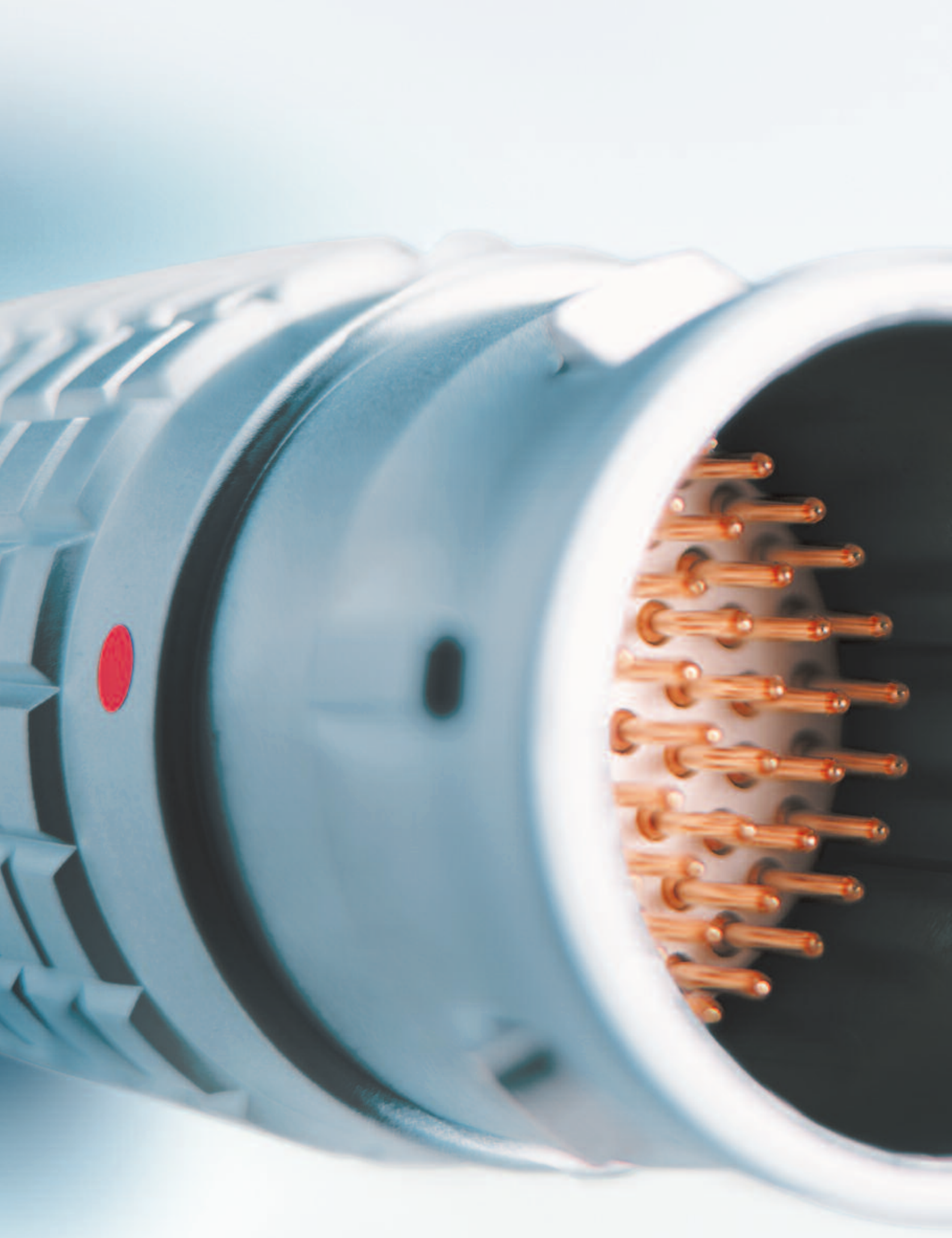
# UNIPOLE & MULTIPOLE CONNECTORS

LEMO



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# LEMO unipole and multipole connectors

This catalogue gives the complete description of LEMO unipole and multipole type connectors. The LEMO manufacturing programme has been extended to almost 40 series divided into 7 product families with specific mating and environmental characteristics. Each series includes a wide variety of plug, socket, coupler and bridge plug models, available in contact configurations adapted to all round cables, including up to 106 conductors, and a maximum diameter of 30 mm.
Watertight and vacuumtight models are also available. Since LEMO connectors are perfectly screened and designed to guarantee very low resistance to shell electrical continuity, they are particularly adapted to applications where electro-magnetic compatibility (EMC) is important.

## Table of Contents


**3 steps to select the right connector** ..... 3

**B Series (indoor, keyed)**
- Part Numbering system ..... 11
- Metal Housing models ..... 12
- Elbow socket models ..... 22
- Plastic housing models ..... 24
- Watertight and vacuumtight models ..... 26
- Bridge models ..... 29
- Threaded-latching models ..... 30
- Alignment Key and Polarized Keying System ..... 31

**K Series (outdoor, keyed)**
- Part Numbering system ..... 33
- Metal Housing models ..... 34
- Watertight and vacuumtight models ..... 41
- Alignment Key and Polarized Keying System ..... 43

**B and K Series**
- Insert configuration, Housings, Insulators, Contacts ..... 45

**S Series (indoor, stepped insert)**
- Part Numbering system ..... 57
- Metal Housing models ..... 58
- Elbow socket models ..... 68
- Plastic housing models ..... 70

**E Series (outdoor, stepped insert)**
- Part Numbering system ..... 75
- Metal Housing models ..... 76
- Watertight and vacuumtight models ..... 82

**L Series (outdoor, stepped insert)**
- Part Numbering system ..... 85
- Metal Housing models ..... 86
- Vacuumtight models ..... 89
- Alignment Key and Polarized Keying System ..... 90

**S, E and L Series**
- Insert configuration, Housings, Insulators, Contacts ..... 91

**2G Series (indoor, keyed)** ..... 110

**2C Series (indoor, stepped insert)** ..... 116

**1D Series (indoor, 4 concentric contacts)** ..... 124

**Spare parts** ..... 130

**Accessories** ..... 136

**Tooling** ..... 146

**Panel cut-outs** ..... 152

**PCB drilling pattern** ..... 154

**Cable assembly** (B, K, S and E series) ..... 161

**Technical characteristics** ..... 171

## Precision modular connectors to suit your application

Since it's creation in Switzerland in 1946 the LEMO Group has been recognized as a global leader of circular Push-Pull connectors and connector solutions. Today LEMO and its affiliated companies, REDEL and COELVER, are active in more than 80 countries with the help of over 40 subsidiaries and distributors.

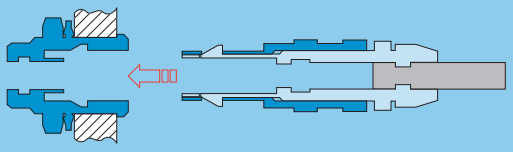
## Over 75'000 connectors

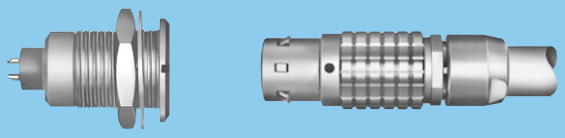
The modular design of the LEMO range provides over 75'000 connectors from miniature ø 3 mm to ø 50 mm, capable of handling cable diameters up to 30 mm and for up to 106 contacts.

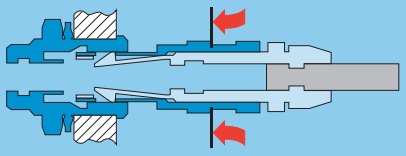
This vast portfolio enables you to select the ideal connector configuration to suit almost any specific requirement in most markets, including medical devices, test and measurement instruments, machinery, audio video broadcast, telecommunications and military.

## LEMO's Push-Pull Self-Latching Connection System

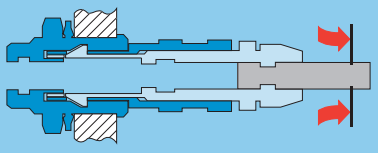
This self-latching system is renowned worldwide for its easy and quick mating and unmating features. It provides absolute security against vibration, shock or pull on the cable, and facilitates operation in a very limited space.



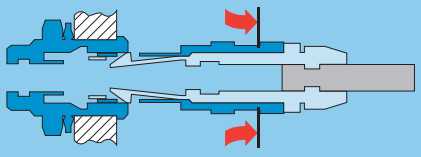




The LEMO self-latching system allows the connector to be mated by simply pushing the plug axially into the socket.



Once firmly latched, connection cannot be broken by pulling on the cable or any other component part other than the outer release sleeve.



When required, the connector is disengaged by a single axial pull on the outer release sleeve. This first disengages the latches and then withdraws the plug from the socket.

## UL Recognition

LEMO connectors are recognized by the Underwriters Laboratories (UL). The approval of the complete system (LEMO connector, cable and your equipment) will be easier because LEMO connectors are recognized.

## CE marking

CE marking means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives. CE marking applies to complete products or equipment, **but not to electromechanical components, such as connectors**.

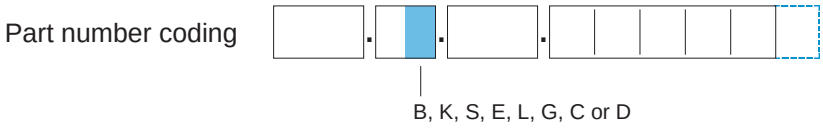
## RoHS

LEMO connector specifications conforms the requirements of the RoHS directive (2011/65/EU) of the European Parliament and the latest amendments. This directive specifies the restrictions of the use of hazardous substances in electrical and electronic equipment marketed in Europe.

# 3 steps to select the right connector

## Step 1: Select connector series

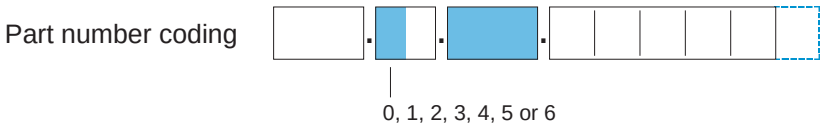
Select the appropriate LEMO connector series according to the environmental parameters that will affect your device or cable such as indoor, outdoor, temperature range, ingress protection of the mated connector and of your device. Use the table shown on page 4.




## Step 2: Select connector size

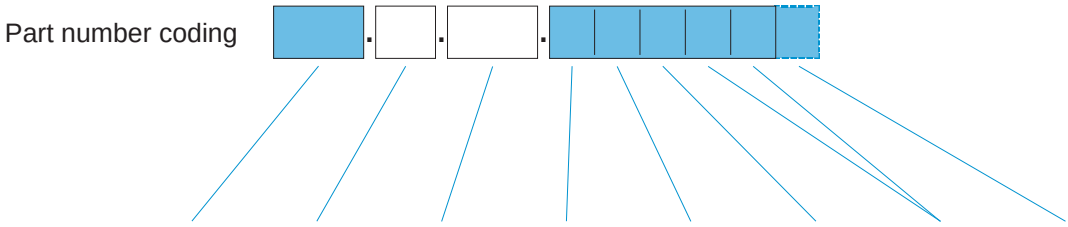
Use the section (mm²) or the AWG of your cable wire to select the optimal contact diameter (values vary between solder, crimp or print contact), see page 7.

Use this optimal contact diameter to determine the right connector size as well as the insert configuration, see page 6.




## Step 3: Complete the part number

Now that you know the series, as well as the insulator configuration, complete the part numbering system with the help of the following table.




| | Model | Series | Insert configuration | Housing material | Insulator material | Contact | Collet | Variant |
|---|---|---|---|---|---|---|---|---|
| B Series (indoor, keyed) | 12 | 12 | 45 | 50 | 50 | 50 | 52 | 54 |
| K Series (outdoor, keyed) | 34 | 34 | 45 | 50 | 50 | 50 | 53 | 54 |
| S Series (indoor, stepped insert) | 58 | 58 | 91 | 99 | 99 | 99 | 102 | 107 |
| E Series (outdoor, stepped insert) | 76 | 76 | 91 | 99 | 99 | 99 | 105 | 107 |
| L Series (outdoor, keyed, stepped insert) | 86 | 86 | 92 | 99 | 99 | 99 | 106 | 107 |
| G Series (indoor, keyed) | 111 | 111 | 112 | 112 | 110 | 113 | 113 | 113 |
| C Series (indoor, stepped insert) | 117 | 117 | 120 | 120 | 116 | 120 | 121 | 121 |
| D Series (indoor, 4 concentric contacts) | 125 | 125 | 127 | 127 | 124 | 127 | 127 | 128 |

**Note:** Figures in the above table refer to the catalogue pages.

# Step 1: Select Connector Series

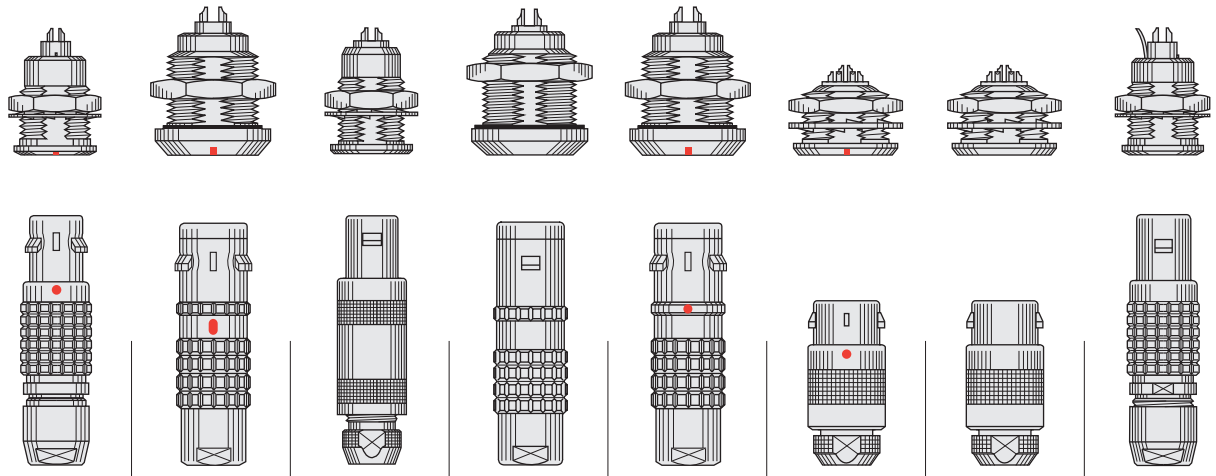
## LEMO unipole and multipole connectors

**The standard keyed Series** (B, 00, G)
The characteristic feature of these connector series is a keying system which allows higher contact density and prevents all errors in alignment. The various keying alternatives prevent unwanted cross mating of otherwise similar connectors. It is also possible to use crimp contacts to reduce cable assembly time. These connector series, include the 0B to 5B range as well as the 00 multipole and 2G (shortened version of the 2B series), some vacuumtight models are also available.

**The watertight keyed Series** (K, L)
These series are watertight when mated and assembled to an appropriate cable. They include the 0K to 5K series, available in the same types as the 0B to 5B series, and the 0L to 2L series with keying and hermaphroditic insulator.

**The standard Series** (S, 00, C, D)
The characteristic feature of these connector series is the hermaphroditic insulator in the multipole version. They include principally the 0S to 6S series, as well as the 00 unipole series, the 2C (shortened version) and the 1D quadrax type (with 4 concentric contacts).

**The watertight Series** (E)
These series are watertight when mated and assembled to an appropriate cable. They include the 0E to 6E series and are available in the same types as the S series.



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Series** | 00 multipole B | K | 00 unipole S | E | L | G | C | D |
| **Environment** | indoor | outdoor or harsh env. | indoor | outdoor or harsh environment | | indoor | | |
| **Ingress [1] protection** | IP50 | IP66 to IP68 | IP50 | IP66 to IP68 | | IP50 | | |
| **Ingress [2] protection** | IP50 to IP68 vacuumtight | IP66 to IP68 vacuumtight | IP50 to IP68 vacuumtight | IP66 to IP68 vacuumtight | | IP50 | IP50 to IP68 vacuumtight | IP50 |
| **Temperature range** | - 55 to 250°C | - 55 to 200°C | - 55 to 250°C | - 55 to 200°C | | - 55 to 250°C | | - 40 to 120°C |
| **Latching** | Push-Pull self-latching | | | | | | | |
| **Shell sizes** | 8 metal and 4 plastic | 6 metal | 7 metal and 5 plastic | 6 metal | | 3 metal | 4 metal | 1 metal |
| **Insulator type** | Multipole | | Unipole or multipole hermaphroditic | | Multipole hermaphroditic | Multipole | Multipole hermaphroditic | Quadrax |
| **Contact type** | Solder, crimp or print | | Solder, crimp or print | | Solder, crimp or print | Solder or print | | Solder |
| **Features** | 13 keyways | 9 keyways | Stepped insert | | Stepped insert | 1 keyway | Stepped insert | 4 concentric contacts |
| **Page** | 9 to 31 | 32 to 44 | 55 to 73 | 74 to 83 | 84 to 90 | 109 to 115 | 116 to 122 | 123 to 128 |

**Note:**
[1] Mated connector. See ingress protection code page 5.
[2] Your device. For selection of connectors for watertight and vacuumtight devices, see page 5.

## Definition of Ingress Protection (IP code)

IEC 60529 outlines an international classification system for the sealing effectiveness of enclosures of electrical equipment against the intrusion into the equipment of foreign bodies (i.e. tools, dust, fingers) and moisture. This classification system utilizes the letters «IP» (Ingress Protection) followed by two digits.

**Example: IP 50 = IP 5 0**

IP letter code
1st digit
2nd digit

### Degrees of protection - First digit

The first digit of the IP code indicates the degree to which persons are protected against contact with moving parts and the degree that equipment is protected against solid foreign bodies intruding into an enclosure.

| Code | First digit description |
|---|---|
| 0 | No special protection |
| 1 | Protection from a large part of the body such as hand or from solid objects greater than 50 mm in diameter |
| 2 | Protection against objects not greater than 80 mm in length and 12 mm in diameter |
| 3 | Protection from entry by tools, wires, etc., with a diameter or thickness greater than 2.5 mm |
| 4 | Protection from entry by solid objects with a diameter or thickness greater than 1.0 mm |
| 5 | Protection from the amount of dust that would interfere with the operation of the equipment |
| 6 | Dust-tight |
| 7 | – |
| 8 | – |

### Degrees of protection - Second digit

The second digit indicates the degree of protection of the equipment inside the enclosure against the harmful entry of various forms of moisture (e.g. dripping, spraying, submersion, etc.)

| Code | Second digit description |
|---|---|
| 0 | No special protection |
| 1 | Protection from vertically dripping water |
| 2 | Protection from dripping water when tilted up to 15° |
| 3 | Protection from sprayed water |
| 4 | Protection from splashed water |
| 5 | Protection from water projected from a nozzle |
| 6 | Protection against heavy seas, or powerful jets of water |
| 7 | Protection against temporary immersion |
| 8 | Protection against complete continuous submersion in water |

## Selection of connectors for watertight or vacuumtight devices

LEMO B and S series are rated IP50 only when mated. LEMO E, K and L series are rated IP66 (and over) only when mated. If a device must be watertight or vacuumtight when the connectors are unmated, it is important to select a watertight or vacuumtight socket. You can consider the following two situations:

A) Figure 1 shows a typical outdoor device. To ensure this device retains IP66 or above when connectors are unmated, it is important to choose a watertight socket from B, S, E, K or L series.

B) Figure 2 shows a device which is subjected to pressure difference such as a near vacuum or pressurized gas and must exhibit no leakage. To ensure the device maintains its sealing, the socket is additionally tested for helium leakage (according MIL 1344A).

Fig. 1

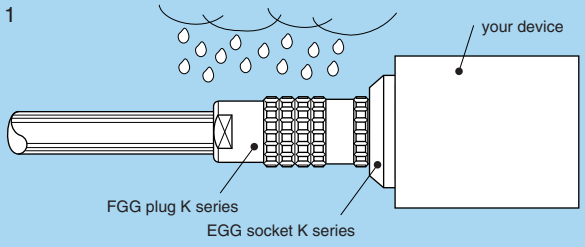
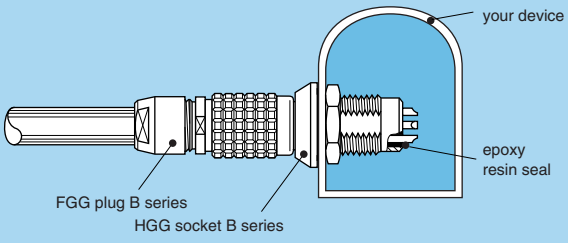



Fig. 2

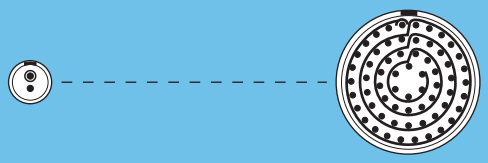
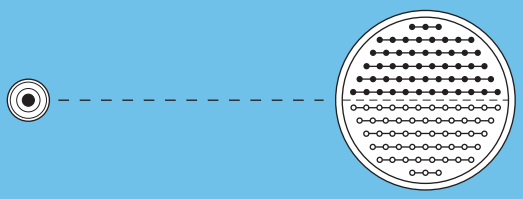



Check temperature range (see section on pages 26, 41, 72, 82 and 89).

# Step 2: Select Connector Size

## Select the right connector size and insert configuration

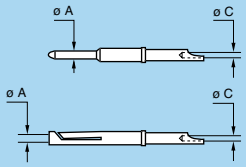
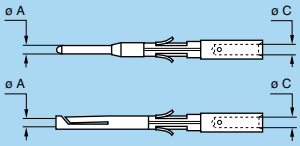
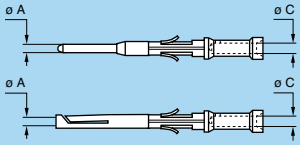
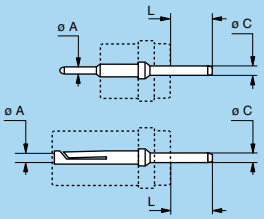
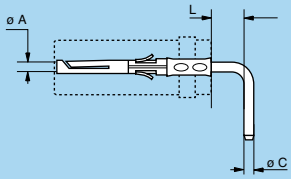
To be able to select the right connector size (0 to 6), it is important to define the contact diameter (ø A).
Find out the available contact diameter (ø A) of the LEMO connector depending on the number of contacts required and depending on the rating required (see pages 45 to 49 and 91 to 98).
The following table shows the contact diameter (ø A), or the solder pot diameter (ø C) for the 1D series.

| | Number of contacts | Insert configuration | Series | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | |  | | | | | | |  | | | | | | | | | | | |
| | | | 00 | 0B-0K | 1B-1K | XB | 2B-2K | 3B-3K | 4B-4K | 5B-5K | 00 | 0S-0E-0L [1] | 1S-1E-1L [1] | 2S-2E-2L [1] | 3S-3E | 4S-4E | 5S-5E | 6S-6E | 2G | 2C | 1D (ø C) |
| Unipole | 1 | 113 | | | | | | | | | 1.3 | | | | | | | | | | |
| | 1 | 116 | | | | | | | | | | 1.6 | | | | | | | | | |
| | 1 | 120 | | | | | | | | | | | 2.0 | | | | | | | | |
| | 1 | 130 | | | | | | | | | | | 3.0 | 3.0 | | | | | | | |
| | 1 | 140 | | | | | | | | | | | | 4.0 | 4.0 | 4.0 | | | | | |
| | 1 | 160 | | | | | | | | | | | | | 6.0 | 6.0 | | | | | |
| | 1 | 112 | | | | | | | | | | | | | | | 12.0 | | | | |
| Multipole | 2 | 302 | 0.5 | 0.9 | 1.3 | | 2.0 | 3.0 | | 6.0 | | 0.9 | 1.3 | 1.6 | 2.0 | 4.0 | 6.0 | | | 1.6 | |
| | 3 | 303 | 0.5 | 0.9 | 1.3 | | 1.6 | 2.0 | | | | 0.7 | 0.9 | 1.3 | 2.0 | 3.0 | 6.0/4.0 | 6.0 | | 1.3 | |
| | 4 | 304 | 0.5 | 0.7 | 0.9 | | 1.3 | 2.0 | 3.0 | 4.0 | | 0.7 | 0.9 | 1.3 | 2.0 | 3.0 | 4.0 | 8.0 | | 1.3 | 0.6 |
| | 5 | 305 | 0.35 | 0.7 | 0.9 | | 1.3 | 1.6 | | | | | 0.9/0.7 | 1.3 | 2.0/1.3 | 3.0/2.0 | 4.0/3.0 | | | | |
| | 6 | 306 | | 0.5 | 0.7 | | 1.3 | 1.6 | 2.0 | | | | 0.7 | 1.3 | 1.3 | 2.0 | 3.0 | | | 1.3 | |
| | 7 | 307 | | 0.5 | 0.7 | | 1.3 | 1.6 | 2.0 | | | | | 1.3/0.9 | 1.3 | 2.0/1.3 | | | | | |
| | 8 | 308 | | | 0.7 | | 0.9 | 1.3 | | | | | | 0.9 | 1.3 | 1.3 | 3.0 | | | 0.7 | |
| | 9 | 309 | | 0.5 | | | | 1.3/2.0 | | | | | | | | 1.3 | | | | | |
| | 10 | 310 | | | 0.5 | | 0.9 | 1.3 | 1.6 | 3.0 | | | | 0.9 | 1.3 | 1.3 | 2.0 | | | 0.7 | |
| | 12 | 312 | | 0.35 | | 0.7 | 0.7 | 0.9 | 1.3 | | | | | | 0.9 | 1.3 | 2.0 | 4.0/5.0 | | 0.7 | |
| | 13 | 313 | | | | | | | | | | | | | 0.9 | 1.3 | | | | | |
| | 14 | 314 | | | 0.5 | | 0.7 | 0.9 | | 2.0 | | | | | 0.9 | 1.3 | 3.0/2.0 | | | 0.7 | |
| | 16 | 316 | | | 0.5 | | 0.7 | 0.9 | 0.9 | 2.0 | | | | | 0.9 | 0.9 | 2.0 | 3.0 | | | |
| | 18 | 318 | | | | | 0.7 | 0.9 | | | | | | | 0.9 | 0.9 | 3.0/1.6 | 4.0 | 0.7 | | |
| | 19 | 319 | | | | | 0.7 | | | | | | | | | | | | | | |
| | 20 | 320 | | | | | | 0.7 | 0.9 | 1.6 | | | | | | 0.9 | 1.6 | 3.0 | | | |
| | 22 | 322 | | | | 0.5 | | 0.7 | | | | | | | | 0.9 | 3.0/1.6 | | | | |
| | 24 | 324 | | | | | | 0.7 | 0.9 | | | | | | | 0.9 | 1.6 | 3.0 | | | |
| | 26 | 326 | | | | | 0.5 | 0.7 | | | | | | | | | | | | | |
| | 30 | 330 | | | | | | 0.7 | 0.9 | 1.3 | | | | | | | 1.3 | 2.0 | | | |
| | 32 | 332 | | | | | 0.5 | | | | | | | | | | | 2.0 | | | |
| | 36 | 336 | | | | | | | | | | | | | | | 1.3 | 2.0 [2] | | | |
| | 40 | 340 | | | | | | | 0.7 | 1.3 | | | | | | | 1.3 | 2.0 | | | |
| | 44 | 344 | | | | | | | | | | | | | | | 1.3 | | | | |
| | 48 | 348 | | | | | | | 0.7 | 1.3 | | | | | | | 1.3 | 2.0 | | | |
| | 50 | 350 | | | | | | | | 0.9 | | | | | | | | | | | |
| | 54 | 354 | | | | | | | | 0.9 | | | | | | | | | | | |
| | 60 | 360 | | | | | | | | | | | | | | | | 1.6 | | | |
| | 62 | 362 | | | | | | | | | | | | | | | | 1.6 | | | |
| | 64 | 364 | | | | | | | | 0.9 | | | | | | | | 1.3 | | | |
| | 72 | 372 | | | | | | | | | | | | | | | | 1.3 | | | |
| | 106 | 106 | | | | | | | | | | | | | | | | 0.9 | | | |

**Note:** [1] L series not available in unipole version. [2] 2.0 is for 6S series, for 6E the values are 1.3 and 5.0.

## Verify the fitting to your wire

Verify if the selected contact diameter (ø A) of the LEMO connector fits to your cable wire diameter (AWG number or max. available section).

| Contact type | Contact | | | Conductor | | | | | | $F_r$ [1] (N) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Solid | | Stranded | | | | | |
| | | | | | | AWG | | Section (mm²) | | | |
| | ø A (mm) | ø C (mm) | Form per fig. | AWG max. | Section max. (mm²) | min. | max. | min. | max. | | |
| Solder  | 0.35 | 0.40 | – | 28 | 0.09 | – | 30 | – | 0.05 | – | ● |
| | 0.5[2] | 0.40[2] | – | 28 | 0.09 | – | 30 | – | 0.05 | – | |
| | 0.5 | 0.45[7] | – | 28 | 0.09 | – | 28 | – | 0.09 | – | |
| | 0.7[3] | 0.60[3] | – | 24 | 0.25 | – | 26 | – | 0.14 | – | |
| | 0.7 | 0.80 | – | 22 | 0.34 | – | 22[4] | – | 0.34 | – | |
| | 0.9 | 0.80[6] | – | 22[6] | 0.34[6] | – | 22[4][6] | – | 0.34[6] | – | |
| | 1.3 | 1.00 | – | 20 | 0.50 | – | 20[4] | – | 0.50 | – | |
| | 1.6 | 1.40 | – | 16 | 1.00 | – | 18 | – | 1.00 | – | |
| | 2.0 | 1.80 | – | 14 | 1.50 | – | 16 | – | 1.50 | – | |
| | 3.0 | 2.70 | – | 10 | 4.00 | – | 12 | – | 4.00 | – | |
| | 4.0 | 3.70 | – | 10 | 6.00 | – | 10 | – | 6.00 | – | |
| | 5.0 | 5.20 | – | – | – | – | 8 | – | 10.00 | – | |
| | 6.0 | 5.20 | – | – | – | – | 8 | – | 10.00 | – | |
| | 8.0 | 7.00 | – | – | – | – | 4 | – | 21.00 | – | |
| | 12.0 | 11.50 | – | – | – | – | 0 | – | 50.00 | – | |
| Crimp fig. 1  | 0.5[5] | 0.45 | 1 | – | – | 32 | 28 | 0.035 | 0.09 | 12 | ● |
| | 0.7 | 0.80 | 1 | – | – | 26 | 22[4] | 0.140 | 0.34 | 22 | ● |
| | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| | 0.9 | 1.10 | 1 | – | – | 24 | 20 | 0.250 | 0.50 | 30 | ● |
| | | 0.80 | 2 | – | – | 26 | 22[4] | 0.140 | 0.34 | | ○ |
| | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| | 1.3 | 1.40 | 1 | – | – | 20 | 18 | 0.500 | 1.00 | 40 | ● |
| | | 1.10 | 2 | – | – | 24 | 20 | 0.250 | 0.50 | | ○ |
| | | 0.80 | 2 | – | – | 26 | 22[4] | 0.140 | 0.34 | | ○ |
| fig. 2  | 1.6 | 1.90 | 1 | – | – | 18 | 14[4] | 1.000 | 1.50 | 50 | ● |
| | | 1.40 | 2 | – | – | 22 | 18 | 0.340 | 1.00 | | ○ |
| | 2.0 | 2.40 | 1 | – | – | 16 | 12[4] | 1.500 | 2.50 | 65 | ● |
| | | 1.90 | 2 | – | – | 18 | 14 | 1.000 | 1.50 | | ○ |
| | 3.0 | 3.20 | 1 | – | – | 14 | 10[4] | 2.500 | 4.00 | 75 | ● |
| | 4.0 | 4.00 | 1 | – | – | 12 | 10 | 4.000 | 6.00 | 90 | ● |
| Print  | L dimensions and C are detailed in the section on PCB drilling pattern. See page 156 and 159. | | | | | | | | | | ● |
| Print (elbow)  | L dimensions and C are detailed in the section on PCB drilling pattern. See page 157 and 160. | | | | | | | | | | ● |

**Note:** [1] contact retention force in the insulator (according to IEC 60512-8 test 15 a).
[2] for 00 multipole series.
[3] for S, E, 2C, 2G and 1D series.
[4] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter. Make sure that the maximum conductor diameter is smaller than ø C.
[5] for 00 multipole series or for 0B and 1B series with male contacts.
[6] for 0B.302/0B.303 and 0K.302/0K.303 ø C = 1.0 mm, AWG max 20, section max (mm²) 0.50.
[7] for 00 and 1B/1K series, according to manufacturing and plating tolerance ø C min = 0.43 mm.

## Verify the fitting to your cable

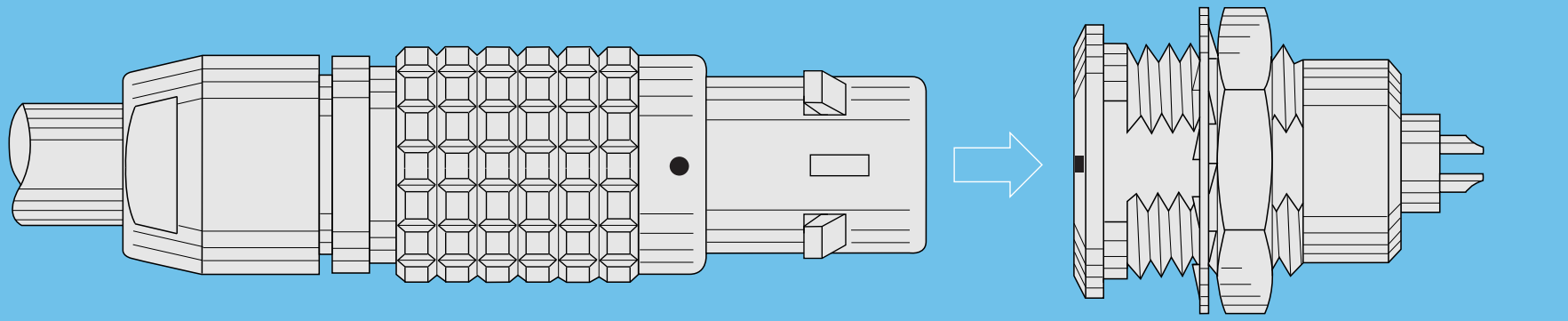
Verify if the selected connector size fits to your cable diameter.

| Series | Cable diameter range (mm) | | | |
|---|---|---|---|---|
| | Collet | | Collet for fitting a bend relief | |
| | min. | max. | min. | max. |
| 00[1] | 1.1 | 3.4 | 1.1 | 3.4 |
| 0B | 1.5 | 5.5 | 1.5 | 5.0 |
| 1B | 2.2 | 7.5 | 2.2 | 7.0 |
| XB | 4.4 | 8.0 | 4.4 | 7.0 |
| 2B | 1.5 | 9.7 | 1.5 | 9.0 |
| 3B | 4.1 | 11.7 | 4.1 | 11.0 |
| 4B | 5.1 | 16.0 | 5.1 | 15.0 |
| 5B | 9.6 | 25.0 | 9.6 | 15.5 |
| 0K | 1.0 | 5.0 | 1.0 | 5.0 |
| 1K | 1.3 | 8.5[3] | 1.3 | 8.5 |
| 2K | 1.3 | 10.5[3] | 1.3 | 10.5 |
| 3K | 2.6 | 15.0[3] | 2.6 | 15.0 |
| 4K | 4.6 | 23.5[3] | 4.6 | 15.0 |
| 5K | 9.6 | 23.5 | – | – |

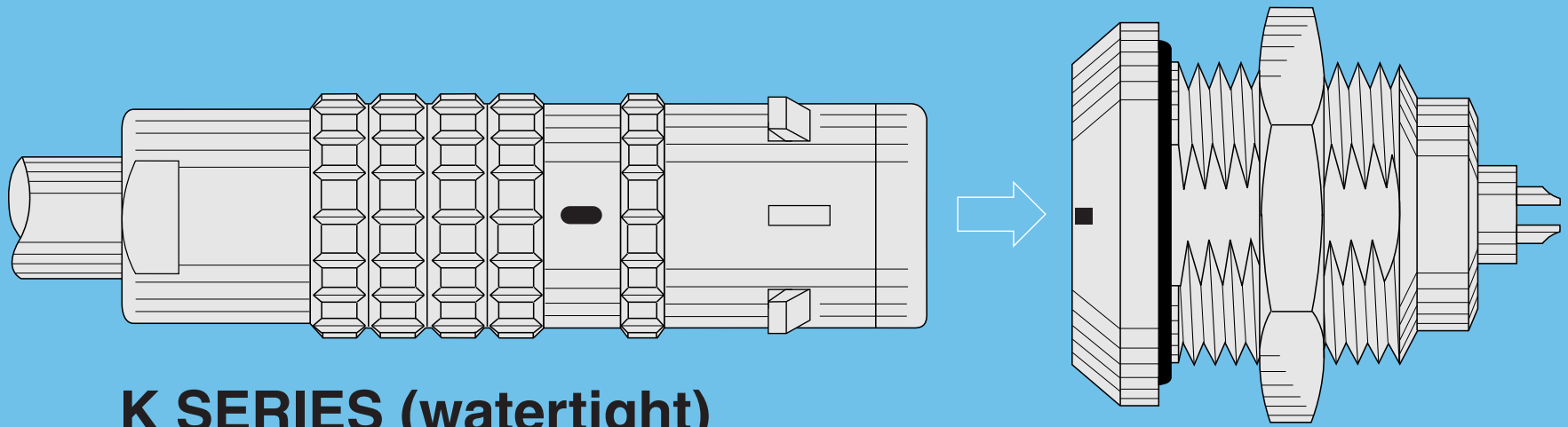
| Series | Cable diameter range (mm) | | | |
|---|---|---|---|---|
| | Collet | | Collet for fitting a bend relief | |
| | min. | max. | min. | max. |
| 00[2] | 1.1 | 4.1 | 1.1 | 4.1 |
| 0S | 1.3 | 6.7 | 1.3 | 6.1 |
| 1S | 1.3 | 8.5 | 1.3 | 8.0 |
| 2S | 1.3 | 10.5 | 1.3 | 10.0 |
| 3S | 2.5 | 13.0 | 2.5 | 13.0 |
| 4S | 4.1 | 22.0 | 4.1 | 13.0 |
| 5S | 6.1 | 30.0 | – | – |
| 6S | 11.1 | 30.0 | – | – |
| 0E | 1.0 | 5.0 | 1.0 | 5.0 |
| 1E | 1.3 | 8.5[3] | 1.3 | 8.5 |
| 2E | 1.3 | 10.5[3] | 1.3 | 10.5 |
| 3E | 2.6 | 15.0[3] | 2.6 | 15.0 |
| 4E | 4.6 | 23.5[3] | 4.6 | 15.0 |
| 5E | 9.6 | 23.5 | – | – |
| 6E | 13.0 | 30.0 | – | – |
| 0L | 1.0 | 5.0 | 1.0 | 5.0 |
| 1L | 1.3 | 8.5[3] | 1.3 | 8.5 |
| 2L | 1.3 | 10.5[3] | 1.3 | 10.5 |

| Series | Cable diameter range (mm) | | | |
|---|---|---|---|---|
| | Collet | | Collet for fitting a bend relief | |
| | min. | max. | min. | max. |
| 2C | 2.2 | 8.1 | 2.2 | 8.1 |
| 2G | 4.5 | 7.9 | 4.5 | 7.9 |
| 1D | 3.1 | 7.5 | 3.1 | 7.0 |

**Note:**
[1] for multipole only.
[2] for unipole only.
[3] for these series the maximum cable diameter require models with oversized cable collet (type K).



**B SERIES**



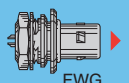
**K SERIES (watertight)**

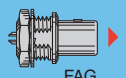
# B Series

B series connectors provide the following main features:
– security of the Push-Pull self-latching system
– solder, crimp or print contacts (straight or elbow)
– multiple key options to avoid cross mating of similar connectors
– 360° screening for full EMC shielding.
– multipole types 2 to 64 contacts
– high packing density for space savings
– keying system («G» key standard) for connector alignment

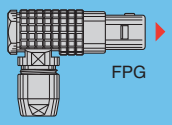
## Metal housing models (page 12)

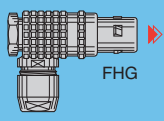
### Fixed plugs

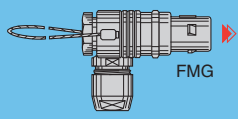


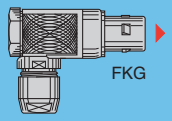




### Elbow plugs

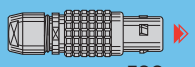


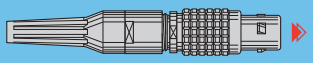



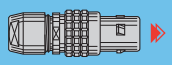



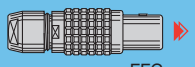



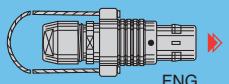

### Straight plugs

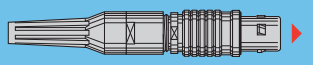


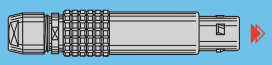



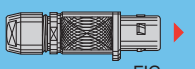



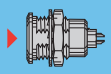



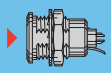



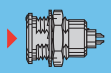



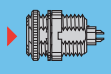



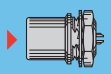

### Fixed sockets

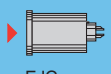


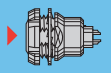



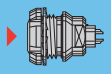



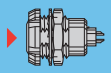



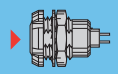



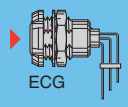



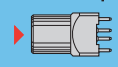



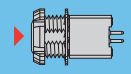



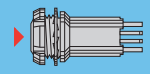



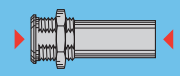



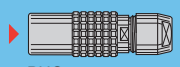



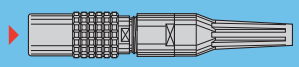



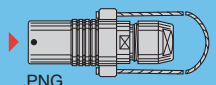

### Fixed coupler



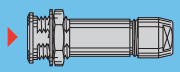

### Free sockets

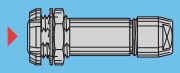


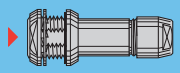




### Fixed sockets

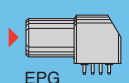


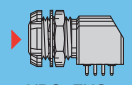




## Elbow socket models (page 22)

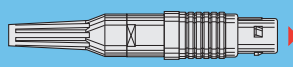
### Elbow sockets

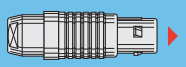


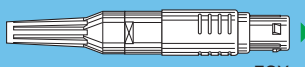



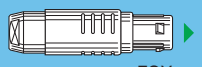

## Plastic housing models (page 24)

### Straight plugs

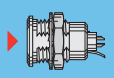


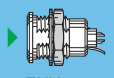



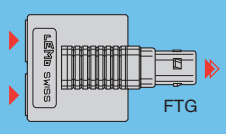

### Fixed sockets



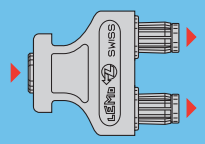




## Bridge models (page 29)

### Plug with two parallel sockets

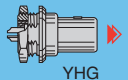



### Bridge plugs

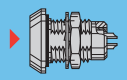


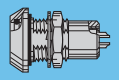

## Watertight or vacuumtight models (page 26)

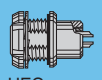
### Fixed plug

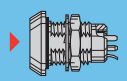


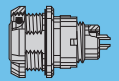

### Fixed sockets

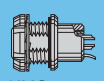


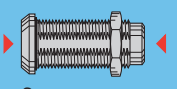



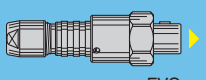




### Fixed coupler



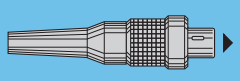

## Threaded-latching models (page 30)

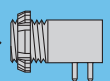
### Straight plugs



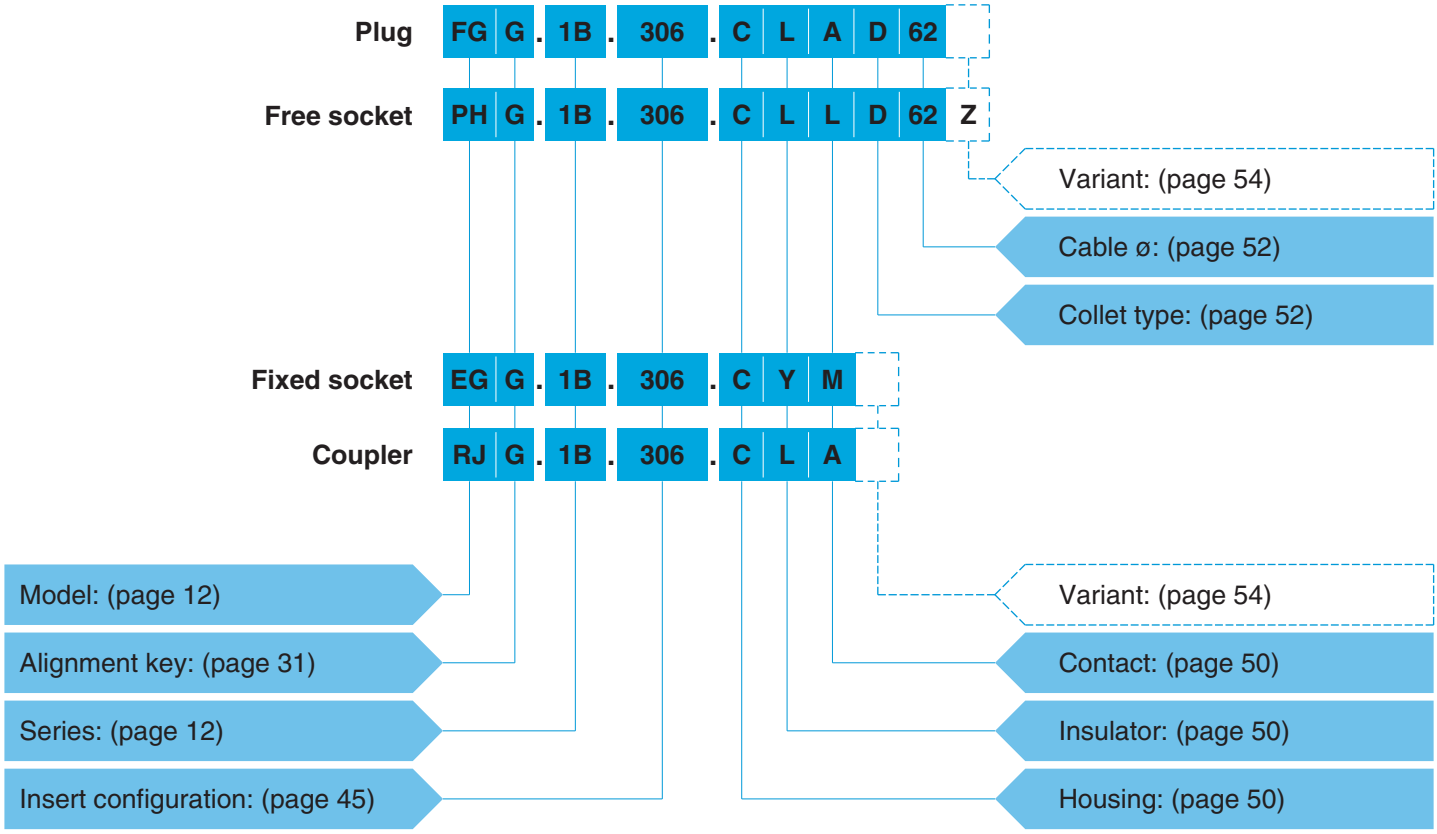

### Fixed socket

### Elbow socket



## Part Numbering System




## Part Number Example

**Straight plug with cable collet:**
**FGG.1B.306.CLAD62** = straight plug with key (G) and cable collet, 1B series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, D type collet for 6.0 mm diameter cable.

**Free socket:**
**PHG.1B.306.CLLD62Z** = free socket with key (G) and cable collet, 1B series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, D type collet for 6.0 mm diameter cable and nut for fitting a bend relief.

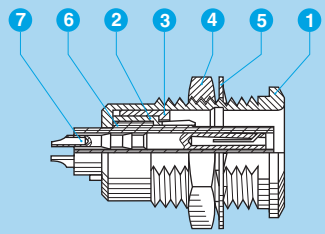
**Fixed socket:**
**EGG.1B.306.CYM** = fixed socket, nut fixing, with key (G), 1B series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK extended insulator, female crimp contacts.

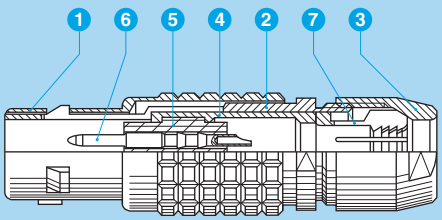
**Fixed coupler:**
**RJG.1B.306.CLA** = straight fixed coupler with keys (J) at the flange end and key (G) at the other end, 1B series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, male-female contacts.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. earthing crown
3. retaining ring
4. hexagonal nut
5. locking washer
6. insulator
7. female contact




**Straight plug**

1. outer shell
2. latch sleeve
3. collet nut
4. split insert carrier
5. insulator
6. male contact
7. collet

# Metal housing models

## Technical Characteristics

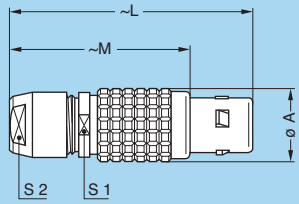
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range | - 55° C, +250° C | |
| Resistance to vibration | 10-2000 Hz, 15 g | IEC 60512-4 test 6d |
| Shock resistance | 100 g, 6 ms | IEC 60512-4 test 6c |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index (mated) | IP50 | IEC 60529 |
| Climatical category | 55/175/21 | IEC 60068-1 |

### Electrical

| Characteristics | | Value | Standard |
|---|---|---|---|
| Shielding efficiency | at 10 MHz | > 75 dB | IEC 60169-1-3 |
| | at 1 GHz | > 40 dB | IEC 60169-1-3 |

**Note:**
the various tests have been carried out with FGG and EGG connector pairs, with chrome-plated brass shell and PEEK insulator.
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

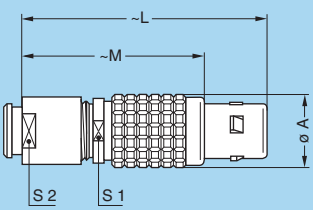



### FGG Straight plug, key (G) or keys (A…M and R), cable collet

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FGG | 00[1)] | 6.4 | 28.5 | 20.5 | 5.5 | 5 |
| FGG | 0B | 9.5 | 36.0 | 26.0 | 8.0 | 7 |
| FGG | 1B | 12.0 | 43.0 | 32.0 | 10.0 | 9 |
| FGG | XB | 13.0 | 44.0 | 33.5 | 11.0 | 10 |
| FGG | 2B | 15.0 | 50.0 | 38.0 | 13.0 | 12 |
| FGG | 3B | 18.0 | 58.0 | 43.0 | 15.0 | 14 |
| FGG | 4B | 25.0 | 75.0 | 57.0 | 21.0 | 20 |
| FGG | 5B | 35.0 | 103.0 | 78.0 | 31.0 | 30 |

**M1** Cable assembly (page 161)

**Note:** 1) the surface design of the 00 series is different.

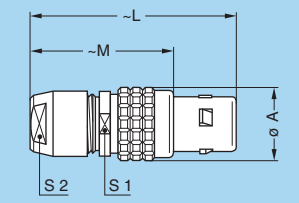



### FGG Straight plug, key (G) or keys (A…M), cable collet and nut for fitting a bend relief 2)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FGG | 00[1)] | 6.4 | 28.7 | 20.7 | 5.5 | 6 |
| FGG | 0B | 9.5 | 35.0 | 25.0 | 8.0 | 7 |
| FGG | 1B | 12.0 | 42.0 | 31.0 | 10.0 | 9 |
| FGG | XB | 13.0 | 47.5 | 37.0 | 11.0 | 10 |
| FGG | 2B | 15.0 | 49.0 | 37.0 | 13.0 | 12 |
| FGG | 3B | 18.0 | 56.5 | 41.5 | 15.0 | 15 |
| FGG | 4B | 25.0 | 71.0 | 53.0 | 21.0 | 20 |

**M1** Cable assembly (page 161)

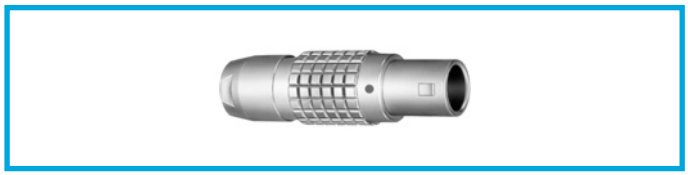
**Note:** 1) the surface design of the 00 series is different.
2) to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

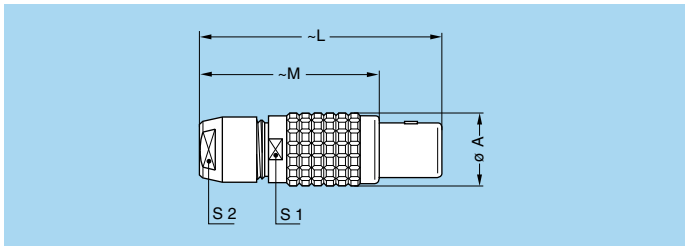



### JGG Straight plug, short version, key (G), cable collet

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| JGG | 0B | 9.5 | 32.0 | 22.0 | 8.0 | 7 |

**M4** Cable assembly (page 161)

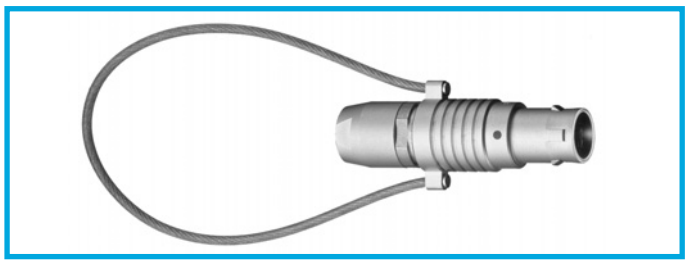


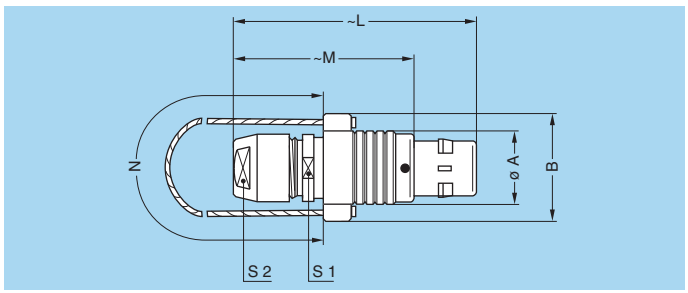



## FFG Straight plug, non-latching, key (G) or keys (A…M), cable collet

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FFG | 0B | 9.5 | 36 | 26 | 8 | 7 |
| FFG | 1B | 12.0 | 43 | 32 | 10 | 9 |
| FFG | 2B | 15.0 | 50 | 38 | 13 | 12 |
| FFG | 3B | 18.0 | 58 | 43 | 15 | 14 |
| FFG | 4B | 25.0 | 75 | 57 | 21 | 20 |

M1 Cable assembly (page 161)



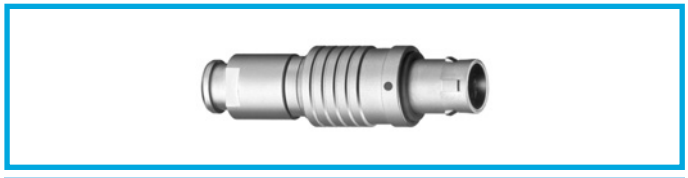


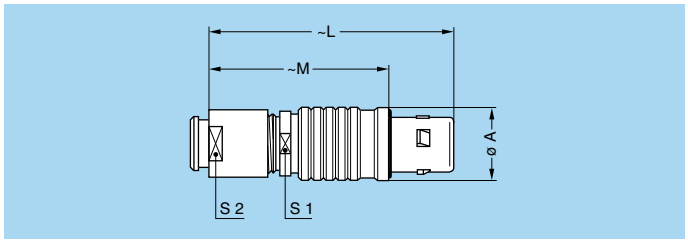

## FNG Straight plug, key (G) or keys (A…M and R), cable collet and lanyard release

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | N | S1 | S2 |
| FNG | 0B | 9.5 | 15.5 | 36.0 | 26.0 | 140 | 8 | 7 |
| FNG | 1B | 12.0 | 18.0 | 43.0 | 32.0 | 140 | 10 | 9 |
| FNG | 2B | 15.0 | 21.0 | 49.0 | 37.0 | 160 | 13 | 12 |
| FNG | 3B | 18.0 | 25.0 | 58.0 | 43.0 | 190 | 15 | 14 |
| FNG | 4B | 25.0 | 32.0 | 75.0 | 57.0 | 230 | 21 | 20 |
| FNG | 5B | 35.0 | 42.0 | 103.0 | 78.0 | 300 | 31 | 30 |

M1 Cable assembly (page 161)

**Note:** cable material: stainless steel with Polyamide sheath.



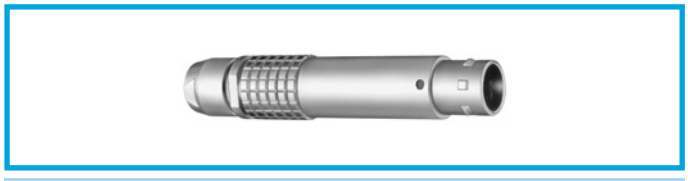


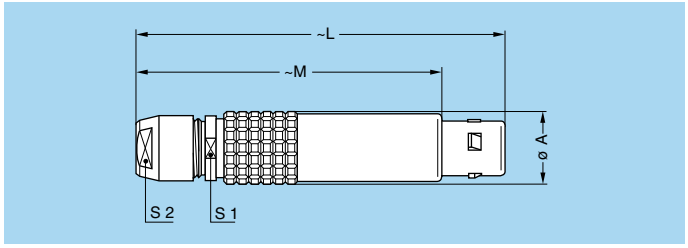

## FEG Straight plug, key (G) or keys (A…L), cable collet, front seal and nut for fitting a bend relief [1] (IP 54 protection index when mated)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FEG | 0B | 11.0 | 35.0 | 25.0 | 8 | 7 |
| FEG | 1B | 13.5 | 42.0 | 33.0 | 10 | 9 |
| FEG | 2B | 16.5 | 48.0 | 36.0 | 13 | 12 |
| FEG | 3B | 19.0 | 56.5 | 41.5 | 15 | 15 |

M1 Cable assembly (page 161)

**Note:** [1] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

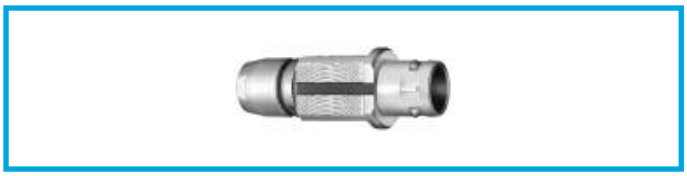


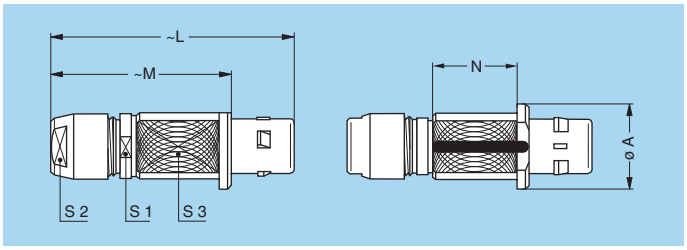



## FDG Straight plug, long version, key (G) or keys (A…L), cable collet

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FDG | 1B | 12 | 68 | 57 | 10 | 9 |
| FDG | 2B | 15 | 79 | 67 | 13 | 12 |

M2 Cable assembly (page 162)

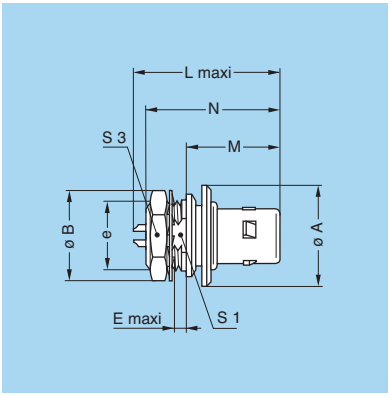





## FIG Straight plug for remote handling, key (G) or keys (A…L and R), special alignment mark, knurled handling surface, cable collet

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | L | M | N | S1 | S2 | S3 |
| FIG | 2B | 20 | 49 | 37 | 17.5 | 13 | 12 | 15 |
| FIG | 3B | 22 | 58 | 43 | 21.5 | 15 | 14 | 18 |
| FIG | 4B | 30 | 75 | 57 | 28.5 | 21 | 20 | 25 |
| FIG | 5B | 40 | 103 | 78 | 41.0 | 31 | 30 | 35 |

M1 Cable assembly (page 161)

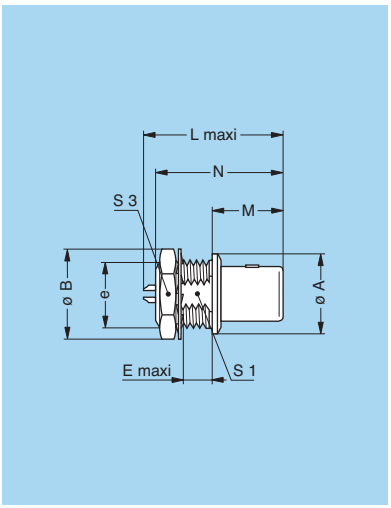



## FWG Fixed plug, nut fixing, key (G) or keys (A…L)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| FWG | 0B | 14.0 | 12.4 | M9x0.6 | 1.8 | 22.5 | 14.5 | 19.5 | 8.2 | 11 |
| FWG | 1B | 18.0 | 15.8 | M12x1.0 | 2.9 | 24.9 | 17.0 | 24.8 | 10.5 | 14 |
| FWG | 2B | 19.5 | 19.2 | M15x1.0 | 4.1 | 28.6 | 18.0 | 27.3 | 13.5 | 17 |
| FWG | 3B | 25.0 | 25.0 | M18x1.0 | 4.2 | 32.1 | 23.0 | 31.5 | 16.5 | 22 |

P9 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts

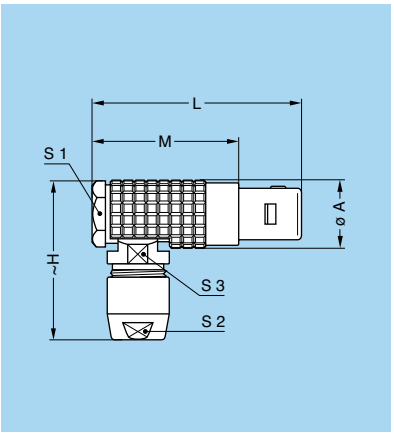



## FAG Fixed plug, non-latching, nut fixing, key (G) or keys (A…M and R)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| FAG | 00 | 8 | 10.2 | M7x0.5 | 2.9 | 18.1 | 9.0 | 15.0 | 6.3 | 9 |
| FAG | 0B | 10 | 12.4 | M9x0.6 | 4.2 | 20.8 | 11.5 | 18.9 | 8.2 | 11 |
| FAG | 1B | 14 | 15.8 | M12x1.0 | 5.4 | 25.2 | 12.5 | 21.6 | 10.5 | 14 |
| FAG | 2B | 18 | 19.2 | M15x1.0 | 6.0 | 28.7 | 13.8 | 23.9 | 13.5 | 17 |
| FAG | 3B | 22 | 25.0 | M18x1.0 | 5.8 | 32.1 | 17.0 | 30.2 | 16.5 | 22 |
| FAG | 4B | 29 | 34.0 | M25x1.0 | 6.8 | 37.1 | 20.5 | 34.7 | 23.5 | 30 |
| FAG | 5B | 40 | 40.0 | M35x1.0 | 6.8 | 47.1 | 28.0 | 42.8 | 33.5 | – |

P1 Panel cut-out (page 152)

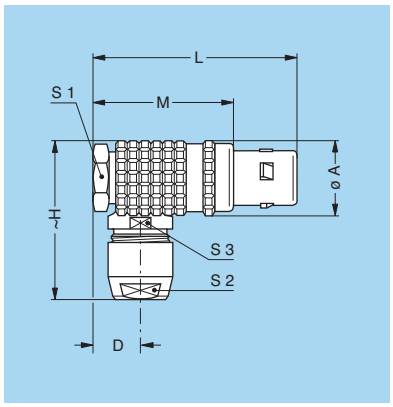
**Note:** 1) maximum length with crimp contacts. The 5B series is delivered without locking washer or tapered washer and with a round nut.




## FPG Elbow (90°) plug, key (G) or keys (A…M and R), cable collet

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | H | L | M | S1 | S2 | S3 |
| FPG | 00 | 7.5 | 18.0 | 24.5 | 16.5 | 6.5 | 5 | 5.3 |
| FPG | 0B | 9.5 | 23.0 | 30.0 | 20.0 | 8.0 | 7 | 8.0 |
| FPG | 1B | 12.0 | 29.0 | 36.0 | 25.0 | 11.0 | 9 | 10.0 |
| FPG | 2B | 15.0 | 35.0 | 41.5 | 29.5 | 13.5 | 12 | 13.0 |

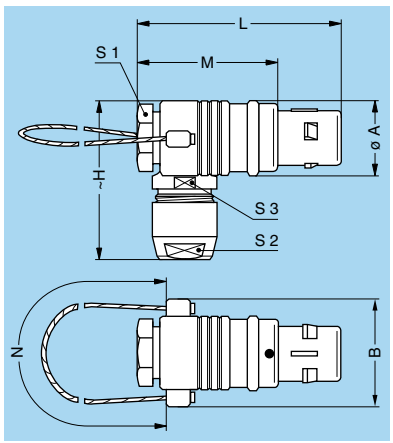
M3 Cable assembly (page 161)




## FHG Elbow (90°) plug, key (G) or keys (A…M and R), cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FHG | 3B | 19.0 | 10.0 | 37.0 | 50.0 | 35.0 | 17 | 14 | 15.0 |
| FHG | 4B | 26.0 | 15.0 | 52.0 | 67.0 | 49.0 | 22 | 20 | 21.0 |
| FHG | 5B | 36.0 | 21.0 | 74.0 | 90.0 | 65.0 | 32 | 30 | 31.0 |

**M3** Cable assembly (page 161)

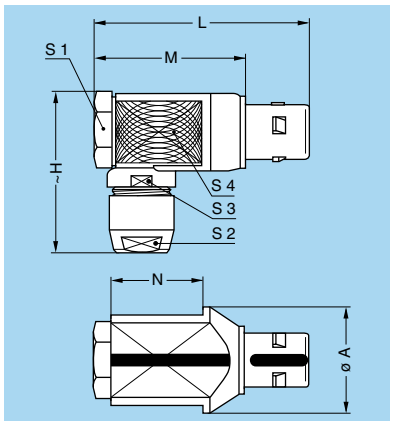



## FMG Elbow (90°) plug, key (G) or keys (A…M), cable collet and lanyard release, long key [1)]

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | H | L | M | N | S1 | S2 | S3 |
| FMG | 0B | 11 | 17 | 26 | 31.6 | 21.6 | 140 | 10 | 7 | 8 |
| FMG | 3B | 19 | 26 | 39 | 50.0 | 35.0 | 190 | 17 | 14 | 15 |

**M3** Cable assembly (page 161)

**Note:** [1)] long key: only in 0B series and with key (G).
Cable material: stainless steel with Polyamide sheath.

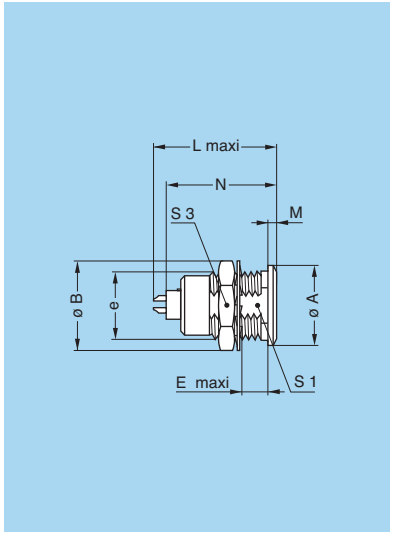



## FKG Elbow (90°) plug for remote handling, key (G) or keys (A…L), special alignment mark, knurled handling surface, cable collet

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | H | L | M | N | S1 | S2 | S3 | S4 |
| FKG | 3B | 25 | 37.0 | 50.0 | 35.0 | 21.0 | 17 | 14 | 15 | 21 |
| FKG | 4B | 32 | 52.0 | 67.0 | 49.0 | 28.5 | 22 | 20 | 21 | 26 |
| FKG | 5B | 46 | 74.2 | 89.5 | 64.5 | 40.0 | 32 | 30 | 31 | 38 |

**M3** Cable assembly (page 161)

**Note:** dimension D is the same as for the FHG model.

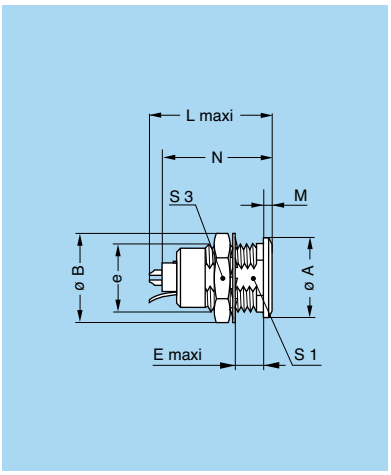



## EGG Fixed socket, nut fixing, key (G) or keys (A…M and R)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| EGG | 00 | 8 | 10.2 | M7x0.5 | 6.0 | 15.5 | 1.0 | 13.7 | 6.3 | 9 |
| EGG | 0B | 10 | 12.4 | M9x0.6 | 7.0 | 20.7 | 1.2 | 19.1 | 8.2 | 11 |
| EGG | 1B | 14 | 15.8 | M12x1.0 | 7.5 | 23.0 | 1.5 | 21.1 | 10.5 | 14 |
| EGG | XB | 16 | 19.0 | M14x1.0 | 7.0 | 23.5 | 1.5 | 20.0 | 12.5 | 17 |
| EGG | 2B | 18 | 19.2 | M15x1.0 | 8.5 | 26.7 | 1.8 | 24.6 | 13.5 | 17 |
| EGG | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 30.7 | 2.0 | 28.1 | 16.5 | 22 |
| EGG | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 35.7 | 2.5 | 34.1 | 23.5 | 30 |
| EGG | 5B | 40 | 40.0 | M35x1.0 | 11.0 | 43.5 | 3.0 | 39.6 | 33.5 | – |

**P1** Panel cut-out (page 152)

**Note:** [1)] maximum length with crimp contacts.
The 5B series is delivered with a tapered washer and a round nut.

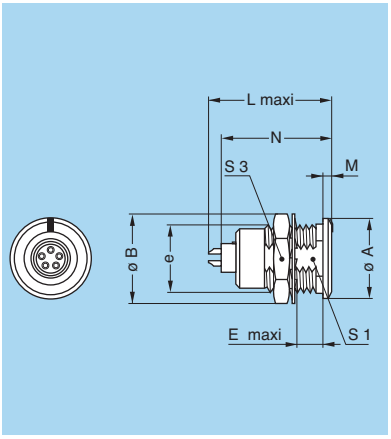



## ENG Fixed socket with earthing tag, nut fixing, key (G) or keys (A…M)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| ENG | 00 | 8 | 10.2 | M7x0.5 | 6.0 | 15.5 | 1.0 | 13.7 | 6.3 | 9 |
| ENG | 0B | 10 | 12.4 | M9x0.6 | 7.0 | 20.7 | 1.2 | 19.1 | 8.2 | 11 |
| ENG | 1B[2)] | 14 | 15.8 | M12x1.0 | 7.5 | 23.0 | 1.5 | 21.1 | 10.5 | 14 |
| ENG | 2B | 18 | 19.2 | M15x1.0 | 8.5 | 26.7 | 1.8 | 24.6 | 13.5 | 17 |
| ENG | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 30.7 | 2.0 | 28.1 | 16.5 | 22 |
| ENG | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 35.7 | 2.5 | 34.1 | 23.5 | 30 |

P1 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts.
2) for the 1B series the earthing tag is on the same side of the key.

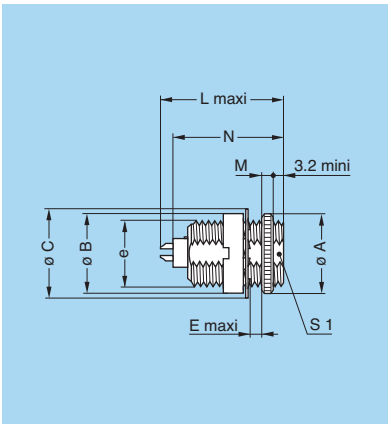



## EKG Fixed socket, nut fixing, key (G) or keys (A…L and R), special alignment mark on the front

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| EKG | 2B | 18 | 19.2 | M15x1.0 | 8.5 | 26.7 | 1.8 | 24.6 | 13.5 | 17 |
| EKG | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 30.7 | 2.0 | 28.1 | 16.5 | 22 |
| EKG | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 35.7 | 2.5 | 34.1 | 23.5 | 30 |
| EKG | 5B | 40 | 40.0 | M35x1.0 | 11.0 | 43.5 | 3.0 | 39.6 | 33.5 | – |

P1 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts.
The 5B series is delivered with a tapered washer and a round nut.



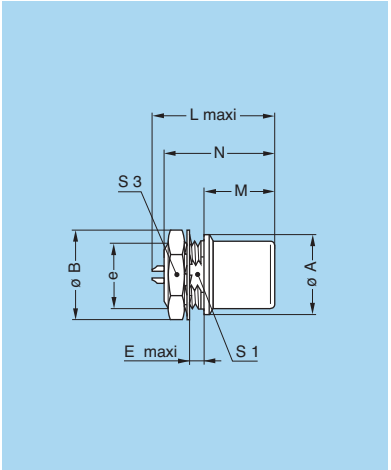

## ESG Fixed socket with two round nuts, key (G) or keys (A…L), long threaded shell (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | e | E | L | M | N[1)] | S1 |
| ESG | 00 | 9 | 9 | 9.5 | M7x0.5 | 3.2 | 15.5 | 2 | 13.7 | – |
| ESG | 1B | 14 | 14 | 16.0 | M12x1.0 | 8.0 | 23.0 | 2 | 21.1 | 10.5 |

P1 Panel cut-out 1B series (page 152)

P2 Panel cut-out 00 series (page 152)

**Note:** 1) maximum length with crimp contacts.

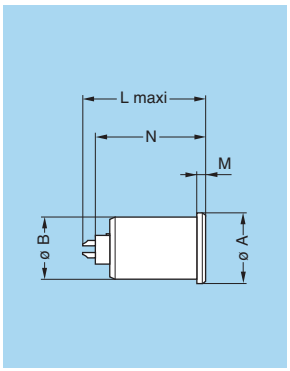



## EHG Fixed socket, nut fixing, key (G) or keys (A…M and R), and protruding shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| EHG | 00 | 8.0 | 10.2 | M7x0.5 | 2.0 | 15.5 | 8.5 | 13.7 | 6.3 | 9 |
| EHG | 0B | 10.0 | 12.4 | M9x0.6 | 2.0 | 19.5 | 12.5 | 19.1 | 8.2 | 11 |
| EHG | 1B | 14.0 | 15.8 | M12x1.0 | 4.0 | 21.7 | 12.0 | 21.1 | 10.5 | 14 |
| EHG | 2B | 18.0 | 19.2 | M15x1.0 | 5.1 | 22.7 | 12.5 | 24.6 | 13.5 | 17 |
| EHG | 3B | 22.0 | 25.0 | M18x1.0 | 7.1 | 30.7 | 13.5 | 30.3 | 16.5 | 22 |
| EHG | 5B | 40.0 | 40.0 | M35x1.0 | 2.5 | 43.5 | 28.0 | 38.5 | 33.5 | – |

P1 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts. The 5B series is delivered without locking washer or tapered washer and with a round nut.

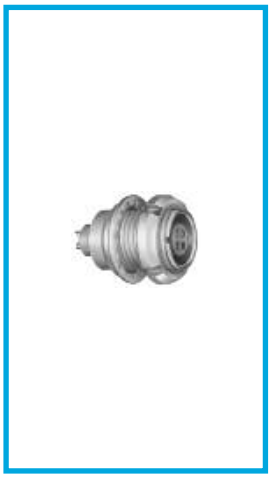


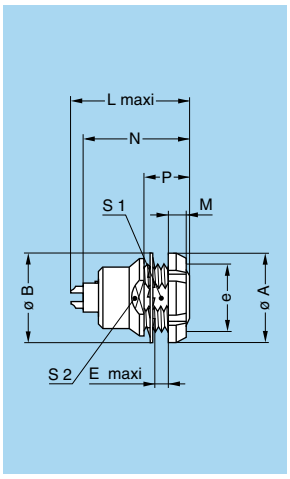

## EJG Fixed socket, press or adhesive fit, key (G) or keys (A…M)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | N[1)] |
| EJG | 0B | 9.2 | 8.35 | 20.7 | 1.5 | 19.1 |
| EJG | 1B | 12.5 | 11.20 | 23.0 | 1.5 | 21.1 |
| EJG | 2B | 16.5 | 14.00 | 26.7 | 1.5 | 24.6 |

P5 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts.



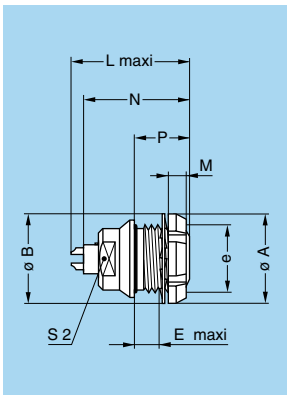



## EEG Fixed socket, nut fixing, key (G) or keys (A…M and R) (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | P | S1 | S2 |
| EEG | 00 | 10 | 9.5 | M7x0.5 | 2.3 | 15.5 | 2.5 | 13.7 | 6.0 | 6.3 | 7.5 |
| EEG | 0B | 12 | 12.5 | M9x0.6 | 2.4 | 20.7 | 2.5 | 19.1 | 6.3 | 8.2 | 9.0 |
| EEG | 1B | 16 | 16.0 | M12x1.0 | 6.5 | 23.0 | 3.5 | 21.1 | 11.0 | 10.5 | 13.0 |
| EEG | 2B | 20 | 20.0 | M15x1.0 | 4.3 | 26.7 | 3.5 | 24.6 | 9.0 | 13.5 | 15.0 |
| EEG | 3B | 24 | 25.0 | M18x1.0 | 6.1 | 30.7 | 4.5 | 28.1 | 12.0 | 16.5 | 20.0 |
| EEG | 5B | 41 | 40.0 | M35x1.0 | 13.5 | 43.5 | 5.0 | 39.6 | 19.5 | 33.5 | 38.0 |

P1 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts. The 3B and 5B series are delivered with a conical nut. The 5B series is delivered without locking washer or tapered washer.

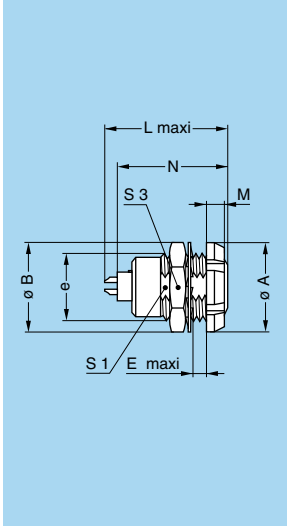



## EFG Fixed socket, nut fixing, key (G) or keys (A…M), with two flats on the shell and O-ring (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | P | S2 |
| EFG | 0B | 12 | 12.5 | M9x0.6 | 5.5 | 20.7 | 2.5 | 19.1 | 9 | 8 |

P2 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts.

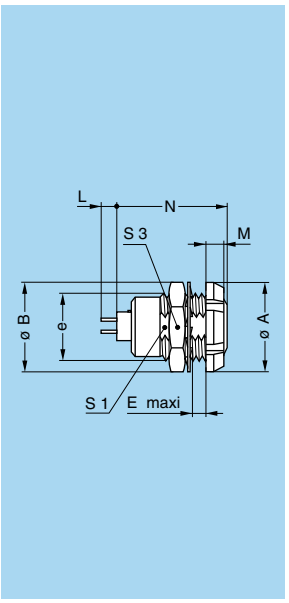



## ECG Fixed socket with two nuts, key (G) or keys (A…M and R) (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| ECG | 00 | 10 | 10.2 | M7x0.5 | 4.3 | 13.7 | 2.5 | 13.7 | 6.3 | 9 |
| ECG | 0B | 12 | 12.4 | M9x0.6 | 5.5 | 20.7 | 2.5 | 19.1 | 8.2 | 11 |
| ECG | 1B | 16 | 15.8 | M12x1.0 | 6.0 | 23.0 | 3.5 | 21.1 | 10.5 | 14 |
| ECG | XB | 18 | 19.0 | M14x1.0 | 6.0 | 23.5 | 3.5 | 20.0 | 12.5 | 17 |
| ECG | 2B | 20 | 19.2 | M15x1.0 | 6.5 | 26.7 | 3.5 | 24.6 | 13.5 | 17 |
| ECG | 3B | 24 | 25.0 | M18x1.0 | 9.0 | 30.7 | 4.5 | 28.1 | 16.5 | 22 |
| ECG | 4B | 30 | 34.0 | M25x1.0 | 10.0 | 35.7 | 4.5 | 32.6 | 23.5 | 30 |
| ECG | 5B | 41 | 40.0 | M35x1.0 | 9.0 | 43.5 | 5.0 | 39.6 | 33.5 | – |

P1 Panel cut-out (page 152)

**Note:** 1) maximum length with crimp contacts. The 3B, 4B and 5B series are delivered with a conical nut. The 5B series is delivered with a tapered washer and a round nut.

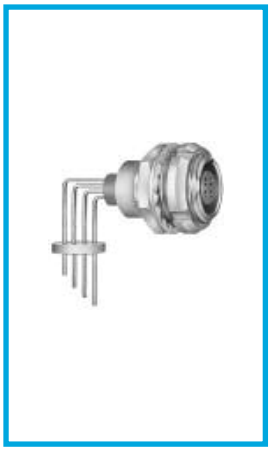


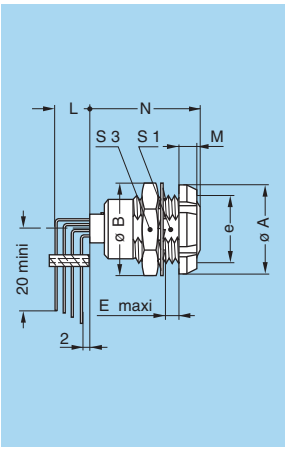

## ECG Fixed socket with two nuts, key (G) or keys (A…F and R) and straight contact for printed circuit
(back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | S1 | S3 |
| ECG | 00 | 10 | 10.2 | M7x0.5 | 4.3 | 2.5 | 13.7 | 6.3 | 9 |
| ECG | 0B | 12 | 12.4 | M9x0.6 | 5.5 | 2.5 | 16.1 | 8.2 | 11 |
| ECG | 1B | 16 | 15.8 | M12x1.0 | 6.0 | 3.5 | 19.8 | 10.5 | 14 |
| ECG | XB | 18 | 19.0 | M14x1.0 | 6.0 | 3.5 | 20.0 | 12.5 | 17 |
| ECG | 2B | 20 | 19.2 | M15x1.0 | 6.5 | 3.5 | 21.8 | 13.5 | 17 |
| ECG | 3B | 24 | 25.0 | M18x1.0 | 9.0 | 4.5 | 25.8 | 16.5 | 22 |
| ECG | 4B | 30 | 34.0 | M25x1.0 | 10.0 | 4.5 | 29.8 | 23.5 | 30 |
| ECG | 5B | 41 | 40.0 | M35x1.0 | 9.0 | 5.0 | 36.8 | 33.5 | – |

P1 Panel cut-out (page 152)
P15 PCB drilling pattern (page 154)

**Note:** this contact type is available for E●● socket models fitted with female contacts.
Length «L» depends on the number of contacts, see table on page 156.
The 5B series is delivered with a tapered washer and a round nut.
The 3B, 4B and 5B series are delivered with a conical nut.



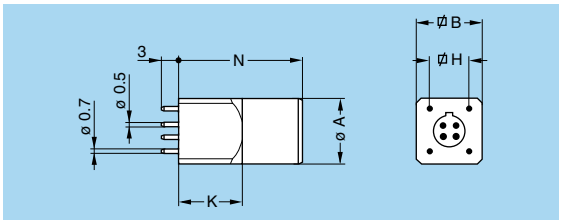



## ECG Fixed socket with two nuts, key (G) or keys (A…F) with elbow (90°) contact for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N max | S1 | S3 |
| ECG | 0B | 12 | 12.4 | M9x0.6 | 5.5 | 2.5 | 18.3 | 8.2 | 11 |
| ECG | 1B | 16 | 15.8 | M12x1.0 | 6.0 | 3.5 | 20.3 | 10.5 | 14 |
| ECG | 2B | 20 | 19.2 | M15x1.0 | 6.5 | 3.5 | 22.3 | 13.5 | 17 |
| ECG | 3B | 24 | 25.0 | M18x1.0 | 9.0 | 4.5 | 25.8 | 16.5 | 22 |

P1 Panel cut-out (page 152)
P17 PCB drilling pattern (page 157)

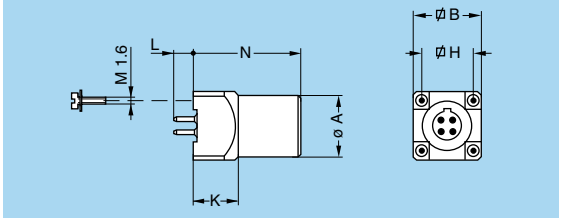
**Note:** this female contact type is available for all back panel mounting socket models.
Length «L» depends on the number of contacts, see PCB drilling pattern on page 157.
For male contacts, sockets are available upon request, with J, K or L keys.
The 3B series is delivered with a conical nut.




## EZG Straight socket for printed circuit, key (G) or keys (A, B)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | H | K | N |
| EZG | 00 | 6.8 | 7 | 5.08 | 7 | 14 |

P15+P16 PCB drilling pattern (pages 154 and 156)

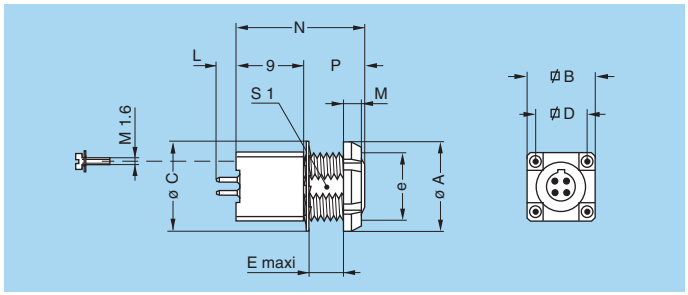



## EZG Straight socket for printed circuit, key (G) or keys (A…F)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | H | K | N |
| EZG | 0B | 9 | 10 | 7.62 | 8 | 15.0 |
| EZG | 1B | 11 | 12 | 7.62 | 8 | 19.0 |
| EZG | 2B | 14 | 15 | 10.16 | 9 | 22.5 |

P15+P16 PCB drilling pattern (pages 154 and 156)

**Note:** Length «L» depends on the number of contacts, see table on page 156.




## EYG Fixed socket for printed circuit, nut fixing, key (G) or keys (A…F) (back panel mounting)

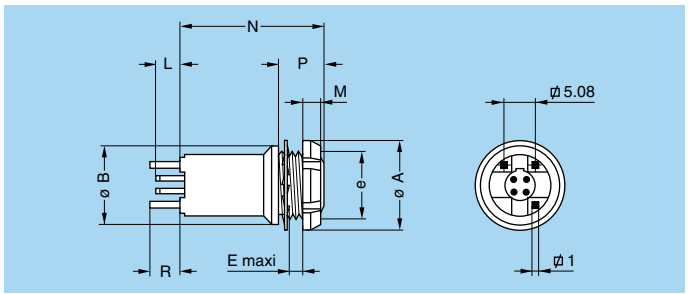
| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | D | e | E | M | N | P | S1 |
| EYG | 0B | 12 | 10 | 12.5 | 7.62 | M9x0.6 | 2.6 | 2.5 | 15.0 | 6.0 | 8.2 |
| EYG | 1B | 14 | 12 | 16.0 | 7.62 | M11x0.5 | 5.0 | 3.5 | 19.0 | 10.0 | – |
| EYG | 2B | 20 | 15 | 19.5 | 10.16 | M15x1.0 | 7.5 | 3.5 | 22.5 | 13.5 | 13.5 |

**P1** Panel cut-out 0B and 2B series (page 152)

**P10** Panel cut-out 1B series (page 152)

**P15**+**P16** PCB drilling pattern (pages 154 and 156)

**Note:** Length «L» depends on the number of contacts, see page 156.



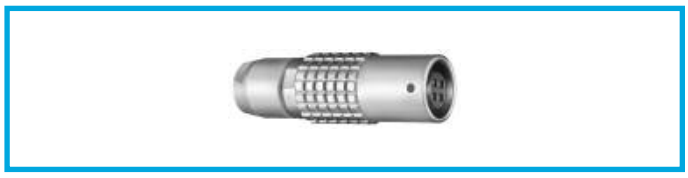

## XPF Fixed socket, nut fixing, long shell, keys (F) for printed circuit (back panel mounting)

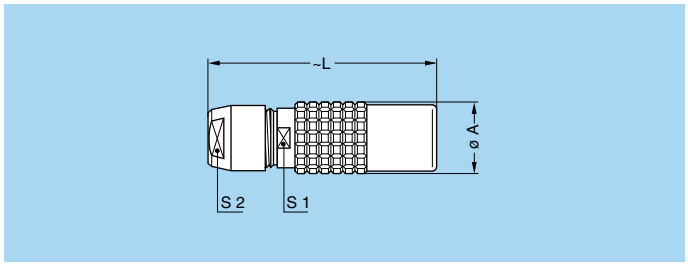
| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | P | R |
| XPF | 0B | 12 | 11 | M9x0.6 | 1.5 | 2.5 | 19 | 5 | 4 |

**P2** Panel cut-out (page 152)

**P15**+**P16** PCB drilling pattern (pages 154 and 156)

**Note:**
Length «L» depends on the number of contacts, see table on page 156.



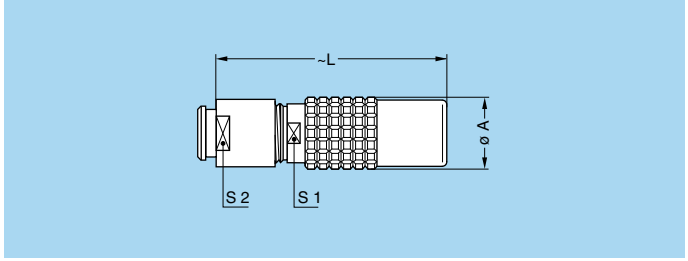



## PHG Free socket, key (G) or keys (A…M and R), cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | S1 | S2 |
| PHG | 00[1)] | 6.8 | 26.0 | 5.5 | 5 |
| PHG | 0B | 9.5 | 35.5 | 8.0 | 7 |
| PHG | 1B | 12.5 | 40.5 | 10.0 | 9 |
| PHG | XB | 13.0 | 46.0 | 11.0 | 10 |
| PHG | 2B | 16.5 | 47.0 | 13.0 | 12 |
| PHG | 3B | 19.0 | 56.0 | 15.0 | 14 |
| PHG | 4B | 26.0 | 73.0 | 21.0 | 20 |
| PHG | 5B | 36.0 | 99.0 | 31.0 | 30 |

**M1** Cable assembly (page 161)

**Note:**
1) the surface design of the 00 series is different.



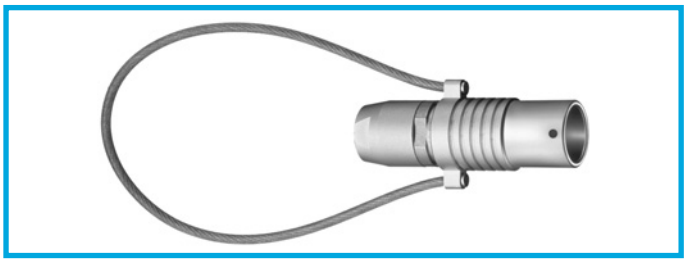

## PHG Free socket, key (G) or keys (A…M), cable collet and nut for fitting a bend relief 2)

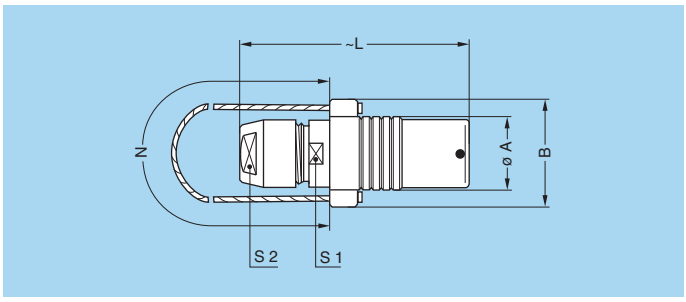
| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | S1 | S2 |
| PHG | 00[1)] | 6.8 | 34.0 | 5.5 | 6 |
| PHG | 0B | 9.5 | 34.5 | 8.0 | 7 |
| PHG | 1B | 12.5 | 39.5 | 10.0 | 9 |
| PHG | XB | 13.0 | 49.5 | 11.0 | 10 |
| PHG | 2B | 16.5 | 46.0 | 13.0 | 12 |
| PHG | 3B | 19.0 | 54.5 | 15.0 | 15 |
| PHG | 4B | 26.0 | 69.0 | 21.0 | 20 |

**M1** Cable assembly (page 161)

**Note:**
1) the surface design of the 00 series is different.
2) to order, add a «Z» at the end of the reference.

**Note:** The bend relief must be ordered separately (see page 141).



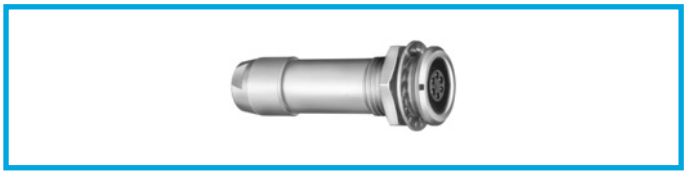


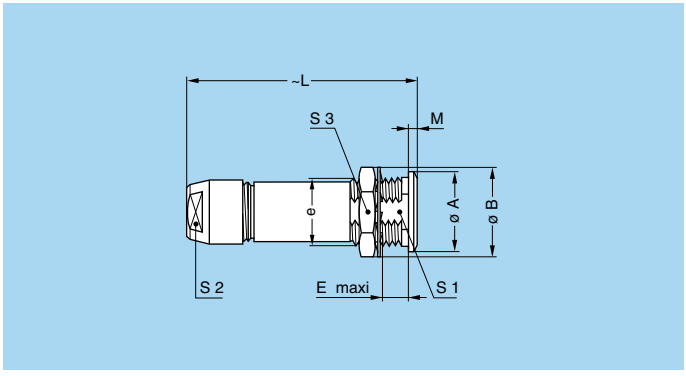

## PNG Free socket, nut fixing, key (G) or keys (A…L and R), cable collet with lanyard release

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | N | S1 | S2 |
| PNG | 1B | 12.4 | 18.4 | 40.5 | 140 | 10 | 9 |
| PNG | 2B | 16.5 | 22.5 | 47.0 | 160 | 13 | 12 |
| PNG | 3B | 19.0 | 26.0 | 56.0 | 190 | 15 | 14 |
| PNG | 4B | 26.0 | 33.0 | 73.0 | 230 | 21 | 20 |
| PNG | 5B | 36.0 | 43.0 | 99.0 | 300 | 31 | 30 |

M1 Cable assembly (page 161)

**Note:** cable material: stainless steel with Polyamide sheath





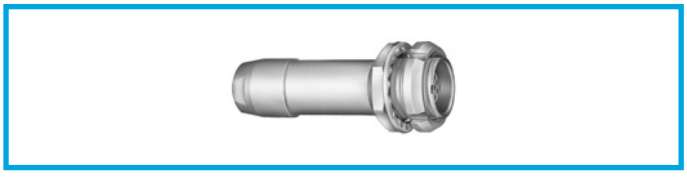

## PKG Fixed socket, nut fixing, key (G) or keys (A…M and R), cable collet

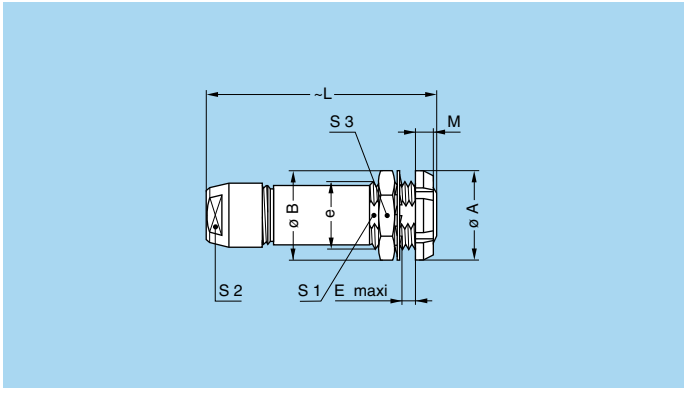
| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PKG | 00 | 8 | 10.2 | M7x0.5 | 6.5 | 26.0 | 1.0 | 6.3 | 5 | 9 |
| PKG | 0B | 10 | 12.4 | M9x0.6 | 7.0 | 35.5 | 1.2 | 8.2 | 7 | 11 |
| PKG | 1B | 14 | 15.8 | M12x1.0 | 7.5 | 40.5 | 1.5 | 10.5 | 9 | 14 |
| PKG | 2B | 18 | 19.2 | M15x1.0 | 8.5 | 47.0 | 1.8 | 13.5 | 12 | 17 |
| PKG | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 56.0 | 2.0 | 16.5 | 14 | 22 |
| PKG | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 73.0 | 2.5 | 23.5 | 20 | 30 |
| PKG | 5B | 40 | 40.0 | M35x1.0 | 11.0 | 99.0 | 3.0 | 33.5 | 30 | – |

P1 Panel cut-out (page 152)

M1 Cable assembly (page 161)

**Note:** the 5B series is delivered with a tapered washer and a round nut.





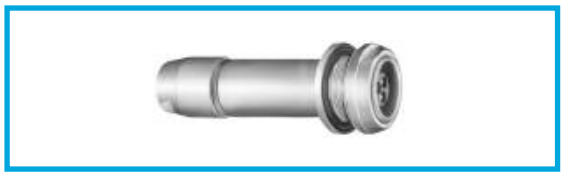

## PFG Fixed socket, with two nuts, key (G) or keys (A…M and R), cable collet (back panel mounting)

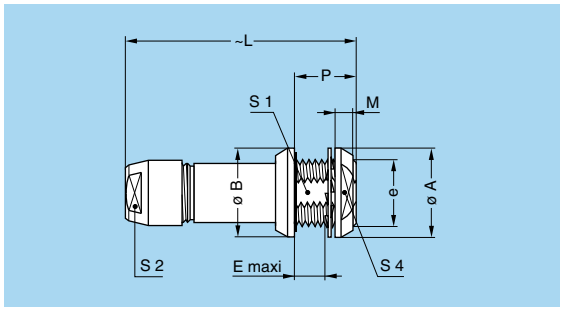
| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PFG | 00 | 10 | 10.2 | M7x0.5 | 5.3 | 26.0 | 2.5 | 6.3 | 5 | 9 |
| PFG | 0B | 12 | 12.4 | M9x0.6 | 5.0 | 35.5 | 2.5 | 8.2 | 7 | 11 |
| PFG | 1B | 16 | 15.8 | M12x1.0 | 5.0 | 40.5 | 3.5 | 10.5 | 9 | 14 |
| PFG | 2B | 20 | 19.2 | M15x1.0 | 6.5 | 47.0 | 3.5 | 13.5 | 12 | 17 |
| PFG | 3B | 24 | 25.0 | M18x1.0 | 9.0 | 56.0 | 4.5 | 16.5 | 14 | 22 |
| PFG | 4B | 30 | 34.0 | M25x1.0 | 11.0 | 73.0 | 4.5 | 23.5 | 20 | 30 |
| PFG | 5B | 41 | 40.0 | M35x1.0 | 10.0 | 99.0 | 5.0 | 33.5 | 30 | – |

P1 Panel cut-out (page 152)

M1 Cable assembly (page 161)

**Note:** the 3B, 4B and 5B series are delivered with a conical nut.
The 5B series is delivered with a tapered washer and a round nut.






## PEG Fixed socket, nut fixing, key (G) or keys (A…L), cable collet (back panel mounting)

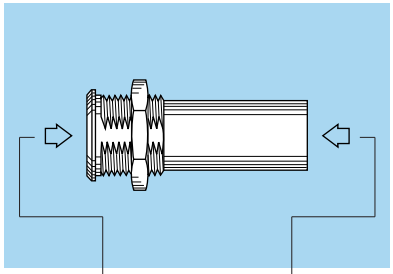
| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S4 | P |
| PEG | 3B | 24 | 25 | M18x1.0 | 5.0 | 56 | 4.5 | 16.5 | 14 | 20 | 12 |
| PEG | 4B | 32 | 34 | M25x1.0 | 12.5 | 73 | 5.0 | 23.5 | 20 | 27 | 20 |

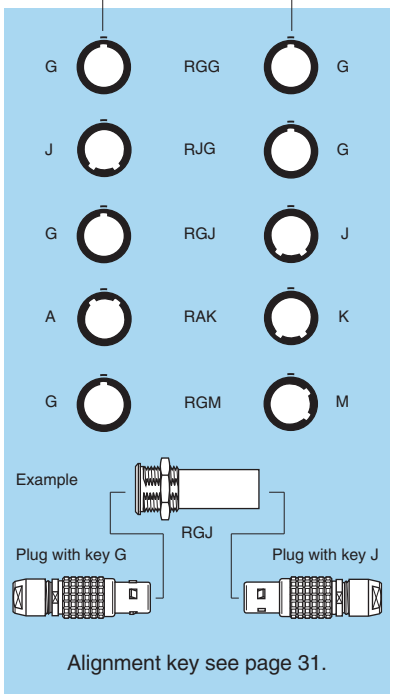
P1 Panel cut-out (page 152)

M1 Cable assembly (page 161)

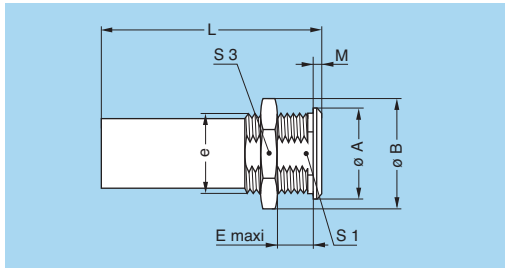
**Note:** the 4B series has an o-ring on the flange.

