   |  |  |
| RG 178 B/U     | 0.87 | 1                  | 83 SMC-0-1-2  | 3052                   | 86 SMC-50-1-2  | 3048   | A |   |  |
| RG 196 A/U     |      |                    |               |                        |                |  |   |   |  |
| RG 174/U       | 1.5  | 1                  | 83 SMC-0-2-2  | 3052                   | 86 SMC-50-2-2  | 3048   | A |   |  |
| RG 188 A/U     |      |                    |               |                        |                |  |   |   |  |
| K 02252-d      | 1.5  | 2                  | 83 SMC-0-2-7c | 3052                   | 86 SMC-50-2-7c | 3048   | A |   |  |

Mounting hole ML 15  
(see page 18)



# Series SMA



Precision sub-miniature coaxial connector, with screw-on coupling mechanism, for cable sheath diameters 2.6–5.7 mm.

|                             |  |                                 |
|-----------------------------|--|---------------------------------|
| Impedance                   | 50 ohms  |                                 |
| Recommended frequency range | DC - 18 GHz  | (with semi-rigid cables)        |
|                             | DC - 12.4 GHz  | (with flexible cables)          |
| Working voltage             | 335 V RMS/50 Hz;<br>for 1.5 mm insulated<br>connectors 250 V RMS/50 Hz |                                 |
| Insulation                  | PTFE   |                                 |
| Body and contacts           | Beryllium bronze   |                                 |
| Surface finish              | contact pins and sockets   | hard gold-plated (HV 380...450) |
|                             | other metal parts  | gold-plated                     |
| Temperature range           | -55... +165°C  |                                 |

# Series MCX



Microminiature coaxial connector for cable sheath diameters 1.7–3.0 mm

|                             |  |  |
|-----------------------------|--|--|
| Impedance                   | 50 ohms  |  |
| Recommended frequency range | DC - 2000 MHz  |  |
| Inner contact               | Connector types with index «c» are captivated  |  |
| Insulation                  | PTFE   |  |
| Surface finish              | Spring contacts<br>hard gold-plated (HV 350...450)<br>Other metal parts<br>gold-plated |  |
| Temperature range           | -55... +125°C  |  |

# Series QLA



Subminiature coaxial connector with quick lock mechanism, for cable sheath diameters 1.7–3.0 mm

|                             |   |  |
|-----------------------------|---|--|
| Impedance                   | not matched   |  |
| Recommended frequency range | DC - 1400 MHz   |  |
| Inner contact               | Connector types with index «c» are captivated                                       |  |
| Insulation                  | PTFE  |  |
| Surface finish              | Contacts gold-plated<br>Latch springs Sucoplate®<br>Outer metal parts nickel-plated |  |
| Temperature range           | -55°C... +150°C   |  |





| No. of screens         |      | Insulation dia. mm. |                        | Assembly instructions |  |
|------------------------|------|---------------------|------------------------|-----------------------|--|
| Suitable cable example |      | Straight cable plug |                        |                       |  |
| <b>50 Ω Cable</b>      |      |                     |                        |                       |  |
| RG 174/U               | 1.5  | 1                   | <b>11 SMA-50-2-5c</b>  | 3069                  |  |
| RG 188 A/U             |      |                     | 39012/55-4019          |                       |  |
| RG 316/U               |      |                     | <b>11 SMA-50-2-55c</b> | 3069                  |  |
|                        |      |                     | 39012/55-3019          |                       |  |
| K 02252-d              | 1.5  | 2                   | <b>11 SMA-50-2-6c</b>  | 3069                  |  |
|                        |      |                     | <b>11 SMA-50-2-56c</b> | 3069                  |  |
| RG 58 C/U              | 2.95 | 1                   | <b>11 SMA-50-3-5c</b>  | 3069                  |  |
| RG 141 A/U             |      |                     | 39012/55-4021          |                       |  |
| RG 303/U               |      |                     | -4024                  |                       |  |
|                        |      |                     | <b>11 SMA-50-3-55c</b> | 3069                  |  |
|                        |      |                     | 39012/55-3014          |                       |  |
| RG 142 A/U             | 2.95 | 2                   | <b>11 SMA-50-3-6c</b>  | 3069                  |  |
| RG 223/U               |      |                     | 39012/55-4022          |                       |  |
|                        |      |                     | -4023                  |                       |  |
|                        |      |                     | <b>11 SMA-50-3-56c</b> | 3069                  |  |
|                        |      |                     | 39012/55-3016          |                       |  |


