P SERIES

REDEL

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Precision modular connectors to suit your application

Since its 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.

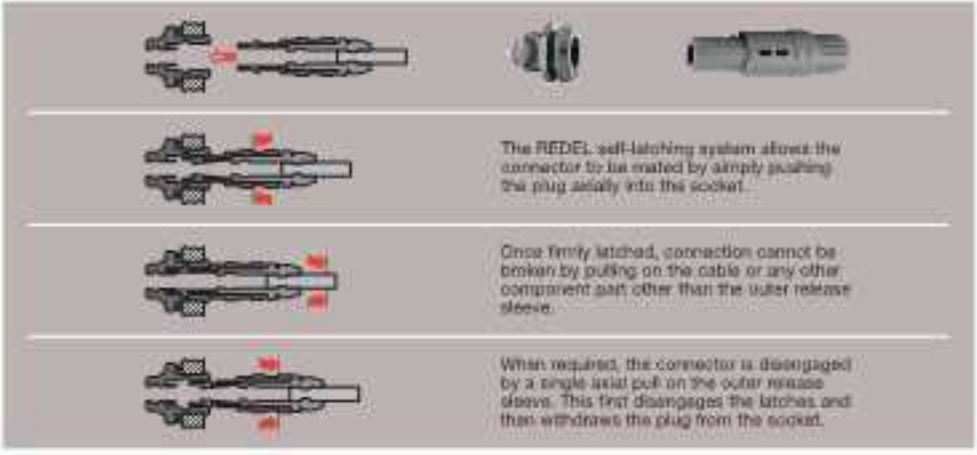
Over 5'000 REDEL connectors

The modular design of the REDEL range provides over 5'000 connectors from ø 14 mm to ø 21 mm, capable of handling cable diameters up to 8.5 mm and up to 32 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.

REDEL'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.



UL Recognition

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

CE Marking CE

CE marking CE means that the appliance or equipment bearing it complies with the protection requirements of one or several European safety directives.

CE marking CE applies to complete products or equipment, **but not to electromechanical components, such as connectors.**

RoHS

REDEL 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.

REDEL connector range

The REDEL connectors are plastic Push-Pull connectors. These circular plastic connectors are especially adapted for applications such as medical electronics and test & measurement. REDEL offers a wide choice of connectors with various contact configurations: multipole contacts, coaxial, fibre optics and fluidic connectors. In addition, a range of one time use connectors and connectors for mains power is available. The REDEL connectors are available in 3 sizes, depending on the cable diameter.

Features & Benefits

- Aesthetically pleasing design
- Lightweight
- Plastic shell made of PSU or PEI
- Extensive sterilisation (over 100 cycles)
- Excellent electrical safety (touch & scoop proof)
- Wide choice of colours for easy identification (grey, blue, yellow, black, red, green and white)
- Large choice of keying to avoid cross mating
- Various contact types: solder, crimp, print and elbow print 90°
- Disposable models

Applications

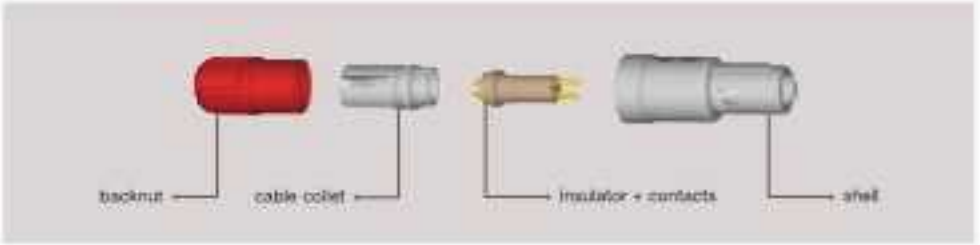
- Medical electronics
- Test and measurement
- Industrial electronics
- Automotive

	1P	2P	3P
Environment	Indoor / splash proof	Indoor / outdoor	Indoor / dripping water
Ingress protection	IP50 / IP54	IP50 / IP68	IP61
Temperature range	PSU: -30°/ +150°C PEI: -50°/ +170°C	PSU: -30°/ +150°C PEI: -50°/ +170°C	PSU: -30°/ +150°C
Latching	Push-Pull self latching		
Insulator type	Multipole, Mains Power, Fluidic	Multipole, Hybrid: fluidic + LV, coaxial + LV	Multipole, Hybrid: high voltage + LV, coaxial + LV, fibre optic + LV, fluidic + LV
Contact type	Solder, crimp or print		
Other	Disposable models	—	—
Cable diameter	2.7 mm to 6.5 mm	3.2 mm to 9.2 mm	6.7 mm to 9.5 mm
Features	6 keyways	4 keyways	Insert Polarizations

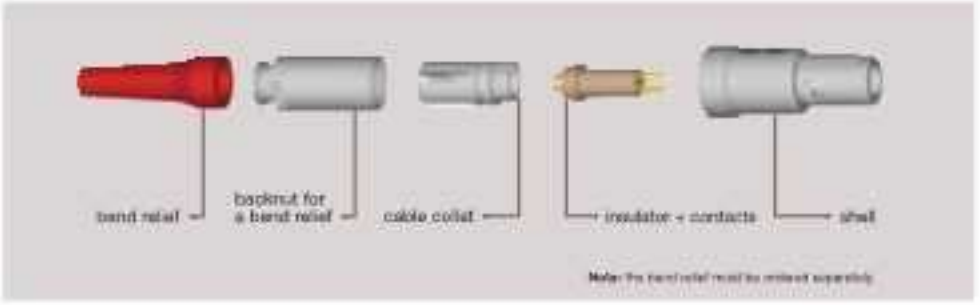
Note: x coded connector

Exploded view of the REDEL 1P

Straight plug

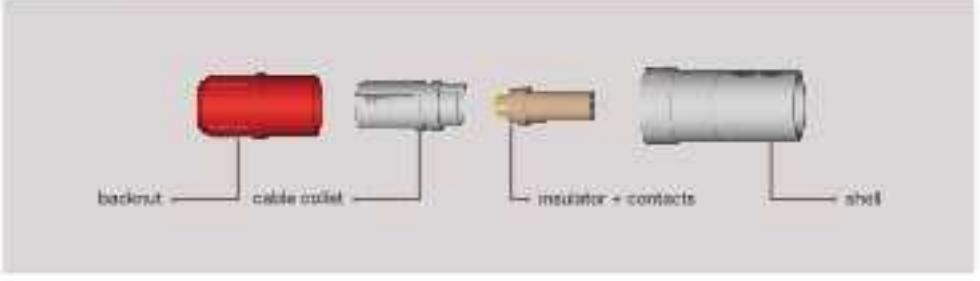


Straight plug with bend relief



Fixed socket

Free socket



1P SERIES

1P Series

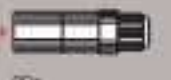
A well proven connector of a small size to accomodate cable diameter up to 6.5 mm and allow up to 14 solder contacts. Top quality lightweight and rugged materials have been chosen to optimize most applications. Polysulfone (PSU), UL certified as autoextinguishable, can be sterilized by gas or by steam. The contacts are gold-plated over copper and nickel to ensure at least 2000 mating/unmating cycles without significantly affecting the electrical characteristics. A keying system combined with colour coding can be incorporated on most connector models to assist in the prevention of mismating. Colour coding of the plug collet nut and socket flange will give an instant visual indication of connector compatibility.

Standard models (page 8 to 11)

Straight plugs

Fixed sockets

Free sockets



Fixed sockets

Elbow socket models (page 12)

Disposable plug (limited use) (page 13)

Disposable socket (limited use) (page 13)

Watertight models (page 14 to 15)

Straight plug

Fixed socket

Free socket

Fluidic configuration (page 16 to 17)

Straight plugs

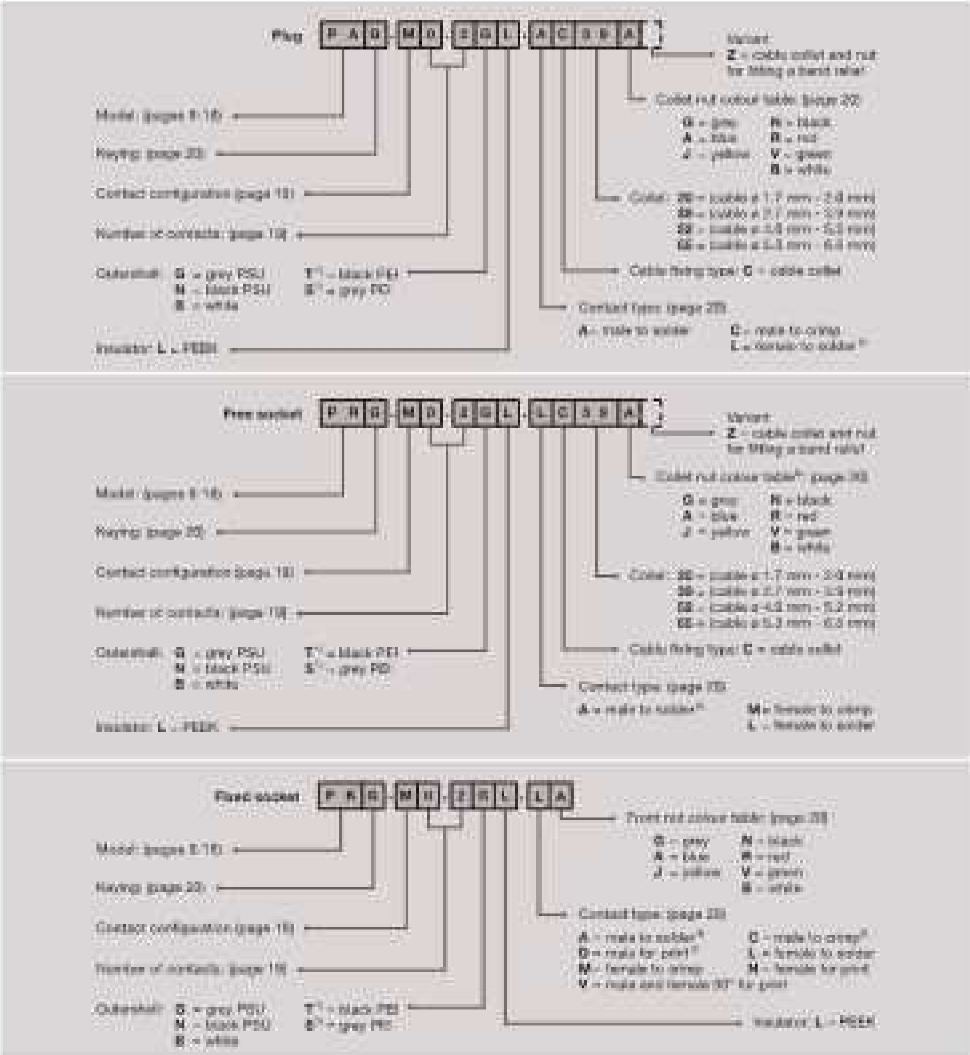
Fixed sockets

Mains power configuration (page 18)

Straight plug

Fixed socket

Part numbering system



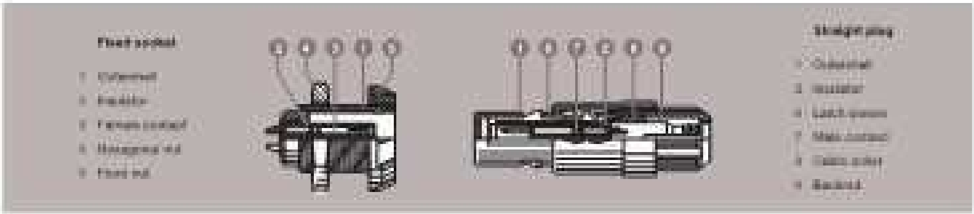
PAG.M0.2GL.AC39A Straight plug with cable collet and alignment key (G), multipole type with 2 male contacts to solder, grey PSU outershell, PEEK insulator, collet for a cable ø 2.7 to 3.9 mm and blue collet nut.

PRG.M0.2GL.LC39A Free socket with cable collet and alignment key (G), multipole with 2 female contacts to solder, grey PSU outershell, PEEK insulator, collet for a cable ø 2.7 to 3.9 mm and blue collet nut.

PKG.M0.2GL.LA Fixed socket with two nuts and alignment key (G), multipole type with 2 female contacts to solder, grey PSU outershell, PEEK insulator, and blue plastic front nut.

Note: [illegible]

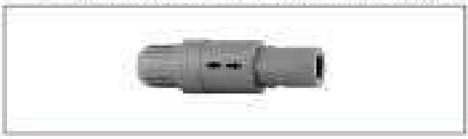
Standard models (IP50)



Characteristics	Value	Standards
Average retention force when pulling on the cable (N ≥ 0.150 kg)	30 N	IEC 60512-8 test 15f
Cable retention force depending on cable construction (N ≥ 0.150 kg)	50 ÷ 150 N	IEC 60512-8 test 17c

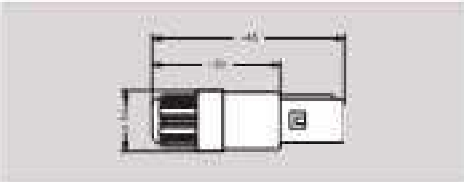
Characteristics	Value	Standards
Endurance (latching)	> 3000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	-
Working temperature range (PE)	-50/+170°C	-

PAG Straight plug, key (G) or keys (A, B, C, H and J), with cable collet

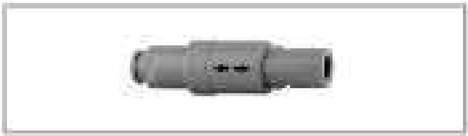


Part Number	Cable ø	
	min.	max.
PAG.M*.**GL.AC[illegible]	1.7	2.6
PAG.M*.**GL.AC[illegible]	2.7	3.8
PAG.M*.**GL.AC[illegible]	4.0	5.2
PAG.M*.**GL.AC[illegible]	5.3	6.5

Note: replace * * by contact configuration (see page 18).

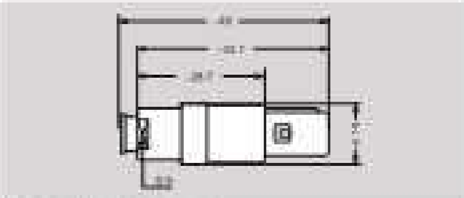


PAG Straight plug, key (G) or keys (A, B, C, H and J), with cable collet and nut for fitting a bend relief



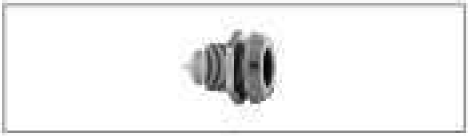
Part Number	Cable ø	
	min.	max.
PAG.M*.**GL.AC[illegible]	1.7	2.6
PAG.M*.**GL.AC[illegible]	2.7	3.8
PAG.M*.**GL.AC[illegible]	4.0	5.2
PAG.M*.**GL.AC[illegible]	5.3	6.5

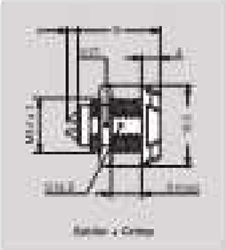
Note: replace * * by contact configuration (see page 18).
The bend relief must be ordered separately (see page 77).