## R●● Fixed coupler, nut fixing, key (G) or keys (A and J) at the flange end and keys (J, K or M) at the other end






Alignment key see page 31.




| Reference | | Contacts | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | Type | A | B | e | E | L | M | S1 | S3 |
| RGG [1] | 0B | female – female | 12 | 13.8 | M10x0.75 | 8.0 | 34 | 2.0 | 9.0 | 12 |
| RGG [2] | 0B | female – female | 12 | 13.8 | M10x0.75 | 8.0 | 43 | 2.0 | 9.0 | 12 |
| RJG | 0B | male – female | 12 | 13.8 | M10x0.75 | 8.0 | 34 | 2.0 | 9.0 | 12 |
| RGJ | | female – male | | | | | | | | |
| RAK | | female – male | | | | | | | | |
| RGM | | female – male | | | | | | | | |
| RGG [3] | 1B | female – female | 16 | 19.2 | M14x1.00 | 8.5 | 47 | 2.5 | 12.5 | 17 |
| RJG | 1B | male – female | 16 | 19.2 | M14x1.00 | 8.5 | 39 | 2.5 | 12.5 | 17 |
| RGJ | | female – male | | | | | | | | |
| RJG | 2B | male – female | 20 | 21.5 | M16x1.00 | 12.0 | 44 | 4.0 | 15.0 | 19 |
| RGJ | | female – male | | | | | | | | |
| RGJ | 3B | female – male | 25 | 27.0 | M20x1.00 | 32.0 | 53 | 4.0 | 18.5 | 24 |
| RGJ | 4B | female – male | 34 | 34.0 | M25x1.00 | 50.0 | 65 | 4.0 | 23.5 | 30 |

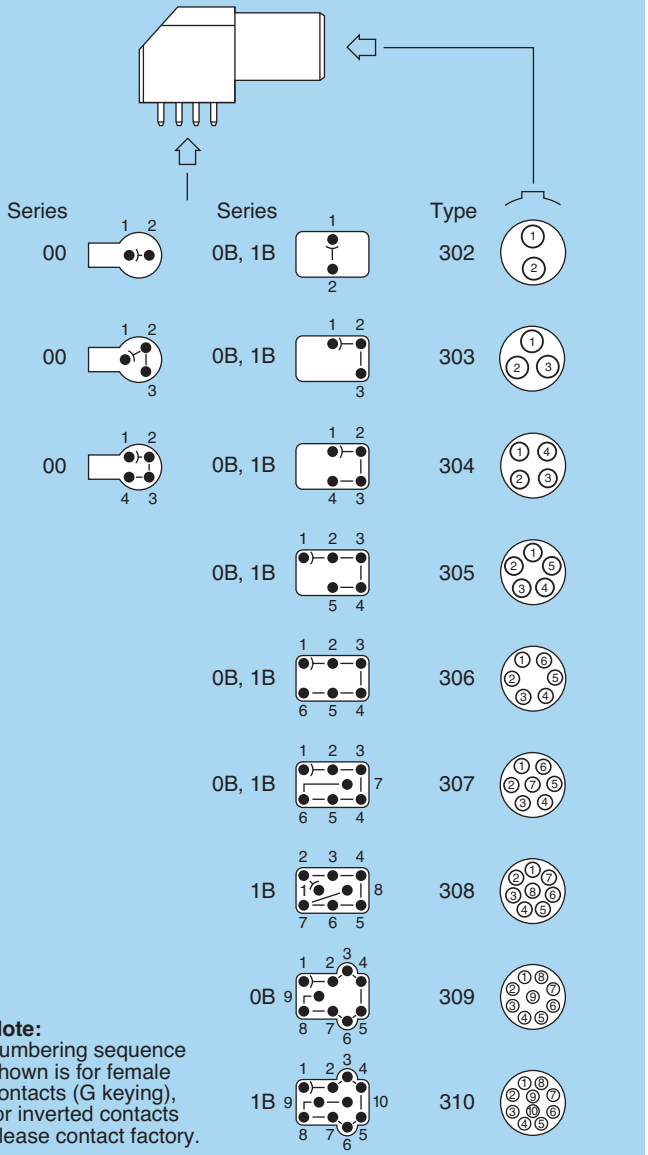
P4 Panel cut-out (page 152)

**Note:**
[1] only available with two contacts.
[2] RGG.0B only available from 3 till 5 contacts.
[3] RGG.1B only available till 7 contacts.
For this fixed coupler, the first contact type mentioned is always the one at the flange end. On request, these couplers can be produced in other series, with other keys.

# Elbow socket models

## Technical Characteristics

### Types




**Note:**
numbering sequence shown is for female contacts (G keying), for inverted contacts please contact factory.

### Materials and Treatment

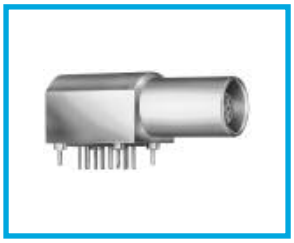
| Component | Material | Surface treat. (µm) | | |
|---|---|---|---|---|
| | | Cu | Ni | Au |
| Housing | PPS | – | | |
| | Brass | 0.5 | 3 | – |
| Metallic parts | Brass | 0.5 | 3 | – |
| Earthing crown | Bronze | 0.5 | 3 | – |
| Insulator | PEEK | – | | |
| Female contact | Bronze | 0.5 | 3 | 1.5 |

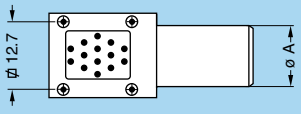
**Note:**
The surface treatment standards are as follows:
– Nickel: SAE AMS QQ N 290. – Gold: ISO 27874

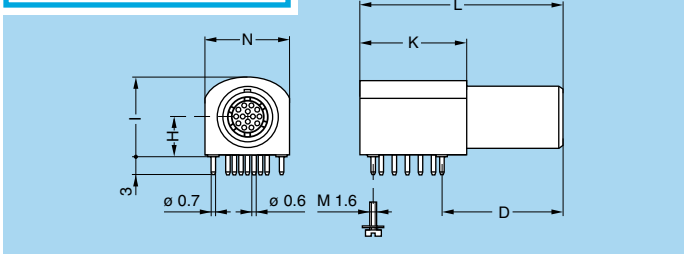
### Electrical

| Model | Series | Types | Test voltage (kV rms)[1] Contact-contact | Test voltage (kV rms)[1] Contact-shell | Rated current (A)[1] |
|---|---|---|---|---|---|
| EPG-XBG | 00 | 302-303-304 | 1.00 | 1.00 | 2.0 |
| EPG-EXG | 0B | 302 | 1.45 | 1.20 | 4.5 |
| EPG-EXG | 0B | 303 | 1.70 | 1.60 | 4.5 |
| EPG-EXG | 0B | 304 | 1.30 | 1.10 | 4.5 |
| EPG-EXG | 0B | 305 | 1.25 | 1.20 | 4.5 |
| EPG-EXG | 0B | 306 | 1.25 | 1.20 | 2.5 |
| EPG-EXG | 0B | 307 | 1.00 | 1.00 | 2.0 |
| EPG-EXG | 0B | 309 | 1.00 | 1.10 | 1.5 |
| EPG-EXG | 1B | 302 | 1.70 | 1.45 | 4.5 |
| EPG-EXG | 1B | 303 | 1.60 | 1.85 | 4.5 |
| EPG-EXG | 1B | 304 | 1.70 | 1.80 | 4.5 |
| EPG-EXG | 1B | 305 | 1.30 | 1.55 | 4.5 |
| EPG-EXG | 1B | 306 | 1.35 | 1.45 | 4.5 |
| EPG-EXG | 1B | 307 | 1.45 | 1.45 | 2.0 |
| EPG-EXG | 1B | 308 | 1.30 | 1.30 | 2.0 |
| EPG-EXG | 1B | 310 | 1.00 | 1.00 | 1.5 |
| EPG | 1B | 314 | 1.00 | 1.30 | 1.0 |

**Note:**
[1] see calculation method, caution and suggested standard on page 178.





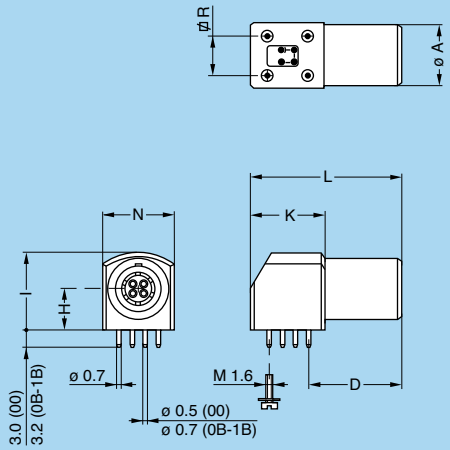




## EPG Elbow (90°) socket for printed circuit, key (G) or keys (A…F) (solder or screw fixing)

| Reference | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | D | H | I | K | L | N |
| EPG.1B.314.NLN | 11 | 21 | 7.7 | 14.3 | 19 | 36 | 15.4 |

P20 PCB drilling pattern (page 158)

**Note:** to replace the 4 ground pins by 4 screws (M1.6) add an «S» to the end of the part number. (e.g.: EPG.1B.314.NLNS)



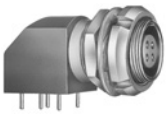

## EPG Elbow (90°) socket for printed circuit, key (G) or keys (A…F) (solder or screw fixing)

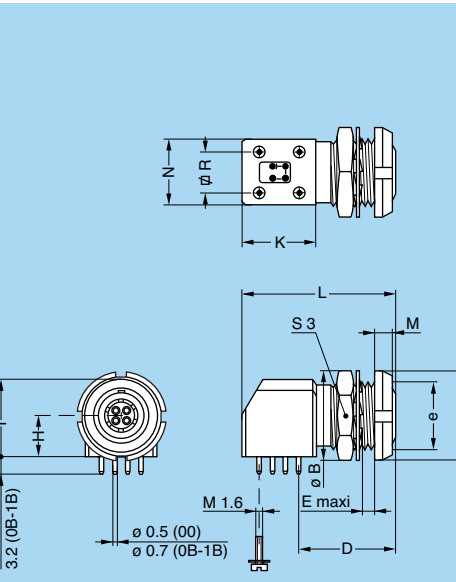
| Reference | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | D | H | I | K | L | N | R |
| EPG.00.302.HLN | 6.8 | 11.5 | 3.5 | 7.0 | 8.7 | 19 | 7.1 | 5.08 |
| EPG.00.303.HLN | | | | | | | | |
| EPG.00.304.HLN | | | | | | | | |
| EPG.0B.302.HLN | 9.0 | 14.6 | 6.7 | 12.6 | 13.3 | 25 | 11.7 | 7.62 |
| EPG.0B.303.HLN | | | | | | | | |
| EPG.0B.304.HLN | | | | | | | | |
| EPG.0B.305.HLN | | | | | | | | |
| EPG.0B.306.HLN | | | | | | | | |
| EPG.0B.307.HLN | | | | | | | | |
| EPG.0B.309.HLN | | | | | | | | |
| EPG.1B.302.HLN | 11.0 | 16.6 | 7.5 | 14.0 | 13.3 | 27 | 12.6 | 7.62 |
| EPG.1B.303.HLN | | | | | | | | |
| EPG.1B.304.HLN | | | | | | | | |
| EPG.1B.305.HLN | | | | | | | | |
| EPG.1B.306.HLN | | | | | | | | |
| EPG.1B.307.HLN | | | | | | | | |
| EPG.1B.308.HLN | | | | | | | | |
| EPG.1B.310.HLN | | | | | | | | |

**P18** PCB drilling pattern 00 series (page 158)

**P19** PCB drilling pattern 0B, 1B series (page 158)

**Note:** In the 0B and 1B series, it is possible to replace the 4 ground pins by 4 screws (M1.6) add an «S» to the end of the part number. (e.g.: EPG.0B.307.HLNS)






## EXG Elbow (90°) socket for printed circuit with two nuts, key (G) or keys (A…F) (solder or screw fixing) (back panel mounting)

## XBG Elbow (90°) socket fixing nut for printed circuit, key (G) or keys (A, B) (back panel mounting)

| Reference | Dimensions (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | D | e | E | H | I | K | L | M | N | R | S3 |
| XBG.00.302.HLN | 10 | 10.2 | 11.5 | M7x0.5 | 2.1 | 3.5 | 7.0 | 8.7 | 19 | 2.5 | 7.1 | 5.08 | 9 |
| XBG.00.303.HLN | | | | | | | | | | | | | |
| XBG.00.304.HLN | | | | | | | | | | | | | |
| EXG.0B.302.HLN | 12 | 12.4 | 14.6 | M9x0.6 | 4.5 | 6.7 | 12.6 | 13.3 | 25 | 2.5 | 11.7 | 7.62 | 11 |
| EXG.0B.303.HLN | | | | | | | | | | | | | |
| EXG.0B.304.HLN | | | | | | | | | | | | | |
| EXG.0B.305.HLN | | | | | | | | | | | | | |
| EXG.0B.306.HLN | | | | | | | | | | | | | |
| EXG.0B.307.HLN | | | | | | | | | | | | | |
| EXG.0B.309.HLN | | | | | | | | | | | | | |
| EXG.1B.302.HLN | 14 | 15.0 | 16.6 | M11x0.5 | 7.5 | 7.5 | 14.0 | 13.3 | 27 | 3.5 | 12.6 | 7.62 | 13 |
| EXG.1B.303.HLN | | | | | | | | | | | | | |
| EXG.1B.304.HLN | | | | | | | | | | | | | |
| EXG.1B.305.HLN | | | | | | | | | | | | | |
| EXG.1B.306.HLN | | | | | | | | | | | | | |
| EXG.1B.307.HLN | | | | | | | | | | | | | |
| EXG.1B.308.HLN | | | | | | | | | | | | | |
| EXG.1B.310.HLN | | | | | | | | | | | | | |

**P2** Panel cut-out 00, 0B series (page 152)

**P10** Panel cut-out 1B series (page 152)

**P18** PCB drilling pattern 00 series (page 158)

**P19** PCB drilling pattern 0B, 1B series (page 158)

**Note:** In the 0B and 1B series, it is possible to replace the 4 ground pins by 4 screws (M1.6) add an «S» to the end of the part number. (e.g.: EXG.0B.307.HLNS).

# Plastic housing models

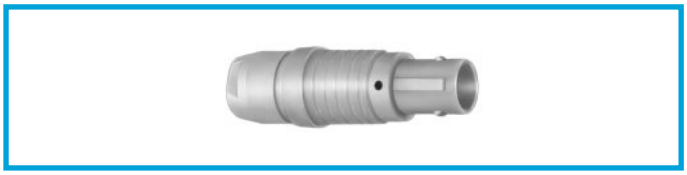
These connectors are particularly recommended for all applications requiring maximum electrical insulation when mated. The design, including a latch sleeve and a metal earthing crown, guarantees EMC screening efficiency to meet most requirements.

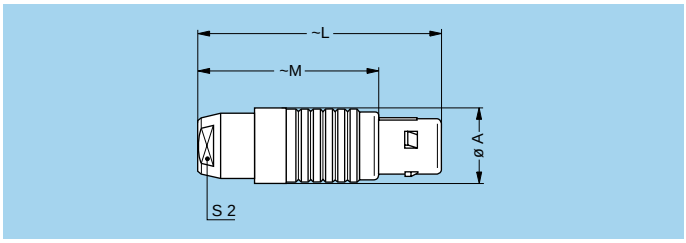
## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | | | Standard |
|---|---|---|---|---|
| | PEEK | PSU | PPSU | |
| Colour | natural (beige) | white or grey | cream | – |
| Endurance | > 5000 cycles | > 5000 cycles | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | | | – |
| Temperature range | - 50° C/+250° C | - 50° C/+150° C | - 50° C/+180° C | – |
| Sterilization resistance [1] | > 200 cycles | ~20 cycles | > 100 cycles | IEC 60601-1 § 44.7 |
| Resistance to solvents | very good | limited | good | – |

**Note:** [1] Steam sterilization

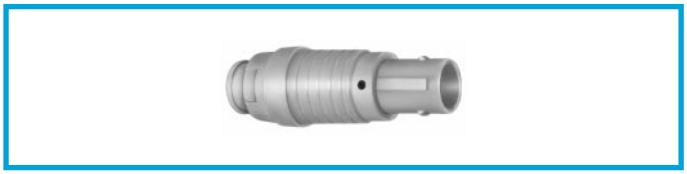


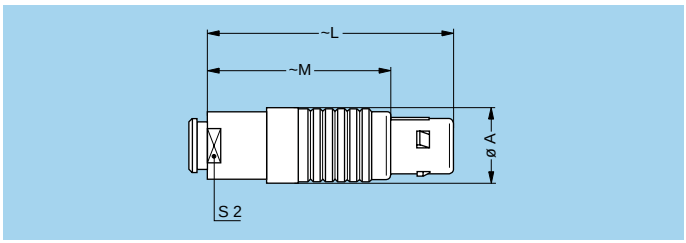



### FGG Straight plug, key (G or J), cable collet, PEEK outer shell

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGG | 1B | 13.5 | 43.0 | 32.0 | 10 |
| FGG | 3B | 19.0 | 62.0 | 47.0 | 15 |
| FGG | 4B | 26.0 | 78.5 | 60.5 | 20 |

**M1** Cable assembly (page 161)





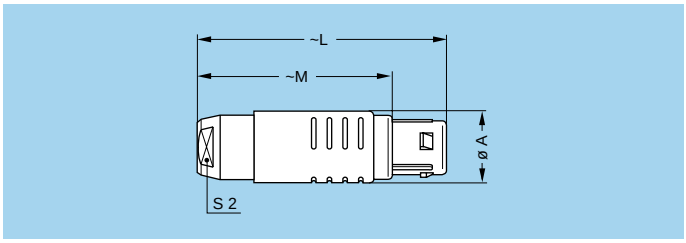

### FGG Straight plug, key (G or J), cable collet, PEEK outer shell and nut for fitting a bend relief [1]

| Reference | | Dimensions (mm) | | | | Note on availability |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 | |
| FGG | 1B | 13.5 | 42.2 | 31.2 | 10 | for all collet type |
| FGG | 4B | 26.0 | 83.2 | 65.2 | 20 | only from collet M82 and up |

**M1** Cable assembly (page 161)

**Note:** [1] to order, add a «Z» at the end of the reference.

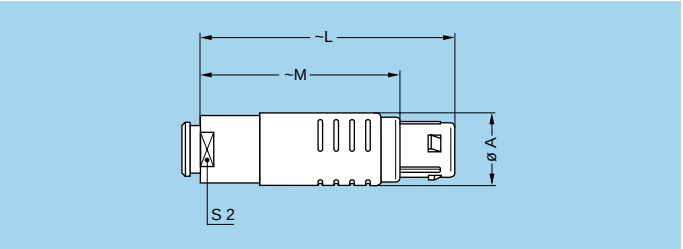
The bend relief must be ordered separately (see page 141).




### FGY Straight plug, keys (Y), cable collet and PSU or PPSU outer shell

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGY | 2B | 16.5 | 50.5 | 39.5 | 13 |
| FGY | 3B | 19.0 | 58.0 | 43.0 | 15 |
| FGY | 4B | 26.0 | 76.2 | 58.2 | 20 |

**M1** Cable assembly (page 161)



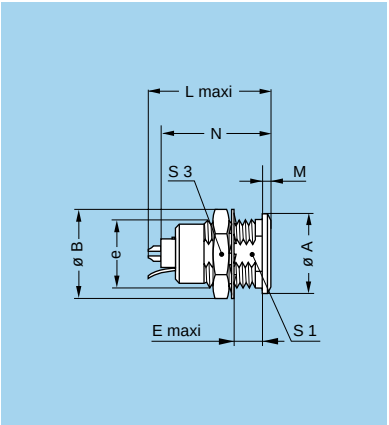

## FGY Straight plug, keys (Y), cable collet and PSU or PPSU outer shell and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | | | Note on availability |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 | |
| FGY | 2B | 16.5 | 49.5 | 38.5 | 13 | only for collet M42 and up |
| FGY | 3B | 19.0 | 56.5 | 41.5 | 15 | only for collet D62 and up |
| FGY | 4B | 26.0 | 74.4 | 56.4 | 20 | only for collet M82 and up |

**M1** Cable assembly (page 161)

**Note:** [1)] to order, add a «Z» at the end of the reference.

The bend relief must be ordered separately (see page 141).

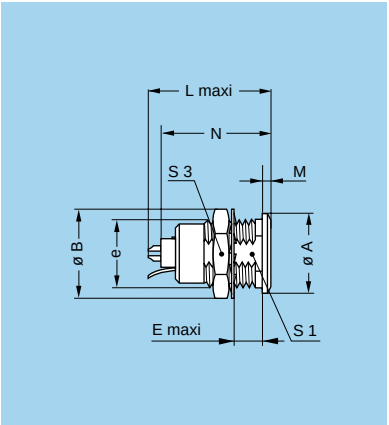



## ENG Fixed socket with earthing tag, nut fixing, key (G or J), PEEK outer shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| ENG | 1B | 14 | 15.8 | M12x1.0 | 7.5 | 23.0 | 1.5 | 21.1 | 10.5 | 14 |
| ENG | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 30.7 | 2.0 | 28.1 | 16.5 | 22 |
| ENG | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 35.7 | 2.5 | 32.6 | 23.5 | 30 |

**P1** Panel cut-out (page 152)

**Note:** [1)] maximum length with crimp contacts.




## ENY Fixed socket with earthing tag, nut fixing, keys (Y), PSU or PPSU outer shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| ENY | 2B | 18 | 19.2 | M15x1.0 | 8.5 | 26.7 | 1.8 | 24.6 | 13.5 | 17 |
| ENY | 3B | 22 | 25.0 | M18x1.0 | 11.5 | 30.7 | 2.0 | 28.1 | 16.5 | 22 |
| ENY | 4B | 28 | 34.0 | M25x1.0 | 12.0 | 35.7 | 2.5 | 32.6 | 23.5 | 30 |

**P1** Panel cut-out (page 152)

**Note:** [1)] maximum length with crimp contacts.

**Note:** other models with plastic outer shell are available on request.

# Watertight or vacuumtight models

These plug, socket and coupler models allow the device on which they are fitted to reach a protection index of IP68 as per IEC 60529. They are fully compatible with plugs of the same series and are widely used for portable radios, military, laboratory equipment, aviation, etc.
These models are identified by a letter «P» at the end of the reference.
Most of these models are also available in a vacuumtight version. Such models are identified by an additional letter «V» at the end of the part number (certificate on request).
Epoxy resin is used to seal these models.

## Technical Characteristics

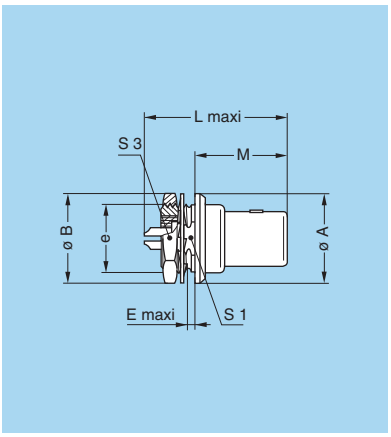
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range (00 to 1B) | - 20° C/+100° C | |
| Temperature range (2B to 5B) | - 20° C/+80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Climatical category | 20/80/21 | IEC 60068-1 |
| Leakage rate (He)[1)] | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |

**Note:** [1)] only for vacuumtight models.

| Characteristics | | Value | Standard |
|---|---|---|---|
| Maximum operating pressure[2)] | 00 | 60 bar | IEC 60512-7 test 14d |
| | 0B | 60 bar | |
| | 1B | 60 bar | |
| | 2B | 40 bar | |
| | 3B | 30 bar | |
| | 4B | 15 bar | |
| | 5B | 5 bar | |

**Note:** [2)] this value corresponds to the maximum allowed pressure difference for the assembled socket.

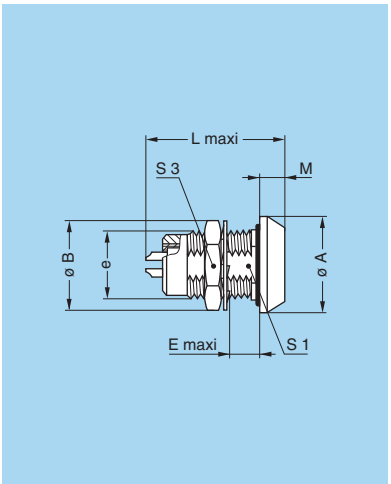



### YHG Fixed plug, nut fixing, non-latching, key (G) or keys (A…M)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| YHG | 0B | 13.0 | 12.4 | M9x0.6 | 2.4 | 24.1 | 14.2 | 8.2 | 11 |
| YHG | 1B | 16.0 | 15.8 | M12x1.0 | 3.9 | 28.0 | 16.2 | 10.5 | 14 |
| YHG | 2B | 19.0 | 19.2 | M15x1.0 | 5.5 | 33.1 | 17.8 | 13.5 | 17 |
| YHG | 3B | 22.0 | 25.0 | M18x1.0 | 5.1 | 38.2 | 22.2 | 16.5 | 22 |

**P9** Panel cut-out (page 152)

**Note:** this model does not include an O-ring behind the flange, it ensures only IP61 protection index. Consequently, it is not vacuumtight. Watertightness (when mated) is only ensured with HHG and HCG sockets.

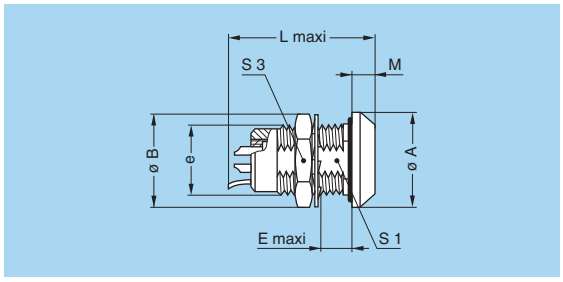



### HGG Fixed socket, nut fixing, key (G) or keys (A…M and R), watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| HGG | 00 | 11 | 10.2 | M7x0.5 | 8.0 | 18.0 | 1.5 | – | 9 |
| HGG | 0B | 13 | 12.4 | M9x0.6 | 7.0 | 21.5 | 3.0 | 8.2 | 11 |
| HGG | 1B | 18 | 15.8 | M12x1.0 | 7.0 | 26.6 | 4.5 | 10.5 | 14 |
| HGG | 2B | 20 | 19.2 | M15x1.0 | 8.0 | 31.6 | 4.0 | 13.5 | 17 |
| HGG | 3B | 25 | 25.0 | M18x1.0 | 11.5 | 36.1 | 4.0 | 16.5 | 22 |
| HGG | 4B | 34 | 34.0 | M25x1.0 | 11.0 | 43.1 | 4.0 | 23.5 | 30 |
| HGG | 5B | 45 | 40.0 | M35x1.0 | 11.0 | 53.6 | 5.0 | 33.5 | – |

**P9** Panel cut-out (page 152)

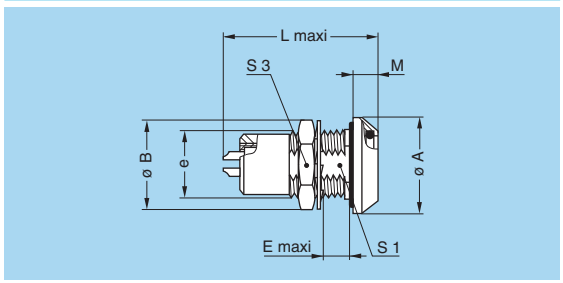
**Note:** the 5B series is delivered with a tapered washer and a round nut.




## HNG Fixed socket, nut fixing, with earthing tag, key (G) or keys (A…M), watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| HNG | 0B | 13 | 12.4 | M9x0.6 | 7 | 21.5 | 3 | 8.2 | 11 |

P9 Panel cut-out (page 152)

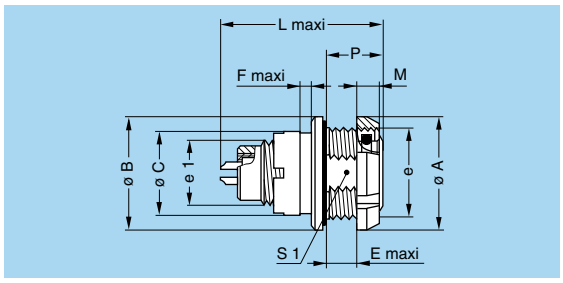



## HHG Fixed socket, nut fixing, key (G) or keys (A…M), watertight or vacuumtight (watertight when mated)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| HHG | 0B | 13 | 12.4 | M9x0.6 | 7.0 | 24.5 | 4.8 | 8.2 | 11 |
| HHG | 1B | 18 | 15.8 | M12x1.0 | 7.0 | 30.3 | 5.2 | 10.5 | 14 |
| HHG | 2B | 22 | 19.2 | M15x1.0 | 8.0 | 35.6 | 6.0 | 13.5 | 17 |
| HHG | 3B | 25 | 25.0 | M18x1.0 | 11.5 | 41.3 | 7.2 | 16.5 | 22 |

P9 Panel cut-out (page 152)

**Note:** this model ensures watertightness (IP66) in the mating area when mated with FGG or similar plug.

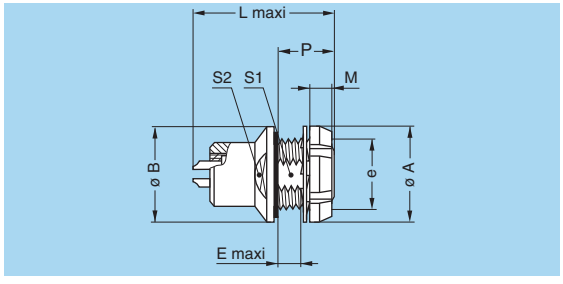



## HCG Fixed socket, nut fixing, key (G) or keys (A…M), watertight or vacuumtight (watertight when mated) (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | e | e1 | E | F | L | M | P | S1 |
| HCG | 0B | 18 | 18 | 12.0 | M14x1.0 | M9x0.6 | 3.9 | 1.0 | 24.5 | 3.5 | 7.5 | 12.5 |
| HCG | 1B | 20 | 20 | 14.5 | M16x1.0 | M12x1.0 | 6.2 | 2.0 | 30.3 | 3.5 | 10.0 | 14.5 |
| HCG | 2B | 24 | 24 | 17.5 | M19x1.0 | M14x1.0 | 6.7 | 1.5 | 35.6 | 3.5 | 11.3 | 17.0 |

P3 Panel cut-out (page 152)

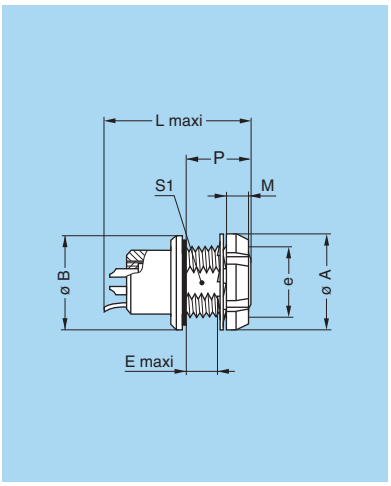
**Note:** this model ensures watertightness (IP66) in the mating area when mated with FGG or similar plug.




## HEG Fixed socket, nut fixing, key (G) or keys (A…M), watertight or vacuumtight (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | P | S1 | S2 |
| HEG | 00 | 10 | 11 | M7x0.5 | 2.5 | 18.2 | 2.5 | 6.0 | 6.3 | – |
| HEG | 0B | 12 | 13 | M9x0.6 | 5.5 | 21.5 | 2.5 | 9.0 | 8.2 | – |
| HEG | 1B | 16 | 18 | M12x1.0 | 6.5 | 26.6 | 3.5 | 11.0 | 10.5 | – |
| HEG | 2B | 20 | 20 | M15x1.0 | 5.0 | 31.6 | 3.5 | 9.6 | 13.5 | 15 |

P9 Panel cut-out (page 152)



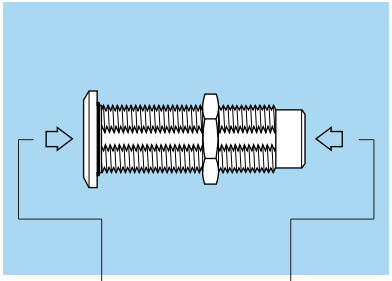

## HMG Fixed socket with earthing tag, nut fixing, key (G) or keys (A…M), watertight or vacuumtight (back panel mounting)

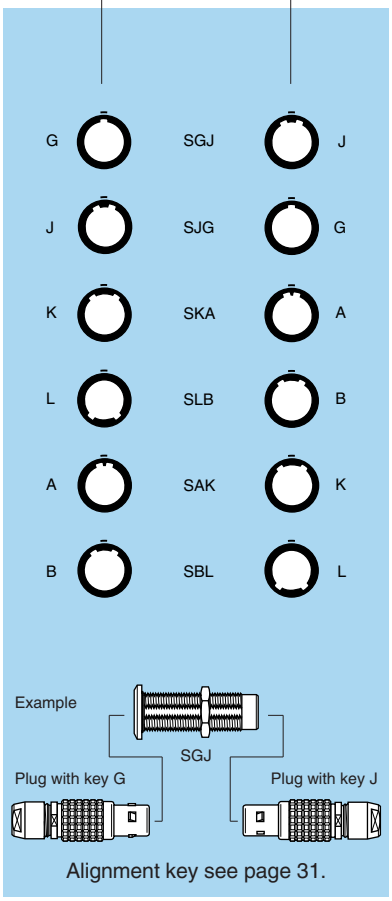
| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | P | S1 |
| HMG | 00 | 10 | 11 | M7x0.5 | 2.5 | 18.0 | 2.5 | 6.0 | 6.3 |
| HMG | 0B | 12 | 13 | M9x0.6 | 5.5 | 21.5 | 2.5 | 9.0 | 8.2 |
| HMG | 1B | 16 | 18 | M12x1.0 | 5.5 | 26.6 | 3.5 | 11.0 | 10.5 |
| HMG | 2B[1)] | 20 | 20 | M15x1.0 | 5.5 | 31.6 | 3.5 | 9.6 | 13.5 |
| HMG | 3B | 24 | 25 | M18x1.0 | 7.5 | 36.1 | 4.5 | 14.0 | 16.5 |

P9 Panel cut-out (page 152)

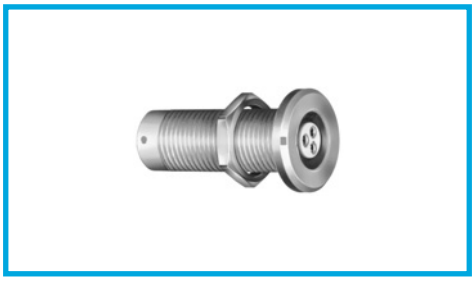
**Note:** 1) the surface design of the 2B series is different.
The 3B series is delivered with a conical nut.

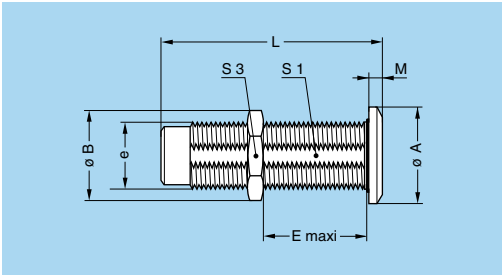
## S●● Fixed coupler, nut fixing, key (G) or keys (A, B, J, K and L) at the flange end and key (G) or keys (A, B, J, K and L) at the other end, watertight or vacuumtight






Alignment key see page 31.






| Reference | | Contacts | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | Type | A | B | e | E | L | M | S1 | S3 |
| SGJ | 0B | female – male | 14 | 13.8 | M10x0.75 | 17 | 34 | 2.0 | 9.0 | 12 |
| SJG | | male – female | | | | | | | | |
| SGJ | 1B | female – male | 17 | 15.8 | M12x1.00 | 28 | 39 | 2.5 | 10.5 | 14 |
| SJG | | male – female | | | | | | | | |
| SGJ | 2B | female – male | 20 | 21.5 | M16x1.00 | 25 | 44 | 4.0 | 15.0 | 19 |
| SJG | | male – female | | | | | | | | |
| SGJ | 3B | female – male | 25 | 27.0 | M20x1.00 | 30 | 53 | 4.0 | 18.5 | 24 |
| SJG | | male – female | | | | | | | | |
| SAK | | female – male | | | | | | | | |
| SBL | | female – male | | | | | | | | |
| SAK | 4B | female – male | 34 | 34.0 | M25x1.00 | 50 | 65 | 4.0 | 23.5 | 30 |
| SBL | | female – male | | | | | | | | |
| SGJ | | female – male | | | | | | | | |
| SJG | | male – female | | | | | | | | |
| SGJ | 5B | female – male | 45 | 40.0 | M35x1.00 | 58 | 80 | 5.0 | 33.5 | – |
| SJG | | male – female | | | | | | | | |
| SKA | | male – female | | | | | | | | |
| SLB | | male – female | | | | | | | | |
| SAK | | female – male | | | | | | | | |
| SBL | | female – male | | | | | | | | |

P4 Panel cut-out (page 152)

P9 Panel cut-out 1B series (page 152)

**Note:** for this fixed coupler, the first contact type mentioned is always the one at the flange end.
On request these couplers can be produced in other series, with other keys.
The 5B series is delivered with a round nut.

# Bridge models

## Technical Characteristics

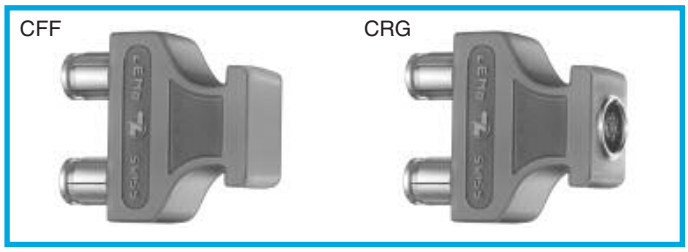
### Mechanical and Climatical

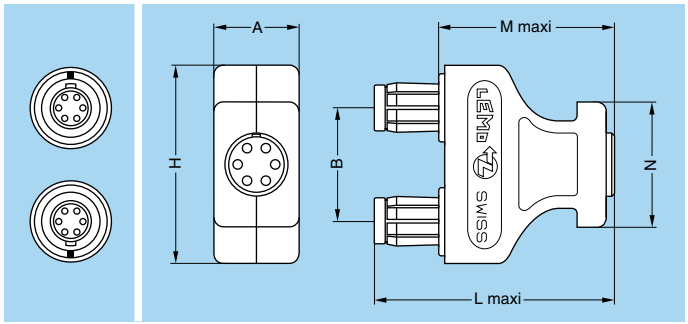
| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 1000 cycles | IEC 60512-5 test 9a |
| Working temperature | maximum 90° C | |

### Materials and Treatment

| Component | Material | Surface treat. (µm) | | | |
|---|---|---|---|---|---|
| | | Cu | Ni | Cr | Au |
| Plastic housing | Polyamide | – | | | |
| Metallic parts | Brass | 0.5 | 3 | – | – |
| | Brass | 0.5 | 3 | 0.3 | – |
| Insulator | PEEK | – | | | |
| Male contact | Brass | 0.5 | 3 | – | 1.0 |
| Female contact | Bronze | 0.5 | 3 | – | 1.5 |

**Note:** the surface treatment standards are as follows:
– Nickel: SAE AMS QQ N 290, chrome: SAE AMS 2460, gold: ISO 27874




### Electrical

| Characteristics | Value | Standard |
|---|---|---|
| Contact resistance | < 6 mΩ | IEC 60512-2 test 2a |

| Reference | Series | Audio-Mono | Audio-Stereo | Test voltage (kV rms) [1][2] | Rated current (A) |
|---|---|---|---|---|---|
| CFF.0B.302.PLCG | 0B | ● | – | 1.05 | 4 |
| CRG.0B.302.PLEG | 0B | ● | – | 1.05 | 4 |
| CFF.0B.303.PLCG | 0B | ● | – | 0.80 | 4 |
| CRG.0B.303.PLEG | 0B | ● | – | 0.80 | 4 |
| CRG.0B.306.PLEG | 0B | – | ● | 0.40 | 2 |
| CFF.1B.303.PLCG | 1B | ● | – | 1.25 | 5 |
| CRG.1B.303.PLEG | 1B | ● | – | 1.25 | 5 |
| CFF.1B.306.PLCG | 1B | – | ● | 0.80 | 3 |
| CRG.1B.306.PLEG | 1B | – | ● | 0.80 | 3 |

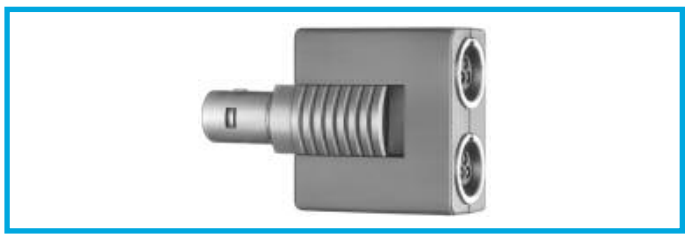
**Note:** the last letter of the part number indicates the colour of the housing. Ex. G (standard) is grey. To obtain another colour, replace this letter by the letter corresponding to the selected colour (see table on page 54).
[1] see calculation method, caution and suggested standard on page 178.
[2] lowest measured value; contact to contact or contact to shell.

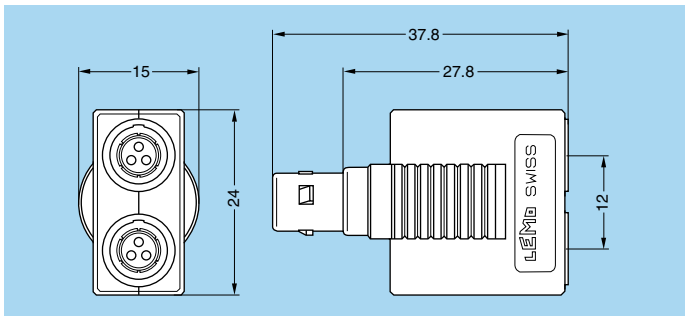
### CFF Bridge plug with two non-latching plugs

### CRG Bridge plug with two non-latching plugs, and monitoring socket, key (G) or keys (A…M)

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | H | L | M | N |
| CFF-CRG | 0B | 13.5 | 14 | 27.5 | 37.2 | 27.2 | 22.5 |
| CFF-CRG | 1B | 15.0 | 20 | 35.0 | 42.0 | 31.0 | 22.0 |

**Note:** in order to provide the user with a coding system, the bridge plug housing, the double panel washers and the bend reliefs are available in nine colours.

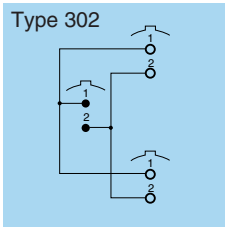


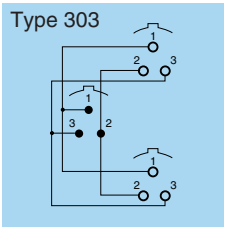


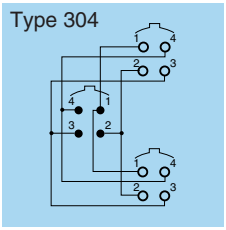

### FTG Straight plug, key (G) and two parallel sockets

| Reference | Number of contacts | Test voltage (kV rms) [1] | Rated current (A) |
|---|---|---|---|
| FTG.0B.302.PLFG | 2 | 1.05 | 4 |
| FTG.0B.303.PLFG | 3 | 0.80 | 4 |
| FTG.0B.304.PLFG | 4 | 0.80 | 3 |

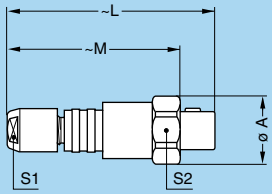
**Note:**
[1] see calculation method, caution and suggested standard on page 178.



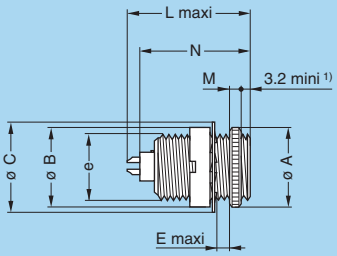
# Threaded-latching models




## FVG Straight plug, key (G) or keys (B), cable collet

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FVG | 00 | 9 | 28.5 | 24 | 5 | 8 |

**Note:** to be ordered with nut for fitting a bend relief to obtain the rating IP 64.

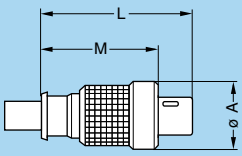



## ESG Fixed socket with two round nuts, key (G) or keys (B), long threaded shell (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | e | E | L | M | N |
| ESG | 00 | 9 | 9 | 9.5 | M7x0.5 | 3.2 | 15.5 | 2 | 13.7 |

P2 Panel cut-out (page 152)

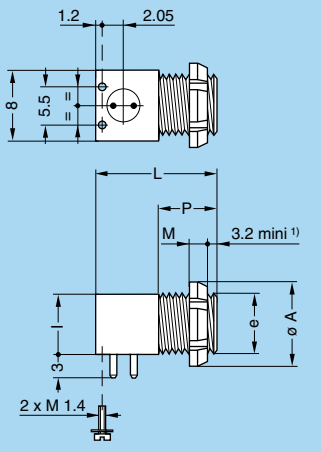
**Note:** 1) minimum length of free thread to ensure mating.




## FVB Straight plug, keys (B), short shell for special cable crimping and for fitting a bend relief

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | M |
| FVB | 00 | 9 | 20 | 15.4 |

**Note:** after assembly the special bend relief GMF.00.018.D● (to be ordered separately) is to be fitted.




## XRB Elbow (90°) socket for printed circuit, keys (B), short shell with one nut, screw fixing (back panel mounting)

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | e | I | L | M | P |
| XRB | 00 | 10 | M7x0.5 | 7 | 14 | 2.5 | 7 |

P2 Panel cut-out (page 152)

P18 PCB drilling pattern for contact only (page 158)

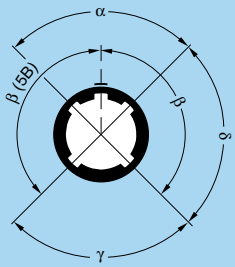
**Note:** 1) minimum length of free thread to ensure mating.

# Alignment Key (B series)

## Alignment Key and Polarized Keying System

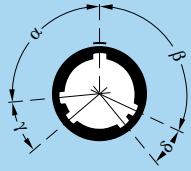
B series connector model part numbers are composed of three letters. The LAST LETTER indicates the key position and the contact type (male or female).

Front view of a socket




| Reference | Nb of keys | Angles | Series 00 | Series 0B | Series 1B | Reference | Nb of keys | Angles | Series XB | Series 2B | Series 3B | Series 4B | Series 5B | Contact type Plug | Contact type Socket | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1 | | 0° | 0° | 0° | G | 1 | | 0° | 0° | 0° | 0° | 0° | male | female | ● |
| A | 2 | α | 30° | 30° | 30° | A | 2 | α | 30° | 30° | 30° | 30° | 30° | male | female | ● |
| B | 2 | α | 60° | 60° | 60° | B | 2 | α | – | 45° | 45° | 45° | 45° | male | female | ● |
| C | 2 | α | – | 90° | 90° | C | 2 | α | – | 60° | 60° | 60° | 60° | male | female | ● |
| D | 2 | β | – | 135° | 135° | D | 2 | γ | – | 95° | 95° | 95° | 95° | male | female | ○ |
| E | 2 | β | – | 145° | 145° | E | 2 | β | 120° | 120° | 120° | 120° | 120° | male | female | ○ |
| F | 2 | β | – | 155° | 155° | F | 2 | β | – | 145° | 145° | 145° | 145° | male | female | ○ |
| J | 2 | γ | 45° | 45° | 45° | J | 2 | α | – | 37.5° | 37.5° | 37.5° | 37.5° | female | male | ● |
| K | 2 | γ | – | 70° | 70° | K | 2 | α | – | 52.5° | 52.5° | 52.5° | 52.5° | female | male | ○ |
| L | 2 | γ | – | 80° | 80° | L | 2 | γ | – | 70° | 70° | 70° | 70° | female | male | ○ |
| M | 2 | δ | – | 110° | – | M | 2 | – | – | – | – | – | – | female | male | ○ |
| Y | 3 | – | – | – | – | Y | 3 | β | – | 112.5° | 126° | 112.5° | – | male | female | ●[1)] |
| | | – | – | – | – | | | γ | – | 100° | 102° | 147.5° | – | | | |

Front view of a socket




| Reference | Nb of keys | Angles | Series 00 | Series 0B | Series 1B | Reference | Nb of keys | Angles | Series XB | Series 2B | Series 3B | Series 4B | Series 5B | Contact type Plug | Contact type Socket | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | 5 | α | – | – | – | R | 5 | α | – | – | – | – | 95° | male | female | ● |
| | | β | – | – | – | | | β | – | – | – | – | 115° | | | |
| | | γ | – | – | – | | | γ | – | – | – | – | 20° | | | |
| | | δ | – | – | – | | | δ | – | – | – | – | 30° | | | |

**Note:**
FTG, FGY, ENY models are not available with all the keys. Please consult pages corresponding to these models.
For R●● models see explanation on page 21 and for S●● models see explanation on page 28.
[1)] only FGY and ENY models are available.

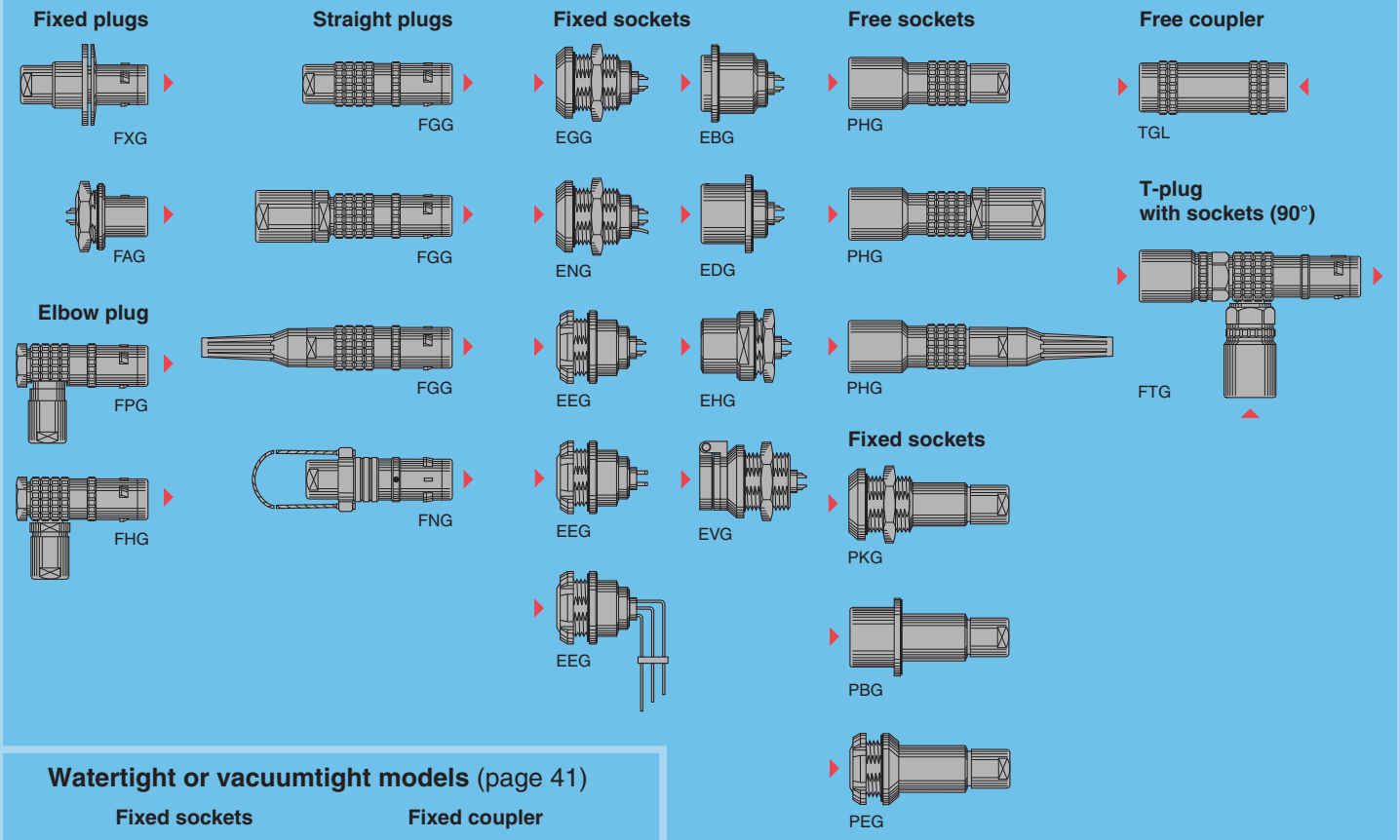
● First choice alternative
○ Special order alternative

# K Series

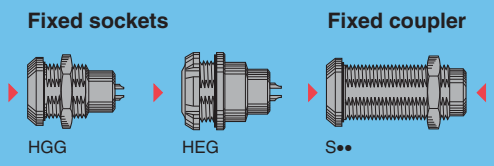
K series connectors have been specifically designed for outdoor applications.
They include an inner sleeve and two seals to prevent penetration of solids or liquids into the housing formed by the plug, free socket, fixed socket or coupler. All models of this series are watertight when mated to give a protection index of IP68 as per IEC 60529 standard (in mated condition) when correctly assembled to an appropriate cable (IP66 otherwise).
K series connectors have the same insulators as the B series and have the following main features:

- security of the Push-Pull latching system
- multipole types 2 to 64 contacts
- keying system («G» key standard) for connector alignment
- 360° screening for full EMC shielding
- rugged housing for extreme working conditions.
- watertight connection (IP 68/IP 66)
- solder, crimp or print (straight or elbow) contacts
- multiple key options to avoid cross mating of similar connectors
- high packing density for space savings

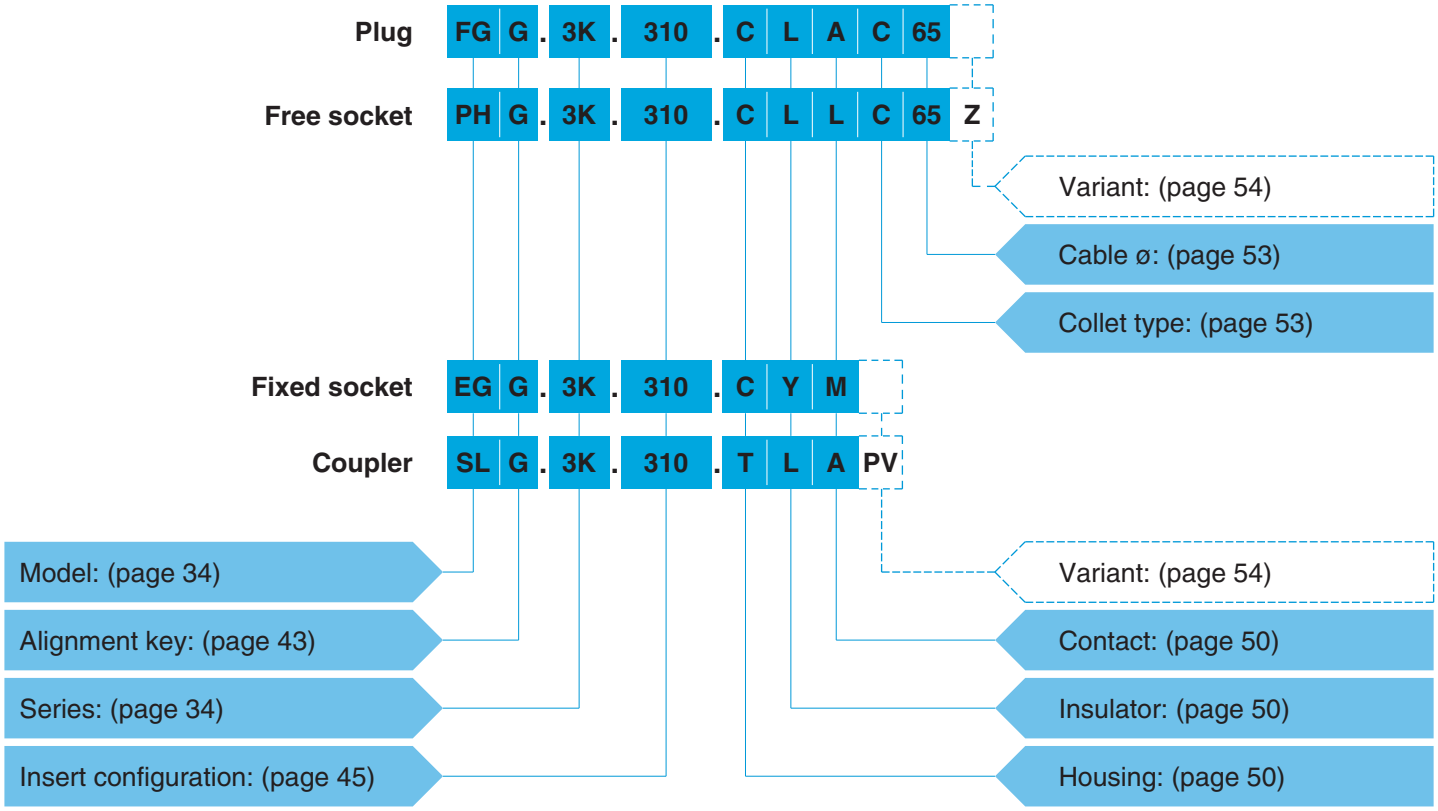
## Metal housing models (page 34)




## Watertight or vacuumtight models (page 41)



## Part Numbering System




## Part Number Example

**Straight plug with cable collet:**
**FGG.3K.310.CLAC65** = straight plug with key (G) and cable collet, 3K series, multipole type with 10 contacts, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 6.5 mm diameter cable.

**Free socket:**
**PHG.3K.310.CLLC65Z** = free socket with key (G) and cable collet, 3K series, multipole type with 10 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts, C type collet for 6.5 mm diameter cable and nut for fitting a bend relief.

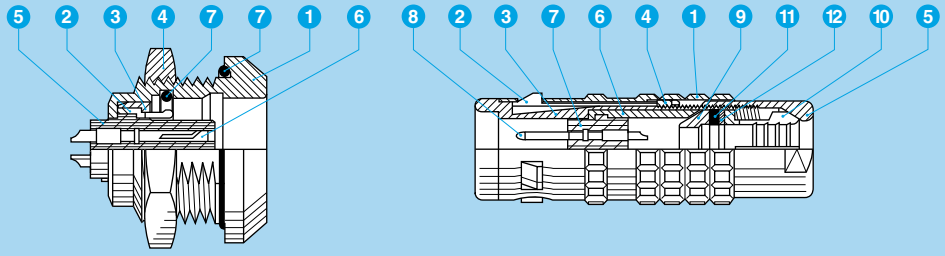
**Fixed socket:**
**EGG.3K.310.CYM** = fixed socket, nut fixing, with key (G), 3K series, multipole type with 10 contacts, outer shell in chrome-plated brass, PEEK extended insulator, female crimp contacts.

**Fixed coupler:**
**SLG.3K.310.TLAPV** = fixed coupler, nut fixing, keys (L) on the flange end and key (G) at the other end, 3K series, multipole type with 10 contacts, outer shell in stainless steel, PEEK insulator, male-female contacts, vacuumtight.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. earthing crown
3. retaining ring
4. hexagonal nut
5. insulator
6. female contact
7. o-ring




**Straight plug**

1. outer shell
2. latch sleeve
3. inner shell
4. retaining ring
5. collet nut
6. split insert carrier
7. insulator
8. male contact
9. earthing cone
10. collet
11. gasket
12. washer

# Metal housing models

## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range[1)] | - 55° C, +200° C | |
| Resistance to vibrations | 10-2000 Hz, 15 g | IEC 60512-4 test 6d |
| Shock resistance | 100 g, 6 ms | IEC 60512-4 test 6c |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index (mated)[2)] | IP 68/IP 66 | IEC 60529 |
| Climatical category | 50/175/21 | IEC 60068-1 |

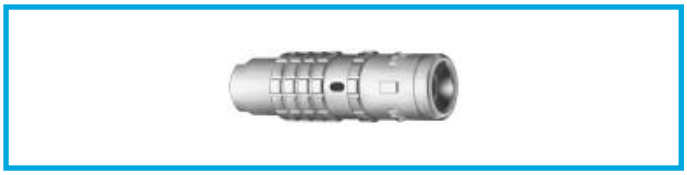
### Electrical

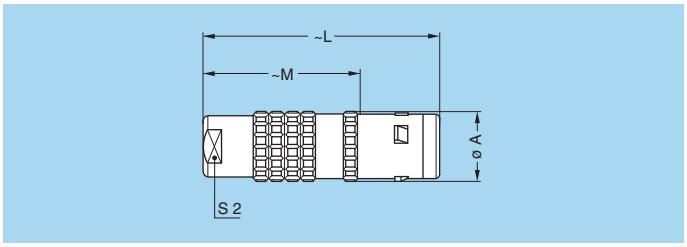
| Characteristics | | Value | Standard |
|---|---|---|---|
| Shielding efficiency | at 10 MHz | > 95 dB | IEC 60169-1-3 |
| | at 1 GHz | > 80 dB | IEC 60169-1-3 |

**Note:**
the various tests have been carried out with FGG and EGG connector pairs, with chrome-plated brass shell, PEEK insulator and silicone O-ring. Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

1) minimum operating temperature is -20°C for sockets fitted with an FPM (Viton®) O-ring.

2) IP68 achieved providing that the cable is perfectly circular and that assembly process ensures a high integrity seal.

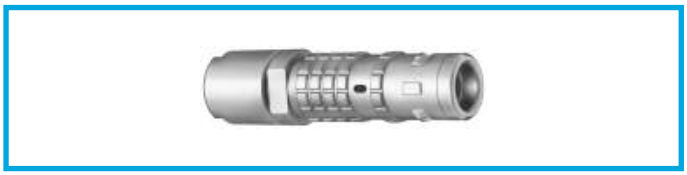


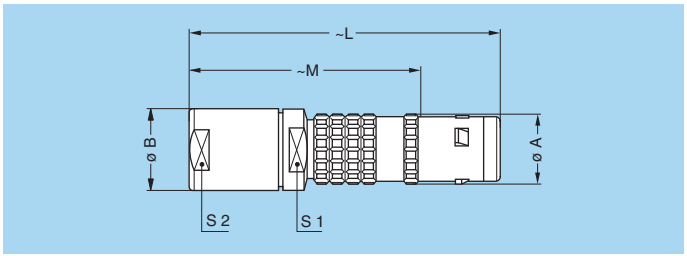



### FGG Straight plug, key (G) or keys (A to F, L and R), cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGG | 0K | 11 | 34 | 23.0 | 8 |
| FGG | 1K | 13 | 42 | 28.0 | 9 |
| FGG | 2K | 16 | 52 | 36.0 | 12 |
| FGG | 3K | 19 | 61 | 41.0 | 15 |
| FGG | 4K | 25 | 71 | 50.5 | 19 |
| FGG | 5K | 38 | 92 | 67.0 | 30 |

M1 Cable assembly (page 162)



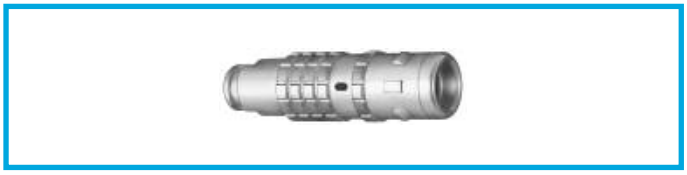


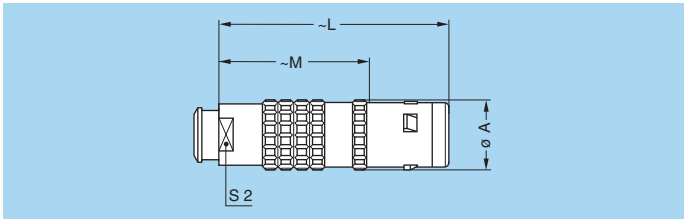

### FGG Straight plug, key (G) or keys (A to F, L and R), cable collet and oversize cable collet [1)]

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | S1 | S2 |
| FGG | 1K | 13 | 14.5 | 60.0 | 46 | 12 | 12 |
| FGG | 2K | 16 | 17.0 | 68.0 | 52 | 15 | 15 |
| FGG | 3K | 19 | 22.0 | 85.0 | 65 | 19 | 19 |
| FGG | 4K | 25 | 36.0 | 119.5 | 99 | 30 | 32 |

M2 Cable assembly (page 163)

**Note:** 1) correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 53).



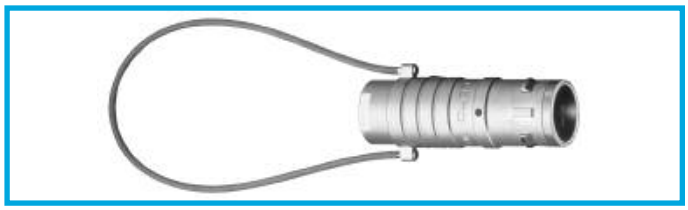


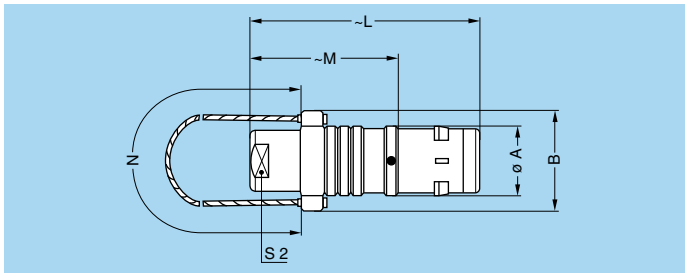

### FGG Straight plug, key (G) or keys (A to F, L and R), cable collet and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGG | 0K | 11 | 34 | 23.0 | 7 |
| FGG | 1K | 13 | 42 | 28.0 | 9 |
| FGG | 2K | 16 | 52 | 36.0 | 12 |
| FGG | 3K | 19 | 60 | 40.0 | 15 |
| FGG | 4K | 25 | 71 | 50.5 | 19 |

M1 Cable assembly (page 162)

**Note:** 1) to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).



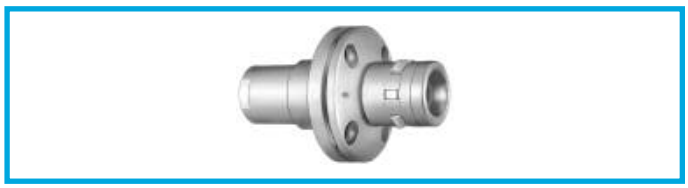


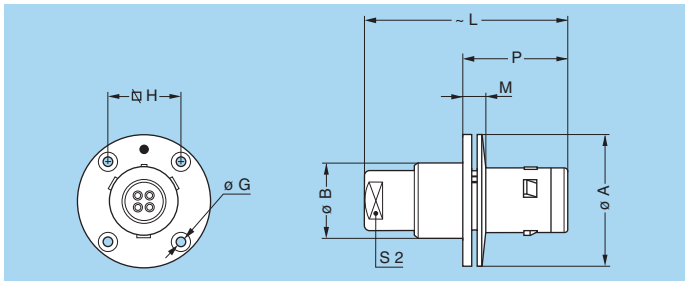

## FNG Straight plug, key (G) or keys (A to F and L), cable collet and lanyard release

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | N | S2 |
| FNG | 2K | 16 | 22 | 52 | 36.0 | 160 | 12 |
| FNG | 4K | 25 | 32 | 71 | 50.5 | 230 | 19 |

**M1** Cable assembly (page 162)

**Note:** cable material: stainless steel with Polyamide sheath



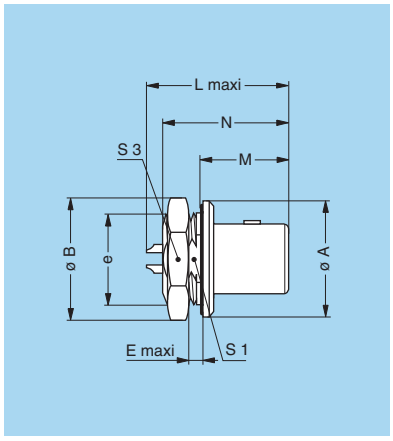



## FXG Fixed plug with round flange, key (G) or keys (A to F, L and R) and screw fixing

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | G | H | L | M | P | S2 |
| FXG | 3K | 38 | 22.5 | 3.4 | 20.6 | 61 | 10.0 | 30.0 | 15 |
| FXG | 4K | 47 | 28.5 | 3.4 | 27.0 | 71 | 11.0 | 32.0 | 19 |
| FXG | 5K | 65 | 42.5 | 4.4 | 38.0 | 100 | 12.5 | 38.5 | 30 |

**P6** Panel cut-out (page 153)

**Note:** this model does not include an O-ring behind the flange, it allows the device on which it is fitted to reach only IP50 protection index.
It does not have a cable collet.

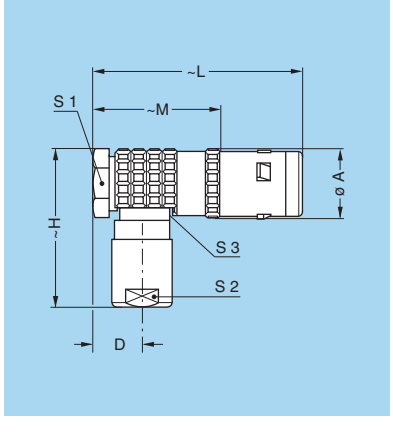



## FAG Fixed plug, nut fixing, non-latching, key (G) or keys (A to F, L and R)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| FAG | 1K | 20 | 21.5 | M16x1.0 | 2.3 | 22.6 | 16.0 | 22.5 | 14.5 | 19 |
| FAG | 2K | 25 | 27.0 | M20x1.0 | 4.5 | 33.6 | 18.0 | 28.3 | 18.5 | 24 |
| FAG | 3K | 31 | 34.0 | M24x1.0 | 4.0 | 34.3 | 22.5 | 33.8 | 22.5 | 30 |
| FAG | 4K | 37 | 40.5 | M30x1.0 | 4.0 | 35.3 | 23.0 | 36.3 | 28.5 | 36 |
| FAG | 5K | 55 | 54.0 | M45x1.5 | 4.0 | 43.5 | 28.5 | 42.3 | 42.5 | – |

**P1** Panel cut-out (page 153)

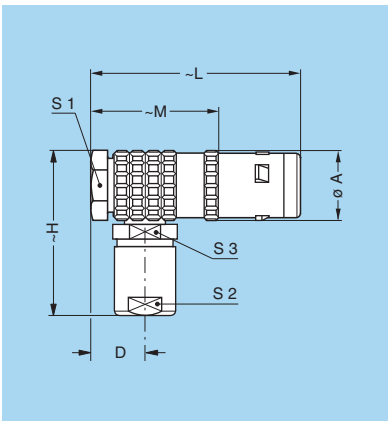
**Note:** [1)] maximum length with crimp contacts. The 1K series is delivered with a locking washer. The 5K series is delivered with a round nut.




## FPG Elbow (90°) plug, key (G) or keys (A to F, L and R), cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FPG | 0K | 11 | 7.3 | 25 | 36 | 25 | 9 | 8 | 8 |
| FPG | 1K | 13 | 8.7 | 33 | 42 | 28 | 11 | 9 | 10 |
| FPG | 2K | 16 | 10.2 | 40 | 51 | 35 | 14 | 12 | 13 |

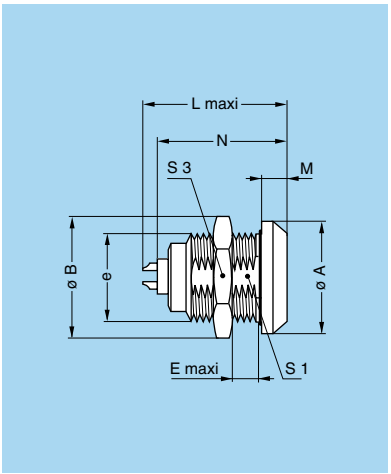
**M3** Cable assembly (page 162)




## FHG Elbow (90°) plug, key (G) or keys (A to F, L and R), cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FHG | 3K | 21.0 | 11.5 | 47 | 60 | 40.0 | 18 | 15 | 15 |
| FHG | 4K | 27.5 | 15.5 | 57 | 72 | 51.5 | 24 | 19 | 20 |

**M3** Cable assembly (page 162)

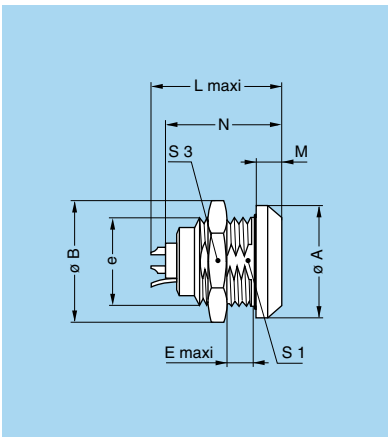



## EGG Fixed socket, nut fixing, key (G) or keys (A to F, L and R)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| EGG | 0K | 18 | 19.2 | M14x1.0 | 6 | 21.7 | 4.0 | 20.1 | 12.5 | 17 |
| EGG | 1K | 20 | 21.5 | M16x1.0 | 9 | 27.0 | 4.5 | 25.1 | 14.5 | 19 |
| EGG | 2K | 25 | 27.0 | M20x1.0 | 9 | 30.7 | 5.0 | 28.6 | 18.5 | 24 |
| EGG | 3K | 31 | 34.0 | M24x1.0 | 11 | 36.2 | 6.0 | 33.6 | 22.5 | 30 |
| EGG | 4K | 37 | 40.5 | M30x1.0 | 9 | 40.2 | 6.5 | 38.6 | 28.5 | 36 |
| EGG | 5K | 55 | 54.0 | M45x1.5 | 10 | 47.5 | 9.0 | 43.6 | 42.5 | – |

**P1** Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.
The 5K series is delivered with a round nut.

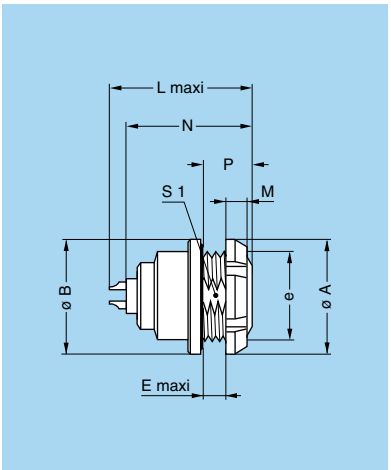



## ENG Fixed socket, nut fixing, key (G) or keys (A to F, L and R) and earthing tag

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| ENG | 3K | 31 | 34 | M24x1.0 | 11.3 | 36.2 | 6 | 33.6 | 22.5 | 30 |

**P1** Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.

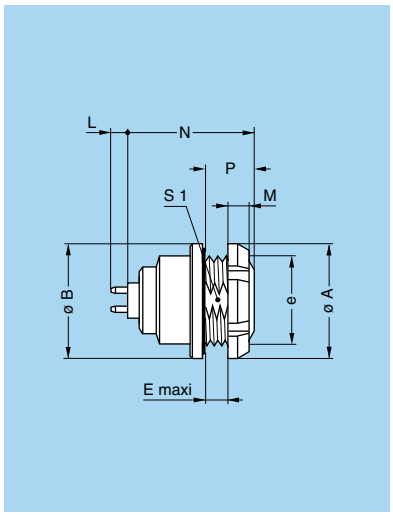



## EEG Fixed socket, nut fixing, key (G) or keys (A to F, L and R) (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | P | S1 |
| EEG | 0K | 18.0 | 18 | M14x1.0 | 3.4 | 21.7 | 3.5 | 20.1 | 7.0 | 12.5 |
| EEG | 1K | 20.0 | 20 | M16x1.0 | 6.2 | 27.0 | 3.5 | 25.1 | 10.0 | 14.5 |
| EEG | 2K | 25.0 | 25 | M20x1.0 | 5.0 | 30.7 | 3.5 | 28.6 | 10.0 | 18.5 |
| EEG | 3K | 30.0 | 31 | M24x1.0 | 7.5 | 36.2 | 4.5 | 33.6 | 12.0 | 22.5 |
| EEG | 4K | 41.5 | 37 | M30x1.0 | 6.0 | 40.2 | 7.0 | 38.6 | 13.5 | 28.5 |

**P1** Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.
The 3K and 4K series are delivered with a conical nut.

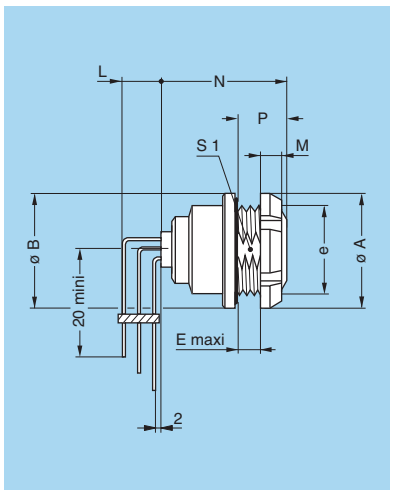



## EEG Fixed socket, nut fixing, key (G) or keys (A to F and R) with straight print contacts for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | P | S1 |
| EEG | 0K | 18.0 | 18 | M14x1.0 | 3.4 | 3.5 | 17.6 | 7.0 | 12.5 |
| EEG | 1K | 20.0 | 20 | M16x1.0 | 6.2 | 3.5 | 23.8 | 10.0 | 14.5 |
| EEG | 2K | 25.0 | 25 | M20x1.0 | 5.0 | 3.5 | 25.8 | 10.0 | 18.5 |
| EEG | 3K | 30.0 | 31 | M24x1.0 | 7.5 | 4.5 | 31.3 | 12.0 | 22.5 |
| EEG | 4K | 41.5 | 37 | M30x1.0 | 6.0 | 7.0 | 34.3 | 13.5 | 28.5 |

**P1** Panel cut-out (page 153) **P15** PCB drilling pattern (page 154)

**Note:** this contact type is available for E●● socket models fitted with female contact.
Length «L» depends on the number of contacts, see table page 156.
The 3K and 4K series are delivered with a conical nut.

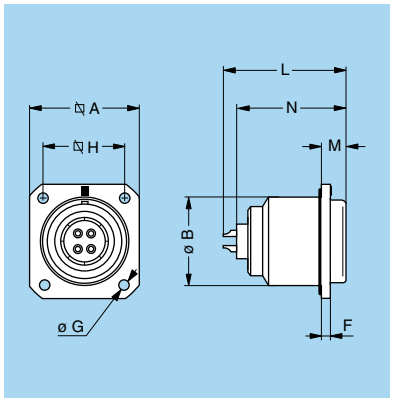



## EEG Fixed socket, nut fixing, key (G) or keys (A to F and R) with elbow (90°) contacts for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | P | S1 |
| EEG | 0K | 18 | 18 | M14x1.0 | 3.4 | 3.5 | 19.3 | 7 | 12.5 |
| EEG | 1K | 20 | 20 | M16x1.0 | 6.2 | 3.5 | 24.3 | 10 | 14.5 |
| EEG | 2K | 25 | 25 | M20x1.0 | 5.0 | 3.5 | 26.6 | 10 | 18.5 |
| EEG | 3K | 30 | 31 | M24x1.0 | 7.5 | 4.5 | 31.3 | 12 | 22.5 |

**P1** Panel cut-out (page 153) **P17** PCB drilling pattern (page 157)

**Note:** length «L» depends on the number of contacts, see PCB drilling pattern page 157. The 3K series is delivered with a conical nut.

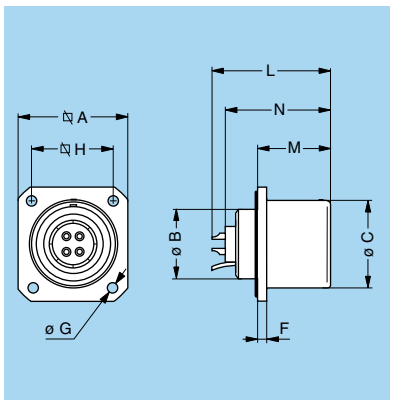



## EBG Fixed socket with square flange, key (G) or keys (A to F, L and R) and screw fixing

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | F | G | H | L | M | N[1)] |
| EBG | 3K | 29 | 23 | 3 | 3.4 | 23 | 36.2 | 6.0 | 32.6 |
| EBG | 4K | 37 | 30 | 3 | 3.4 | 29 | 40.2 | 6.5 | 36.6 |
| EBG | 5K | 54 | 45 | 4 | 4.4 | 44 | 47.5 | 8.0 | 42.1 |

**P7** Panel cut-out (page 153)

**Note:** [1)] maximum length with crimp contacts.

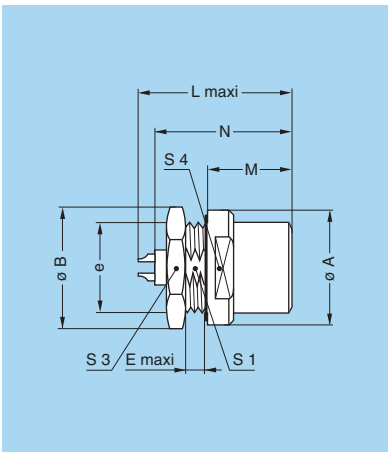



## EDG Fixed socket with square flange, key (G) or keys (A to F, L and R), protruding shell and earthing tag, screw fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | F | G | H | L | M | N[1)] |
| EDG | 3K | 29 | 18 | 23 | 3 | 3.4 | 23 | 36.2 | 22.5 | 32.6 |

**P7** Panel cut-out (page 153)

**Note:** [1)] maximum length with crimp contacts.

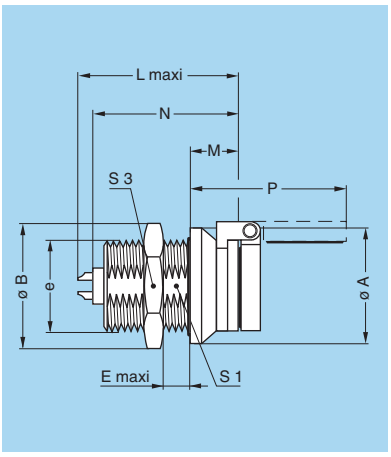



## EHG Fixed socket, nut fixing, key (G) or keys (A to F and L), protruding shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 | S4 |
| EHG | 0K | 18 | 19.2 | M14x1.0 | 1.5 | 21.7 | 10.5 | 20.1 | 12.5 | 17 | 15 |
| EHG | 1K | 20 | 21.5 | M16x1.0 | 1.5 | 27.0 | 15.5 | 25.1 | 14.5 | 19 | 17 |
| EHG | 2K | 25 | 27.0 | M20x1.0 | 1.5 | 30.7 | 17.0 | 27.1 | 18.5 | 24 | 20 |

P1 Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.

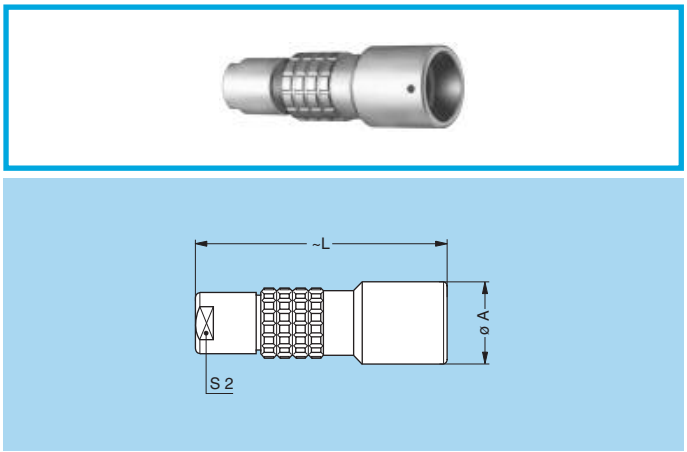



## EVG Fixed socket, nut fixing, key (G) or keys (A to F and L) and dust cap (spring loaded)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | P | S1 | S3 |
| EVG | 0K | 18 | 19.2 | M14x1.0 | 6.5 | 24.8 | 6.3 | 23.3 | 23.3 | 12.5 | 17 |

P1 Panel cut-out (page 153)

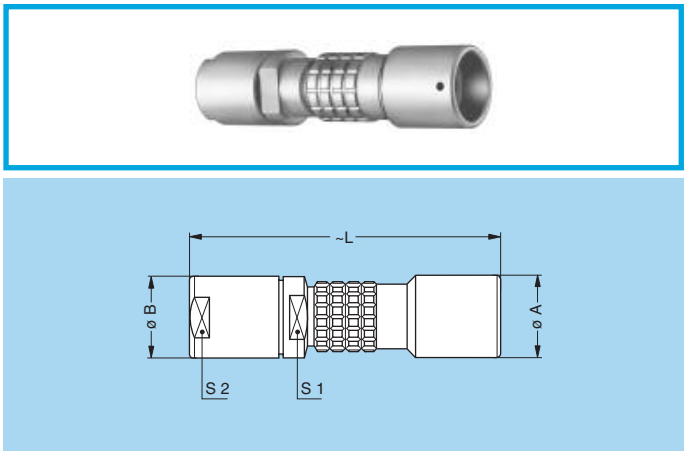
**Note:** 1) maximum length with crimp contacts.




## PHG Free socket, key (G) or keys (A to F, L and R), cable collet

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PHG | 0K | 13 | 34.0 | 8 |
| PHG | 1K | 15 | 45.0 | 9 |
| PHG | 2K | 19 | 54.0 | 12 |
| PHG | 3K | 23 | 65.0 | 15 |
| PHG | 4K | 29 | 75.5 | 19 |
| PHG | 5K | 42 | 95.0 | 30 |

M1 Cable assembly (page 162)

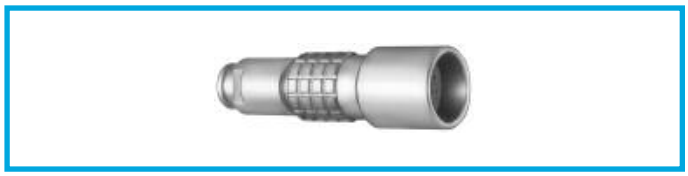


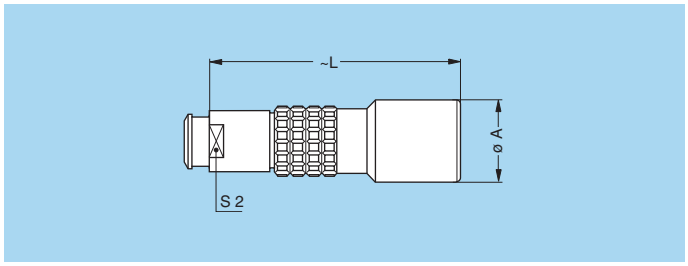

## PHG Free socket, key (G) or keys (A to F, L and R), cable collet and oversize cable collet 1)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | L | S1 | S2 |
| PHG | 1K | 15 | 14.5 | 63 | 12 | 12 |
| PHG | 2K | 19 | 17.0 | 70 | 15 | 15 |
| PHG | 3K | 23 | 22.0 | 89 | 19 | 19 |
| PHG | 4K | 29 | 36.0 | 124 | 30 | 32 |

M2 Cable assembly (page 163)

**Note:** 1) correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 53).





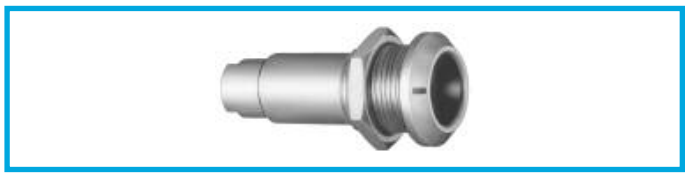

## PHG Free socket, key (G) or keys (A to F, L and R), cable collet and nut for fitting a bend relief [1)]

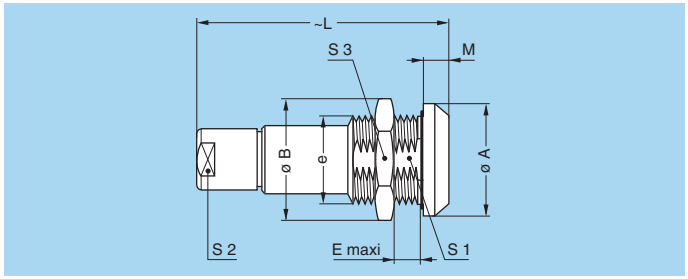
| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PHG | 0K | 13 | 34.0 | 7 |
| PHG | 1K | 15 | 45.0 | 9 |
| PHG | 2K | 19 | 54.0 | 12 |
| PHG | 3K | 23 | 64.0 | 15 |
| PHG | 4K | 29 | 75.5 | 19 |

**Note:** [1)] to order, add a «Z» at the end of the reference.

**M1** Cable assembly (page 162)

**Note:** The bend relief must be ordered separately (see page 141).



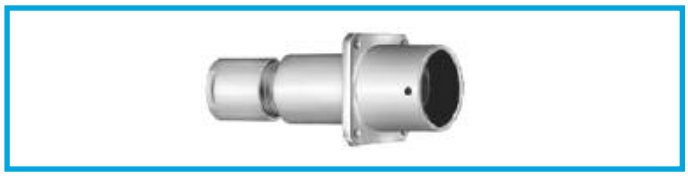


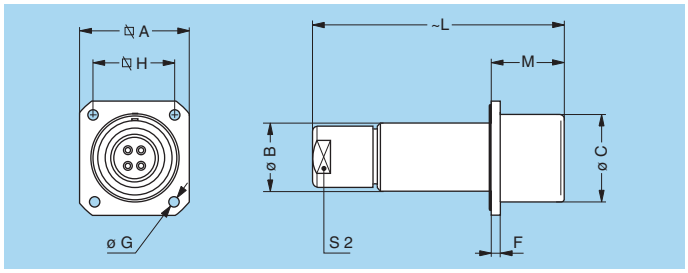

## PKG Fixed socket, nut fixing, key (G) or keys (A to F, L and R), cable collet

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PKG | 0K | 18 | 19.2 | M14x1.0 | 6.0 | 34.0 | 4.0 | 12.5 | 8 | 17 |
| PKG | 1K | 20 | 21.5 | M16x1.0 | 9.0 | 45.0 | 4.5 | 14.5 | 9 | 19 |
| PKG | 2K | 25 | 27.0 | M20x1.0 | 9.0 | 54.0 | 5.0 | 18.5 | 12 | 24 |
| PKG | 3K | 31 | 34.0 | M24x1.0 | 11.5 | 65.0 | 6.0 | 22.5 | 15 | 30 |
| PKG | 4K | 37 | 40.5 | M30x1.0 | 9.0 | 75.5 | 6.5 | 28.5 | 19 | 36 |
| PKG | 5K | 55 | 54.0 | M45x1.0 | 15.0 | 98.0 | 9.0 | 42.5 | 30 | – |

**P1** Panel cut-out (page 153) **M1** Cable assembly (page 162)

**Note:** the 5K series is delivered with a round nut.

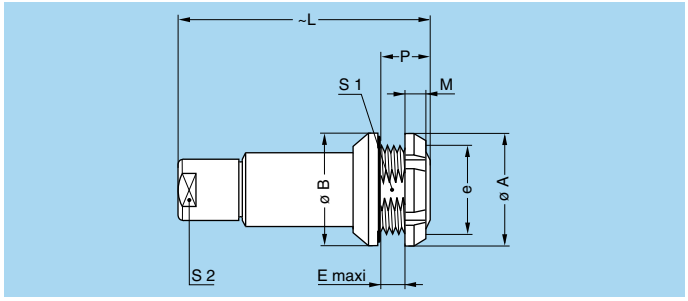





## PBG Fixed socket, key (G) with square flange, cable collet and screw fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | F | G | H | L | M | S2 |
| PBG | 3K | 29 | 19 | 23 | 3 | 3.4 | 23 | 65 | 22.5 | 15 |

**P7** Panel cut-out (page 153) **M1** Cable assembly (page 162)

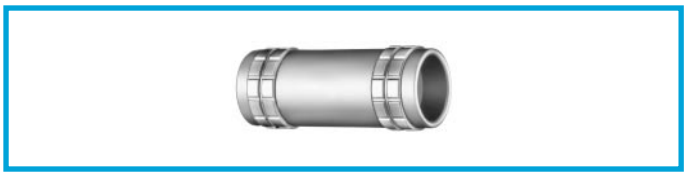


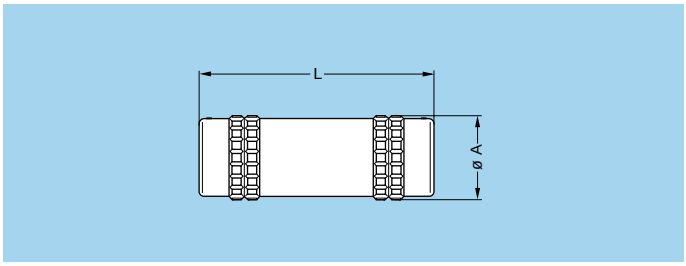

## PEG Fixed socket, nut fixing, key (G) or keys (A to F, L and R), cable collet (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | P | S1 | S2 |
| PEG | 0K | 18 | 18 | M14x1.0 | 5.0 | 34 | 3.5 | 8.5 | 12.5 | 8 |
| PEG | 1K | 20 | 20 | M16x1.0 | 6.5 | 45 | 3.5 | 10.0 | 14.5 | 9 |
| PEG | 2K | 25 | 25 | M20x1.0 | 4.0 | 54 | 3.5 | 7.5 | 18.5 | 12 |
| PEG | 3K | 30 | 31 | M24x1.0 | 7.5 | 65 | 4.5 | 12.0 | 22.5 | 15 |

**P1** Panel cut-out (page 153) **M1** Cable assembly (page 162)

**Note:** the 3K series is delivered with a conical nut.

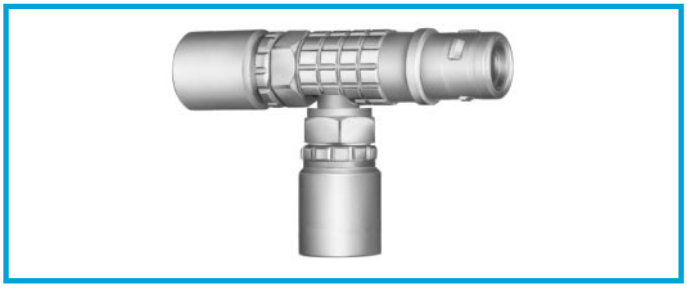


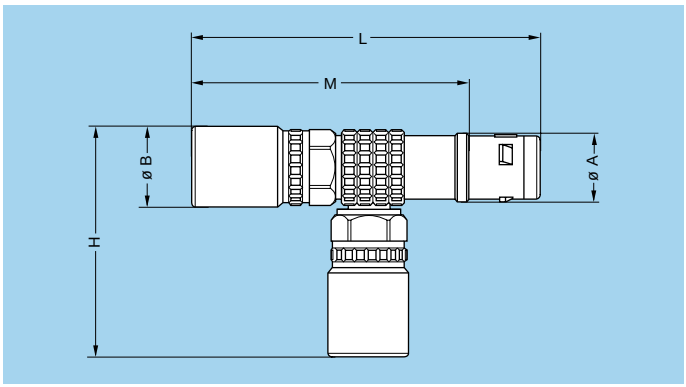



## TGL Free coupler, key (G) on one side and keys (L) on the other

| Reference | Dim. (mm) | |
|---|---|---|
| | A | L |
| TGL.3K.3●●.CLLP | 24 | 64.2 |

**Note:** this model is only available in type 308, 310, 316, 318, 320, 324 and 330.






## FTG T-plug, key (G) with sockets (90°), key (G)

| Reference | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | A | B | H | L | M |
| FTG.2K.304.CLF | 16 | 19 | 48 | 77 | 60 |
| FTG.2K.308.CLF | 16 | 19 | 48 | 77 | 60 |

# Watertight or vacuumtight models

These socket and coupler models allow the device on which they are fitted to reach a protection index of IP68 as per IEC 60529. They are fully compatible with plugs of the same series and are widely used for portable radios, military, laboratory equipment, aviation, etc.
These models are identified by a letter «P» at the end of the reference.
Most of these models are also available in a vacuumtight version. Such models are identified by an additional letter «V» at the end of the part number (certificate on request).
Epoxy resin is used to seal these models.

## Technical Characteristics

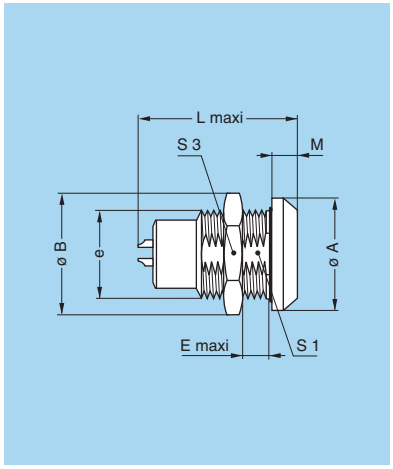
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range (0K-1K) | - 20° C/+100° C | |
| Temperature range (2K to 5K) | - 20° C/+80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Climatical category | 20/80/21 | IEC 60068-1 |
| Leakage rate (He)[1)] | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |

**Note:** [1)] only for vacuumtight models.

| Characteristics | | Value | Standard |
|---|---|---|---|
| Maximum operating pressure[2)] | 0K | 60 bar | IEC 60512-7 test 14d |
| | 1K | 60 bar | |
| | 2K | 40 bar | |
| | 3K | 30 bar | |
| | 4K | 15 bar | |
| | 5K | 5 bar | |

**Note:** [2)] this value corresponds to the maximum allowed pressure difference for the assembled socket.

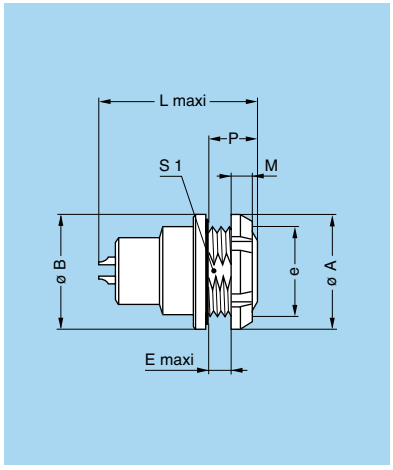



### HGG Fixed socket, nut fixing, key (G) or keys (A to F and L), watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| HGG | 0K | 18 | 19.2 | M14x1.0 | 5.5 | 23.0 | 4.0 | 12.5 | 17 |
| HGG | 1K | 20 | 21.5 | M16x1.0 | 9.0 | 30.0 | 4.5 | 14.5 | 19 |
| HGG | 2K | 25 | 27.0 | M20x1.0 | 13.0 | 33.7 | 5.0 | 18.5 | 24 |
| HGG | 3K | 31 | 34.0 | M24x1.0 | 16.0 | 41.7 | 6.0 | 22.5 | 30 |
| HGG | 4K | 37 | 40.5 | M30x1.0 | 14.0 | 49.2 | 6.5 | 28.5 | 36 |
| HGG | 5K | 55 | 54.0 | M45x1.5 | 10.0 | 55.7 | 9.0 | 42.5 | – |

**P1** Panel cut-out (page 153)

**Note:** the 5K series is delivered with a round nut.

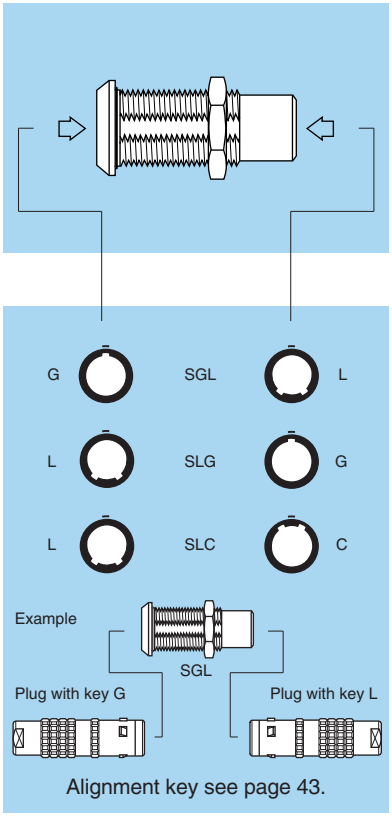



### HEG Fixed socket, nut fixing, key (G) or keys (A to F and L), watertight or vacuumtight (back panel mounting)

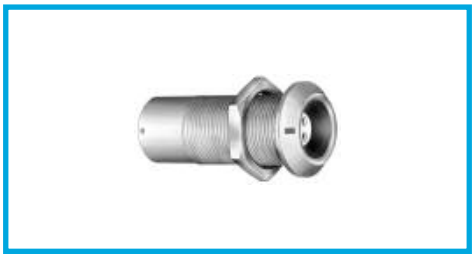
| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | P | S1 |
| HEG | 0K | 18 | 18 | M14x1.0 | 3.4 | 23.0 | 3.5 | 7 | 12.5 |
| HEG | 1K | 20 | 20 | M16x1.0 | 6.2 | 30.0 | 3.5 | 10 | 14.5 |
| HEG | 2K | 25 | 25 | M20x1.0 | 5.0 | 33.7 | 3.5 | 10 | 18.5 |

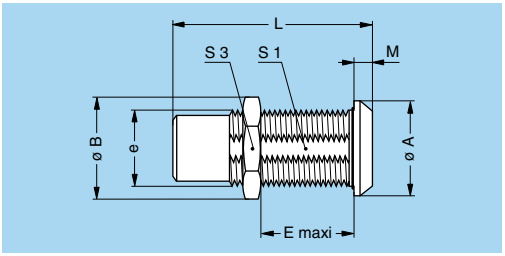
**P1** Panel cut-out (page 153)

## S●● Fixed coupler, nut fixing, key (G) or keys (L) at the flange end, and key (G) or keys (C or L) at the other end, watertight or vacuumtight




Alignment key see page 43.






| Reference | | Contacts | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | Type | A | B | e | E | L | M | S1 | S3 |
| SGL | 2K | female – male | 25 | 27.0 | M20x1.0 | 25 | 52.4 | 5.0 | 18.5 | 24 |
| SLG | | male – female | | | | | | | | |
| SLG | 3K | male – female | 31 | 34.0 | M24x1.0 | 33 | 64.0 | 6.0 | 22.5 | 30 |
| SLG | 4K | male – female | 37 | 40.5 | M30x1.0 | 48 | 74.0 | 6.5 | 28.5 | 36 |
| SLC | | | | | | | | | | |
| SLG | 5K | male – female | 55 | 54.0 | M45x1.5 | 58 | 88.0 | 9.0 | 42.5 | – |
| SLC | | | | | | | | | | |

P1 Panel cut-out (page 153)

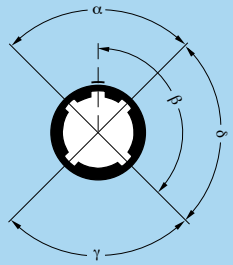
**Note:** for this fixed coupler, the first contact type mentioned is always the one at the flange end.
On request, these couplers can be produced in other series, with other keys.
The 5K series is delivered with a round nut.

# Alignment Key (K series)

## Alignment Key and Polarized Keying System

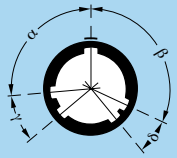
K series connector model part numbers are composed of three letters. The LAST LETTER indicates the key position and the contact type (male or female).

Front view of a socket




| Reference | Nb of keys | Angles | Series 0K | 1K | 2K | 3K | 4K | 5K | Contact type Plug | Socket | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1 | | 0° | 0° | 0° | 0° | 0° | 0° | male | female | ● |
| A | 2 | α | 30° | 30° | 30° | 30° | 30° | 30° | male | female | ● |
| B | 2 | α | 45° | 45° | 45° | 45° | 45° | 45° | male | female | ● |
| C | 2 | α | 60° | 60° | 60° | 60° | 60° | 60° | male | female | ● |
| D | 2 | γ | 95° | 95° | 95° | 95° | 95° | 95° | male | female | ○ |
| E | 2 | β | 120° | 120° | 120° | 120° | 120° | 120° | male | female | ○ |
| F | 2 | β | 145° | 145° | 145° | 145° | 145° | 145° | male | female | ○ |
| L | 2 | γ | 75° | 75° | 75° | 75° | 75° | 75° | female | male | ● |

Front view of a socket



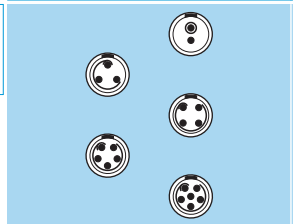
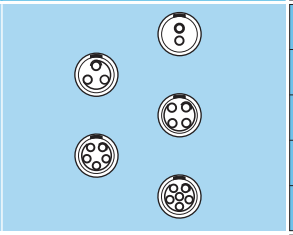
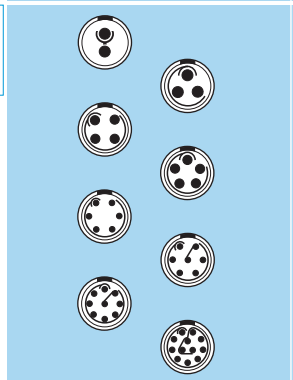
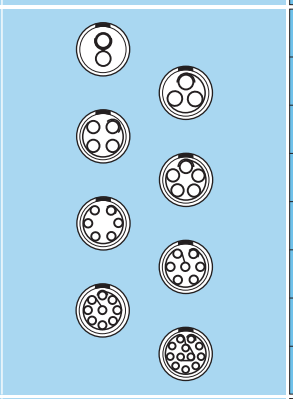
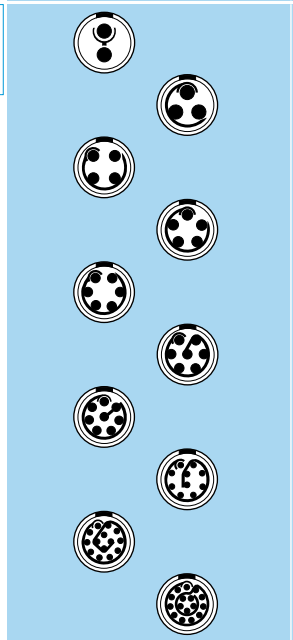
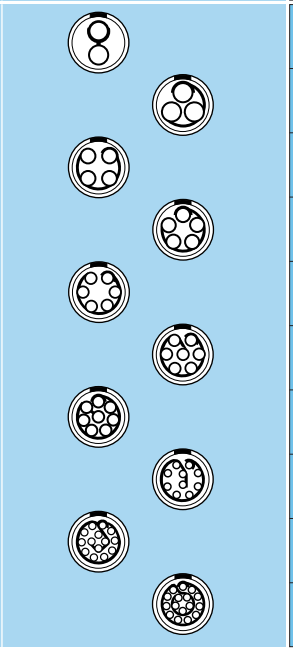

| Reference | Nb of keys | Angles | Series 0K | 1K | 2K | 3K | 4K | 5K | Contact type Plug | Socket | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | 5 | α | – | – | – | 95° | – | – | male | female | ● |
| | | β | – | – | – | 115° | – | – | | | |
| | | γ | – | – | – | 35° | – | – | | | |
| | | δ | – | – | – | 25° | – | – | | | |

**Note:** S●● and TGL models are not available with all the keys. For S●● models see explanation on page 42.
Please consult the pages corresponding to these models.