*Italics: Type to US-MIL-C-39012, category B.*

| No. of screens         |      | Insulation dia. mm. |                        | Assembly instructions |  |
|------------------------|------|---------------------|------------------------|-----------------------|--|
| Suitable cable example |      | Straight cable plug |                        |                       |  |
| <b>50 Ω Cable</b>      |      |                     |                        |                       |  |
| RG 178 B/U             | 0.87 | 1                   | <b>11 MCX-50-1-10</b>  | 3097                  |  |
| RG 196 A/U             |      |                     |                        |                       |  |
| RG 174/U               | 1.5  | 1                   | <b>11 MCX-50-2-10c</b> | 3097                  |  |
| RG 188 A/U             |      |                     |                        |                       |  |
| RG 316/U               |      |                     |                        |                       |  |
| K 02252-d              | 1.5  | 2                   | <b>11 MCX-50-2-11c</b> | 3097                  |  |

| No. of screens         |      | Insulation dia. mm. |                       | Assembly instructions |  |
|------------------------|------|---------------------|-----------------------|-----------------------|--|
| Suitable cable example |      | Straight cable plug |                       |                       |  |
| <b>50 Ω Cable</b>      |      |                     |                       |                       |  |
| RG 178 B/U             | 0.87 | 1                   | <b>11 QLA-01-1-8</b>  | 9007                  |  |
| RG 196 A/U             |      |                     |                       |                       |  |
| RG 174/U               | 1.5  | 1                   | <b>11 QLA-01-2-8c</b> | 9007                  |  |
| RG 188 A/U             |      |                     |                       |                       |  |
| RG 316/U               |      |                     |                       |                       |  |
| K 02252-d              | 1.5  | 2                   | <b>11 QLA-01-2-9c</b> | 9007                  |  |
| RG 58 C/U              | 2.95 | 1                   | <b>11 QLA-01-3-1c</b> | 3015                  |  |
| RG 141 A/U             |      |                     |                       |                       |  |

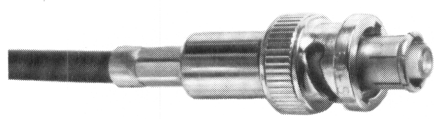
| Assembly instructions                    |      | Assembly instructions                    |      | Assembly instructions                    |                                   | Crimp insert<br>Braiding<br>Inner contact |   | Remarks                                   |
|--|------|--|------|--|-----------------------------------|---|---|---|
| Angle cable plug                         |      | Straight cable jack                      |      | Panel jack, with flange                  | Mounting hole ML 19 (see page 18) |   |   |   |
| 16 SMA-50-2-5c<br>39012/56-4019          | 3070 | 21 SMA-50-2-5c<br>39012/57-4019          | 3069 | 25 SMA-50-2-5c<br>39012/58-4019          | 4 holes, 2.6 mm. dia.             | 3072                                      | A | Inner contact soldered                    |
|  |      |  |      |  |                                   |   | A | Stainless steel<br>Inner contact soldered |
| 16 SMA-50-2-6c                           | 3070 | 21 SMA-50-2-6c                           | 3069 | 25 SMA-50-2-6c                           | 4 holes, 2.6 mm. dia.             | 3072                                      | A | Inner contact soldered                    |
|  |      |  |      |  |                                   |   | A | Stainless steel<br>Inner contact soldered |
| 16 SMA-50-3-5c<br>39012/56-4021<br>-4024 | 3070 | 21 SMA-50-3-5c<br>39012/57-4021<br>-4024 | 3069 | 25 SMA-50-3-5c<br>39012/58-4021<br>-4024 | 4 holes, 2.6 mm. dia.             | 3072                                      | B | Inner contact soldered                    |
|  |      |  |      |  |                                   |   | B | Stainless steel<br>Inner contact soldered |
| 16 SMA-50-3-6c<br>39012/56-4022<br>-4023 | 3070 | 21 SMA-50-3-6c<br>39012/57-4022<br>-4023 | 3069 | 25 SMA-50-3-6c<br>39012/58-4022<br>-4023 | 4 holes, 2.6 mm. dia.             | 3072                                      | B | Inner contact soldered                    |
|  |      |  |      |  |                                   |   | B | Stainless steel<br>Inner contact soldered |