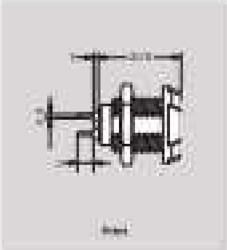


Note: all dimensions are in millimetres

PLG Fixed socket, key (G) or keys (A, B, C, H and J), nut fixing



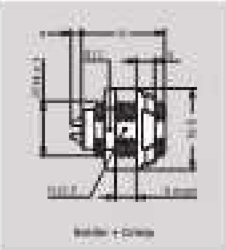


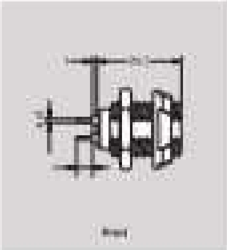


Part Number	number of contacts	Contact					
		Solder		Crimp		Print	
		N	a max	N	a	c	ø d
PLG.M0.2GL.LG	2	20.5	2.9	22.2	0	5	0.7
PLG.M0.4GL.LG	4	20.5	2.9	22.2	0	5	0.7
PLG.M0.5GL.LG	5	20.5	2.9	22.2	0	5	0.7
PLG.M0.6GL.LG	6	20.5	2.5	22.2	0	5	0.5
PLG.M0.7GL.LG	7	20.5	4.5	22.2	0	5	0.5
PLG.M0.8GL.LG	8	20.5	4.5	22.2	0	5	0.5
PLG.M0.9GL.LG	9	20.5	3.8	–	–	3	0.5
PLG.M1.0GL.LG	10	20.5	3.8	–	–	5	0.5
PLG.M1.4GL.LG	14	20.5	3.8	–	–	3	0.5

Note: for PCB drilling pattern and panel hole see page 24.

PKG Fixed socket, key (G) or keys (A, B, C, H and J), with two nuts (back panel mounting)

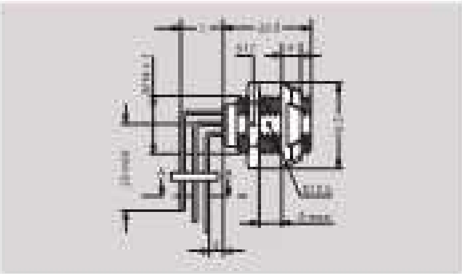




Part Number	number of contacts	Contact					
		Solder		Crimp		Print	
		N	a max	N	a	c	ø d
PKG.M0.2GL.LG	2	20.5	2.9	22.2	0	5	0.7
PKG.M0.4GL.LG	4	20.5	2.9	22.2	0	5	0.7
PKG.M0.5GL.LG	5	20.5	2.9	22.2	0	5	0.7
PKG.M0.6GL.LG	6	20.5	2.5	22.2	0	3	0.5
PKG.M0.7GL.LG	7	20.5	4.5	22.2	0	3	0.5
PKG.M0.8GL.LG	8	20.5	4.5	22.2	0	3	0.5
PKG.M0.9GL.LG	9	20.5	3.8	–	–	3	0.5
PKG.M1.0GL.LG	10	20.5	3.8	–	–	3	0.5
PKG.M1.4GL.LG	14	20.5	3.8	–	–	3	0.5

Note: for PCB drilling pattern and panel hole see page 24.

PKG Fixed socket, key (G) or keys (A, B, C, H and J), with two nuts, with 90° contacts (back panel mounting)

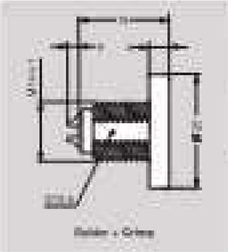


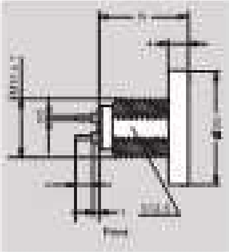
Part Number	number of contacts	L
PKG.M0.2GL.VG	2	8.4
PKG.M0.4GL.VG	4	8.2
PKG.M0.5GL.VG	5	7.7
PKG.M0.6GL.VG	6	7.7
PKG.M0.7GL.VG	7	7.1
PKG.M0.8GL.VG	8	7.7
PKG.M0.9GL.VG	9	10.3
PKG.M1.0GL.VG	10	10.3
PKG.M1.4GL.VG	14	12.0

Note: for PCB drilling pattern see page 23.
Panel hole see page 24.

Note: all dimensions are in millimeters

PMG Fixed socket, key (G) or keys (A, B, C, H and J), with square flange

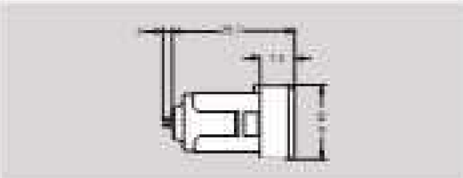




Part number	number of contacts	Contact					
		Solder		Crimp		Print	
		N	ø max	N	a		ø d
PMG.M0.2GL.LG	2	20.3	2.5	22.2	3	3	0.7
PMG.M0.4GL.LG	4	20.3	2.0	22.2	3	3	0.7
PMG.M0.5GL.LG	5	20.3	2.0	22.2	3	3	0.7
PMG.M0.6GL.LG	6	20.3	2.5	22.2	3	3	0.5
PMG.M0.7GL.LG	7	20.3	4.5	22.2	3	3	0.5
PMG.M0.8GL.LG	8	20.3	4.5	22.2	3	3	0.5
PMG.M0.9GL.LG	9	20.3	2.0	–	–	3	0.5
PMG.M1.0GL.LG	10	20.3	2.0	—	—	3	0.5
PMG.M1.4GL.LG	14	20.3	2.0	–	–	3	0.5

Note: for PCB drilling pattern see page 24.
Panel hole see page 24.

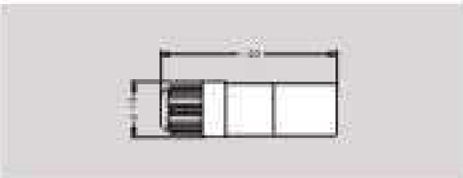
PYG Fixed socket, key (G) or keys (A, B or H), snap-on fixing



Part number	number of contacts	Solder
		ø max
PYG.M0.2GL.LG	2	2.2
PYG.M0.4GL.LG	4	2.2
PYG.M0.5GL.LG	5	2.2
PYG.M0.6GL.LG	6	2.6
PYG.M0.7GL.LG	7	2.4
PYG.M0.8GL.LG	8	3.5
PYG.M0.9GL.LG	9	4.5
PYG.M1.0GL.LG	10	4.5
PYG.M1.4GL.LG	14	4.5

Note: only with A, B or G keying (2 to 14 contacts) or H (8,10 or 14 contacts).
The insulator is made of PEEK.

PRG Free socket, key (G) or keys (A, B, C, H and J), with cable collet

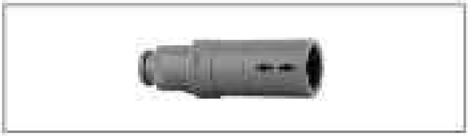


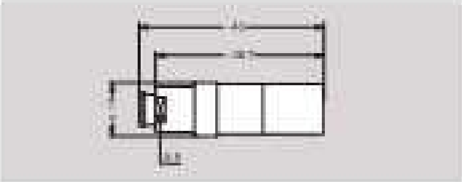
Part number	Cable ø	
	min	max
PRG.M0.xxG.LLC27G	1.7	2.8
PRG.M0.xxG.LLC35G	2.7	3.5
PRG.M0.xxG.LLC52G	4.0	5.7
PRG.M0.xxG.LLC65G	5.7	6.5

Note: replace x x by contact configuration (see page 18)

Note: all dimensions are in millimeters

PRG Free socket, key (G) or keys (A, B, C, H and J), with cable collet and nut for fitting a bend relief

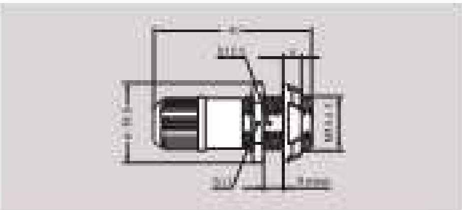




Part Number	Cable ø	
	min	max
[illegible]	1.7	2.8
[illegible]	2.7	3.8
[illegible]	4.0	5.2
[illegible]	5.3	6.5

Note: replace ●.● by contact configuration (see page 19).
The bend relief must be ordered separately (see page 22).

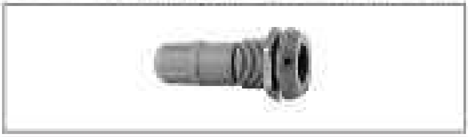
PTG Fixed socket, key (G) or keys (A, B, C, H and J), with two nuts and cable collet (back panel mounting)

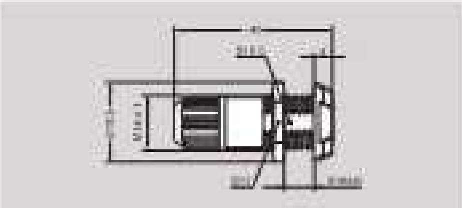


Part Number	Cable ø	
	min	max
[illegible]	1.7	2.8
[illegible]	2.7	3.8
[illegible]	4.0	5.2
[illegible]	5.3	6.5

Note: replace ●.● by contact configuration (see page 19).
Panel hole see page 24.

PDG Fixed socket, key (G) or keys (A, B, C, H and J), nut fixing and cable collet





Part Number	Cable ø	
	min	max
[illegible]	1.7	2.8
[illegible]	2.7	3.8
[illegible]	4.0	5.2
[illegible]	5.3	6.5

Note: replace ●.● by contact configuration (see page 19).
Panel hole see page 24.

Note: all dimensions are in millimetres

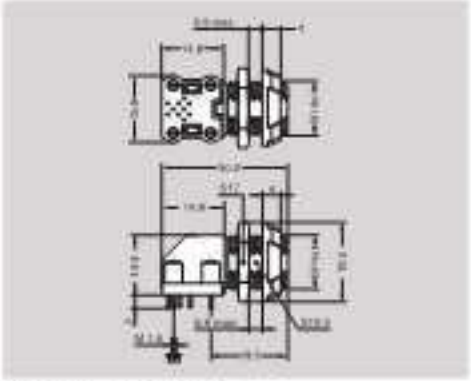
Elbow socket models (IP50)

PPG Elbow socket, key (G) or keys (A, B, C), for printed circuit

Part number	number of contacts
PPG.M0.300.N	3
PPG.M0.400.N	4
PPG.M0.500.N	5
PPG.M0.600.N	6
PPG.M0.700.N	7
PPG.M0.800.N	8
PPG.M0.900.N	9
PPG.M1.000.N	10

Note: only available with G or A, B, C keying. The insulator is made of PSU.
Outershell material is grey or black PSU.
For PCB drilling, see page 78.
It is possible to replace the 4 ground pins by 4 screws (M1.6) add an «5» to the end of the part number (e.g. PPG.M0.3005.N5)

PXG Elbow socket, key (G) or keys (A, B, C), with two nuts, for printed circuit

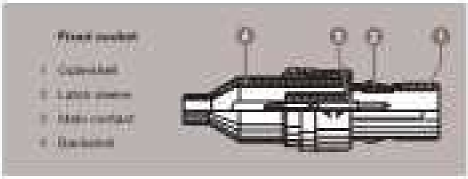


Part number	number of contacts
PXG.M0.300.NG	3
PXG.M0.400.NG	4
PXG.M0.500.NG	5
PXG.M0.600.NG	6
PXG.M0.700.NG	7
PXG.M0.800.NG	8
PXG.M0.900.NG	9
PXG.M1.000.NG	10

Note: only available with G or A, B, C keying. The insulator is made of PSU.
Outershell material is grey or black PSU.
For PCB drilling, see page 78.
Panel hole see page 74.
It is possible to replace the 4 ground pins by 4 screws (M1.6) add an «5» to the end of the part number (e.g. PXG.M0.3005.NG5)

Note: all dimensions are in millimetres.
For outershell in black PSU replace material code by «N»

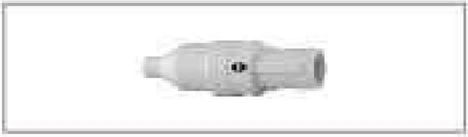
Disposable plug (limited use)



Characteristics	Value	Standards
Endurance for PJG latching 1)	10 cycles min.	IEC 60512-5 test 9a
Working temperature range (PSU)	-20 / +80°C	–
Outershell / insulator material	PSU	–
[illegible]	ABS	–

Note: 1) with machined contacts

PJG Straight disposable plug



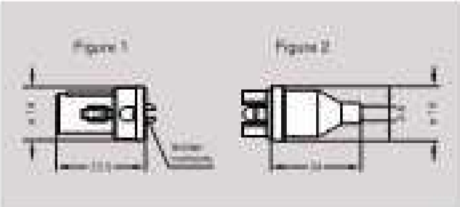


Figure 1 P J G . M 1 . 3 G G . A G

Keying: A, B, C, G

Number of contacts: 7, 9, 10, 14

Colour: **B** = white, **G** = grey

Figure 2 P J G . 1 3 8 . A G

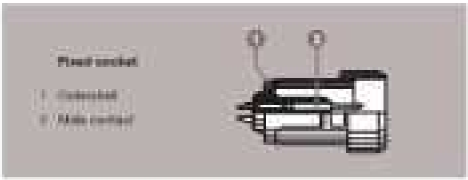
ø C (mm): 3.8 mm = 138

Material: A = ABS

Colour: **B** = white, **G** = grey

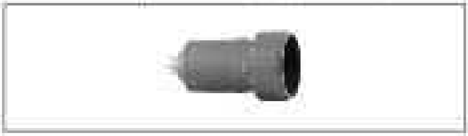
Note: 7 pin ø 0.7 mm male with ø 0.6 mm solder buckets. 9, 10 and 14 pin ø 0.5 mm male with ø 0.44 mm solder buckets. Not intended for use with PHx or PYx sockets.

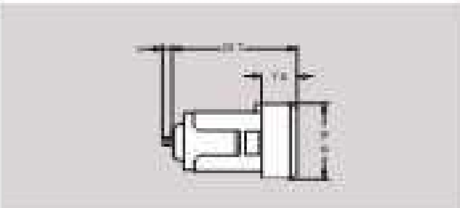
Disposable socket (limited use)



Characteristics	Value	Standards
Endurance for PYx latching	> 2000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	–
Average latching force	6N	IEC 60512-7 test 13a
Average unlatching force	7N	IEC 60512-7 test 13a
Average retention force	80N	IEC 60512-7 test 13a

PY● Fixed disposable socket, snap on fixing





Part Number	Nb. of cts.	Contact Type	Solder ø max	Shell color	Recommended Mating straight plug part number
[illegible]	4	female	2.5	grey	PAG.M0.4GL.AC***
[illegible]	4	female	2.5	black	PAG.M0.4GL.AC***
[illegible]	9	male	2.5	blue	PW1.M0.9GL.LC***
[illegible]	9	male	2.5	white	PW1.M0.9GL.LC***
[illegible]	10	female	4.0	grey	PAA.M1.[illegible]GL.AC***
[illegible]	10	male	4.0	blue	PWM.M1.[illegible]GL.LC***

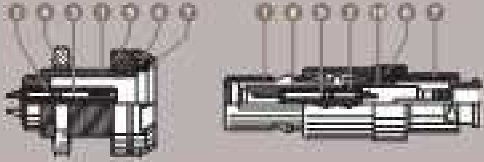
Note:
The outershell and the insulator are moulded out of the same material (PSU).
Protective backshell available (see page 27).
Part number last digit represents the colour.

Note: all dimensions are in millimeters

Watertight models (IP64 when mated)

Fixed socket

1 Outer shell
2 Insulator
3 Female contact
4 Hexagonal nut
5 Flat gasket
6 Gasket
7 Nut



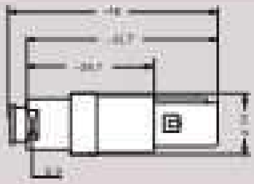
Straight plug

1 Outer shell
2 Insulator
6 Gasket
7 Nut
8 Latch sleeve
9 Male contact
10 Cable collet

Characteristics	Value	Standards
Average retention force when pulling on the cable (N = 0.102 kg)	[illegible]	IEC 60512-8 test 15f
Cable retention force (depends on cable construction) (N = 0.102 kg)	50 – 150 N	IEC 60512-8 test 17c

Characteristics	Value	Standards
Endurance (latching)	> 2000 cycles	IEC 60512-5 test 9a
Working temperature range (PEI)	-55/+90°C	-
Gasket material	Fluorine (FPM)	-

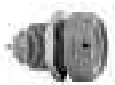
PFG Straight plug with cable collet and nut for fitting a bend relief

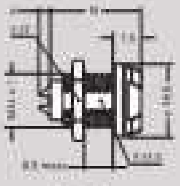


Part Number	Cable ø	
	min.	max.
[illegible]	1.7	2.8
[illegible]	2.7	3.8
[illegible]	4.0	5.2
[illegible]	5.3	6.5

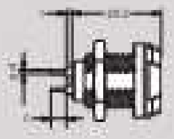
Note: the bend relief must be ordered separately (see page 70). Replace • • by contact configuration (see page 18).