● First choice alternative
○ Special order alternative

# Insert configuration (B and K series)

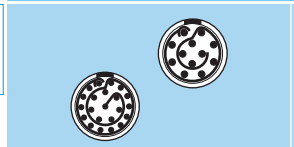
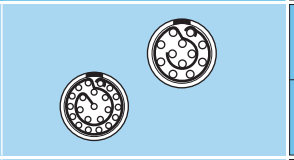
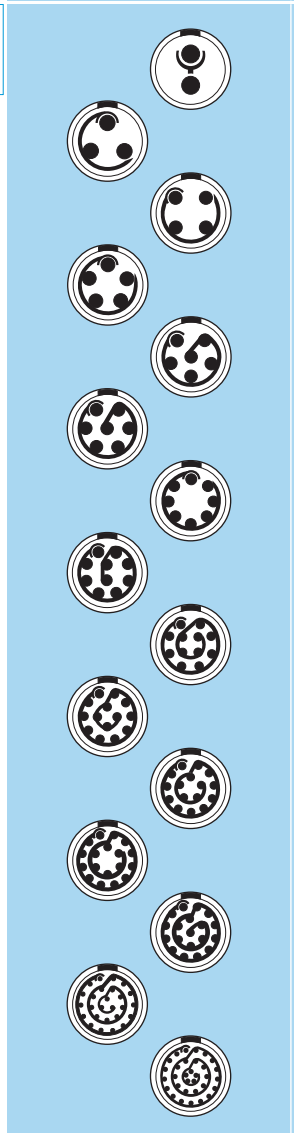
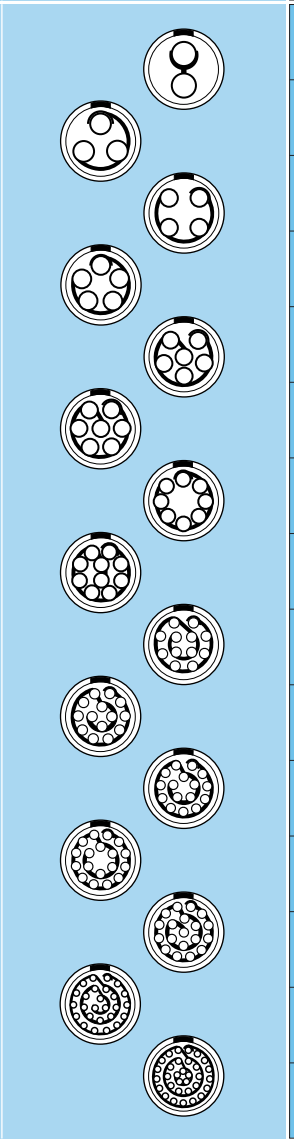
## Multipole

| | Male solder contacts / Male crimp contacts | Female solder contacts / Female crimp contacts | Reference | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Crimp | Contact type: Print (straight) | Contact type: Print (elbow) | Solder contact: Test voltage (kV rms)[1] Contact-contact | Solder contact: Test voltage (kV rms)[1] [5] Contact-shell | Crimp contact: Test voltage (kV rms)[1] Contact-contact | Crimp contact: Test voltage (kV rms)[1] [5] Contact-shell | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 |  |  | 302 | 2 | 0.5 | ● | ● | ● | ● | 1.00 | 0.95 | 1.15 | 1.20 | 3.5 |
| | | | 303 | 3 | 0.5 | ● | ● | ● | ● | 0.80 | 0.95 | 1.35 | 1.10 | 3.0 |
| | | | 304 | 4 | 0.5 | ● | ● | ● | ● | 0.80 | 0.65 | 1.05 | 1.05 | 2.0 |
| | | | 305 | 5 | 0.35 | ● | – | ● | – | 0.70 | 1.00 | – | – | 1.7 |
| | | | 306 | 6 | 0.35 | ● | – | – | – | 0.60 | 0.75 | – | – | 1.5 |
| 0B 0K |  |  | 302 | 2 | 0.9 | ● | ● | ● | ● | 1.00 | 1.05 | 1.45 | 1.20 | 10.0[2] |
| | | | 303 | 3 | 0.9 | ● | ● | ● | ● | 1.20 | 0.90 | 1.70 | 1.60 | 8.0[2] |
| | | | 304 | 4 | 0.7 | ● | ● | ● | ● | 0.85 | 0.70 | 1.35 | 1.10 | 7.0[2] |
| | | | 305 | 5 | 0.7 | ● | ● | ● | ● | 1.00 | 0.70 | 1.25 | 1.20 | 6.5[2] |
| | | | 306 | 6 | 0.5 | ● | ○[4] | ● | ● | 0.85 | 0.65 | 1.40 | 1.20 | 2.5 |
| | | | 307 | 7 | 0.5 | ● | ○[4] | ● | ● | 0.80 | 0.70 | 1.40 | 1.20 | 2.5 |
| | | | 309 | 9 | 0.5 | ● | ○[4] | ● | ○ | 0.60 | 0.50 | 1.00 | 0.85 | 2.0 |
| | | | 312 | 12 | 0.35 | ● | – | – | – | 0.80 | 1.00 | – | – | 1.5 |
| 1B 1K |  |  | 302 | 2 | 1.3 | ● | ● | ● | ● | 1.50 | 1.35 | 1.70 | 1.45 | 15.0[3] |
| | | | 303 | 3 | 1.3 | ● | ● | ● | ● | 1.30 | 1.55 | 1.60 | 1.85 | 12.0 |
| | | | 304 | 4 | 0.9 | ● | ● | ● | ● | 1.35 | 1.45 | 1.70 | 1.80 | 10.0[2] |
| | | | 305 | 5 | 0.9 | ● | ● | ● | ● | 1.25 | 1.15 | 1.30 | 1.55 | 9.0[2] |
| | | | 306 | 6 | 0.7 | ● | ● | ● | ● | 1.05 | 1.20 | 1.35 | 1.45 | 7.0[2] |
| | | | 307 | 7 | 0.7 | ● | ● | ● | ● | 0.95 | 1.05 | 1.45 | 1.45 | 7.0[2] |
| | | | 308 | 8 | 0.7 | ● | ● | ● | ● | 0.95 | 1.15 | 1.30 | 1.30 | 5.0 |
| | | | 310 | 10 | 0.5 | ● | ○[4] | ● | ● | 0.90 | 1.50 | 1.20 | 1.80 | 2.5 |
| | | | 314 | 14 | 0.5 | ● | ○[4] | ● | ● | 0.80 | 1.20 | 0.95 | 1.60 | 2.0 |
| | | | 316 | 16 | 0.5 | ● | ○[4] | ● | ○ | 0.80 | 1.25 | 0.95 | 1.60 | 1.5 |

● First choice alternative
○ Special order alternative

**Note:**
[1] see calculation method, caution and suggested standard on page 178.
[2] rated current = 6A for socket with elbow (90°) contact for printed circuit.
[3] rated current = 12A for socket with elbow (90°) contact for printed circuit.
[4] available only for connectors fitted with male contacts.
[5] test voltage (kV) contact-shell is slightly lower for K series (values here are for B series).

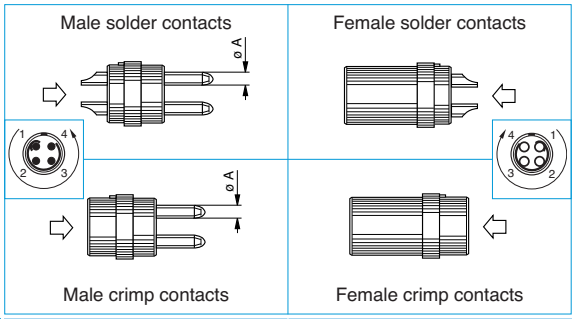
# Multipole

| | Male solder contacts / Male crimp contacts | Female solder contacts / Female crimp contacts | Reference | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Crimp | Contact type: Print (straight) | Contact type: Print (elbow) | Solder contact: Test voltage (kV rms)[1] Contact-contact | Solder contact: Test voltage (kV rms)[1] [4] Contact-shell | Crimp contact: Test voltage (kV rms)[1] Contact-contact | Crimp contact: Test voltage (kV rms)[1] [4] Contact-shell | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| XB |  |  | 312 | 12 | 0.7 | ● | – | ● | – | 1.35 | 1.65 | – | – | 5.0 |
| | | | 322 | 22 | 0.5 | ● | – | ● | – | 0.50 | 0.90 | – | – | 1.5 |
| 2B 2K |  |  | 302 | 2 | 2.0 | ● | ● | ● | ● | 2.10 | 1.75 | 2.85 | 2.70 | 25.0[3] |
| | | | 303 | 3 | 1.6 | ● | ● | ● | ● | 2.40 | 1.85 | 1.90 | 1.90 | 17.0[3] |
| | | | 304 | 4 | 1.3 | ● | ● | ● | ● | 1.85 | 1.85 | 2.20 | 2.20 | 15.0[3] |
| | | | 305 | 5 | 1.3 | ● | ● | ● | ● | 1.75 | 1.60 | 2.15 | 2.15 | 14.0[3] |
| | | | 306 | 6 | 1.3 | ● | ● | ● | ● | 1.35 | 1.45 | 2.00 | 2.35 | 12.0 |
| | | | 307 | 7 | 1.3 | ● | ● | ● | ● | 1.75 | 1.60 | 1.95 | 2.15 | 11.0 |
| | | | 308 | 8 | 0.9 | ● | ● | ● | ● | 1.50 | 1.25 | 1.95 | 1.95 | 10.0[2] |
| | | | 310 | 10 | 0.9 | ● | ● | ● | ● | 1.45 | 1.30 | 1.80 | 2.10 | 8.0[2] |
| | | | 312 | 12 | 0.7 | ● | ● | ● | ● | 1.25 | 1.35 | 1.65 | 2.00 | 7.0[2] |
| | | | 314 | 14 | 0.7 | ● | ● | ● | ● | 1.15 | 1.35 | 1.55 | 1.55 | 6.5[2] |
| | | | 316 | 16 | 0.7 | ● | ● | ● | ● | 0.95 | 1.25 | 1.55 | 1.75 | 6.0 |
| | | | 318 | 18 | 0.7 | ● | ● | ● | ● | 0.85 | 1.20 | 1.45 | 2.10 | 5.5 |
| | | | 319 | 19 | 0.7 | ● | ● | ● | ● | 0.95 | 1.25 | 1.55 | 1.65 | 5.0 |
| | | | 326 | 26 | 0.5 | ● | – | ● | ○ | 0.95 | 1.30 | 1.20 | 1.80 | 2.0 |
| | | | 332 | 32 | 0.5 | ● | – | ● | ○ | 0.80 | 1.2 | 0.95 | 1.60 | 1.5 |

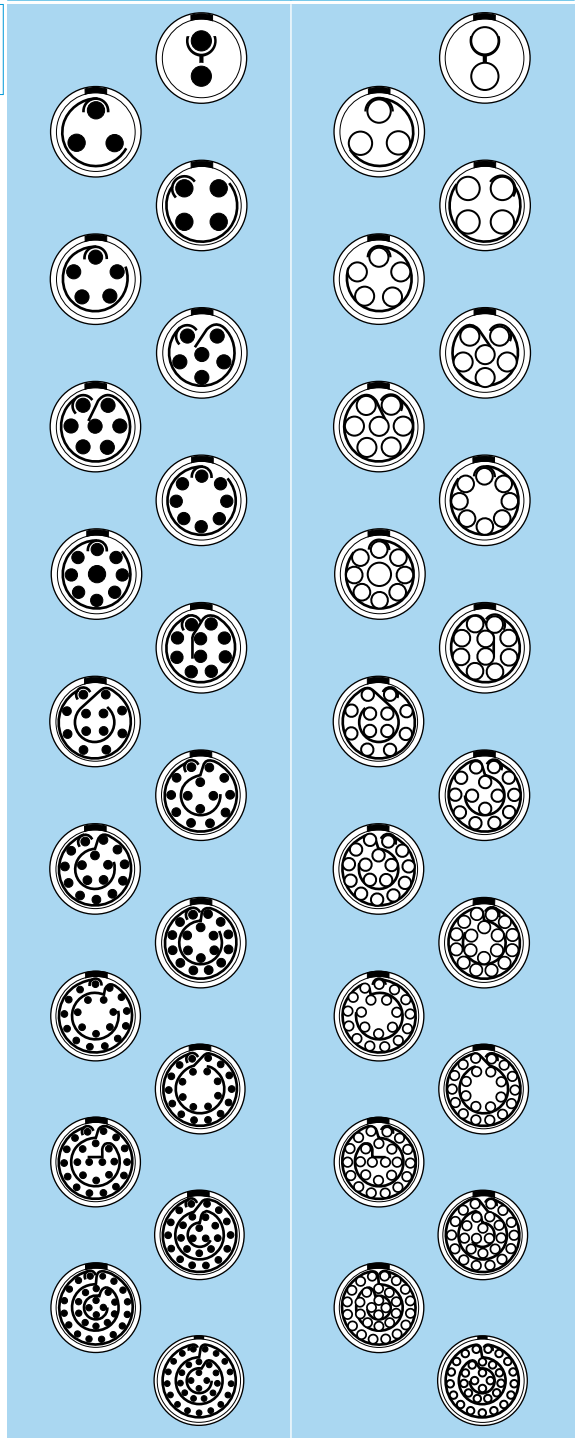
● First choice alternative
○ Special order alternative

**Note:** [1] see calculation method, caution and suggested standard on page 178.
[2] rated current = 6A for socket with elbow (90°) contact for printed circuit.
[3] rated current = 12A for socket with elbow (90°) contact for printed circuit.
[4] test voltage (kV) contact-shell is slightly lower for K series (values here are for B series).

# Multipole




3B
3K



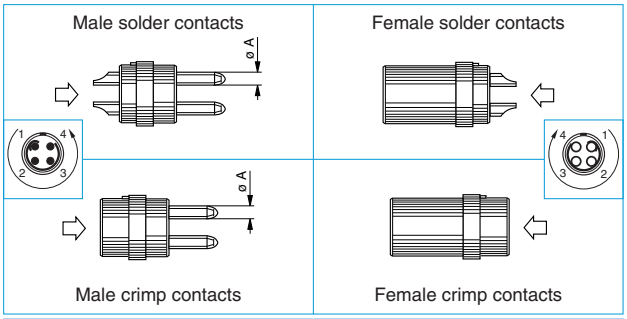
| Reference | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Crimp | Contact type: Print (straight) | Contact type: Print (elbow) | Solder contact: Test voltage (kV rms)[1] Contact-contact | Solder contact: Test voltage (kV rms)[1] [3] Contact-shell | Crimp contact: Test voltage (kV rms)[1] Contact-contact | Crimp contact: Test voltage (kV rms)[1] [3] Contact-shell | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 302 | 2 | 3.0 | ● | ● | ○ | – | 2.10 | 1.55 | 2.30 | 1.80 | 35.0 |
| 303 | 3 | 2.0 | ● | ● | ● | ○ | 1.90 | 1.50 | 3.20 | 2.65 | 25.0 |
| 304 | 4 | 2.0 | ● | ● | ● | ● | 1.45 | 1.25 | 2.50 | 2.20 | 19.0 |
| 305 | 5 | 1.6 | ● | ● | ● | ○ | 1.90 | 1.25 | 2.40 | 1.75 | 19.0 |
| 306 | 6 | 1.6 | ● | ● | ● | ● | 1.60 | 1.15 | 1.90 | 1.80 | 17.0 |
| 307 | 7 | 1.6 | ● | ● | ● | ○ | 1.70 | 1.25 | 2.00 | 2.05 | 15.0 |
| 308 | 8 | 1.3 | ● | ● | ● | ● | 1.65 | 1.15 | 1.85 | 1.75 | 13.0 |
| 309 | 8<br>1 | 1.3<br>2.0 | ● | ● | ● | – | 1.35<br>1.35 | 1.05<br>1.05 | 1.10<br>1.10 | 1.05<br>1.05 | 6.0<br>15.0 |
| 310 | 10 | 1.3 | ● | ● | ● | ● | 1.25 | 0.90 | 1.50 | 1.80 | 12.0 |
| 312 | 12 | 0.9 | ● | ● | ● | ● | 1.45 | 1.00 | 1.65 | 1.85 | 9.0 |
| 314 | 14 | 0.9 | ● | ● | ● | ● | 1.20 | 1.20 | 1.80 | 1.65 | 9.0[2] |
| 316 | 16 | 0.9 | ● | ● | ● | ● | 1.20 | 0.85 | 1.80 | 1.50 | 8.0 |
| 318 | 18 | 0.9 | ● | ● | ● | ● | 1.20 | 1.05 | 1.85 | 1.60 | 7.0 |
| 320 | 20 | 0.7 | ● | ● | ● | ● | 1.00 | 0.90 | 1.35 | 1.55 | 6.0 |
| 322 | 22 | 0.7 | ● | ● | ● | ○ | 1.00 | 0.90 | 1.70 | 1.45 | 5.5 |
| 324 | 24 | 0.7 | ● | ● | ● | ● | 0.95 | 0.80 | 1.35 | 1.35 | 4.0 |
| 326 | 26 | 0.7 | ● | ● | ● | ○ | 0.95 | 0.70 | 1.50 | 1.30 | 4.0 |
| 330 | 30 | 0.7 | ● | ● | ● | ● | 0.80 | 0.70 | 1.35 | 1.20 | 3.5 |
| 332 | 32 | 0.7 | ● | ○ | ● | ○ | 0.75 | 0.70 | – | – | 3.0 |

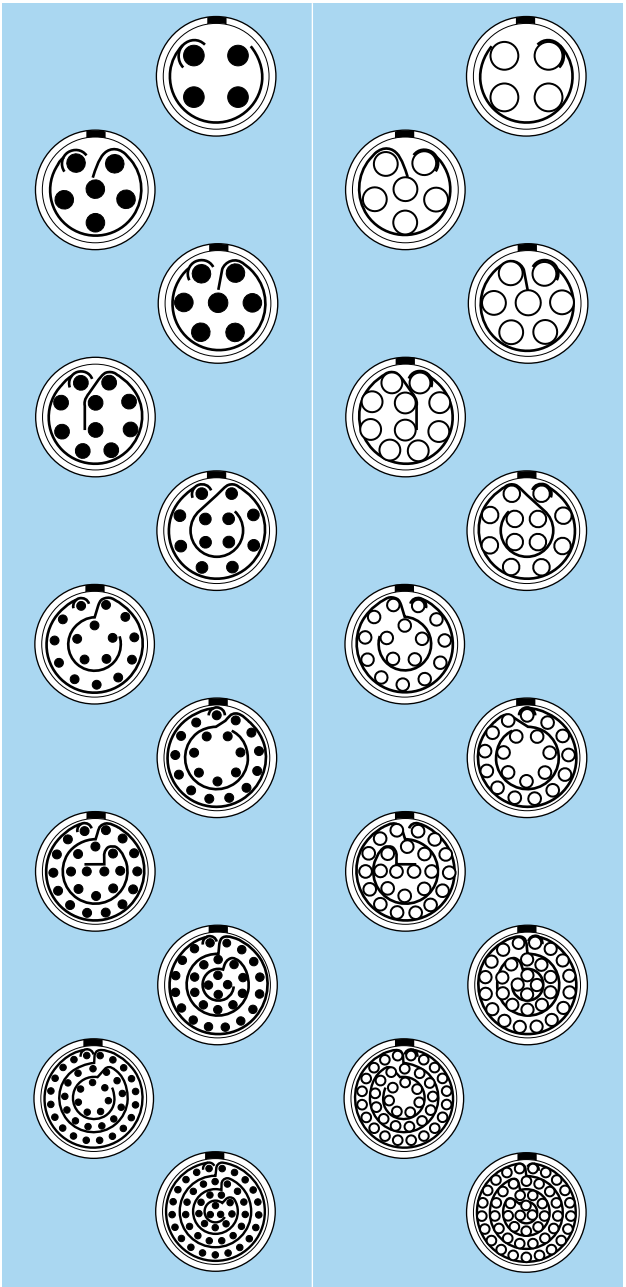
● First choice alternative
○ Special order alternative

**Note:** [1] see calculation method, caution and suggested standard on page 178.
[2] rated current = 6A for socket with elbow (90°) contact for printed circuit.
[3] test voltage (kV) contact-shell is slightly lower for K series (values here are for B series).

# Multipole

## 4B 4K



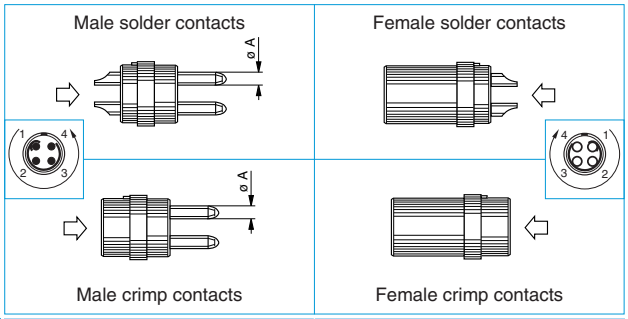
| Reference | Number of contacts | ø A (mm) | Contact type | | | Solder contact | | Crimp contact | | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Solder | Crimp | Print (straight) | Test voltage (kV rms)[1] Contact-contact | Test voltage (kV rms)[1] [2] Contact-shell | Test voltage (kV rms)[1] Contact-contact | Test voltage (kV rms)[1] [2] Contact-shell | |
| 304 | 4 | 3.0 | ● | ● | ○ | 2.10 | 1.50 | 1.80 | 1.20 | 30.0 |
| 306 | 6 | 2.0 | ● | ● | ○ | 2.00 | 1.75 | 2.75 | 2.40 | 24.0 |
| 307 | 7 | 2.0 | ● | ● | ○ | 2.00 | 1.80 | 1.50 | 1.35 | 20.0 |
| 310 | 10 | 1.6 | ● | ● | ○ | 1.85 | 1.30 | 1.90 | 1.95 | 17.0 |
| 312 | 12 | 1.3 | ● | ● | ○ | 1.45 | 1.60 | 1.90 | 1.85 | 12.0 |
| 316 | 16 | 0.9 | ● | ● | ● | 1.35 | 1.50 | 2.30 | 2.10 | 10.0 |
| 320 | 20 | 0.9 | ● | ● | ● | 1.35 | 1.00 | 1.05 | 0.95 | 8.0 |
| 324 | 24 | 0.9 | ● | ● | ● | 1.20 | 1.45 | 1.80 | 2.05 | 7.0 |
| 330 | 30 | 0.9 | ● | ● | ● | 0.95 | 0.85 | 1.75 | 1.45 | 5.0 |
| 340 | 40 | 0.7 | ● | ● | ● | 0.90 | 0.90 | 1.30 | 1.30 | 2.0 |
| 348 | 48 | 0.7 | ● | ● | ● | 0.70 | 0.70 | 1.00 | 1.00 | 1.5 |

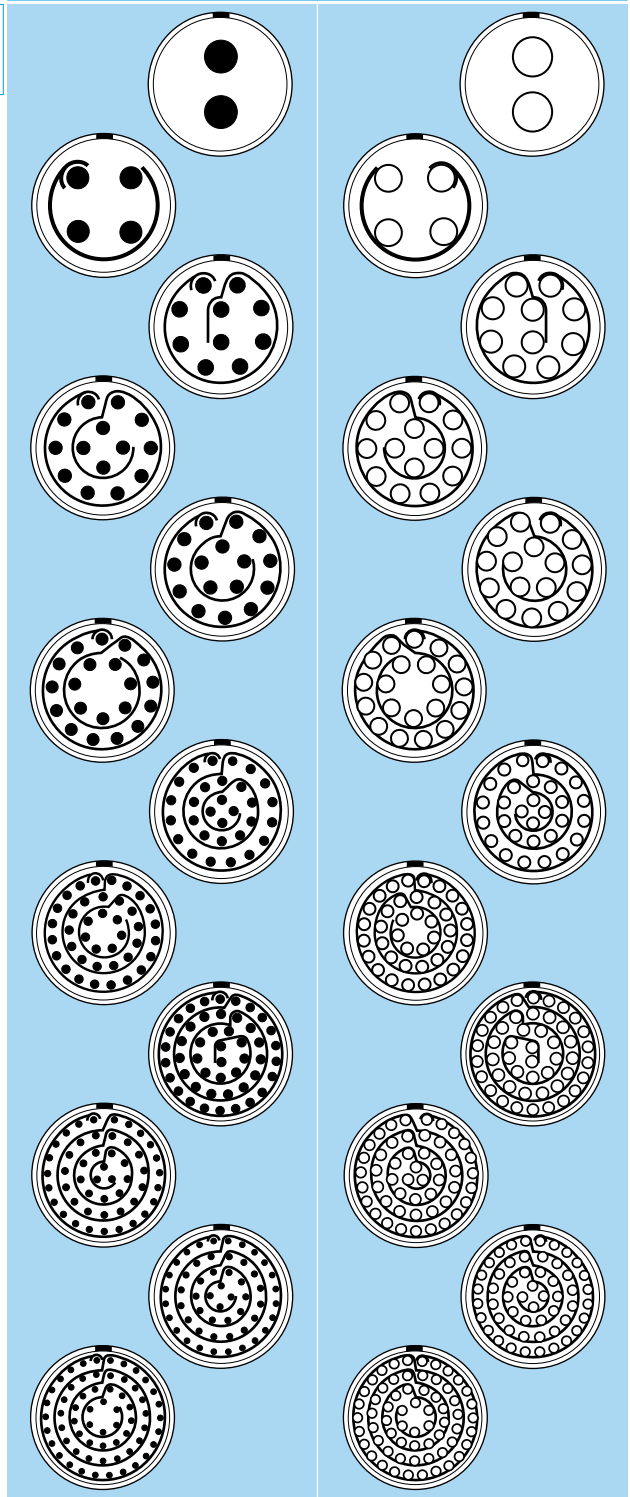
● First choice alternative
○ Special order alternative

**Note:** [1] see calculation method, caution and suggested standard on page 178.
[2] test voltage (kV) contact-shell is slightly lower for K series (values here are for B series).

# Multipole

**5B**
**5K**



| Reference | Number of contacts | ø A (mm) | Contact type | | | Solder contact | | Crimp contact | | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Solder | Crimp | Print (straight) | Test voltage (kV rms)[1] Contact-contact | Test voltage (kV rms)[1] [2] Contact-shell | Test voltage (kV rms)[1] Contact-contact | Test voltage (kV rms)[1] [2] Contact-shell | |
| 302 | 2 | 6.0 | ● | – | – | 3.60 | 2.95 | – | – | 50.0 |
| 304 | 4 | 4.0 | ● | ● | ○ | 2.95 | 2.65 | 3.20 | 2.40 | 35.0 |
| 310 | 10 | 3.0 | ● | ● | ○ | 2.35 | 2.30 | 2.65 | 3.20 | 20.0 |
| 314 | 14 | 2.0 | ● | ● | ○ | 2.10 | 2.00 | 2.85 | 2.95 | 18.0 |
| 316 | 16 | 2.0 | ● | ● | ○ | 1.85 | 1.95 | 2.45 | 3.05 | 12.0 |
| 320 | 20 | 1.6 | ● | ● | ○ | 1.90 | 1.70 | 2.20 | 2.40 | 10.0 |
| 330 | 30 | 1.3 | ● | ● | ○ | 1.45 | 1.60 | 2.05 | 2.45 | 8.0 |
| 340 | 40 | 1.3 | ● | ● | ○ | 1.30 | 1.45 | 2.00 | 1.95 | 7.0 |
| 348 | 48 | 1.3 | ● | ● | ● | 1.20 | 1.10 | 2.00 | 1.55 | 6.0 |
| 350 | 50 | 0.9 | ● | ● | ● | 1.30 | 1.60 | 1.20 | 1.45 | 6.0 |
| 354 | 54 | 0.9 | ● | ● | ● | 1.15 | 1.55 | 2.00 | 2.10 | 5.0 |
| 364 | 64 | 0.9 | ● | ● | ● | 1.30 | 1.55 | 1.35 | 1.85 | 3.0 |

● First choice alternative
○ Special order alternative

**Note:** [1] see calculation method, caution and suggested standard on page 178.
[2] test voltage (kV) contact-shell is slightly lower for K series (values here are for B series).

# Housings (B and K series)

| Ref. | Outer shell and collet nut | | Latch sleeve + earthing crown | | Other metallic components | | Remarks | Note |
|---|---|---|---|---|---|---|---|---|
| | Material | Surf. treatment | Material | Surf. treatment | Material | Surf. treatment | | |
| C | Brass | chrome | brass/bronze | nickel 2) | brass | nickel | | ● |
| N | Brass | nickel | brass/bronze | nickel 2) | brass | nickel | | ○ |
| K | Brass | black chrome | brass/bronze | nickel 2) | brass | nickel | | ● |
| S | Stainless steel | – | brass/bronze | nickel 2) | brass | nickel | | ● |
| T | Stainless steel | – | stainless steel | – | brass | nickel | | ○ |
| U | Stainless steel | – | stainless steel | – | stainless steel | – | | ○ |
| L | Aluminium alloy | anodized | brass/bronze | nickel 2) | brass | nickel | 1) | ○ |
| X | Aluminium alloy | nickel anthracite | brass/bronze | nickel 2) | brass | nickel | | ○ |
| G | PEEK (natural) | – | brass/bronze | nickel 2) | brass | nickel | Only for FGG and ENG (B series) | ● |
| P | PSU | – | brass/bronze | nickel 2) | brass | nickel | Only for FGY and ENY (B series) 1) | ● |
| R | PPSU | – | brass/bronze | nickel 2) | brass | nickel | Only for FGY and ENY (B series) 1) | ● |
| H | PPS/brass | –/nickel | brass/bronze | nickel 2) | brass | nickel | Only for elbow sockets (B series) | ● |
| P | PA.6 | – | brass/bronze | nickel 2) | brass | nickel | Only for CRF and CRG bridge plug 1) | ● |

**Note:** detailed characteristics of these materials and treatments are presented on page 171.
1) see «variant» for the colour.
2) in the K series, the latch sleeve is chrome-plated.

● First choice alternative
○ Special order alternative

# Insulators (B and K series)

| Ref. | Material | Contact type | Remarks | Note |
|---|---|---|---|---|
| Y | PEEK | Crimp | extended design, with contacts that recess into insulator | ● |
| L | PEEK | Solder or print | | ● |

**Note:** detailed characteristics of these materials are presented on page 175.

# Contacts (B and K series)

## Soldering characteristics

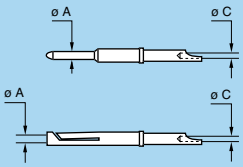
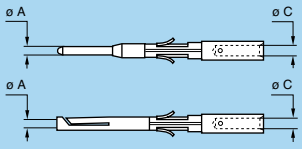
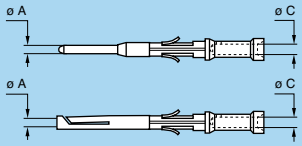
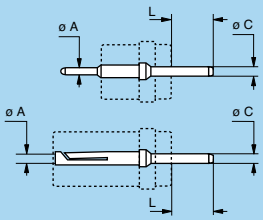
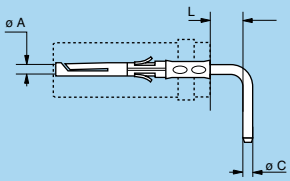
– no need to order specific tools, a simple soldering iron is sufficient
– ideal for very small and fragile conductors
– contacts with solder cups to allow the solder to flow

## Crimping characteristics

– practical, quick contact fixing outside the insulator
– possible use at high temperature
– need to order specific tools
– no risk of heating the insulator during the conductor-contact fixing
– high tensile strength
– totally lead-free solution

**Note:** see page 176 for more information.

## Contacts reference for plugs, free or fixed sockets

| Contact type | Reference | | Contact | | | Conductor | | | | | | $F_r$ [1] (N) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Solid | | Stranded | | | | | |
| | | | | | | | | AWG | | Section (mm²) | | | |
| | Male | Female | ø A (mm) | ø C (mm) | Form per fig. | AWG max. | Section max. (mm²) | min. | max. | min. | max. | | |
| Solder  | A | L | 0.35 | 0.40 | – | 28 | 0.09 | – | 30 | – | 0.05 | – | |
| | | | 0.5[2] | 0.40[2] | – | 28 | 0.09 | – | 30 | – | 0.05 | – | |
| | | | 0.5 | 0.45[6] | – | 28 | 0.09 | – | 28 | – | 0.09 | – | |
| | | | 0.7 | 0.80 | – | 22 | 0.34 | – | 22[3] | – | 0.34 | – | |
| | | | 0.9 | 0.80[5] | – | 22[5] | 0.34[5] | – | 22[3][5] | – | 0.34[5] | – | |
| | | | 1.3 | 1.00 | – | 20 | 0.50 | – | 20[3] | – | 0.50 | – | ● |
| | | | 1.6 | 1.40 | – | 16 | 1.00 | – | 18 | – | 1.00 | – | |
| | | | 2.0 | 1.80 | – | 14 | 1.50 | – | 16 | – | 1.50 | – | |
| | | | 3.0 | 2.70 | – | 10 | 4.00 | – | 12 | – | 4.00 | – | |
| | | | 4.0 | 3.70 | – | 10 | 6.00 | – | 10 | – | 6.00 | – | |
| | | | 6.0 | 5.20 | – | – | – | – | 8 | – | 10.00 | – | |
| fig. 1 Crimp  | C | M | 0.5[4] | 0.45 | 1 | – | – | 32 | 28 | 0.035 | 0.09 | 12 | ● |
| | C | M | 0.7 | 0.80 | 1 | – | – | 26 | 22[3] | 0.140 | 0.34 | 22 | ● |
| | B | P | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| | C | M | 0.9 | 1.10 | 1 | – | – | 24 | 20 | 0.250 | 0.50 | 30 | ● |
| | B | P | | 0.80 | 2 | – | – | 26 | 22[3] | 0.140 | 0.34 | | ○ |
| | G | U | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| | C | M | 1.3 | 1.40 | 1 | – | – | 20 | 18 | 0.500 | 1.00 | 40 | ● |
| | B | P | | 1.10 | 2 | – | – | 24 | 20 | 0.250 | 0.50 | | ○ |
| fig. 2  | G | U | | 0.80 | 2 | – | – | 26 | 22[3] | 0.140 | 0.34 | | ○ |
| | C | M | 1.6 | 1.90 | 1 | – | – | 18 | 14[3] | 1.000 | 1.50 | 50 | ● |
| | B | P | | 1.40 | 2 | – | – | 22 | 18 | 0.340 | 1.00 | | ○ |
| | C | M | 2.0 | 2.40 | 1 | – | – | 16 | 12[3] | 1.500 | 2.50 | 65 | ● |
| | B | P | | 1.90 | 2 | – | – | 18 | 14 | 1.000 | 1.50 | | ○ |
| | C | M | 3.0 | 3.20 | 1 | – | – | 14 | 10[3] | 2.500 | 4.00 | 75 | ● |
| | C | M | 4.0 | 4.00 | 1 | – | – | 12 | 10 | 4.000 | 6.00 | 90 | ● |
| Print  | D | N | L dimensions and C are detailed in the section on PCB drilling pattern. See page 156. | | | | | | | | | | ● |
| Print (elbow)  | V | V | L dimensions and C are detailed in the section on PCB drilling pattern. See page 157. | | | | | | | | | | ● |

**Note:** [1] contact retention force in the insulator (according to IEC 60512-8 test 15 a).
[2] for 00 multipole series.
[3] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter. Make sure that the maximum conductor diameter is smaller than ø C.
[4] available only for 00 multipole series and connectors fitted with male contacts of the 0B and 1B series.
[5] for 0B.302/0B.303 and 0K.302/0K.303 ø C = 1.0 mm, AWG max 20, section max (mm²) 0.50.
[6] for 00 and 1B/1K series, according to manufacturing and plating tolerance ø C min = 0.43 mm.

● First choice alternative
○ Special order alternative

## Contacts reference for couplers R●●, S●● and TGL

| Ref. | Contact type | Remarks |
|---|---|---|
| A | Male - Female | contact configuration is explained on page 21, 28, 42 |
| L | Female - Male | contact configuration is explained on page 21, 28, 42 |
| M | Female - Female | contact configuration is explained on page 21 |

# Collets (B and K series)

## D and M type collets for B series

D type

M type

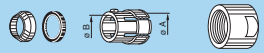
| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 00 | D | 22 | 2.2 | – | 2.2 | 1.4 | |
| | D | 27 | 2.7 | – | 2.7 | > 2.2 | |
| | D | 35 | 3.5 | 2.8 | 3.5 | > 2.7 | |
| 0B | D | 21 | 2.1 | – | 2.2 | 1.4 | 2) |
| | D | 32 | 3.2 | – | 3.2 | > 2.2 | |
| | D | 42 | 4.2 | – | 4.2 | > 3.2 | |
| | D | 52 | 5.2 | 4.7 | 5.2 | > 4.2 | |
| | D | 56 | 5.6 | 4.7 | 5.6 | > 5.2 | 1) |
| 1B | M | 27 | 2.7 | – | 2.7 | > 2.2 | |
| | M | 31 | 3.1 | – | 3.1 | > 2.7 | |
| | D | 42 | 4.2 | – | 4.2 | 3.1 | |
| | D | 52 | 5.2 | – | 5.2 | > 4.2 | |
| | D | 62 | 6.2 | – | 6.2 | > 5.2 | |
| | D | 72 | 7.2 | 6.2 | 7.2 | > 6.2 | |
| | D | 76 | 7.6 | 6.9 | 7.6 | > 7.2 | 1) |
| XB | D | 52 | 5.2 | 7.2 | 5.0 | 4.4 | |
| | D | 62 | 6.2 | 7.2 | 6.0 | 5.4 | |
| | D | 72 | 7.2 | 7.2 | 7.0 | 6.4 | |
| | D | 82 | 8.2 | 7.2 | 8.0 | 7.4 | 1) |
| 2B | M | 21 | 2.1 | – | 2.2 | 1.4 | |
| | M | 32 | 3.1 | – | 3.2 | > 2.2 | |
| | D | 42 | 4.2 | – | 4.2 | > 3.2 | |
| | D | 52 | 5.2 | – | 5.2 | > 4.2 | |
| | D | 62 | 6.2 | – | 6.2 | > 5.2 | |
| | D | 72 | 7.2 | – | 7.2 | > 6.2 | |
| | D | 82 | 8.2 | – | 8.2 | > 7.2 | |
| | D | 92 | 9.2 | 8.6 | 9.2 | > 8.2 | |
| | D | 99 | 9.9 | 8.6 | 9.9 | > 9.2 | 1) |

| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 3B | M | 52 | 5.2 | – | 5.2 | > 4.2 | |
| | D | 62 | 6.2 | – | 6.2 | 4.9 | |
| | D | 72 | 7.2 | – | 7.7 | > 6.2 | |
| | D | 92 | 9.2 | – | 9.2 | > 7.7 | |
| | D | 10 | 10.2 | – | 10.0 | > 9.2 | |
| | D | 11 | 11.0 | – | 11.0 | > 10.1 | |
| | D | 12 | 12.0 | 10.2 | 11.9 | 10.8 | 1) |
| 4B | M | 62 | 6.2 | – | 6.2 | 4.9 | |
| | M | 72 | 7.2 | – | 7.7 | > 6.2 | |
| | M | 92 | 9.2 | 8.6 | 9.2 | > 7.7 | |
| | D | 10 | 10.8 | – | 10.5 | 9.1 | |
| | D | 12 | 12.3 | – | 12.0 | 10.6 | |
| | D | 13 | 13.8 | 12.5 | 13.5 | 12.1 | |
| | D | 15 | 15.3 | 12.5 | 15.0 | 13.6 | |
| | D | 16 | 16.3 | 12.5 | 16.0 | 15.1 | 1) |
| 5B | D | 11 | 11.8 | – | 11.5 | 9.6 | |
| | D | 13 | 13.8 | – | 13.5 | 11.6 | |
| | D | 15 | 15.8 | – | 15.5 | 13.6 | |
| | D | 17 | 17.8 | – | 17.5 | 15.6 | 1) |
| | D | 19 | 19.8 | – | 19.5 | 17.6 | 1) |
| | D | 21 | 21.8 | – | 21.5 | 19.6 | 1) |
| | D | 23 | 23.8 | 21.8 | 23.5 | 21.6 | 1) |
| | D | 25 | 25.3 | 21.8 | 25.0 | 23.6 | 1) |

**Note:** all dimensions are in millimetres.
1) these collets cannot be used for connector models with nut for fitting a bend relief.
2) the inner diameter of the smallest bend relief available is 2.5 mm.

## C and K type collets for K series

C type



K type
oversize
cable collet

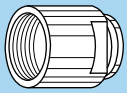
| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 0K | C | 10 | 1.6 | – | 1.2 | 1.0 | 1) |
| | C | 15 | 1.6 | – | 1.5 | 1.3 | 1) |
| | C | 20 | 2.1 | – | 2.0 | 1.6 | 1) |
| | C | 25 | 3.1 | – | 2.5 | 2.1 | |
| | C | 30 | 3.1 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | 4.2 | 3.5 | 3.1 | |
| | C | 40 | 4.2 | 4.2 | 4.0 | 3.6 | |
| | C | 45 | 5.2 | 5.2 | 4.5 | 4.1 | |
| | C | 50 | 5.2 | 5.2 | 5.0 | 4.6 | |
| 1K | C | 15 | 1.6 | – | 1.5 | 1.3 | |
| | C | 20 | 2.2 | – | 2.0 | 1.6 | |
| | C | 25 | 3.2 | – | 2.5 | 2.1 | |
| | C | 30 | 3.2 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | – | 3.5 | 3.1 | |
| | C | 40 | 4.2 | – | 4.0 | 3.6 | |
| | C | 45 | 5.2 | – | 4.5 | 4.1 | |
| | C | 50 | 5.2 | – | 5.0 | 4.6 | |
| | C | 55 | 6.2 | 6.2 | 5.5 | 5.1 | |
| | C | 60 | 6.2 | 6.2 | 6.0 | 5.6 | |
| | C | 65 | 7.2 | 6.7 | 6.5 | 6.1 | |
| | K | 70 | 7.2 | – | 7.0 | 6.6 | |
| | K | 75 | 8.2 | 8.2 | 7.5 | 7.1 | |
| | K | 80 | 8.2 | 8.2 | 8.0 | 7.6 | |
| | K | 85 | 9.2 | 8.6 | 8.5 | 8.1 | |
| 2K | C | 15 | 2.2 | – | 1.5 | 1.3 | |
| | C | 20 | 2.2 | – | 2.0 | 1.6 | |
| | C | 25 | 3.2 | – | 2.5 | 2.1 | |
| | C | 30 | 3.2 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | – | 3.5 | 3.1 | |
| | C | 40 | 4.2 | – | 4.0 | 3.6 | |
| | C | 45 | 5.2 | – | 4.5 | 4.1 | |
| | C | 50 | 5.2 | – | 5.0 | 4.6 | |
| | C | 55 | 6.2 | – | 5.5 | 5.1 | |
| | C | 60 | 6.2 | – | 6.0 | 5.6 | |
| | C | 65 | 7.2 | – | 6.5 | 6.1 | |
| | C | 70 | 7.2 | – | 7.0 | 6.6 | |
| | C | 75 | 8.2 | 8.2 | 7.5 | 7.1 | |
| | C | 80 | 8.2 | 8.2 | 8.0 | 7.6 | |
| | C | 85 | 9.2 | 8.6 | 8.5 | 8.1 | |
| | K | 90 | 9.2 | – | 9.0 | 8.6 | |
| | K | 95 | 10.2 | 10.2 | 9.5 | 9.1 | |
| | K | 10 | 10.2 | 10.2 | 10.0 | 9.6 | |
| | K | 11 | 11.2 | 10.6 | 10.5 | 10.1 | |
| 3K | C | 30 | 3.2 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | – | 3.5 | 3.1 | |
| | C | 40 | 4.2 | – | 4.0 | 3.6 | |
| | C | 45 | 5.2 | – | 4.5 | 4.1 | |
| | C | 50 | 5.2 | – | 5.0 | 4.6 | |
| | C | 55 | 6.2 | – | 5.5 | 5.1 | |
| | C | 60 | 6.2 | – | 6.0 | 5.6 | |
| | C | 65 | 7.2 | – | 6.5 | 6.1 | |

| | Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. |
| 3K | C | 70 | 7.2 | – | 7.0 | 6.6 |
| | C | 75 | 8.2 | – | 7.5 | 7.1 |
| | C | 80 | 8.2 | – | 8.0 | 7.6 |
| | C | 85 | 9.2 | – | 8.5 | 8.1 |
| | C | 90 | 9.2 | – | 9.0 | 8.6 |
| | C | 95 | 10.2 | 10.2 | 9.5 | 9.1 |
| | C | 10 | 10.2 | 10.2 | 10.0 | 9.6 |
| | C | 11 | 11.2 | 10.6 | 10.5 | 10.1 |
| | K | 11 | 12.3 | – | 12.0 | 10.6 |
| | K | 12 | 13.8 | 13.8 | 12.8 | 12.1 |
| | K | 13 | 13.8 | 13.8 | 13.5 | 12.9 |
| | K | 14 | 15.3 | 15.3 | 14.0 | 13.6 |
| | K | 15 | 15.3 | 15.3 | 15.0 | 14.1 |
| 4K | C | 50 | 6.3 | – | 5.0 | 4.6 |
| | C | 55 | 6.3 | – | 5.5 | 5.1 |
| | C | 60 | 6.3 | – | 6.0 | 5.6 |
| | C | 65 | 7.3 | – | 6.5 | 6.1 |
| | C | 70 | 7.3 | – | 7.0 | 6.6 |
| | C | 75 | 8.3 | – | 7.5 | 7.1 |
| | C | 80 | 8.3 | – | 8.0 | 7.6 |
| | C | 85 | 9.3 | – | 8.5 | 8.1 |
| | C | 90 | 9.3 | – | 9.0 | 8.6 |
| | C | 95 | 10.8 | – | 9.5 | 9.1 |
| | C | 10 | 10.8 | – | 10.5 | 9.6 |
| | C | 11 | 12.3 | – | 12.0 | 10.6 |
| | C | 12 | 13.8 | 13.8 | 12.8 | 12.1 |
| | C | 13 | 13.8 | 13.8 | 13.5 | 12.9 |
| | C | 14 | 15.3 | 15.3 | 14.0 | 13.6 |
| | C | 15 | 15.3 | 15.3 | 15.0 | 14.1 |
| | K | 16 | 17.8 | – | 16.5 | 15.6 |
| | K | 17 | 17.8 | – | 17.5 | 16.6 |
| | K | 18 | 19.8 | – | 18.5 | 17.6 |
| | K | 19 | 19.8 | – | 19.5 | 18.6 |
| | K | 20 | 21.8 | – | 20.5 | 19.6 |
| | K | 21 | 21.8 | – | 21.5 | 20.6 |
| | K | 22 | 23.8 | 23.8 | 22.5 | 21.6 |
| | K | 23 | 23.8 | 23.8 | 23.5 | 22.6 |
| 5K | C | 10 | 11.8 | – | 10.5 | 9.6 |
| | C | 11 | 11.8 | – | 11.5 | 10.6 |
| | C | 12 | 13.8 | – | 12.5 | 11.6 |
| | C | 13 | 13.8 | – | 13.5 | 12.6 |
| | C | 14 | 15.8 | – | 14.5 | 13.6 |
| | C | 15 | 15.8 | – | 15.5 | 14.6 |
| | C | 16 | 17.8 | – | 16.5 | 15.6 |
| | C | 17 | 17.8 | – | 17.5 | 16.6 |
| | C | 18 | 19.8 | – | 18.5 | 17.6 |
| | C | 19 | 19.8 | – | 19.5 | 18.6 |
| | C | 20 | 21.8 | – | 20.5 | 19.6 |
| | C | 21 | 21.8 | – | 21.5 | 20.6 |
| | C | 22 | 23.8 | 23.8 | 22.5 | 21.6 |
| | C | 23 | 23.8 | 23.8 | 23.5 | 22.6 |

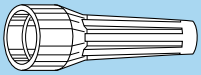
**Note:** 1) the inner diameter of the smallest bend relief available is 2.5 mm. All dimensions are in millimetres.

# Variant (B and K series)

## Bend relief for B series models with collet

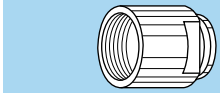


Need to be ordered

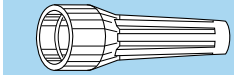


| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 00 | Z | D | 22 to 35 | GMA.00.●●●.●● GMB.00.●●●.●● |
| 0B | Z | D | 21 to 52 | GMA.0B.●●●.●● |
| 1B | Z | M | 27 and 31 | GMA.1B.●●●.●● |
| | | D | 42 to 72 | GMA.1B.●●●.●● |
| XB | Z | D | 52 to 72 | GMA.1B.●●●.●● |
| 2B | Z | M | 21 and 31 | GMA.0B.●●●.●● |
| | | D | 42 to 92 | GMA.2B.●●●.●● |
| 3B | Z | M | 52 | GMA.1B.●●●.●● |
| | | D | 62 to 10 | GMA.3B.●●●.●● |
| 4B | Z | M | 62 and 72 | GMA.2B.●●●.●● |
| | | M | 92 | GMA.4B.●●●.●● |
| | | D | 10 to 15 | GMA.4B.●●●.●● |
| 5B | Z | D | 11 to 15 | GMA.4B.●●●.●● |

## Bend relief for K series models with collet



Need to be ordered



| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 0K | Z | C | 10 to 50 | GMA.0B.●●●.●● |
| 1K | Z | C | 15 to 65 | GMA.1B.●●●.●● |
| | | K | 70 to 85 | GMA.2B.●●●.●● |
| 2K | Z | C | 15 to 85 | GMA.2B.●●●.●● |
| | | K | 90 to 10 | GMA.3B.●●●.●● |
| 3K | Z | C | 30 to 10 | GMA.3B.●●●.●● |
| | | K | 11 to 15 | GMA.4B.●●●.●● |
| 4K | Z | C | 50 to 15 | GMA.4B.●●●.●● |

**Note:** All dimensions are in millimetres.

## Colour of the bridge plug shells and connectors shell made of plastic material and aluminium alloys

| Reference | Colour | Bridge plug and plastic shell | | | Aluminium alloys | |
|---|---|---|---|---|---|---|
| | | PSU | PPSU | PA.6 | Anodized colour | Anodized colour for bend relief collet nut |
| A | blue | | | ● | ● | |
| B | white | ● | | ● | | |
| G | grey | ● | | ● | | |
| J | yellow | | | ● | ● | |
| M | brown | | | ● | | |
| N | black | | | ● | ● | |
| R | red | | | ● | ● | |
| S | orange | | | ● | | |
| T | natural | | | | ● | |
| V | green | | | ● | ● | |
| L | black | | | | | ● |
| X | natural | | | | | ● |
| F | cream | | ● | | | |

**Note:** other anodizing colours are available for connectors with collet nut for bend relief. Please consult us.

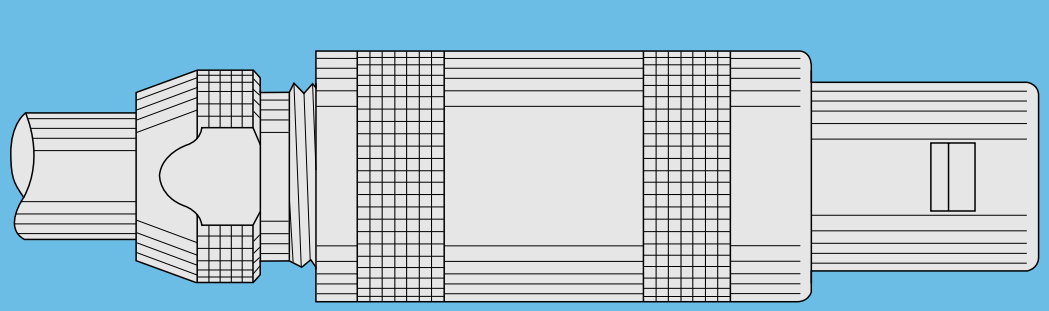
## Watertight and vacumtight socket and coupler models (B and K series)

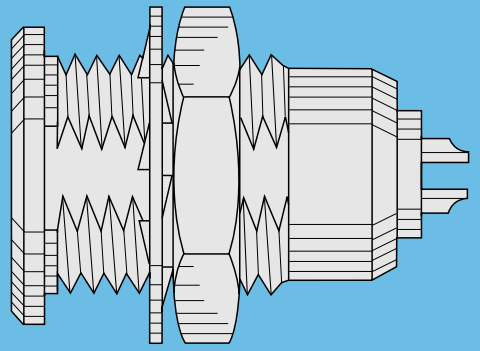
| | Model | Reference | |
|---|---|---|---|
| | | Watertight | Vacuumtight |
| B | YH●, HG●, HN●, HH●, HC●, HE●, HM●, S●● | P | PV |
| K | HG●, HE●, S●● | P | PV |

## O-ring and gasket material (K series)

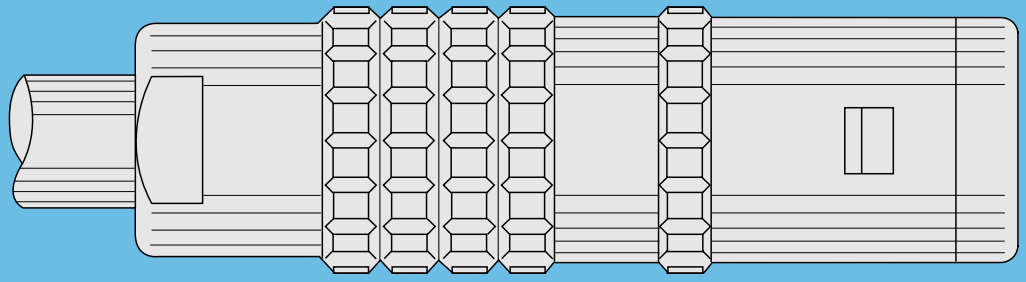
Standard connectors are delivered with silicone o-ring and gaskets. The vacuumtight models, identified with the letter «PV», are delivered with Viton® gaskets. Other gaskets material can be delivered upon special request.

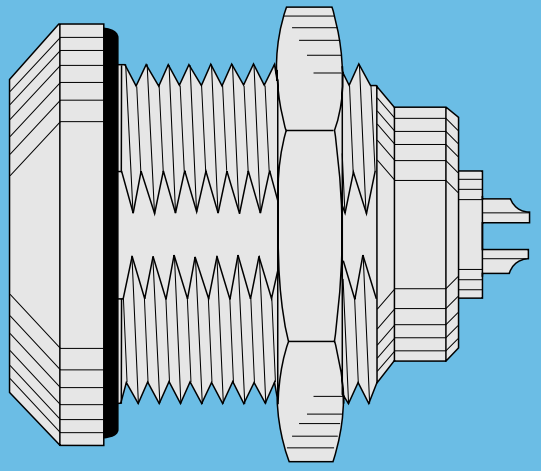
| O-ring material | Reference |
|---|---|
| FPM (Viton®) | H |
| EPDM | E |
| FPM (Viton®) and collet nut for bend relief | D |



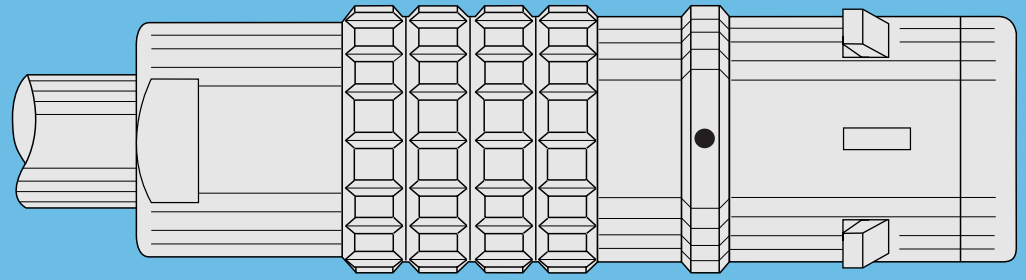


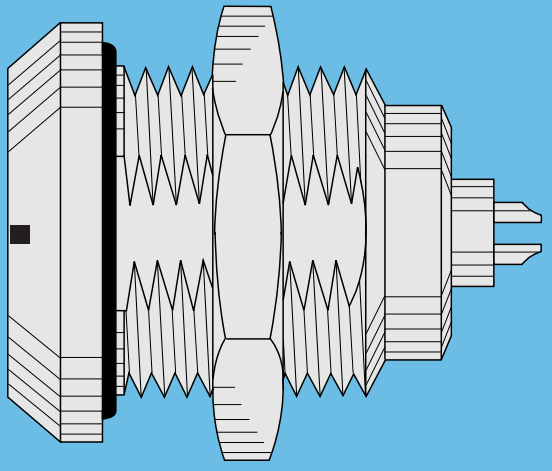
S SERIES





E SERIES (watertight)





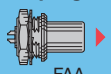
L SERIES (watertight keyed)

# S Series

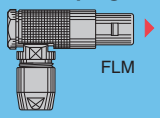
S series connectors have main features as follows:
– security of the Push-Pull self-latching system
– unipole types transmitting current up to 230 A and multipole types with up to 106 contacts
– 360° screening for full EMC shielding.
– solder or print contacts (straight or elbow)
– polarisation by stepped insert (half-moon) fitted with male and female contacts

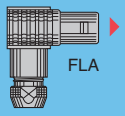
## Metal housing models (page 58)

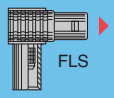
**Fixed plug**


FAA

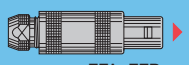
**Elbow plugs**

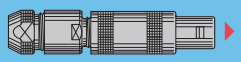

FLM

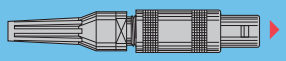

FLA

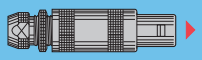

FLS

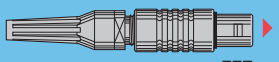
**Straight plugs**

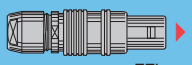

FFA, FFP

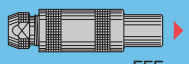

FFA

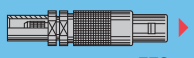

FFA, FFP

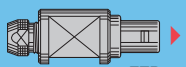

FFB


FFE

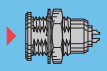

FFL

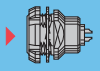

FFF

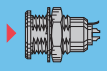

FFS

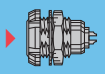

FZP

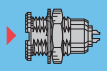
**Fixed sockets**

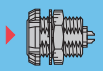

ERA

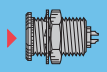

EEP

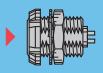

ERN

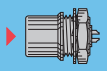

ERD

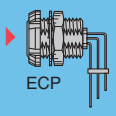

ERC

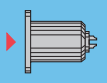

ECP


ERS

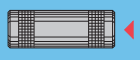

ECP

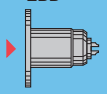

EHP


ECP

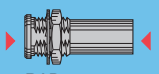

EBD

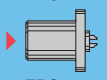
**Free coupler**


RMA

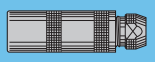

EBS

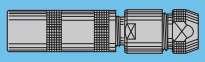
**Fixed coupler**

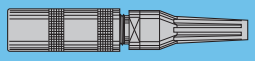

RAD

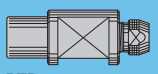

EBC

**Free sockets**

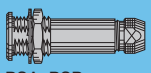

PCA, PCP

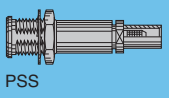

PCA


PCA, PCP

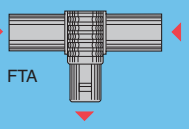

PZP

**Fixed sockets**


PSA, PSP

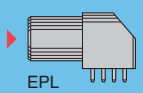

PSS

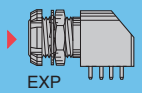
**T-plug**


FTA

## Elbow socket models (page 68)

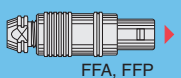
**Elbow sockets**

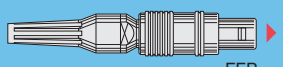

EPL

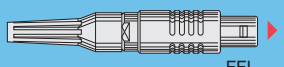

EXP

## Plastic housing models (page 70)

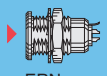
**Straight plugs**


FFA, FFP


FFP

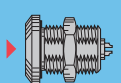

FFL

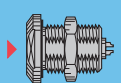
**Fixed socket**

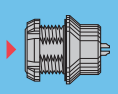

ERN

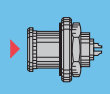
## Watertight or vacuumtight models (page 72)

**Fixed sockets**

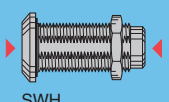

HGP


EWB

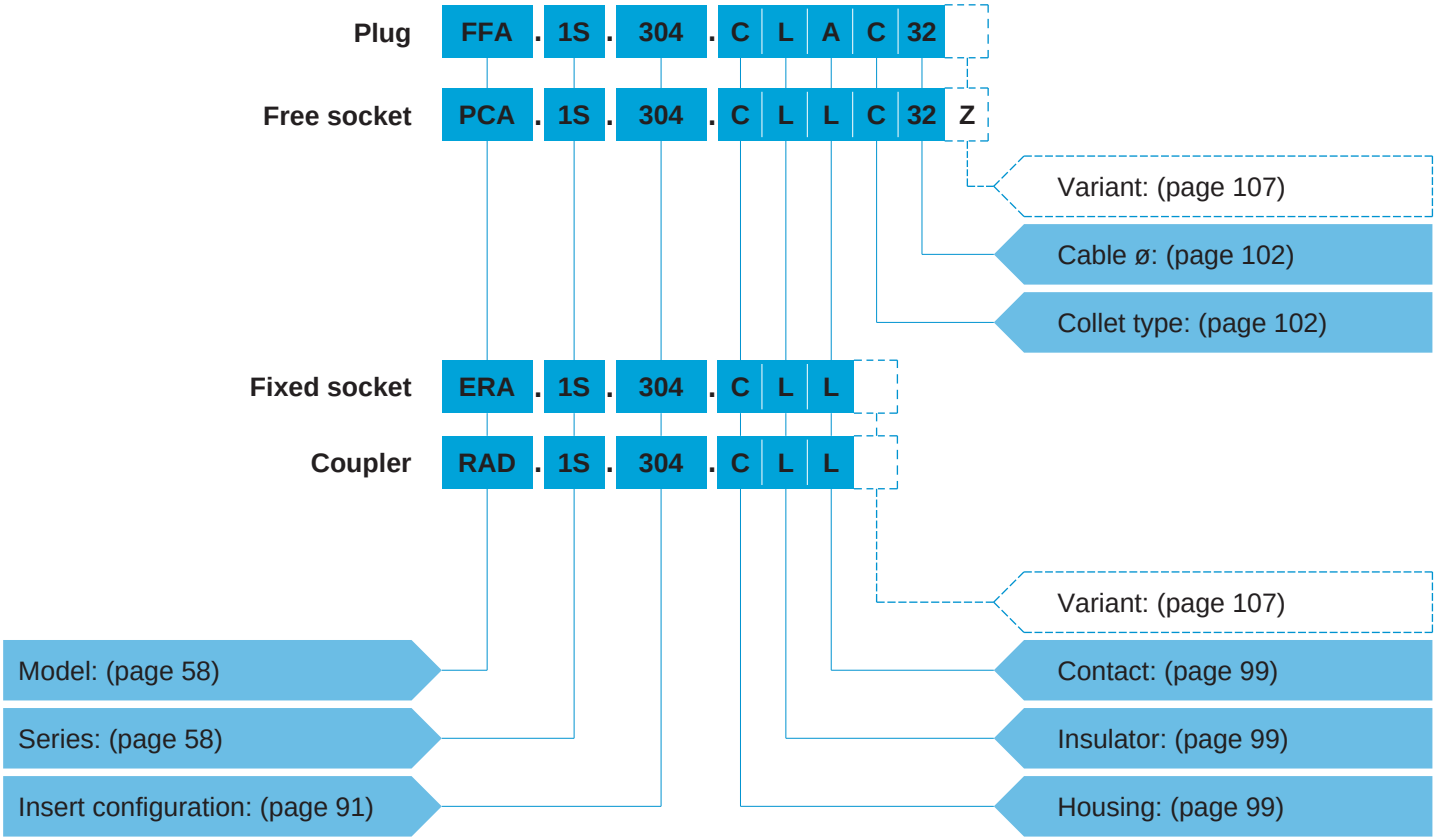

HCP


HGW

**Fixed coupler**


SWH

## Part Numbering System




## Part Number Example

**Straight plug with cable collet:**
**FFA.1S.304.CLAC32** = straight plug with cable collet, 1S series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 male and 2 female solder contacts, C type collet for a 3.2 mm diameter cable.

**Free socket:**
**PCA.1S.304.CLLC32Z** = free socket, with cable collet, 1S series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male solder contacts, C type collet for a 3.2 mm diameter cable and nut for fitting a bend relief.

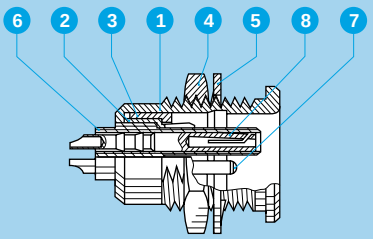
**Fixed socket:**
**ERA.1S.304.CLL** = fixed socket, nut fixing, 1S series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male solder contacts.

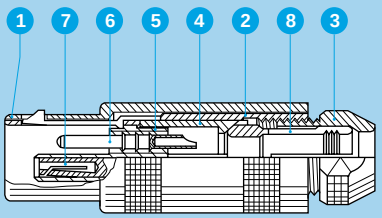
**Fixed coupler:**
**RAD.1S.304.CLL** = straight coupler, nut fixing, 1S series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male contacts each end.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. earthing crown
3. retaining ring
4. hexagonal nut
5. locking washer
6. insulator
7. male contact
8. female contact




**Straight plug**

1. outer shell
2. latch sleeve
3. collet nut
4. centre-piece
5. insulator
6. male contact
7. female contact
8. collet

# Metal housing models

## Technical Characteristics

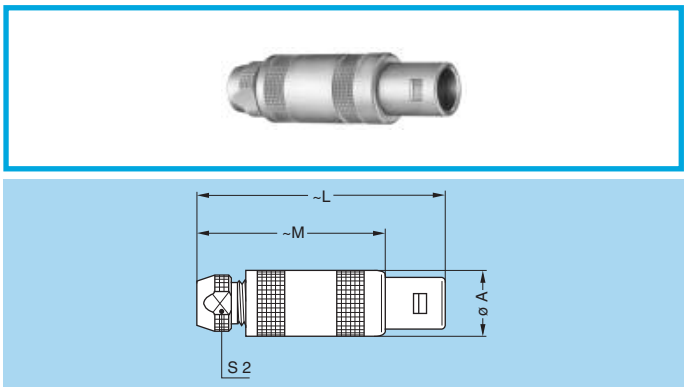
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range | - 55° C, +250° C | |
| Resistance to vibrations | 10-2000 Hz, 15 g | IEC 60512-4 test 6d |
| Shock resistance | 100 g, 6 ms | IEC 60512-4 test 6c |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index (mated) | IP 50 | IEC 60529 |
| Climatical category | 55/175/21 | IEC 60068-1 |

### Electrical

| Characteristics | | Value | Standard |
|---|---|---|---|
| Shielding efficiency | at 10 MHz | > 75 dB | IEC 60169-1-3 |
| | at 1 GHz | > 40 dB | IEC 60169-1-3 |

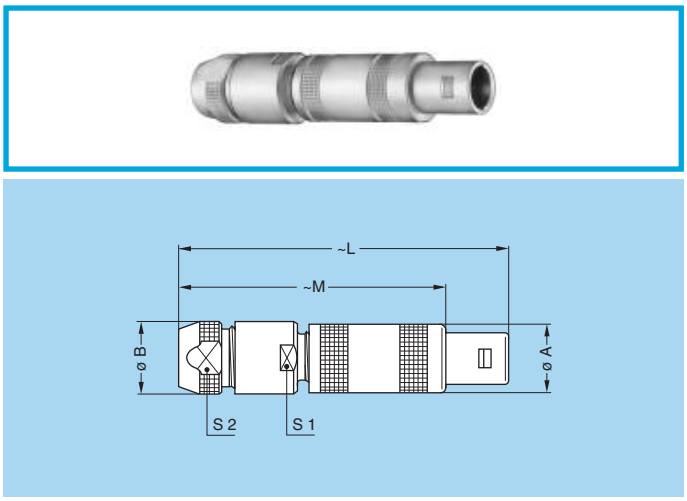
**Note:**
The various tests have been carried out with FFA and ERA connector pairs, with chrome-plated brass shell and PEEK insulator.
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.




### FFA Straight plug, cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFA | 00 | 6.4 | 26.0 | 18.0 | 4.5 |
| FFA | 0S | 9.0 | 34.5 | 24.5 | 6.5 |
| FFA | 1S | 12.0 | 42.5 | 31.5 | 8.5 |
| FFA | 2S | 14.8 | 52.0 | 40.0 | 11.0 |
| FFA | 3S | 17.8 | 61.0 | 46.0 | 14.0 |
| FFA | 4S | 24.8 | 77.0 | 59.0 | 19.0 |
| FFA | 5S | 35.0 | 103.0 | 78.0 | 29.0 |
| FFA | 6S | 46.0 | 106.0 | 81.0 | 38.0 |

**M1**
Cable assembly
(pages 163 to 165)

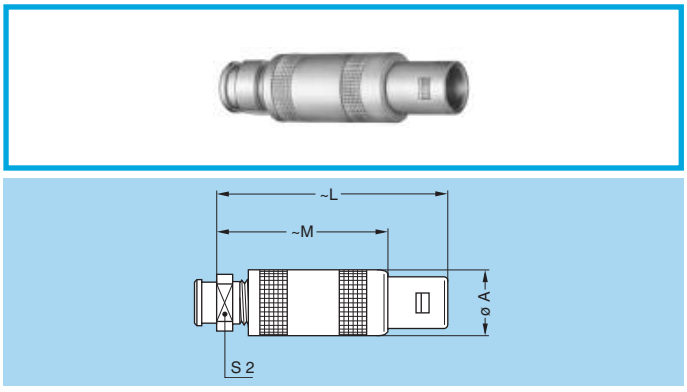



### FFA Straight plug with oversize cable collet [1)]

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | S1 | S2 |
| FFA | 00 | 6.4 | 8.0 | 34.0 | 26.0 | 7.0 | 6.5 |
| FFA | 0S | 9.0 | 10.0 | 45.5 | 35.5 | 9.0 | 8.5 |
| FFA | 1S | 12.0 | 13.0 | 57.0 | 46.0 | 12.0 | 11.0 |
| FFA | 2S | 14.8 | 18.0 | 67.0 | 55.0 | 14.0 | 14.0 |
| FFA | 3S | 17.8 | 21.0 | 85.0 | 70.0 | 19.0 | 19.0 |
| FFA | 4S | 24.8 | 31.8 | 107.0 | 89.0 | 28.5 | 29.0 |
| FFA | 5S | 35.0 | 41.8 | 138.0 | 113.0 | 37.5 | 38.0 |

**M2** Cable assembly (pages 164 and 166)

**Note:** [1)] correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 102).

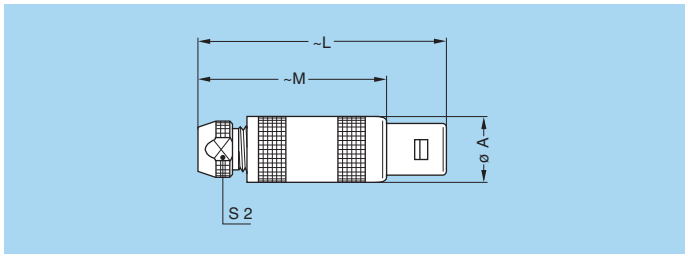



### FFA Straight plug, cable collet and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFA | 00 | 6.4 | 26.0 | 18.0 | 6 |
| FFA | 0S | 9.0 | 34.5 | 24.5 | 7 |
| FFA | 1S | 12.0 | 42.5 | 31.5 | 9 |
| FFA | 2S | 14.8 | 52.0 | 40.0 | 12 |
| FFA | 3S | 17.8 | 61.0 | 46.0 | 14 |
| FFA | 4S | 24.8 | 77.0 | 59.0 | 20 |

**M1**
Cable assembly
(pages 163 and 164)

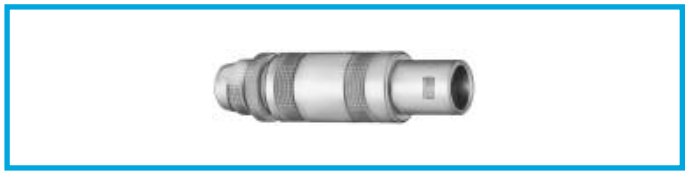
**Note:**
[1)] to order, add a «Z» at the end of the reference. The bend relief must be ordered separately (see page 141).

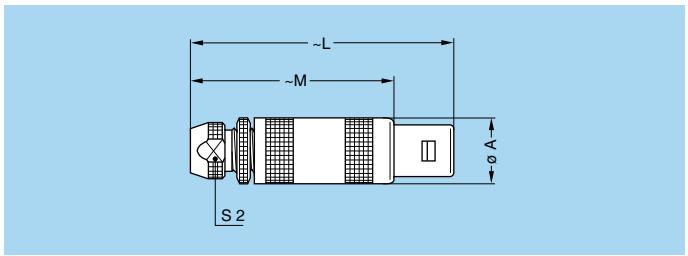



## FFP Straight plug, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFP | 1S | 12.0 | 42.5 | 31.5 | 8.5 |
| FFP | 2S | 14.8 | 52.0 | 40.0 | 11.0 |
| FFP | 3S | 17.8 | 61.0 | 46.0 | 14.0 |
| FFP | 4S | 24.8 | 77.0 | 59.0 | 19.0 |

**M1** Cable assembly (pages 163 and 164)



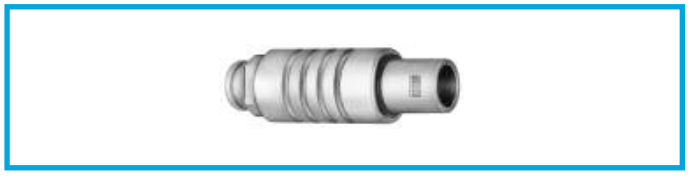


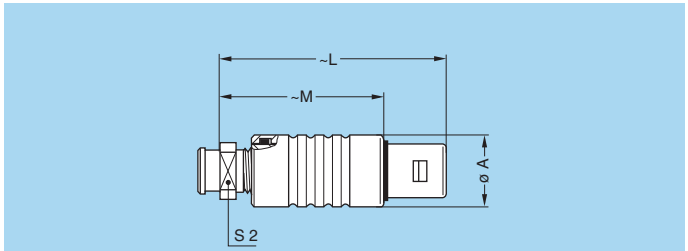

## FFB Straight plug, cable collet and safety locking ring

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFB | 0S | 9.0 | 36.8 | 26.8 | 6.5 |
| FFB | 1S | 12.0 | 45.0 | 34.0 | 8.5 |
| FFB | 2S | 14.8 | 55.5 | 43.5 | 11.0 |
| FFB | 3S | 17.8 | 65.0 | 50.0 | 14.0 |

**M1** Cable assembly (pages 163 and 164)

**Note:** nut for fitting a bend relief (available only for size 1S).



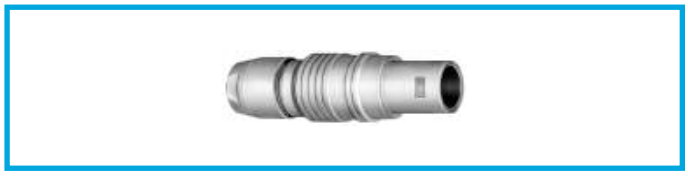


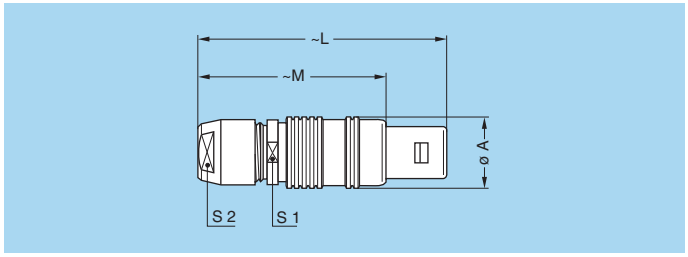

## FFE Straight plug, cable collet, front seal and nut for fitting a bend relief [1] (protected to IP54 when mated)

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFE | 00 | 7.4 | 26.0 | 18.0 | 6 |
| FFE | 0S | 10.0 | 34.5 | 24.5 | 7 |
| FFE | 1S | 13.0 | 42.5 | 31.5 | 9 |
| FFE | 2S | 16.0 | 52.0 | 40.0 | 12 |
| FFE | 3S | 19.0 | 61.0 | 46.0 | 14 |

**M1** Cable assembly (pages 163 and 164)

**Note:** [1] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).



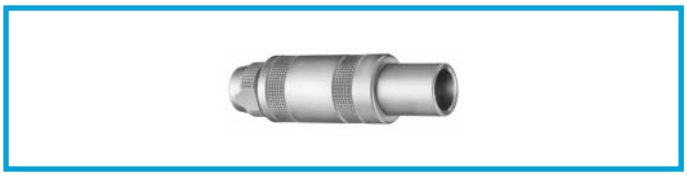


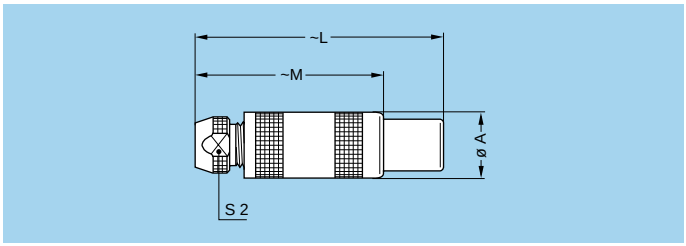

## FFL Straight plug, flats on latch sleeve, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FFL | 2S | 15.0 | 49.0 | 37.0 | 13 | 12 |

**M4** Cable assembly (page 165)

**Note:** this model is fitted with a «D or M» type collet system.
It is also adapted for crimp contacts.
Available only for multipole.

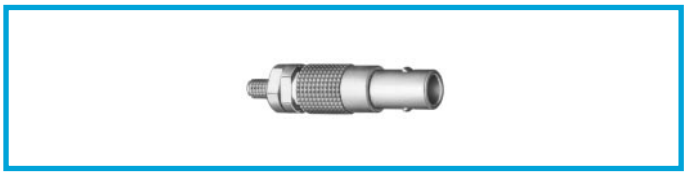


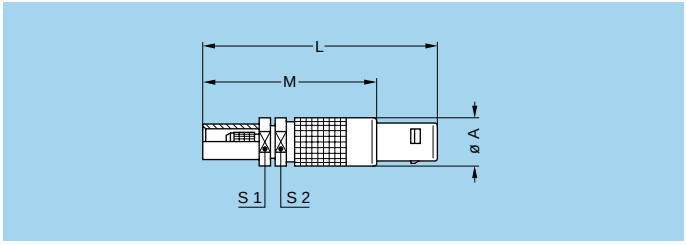



## FFF Straight plug, non-latching, cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFF | 00 | 6.4 | 26.0 | 18.0 | 4.5 |
| FFF | 0S | 9.0 | 34.5 | 24.5 | 6.5 |
| FFF | 1S | 12.0 | 42.5 | 31.5 | 8.5 |
| FFF | 2S | 14.8 | 52.0 | 40.0 | 11.0 |

**M1** Cable assembly (pages 163 and 164)



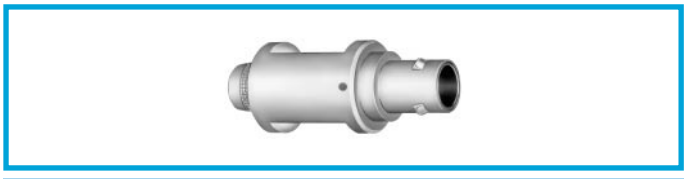


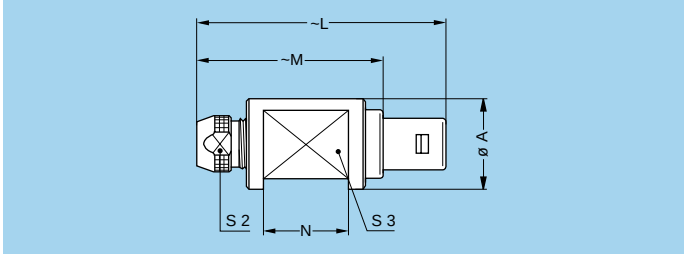

## FFS Straight plug for cable crimping

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | M | S1 | S2 |
| FFS | 00 | 6.4 | 31 | 23 | 5.5 | 5.5 |

**M5** Cable assembly (page 163)

**Note:** Model available only with crimp backnut E31 similar to 00.250 series.

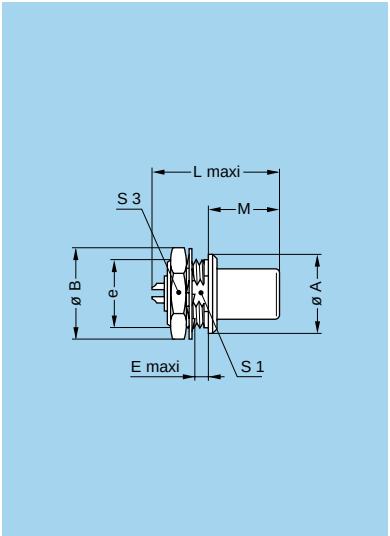





## FZP Straight plug for remote handling, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | L | M | N | S2 | S3 |
| FZP | 1S | 16 | 42.5 | 31.5 | 15 | 8.5 | 12 |
| FZP | 2S | 24 | 52.0 | 40.0 | 21 | 11.0 | 18 |
| FZP | 3S | 24 | 61.0 | 46.0 | 24 | 14.0 | 18 |
| FZP | 4S | 35 | 77.0 | 59.0 | 30 | 19.0 | 28 |
| FZP | 5S | 43 | 103.0 | 78.0 | 44 | 29.0 | 35 |
| FZP | 6S | 60 | 106.0 | 81.0 | 44 | 38.0 | 50 |

**M1** Cable assembly (pages 163 to 165)



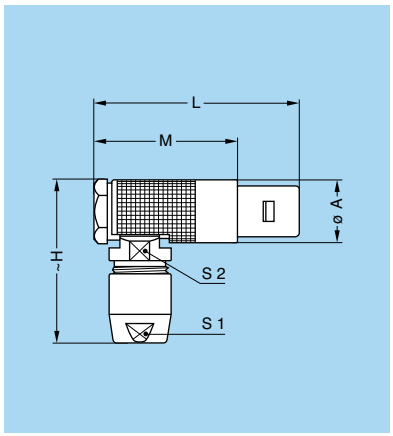

## FAA Fixed plug non-latching, nut fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| FAA | 00 | 8 | 10.2 | M7x0.5 | 2.0 | – | 15.5 | 9.0 | 6.3 | 9 |
| FAA | 0S | 10 | 12.4 | M9x0.6 | 2.0 | 18.5 | 18.0 | 11.2 | 8.2 | 11 |
| FAA | 1S | 14 | 15.8 | M12x1.0 | 2.5 | 22.5 | 21.7 | 12.5 | 10.5 | 14 |
| FAA | 2S | 18 | 19.2 | M15x1.0 | 4.0 | 25.0 | 25.3 | 13.8 | 13.5 | 17 |
| FAA | 3S | 22 | 25.0 | M18x1.0 | 4.0 | 31.0 | 29.0 | 17.0 | 16.5 | 22 |
| FAA | 4S | 28 | 34.0 | M25x1.0 | 2.5 | 35.5 | 39.0 | 20.5 | 23.5 | 30 |
| FAA | 5S | 40 | 40.0 | M35x1.0 | 2.5 | 45.0 | – | 28.0 | 33.5 | – |
| FAA | 6S | 54 | 54.0 | M48x1.5 | 2.5 | 45.0 | – | 28.0 | – | – |

**P1** Panel cut-out (page 152)

**P2** Panel cut-out 6S series (page 152)

**Note:** [1)] unipole model

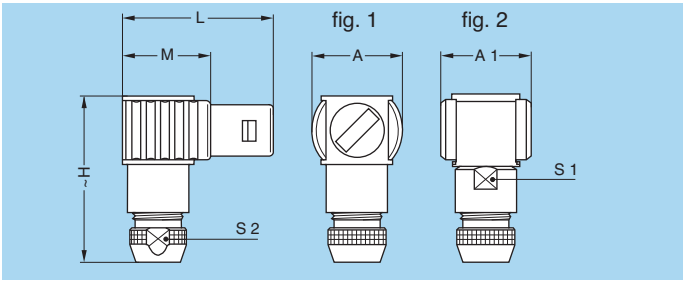



## FLC/FLM Elbow (90°) plug, cable collet

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | H | L | M | S1 | S2 |
| FLC | 00 | 7.5 | 16.5 | 19.5 | 11.5 | 4.5 | 6 |
| FLM | 0S | 9.5 | 23.0 | 30.0 | 20.0 | 7.0 | 8 |
| FLM | 1S | 12.0 | 29.0 | 36.0 | 25.0 | 9.0 | 10 |
| FLM | 2S | 14.8 | 35.0 | 41.5 | 29.5 | 12.0 | 13 |

**M3** Cable assembly (pages 163 to 165)

**Note:** FLC.00 model is used for the unipole type.
For 0S, 1S and 2S series use «D» type collet, see page 52.



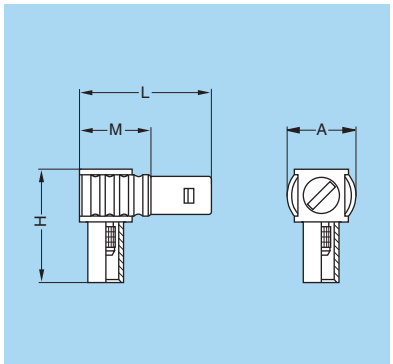

## FLA Elbow (90°) plug, cable collet

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | A1 | H | L | M | S1 | S2 |
| FLA | 3S | 21 | 21 | 44.0 | 38.5 | 23.5 | 15 | 14.0 |
| FLA | 4S | 28 | 28 | 56.0 | 49.0 | 31.0 | 20 | 19.0 |
| FLA | 5S | – | 37 | 76.5 | 65.0 | 40.0 | 30 | 29.0 |
| FLA | 6S | – | 48 | 94.0 | 81.0 | 56.0 | 40 | 38.0 |

**M3** Cable assembly (pages 163 to 165)

**Note:**
fig. 1 is used for the unipole type, fig. 2 is used for the multipole type.

- Maximum operating temperature: 120°C



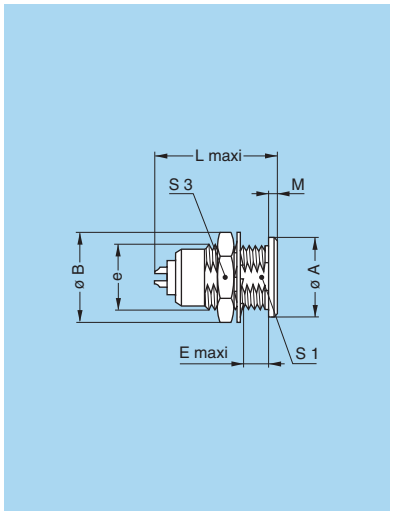

## FLS Elbow (90°) plug for cable crimping

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | H | L | M |
| FLS | 00 | 9 | 16 | 17.5 | 9.5 |

**M6** Cable assembly (page 163)

**Note:** Model available only with crimp backnut E31 similar to 00.250 series.

- Maximum operating temperature: 120°C

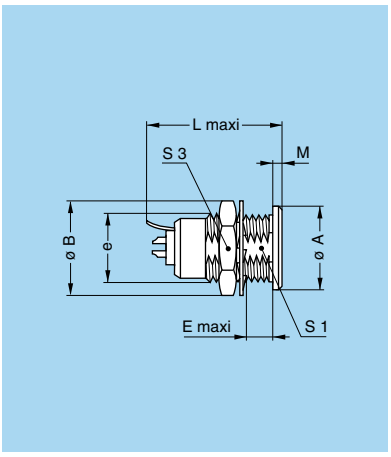



## ERA Fixed socket, nut fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ERA | 00 | 8 | 10.2 | M7x0.5 | 5.5 | – | 14.5 | 1.0 | 6.3 | 9 |
| ERA | 0S | 10 | 12.4 | M9x0.6 | 7.0 | 17.5 | 18.0 | 1.2 | 8.2 | 11 |
| ERA | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 20.2 | 20.5 | 1.5 | 10.5 | 14 |
| ERA | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 24.5 | 23.5 | 1.8 | 13.5 | 17 |
| ERA | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 29.0 | 27.5 | 2.0 | 16.5 | 22 |
| ERA | 4S | 28 | 34.0 | M25x1.0 | 12.0 | 34.0 | 33.5 | 2.5 | 23.5 | 30 |
| ERA | 5S | 40 | 40.0 | M35x1.0 | 15.5 | 45.0 | 78.5 | 3.0 | 33.5 | – |
| ERA | 6S | 54 | 54.0 | M48x1.5 | 16.0 | 45.0 | – | 3.5 | 45.5 | – |

**P1** Panel cut-out (page 152) **Note:** [1)] unipole model

**Note:** the 5S series is delivered with a tapered washer and a round nut.
The 6S series is delivered without a locking washer and with a round nut.

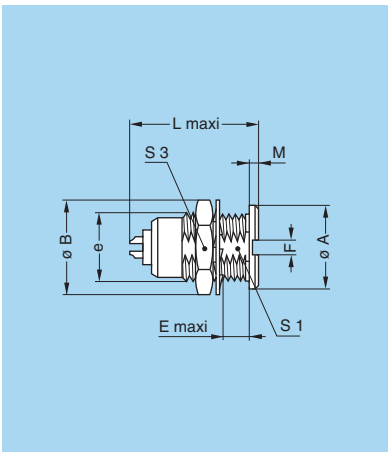



## ERN Fixed socket, nut fixing, with earthing tag

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ERN | 0S | 10 | 12.4 | M9x0.6 | 7.0 | 19.3 | 19.3 | 1.2 | 8.2 | 11 |
| ERN | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 22.4 | 22.4 | 1.5 | 10.5 | 14 |
| ERN | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 26.3 | 26.3 | 1.8 | 13.5 | 17 |
| ERN | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 29.8 | 29.8 | 2.0 | 16.5 | 22 |

P1 Panel cut-out (page 152)

**Note:** 1) unipole model

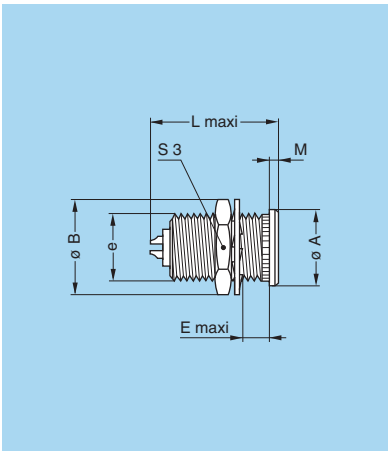



## ERC Fixed socket, nut fixing with slot in the flange

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | F | L | L[1)] | M | S1 | S3 |
| ERC | 00 | 8 | 10.2 | M7x0.5 | 5.5 | 1.6 | – | 14.5 | 1.0 | 6.3 | 9 |
| ERC | 0S | 10 | 12.4 | M9x0.6 | 7.0 | 2.0 | 17.5 | 18.0 | 1.2 | 8.2 | 11 |
| ERC | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 2.5 | 20.2 | 20.5 | 1.5 | 10.5 | 14 |

P1 Panel cut-out (page 152)

**Note:** 1) unipole model

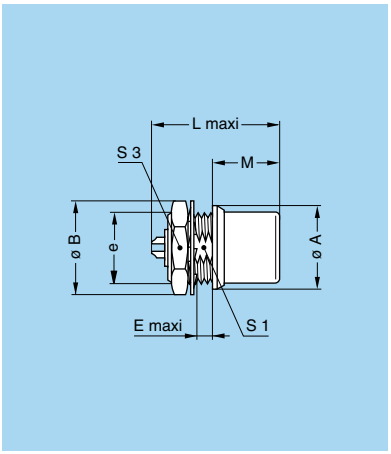



## ERS Fixed socket, nut fixing, long threaded shell, without flats

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S3 |
| ERS | 0S | 10 | 12.4 | M9x0.6 | 10.5 | 17.5 | 18.0 | 1.2 | 11 |

P2 Panel cut-out (page 152)

**Note:** 1) unipole model



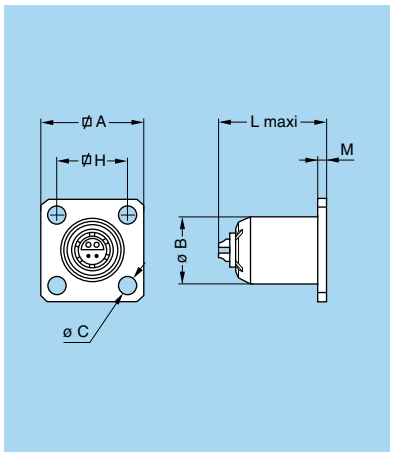

## EHP Fixed socket, nut fixing, protruding shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| EHP | 0S | 10 | 12.4 | M9x0.6 | 2.0 | 20.5 | 18.0 | 12.5 | 8.2 | 11 |
| EHP | 1S | 14 | 15.8 | M12x1.0 | 3.5 | 20.2 | 20.5 | 12.0 | – | 14 |
| EHP | 3S | 22 | 25.0 | M18x1.0 | 4.0 | 29.0 | 29.0 | 18.7 | – | 22 |

P1 Panel cut-out 0S series (page 152)

P2 Panel cut-out (page 152)

**Note:** 1) unipole model

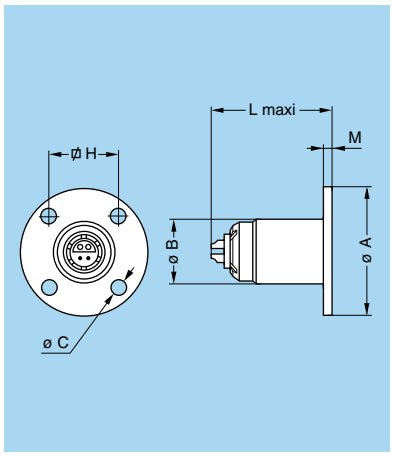



## EBD Fixed socket with square flange and screw fixing

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | H | L | L[1)] | M |
| EBD | 2S | 22 | 15 | 3.2 | 15.5 | 24.5 | 26 | 2 |

**P6** Panel cut-out (page 152)

**Note:** [1)] unipole model

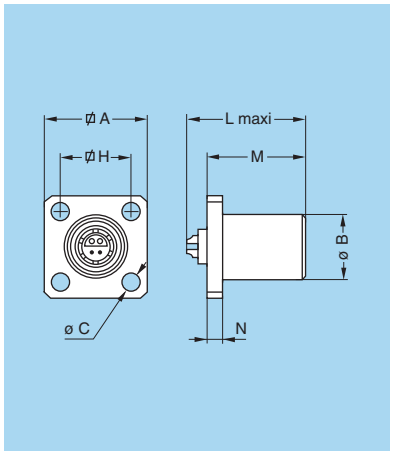



## EBS Fixed socket with round flange and screw fixing

| Reference | | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | H | L | L[1)] | M |
| EBS | 1S | 22 | 11 | 2.5 | 12.4 | 20.2 | 20.5 | 1.5 |

**P7** Panel cut-out (page 152)

**Note:** [1)] unipole model

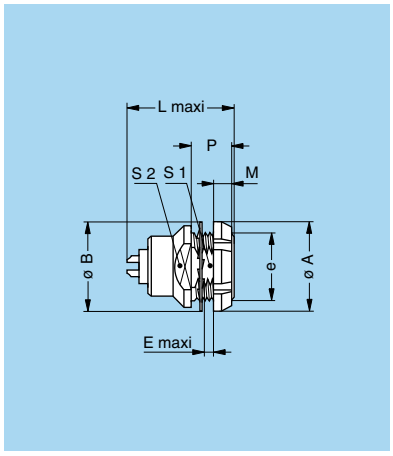



## EBC Fixed socket with square flange, protruding shell and screw fixing

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | H | L | L[1)] | M | N |
| EBC | 1S | 18 | 11.5 | 3.2 | 12.7 | 20.2 | 20.5 | 16.5 | 2.8 |
| EBC | 2S | 22 | 15.0 | 3.2 | 15.5 | 24.5 | 23.5 | 18.5 | 4.4 |
| EBC | 3S | 25 | 18.0 | 3.2 | 18.0 | 29.0 | 27.5 | 23.5 | 3.0 |
| EBC | 5S | 45 | 40.0 | 4.3 | 36.8 | 45.0 | 78.5 | 15.0 | 4.0 |

**P6** Panel cut-out (page 152)

**Note:** [1)] unipole model

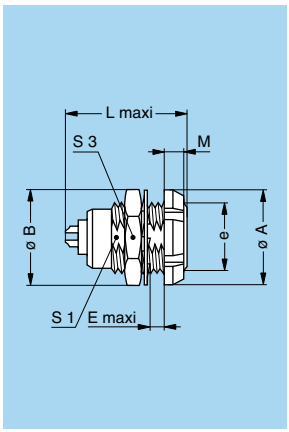



## EEP Fixed socket, nut fixing (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | P | S1 | S2 |
| EEP | 1S | 16 | 16.0 | M12x1 | 6.5 | 20.2 | 20.5 | 3.5 | 11 | 10.5 | 13 |
| EEP | 2S | 20 | 19.5 | M15x1 | 4.3 | 24.5 | 23.5 | 3.5 | 9 | 13.5 | 15 |

**P1** Panel cut-out (page 152)

**Note:** [1)] unipole model

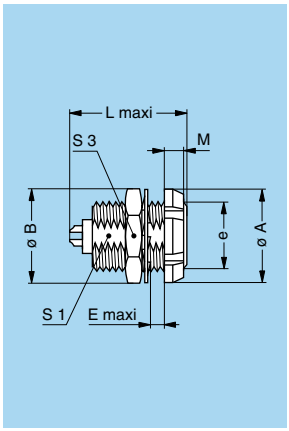



## ERD Fixed socket with two nuts (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ERD | 0S | 12 | 12.4 | M9x0.6 | 5.5 | 17.5 | 18.0 | 2.5 | 8.2 | 11 |
| ERD | 1S | 16 | 15.8 | M12x1.0 | 6.0 | 20.2 | 20.5 | 3.5 | 10.5 | 14 |
| ERD | 2S | 20 | 19.2 | M15x1.0 | 6.5 | 24.5 | 23.5 | 3.5 | 13.5 | 17 |
| ERD | 3S | 24 | 25.0 | M18x1.0 | 9.0 | 29.0 | 27.5 | 4.5 | 16.5 | 22 |
| ERD | 4S | 30 | 34.0 | M25x1.0 | 10.0 | 34.0 | 33.5 | 4.5 | 23.5 | 30 |

P1 Panel cut-out (page 152)

**Note:** 1) unipole model.
The 3S and 4S series are delivered with a conical nut.

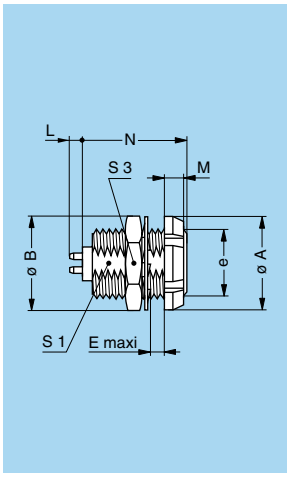



## ECP Fixed socket with two nuts, long threaded shell (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ECP | 0S | 12 | 12.4 | M9x0.6 | 8.5 | 17.5 | 18.5 | 2.5 | 8.2 | 11 |
| ECP | 1S | 16 | 15.8 | M12x1.0 | 10.0 | 20.2 | 21.5 | 3.5 | 10.5 | 14 |
| ECP | 2S | 20 | 19.2 | M15x1.0 | 11.0 | 24.5 | 26.0 | 3.5 | 13.5 | 17 |
| ECP | 3S | 24 | 25.0 | M18x1.0 | 14.0 | 29.0 | 30.0 | 4.5 | 16.5 | 22 |

P1 Panel cut-out (page 152)

**Note:** 1) unipole model.
The 3S series is delivered with a conical nut.

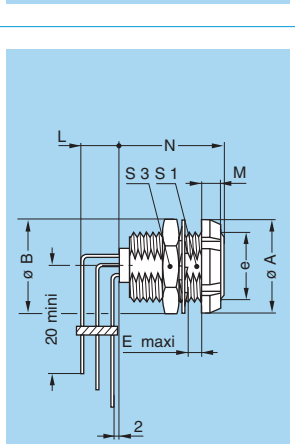



## ECP Fixed socket with two nuts, long threaded shell, with straight contact for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | S1 | S3 |
| ECP | 0S | 12 | 12.4 | M9x0.6 | 8.5 | 2.5 | 15.0 | 8.2 | 11 |
| ECP | 1S | 16 | 15.8 | M12x1.0 | 10.0 | 3.5 | 17.5 | 10.5 | 14 |
| ECP | 2S | 20 | 19.2 | M15x1.0 | 11.0 | 3.5 | 20.0 | 13.5 | 17 |
| ECP | 3S | 24 | 25.0 | M18x1.0 | 14.0 | 4.5 | 24.0 | 16.5 | 22 |

P1 Panel cut-out (page 152) P21 PCB drilling pattern (page 159)

**Note:** this contact type is available for all E●● socket models.
See page 159 for table of available types.
Length «L» depends on the number of contacts, see table on page 159.
The 3S series is delivered with a conical nut.

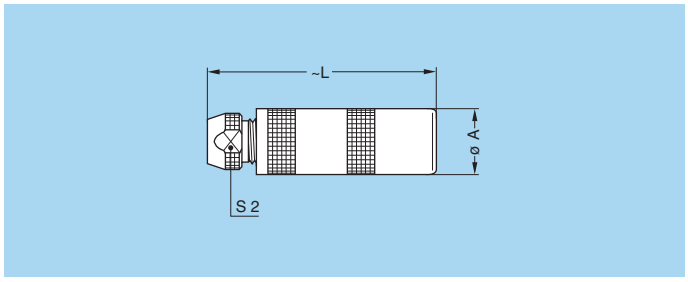



## ECP Fixed socket with two nuts, long threaded shell, with elbow (90°) contacts for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | S1 | S3 |
| ECP | 0S | 12 | 12.4 | M9x0.6 | 8.5 | 2.5 | 15.0 | 8.2 | 11 |
| ECP | 1S | 16 | 15.8 | M12x1.0 | 10.0 | 3.5 | 17.5 | 10.5 | 14 |
| ECP | 2S | 20 | 19.2 | M15x1.0 | 11.0 | 3.5 | 20.0 | 13.5 | 17 |
| ECP | 3S | 24 | 25.0 | M18x1.0 | 14.0 | 4.5 | 24.0 | 16.5 | 22 |

P1 Panel cut-out (page 152) P24 PCB drilling pattern (page 160)

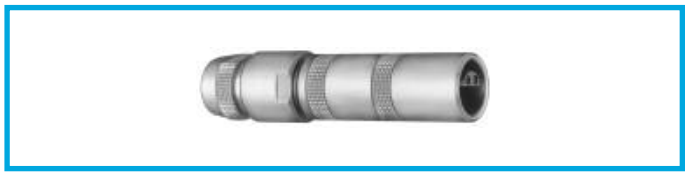
**Note:** this contact type is available for all back panel mounting socket types.
See page 160 for available types.
Length «L» depends on the number of contacts, see PCB drilling pattern on page 160.
The 3S series is delivered with a conical nut.