| Assembly instructions  |      | Assembly instructions   |      | Assembly instructions   |      | Assembly instructions  |      | Remarks |                          |
|--|------|---|------|---|------|--|------|---------|--------------------------|
| Angle cable plug   |      | Straight cable jack   |      | Bulkhead jack, 1-hole mounting  |      | Straight PCB, cable receptacle   |      |         |                          |
|  |      |  |      |  |      |  |      |         |                          |
|  |      | 21 MCX-50-1-10  | 3097 | 24 MCX-50-1-10  | 3097 | 83 MCX-0-1-5   | 3099 | 1       | A                        |
| 16 MCX-50-1-5c   | 3098 |   |      |   |      |  |      |         | A Inner contact soldered |
|  |      | 21 MCX-50-2-10c   | 3097 | 24 MCX-50-2-10c   | 3097 | 83 MCX-0-2-5   | 3099 | 1       | A                        |
| 16 MCX-50-2-10c  | 3098 |   |      |   |      |  |      |         | A Inner contact soldered |
|  |      | 21 MCX-50-2-11c   | 3097 | 24 MCX-50-2-11c   | 3097 | 83 MCX-0-2-6   | 3099 | 1       | A                        |
| 16 MCX-50-2-6c   | 3098 |   |      |   |      |  |      |         | A Inner contact soldered |

| Assembly instructions  |                | Assembly instructions |                | Assembly instructions          |                | Remarks   |  |
|--|----------------|-----------------------|----------------|--------------------------------|----------------|---|--|
| Angle cable plug   |                | Straight cable jack   |                | Bulkhead jack, 1-hole mounting |                | Mounting hole ML 23 (see page 18)<br>max. panel thickness 4 mm. |  |
|  |                |                       |                |                                |                |   |  |
|  | 16 QLA-01-1-1c | 3091                  |                |                                |                |   |  |
|  |                |                       | 21 QLA-01-1-1c | 3089                           | 24 QLA-01-1-1c | 3089  |  |
|  |                |                       |                |                                |                |   |  |
|  | 16 QLA-01-2-1c | 3091                  |                |                                |                |   |  |
|  |                |                       | 21 QLA-01-2-1c | 3089                           | 24 QLA-01-2-1c | 3089  |  |
|  |                |                       |                |                                |                |   |  |
|  | 16 QLA-01-2-4c | 3091                  |                |                                |                |   |  |
|  |                |                       | 21 QLA-01-2-4c | 3089                           | 24 QLA-01-2-4c | 3089  |  |
|  |                |                       |                |                                |                |   |  |

# High voltage

## Series SHV

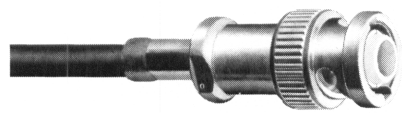


Safe High Voltage coaxial connector to NIM NC-545 and ANSI N 42.4, bayonet coupling mechanism, for cable sheath diameters 4.4–6.7 mm