PNG Fixed socket, nut fixing





Solder + Crimp



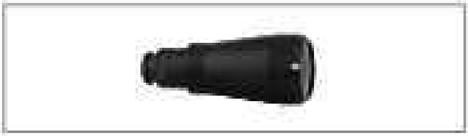
Print

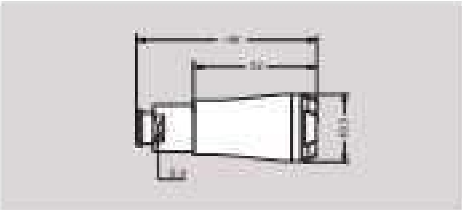
Part Number	number of contacts	Contact					
		Solder		Crimp		Print	
		N	ø max	N	ø	n	ø d
[illegible]	2	23.3	2.5	25.0	[illegible]	5	0.7
[illegible]	4	23.3	2.5	25.0	[illegible]	5	0.7
[illegible]	5	23.3	2.8	25.0	[illegible]	6	0.7
[illegible]	6	23.3	2.5	25.0	[illegible]	3	0.5
[illegible]	7	23.3	4.5	25.0	[illegible]	3	0.5
[illegible]	8	23.3	4.5	25.0	[illegible]	3	0.5
[illegible]	9	23.3	3.9	–	–	3	0.5
[illegible]	10	23.3	3.9	–	–	3	0.5
[illegible]	14	23.3	3.9	–	–	3	0.5

Note: for PCB drilling pattern see page 74.

Note: all dimensions are in millimetres

PSG Free socket, conical outershell with cable collet and nut for fitting a bend relief





Note: all dimensions are in millimeters

Part Number	Cable ø	
	min.	max.
[illegible]	4.00	5.2
[illegible]	5.0	6.5
[illegible]	5.0	6.0
[illegible]	4.00	5.2

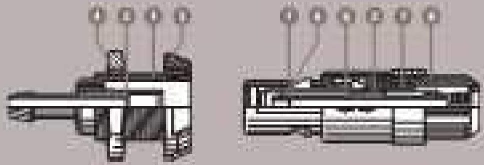
Note: replace ● ● by contact configuration (see page 16)
Outershell is black Delrin®
The bend relief must be ordered separately (see page 22)

Fluidic configuration (2 bars)

The REDEL fluidic connector has many applications for example in medical or dentistry equipment. The connector is a monotube type and primarily intended for use with air or inert gas.

Fixed socket

1. Outershell
2. Fluidic tube
3. Fixing nut
4. Hexagonal nut



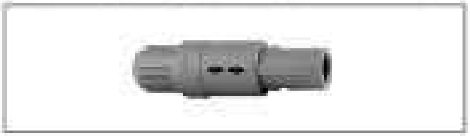
Straight plug

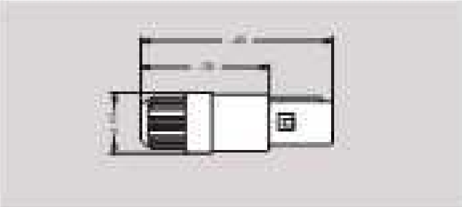
1. Outershell
2. Fluidic tube
3. Latch sleeve
6. O-ring
7. Cable collet
8. Backnut

Characteristics	Value	Standards
Max. working pressure	2 bars	–
Endurance (Mating)	> 5000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-20/+150°C	–

Characteristics	Value	Standards
Inner fluidic contact diameter	2.6 mm	–
Tube diameter (min/max)	3 mm / 4 mm	–
Fluidic tube material	Ni plated brass	–
O-ring material	FPM (Viton®)	–

PAG Straight plug, key (G) or keys (A, B, C, H and J), with cable collet

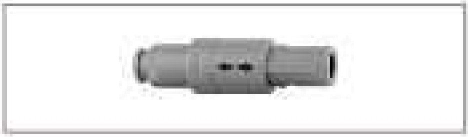


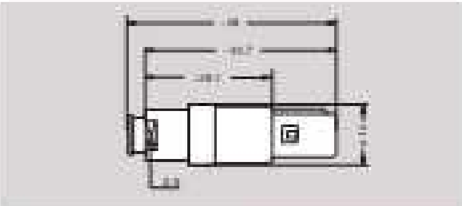


Part Number	⌀ max. tube (mm)	⌀ inner tube (mm)
[illegible]	6.5	4

Note: For outer nut colour replace last digit (see table page 28).

PAG Straight plug, key (G) or keys (A, B, C, H and J), with cable collet and nut for fitting a bend relief



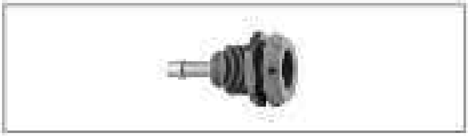


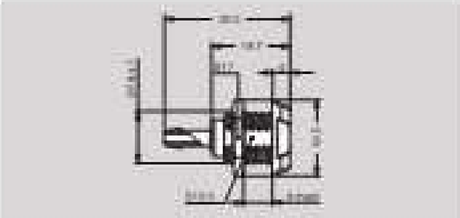
Part Number	⌀ max. tube (mm)	⌀ inner tube (mm)
[illegible]	6.5	4

The bend relief must be ordered separately (see page 33).

Note: all dimensions are in millimeters

PLG Fixed socket, key (G) or keys (A, B, C, H and J), with fluidic contact, nut fixing

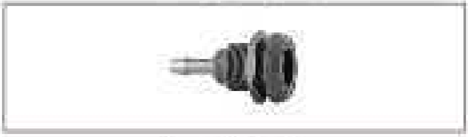


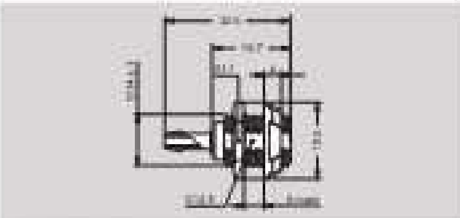


Part Number	ø inner tube (mm)
PLG.A0.102.[illegible]	4

Note: For front nut colour replace last digit (see table page 38). Recommended tube Legris 1025A04

PKG Fixed socket, key (G) or keys (A, B, C, H and J), with fluidic contact, with two nuts (back panel mounting)





Part Number	ø inner tube (mm)
PKG.A0.102.ZN	4

Note: For front nut colour replace last digit (see table page 38). Recommended tube Legris 1025A04

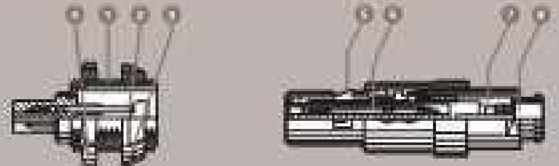
Note: all dimensions are in millimeters

Mains power configuration

The new PA● and PK● models are used for mains power in medical applications. The design of a special insulator offers the required creepage distance. The 3 contacts are only solder type with a maximum AWG 18 (wire size max 1.35 mm). The connectors are UL certified to be used at 250 Volt AC (3 Amps). See UL approval file number N°E242949 (only valid for 3 contact configuration).

Fixed socket

1. Outer shell
2. Male contact
3. Front nut
4. Hexagonal nut



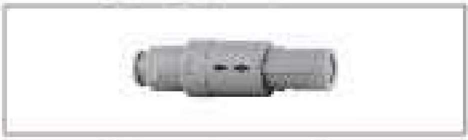
Straight plug

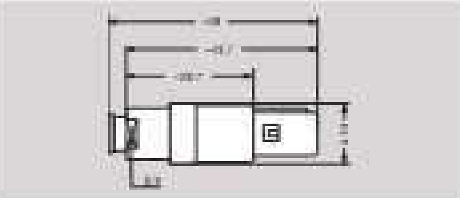
5. Latch sleeve
6. Female contact
7. Cable collet
8. Backnut

Characteristics	Value	Standards
Test voltage (rms)	1.5 kV	IEC 60512-2 test 4a
Rated voltage (rms)	250 V	IEC 60601/UL 60601-1
Average retention force when pulling on the cable (N) = 0.250 kg	90 N	IEC 60512-8 test 15f

Characteristics	Value	Standards
Cable retention force (depends on cable construction)	80 – 100 N	IEC 60512-9 test 17c
Endurance (latching)	> 5000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	-
UL file number	E242949	-

PA● Straight plug, key (H or G), with cable collet and nut for fitting a bend relief

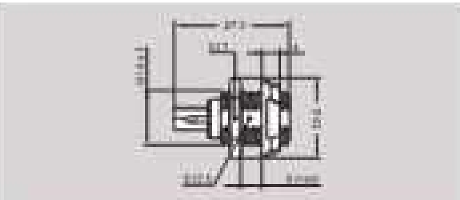




Part Number	Cable ø	
	min	max
[illegible]	3.0	5.2
[illegible]	5.3	6.6
[illegible]	3.0	5.2
[illegible]	5.2	6.6

Note: The bend relief must be ordered separately (see page [illegible]).

PK● Fixed socket, key (H or G), with two nuts (back panel mounting)

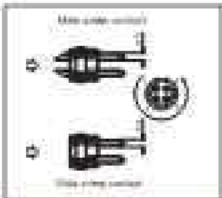


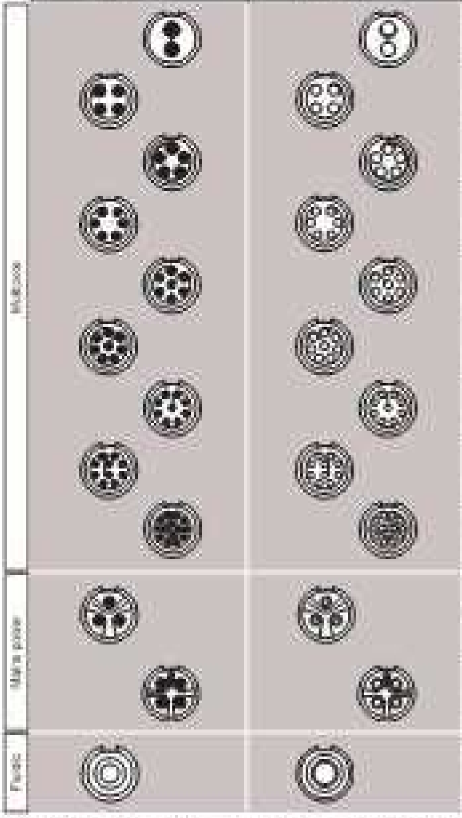
Part Number
[illegible]
[illegible]

Note: For front nut colour replace [illegible] (see table page [illegible]).
Not available with print contact.

Note: all dimensions are in millimeters

Insert configuration





Insert code	Number of contacts	Contact Ø (mm)	Solder bucket Ø (mm)	Crimp bucket Ø (mm)	Contact type: Solder	Crimp	Print (straight)	Print (elbow)	Test voltage (kV rms)¹	Air distance² / Creepage distance³ (mm)	Rated current (A)
[illegible]	2	1.3	1.10	1.4	•	•	•	•	1.20	1.30	10.0
[illegible]	4	0.9	0.80	1.1	•	•	•	•	1.20	1.20	6.0
[illegible]	5	0.9	0.80	1.1	•	•	•	•	1.05	0.80	7.5
[illegible]	6	0.7	0.80	0.8	•	•	•	•	1.05	0.85	6.5
[illegible]	7	0.7	0.80	0.8	•	•	•	•	1.05	0.85	5.5
[illegible]	8	0.7	0.80	0.8	•	•	•	•	1.05	0.80	5.5
[illegible]	9	0.5	0.45	–	•	–	•	•	0.85	0.80	5.5
[illegible]	10	0.6	0.40	–	•	–	•	•	0.85	0.40	5.0⁴
[illegible]	14	0.6	0.45	–	•	–	•	•	0.80	0.80	2.0
[illegible]	3	0.9	1.30	–	•	–	–	–	1.50	3.00 / 5.00	9.0⁶
[illegible]	4	0.9	1.40	–	•	–	–	–	2.50	1.30 / 5.50	8.0
[illegible]	1 Fluidic monofluid up to 2 bars										

Note: ¹ depending on specific application and related standard, more restrictive operating voltage may apply.
We suggest operating voltage = 1/3 test voltage, see page 88.
² shortest distance in air between two conductive parts.
³ shortest distance along the surface of the insulating material between two conductive parts
⁴ for PPG and PXG (with 10 contacts) electrical characteristics, please contact factory.
⁵ for a given AWG, the diameter of some stranded conductor design is larger than the solder cup diameter (see page 78).
⁶ UL file number: [illegible]

Alignment key

Verify the third digit of the part number in order to select the right keying.
The standard keying is «G» coded.

Keying (plug front view)						
Reference	G	A	B	C	H	J
Contact type for plug	male	male	male	male	female	female
Contact type for socket	female	female	female	female	male	male
Number of contacts	2 to 14				3, 10 or 14	

Outer shell material

Material	Code	Colour	Temperature
PEI	3	Grey	-50° / +170°C
PSU	5	Black	
PSU	G	Grey	-50° / +150°C
PSU	B	Black	

Note: for polarizing shell/collar use PEI. For complete connector in PEI (metal nut, front nut or flange also in PEI), available colours are grey or black only. Use colour coding grey or black according to colour coding table (see below).

Contact type

Select the type of contact: solder or crimp?

Plug

Type	Male	Female
solder	A	1
crimp	C	

Socket

Type	Male	Female
solder	A1	1
crimp		B
print	D	N
print 90°	V	X

Note: 1 only for H and J keying with 3, 10 or 14 contacts. For complete connector in PEI (metal nut, front nut or flange also in PEI), available colours are grey or black only. Use colour coding grey or black according to colour coding table (see below).

When should I use crimp rather than solder contacts ?

Soldering

- recommended for small volumes
- requires little amount of tooling (soldering iron)
- requires more time

Crimping

- recommended for large volumes
- no heat is required to make the connection
- for contacts with high density
- for use in high temperature environment
- requires extra tooling (crimping tools)

Colour coding

	Colours						
	grey	blue	yellow	black	red	green	white
Reference	3	A	J	N	R	V	B
RAL code	7001	5002	1016	9004	3001	6024	9003

Note: the RAL colours are indicative and depend on raw material and production process. Colour may differ.

Easy identification with the assistance of colour coding.
Outershell is only available in grey or black.

Accessories

PAG-PLG Insulator for crimp contacts

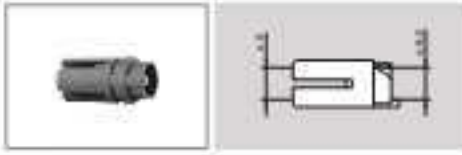
Contact configuration	Insulator part number	
	For male contact	For female contact
MI.2	PAG.302.YL	PLG.402.YL
MI.4	PAG.304.YL	PLG.404.YL
MI.5	PAG.305.YL	PLG.405.YL
MI.6	PAG.306.YL	PLG.406.YL
MI.7	PAG.307.YL	PLG.407.YL
MI.8	PAG.308.YL	PLG.408.YL

PAG-PKG Crimp contacts, kit with the number of contacts in a tube

Contact configuration	qty. of contacts	ø conductor (mm)	Kit contact part number	
			Male	Female
MI.2	2	1.5	PAG.907.02C	PAG.907.02M
MI.4	4	0.5	PAG.907.04C	PAG.907.04M
MI.5	5	0.5	PAG.907.05C	PAG.907.05M
MI.6	6	0.7	PAG.907.06C	PAG.907.06M
MI.7	7	0.7	PAG.907.07C	PAG.907.07M
MI.8	8	0.7	PAG.907.08C	PAG.907.08M

Note: open versions, contacts with reduced crimp barrel are available.