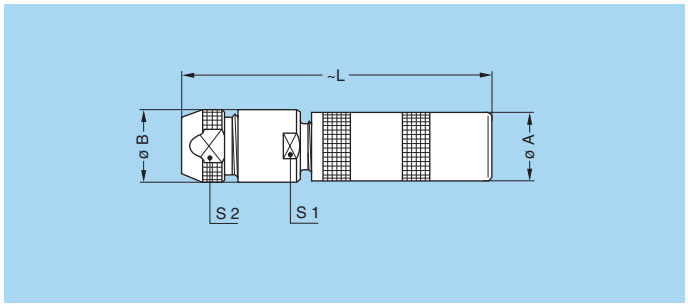



## PCA Free socket, cable collet

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCA | 00 | 6.5 | 25.0 | 4.5 |
| PCA | 0S | 8.9 | 33.5 | 6.5 |
| PCA | 1S | 11.9 | 40.5 | 8.5 |
| PCA | 2S | 14.8 | 50.0 | 11.0 |
| PCA | 3S | 17.8 | 59.0 | 14.0 |
| PCA | 4S | 24.8 | 75.0 | 19.0 |
| PCA | 5S | 34.7 | 99.0 | 29.0 |
| PCA | 6S | 46.0 | 102.0 | 38.0 |

**M1** Cable assembly (pages 163 to 165)



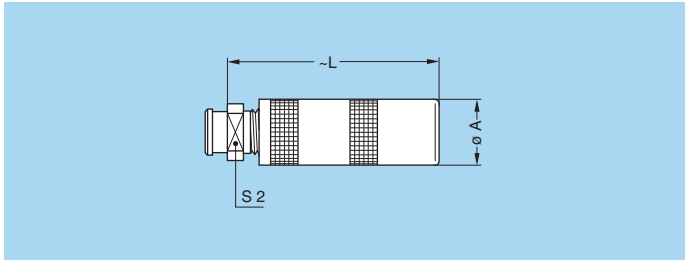



## PCA Free socket with oversize cable collet [1)]

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | L | S1 | S2 |
| PCA | 00 | 6.5 | 8.0 | 33.0 | 7.0 | 6.5 |
| PCA | 0S | 8.9 | 10.0 | 44.5 | 9.0 | 8.5 |
| PCA | 1S | 11.9 | 13.0 | 55.0 | 12.0 | 11.0 |
| PCA | 2S | 14.8 | 18.0 | 65.0 | 14.0 | 14.0 |
| PCA | 3S | 17.8 | 21.0 | 83.0 | 19.0 | 19.0 |
| PCA | 4S | 24.8 | 31.8 | 105.0 | 28.5 | 29.0 |

**M2** Cable assembly (pages 164 and 166)

**Note:** [1)] correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 102).

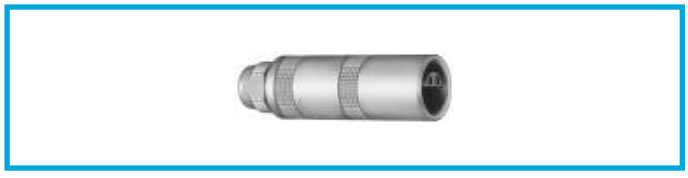


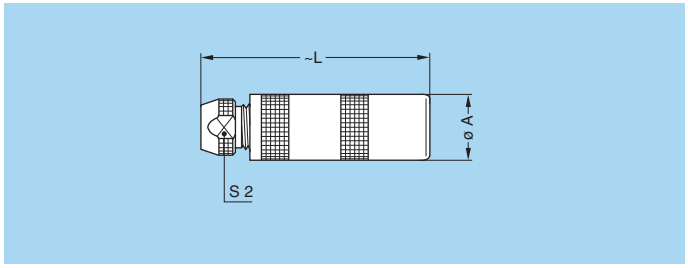

## PCA Free socket, cable collet and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCA | 00 | 6.5 | 25.0 | 6 |
| PCA | 0S | 8.9 | 33.5 | 7 |
| PCA | 1S | 11.9 | 40.5 | 9 |
| PCA | 2S | 14.8 | 50.0 | 12 |
| PCA | 3S | 17.8 | 59.0 | 14 |
| PCA | 4S | 24.8 | 75.0 | 20 |

**M1**
Cable assembly
(pages 163 and 164)

**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

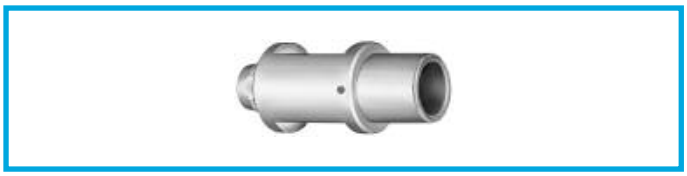


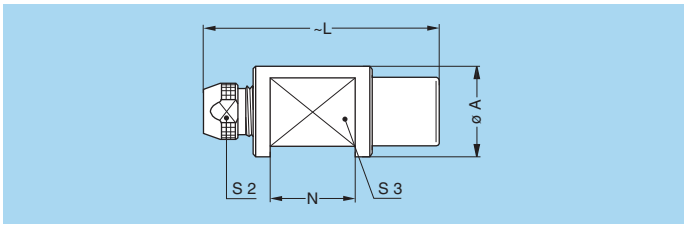



## PCP Free socket, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCP | 1S | 11.9 | 40.5 | 8.5 |
| PCP | 2S | 14.8 | 50.0 | 11.0 |
| PCP | 3S | 17.8 | 59.0 | 14.0 |
| PCP | 4S | 24.8 | 75.0 | 19.0 |

**M1** Cable assembly (pages 163 and 164)

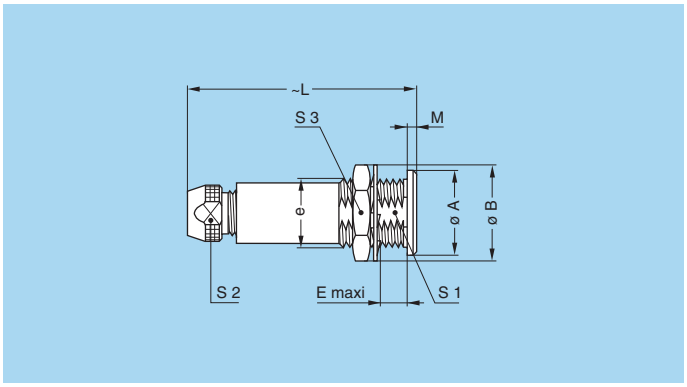





## PZP Free socket for remote handling with cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | L | N | S2 | S3 |
| PZP | 1S | 16 | 40.5 | 15 | 8.5 | 12 |
| PZP | 2S | 24 | 50.0 | 21 | 11.0 | 18 |
| PZP | 3S | 24 | 59.0 | 24 | 14.0 | 18 |

**M1** Cable assembly (pages 163 and 164)



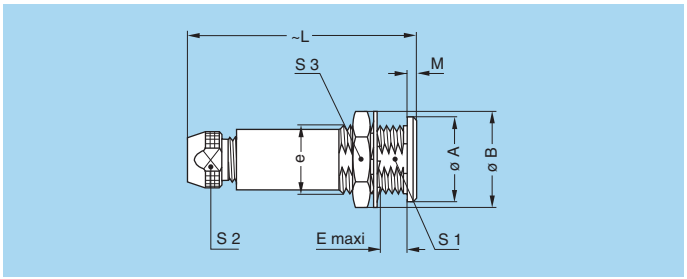

## PSA Fixed socket, nut fixing, cable collet

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PSA | 00 | 8 | 10.2 | M7x0.5 | 5.5 | 25.0 | 1.0 | 6.3 | 4.5 | 9 |
| PSA | 0S | 10 | 12.4 | M9x0.6 | 7.0 | 33.5 | 1.2 | 8.2 | 6.5 | 11 |
| PSA | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 40.5 | 1.5 | 10.5 | 8.5 | 14 |
| PSA | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 50.0 | 1.8 | 13.5 | 11.0 | 17 |
| PSA | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 59.0 | 2.0 | 16.5 | 14.0 | 22 |
| PSA | 4S | 28 | 34.0 | M25x1.0 | 12.0 | 75.0 | 2.5 | 23.5 | 19.0 | 30 |
| PSA | 5S | 40 | 40.0 | M35x1.0 | 15.5 | 99.0 | 3.0 | 33.5 | 29.0 | – |
| PSA | 6S | 54 | 54.0 | M48x1.5 | 16.0 | 102.0 | 3.5 | 45.5 | 38.0 | – |

**M1** Cable assembly (pages 163 to 165)

**P1** Panel cut-out (page 152)

**Note:** the 5S series is delivered with a tapered washer and a round nut. The 6S series is delivered without a locking washer and with a round nut.

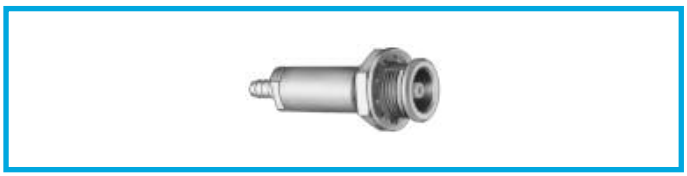


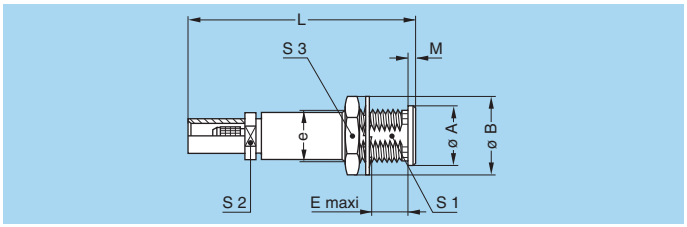

## PSP Fixed socket, nut fixing, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PSP | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 40.5 | 1.5 | 10.5 | 8.5 | 14 |
| PSP | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 50.0 | 1.8 | 13.5 | 11.0 | 17 |
| PSP | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 59.0 | 2.0 | 16.5 | 14.0 | 22 |
| PSP | 4S | 28 | 34.0 | M25x1.0 | 12.0 | 75.0 | 2.5 | 23.5 | 19.0 | 30 |

**M1** Cable assembly (pages 163 and 164)

**P1** Panel cut-out (page 152)





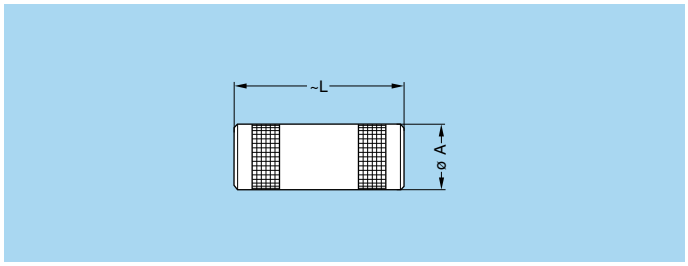

## PSS Free socket, nut fixing for cable crimping

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PSS | 00 | 8 | 10.2 | M7x0.5 | 5.5 | 30 | 1 | 6.3 | 5.5 | 9 |

**M5** Cable assembly (page 163)

**P1** Panel cut-out (page 152)

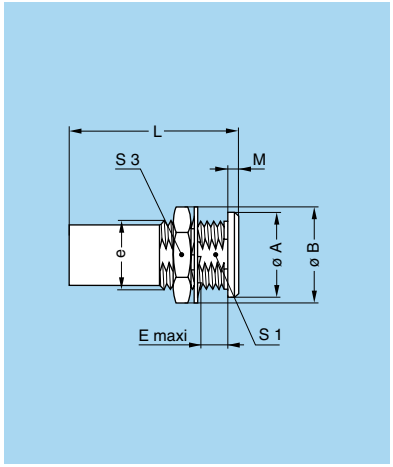
**Note:** Model available only with crimp backnut E31 similar to 00.250 series.




## RMA Free coupler

| Reference | | Dim. (mm) | |
|---|---|---|---|
| Model | Series | A | L |
| RMA | 00 | 6.4 | 22.0 |
| RMA | 0S | 8.9 | 25.0 |
| RMA | 1S | 11.9 | 28.5 |
| RMA | 2S | 14.8 | 31.5 |
| RMA | 3S | 17.8 | 38.5 |
| RMA | 4S | 24.8 | 46.5 |
| RMA | 5S | 34.7 | 60.5 |

**Note:** see page 101 for the available plug and contact configurations and in order to ensure correct contact alignment.




**Note:** see page 101 for the available plug and contact configurations and in order to ensure correct contact alignment.

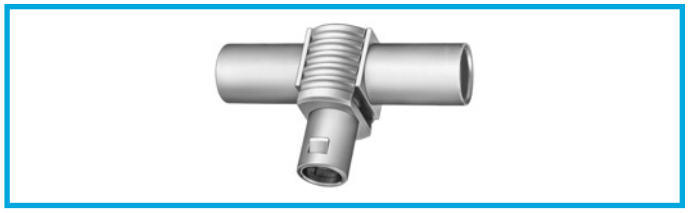
## RAD Fixed coupler, nut fixing

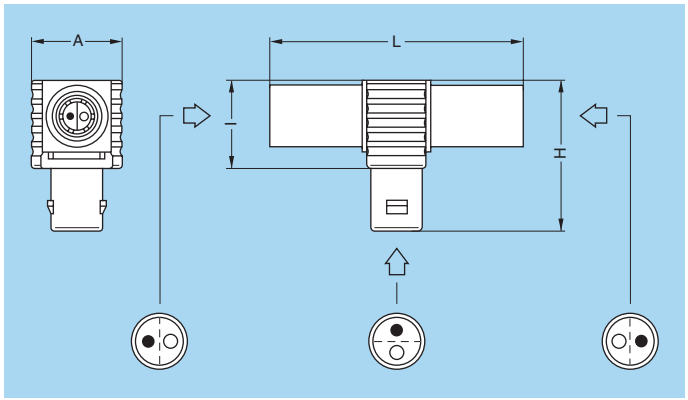
| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 |
| RAD | 00 | 8 | 10.2 | M7x0.5 | 5.5 | 22.0 | 1.0 | 6.3 | 9 |
| RAD | 0S | 10 | 12.4 | M9x0.6 | 7.0 | 25.0 | 1.2 | 8.2 | 11 |
| RAD | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 28.5 | 1.5 | 10.5 | 14 |
| RAD | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 31.5 | 1.8 | 13.5 | 17 |
| RAD | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 38.5 | 2.0 | 16.5 | 22 |
| RAD | 4S | 28 | 34.0 | M25x1.0 | 12.0 | 46.5 | 2.5 | – | 30 |
| RAD | 5S | 40 | 40.0 | M35x1.0 | 15.5 | 60.5 | 3.0 | – | – |

**P1** Panel cut-out (page 152)

**P2** Panel cut-out 4S and 5S series (page 152)

**Note:** the 5S series is delivered with a tapered washer and a round nut.






## FTA T-plug with two in line sockets

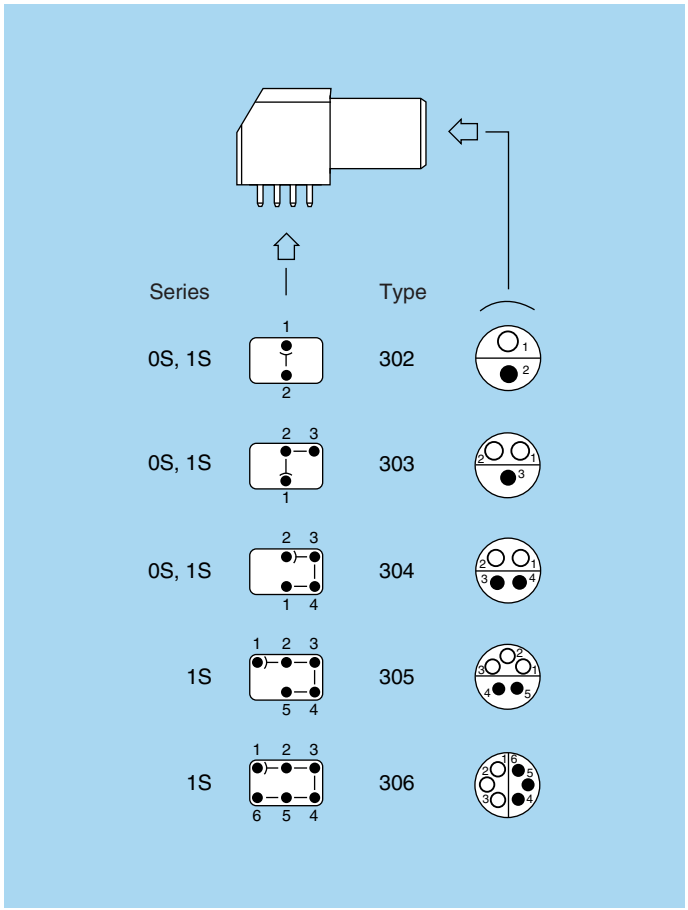
| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | H | I | L |
| FTA | 00 | 9 | 17.5 | 9.5 | 30 |
| FTA | 0S | 13 | 23.0 | 13.0 | 38 |
| FTA | 1S | 16 | 26.5 | 16.5 | 45 |
| FTA | 3S | 21 | 38.5 | 23.5 | 64 |

**Note:** multipole version available only with 2 contacts (type 302).

# Elbow socket models

## Technical Characteristics

### Types




### Materials and Treatment

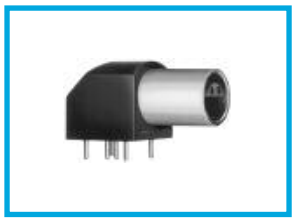
| Component | Material | Surface Treat. (µm) | | |
|---|---|---|---|---|
| | | Cu | Ni | Au |
| Housing | PPS 1) | – | | |
| | Brass | 0.5 | 3 | – |
| Metallic parts | Brass | 0.5 | 3 | – |
| Earthing crown | Bronze | 0.5 | 3 | – |
| Insulator | PEEK | – | | |
| Female contact | Bronze | 0.5 | 3 | 1.5 |

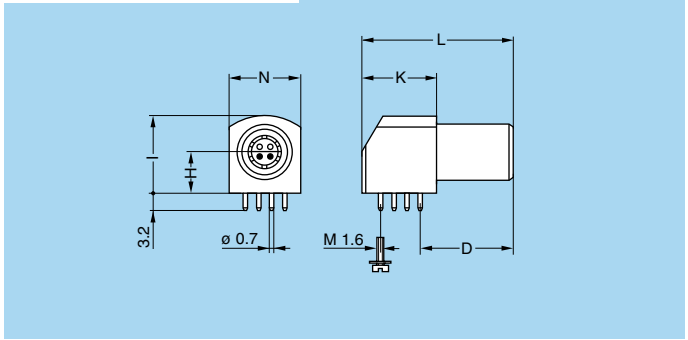
**Note:** 1) not used for all sizes.
The surface treatment standards are as follows:
– Nickel SAE AMS QQ N 290
– Gold: ISO 27874

### Electrical

| Model | Series | Types | Test voltage (kV rms)1) | Rated current (A) |
|---|---|---|---|---|
| EPL | 0S | 302-303-304 | 1.20 | 4.5 |
| EXP | 0S | | | |
| EPL | 1S | | | |
| EXP | 1S | | | |
| EPL | 1S | 305-306 | 0.70 | 4.5 |
| EXP | 1S | | | |

**Note:**
1) see calculation method, caution and suggested standard on page 178.



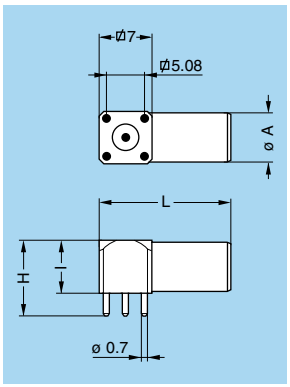



## EPL Elbow (90°) socket for printed circuit (solder or screw fixing)

| Part Number | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | D | H | I | K | L | N |
| EPL.0S.302.HLN | 9 | 14.6 | 6.7 | 12.6 | 13.3 | 25 | 11.7 |
| EPL.0S.303.HLN | | | | | | | |
| EPL.0S.304.HLN | | | | | | | |
| EPL.1S.302.HLN | 11 | 16.6 | 7.5 | 14.0 | 13.3 | 27 | 12.6 |
| EPL.1S.303.HLN | | | | | | | |
| EPL.1S.304.HLN | | | | | | | |
| EPL.1S.305.HLN | | | | | | | |
| EPL.1S.306.HLN | | | | | | | |

**Note:** to replace the 4 ground pins by 4 screws (M1.6) add an «S» to the end of the part number. (e.g.: EPL.1S.303.HLNS)

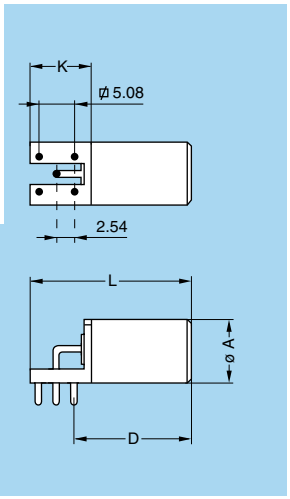
**P22** PCB drilling pattern (page 160)




## EPL Elbow (90°) socket for printed circuit

| Part Number | Dim. (mm) | | |
|---|---|---|---|
| | A | H | I |
| EPL.00.113.NLN | 6.8 | 10 | 7 |

P23 PCB drilling pattern (page 160)

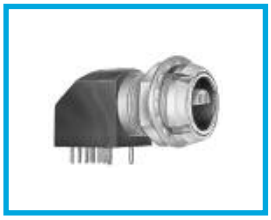


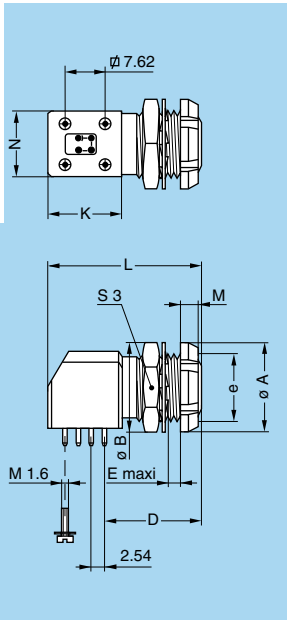

## EPL Elbow (90°) socket for printed circuit

| Part Number | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | D | H | I | K | L | N |
| EPL.0S.116.DTL | 8.8 | 16 | 12 | 9 | 7.7 | 22.7 | 9 |

**Note:** available only in unipole version.

P23 PCB drilling pattern (page 160)






## EXP Elbow (90°) socket for printed circuit with two nuts (solder or screw fixing)

| Part Number | Dimensions (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | D | e | E | H | I | K | L | M | N | S3 |
| EXP.0S.302.HLN | 12 | 12.4 | 14.6 | M9x0.6 | 6.0 | 6.7 | 12.6 | 13.3 | 25 | 2.5 | 11.7 | 11 |
| EXP.0S.303.HLN | | | | | | | | | | | | |
| EXP.0S.304.HLN | | | | | | | | | | | | |
| EXP.1S.302.HLN | 14 | 15.0 | 16.6 | M11x0.5 | 7.5 | 7.5 | 14.0 | 13.3 | 27 | 3.5 | 12.6 | 13 |
| EXP.1S.303.HLN | | | | | | | | | | | | |
| EXP.1S.304.HLN | | | | | | | | | | | | |
| EXP.1S.305.HLN | | | | | | | | | | | | |
| EXP.1S.306.HLN | | | | | | | | | | | | |

**Note:** to replace the 4 ground pins by 4 screws (M1.6) add an «S» to the end of the part number. (e.g.: EXP.1S.303.HLNS).

P2 Panel cut-out 0S series (page 152)

P10 Panel cut-out 1S series (page 152)

P22 PCB drilling pattern (page 160)

# Plastic housing models

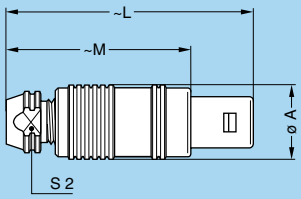
These connectors are particularly recommended for all applications requiring maximum electrical insulation when mated. The design, including a latch sleeve and a metal earthing crown, guarantees EMC screening efficiency to meet most requirements.

## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | | | | Standard |
|---|---|---|---|---|---|
| | PEEK | POM | PSU | PPSU | |
| Colour | natural (beige) | black | white or grey | cream | – |
| Endurance | > 5000 cycles | > 5000 cycles | > 5000 cycles | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | | | | – |
| Temperature range | - 50° C/+250° C | - 50° C/+115° C | - 50° C/+150° C | - 50° C/+180° C | – |
| Sterilization resistance [1] | > 200 cycles | none | ~20 cycles | > 100 cycles | IEC 60601-1 § 44.7 |
| Resistance to organic solvents | very good | very good | limited | good | – |

**Note:**
[1] Steam sterilization

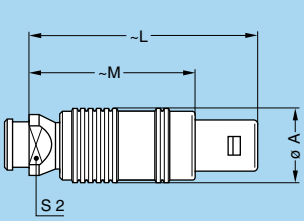



### FFA Straight plug, cable collet, PEEK or POM outer shell

### FFP Straight plug, cable collet, PEEK or POM outer shell and inner anti-rotating device

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFA | 00 | 7.0 | 33.5 | 25.5 | 6.0 |
| FFP | 1S | 12.0 | 42.5 | 31.5 | 10.0 |
| FFP | 2S | 15.0 | 52.0 | 40.0 | 12.0 |
| FFP | 3S | 18.0 | 61.0 | 46.0 | 14.0 |

**M1**
Cable assembly
(pages 163 and 164)

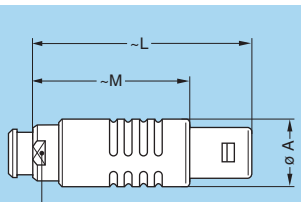



### FFP Straight plug, cable collet, PEEK or POM outer shell, inner anti-rotating device and nut for fitting a bend relief [1]

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFP | 1S | 12.0 | 41.5 | 30.5 | 10.0 |
| FFP | 2S | 15.0 | 51.0 | 39.0 | 12.0 |
| FFP | 3S | 18.0 | 61.0 | 46.0 | 14.0 |

**M1** Cable assembly (pages 163 and 164)

**Note:** [1] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

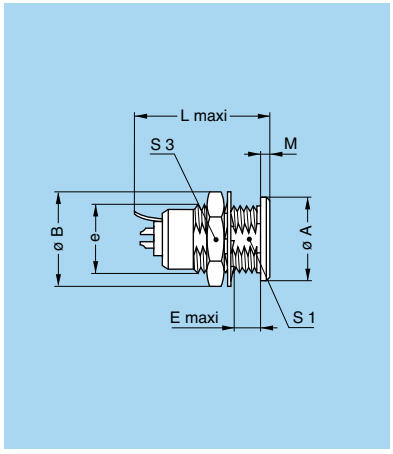



### FFL Straight plug, cable collet, with PSU and PPSU outer shell, inner anti-rotating device and nut for fitting a bend relief [1]

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFL | 2S | 16.5 | 51.5 | 39.5 | 13 |

**M4** Cable assembly (page 165)

**Note:** [1] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).
This model is fitted with a «D or M» type collet system.
It is also adapted for crimp contacts.
Available only for multipole.




## ERN Fixed socket, nut fixing, with earthing tag, PEEK or POM outer shell

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ERN | 00 | 9 | 10.2 | M7x0.5 | 5.5 | – | 14.5 | 1.0 | 6.3 | 9 |
| ERN | 0S | 11 | 12.4 | M9x0.6 | 6.4 | 19.3 | 19.3 | 1.8 | 8.2 | 11 |
| ERN | 1S | 14 | 15.8 | M12x1.0 | 7.5 | 22.4 | 22.4 | 1.5 | 10.5 | 14 |
| ERN | 2S | 18 | 19.2 | M15x1.0 | 8.5 | 26.3 | 26.3 | 2.0 | 13.5 | 17 |
| ERN | 3S | 22 | 25.0 | M18x1.0 | 11.5 | 29.8 | 29.8 | 2.0 | 16.5 | 22 |

**P1** Panel cut-out (page 152)

**Note:** 1) unipole model

# Watertight or vacuumtight models

These socket or coupler models allow the device on which they are fitted to reach a protection index of IP68 as per IEC 60529. They are fully compatible with plugs of the same series and are widely used for portable radios, military, laboratory equipment, aviation, etc.
These models are identified by a letter «P» at the end of the reference.
Most of these models are also available in a vacuumtight version. Such models are identified by an additional letter «V» at the end of the part number (certificate on request).
Epoxy resin is used to seal these models.

## Technical Characteristics

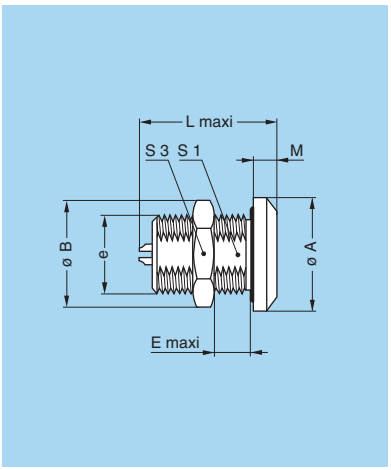
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range (0S-1S) | - 20° C/+100° C | |
| Temperature range (2S-6S) | - 20° C/+80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Climatical category | 20/80/21 | IEC 60068-1 |
| Leakage rate (He)[1)] | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |

**Note:** [1)] only for vacuumtight models.

| Characteristics | | Value | Standard |
|---|---|---|---|
| Maximum operating pressure[2)] | 0S | 60 bar | IEC 60512-7 test 14d |
| | 1S | 60 bar | |
| | 2S | 40 bar | |
| | 3S | 30 bar | |
| | 4S | 15 bar | |
| | 5S | 5 bar | |
| | 6S | 5 bar | |

**Note:** [2)] this value corresponds to the maximum allowed pressure difference for the assembled socket.



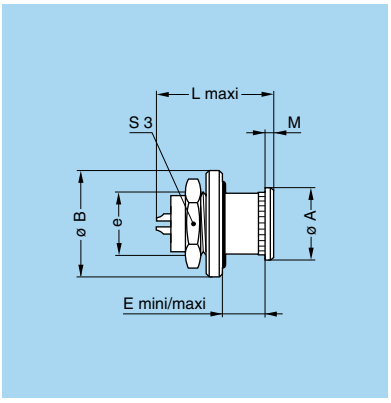

## HGP Fixed socket, nut fixing, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| HGP | 0S | 18 | 15.8 | M12x1.0 | 11.5 | 20.5 | 21.5 | 4.0 | 10.5 | 14 |
| HGP | 1S | 20 | 19.2 | M14x1.0 | 15.5 | 25.0 | 22.0 | 4.0 | 12.5 | 17 |
| HGP | 2S | 20 | 21.5 | M16x1.0 | 17.0 | 29.5 | 28.0 | 4.0 | 14.5 | 19 |
| HGP | 3S | 28 | 27.0 | M20x1.0 | 18.0 | 33.0 | 34.0 | 6.0 | 18.5 | 24 |
| HGP | 4S | 34 | 34.0 | M25x1.0 | 22.5 | 39.0 | 43.0 | 6.5 | 23.5 | 30 |
| HGP | 5S | 45 | 40.0 | M35x1.0 | 28.0 | 50.5 | 78.5 | 7.5 | 33.5 | – |
| HGP | 6S | 58 | 54.0 | M48x1.5 | 22.0 | 51.0 | – | 6.0 | 45.5 | – |

P3 Panel cut-out (page 152)

**Note:** [1)] unipole model

**Note:** the 5S and 6S series are delivered with a round nut.

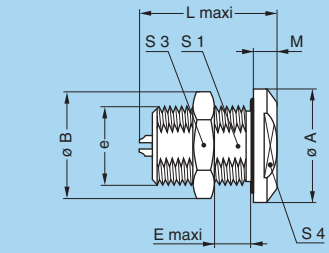



## HGW Fixed socket, nut fixing, with back washer, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E mini | E maxi | L | M | S3 |
| HGW | 0S | 10 | 15 | M9x0.6 | 2.0 | 3.0 | 20.5 | 1.2 | 11 |
| HGW | 1S | 14 | 18 | M12x1.0 | 2.0 | 4.0 | 25.0 | 1.5 | 14 |

P11 Panel cut-out (page 152)

**Note:** vacuumtight version is only available in the 0S series.

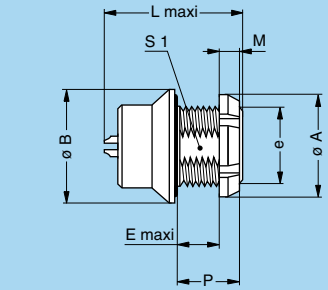



## EWB Fixed socket, nut fixing, with two flats on the flange, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 | S4 |
| EWB | 0S | 18 | 15.8 | M12x1.0 | 11.0 | 20.5 | – | 4.0 | 10.5 | 14 | 14 |
| EWB | 1S | 20 | 19.2 | M14x1.0 | 15.5 | 25.5 | 25.5 | 4.0 | 12.5 | 17 | 16 |
| EWB | 2S | 20 | 21.5 | M16x1.0 | 17.0 | 28.0 | 26.5 | 4.0 | 14.5 | 19 | 16 |
| EWB | 4S | 34 | 34.0 | M25x1.0 | 22.5 | 43.0 | – | 6.5 | 23.5 | 30 | 27 |

P3 Panel cut-out (page 152)

**Note:** [1)] unipole model

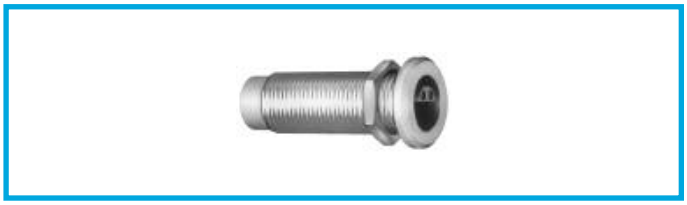


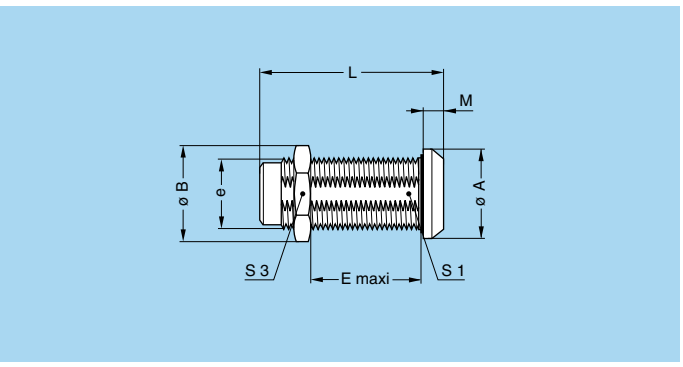

## HCP Fixed socket, nut fixing, watertight or vacuumtight (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | P | S1 |
| HCP | 1S | 18 | 20 | M14x1.0 | 8.6 | 25.5 | 3.5 | 12.0 | – |
| HCP | 2S | 20 | 20 | M16x1.0 | 12.5 | 29.0 | 3.5 | 16.5 | 14.5 |
| HCP | 4S | 27 | 34 | M25x1.0 | 15.5 | 41.0 | 4.5 | 20.0 | 23.5 |

P3 Panel cut-out (page 152)

**Note:** the 2S and 4S series are delivered with a conical nut.






## SWH Fixed coupler, nut fixing, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| SWH | 0S | 14 | 13.8 | M10x0.75 | 17 | 34 | 2.0 | 9.0 | 12 |
| SWH | 1S | 17 | 15.8 | M12x1.00 | 28 | 39 | 2.5 | 10.5 | 14 |
| SWH | 2S | 20 | 21.5 | M16x1.00 | 25 | 44 | 4.0 | 15.0 | 19 |
| SWH | 3S | 25 | 27.0 | M20x1.00 | 30 | 53 | 4.0 | 18.5 | 24 |
| SWH | 4S | 34 | 34.0 | M25x1.00 | 50 | 65 | 4.0 | 23.5 | 30 |
| SWH | 5S | 45 | 40.0 | M35x1.00 | 58 | 80 | 5.0 | 33.5 | – |
| SWH | 6S | 58 | 54.0 | M48x1.50 | 55 | 81 | 6.0 | 45.5 | – |

P4 Panel cut-out (page 152)

**Note:** see page 101 for the available plug and contact configurations and in order to ensure correct contact alignment.
The 5S and 6S series are delivered with a round nut.

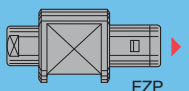
# E Series

E series connectors have been specifically designed for outdoor applications.
They include an inner sleeve and two seals to prevent penetration of solids or liquids into the housing formed by the plug, free socket, fixed socket or coupler. All models of these series are watertight when mated and give a protection index of IP 68 as per IEC 60529 standard (in mated condition) when correctly assembled to an appropriate cable (IP 66 otherwise).

– security of the Push-Pull latching system
– unipole types transmitting current up to 230 A and multipole types with up to 106 contacts
– wide range of models satisfying most applications
– 360° screening for full EMC shielding
– watertight connection (IP 68/IP 66)
– polarization by stepped insert (half-moon) fitted with male and female contacts
– solder or print contacts (straight or elbow)
– rugged housing for extreme working condition.

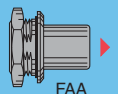
## **Metal housing models** (page 76)

### Straight plug



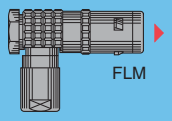
FZP

### Fixed plug

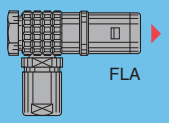


FAA

### Elbow plug

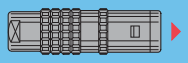


FLM

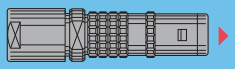


FLA

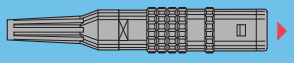
### Straight plugs



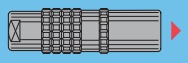
FFA, FFP



FFA

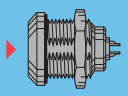


FFA

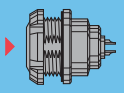


FFF

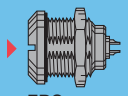
### Fixed sockets



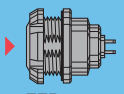
ERA



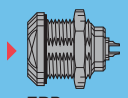
EEP



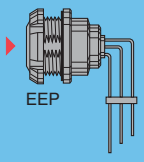
ERC



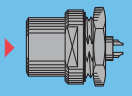
EEP



ERB

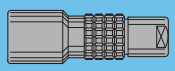


EEP

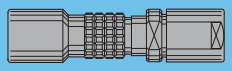


EHP

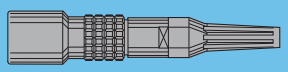
### Free sockets



PCA, PCP

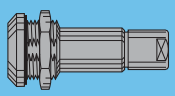


PCA



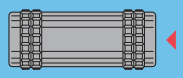
PCA

### Fixed socket



PSA

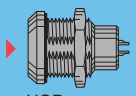
### Free coupler



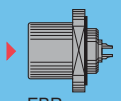
RMA

## **Watertight or vacuumtight models** (page 82)

### Fixed sockets

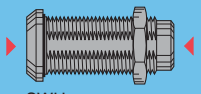


HGP



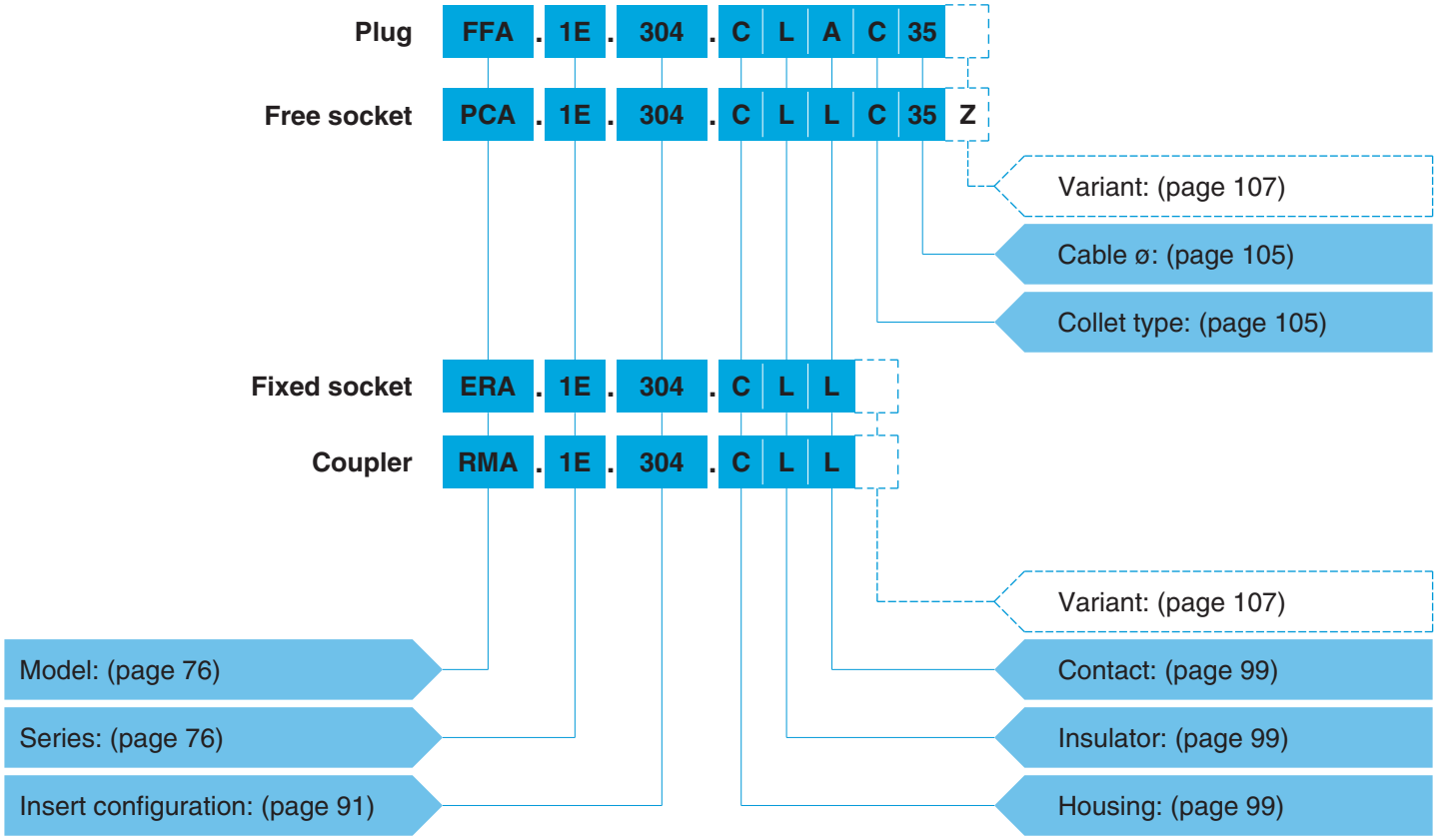
EBR

### Fixed coupler



SWH

## Part Numbering System




## Part Number Example

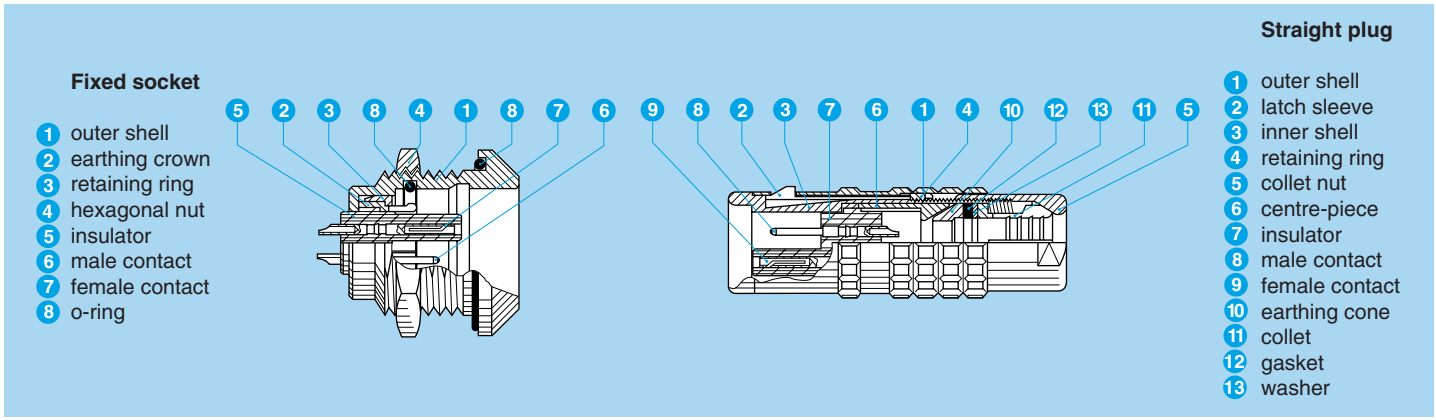
**Straight plug with cable collet:**
**FFA.1E.304.CLAC35** = straight plug with cable collet, 1E series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 male and 2 female solder contacts, C type collet for a 3.5 mm diameter cable.

**Free socket:**
**PCA.1E.304.CLLC35Z** = free socket with cable collet, 1E series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male solder contacts, C type collet for a 3.5 mm diameter cable and collet nut for fitting a bend relief.

**Fixed socket:**
**ERA.1E.304.CLL** = fixed socket, nut fixing, 1E series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male solder contacts.

**Free coupler:**
**RMA.1E.304.CLL** = straight coupler, 1E series, multipole type with 4 contacts, outer shell in chrome-plated brass, PEEK insulator, 2 female and 2 male contacts each end.

## Part Section Showing Internal Components



# Metal housing models

## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range[1)] | - 55° C, +200° C | |
| Resistance to vibrations | 10-2000 Hz, 15 g | IEC 60512-4 test 6d |
| Shock resistance | 100 g, 6 ms | IEC 60512-4 test 6c |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index (mated)[2)] | IP 68/IP 66 | IEC 60529 |
| Climatical category | 50/175/21 | IEC 60068-1 |

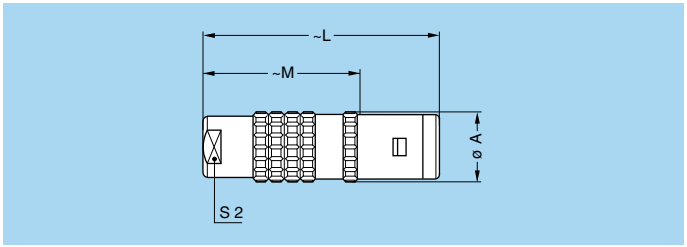
### Electrical

| Characteristics | | Value | Standard |
|---|---|---|---|
| Shielding efficiency | at 10 MHz | > 95 dB | IEC 60169-1-3 |
| | at 1 GHz | > 80 dB | IEC 60169-1-3 |

**Note:** the various tests have been carried out with FFA and ERA connector pairs, with chrome-plated brass shell, PEEK insulator and silicone O-ring. Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

1) minimum operating temperature is -20°C for sockets fitted with an FPM (Viton®) O-ring.

2) IP68 achieved providing that the cable is perfectly circular and that assembly process ensures a high integrity seal.

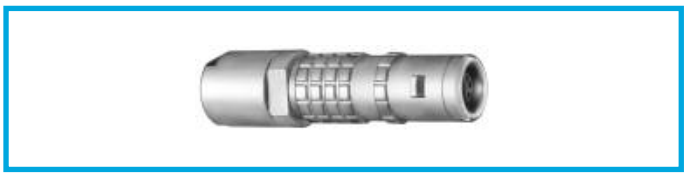


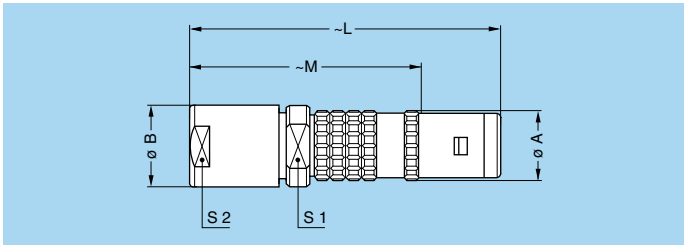

### FFA Straight plug, cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFA | 0E | 11 | 34 | 23.0 | 8 |
| FFA | 1E | 13 | 42 | 28.0 | 9 |
| FFA | 2E | 16 | 52 | 36.0 | 12 |
| FFA | 3E | 19 | 61 | 41.0 | 15 |
| FFA | 4E | 25 | 71 | 50.5 | 19 |
| FFA | 5E | 38 | 92 | 67.0 | 32 |
| FGG[1)] | 6E | 47 | 118 | 89.0 | 38 |

**M1** Cable assembly (pages 167 and 168)

**Note:** 1) with key (G)



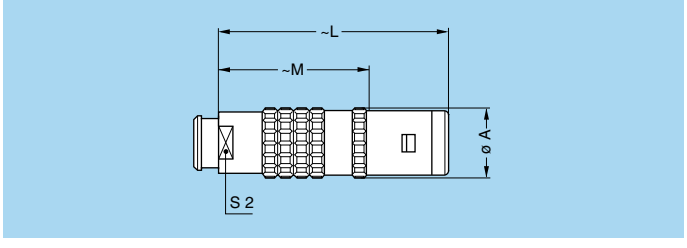



### FFA Straight plug with oversize cable collet 1)

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | S1 | S2 |
| FFA | 1E | 13 | 14.5 | 55 | 41 | 12 | 12 |
| FFA | 2E | 16 | 17.0 | 65 | 49 | 15 | 15 |
| FFA | 3E | 19 | 22.0 | 80 | 60 | 19 | 19 |
| FFA | 4E | 25 | 36.0 | 118 | 84 | 30 | 32 |

**M2** Cable assembly (pages 167 and 169)

**Note:** 1) correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 105).

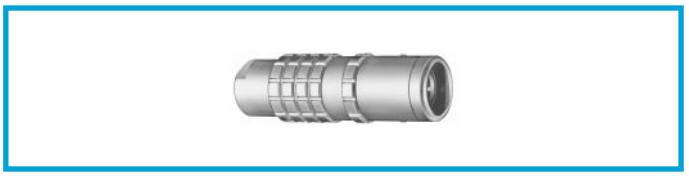


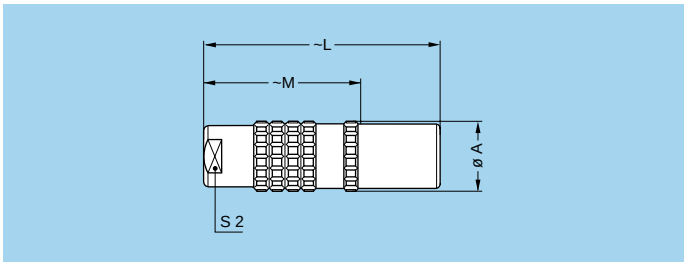

### FFA Straight plug, cable collet and nut for fitting a bend relief 1)

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFA | 0E | 11 | 34 | 23.0 | 7 |
| FFA | 1E | 13 | 42 | 28.0 | 9 |
| FFA | 2E | 16 | 52 | 36.0 | 12 |
| FFA | 3E | 19 | 60 | 40.0 | 15 |
| FFA | 4E | 25 | 71 | 50.5 | 19 |

**M1** Cable assembly (pages 167 and 168)

**Note:** 1) to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

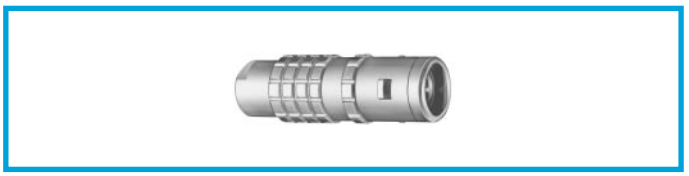


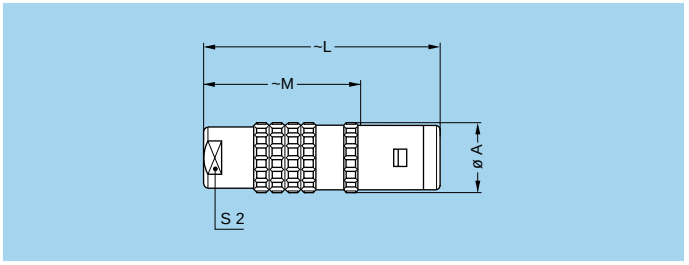



## FFF Straight plug non-latching, cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFF | 0E | 11 | 34 | 23 | 8 |
| FFF | 1E | 13 | 42 | 28 | 9 |

**M1** Cable assembly (page 167)

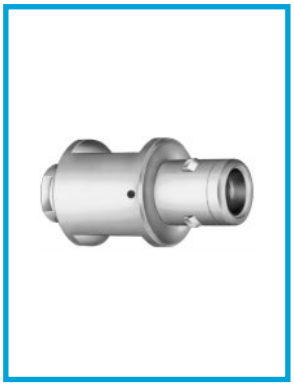


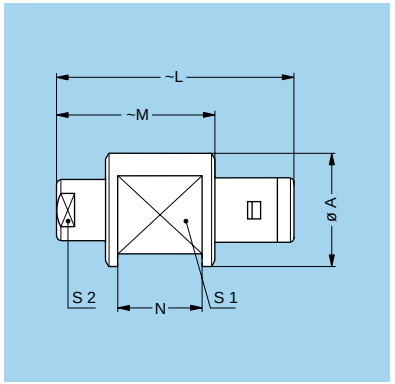



## FFP Straight plug, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FFP | 3E | 19 | 61 | 41.0 | 15 |
| FFP | 4E | 25 | 71 | 50.5 | 19 |

**M1** Cable assembly (pages 167 and 168)

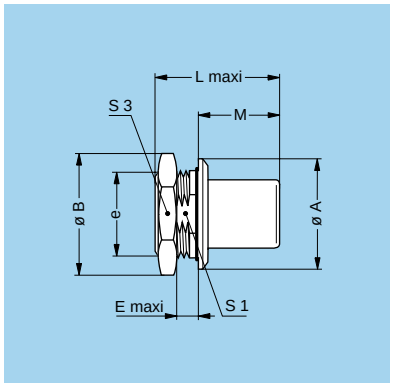





## FZP Straight plug for remote handling, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | L | M | N | S1 | S2 |
| FZP | 1E | 20 | 42 | 28.0 | 15 | 15 | 9 |
| FZP | 2E | 22 | 52 | 36.0 | 16 | 16 | 12 |
| FZP | 3E | 23 | 61 | 41.0 | 20 | 19 | 15 |
| FZP | 4E | 32 | 71 | 50.5 | 29 | 25 | 19 |
| FZP | 5E | 44 | 92 | 67.0 | 40 | 36 | 32 |

**M1** Cable assembly (pages 167 and 168)

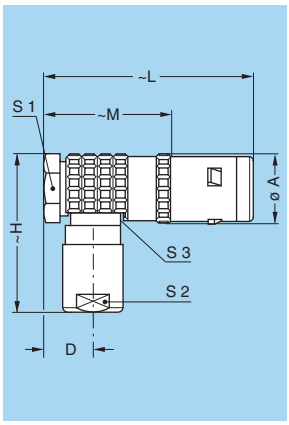



## FAA Fixed plug non-latching, nut fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| FAA | 0E | 18 | 19.2 | M14x1.0 | 3.5 | 19.5 | 19.5 | 13.0 | 12.5 | 17 |
| FAA | 1E | 20 | 21.5 | M16x1.0 | 3.5 | 23.0 | 23.0 | 16.0 | 14.5 | 19 |
| FAA | 2E | 25 | 27.0 | M20x1.0 | 4.0 | 27.0 | 27.0 | 18.0 | 18.5 | 24 |
| FAA | 3E | 31 | 34.0 | M24x1.0 | 4.5 | 32.5 | 32.5 | 22.5 | 22.5 | 30 |

**P1** Panel cut-out (page 153)

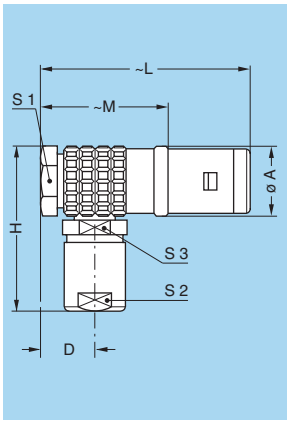
**Note:** [1)] unipole model




## FLM Elbow (90°) plug, cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FLM | 0E | 11 | 7.3 | 25 | 36 | 25 | 9 | 8 | 8 |
| FLM | 1E | 13 | 8.7 | 33 | 42 | 28 | 11 | 9 | 10 |
| FLM | 2E | 16 | 10.2 | 40 | 51 | 35 | 14 | 12 | 13 |

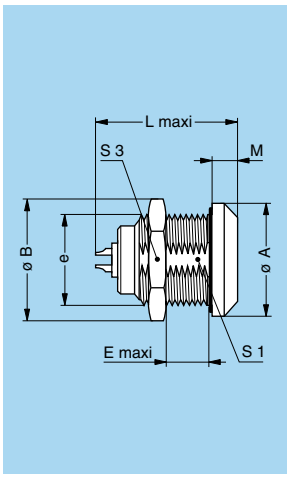
**M3** Cable assembly (page 162)




## FLA Elbow (90°) plug, cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FLA | 3E | 21.0 | 11.5 | 47 | 60 | 40.0 | 18 | 15 | 15 |
| FLA | 4E | 27.5 | 15.5 | 57 | 72 | 51.5 | 24 | 19 | 20 |

**M3** Cable assembly (pages 167 and 168)

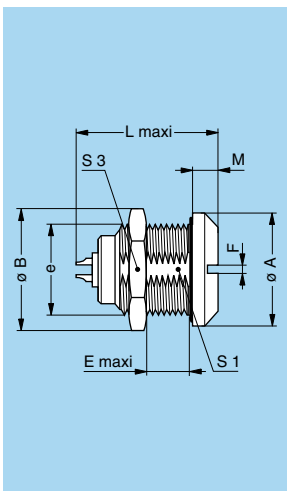



## ERA Fixed socket, nut fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| ERA | 0E | 18 | 19.2 | M14x1.0 | 5.5 | 19.5 | 20.5 | 4.0 | 12.5 | 17 |
| ERA | 1E | 20 | 21.5 | M16x1.0 | 9.0 | 24.0 | 25.3 | 4.5 | 14.5 | 19 |
| ERA | 2E | 25 | 27.0 | M20x1.0 | 9.0 | 28.5 | 30.0 | 5.0 | 18.5 | 24 |
| ERA | 3E | 31 | 34.0 | M24x1.0 | 11.0 | 34.0 | 35.0 | 6.0 | 22.5 | 30 |
| ERA | 4E | 37 | 40.5 | M30x1.0 | 9.0 | 36.0 | 38.0 | 6.5 | 28.5 | 36 |
| ERA | 5E | 55 | 54.0 | M45x1.5 | 10.0 | 44.5 | 78.0 | 9.0 | 42.5 | – |
| EGG[2)] | 6E | 65 | 65.0 | M55x2.0 | 10.5 | 48.5 | – | 10.0 | 52.0 | – |

**P1** Panel cut-out (page 153)

**Note:** The 5E and 6E series are delivered with a round nut.
[1)] unipole model. [2)] with key (G).

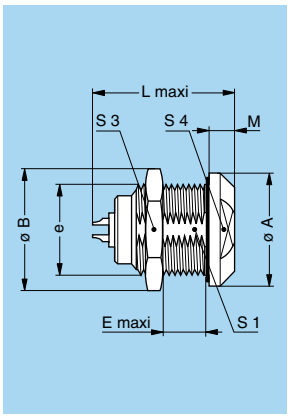



## ERC Fixed socket, nut fixing with slot in the flange

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | F | L | L[1)] | M | S1 | S3 |
| ERC | 0E | 18 | 19.2 | M14x1.0 | 5.5 | 1.5 | 19.5 | 20.5 | 4.0 | 12.5 | 17 |
| ERC | 3E | 31 | 34.0 | M24x1.0 | 11 | 3.0 | 34.0 | 35.0 | 6.0 | 22.5 | 30 |
| ERC | 4E | 37 | 40.5 | M30x1.0 | 9 | 3.0 | 36.0 | 38.0 | 6.5 | 28.5 | 36 |

**P1** Panel cut-out (page 153)

**Note:** [1)] unipole model

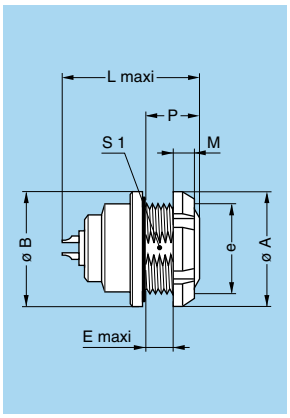



## ERB Fixed socket, nut fixing with two flats in the flange

| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 | S4 |
| ERB | 0E | 18 | 19.2 | M14x1.0 | 5.5 | 19.5 | 20.5 | 4.0 | 12.5 | 17 | 14 |
| ERB | 1E | 20 | 21.5 | M16x1.0 | 9 | 24.0 | 25.3 | 4.5 | 14.5 | 19 | 17 |
| ERB | 2E | 25 | 27.0 | M20x1.0 | 9 | 28.5 | 30.0 | 5.0 | 18.5 | 24 | 20 |
| ERB | 3E | 31 | 34.0 | M24x1.0 | 11 | 34.0 | 35.0 | 6.0 | 22.5 | 30 | 24 |

**P1** Panel cut-out (page 153)

**Note:** [1)] unipole model



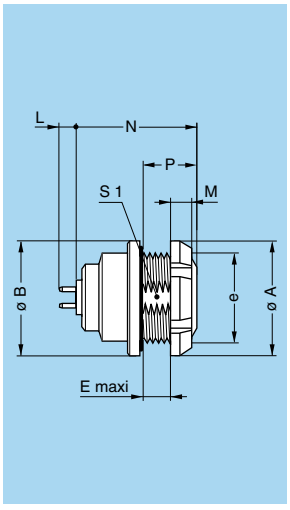

## EEP Fixed socket, nut fixing (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | P | S1 |
| EEP | 0E | 18 | 18 | M14x1.0 | 3.5 | 19.5 | 20.5 | 3.5 | 7 | 12.5 |
| EEP | 1E | 20 | 20 | M16x1.0 | 6.5 | 24.0 | 25.3 | 3.5 | 10 | 14.5 |
| EEP | 2E | 25 | 25 | M20x1.0 | 6.5 | 28.5 | 30.0 | 3.5 | 10 | 18.5 |
| EEP | 3E | 30 | 31 | M24x1.0 | 7.5 | 34.0 | 35.0 | 4.5 | 12 | 22.5 |

**P1** Panel cut-out (page 153)

**Note:** [1)] unipole model

**Note:** the 3E series is delivered with a conical nut.



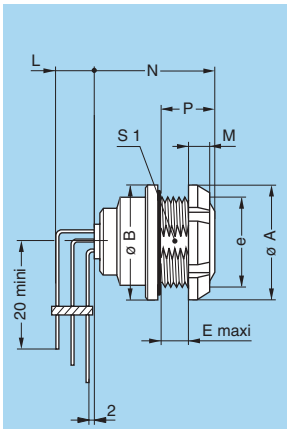

## EEP Fixed socket, nut fixing, with straight contact for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | P | S1 |
| EEP | 0E | 18 | 18 | M14x1.0 | 3.5 | 3.5 | 16.0 | 7 | 12.5 |
| EEP | 1E | 20 | 20 | M16x1.0 | 6.5 | 3.5 | 21.5 | 10 | 14.5 |
| EEP | 2E | 25 | 25 | M20x1.0 | 6.5 | 3.5 | 24.0 | 10 | 18.5 |
| EEP | 3E | 30 | 31 | M24x1.0 | 7.5 | 4.5 | 29.5 | 12 | 22.5 |

**P1** Panel cut-out (page 153)

**P21** PCB drilling pattern (page 159)

**Note:** this contact type is available for all E●● socket models.
See page 159 for table of available types.
Length «L» depends on the number of contacts, see PCB drilling pattern on page 159.
The 3E series is delivered with a conical nut.



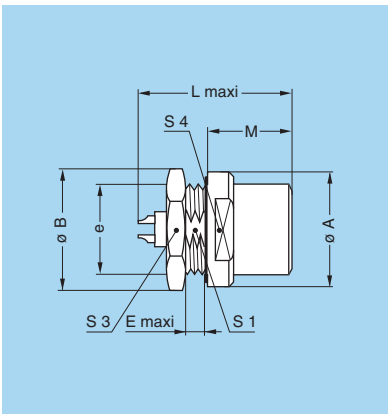

## EEP Fixed socket, nut fixing, with elbow (90°) contacts for printed circuit (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | M | N | P | S1 |
| EEP | 1E | 20 | 20 | M16x1.0 | 6.5 | 3.5 | 21.5 | 10 | 14.5 |
| EEP | 2E | 25 | 25 | M20x1.0 | 6.5 | 3.5 | 24.0 | 10 | 18.5 |

**P1** Panel cut-out (page 153)

**P24** PCB drilling pattern (page 160)

**Note:** this contact type is available for all back panel mounting socket types. See page 160 for available types.
Length «L» depends on the number of contacts, see PCB drilling pattern on page 160.

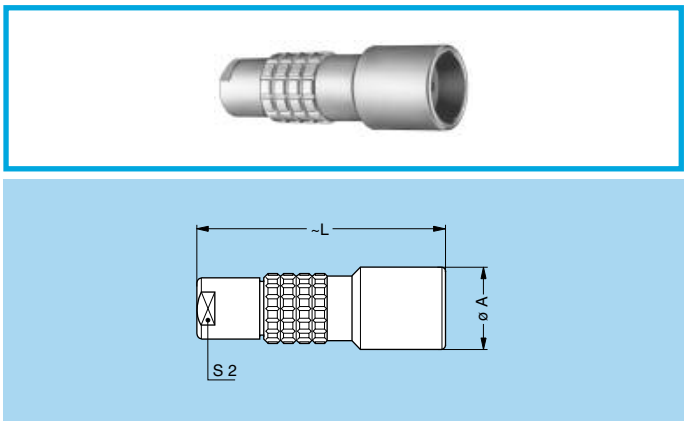



## EHP Fixed socket, nut fixing, protruding shell

| Reference | | Dimensions (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 | S4 |
| EHP | 0E | 18 | 19.2 | M14x1.0 | 1.5 | 19.5 | 20.5 | 10.5 | 12.5 | 17 | 15 |
| EHP | 1E | 20 | 21.5 | M16x1.0 | 1.5 | 24.0 | 25.3 | 15.5 | 14.5 | 19 | 17 |
| EHP | 2E | 25 | 27.0 | M20x1.0 | 1.5 | 28.5 | 30.0 | 17.0 | 18.5 | 24 | 20 |

**P1** Panel cut-out (page 153)

**Note:** 1) unipole model

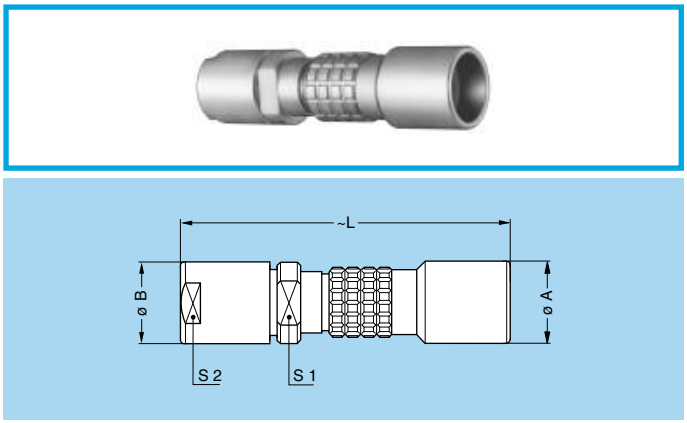



## PCA Free socket, cable collet

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCA | 0E | 13 | 34.0 | 8 |
| PCA | 1E | 15 | 45.0 | 9 |
| PCA | 2E | 19 | 54.0 | 12 |
| PCA | 3E | 23 | 65.0 | 15 |
| PCA | 4E | 29 | 75.5 | 19 |
| PCA | 5E | 42 | 95.0 | 32 |
| PHG[1)] | 6E | 52 | 125.0 | 38 |

**M1** Cable assembly (pages 167 and 168)

**Note:** 1) with key (G)

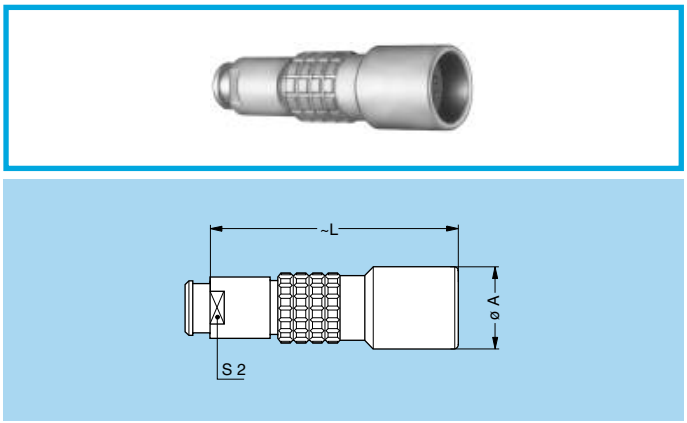



## PCA Free socket with oversize cable collet 1)

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | L | S1 | S2 |
| PCA | 1E | 15 | 14.5 | 58.0 | 12 | 12 |
| PCA | 2E | 19 | 17.0 | 67.0 | 15 | 15 |
| PCA | 3E | 23 | 22.0 | 84.0 | 19 | 19 |
| PCA | 4E | 29 | 36.0 | 109.0 | 30 | 32 |

**M2** Cable assembly (pages 167 and 169)

**Note:** 1) correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 105).

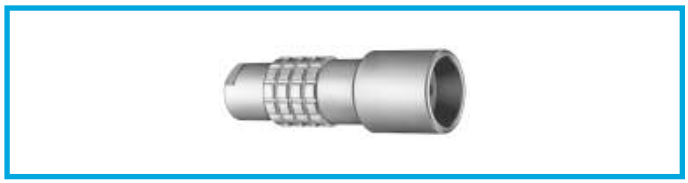


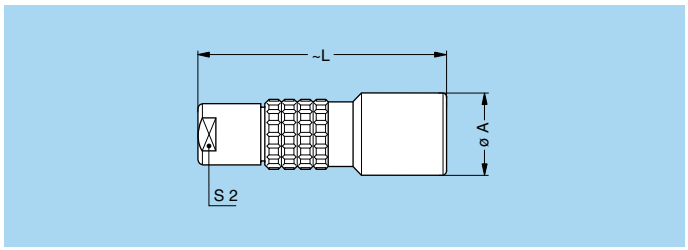

## PCA Free socket, cable collet and nut for fitting a bend relief 1)

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCA | 0E | 13 | 34.0 | 7 |
| PCA | 1E | 15 | 45.0 | 9 |
| PCA | 2E | 19 | 54.0 | 12 |
| PCA | 3E | 23 | 64.0 | 15 |
| PCA | 4E | 29 | 75.5 | 19 |

**M1** Cable assembly (pages 167 and 168)

**Note:** 1) to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

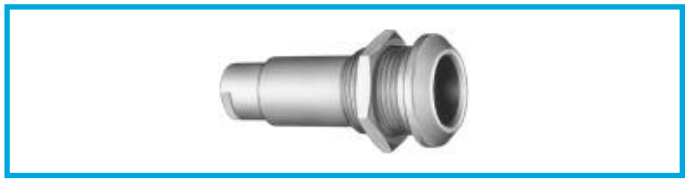


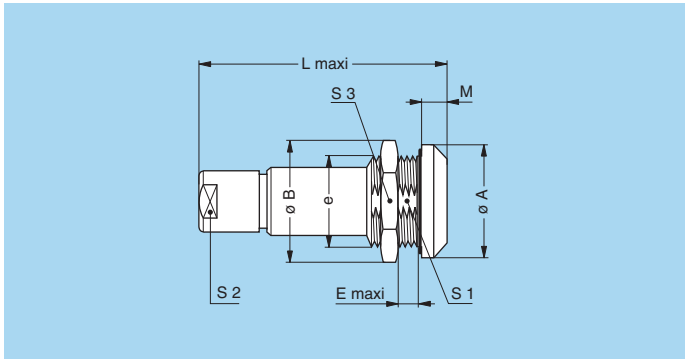



## PCP Free socket, cable collet and inner anti-rotating device

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PCP | 3E | 23 | 65.0 | 15 |
| PCP | 4E | 29 | 75.5 | 19 |

**M1** Cable assembly (pages 167 and 168)





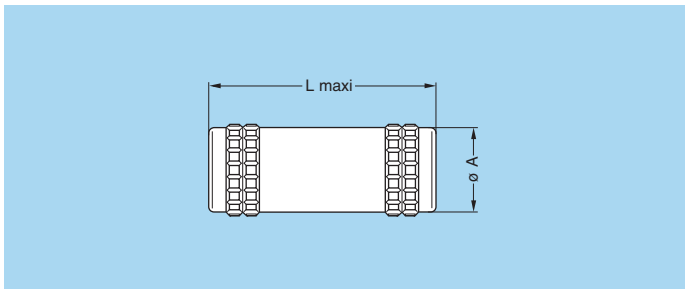

## PSA Fixed socket, nut fixing, cable collet

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PSA | 0E | 18 | 19.2 | M14x1.0 | 5.5 | 34.0 | 4.0 | 12.5 | 8 | 17 |
| PSA | 1E | 20 | 21.5 | M16x1.0 | 9.0 | 45.0 | 4.5 | 14.5 | 9 | 19 |
| PSA | 2E | 25 | 27.0 | M20x1.0 | 9.0 | 54.0 | 5.0 | 18.5 | 12 | 24 |
| PSA | 3E | 31 | 34.0 | M24x1.0 | 11.0 | 65.0 | 6.0 | 22.5 | 15 | 30 |
| PSA | 4E | 37 | 40.5 | M30x1.0 | 9.0 | 75.5 | 6.5 | 28.5 | 19 | 36 |
| PSA | 5E | 51 | 54.0 | M45x1.5 | 10.0 | 95.0 | 9.0 | – | 32 | 54 |
| PKG[1)] | 6E | 65 | 65.0 | M55x2.0 | 10.5 | 125.0 | 10.0 | – | 38 | – |

**P1** Panel cut-out (page 153)

**M1** Cable assembly (pages 167 and 168)

**Note:** 1) with key (G).
The 5E and 6E series are delivered with a round nut.




## RMA Free coupler

| Reference | | Dim. (mm) | |
|---|---|---|---|
| Model | Series | A | L |
| RMA | 0E | 14 | 30 |
| RMA | 1E | 16 | 40 |
| RMA | 2E | 20 | 44 |
| RMA | 3E | 25 | 54 |
| RMA | 4E | 30 | 57 |
| RMA | 5E | 44 | 67 |

**Note:** see page 101 for the available plug and contact configurations and in order to ensure correct contact alignment.

# Watertight or vacuumtight models

These socket or coupler models allow the device on which they are fitted to reach a protection index of IP 68 as per IEC 60529. They are fully compatible with plugs of the same series and are widely used for portable radios, military, laboratory equipment, aviation, etc.
These models are identified by a letter «P» at the end of the reference.
Most of these models are also available in a vacuumtight version. Such models are identified by an additional letter «V» at the end of the part number (certificate on request).
Epoxy resin is used to seal these models.

## Technical Characteristics

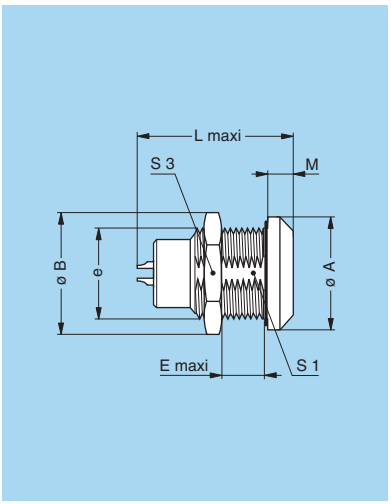
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range (0E-1E) | - 20° C/+100° C | |
| Temperature range (2E-6E) | - 20° C/+80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Climatical category | 20/80/21 | IEC 60068-1 |
| Leakage rate (He)[1)] | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |

**Note:** [1)] only for vacuumtight models.

| Characteristics | | Value | Standard |
|---|---|---|---|
| Maximum operating pressure[2)] | 0E | 60 bar | IEC 60512-7 test 14d |
| | 1E | 60 bar | |
| | 2E | 40 bar | |
| | 3E | 30 bar | |
| | 4E | 15 bar | |
| | 5E | 5 bar | |
| | 6E | 5 bar | |

**Note:** [2)] this value corresponds to the maximum allowed pressure difference for the assembled socket.

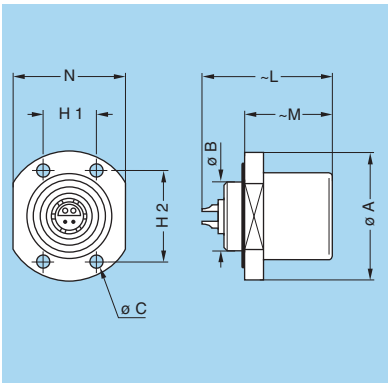



## HGP Fixed socket, nut fixing, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | L[1)] | M | S1 | S3 |
| HGP | 0E | 18 | 19.2 | M14x1.0 | 5.5 | 23.5 | 22.0 | 4.0 | 12.5 | 17 |
| HGP | 1E | 20 | 21.5 | M16x1.0 | 9.0 | 29.5 | 28.0 | 4.5 | 14.5 | 19 |
| HGP | 2E | 25 | 27.0 | M20x1.0 | 10.5 | 32.5 | 28.0 | 5.0 | 18.5 | 24 |
| HGP | 3E | 31 | 34.0 | M24x1.0 | 15.5 | 39.5 | 38.5 | 6.0 | 22.5 | 30 |
| HGP | 4E | 37 | 40.5 | M30x1.0 | 17.5 | 43.0 | 44.0 | 6.5 | 28.5 | 36 |
| HGP | 5E | 55 | 54.0 | M45x1.5 | 20.0 | 52.0 | 76.0 | 9.0 | 42.5 | – |
| HGP[2)] | 6E | 65 | 65.0 | M55x2.0 | 20.5 | 52.0 | – | 10.0 | 52.0 | – |

**P1** Panel cut-out (page 153)

**Note:** The 5E and 6E series are delivered with a round nut.
[1)] unipole model.
[2)] with key (G).

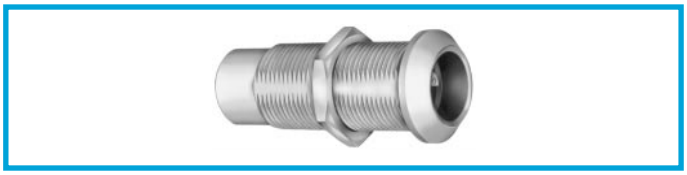


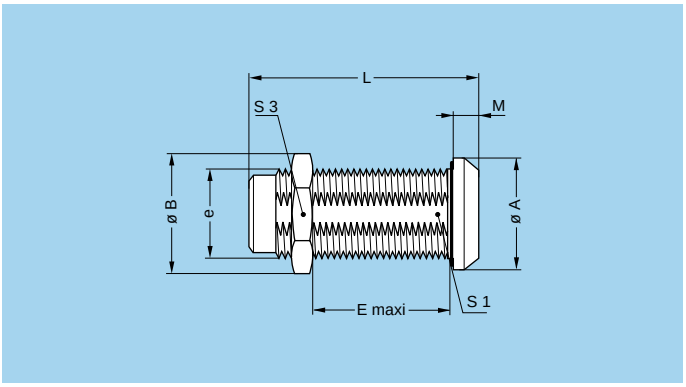

## EBR Fixed socket with round flange, watertight, protruding shell and screw fixing

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | C | H1 | H2 | L | L[1)] | M | N |
| EBR | 2E | 28 | 15 | 2.8 | 11.8 | 20.4 | 32.5 | 28.0 | 19 | 25 |

**P6** Panel cut-out (page 153)

**Note:** [1)] unipole model.
This model is only available in a watertight version.






## SWH Fixed coupler, nut fixing, watertight or vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| SWH | 0E | 18 | 19.2 | M14x1.0 | 22.5 | 36.0 | 4.0 | 12.5 | 17 |
| SWH | 1E | 20 | 21.5 | M16x1.0 | 30.5 | 47.0 | 4.5 | 14.5 | 19 |
| SWH | 2E | 25 | 27.0 | M20x1.0 | 28.0 | 52.4 | 5.0 | 18.5 | 24 |
| SWH | 3E | 31 | 34.0 | M24x1.0 | 33.0 | 64.2 | 6.0 | 22.5 | 30 |
| SWH | 4E | 37 | 40.5 | M30x1.0 | 44.5 | 70.0 | 6.5 | 28.5 | 36 |
| SWH | 5E | 55 | 54.0 | M45x1.5 | 47.0 | 81.0 | 9.0 | 42.5 | – |
| SWH[1)] | 6E | 65 | 65.0 | M55x2.0 | 12.0 | 76.0 | 10.0 | – | – |

**P1** Panel cut-out (page 153)

**Note:** 1) with key (G). The 5E and 6E series are delivered with a round nut. See page 101 for the available plug and contact configurations and in order to ensure correct contact alignment.

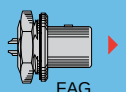
# L Series

L series connectors have been specifically designed for outdoor applications. This series offer superior polarization combining the stepped insert (half-moon) of the S/E series with the keying system of the K series.
They include an inner sleeve and two seals to prevent penetration of solids or liquids into the housing formed by the plug, free socket, fixed socket or coupler. All models of this series are watertight when mated to give a protection index of IP68 as per IEC 60529 standard (in mated condition) when correctly assembled to an appropriate cable (IP66 otherwise).
L series connectors have the same insulators as the S series and have the following main features:

- security of the Push-Pull latching system
- multipole types 2 to 10 contacts
- stepped insert (half-moon) fitted with male and female contacts
- high packing density for space savings
- keying system («G» key standard) for connector alignment
- watertight connection (IP 68/IP 66)
- solder, crimp or print (straight) contacts
- multiple key options to avoid cross mating of similar connectors
- 360° screening for full EMC shielding
- rugged housing for extreme working conditions.

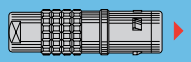
**Metal housing models** (page 86)

**Fixed plug**



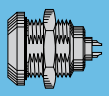
FAG

**Straight plugs**



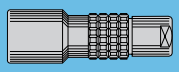
FGG

**Fixed sockets**



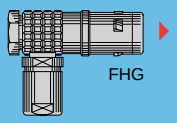
EGG

**Free sockets**

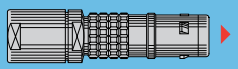


PHG

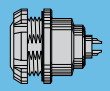
**Elbow plug**



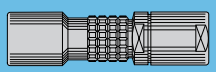
FHG



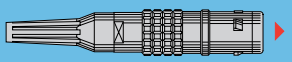
FGG



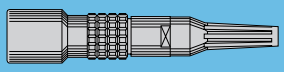
EEG



PHG



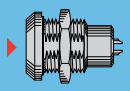
FGG



PHG

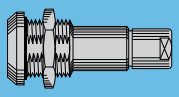
**Vacuumtight model** (page 89)

**Fixed socket**



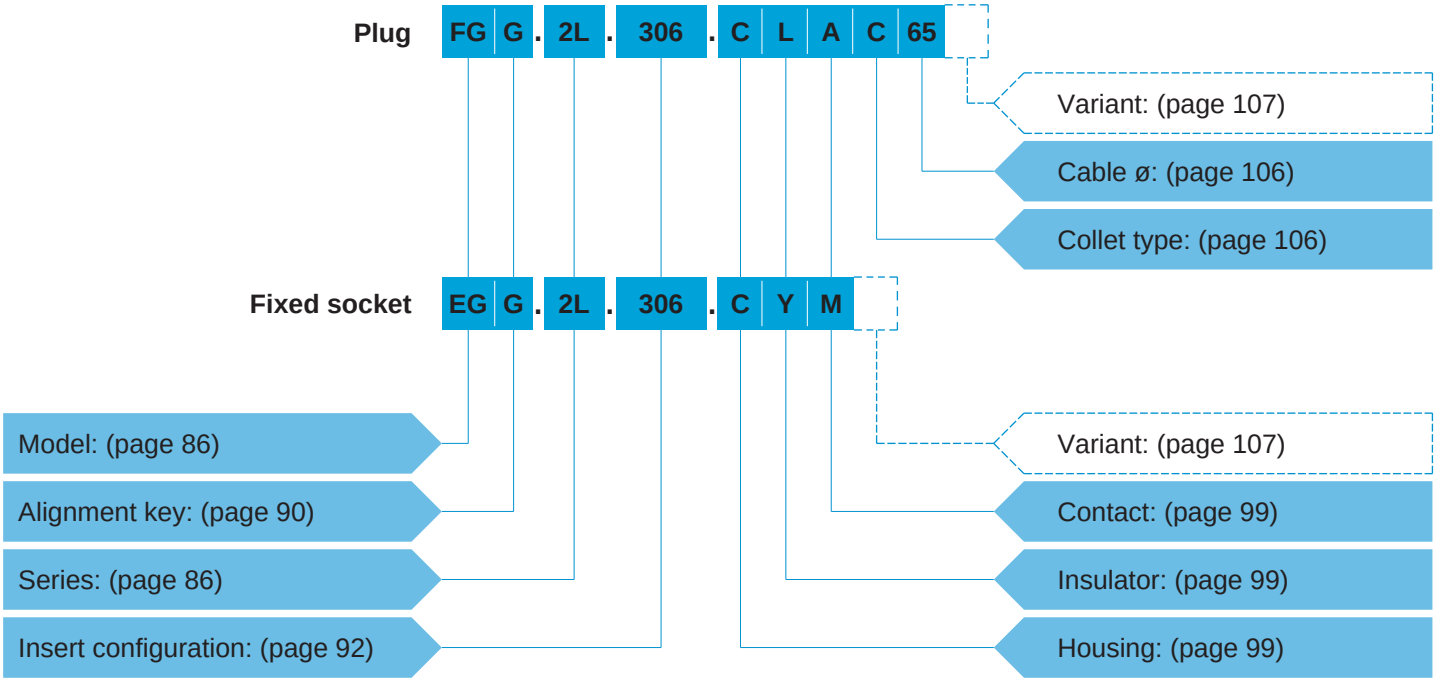
HGG

**Fixed socket**



PKG

## Part Numbering System

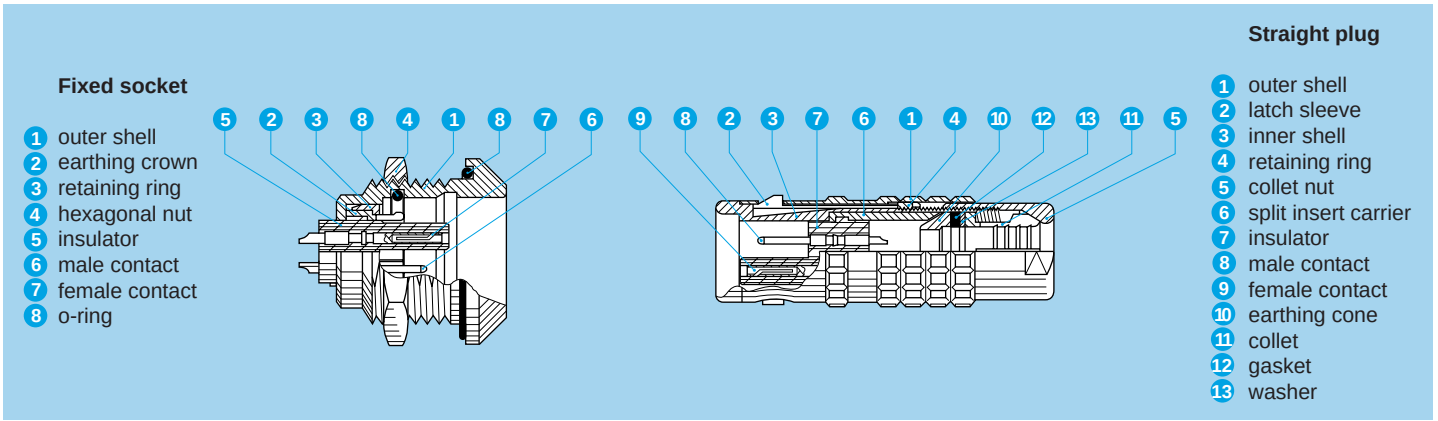



## Part Number Example

**Straight plug with cable collet:**
**FGG.2L.306.CLAC65** = straight plug with key (G) and cable collet, 2L series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, with 3 male and 3 female solder contacts, C type collet for 6.5 mm diameter cable.

**Fixed socket:**
**EGG.2L.306.CYM** = fixed socket, nut fixing, with key (G), 2L series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK extended insulator, with 3 female and 3 male crimp contacts.

## Part Section Showing Internal Components



# Metal housing models

## Technical Characteristics

### Mechanical and Climatical

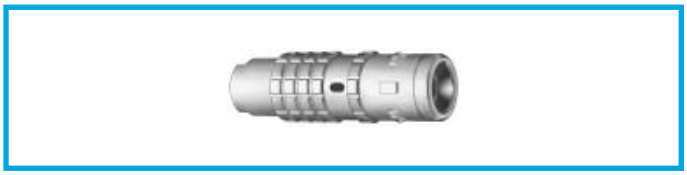
| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range[1)] | - 55° C, +200° C | |
| Resistance to vibrations | 10-2000 Hz, 15 g | IEC 60512-4 test 6d |
| Shock resistance | 100 g, 6 ms | IEC 60512-4 test 6c |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index (mated)[2)] | IP 68/IP 66 | IEC 60529 |
| Climatical category | 50/175/21 | IEC 60068-1 |

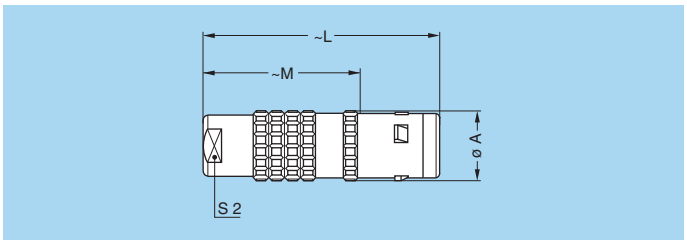
### Electrical

| Characteristics | | Value | Standard |
|---|---|---|---|
| Shielding efficiency | at 10 MHz | > 95 dB | IEC 60169-1-3 |
| | at 1 GHz | > 80 dB | IEC 60169-1-3 |

**Note:**
The various tests have been carried out with FGG and EGG connector pairs, with chrome-plated brass shell, PEEK insulator and silicone O-ring.
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

1) minimum operating temperature is -20°C for sockets fitted with an FPM (Viton®) O-ring.
2) IP68 achieved providing that the cable is perfectly circular and that assembly process ensures a high integrity seal.

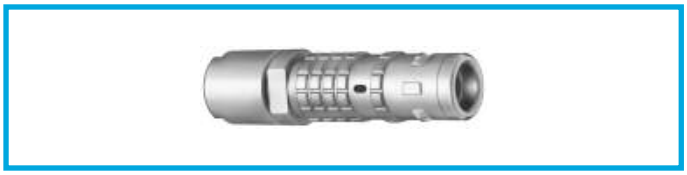


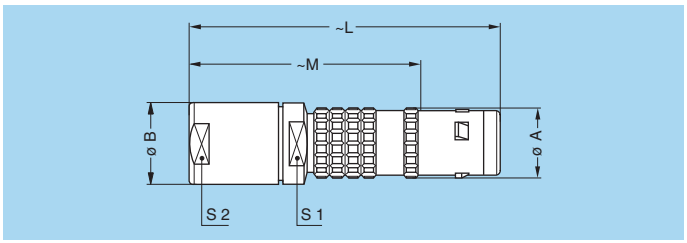



### FGG Straight plug, key (G) or keys (A to C and L), cable collet

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGG | 0L | 11 | 34 | 23.0 | 8 |
| FGG | 1L | 13 | 42 | 28.0 | 9 |
| FGG | 2L | 16 | 52 | 36.0 | 12 |

**M1** Cable assembly (page 170)



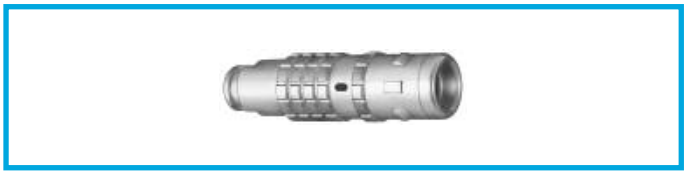


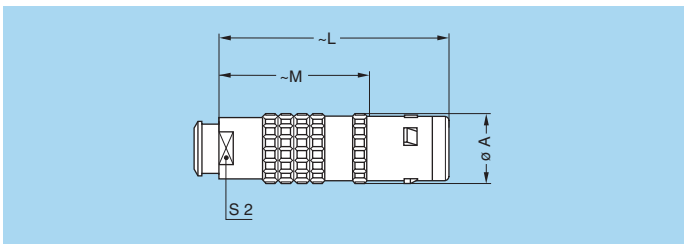

### FGG Straight plug, key (G) or keys (A to C and L), cable collet and oversize cable collet [1)]

| Reference | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| Model | Series | A | B | L | M | S1 | S2 |
| FGG | 1L | 13 | 14.5 | 60 | 46 | 12 | 12 |
| FGG | 2L | 16 | 17.0 | 68 | 52 | 15 | 15 |

**M2** Cable assembly (page 170)

**Note:** 1) correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 106).



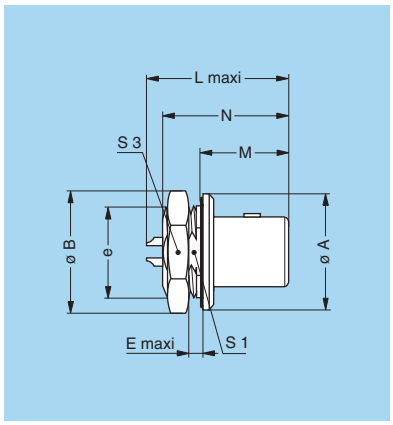



### FGG Straight plug, key (G) or keys (A to C and L), cable collet and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| Model | Series | A | L | M | S2 |
| FGG | 0L | 11 | 34 | 23 | 7 |
| FGG | 1L | 13 | 42 | 28 | 9 |
| FGG | 2L | 16 | 52 | 36 | 12 |

**M1** Cable assembly (page 170)

**Note:** 1) to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

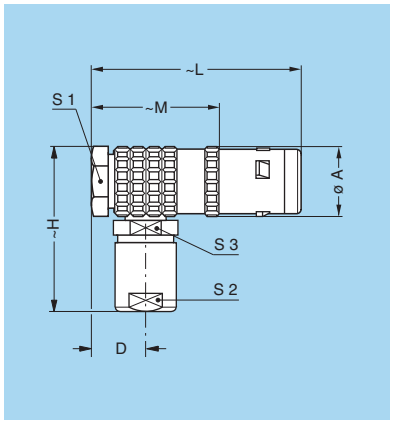



## FAG Fixed plug, nut fixing, non-latching, key (G) or keys (A to C and L)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| FAG | 2L | 25 | 27.0 | M20x1.0 | 4.5 | 28.2 | 18.0 | 28.3 | 18.5 | 24 |

P1 Panel cut-out (page 153)

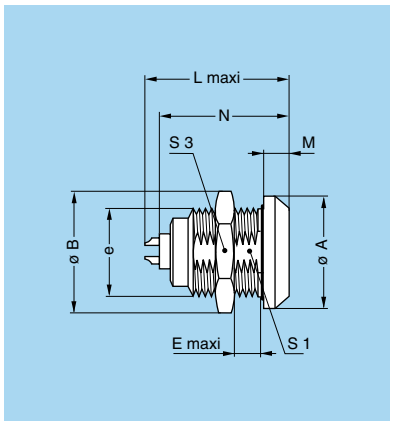
**Note:** 1) maximum length with crimp contacts.




## FHG Elbow (90°) plug, key (G) or keys (A to C and L), cable collet

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | D | H | L | M | S1 | S2 | S3 |
| FHG | 0L | 11.5 | 7.6 | 27 | 36 | 25.0 | 10 | 8 | 8 |
| FHG | 1L | 14.0 | 8.8 | 33 | 43 | 29.0 | 12 | 9 | 10 |
| FHG | 2L | 17.5 | 10.5 | 40 | 51 | 35.0 | 15 | 12 | 13 |

M3 Cable assembly (page 170)

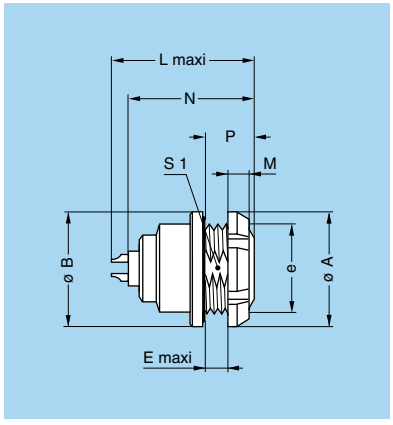



## EGG Fixed socket, nut fixing, key (G) or keys (A to C and L)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | S1 | S3 |
| EGG | 0L | 18 | 19.2 | M14x1.0 | 6 | 21.7 | 4.0 | 20.1 | 12.5 | 17 |
| EGG | 1L | 20 | 21.5 | M16x1.0 | 9 | 27.0 | 4.5 | 25.1 | 14.5 | 19 |
| EGG | 2L | 25 | 27.0 | M20x1.0 | 9 | 30.7 | 5.0 | 28.6 | 18.5 | 24 |

P1 Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.

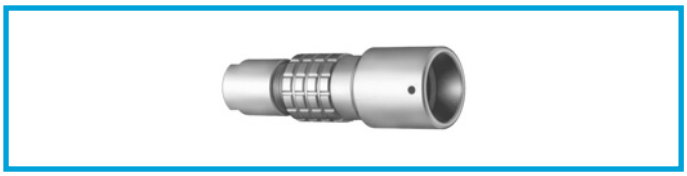


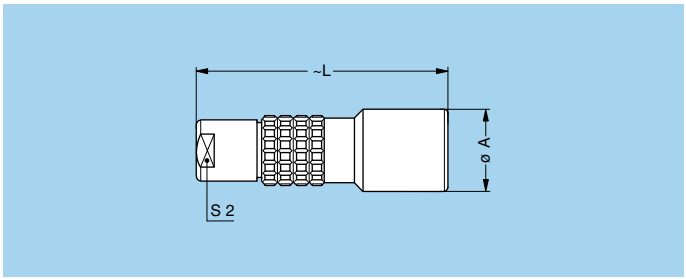

## EEG Fixed socket, nut fixing, key (G) or keys (A to C and L) (back panel mounting)

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | N[1)] | P | S1 |
| EEG | 0L | 18.0 | 18 | M14x1.0 | 3.4 | 21.7 | 3.5 | 20.1 | 7.0 | 12.5 |
| EEG | 1L | 20.0 | 20 | M16x1.0 | 6.2 | 27.0 | 3.5 | 25.1 | 10.0 | 14.5 |
| EEG | 2L | 25.0 | 25 | M20x1.0 | 5.0 | 30.7 | 3.5 | 28.6 | 10.0 | 18.5 |

P1 Panel cut-out (page 153)

**Note:** 1) maximum length with crimp contacts.

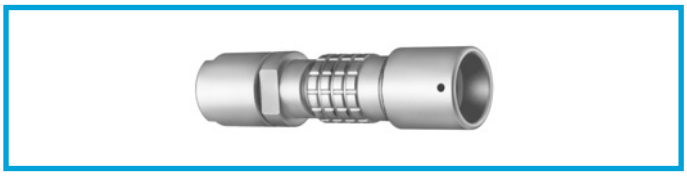


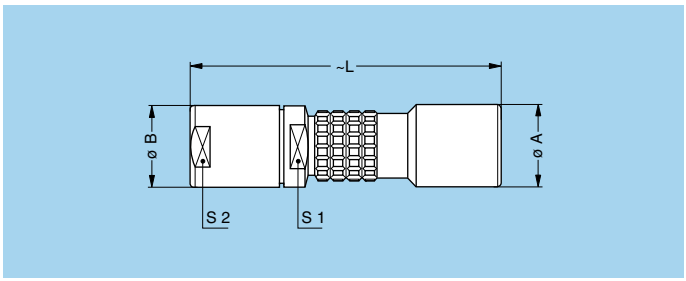



## PHG Free socket, key (G) or keys (A to C and L), cable collet

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PHG | 0L | 13 | 34.0 | 8 |
| PHG | 1L | 15 | 45.0 | 9 |
| PHG | 2L | 19 | 54.0 | 12 |

**M1** Cable assembly (page 170)



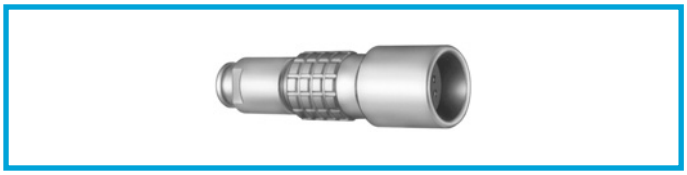


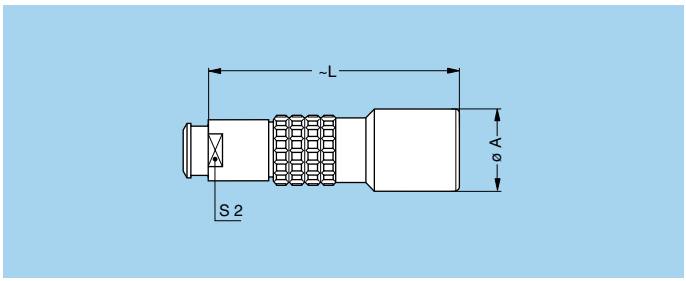

## PHG Free socket, key (G) or keys (A to C and L), cable collet and oversize cable collet [1)]

| Reference | | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| Model | Series | A | B | L | S1 | S2 |
| PHG | 1L | 15 | 14.5 | 63 | 12 | 12 |
| PHG | 2L | 19 | 17.0 | 70 | 15 | 15 |

**M2** Cable assembly (page 170)

**Note:** [1)] correspond to K type of collet, the fitting of oversize collets onto this model allows them to be fitted to the cables that can be accommodated by the next housing size up (see page 106).



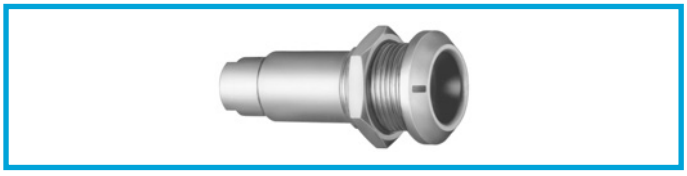


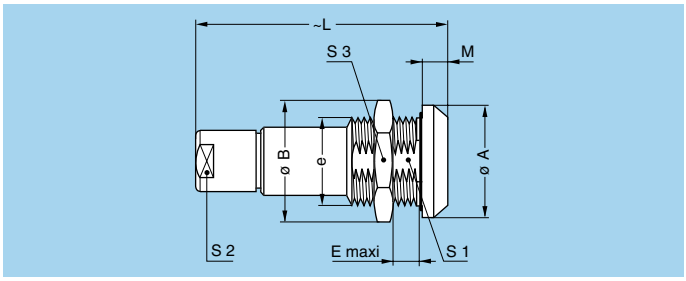

## PHG Free socket, key (G) or keys (A to C and L), cable collet and nut for fitting a bend relief [1)]

| Reference | | Dimensions (mm) | | |
|---|---|---|---|---|
| Model | Series | A | L | S2 |
| PHG | 0L | 13 | 34.0 | 7 |
| PHG | 1L | 15 | 45.0 | 9 |
| PHG | 2L | 19 | 54.0 | 12 |

**M1** Cable assembly (page 170)

**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).






## PKG Fixed socket, nut fixing, key (G) or keys (A to C and L), cable collet

| Reference | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S2 | S3 |
| PKG | 0L | 18 | 19.2 | M14x1.0 | 6 | 34.0 | 4.0 | 12.5 | 8 | 17 |
| PKG | 1L | 20 | 21.5 | M16x1.0 | 9 | 45.0 | 4.5 | 14.5 | 9 | 19 |
| PKG | 2L | 25 | 27.0 | M20x1.0 | 9 | 54.0 | 5.0 | 18.5 | 12 | 24 |

**M1** Cable assembly (page 170)

**P1** Panel cut-out (page 153)

# Watertight or vacuumtight models

This socket model allow the device on which they are fitted to reach a protection index of IP68 as per IEC 60529.
This model is also available in a vacuumtight version. It is identified by the letter «PV» at the end of the part number (certificate on request).
Epoxy resin is used to seal this model.