- Impedance 50 ohms
- Recommended frequency range DC - 300 MHz
- Inner contact captivated
- Insulation (a) PTFE (b) Polystyrene
- Nuclear radiation resistance Polystyrene insulated: 10<sup>10</sup> rad.
- Surface finish inner contacts gold-plated other metal parts Sucoplate®
- Temperature range PTFE insulated: -65°C... +200°C Polystyrene insulated: -55°C... +100°C

| No. of screens         |      | Insulation dia. mm. |                | Assembly instructions |                | Assembly instructions |  |
|------------------------|------|---------------------|----------------|-----------------------|----------------|-----------------------|--|
| Suitable cable example |      | Straight cable plug |                | Straight cable jack   |                |                       |  |
| <b>50 Ω Cable</b>      |      |                     |                |                       |                |                       |  |
| RG 58 C/U              | 2.95 | 1                   | 11 SHV-50-3-1c | 3092                  | 21 SHV-50-3-1c | 3092                  |  |
|                        |      |                     | 11 SHV-50-3-5c | 3092                  | 21 SHV-50-3-5c | 3092                  |  |
|                        |      |                     |                |                       |                |                       |  |
| RG 223/U               | 2.95 | 2                   | 11 SHV-50-3-3c | 3092                  | 21 SHV-50-3-3c | 3092                  |  |
|                        |      |                     |                |                       |                |                       |  |
| <b>75 Ω Cable</b>      |      |                     |                |                       |                |                       |  |
| RG 59 B/U              | 3.7  | 1                   | 11 SHV-50-4-1c | 3092                  | 21 SHV-50-4-1c | 3092                  |  |
|                        |      |                     | 11 SHV-50-4-5c | 3092                  | 21 SHV-50-4-5c | 3092                  |  |
|                        |      |                     |                |                       |                |                       |  |
| G 04233-d              | 3.7  | 2                   | 11 SHV-50-4-3c | 3092                  | 21 SHV-50-4-3c | 3092                  |  |

## Series MHV (H4)



Handy and safe-to-touch coaxial connector, with bayonet coupling mechanism, corrosion-resistant, for sheath diameters 4.9–6.8 mm.

- Impedance 50 ohms
- Safety if live end is jack (female)
- Recommended frequency range DC - 400 MHz
- Working voltage (safe voltage) max. 5 kV RMS/50 Hz (continuous)
- Inner contact loose
- Insulation PTFE
- Surface finish inner contact gold-plated, other parts Sucoplate®
- Temperature range -55... +165°C

| No. of screens         |      | Insulation dia. mm. |              | Straight cable plug |              | Straight cable jack |  |
|------------------------|------|---------------------|--------------|---------------------|--------------|---------------------|--|
| Suitable cable example |      |                     |              |                     |              |                     |  |
| <b>50 Ω Cable</b>      |      |                     |              |                     |              |                     |  |
| RG 58 C/U              | 2.95 | 1                   | 11 H4-50-3-3 |                     | 21 H4-50-3-2 |                     |  |
|                        |      |                     |              |                     |              |                     |  |
| <b>75 Ω Cable</b>      |      |                     |              |                     |              |                     |  |
| RG 59 B/U              | 3.7  | 1                   | 11 H4-50-4-4 |                     |              |                     |  |

Mounting hole ML 4  
(see page 18)  
max. panel  
thickness 3.5 mm.