PLA Collet



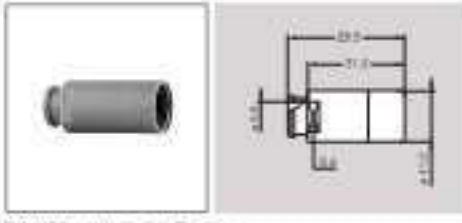
Part Number	ø A (mm)	Cable ø (mm)	
		min	max
PLA.722.++	2.0	1.7	2.0
PLA.739.++	3.9	2.7	3.9
PLA.752.++	5.2	4.0	5.2
PLA.760.++	6.0	5.3	6.0

Note: ++ = UG (grey PSU). TN (black PEI) or UN (black PSU)

PKG Plastic front nut for PK● and PT● models

Part Number	Mat.	Colours
PKG.203.UN	PSU	black
PKG.203.UB	PSU	white
PKG.203.UG	PSU	grey
PKG.203.UJ	PSU	yellow
PKG.203.UN	PSU	black
PKG.203.UR	PSU	red
PKG.203.UV	PSU	green
PKG.203.TG	PEI	grey
PKG.203.TN	PEI	black

PAM.130.●● Nut for fitting a GMA.1B bend relief

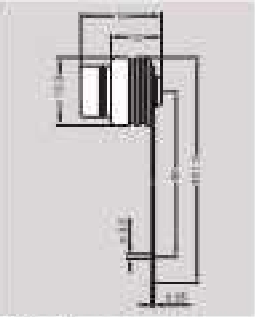


Part Number	Mat.	Colours
PAM.130.UN	PSU	black
PAM.130.UB	PSU	white
PAM.130.UG	PSU	grey
PAM.130.UJ	PSU	yellow
PAM.130.UN	PSU	black
PAM.130.UR	PSU	red
PAM.130.UV	PSU	green
PAM.130.TG	PEI	black
PAM.130.TG	PEI	grey

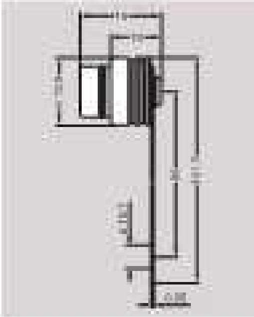
Note: all dimensions are in millimeters.

Note: only for PK●, PS● or PT● models.

PBG.200.BMV Blanking cap for REDEL P

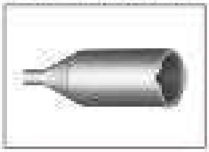


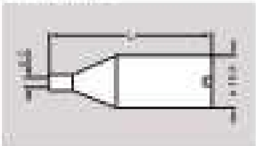
PBG.201.BMV Blanking cap for REDEL P

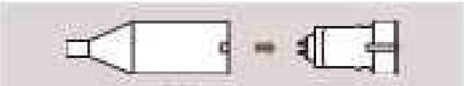


With PKG socket model it offers IP64. Material: Delrin®, colours: black

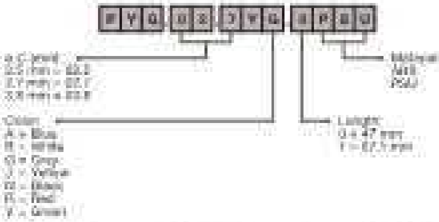
PYG.0... Protective backshell for PY●





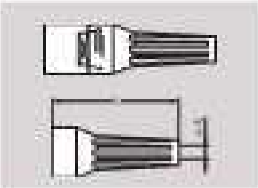


PYG.0... PKG



Note: Length 47 mm can be delivered in 3 different diameters 2.5/3.7/3.8 mm. Length 67 mm can be delivered in 2 different diameters 2.5 and 3.7 mm.

GMA.1B Bend relief



A bend relief absorbs the force that may be exerted on cables.
These are designed for plugs and free sockets with cable collet and nut.

Part Number	Dimensions (mm)				Material	Temperature range	
	Bend relief		Cable ø			in the atmosphere	in water steam
	A	L	max.	min.			
GMA.1B.025.CG	2.8	30	2.9	2.5	TPU (Thermoplastic Polyurethane)	-40°C...+80°C	-
GMA.1B.030.CG	3.8	30	3.4	3.0			
GMA.1B.035.CG	3.9	30	3.8	3.5			
GMA.1B.040.CG	4.3	30	4.4	4.0			
GMA.1B.045.CG	4.5	30	4.9	4.5			
GMA.1B.051.CG	5.4	30	6.0	5.6			
GMA.1B.065.CG ¹⁾	6.5	30	7.0	6.5			
GMA.1B.025.RG	2.5	34	2.9	2.5	Silicone elastomer VMQ	-60°C...+200°C	+140°C
GMA.1B.030.RG	3.0	34	3.4	3.0			
GMA.1B.035.RG	3.8	34	3.9	3.5			
GMA.1B.040.RG	4.8	34	4.4	4.0			
GMA.1B.045.RG	2.6	34	6.0	5.5			
GMA.1B.051.RG	5.1	34	5.6	5.1			
GMA.1B.057.RG	5.7	34	6.2	5.7			
GMA.1B.063.RG	6.3	34	7.0	6.3			

Reference	Colours
A	blue
B	white
G	grey
J	yellow
M	brown
N	black
R	red
S	orange
V	green

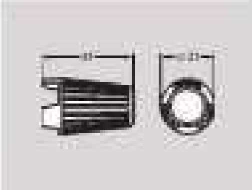
The selection of pigments, which should remain stable at high temperature, is limited by the new regulations. For this reason some colours will be a shade different from those used for TPU bend reliefs. The selected solutions represent the best possible compromise.

¹⁾ Design may differ from other bend relief model without stripes. The last letter «G» of the part number indicates a grey colour, see the adjacent table and replace letter «G» by the letter of the colour required. All dimensions are in millimeters.

POP.125.GN Spanner for outershell

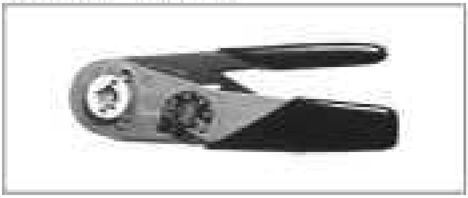
Both spanners available as a kit, ref. [illegible]
Material: PA 6.6

POB.165.GN Spanner for front nut



Material: PA 6.6

DPC.91.701.V Crimping tool

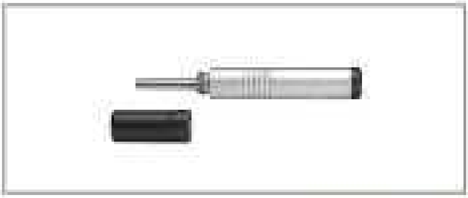


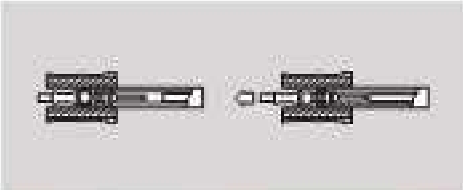
DCE Positioners for crimp contacts

male

female

DCF Automatic extraction tools for crimp contacts



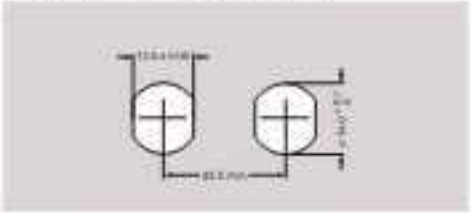


Configuration	Contact ø (mm)	Conductor AWG	Positioner part number		Selector No Setting	Part number extractor	
			Male contact	Female contact		Male contact	Female contact
[illegible]	1.3	18-20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.9	20-22-24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.7	22-24-26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

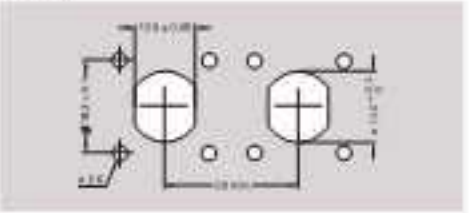
The variance in conductor stranding diameter for the minimum AWG is such that some can have a cross section which is not sufficient to guarantee crimping as per IEC 60352-2 standard. All dimensions are in millimetres.

Panel hole

For PL●, PK●, PN●, PX●, PT● and PD●



For PM●



Note: PT● is also designed for snap-in fixing into customer housing. Cutout factory for information.
Socket mounting nut torque ≤ 1.5 Nm

PCB drilling pattern

For straight contacts


M3.2


M3.4


M3.5


M3.6


M3.7


M3.8

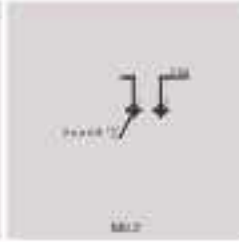

M3.9

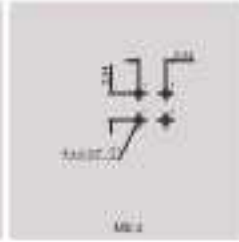

M3.3

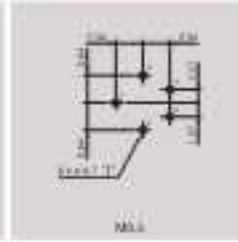

M1.4

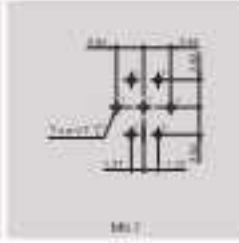
Note: all dimensions are in millimeters

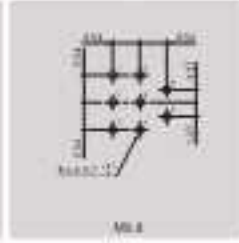
For 90° elbow contacts (A-A view)

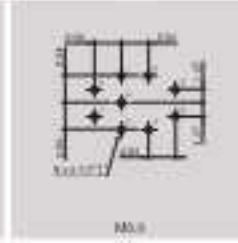


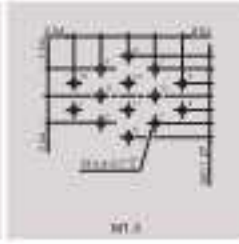




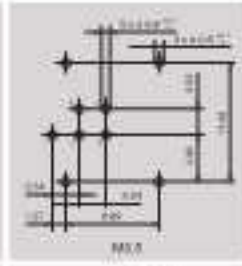


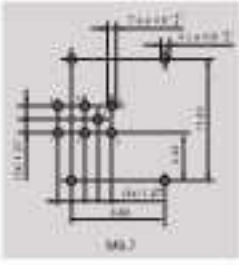






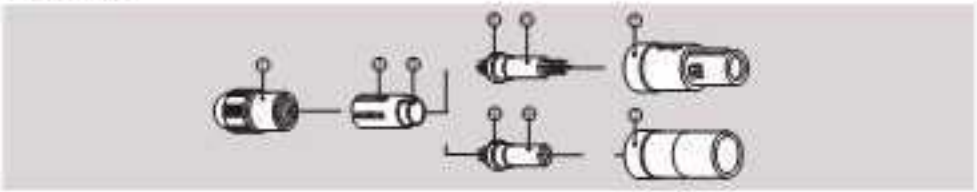
For PPG and PXG models





Assembly instructions

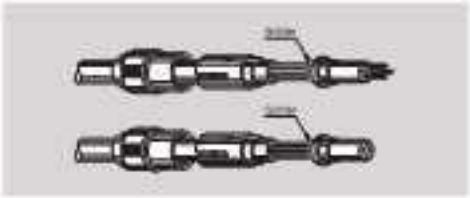
Solder contacts



1. Strip the cable according to the lengths given in the table. Tin the conductors.

Configuration	Dimensions (mm)	
	L	T
MS.3	11.5	3.0
MS.4, MS.5	13.0	3.0
MS.6 to MS.8	12.5	2.5
NS.3	11.5	3.0
NS.4	11.5	3.0

2. Slide the collet nut ① and then the collet ② onto the cable.



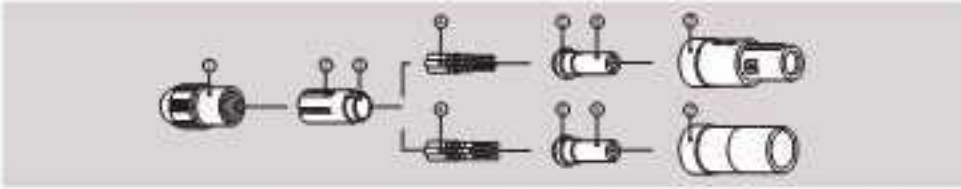
3. Solder conductors into contacts, making sure that neither solder nor flux gets onto the insulator or cable insulation.

4. Slide the collet ② forward and locate tag ③ in the slot ④ on the insulator ⑤.
Slide collet nut ① over collet ② and then push the whole assembly into the shell ⑥ whilst turning it to ensure that the tag ③ locates in the inside slot of the shell. Tighten the collet nut ① to the maximum torque of 0.25 Nm.

– Socket mounting nut torque – 1.5 Nm.

For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Crimp contacts



1. Strip the cable according to the lengths given in the table.

Configuration	Dimensions (mm)	
	L	I
MIL 5 to MIL 8	14.3	4.8

2. Slide the collet nut ① and then the collet ② onto the cable.

3. Fix the appropriate positioner (table page 23) in the crimping tool. Set selector to the number corresponding to the conductor AWG as indicated on the positioner label. Fit conductor into contact ③ and make sure it is visible through the inspection hole in the crimp barrel. Slide conductor-contact combination into the open crimping tool, make sure that the contact is fully pushed into the positioner. Close the tool. Remove from crimping tool and check that conductor is secure in contact and shows in inspection hole.

4. Now arrange contact-conductor combinations according to the insert marking and locate them into the insert ④. Check that all contacts are correctly located and remain in position when given a gentle pull.

5. Slide the collet ⑤ forward and locate tag ⑥ in the slot ⑦ on the insulator ⑧. Slide collet nut ① over collet ⑤ and then push the whole assembly into the shell ⑨ whilst turning it to ensure that the tag ⑥ locates in the inside slot of the shell. Tighten the collet nut ① to the maximum torque of 0.25 Nm.

– Socket mounting nut torque = 1.5 Nm.

For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Solder contacts (For PJ#)

1. Strip the cable according to the lengths given in the drawing. Tin the conductors.

Configuration	Dimensions (mm)	
	L	T
MKS.MT.0.MI.#	12.5	3.0

2. Slide the backshell ① onto the cable.

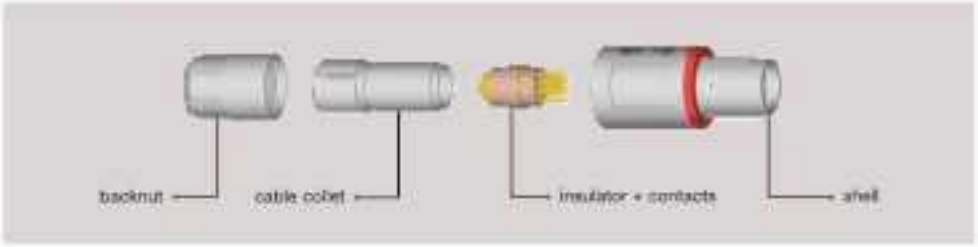
3. Solder conductors into contacts ②, making sure that neither solder nor flux gets onto the cable insulation.

4. Slide backshell ① forward and align the tabs to the slots on the plug ③. Snap backshell onto the plug to complete the assembly. Various strain relief techniques can be incorporated, depending on application.