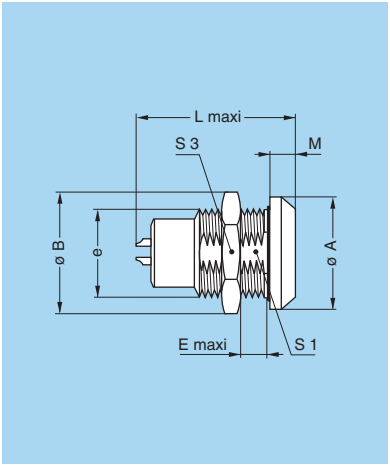
## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 5000 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range (0L-1L) | - 20° C/+100° C | |
| Temperature range (2L) | - 20° C/+80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |

| Characteristics | | Value | Standard |
|---|---|---|---|
| Climatical category | | 20/80/21 | IEC 60068-1 |
| Leakage rate (He) | | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |
| Maximum operating pressure[1)] | 0L | 60 bar | IEC 60512-7 test 14d |
| | 1L | 60 bar | |
| | 2L | 40 bar | |

**Note:** [1)] this value corresponds to the maximum allowed pressure difference for the assembled socket.




### HGG Fixed socket, nut fixing, key (G) or keys (A to C and L), vacuumtight

| Reference | | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Series | A | B | e | E | L | M | S1 | S3 |
| HGG | 0L | 18 | 19.2 | M14x1.0 | 5.5 | 21.7 | 4.0 | 12.5 | 17 |
| HGG | 1L | 20 | 21.5 | M16x1.0 | 9.0 | 30.0 | 4.5 | 14.5 | 19 |
| HGG | 2L | 25 | 27.0 | M20x1.0 | 13.0 | 33.7 | 5.0 | 18.5 | 24 |

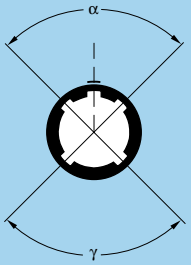
P1 Panel cut-out (page 153)

# Alignment Key (L series)

## Alignment Key and Polarized Keying System

L series connector model part numbers are composed of three letters. The LAST LETTER indicates the key position and the contact type (male or female).

Front view of a socket

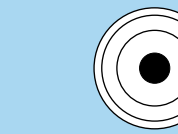
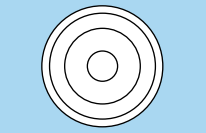
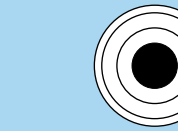
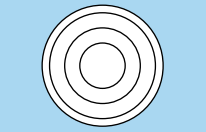
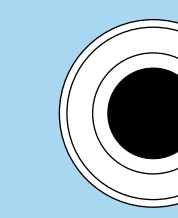
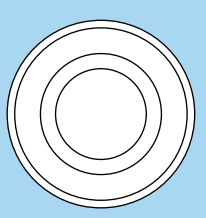



| Reference | Nb of keys | Angles | Series | | | Contact type | | Note |
|---|---|---|---|---|---|---|---|---|
| | | | 0L | 1L | 2L | Plug | Socket | |
| G | 1 | | 0° | 0° | 0° | male | female | ● |
| A | 2 | α | 30° | 30° | 30° | male | female | ● |
| B | 2 | | 45° | 45° | 45° | male | female | ○ |
| J | 2 | γ | 105° | 105° | 105° | female | male | ○ |
| L | 2 | | 75° | 75° | 75° | male | female | ●[1)] |

**Note:** [1)] that contact type is not as for the K series.
● First choice alternative
○ Special order alternative

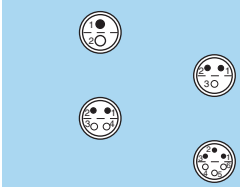
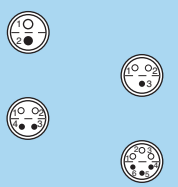
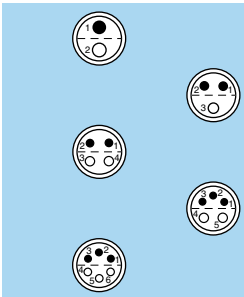
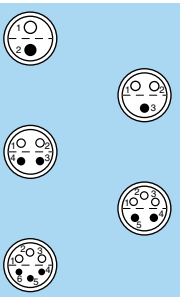
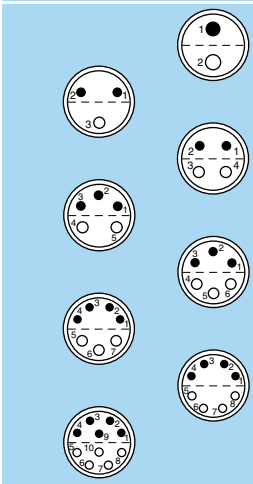
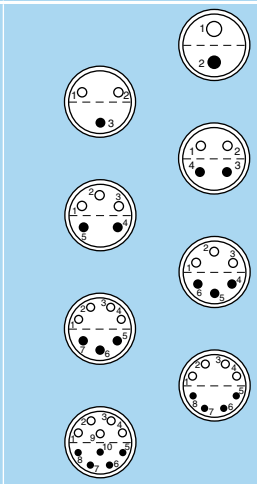
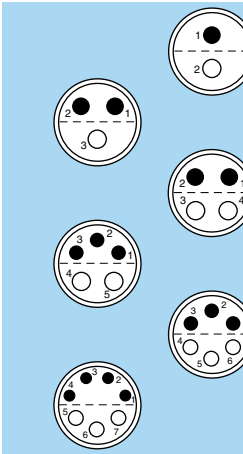
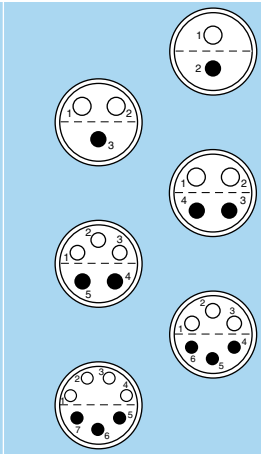
# Insert configuration (S, E and L series)

## Unipole

| | Male solder contacts | Female solder contacts | Reference | Series: Standard | Series: Watertight | ø A (mm) | Contact type: Solder | Contact type: Crimp | Test voltage (kV rms)[1] | Test voltage (kV dc)[1] | Rated current (A)[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | | | 113 | 00 | – | 1.3 | ●[2] | ● | 0.8 | 1.2 | 8 |
| 0S 0E | | | 116 | 0S | 0E | 1.6 | ●[2] | – | 1.5 | 2.1 | 12 |
| 1S 1E | | | 120 | 1S | 1E | 2.0 | ●[2] | – | 1.9 | 2.7 | 18 |
| | | | 130 | 1S | 1E | 3.0 | ● | – | 1.5 | 2.1 | 25 |
| 2S 2E | | | 130 | 2S | 2E | 3.0 | ● | – | 2.1 | 3.0 | 30 |
| | | | 140 | 2S | 2E | 4.0 | ● | – | 1.7 | 2.4 | 40 |
| 3S 3E | | | 140 | 3S | 3E | 4.0 | ● | – | 2.3 | 3.3 | 43 |
| | | | 160 | 3S | 3E | 6.0 | ● | – | 1.7 | 2.4 | 65 |
| 4S 4E |  |  | 140 | 4S | – | 4.0 | ● | – | 3.0 | 4.2 | 46 |
| |  |  | 160 | 4S | 4E | 6.0 | ● | – | 2.7 | 3.9 | 70 |
| 5S 5E |  |  | 112 | 5S | 5E | 12.0 | ● | – | 1.5 | 2.1 | 230 |

**Note:** [1] see calculation method, caution and suggested standard on page 178.
[2] also available with inversed contacts: plug = female, socket = male.

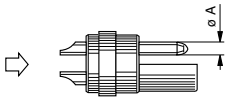
# Multipole

| | Male solder contacts | Female solder contacts | Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Crimp | Contact type: Print (straight) | Contact type: Print (elbow) | Test voltage (kV rms)[1) 2)] | Test voltage (kV dc)[1) 2)] | Rated current (A)[1)] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0S 0E 0L |  |  | 302 | 0S | 0E | 2 | 0.9 | ● | ● | ● | ● | 1.1 | 1.6 | 10[3)] |
| | | | 303 | 0S | 0E | 3 | 0.7 | ● | ○ | ● | ● | 1.0 | 1.5 | 7[3)] |
| | | | 304 | 0S | 0E | 4 | 0.7 | ● | ● | ● | ● | 1.0 | 1.5 | 7[3)] |
| | | | 306 | 0S | 0E | 6 | 0.5 | ● | ○ | ● | ○ | 0.9 | 1.3 | 2.5 |
| 1S 1E 1L |  |  | 302 | 1S | 1E | 2 | 1.3 | ● | ● | ● | ● | 1.2 | 1.8 | 15[3)] |
| | | | 303 | 1S | 1E | 3 | 0.9 | ● | ○ | ● | ● | 1.2 | 1.8 | 10[3)] |
| | | | 304 | 1S | 1E | 4 | 0.9 | ● | ● | ● | ● | 1.2 | 1.8 | 10[3)] |
| | | | 305 | 1S | 1E | 2<br>3 | 0.9<br>0.7 | ● | ○ | ● | ● | 1.5<br>1.5 | 2.1<br>2.1 | 10[3)]<br>7[3)] |
| | | | 306 | 1S | 1E | 6 | 0.7 | ● | ○ | ● | ● | 1.2 | 1.7 | 7[3)] |
| 2S 2E 2L |  |  | 302 | 2S | 2E | 2 | 1.6 | ● | ○ | ○ | ○ | 1.7 | 2.4 | 20[4)] |
| | | | 303 | 2S | 2E | 3 | 1.3 | ● | ○ | ● | ○ | 1.5 | 2.1 | 15[4)] |
| | | | 304 | 2S | 2E | 4 | 1.3 | ● | ○ | ● | ● | 1.7 | 2.4 | 15[4)] |
| | | | 305 | 2S | 2E | 5 | 1.3 | ● | ○ | ● | ● | 1.5 | 2.1 | 13[4)] |
| | | | 306 | 2S | 2E | 6 | 1.3 | ● | ●[5)] | ● | ● | 1.5 | 2.1 | 12 |
| | | | 307 | 2S | 2E | 3<br>4 | 1.3<br>0.9 | ● | ○ | ● | ● | 0.8<br>0.8 | 1.2<br>1.2 | 12[3)]<br>9[3)] |
| | | | 308 | 2S | 2E | 8 | 0.9 | ● | ○ | ● | ● | 0.8 | 1.2 | 9[3)] |
| | | | 310 | 2S | 2E | 10 | 0.9 | ● | ○ | ● | ● | 0.8 | 1.2 | 7[3)] |
| 3S 3E |  |  | 302 | 3S | 3E | 2 | 2.0 | ● | – | ○ | – | 3.0 | 4.2 | 23 |
| | | | 303 | 3S | 3E | 3 | 2.0 | ● | – | ○ | – | 1.5 | 2.1 | 20 |
| | | | 304 | 3S | 3E | 4 | 2.0 | ● | – | ○ | – | 1.5 | 2.1 | 18 |
| | | | 305 | 3S | 3E | 2<br>3 | 2.0<br>1.3 | ● | – | ○ | – | 1.5<br>1.5 | 2.1<br>2.1 | 18<br>14 |
| | | | 306 | 3S | 3E | 6 | 1.3 | ● | – | ● | – | 2.1 | 3.0 | 14 |
| | | | 307 | 3S | 3E | 7 | 1.3 | ● | – | ● | – | 1.0 | 1.5 | 12 |

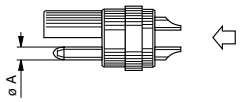
**Note:**
1) see calculation method, caution and suggested standard on page 178.
2) lowest measured value; contact to contact or contact to shell.
3) rated current = 6A for socket with elbow (90°) contacts for printed circuit.
4) rated current = 12A for socket with elbow (90°) contacts for printed circuit.
5) only for FFL model.

● First choice alternative
○ Special order alternative

# Multipole




Male solder contacts



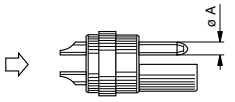

Female solder contacts

| | Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Crimp | Contact type: Print (straight) | Contact type: Print (elbow) | Test voltage (kV rms)[1) 2)] | Test voltage (kV dc)[1) 2)] | Rated current (A)[1)] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3S 3E | 308 | 3S | 3E | 8 | 1.3 | ● | – | ● | ○ | 1.0 | 1.5 | 10 |
| | 310 | 3S | 3E | 10 | 1.3 | ● | – | ● | ● | 1.0 | 1.5 | 9 |
| | 312 | 3S | 3E | 12 | 0.9 | ● | – | ● | ● | 1.5 | 2.1 | 8 |
| | 313 | 3S | 3E | 13 | 0.9 | ● | – | ● | ○ | 1.5 | 2.1 | 8 |
| | 314 | 3S | 3E | 14 | 0.9 | ● | – | ● | ● | 1.5 | 2.1 | 7 |
| | 316 | 3S | 3E | 16 | 0.9 | ● | – | ● | ● | 1.0 | 1.5 | 7 |
| | 318 | 3S | 3E | 18 | 0.9 | ● | – | ● | ○ | 1.0 | 1.5 | 6 |
| 4S 4E | 302 | 4S | 4E | 2 | 4.0 | ● | – | ○ | – | 2.1 | 3.0 | 35 |
| | 303 | 4S | 4E | 3 | 3.0 | ● | – | ○ | – | 2.1 | 3.0 | 25 |
| | 304 | 4S | 4E | 4 | 3.0 | ● | – | ○ | – | 2.1 | 3.0 | 22 |
| | 305 | 4S | 4E | 2<br>3 | 3.0<br>2.0 | ● | – | ○ | – | 2.1<br>2.1 | 3.0<br>3.0 | 22<br>16 |
| | 306 | 4S | 4E | 6 | 2.0 | ● | – | ○ | – | 2.1 | 3.0 | 16 |
| | 307 | 4S | 4E | 3<br>4 | 2.0<br>1.3 | ● | – | ○ | – | 2.1<br>2.1 | 3.0<br>3.0 | 16<br>13 |
| | 308 | 4S | 4E | 8 | 1.3 | ● | – | ○ | – | 2.7 | 3.9 | 13 |
| | 309 | 4S | 4E | 9 | 1.3 | ● | – | ○ | – | 2.1 | 3.0 | 12 |
| | 310 | 4S | 4E | 10 | 1.3 | ● | – | ○ | – | 2.1 | 3.0 | 11 |
| | 312 | 4S | 4E | 12 | 1.3 | ● | – | ○ | – | 2.1 | 3.0 | 9 |
| | 313 | 4S | – | 13 | 1.3 | ● | – | ○ | – | 2.1 | 3.0 | 9 |

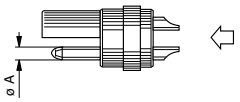
**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

● First choice alternative
○ Special order alternative

# Multipole




Male solder contacts

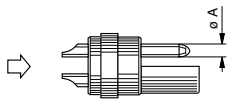



Female solder contacts

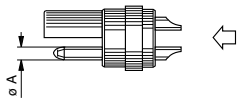
| | Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Print (straight) | Contact type: Print (elbow) | Test voltage (kV rms)[1) 2)] | Test voltage (kV dc)[1) 2)] | Rated current (A)[1)] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4S 4E | 314 | 4S | 4E | 14 | 1.3 | ● | ○ | – | 2.1 | 3.0 | 9 |
| | 316 | 4S | 4E | 16 | 0.9 | ● | ○ | – | 2.1 | 3.0 | 7 |
| | 318 | 4S | 4E | 18 | 0.9 | ● | ○ | – | 2.1 | 3.0 | 7 |
| | 320 | 4S | 4E | 20 | 0.9 | ● | ○ | – | 2.1 | 3.0 | 7 |
| | 322 | 4S | 4E | 22 | 0.9 | ● | ○ | – | 2.1 | 3.0 | 7 |
| | 324 | 4S | 4E | 24 | 0.9 | ● | ○ | – | 2.1 | 3.0 | 7 |
| 5S 5E | 302 | 5S | 5E | 2 | 6.0 | ● | – | – | 3.7 | 5.2 | 50 |
| | 303 | 5S | 5E | 1<br>2 | 6.0<br>4.0 | ● | – | – | 3.7<br>3.7 | 5.2<br>5.2 | 50<br>35 |
| | 304 | 5S | 5E | 4 | 4.0 | ● | – | – | 3.7 | 5.2 | 35 |
| | 305 | 5S | 5E | 2<br>3 | 4.0<br>3.0 | ● | – | – | 3.0<br>3.0 | 4.2<br>4.2 | 35<br>25 |
| | 306 | 5S | 5E | 6 | 3.0 | ● | – | – | 3.0 | 4.2 | 25 |
| | 308 | 5S | 5E | 8 | 3.0 | ● | – | – | 2.1 | 3.0 | 22 |
| | 310 | 5S | 5E | 10 | 2.0 | ● | – | – | 2.1 | 3.0 | 18 |

**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

# Multipole

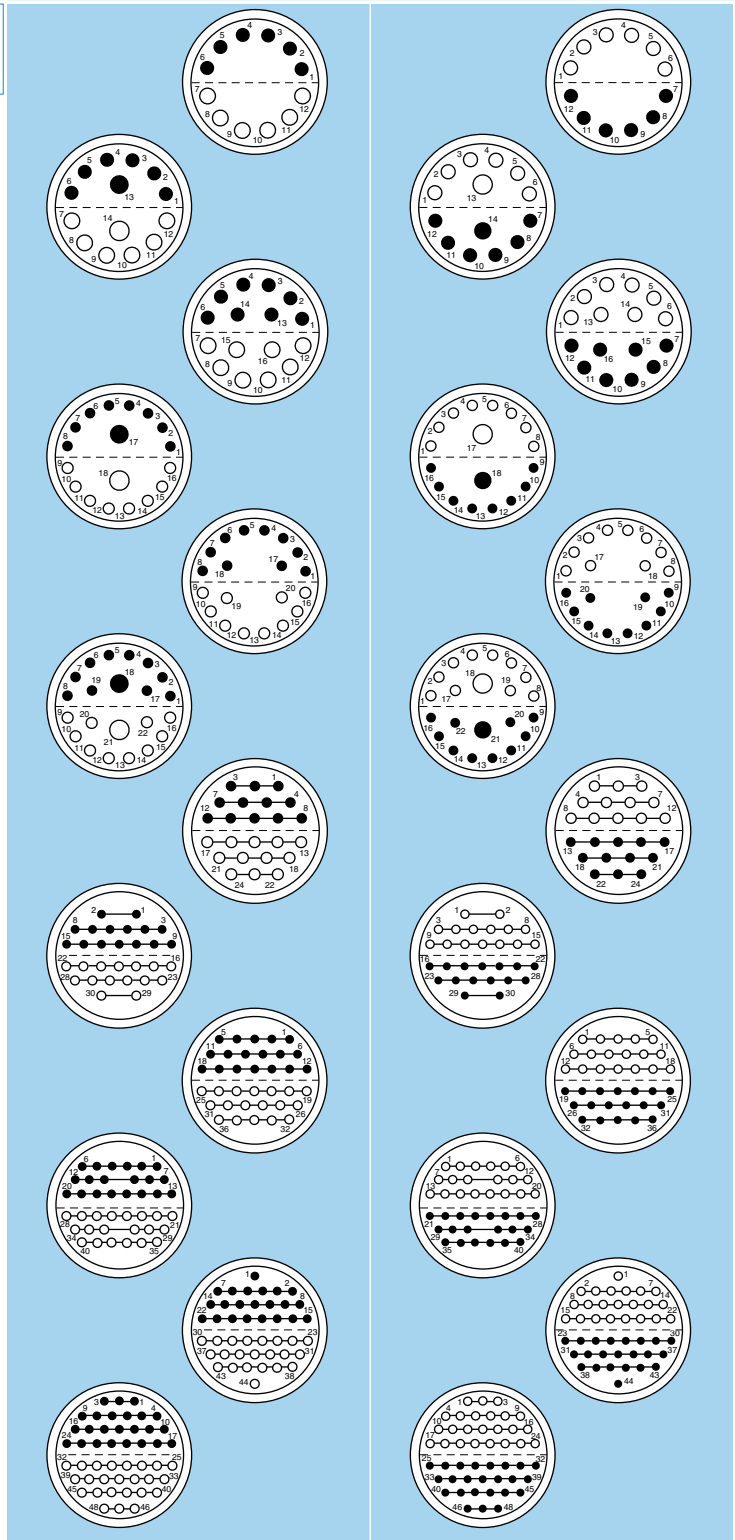



Male solder contacts




Female solder contacts

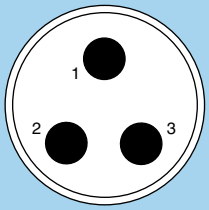
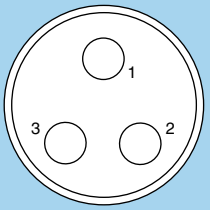
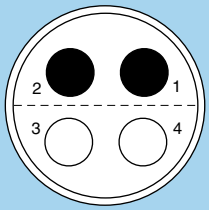
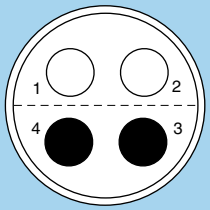
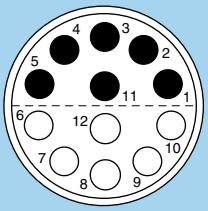
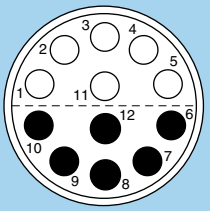
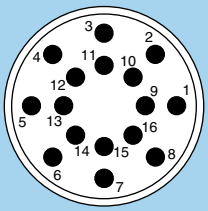
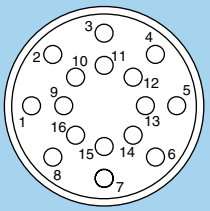
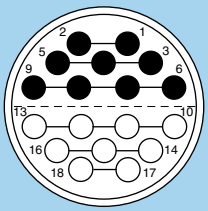
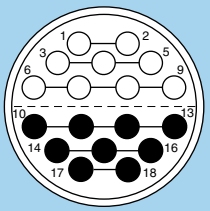
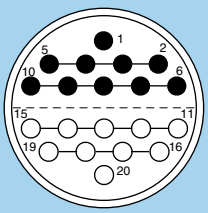
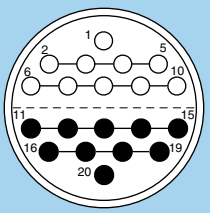
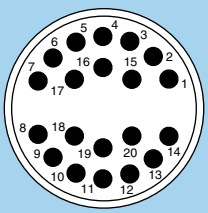
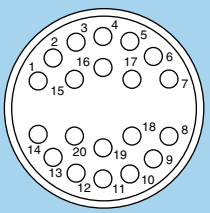
5S
5E



| Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Print (straight) | Contact type: Print (elbow) | Test voltage (kV rms) 1) 2) | Test voltage (kV dc) 1) 2) | Rated current (A) 1) |
|---|---|---|---|---|---|---|---|---|---|---|
| 312 | 5S | 5E | 12 | 2.0 | ● | – | – | 2.1 | 3.0 | 18 |
| 314 | 5S | 5E | 2<br>12 | 3.0<br>2.0 | ● | – | – | 1.8<br>1.8 | 2.4<br>2.4 | 20<br>15 |
| 316 | 5S | 5E | 16 | 2.0 | ● | – | – | 1.8 | 2.4 | 15 |
| 318 | 5S | 5E | 2<br>16 | 3.0<br>1.6 | ● | – | – | 1.8<br>1.8 | 2.4<br>2.4 | 18<br>11 |
| 320 | 5S | 5E | 20 | 1.6 | ● | – | – | 1.8 | 2.4 | 11 |
| 322 | 5S | 5E | 2<br>20 | 3.0<br>1.6 | ● | – | – | 1.8<br>1.8 | 2.4<br>2.4 | 16<br>9 |
| 324 | 5S | 5E | 24 | 1.6 | ● | – | – | 2.7 | 3.9 | 9 |
| 330 | 5S | 5E | 30 | 1.3 | ● | – | – | 1.8 | 2.4 | 8 |
| 336 | 5S | 5E | 36 | 1.3 | ● | – | – | 1.8 | 2.4 | 7 |
| 340 | 5S | 5E | 40 | 1.3 | ● | – | – | 1.2 | 1.8 | 7 |
| 344 | 5S | 5E | 44 | 1.3 | ● | – | – | 1.2 | 1.8 | 6 |
| 348 | 5S | 5E | 48 | 1.3 | ● | – | – | 1.2 | 1.8 | 6 |

**Note:** 1) see calculation method, caution and suggested standard on page 178.
2) lowest measured value; contact to contact or contact to shell.

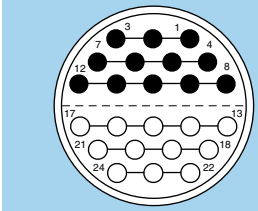
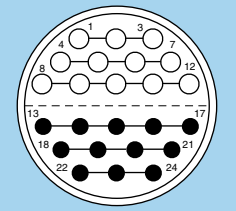
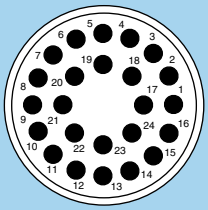
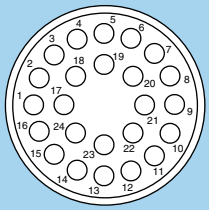
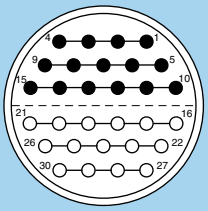
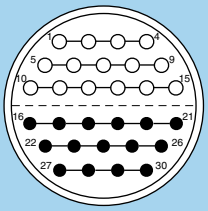
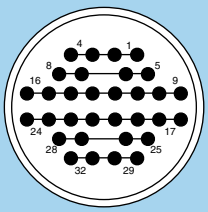
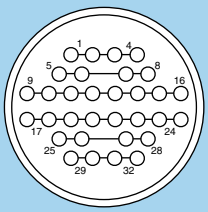
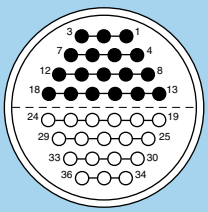
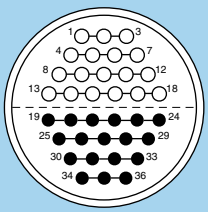
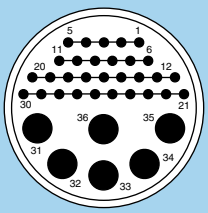
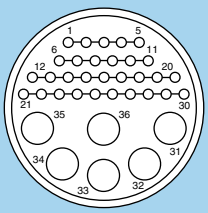
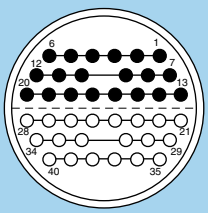
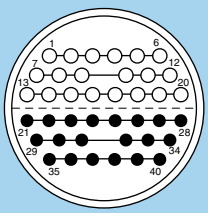
# Multipole

| Male solder contacts | Female solder contacts | Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Solder contacts | Test voltage (kV rms) [1) 2)] | Test voltage (kV dc) [1) 2)] | Rated current (A) [1)] |
|---|---|---|---|---|---|---|---|---|---|---|
| 6S 6E | | | | | | | | | | |
|  |  | 303 | – | 6E | 3 | 6.0 | ● | 3.0 | 4.2 | 50 |
|  |  | 304 | 6S | 6E | 4 | 8.0 | ● | 3.0 | 4.2 | 60 |
|  |  | 312 | 6S<br>– | –<br>6E | 12<br>12 | 4.0<br>5.0 | ● | 2.1 | 3.0 | 22 |
|  |  | 316 | – | 6E | 16 | 3.0 | ● | 1.5 | 2.1 | 14 |
|  |  | 318 | 6S | – | 18 | 4.0 | ● | 1.2 | 1.8 | 16 |
|  |  | 320 | 6S | – | 20 | 3.0 | ● | 1.5 | 2.1 | 14 |
|  |  | 320 | – | 6E | 20 | 3.0 | ● | 1.5 | 2.1 | 14 |

**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

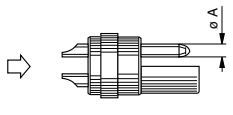
# Multipole

**6S**
**6E**

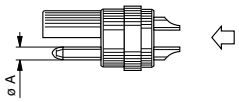
| Male solder contacts | Female solder contacts | Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Solder contacts | Test voltage (kV rms)[1) 2)] | Test voltage (kV dc)[1) 2)] | Rated current (A)[1)] |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | 324 | 6S | – | 24 | 3.0 | ● | 1.2 | 1.8 | 12 |
|  |  | 324 | – | 6E | 24 | 3.0 | ● | 1.2 | 1.8 | 12 |
|  |  | 330 | 6S | 6E | 30 | 2.0 | ● | 2.1 | 3.0 | 10 |
|  |  | 332 | – | 6E | 32 | 2.0 | ● | 1.5 | 2.1 | 10 |
|  |  | 336 | 6S | – | 36 | 2.0 | ● | 1.5 | 2.1 | 8 |
|  |  | 336 | – | 6E | 30<br>6 | 1.3<br>5.0 | ● | 1.5<br>1.5 | 2.1<br>2.1 | 4<br>22 |
|  |  | 340 | – | 6E | 40 | 2.0 | ● | 1.5 | 2.1 | 8 |

**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

# Multipole




Male solder contacts




Female solder contacts

6S
6E

| Reference | Series: Standard | Series: Watertight | Number of contacts | ø A (mm) | Solder contacts | Test voltage (kV rms) [1) 2)] | Test voltage (kV dc) [1) 2)] | Rated current (A) [1)] |
|---|---|---|---|---|---|---|---|---|
| 348 | 6S | 6E | 48 | 2.0 | ● | 1.5 | 2.1 | 7 |
| 360 | 6S | 6E | 60 | 1.6 | ● | 1.5 | 2.1 | 5 |
| 362 | – | 6E | 62 | 1.6 | ● | 1.5 | 2.1 | 5 |
| 364 | 6S | 6E | 64 | 1.3 | ● | 1.2 | 1.8 | 4 |
| 372 | 6S | 6E | 72 | 1.3 | ● | 1.2 | 1.8 | 4 |
| 106 | – | 6E | 106 | 0.9 | ● | 0.8 | 1.2 | 2 |
| 106 | 6S | – | 106 | 0.9 | ● | 0.8 | 1.2 | 2 |

**Note:** 1) see calculation method, caution and suggested standard on page 178.
2) lowest measured value; contact to contact or contact to shell.

## Housings (S, E and L series)

| Ref. | Outer shell and collet nut | | Latch sleeve + earthing crown | | Other metallic components | | Remarks | Note |
|---|---|---|---|---|---|---|---|---|
| | Material | Surf. treatment | Material | Surf. treatment | Material | Surf. treatment | | |
| C | Brass | chrome | brass/bronze | nickel 2) | brass | nickel | | ● |
| D | Brass | gold-plated | brass/bronze | nickel 2) | brass | nickel | | ○ |
| N | Brass | nickel | brass/bronze | nickel 2) | brass | nickel | | ○ |
| K | Brass | black chrome | brass/bronze | nickel 2) | brass | nickel | | ● |
| S | Stainless steel | – | brass/bronze | nickel 2) | brass | nickel | | ○ |
| T | Stainless steel | – | stainless steel | – | brass | nickel | | ○ |
| U | Stainless steel | – | stainless steel | – | stainless steel | – | | ○ |
| L | Aluminium alloy | anodized | brass/bronze | nickel 2) | brass | nickel | 1) | ○ |
| B | POM (black) | – | brass/bronze | nickel 2) | brass | nickel | Only for FFP, ERN and PCP (S series) | ● |
| G | PEEK (natural) | – | brass/bronze | nickel 2) | brass | nickel | Only for FFP, ERN and PCP (S series) | ● |
| P | PSU | – | brass/bronze | nickel 2) | brass | nickel | Only for FFL (S series) 1) | ● |
| R | PPSU | – | brass/bronze | nickel 2) | brass | nickel | Only for FFL (S series) 1) | ● |
| H | PPS/brass | –/nickel | brass/bronze | nickel 2) | brass | nickel | Only for EPL and EXP (S series) | ● |

**Note:** detailed characteristics of these materials and treatments are presented on page 171.
1) see «variant» for the colour.
2) in the E and L series, the latch sleeve is chrome-plated.

● First choice alternative
○ Special order alternative

## Insulators (S, E and L series)

| Ref. | Material | Contact type | Remarks | Note |
|---|---|---|---|---|
| L | PEEK | Solder or print | | ● |
| Y | PEEK | Crimp | | ● |
| T | PTFE | Solder | only for unipole types | ● |
| T | FEP | Solder | only for multipole types of the S or E series | ○ |
| V | PI | Solder | only for multipole types of the S or E series | ○ |
| N | PA6.6 | Solder | material for 5S/5E and 6S/6E series multipole inserts | ● |

**Note:** detailed characteristics of these materials are presented on page 175.

● First choice alternative
○ Special order alternative

## Contacts (S, E and L series)

### Soldering characteristics

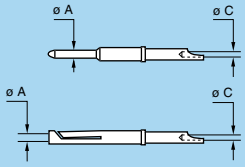
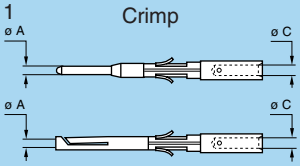
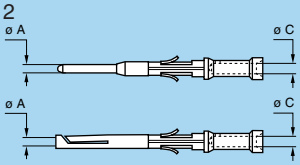
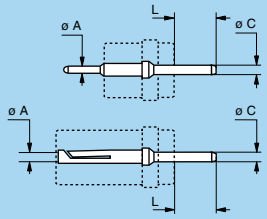
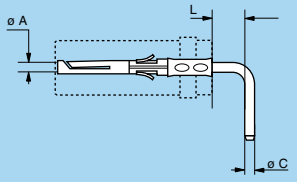
– no need to order specific tools, a simple soldering iron is sufficient
– ideal for very small and fragile conductors
– contacts with solder cups to allow the solder to flow

### Crimping characteristics

– practical, quick contact fixing outside the insulator
– possible use at high temperature
– need to order specific tools
– no risk of heating the insulator during the conductor-contact fixing
– high tensile strength
– totally lead-free solution

**Note:** see page 176 for more information.

## Contacts reference for plugs, free or fixed sockets

| Contact type | Reference | | Contact | | | Conductor | | | | | | $F_r$ [1] (N) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Solid | | Stranded | | | | | |
| | | | | | | | | AWG | | Section (mm²) | | | |
| | Male | Female | ø A (mm) | ø C (mm) | Form per fig. | AWG max. | Section max. (mm²) | min. | max. | min. | max. | | |
| Solder  | A | L | 0.7 | 0.60 | – | 24 | 0.25 | – | 26 | – | 0.14 | – | ● |
| | | | 0.9 | 0.80 | – | 22 | 0.34 | – | 22[2] | – | 0.34 | – | |
| | | | 1.3 | 1.00 | – | 20 | 0.50 | – | 20[2] | – | 0.50 | – | |
| | | | 1.6 | 1.40 | – | 16 | 1.00 | – | 18 | – | 1.00 | – | |
| | | | 2.0 | 1.80 | – | 14 | 1.50 | – | 16 | – | 1.50 | – | |
| | | | 3.0 | 2.70 | – | 10 | 4.00 | – | 12 | – | 4.00 | – | |
| | | | 4.0 | 3.70 | – | 10 | 6.00 | – | 10 | – | 6.00 | – | |
| | | | 5.0 | 5.20 | – | – | – | – | 8 | – | 10.00 | – | |
| | | | 6.0 | 5.20 | – | – | – | – | 8 | – | 10.00 | – | |
| | | | 8.0 | 7.00 | – | – | – | – | 4 | – | 21.00 | – | |
| | | | 12.0 | 11.50 | – | – | – | – | 0 | – | 50.00 | – | |
| fig. 1 Crimp  | C | M | 0.7 | 0.80 | 1 | – | – | 26 | 22[2] | 0.140 | 0.34 | 22 | ● |
| | B | P | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| | C | M | 0.9 | 1.10 | 1 | – | – | 24 | 20 | 0.250 | 0.50 | 30 | ● |
| | B | P | | 0.80 | 2 | – | – | 26 | 22[2] | 0.140 | 0.34 | | ○ |
| | G | U | | 0.45 | 2 | – | – | 32 | 28 | 0.035 | 0.09 | | ○ |
| fig. 2  | C | M | 1.3 | 1.40 | 1 | – | – | 20 | 18 | 0.500 | 1.00 | 40 | ● |
| | B | P | | 1.10 | 2 | – | – | 24 | 20 | 0.250 | 0.50 | | ○ |
| | G | U | | 0.80 | 2 | – | – | 26 | 22[2] | 0.140 | 0.34 | | ○ |
| | C | M | 1.6 | 1.90 | 1 | – | – | 18 | 14[2] | 1.000 | 1.50 | 50 | ● |
| | B | P | | 1.40 | 2 | – | – | 22 | 18 | 0.340 | 1.00 | | ○ |
| | C | M | 2.0 | 2.40 | 1 | – | – | 16 | 12[2] | 1.500 | 2.50 | 65 | ● |
| | B | P | | 1.90 | 2 | – | – | 18 | 14 | 1.000 | 1.50 | | ○ |
| Print  | D | N | L dimensions and C are detailed in the section on PCB drilling pattern. See page 159. | | | | | | | | | | ● |
| Print (elbow)  | V | V | L dimensions and C are detailed in the section on PCB drilling pattern. See page 160. | | | | | | | | | | ● |

**Note:** [1] contact retention force in the insulator (according to IEC 60512-8 test 15 a).
[2] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter. Make sure that the maximum conductor diameter is smaller than ø C.

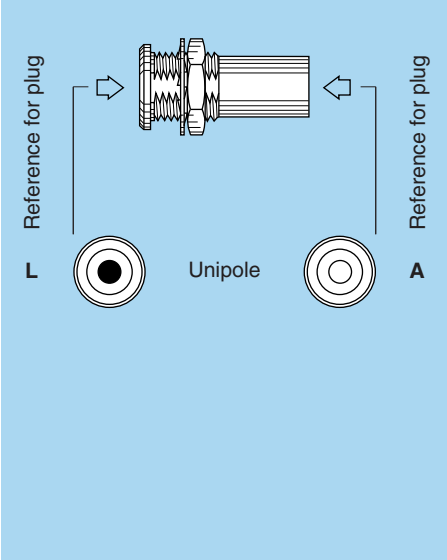
● First choice alternative
○ Special order alternative

## Contacts reference for coupler and plug with socket

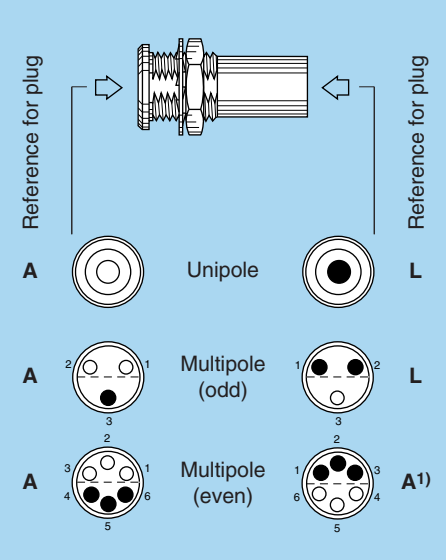
| Ref. | Contact type | Remarks |
|---|---|---|
| A | Male - Female | contact configuration is explained on page 101 |
| L | Female - Male | contact configuration is explained on page 101 |
| M | Female - Female | contact configuration is explained on page 101 |
| F | Female - Female - Male | for the FTA model of the S series |

## Contacts reference for fixed and free couplers RMA, RAD and SWH

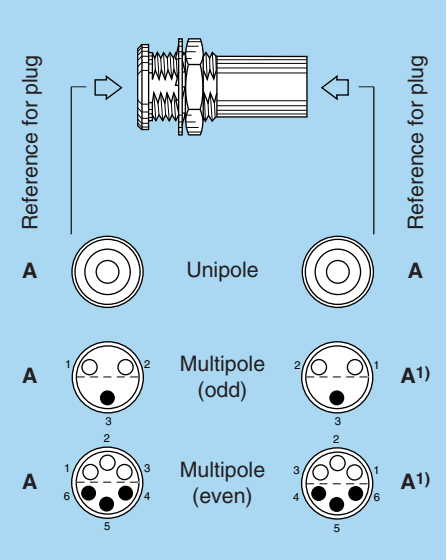
### A Male - Female




### L Female - Male




### M Female - Female




### Use of plugs for mating with RAD, RMA and SWH couplers

**Unipole type:**

Reference M for coupling two identical plugs fitted with male contact (contact reference A).
Reference L for coupling a plug fitted with male contacts (contact reference A) at the flange end for RAD and SWH and an inverted plug fitted with female contacts (contact reference L) at the other end.
Reference A for the inverted version of code L.

**Multipole type:**

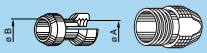
Reference L for coupling a standard plug (contact reference A) at the flange end for RAD and SWH and an inverted plug (contact reference as indicated in the above table) at the other end.
Reference M for coupling two standard plugs (contact type A).
Only available for RAD and RMA models.

**Note: 1) this connector combination does not allow for contact numbering. One of the plugs has to be cable mounted in a way to ensure correct signal continuity.**

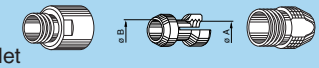
# Collets (S, E and L series)

## C, K and L type collets for S series

C type



K type
oversize
cable collet



L type
(non EMC)

### 00

| Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. | |
| C | 17 | 1.7 | 1.5 | 1.7 | 1.3 | |
| C | 22 | 2.2 | – | 2.2 | > 1.7 | |
| C | 27 | 2.7 | – | 2.7 | > 2.2 | |
| C | 31 | 3.1 | 2.7 | 3.1 | > 2.7 | |
| K | 37 | 3.7 | – | 3.7 | > 3.2 | |
| K | 42 | 4.2 | 3.7 | 4.4 | > 3.7 | |
| L | 27 | 2.7 | – | 2.6 | 2.2 | 2) |
| L | 31 | 3.1 | – | 3.0 | 2.6 | 2) |

### 0S

| Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. | |
| C | 22 | 2.2 | – | 2.2 | 1.3 | 3) |
| C | 32 | 3.2 | – | 3.2 | > 2.2 | |
| C | 37 | 3.7 | – | 3.7 | > 3.2 | |
| C | 44 | 4.4 | 3.7 | 4.4 | > 3.7 | |
| K | 52 | 5.2 | – | 5.2 | > 4.2 | |
| K | 62 | 6.2 | 5.2 | 6.2 | > 5.2 | |
| L | 22 | 2.2 | – | 2.2 | 1.3 | 2) |
| L | 32 | 3.2 | – | 3.2 | > 2.2 | 2) |
| L | 37 | 3.7 | – | 3.7 | > 3.2 | 2) |
| L | 44 | 4.4 | – | 4.3 | 3.5 | 1) 2) |
| L | 48 | 4.8 | – | 4.8 | 4.4 | 1) 2) |

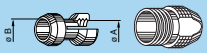
### 1S

| Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. | |
| C | 22 | 2.2 | – | 2.2 | > 1.2 | |
| C | 32 | 3.2 | – | 3.2 | > 2.2 | |
| C | 42 | 4.2 | – | 4.2 | > 3.2 | |
| C | 52 | 5.2 | – | 5.2 | > 4.2 | |
| C | 57 | 5.7 | 5.2 | 5.7 | > 4.9 | |
| C | 62 | 6.2 | 5.2 | 6.2 | > 5.4 | |
| K | 72 | 7.2 | – | 7.2 | > 6.2 | |
| K | 82 | 8.2 | 6.7 | 8.2 | > 7.2 | |
| K | 87 | 8.7 | 6.7 | 8.7 | > 8.2 | |
| L | 22 | 2.2 | – | 2.2 | 1.2 | 2) |
| L | 32 | 3.2 | – | 3.2 | > 2.2 | 2) |
| L | 42 | 4.2 | – | 4.2 | > 3.2 | 2) |
| L | 52 | 5.2 | – | 5.2 | > 4.2 | 2) |
| L | 62 | 6.2 | – | 6.2 | > 5.2 | 2) |
| L | 66 | 6.6 | – | 6.5 | 5.9 | 1) 2) |

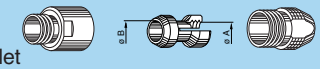
**Note:**
1) these collets cannot be used for connectors models with nut for fitting a bend relief.
2) these collets cannot be used for elbow connectors.
3) the inner diameter of the smallest bend relief available is 2.5 mm.
All dimensions are in millimetres.

## C, K and L type collets for S series

C type



K type
oversize
cable collet



L type
(non EMC)

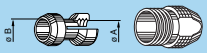
| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 2S | C | 27 | 2.7 | – | 2.7 | 1.3 | |
| | C | 32 | 3.2 | – | 3.2 | > 2.5 | |
| | C | 42 | 4.2 | – | 4.2 | > 3.2 | |
| | C | 52 | 5.2 | – | 5.2 | > 4.2 | |
| | C | 62 | 6.2 | – | 6.2 | > 5.2 | |
| | C | 72 | 7.2 | 6.7 | 7.2 | > 6.2 | |
| | C | 82 | 8.2 | 6.7 | 8.2 | > 7.2 | |
| | C | 87 | 8.7 | 6.7 | 8.7 | > 8.2 | |
| | K | 97 | 9.7 | 9.0 | 9.7 | > 8.7 | |
| | K | 11 | 10.5 | 9.0 | 10.5 | > 9.5 | |
| | L | 32 | 3.2 | – | 3.2 | 2.5 | 2) |
| | L | 42 | 4.2 | – | 4.2 | > 3.2 | 2) |
| | L | 52 | 5.2 | – | 5.2 | > 4.2 | 2) |
| | L | 62 | 6.2 | – | 6.2 | > 5.2 | 2) |
| | L | 72 | 7.2 | – | 7.2 | > 6.2 | 2) |
| | L | 82 | 8.2 | – | 8.2 | > 7.2 | 2) |
| | L | 87 | 8.7 | – | 8.7 | > 8.2 | 1) 2) |
| 3S | C | 42 | 4.2 | 7.7 | 4.2 | 2.6 | |
| | C | 57 | 5.7 | 7.7 | 5.7 | 4.3 | |
| | C | 72 | 7.2 | 7.7 | 7.2 | 5.8 | |
| | C | 87 | 8.7 | 8.7 | 8.7 | 7.3 | |
| | C | 97 | 9.7 | 9.0 | 9.7 | 8.8 | |
| | C | 11 | 10.5 | 9.0 | 10.5 | 9.8 | |
| | K | 12 | 12.2 | – | 12.0 | 11.1 | |
| | K | 13 | 13.2 | 12.2 | 13.0 | 12.1 | |
| | L | 42 | 4.2 | – | 4.2 | 2.6 | 2) |
| | L | 57 | 5.7 | – | 5.7 | > 4.2 | 2) |
| | L | 72 | 7.2 | – | 7.2 | > 5.7 | 2) |
| | L | 87 | 8.7 | – | 8.7 | > 7.2 | 2) |
| | L | 97 | 9.7 | – | 9.7 | > 8.7 | 2) |
| | L | 11 | 10.7 | – | 10.7 | > 9.7 | 1) 2) |

| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 4S | C | 52 | 5.2 | – | 5.0 | 4.1 | |
| | C | 62 | 6.2 | – | 6.0 | 5.1 | |
| | C | 72 | 7.2 | – | 7.0 | 6.1 | |
| | C | 82 | 8.2 | – | 8.0 | 7.1 | |
| | C | 92 | 9.2 | – | 9.0 | 8.1 | |
| | C | 10 | 10.2 | – | 10.0 | 9.1 | |
| | C | 11 | 11.2 | – | 11.0 | 10.1 | |
| | C | 12 | 12.2 | – | 12.0 | 11.1 | |
| | C | 13 | 13.2 | 12.2 | 13.0 | 12.6 | |
| | K | 14 | 14.2 | – | 14.0 | 13.1 | 1) |
| | K | 15 | 15.2 | – | 15.0 | 14.1 | 1) |
| | K | 16 | 16.2 | – | 16.0 | 15.1 | 1) |
| | K | 17 | 17.2 | – | 17.0 | 16.1 | 1) |
| | K | 18 | 18.2 | – | 18.0 | 17.1 | 1) |
| | K | 19 | 19.2 | – | 19.0 | 18.1 | 1) |
| | K | 20 | 20.2 | 19.7 | 20.0 | 19.1 | 1) |
| | K | 21 | 21.2 | 19.7 | 21.0 | 20.1 | 1) |
| | K | 22 | 22.2 | 19.7 | 22.0 | 21.1 | 1) |
| | L | 52 | 5.2 | – | 5.0 | 4.1 | 2) |
| | L | 62 | 6.2 | – | 6.0 | 5.1 | 2) |
| | L | 72 | 7.2 | – | 7.0 | 6.1 | 2) |
| | L | 82 | 8.2 | – | 8.0 | 7.1 | 2) |
| | L | 92 | 9.2 | – | 9.0 | 8.1 | 2) |
| | L | 10 | 10.2 | – | 10.0 | 9.1 | 2) |
| | L | 11 | 11.2 | – | 11.0 | 10.1 | 2) |
| | L | 12 | 12.2 | – | 12.0 | 11.1 | 2) |
| | L | 13 | 13.2 | – | 13.0 | 12.6 | 2) |

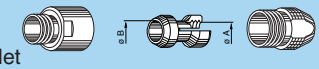
**Note:**
1) these collets cannot be used for connectors models with nut for fitting a bend relief.
2) these collets cannot be used for elbow connectors.
All dimensions are in millimetres.

## C, K and L type collets for S series

C type



K type
oversize cable collet



L type
(non EMC)

**5S**

| Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. | |
| C | 72 | 7.2 | – | 7.0 | 6.1 | 1) |
| C | 82 | 8.2 | – | 8.0 | 7.1 | 1) |
| C | 92 | 9.2 | – | 9.0 | 8.1 | 1) |
| C | 10 | 10.2 | – | 10.0 | 9.1 | 1) |
| C | 11 | 11.2 | – | 11.0 | 10.1 | 1) |
| C | 12 | 12.2 | – | 12.0 | 11.1 | 1) |
| C | 13 | 13.2 | – | 13.0 | 12.1 | 1) |
| C | 14 | 14.2 | – | 14.0 | 13.1 | 1) |
| C | 15 | 15.2 | – | 15.0 | 14.1 | 1) |
| C | 16 | 16.2 | – | 16.0 | 15.1 | 1) |
| C | 17 | 17.2 | – | 17.0 | 16.1 | 1) |
| C | 18 | 18.2 | – | 18.0 | 17.1 | 1) |
| C | 19 | 19.2 | – | 19.0 | 18.1 | 1) |
| C | 20 | 20.2 | 19.7 | 20.0 | 19.1 | 1) |
| C | 21 | 21.2 | 19.7 | 21.0 | 20.1 | 1) |
| C | 22 | 22.2 | 19.7 | 22.0 | 21.1 | 1) |
| K | 23 | 23.2 | – | 23.0 | 22.1 | 1) |
| K | 24 | 24.2 | – | 24.0 | 23.1 | 1) |
| K | 25 | 25.2 | – | 25.0 | 24.1 | 1) |
| K | 26 | 26.2 | – | 26.0 | 25.1 | 1) |
| K | 27 | 27.2 | – | 27.0 | 26.1 | 1) |
| K | 28 | 28.2 | 27.2 | 28.0 | 27.1 | 1) |
| K | 29 | 29.2 | 27.2 | 29.0 | 28.1 | 1) |
| K | 30 | 30.2 | 27.2 | 30.0 | 29.1 | 1) |
| L | 92 | 9.2 | – | 9.0 | 8.1 | 1) 2) |
| L | 10 | 10.2 | – | 10.0 | 9.1 | 1) 2) |
| L | 11 | 11.2 | – | 11.0 | 10.1 | 1) 2) |
| L | 12 | 12.2 | – | 12.0 | 11.1 | 1) 2) |
| L | 13 | 13.2 | – | 13.0 | 12.1 | 1) 2) |
| L | 14 | 14.2 | – | 14.0 | 13.1 | 1) 2) |
| L | 15 | 15.2 | – | 15.0 | 14.1 | 1) 2) |
| L | 16 | 16.2 | – | 16.0 | 15.1 | 1) 2) |
| L | 17 | 17.2 | – | 17.0 | 16.1 | 1) 2) |
| L | 18 | 18.2 | – | 18.0 | 17.1 | 1) 2) |
| L | 19 | 19.2 | – | 19.0 | 18.1 | 1) 2) |
| L | 20 | 20.2 | – | 20.0 | 19.1 | 1) 2) |
| L | 21 | 21.2 | – | 21.0 | 20.1 | 1) 2) |

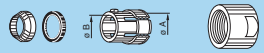
**6S**

| Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. | |
| C | 12 | 12.2 | – | 12.0 | 11.1 | 1) |
| C | 13 | 13.2 | – | 13.0 | 12.1 | 1) |
| C | 14 | 14.2 | – | 14.0 | 13.1 | 1) |
| C | 15 | 15.2 | – | 15.0 | 14.1 | 1) |
| C | 16 | 16.2 | – | 16.0 | 15.1 | 1) |
| C | 17 | 17.2 | – | 17.0 | 16.1 | 1) |
| C | 18 | 18.2 | – | 18.0 | 17.1 | 1) |
| C | 19 | 19.2 | – | 19.0 | 18.1 | 1) |
| C | 20 | 20.2 | – | 20.0 | 19.1 | 1) |
| C | 21 | 21.2 | – | 21.0 | 20.1 | 1) |
| C | 22 | 22.2 | – | 22.0 | 21.1 | 1) |
| C | 23 | 23.2 | – | 23.0 | 22.1 | 1) |
| C | 24 | 24.2 | – | 24.0 | 23.1 | 1) |
| C | 25 | 25.2 | – | 25.0 | 24.1 | 1) |
| C | 26 | 26.2 | – | 26.0 | 25.1 | 1) |
| C | 27 | 27.2 | – | 27.0 | 26.1 | 1) |
| C | 28 | 28.2 | 27.2 | 28.0 | 27.1 | 1) |
| C | 29 | 29.2 | 27.2 | 29.0 | 28.1 | 1) |
| C | 30 | 30.2 | 27.2 | 30.0 | 29.1 | 1) |
| L | 12 | 12.2 | – | 12.0 | 11.1 | 1) 2) |
| L | 13 | 13.2 | – | 13.0 | 12.1 | 1) 2) |
| L | 14 | 14.2 | – | 14.0 | 13.1 | 1) 2) |
| L | 15 | 15.2 | – | 15.0 | 14.1 | 1) 2) |
| L | 16 | 16.2 | – | 16.0 | 15.1 | 1) 2) |
| L | 17 | 17.2 | – | 17.0 | 16.1 | 1) 2) |
| L | 18 | 18.2 | – | 18.0 | 17.1 | 1) 2) |
| L | 19 | 19.2 | – | 19.0 | 18.1 | 1) 2) |
| L | 20 | 20.2 | – | 20.0 | 19.1 | 1) 2) |
| L | 21 | 21.2 | – | 21.0 | 20.1 | 1) 2) |
| L | 22 | 22.2 | – | 22.0 | 21.1 | 1) 2) |
| L | 23 | 23.2 | – | 23.0 | 22.1 | 1) 2) |
| L | 24 | 24.2 | – | 24.0 | 23.1 | 1) 2) |
| L | 25 | 25.2 | – | 25.0 | 24.1 | 1) 2) |
| L | 26 | 26.2 | – | 26.0 | 25.1 | 1) 2) |
| L | 27 | 27.2 | – | 27.0 | 26.1 | 1) 2) |
| L | 28 | 28.2 | – | 28.0 | 27.1 | 1) 2) |
| L | 29 | 29.2 | – | 29.0 | 28.1 | 1) 2) |
| L | 30 | 30.2 | – | 30.0 | 29.1 | 1) 2) |

**Note:** The 5S.112 is only available with L type of collet.
1) these collets cannot be used for connectors models with nut for fitting a bend relief.
2) these collets cannot be used for elbow connectors.
All dimensions are in millimetres.

## C and K type collets for E series

C type



K type
oversize
cable collet

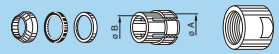
| | Reference | | Collet ø | | Cable ø | | Notes |
|---|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. | |
| 0E | C | 10 | 1.6 | – | 1.2 | 1.0 | 1) |
| | C | 15 | 1.6 | – | 1.5 | 1.3 | 1) |
| | C | 20 | 2.1 | – | 2.0 | 1.6 | 1) |
| | C | 25 | 3.1 | – | 2.5 | 2.1 | |
| | C | 30 | 3.1 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | 4.2 | 3.5 | 3.1 | |
| | C | 40 | 4.2 | 4.2 | 4.0 | 3.6 | |
| | C | 45 | 5.2 | 5.2 | 4.5 | 4.1 | |
| | C | 50 | 5.2 | 5.2 | 5.0 | 4.6 | |
| 1E | C | 15 | 1.6 | – | 1.5 | 1.3 | |
| | C | 20 | 2.2 | – | 2.0 | 1.6 | |
| | C | 25 | 3.2 | – | 2.5 | 2.1 | |
| | C | 30 | 3.2 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | – | 3.5 | 3.1 | |
| | C | 40 | 4.2 | – | 4.0 | 3.6 | |
| | C | 45 | 5.2 | – | 4.5 | 4.1 | |
| | C | 50 | 5.2 | – | 5.0 | 4.6 | |
| | C | 55 | 6.2 | 6.2 | 5.5 | 5.1 | |
| | C | 60 | 6.2 | 6.2 | 6.0 | 5.6 | |
| | C | 65 | 7.2 | 6.7 | 6.5 | 6.1 | |
| | K | 70 | 7.2 | – | 7.0 | 6.6 | |
| | K | 75 | 8.2 | 8.2 | 7.5 | 7.1 | |
| | K | 80 | 8.2 | 8.2 | 8.0 | 7.6 | |
| | K | 85 | 9.2 | 8.6 | 8.5 | 8.1 | |
| 2E | C | 15 | 2.2 | – | 1.5 | 1.3 | |
| | C | 20 | 2.2 | – | 2.0 | 1.6 | |
| | C | 25 | 3.2 | – | 2.5 | 2.1 | |
| | C | 30 | 3.2 | – | 3.0 | 2.6 | |
| | C | 35 | 4.2 | – | 3.5 | 3.1 | |
| | C | 40 | 4.2 | – | 4.0 | 3.6 | |
| | C | 45 | 5.2 | – | 4.5 | 4.1 | |
| | C | 50 | 5.2 | – | 5.0 | 4.6 | |
| | C | 55 | 6.2 | – | 5.5 | 5.1 | |
| | C | 60 | 6.2 | – | 6.0 | 5.6 | |
| | C | 65 | 7.2 | – | 6.5 | 6.1 | |
| | C | 70 | 7.2 | – | 7.0 | 6.6 | |
| | C | 75 | 8.2 | 8.2 | 7.5 | 7.1 | |
| | C | 80 | 8.2 | 8.2 | 8.0 | 7.6 | |
| | C | 85 | 9.2 | 8.6 | 8.5 | 8.1 | |
| | K | 90 | 9.2 | – | 9.0 | 8.6 | |
| | K | 95 | 10.2 | 10.2 | 9.5 | 9.1 | |
| | K | 10 | 10.2 | 10.2 | 10.0 | 9.6 | |
| | K | 11 | 11.2 | 10.6 | 10.5 | 10.1 | |

| | Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. |
| 3E | C | 30 | 3.2 | – | 3.0 | 2.6 |
| | C | 35 | 4.2 | – | 3.5 | 3.1 |
| | C | 40 | 4.2 | – | 4.0 | 3.6 |
| | C | 45 | 5.2 | – | 4.5 | 4.1 |
| | C | 50 | 5.2 | – | 5.0 | 4.6 |
| | C | 55 | 6.2 | – | 5.5 | 5.1 |
| | C | 60 | 6.2 | – | 6.0 | 5.6 |
| | C | 65 | 7.2 | – | 6.5 | 6.1 |
| | C | 70 | 7.2 | – | 7.0 | 6.6 |
| | C | 75 | 8.2 | – | 7.5 | 7.1 |
| | C | 80 | 8.2 | – | 8.0 | 7.6 |
| | C | 85 | 9.2 | – | 8.5 | 8.1 |
| | C | 90 | 9.2 | – | 9.0 | 8.6 |
| | C | 95 | 10.2 | 10.2 | 9.5 | 9.1 |
| | C | 10 | 10.2 | 10.2 | 10.0 | 9.6 |
| | C | 11 | 11.2 | 10.6 | 10.5 | 10.1 |
| | K | 11 | 12.3 | – | 12.0 | 10.6 |
| | K | 12 | 13.8 | 13.8 | 12.8 | 12.1 |
| | K | 13 | 13.8 | 13.8 | 13.5 | 12.9 |
| | K | 14 | 15.3 | 15.3 | 14.0 | 13.6 |
| | K | 15 | 15.3 | 15.3 | 15.0 | 14.1 |
| 4E | C | 50 | 6.3 | – | 5.0 | 4.8 |
| | C | 55 | 6.3 | – | 5.5 | 5.1 |
| | C | 60 | 6.3 | – | 6.0 | 5.6 |
| | C | 65 | 7.3 | – | 6.5 | 6.1 |
| | C | 70 | 7.3 | – | 7.0 | 6.6 |
| | C | 75 | 8.3 | – | 7.5 | 7.1 |
| | C | 80 | 8.3 | – | 8.0 | 7.6 |
| | C | 85 | 9.3 | – | 8.5 | 8.1 |
| | C | 90 | 9.3 | – | 9.0 | 8.6 |
| | C | 95 | 10.8 | – | 9.5 | 9.1 |
| | C | 10 | 10.8 | – | 10.5 | 9.6 |
| | C | 11 | 12.3 | – | 12.0 | 10.6 |
| | C | 12 | 13.8 | 13.8 | 12.8 | 12.1 |
| | C | 13 | 13.8 | 13.8 | 13.5 | 12.9 |
| | C | 14 | 15.3 | 15.3 | 14.0 | 13.6 |
| | C | 15 | 15.3 | 15.3 | 15.0 | 14.1 |
| | K | 16 | 17.8 | – | 16.5 | 15.6 |
| | K | 17 | 17.8 | – | 17.5 | 16.6 |
| | K | 18 | 19.8 | – | 18.5 | 17.6 |
| | K | 19 | 19.8 | – | 19.5 | 18.6 |
| | K | 20 | 21.8 | – | 20.5 | 19.6 |
| | K | 21 | 21.8 | – | 21.5 | 20.6 |
| | K | 22 | 23.8 | 23.8 | 22.5 | 21.6 |
| | K | 23 | 23.8 | 23.8 | 23.5 | 22.6 |

**Note:**
1) the inner diameter of the smallest bend relief available is 2.5 mm.
All dimensions are in millimetres.

## C and K type collets for E series

C type



K type
oversize
cable collet

**5E**

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 10 | 11.8 | – | 10.5 | 9.6 |
| C | 11 | 11.8 | – | 11.5 | 10.6 |
| C | 12 | 13.8 | – | 12.5 | 11.6 |
| C | 13 | 13.8 | – | 13.5 | 12.6 |
| C | 14 | 15.8 | – | 14.5 | 13.6 |
| C | 15 | 15.8 | – | 15.5 | 14.6 |
| C | 16 | 17.8 | – | 16.5 | 15.6 |
| C | 17 | 17.8 | – | 17.5 | 16.6 |
| C | 18 | 19.8 | – | 18.5 | 17.6 |
| C | 19 | 19.8 | – | 19.5 | 18.6 |
| C | 20 | 21.8 | – | 20.5 | 19.6 |
| C | 21 | 21.8 | – | 21.5 | 20.6 |
| C | 22 | 23.8 | 23.8 | 22.5 | 21.6 |
| C | 23 | 23.8 | 23.8 | 23.5 | 22.6 |

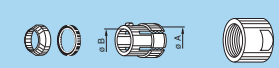
**6E**

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 14 | 14.2 | – | 14.0 | 13.0 |
| C | 15 | 15.2 | – | 15.0 | 14.1 |
| C | 16 | 15.7 | – | 15.5 | 14.6 |
| C | 17 | 16.7 | – | 16.5 | 15.6 |
| C | 18 | 18.2 | – | 18.0 | 17.1 |
| C | 21 | 23.2 | – | 21.5 | 20.6 |
| C | 22 | 23.2 | – | 22.0 | 21.1 |
| C | 23 | 23.2 | – | 23.0 | 22.1 |
| C | 27 | 27.2 | – | 27.0 | 26.1 |
| L | 30 | 30.2 | – | 30.0 | 29.5 |

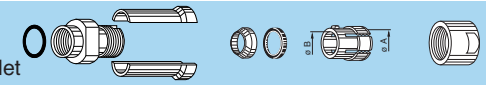
**Note:** all dimensions are in millimetres.

## C and K type collets for L series

C type



K type
oversize
cable collet



**0L**

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 10 | 1.6 | – | 1.2 | 1.0 |
| C | 15 | 1.6 | – | 1.5 | 1.3 |
| C | 20 | 2.1 | – | 2.0 | 1.6 |
| C | 25 | 3.1 | – | 2.5 | 2.1 |
| C | 30 | 3.1 | – | 3.0 | 2.6 |
| C | 35 | 4.2 | 4.2 | 3.5 | 3.1 |
| C | 40 | 4.2 | 4.2 | 4.0 | 3.6 |
| C | 45 | 5.2 | 5.2 | 4.5 | 4.1 |
| C | 50 | 5.2 | 5.2 | 5.0 | 4.6 |

**1L**

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 15 | 1.6 | – | 1.5 | 1.3 |
| C | 20 | 2.2 | – | 2.0 | 1.6 |
| C | 25 | 3.2 | – | 2.5 | 2.1 |
| C | 30 | 3.2 | – | 3.0 | 2.6 |
| C | 35 | 4.2 | – | 3.5 | 3.1 |
| C | 40 | 4.2 | – | 4.0 | 3.6 |
| C | 45 | 5.2 | – | 4.5 | 4.1 |
| C | 50 | 5.2 | – | 5.0 | 4.6 |
| C | 55 | 6.2 | 6.2 | 5.5 | 5.1 |
| C | 60 | 6.2 | 6.2 | 6.0 | 5.6 |
| C | 65 | 7.2 | 6.7 | 6.5 | 6.1 |
| K | 70 | 7.2 | – | 7.0 | 6.6 |
| K | 75 | 8.2 | 8.2 | 7.5 | 7.1 |
| K | 80 | 8.2 | 8.2 | 8.0 | 7.6 |
| K | 85 | 9.2 | 8.6 | 8.5 | 8.1 |

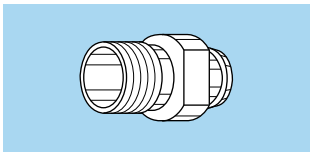
**2L**

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 15 | 2.2 | – | 1.5 | 1.3 |
| C | 20 | 2.2 | – | 2.0 | 1.6 |
| C | 25 | 3.2 | – | 2.5 | 2.1 |
| C | 30 | 3.2 | – | 3.0 | 2.6 |
| C | 35 | 4.2 | – | 3.5 | 3.1 |
| C | 40 | 4.2 | – | 4.0 | 3.6 |
| C | 45 | 5.2 | – | 4.5 | 4.1 |
| C | 50 | 5.2 | – | 5.0 | 4.6 |
| C | 55 | 6.2 | – | 5.5 | 5.1 |
| C | 60 | 6.2 | – | 6.0 | 5.6 |
| C | 65 | 7.2 | – | 6.5 | 6.1 |
| C | 70 | 7.2 | – | 7.0 | 6.6 |
| C | 75 | 8.2 | 8.2 | 7.5 | 7.1 |
| C | 80 | 8.2 | 8.2 | 8.0 | 7.6 |
| C | 85 | 9.2 | 8.6 | 8.5 | 8.1 |
| K | 90 | 9.2 | – | 9.0 | 8.6 |
| K | 95 | 10.2 | 10.2 | 9.5 | 9.1 |
| K | 10 | 10.2 | 10.2 | 10.0 | 9.6 |
| K | 11 | 11.2 | 10.6 | 10.5 | 10.1 |

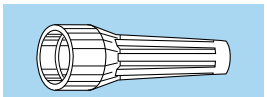
**Note:** all dimensions are in millimetres.

# Variant (S, E and L series)

## Bend relief for S series models with collet

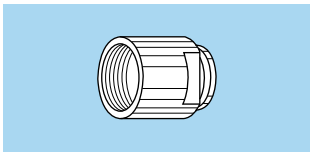


Need to be ordered

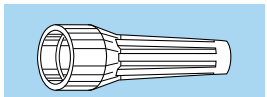


| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 00 | Z | C | 17 to 31 | GMA.00.0●●.D● |
| | | K | 37 to 42 | GMA.0B.0●●.D● |
| | | L | 27 to 31 | GMA.00.0●●.D● |
| 0S | Z | C | 32 to 44 | GMA.0B.0●●.D● |
| | | K | 52 to 62 | GMA.1B.0●●.D● |
| | | L | 32 to 48 | GMA.0B.0●●.D● |
| 1S | Z | C | 32 to 62 | GMA.1B.0●●.D● |
| | | K | 72 to 87 | GMA.2B.0●●.D● |
| | | L | 32 to 66 | GMA.1B.0●●.D● |
| 2S | Z | C | 42 to 87 | GMA.2B.0●●.D● |
| | | K | 97 to 11 | GMA.3B.0●●.D● |
| | | L | 42 to 87 | GMA.2B.0●●.D● |
| 3S | Z | C | 57 to 97 | GMA.3B.0●●.D● |
| | | K | 12 to 13 | GMA.4B.0●●.D● |
| | | L | 57 to 97 | GMA.3B.0●●.D● |
| 4S | Z | C | 82 to 13 | GMA.4B.0●●.D● |
| | | L | 82 to 13 | GMA.4B.0●●.D● |

## Bend relief for E and L series models with collet



Need to be ordered



| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 0E 0L | Z | C | 10 to 50 | GMA.0B.●●●.●● |
| 1E 1L | Z | C | 15 to 65 | GMA.1B.●●●.●● |
| | | K | 70 to 85 | GMA.2B.●●●.●● |
| 2E 2L | Z | C | 15 to 85 | GMA.2B.●●●.●● |
| | | K | 90 to 10 | GMA.3B.●●●.●● |
| 3E | Z | C | 30 to 10 | GMA.3B.●●●.●● |
| | | K | 11 to 15 | GMA.4B.●●●.●● |
| 4E | Z | C | 50 to 15 | GMA.4B.●●●.●● |

**Note:** All dimensions are in millimetres.

## Colour of connectors shell made of plastic material and aluminium alloys

| Reference | Colour | Plastic shell | | | Aluminium alloys | |
|---|---|---|---|---|---|---|
| | | PSU | PPSU | PA.6 | Anodized colour | Anodized colour for bend relief collet nut |
| A | blue | | | ● | ● | |
| B | white | ● | | ● | | |
| G | grey | ● | | ● | | |
| J | yellow | | | ● | ● | |
| M | brown | | | ● | | |
| N | black | | | ● | ● | |
| R | red | | | ● | ● | |
| S | orange | | | ● | | |
| T | natural | | | | ● | |
| V | green | | | ● | ● | |
| L | black | | | | | ● |
| X | natural | | | | | ● |
| F | cream | | ● | | | |

**Note:** other anodizing colours are available for connectors with collet nut for bend relief. Please consult us.

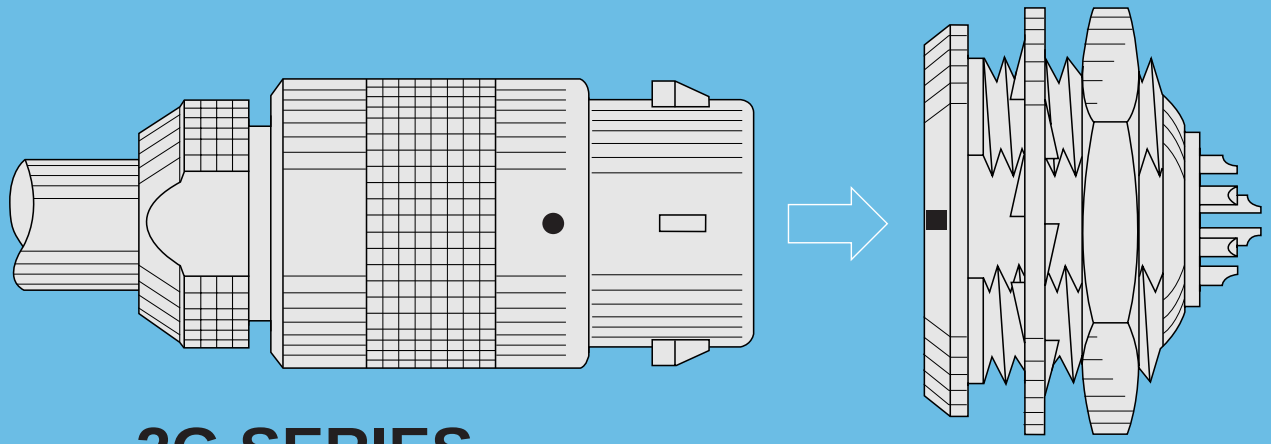
## Watertight and vacumtight socket and coupler models (S, E and L series)

| | Model | Reference | |
|---|---|---|---|
| | | Watertight | Vacuumtight |
| S | EWB, HCP, HGP, HGW, SWH | P | PV |
| E | EBR, HGP, SWH | P | PV |
| L | HGG | P | PV |

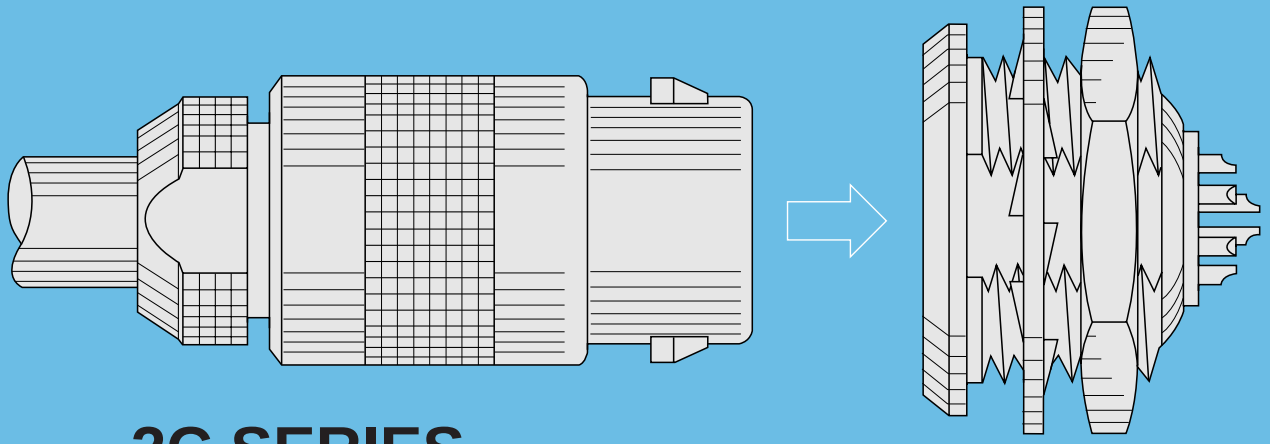
## O-ring and gasket material (E and L series)

Standard connectors are delivered with silicone o-ring and gaskets. The vacuumtight models, identified with the letter «PV», are delivered with Viton® gaskets. Other gaskets material can be delivered upon special request.

| O-ring material | Reference |
|---|---|
| FPM (Viton®) | H |
| EPDM | E |
| FPM (Viton®) and collet nut for bend relief | D |



2G SERIES

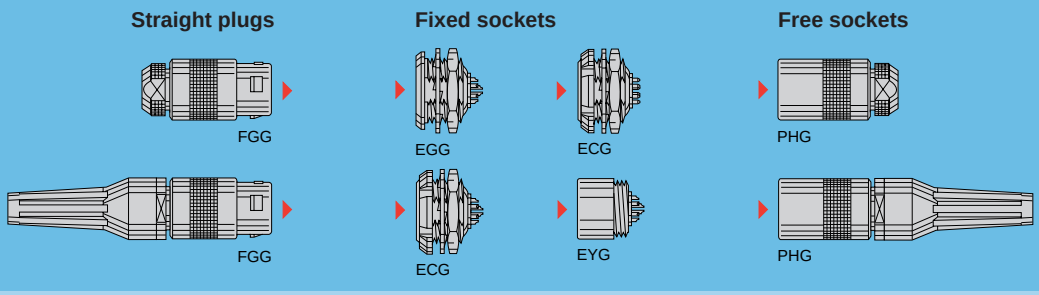


2C SERIES

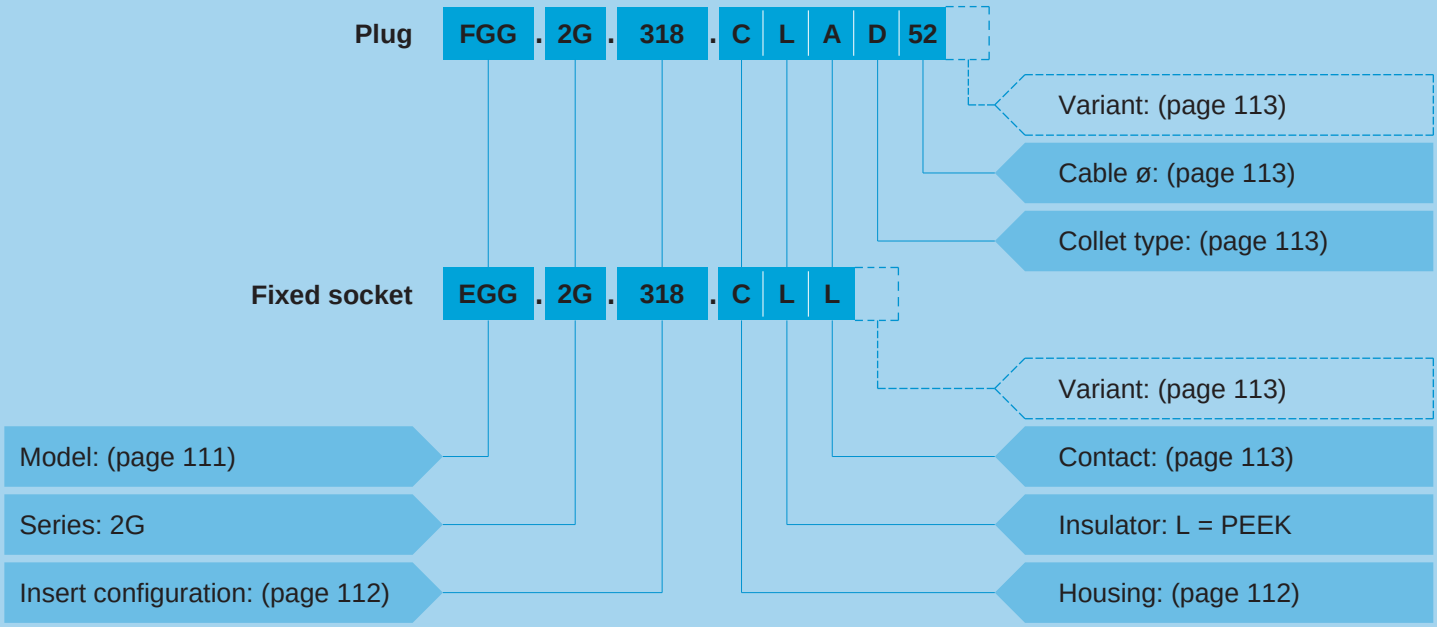
# 2G Series

The 2G series with key (G) provides the same advantages of space saving due to its small dimensions as the 2C series and is available in multipole type with 18 contacts.

**Metal housing models** (page 111)




## Part Numbering System




## Part Number Example

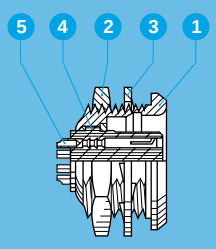
**Straight plug with cable collet:**
**FGG.2G.318.CLAD52** = straight plug with cable collet, 2G series, multipole type with 18 contacts, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, D type collet for 5.2 mm diameter cable.

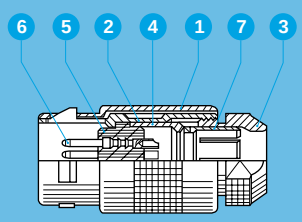
**Fixed socket:**
**EGG.2G.318.CLL** = fixed socket, 2G series, multipole type with 18 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. hexagonal nut
3. locking washer
4. insulator
5. female contact




**Straight plug**

1. outer shell
2. latch sleeve
3. collet nut
4. split centre-piece
5. insulator
6. male contact
7. collet

# Metal housing models

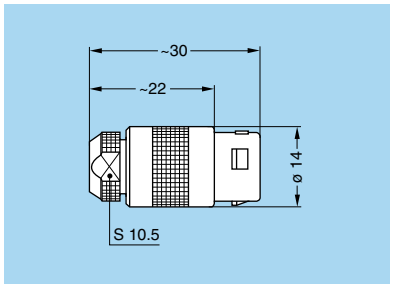
## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 500 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range | - 55° C + 250° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index | IP50 | IEC 60529 |
| Climatical category | 55/175/21 | IEC 60068-1 |

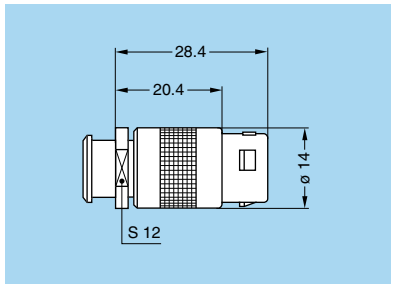
**Note:**
The various tests have been carried out with FGG and EGG connector pairs, with chrome-plated brass shell and PEEK insulator.
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

### FGG.2G Straight plug, key (G), cable collet




Cable assembly (page 115)

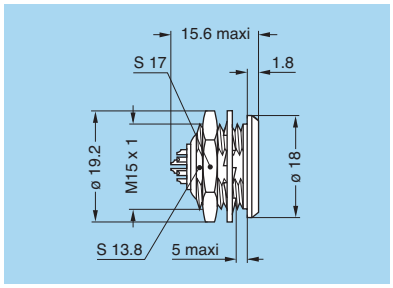
### FGG.2G Straight plug, key (G), cable collet and nut for fitting a bend relief [1)]




Cable assembly (page 115)

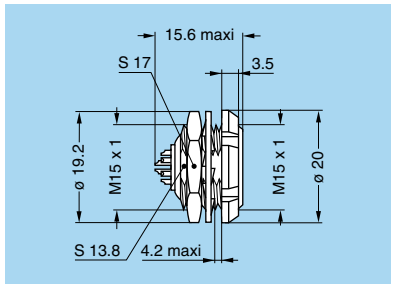
**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

### EGG.2G Fixed socket, nut fixing, key (G)



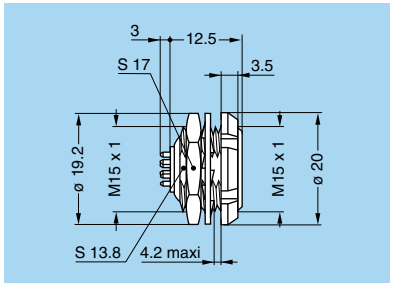

Panel cut-out (page 115)

### ECG.2G Fixed socket with two nuts, key (G) (back panel mounting)




Panel cut-out (page 115)

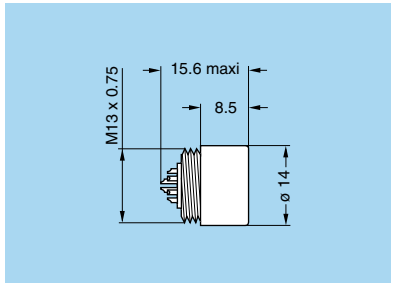
### ECG.2G Fixed socket with two nuts, key (G), straight contact for printed circuit (back panel mounting)




Panel cut-out (page 115)

PCB drilling pattern (page 115)

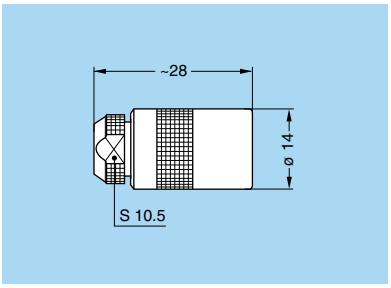
### EYG.2G Fixed socket, key (G), protruding shell (screw fixing on the panel)




Panel cut-out (page 115)

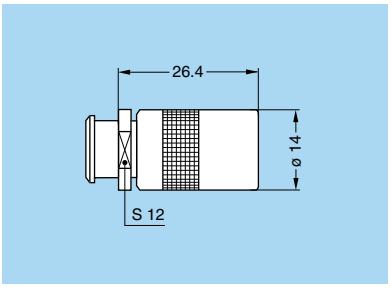
**Note:** all dimensions are in millimetres.

## PHG.2G Free socket, key (G), cable collet




Cable assembly (page 115)

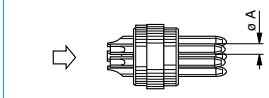
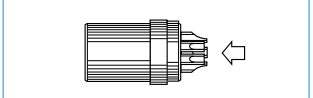
## PHG.2G Free socket, key (G), cable collet and nut for fitting a bend relief [1)]




Cable assembly (page 115)

**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

## Insert configuration (2G series)

| | Male solder contacts | Female solder contacts | Reference | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Print | Test voltage (kV rms) [2)] | Test voltage (kV dc) [2)] | Rated current (A) [1)] |
|---|---|---|---|---|---|---|---|---|---|---|
| 2G |  |  | 318 | 18 | 0.7 | ● | ● | 0.85 | 1.2 | 5.5 |

**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

## Housings (2G series)

| Ref. | Outer shell and collet nut | | Latch sleeve | | Other metallic components | | Note |
|---|---|---|---|---|---|---|---|
| | Material | Surf. treatment | Material | Surf. treatment | Material | Surf. treatment | |
| C | Brass | chrome | brass/bronze | nickel | brass | nickel | ● |
| N | Brass | nickel | brass/bronze | nickel | brass | nickel | ○ |
| K | Brass | black chrome | brass/bronze | nickel | brass | nickel | ● |

● First choice alternative
○ Special order alternative

**Note:** detailed characteristics of these materials and treatments are presented on page 171.

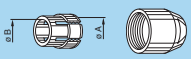
## Contacts (2G series)

| Ref. | Contact type |
|---|---|
| A | Male solder |
| L | Female solder |
| N | Female print |

## Collets (2G series)

### D type collets for 2G series

D type

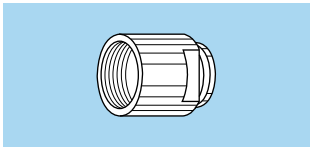


| | Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|---|
| | Type | Code | ø A | ø B | max. | min. |
| 2G | D | 52 | 5.2 | – | 5.1 | 4.5 |
| | D | 62 | 6.2 | – | 6.1 | 5.5 |
| | D | 72 | 7.2 | 6.2 | 7.1 | 6.5 |
| | D | 80 | 8.0 | 6.2 | 7.9 | 7.5 |

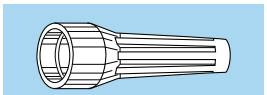
**Note:** all dimensions are in millimetres.

## Variant (2G series)

### Bend relief for 2G series models with collet

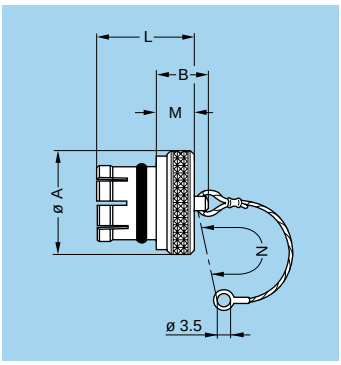


**Need to be ordered**



| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 2G | Z | D | 52 to 80 | GMA.2B.●●●.●● |

# Accessories (2G series)

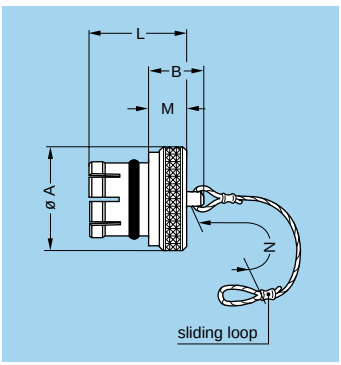



## BRE Blanking caps for fixed and free sockets

| Part number | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | A | B | L | M | N |
| BRE.2G.200.NAS | 18 | 12 | 10.6 | 6.0 | 85 |

**Note:** these caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the material of the O ring (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 200°C
- Watertightness: IP61 according to IEC 60529

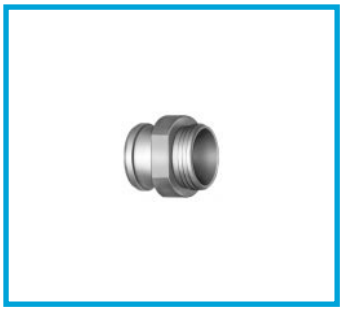


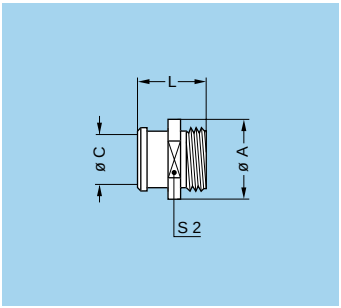

## BRF Blanking caps for fixed sockets

| Part number | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | A | B | L | M | N |
| BRF.2G.200.NAS | 18 | 12 | 14.0 | 6.0 | 85 |

**Note:** this caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the material of the O ring (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 200°C
- Watertightness: IP61 according to IEC 60529






## FFM Nut for bend relief

| Part number | Dimensions (mm) | | | |
|---|---|---|---|---|
| | A | C | L | S2 |
| FFM.2C.130.LC | 14 | 8 | 12.2 | 12 |

**Note:** for bend reliefs to be used with this nut see section «Accessories» page 141.

- Material: Chrome-plated brass (0.3 µm)

**Note:** other accessories are also available. See section «Accessories» on page 135.

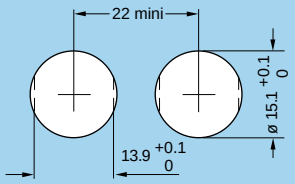
# Tooling (2G series)

Please consult the «Tooling» section (page 146).

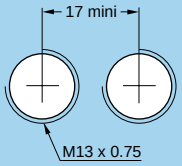
# Panel cut-outs (2G series)

## Panel cut-outs

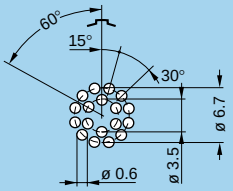
EGG - ECG




EYG



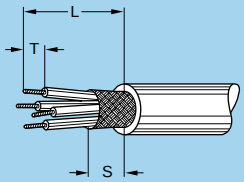

## PCB drilling pattern




**Note:** mounting nut torque: 6 Nm (1N = 0.102 kg)

# Cable assembly (2G series)

## Cable stripping lengths (2G series)



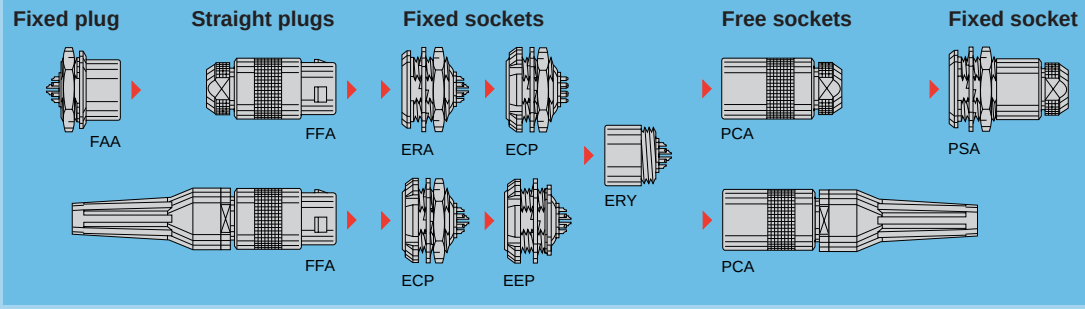

| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | |
|---|---|---|---|---|---|
| Series | Type | | L | S | T |
| 2G | 318 | 0.7 | 9 | 7 | 3 |

**Note:** the tolerances on these dimensions are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm.

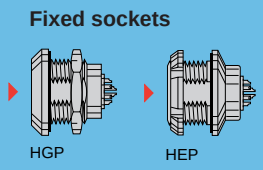
# 2C Series

In many applications, it is necessary to use multipole connectors which have shortened dimensions but require high contact density. LEMO short series connectors, which are shorter than 30 mm, perfectly meet these needs.
The 2C series, featuring a hermaphroditic insert, is available in multipole type up to 14 contacts.

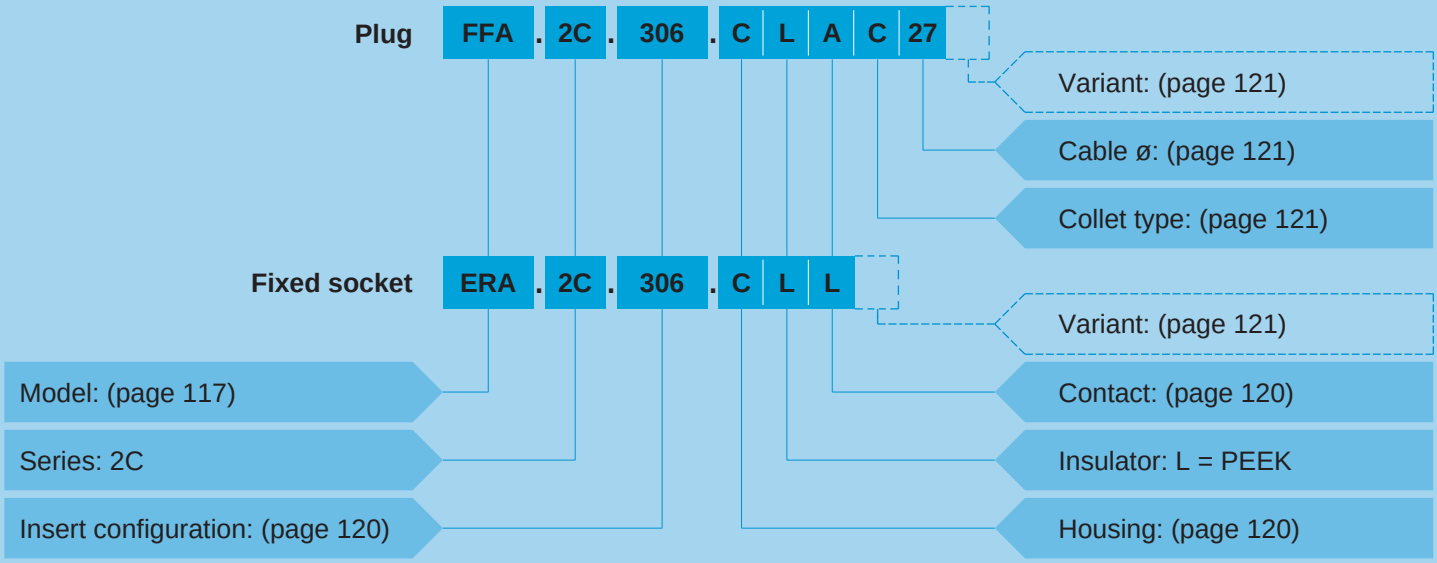
**Metal housing models** (page 117)




**Watertight or vacuumtight models** (page 119)




## Part Numbering System




## Part Number Example

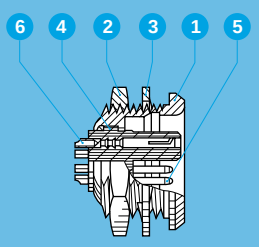
**Straight plug with cable collet:**
**FFA.2C.306.CLAC27** = straight plug with cable collet, 2C series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, male solder contacts, C type collet for 2.7 mm diameter cable.

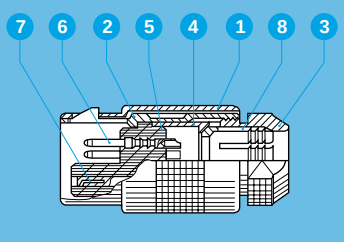
**Fixed socket:**
**ERA.2C.306.CLL** = fixed socket, nut fixing, 2C series, multipole type with 6 contacts, outer shell in chrome-plated brass, PEEK insulator, female solder contacts.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. hexagonal nut
3. locking washer
4. insulator
5. male contact
6. female contact




**Straight plug**

1. outer shell
2. latch sleeve
3. collet nut
4. split centre-piece
5. insulator
6. male contact
7. female contact
8. collet

# Metal housing models

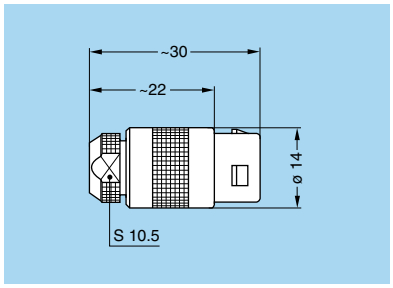
## Technical Characteristics

### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 500 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range | - 55° C + 250° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index | IP50 | IEC 60529 |
| Climatical category | 55/175/21 | IEC 60068-1 |

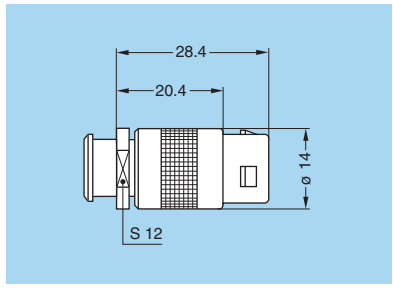
**Note:**
The various tests have been carried out with FFA and ERA connector pairs, with chrome-plated brass shell and PEEK insulator.
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

### FFA.2C Straight plug, cable collet




Cable assembly (page 122)

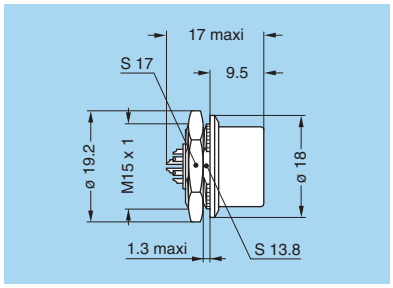
### FFA.2C Straight plug, cable collet and nut for fitting a bend relief [1)]




Cable assembly (page 122)

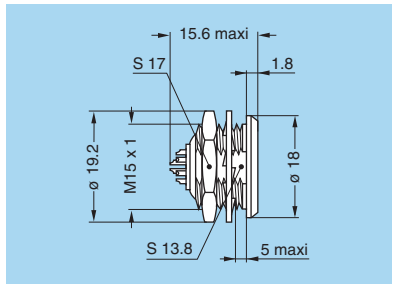
**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

### FAA.2C Fixed plug, nut fixing, non-latching



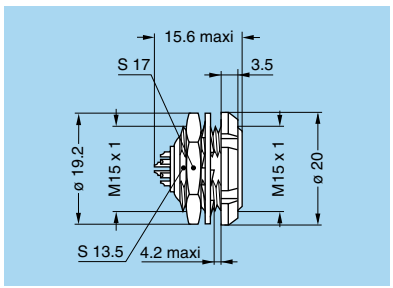

Panel cut-out (page 122)

### ERA.2C Fixed socket, nut fixing




Panel cut-out (page 122)

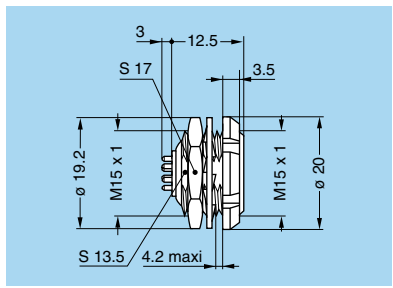
### ECP.2C Fixed socket with two nuts (back panel mounting)




Panel cut-out (page 122)

**Note:** all dimensions are in millimetres.

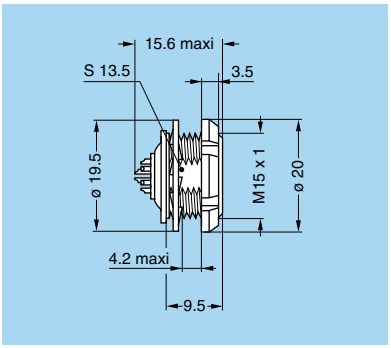
### ECP.2C Fixed socket with two nuts, straight contact for printed circuit (back panel mounting)




Panel cut-out (page 122)

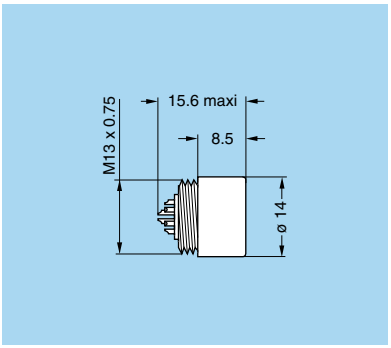
PCB drilling pattern (page 122)

## EEP.2C Fixed socket, nut fixing (back panel mounting)



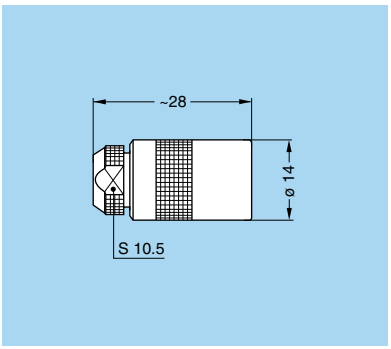

Panel cut-out (page 122)

## ERY.2C Fixed socket, protruding shell, (screw fixing on the panel)



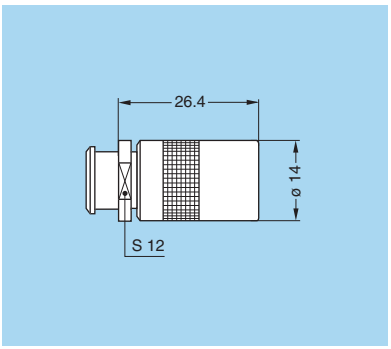

Panel cut-out (page 122)

## PCA.2C Free socket, cable collet




Cable assembly (page 122)

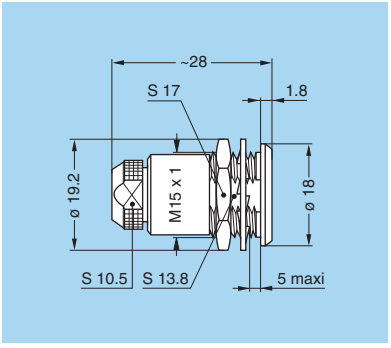
## PCA.2C Free socket, cable collet and nut for fitting a bend relief [1)]




Cable assembly (page 122)

**Note:** [1)] to order, add a «Z» at the end of the reference.
The bend relief must be ordered separately (see page 141).

## PSA.2C Fixed socket nut fixing, cable collet




Panel cut-out (page 122)

**Note:** all dimensions are in millimetres.

# Watertight or vacuumtight models

These socket allow the device on which they are fitted to reach a protection index of IP68 as per IEC 60529. They are fully compatible with plugs of the same series and are widely used for portable radios, military, laboratory equipment, aviation, etc.
These models are identified by a letter «P» at the end of the reference.
These models are also available in a vacuumtight version. Such models are identified by an additional letter «V» at the end of the part number (certificate on request).
Epoxy resin is used to seal these models.