Crimp insert

Braiding

Inner contact

Assembly instructions

Assembly instructions Assembly instructions

**Bulkhead jack  
1-hole mounting**



**Panel jack,  
with flange**



Mounting hole  
ML 8  
(see page 18)

Remarks

|                       |      |                       |                                |      |   |   |   |
|-----------------------|------|-----------------------|--------------------------------|------|---|---|---|
| <b>24 SHV-50-3-1c</b> | 3092 | <b>25 SHV-50-3-1c</b> | 4 threads<br>UNF 3 – 56, M 2.5 | 3092 | 2 | B | Insulator PTFE  |
| <b>24 SHV-50-3-5c</b> | 3092 | <b>25 SHV-50-3-5c</b> | 4 threads<br>UNF 3 – 56, M 2.5 | 3092 | 2 | B | Insulator nuclear radiation resistant                                     |
|                       |      | <b>25 SHV-50-3-2c</b> | 4 holes, 3.1 mm. dia.          | 3092 | 2 | B | Insulator PTFE  |
|                       |      | <b>25 SHV-50-3-6c</b> | 4 holes, 3.1 mm. dia.          | 3092 | 2 | B | Insulator nuclear radiation resistant                                     |
| <b>24 SHV-50-3-3c</b> | 3092 | <b>25 SHV-50-3-3c</b> | 4 threads<br>UNF 3 – 56, M 2.5 | 3092 | 2 | B | Insulator PTFE  |
|                       |      | <b>25 SHV-50-3-4c</b> | 4 holes, 3.1 mm. dia.          | 3092 | 2 | B | Insulator PTFE  |
| <b>24 SHV-50-4-1c</b> | 3092 | <b>25 SHV-50-4-1c</b> | 4 threads<br>UNF 3 – 56, M 2.5 | 3092 | 2 | C | Insulator PTFE<br>Connector not matched to 75 ohms                        |
| <b>24 SHV-50-4-5c</b> | 3092 | <b>25 SHV-50-4-5c</b> | 4 threads<br>UNF 3 – 56, M 2.5 | 3092 | 2 | C | Insulator nuclear radiation resistant<br>Connector not matched to 75 ohms |
|                       |      | <b>25 SHV-50-4-2c</b> | 4 holes, 3.1 mm. dia.          | 3092 | 2 | C | Insulator PTFE<br>Connector not matched to 75 ohms                        |
|                       |      | <b>25 SHV-50-4-6c</b> | 4 holes, 3.1 mm. dia.          | 3092 | 2 | C | Insulator nuclear radiation resistant<br>Connector not matched to 75 ohms |
| <b>24 SHV-50-4-3c</b> | 3092 |                       |                                |      | 2 | C | Insulator PTFE<br>Connector not matched to 75 ohms                        |

Crimp insert

Braiding

Inner contact

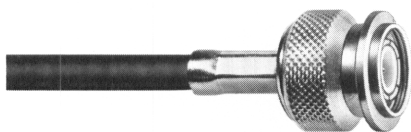
Assembly instructions

Remarks

|  |      |   |  |
|--|------|---|--|
|  | 3078 | B | Inner contact soldered                                     |
|  |      |   |  |
|  |      |   |  |
|  | 3078 | C | Inner contact soldered<br>Connector not matched to 75 ohms |
|  |      |   |  |



# Series TNC



Robust coaxial connector with sealable screw-on coupling mechanism, corrosion-proof, for sheath diameters 4.9...6.8 mm.

|                             |  |
|-----------------------------|--|
| Impedance                   | 50 and 75 ohms*  |
| Recommended frequency range | DC - 4000 MHz  |
| Inner contact               | types with index c = captive<br>remaining types = secured against pull from the cable side |
| Working voltage             | 1 kV RMS/50 Hz   |
| Insulation                  | PTFE   |
| Surface finish              | inner contact gold-plated<br>other parts Sucoplate®  |
| Temperature range           | -55... +165°C  |

\* TNC connectors are dimensionally designed for 50 ohm systems. They are, however, mateable with 75-ohm TNC connectors. The 75 ohm type does not ensure a good matching.

No. of screens

Insulation dia. mm.