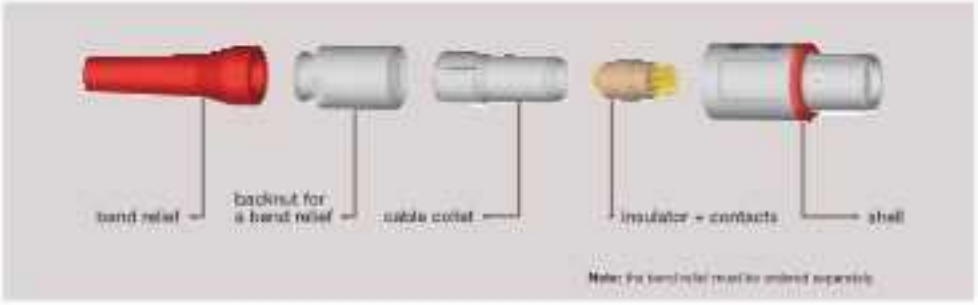
5. If the need arises to remove an installed contact, during the assembly process or subsequent repair, individual contacts can be removed using LEMO extraction tool (part number: DCF.91.050.2LT). DO NOT reuse extracted contacts.
The only recommended chemical cleaner is Isopropyl Alcohol.

Exploded view of the REDEL 2P

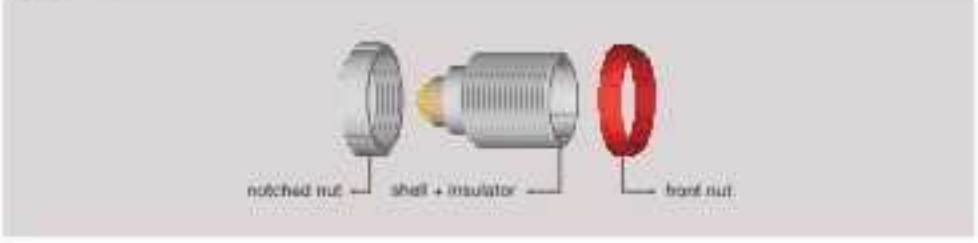
Straight plug



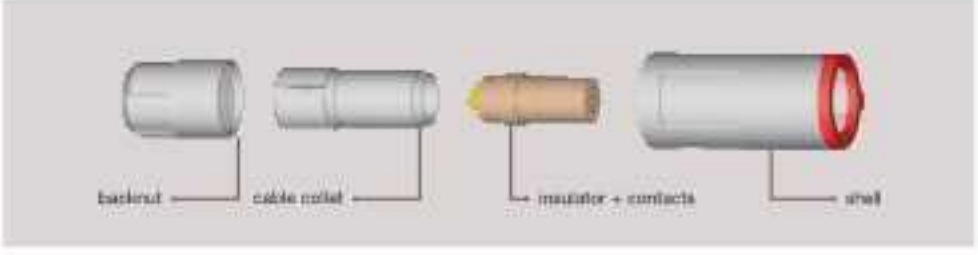
Straight plug with bend relief



Fixed socket



Free socket



2P SERIES

2P Series

This a 18 mm connector accomodates cable diameter up to 9.2 mm and allows up to 34 solder or crimp contacts.
Top quality lightweight but rugged materials have been chosen to optimize most applications. Polysulfone (PSU), UL certified as autoextinguishable, can be sterilized by gas or by steam. The contacts are gold-plated over copper and nickel to ensure at least 1000 mating/unmating cycles without significantly affecting the electrical characteristics. Five keys on the plug nose will allow blind mating. Colour coding of the plug and socket flange will give an instant visual indication as to whether connectors are compatible or not. Water resistant to IP 66 options are available.

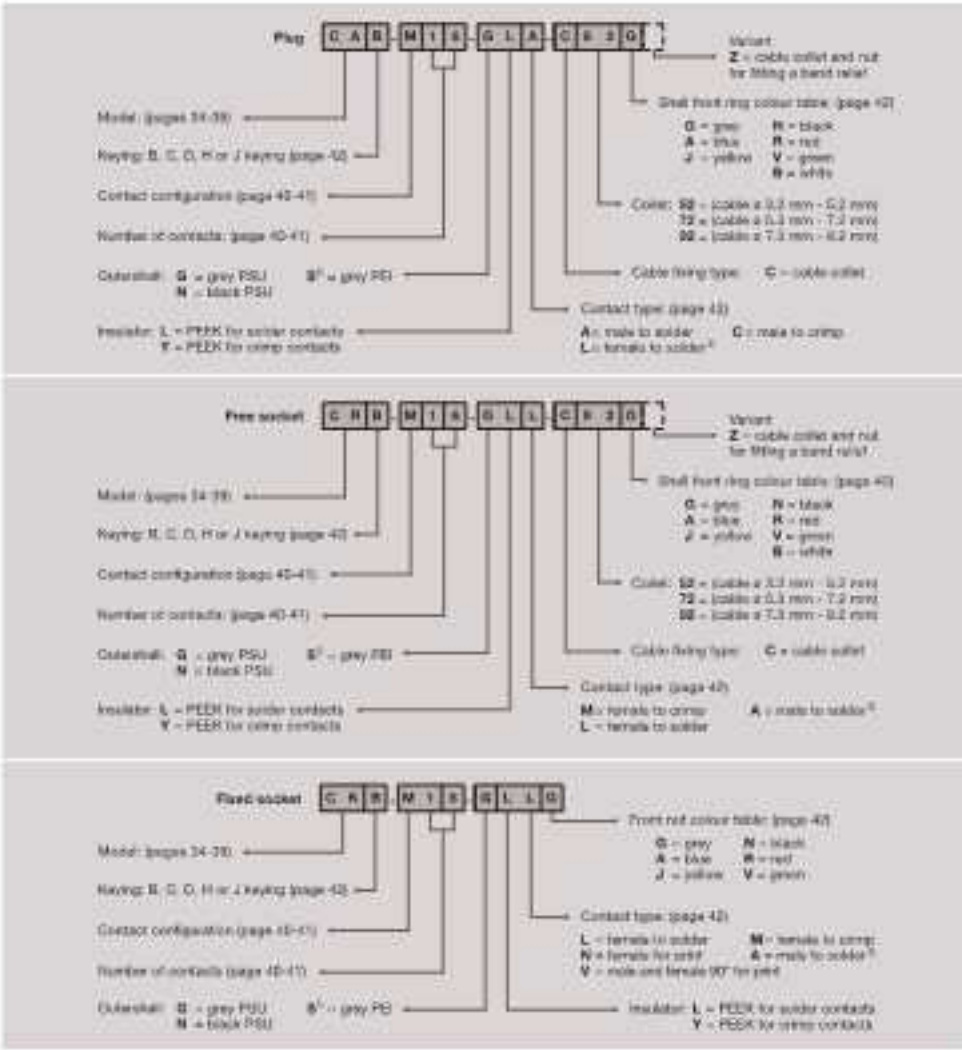
Standard models (page 34 to 36)

Watertight models (page 37 to 38)

Disposable socket (limited use) (page 38)

Fluidic configuration (page 39)

Part numbering system



CAB.M16.GLA.C92G Straight plug with cable collet and alignment key (B), multipole type with 16 male contacts to solder, grey PSU outershell, PEEK insulator, collet for a cable ø 7.3 to 9.2 mm and grey front ring.

CRB.M16.GLL.C92G Free socket with two nuts and alignment key (B), multipole type with 16 female contacts to solder, grey PSU outershell, PEEK insulator, collet for a cable ø 7.3 to 9.2 mm and grey front ring.

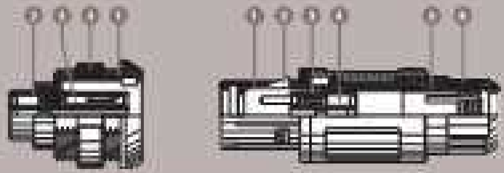
CKB.M16.GLLG Fixed socket with two nuts and alignment key (B), multipole type with 16 female contacts to solder, grey PSU outershell, PEEK insulator, and grey front ring.

Note: 1) for contacts insert modification we propose polythermide ULTEM® (PEI)
2) riveted available only with H and J keying and with 26 or 34 contacts (inverted contacts)

Standard models (IP50)

Fixed socket

1. Outershell
2. Insulator
3. Female crimp contact
4. Hexagonal nut



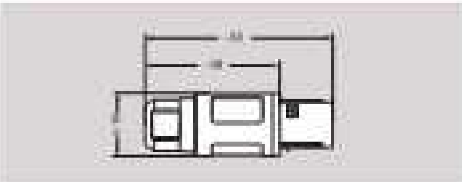
Straight plug

1. Outershell
2. Latch sleeve
3. Insulator
4. Male crimp contact
5. Collet + [illegible]
6. Collet nut

Characteristics	Value	Standards
Average retention force when pulling on the cable [illegible]	150 N	IEC 60512-8 test 15f
Cable retention force depending on cable construction [illegible]	150 – 250 N	IEC 60512-8 test 17c

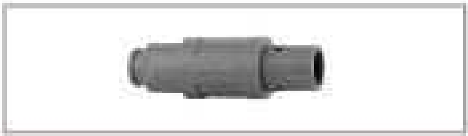
Characteristics	Value	Standards
Endurance (latching)	> 1000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	-
Working temperature range (PEI)	-50/+170°C	-

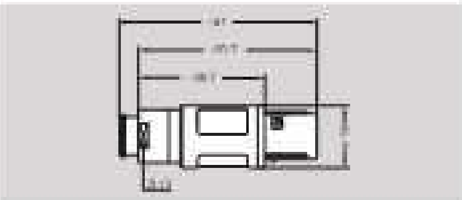
CAB Straight plug with cable collet



Part Number	Cable ø	
	min	max
[illegible]	3.7	5.2
[illegible]	5.3	7.2
[illegible]	7.3	9.2

CAB Straight plug with cable collet and nut for fitting a bend relief

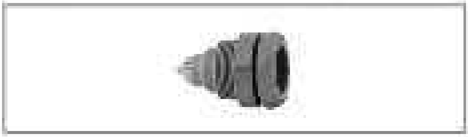


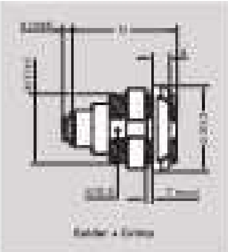


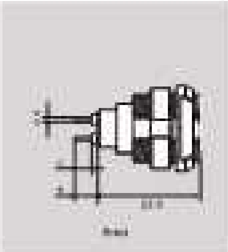
Part Number	Cable ø	
	min	max
[illegible]	4.2	5.2
[illegible]	5.3	7.3
[illegible]	7.3	9.2

Note: the bend relief must be ordered separately (see page [illegible]).

CKB Fixed socket with two nuts (back panel mounting)



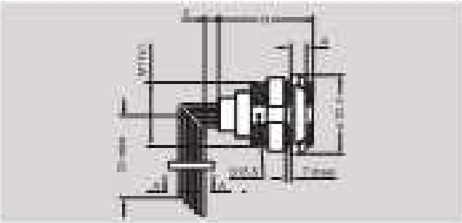




Part Number	number of contacts	Contact						
		Solder		Crimp		Print		
		N	z	N	x	c	ø d	e
[illegible]	18	23.8	3.4	25.1	8	5.7	0.7	6.0
[illegible]	18	23.8	4.0	25.1	8	5.7	0.7	6.0
[illegible]	26	23.8	4.7	25.1	8	3.0	0.5	3.0
[illegible]	32	23.8	4.7	25.1	8	3.0	0.5	3.0

Note: for PCB drilling pattern see page 4[illegible].
Panel hole see page 4[illegible].

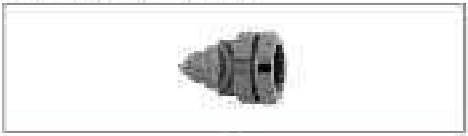
CKB Fixed socket with two nuts with 90° contacts (back panel mounting)

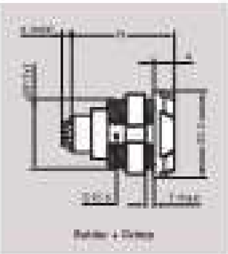


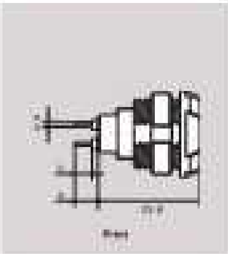
Part Number	number of contacts	N (mm)
[illegible]	18	20.6
[illegible]	18	24.2
[illegible]	18	24.2
[illegible]	26	24.2

Note: for PCB drilling pattern see page [illegible]
Panel hole see page 4[illegible]

GLB Fixed socket, nut fixing



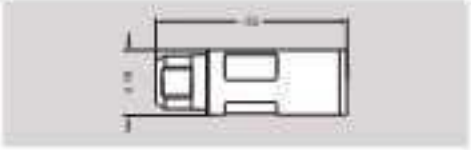




Part Number	number of contacts	Contact						
		Solder		Crimp		Print		
		N	z	N	x	c	ø d	e
[illegible]	18	23.8	3.4	25.1	8	6.1	0.7	6.0
[illegible]	18	23.8	4.0	28.1	8	5.7	0.7	6.0
[illegible]	26	23.8	4.7	25.1	8	3.0	0.5	3.0
[illegible]	32	23.8	4.7	25.1	8	3.0	0.5	3.0

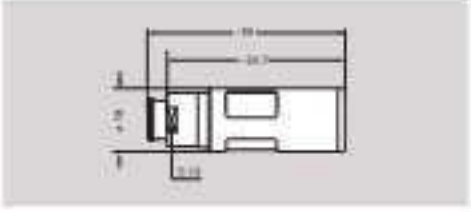
Note: for PCB drilling pattern see page 4[illegible]
Panel hole see page 4[illegible]

CRB Free socket with cable collet



Part Number	Cable ø	
	min	max
CRB/M4x0.7/LC/3/5	3.2	5.2
CRB/M4x0.7/LC/5/7	5.2	7.2
CRB/M4x0.7/LC/7/9	7.2	9.2

CRB Free socket with cable collet and nut for fitting a bend relief



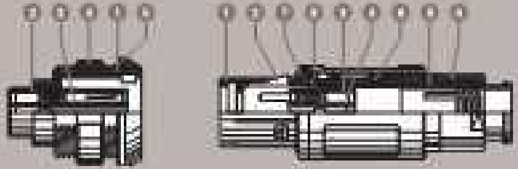
Part Number	Cable ø	
	min	max
CRB/M4x0.7/LC/3/5	3.2	5.2
CRB/M4x0.7/LC/5/7	5.2	7.2
CRB/M4x0.7/LC/7/9	7.2	9.2

Note! The bend relief must be ordered separately see page 44.

Watertight models (IP66)

Fixed socket

1. Outer shell
2. Insulator
3. Female crimp contact
4. Hexagonal nut
5. O-ring



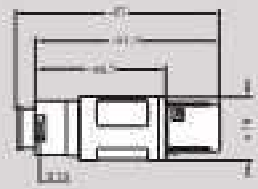
Straight plug

1. Outer shell
2. Latch sleeve
3. Insulator
4. Male crimp contact
5. Collet + seal/sleeve
6. Collet nut
7. Front seal
8. Sealed

Characteristics	Value	Standards
Average retention force when pulling on the cable (N = 0,102 kg)	90 N	IEC 60512-8 test 15f
Cable retention force depending on cable construction (N = 0,102 kg)	50 - 150 N	IEC 60512-8 test 17c

Characteristics	Value	Standards
Endurance (latching)	> 1000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	-
Working temperature range (PE)	-50/+170°C	-
Water protection	IP66	IEC 60529

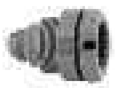
CFB Straight plug with cable collet and nut for fitting a bend relief

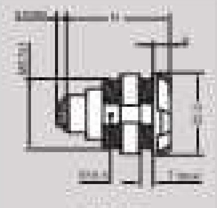


Part Number	Cable ø	
	min	max
[illegible]	5.7	6.2
[illegible]	6.3	7.2
[illegible]	7.3	8.2

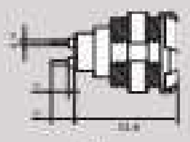
Note: the bend relief must be ordered separately (see page 46).