## Technical Characteristics

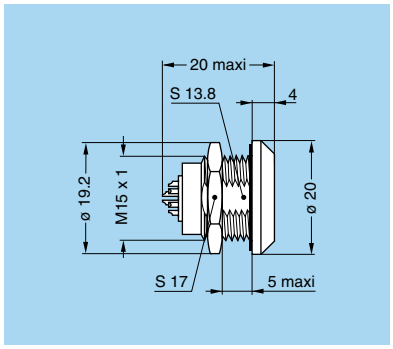
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 500 cycles | IEC 60512-5 test 9a |
| Humidity | up to 95% at 60° C | |
| Temperature range | - 20° C, +80° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |

| Characteristics | Value | Standard |
|---|---|---|
| Climatical category | 20/80/21 | IEC 60068-1 |
| Leakage rate (He)[1)] | < $10^{-7}$ mbar.l.s$^{-1}$ | IEC 60512-7 test 14b |
| Maximum operating pressure | 5 bar | IEC 60512-7 test 14d |

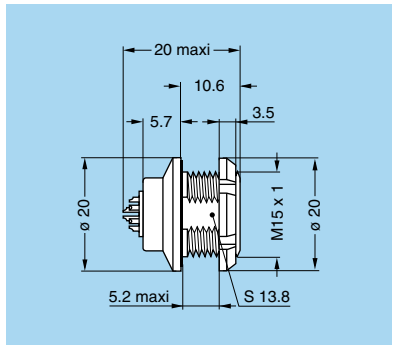
**Note:** [1)] only for vacuumtight models.

### HGP.2C Fixed socket, nut fixing, watertight or vacuumtight



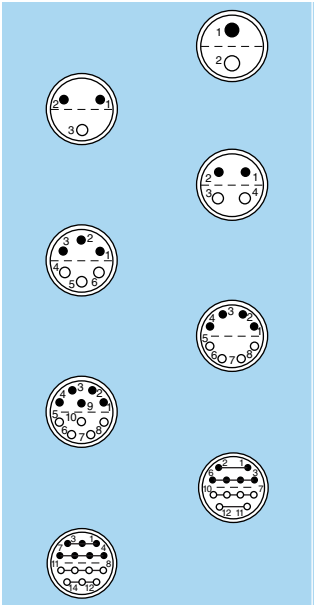
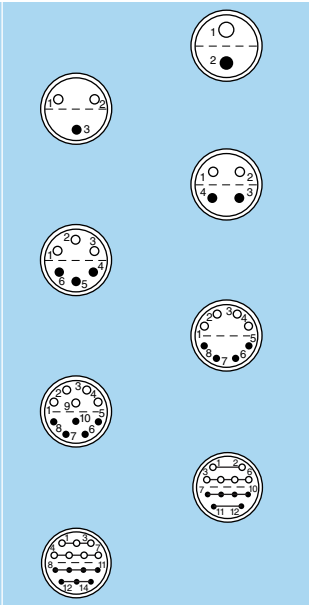

Panel cut-out (page 122)

### HEP.2C Fixed socket, nut fixing, watertight or vacuumtight (back panel mounting)




Panel cut-out (page 122)

# Insert configuration (2C series)

| | Male solder contacts | Female solder contacts | Reference | Number of contacts | ø A (mm) | Contact type: Solder | Contact type: Print | Test voltage (kV rms) 1) 2) | Test voltage (kV dc) 1) 2) | Rated current (A) 1) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2C |  |  | 302 | 2 | 1.6 | ● | – | 1.80 | 2.40 | 20 |
| | | | 303 | 3 | 1.3 | ● | – | 1.50 | 2.10 | 15 |
| | | | 304 | 4 | 1.3 | ● | – | 1.80 | 2.40 | 15 |
| | | | 306 | 6 | 1.3 | ● | – | 1.50 | 2.10 | 12 |
| | | | 308 | 8 | 0.7 | ● | ● | 0.95 | 1.35 | 7 |
| | | | 310 | 10 | 0.7 | ● | ● | 0.95 | 1.35 | 7 |
| | | | 312 | 12 | 0.7 | ● | ● | 0.60 | 0.90 | 5 |
| | | | 314 | 14 | 0.7 | ● | ● | 0.60 | 0.90 | 5 |

**Note:** 1) see calculation method, caution and suggested standard on page 178.
2) lowest measured value; contact to contact or contact to shell.

# Housings (2C series)

| Ref. | Outer shell and collet nut | | Latch sleeve | | Other metallic components | | Note |
|---|---|---|---|---|---|---|---|
| | Material | Surf. treatment | Material | Surf. treatment | Material | Surf. treatment | |
| C | Brass | chrome | brass/bronze | nickel | brass | nickel | ● |
| N | Brass | nickel | brass/bronze | nickel | brass | nickel | ○ |
| K | Brass | black chrome | brass/bronze | nickel | brass | nickel | ● |

● First choice alternative
○ Special order alternative

**Note:** detailed characteristics of these materials and treatments are presented on page 171.

# Contacts (2C series)

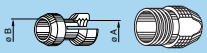
| Ref. | Contact type |
|---|---|
| A | Male solder |
| L | Female solder |
| N | Female print |

Multipole connectors are fitted with hermaphroditic inserts including male and female contacts. However, by convention, the letter indicating the contact type in the part number composition will be the male contact (reference A) for plugs and female contact (reference L) for sockets.

# Collets (2C series)

## C and L type collets for 2C series

C type



| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| C | 27 | 2.7 | – | 2.6 | 2.2 |
| C | 32 | 3.2 | – | 3.1 | 2.7 |
| C | 37 | 3.7 | – | 3.6 | 3.2 |
| C | 42 | 4.2 | – | 4.1 | 3.7 |
| C | 47 | 4.7 | – | 4.6 | 4.2 |
| C | 52 | 5.2 | – | 5.1 | 4.7 |
| C | 57 | 5.7 | – | 5.6 | 5.2 |
| C | 62 | 6.2 | – | 6.1 | 5.7 |
| C | 67 | 6.7 | 6.2 | 6.6 | 6.2 |
| C | 72 | 7.2 | 6.2 | 7.1 | 6.7 |
| C | 75 | 7.5 | 6.2 | 7.4 | 7.2 |
| C | 80 | 8.0 | 6.2 | 7.9 | 7.5 |

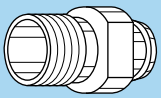
L type (non EMC)

| Reference | | Collet ø | | Cable ø | |
|---|---|---|---|---|---|
| Type | Code | ø A | ø B | max. | min. |
| L | 14 | 1.4 | – | 1.3 | 0.8 |
| L | 27 | 2.7 | – | 2.6 | 2.2 |
| L | 32 | 3.2 | – | 3.1 | 2.7 |
| L | 37 | 3.7 | – | 3.6 | 3.2 |
| L | 42 | 4.2 | – | 4.1 | 3.7 |
| L | 47 | 4.7 | – | 4.6 | 4.2 |
| L | 52 | 5.2 | – | 5.1 | 4.7 |
| L | 57 | 5.7 | – | 5.6 | 5.2 |
| L | 62 | 6.2 | – | 6.1 | 5.7 |
| L | 67 | 6.7 | – | 6.6 | 6.2 |
| L | 72 | 7.2 | – | 7.1 | 6.7 |
| L | 77 | 7.7 | – | 7.6 | 7.2 |
| L | 82 | 8.2 | – | 8.1 | 7.7 |

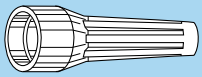
**Note:** all dimensions are in millimetres.

# Variant (2C series)

## Bend relief for 2C series models with collet



Need to be ordered



| Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|
| | Type | Code | |
| Z | C | 42 to 80 | GMA.2B.0●●.D● |
| | L | 42 to 82 | GMA.2B.0●●.D● |

## Watertight and vacumtight socket models (2C series)

| Model | Reference | |
|---|---|---|
| | Watertight | Vacuumtight |
| HEP<br>HGP | P | PV |

# Accessories (2C series)

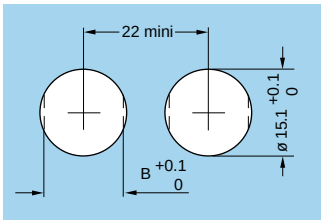
Accessories for the 2C series are identical with the 2G series. Please refer to corresponding pages (page 114).

# Tooling (2C series)

Please consult the «Tooling» section (page 146).

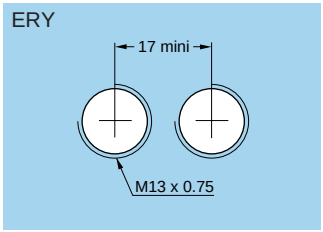
# Panel cut-outs (2C series)

## Panel cut-outs




| Model | B (mm) | Model | B (mm) |
|---|---|---|---|
| ECP | 13.6 | HGP | 13.9 |
| EEP | 13.6 | PSA | 13.9 |
| ERA | 13.9 | | |
| FAA | 13.9 | | |
| HEP | 13.9 | | |

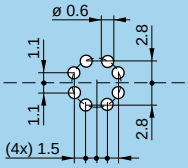
ERY



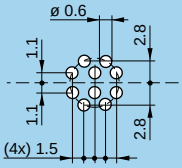

**Note:**
mounting nut torque:
6 Nm (1N = 0.102 kg)

## PCB drilling patterns

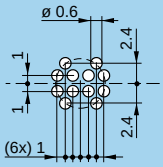
308



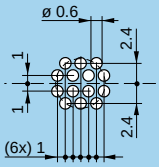

310




312

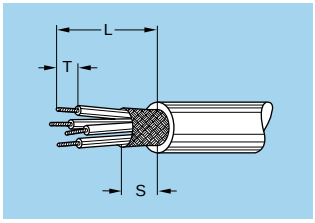



314



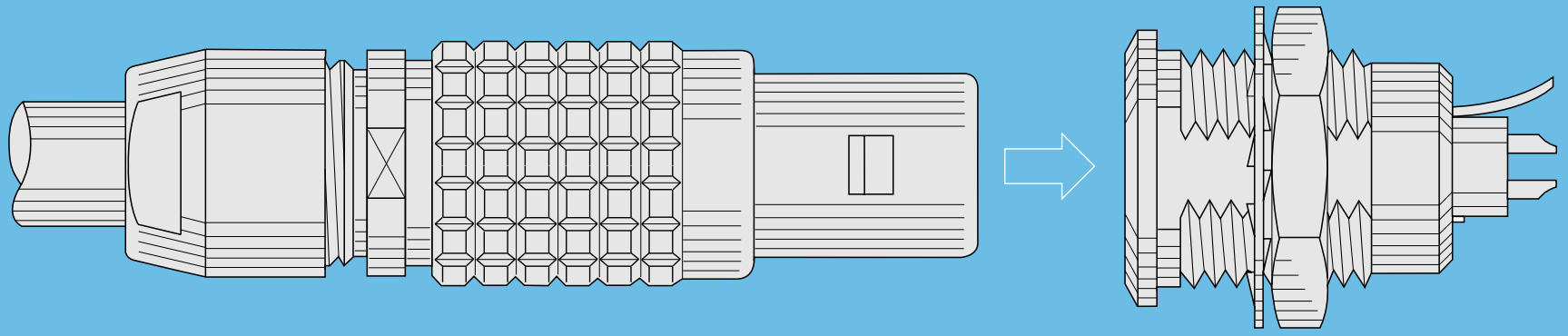

# Cable assembly (2C series)

## Cable stripping lengths (2C series)




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | |
|---|---|---|---|---|---|
| Series | Type | | L | S | T |
| 2C | 302 | 1.6 | 11 | 8 | 3 |
| | 303/304/306 | 1.3 | 11 | 8 | 3 |
| | 308/310/312/314 | 0.7 | 11 | 8 | 3 |

**Note:** the tolerances on these dimensions are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm.

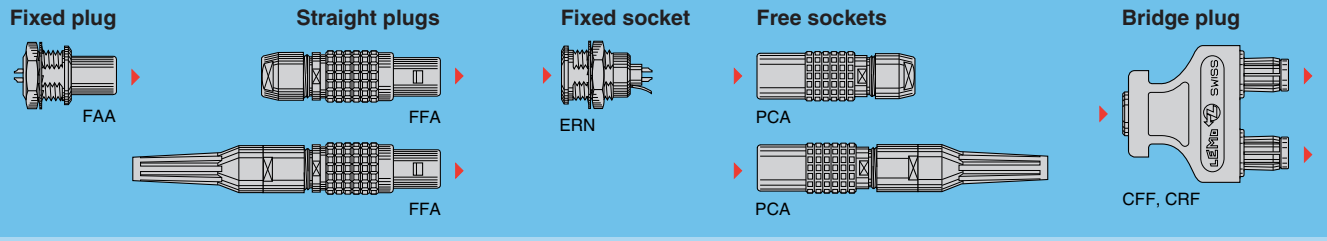


# 1D SERIES (quadrax)

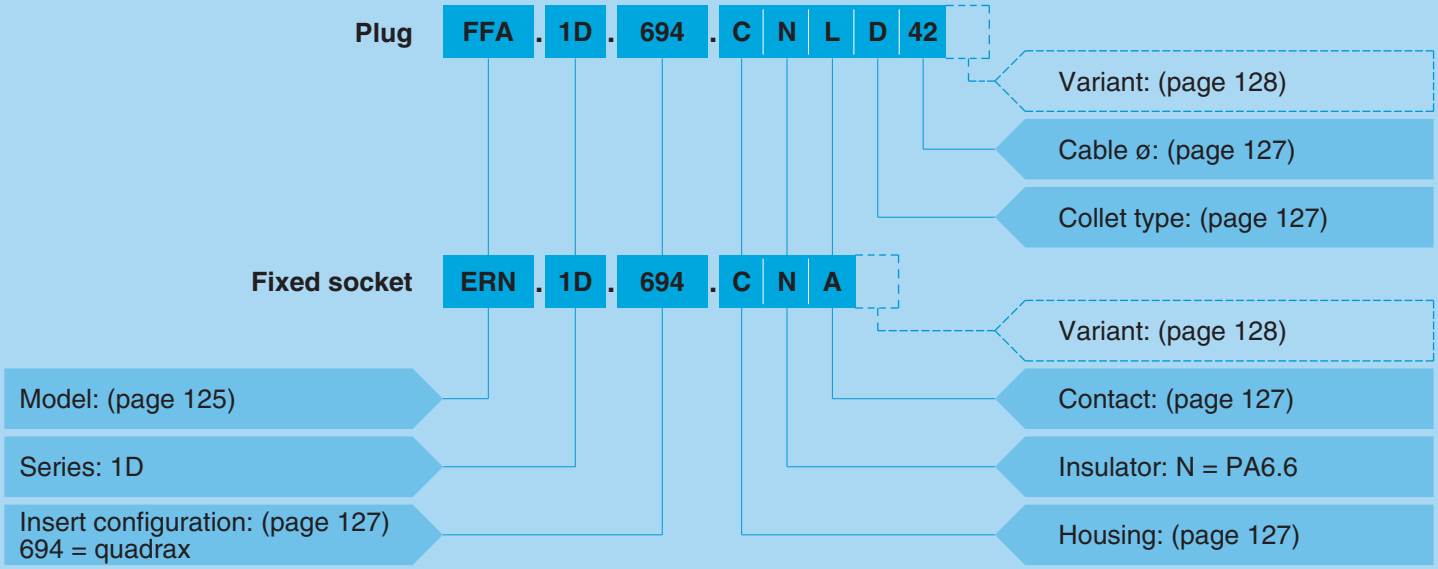
# 1D Series

1D series QUADRAX connectors have four concentric contacts insulated from the connector shell.
Specially developed for major radio and television channels, this new connector type provides the possibility of blind mating with the full security of the LEMO Push-Pull self-latching system.

**Metal housing models** (page 125)




## Part Numbering System




## Part Number Example

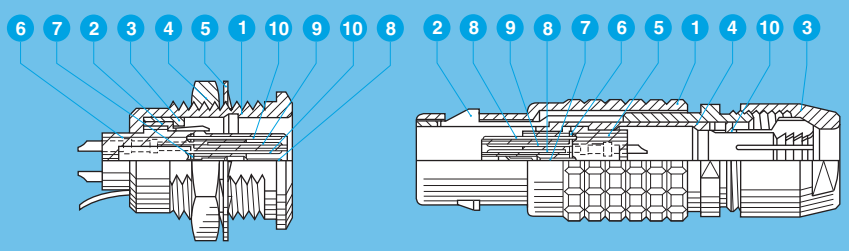
**Straight plug with cable collet:**
**FFA.1D.694.CNLD42** = straight plug with cable collet, 1D series, quadrax type, outer shell in chrome-plated brass, PA6.6 insulator, female solder contacts, D type collet for 4.2 mm diameter cable.

**Fixed socket:**
**ERN.1D.694.CNA** = fixed socket, 1D series, quadrax type, outer shell in chrome-plated brass, PA6.6 insulator, male solder contacts.

## Part Section Showing Internal Components

**Fixed socket**

1. outer shell
2. earthing crown
3. retaining ring
4. hexagonal nut
5. locking washer
6. insulator
7. printed circuit
8. male contact
9. male intermediate contact
10. female intermediate contact




**Straight plug**

1. outer shell
2. latch sleeve
3. collet nut
4. split centre-piece
5. insulator
6. printed circuit
7. female contact
8. male intermediate contact
9. female intermediate contact
10. collet

# Metal housing models

## Technical Characteristics

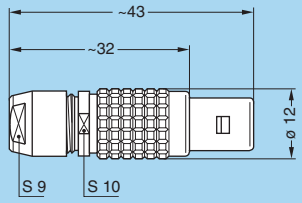
### Mechanical and Climatical

| Characteristics | Value | Standard |
|---|---|---|
| Endurance | > 1000 cycles | IEC 60512-5 test 9a |
| Temperature range[1)] | -40° C, +120° C | |
| Salt spray corrosion test | > 1000h | IEC 60512-6 test 11f |
| Protection index | IP50 | IEC 60529 |

**Note:**
[1)] for bridge plug: -40° C, +80° C
Detailed electrical characteristics, as well as materials and treatment are presented in the chapter Technical Characteristics on page 171.

### Electrical

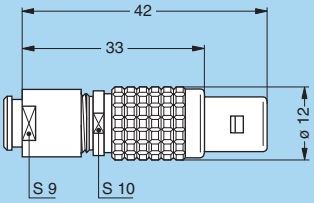
| Characteristics | | Value | Standard |
|---|---|---|---|
| Insulation resistance | | > $10^{11}\Omega$ | IEC 60512-2 test 3a |
| Insul. res. after 48h 95%RH | | > $10^{10}\Omega$ | IEC 60512-2 test 3a |
| Screening efficiency | at 10 MHz | > 70 dB | IEC 60169-1-3 |
| | at 1 GHz | > 35 dB | IEC 60169-1-3 |
| Contact resistance | | < 20mΩ | IEC 60512-2 test 2a |




## FFA Straight plug, cable collet

| Part number |
|---|
| FFA.1D.694.CNLD42 |
| FFA.1D.694.CNLD52 |
| FFA.1D.694.CNLD62 |
| FFA.1D.694.CNLD72 |
| FFA.1D.694.CNLD76 |

Cable assembly (page 128)

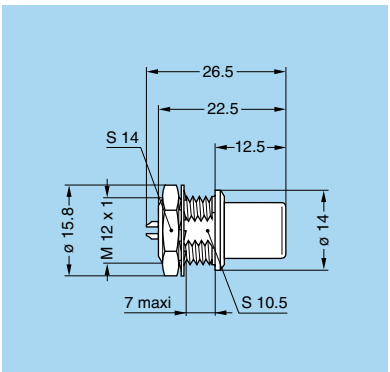



## FFA Straight plug, cable collet and nut for fitting a bend relief

| Part number |
|---|
| FFA.1D.694.CNLD42Z |
| FFA.1D.694.CNLD52Z |
| FFA.1D.694.CNLD62Z |
| FFA.1D.694.CNLD72Z |

Cable assembly (page 128)

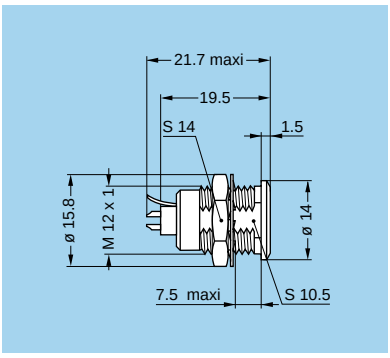
**Note:** The bend relief must be ordered separately (see page 141).




## FAA Fixed plug, nut fixing, non-latching

| Part number |
|---|
| FAA.1D.694.CNL |

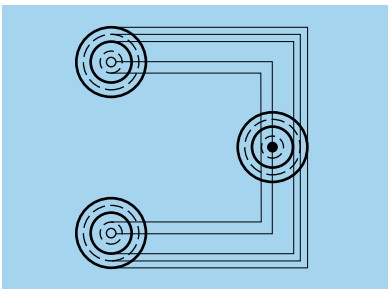
Panel cut-out (page 128)

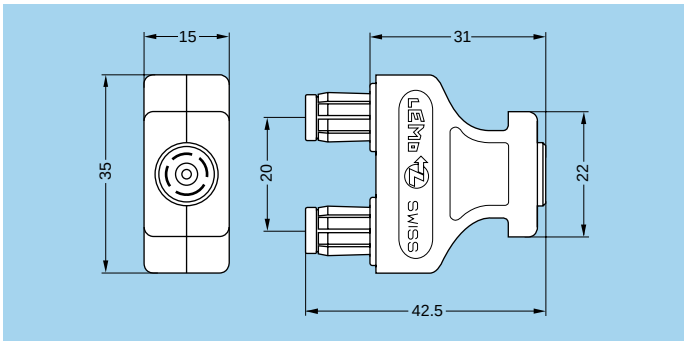



## ERN Fixed socket nut fixing, with earthing tag

| Part number |
|---|
| ERN.1D.694.CNA |

Panel cut-out (page 128)



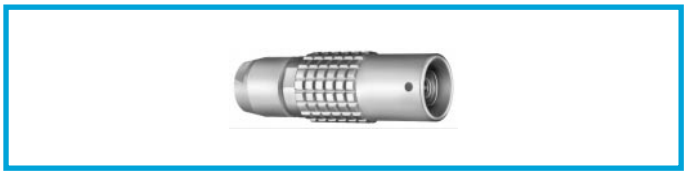


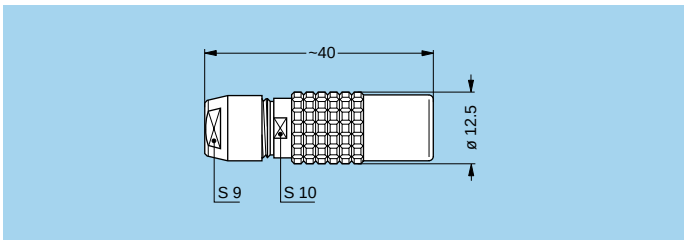

## CFF Bridge plug with two non-latching plugs

## CRF Bridge plug with two non-latching plugs with monitoring output

| Part number |
|---|
| CFF.1D.694.PNMG |
| CRF.1D.694.PNFG |

**Note:** the last letter (G) of the part number indicates the grey colour of the housing. For other colours, replace this letter (G) by the one corresponding to the required colour.

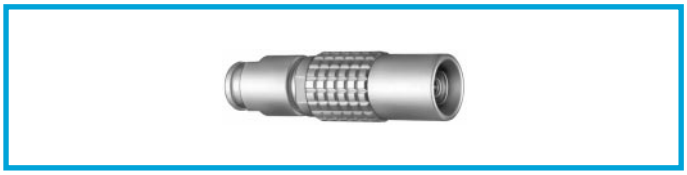


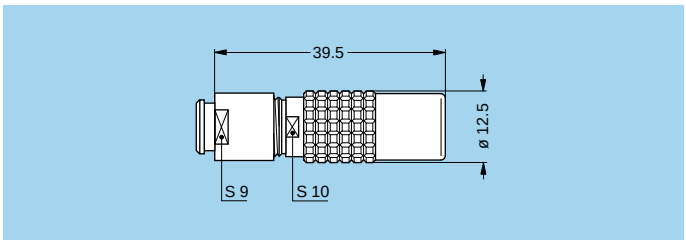



## PCA Free socket, cable collet

| Part number |
|---|
| PCA.1D.694.CNAD42 |
| PCA.1D.694.CNAD52 |
| PCA.1D.694.CNAD62 |
| PCA.1D.694.CNAD72 |
| PCA.1D.694.CNAD76 |

Cable assembly (page 128)





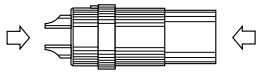
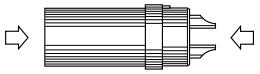

## PCA Free socket, cable collet and nut for fitting a bend relief

| Part number |
|---|
| PCA.1D.694.CNAD42Z |
| PCA.1D.694.CNAD52Z |
| PCA.1D.694.CNAD62Z |
| PCA.1D.694.CNAD72Z |

Cable assembly (page 128)

**Note:** The bend relief must be ordered separately (see page 141).

# Insert configuration (1D series)

| Male solder contacts | Female solder contacts | Reference | Number of contacts | Contact type: Solder | Test voltage (kV rms)[1) 2)] | Test voltage (kV dc)[1) 2)] | Rated current (A)[1)] |
|---|---|---|---|---|---|---|---|
|  |  | 694 | 4 | ● | 0.42 | 0.6 | 0.5 |

**Note:** [1)] see calculation method, caution and suggested standard on page 178.
[2)] lowest measured value; contact to contact or contact to shell.

# Housings (1D series)

| Ref. | Outer shell and collet nut | | Latch sleeve + earthing crown | | Other metallic components | | Remarks | Note |
|---|---|---|---|---|---|---|---|---|
| | Material | Surf. treatment | Material | Surf. treatment | Material | Surf. treatment | | |
| C | Brass | chrome | brass/bronze | nickel | brass | nickel | | ● |
| P | PA.6 | – | brass/bronze | nickel | brass | nickel | Only for CFF and CRF bridge plug [1)] | ● |

**Note:** detailed characteristics of these materials and treatments are presented on page 171. [1)] see «variant» for the colour.

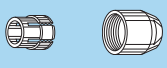
● First choice alternative
○ Special order alternative

# Contacts (1D series)

| Ref. | Contact type | Remarks |
|---|---|---|
| A | Male solder center contact | For sockets |
| L | Female solder center contact | For plugs |

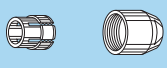
# Collets (1D series)

## D type collets for 1D series

D type 

| | Reference | | Cable ø | | Notes |
|---|---|---|---|---|---|
| | Type | Code | max. | min. | |
| 1D | D | 42 | 4.2 | 3.1 | |
| | D | 52 | 5.2 | > 4.2 | |
| | D | 62 | 6.2 | > 5.2 | |

## D type collets for 1D series

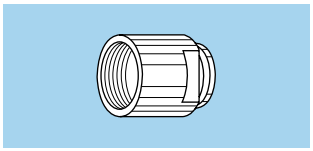
D type 

| | Reference | | Cable ø | | Notes |
|---|---|---|---|---|---|
| | Type | Code | max. | min. | |
| 1D | D | 72 | 7.2 | > 6.2 | |
| | D | 76 | 7.6 | > 7.2 | 1) |
| | | | | | |

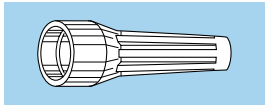
**Note:** [1)] these collets cannot be used for connector models with nut for fitting a bend relief. All dimensions are in millimetres.

## Variant (1D series)

### Bend relief for 1D series models with collet



### Need to be ordered



| | Ref. | Collet | | Need to be ordered separately (see pages 141 and 142) |
|---|---|---|---|---|
| | | Type | Code | |
| 1D | Z | D | 42 to 72 | GMA.1B.●●●.●● |

### Colour of the bridge plug shells

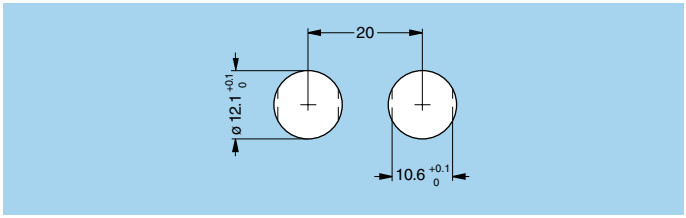
| Reference | Colour |
|---|---|
| A | blue |
| B | white |
| G | grey |
| J | yellow |
| M | brown |
| N | black |
| R | red |
| V | green |

## Accessories and Tooling (1D series)

Accessories and tooling for the 1D series are identical with the 1B series. Please refer to corresponding pages (page 135 and 146).

## Panel cut-outs (1D series)

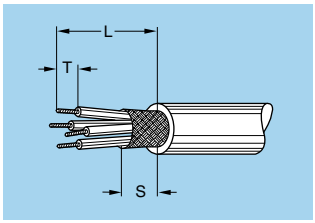
### Panel cut-out




**Note:** mounting nut torque: 4.5 Nm (1N = 0.102 kg)
When connectors are assembled with double panel washers or insulating washers the mounting nut torque is 4 Nm.

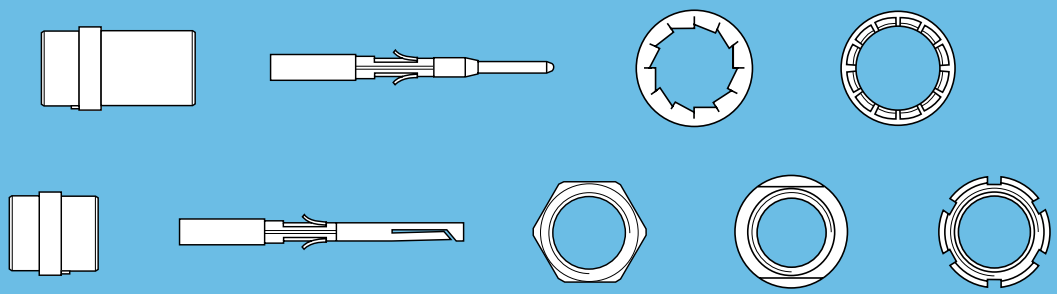
## Cable assembly (1D series)

### Cable stripping lengths (1D series)




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | |
|---|---|---|---|---|---|
| Series | Type | | L | S | T |
| 1D | 694 | – | 14 | 8 | 3 |

**Note:** the tolerances on these dimensions are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm.



# SPARE PARTS

# Spare parts

male

female

## FGG-EGG Insulators for crimp contacts

| | Type | Insulator part number | |
|---|---|---|---|
| | | Male contact | Female contact |
| 00 | 302 | FGG.00.302.YL | EGG.00.402.YL |
| | 303 | FGG.00.303.YL | EGG.00.403.YL |
| | 304 | FGG.00.304.YL | EGG.00.404.YL |
| 0B 0K | 302 | FGG.0B.302.YL | EGG.0B.402.YL |
| | 303 | FGG.0B.303.YL | EGG.0B.403.YL |
| | 304 | FGG.0B.304.YL | EGG.0B.404.YL |
| | 305 | FGG.0B.305.YL | EGG.0B.405.YL |
| | 306 | FGG.0B.306.YL | – |
| | 307 | FGG.0B.307.YL | – |
| | 309 | FGG.0B.309.YL | – |
| 1B 1K | 302 | FGG.1B.302.YL | EGG.1B.402.YL |
| | 303 | FGG.1B.303.YL | EGG.1B.403.YL |
| | 304 | FGG.1B.304.YL | EGG.1B.404.YL |
| | 305 | FGG.1B.305.YL | EGG.1B.405.YL |
| | 306 | FGG.1B.306.YL | EGG.1B.406.YL |
| | 307 | FGG.1B.307.YL | EGG.1B.407.YL |
| | 308 | FGG.1B.308.YL | EGG.1B.408.YL |
| | 310 | FGG.1B.310.YL | – |
| | 314 | FGG.1B.314.YL | – |
| | 316 | FGG.1B.316.YL | – |
| 2B 2K | 302 | FGG.2B.302.YL | EGG.2B.402.YL |
| | 303 | FGG.2B.303.YL | EGG.2B.403.YL |
| | 304 | FGG.2B.304.YL | EGG.2B.404.YL |
| | 305 | FGG.2B.305.YL | EGG.2B.405.YL |
| | 306 | FGG.2B.306.YL | EGG.2B.406.YL |
| | 307 | FGG.2B.307.YL | EGG.2B.407.YL |
| | 308 | FGG.2B.308.YL | EGG.2B.408.YL |
| | 310 | FGG.2B.310.YL | EGG.2B.410.YL |
| | 312 | FGG.2B.312.YL | EGG.2B.412.YL |
| | 314 | FGG.2B.314.YL | EGG.2B.414.YL |
| | 316 | FGG.2B.316.YL | EGG.2B.416.YL |
| | 318 | FGG.2B.318.YL | EGG.2B.418.YL |
| | 319 | FGG.2B.319.YL | EGG.2B.419.YL |
| 3B 3K | 302 | FGG.3B.302.YL | EGG.3B.402.YL |
| | 303 | FGG.3B.303.YL | EGG.3B.403.YL |
| | 304 | FGG.3B.304.YL | EGG.3B.404.YL |
| | 305 | FGG.3B.305.YL | EGG.3B.405.YL |
| | 306 | FGG.3B.306.YL | EGG.3B.406.YL |
| | 307 | FGG.3B.307.YL | EGG.3B.407.YL |

| | Type | Insulator part number | |
|---|---|---|---|
| | | Male contact | Female contact |
| 3B 3K | 308 | FGG.3B.308.YL | EGG.3B.408.YL |
| | 309 | FGG.3B.309.ML | EGG.3B.409.ML |
| | 310 | FGG.3B.310.YL | EGG.3B.410.YL |
| | 312 | FGG.3B.312.YL | EGG.3B.412.YL |
| | 314 | FGG.3B.314.YL | EGG.3B.414.YL |
| | 316 | FGG.3B.316.YL | EGG.3B.416.YL |
| | 318 | FGG.3B.318.YL | EGG.3B.418.YL |
| | 320 | FGG.3B.320.YL | EGG.3B.420.YL |
| | 322 | FGG.3B.322.YL | EGG.3B.422.YL |
| | 324 | FGG.3B.324.YL | EGG.3B.424.YL |
| | 326 | FGG.3B.326.YL | EGG.3B.426.YL |
| | 330 | FGG.3B.330.YL | EGG.3B.430.YL |
| 4B 4K | 304 | FGG.4B.304.YL | EGG.4B.404.YL |
| | 306 | FGG.4B.306.YL | EGG.4B.406.YL |
| | 307 | FGG.4B.307.YL | EGG.4B.407.YL |
| | 310 | FGG.4B.310.YL | EGG.4B.410.YL |
| | 312 | FGG.4B.312.YL | EGG.4B.412.YL |
| | 316 | FGG.4B.316.YL | EGG.4B.416.YL |
| | 320 | FGG.4B.320.YL | EGG.4B.420.YL |
| | 324 | FGG.4B.324.YL | EGG.4B.424.YL |
| | 330 | FGG.4B.330.YL | EGG.4B.430.YL |
| | 340 | FGG.4B.340.YL | EGG.4B.440.YL |
| | 348 | FGG.4B.348.YL | EGG.4B.448.YL |
| 5B 5K | 304 | FGG.5B.304.ML | EGG.5B.404.ML |
| | 310 | FGG.5B.310.YL | EGG.5B.410.YL |
| | 314 | FGG.5B.314.YL | EGG.5B.414.YL |
| | 316 | FGG.5B.316.YL | EGG.5B.416.YL |
| | 320 | FGG.5B.320.YL | EGG.5B.420.YL |
| | 330 | FGG.5B.330.YL | EGG.5B.430.YL |
| | 340 | FGG.5B.340.YL | EGG.5B.440.YL |
| | 348 | FGG.5B.348.YL | EGG.5B.448.YL |
| | 350 | FGG.5B.350.ML | EGG.5B.450.ML |
| | 354 | FGG.5B.354.YL | EGG.5B.454.YL |
| | 364 | FGG.5B.364.YL | EGG.5B.464.YL |

**Note:** each insulator can be used both for crimp contacts of normal shape (fig. 1) or with reduced solder cups (fig. 2) as shown on page 131.

## FGG-EGG Crimp contacts

Fig. 1

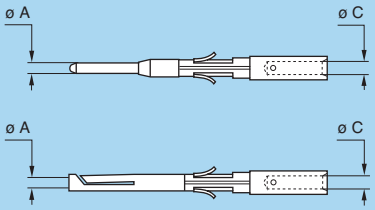
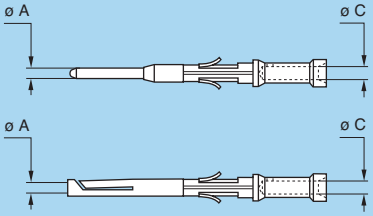
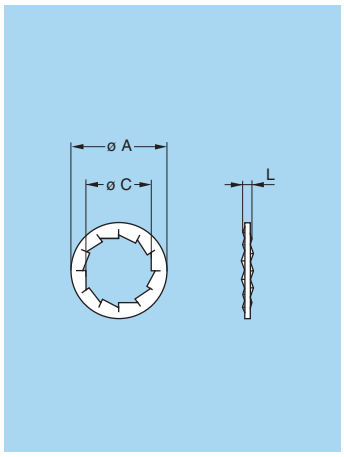



Fig. 2




| | Types | ø A (mm) | ø C (mm) | Contact part number | |
|---|---|---|---|---|---|
| | | | | Male | Female |
| 00 | 302 | 0.5 | 0.45 | FGG.00.554.ZZC | EGG.00.654.ZZM |
| | 303 | 0.5 | 0.45 | FGG.00.554.ZZC | EGG.00.654.ZZM |
| | 304 | 0.5 | 0.45 | FGG.00.554.ZZC | EGG.00.654.ZZM |
| 0B 0K | 302/303 | 0.9 | 1.10 | FGG.0B.560.ZZC | EGG.0B.660.ZZM |
| | 304/305 | 0.7 | 0.80 | FGG.0B.555.ZZC | EGG.0B.655.ZZM |
| | 306/307/309 | 0.5 | 0.45 | FGG.0B.554.ZZC | – |
| 0S | 302 | 0.9 | 1.10 | FGG.0B.560.ZZC | EGG.0B.660.ZZM |
| | 304 | 0.7 | 0.80 | FGG.0B.555.ZZC | EGG.0B.655.ZZM |
| 1B 1K | 302/303 | 1.3 | 1.40 | FGG.1B.565.ZZC | EGG.1B.665.ZZM |
| | 304/305 | 0.9 | 1.10 | FGG.1B.560.ZZC | EGG.1B.660.ZZM |
| | 306/307/308 | 0.7 | 0.80 | FGG.1B.555.ZZC | EGG.1B.655.ZZM |
| | 310/314/316 | 0.5 | 0.45 | FGG.1B.554.ZZC | – |
| 1S | 302 | 1.3 | 1.40 | FGG.1B.565.ZZC | EGG.1B.665.ZZM |
| | 304 | 0.9 | 1.10 | FGG.1B.560.ZZC | EGG.1B.660.ZZM |
| 2B 2K | 302 | 2.0 | 2.40 | FGG.2B.575.ZZC | EGG.2B.675.ZZM |
| | 303 | 1.6 | 1.90 | FGG.2B.570.ZZC | EGG.2B.670.ZZM |
| | 304/305 | 1.3 | 1.40 | FGG.2B.565.ZZC | EGG.2B.665.ZZM |
| | 306/307 | 1.3 | 1.40 | FGG.2B.565.ZZC | EGG.2B.665.ZZM |
| | 308/310 | 0.9 | 1.10 | FGG.2B.560.ZZC | EGG.2B.660.ZZM |
| | 312/314/316 | 0.7 | 0.80 | FGG.2B.555.ZZC | EGG.2B.655.ZZM |
| | 318/319 | 0.7 | 0.80 | FGG.2B.555.ZZC | EGG.2B.655.ZZM |
| 2S | 306 | 1.3 | 1.40 | FGG.2B.565.ZZC | EGG.2B.665.ZZM |
| | | | | | |
| 3B 3K | 302 | 3.0 | 3.20 | FGG.3B.580.ZZC | EGG.3B.680.ZZM |
| | 303/304/309 | 2.0 | 2.40 | FGG.3B.575.ZZC | EGG.3B.675.ZZM |
| | 305/306/307 | 1.6 | 1.90 | FGG.3B.570.ZZC | EGG.3B.670.ZZM |
| | 308/309/310 | 1.3 | 1.40 | FGG.3B.565.ZZC | EGG.3B.665.ZZM |
| | 312/314 | 0.9 | 1.10 | FGG.3B.560.ZZC | EGG.3B.660.ZZM |
| | 316/318 | 0.9 | 1.10 | FGG.3B.560.ZZC | EGG.3B.660.ZZM |
| | 320/322/324 | 0.7 | 0.80 | FGG.3B.555.ZZC | EGG.3B.655.ZZM |
| | 326/330 | 0.7 | 0.80 | FGG.3B.555.ZZC | EGG.3B.655.ZZM |
| 4B 4K | 304 | 3.0 | 3.20 | FGG.4B.580.ZZC | EGG.4B.680.ZZM |
| | 306/307 | 2.0 | 2.40 | FGG.4B.575.ZZC | EGG.4B.675.ZZM |
| | 310 | 1.6 | 1.90 | FGG.4B.570.ZZC | EGG.4B.670.ZZM |
| | 312 | 1.3 | 1.40 | FGG.4B.565.ZZC | EGG.4B.665.ZZM |
| | 316/320 | 0.9 | 1.10 | FGG.4B.560.ZZC | EGG.4B.660.ZZM |
| | 324/330 | 0.9 | 1.10 | FGG.4B.560.ZZC | EGG.4B.660.ZZM |
| | 340/348 | 0.7 | 0.80 | FGG.4B.555.ZZC | EGG.4B.655.ZZM |
| 5B 5K | 304 | 4.0 | 4.00 | FGG.5B.582.ZZC | EGG.5B.682.ZZM |
| | 310 | 3.0 | 3.20 | FGG.5B.580.ZZC | EGG.5B.680.ZZM |
| | 314/316 | 2.0 | 2.40 | FGG.5B.575.ZZC | EGG.5B.675.ZZM |
| | 320 | 1.6 | 1.90 | FGG.5B.570.ZZC | EGG.5B.670.ZZM |
| | 330/340/348 | 1.3 | 1.40 | FGG.5B.565.ZZC | EGG.5B.665.ZZM |
| | 350/354/364 | 0.9 | 1.10 | FGG.5B.560.ZZC | EGG.5B.660.ZZM |

| | Types | ø A (mm) | ø C (mm) | Contact part number | |
|---|---|---|---|---|---|
| | | | | Male | Female |
| 0B 0K | 302/303 | 0.9 | 0.80 | FGG.0B.561.ZZC | EGG.0B.661.ZZM |
| | 302/303 | 0.9 | 0.45 | FGG.0B.562.ZZC | EGG.0B.662.ZZM |
| | 304/305 | 0.7 | 0.45 | FGG.0B.556.ZZC | EGG.0B.656.ZZM |
| 0S | 302 | 0.9 | 0.80 | FGG.0B.561.ZZC | EGG.0B.661.ZZM |
| | 302 | 0.9 | 0.45 | FGG.0B.562.ZZC | EGG.0B.662.ZZM |
| | 304 | 0.7 | 0.45 | FGG.0B.556.ZZC | EGG.0B.656.ZZM |
| 1B 1K | 302/303 | 1.3 | 1.10 | FGG.1B.566.ZZC | EGG.1B.666.ZZM |
| | 304/305 | 0.9 | 0.80 | FGG.1B.561.ZZC | EGG.1B.661.ZZM |
| | 306/307/308 | 0.7 | 0.45 | FGG.1B.556.ZZC | EGG.1B.656.ZZM |
| 1S | 302 | 1.3 | 1.10 | FGG.1B.566.ZZC | EGG.1B.666.ZZM |
| | 304 | 0.9 | 0.80 | FGG.1B.561.ZZC | EGG.1B.661.ZZM |
| 2B 2K | 302 | 2.0 | 1.90 | FGG.2B.576.ZZC | EGG.2B.676.ZZM |
| | 303 | 1.6 | 1.40 | FGG.2B.571.ZZC | EGG.2B.671.ZZM |
| | 304/305 | 1.3 | 1.10 | FGG.2B.566.ZZC | EGG.2B.666.ZZM |
| | 306/307 | 1.3 | 1.10 | FGG.2B.566.ZZC | EGG.2B.666.ZZM |
| | 304/305 | 1.3 | 0.80 | FGG.2B.567.ZZC | EGG.2B.667.ZZM |
| | 306/307 | 1.3 | 0.80 | FGG.2B.567.ZZC | EGG.2B.667.ZZM |
| | 308/310 | 0.9 | 0.80 | FGG.2B.561.ZZC | EGG.2B.661.ZZM |
| | 308/310 | 0.9 | 0.45 | FGG.2B.562.ZZC | EGG.2B.662.ZZM |
| | 312/314/316 | 0.7 | 0.45 | FGG.2B.556.ZZC | EGG.2B.656.ZZM |
| | 318/319 | 0.7 | 0.45 | FGG.2B.556.ZZC | EGG.2B.656.ZZM |
| 2S | 306 | 1.3 | 1.10 | FGG.2B.566.ZZC | EGG.2B.666.ZZM |
| | 306 | 1.3 | 0.80 | FGG.2B.567.ZZC | EGG.2B.667.ZZM |
| 3B 3K | 303/304/309 | 2.0 | 1.90 | FGG.3B.576.ZZC | EGG.3B.676.ZZM |
| | 305/306/307 | 1.6 | 1.40 | FGG.3B.571.ZZC | EGG.3B.671.ZZM |
| | 308/309/310 | 1.3 | 1.10 | FGG.3B.566.ZZC | EGG.3B.666.ZZM |
| | 312/314 | 0.9 | 0.80 | FGG.3B.561.ZZC | EGG.3B.661.ZZM |
| | 316/318 | 0.9 | 0.80 | FGG.3B.561.ZZC | EGG.3B.661.ZZM |
| | 316/318 | 0.9 | 0.45 | FGG.3B.562.ZZC | EGG.3B.662.ZZM |
| | 320/322/324 | 0.7 | 0.45 | FGG.3B.556.ZZC | EGG.3B.656.ZZM |
| | 326/330 | 0.7 | 0.45 | FGG.3B.556.ZZC | EGG.3B.656.ZZM |
| 4B 4K | 306/307 | 2.0 | 1.90 | FGG.4B.576.ZZC | EGG.4B.676.ZZM |
| | 310 | 1.6 | 1.40 | FGG.4B.571.ZZC | EGG.4B.671.ZZM |
| | 312 | 1.3 | 1.10 | FGG.4B.566.ZZC | EGG.4B.666.ZZM |
| | 316/320 | 0.9 | 0.80 | FGG.4B.561.ZZC | EGG.4B.661.ZZM |
| | 324/330 | 0.9 | 0.80 | FGG.4B.561.ZZC | EGG.4B.661.ZZM |
| | 340/348 | 0.7 | 0.45 | FGG.4B.556.ZZC | EGG.4B.656.ZZM |
| 5B 5K | 314/316 | 2.0 | 1.90 | FGG.5B.576.ZZC | EGG.5B.676.ZZM |
| | 320 | 1.6 | 1.40 | FGG.5B.571.ZZC | EGG.5B.671.ZZM |
| | 330/340/348 | 1.3 | 1.10 | FGG.5B.566.ZZC | EGG.5B.666.ZZM |
| | 330/340/348 | 1.3 | 0.80 | FGG.5B.567.ZZC | EGG.5B.667.ZZM |
| | 350/354/364 | 0.9 | 0.80 | FGG.5B.561.ZZC | EGG.5B.661.ZZM |

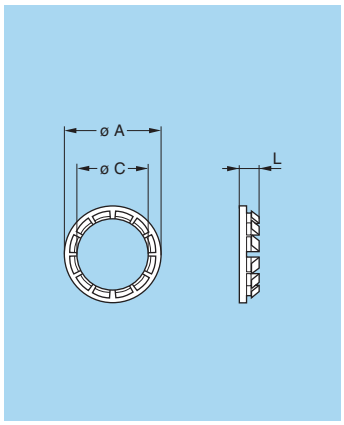



## GBA Locking washers

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | A | C | L |
| GBA.00.250.FN | 00 | 9.5 | 7.1 | 1.0 |
| GBA.0S.250.FN | 0S-0B | 12.5 | 9.1 | 1.0 |
| GBA.1S.250.FN | 1S-1B 1D | 16.0 | 12.1 | 1.0 |
| GBA.0E.250.FN | XB | 19.6 | 14.1 | 1.2 |
| GBA.1E.250.FN | 1E-1K | 21.8 | 16.1 | 1.2 |
| GBA.2S.250.FN | 2S-2B 2C-2G | 19.5 | 15.1 | 1.2 |
| GBA.3S.250.FN | 3S-3B | 25.0 | 18.1 | 1.4 |
| GBA.4S.250.FN | 4S-4B | 32.0 | 25.1 | 1.4 |

- Material: Nickel-plated bronze (3 µm)

**Note:** to order this accessory separately, use the above part numbers.

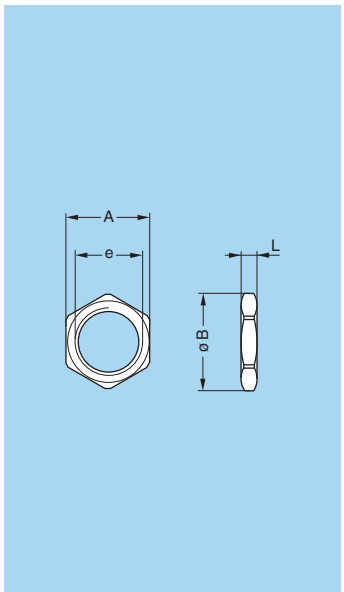



## GBB Tapered washers

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | A | C | L |
| GBB.00.250.LN | 00 | 9 | 7.1 | 2.0 |
| GBB.0S.250.LN | 0S-0B | 11 | 9.1 | 2.5 |
| GBB.1S.250.LN | 1S-1B | 15 | 12.1 | 3.5 |
| GBB.2S.250.LN | 2S-2B 2C-2G | 18 | 15.1 | 4.0 |
| GBB.3S.250.LN | 3S-3B | 22 | 18.1 | 4.5 |
| GBB.4S.250.LN | 4S-4B | 28 | 25.2 | 5.0 |
| GBB.5S.250.LN | 5S-5B | 40 | 35.2 | 7.5 |

- Material: Nickel-plated brass (3 µm)

**Note:** sockets of series 5B and 5S are always supplied with a tapered washer. To order this accessory separately, use the above part numbers.

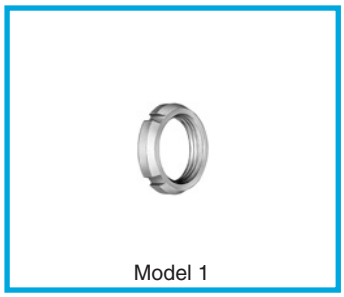


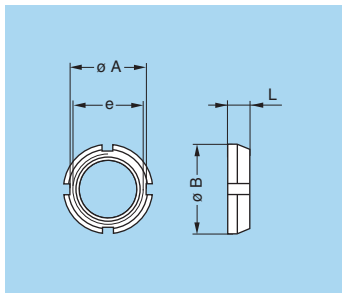

## GEA Hexagonal nuts

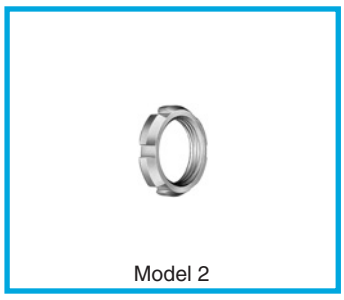
| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | e | L |
| GEA.00.240.LN | 00 | 9 | 10.2 | M7 x 0.50 | 2.0 |
| GEA.0S.240.LN | 0S-0B | 11 | 12.4 | M 9 x 0.60 | 2.0 |
| GEA.0S.241.LN | 0S-0B | 12 | 13.8 | M10 x 0.75 | 2.5 |
| GEA.0E.240.LN | 0E-0K-0L 1S-1B-XB | 17 | 19.2 | M14 x 1.00 | 2.5 |
| GEA.1S.240.LN | 1S-1B-1D | 14 | 15.8 | M12 x 1.00 | 2.5 |
| GEA.1E.240.LN | 1E-1K-1L 2S-2B | 19 | 21.5 | M16 x 1.00 | 3.0 |
| GEA.2S.240.LN | 2S-2B | 17 | 19.2 | M15 x 1.00 | 2.7 |
| GEA.2E.240.LN | 2E-2K-2L | 24 | 27.0 | M20 x 1.00 | 4.0 |
| GEA.3S.240.LN | 3S-3B | 22 | 25.0 | M18 x 1.00 | 3.0 |
| GEA.3E.240.LN | 3E-3K | 30 | 34.0 | M24 x 1.00 | 5.0 |
| GEA.4S.240.LN | 4S-4B | 30 | 34.0 | M25 x 1.00 | 5.0 |
| GEA.4E.240.LN | 4E-4K | 36 | 40.5 | M30 x 1.00 | 7.0 |

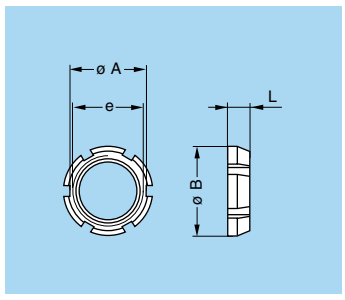
- Material:
  – Nickel-plated brass (3 µm)
  – Natural anodized aluminium alloy
  – Stainless steel

**Note:** to order this part separately, use the above part numbers. The last letters «LN» of the part number refer to the nut material and treatment. If a nut in aluminium alloy or stainless steel is desired, replace the last letters of the part number by «PT» or «AZ» respectively.



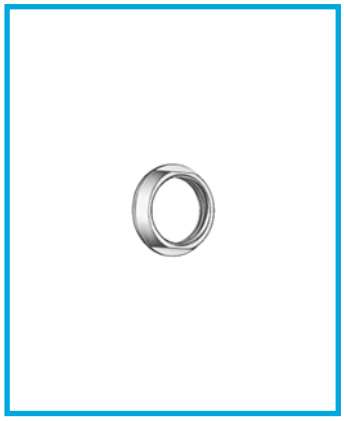



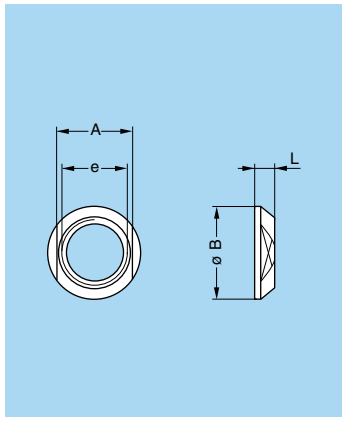

## GEG Notched nut

| Part number | Model | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | e | L |
| GEG.00.240.LC | 1 | 8.6 | 10 | M7 x 0.5 | 2.5 |
| GEG.0S.240.LC | 1 | 10.5 | 12 | M9 x 0.6 | 2.5 |
| GEG.0E.240.LC | 1 | 15.8 | 18 | M14 x 1.0 | 3.5 |
| GEG.1S.240.LC | 1 | 14.0 | 16 | M12 x 1.0 | 3.5 |
| GEG.1E.240.LC | 2 | 17.5 | 20 | M16 x 1.0 | 3.5 |
| GEG.1S.242.LC | 1 | 12.1 | 14 | M11 x 0.5 | 3.5 |
| GEG.2S.240.LC | 2 | 17.5 | 20 | M15 x 1.0 | 3.5 |
| GEG.2S.241.LC | 2 | 20.5 | 24 | M19 x 1.0 | 3.5 |
| GEG.2E.240.LC | 2 | 22.5 | 25 | M20 x 1.0 | 3.5 |

- Material: Chrome-plated brass (Ni 3 µm + Cr 0.3 µm)

**Note:** 00, 0B, 0S, 1B, 1S, 2B and 2S series fixed and free sockets for back panel mounting are always delivered with this notched nut.
To order this accessory separately, use the above part numbers.



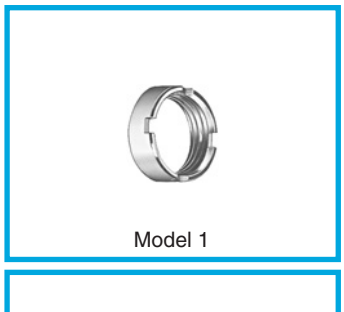


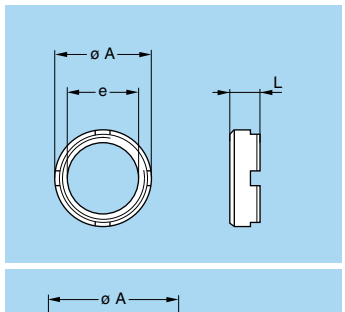

## GEC Conical nuts

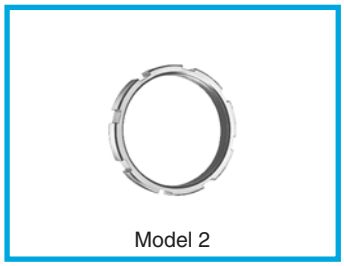
| Part number | Dimensions (mm) | | | |
|---|---|---|---|---|
| | A | B | e | L |
| GEC.00.240.LC | 8 | 10.0 | M7 x 0.5 | 2.5 |
| GEC.0S.240.LC | 10 | 12.0 | M9 x 0.6 | 2.5 |
| GEC.0E.240.LC | 16 | 18.0 | M14 x 1.0 | 3.0 |
| GEC.1S.240.LC | 13 | 16.0 | M12 x 1.0 | 3.2 |
| GEC.1S.241.LC | 17 | 20.0 | M16 x 1.0 | 4.0 |
| GEC.1S.242.LC | 12 | 14.0 | M11 x 0.5 | 3.2 |
| GEC.2S.240.LC | 17 | 20.0 | M15 x 1.0 | 3.8 |
| GEC.2S.241.LC | 20 | 24.0 | M19 x 1.0 | 5.8 |
| GEC.2E.240.LC | 22 | 25.0 | M20 x 1.0 | 5.0 |
| GEC.3S.240.LC | 20 | 24.0 | M18 x 1.0 | 4.5 |
| GEC.3E.240.LC | 27 | 30.0 | M24 x 1.0 | 4.5 |
| GEC.4S.240.LC | 27 | 30.0 | M25 x 1.0 | 4.5 |
| GEC.4K.241.LC | 32 | 35.5 | M30 x 1.0 | 5.0 |
| GEC.5S.240.LC | 37 | 41.0 | M35 x 1.0 | 5.0 |

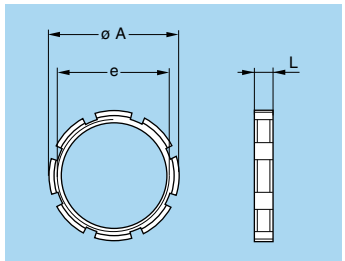
- Material: Chrome-plated brass (Ni 3 µm + Cr 0.3 µm)

**Note:** 3B, 3K, 3S, 3E, 4B, 4K, 4S, 4E, 5B, 5K, 5S, 5E, 6S and 6E series fixed and free sockets for back panel mounting are always delivered with a conical nut. To order this accessory separately, use the part numbers in the adjacent table.



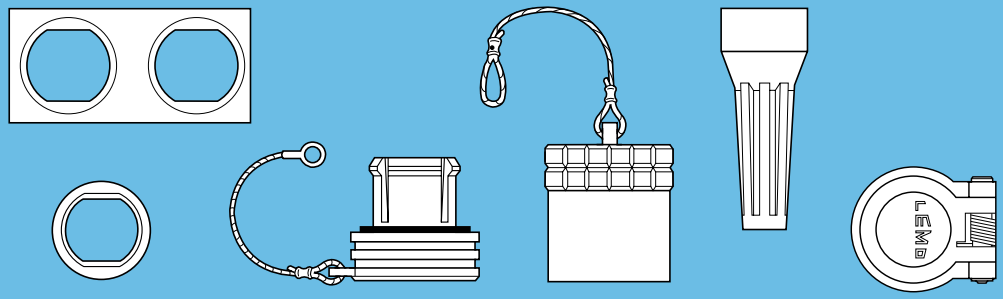




## GEB Round nuts

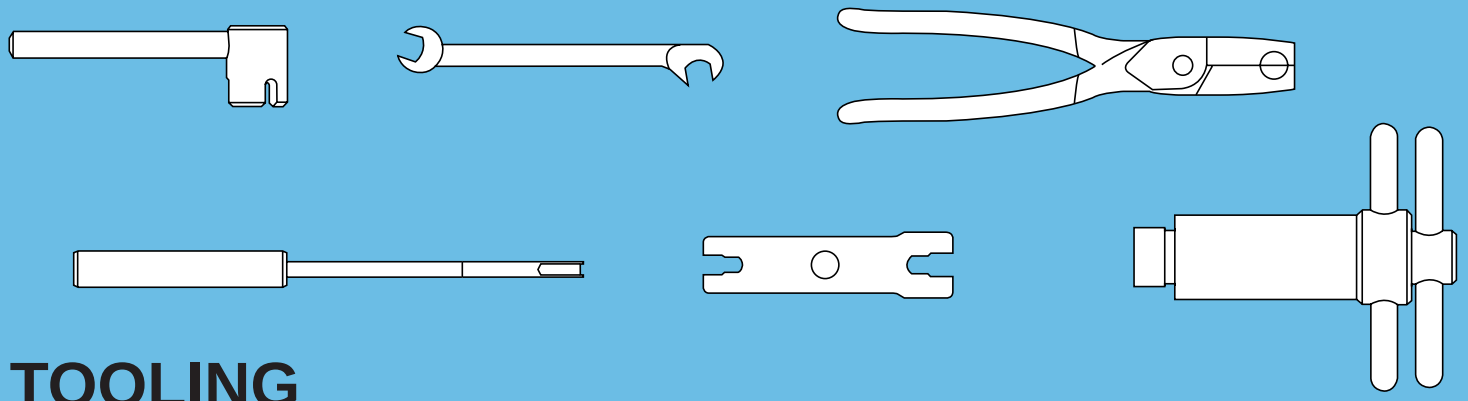
| Part number | Model | Dimensions (mm) | | |
|---|---|---|---|---|
| | | A | e | L |
| GEB.00.240.LN | 1 | 9.0 | M7 x 0.50 | 4.0 |
| GEB.0S.240.LN | 1 | 11.0 | M9 x 0.60 | 4.0 |
| GEB.0E.240.LN | 1 | 18.0 | M14 x 1.00 | 5.0 |
| GEB.1S.240.LN | 1 | 14.0 | M12 x 1.00 | 5.0 |
| GEB.1E.240.LN | 1 | 20.0 | M16 x 1.00 | 5.0 |
| GEB.2S.240.LN | 1 | 18.0 | M15 x 1.00 | 5.5 |
| GEB.2B.240.LN | 1 | 17.5 | M15 x 0.75 | 2.5 |
| GEB.3S.240.LN | 1 | 22.0 | M18 x 1.00 | 5.5 |
| GEB.4S.240.LN | 1 | 28.0 | M25 x 1.00 | 6.0 |
| GEB.5S.240.LN | 2 | 40.0 | M35 x 1.00 | 8.0 |
| GEB.5E.240.LN | 2 | 54.0 | M45 x 1.50 | 8.0 |
| GEB.6S.241.LN | 2 | 54.0 | M48 x 1.50 | 8.0 |
| GEB.6E.240.LN | 2 | 65.0 | M55 x 2.00 | 9.0 |

- Material: Nickel-plated brass (3 µm)

**Note:** 5B, 5K, 5S, 5E, 6S and 6E series sockets are always supplied with model 2 round nuts. To order this accessory separately, use the part numbers in the adjacent table.

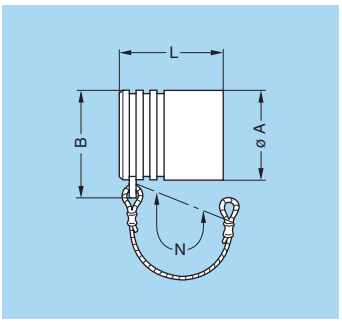


## ACCESSORIES



## TOOLING

# Accessories

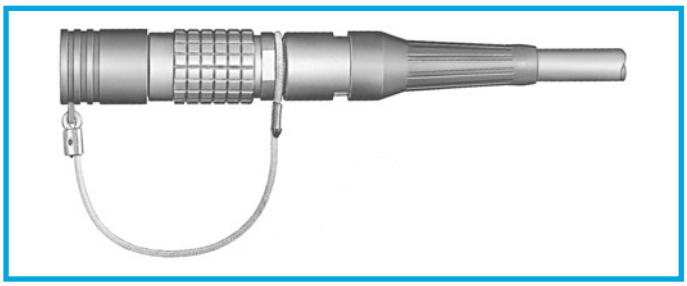



- Body material: Polyoxymethylene (POM) grey (or black)
- Cord material: Polyamide 6, grey (or black)
- Gasket material: Silicone rubber
- Maximum operating temperature: 100°C
- Watertightness: IP51 according to IEC 60529

## BFG Plug caps

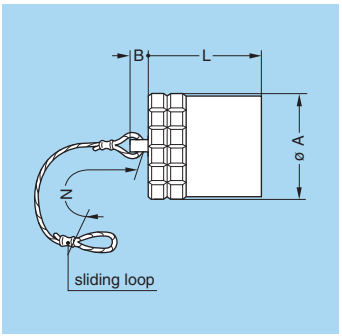
| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | L | N |
| BFG.00.100 PCSG | 00 | 7.5 | 9.8 | 10.0 | 60 |
| BFG.0B.100.PCSG | 0S-0B | 9.5 | 12.0 | 12.2 | 85 |
| BFG.1B.100.PCSG | 1S-1B 1D | 12.0 | 15.0 | 13.8 | 85 |
| BFG.2B.100.PCSG | 2S-2B | 15.0 | 18.0 | 15.0 | 85 |
| BFG.3B.100.PCSG | 3S-3B | 18.5 | 22.0 | 18.5 | 95 |

**Note:** this cap is available only with an alignment key (G). Upon request this cap can be supplied in black and the last letter «G» of the part number should be replaced with «N».



## Fitting the cord

Slide the plug into the loop of the cord.
Place the loop into the groove in front of the collet nut and tighten the loop.

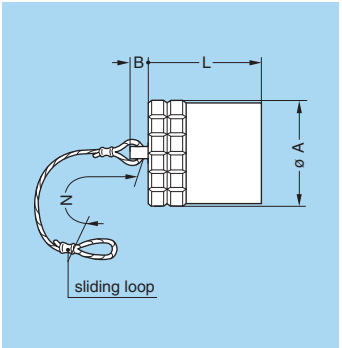



- Body material: Nickel-plated brass (Ni 3µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP68 according to IEC 60529 for E series

## BFA Plug caps

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | L | N |
| BFA.0E.100.NAS | 0E | 14.0 | 6 | 12.5 | 85 |
| BFA.1E.100.NAS | 1E | 16.0 | 6 | 15.5 | 85 |
| BFA.2E.100.NAS | 2E | 19.5 | 6 | 17.5 | 85 |
| BFA.3E.100.NAS | 3E | 23.0 | 6 | 22.0 | 120 |
| BFA.4E.100.NAS | 4E | 29.0 | 10 | 22.5 | 120 |
| BFA.4S.100.NAS | 4S | 25.0 | 10 | 22.2 | 120 |
| BFA.5E.100.NAS | 5E | 44.0 | 10 | 27.0 | 150 |
| BFA.5S.100.NAS | 5S | 36.0 | 10 | 30.2 | 150 |
| BFA.6S.100.NAS | 6S | 46.0 | 10 | 33.0 | 150 |

**Note:** the last letter «S» of the part number stands for the material of the O-ring (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

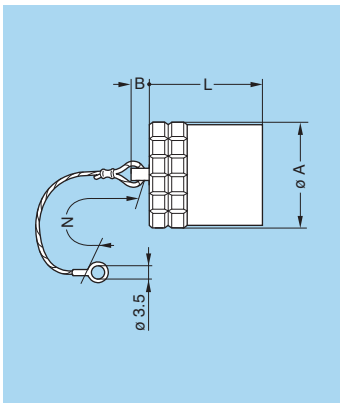



- Body material: Nickel-plated brass (Ni 3µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP68 according to IEC 60529 for E and K series

## BFG Plug caps with key (G)

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | L | N |
| BFG.0K.100.NAS | 0K-0L | 14.0 | 6 | 12.5 | 85 |
| BFG.1K.100.NAS | 1K-1L | 16.0 | 6 | 15.5 | 85 |
| BFG.2K.100.NAS | 2K-2L | 19.5 | 6 | 17.5 | 85 |
| BFG.3K.100.NAS | 3K | 23.0 | 6 | 22.0 | 120 |
| BFG.4B.100.NAS | 4B | 25.0 | 10 | 20.2 | 120 |
| BFG.4K.100.NAS | 4K | 29.0 | 10 | 22.5 | 120 |
| BFG.5B.100.NAS | 5B | 36.0 | 10 | 27.2 | 150 |
| BFG.5K.100.NAS | 5K | 44.0 | 10 | 27.0 | 150 |
| BFG.6E.100.NAS | 6E | 54.0 | 10 | 31.0 | 150 |

**Note:** this cap is available only with an alignment key (G). The last letter «S» of the part number stands for the material of the O-ring (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

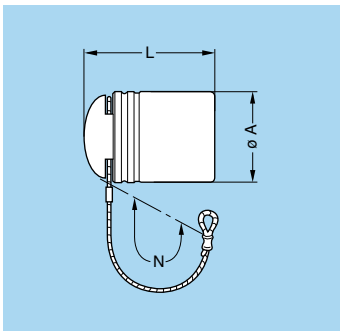



## BHG Plug caps, nut fixing or flange

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | L | N |
| BHG.0K.100.NAS | 0K-0L | 14.0 | 6 | 12.5 | 85 |
| BHG.1K.100.NAS | 1K-1L | 16.0 | 6 | 15.5 | 85 |
| BHG.2K.100.NAS | 2K-2L | 19.5 | 6 | 17.5 | 85 |
| BHG.3K.100.NAS | 3K | 23.0 | 6 | 22.0 | 120 |
| BHG.4B.100.NAS | 4B | 25.0 | 10 | 20.2 | 120 |
| BHG.4K.100.NAS | 4K | 29.0 | 10 | 22.5 | 120 |
| BHG.5B.100.NAS | 5B | 36.0 | 10 | 27.2 | 150 |
| BHG.5K.100.NAS | 5K | 44.0 | 10 | 27.0 | 150 |
| BHG.6E.100.NAS | 6E | 54.0 | 10 | 31.0 | 150 |

- Body material: Nickel-plated brass (Ni 3µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP68 according to IEC 60529 for E and K series

**Note:** this cap is available only with an alignment key (G). The last letter «S» of the part number stands for the material of the O-ring (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

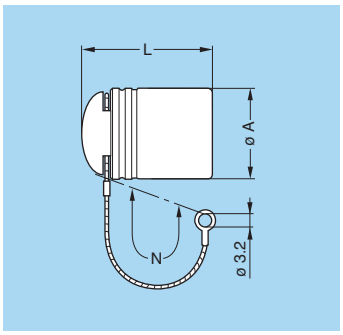



## BFG Plug cap

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | A | L | N |
| BFG.3K.100.EAN | 3K | 26 | 31 | 155 |

- Material: black ALCRYN®
- Lanyard material: Stainless steel
- Crimp ferrule material: Stainless steel AISI 304 + polyolefin

**Note:** These caps are suitable for use with any alignment key configuration.

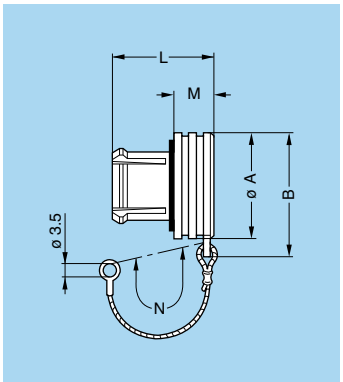



## BHA Plug cap

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | A | L | N |
| BHA.3K.100.EAN | 3K | 26 | 31 | 120 |

- Material: black ALCRYN®
- Lanyard material: Stainless steel
- Crimp ferrule material: Stainless steel AISI 304 + polyolefin

**Note:** These caps are suitable for use with any alignment key configuration.

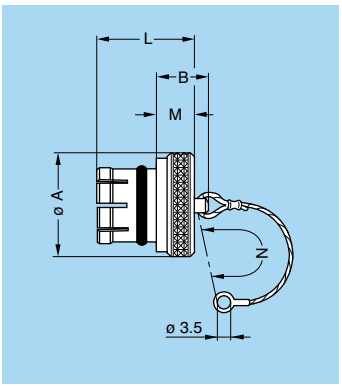



## BRA Blanking caps for fixed sockets and free straight sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRA.00.200.PCSG | 00 | 7.5 | 9.8 | 9.0 | 3.5 | 60 |
| BRA.0B.200.PCSG | 0S-0B | 10.0 | 12.5 | 11.0 | 4.8 | 60 |
| BRA.1B.200.PCSG | 1S-1B 1D | 14.0 | 17.0 | 13.5 | 5.6 | 60 |
| BRA.2B.200.PCSG | 2S-2B 2C-2G | 18.0 | 21.0 | 14.5 | 6.0 | 60 |
| BRA.3B.200.PCSG | 3S-3B | 22.0 | 25.5 | 17.0 | 7.0 | 60 |

- Body material: Polyoxymethylene (POM) grey (or black)
- Cord material: Polyamide 6, grey (or black)
- Gasket material: Silicone rubber
- Maximum operating temperature: 100°C
- Watertightness: IP61 according to IEC 60529

**Note:** these caps are suitable for use with any alignment key configuration. On request this cap can be supplied in black. If so, replace the last letter «G» of the part number by «N».

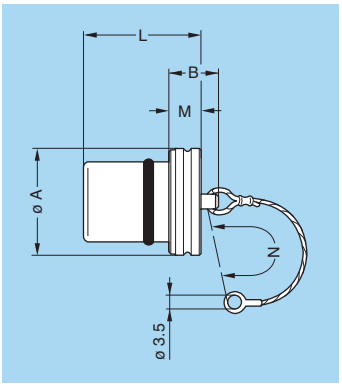



## BRE Blanking caps for fixed sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRE.00.200.NAS | 00 | 8 | 7.5 | 8.8 | 3.5 | 60 |
| BRE.0S.200.NAS | 0S-0B | 10 | 9.5 | 10.5 | 4.5 | 85 |
| BRE.1S.200.NAS | 1S-1B 1D | 14 | 11.0 | 12.5 | 5.0 | 85 |
| BRE.2S.200.NAS | 2S-2B | 18 | 12.0 | 14.0 | 6.0 | 85 |
| BRE.3S.200.NAS | 3S-3B | 22 | 14.0 | 18.0 | 8.0 | 120 |
| BRE.4S.200.NAS | 4S-4B | 28 | 20.0 | 23.0 | 10.0 | 120 |
| BRE.5S.200.NAS | 5S-5B | 40 | 22.0 | 30.0 | 12.0 | 150 |
| BRE.6S.200.NAS | 6S | 54 | 22.0 | 30.0 | 12.0 | 150 |
| BRE.6E.200.NAS | 6E | 57 | 24.0 | 31.5 | 14.0 | 150 |

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP61 according to IEC 60529 for S series

**Note:** these caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the O-ring material (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

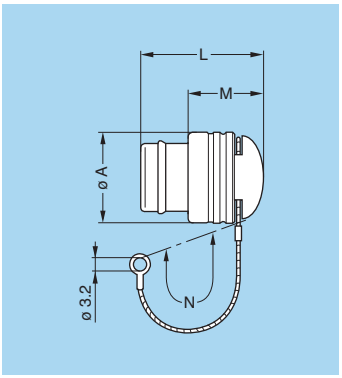



## BRE Blanking caps for fixed sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRE.0K.200.NAS | 0K-0E-0L | 15.0 | 10 | 15.0 | 4 | 85 |
| BRE.1K.200.NAS | 1K-1E-1L | 17.0 | 12 | 20.0 | 6 | 85 |
| BRE.2K.200.NAS | 2K-2E-2L | 20.5 | 14 | 24.0 | 8 | 85 |
| BRE.3K.200.NAS | 3K-3E | 24.0 | 14 | 28.0 | 8 | 120 |
| BRE.4K.200.NAS | 4K-4E | 30.0 | 20 | 30.5 | 10 | 120 |
| BRE.5K.200.NAS | 5K-5E | 44.0 | 22 | 37.0 | 12 | 150 |

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP68 according to IEC 60529

**Note:** these caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the O-ring material (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

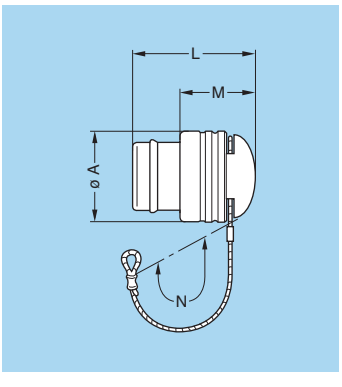



## BRA Blanking caps for fixed sockets

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | L | M | N |
| BRA.3K.200.EAN | 3K | 26 | 27 | 14.5 | 120 |
| BRA.4K.200.EAN | 4K | 31 | 31 | 17.0 | 120 |

- Material: black ALCRYN®
- Lanyard material: Stainless steel
- Crimp ferrule material: Stainless steel AISI 304 + polyolefin

**Note:** These caps are suitable for use with any alignment key configuration.

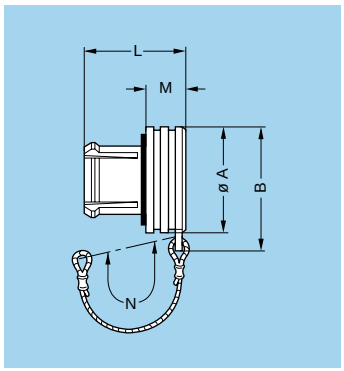



## BRF Blanking caps for free sockets

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | L | M | N |
| BRF.3K.200.EAN | 3K | 26 | 27 | 14.5 | 155 |

- Material: black ALCRYN®
- Lanyard material: Stainless steel
- Crimp ferrule material: Stainless steel AISI 304 + polyolefin

**Note:** These caps are suitable for use with any alignment key configuration.

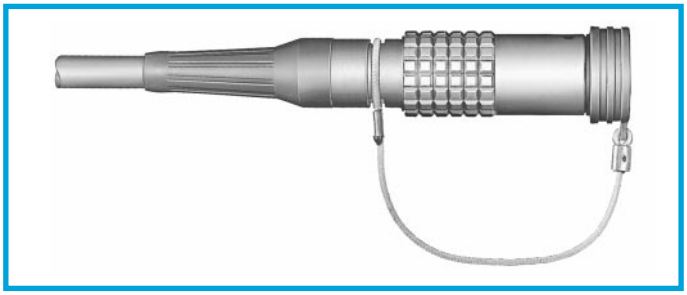



## BRD Blanking caps for free sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRD.00.200.PCSG | 00 | 7.5 | 9.8 | 9.0 | 3.5 | 85 |
| BRD.0B.200.PCSG | 0S-0B | 10.0 | 12.5 | 11.0 | 4.8 | 85 |
| BRD.1B.200.PCSG | 1S-1B 1D | 14.0 | 17.0 | 13.5 | 5.6 | 85 |
| BRD.2B.200.PCSG | 2S-2B | 18.0 | 21.0 | 14.5 | 6.0 | 85 |
| BRD.3B.200.PCSG | 3S-3B | 22.0 | 25.5 | 17.0 | 7.0 | 95 |

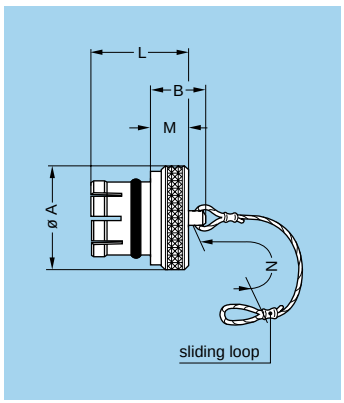
- Body material: Polyoxymethylene (POM) grey (or black)
- Cord material: Polyamide 6, grey (or black)
- Gasket material: Silicone rubber
- Maximum operating temperature: 100°C
- Watertightness: IP61 according to IEC 60529

**Note:** on request this cap is available in black. If required, replace the last letter «G» of the part number by «N».



### Fitting the cord

Slide the socket into the loop of the cord.
Place the loop into the groove in front of the collet nut.
Tighten the loop.

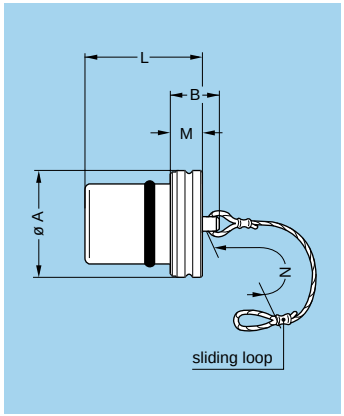



## BRF Blanking caps for free sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRF.00.200.NAS | 00 | 8 | 7.5 | 8.8 | 3.5 | 85 |
| BRF.0S.200.NAS | 0S-0B | 10 | 9.5 | 10.5 | 4.5 | 85 |
| BRF.1S.200.NAS | 1S-1B 1D | 14 | 11.0 | 12.5 | 5.0 | 85 |
| BRF.2S.200.NAS | 2S-2B | 18 | 12.0 | 14.0 | 6.0 | 85 |
| BRF.3S.200.NAS | 3S-3B | 22 | 14.0 | 18.0 | 8.0 | 120 |
| BRF.4S.200.NAS | 4S-4B | 28 | 20.0 | 23.0 | 10.0 | 120 |
| BRF.5S.200.NAS | 5S-5B | 40 | 22.0 | 30.0 | 12.0 | 150 |
| BRF.6S.200.NAS | 6S | 54 | 22.0 | 30.0 | 12.0 | 150 |

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP61 according to IEC 60529 for S series

**Note:** these caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the O-ring material (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

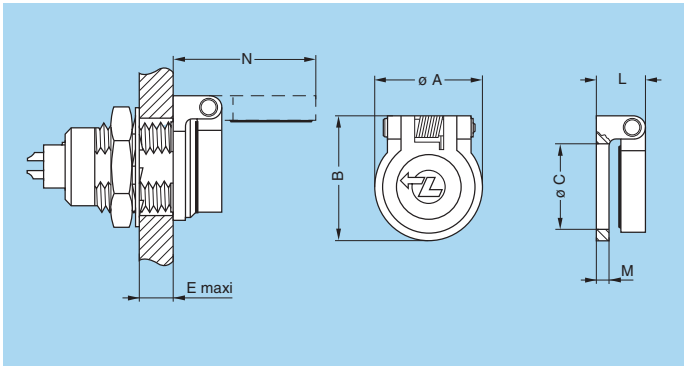



## BRF Blanking caps for free sockets

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | A | B | L | M | N |
| BRF.0K.200.NAS | 0K-0E-0L | 15.0 | 10 | 15.0 | 4 | 85 |
| BRF.1K.200.NAS | 1K-1E-1L | 17.0 | 12 | 20.0 | 6 | 85 |
| BRF.2K.200.NAS | 2K-2E-2L | 20.5 | 14 | 24.0 | 8 | 85 |
| BRF.3K.200.NAS | 3K-3E | 24.0 | 14 | 28.0 | 8 | 120 |
| BRF.4K.200.NAS | 4K-4E | 30.0 | 20 | 30.5 | 10 | 120 |
| BRF.5K.200.NAS | 5K-5E | 44.0 | 22 | 37.0 | 12 | 150 |

**Note:** these caps are suitable for use with any alignment key configuration. The last letter «S» of the part number stands for the O-ring material (silicone rubber). O-ring's made from FPM are also available; if required, replace the letter «S» by «V».

- Body material: Nickel-plated brass (Ni 3 µm)
- Lanyard material: Stainless steel
- Crimp ferrule material: Nickel-plated brass + polyolefin
- O-ring material: Silicone rubber or FPM
- Maximum operating temperature: 135°C
- Watertightness: IP68 according to IEC 60529

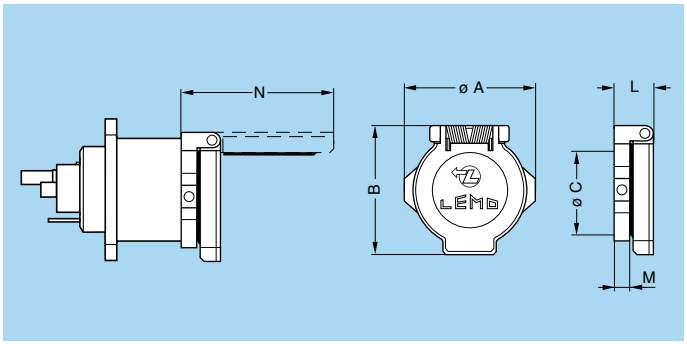



## BRR Spring loaded dust caps for ERA, ERN and EG● sockets or PSA and PK● fixed sockets

| Part number | Series | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | E | L | M | N |
| BRR.0S.200.PZVG | 0S-0B | 11.0 | 13.3 | 9.0 | 5.8 | 5.0 | 1.2 | 15.3 |
| BRR.1S.200.PZVG | 1S-1B 1D | 14.2 | 17.1 | 12.0 | 6.0 | 6.3 | 1.5 | 20.3 |
| BRR.2S.200.PZVG | 2S-2B 2C-2G | 18.6 | 22.4 | 15.2 | 6.5 | 8.2 | 2.0 | 26.2 |
| BRR.3S.200.PZVG | 3S-3B | 22.5 | 26.5 | 18.2 | 9.0 | 8.8 | 2.5 | 30.8 |

**Note:** On request, this cap is available in black, blue or white. If so replace the last letter «G» of the part number by «N», «A» or «B».

- Body material: PSU
- Gasket material: FKM
- Spring material: Stainless steel
- Axes material: Nickel-plated brass
- Maximum operating temperature: 100°C
- Watertightness: IP61 according to IEC 60529

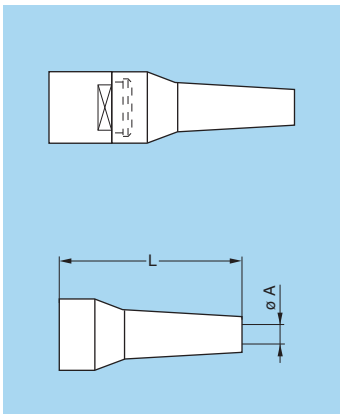



## BRR Spring loaded dust cap for ED● and EB● fixed sockets

| Part number | Series | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | A | B | C | L | M | N |
| BRR.3K.200.PZSG | 3K | 29 | 29 | 23 | 8.1 | 3 | 33.2 |

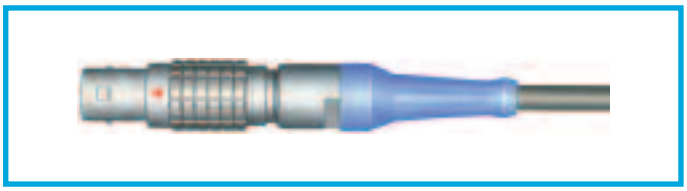
**Note:** Use Allen key (0.9 mm flat) to secure cap on connector.

- Cap material: Polyoxymethylene (POM) grey
- Body material: Nickel-plated brass
- Gasket material: Silicone rubber
- Spring material: Stainless steel
- Axes material: Nickel-plated brass
- Maximum operating temperature: 100°C
- Watertightness: IP61 according to IEC 60529




## GM● Bend relief (TPU)

A bend relief made from thermoplastic polyurethane elastomer can be fitted over LEMO plugs and sockets that are supplied with nut for fitting such bend relief.
They are available in nine different colours match with the GRA insulating washers (see page 144).
Use the part numbers shown below to order this accessory separately.



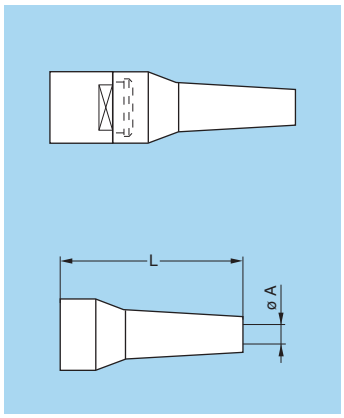
### Main characteristics

- Material: TPU (Thermoplastic Polyurethane)
- Temperature range in dry atmosphere: -40°C +80°C

| Part number | Dimensions (mm) | | | | Series |
|---|---|---|---|---|---|
| | Bend relief | | Cable ø | | |
| | A | L | max. | min. | |
| GMA.00.012.DG | 1.2 | 22 | 1.4 | 1.1 | 00 |
| GMA.00.018.DG | 1.8 | 22 | 2.1 | 1.8 | |
| GMB.00.025.DG | 2.5 | 22 | 2.8 | 2.5 | |
| GMB.00.028.DG | 2.8 | 22 | 3.1 | 2.8 | |
| GMB.00.032.DG | 3.2 | 22 | 3.5 | 3.2 | |
| GMD.00.025.DG | 2.5 | 22 | 2.8 | 2.5 | |
| GMD.00.028.DG | 2.8 | 22 | 3.1 | 2.8 | |
| GMD.00.032.DG | 3.2 | 22 | 3.5 | 3.2 | |
| GMA.0B.025.DG | 2.5 | 24 | 2.9 | 2.5 | 0B |
| GMA.0B.030.DG | 3.0 | 24 | 3.4 | 3.0 | |
| GMA.0B.035.DG | 3.5 | 24 | 3.9 | 3.5 | 0S |
| GMA.0B.040.DG | 4.0 | 24 | 4.4 | 4.0 | |
| GMA.0B.045.DG | 4.5 | 24 | 5.2 | 4.5 | 0E-0K-0L |
| GMA.1B.025.DG | 2.5 | 30 | 2.9 | 2.5 | 1B-XB 1D |
| GMA.1B.030.DG | 3.0 | 30 | 3.4 | 3.0 | |
| GMA.1B.035.DG | 3.5 | 30 | 3.9 | 3.5 | |
| GMA.1B.040.DG | 4.0 | 30 | 4.4 | 4.0 | 1S |
| GMA.1B.045.DG | 4.5 | 30 | 4.9 | 4.5 | |
| GMA.1B.054.DG | 5.4 | 30 | 6.0 | 5.4 | 1E-1K-1L |
| GMA.1B.065.DG | 6.5 | 30 | 7.0 | 6.5 | |

| Part number | Dimensions (mm) | | | | Series |
|---|---|---|---|---|---|
| | Bend relief | | Cable ø | | |
| | A | L | max. | min. | |
| GMA.2B.040.DG | 4.0 | 36 | 4.5 | 4.0 | 2B |
| GMA.2B.045.DG | 4.5 | 36 | 5.0 | 4.5 | |
| GMA.2B.050.DG | 5.0 | 36 | 5.5 | 5.0 | 2S |
| GMA.2B.060.DG | 6.0 | 36 | 6.5 | 6.0 | |
| GMA.2B.070.DG | 7.0 | 36 | 7.7 | 7.0 | 2E-2K-2L |
| GMA.2B.080.DG | 7.8 | 36 | 8.8 | 7.8 | 2C-2G |
| GMA.3B.050.DG | 4.5 | 42 | 5.2 | 4.5 | 3S |
| GMA.3B.060.DG | 6.0 | 42 | 6.9 | 6.0 | |
| GMA.3B.070.DG | 7.0 | 42 | 7.9 | 7.0 | 3B |
| GMA.3B.080.DG | 8.0 | 42 | 8.9 | 8.0 | |
| GMA.3B.090.DG | 9.0 | 42 | 10.0 | 9.0 | 3E-3K |
| | | | | | 4S |
| GMA.4B.080.DG | 8.0 | 60 | 9.0 | 8.0 | 4S |
| GMA.4B.010.DG | 10.0 | 60 | 10.9 | 10.0 | |
| GMA.4B.011.DG | 11.0 | 60 | 11.9 | 11.0 | 4B |
| GMA.4B.012.DG | 12.0 | 60 | 13.0 | 12.0 | |
| GMA.4B.013.DG | 13.5 | 60 | 14.5 | 13.5 | 4E-4K |

**Note:** The «GMD» are thin bend reliefs (for very flexible cables).
The last letter «G» of the part number indicates the grey colour of the bend relief. For ordering a bend relief with another colour, see table on page 142 and replace the letter «G» by the letter of the required colour.
See also detailed information for each series: B series on page 54: K series on page 54; S series on page 107; E series on page 107.




## GMA Bend relief (Silicone)

A bend relief has been designed for connectors used in applications at high temperature or requiring vapour sterilization.
These bend reliefs are different from previous ones as for their material, a silicone elastomer which is noted for its retention of flexibility over a wide temperature range. They are available in nine colours.
Use the part numbers shown below to order this accessory separately.

### Main characteristics

- Material: Silicone elastomer VMQ
- Temperature range in dry atmosphere: -60°C +200°C
- Temperature range in water steam: +140°C

| Part number | Dimensions (mm) | | | | Series |
|---|---|---|---|---|---|
| | Bend relief | | Cable ø | | |
| | A | L | max. | min. | |
| GMA.0B.025.RG | 2.5 | 27 | 2.9 | 2.5 | 0B |
| GMA.0B.030.RG | 3.0 | 27 | 3.4 | 3.0 | |
| GMA.0B.035.RG | 3.5 | 27 | 3.9 | 3.5 | 0S |
| GMA.0B.040.RG | 4.0 | 27 | 4.4 | 4.0 | |
| GMA.0B.045.RG | 4.5 | 27 | 5.2 | 4.5 | 0E-0K-0L |
| GMA.1B.025.RG | 2.5 | 34 | 2.9 | 2.5 | 1B-1D |
| GMA.1B.030.RG | 3.0 | 34 | 3.4 | 3.0 | |
| GMA.1B.035.RG | 3.5 | 34 | 3.9 | 3.5 | |
| GMA.1B.040.RG | 4.0 | 34 | 4.4 | 4.0 | 1S |
| GMA.1B.045.RG | 4.5 | 34 | 5.0 | 4.5 | |
| GMA.1B.051.RG | 5.1 | 34 | 5.6 | 5.1 | |
| GMA.1B.057.RG | 5.7 | 34 | 6.2 | 5.7 | 1E-1K-1L |
| GMA.1B.063.RG | 6.3 | 34 | 7.0 | 6.3 | |

| Part number | Dimensions (mm) | | | | Series |
|---|---|---|---|---|---|
| | Bend relief | | Cable ø | | |
| | A | L | max. | min. | |
| GMA.2B.040.RG | 4.0 | 41 | 4.4 | 4.0 | 2B |
| GMA.2B.045.RG | 4.5 | 41 | 5.0 | 4.5 | |
| GMA.2B.051.RG | 5.1 | 41 | 5.6 | 5.1 | 2S |
| GMA.2B.057.RG | 5.7 | 41 | 6.2 | 5.7 | |
| GMA.2B.063.RG | 6.3 | 41 | 7.0 | 6.3 | 2E-2K-2L |
| GMA.2B.071.RG | 7.1 | 41 | 7.9 | 7.1 | |
| GMA.2B.080.RG | 8.0 | 41 | 9.0 | 8.0 | 2C-2G |

**Note:** the last letter «G» of the part number indicates the grey colour of the bend relief. For ordering a bend relief with another colour, see table on page 142 and replace the letter «G» by the letter of the required colour.
See also detailed information for each series: B series on page 54: K series on page 54; S series on page 107; E series on page 107.

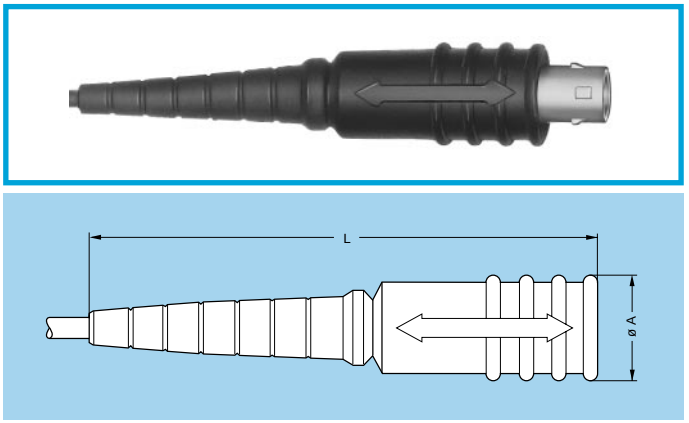
**Note:** the selection of pigments, which should remain stable at high temperature, is limited by the new regulations. For this reason, some colours will be a shade different from those used for Desmopan bend reliefs. The selected solutions represent the best possible compromise.

| Ref. | Colour |
|---|---|
| A | blue |
| B | white |
| G | grey |
| J | yellow |
| M | brown |

| Ref. | Colour |
|---|---|
| N | black |
| R | red |
| S | orange |
| V | green |
| | |

## GM● Overall bend relief for plugs and sockets

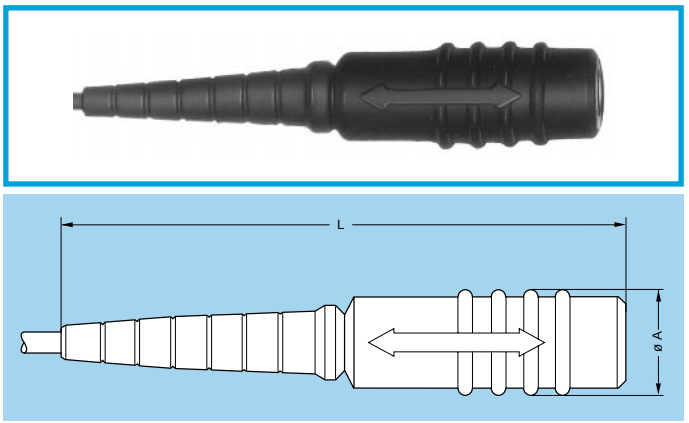
Overall bend reliefs, type GMF for plugs and GMP for sockets offer optimum protection against mechanical damage and give a protection index of IP65 according to IEC 60529 (mated position). These bend reliefs slide easily over the connector shell and are positioned by slightly pressing the bend relief backnut.
The special design of the bend relief for plug provides for easy use of the push-pull self-latching system.




### GMF Bend relief for straight plug

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | Bend relief | | Cable ø | |
| | | A | L | max. | min. |
| GMF.0B.035.060EN | 0S-0B | 11.0 | 60.5 | 3.5 | 1.0 |
| GMF.1B.062.072EN | 1S-1B | 16.0 | 72.0 | 6.2 | 2.5 |
| GMF.2B.082.095EN | 2S-2B | 22.0 | 95.0 | 8.2 | 5.0 |

- Material: Elastomer rubber black colour
- Operating temperature: -30°C to +120°C



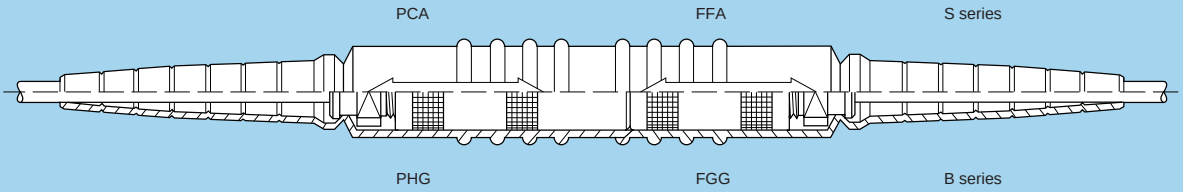

### GMP Bend relief for free socket

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | Bend relief | | Cable ø | |
| | | A | L | max. | min. |
| GMP.0B.035.069EN | 0S-0B | 11.0 | 69.0 | 3.5 | 1.0 |
| GMP.1B.062.079EN | 1S-1B | 16.0 | 80.0 | 6.2 | 2.5 |
| GMP.2B.082.102EN | 2S-2B | 21.0 | 102.5 | 8.2 | 5.0 |

- Material: Elastomer rubber black colour
- Operating temperature: -30°C to +120°C

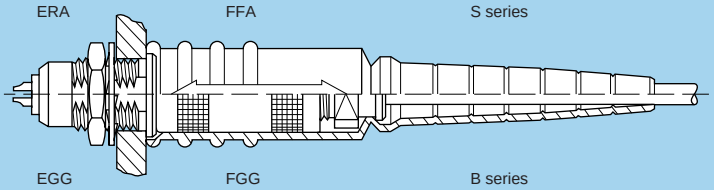
– The overall bend relief shall be installed over plug or free socket fitted with a nut for bend relief.
– The typical applications are shown below.
– The overall bend relief can be cut at different length depending on cable diameter.

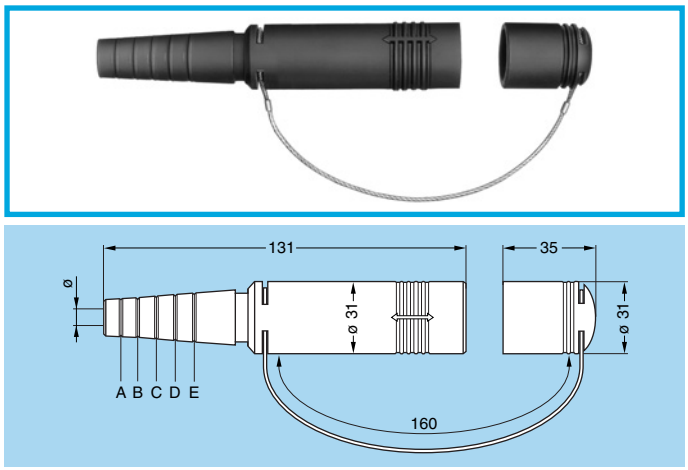
Plug-free socket




Plug-fixed socket

Optimum protection is offered only when using front panel mounting fixed sockets

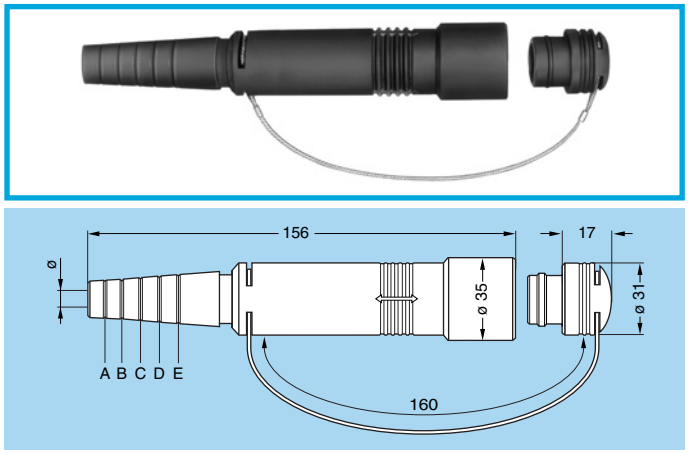





## GMF Bend relief with cap for plug

| Part number | Series | For models | Cut | admissible ø (mm) | |
|---|---|---|---|---|---|
| | | | | min. | max. |
| GMF.4K.080.EANZ | 4E | FFA | – | 8.0 | 8.9 |
| | | | A | 9.0 | 9.9 |
| | | | B | 10.0 | 11.4 |
| | 4K | FGG | C | 11.5 | 12.9 |
| | | | D | 13.0 | 14.9 |
| | | | E | 15.0 | 16.5 |

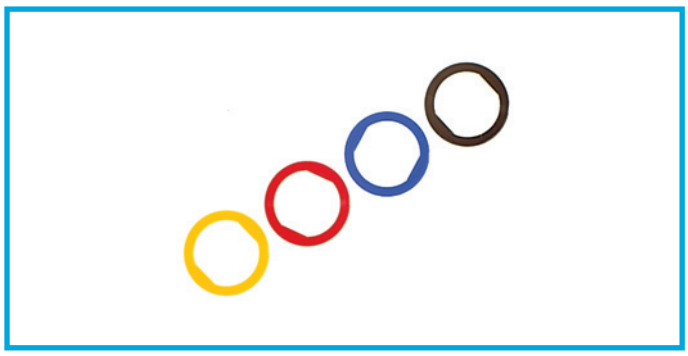
- Material: Black EPDM

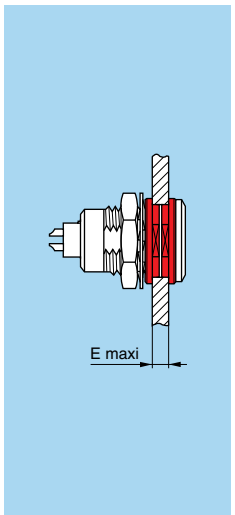


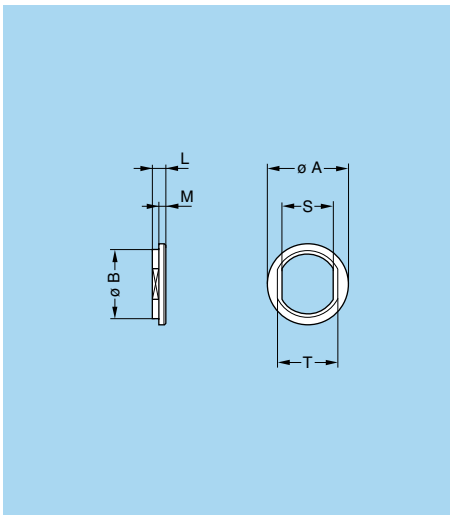

## GMP Bend relief with cap for free socket

| Part number | Series | For models | Cut | admissible ø (mm) | |
|---|---|---|---|---|---|
| | | | | min. | max. |
| GMP.4K.080.EANZ | 4E | PCA | – | 8.0 | 8.9 |
| | | | A | 9.0 | 9.9 |
| | | | B | 10.0 | 11.4 |
| | 4K | PHG | C | 11.5 | 12.9 |
| | | | D | 13.0 | 14.9 |
| | | | E | 15.0 | 16.5 |

- Material: Black EPDM






- Material: Polyamide
- Maximum operating temperature: 90° C

## GRA Insulating washers

Sockets or plugs mounted on panels can be fitted with insulating washers. The nine colours available combined with those for the bend reliefs makes colour coding possible.

| Part number | Series | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | E | L | M | S | T |
| GRA.00.269.GG | 00 | 10.0 | 8.8 | 4.5 | 1.8 | 1.0 | 6.4 | 8.0 |
| GRA.0S.269.GG | 0S-0B | 12.0 | 10.8 | 6.0 | 1.8 | 1.0 | 8.3 | 9.9 |
| GRA.1S.269.GG | 1S-1B | 16.0 | 13.8 | 6.5 | 1.8 | 1.0 | 10.6 | 12.2 |
| GRA.2S.269.GG | 2S-2B | 21.1 | 17.9 | 7.3 | 2.3 | 1.3 | 13.6 | 16.2 |
| GRA.3S.269.GG | 3S-3B | 25.0 | 21.8 | 10.3 | 2.2 | 1.2 | 16.7 | 20.2 |
| GRA.4S.269.GG | 4S-4B | 31.9 | 28.7 | 10.5 | 2.5 | 1.5 | 23.6 | 27.1 |

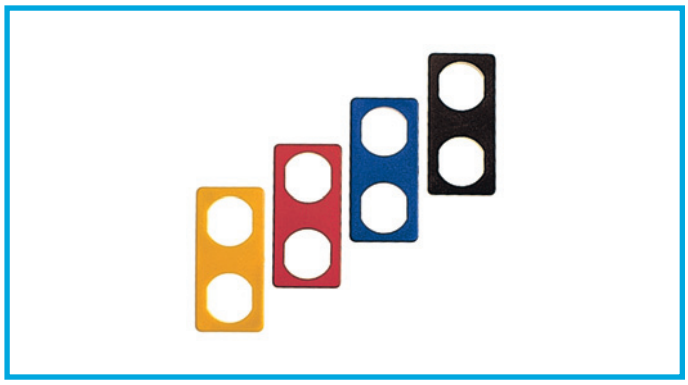
**Note:** insulating washers for series 5B are available on request.