Suitable cable example

Straight cable plug

Angle cable plug

**50  $\Omega$  Cable**





|            |      |   |                                 |                                  |
|------------|------|---|---------------------------------|----------------------------------|
| RG 188 A/U | 1.5  | 1 | 11 TNC-50-2-9c<br>39012/26-0020 |                                  |
| K 02252-d  | 1.5  | 2 | 11 TNC-50-2-10c                 |                                  |
| RG 58 C/U  | 2.95 | 1 | 11 TNC-50-3-9<br>39012/26-0005  |                                  |
|            |      |   |                                 | 16 TNC-50-3-13c<br>39012/30-0005 |
| RG 223/U   | 2.95 | 2 | 11 TNC-50-3-14<br>39012/26-0016 |                                  |
|            |      |   |                                 | 16 TNC-50-3-18c<br>39012/30-0016 |
| RG 141 A/U | 2.95 | 1 | 11 TNC-50-3-24<br>39012/26-0015 | 16 TNC-50-3-12c                  |
| RG 142 B/U | 2.95 | 2 | 11 TNC-50-3-25<br>39012/26-0006 | 16 TNC-50-3-21c<br>39012/30-0006 |

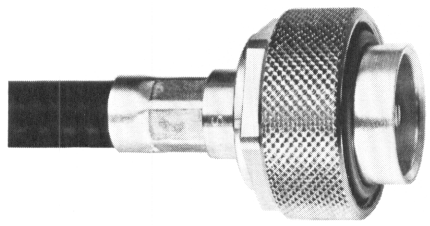
**75  $\Omega$  Cable**

|           |      |   |                                |                                  |
|-----------|------|---|--------------------------------|----------------------------------|
| G 03233   | 2.95 | 1 |                                | 16 TNC-50-3-9c                   |
| G 03233-d | 2.95 | 2 |                                | 16 TNC-50-3-10c                  |
| RG 59 B/U | 3.7  | 1 | 11 TNC-50-4-7<br>39012/26-0007 |                                  |
|           |      |   |                                | 16 TNC-50-4-10c<br>39012/30-0007 |
|           |      |   | 11 TNC-75-4-4                  |                                  |
| G 04233-d | 3.7  | 2 | 11 TNC-50-4-8                  |                                  |
|           |      |   |                                |                                  |
|           |      |   | 11 TNC-75-4-9                  |                                  |

*Italics: Type to US-MIL-C-39012, category B.*

| Straight cable jack  |  | Bulkhead jack 1-hole mounting  |  | Panel jack with flange           |  | Mounting hole ML 8 (see page 18) |  | Remarks |     |
|--|--|--|--|----------------------------------|--|----------------------------------|--|---------|-----|
|  |  |  |  |                                  |  |                                  |  |         |     |
|  |  | 24 TNC-50-2-4c<br>39012/28-0020  |  |                                  |  |                                  |  | 9063    | 1 A |
|  |  |  |  |                                  |  |                                  |  | 9063    | 1 A |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 B |
| 21 TNC-50-3-7c<br>39012/27-0005  |  | 24 TNC-50-3-6c<br>39012/28-0005  |  |                                  |  |                                  |  | 3015    | 2 B |
|  |  |  |  | 25 TNC-50-3-12c                  |  | 4 holes, 3.1 mm. dia.            |  | 3015    | 2 B |
|  |  |  |  | 25 TNC-50-3-14c<br>39012/29-0005 |  | 4 threads<br>UNF 3 – 56, M 2.5   |  | 3015    | 2 B |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 B |
| 21 TNC-50-3-9c<br>39012/27-0016  |  | 24 TNC-50-3-8c<br>39012/28-0016  |  |                                  |  |                                  |  | 3015    | 2 B |
|  |  |  |  | 25 TNC-50-3-21c                  |  | 4 holes, 3.1 mm. dia.            |  | 3015    | 2 B |
|  |  |  |  | 25 TNC-50-3-22c<br>39012/29-0016 |  | 4 threads<br>UNF 3 – 56, M 2.5   |  | 3015    | 2 B |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 B |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 B |
|  |  |  |  |                                  |  |                                  |  |         |     |
|  |  |  |  |                                  |  |                                  |  | 3058    | B   |
|  |  |  |  |                                  |  |                                  |  | 3058    | B   |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 C |
| 21 TNC-50-4-6c<br>39012/27-0007  |  | 24 TNC-50-4-5c<br>39012/28-0007  |  |                                  |  |                                  |  | 3015    | 2 C |
|  |  |  |  | 25 TNC-50-4-11c                  |  | 4 threads<br>UNF 3 – 56, M 2.5   |  | 3015    | 2 C |
|  |  |  |  | 25 TNC-50-4-12c                  |  | 4 holes, 3.1 mm. dia.            |  | 3015    | 2 C |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 C |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 C |
| 21 TNC-50-4-7c   |  | 24 TNC-50-4-6c   |  |                                  |  |                                  |  | 3015    | 2 C |
|  |  |  |  | 25 TNC-50-4-14c                  |  | 4 holes, 3.1 mm. dia.            |  | 3015    | 2 C |
|  |  |  |  | 25 TNC-50-4-13c                  |  | 4 threads<br>UNF 3 – 56, M 2.5   |  | 3015    | 2 C |
|  |  |  |  |                                  |  |                                  |  | 3015    | 2 C |