CNB Fixed socket, nut fixing





Solder + Crimp

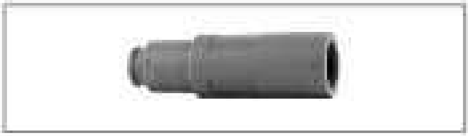


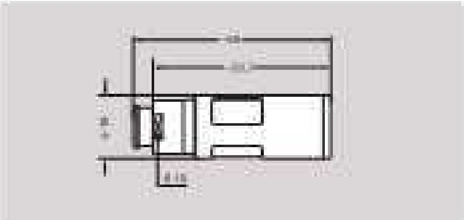
Print

Part Number	number of contacts	Contact						
		Solder		Crimp		Print		
		H	a	H1	a	[illegible]	[illegible]	[illegible]
[illegible]	18	22.8	3.4	25.1	8	3.7	0.7	6.0
[illegible]	18	22.8	4.9	25.1	8	5.7	0.7	6.0
[illegible]	26	22.8	4.7	25.1	8	3.0	0.6	3.0
[illegible]	32	22.8	4.7	25.1	8	3.0	0.6	3.0

Note: for PCB drilling pattern see page 46.
Panel hole see page 46.

CSB Free socket with cable collet and nut for fitting a bend relief

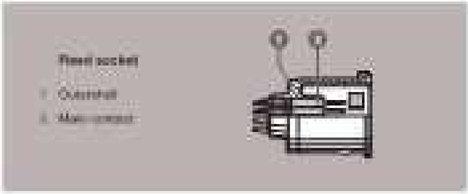




Part Number	Cable Ø	
	min	max
CSB.M●●-[illegible]	3.2	5.2
CSB.M●●-[illegible]	5.3	7.2
CSB.M●●-[illegible]	7.3	9.2

Note: the bend relief must be ordered separately (see page 44).

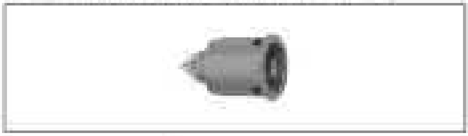
Disposable socket (limited use)

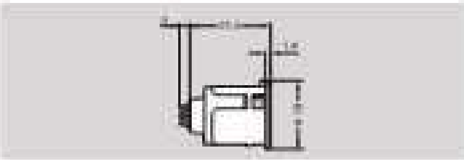


Characteristics	Value	Standards
Endurance for CU● matching [1]	100 cycles min	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	–
Average latching force	[illegible] N	IEC 60512-7 test 13a
Average unlatching force	[illegible] N	IEC 60512-7 test 13a
Average retention force	150N	IEC 60512-7 test 13a

Note: [1] with machined contacts. The outershell and the insulator are moulded out of the same material (PSU).

CU● Fixed disposable socket, snap on fixing





C U J - M 2 6 - [illegible] [illegible] A

Keying: H...J

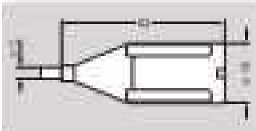
Number of contacts: 26, 34

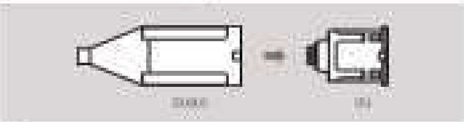
Color:
AA = blue
EE = white
GG = grey
JJ = yellow
NN = black
RR = red
VV = green

Number of contacts	Ø
26	5.5
34	7.0

Note: contacts are ø 0.5 mm male with ø 0.44 mm solder buckets.

CUG Protective backshell for CU●





C U G - [illegible] 2 5 - A [illegible]

Ø C (max):
2.5 mm = 025
[illegible] mm = [illegible]
[illegible] mm = [illegible]

Color:
E = white
G = grey

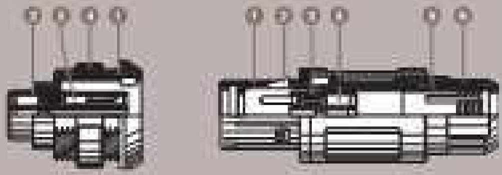
Material: A = ABS

Note: ABS working temperature: -[illegible]°C +[illegible]°C
All dimensions are in millimeters.

Fluidic models

Fixed socket

1. Outershell
2. Insulator
3. Female crimp contact
4. Hexagonal nut



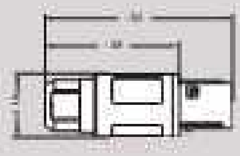
Straight plug

1. Outershell
2. Latch sleeve
3. Insulator
4. Male crimp contact
5. Collet + stop plate
6. Collet nut

Characteristics	Value	Standards
Average retention force when pulling on the cable (N) (0.1x) kg	90 N	IEC 60512-8 test 15f
Cable retention force (depends on cable construction) (N) (0.1x2 kg)	50 - 150 N	IEC 60512-8 test 17c

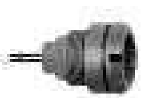
Characteristics	Value	Standards
Endurance (latching)	> 1000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU)	-50/+150°C	-
Working temperature range (PE)	-50/+110°C	-

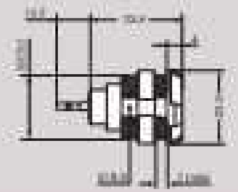
CAB Straight plug with cable collet



Part Number	Cable ø	
	min	max
[illegible]	5.7	6.2
[illegible]	6.3	7.2
[illegible]	7.3	8.2

CLS Fixed socket nut fixing





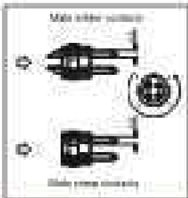
Part Number	Number of low voltage contacts	Fluidic contact	Maximum working pressure (bars)
[illegible]	4	without valve	8
[illegible]	10	without valve	8
[illegible]	4	with valve	8
[illegible]	10	with valve	8

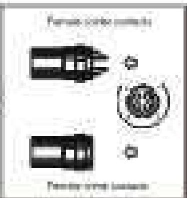
Note: panel hole see page 40.

Insert configuration

Reference	Number of contacts	Contact ø (mm)	Screwdriver ø (mm)[1]	Crimp socket ø (mm)[2]	Contact type: Solid	Crimp	Print straight	Print offset	Test voltage (kV rms)[3] Contact contact	Air clearance (min.) (mm) Creepage distance (min.) (mm)[4]	Rated current (A)[5]
M02	2	2.0	1.8	2.4	•	•	•	•	2.10	1.60	30.00
M03	3	1.6	1.4	1.8	•	•	•	•	2.40	1.30	17.00
M04	4	1.3	1.2	1.4	•	•	•	•	1.85	1.80	15.00
M06	6	1.2	1.0	1.2	•	•	•	•	1.75	1.10	13.00
M08	8	1.2	1.0	1.4	•	•	•	•	1.55	0.85	12.00
M07	7	1.0	1.0	1.4	•	•	•	•	1.70	0.85	11.00
M08	8	0.9	0.8	1.1	•	•	•	•	1.30	1.00	10.00
M10	10	0.9	0.8	1.7	•	•	•	•	1.45	0.70	8.00
M12	12	0.7	0.6	0.8	•	•	•	•	1.25	0.80	7.00
M16	16	0.7	0.6	0.8	•	•	•	•	1.50	0.95	6.00
M19	19	0.7	0.6	0.8	•	•	•	•	1.40	0.60	5.00
M26	26	0.5	0.4	-	•	-	•	•	1.80	0.50	3.00
M37	37	0.5	0.4	-	•	-	•	-	3.70	0.35	1.50
M52	52	0.5	0.4	-	•	-	-	-	3.70	0.35	1.00

Note: • depending on specific application and related standard, more restrictive operating voltage may apply
We suggest operating voltage = 1/3 test voltage, see page 05.
[1] shortest clearance in an insulator between two conductive parts
[2] shortest distance along the surface of the insulating material between two conductive parts
[3] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter (see page 69)





Fluidic

Coaxial

Reference	Number of contacts	Contact ⌀ (mm)	Solder bucket ⌀ (mm)	Crimp bucket ⌀ (mm)	Contact Type: Solder	Crimp	Print (straight)	Print (elbow)	Test voltage (kV rms) Contact-contact	Min. distance (mm) / Creepage distance (mm)	Rated current (A)
311	4	0.7	0.8	0.9	•	•	–	–	0.80	0.00	5.0
312	10	0.7	0.8	0.9	•	•	–	–	1.10	0.00	5.0
P12	4	0.7	0.8	0.9	•	•	–	–	0.80	0.00	5.0
P15	10	0.7	0.8	0.9	•	•	–	–	1.10	0.00	5.0
P24	4	0.7	0.8	0.9	•	•	–	–	0.80	0.00	5.0
P25	10	0.7	0.8	0.9	•	•	–	–	1.20	0.00	5.0
314	14	0.2	0.4	–	•	–	–	–	0.70	0.00	1.5

Note: = depending on specific application and safety standard, more restrictive operating voltage may apply.
We suggest operating voltage = 1/3 test voltage; see page 85.
[illegible]
[illegible]
[illegible]
= for a given AWG, the diameter of some stranded conductor design is larger than the solder cup diameter (see page 69).
[illegible]

Alignment key

Verify the third digit of the part number in order to select the right keying.
The standard keying is «B» coded.

keying (plug front view)	A	B	D	H	J
Reference	A	B	D	H	J
Contact type for plug	male	male	male	female	female
Contact type for socket	female	female	female	male	male

Outer shell material

Material		Colour	Temperature
PEI	S	Grey	-65° / +170°C
PEI	M	Grey	-55° / +155°C
PEI	N	Black	

Note: for extensive sterilization use PEI

Contact type

Select the type of contact: solder or crimp?

Plug

Type	Male	Female
solder	A	L
crimp	C	-

Socket

Type	Male	Female
solder	A	L
crimp	-	M
print	-	R
print 90°	S	V

When should I use crimp rather than solder contacts ?

Soldering

- recommended for small volumes
- requires little amount of tooling (soldering iron)
- requires more time

Crimping

- recommended for large volumes
- no heat is required to make the connection
- for contacts with high density
- for use in high temperature environment
- requires extra tooling (crimping tools)

Colour coding

	Colours					
	grey	blue	yellow	black	red	green
Reference	C	A	J	N	R	V
RAL code	7035	5012	1016	9005	3020	6024

Note: the RAL colours are indicative and depend on raw material and production process. Colour may differ.

Easy identification with the assistance of colour coding.
Outershell is only available in grey or black.

Accessories

CAG-CLG Insulator for crimp contacts

Contact configuration	Insulator part number	
	For male contact	For female contact
M32	CAG.332.YL	CLG.432.YL
M40	CAG.340.YL	CLG.440.YL
M48	CAG.348.YL	CLG.448.YL
M56	CAG.356.YL	CLG.456.YL
M68	CAG.368.YL	CLG.468.YL
M37	CAG.337.YL	CLG.437.YL
M45	CAG.345.YL	CLG.445.YL
M10	CAG.310.YL	CLG.410.YL
M12	CAG.312.YL	CLG.412.YL
M16	CAG.316.YL	CLG.416.YL
M19	CAG.319.YL	CLG.419.YL

CAG-CLG Crimp contacts, kit with the number of contacts in a tube

Contact configuration	No. of contacts	a contact (mm)	Kit contact part number	
			Male	Female
M32	2	2.0	CAG.479.02C	CLG.479.02M
M40	2	1.6	CAG.478.02C	CLG.478.02M
M48	3	1.3	CAG.483.03C	CLG.483.03M
M56	3	1.3	CAG.565.03C	CLG.565.03M
M68	3	1.3	CAG.569.03C	CLG.569.03M
M37	7	1.3	CAG.565.21C	CLG.565.07M
M45	7	1.3	CAG.569.21C	CLG.569.07M
M10	19	0.9	CAG.565.57C	CLG.565.19M
M12	19	0.9	CAG.569.57C	CLG.569.19M
M16	19	0.7	CAG.565.19C	CLG.565.19M
M19	19	0.7	CAG.569.19C	CLG.569.19M

CAB Collet

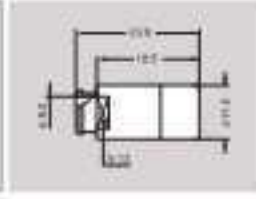
Part Number	Cable ø (mm)	
	min.	max.
CAB.152.xx	3.2	4.2
CAB.172.xx	5.3	7.2
CAB.192.xx	7.2	9.2

Note: xx = UG (grey PEU), UN (black PEU), TG (grey PP), TN (black PP)

CKG Plastic front nut for CKB models

Part Number	Mat.	Colours
CKG.240.UG	PEU	blue
CKG.240.UG....	PEU	grey
CKG.240.UG	PEU	yellow
CKG.240.UN	PEU	black
CKG.240.UR	PEU	red
CKG.240.UV	PEU	green

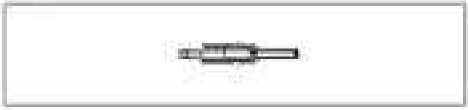
CAM Nut for fitting a GMA.2B bend relief

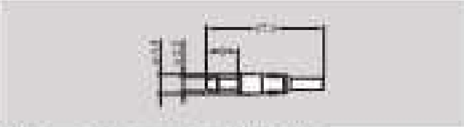


Part Number	Mat.	Colours
CAM.130.UG	PEU	grey
CAM.130.UN	PEU	black
CAM.130.TG	PP	grey

Note: all dimensions are in millimeters

FGG.P1 Male fluidic contact with valve

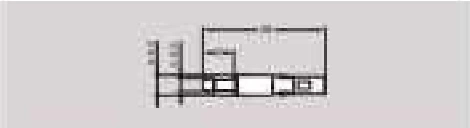




Part Number
FGG.P1.[illegible]

Note: Connectors are delivered without the P1 contacts.

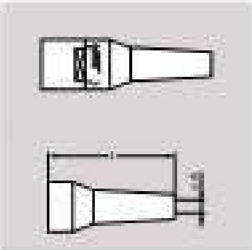
EGG.P1 Female fluidic contact with valve



Part Number
EGG.P1.[illegible]

Note: Connectors are delivered without the P1 contacts.

GMA Bend relief



A bend relief absorbs the force that may be exerted on cables.
These are designed for plugs and free sockets with cable collet and nut.

Part Number	Dimensions (mm)				Material	Temperature range	
	Bend relief		Cable Ø				
	A	L	max.	min.		in dry atmosphere	in water steam
[illegible]	4.2	26	4.5	4.0	TPU (Thermoplastic Polyurethane)	-40°C, +80°C	–
[illegible]	4.8	30	5.4	4.5			
[illegible]	5.8	30	6.0	6.0			
[illegible]	6.8	30	6.5	6.0			
[illegible]	7.5	30	7.7	7.0			
[illegible]	7.8	30	8.8	7.5			
[illegible]	4.2	41	4.4	4.0	Silicone elastomer (VMQ)	-60°C, +200°C	+140°C
[illegible]	4.5	41	5.0	4.5			
[illegible]	5.5	41	5.6	5.1			
[illegible]	5.7	41	6.2	5.7			
[illegible]	6.3	41	7.0	6.3			
[illegible]	7.5	41	7.8	7.1			
[illegible]	8.3	41	8.8	8.0			

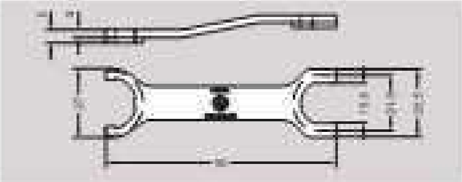
Note: The last letter «G» of the part number indicates a grey colour; see the adjacent table and replace letter «G» by the letter of the colour required.