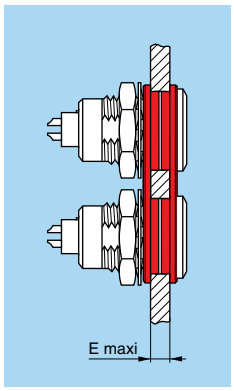
**Caution:** these insulating washers can be used with fixed and free sockets with across flat dimension S1 equivalent to the S dimension of the washer.

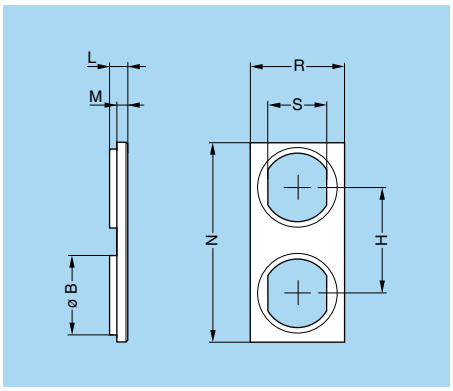
| Ref. | Colour |
|---|---|
| A | blue |
| B | white |
| G | grey |
| J | yellow |
| M | brown |

| Ref. | Colour |
|---|---|
| N | black |
| R | red |
| S | orange |
| V | green |
| | |

**Note:** the last letter «G» of the part number indicates the colour grey for the insulating washer. To obtain an insulating washer of another colour, refer to the table above and change the letter «G» of the part number to the corresponding letter of the colour required.
For the panel cut-out, please consult chapter «Panel cut-out» on page 153.






- Material: Polyamide
- Maximum operating temperature: 90° C

## GRC Double panel washers

Double panel washers have been designed to make the drilling of panel holes easier for mounting fixed and free sockets. The combination of the nine different colours of the double panel washers and of the bend reliefs makes colour coding possible.

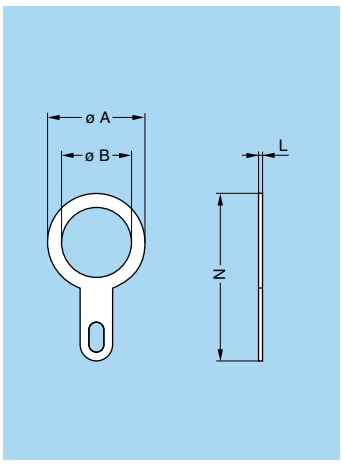
| Part number | Series | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | E | H | L | M | N | R | S |
| GRC.0S.260.HG | 0S-0B | 10.9 | 5 | 14 | 2.5 | 1.5 | 26.5 | 12.5 | 8.3 |
| GRC.1B.260.HG | 1S-1B | 13.9 | 5 | 20 | 3.3 | 1.8 | 34.5 | 14.5 | 10.6 |

**Caution:** these double panel washers can be used with fixed or free sockets with across flat dimension S1 equivalent to the S dimension of the washer.

| Ref. | Colour |
|---|---|
| A | blue |
| B | white |
| G | grey |
| J | yellow |
| M | brown |

| Ref. | Colour |
|---|---|
| N | black |
| R | red |
| S | orange |
| V | green |
| | |

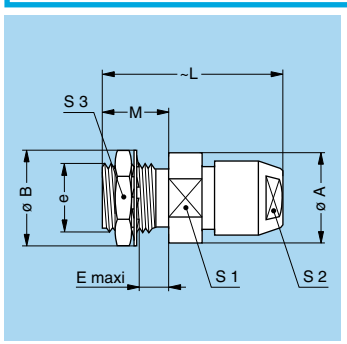
**Note:** the last letter «G» of the washer's part number indicates the colour grey. For other colours, refer to the above table and replace letter «G» by the one corresponding to the colour required.
For the panel cut-out, please consult chapter «Panel cut-out» on page 153.

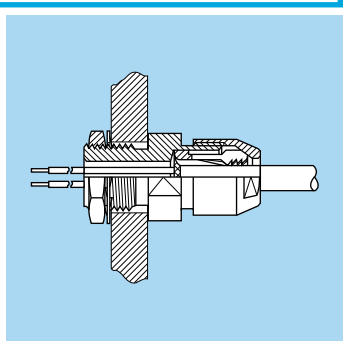



- Material: CuSnZn plated brass (2 µm)

## GCA Earthing washer

| Part number | Series | Dimensions (mm) | | | |
|---|---|---|---|---|---|
| | | A | B | L | N |
| GCA.00.255.LT | 00 | 9.5 | 7.1 | 0.4 | 18.2 |
| GCA.0S.255.LT | 0S-0B | 13.0 | 9.1 | 0.4 | 22.0 |
| GCA.0E.255.LT | 0E-0K | 17.0 | 14.1 | 0.5 | 27.5 |
| GCA.1S.255.LT | 1S-1B | 17.0 | 12.2 | 0.5 | 27.5 |
| GCA.1E.255.LT | 1E-1K | 20.0 | 16.2 | 0.5 | 32.0 |
| GCA.2S.255.LT | 2S-2B | 20.0 | 15.2 | 0.5 | 32.0 |
| GCA.2E.255.LT | 2E-2K | 25.0 | 20.2 | 0.5 | 39.0 |
| GCA.3S.255.LT | 3S-3B | 25.0 | 18.2 | 0.5 | 39.0 |
| GCA.4S.255.LT | 4S-4B | 35.0 | 25.6 | 0.6 | 50.0 |
| GCA.4E.255.LT | 4E-4K | 35.0 | 30.6 | 0.6 | 50.0 |
| GCA.5S.255.LT | 5S-5B | 42.0 | 35.1 | 0.3 | 57.5 |



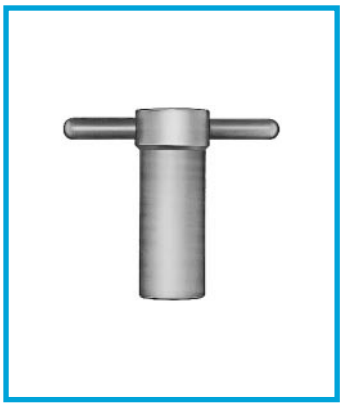



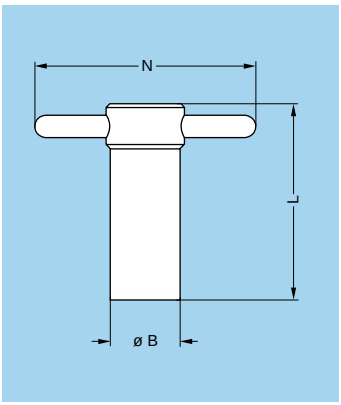
## GSC Lead-through with cable collet

| Part number | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | e | E | L | M | S1 | S2 | S3 |
| GSC.00.290.CD•• | 6.5 | 8.1 | M5x0.5 | 1.5 | 16 | 4.0 | 5 | 6 | 7 |
| GSC.1S.290.ND•• | 12.0 | 12.5 | M9x0.6 | 5.0 | 26 | 7.5 | 11 | 9 | 11 |
| GSC.3S.290.ND•• | 17.0 | 19.5 | M15x1.0 | 8.1 | 30 | 12.0 | – | 14 | 17 |

**Note:** •• = collet cable diameter of the B series. For cable diameter refer to page 52.
The cable collet system stands for both screened and unscreened cables. It can be delivered with a nut for fitting a bend relief it you add a «Z» at the end of the part number.

# Tooling

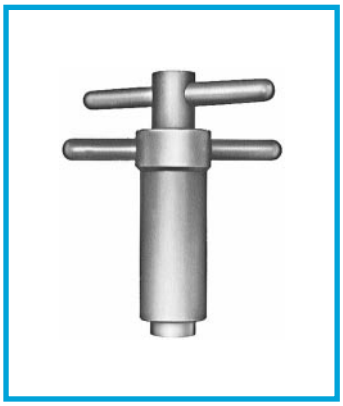


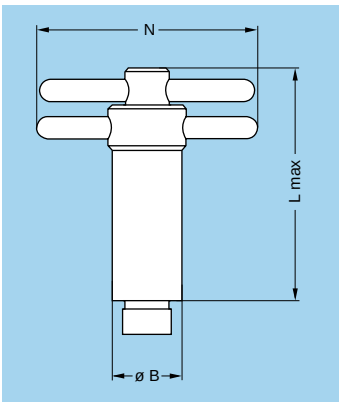



## DCG Spanners for hexagonal nuts

| Part number | Dimensions (mm) | | | Part number of the nut |
|---|---|---|---|---|
| | B | L | N | |
| DCG.91.149.0TN | 14 | 40 | 50 | GEA.00.240.LN |
| DCG.91.161.1TN | 16 | 45 | 52 | GEA.0S.240.LN |
| DCG.91.201.4TN | 20 | 52 | 65 | GEA.1S.240.LN |
| DCG.91.231.7TN | 23 | 62 | 68 | GEA.2S.240.LN |
| DCG.91.282.2TN | 28 | 76 | 73 | GEA.3S.240.LN |

- Material: blackened steel

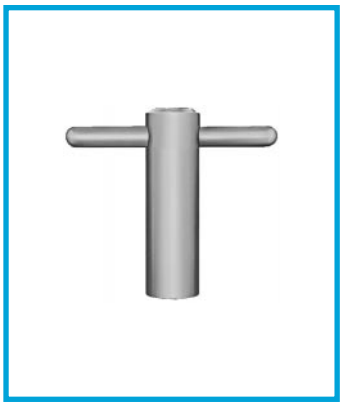


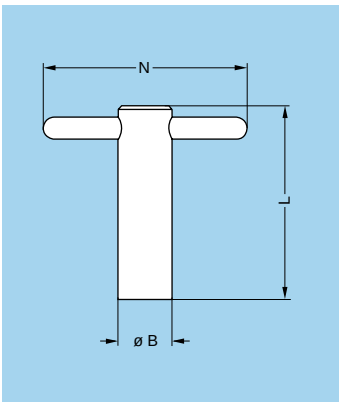



## DCA Spanners for hexagonal nuts with locator for flats on socket thread

| Part number | Dimensions (mm) | | | Part number of the nut |
|---|---|---|---|---|
| | B | L | N | |
| DCA.91.149.0TN | 14 | 65 | 50 | GEA.00.240.LN |
| DCA.91.161.1TN | 16 | 73 | 52 | GEA.0S.240.LN |
| DCA.91.201.4TN | 20 | 85 | 65 | GEA.1S.240.LN |
| DCA.91.231.7TN | 23 | 100 | 68 | GEA.2S.240.LN |
| DCA.91.282.2TN | 28 | 120 | 73 | GEA.3S.240.LN |

- Material: blackened steel

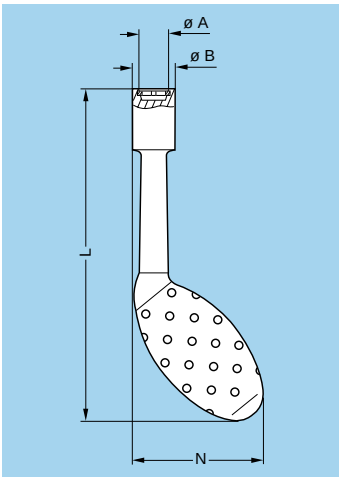





## DCB Spanners for round nuts

| Part number | Dimensions (mm) | | | Part number of the nut |
|---|---|---|---|---|
| | B | L | N | |
| DCB.91.119.0TN | 11 | 40 | 50 | GEB.00.240.LN |
| DCB.91.131.1TN | 13 | 45 | 50 | GEB.0S.240.LN |
| DCB.91.161.4TN | 16 | 52 | 65 | GEB.1S.240.LN |
| DCB.91.201.8TN | 20 | 62 | 65 | GEB.2S.240.LN |
| DCB.91.242.2TN | 24 | 76 | 70 | GEB.3S.240.LN |

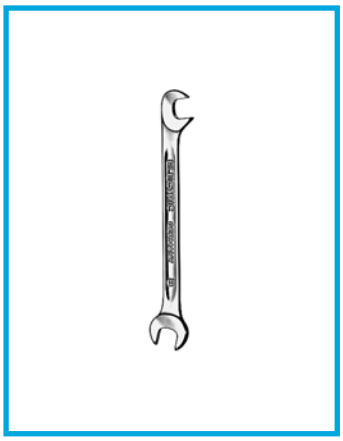
- Material: blackened steel

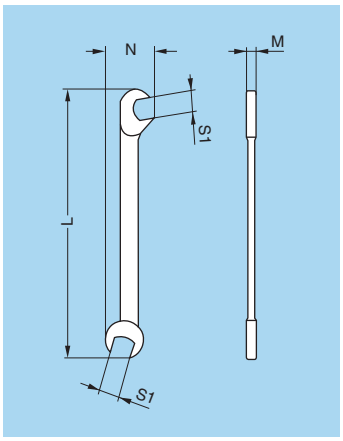



## DCH Spanners for conical nut

| Part number | Dimensions (mm) | | | | Part number of the nut |
|---|---|---|---|---|---|
| | A | B | L | N | |
| DCH.91.101.PN | 10.1 | 12.8 | 124 | 48.3 | GEC.00.240.LC |
| DCH.91.121.PN | 12.1 | 14.8 | 124 | 49.3 | GEC.0S.240.LC |
| DCH.91.161.PN | 16.1 | 21.0 | 124 | 51.9 | GEC.1S.240.LC |
| DCH.91.201.PN | 20.1 | 22.8 | 129 | 53.5 | GEC.2S.240.LC |

- Material: dark grey polyurethane

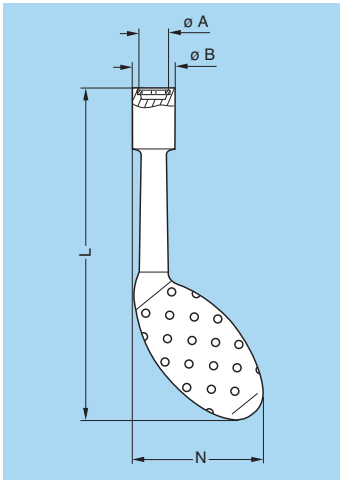





## DCP Flat spanners for collet nut

| Part number | Dimensions (mm) | | | |
|---|---|---|---|---|
| | L | M | N | S1 |
| DCP.99.040.TC | 70 | 0.95 | 10.5 | 4.0 |
| DCP.99.045.TC | 70 | 2.00 | 10.5 | 4.5 |
| DCP.99.050.TC | 78 | 2.00 | 12.6 | 5.0 |
| DCP.99.055.TC | 78 | 2.00 | 12.6 | 5.5 |
| DCP.99.060.TC | 78 | 2.00 | 12.6 | 6.0 |

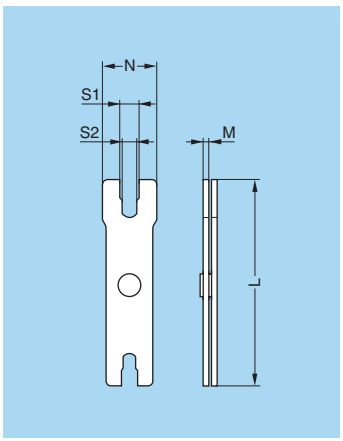
- Material: chrome-plated steel




## DCH Spanners for notched nuts

| Part number | Dimensions (mm) | | | | Part number of the nut |
|---|---|---|---|---|---|
| | A | B | L | N | |
| DCH.91.101.PA | 10.1 | 12.8 | 124 | 48.3 | GEG.00.240.LC |
| DCH.91.121.PA | 12.1 | 14.8 | 124 | 49.3 | GEG.0S.240.LC |
| DCH.91.181.PA | 18.1 | 22.8 | 129 | 53.1 | GEG.0E.240.LC |
| DCH.91.161.PA | 16.1 | 21.0 | 124 | 51.2 | GEG.1S.240.LC |
| DCH.91.201.PA | 20.1 | 22.8 | 129 | 53.5 | GEG.1E.240.LC |
| DCH.91.141.PA | 14.1 | 18.6 | 124 | 51.2 | GEG.1S.242.LC |
| DCH.91.201.PA | 20.1 | 22.8 | 129 | 53.5 | GEG.2S.240.LC |
| DCH.91.241.PA | 24.1 | 30.8 | 134 | 52.6 | GEG.2S.241.LC |
| DCH.91.251.PA | 25.1 | 32.8 | 134 | 55.5 | GEG.2E.240.LC |

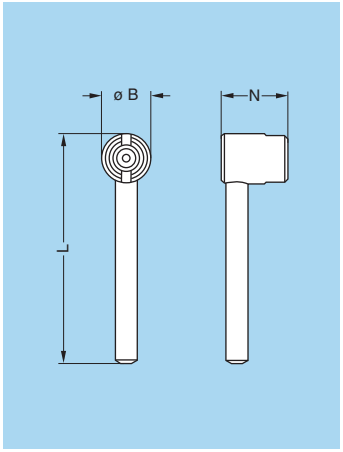
- Material: blue polyurethane




## DCP Set of flat spanners for collet nuts

| Part number | Series | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | M | N | S1 | S2 |
| DCP.91.001.TN | 0B | 95 | 2.5 | 21 | 8.1 | 7.1 |
| | 1B | 95 | 2.5 | 25 | 10.1 | 9.1 |
| DCP.91.023.TN | 2B-2K | 115 | 3.0 | 30 | 13.1 | 12.1 |
| | 3B-3K | 115 | 3.0 | 35 | 15.1 | 14.1 |
| DCP.91.045.TN | 4B | 130 | 3.0 | 44 | 21.1 | 20.1 |
| | 5B | 130 | 3.0 | 54 | 31.1 | 30.1 |

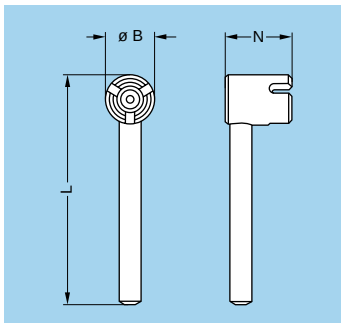
- Material: blackened steel




## DCL Spanners for assembling plugs with 2 latches

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | B | L | N |
| DCL.91.105.0TK | 00 | 10 | 45 | 13.5 |
| DCL.91.127.0TK | 0S | 12 | 47 | 17.0 |
| DCL.91.149.0TK | 1S | 14 | 52 | 19.0 |

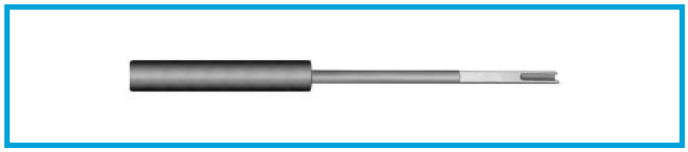
- Material: blackened steel

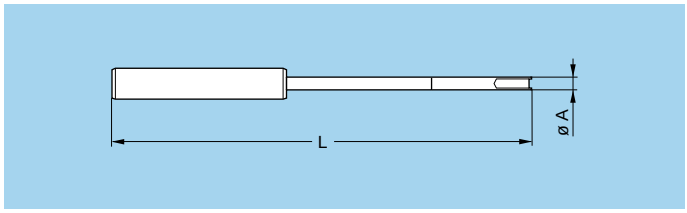



## DCN Spanners for assembling plugs with 3 latches

| Part number | Series | Dimensions (mm) | | |
|---|---|---|---|---|
| | | B | L | N |
| DCN.91.905.0TK | 00 | 9 | 42 | 12 |
| DCN.91.125.0TK | 0S | 12 | 47 | 17 |
| DCN.91.149.0TK | 1S | 14 | 53 | 19 |
| DCN.91.171.2TK | 2S-2C | 17 | 63 | 20 |
| DCN.91.201.5TK | 3S | 20 | 74 | 22 |

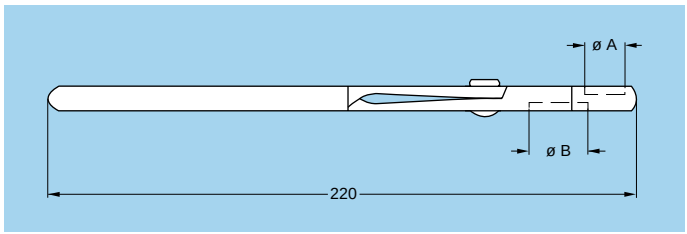
- Material: blackened steel





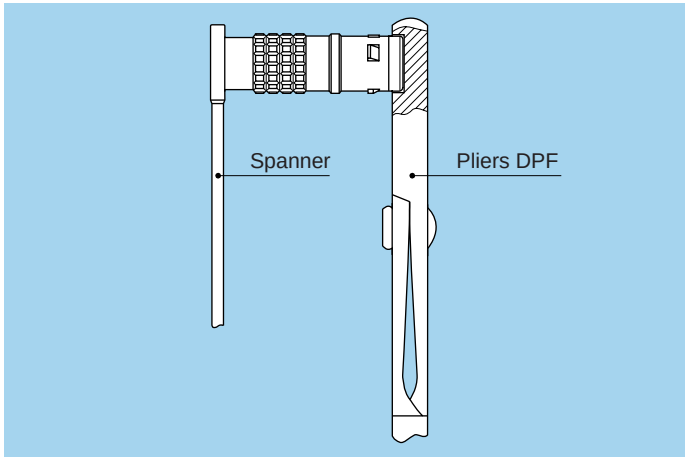

## DCL Assembly tool for FVB.00.303.NLA plugs

| Part number | Series | Dim. (mm) | |
|---|---|---|---|
| | | A | L |
| DCL.91.516.5TK | 00 | 5 | 165 |



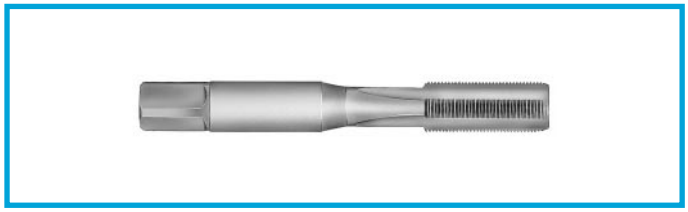

## DPF Pliers for assembling plugs (series K, E and L)

| Part number | Series | Dimensions (mm) | |
|---|---|---|---|
| | | A | B |
| DPF.91.001.TA | 0E-0K-0L | 10 | – |
| | 1E-1K-1L | – | 12 |
| DPF.91.023.TA | 2E-2K-2L | 15 | – |
| | 3E-3K | – | 18 |




### Example for use

The plug end must be held in the pliers whilst the nut is tightened with the flat spanner.



## DTA Taps

| Part number | Series | Thread |
|---|---|---|
| DTA.99.700.5Z | 00 | M7 x 0.5 |
| DTA.99.900.6Z | 0S-0B | M9 x 0.6 |

# Crimping tools for electrical contacts

Fig. A

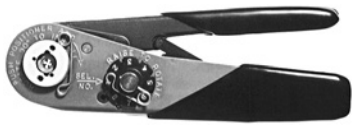
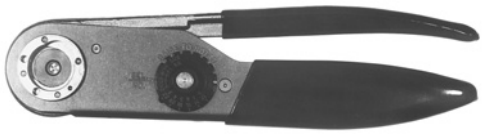


Fig. B



## Manual crimping tools

| Supplier | Part number | | |
|---|---|---|---|
| | contact ø 0.5-0.7 0.9-1.3 (Fig. A) | contact ø 1.6-2.0 (Fig. B) | contact ø 3.0-4.0 (Fig. B) |
| LEMO | DPC.91.701.V[1)] | DPC.91.101.A[2)] | DPC.91.102.V |
| DANIELS | MH860[1)] | AF8[2)] | M300BT |
| ASTRO | 616336[1)] | 615708[2)] | – |

[1)] According to specification MIL-C-22520/7-01.
[2)] According to specification MIL-C-22520/1-01.

## Pneumatic crimping tools

| Supplier | Part number |
|---|---|
| LEMO | DPC.91.701.C |
| BALMAR | 85230 |
| BUCHANAN | 621101 |

According to specification MIL-C-22520/7-01.
For LEMO contacts ø 0.5-0.7-0.9-1.3 mm

male

female

These positioners are suitable for use with both manual and pneumatic crimping tools according to the MIL-C-22520/7-01 standard.

Fig. 1

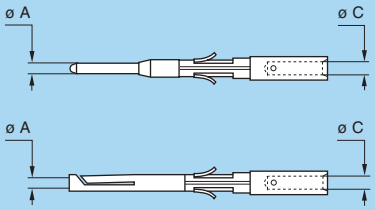
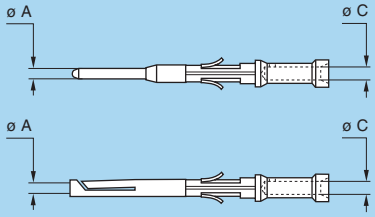



Fig. 2



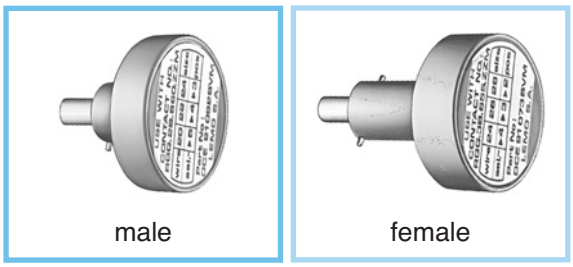

**Note:** a wide variation of strand number and diameter combinations are quoted as being AWG, some of which do not have a large enough cross section to guarantee a crimp as per either MIL-C-22520/1-01 or /7-01. Our technical department is at your disposal to study and propose a solution to all your applications.

**Note:** see table on page 51 for connector selection and the table on page 131 for contact selection.

## DCE Positioners for crimp contacts ø 0.5-0.7-0.9 and 1.3 mm

| | Connector + Contact | | | | | Positioners part number | |
|---|---|---|---|---|---|---|---|
| | Type | ø A | ø C | Fig. | Conductor AWG | For male contact | For female contact |
| 00 | 302 303 304 | 0.5 | 0.45 | 1 | 28-30-32 | DCE.91.050.0VC | DCE.91.050.0VM |
| 0B 0K 0S | 302[1)] 303 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.090.BVC | DCE.91.090.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |
| | | 0.9 | 0.45 | 2 | 28-30-32 | DCE.91.090.AVC | DCE.91.090.AVM |
| | 304[1)] 305 | 0.7 | 0.80 | 1 | 22-24-26 | DCE.91.070.BVC | DCE.91.070.BVM |
| | | 0.7 | 0.45 | 2 | 28-30-32 | | |
| | 306/307 309 | 0.5 | 0.45 | 1 | 28-30-32 | DCE.91.050.BVC | DCE.91.050.BVM |
| 1B 1K 1S | 302[1)] 303 | 1.3 | 1.40 | 1 | 18-20 | DCE.91.131.BVC | DCE.91.131.BVM |
| | | 1.3 | 1.10 | 2 | 20-22-24 | | |
| | 304[1)] 305 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.091.BVC | DCE.91.091.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |
| | 306/307 308 | 0.7 | 0.80 | 1 | 22-24-26 | DCE.91.071.BVC | DCE.91.071.BVM |
| | | 0.7 | 0.45 | 2 | 28-30-32 | | |
| | 310/314 316 | 0.5 | 0.45 | 1 | 28-30-32 | DCE.91.051.BVC | DCE.91.051.BVM |
| 2B 2K 2S | 304/305 306[1)] 307 | 1.3 | 1.40 | 1 | 18-20 | DCE.91.132.BVC | DCE.91.132.BVM |
| | | 1.3 | 1.10 | 2 | 20-22-24 | | |
| | | 1.3 | 0.80 | 2 | 22-24-26 | DCE.91.132.CVC | DCE.91.132.CVM |
| | 308/310 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.092.BVC | DCE.91.092.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |
| | | 0.9 | 0.45 | 2 | 28-30-32 | DCE.91.092.AVC | DCE.91.092.AVM |
| | 312/314 316/318 319 | 0.7 | 0.80 | 1 | 22-24-26 | DCE.91.072.BVC | DCE.91.072.BVM |
| | | 0.7 | 0.45 | 2 | 28-30-32 | | |

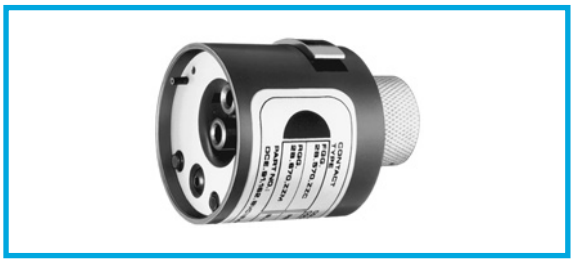
**Note:** [1)] only these types are available in S series.




These positioners are suitable for use with both manual and pneumatic crimping tools according to the MIL-C-22520/7-01 standard.

## DCE Positioners for crimp contacts 0.5-0.7-0.9 and 1.3 mm diameter

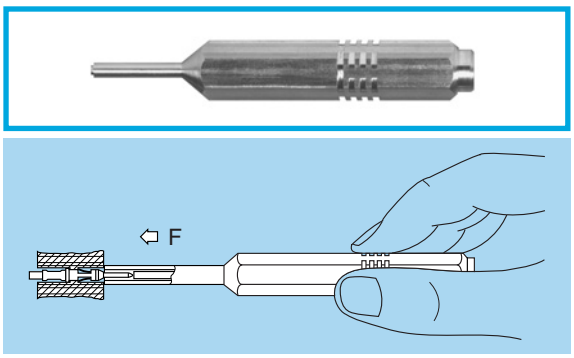
| | Connector + Contact | | | | | Positioners part number | |
|---|---|---|---|---|---|---|---|
| | Type | ø A | ø C | Fig. | Conductor AWG | For male contact | For female contact |
| 3B 3K | 308/309 310 | 1.3 | 1.40 | 1 | 18-20 | DCE.91.133.BVC | DCE.91.133.BVM |
| | | 1.3 | 1.10 | 2 | 20-22-24 | | |
| | 312/314 316/318 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.093.BVC | DCE.91.093.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |
| | 320/322 324/326 330 | 0.7 | 0.80 | 1 | 22-24-26 | DCE.91.073.BVC | DCE.91.073.BVM |
| | | 0.7 | 0.45 | 2 | 28-30-32 | | |
| 4B 4K | 312 | 1.3 | 1.40 | 1 | 18-20 | DCE.91.134.BVC | DCE.91.134.BVM |
| | | 1.3 | 1.10 | 2 | 20-22-24 | | |
| | 316/320 324/330 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.094.BVC | DCE.91.094.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |
| | 340/348 | 0.7 | 0.80 | 1 | 22-24-26 | DCE.91.074.BVC | DCE.91.074.BVM |
| | | 0.7 | 0.45 | 2 | 28-30-32 | | |
| 5B 5K | 330/340 348 | 1.3 | 1.40 | 1 | 18-20 | DCE.91.135.BVC | DCE.91.135.BVM |
| | | 1.3 | 1.10 | 2 | 20-22-24 | | |
| | | 1.3 | 0.80 | 2 | 22-24-26 | DCE.91.135.BVG | DCE.91.135.BVU |
| | 350/354 364 | 0.9 | 1.10 | 1 | 20-22-24 | DCE.91.095.BVC | DCE.91.095.BVM |
| | | 0.9 | 0.80 | 2 | 22-24-26 | | |



**Note:** these turrets can be used with manual crimping tool according to MIL-C-22520/1-01 standard.

## DCE Turret for crimp contacts 1.6-2.0-3.0 and 4.0 mm diameter

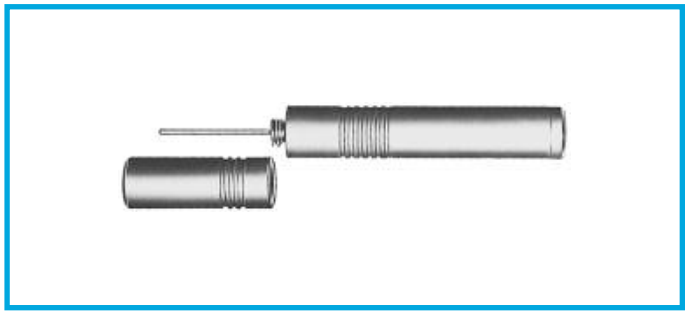
| | Connector + Contact | | | | | Positioners |
|---|---|---|---|---|---|---|
| | Type | ø A | ø C | Fig. | Conductor AWG | Part number |
| 2B 2K | 302 | 2.0 | 2.4 | 1 | 12-14-16 | DCE.91.202.BVCM |
| | | 2.0 | 1.9 | 2 | 14-16-18 | |
| | 303 | 1.6 | 1.9 | 1 | 14-16-18 | DCE.91.162.BVCM |
| | | 1.6 | 1.4 | 2 | 18-20-22 | |
| 3B 3K | 302 | 3.0 | 3.2 | 1 | 10-12-14 | DCE.91.303.BVCM |
| | 303/304 309 | 2.0 | 2.4 | 1 | 12-14-16 | DCE.91.203.BVCM |
| | | 2.0 | 1.9 | 2 | 14-16-18 | |
| | 305/306 307 | 1.6 | 1.9 | 1 | 14-16-18 | DCE.91.163.BVCM |
| | | 1.6 | 1.4 | 2 | 18-20-22 | |
| 4B 4K | 304 | 3.0 | 3.2 | 1 | 10-12-14 | DCE.91.304.BVCM |
| | 306/307 | 2.0 | 2.4 | 1 | 12-14-16 | DCE.91.204.BVCM |
| | | 2.0 | 1.9 | 2 | 14-16-18 | |
| | 310 | 1.6 | 1.9 | 1 | 14-16-18 | DCE.91.164.BVCM |
| | | 1.6 | 1.4 | 2 | 18-20-22 | |
| 5B 5K | 304 | 4.0 | 4.0 | 1 | 10-12 | DCE.91.405.BVCM |
| | 310 | 3.0 | 3.2 | 1 | 10-12-14 | DCE.91.305.BVCM |
| | 314/316 | 2.0 | 2.4 | 1 | 12-14-16 | DCE.91.205.BVCM |
| | | 2.0 | 1.9 | 2 | 14-16-18 | |
| | 320 | 1.6 | 1.9 | 1 | 14-16-18 | DCE.91.165.BVCM |
| | | 1.6 | 1.4 | 2 | 18-20-22 | |

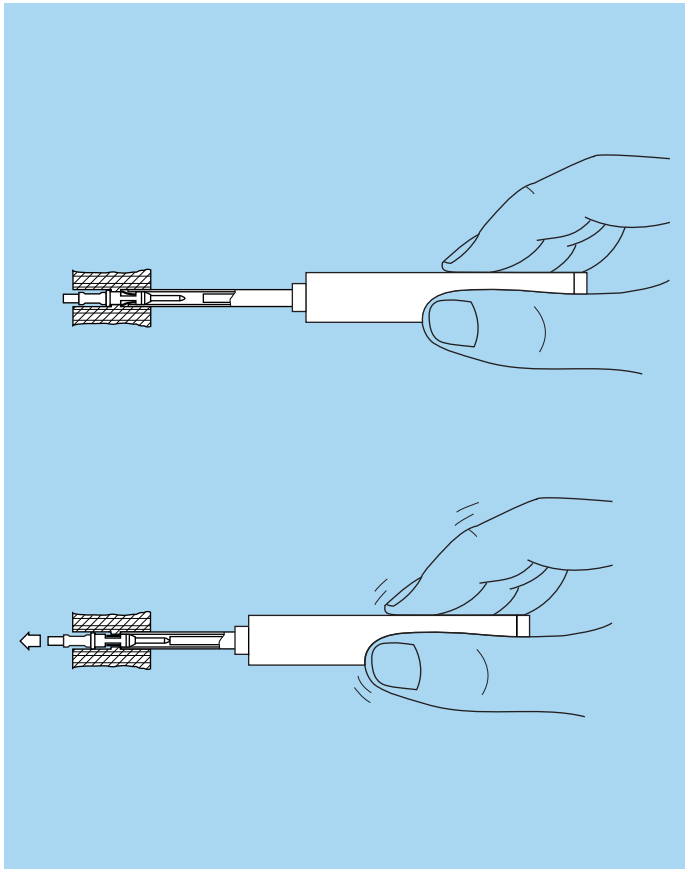



## DCK Retention testing tools for crimp contacts 0.5-0.7-0.9 and 1.3 mm diameter

| Contact ø A | Test force (N) | Testing tool part number | |
|---|---|---|---|
| | | For male contact | For female contact |
| 0.5 | 8 | DCK.91.050.8LRC | DCK.91.050.8LRM |
| 0.7 | 10 | DCK.91.071.0LRC | DCK.91.071.0LRM |
| 0.9 | 14 | DCK.91.091.4LRC | DCK.91.091.4LRM |
| 1.3 | 25 | DCK.91.132.5LRC | DCK.91.132.5LRM |

## DCF **Automatic extraction tools for crimp contacts** (not valid for FA● and FW● models)





| | Connector | | Extractors part number |
|---|---|---|---|
| | Type | Contact ø A | For male and female contacts |
| 00 | 302/303/304 | 0.5 | DCF.91.050.2LT |
| 0B 0K | 302/303 | 0.9 | DCF.91.090.2LT |
| | 304/305 | 0.7 | DCF.92.070.3LT |
| | 306/307/309 | 0.5 | DCF.91.050.2LT |
| 1B 1K | 302/303 | 1.3 | DCF.91.131.2LT |
| | 304/305 | 0.9 | DCF.91.090.2LT |
| | 306/307/308 | 0.7 | DCF.91.070.2LT |
| | 310/314/316 | 0.5 | DCF.91.050.2LT |
| 2B 2K | 302 | 2.0 | DCC.91.202.5LA [1] |
| | 303 | 1.6 | DCF.91.162.2LT |
| | 304/305/306/307 | 1.3 | DCF.91.131.2LT |
| | 308/310 | 0.9 | DCF.91.090.2LT |
| | 312/314/316/318/319 | 0.7 | DCF.91.070.2LT [2] |
| 3B 3K | 302 | 3.0 | DCF.91.303.5LT |
| | 303/304/309 | 2.0 | DCC.91.202.5LA [1] |
| | 305/306/307 | 1.6 | DCF.91.163.5LT |
| | 308/309/310 | 1.3 | DCF.91.133.5LT |
| | 312/314/316/318 | 0.9 | DCF.91.093.5LT |
| | 320/322/324/326/330 | 0.7 | DCF.91.073.5LT |
| 4B 4K | 304 | 3.0 | DCF.91.303.5LT |
| | 306/307 | 2.0 | DCC.91.202.5LA [1] |
| | 310 | 1.6 | DCF.91.163.5LT |
| | 312 | 1.3 | DCF.91.133.5LT |
| | 316/320/324/330 | 0.9 | DCF.91.093.5LT |
| | 340/348 | 0.7 | DCF.91.073.5LT |
| 5B 5K | 304 | 4.0 | DCF.91.405.5LT |
| | 310 | 3.0 | DCF.91.303.5LT |
| | 314/316 | 2.0 | DCC.91.202.5LA [1] |
| | 320 | 1.6 | DCF.91.163.5LT |
| | 330/340/348 | 1.3 | DCF.91.133.5LT |
| | 350/354/364 | 0.9 | DCF.91.093.5LT |

**Note:** [1] this model is thumb-operated. S Series available on request.
[2] For inverted contacts, please use DCF.92.070.3LT instead.

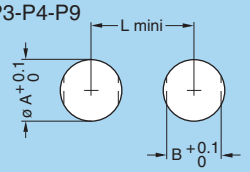
## DCF **Automatic extraction tools for crimp contacts** (for FA● and FW● models)

| | Contact ø A (mm) | Extractors part number For male and female contacts |
|---|---|---|
| 0B/0K to 3B/3K | 1.6 | DCF.92.162.3LT |
| | 1.3 | DCF.92.131.3LT |
| | 0.9 | DCF.92.090.3LT |
| | 0.7 | DCF.92.070.3LT |

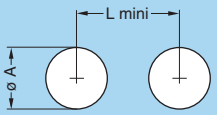
**Note:** extractor for FA● of the 4B/4K and 5B/5K still need to be determinated.

# Panel cut-outs

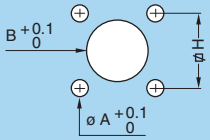
P1-P3-P4-P9



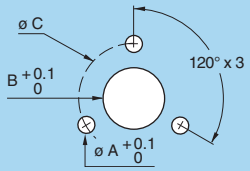

P2-P5-P10-P11




P6-P7




P8




## B series

| Series | P1 | | | P2 | | P3 | | | P4 | | | P5 | | P6 | | | P8 | | | P9 | | | P10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ø A | B | L | ø A | L | ø A | B | L | ø A | B | L | ø A[2] | L | ø A | B | H | ø A | B | C | ø A | B | L | ø A | L |
| 00 | 7.1 | 6.4 | 12.5 | 7.1 | 11.5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 7.1 | – | 12 | – | – |
| 0B | 9.1 | 8.3 | 14.5 | 9.1 | 13.5 | 14.1 | 12.6 | 20.1 | 10.1 | 9.1 | 15.0 | 8.30 | 10.5 | – | – | – | – | – | – | 9.1 | 8.3 | 15 | – | – |
| 1B | 12.1 | 10.6 | 18.5 | – | – | 16.1 | 14.6 | 22.0 | 14.1 | 12.6 | 21.0 | 11.17 | 14.0 | – | – | – | – | – | – | 12.1 | 10.6 | 19 | 11.1 | 17 |
| XB | 14.1 | 12.6 | 21.5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 2B | 15.1 | 13.6 | 22.5 | – | – | 19.2 | 17.1 | 28.0 | 16.1 | 15.1 | 23.0 | 13.95 | 18.0 | – | – | – | – | – | – | 15.1 | 13.6 | 23 | – | – |
| 3B | 18.2 | 16.6 | 27.0 | – | – | – | – | – | 20.2 | 18.6 | 29.5 | – | – | – | – | – | – | – | – | 18.2 | 16.6 | 27 | – | – |
| 4B | 25.2 | 23.6 | 36.0 | – | – | – | – | – | 25.2 | 23.6 | 36.1 | – | – | – | – | – | – | – | – | 25.2 | 23.6 | 36 | – | – |
| 5B | 35.2[1] | 33.6 | 44.0 | – | – | – | – | – | 35.2 | 33.6 | 47.1 | – | – | 3.3 | 35.2 | 34 | 2.8 | 35.2 | 47 | 35.2 | 33.6 | 47 | – | – |

**Note:** [1] for using the tapered washer a round hole ø 36 mm apply. [2] tolerance: $^{+\ 0.02}_{0}$

### Cut-out types

| Model | Type | Model | Type | Model | Type | Model | Type | Model | Type |
|---|---|---|---|---|---|---|---|---|---|
| ECG | P1 | EKG | P1 | FAG | P1 | HMG | P9 | S●● | P4/P9[3] |
| EEG | P1 | ENG | P1 | FWG | P9 | HNG | P9 | XBG | P2 |
| EGG | P1 | ENY | P1 | HCG | P3 | PEG | P1 | XPF | P2 |
| EFG | P2 | ESG | P1/P2 | HEG | P9 | PFG | P1 | XRB | P2 |
| EHG | P1 | EXG | P2/P10 | HGG | P9 | PKG | P1 | YHG | P9 |
| EJG | P5 | EYG | P1/P10 | HHG | P9 | R●● | P4 | | |

**Note:** [3] in series 1B use P9. [4] these values apply when metal shell are mounted with insulating washer.

### Mounting nut torque

| Series | Torque (Nm) | |
|---|---|---|
| | Metal shell | Plastic shell[4] |
| 00 | 1.0 | 0.4 |
| 0B | 2.5 | 0.4 |
| 1B | 4.5 | 0.7 |
| XB | 5.0 | – |
| 2B | 6.0 | 0.8 |
| 3B | 9.0 | 1.0 |
| 4B | 12.0 | 5.0 |
| 5B | 17.0 | – |

## S series

| Series | P1 | | | P2 | | P3 | | | P4 | | | P5 | | P6 | | | P7 | | | P10 | | P11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ø A | B | L | ø A | L | ø A | B | L | ø A | B | L | ø A[2] | L | ø A | B | H | ø A | B | H | ø A | L | ø A | L |
| 00 | 7.1 | 6.4 | 12.5 | 7.1 | 11.5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 0S | 9.1 | 8.3 | 14.5 | 9.1 | 13.5 | 12.1 | 10.6 | 20.0 | 10.1 | 9.1 | 15 | – | – | – | – | – | – | – | – | – | – | 9.1 | 16 |
| 1S | 12.1 | 10.6 | 18.5 | 12.1 | 19.0 | 14.1 | 12.6 | 21.0 | 12.1 | 10.6 | 18 | 11.92 | 15.5 | 3.3 | 12.1 | 12.7 | 2.7 | 11.1 | 12.4 | 11.1 | 17 | 12.1 | 19 |
| 2S | 15.1 | 13.6 | 22.5 | 15.1 | 21.5 | 16.1 | 14.6 | 22.0 | 16.1 | 15.1 | 23 | – | – | 3.3 | 15.1 | 15.5 | – | – | – | – | – | – | – |
| 3S | 18.2 | 16.6 | 27.0 | 18.2 | 27.0 | 20.2 | 18.6 | 30.0 | 20.2 | 18.6 | 29 | – | – | 3.3 | 18.2 | 18.0 | – | – | – | – | – | – | – |
| 4S | 25.2 | 23.6 | 36.0 | 25.2 | 34.0 | 25.2 | 23.6 | 36.0 | 25.2 | 23.6 | 36 | – | – | – | – | – | – | – | – | – | – | – | – |
| 5S | 35.2[1] | 33.6 | 44.0 | 35.2 | 44.0 | 35.2 | 33.6 | 47.0 | 35.2 | 33.6 | 47 | – | – | 4.4 | 35.2 | 36.8 | – | – | – | – | – | – | – |
| 6S | 48.3 | 45.6 | 58.0 | 48.3 | 58.0 | 48.3 | 45.6 | 60.0 | 48.3 | 45.6 | 60 | – | – | – | – | – | – | – | – | – | – | – | – |

**Note:** [1] for using the tapered washer a round hole ø 36 mm apply. [2] tolerance: $^{+\ 0.02}_{0}$

### Cut-out types

| Model | Type | Model | Type | Model | Type | Model | Type |
|---|---|---|---|---|---|---|---|
| EBC | P6 | ERA | P1 | EWB | P3 | PSP | P1 |
| EBD | P6 | ERC | P1 | FAA | P1/P2[3] | PSS | P1 |
| EBS | P7 | ERD | P1 | HCP | P3[4] | RAD | P1/P2[5] |
| ECP | P1 | ERN | P1 | HGP | P3 | SWH | P4 |
| EEP | P1 | ERS | P2 | HGW | P11 | | |
| EHP | P2/P1 | EXP | P2/P10 | PSA | P1 | | |

1 N = 0.102 kg

**Note:** [3] in series 6S use P2. [4] use only ø A in 1S series.
[5] in series 4S and 5S use P2.

### Mounting nut torque

| Series | Torque (Nm) | |
|---|---|---|
| | Metal shell | Plastic shell[6] |
| 0S | 2.5 | 0.4 |
| 1S | 4.5 | 0.7 |
| 2S | 6.0 | 0.8 |
| 3S | 9.0 | 1.0 |
| 4S | 12.0 | 5.0 |
| 5S | 17.0 | – |
| 6S | 22.0 | – |

**Note:** [6] these values apply when metal shell are mounted with insulating washer.

## K series

| Series | P1 | | | P6 | | | P7 | | |
|---|---|---|---|---|---|---|---|---|---|
| | ø A | B | L | ø A | B | H | ø A | B | H |
| 0K | 14.1 | 12.6 | 20.5 | – | – | – | – | – | – |
| 1K | 16.1 | 14.6 | 22.5 | – | – | – | – | – | – |
| 2K | 20.2 | 18.6 | 29.0 | – | – | – | – | – | – |
| 3K | 24.2 | 22.6 | 35.5 | 3.5 | 22.6 | 20.6 | 3.5 | 23.1 | 23.0 |
| 4K | 30.2 | 28.6 | 43.0 | 3.5 | 28.6 | 27.0 | 3.5 | 30.1 | 29.0 |
| 5K | 45.2 | 42.6 | 57.0 | 4.5 | 42.6 | 38.0 | 4.5 | 45.1 | 44.0 |

### Cut-out types

| Model | Type |
|---|---|
| EBG | P7 |
| EDG | P7[2)] |
| EEG | P1 |
| EGG | P1 |
| EHG | P1 |
| ENG | P1 |

| Model | Type |
|---|---|
| EVG | P1 |
| FAG | P1 |
| FXG | P6 |
| HEG | P1 |
| HGG | P1 |
| PBG | P7[3)] |

| Model | Type |
|---|---|
| PEG | P1 |
| PKG | P1 |
| S●● | P1 |
| | |
| | |
| | |

### Mounting nut torque

| Series | Torque (Nm) |
|---|---|
| 0K | 5 |
| 1K | 7 |
| 2K | 9 |
| 3K | 12 |
| 4K | 17 |
| 5K | 22 |

1 N = 0.102 kg

**Note:** [2)] for this model dimension B = 18.1. [3)] for this model dimension B = 19.1.

## E and L series

| Series | P1 | | | P6 | | |
|---|---|---|---|---|---|---|
| | ø A | B | L | ø A | B | H |
| 0E-0L | 14.1 | 12.6 | 20.5 | – | – | – |
| 1E-1L | 16.1 | 14.6 | 22.5 | – | – | – |
| 2E-2L | 20.2 | 18.6 | 29.0 | 2.9 | 15.1 | 11.8x20.4 |
| 3E | 24.2 | 22.6 | 35.5 | – | – | – |
| 4E | 30.2 | 28.6 | 43.0 | – | – | – |
| 5E | 45.2 | 42.6 | 57.0 | – | – | – |
| 6E | 55.3 | 52.1 | 68.0 | – | – | – |

### Cut-out types E series

| Model | Type |
|---|---|
| EBR | P6 |
| EEP | P1 |
| EHP | P1 |
| ERA | P1 |
| ERB | P1 |
| ERC | P1 |
| FAA | P1 |

| Model | Type |
|---|---|
| HGP | P1 |
| PSA | P1 |
| PSP | P1 |
| SWH | P1 |
| | |
| | |
| | |

### Cut-out types L series

| Model | Type |
|---|---|
| EEG | P1 |
| EGG | P1 |
| FAG | P1 |
| HGG | P1 |
| PKG | P1 |
| | |
| | |

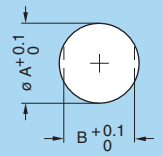
### Mounting nut torque

| Series | Torque (Nm) |
|---|---|
| 0E-0L | 5 |
| 1E-1L | 7 |
| 2E-2L | 9 |
| 3E | 12 |
| 4E | 17 |
| 5E | 22 |
| 6E | 27 |

1 N = 0.102 kg

### Panel cut-out for mounting with insulating washer (S-B series)

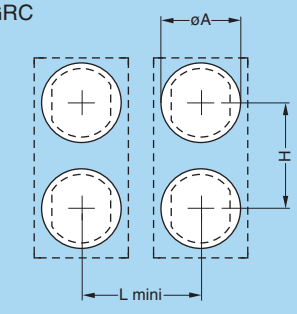
GRA




| Series | Dim. (mm) | |
|---|---|---|
| | ø A | B |
| 00 | 8.9 | 8.1 |
| 0S-0B | 10.9 | 10.0 |
| 1S-1B | 13.9 | 12.3 |
| 2S-2B | 18.0 | 16.3 |
| 3S-3B | 21.9 | 20.3 |
| 4S-4B | 29.1 | 27.4 |

### Panel cut-out for mounting with double panel washer (S-B series)

GRC



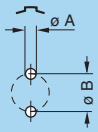

| Series | Dimensions (mm) | | |
|---|---|---|---|
| | ø A | H | L |
| 0S-0B | 11 | 14 | 13.5 |
| 1S-1B | 14 | 20 | 17.0 |

**Note:** for nut tightening torques please refer to the corresponding series in the table on page 152.

## PCB drilling pattern

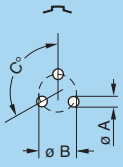
### Fixed socket with straight print contact (B-K series) P15

302



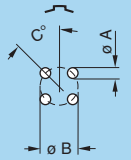

| Series | Dimensions | |
|---|---|---|
| | A | B |
| 00 | 0.6 | 1.2 |
| 0B-0K | 0.8 | 2.2 |
| 1B-1K | 0.8 | 2.8 |
| 2B-2K | 0.8 | 4.4 |

303



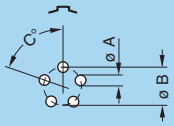

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 00 | 0.6 | 1.35 | 120° |
| 0B-0K | 0.8 | 2.30 | 120° |
| 1B-1K | 0.8 | 3.00 | 120° |
| 2B-2K | 0.8 | 4.60 | 120° |
| 3B-3K | 0.8 | 5.60 | 120° |

304



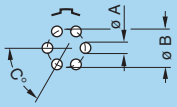

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 00 | 0.6 | 1.6 | 45° |
| 0B-0K | 0.6 | 2.5 | 45° |
| 1B-1K | 0.8 | 3.1 | 45° |
| 2B-2K | 0.8 | 5.0 | 45° |
| 3B-3K | 0.8 | 6.2 | 45° |

305



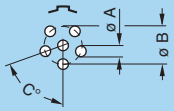

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 00 | 0.5 | 1.7 | 72° |
| 0B-0K | 0.6 | 2.8 | 72° |
| 1B-1K | 0.8 | 3.4 | 72° |
| 2B-2K | 0.8 | 5.2 | 72° |
| 3B-3K | 0.8 | 6.7 | 72° |

306



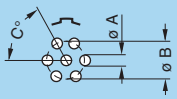

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0B-0K | 0.6 | 3.0 | 60° |
| 1B-1K | 0.8 | 3.7 | 60° |

306



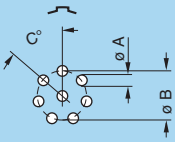

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 2B-2K | 0.8 | 5.6 | 72° |
| 3B-3K | 0.8 | 7.1 | 72° |

307



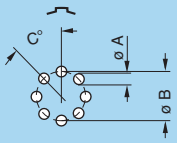

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0B-0K | 0.6 | 3.00 | 60° |
| 1B-1K | 0.8 | 3.70 | 60° |
| 2B-2K | 0.8 | 5.80 | 60° |
| 3B-3K | 0.8 | 7.08 | 60° |

308



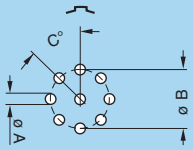

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 1B-1K | 0.8 | 3.8 | 51°26’ |

308



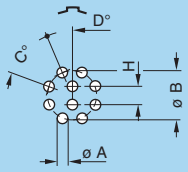

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 2B-2K | 0.8 | 6.4 | 45° |
| 3B-3K | 0.8 | 7.5 | 45° |

309



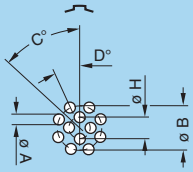

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0B-0K | 0.6 | 3.2 | 45° |
| 3B-3K | 0.8 | 7.5 | 45° |

310



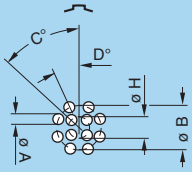

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | H |
| 1B-1K | 0.6 | 3.95 | 45° | 22°30' | 1.40 |
| 2B-2K | 0.8 | 6.30 | 45° | 22°30' | 2.15 |
| 3B-3K | 0.8 | 7.90 | 45° | 22°30' | 2.80 |

312



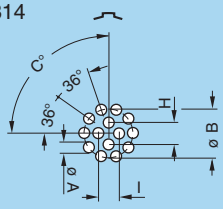

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | H |
| XB | 0.8 | 5.40 | 45° | 22°30' | 2.40 |

312



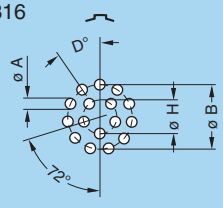

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | H |
| 2B-2K | 0.8 | 6.50 | 45° | 22°30’ | 2.80 |
| 3B-3K | 0.8 | 8.20 | 45° | 22°30’ | 3.40 |

314



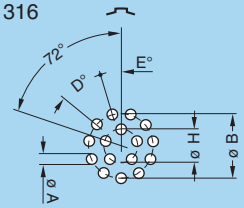

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | H | I |
| 1B-1K | 0.6 | 4.4 | 90° | 1.90 | 1.80 |
| 2B-2K | 0.8 | 6.5 | 90° | 2.65 | 2.65 |
| 3B-3K | 0.8 | 8.2 | 90° | 3.40 | 3.40 |

316



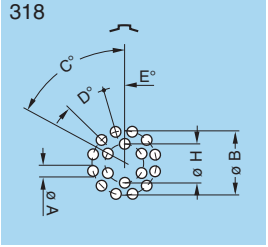

| Series | Dimensions | | | |
|---|---|---|---|---|
| | A | B | D | H |
| 1B-1K | 0.6 | 4.4 | 32°44’ | 2.00 |

316



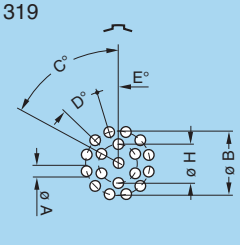

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | D | E | H |
| 2B-2K | 0.8 | 6.6 | 32°44' | 16°22’ | 3.10 |
| 3B-3K | 0.8 | 8.4 | 32°44' | 16°22’ | 3.86 |
| 4B-4K | 0.6 | 10.5 | 32°44' | 16°22’ | 5.00 |

318



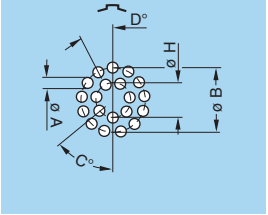

| Series | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | H |
| 2B-2K | 0.8 | 6.7 | 60° | 30° | 15° | 3.50 |
| 3B-3K | 0.8 | 8.4 | 60° | 30° | 15° | 4.34 |

319



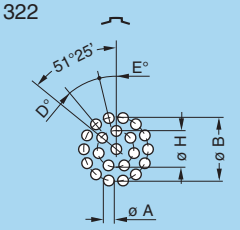

| Series | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | H |
| 2B-2K | 0.8 | 6.7 | 60° | 30° | 15° | 3.5 |

320



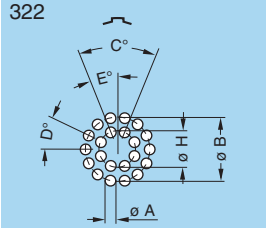

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | H |
| 3B-3K | 0.6 | 8.62 | 51°26' | 27°42' | 4.78 |
| 4B-4K | 0.6 | 11.00 | 51°26' | 27°42' | 6.00 |

322



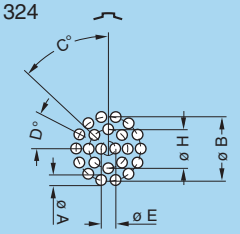

| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | D | E | H |
| XB | 0.6 | 5.7 | 25°42' | 12°51' | 3.1 |

322



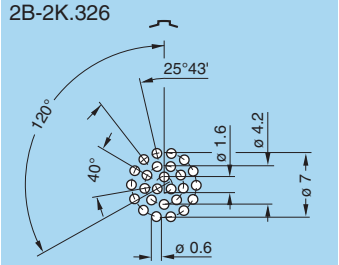

| Series | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | H |
| 3B-3K | 0.6 | 8.8 | 45° | 25°43' | 22°30' | 5 |

324

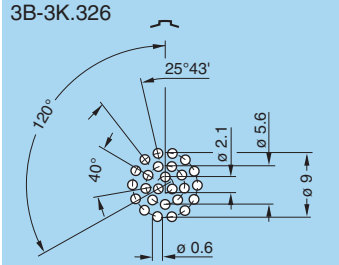



| Series | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | H |
| 3B-3K | 0.6 | 8.8 | 45° | 25°43' | 1.8 | 5.30 |
| 4B-4K | 0.6 | 11.1 | 45° | 25°43' | 2.2 | 6.65 |

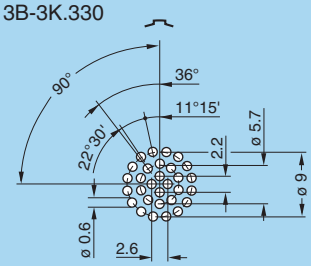
2B-2K.326



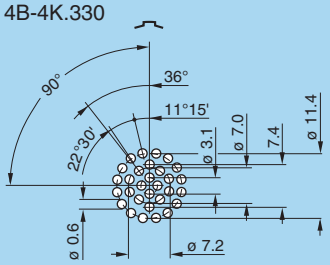

3B-3K.326



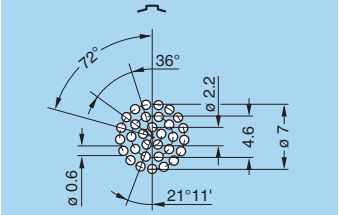

3B-3K.330



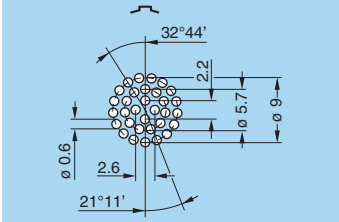

4B-4K.330



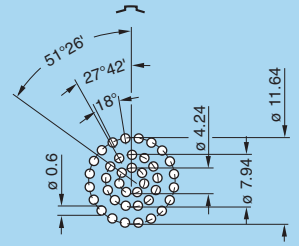

2B-2K.332



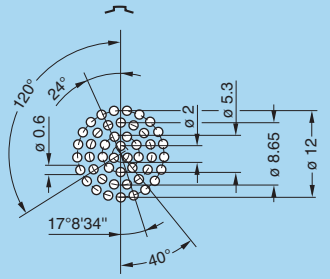

3B-3K.332



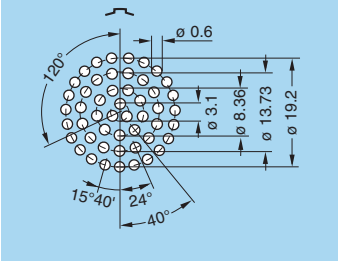

4B-4K.340



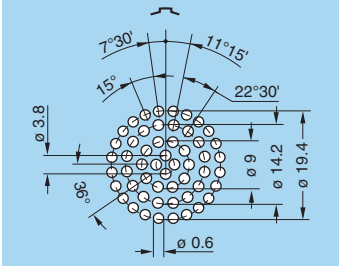

4B-4K.348



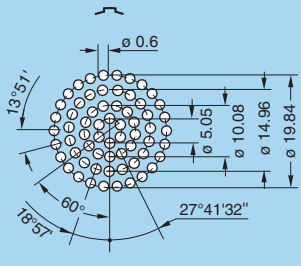

5B-5K.350




5B-5K.354




5B-5K.364




**Note:** all views are from the side of the socket.

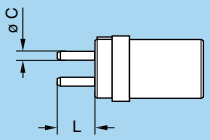
## Length of straight print contacts (for socket E●●)

| | Type | Dimensions | |
|---|---|---|---|
| | | ø C | L |
| 00 | 302 | 0.5 | 3.0 |
| | 303 | 0.5 | 3.0 |
| | 304 | 0.5 | 3.0 |
| 0B 0K | 302/303 | 0.7 | 3.2 |
| | 304/305 | 0.5 | 3.2 |
| | 306/307/309 | 0.5 | 3.2 |
| 1B 1K | 302/303/304/305 | 0.7 | 3.0 |
| | 306/307/308 | 0.7 | 3.0 |
| | 310/314/316 | 0.5 | 4.0 |
| XB | 312 | 0.7 | 3.0 |
| | 322 | 0.5 | 3.0 |
| | | | |
| 2B 2K | 302/303/304/305/306/307 | 0.7 | 3.0 |
| | 308/310/312/314/316/318/319 | 0.7 | 3.0 |
| | 326/332 | 0.5 | 3.0 |
| 3B 3K | 303/304/305/306/307 | 0.7 | 3.0 |
| | 308/309/310/312/314/316/318 | 0.7 | 3.0 |
| | 320/322/324/326/330/332 | 0.5 | 5.0 |
| 4B 4K | 316/320 | 0.5 | 5.0 |
| | 324/330 | 0.5 | 5.0 |
| | 340/348 | 0.5 | 5.0 |
| 5B 5K | 348 | 0.7 | 5.0 |
| | 350 | 0.5 | 5.0 |
| | 354 | 0.5 | 5.0 |
| | 364 | 0.5 | 5.0 |

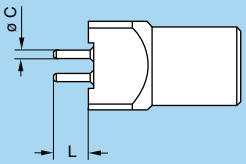
## Length of straight print contacts (for socket EZG/EYG/XPF)

| | Type | Models | | | |
|---|---|---|---|---|---|
| | | EZG/EYG | | XPF | |
| | | ø C | L | ø C | L |
| 0B | 302/303 | 0.7 | 4.5 | – | – |
| | 304/305 | 0.5 | 4.5 | 0.7 | 3.0 |
| | 306/307/309 | 0.5 | 3.0 | – | – |
| 1B | 302/303/304/305 | 0.7 | 3.8 | – | – |
| | 306/307/308 | 0.7 | 3.8 | – | – |
| | 310/314/316 | 0.5 | 3.8 | – | – |
| 2B | 302/303/304/305 | 0.7 | 5.5 | – | – |
| | 306/307/308/310 | 0.7 | 5.5 | – | – |
| | 312/314/316/318/319 | 0.7 | 5.5 | – | – |

E●●




EZG/EYG/XPF

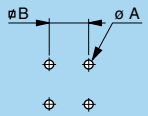



**Note:** This table does not apply for socket H●●; socket EH● and plugs FA●/FW●.

## Fixed socket for printed circuit (B series) P16

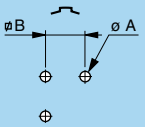
Holes for fixing the housing

EYG-EZG




| Series | Dimensions | |
|---|---|---|
| | A | B |
| 00 | 0.8[1)] | 5.08 |
| 0B | 1.7[2)] | 7.62 |
| 1B | 1.7[2)] | 7.62 |
| 2B | 1.7[2)] | 10.16 |

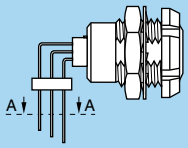
XPF.0B



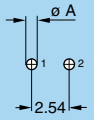

| Series | Dimensions | |
|---|---|---|
| | A | B |
| 0B | 1.7 | 5.08 |

**Note:** Mounting torque for screws: 0.1 Nm.
[1)] to solder. [2)] to screw.

## Fixed socket with elbow print contact (B-K series) P17

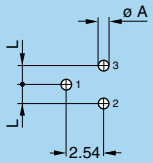



302



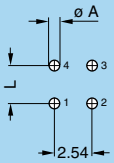

| Series | Dim. A |
|---|---|
| 00 | 0.6 |
| 0B-0K | 0.7 |
| 1B-1K | 0.9 |
| 2B-2K | 0.9 |

303



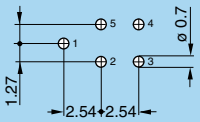

| Series | Dim. A | Dim. L |
|---|---|---|
| 00 | 0.6 | 1.27 |
| 0B-0K | 0.7 | 1.27 |
| 1B-1K | 0.9 | 1.27 |
| 2B-2K | 0.9 | 2.54 |

304

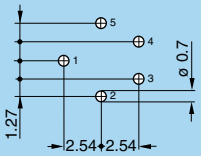



| Series | Dim. A | Dim. L |
|---|---|---|
| 00 | 0.6 | 2.54 |
| 0B-0K | 0.7 | 2.54 |
| 1B-1K | 0.7 | 2.54 |
| 2B-2K | 0.9 | 3.50 |
| 3B-3K | 0.9 | 2.54 |

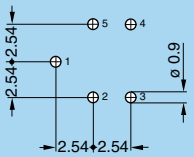
0B-0K.305



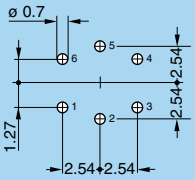

1B-1K.305



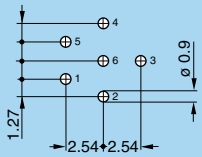

2B-2K.305



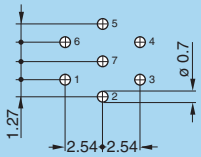

0B-0K / 1B-1K.306



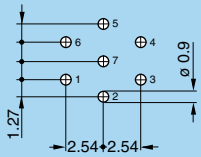

2B-2K / 3B-3K.306



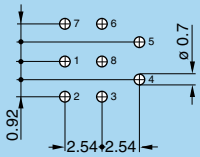

0B-0K / 1B-1K.307



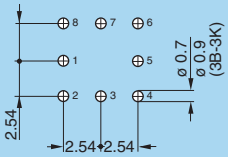

2B-2K.307



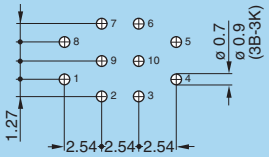

1B-1K.308



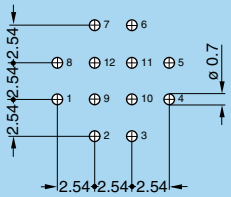

2B-2K / 3B-3K.308



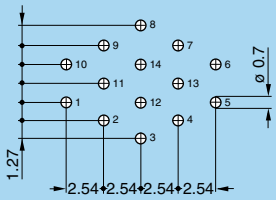

1B-1K / 2B-2K / 3B-3K.310



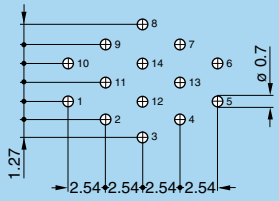

2B-2K / 3B-3K.312



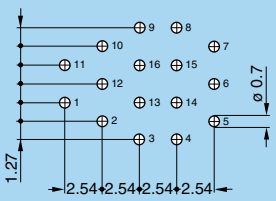

1B-1K / 2B-2K.314



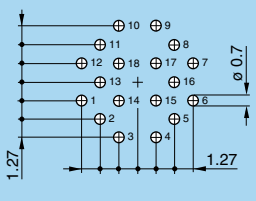

3B-3K.314



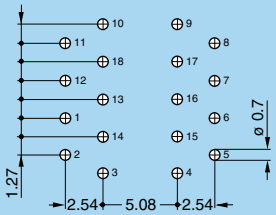

2B-2K / 3B-3K.316



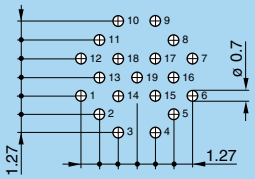

2B-2K.318



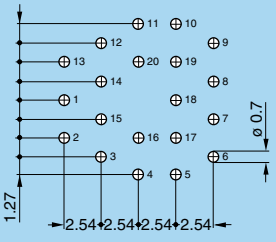

3B-3K.318



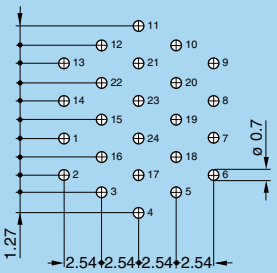

2B-2K.319



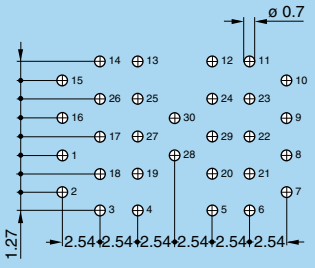

3B-3K.320



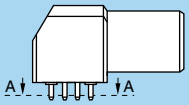

3B-3K.324



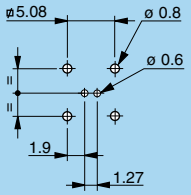

3B-3K.330



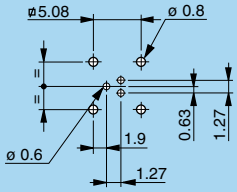
## Elbow socket (90°) for printed circuit (B series) P18 P19 P20



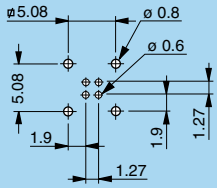

**P18** - EPG.00.302 - XBG.00.302
XRB.00.302[1)]



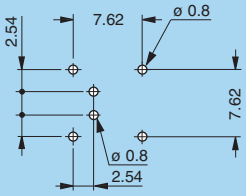

**P18** - EPG.00.303[2)] - XBG.00.303[2)]
XRB.00.303[1)]



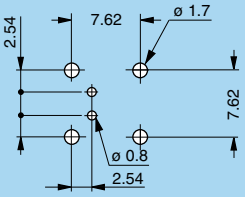

**P18** - EPG.00.304 - XBG.00.304
XRB.00.304[1)]



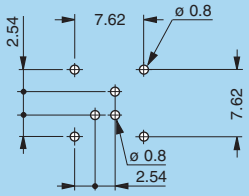

**P19** - EPG-EXG (0B/1B.302)
Solder mount



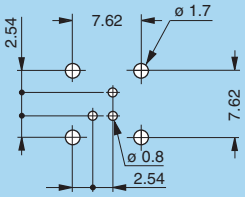

**P19** - EPG-EXG (0B/1B.302)
Screw mount



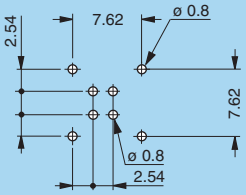

**P19** - EPG-EXG (0B/1B.303)
Solder mount



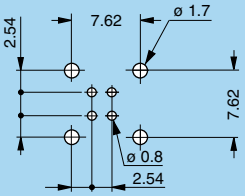

**P19** - EPG-EXG (0B/1B.303)
Screw mount



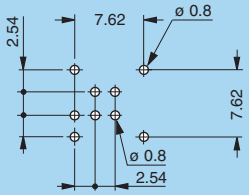

**P19** - EPG-EXG (0B/1B.304)
Solder mount



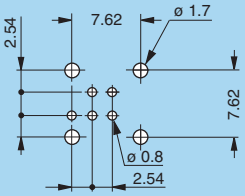

**P19** - EPG-EXG (0B/1B.304)
Screw mount



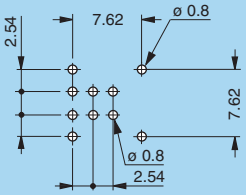

**P19** - EPG-EXG (0B/1B.305)
Solder mount



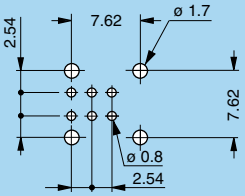

**P19** - EPG-EXG (0B/1B.305)
Screw mount



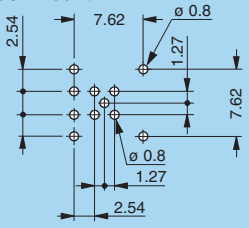

**P19** - EPG-EXG (0B/1B.306)
Solder mount



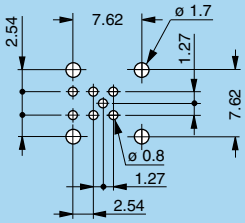

**P19** - EPG-EXG (0B/1B.306)
Screw mount



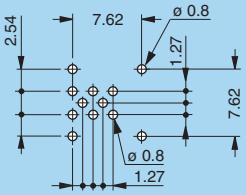

**P19** - EPG-EXG (0B/1B.307)
Solder mount



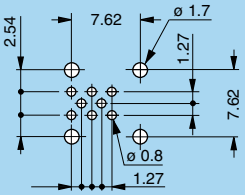

**P19** - EPG-EXG (0B/1B.307)
Screw mount



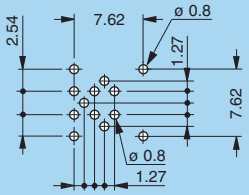

**P19** - EPG-EXG (1B.308)
Solder mount



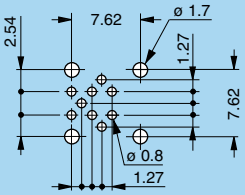

**P19** - EPG-EXG (1B.308)
Screw mount



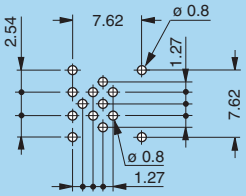

**P19** - EPG-EXG (0B.309)
Solder mount



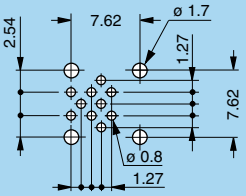

**P19** - EPG-EXG (0B.309)
Screw mount



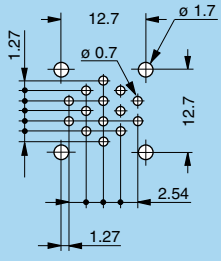

**P19** - EPG-EXG (1B.310)
Solder mount




**P19** - EPG-EXG (1B.310)
Screw mount



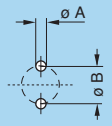

**P20** - EPG.1B.314




**Note:** [1)] for the XRB.00 series the holes for shell fixing are different (see p. 30).
[2)] the dimensions for the EPG.00.303.HLN and XBG.00.303.HLN models are given on page 23. For other models please contact factory.

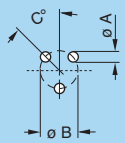
## Fixed socket with straight print contact (S-E series) P21

302



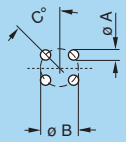

| Series | Dimensions | |
|---|---|---|
| | A | B |
| 0S-0E | 0.8 | 2.2 |
| 1S-1E | 0.8 | 3.0 |

303



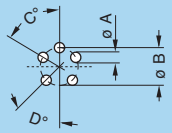

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0S-0E | 0.6 | 2.8 | 45° |
| 1S-1E | 0.8 | 3.5 | 45° |
| 2S-2E | 0.8 | 5.5 | 60° |

304



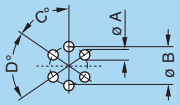

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0S-0E | 0.6 | 2.8 | 45° |
| 1S-1E | 0.8 | 3.5 | 45° |
| 2S-2E | 0.8 | 5.0 | 45° |

305



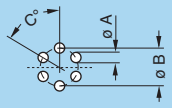

| Series | Dimensions | | | |
|---|---|---|---|---|
| | A | B | C | D |
| 1S-1E | 0.8 | 3.5 | 60° | 45° |
| 2S-2E | 0.8 | 5.5 | 60° | 60° |

306



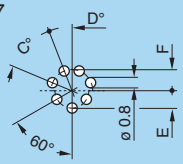

| Series | Dimensions | | | |
|---|---|---|---|---|
| | A | B | C | D |
| 0S-0E | 0.6 | 3 | 55° | 70° |

306



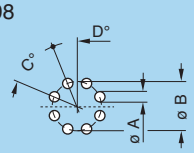

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 1S-1E | 0.8 | 3.5 | 60° |
| 2S-2E | 0.8 | 5.5 | 60° |
| 3S-3E | 0.8 | 6.5 | 60° |

307



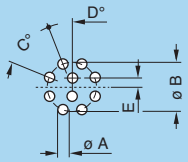

| Series | Dimensions | | | |
|---|---|---|---|---|
| | C | D | E | F |
| 2S-2E | 45° | 22°30' | 2.75 | 3.25 |
| 3S-3E | 45° | 22°30' | 3.25 | 3.90 |

308



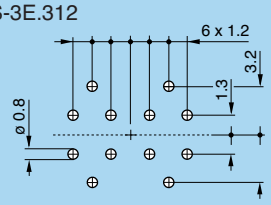

| Series | Dimensions | | | |
|---|---|---|---|---|
| | A | B | C | D |
| 2S-2E | 0.8 | 6.5 | 45° | 22°30' |
| 3S-3E | 0.8 | 7.8 | 45° | 22°30' |

310

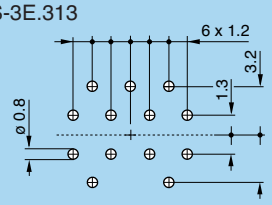



| Series | Dimensions | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| 2S-2E | 0.8 | 6.5 | 45° | 22°30' | 1.25 |
| 3S-3E | 0.8 | 7.8 | 45° | 22°30' | 1.50 |

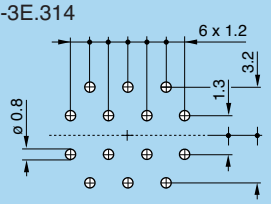
3S-3E.312



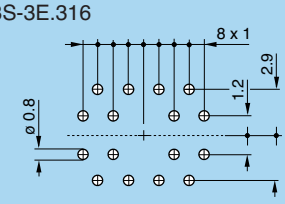

3S-3E.313



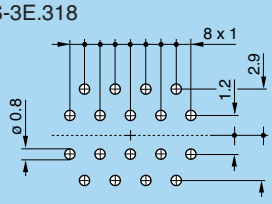

3S-3E.314




3S-3E.316

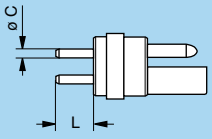



3S-3E.318




**Note:** all views are from the side of the socket.

## Length of straight print contacts (for socket E●●)



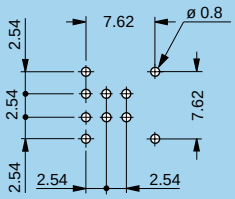

| | Type | Dimensions | |
|---|---|---|---|
| | | ø C | L |
| 0S 0E | 302 | 0.7 | 3.0 |
| | 303 | 0.5 | 3.0 |
| | 304/306 | 0.5 | 3.0 |
| 1S 1E | 302 | 0.7/1.5 | 3.0/5.0 |
| | 303/304/305 | 0.7 | 3.0 |
| | 305/306 | 0.5 | 3.0 |

| | Type | Dimensions | |
|---|---|---|---|
| | | ø C | L |
| 2S 2E | 303/304/305 | 0.7 | 3.0 |
| | 306/307 | 0.7 | 3.0 |
| | 308/310 | 0.7 | 3.0 |
| 3S 3E | 305/306/307/308/310 | 0.7 | 3.0 |
| | 312/313/314 | 0.7 | 3.0 |
| | 316/318 | 0.7 | 3.0 |

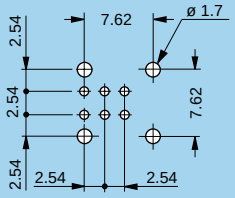
**Note:** This table does not apply for HGP and EHP sockets and for FAA plugs.

## Elbow socket (90°) for printed circuit (S series) P22 P23

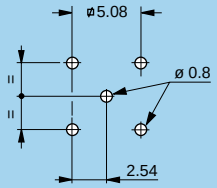
**P22** - EPL - EXP
Solder mount



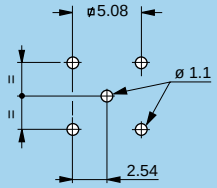

**P22** - EPL - EXP
Screw mount




**P23** - EPL.00.113

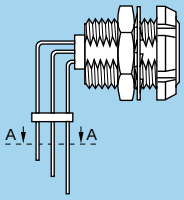



**P23** - EPL.0S.116

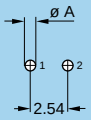



**Note:** all dimensions are in millimetres.

## Fixed socket with elbow print contact (S-E series) P24

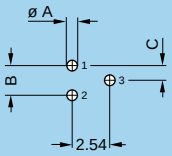



302



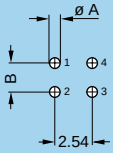

| Series | Dim. |
|---|---|
| | A |
| 0S-0E | 0.7 |
| 1S-1E | 0.9 |

303



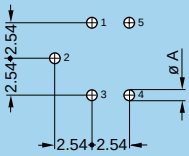

| Series | Dimensions | | |
|---|---|---|---|
| | A | B | C |
| 0S-0E | 0.7 | 2.00 | 1.00 |
| 1S-1E | 0.7 | 2.48 | 1.24 |

304



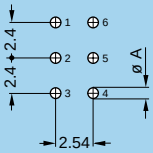

| Series | Dimensions | |
|---|---|---|
| | A | B |
| 0S-0E | 0.7 | 2.00 |
| 1S-1E | 0.7 | 3.50 |
| 2S-2E | 0.9 | 3.50 |

305



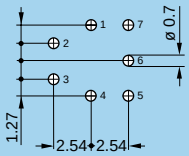

| Series | Dim. |
|---|---|
| | A |
| 1S-1E | 0.7 |
| 2S-2E | 0.9 |

306

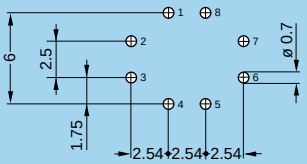



| Series | Dim. |
|---|---|
| | A |
| 1S-1E | 0.7 |
| 2S-2E | 0.9 |

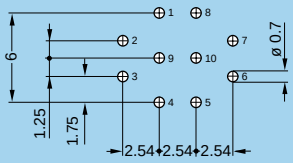
2S-2E.307



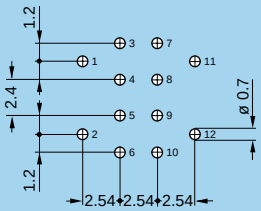

2S-2E.308



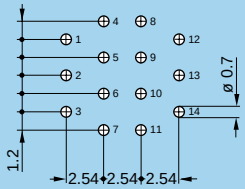

2S-2E / 3S-3E.310



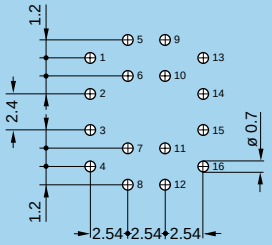

3S-3E.312




3S-3E.314




3S-3E.316

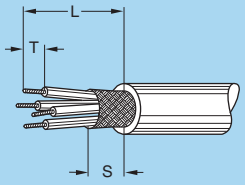


# Cable assembly (B, K, S and E series)

## Cable stripping lengths (B series)

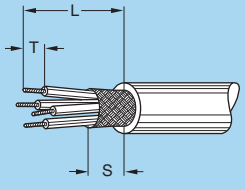
**M1** straight plugs and sockets with cable collet, clamping type D or M (solder or crimp contacts)

**M3** elbow plugs (90°) with cable collet, clamping type D or M (solder or crimp contacts)




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | | | | M3 | | | | | |
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 00 | 302/303/304 | 0.5 | 7.0 | 4 | 2.5 | 10.0 | 4 | 3.0 | 9.5 | 4 | 2.5 | 12.5 | 4 | 3.0 |
| | 305 | 0.35 | 7.0 | 4 | 2.5 | – | – | – | 9.5 | 4 | 2.5 | – | – | – |
| 0B[1] | 302/303 | 0.9 | 14.5 | 7 | 3.5 | 17.0 | 7 | 4.0 | 19.5 | 7 | 3.5 | 22.0 | 7 | 4.0 |
| | 304/305 | 0.7 | 14.5 | 7 | 3.5 | 17.0 | 7 | 4.0 | 19.5 | 7 | 3.5 | 22.0 | 7 | 4.0 |
| | 306/307/309[2] | 0.5 | 14.0 | 7 | 2.5 | 18.0 | 7 | 3.0 | 19.0 | 7 | 2.5 | 23.0 | 7 | 3.0 |
| | 312 | 0.35 | 14.0 | 7 | 2.5 | – | – | – | 19.0 | 7 | 2.5 | – | – | – |
| 1B[1] | 302/303 | 1.3 | 14.5 | 8 | 3.5 | 18.0 | 8 | 4.0 | 25.5 | 8 | 3.5 | 28.0 | 8 | 4.0 |
| | 304/305 | 0.9 | 14.5 | 8 | 3.0 | 18.0 | 8 | 4.0 | 25.5 | 8 | 3.0 | 28.0 | 8 | 4.0 |
| | 306/307/308 | 0.7 | 14.5 | 8 | 3.0 | 18.0 | 8 | 4.0 | 25.5 | 8 | 3.0 | 28.0 | 8 | 4.0 |
| | 310/314/316 | 0.5 | 16.5 | 8 | 2.5 | – | – | – | 27.5 | 8 | 2.5 | – | – | – |
| XB | 312 | 0.7 | 16.5 | 7.5 | 3.5 | – | – | – | – | – | – | – | – | – |
| | 322 | 0.5 | 17.5 | 8 | 4.0 | – | – | – | – | – | – | – | – | – |
| 2B | 302 | 2.0 | 19.0 | 9 | 4.0 | 22.0 | 9 | 5.5 | 30.0 | 9 | 4.0 | 33.0 | 9 | 5.5 |
| | 303 | 1.6 | 19.0 | 9 | 3.5 | 22.0 | 9 | 5.5 | 30.0 | 9 | 3.5 | 33.0 | 9 | 5.5 |
| | 304/305/306/307 | 1.3 | 18.0 | 9 | 3.5 | 20.0 | 9 | 4.0 | 29.0 | 9 | 3.5 | 31.0 | 9 | 4.0 |
| | 308/310 | 0.9 | 17.0 | 9 | 3.0 | 20.0 | 9 | 4.0 | 28.0 | 9 | 3.0 | 31.0 | 9 | 4.0 |
| | 312/314/316/318/319 | 0.7 | 17.0 | 9 | 3.0 | 20.0 | 9 | 4.0 | 28.0 | 9 | 3.0 | 31.0 | 9 | 4.0 |
| | 326/332 | 0.5 | 17.0 | 9 | 2.5 | – | – | – | 28.0 | 9 | 2.5 | – | – | – |
| 3B | 302 | 3.0 | 24.0 | 10 | 4.5 | 28.0 | 10 | 5.5 | 35.0 | 10 | 4.5 | 39.0 | 10 | 5.5 |
| | 303/304 | 2.0 | 23.0 | 10 | 4.0 | 27.0 | 10 | 5.5 | 34.0 | 10 | 4.0 | 38.0 | 10 | 5.5 |
| | 305/306/307 | 1.6 | 23.0 | 10 | 3.5 | 27.0 | 10 | 5.5 | 34.0 | 10 | 3.5 | 38.0 | 10 | 5.5 |
| | 308/310 | 1.3 | 22.0 | 10 | 3.5 | 25.0 | 10 | 4.0 | 33.0 | 10 | 3.5 | 36.0 | 10 | 4.0 |
| | 309 | 1.3 | 22.0 | 10 | 3.5 | 25.0 | 10 | 4.0 | 33.0 | 10 | 3.5 | 36.0 | 10 | 4.0 |
| | | 2.0 | | | 4.0 | | | 5.5 | | | 4.0 | | | 5.5 |
| | 312/314/316/318 | 0.9 | 21.0 | 10 | 3.0 | 25.0 | 10 | 4.0 | 32.0 | 10 | 3.0 | 36.0 | 10 | 4.0 |
| | 320/322/324/326/330/332 | 0.7 | 21.0 | 10 | 3.0 | 25.0 | 10 | 4.0 | 32.0 | 10 | 3.0 | 36.0 | 10 | 4.0 |
| 4B | 304 | 3.0 | 33.0 | 12 | 4.5 | 36.0 | 12 | 5.5 | 41.0 | 12 | 4.5 | 45.0 | 12 | 5.5 |
| | 306/307 | 2.0 | 32.0 | 12 | 4.0 | 36.0 | 12 | 5.5 | 41.0 | 12 | 4.0 | 45.0 | 12 | 5.5 |
| | 310 | 1.6 | 32.0 | 12 | 3.5 | 36.0 | 12 | 5.5 | 39.0 | 12 | 3.5 | 43.0 | 12 | 5.5 |
| | 312 | 1.3 | 32.0 | 12 | 3.5 | 36.0 | 12 | 4.0 | 39.0 | 12 | 3.5 | 43.0 | 12 | 4.0 |
| | 316/320/324/330 | 0.9 | 32.0 | 12 | 3.0 | 34.0 | 12 | 4.0 | 39.0 | 12 | 3.0 | 43.0 | 12 | 4.0 |
| | 340/348 | 0.7 | 32.0 | 12 | 3.0 | 34.0 | 12 | 4.0 | 39.0 | 12 | 3.0 | 43.0 | 12 | 4.0 |
| 5B[1] | 302 | 6.0 | 42.0 | 18 | 7.5 | – | – | – | 70.0 | 18 | 7.5 | – | – | – |
| | 304 | 4.0 | 47.0 | 18 | 5.5 | 50.0 | 18 | 7.0 | 75.0 | 18 | 5.5 | 78.0 | 18 | 7.0 |
| | 310 | 3.0 | 47.0 | 18 | 4.5 | 50.0 | 18 | 7.0 | 75.0 | 18 | 4.5 | 78.0 | 18 | 7.0 |
| | 314/316 | 2.0 | 46.0 | 18 | 4.0 | 49.0 | 18 | 5.5 | 74.0 | 18 | 4.0 | 77.0 | 18 | 5.5 |
| | 320 | 1.6 | 46.0 | 18 | 3.5 | 49.0 | 18 | 5.5 | 74.0 | 18 | 3.5 | 77.0 | 18 | 5.5 |
| | 330/340/348 | 1.3 | 45.0 | 18 | 3.5 | 48.0 | 18 | 4.0 | 74.0 | 18 | 3.5 | 77.0 | 18 | 4.0 |
| | 350/354/364 | 0.9 | 45.0 | 18 | 3.0 | 48.0 | 18 | 4.0 | 74.0 | 18 | 3.0 | 77.0 | 18 | 4.0 |

**M4** straight plug, short version, clamping type D or M (solder or crimp contacts)

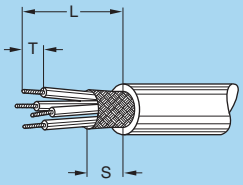



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | M4 | | | | | |
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 0B | 302/303 | 0.9 | 9.5 | 8 | 3.0 | 13.0 | 8 | 4.0 |
| | 304/305 | 0.7 | 9.5 | 8 | 3.0 | 13.0 | 8 | 4.0 |
| | 306/307/309[2] | 0.5 | 10.0 | 8 | 2.5 | 13.5 | 8 | 3.0 |

**Note:** [1] In 0B and 1B series, «L» and «S» dimensions shall be increased by 2 mm for the largest collet (D56 in 0B series; D76 in 1B series). In 5B series, «L» and «S» dimensions shall be increased by 13 mm for the largest collet (D25). [2] Crimp contacts are available only for connectors fitted with male contacts.

**Note:** the tolerances on these dimensions are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm.

**M2** **straight plug, long version, clamping type D or M (solder or crimp contacts)**



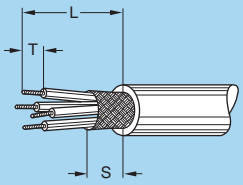

| Connector | | ø contact A (mm) | Cable stripping lengths (mm) M2 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 1B[1)] | 302/303 | 1.3 | 39.5 | 8 | 3.5 | 43.0 | 8 | 4.0 |
| | 304/305 | 0.9 | 39.5 | 8 | 3.0 | 43.0 | 8 | 4.0 |
| | 306/307/308 | 0.7 | 39.5 | 8 | 3.0 | 43.0 | 8 | 4.0 |
| | 310/314/316 | 0.5 | 42.0 | 8 | 2.5 | – | – | – |
| 2B | 302 | 2.0 | 49.0 | 9 | 4.0 | 53.0 | 9 | 5.5 |
| | 303 | 1.6 | 49.0 | 9 | 3.5 | 53.0 | 9 | 5.5 |
| | 304/305/306/307 | 1.3 | 48.0 | 9 | 3.5 | 50.0 | 9 | 4.0 |
| | 308/310 | 0.9 | 47.0 | 9 | 3.0 | 49.0 | 9 | 4.0 |
| | 312/314/316/318/319 | 0.7 | 47.0 | 9 | 3.0 | 49.0 | 9 | 4.0 |
| | 326/332 | 0.5 | 47.0 | 9 | 2.5 | – | – | – |

**Note:**
[1)] In 0B and 1B series, «L» and «S» dimensions shall be increased by 2 mm for the largest collet (D56 in 0B series; D76 in 1B series).
In 5B series, «L» and «S» dimensions shall be increased by 13 mm for the largest collet (D25).
The tolerances on these dimensions are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm

## Cable stripping lengths (K series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder or crimp contacts)**

**M3** **elbow plug (90°) with cable collet, clamping type C (solder or crimp contacts)**

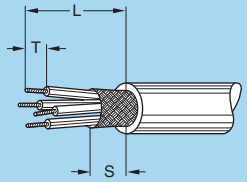



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) M1 | | | | | | M3 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 0K | 302/303 | 0.9 | 9.5 | 6 | 3.5 | 12.0 | 6 | 4.0 | 22.5 | 6 | 3.5 | 25.0 | 6 | 4.0 |
| | 304/305 | 0.7 | 9.5 | 6 | 3.5 | 12.0 | 6 | 4.0 | 22.5 | 6 | 3.5 | 25.0 | 6 | 4.0 |
| | 306/307/309[1)] | 0.5 | 9.0 | 6 | 2.5 | 13.0 | 6 | 4.0 | 22.0 | 6 | 2.5 | 26.0 | 6 | 4.0 |
| | 312 | 0.35 | 9.0 | 6 | 2.5 | – | – | – | 22.0 | 6 | 2.5 | – | – | – |
| 1K | 302/303 | 1.3 | 11.0 | 7 | 3.5 | 14.5 | 7 | 4.0 | 27.5 | 7 | 3.5 | 31.0 | 7 | 4.0 |
| | 304/305 | 0.9 | 11.0 | 7 | 3.0 | 14.5 | 7 | 4.0 | 27.5 | 7 | 3.0 | 31.0 | 7 | 4.0 |
| | 306/307/308 | 0.7 | 11.0 | 7 | 3.0 | 14.5 | 7 | 4.0 | 27.5 | 7 | 3.0 | 31.0 | 7 | 4.0 |
| | 310/314/316 | 0.5 | 13.0 | 7 | 2.5 | – | – | – | 29.5 | 7 | 2.5 | – | – | – |
| 2K | 302 | 2.0 | 16.5 | 8 | 4.0 | 19.5 | 8 | 5.5 | 36.0 | 8 | 4.0 | 39.0 | 8 | 5.5 |
| | 303 | 1.6 | 16.5 | 8 | 3.5 | 19.5 | 8 | 5.5 | 36.0 | 8 | 3.5 | 39.0 | 8 | 5.5 |
| | 304/305/306/307 | 1.3 | 15.5 | 8 | 3.5 | 17.5 | 8 | 4.0 | 35.0 | 8 | 3.5 | 37.0 | 8 | 4.0 |
| | 308/310 | 0.9 | 14.5 | 8 | 3.0 | 17.5 | 8 | 4.0 | 34.0 | 8 | 3.0 | 37.0 | 8 | 4.0 |
| | 312/314/316/318/319 | 0.7 | 14.5 | 8 | 3.0 | 17.5 | 8 | 4.0 | 34.0 | 8 | 3.0 | 37.0 | 8 | 4.0 |
| | 326/332 | 0.5 | 14.5 | 8 | 2.5 | – | – | – | 34.0 | 8 | 2.5 | – | – | – |
| 3K | 302 | 3.0 | 19.0 | 10 | 4.5 | 23.0 | 10 | 5.5 | 48.0 | 10 | 4.5 | 53.0 | 10 | 5.5 |
| | 303/304 | 2.0 | 18.0 | 10 | 4.0 | 22.0 | 10 | 5.5 | 48.0 | 10 | 4.0 | 52.0 | 10 | 5.5 |
| | 305/306/307 | 1.6 | 18.0 | 10 | 3.5 | 22.0 | 10 | 5.5 | 48.0 | 10 | 3.5 | 52.0 | 10 | 5.5 |
| | 308/310 | 1.3 | 17.0 | 10 | 3.5 | 20.0 | 10 | 4.0 | 47.0 | 10 | 3.5 | 50.0 | 10 | 4.0 |
| | 309 | 1.3 | 17.0 | 10 | 3.5 | 20.0 | 10 | 4.0 | 47.0 | 10 | 3.5 | 50.0 | 10 | 4.0 |
| | | 2.0 | | | 4.0 | | | 5.5 | | | 4.0 | | | 5.5 |
| | 312/314/316/318 | 0.9 | 16.0 | 10 | 3.0 | 20.0 | 10 | 4.0 | 46.0 | 10 | 3.0 | 50.0 | 10 | 4.0 |
| | 320/322/324/326/330 | 0.7 | 16.0 | 10 | 3.0 | 20.0 | 10 | 4.0 | 46.0 | 10 | 3.0 | 50.0 | 10 | 4.0 |
| 4K | 304 | 3.0 | 22.0 | 11 | 4.5 | 25.0 | 11 | 5.5 | 52.0 | 11 | 4.5 | 55.0 | 11 | 5.5 |
| | 306/307 | 2.0 | 21.0 | 11 | 4.0 | 25.0 | 11 | 5.5 | 51.0 | 11 | 4.0 | 55.0 | 11 | 5.5 |
| | 310 | 1.6 | 21.0 | 11 | 3.5 | 25.0 | 11 | 5.5 | 51.0 | 11 | 3.5 | 55.0 | 11 | 5.5 |
| | 312 | 1.3 | 21.0 | 11 | 3.5 | 25.0 | 11 | 4.0 | 51.0 | 11 | 3.5 | 55.0 | 11 | 4.0 |
| | 316/320/324/330 | 0.9 | 21.0 | 11 | 3.0 | 23.0 | 11 | 4.0 | 51.0 | 11 | 3.0 | 53.0 | 11 | 4.0 |
| | 340/348 | 0.7 | 21.0 | 11 | 3.0 | 23.0 | 11 | 4.0 | 51.0 | 11 | 3.0 | 53.0 | 11 | 4.0 |
| 5K | 302 | 6.0 | 24.0 | 14 | 7.5 | – | – | – | – | – | – | – | – | – |
| | 304 | 4.0 | 29.0 | 14 | 5.5 | 32.0 | 14 | 7.0 | – | – | – | – | – | – |
| | 310 | 3.0 | 29.0 | 14 | 4.5 | 32.0 | 14 | 7.0 | – | – | – | – | – | – |
| | 314/316 | 2.0 | 28.0 | 14 | 4.0 | 31.0 | 14 | 5.5 | – | – | – | – | – | – |
| | 320 | 1.6 | 28.0 | 14 | 3.5 | 31.0 | 14 | 5.5 | – | – | – | – | – | – |
| | 330/340/348 | 1.3 | 27.0 | 14 | 3.5 | 30.0 | 14 | 4.0 | – | – | – | – | – | – |
| | 350/354/364 | 0.9 | 27.0 | 14 | 3.0 | 30.0 | 14 | 4.0 | – | – | – | – | – | – |

**Note:** [1)] crimp contacts are available only for connectors fitted with male contacts. The tolerances on these dim. are: L: ± 0.5 mm; S: ± 0.5 mm; T: ± 0.2 mm.