# Series 7/16

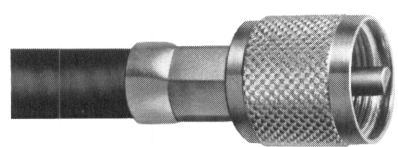


Coaxial connector to IEC 169-4, VG 95250 and DIN 47223, with screw on coupling mechanism, for sheath diameters 10 – 11,3 mm.

|                             |   |
|-----------------------------|---|
| Impedance                   | 50 ohms   |
| Recommended frequency range | DC-7.5 GHz  |
| Inner contact               | captivated  |
| Insulation                  | PTFE  |
| Surface finish              | contacts silver-plated<br>other metal parts<br>SUCOPLATE® |
| Temperature range           | -65...+165° C   |

| No. of screens         |                     |                                     |                                    |
|------------------------|---------------------|-------------------------------------|------------------------------------|
| Insulation dia. mm     |                     |                                     |                                    |
| Suitable cable example |                     |                                     |                                    |
| 50 Ω Cable             | Straight cable plug |                                     | Angle cable plug                   |
|                        |                     |                                     |                                    |
|                        | RG 213/U            | 7.25 1                              | 11-716-50-7-1c                     |
|                        | RG 214/U            | 7.25 2                              | 11-716-50-7-2c                     |
|                        | RG 213/U            | 7.25 1                              | 11-716-50-0-2c<br>with 71 Z-0-7-21 |
| RG 214/U               | 7.25 2              | 11-716-50-01-2c<br>with 71 Z-0-7-22 | 11-716-50-0-2c<br>with 71 Z-0-7-21 |

# Series UHF



Simple coaxial connector with screwed joint, corrosion-resistant  
Inner contact also fits 4 mm banana plug  
Cable sheath diameters 4.9– 11.4 mm.

|                             |  |
|-----------------------------|--|
| Impedance                   | not matched  |
| Recommended frequency range | DC - 200 MHz   |
| Working voltage             | max. 500 V RMS/50 Hz                                     |
| Inner contact               | captive  |
| Insulation                  | (a) polypropylene (PP)<br>(b) PTFE                       |
| Surface finish              | inner contact silver-plated<br>other parts nickel-plated |
| Temperature range           | (a) -25... +70°C<br>(b) -55... +165°C                    |

| No. of screens         |           |        |  |
|------------------------|-----------|--------|--|
| Insulation dia. mm     |           |        |  |
| Suitable cable example |           |        |  |
| 50 Ω Cable             | RG 58 C/U | 2.95 1 |  |
|                        | RG 223/U  | 2.95 2 |  |
|                        | RG 213/U  | 7.25 1 |  |
|                        | RG 214/U  | 7.25 2 |  |
|                        |           |        |  |
| 75 Ω Cable             | RG 59 B/U | 3.7 1  |  |
|                        | G 04233-d | 3.7 2  |  |
|                        |           |        |  |

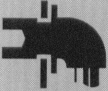


Mounting hole ML 27  
(see page 18)  
max. panel  
thickness 6.5 mm.