Reference	Colours
A	blue
B	white
G	grey
J	yellow
M	brown
N	black
R	red
S	orange
V	green

Note: The selection of pigments, which should remain stable at high temperatures, is limited by the new regulations. For this reason, some colours will be a shade different from those used for TPU bend reliefs. The selected solutions represent the best possible compromise.

Tooling

COP.155.GN Spanner for rear nut

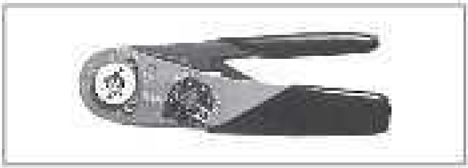


Material: PA 6.6

COB.202.GN Spanner for front nut

Material: PA 6.6

DPC.91.701.V Crimping tool

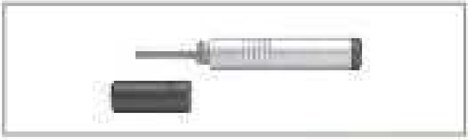


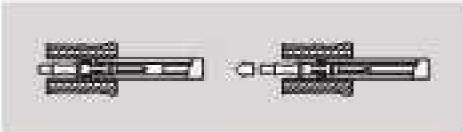
DCE Positioners for crimp contacts

male

female

DCF Automatic extraction tools for crimp contacts



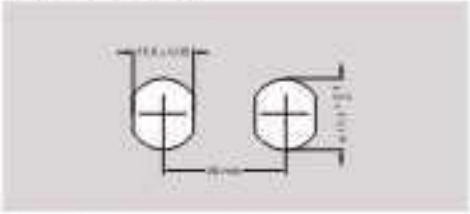


Type	Conductor ømm	Contact ø AWG	Positioner part number		Selector No. Setting	Part number extractor
			Male	Female		For male contact and female contact
M30	3.0	12-14-16	DCE.91.302.BVCM	DCE.91.302.BVCM	-	DCF.91.302.0LA*
M22	1.6	14-16-18	DCE.91.162.BVCM	DCE.91.162.BVCM	-	DCF.91.162.0LT
M4/M5/M8/M10	1.3	18-20	DCE.91.132.BVC	DCE.91.132.BVM	8-7	DCF.91.131.0LT
M08/M10	0.9	20-22-24	DCE.91.092.BVC	DCE.91.092.BVM	6-5-5	DCF.91.090.0LT
M12/M16/M19	0.7	22-24-26	DCE.91.072.BVC	DCE.91.072.BVM	6-5-5	DCF.91.070.0LT
M26/M32	0.5	26-30-32	DCE.91.052.BVC	DCE.91.052.BVM	4-3-3	DCF.91.050.0LT

Note: * this model is thumb-operated.
This model is used for male and female contacts. The variance in conductor stranding diameter for the minimum AWG is such that some wire types a cross section which is not sufficient to guarantee crimping as per IEC 60352-2 standard.

Panel hole

For CK●, CL●, and CN●



Note: Applied mounting nut torque = 0.8 Nm

PCB drilling pattern

For straight contacts

M02

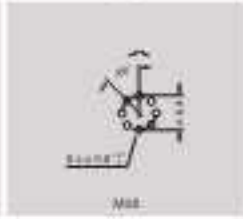
M03

M04

M05

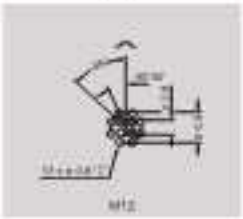
M06

M07

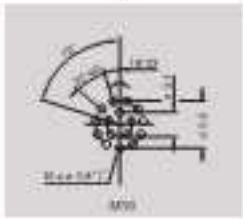


M08

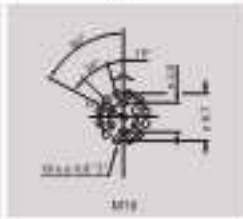
M10



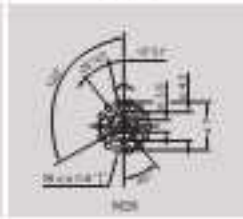
M12



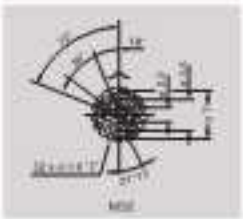
M16



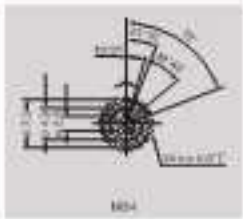
M18



M26

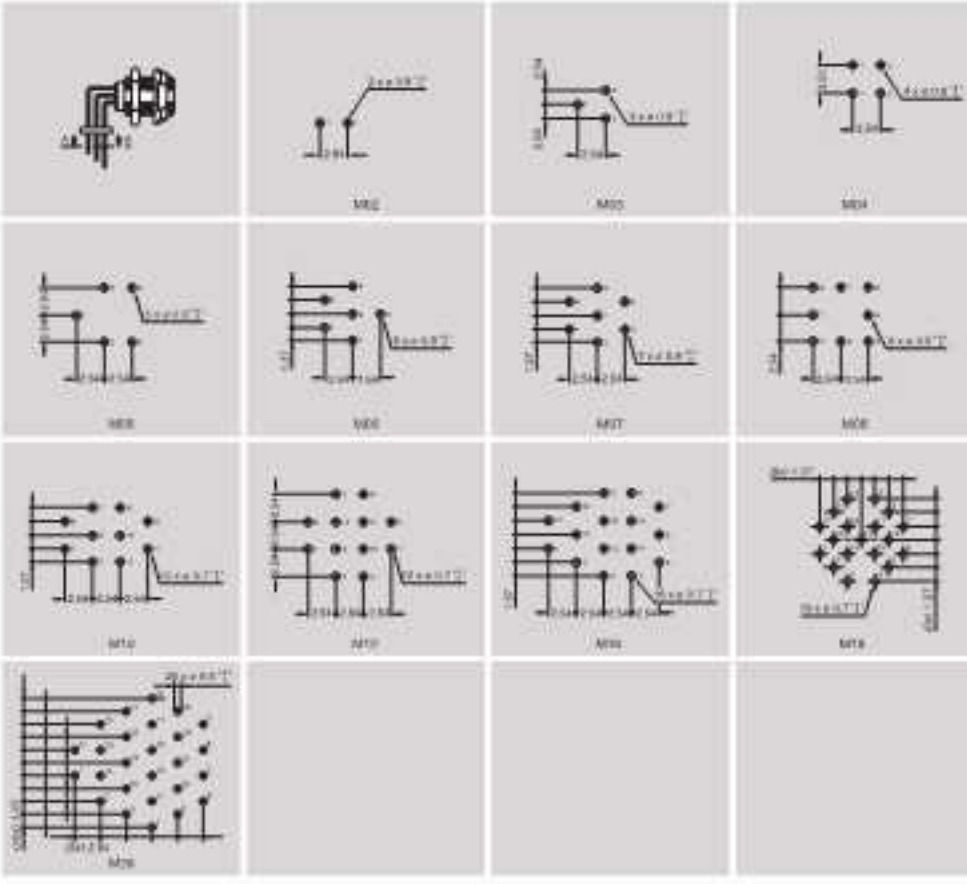


M32



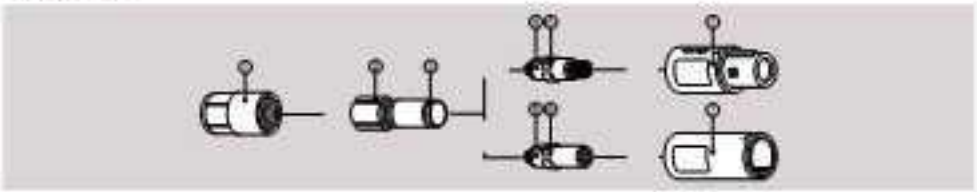
M54

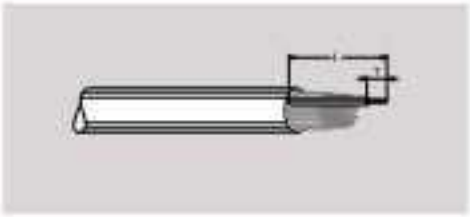
For 90° elbow contacts (A-A view)



Assembly instructions

Solder contacts





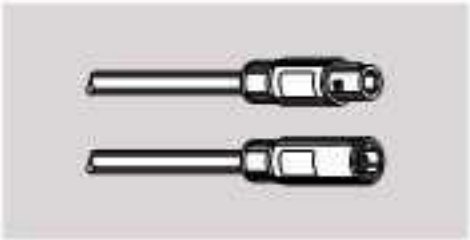
1. Strip the cable according to the lengths given in the table. Tin the conductors.

Configuration	Stripping length	
	L	T
MM2	13.0	4.0
MM3	14.0	5.0
MM4, MM5, MM6, MM7	16.0	6.5
MM8, MM9, MM10, MM11, MM12	17.0	8.0
MM13, MM14	17.0	2.0

2. Slide the collet nut ① and then the collet ② onto the cable.

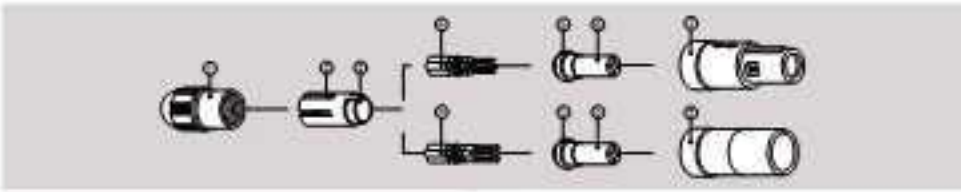
3. Solder conductors into contacts, making sure that neither solder nor flux gets onto the insulator or cable insulation.

4. Slide the collet ② forward and locate slot ③ in the key of the insulator ⑤.
Slide collet nut ① over collet ② and then push the whole assembly into the shell ⑦ whilst positioning it to ensure that the slot ⑥ of insulator ⑤ locates in the inside key of the shell. Tighten the collet nut ① to the maximum torque of 0.5 Nm.



For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Crimp contacts



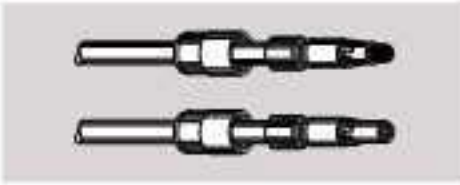
1. Strip the cable according to the lengths given in the table.

Configuration	Dimensions (mm)	
	L	T
M16	17.0	5.5
M23	17.0	5.5
M05, M22, M25, M07	14.0	4.0
M08, M10, M12	14.0	4.0
M18, M09	15.0	4.0

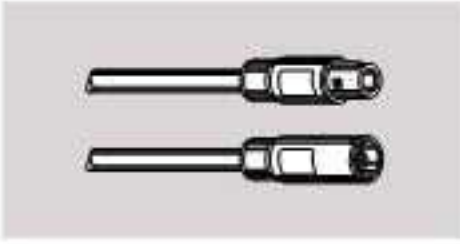
2. Slide the collet nut ① and then the collet ② onto the cable.

3. Fix the appropriate positioner (table page 45) in the crimping tool. Set selector to the number corresponding to the conductor AWG as indicated on the positioner label. Fit conductor into contact ③ and make sure it is visible through the inspection hole in the crimp barrel. Slide conductor-contact combination into the open crimping tool; make sure that the contact is fully pushed into the positioner. Close the tool. Remove from crimping tool and check that conductor is secure in contact and shows in inspection hole.

4. Now arrange contact-conductor combinations according to the insert marking and locate them into the insert ④. Check that all contacts are correctly located and remain in position when given a gentle pull.



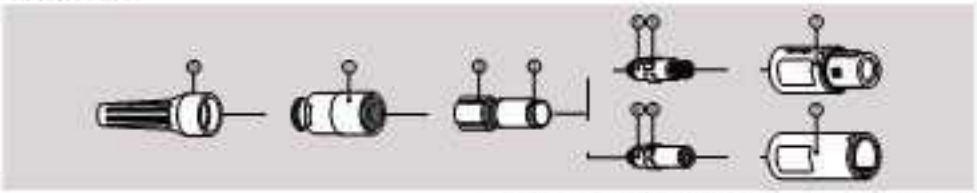
5. Slide the collet ② forward and locate slot ⑦ in the key of the insulator ⑤. Slide collet nut ① over collet ② and then push the whole assembly into the shell ⑥ whilst positioning it to ensure that the slot ⑦ of insulator ⑤ locates in the inside key of the shell. Tighten the collet nut ① to the maximum torque of 0.5 Nm.

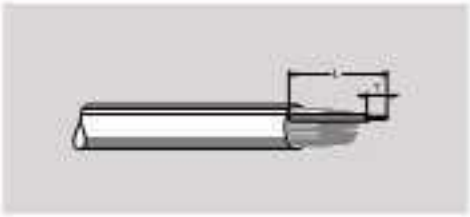


For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Assembly instructions for watertight models

Solder contacts

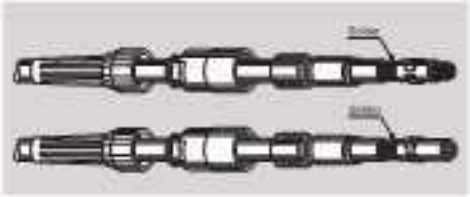




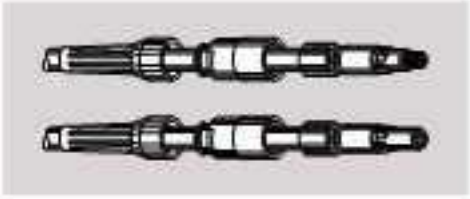
1. Strip the cable according to the lengths given in the table. Tin the conductors.

Configuration	Dimensions (mm)	
	L	T
M22	12.1	4.0
M23	14.1	5.5
M24, M27, M32, M37	15.1	5.5
M38, M12, M13, M16, M19	17.2	9.0
M36, M33	17.1	2.0

2. Slide the bend relief❶, the collet nut ① and then the collet ③ onto the cable.



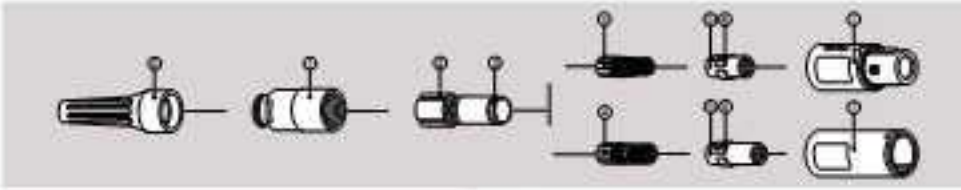
3. Solder conductors into contacts, making sure that neither solder nor flux gets onto the insulator or cable insulation. Fill up completely the inside of the collet ③ and the gap between conductors with the adhesive/sealant DOW CORNING type 3145RTV.

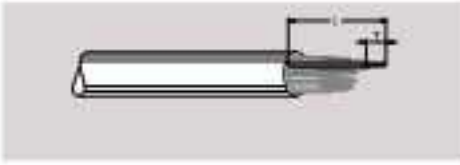


4. Slide the collet ③ forward and locate slot ③ in the key of the insu-lator ⑤.
Slide collet nut ① over collet ③ and then push the whole assembly into the shell ② whilst positioning it to ensure that the slot ⑤ of insulator ⑤ locates in the inside key of the shell. Tighten the collet nut ① to the maximum torque of 0.5 Nm. Push the bend relief ❶ onto the collet nut ①.