## Cable stripping lengths (K series)

**M2** **straight plug and socket with oversize cable collet, clamping type K (solder or crimp contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) M2 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 1K | 302/303 | 1.3 | 23.5 | 8 | 3.5 | 27.5 | 8 | 4.0 |
| | 304/305 | 0.9 | 23.5 | 8 | 3.0 | 27.5 | 8 | 4.0 |
| | 306/307/308 | 0.7 | 23.5 | 8 | 3.0 | 27.5 | 8 | 4.0 |
| | 310/314/316 | 0.5 | 24.5 | 8 | 2.5 | – | – | – |
| 2K | 302 | 2.0 | 29.5 | 10 | 4.0 | 32.5 | 10 | 5.5 |
| | 303 | 1.6 | 29.5 | 10 | 3.5 | 32.5 | 10 | 5.5 |
| | 304/305/306/307 | 1.3 | 28.5 | 10 | 3.5 | 30.5 | 10 | 4.0 |
| | 308/310 | 0.9 | 27.5 | 10 | 3.0 | 30.5 | 10 | 4.0 |
| | 312/314/316/318/319 | 0.7 | 27.5 | 10 | 3.0 | 30.5 | 10 | 4.0 |
| | 326/332 | 0.5 | 27.5 | 10 | 2.5 | – | – | – |
| 3K | 302 | 3.0 | 37.0 | 11 | 4.5 | 41.0 | 11 | 5.5 |
| | 303/304 | 2.0 | 36.0 | 11 | 4.0 | 40.0 | 11 | 5.5 |
| | 305/306/307 | 1.6 | 36.0 | 11 | 3.5 | 40.0 | 11 | 5.5 |
| | 308/310 | 1.3 | 35.0 | 11 | 3.5 | 38.0 | 11 | 4.0 |
| | 309 | 1.3 | 35.0 | 11 | 3.5 | 38.0 | 11 | 4.0 |
| | | 2.0 | | | 4.0 | | | 5.5 |
| | 312/314/316/318 | 0.9 | 34.0 | 11 | 3.0 | 38.0 | 11 | 4.0 |
| | 320/322/324/326/330 | 0.7 | 34.0 | 11 | 3.0 | 38.0 | 11 | 4.0 |
| 4K | 304 | 3.0 | 45.0 | 14 | 4.5 | 48.0 | 14 | 5.5 |
| | 306/307 | 2.0 | 44.0 | 14 | 4.0 | 48.0 | 14 | 5.5 |
| | 310 | 1.6 | 44.0 | 14 | 3.5 | 48.0 | 14 | 5.5 |
| | 312 | 1.3 | 44.0 | 14 | 3.5 | 48.0 | 14 | 4.0 |
| | 316/320/324/330 | 0.9 | 44.0 | 14 | 3.0 | 46.0 | 14 | 4.0 |
| | 340/348 | 0.7 | 44.0 | 14 | 3.0 | 46.0 | 14 | 4.0 |

**Note:**
the tolerances on these dimensions are: L: ± 0.5 mm
S: ± 0.5 mm
T: ± 0.2 mm

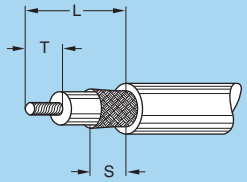
## Cable stripping lengths for unipole connectors (S series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder contacts)**

**M3** **elbow plugs (90°) with cable collet, clamping type C (solder contacts)**

**M5** **straight plugs and sockets with cable crimping type E (crimp contacts)**

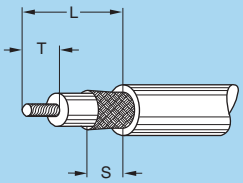
**M6** **elbow plugs (90°) with cable crimping type E (crimp contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | M5 | | | M3 | | | M6 | | |
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 00 | 113 | 1.3 | 9 | 4 | 4 | 19 | 5 | 7 | 7 | 4 | 2 | 17 | 5 | 7 |
| 0S | 116 | 1.6 | 11 | 5 | 4 | – | – | – | 8 | 5 | 2 | – | – | – |
| 1S | 120 | 2.0 | 13 | 8 | 5 | – | – | – | 13 | 8 | 2 | – | – | – |
| | 130 | 3.0 | 13 | 8 | 5 | – | – | – | 13 | 8 | 2 | – | – | – |
| 2S | 130 | 3.0 | 18 | 9 | 6 | – | – | – | 15 | 9 | 2 | – | – | – |
| | 140 | 4.0 | 18 | 9 | 6 | – | – | – | 15 | 9 | 2 | – | – | – |
| 3S | 140 | 4.0 | 21 | 9 | 7 | – | – | – | 19 | 9 | 2 | – | – | – |
| | 160 | 6.0 | 21 | 9 | 9 | – | – | – | 19 | 9 | 2 | – | – | – |
| 4S | 140 | 4.0 | 25 | 9 | 7 | – | – | – | 23 | 9 | 2 | – | – | – |
| | 160 | 6.0 | 25 | 9 | 9 | – | – | – | 23 | 9 | 2 | – | – | – |
| 5S | 112 | 12.0 | 12 | 15 | 12 | – | – | – | – | – | – | – | – | – |

## Cable stripping lengths for unipole connectors (S series)

**M2** **straight plugs and sockets with oversize cable collet, clamping type K (solder contacts)**

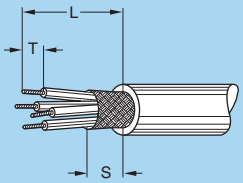



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | |
|---|---|---|---|---|---|
| | | | M2 | | |
| | | | Solder | | |
| Series | Type | | L | S | T |
| 00 | 113 | 1.3 | 16 | 4 | 4 |
| 0S | 116 | 1.6 | 19 | 5 | 4 |
| 1S | 120 | 2.0 | 25 | 8 | 5 |
| | 130 | 3.0 | 25 | 8 | 5 |
| 2S | 130 | 3.0 | 34 | 9 | 6 |
| | 140 | 4.0 | 34 | 9 | 6 |
| 3S | 140 | 4.0 | 39 | 9 | 7 |
| | 160 | 6.0 | 39 | 9 | 9 |
| 4S | 140 | 4.0 | 50 | 9 | 7 |
| | 160 | 6.0 | 50 | 9 | 9 |

## Cable stripping lengths for multipole connectors (S series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder or crimp contacts)**

**M3** **elbow plugs (90°) with cable collet, clamping type C (solder or crimp contacts)**

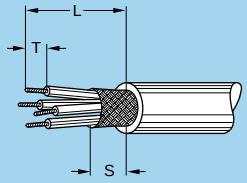



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | | | | M3 | | | | | |
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 0S | 302 | 0.9 | 10 | 5 | 3.5 | 15 | 5 | 4.0 | 10 | 5 | 3.5 | 15 | 5 | 4.0 |
| | 303/304 | 0.7 | 10 | 5 | 3.5 | 15 | 5 | 4.0 | 10 | 5 | 3.5 | 15 | 5 | 4.0 |
| | 306 | 0.5 | 10 | 5 | 2.5 | – | – | – | 10 | 5 | 2.5 | – | – | – |
| 1S | 302 | 1.3 | 12 | 8 | 3.0 | 17 | 8 | 4.0 | 14 | 8 | 3.0 | 17 | 8 | 4.0 |
| | 303/304 | 0.9 | 12 | 8 | 3.0 | 17 | 8 | 4.0 | 14 | 8 | 3.0 | 17 | 8 | 4.0 |
| | 305 | 0.9 | 12 | 8 | 3.0 | 17 | 8 | 4.0 | 14 | 8 | 3.0 | 17 | 8 | 4.0 |
| | | 0.7 | 12 | 8 | 2.5 | 17 | 8 | 4.0 | 14 | 8 | 2.5 | 17 | 8 | 4.0 |
| | 306 | 0.7 | 12 | 8 | 2.5 | 17 | 8 | 4.0 | 14 | 8 | 2.5 | 17 | 8 | 4.0 |
| 2S | 302 | 1.6 | 18 | 9 | 4.5 | 22 | 9 | 5.5 | 18 | 9 | 4.5 | 22 | 9 | 5.5 |
| | 303/304/305/306 | 1.3 | 18 | 9 | 4.0 | 22 | 9 | 4.0 | 18 | 9 | 4.0 | 22 | 9 | 4.0 |
| | 307 | 1.3 | 18 | 9 | 4.0 | 22 | 9 | 4.0 | 18 | 9 | 4.0 | 22 | 9 | 4.0 |
| | | 0.9 | 18 | 9 | 4.0 | 22 | 9 | 4.0 | 18 | 9 | 4.0 | 22 | 9 | 4.0 |
| | 308/310 | 0.9 | 18 | 9 | 4.0 | 22 | 9 | 4.0 | 18 | 9 | 4.0 | 22 | 9 | 4.0 |
| 3S | 302/303/304 | 2.0 | 21 | 9 | 5.0 | – | – | – | – | – | – | – | – | – |
| | 305 | 2.0 | 21 | 9 | 5.0 | – | – | – | – | – | – | – | – | – |
| | | 1.3 | 21 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| | 306/307/308/310 | 1.3 | 21 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| | 312/313/314/316/318 | 0.9 | 21 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| 4S | 302 | 4.0 | 25 | 9 | 7.0 | – | – | – | – | – | – | – | – | – |
| | 303/304 | 3.0 | 25 | 9 | 6.0 | – | – | – | – | – | – | – | – | – |
| | 305 | 3.0 | 25 | 9 | 6.0 | – | – | – | – | – | – | – | – | – |
| | | 2.0 | 25 | 9 | 5.0 | – | – | – | – | – | – | – | – | – |
| | 306 | 2.0 | 25 | 9 | 5.0 | – | – | – | – | – | – | – | – | – |
| | 307 | 2.0 | 25 | 9 | 5.0 | – | – | – | – | – | – | – | – | – |
| | | 1.3 | 25 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| | 308/309/310 | 1.3 | 25 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| | 312/313/314 | 1.3 | 25 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |
| | 316/318/320/322/324 | 0.9 | 25 | 9 | 4.0 | – | – | – | – | – | – | – | – | – |

## Cable stripping lengths for multipole connectors (S series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder contacts)**

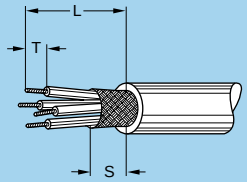
**M3** **elbow plugs (90°) with cable collet, clamping type C (solder contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **M1** | | | **M3** | | |
| | | | Solder | | | Solder | | |
| Series | Type | | L | S | T | L | S | T |
| 5S | 302 | 6.0 | 35 | 22 | 9.0 | 35 | 22 | 9.0 |
| | 303 | 6.0 | 35 | 22 | 9.0 | 35 | 22 | 9.0 |
| | | 4.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | 304 | 4.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | 305 | 4.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | | 3.0 | 35 | 22 | 6.0 | 35 | 22 | 6.0 |
| | 306/308 | 3.0 | 35 | 22 | 6.0 | 35 | 22 | 6.0 |
| | 310/312 | 2.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | 314 | 3.0 | 35 | 22 | 6.0 | 35 | 22 | 6.0 |
| | | 2.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | 316 | 2.0 | 35 | 22 | 7.0 | 35 | 22 | 7.0 |
| | 318 | 3.0 | 35 | 22 | 6.0 | 35 | 22 | 6.0 |
| | | 1.6 | 35 | 22 | 4.5 | 35 | 22 | 4.5 |
| | 320 | 1.6 | 35 | 22 | 4.5 | 35 | 22 | 4.5 |
| | 322 | 3.0 | 35 | 22 | 6.0 | 35 | 22 | 6.0 |
| | | 1.6 | 35 | 22 | 4.5 | 35 | 22 | 4.5 |
| | 324 | 1.6 | 35 | 22 | 4.5 | 35 | 22 | 4.5 |
| | 330/336/340/344/348 | 1.3 | 35 | 22 | 4.0 | 35 | 22 | 4.0 |
| 6S | 304 | 8.0 | 37 | 15 | 10.0 | 37 | 15 | 10.0 |
| | 312/318 | 4.0 | 37 | 15 | 7.0 | 37 | 15 | 7.0 |
| | 320/324 | 3.0 | 37 | 15 | 6.0 | 37 | 15 | 6.0 |
| | 330/336/348 | 2.0 | 37 | 15 | 7.0 | 37 | 15 | 7.0 |
| | 360 | 1.6 | 37 | 15 | 4.5 | 37 | 15 | 4.5 |
| | 364/372 | 1.3 | 37 | 15 | 4.0 | 37 | 15 | 4.0 |
| | 106 | 0.9 | 37 | 15 | 4.0 | 37 | 15 | 4.0 |

## Cable stripping lengths for multipole connectors (S series)

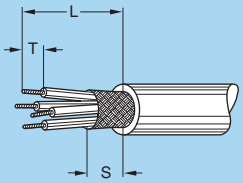
**M4** **straight plug with cable collet, clamping type D or M (solder or crimp contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **M4** | | | | | |
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 2S | 302 | 1.6 | 48 | 9 | 4.5 | 52 | 9 | 5.5 |
| | 303/304/305/306 | 1.3 | 48 | 9 | 4.0 | 52 | 9 | 4.0 |
| | 307 | 1.3 | 48 | 9 | 4.0 | 52 | 9 | 4.0 |
| | | 0.9 | 48 | 9 | 4.0 | 52 | 9 | 4.0 |
| | 308/310 | 0.9 | 48 | 9 | 4.0 | 52 | 9 | 4.0 |

## Cable stripping lengths for multipole connectors (S series)

**M2** straight plugs and sockets with oversize cable collet, clamping type K (solder or crimp contacts)

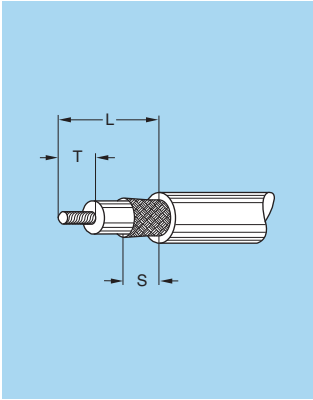



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) M2 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 0S | 302 | 0.9 | 19 | 5 | 3.0 | 23 | 5 | 4.0 |
| | 303/304 | 0.7 | 19 | 5 | 2.5 | 23 | 5 | 4.0 |
| | 306 | 0.5 | 19 | 5 | 2.5 | – | – | – |
| 1S | 302 | 1.3 | 24 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 303/304 | 0.9 | 24 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 305 | 0.9 | 24 | 8 | 3.0 | 28 | 8 | 4.0 |
| | | 0.7 | 24 | 8 | 2.5 | 28 | 8 | 4.0 |
| | 306 | 0.7 | 24 | 8 | 2.5 | 28 | 8 | 4.0 |
| 2S | 302 | 1.6 | 34 | 9 | 4.5 | 38 | 9 | 5.5 |
| | 303/304/305/306 | 1.3 | 34 | 9 | 4.0 | 38 | 9 | 4.0 |
| | 307 | 1.3 | 34 | 9 | 4.0 | 38 | 9 | 4.0 |
| | | 0.9 | 34 | 9 | 4.0 | 38 | 9 | 4.0 |
| | 308/310 | 0.9 | 34 | 9 | 4.0 | 38 | 9 | 4.0 |
| 3S | 302/303/304 | 2.0 | 39 | 9 | 5.0 | – | – | – |
| | 305 | 2.0 | 39 | 9 | 5.0 | – | – | – |
| | | 1.3 | 39 | 9 | 4.0 | – | – | – |
| | 306/307/308/310 | 1.3 | 39 | 9 | 4.0 | – | – | – |
| | 312/313/314/316/318 | 0.9 | 39 | 9 | 4.0 | – | – | – |
| 4S | 302 | 4.0 | 50 | 9 | 7.0 | – | – | – |
| | 303/304 | 3.0 | 50 | 9 | 6.0 | – | – | – |
| | 305 | 3.0 | 50 | 9 | 6.0 | – | – | – |
| | | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | 306 | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | 307 | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | | 1.3 | 50 | 9 | 4.0 | – | – | – |
| | 308/309/310 | 1.3 | 50 | 9 | 4.0 | – | – | – |
| | 312/313/314 | 1.3 | 50 | 9 | 4.0 | – | – | – |
| | 316/318/320/322/324 | 0.9 | 50 | 9 | 4.0 | – | – | – |
| 5S | 302 | 6.0 | 70 | 22 | 9.0 | – | – | – |
| | 303 | 6.0 | 70 | 22 | 9.0 | – | – | – |
| | | 4.0 | 70 | 22 | 7.0 | – | – | – |
| | 304 | 4.0 | 70 | 22 | 7.0 | – | – | – |
| | 305 | 4.0 | 70 | 22 | 7.0 | – | – | – |
| | | 3.0 | 70 | 22 | 6.0 | – | – | – |
| | 306/308 | 3.0 | 70 | 22 | 6.0 | – | – | – |
| | 310/312 | 2.0 | 70 | 22 | 7.0 | – | – | – |
| | 314 | 3.0 | 70 | 22 | 6.0 | – | – | – |
| | | 2.0 | 70 | 22 | 7.0 | – | – | – |
| | 316 | 2.0 | 70 | 22 | 7.0 | – | – | – |
| | 318 | 3.0 | 70 | 22 | 6.0 | – | – | – |
| | | 1.6 | 70 | 22 | 4.5 | – | – | – |
| | 320 | 1.6 | 70 | 22 | 4.5 | – | – | – |
| | 322 | 3.0 | 70 | 22 | 6.0 | – | – | – |
| | | 1.6 | 70 | 22 | 4.5 | – | – | – |
| | 324 | 1.6 | 70 | 22 | 4.5 | – | – | – |
| | 330/336/340/344/348 | 1.3 | 70 | 22 | 4.0 | – | – | – |

## Cable stripping lengths for unipole connectors (E series)

**M1** straight plugs and sockets with cable collet, clamping type C (solder contacts)

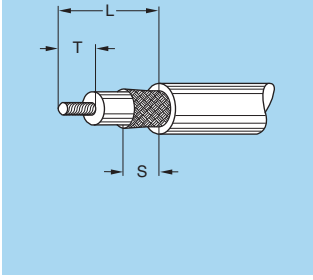
**M3** elbow plugs (90°) with cable collet, clamping type C (solder contacts)




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | M3 | | |
| | | | Solder | | | Solder | | |
| Series | Type | | L | S | T | L | S | T |
| 0E | 116 | 1.6 | 9 | 5 | 4 | 20 | 5 | 4 |
| 1E | 120 | 2.0 | 12 | 8 | 5 | 25 | 8 | 5 |
| | 130 | 3.0 | 13 | 8 | 5 | 25 | 8 | 5 |
| 2E | 130 | 3.0 | 16 | 9 | 6 | 33 | 9 | 6 |
| | 140 | 4.0 | 15 | 9 | 6 | 33 | 9 | 6 |
| 3E | 140 | 4.0 | 19 | 9 | 7 | 40 | 9 | 7 |
| | 160 | 6.0 | 20 | 9 | 9 | 40 | 9 | 9 |
| 4E | 160 | 6.0 | 23 | 9 | 9 | 50 | 9 | 9 |
| 5E | 112 | 12.0 | 12 | 15 | 12 | – | – | – |

## Cable stripping lengths for unipole connectors (E series)

**M2** straight plugs and sockets with oversize cable collet, clamping type K (solder contacts)

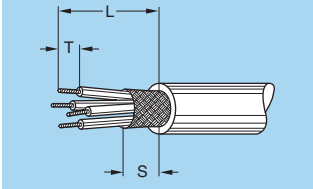



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | |
|---|---|---|---|---|---|
| | | | M2 | | |
| | | | Solder | | |
| Series | Type | | L | S | T |
| 1E | 120 | 2.0 | 25 | 8 | 5 |
| | 130 | 3.0 | 26 | 8 | 5 |
| 2E | 130 | 3.0 | 28 | 9 | 6 |
| | 140 | 4.0 | 27 | 9 | 6 |
| 3E | 140 | 4.0 | 36 | 9 | 7 |
| | 160 | 6.0 | 37 | 9 | 9 |
| 4E | 160 | 6.0 | 50 | 9 | 9 |

## Cable stripping lengths for multipole connectors (E series)

**M1** straight plugs and sockets with cable collet, clamping type C (solder or crimp contacts)

**M3** elbow plugs (90°) with cable collet, clamping type C (solder or crimp contacts)

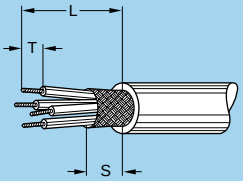



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | | | | M3 | | | | | |
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 0E | 302 | 0.9 | 8 | 5 | 3.0 | 12 | 5 | 4.0 | 19 | 5 | 3.0 | 23 | 5 | 4.0 |
| | 303/304 | 0.7 | 8 | 5 | 2.5 | 12 | 5 | 4.0 | 19 | 5 | 2.5 | 23 | 5 | 4.0 |
| | 306 | 0.5 | 8 | 5 | 2.5 | – | – | – | 19 | 5 | 2.5 | – | – | – |
| 1E | 302 | 1.3 | 10 | 8 | 3.0 | 15 | 8 | 4.0 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 303/304 | 0.9 | 10 | 8 | 3.0 | 15 | 8 | 4.0 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 305 | 0.9 | 10 | 8 | 3.0 | 15 | 8 | 4.0 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | | 0.7 | 10 | 8 | 2.5 | 15 | 8 | 4.0 | 23 | 8 | 2.5 | 28 | 8 | 4.0 |
| | 306 | 0.7 | 10 | 8 | 2.5 | 15 | 8 | 4.0 | 23 | 8 | 2.5 | 28 | 8 | 4.0 |
| 2E | 302 | 1.6 | 15 | 9 | 4.5 | 19 | 9 | 5.5 | 33 | 9 | 4.5 | 37 | 9 | 5.5 |
| | 303/304/305/306 | 1.3 | 15 | 9 | 4.0 | 19 | 9 | 4.0 | 33 | 9 | 4.0 | 37 | 9 | 4.0 |
| | 307 | 1.3 | 15 | 9 | 4.0 | 19 | 9 | 4.0 | 33 | 9 | 4.0 | 37 | 9 | 4.0 |
| | | 0.9 | 15 | 9 | 4.0 | 19 | 9 | 4.0 | 33 | 9 | 4.0 | 37 | 9 | 4.0 |
| | 308/310 | 0.9 | 15 | 9 | 4.0 | 19 | 9 | 4.0 | 33 | 9 | 4.0 | 37 | 9 | 4.0 |

## Cable stripping lengths for multipole connectors (E series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder contacts)**

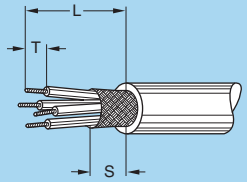
**M3** **elbow plugs (90°) with cable collet, clamping type C (solder contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | M3 | | |
| | | | Solder | | | Solder | | |
| Series | Type | | L | S | T | L | S | T |
| 3E | 302/303/304 | 2.0 | 18 | 9 | 5.0 | 39 | 9 | 5.0 |
| | 305 | 2.0 | 18 | 9 | 5.0 | 39 | 9 | 5.0 |
| | | 1.3 | 18 | 9 | 4.0 | 39 | 9 | 4.0 |
| | 306/307/308/310 | 1.3 | 18 | 9 | 4.0 | 39 | 9 | 4.0 |
| | 312/313/314/316/318 | 0.9 | 18 | 9 | 4.0 | 39 | 9 | 4.0 |
| 4E | 302 | 4.0 | 23 | 9 | 7.0 | 50 | 9 | 7.0 |
| | 303/304 | 3.0 | 23 | 9 | 6.0 | 50 | 9 | 6.0 |
| | 305 | 3.0 | 23 | 9 | 6.0 | 50 | 9 | 6.0 |
| | | 2.0 | 23 | 9 | 5.0 | 50 | 9 | 5.0 |
| | 306 | 2.0 | 23 | 9 | 5.0 | 50 | 9 | 5.0 |
| | 307 | 2.0 | 23 | 9 | 5.0 | 50 | 9 | 5.0 |
| | | 1.3 | 23 | 9 | 4.0 | 50 | 9 | 4.0 |
| | 308/309/310/312/314 | 1.3 | 23 | 9 | 4.0 | 50 | 9 | 4.0 |
| | 316/318/320/322/324 | 0.9 | 23 | 9 | 4.0 | 50 | 9 | 4.0 |
| 5E | 302 | 6.0 | 48 | 15 | 9.0 | – | – | – |
| | 303 | 6.0 | 48 | 15 | 9.0 | – | – | – |
| | | 4.0 | 48 | 15 | 7.0 | – | – | – |
| | 304 | 4.0 | 48 | 15 | 7.0 | – | – | – |
| | 305 | 4.0 | 48 | 15 | 7.0 | – | – | – |
| | | 3.0 | 48 | 15 | 6.0 | – | – | – |
| | 306/308 | 3.0 | 48 | 15 | 6.0 | – | – | – |
| | 310/312 | 2.0 | 48 | 15 | 7.0 | – | – | – |
| | 314 | 3.0 | 48 | 15 | 6.0 | – | – | – |
| | | 2.0 | 48 | 15 | 7.0 | – | – | – |
| | 316 | 2.0 | 48 | 15 | 7.0 | – | – | – |
| | 318 | 3.0 | 48 | 15 | 6.0 | – | – | – |
| | | 1.6 | 48 | 15 | 4.5 | – | – | – |
| | 320 | 1.6 | 48 | 15 | 4.5 | – | – | – |
| | 322 | 3.0 | 48 | 15 | 6.0 | – | – | – |
| | | 1.6 | 48 | 15 | 4.5 | – | – | – |
| | 324 | 1.6 | 48 | 15 | 4.5 | – | – | – |
| | 330/336/340/344/348 | 1.3 | 48 | 15 | 4.0 | – | – | – |
| 6E | 303 | 6.0 | 70 | 30 | 9.0 | – | – | – |
| | 304 | 8.0 | 70 | 30 | 10.0 | – | – | – |
| | 312 | 5.0 | 70 | 30 | 8.0 | – | – | – |
| | 316/320/324 | 3.0 | 70 | 30 | 6.0 | – | – | – |
| | 330/332 | 2.0 | 70 | 30 | 7.0 | – | – | – |
| | 336 | 1.3 | 70 | 30 | 4.0 | – | – | – |
| | | 5.0 | 70 | 30 | 8.0 | – | – | – |
| | 340/348 | 2.0 | 70 | 30 | 7.0 | – | – | – |
| | 360/362 | 1.6 | 70 | 30 | 4.5 | – | – | – |
| | 364/372 | 1.3 | 70 | 30 | 4.0 | – | – | – |
| | 106 | 0.9 | 70 | 30 | 4.0 | – | – | – |

## Cable stripping lengths for multipole connectors (E series)

**M2** **straight plugs and sockets with oversize cable collet, clamping type K (solder or crimp contacts)**

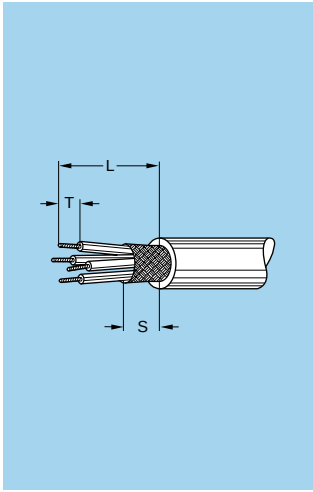



| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | M2 | | | | | |
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 1E | 302 | 1.3 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 303/304 | 0.9 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | 305 | 0.9 | 23 | 8 | 3.0 | 28 | 8 | 4.0 |
| | | 0.7 | 23 | 8 | 2.5 | 28 | 8 | 4.0 |
| | 306 | 0.7 | 23 | 8 | 2.5 | 28 | 8 | 4.0 |
| 2E | 302 | 1.6 | 27 | 9 | 4.5 | 31 | 9 | 5.5 |
| | 303/304/305/306 | 1.3 | 27 | 9 | 4.0 | 31 | 9 | 4.0 |
| | 307 | 1.3 | 27 | 9 | 4.0 | 31 | 9 | 4.0 |
| | | 0.9 | 27 | 9 | 4.0 | 31 | 9 | 4.0 |
| | 308/310 | 0.9 | 27 | 9 | 4.0 | 31 | 9 | 4.0 |
| 3E | 302/303/304 | 2.0 | 35 | 9 | 5.0 | – | – | – |
| | 305 | 2.0 | 35 | 9 | 5.0 | – | – | – |
| | | 1.3 | 35 | 9 | 4.0 | – | – | – |
| | 306/307/308/310 | 1.3 | 35 | 9 | 4.0 | – | – | – |
| | 312/313/314/316/318 | 0.9 | 35 | 9 | 4.0 | – | – | – |
| 4E | 302 | 4.0 | 50 | 9 | 7.0 | – | – | – |
| | 303/304 | 3.0 | 50 | 9 | 6.0 | – | – | – |
| | 305 | 3.0 | 50 | 9 | 6.0 | – | – | – |
| | | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | 306 | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | 307 | 2.0 | 50 | 9 | 5.0 | – | – | – |
| | | 1.3 | 50 | 9 | 4.0 | – | – | – |
| | 308/309/310/312/314 | 1.3 | 50 | 9 | 4.0 | – | – | – |
| | 316/318/320/322/324 | 0.9 | 50 | 9 | 4.0 | – | – | – |

## Cable stripping lengths for multipole connectors (L series)

**M1** **straight plugs and sockets with cable collet, clamping type C (solder or crimp contacts)**

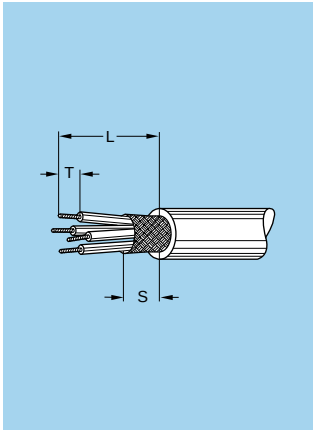
**M3** **elbow plugs (90°) with cable collet, clamping type C (solder or crimp contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M1 | | | | | | M3 | | | | | |
| | | | Solder | | | Crimp | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T | L | S | T | L | S | T |
| 0L | 302 | 0.9 | 10.5 | 6 | 3.0 | 12.0 | 6 | 4.0 | 23.5 | 6 | 3.0 | 25.0 | 6 | 4.0 |
| | 303/304 | 0.7 | 10.5 | 6 | 2.5 | 12.0 | 6 | 4.0 | 23.5 | 6 | 2.5 | 25.0 | 6 | 4.0 |
| 1L | 302 | 1.3 | 12.5 | 7 | 3.0 | 14.5 | 7 | 4.0 | 29.0 | 7 | 3.0 | 31.0 | 7 | 4.0 |
| | 303/304 | 0.9 | 12.5 | 7 | 3.0 | 14.5 | 7 | 4.0 | 29.0 | 7 | 3.0 | 31.0 | 7 | 4.0 |
| | 305 | 0.9 | 12.5 | 7 | 3.0 | 14.5 | 7 | 4.0 | 29.0 | 7 | 3.0 | 31.0 | 7 | 4.0 |
| | | 0.7 | 12.5 | 7 | 2.5 | 14.5 | 7 | 4.0 | 29.0 | 7 | 2.5 | 31.0 | 7 | 4.0 |
| | 306 | 0.7 | 12.5 | 7 | 2.5 | 14.5 | 7 | 4.0 | 29.0 | 7 | 2.5 | 31.0 | 7 | 4.0 |
| 2L | 302 | 1.6 | 18.0 | 8 | 4.5 | 19.5 | 8 | 5.5 | 37.5 | 8 | 4.5 | 39.0 | 8 | 5.5 |
| | 303/304/305/306 | 1.3 | 17.0 | 8 | 4.0 | 17.5 | 8 | 4.0 | 36.5 | 8 | 4.0 | 37.0 | 8 | 4.0 |
| | 307 | 1.3 | 17.0 | 8 | 4.0 | 17.5 | 8 | 4.0 | 36.5 | 8 | 4.0 | 37.0 | 8 | 4.0 |
| | | 0.9 | 16.0 | 8 | 4.0 | 17.5 | 8 | 4.0 | 35.5 | 8 | 4.0 | 37.0 | 8 | 4.0 |
| | 308/310 | 0.9 | 16.0 | 8 | 4.0 | 17.5 | 8 | 4.0 | 35.5 | 8 | 4.0 | 37.0 | 8 | 4.0 |

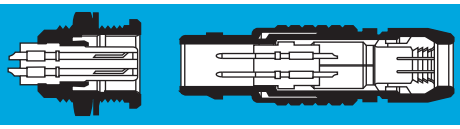
## Cable stripping lengths for multipole connectors (L series)

**M2** **straight plugs and sockets with oversize cable collet, clamping type K (solder or crimp contacts)**




| Connector | | ø contact A (mm) | Cable stripping lengths (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | M2 | | | | | |
| | | | Solder | | | Crimp | | |
| Series | Type | | L | S | T | L | S | T |
| 1L | 302 | 1.3 | 26.5 | 8 | 3.0 | 28.5 | 8 | 4.0 |
| | 303/304 | 0.9 | 26.5 | 8 | 3.0 | 28.5 | 8 | 4.0 |
| | 305 | 0.9 | 26.5 | 8 | 3.0 | 28.5 | 8 | 4.0 |
| | | 0.7 | 26.5 | 8 | 2.5 | 28.5 | 8 | 4.0 |
| | 306 | 0.7 | 26.5 | 8 | 2.5 | 28.5 | 8 | 4.0 |
| 2L | 302 | 1.6 | 31.0 | 10 | 4.5 | 32.5 | 10 | 5.5 |
| | 303/304/305/306 | 1.3 | 30.0 | 10 | 4.0 | 30.5 | 10 | 4.0 |
| | 307 | 1.3 | 30.0 | 10 | 4.0 | 30.5 | 10 | 4.0 |
| | | 0.9 | 29.0 | 10 | 4.0 | 30.5 | 10 | 4.0 |
| | 308/310 | 0.9 | 29.0 | 10 | 4.0 | 30.5 | 10 | 4.0 |

# Technical characteristics



## Outer shell

### Brass

In most cases, LEMO connectors have a brass outer shell which is suitable for most general purpose applications, including civilian and military. The brass outer shells have a chrome nickel-plated surface which ensures very good protection against industrial atmosphere, salt air and most corrosive agents.

Alternative protective coatings are available to satisfy other specific environmental conditions:
– electrolytic nickel
– nickel-gold
– nickel-black chrome. After the black chrome treatment, the part is coated with a protective organic film.

### Stainless steel

For applications where there are severe environmental conditions that may rapidly damage the surface finish, we recommend using stainless steel. The AISI 303 stainless steel is a material for general use adapted to most applications requiring a product made entirely of stainless metal.

For the nuclear industry where elements are subject to radiation and to vaporous nitric acid, we offer AISI 304 stainless steel.

Grade AISI 316L is recommended for medical applications, highly demanding with regard to non-corrosiveness. This material is also used for connector shells soldered by electronic beam onto a device made of the same stainless steel.
These parts have no surface treatment.

### Aluminium alloy

The aluminium alloy outer shells find numerous applications where light weight is a predominant factor; such as in the aeronautics and space industries, and for portable and mobile equipment.
These materials have high mechanical strength and excellent resistance to corrosion. The shell surface is protected by anodizing which is available in six colours: blue, yellow, black, red, green, and natural.

### Plastic materials

Some connector model shells can be made of plastic. This solution offers optimum electrical insulating properties particularly suitable for medical applications. Black Polyoxymethylene (POM) is particularly adapted to products of the 00 or S series.
Grey or white polysulfone (PSU) and beige PEEK offers excellent mechanical properties and is suitable for gas or vapour sterilization.
Some models of the 2B and 3B series are available with an outer shell of cream-coloured polyphenylsulfone (PPSU). We recommend this material particularly for applications where products are to withstand hundreds of vapour sterilization cycles.

Bridge plug or plugs with parallel sockets are made of polyamide (PA.6) available in 9 colours: blue, white, grey, yellow, brown, black, red, orange and green.

Some elbow socket shells for printed circuits are overmoulded in polyphenilene sulfide (PPS).

### Other metallic components

In general, most metallic components are manufactured in brass. However, bronze or beryllium copper are used where good elasticity is required (for example: earthing crown). Depending on the application, these parts have electrolytic nickel or nickel-gold plating.
These parts can also be manufactured in stainless steel.

### Sealing gasket

In general, sealing gaskets are made of silicone rubber MQ/MVQ. However, for vacuumtight sockets and couplers, gaskets are made of fluorosilicone rubber (FPM).

### Sealing resin

An epoxy resin is used to seal both watertight and vacuumtight socket and coupler models.

## Materials and Treatments

| Component | Material (Standard) | Surface treatment (µm) | | | | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | chrome | | | nickel | | gold | | | black chr. | | |
| | | Cu | Ni | Cr | Cu | Ni | Cu | Ni | Au | Ni | Cr | |
| Outer shell, collet nut, conical nut or notched nut and oversized collet | Brass (UNS C 38500) | 0.5 | 3 | 0.3 | 0.5 | 3 | 0.5 | 3 | 0.5 | 1 | 2 | |
| | Stainless steel (AISI 303, 304 or 316L) | without treatment | | | | | | | | | | |
| | Aluminium alloy (AA 6262A or AA 6023) | – | – | – | – | 5 | – | – | – | – | – | 1) |
| | Aluminium alloy (AA 6262A or AA 6023) | anodized | | | | | | | | | | |
| | POM (Delrin® or Ertacetal®), Polyoxymethylene, black | – | | | | | | | | | | 2) |
| | PEEK, Polyether ethercetone, beige | – | | | | | | | | | | 3) |
| | PSU (Udel®), Polysulfone, grey or white | – | | | | | | | | | | 4) |
| | PPSU (Radel®), Polyphenylsulfone, cream | – | | | | | | | | | | 4) |
| | PA.6 (Grilon®), Polyamid | – | | | | | | | | | | 5) |
| | PPS (Ryton®), Polyphenilene sulfide, brown | – | | | | | | | | | | 6) |
| Earthing crown | Bronze (UNS C 54400) or special brass | – | – | – | 0.5 | 3 | 0.5 | 3 | 1.0 | – | – | 7) |
| | Beryllium Copper (UNS C 17300) | – | – | – | 0.5 | 3 | 0.5 | 3 | 1.0 | – | – | 8) |
| | Stainless steel (AISI 416 or 316L) | without treatment | | | | | | | | | | 9) |
| Latch sleeve | Special brass | 0.5 | 3 | 0.3 | 0.5 | 3 | 0.5 | 3 | 0.5 | – | – | |
| | Stainless steel (AISI 416 or 316L) | without treatment | | | | | | | | | | 9) |
| Locking washer | Bronze (UNS C 52100) | – | – | – | 0.5 | 3 | 0.5 | 3 | 0.5 | – | – | |
| Hexagonal or round nut | Brass (UNS C 38500) | | | | | | | | | | | |
| | Stainless steel (AISI 303, 304 or 316L) | without treatment | | | | | | | | | | 10) |
| | Aluminium alloy (AA 6262A or AA 6023) | anodized natural | | | | | | | | | | 10) |
| Other metallic components | Brass (UNS C 38500) | – | – | – | 0.5 | 3 | 0.5 | 3 | 0.5 | – | – | |
| | Stainless steel (AISI 303, 304 or 316L) | without treatment | | | | | | | | | | |
| O-ring and gaskets | Silicone MQ/MVQ or FPM/FKM (Viton®) | – | | | | | | | | | | 11) |
| Sealing resin | Epoxy (Araldite® or Stycast®) | – | | | | | | | | | | |

**Notes:**
standards for surface treatment are as follows:
– chrome-plated: SAE AMS 2460
– nickel-plated: SAE AMS QQ N 290, or MIL DTL 32119
– gold-plated: ISO 27874
– black chrome: MIL DTL 14538 with a minimum of 10 µm of lacquer protection
1) anthracite colour (other colours upon request)
2) for FFP, PCP and ERN models of the 0S to 3S series
3) for FFP, PCP and ERN models of the 0S to 3S series and FGG and ENG models of the 1B, 3B and 4B series
4) for the FGY and ENY models of the 2B and 3B series
5) for bridge plugs of the B series
6) for S and B series elbow sockets for printed circuits
7) gold-plating for unipole types
8) used in 00 series free and fixed sockets and couplers
9) AISI 416 steel is used with shells made of AISI 303 or 304
10) delivered with free and fixed sockets with aluminium alloy or stainless steel shell
11) FPM/FKM (Viton®) o-ring and gaskets are installed upon special request. However standard for vacuumtight models.

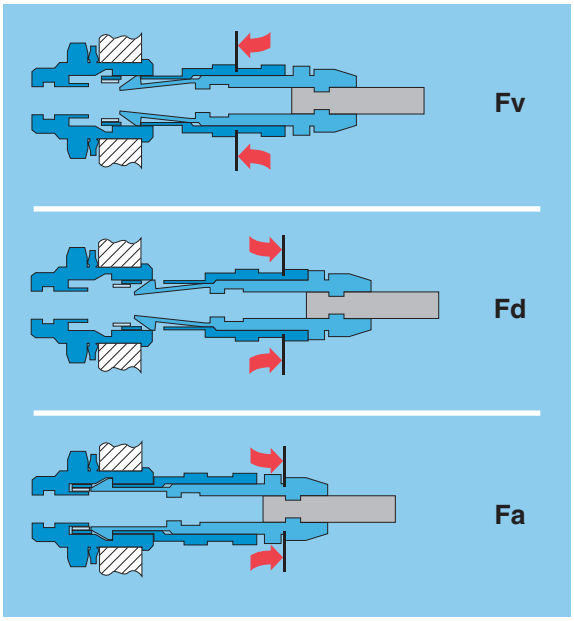
## Technical characteristics of plastic materials

| Type | Standard | Units | POM | PEEK | PSU | PPSU | PPS | PA.6 | Silicone | FPM | Epoxy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Density | ASTM D 792 | – | 1.4 | 1.3-1.4 | 1.24 | 1.3 | 1.67 | 1.14 | ~1.2 | ~1.9 | 1.58 |
| Tensile strength (at 23°C) | ASTM D 638/ ISO R527 | MPa | 70-80 | 92-142 | 70 | 70 | 121 | 55 | > 9 | > 12 | 16 |
| Flexurale strength (at 23°C) | ASTM D 790/ ISO R178 | MPA | – | 170 | 106 | 91 | 179 | 75 | – | – | 24 |
| Dielectric strength | ASTM D 149/IEC 60243 | kV/mm | 60 | 19-25 | 17-20 | 15 | 17 | 35 | 18-30 | – | 15 |
| Volume resis. at 50% HR and 23°C | ASTM D 257/IEC 60093 | Ω • cm | $10^{15}$ | $10^{16}$ | $5x10^{16}$ | – | $10^{16}$ | $10^{15}$ | $10^{14}$ | – | $10^{14}$ |
| Surface resistivity | ASTM D 257 | Ω | $10^{13}$ | $10^{15}$ | – | – | – | – | – | – | – |
| Thermal conductivity | ASTM C 177 | W/K • m | 0.31 | 0.25 | 0.26 | – | 0.3 | – | – | – | 0.8 |
| Comparative tracking index | IEC 60112 | V | CTI 600 | CTI 150 | CTI 150 | – | CTI 200 | CTI 600 | – | – | CTI>600 |
| Maxi. continuous service temperature | UL 746 | °C | 90 | 250 | 140 | 180 | 220 | 80 | 200 | 200 | 80 |
| Min. continuous service temperature | UL 746 | °C | -50 | -55 | -60 | -50 | -60 | -40 | -50 | -20 | -20 |
| Max. short-time service temperature | – | °C | 140 | 300 | 160 | 200 | 250 | 150 | > 250 | 300 | 120 |
| Water absorption in 24h at 23°C | ASTM D 570/ISO R62A | % | 0.85 | 0.12 | 0.3 | 0.37 | < 0.05 | > 3 | – | – | 0.25 |
| Radiation resistance | – | Gy1) | $8x10^3$ | $10^7$ | $10^5$ | – | $> 10^7$ | $5x10^3$ | $10^5$ | $8x10^4$ | $2x10^6$ |
| Flammability rating | ASTM D 635/UL 942) | – | HB | V-0/3.2 | V-0/4.4 | V-0/1.6 | V-0/5V | V-2 | – | – | V-0/4 |
| Resistance to steam sterilization | – | – | bad | excel. | good | excel. | excel. | bad | good | good | bad |

**Notes:** 1) 1 Gy (Gray) = 100 rad. 2) Depends on material thickness (in mm).

ASTM = American Society for Testing Material
ISO = International Standards Organisation
UL = Underwriters Laboratories
IEC = International Electrotechnical Commission

## Mechanical latching characteristics




$F_v$: average latching force.

$F_d$: average unmating force with axial pull on the outer shell.

$F_a$: average pull force with axial pull on the collet nut

### Standard series

| Force (N) | Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 00 | 0S | 1D | 1S | 2C | 2S | 3S | 4S | 5S | 6S |
| Fv | 9 | 14 | 14 | 15 | 12 | 17 | 20 | 40 | 60 | 70 |
| Fd | 7 | 9 | 11 | 10 | 12 | 11 | 14 | 25 | 40 | 55 |
| Fa | 120 | 140 | 300 | 250 | 400 | 350 | 500 | 650 | 750 | 900 |

### Watertight series

| Force (N) | Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0E | 0L | 1E | 1L | 2E | 2L | 3E | 4E | 5E | 6E |
| Fv | 14 | 14 | 16 | 16 | 20 | 20 | 32 | 65 | 85 | 100 |
| Fd | 9 | 9 | 10 | 10 | 13 | 13 | 25 | 40 | 60 | 75 |
| Fa | 250 | 250 | 300 | 300 | 400 | 400 | 550 | 700 | 800 | 900 |

### Keyed series

| Force (N) | Series | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 00 | 0B | 1B | 2B | 2G | 3B | 4B | 5B |
| Fv | 9 | 10 | 14 | 15 | 12 | 17 | 39 | 48 |
| Fd | 7 | 8 | 11 | 12 | 12 | 14 | 38 | 38 |
| Fa | 100 | 180 | 300 | 300 | 400 | 400 | 600 | 800 |

### Keyed watertight series

| Force (N) | Series | | | | | |
|---|---|---|---|---|---|---|
| | 0K | 1K | 2K | 3K | 4K | 5K |
| Fv | 14 | 16 | 20 | 32 | 65 | 85 |
| Fd | 9 | 10 | 13 | 25 | 40 | 60 |
| Fa | 250 | 300 | 400 | 550 | 700 | 800 |

**Notes:** 1N = 0.102 kg.

**Notes:** forces were measured on outer shells **not fitted with contacts**.
**Mechanical endurance:** 5000 cycles.
Mechanical endurance represents the number of cycles after which the latching system is still effective (1 cycle = 1 latching/unlatching at 300 cycles per hour). The values were measured according to the standard IEC 60512-7 test 13a.

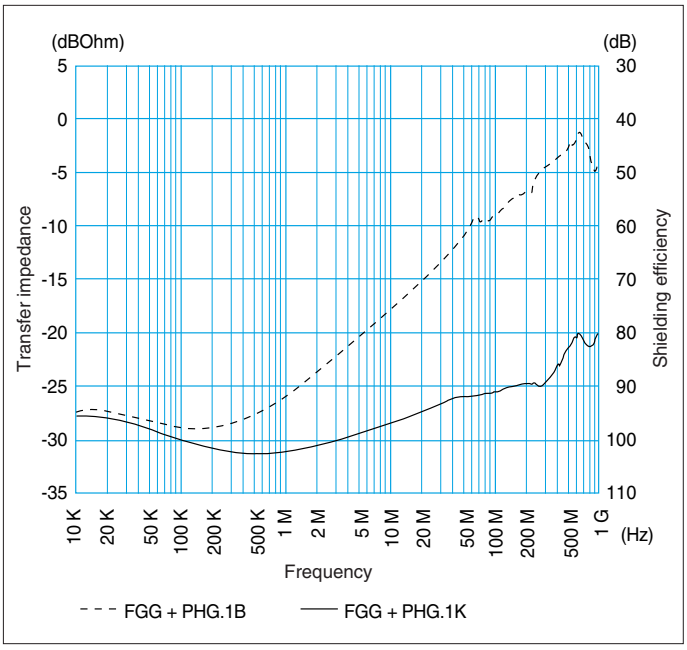
## Electromagnetic compatibility (EMC) and shielding efficiency

The electromagnetic compatibility of a device can only be ensured by meeting a number of basic rules with the design of the device and by carefully selecting components, cables and connectors.

Electrical and electronic devices are to be designed to ensure the following:

a) reduce the emission of generated electromagnetic disturbance to a level where radios and telecommunication and other devices can properly function;
b) electromagnetic immunity against electromagnetic disturbance so that they can properly function.

When selecting a connector, screen or shielding efficiency and low resistance to electric continuity between the cable and the connector should be considered.
The design of LEMO connectors with metal shell and earthing crown guarantee optimum shielding efficiency in all applications where electromagnetic compatibility (EMC) is critical.
The performance of a connector is measured through shielding efficiency, a value that represents the ratio between the electromagnetic field on the outside and the inside of the shell. Our measurements are carried out according to the IEC 60169-1-3 standard.




The performance of S and B series connectors is comparable to the results of measurements carried out on a pair of FGG + PHG.1B connectors.

The performance of E and K series connectors is comparable to the results of measurements carried out on a pair of FGG + PHG.1K connectors.

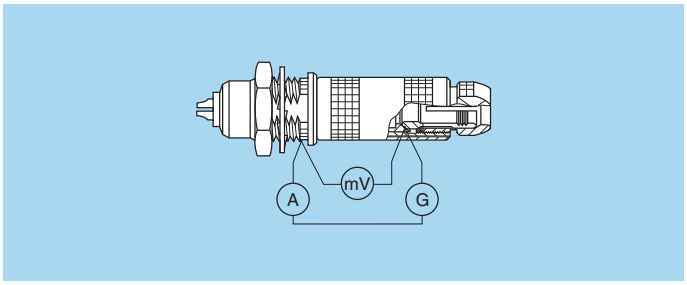
## Shell electrical continuity:
(measured according to IEC 60512-2 test 2f)

Test current: 1A
A = Ammeter
mV = Millivoltmeter
G = Generator

$R_1$ Values with earthing crown and latch sleeve or inner-sleeve nickel-plated.

$R_2$ Values with gold-plated earthing crown and nickel-plated latch sleeve or inner sleeve.

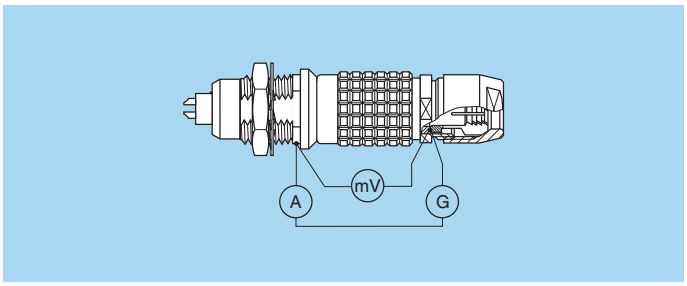
### Standard series




| Series | $R_1$ (mΩ) | $R_2$ (mΩ) |
|---|---|---|
| 00 | 3.5 | 2.8 |
| 0S | 2.8 | 1.6 |
| 1D | 2.5 | 1.1 |
| 1S | 2.2 | 1.5 |
| 2C | – | – |

| Series | $R_1$ (mΩ) | $R_2$ (mΩ) |
|---|---|---|
| 2S | 1.8 | 1.2 |
| 3S | 1.6 | 1.2 |
| 4S | 1.4 | 1.0 |
| 5S | 1.4 | 1.0 |
| 6S | 1.0 | 0.5 |

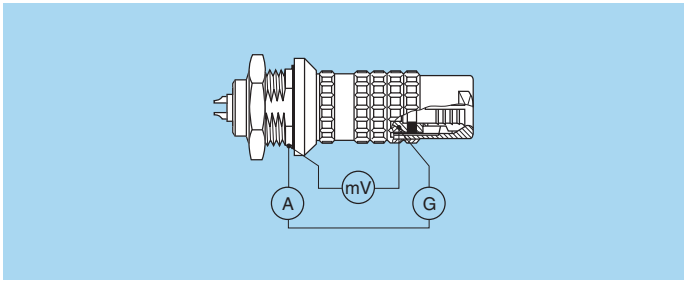
### Keyed series



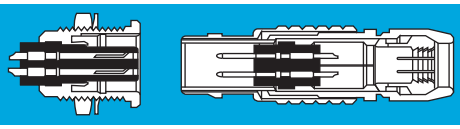

| Series | $R_1$ (mΩ) | $R_2$ (mΩ) |
|---|---|---|
| 00 | 3.5 | 2.8 |
| 0B | 3.5 | 1.3 |
| 1B | 2.5 | 1.1 |
| XB | 2.5 | 1.1 |
| 2B | 2.2 | 0.9 |

| Series | $R_1$ (mΩ) | $R_2$ (mΩ) |
|---|---|---|
| 2G | – | – |
| 3B | 2.2 | 0.7 |
| 4B | 1.5 | 0.5 |
| 5B | 1.5 | 0.3 |

### Watertight series
### Keyed watertight series




| Series | $R_1$ (mΩ) | $R_2$ (mΩ) |
|---|---|---|
| 0E-0K-0L | 2.8 | 1.6 |
| 1E-1K-1L | 2.2 | 1.5 |
| 2E-2K-2L | 1.8 | 1.2 |
| 3E-3K | 1.6 | 1.2 |
| 4E-4K | 1.4 | 1.0 |
| 5E-5K | 1.4 | 1.0 |
| 6E | 1.0 | 0.5 |



# Insulator

Plastic material used by LEMO for manufacturing insulators is selected according to the electric and thermal properties required for the various connector types. Characteristics examined for the two connector types are:
– Dielectric strength;
– Comparative tracking index;
– Surface and volume resistivity;
– Continuous service temperature;
– Water absorption;
– Radiation resistance;
– Flammability rating
– Resistance to hydrocarbon.

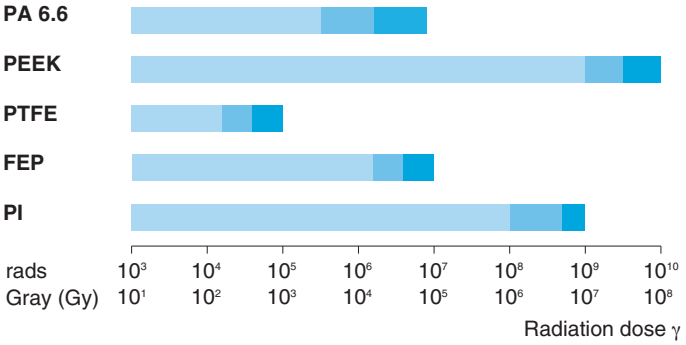
## Mechanical and Electrical Properties

Mechanical characteristics of thermoplastics, such as PA 6.6, and PEEK, are improved by the addition of glass fibres. By adding glass fibres in the resin the performance of this material (mechanical strength and radiation resistance) is enhanced and water absorption rate is reduced. From an electric point of view, the addition of glass fibres improves dielectric strength.

## Selection of the insulator

A number of thermoplastics have common characteristics, some of them are identical with other insulating materials. In this case, the insulator material is selected according to the specific difference in features to provide all the required parameters for the given type.

## Radiation resistance




**Note:** technical data in this chapter provide general information on plastics used by LEMO as electrical insulators. LEMO reserves the right to propose new materials with better technical characteristics, and to withdraw, without notice, any material mentioned in the present catalogue or any other publications edited by LEMO S.A. and/or its subsidiaries. LEMO SA and its subsidiaries use only plastic granules, powder or bars supplied by specialized companies, and thus cannot in any case take responsibility with regard to this material.

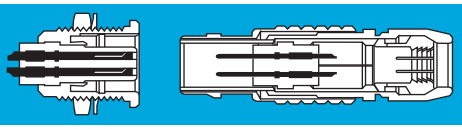
## Technical characteristics

| Type | Standard | Units | PA6.6 | PEEK | PTFE | FEP | PI |
|---|---|---|---|---|---|---|---|
| Dielectric strength | ASTM D 149 / IEC 60243 | kV/mm | 15-17 | 19-25 | 17.2-24 | 20 | 22 |
| Volume resistivity at 50% RH and 23°C | ASTM D 257 / IEC 60093 | Ω • cm | $5.8x10^{15}$ | $10^{16}$ | $10^{18}$ | > $10^{16}$ | > $10^{16}$ |
| Surface resistivity | ASTM D 257 / IEC 60093 | Ω | $10^{12}$ | $10^{15}$ | $10^{17}$ | > $10^{16}$ | > $10^{15}$ |
| Thermal conductivity | ASTM C 177 | W/K • m | 0.21 | 0.25 | 0.23 | 0.24 | 0.35 |
| Comparative tracking index | IEC 60112 | V | CTI 600 | CTI 150 | CTI 500 | – | – |
| Dielectric constant ($10^6$ Hz) | ASTM D 150 / IEC 60250 | – | 4 | 3.2-3.5 | 2-2.1 | 2.1 | 3.6 |
| Dissipation factor ($10^6$ Hz) | ASTM D 150 / IEC 60250 | – | – | < 0.005 | < 0.0003 | < 0.001 | < 0.0034 |
| Maximum continuous service temperature | UL 746 | °C | 120 | 250 | 260 | 200 | 350 |
| Maximum short-time service temperature | – | °C | 150 | 300 | 300 | 260 | 480 |
| Minimum continuous service temperature | – | °C | – | -55 | -200 | -200 | – |
| Water absorption in 24h at 23°C | ASTM D 570 / ISO R624 | % | < 0.7 | < 0.3 | < 0.01 | < 0.01 | 0.24 |
| Radiation resistance | – | Gy | $5x10^3$ | $10^7$ | $2x10^2$ | $2x10^4$ | $10^6$ |
| Flammability rating | ASTM D 635 / UL 94 | – | – | V-0/3.2 | V-0 | V-0 | – |

**Note:** values of insulation resistance between contacts are given on page 177.

| Designation | | Symbol | Standard | Unipole | | | Multipole | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| chemical | commercial | | | 00 | S | E | 00 | S | E | B | K | 2C | 2G | 1D |
| Polyamide (glass fitted) | Nylatron® | PA 6.6 | – | | | | | ● | ● | | | | | ● |
| Polyether Ethercetone | Peek® | PEEK | – | ○ | ○ | ○ | ● | ● | ● | ● | ● | ● | ● | |
| Polytetrafluorethylene | – | PTFE | ASTM D 1457-83 | ● | ● | ● | | | | | | | | |
| Tetrafluorethylene | – | FEP | ASTM D 2116-81 | | | | | ○ | ○ | | | | | |
| Polyimide | Vespel® | PI | – | | | | | ○ | ○ | | | | | |

● First choice alternative
○ Special order alternative

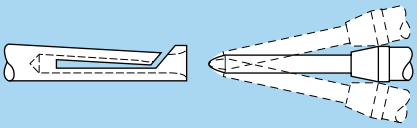


# Electrical contact

## Technical description

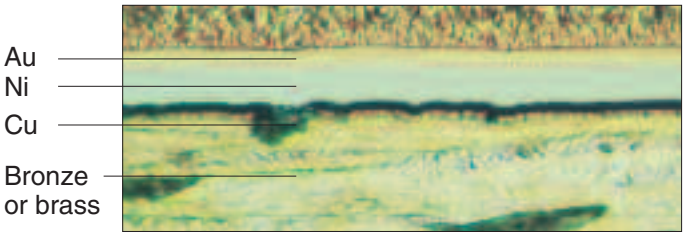
The secure reliable electromechanical connection achieved with LEMO female cylindrical contacts is mainly due to two important design features :

1. *Prod proof entry* on the mating side which ensures perfect concentric mating even with carelessly handled connectors.
2. *The pressure spring*, with good elasticity, maintains a constant even force on the male contact when mated. The leading edge of the pressure spring preserves the surface treatment (gold-plated) and prevents undue wear.



## Contact material and treatment

LEMO female contacts are made of bronze beryllium (QQ-C-530) or bronze (UNS C 54400). These materials are chosen because of their high modulus of elasticity, their excellent electrical conductivity and a high mechanical strength.

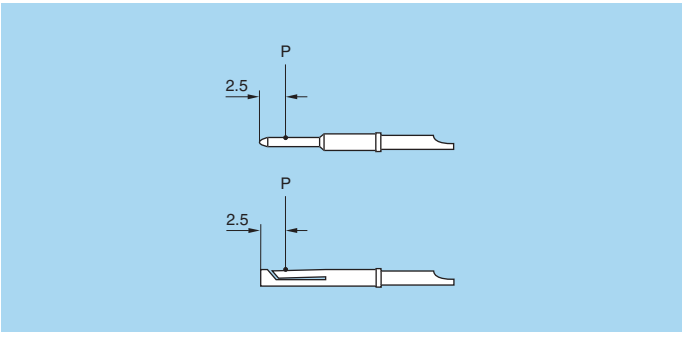



LEMO male solder and print contacts are made of brass (UNS C 38500). Male crimp contacts are made of brass (UNS C 34500) or annealed brass (UNS C 38500) with optimum hardness (HV) for crimping onto the wire.

| Type | Material (standard) | Surf. treatment (µm) | | |
|---|---|---|---|---|
| | | Cu | Ni | Au[1] |
| Male crimp | Brass (UNS C 34500) | 0.5 | 3 | 1.0 |
| | Brass (UNS C 38500) | | | |
| Male print | Brass (UNS C 38500) | | | |
| Female crimp | Bronze (UNS C 54400) Cu-Be (FS QQ-C-530) | 0.5 | 3 | 1.5 |
| Female print | | | | |
| Clips | Cu-Be (FS QQ-C-530) | – | – | – |
| | Stainless steel | | | |
| Connection wire[2] | Brass | – | 3[3] | – |

**Notes:** the standard surface treatment are as follows:
– nickel: SAE AMS QQ N 290 or MIL DTL 32119
– gold: ISO 27874.
[1] minimum value
[2] for elbow print contacts
[3] treatment completed by 6 µm Sn (lead free) tin-plating

## Thickness comparison between the outside and the inside of female contacts




**Note:** P = inspection point

| Contact ø A (mm) | Gold thickness | | |
|---|---|---|---|
| | male (µm) | female | |
| | | outside (µm) | inside (%) |
| 0.35 | 1.0 | 1.5 | 65 |
| 0.50 | 1.0 | 1.5 | 65 |
| 0.70 | 1.0 | 1.5 | 70 |
| 0.90 | 1.0 | 1.5 | 75 |
| 1.30 | 1.0 | 1.5 | 75 |
| 1.60 | 1.0 | 1.5 | 75 |
| 2.00 | 1.0 | 1.5 | 75 |
| 3.00 | 1.0 | 1.5 | 75 |
| 4.00 | 1.0 | 1.5 | 75 |
| 5.00 | 1.0 | 1.5 | 75 |
| 6.00 | 1.0 | 1.5 | 75 |
| 8.00 | 1.0 | 1.5 | 75 |
| 12.00[1] | – | – | – |

**Notes:** [1] contacts are silver plated

### Contact resistance with relation to the number of mating cyles

(measured according to IEC 60512-2 test 2a)

Average values measured after the mating cycles and the salt spray test according to IEC 60512-6 test 11f.

| A ø (mm) | Contact resistance (mΩ) | | |
|---|---|---|---|
| | 1000 cycles | 3000 cycles | 5000 cycles |
| 0.35 | 8.0 | – | – |
| 0.5 | 7.5 | 8.3 | 8.7 |
| 0.7 | 5.6 | 5.7 | 6.1 |
| 0.9 | 4.1 | 4.2 | 4.8 |
| 1.3 | 2.8 | 2.9 | 3.6 |
| 1.6 | 2.9 | 3.1 | 3.5 |
| 2.0 | 2.6 | 2.7 | 3.3 |

| A ø (mm) | Contact resistance (mΩ) | | |
|---|---|---|---|
| | 1000 cycles | 3000 cycles | 5000 cycles |
| 3.0 | 2.0 | 2.2 | 3.1 |
| 4.0 | 1.6 | 2.0 | 2.8 |
| 5.0 | 1.4 | – | – |
| 6.0 | 1.2 | – | – |
| 8.0 | 0.8 | – | – |
| 12.0 | 0.7 | – | – |

### Insulation resistance between the contacts and contact/shell

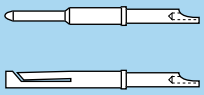
(measured according to IEC 60512-2 test 3a)

| Insulating material | Multipole | Unipole |
|---|---|---|
| | PEEK | PTFE |
| new | > $10^{12}$ Ω | > $10^{12}$ Ω |
| after humidity test[1)] | > $10^{10}$ Ω | > $10^{10}$ Ω |

**Note:** [1)] 21 days at 95% RH according to IEC 60068-2-3.

### Solder contacts

The conductor bucket of these contacts is machined at an angle to form a cup into which the solder can flow.
See page 7 for the range of cable dimensions that can be soldered.



### Crimp contacts

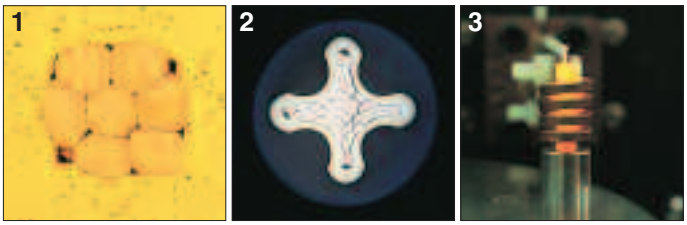
The square form crimp method is used (MIL-C-22520F, class I, type 2) photo 1 for unipole contacts.

For multipole contacts the standard four identer crimp method is used, MIL-C-22520F, class I, type 1), photo 2.
The crimp method requires a controlled compression to obtain a symmetrical deformation of the conductor strand and of the contact material. The radial hole in the side of the contact makes it possible to check whether the conductor is correctly positioned within the contact. A good crimping is characterized by only slightly reduced conductor section and practically no gap.
For optimum crimping of bronze or brass contacts they are annealed to relieve internal stress and reduce material hardening during the crimping process.
Only the crimping zone is annealed with the help of an induction heating machine designed by the LEMO Research and Development Department (see photo 3).

### Advantages of crimping

– practical, quick contact fixing outside the insulator
– possible use at high temperature
– no risk of heating the insulator during the conductor-contact fixing
– high tensile strength

Crimp contacts are available in standard version (form 1) for mounting maximum size conductors.
For some dimensions, these crimp contacts can be produced with reduced crimp barrels (form 2) for mounting reduced size conductors.




### Crimp contacts

The crimp contacts can be with two forms: a standard crimp barrel for large conductors (see fig. 1) or with a reduced crimp barrel for smaller conductors (see fig. 2).

The range of cable dimensions that can be crimped into our contacts are indicated on the table on page 7.

Fig. 1

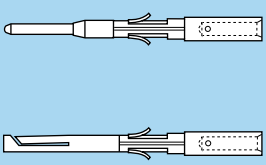
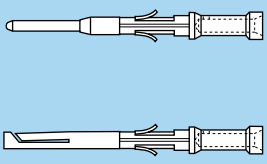


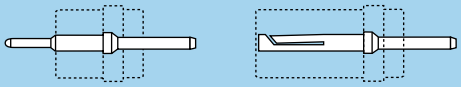
Fig. 2



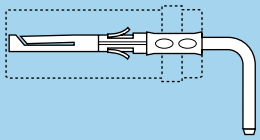
## Print contacts

Print contacts are available in straight or elbow versions for certain connector types, mostly for straight and elbow socket models. Connection is made on flexible or rigid printed circuits by soldering.
Straight print contacts are gold-plated which guarantees optimum soldering, even after long-term storage. However for wave soldering, we recommend removal the gold-plating from the contact end on the printed circuit side before soldering according to the assembly procedures.
Print elbow contacts include a tinned lead free brass wire crimped into a crimp contact.

straight



elbow



## Test voltage

Test voltage (Ue) :
(measured according to the IEC 60512-2 test 4a standard)

It corresponds to 75% of the mean breakdown voltage.
Test voltage is applied at 500 V/s and the test duration is 1 minute.

This test has been carried out with a mated plug and socket, with power supply only on the plug end.

Operating voltage (Us) :
It is proposed according to the following ratio : $Us = \frac{Ue}{3}$

**Caution:**
**For a number of applications, safety requirements for electrical appliances are more severe with regard to operating voltage.**
**In such cases operating voltage is defined according to creepage distance and air clearance) between live parts. Please consult us for the choice of a connector by indicating the safety standard to be met by the product.**

Voltage values are given in the table on insulator types for each series.
They correspond with values measured at sea level. They are adapted to all applications up to an altitude of 2000 m.

In case a device is used at a higher altitude, air clearance between live parts has to be multiplied by the following coefficients.
It means also that test voltage has to be divided by this coefficient.

| altitude (m) | coefficient |
|---|---|
| 2000 | 1.00 |
| 3000 | 1.14 |
| 4000 | 1.29 |
| 5000 | 1.48 |

## Rated current

(measured according to IEC 60512-3 test 5a)

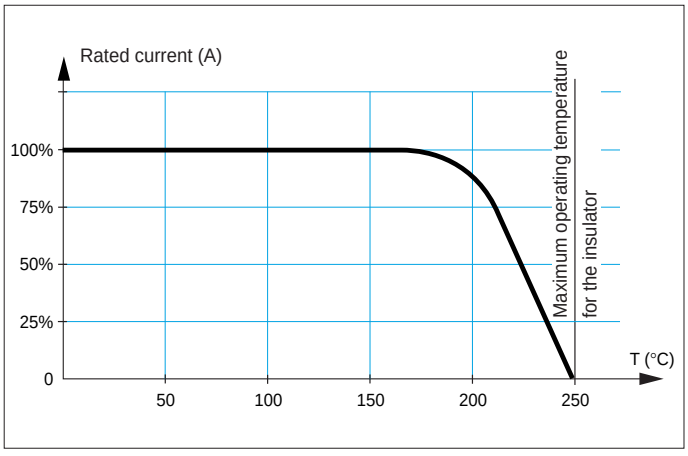
The specified rated current can be applied simultaneously to all the contacts.
It corresponds with an average temperature rise of 40°C of the connector.

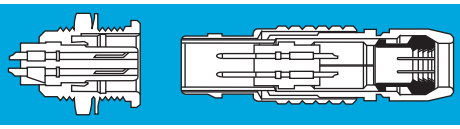
The current values are indicated in the table of insulator types in each series.
For use at higher temperatures acceptable rated current will be lower. It tends towards zero as the material is used at the maximum operating temperature accepted for the insulator.

In most case the current depend on the conductor dimension (see table on page 183) or on the printed circuit dimension.

**Caution:**
**In general, connectors should not be unmated while live.**

For connectors with PEEK insulator, maximum admissible current will follow the curve below depending on the operating temperature T.





## Cable fixing

Cables are fixed into LEMO connectors with cable collet systems. These collets with latches have a design which is very similar to those used for tool machines. This solution guarantees excellent cable retention and ensures perfectly symmetrical deformation of the cable.
The 00 multipole series is also available with hexagonal crimping (MIL-C-22520F).

### Material and treatment

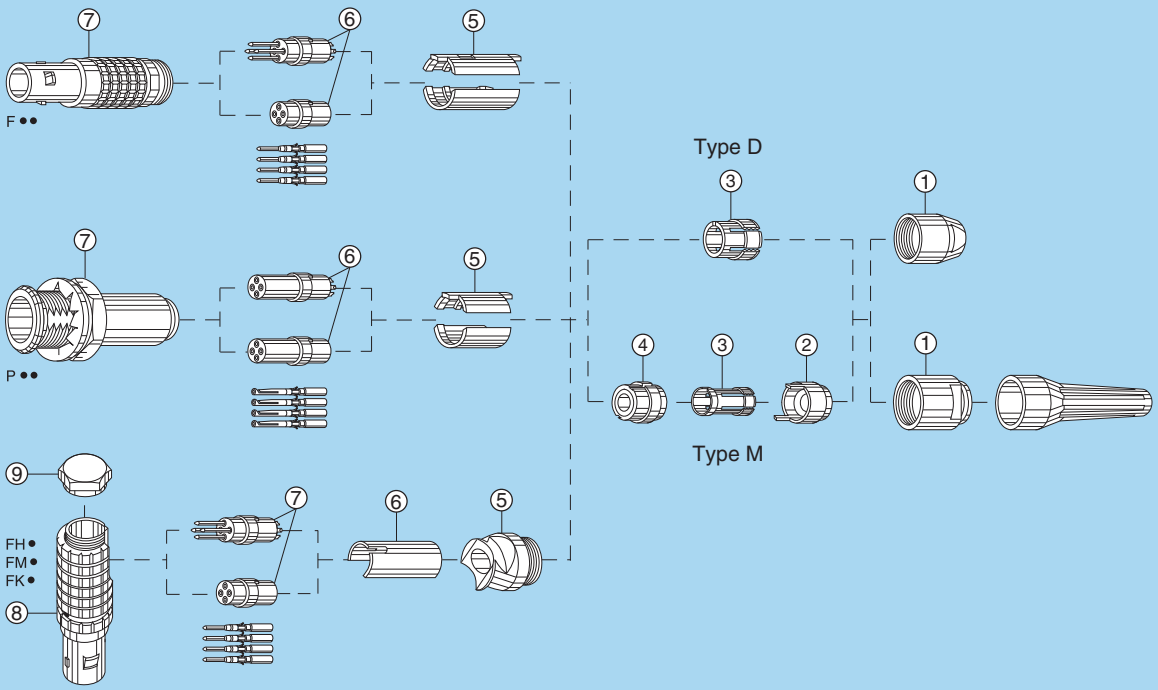
| Component | Material (standard) | Surface treatment (µm) | | | | |
|---|---|---|---|---|---|---|
| | | Nickel[1] | | Gold | | |
| | | Cu | Ni | Cu | Ni | Au |
| Center piece | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Collet | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Crimp ferrule | Copper (UNS C 18700) | 0.5 | 3 | 0.5 | 3 | 0.5 |
| Reducer | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Reducing cone | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Earthing cone | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Metal washer | Brass (UNS C 38500) | 0.5 | 3 | – | – | – |
| Gasket | Silicone MQ/MVQ | – | | | | |
| | FPM (Viton®)[2] | | | | | |

**Notes:**
[1] standards for surface treatment are as follows:
– nickel-plated: SAE AMS QQ N 290.
[2] available upon special request.

## Cable clamping system

### B series (D and M cable clamping)

See assembly instructions under www.lemo.com.

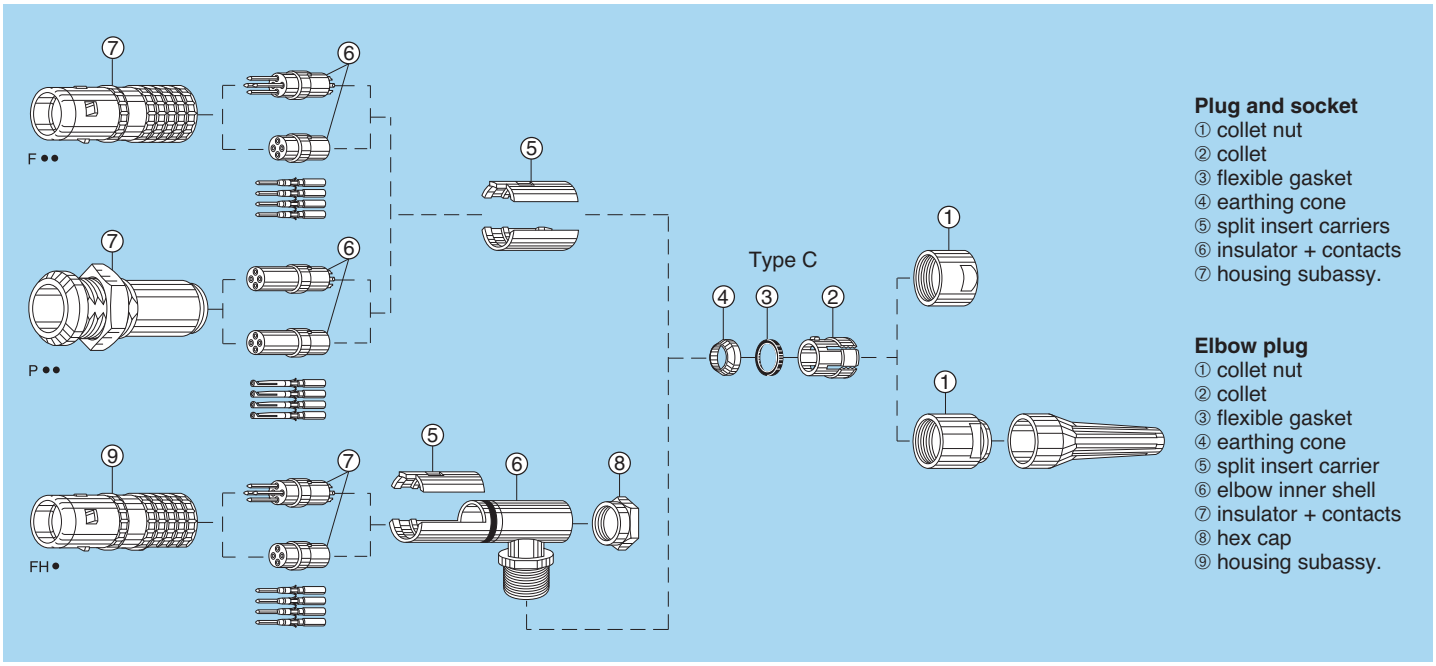



**Plug and socket**
① collet nut
② reducing cone
③ collet
④ reducer
⑤ split insert carriers
⑥ insulator + contacts
⑦ housing subassy.

**Elbow plug**
① collet nut
② reducing cone
③ collet
④ reducer
⑤ elbow outlet
⑥ insert carrier
⑦ insulator + contacts
⑧ housing subassy.
⑨ hex cap

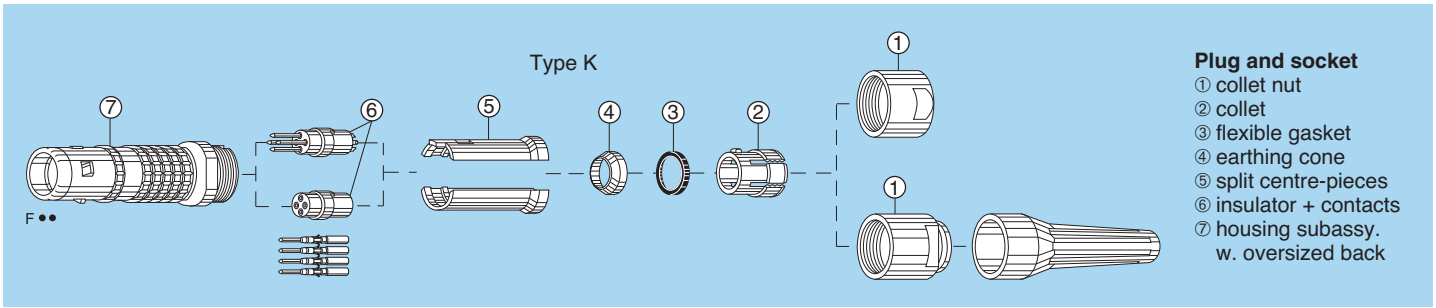
## K series (C and K cable clamping)

See assembly instructions under www.lemo.com.




**Plug and socket**
① collet nut
② collet
③ flexible gasket
④ earthing cone
⑤ split insert carriers
⑥ insulator + contacts
⑦ housing subassy.

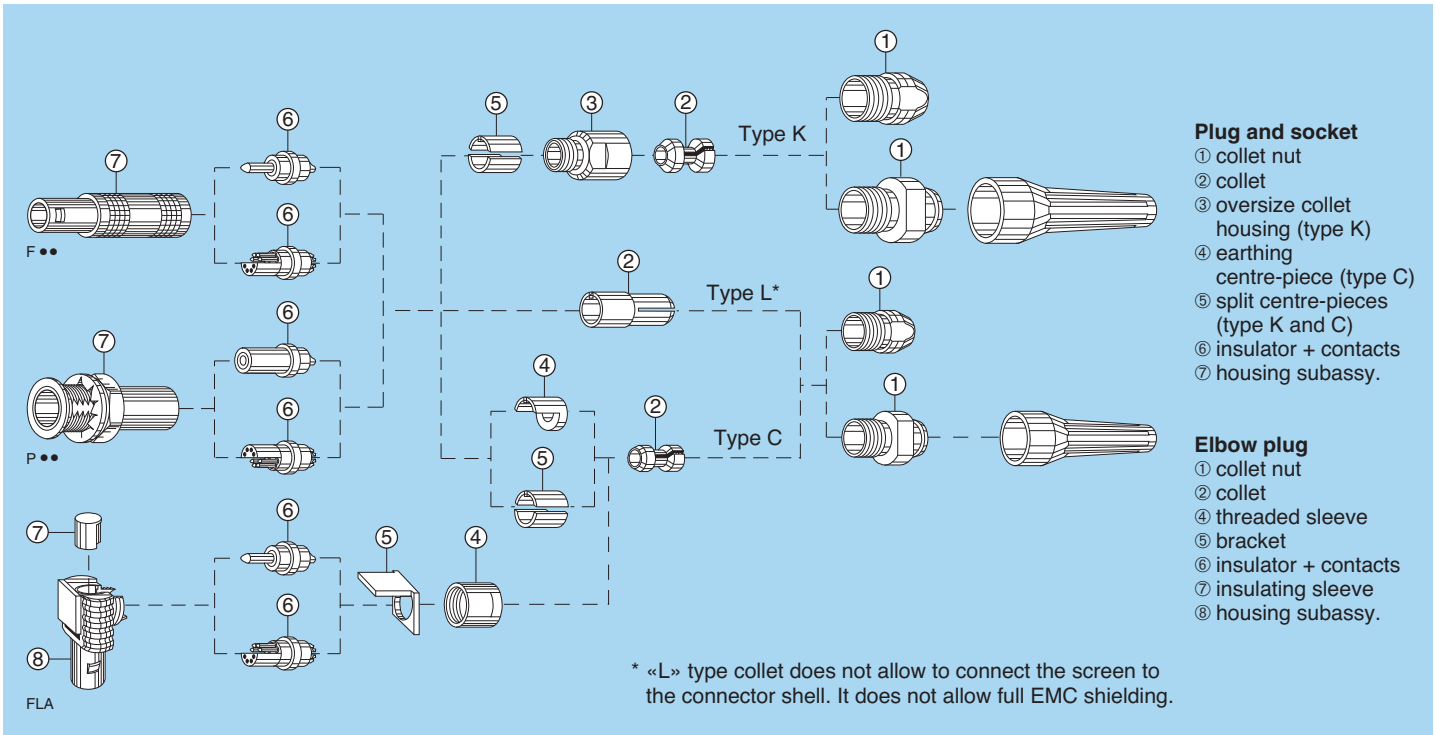
**Elbow plug**
① collet nut
② collet
③ flexible gasket
④ earthing cone
⑤ split insert carrier
⑥ elbow inner shell
⑦ insulator + contacts
⑧ hex cap
⑨ housing subassy.




**Plug and socket**
① collet nut
② collet
③ flexible gasket
④ earthing cone
⑤ split centre-pieces
⑥ insulator + contacts
⑦ housing subassy.
w. oversized back

## S series (C, L and K cable clamping)

See assembly instructions under www.lemo.com.



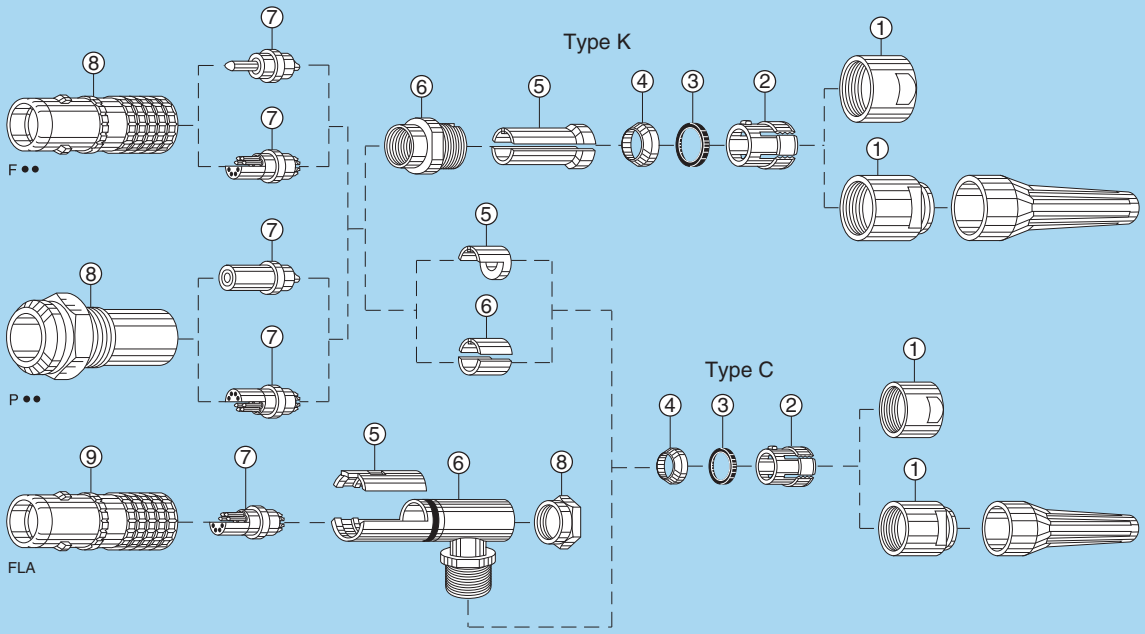

**Plug and socket**
① collet nut
② collet
③ oversize collet housing (type K)
④ earthing centre-piece (type C)
⑤ split centre-pieces (type K and C)
⑥ insulator + contacts
⑦ housing subassy.

**Elbow plug**
① collet nut
② collet
④ threaded sleeve
⑤ bracket
⑥ insulator + contacts
⑦ insulating sleeve
⑧ housing subassy.

* «L» type collet does not allow to connect the screen to the connector shell. It does not allow full EMC shielding.

## E series (C and K cable clamping)

See assembly instructions under www.lemo.com.




**Plug and socket**
① collet nut
② collet
③ flexible gasket
④ earthing cone
⑤ split centre-pieces (type K)
⑤ earthing centre-piece (type C)
⑥ oversize collet housing (type K)
⑥ earthing centre-piece (type C)
⑦ insulator + contacts
⑧ housing subassy.

**Elbow plug**
① collet nut
② collet
③ flexible gasket
④ earthing cone
⑤ split insert carrier
⑥ elbow inner shell
⑦ insulator + contacts
⑧ hex cap
⑨ housing subassy.

### Maximum metal collet nut tightening torque

#### Standard series

| | Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 00 | 0S | 1D | 1S | 2C | 2S | 3S | 4S | 5S | 6S |
| Torque (Nm) | 0.25 | 0.5 | 1.5 | 1.5 | 2.5 | 2.5 | 3 | 8 | 10 | 12 |

#### Watertight series

| | Series | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0E | 0L | 1E | 1L | 2E | 2L | 3E | 4E | 5E | 6E |
| Torque (Nm) | 0.7 | 0.7 | 0.8 | 0.8 | 2 | 2 | 3 | 5 | 8 | 12 |

#### Keyed series

| | Series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 | 0B | 1B | XB | 2B | 2G | 3B | 4B | 5B |
| Torque (Nm) | 0.25 | 0.5 | 1.5 | 2.0 | 2.5 | 2.5 | 4 | 7 | 10 |

#### Watertight keyed series

| | Series | | | | | |
|---|---|---|---|---|---|---|
| | 0K | 1K | 2K | 3K | 4K | 5K |
| Torque (Nm) | 0.7 | 0.8 | 2 | 3 | 5 | 8 |

1N = 0.102 kg

### Maximum elbow plug hex cap tightening torque

#### Keyed series

| | Series | | | | | | |
|---|---|---|---|---|---|---|---|
| | 00 | 0B | 1B | 2B | 3B | 4B | 5B |
| Torque (Nm) | 0.2 | 0.25 | 0.5 | 0.5 | 1.5 | 3 | 5 |

#### Watertight series

| | Series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0E | 0L | 1E | 1L | 2E | 2L | 3E | 4E | 5E |
| Torque (Nm) | 0.8 | 0.8 | 1 | 1 | 1.2 | 1.2 | 1.5 | 3 | 5 |

#### Watertight keyed series

| | Series | | | | | |
|---|---|---|---|---|---|---|
| | 0K | 1K | 2K | 3K | 4K | 5K |
| Torque (Nm) | 0.8 | 1 | 1.2 | 1.5 | 3 | 5 |

1N = 0.102 kg

### Maximum plastic collet nut tightening torque [1)]

| | Series | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 | 0S | 1S | 2S | 3S | 1B | 2B | 3B | 4B |
| Torque (Nm) | 0.15 | 0.45 | 0.50 | 0.50 | 1.00 | 0.50 | 0.50 | 1.00 | 1.50 |

**Note:**
[1)] For applications subject to strong vibration, we recommend fixing the collet nut with epoxy resin. We recommend to tight to the maximum value. Optimal torque may depend on cable jacket design.

# Technical tables

## Table of American Wire Gauge

| AWG | Construction | | ø wire max | | Wire section | |
|---|---|---|---|---|---|---|
| | Strand nb | AWG/ strand | (mm) | (in) | ($mm^2$) | (sq in) |
| 0 | 259 | 24 | 11.277 | 0.444 | 52.90 | 0.0820 |
| 1 | 817 | 30 | 9.702 | 0.382 | 41.40 | 0.0641 |
| 2 | 259 | 26 | 8.89 | 0.35 | 33.20 | 0.0514 |
| 4 | 133 | 25 | 6.9596 | 0.274 | 21.5925 | 0.0335 |
| 6 | 133 | 27 | 5.5118 | 0.217 | 13.5885 | 0.0211 |
| 8 | 168 | 30 | 4.4450 | 0.175 | 8.5127 | 0.0132 |
| 8 | 133 | 29 | 4.3942 | 0.173 | 8.6053 | 0.0133 |
| 10 | 105 | 30 | 3.3020 | 0.13 | 5.3204 | 0.0082 |
| 10 | 37 | 26 | 2.9210 | 0.115 | 4.7397 | 0.0073 |
| 10 | 1 | 10 | 2.6162 | 0.103 | 5.2614 | 0.0082 |
| 12 | 37 | 28 | 2.3114 | 0.091 | 2.9765 | 0.0046 |
| 12 | 19 | 25 | 2.3622 | 0.093 | 3.0847 | 0.0048 |
| 12 [1)] | 7 | 20 | 2.5400 | 0.10 | 3.6321 | 0.0056 |
| 12 | 1 | 12 | 2.0828 | 0.082 | 3.3081 | 0.0051 |
| 14 | 41 | 30 | 2.0574 | 0.081 | 2.0775 | 0.0032 |
| 14 | 19 | 27 | 1.8542 | 0.073 | 1.9413 | 0.0030 |
| 14 [1)] | 7 | 22 | 2.0828 | 0.082 | 2.2704 | 0.0035 |
| 14 | 1 | 14 | 1.6510 | 0.065 | 2.0820 | 0.0032 |
| 16 [1)] | 65 | 34 | 1.5748 | 0.062 | 1.3072 | 0.0020 |
| 16 | 26 | 30 | 1.5748 | 0.062 | 1.3174 | 0.0020 |
| 16 | 19 | 29 | 1.4986 | 0.059 | 1.2293 | 0.0019 |
| 16 [1)] | 7 | 24 | 1.5494 | 0.061 | 1.4330 | 0.0022 |
| 16 | 1 | 16 | 1.3208 | 0.052 | 1.3076 | 0.0020 |
| 18 [1)] | 65 | 36 | 1.2700 | 0.05 | 0.8234 | 0.0013 |
| 18 [1)] | 42 | 34 | 1.2700 | 0.05 | 0.8447 | 0.0013 |
| 18 | 19 | 30 | 1.3208 | 0.052 | 0.9627 | 0.0015 |
| 18 | 16 | 30 | 1.2954 | 0.051 | 0.8107 | 0.0013 |
| 18 | 7 | 26 | 1.2700 | 0.05 | 0.8967 | 0.0014 |
| 18 | 1 | 18 | 1.0414 | 0.041 | 0.8229 | 0.0013 |
| 20 [1)] | 42 | 36 | 1.0160 | 0.04 | 0.5320 | $8.2x10^{-4}$ |
| 20 | 19 | 32 | 1.0414 | 0.041 | 0.6162 | 0.0010 |
| 20 | 10 | 30 | 1.0160 | 0.04 | 0.5067 | $7.9x10^{-4}$ |
| 20 | 7 | 28 | 0.9906 | 0.039 | 0.5631 | $8.7x10^{-4}$ |
| 20 | 1 | 20 | 0.8382 | 0.033 | 0.5189 | $8.0x10^{-4}$ |
| 22 | 19 | 34 | 0.8382 | 0.033 | 0.3821 | $5.9x10^{-4}$ |
| 22 | 7 | 30 | 0.7874 | 0.031 | 0.3547 | $5.5x10^{-4}$ |
| 22 | 1 | 22 | 0.6604 | 0.026 | 0.3243 | $5.0x10^{-4}$ |
| 24 [1)] | 42 | 40 | 0.6604 | 0.026 | 0.2045 | $3.2x10^{-4}$ |
| 24 | 19 | 36 | 0.6858 | 0.027 | 0.2407 | $3.7x10^{-4}$ |
| 24 | 7 | 32 | 0.6350 | 0.025 | 0.2270 | $3.5x10^{-4}$ |
| 24 | 1 | 24 | 0.5588 | 0.022 | 0.2047 | $3.2x10^{-4}$ |
| 26 | 19 | 38 | 0.5588 | 0.022 | 0.1540 | $2.4x10^{-4}$ |
| 26 | 7 | 34 | 0.5080 | 0.02 | 0.1408 | $2.2x10^{-4}$ |
| 26 | 1 | 26 | 0.4318 | 0.017 | 0.1281 | $2.0x10^{-4}$ |
| 28 [1)] | 19 | 40 | 0.4318 | 0.017 | 0.0925 | $1.4x10^{-4}$ |
| 28 | 7 | 36 | 0.4064 | 0.016 | 0.0887 | $1.4x10^{-4}$ |
| 28 | 1 | 28 | 0.3302 | 0.013 | 0.0804 | $1.2x10^{-4}$ |
| 30 | 7 | 38 | 0.3302 | 0.013 | 0.0568 | $8.8x10^{-5}$ |
| 30 | 1 | 30 | 0.2794 | 0.011 | 0.0507 | $7.9x10^{-5}$ |
| 32 | 7 | 40 | 0.2794 | 0.011 | 0.0341 | $5.3x10^{-5}$ |
| 32 | 1 | 32 | 0.2286 | 0.009 | 0.0324 | $5.0x10^{-5}$ |
| 34 | 1 | 34 | 0.1693 | 0.007 | 0.0201 | $3.1x10^{-5}$ |
| 36 | 1 | 36 | 0.127 | 0.005 | 0.0127 | $2.0x10^{-5}$ |
| 38 | 1 | 38 | 0.1016 | 0.004 | 0.0081 | $1.3x10^{-5}$ |
| 40 | 1 | 40 | 0.078 | 0.003 | 0.0049 | $7.5x10^{-6}$ |

## Table of wire gauges according to IEC-60228 standard

| Conductor no x Ø (mm) | Max Ø (mm) | Max Ø (in) | Section ($mm^2$) | Section (sq in) |
|---|---|---|---|---|
| 196x0.40 | 7.50 | 0.295 | 25.00 | 0.0387 |
| 7x2.14 | 6.10 | 0.240 | 25.00 | 0.0387 |
| 125x0.40 | 6.00 | 0.236 | 16.00 | 0.0248 |
| 7x1.72 | 4.90 | 0.192 | 16.00 | 0.0248 |
| 1x4.50 | 4.50 | 0.177 | 16.00 | 0.0248 |
| 80x0.40 | 4.70 | 0.155 | 10.00 | 0.0155 |
| 7x1.38 | 3.95 | 0.155 | 10.00 | 0.0155 |
| 1x3.60 | 3.60 | 0.141 | 10.00 | 0.0155 |
| 84x0.30 | 3.70 | 0.145 | 6.00 | 0.0093 |
| 7x1.50 | 3.15 | 0.124 | 6.00 | 0.0093 |
| 1x2.76 | 2.76 | 0.108 | 6.00 | 0.0093 |
| 56x0.30 | 2.80 | 0.110 | 4.00 | 0.0062 |
| 7x0.86 | 2.58 | 0.098 | 4.00 | 0.0062 |
| 1x2.25 | 2.25 | 0.082 | 4.00 | 0.0062 |
| 50x0.25 | 2.15 | 0.084 | 2.50 | 0.0038 |
| 7x0.68 | 2.04 | 0.080 | 2.50 | 0.0038 |
| 1x1.78 | 1.78 | 0.070 | 2.50 | 0.0038 |
| 30x0.25 | 1.60 | 0.062 | 1.50 | 0.0023 |
| 7x0.52 | 1.56 | 0.061 | 1.50 | 0.0023 |
| 1x1.4 | 1.40 | 0.055 | 1.50 | 0.0023 |
| 32x0.20 | 1.35 | 0.053 | 1.00 | 0.0015 |
| 7x0.43 | 1.29 | 0.050 | 1.00 | 0.0015 |
| 1x1.15 | 1.15 | 0.045 | 1.00 | 0.0015 |
| 42x0.15 | 1.20 | 0.047 | 0.75 | 0.0011 |
| 28x0.20 | 1.15 | 0.045 | 0.75 | 0.0011 |
| 1x1.0 | 1.00 | 0.039 | 0.75 | 0.0011 |
| 28x0.15 | 0.95 | 0.037 | 0.50 | $7.7x10^{-4}$ |
| 16x0.20 | 0.90 | 0.035 | 0.50 | $7.7x10^{-4}$ |
| 1x0.80 | 0.80 | 0.031 | 0.50 | $7.7x10^{-4}$ |
| 7x0.25 | 0.75 | 0.029 | 0.34 | $5.2x10^{-4}$ |
| 1x0.60 | 0.60 | 0.023 | 0.28 | $4.3x10^{-4}$ |
| 14x0.15 | 0.75 | 0.029 | 0.25 | $3.8x10^{-4}$ |
| 7x0.20 | 0.65 | 0.023 | 0.22 | $3.4x10^{-4}$ |
| 18x0.10 | 0.50 | 0.019 | 0.14 | $2.1x10^{-4}$ |
| 14x0.10 | 0.40 | 0.015 | 0.11 | $1.7x10^{-4}$ |
| 21x0.07 | 0.40 | 0.015 | 0.09 | $1.3x10^{-4}$ |
| 14x0.10 | 0.40 | 0.015 | 0.09 | $1.3x10^{-4}$ |

**Note:** [1)] not included in the standard

## Maximum current rating for conductor

Maximum current on insulated conductors up to an ambiant temperature of 30° C (from VDE 0100, parts 430 and 532 as well as other VDE regulations).

| Nominal section $mm^2$ | Group 2 Intens. max. A | Group 3 Intens. max. A |
|---|---|---|
| 0.08 | 1.0 | 1.5 |
| 0.14 | 2.0 | 3.0 |
| 0.25 | 4.0 | 5.0 |
| 0.34 | 6.0 | 8.0 |
| 0.50 | 9.0 | 12.0 |
| 0.75 | 12.0 | 15.0 |
| 1.00 | 15.0 | 19.0 |
| 1.50 | 18.0 | 24.0 |
| 2.50 | 26.0 | 32.0 |

Group 2 Multi-conductor, e. g. solid cable under sheath, shielded cable, lead-sheath cables, …
Group 3 Single conductor and single conductor cable laid on open air in a way to leave at least a space between them equal to their diameter

## Some formulae

Resistance R of a conductor: $R = \rho \bullet \frac{l}{A} [\Omega]$

Where: $\rho$ = conductor resistivity
$l$ = conductor length
$A$ = conductor cross-section

Impedance of coaxial line: $Z = \frac{138}{\sqrt{\varepsilon_r}} \bullet \log \frac{D}{d} [\Omega]$

$\varepsilon_r$ = dielectric constant
$D$ = dielectric outer diameter
$d$ = center conductor outer diameter

Signal attenuation: $\text{Attenuation} = 20 \bullet \log \frac{U_1}{U_2} [\text{dB}]$

$U_1$ = input signal voltage
$U_2$ = output signal voltage

## Conversion of some units:

| | |
|---|---|
| millimeters into inches: | 1 mm = 0.0394 in |
| inches into millimeters: | 1 in = 25.4 mm |
| centimeters into feet: | 1 cm = 0.0328 ft |
| feet (12 in) into centimeters: | 1 ft = 30.48 cm |
| square centimeters into square inches: | 1 $cm^2$ = 0.155 sq in |
| square inches into square centimeters: | 1 sq in = 6.4516 $cm^2$ |
| bar into pounds per square inch: | 1 bar = 14.51 psi |
| bar into Pascal: | 1 bar = $10^5$ Pa |
| °C into °F: | °F = °C•1.8 + 32 |
| newtonmeter (Nm) into inch pound (in•lb) | 1 Nm = 8.85 in•lb |
| mbar•l•$s^{-1}$ into Torr•l•$s^{-1}$ | 1 mbar•l•$s^{-1}$ = 1.33 Torr•l•$s^{-1}$ |

# Product safety notice

**PLEASE READ AND FOLLOW ALL INSTUCTIONS CAREFULLY AND CONSULT ALL RELEVENT NATIONAL AND INTERNATIONAL SAFETY REGULATIONS FOR YOUR APPLICATION.**
**IMPROPER HANDLING, CABLE ASSEMBLY, OR WRONG USE OF CONNECTORS CAN RESULT IN HAZARDOUS SITUATIONS.**

1. **SHOCK AND FIRE HAZARD**
   Incorrect wiring, the use of damaged components, presence of foreign objects (such as metal debris), and / or residue (such as cleaning fluids), can result in short circuits, overheating, and / or risk of electric shock.
   Mated components should never be disconnected while live as this may result in an exposed electric arc and local overheating, resulting in possible damage to components.

2. **HANDLING**
   Connectors and their components should be visually inspected for damage prior to installation and assembly. Suspect components should be rejected or returned to the factory for verification.
   Connector assembly and installation should only be carried out by properly trained personnel. Proper tools must be used during installation and / or assembly in order to obtain safe and reliable performance.

3. **USE**
   Connectors with exposed contacts should never be live (or on the current supply side of a circuit). Under general conditions voltages above 30 VAC and 42 VDC are considered hazardous and proper measures should be taken to eliminate all risk of transmission of such voltages to any exposed metal part of the connector.

4. **TEST AND OPERATING VOLTAGES**
   The maximum admissible operating voltage depends upon the national or international standards in force for the application in question. Air and creepage distances impact the operating voltage; reference values are indicated in the catalog however these may be influenced by PC board design and / or wiring harnesses.
   The test voltage indicated in the catalog is 75% of the mean breakdown voltage; the test is applied at 500 V/s and the test duration is 1 minute.

5. **CE MARKING**
   CE Marking is applied to a complete product or device, and implies that the device complies with one or several European safety directives.
   CE Marking can not be applied to electromechanical components such as connectors.

6. **PRODUCT IMPROVEMENTS**
   The LEMO Group reserves the right to modify and improve to our products or specifications without providing prior notification.