Crimp insert

Braiding

Inner contact

Assembly instructions

| Angle bulkhead jack  | Straight cable jack   | Bulkhead jack 1-hole mounting   | Mounting holes<br>Mounting hole ML 27<br>(see page 18)<br>max. panel<br>thickness 6.5 mm. | Remarks   |
|--|---|---|---|---|
|  |  |  |   |   |
|  | 21-716-50-7-1c  | 25-716-50-7-1c  | 4 holes, 3.6 mm. dia.   | 9017 3 D  |
|  | 21-716-50-7-2c  | 25-716-50-7-2c  | 4 holes, 3.6 mm. dia.   | 9017 3 D  |
| 25-716-50-0-2c<br>with 71 Z-0-7-21   | 21-716-50-0-2c<br>with 71 Z-0-7-21  | 25-716-50-0-2c<br>with 71 Z-0-7-21  | 4 holes, 3.6 mm. dia.   | 9087 D Combination-System<br>Inner contact soldered |
| 25-716-50-0-2c<br>with 71 Z-0-7-22   | 21-716-50-0-2c<br>with 71 Z-0-7-22  | 25-716-50-0-2c<br>with 71 Z-0-7-22  | 4 holes, 3.6 mm. dia.   | 9087 D Combination-System<br>Inner contact soldered |

Crimp insert

Braiding

Inner contact

Assembly instructions

Insulation

Straight cable plug



Assembly instructions

Insulation

Angle cable plug



Assembly instructions

Insulation

Straight cable jack



Remarks

|                |      |      |               |      |      |               |      |      |                          |
|----------------|------|------|---------------|------|------|---------------|------|------|--------------------------|
|                |      |      | 16 UHF-0-3-4c | PTFE | 3058 |               |      | B    | Inner contact soldered   |
| 11 UHF-0-3-17c | PP   | 3075 |               |      |      |               |      | 2    | B                        |
| 11 UHF-0-3-19c | PTFE | 3075 |               |      |      | 21 UHF-0-3-3c | PTFE | 3075 | 2 B                      |
| 11 UHF-0-3-20c | PTFE | 3075 |               |      |      |               |      | 2    | B                        |
|                |      |      | 16 UHF-0-7-4c | PTFE | 3076 |               |      |      | D Inner contact soldered |
| 11 UHF-0-7-17c | PP   | 3075 |               |      |      |               |      | 3    | D                        |
| 11 UHF-0-7-19c | PTFE | 3075 |               |      |      | 21 UHF-0-7-4c | PTFE | 3075 | 3 D                      |
| 11 UHF-0-7-18c | PP   | 3075 |               |      |      |               |      | 3    | D                        |
|                |      |      |               |      |      |               |      |      |                          |
|                |      |      | 16 UHF-0-4-5c | PTFE | 3058 |               |      |      | C Inner contact soldered |
| 11 UHF-0-4-14c | PP   | 3075 |               |      |      |               |      | 2    | C                        |
| 11 UHF-0-4-16c | PTFE | 3075 |               |      |      | 21 UHF-0-4-3c | PTFE | 3075 | 2 C                      |
| 11 UHF-0-4-15c | PP   | 3075 |               |      |      |               |      | 2    | C                        |
| 11 UHF-0-4-17c | PTFE | 3075 |               |      |      |               |      | 2    | C                        |





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