For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Crimp contacts



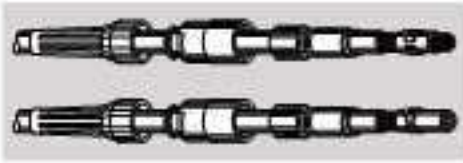


1. Strip the cable according to the lengths given in the table.

Configuration	Dimensions (mm)	
	L	T
MQL	5.0	5.5
MRS	7.0	5.5
MAT, MQT, MRS, MUT	5.0	4.0
MEB, MTG, MTE	5.0	4.0
MTE, MTS	7.0	4.0

2. Slide the bend relief ❽, the collet nut ① and then the collet ② onto the cable.

3. Fit the appropriate positioner (table page 45) in the crimping tool. Set selector to the number corresponding to the conductor AWG as indicated on the positioner label. Fit conductor into contact ④ and make sure it is visible through the inspection hole in the crimp barrel. Slide conductor-contact combination into the open crimping tool; make sure that the contact is fully pushed into the positioner. Close the tool. Remove from crimping tool and check that conductor is secure in contact and shows in inspection hole.



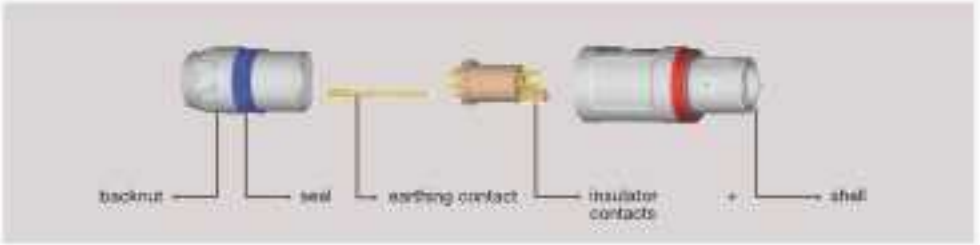
4. Now arrange contact-conductor combinations according to the insert marking and locate them into the insert ⑥. Check that all contacts are correctly located and remain in position when given a gentle pull.

5. Slide the collet ② forward and locate slot ③ in the key of the insulator ⑤. Slide collet nut ① over collet ② and then push the whole assembly into the shell ⑦ whilst positioning it to ensure that the slot ⑨ of insulator ⑤ locates in the inside slot of the shell. Tighten the collet nut ① to the maximum torque of 0.5 Nm.
Push the bend relief ❽ onto the collet nut ①.

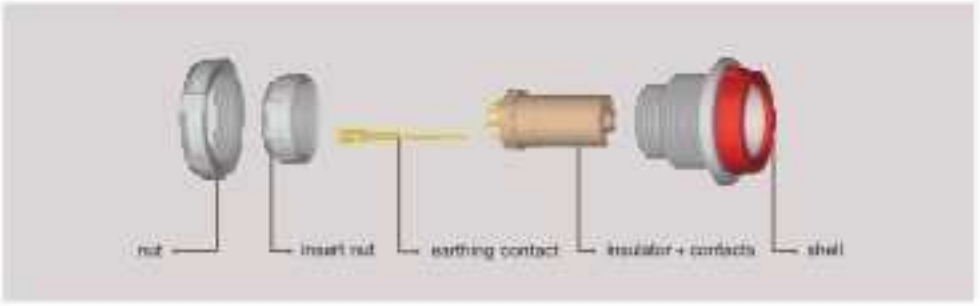
For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Exploded view of the REDEL 3P

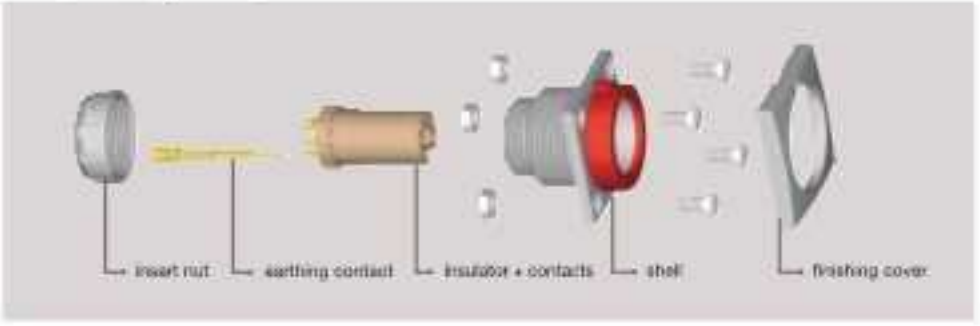
Straight plug



Fixed socket



Fixed socket with square flange



3P SERIES

3P Series

Historically the 3P is LEMO's first series of completely plastic connectors. It is designed to accommodate cable diameters up to 9.5 mm. Available in 11 different contact configurations including multicontact, and hybrid HV/electrical, coax/electrical, fibre optic/electrical, fluidic, the 3P series has been specifically designed for all applications requiring minimum weight, maximum electrical insulation values, and high thermal and mechanical properties, as well as suitability for either vapour or gas sterilization and for cold sterilization with a chemical product.These connectors provide remarkable safety by using nonconductive materials and four different systems to prevent accidental cross-mating, i. e. colour coding, housing keying, insert keying and insert polarization.

Standard models

Straight plug

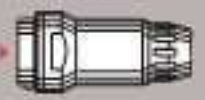
FGG

Fixed sockets

EGG

CBG

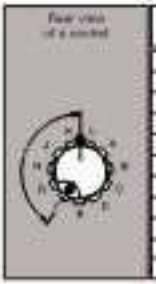
Free socket



PHG

Alignment keys and insert polarization

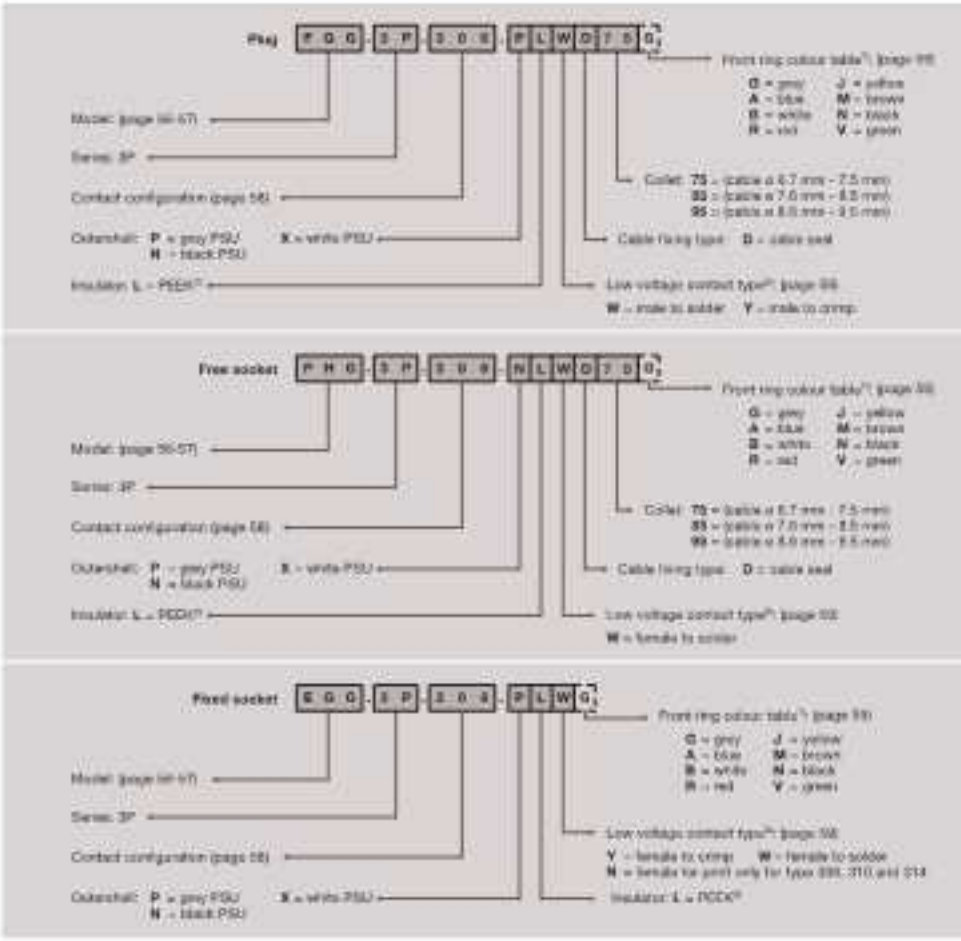
The 3P series makes it possible for the user to configure his own keying system.
The insert can be located into 11 different angular positions relative to the external alignment key.



Insert code	Angle	
	Plug	Socket
A	150°	150°
B	147° 16'	212° 44'
C	114° 55'	245° 27'
D	81° 49'	278° 11'
E	48° 05'	311° 55'
F	16° 27'	343° 38'
G	343° 38'	16° 22'
H	310° 55'	48° 05'
J	278° 11'	81° 49'
K	245° 27'	114° 33'
L	212° 44'	147° 16'

Note the reference letter
- on the plug insert, is placed to the left of the alignment key
- on the socket insert, is placed to the right of the alignment key

Part numbering system



FGG.3P.306.PLWD75G Straight plug with key and cable seal, 3P series, multipole type with 6 contacts, outer shell in grey PSU, PEEK insulator, male solder contact, D type collet for 6.7 mmm to 7.5 mm diameter cable and grey coloured ring.

PHG.3P.310.NLWD75G Free socket with key and cable seal, 3P series, multipole with 6 contacts, outer shell in black PSU, PEEK insulator, female solder contact, D type collet for 6.7 mm to 7.5 mm diameter cable and grey coloured ring.

EGG.3P.306.PLWG Fixed socket with key, 3P series, multipole type with 6 contacts, outer shell in grey PSU, PEEK insulator, female solder contact and grey coloured ring.

Note: - the version position of the part number is used to specify the colour of the coloured ring. For grey PSU (material Code P).
- for the high voltage type «109» Low «J» enhanced PEEK material code. The standard colour is grey and nothing is mentioned in the relevant position.
- the letters W or Y are often used for special arrangements.

Standard models (IP61)

Panel socket

1. Outer shell
2. Retaining nut
3. Round nut
4. Coupling ring
5. Insulator
6. Female contact
7. Male contact (earthing)

Straight plug

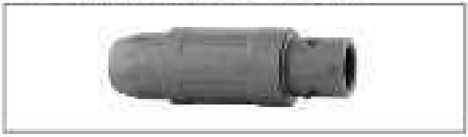
1. Outer shell
2. Latch sleeve
3. Retaining nut
4. Coloured ring
5. Insulator
6. Male contact
7. Female contact (earthing)
8. Clamping sleeve
9. Clamp
10. Screw
11. Washer
12. Seal

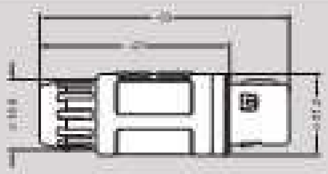
Characteristics	Value	Standards
Average retention force when pulling on the cable (1N = 0.102 kg)	120 N	IEC 60512-8 test 15f
Cable retention force (depends on cable construction) (1N = 0.102 kg)	100 - 300 N	IEC 60512-8 test 17c

Characteristics	Value	Standards
Endurance (mating)	> 1000 cycles	IEC 60512-5 test 9a
Working temperature range* (PSU)	-50/+150°C	-
Watertightness (mated)	IP61	IEC 60529

Note: * for the type hybrid Lx + fibre cable, the temperature is -20/+80°C.

FGG Straight plug with key and cable seal



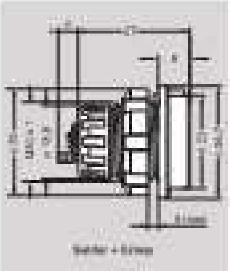


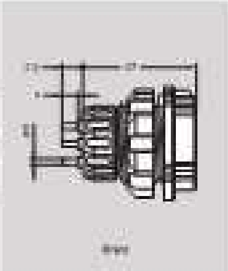
Part Number	Cable ø	
	min.	max.
[illegible]	6.7	7.5
[illegible]	7.0	8.5
[illegible]	8.6	9.5

EOG Fixed socket with key, nut fixing

Part Number	Number of contacts	Contact					
		Solder		Crimp		Print	
		N	ø max	N	ø	L	ø A
[illegible]	6+1LV	37	4.7	37	4.7	5.8	3.7
[illegible]	10+1LV	37	4.7	37	4.7	5.8	3.7
[illegible]	14+1LV	37	4.7	37	4.7	5.8	3.7
[illegible]	18+1LV	37	4.7	37	4.7	-	-

Note: for PCB drilling pattern see page 65.
Panel hole see page 65.

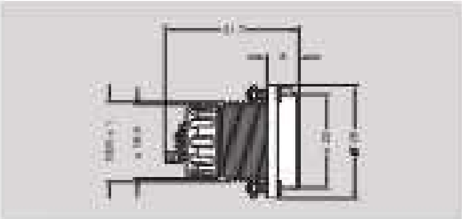

Solder + Crimp


Print

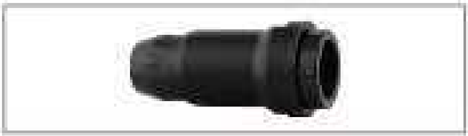
EBG Fixed socket with key, square flange and screw fixing

Part Number
EBG.3P.308.PLWG
EBG.3P.312.PLWG
EBG.3P.314.PLWG

Note: for PCB drilling pattern see page 65.
Panel hole see page 65.

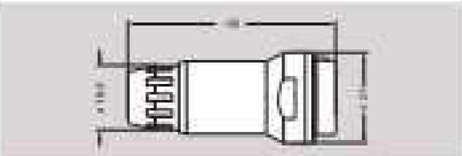


PHG Free socket with key and cable seal

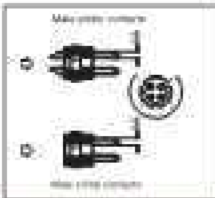


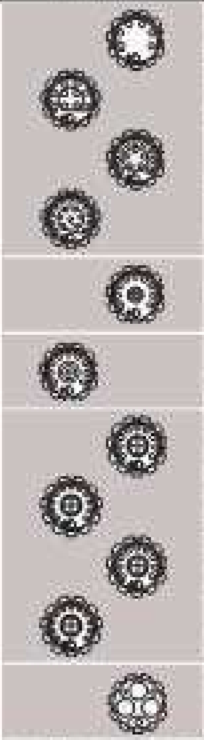
Part Number	Cable ø	
	min	max
[illegible]	6.7	7.5
[illegible]	7.6	8.4
[illegible]	8.6	9.5

Note: the picture shows [illegible]



Insert configuration





Type	Reference	Number of contacts	Ø A (mm)	Solder bucket Ø (mm)	Contact Type: Solder	Contact Type: Crimp	Contact Type: Print (straight)	Test voltage (kV rms)[1]	Air clearance[2] (mm)	Creepage distance[3] (mm)	Rated current (A)
Multipole	[illegible]	6+1LV	0.9	0.8	•	•	•	3.0	1.90	1.90	6.0
Multipole	[illegible]	11+1LV	0.9	0.8	•	•	•	2.5	1.25	1.25	5.0
Multipole	[illegible]	14+1LV	0.9	0.8	•	•	•	1.7	0.90	0.90	4.0
Multipole	[illegible]	18+1LV	0.7	0.8	•	-	-	0.7	0.70	0.70	3.0
HV Hybrid +LV	[illegible]	6+1LV 1HV	0.9	0.8	•	•	-	1.7	0.90	0.90	4.0
Coaxial Hybrid +LV	[illegible]	6+1LV 1Coax[6]	0.9	0.8	•	•	-	1.7	0.90	0.90	4.0
Fibre optic Hybrid +LV	[illegible]	6+1LV 1FO[4]	0.9	0.8	•	•	-	1.7	0.90	0.90	4.0
Fibre optic Hybrid +LV	[illegible]	11+1LV 1FO[4]	0.7	0.8	•	-	-	0.7	0.70	0.70	3.0
Fibre optic Hybrid +LV	[illegible]	6+1LV 1FO[4]	0.9	0.8	•	•	-	1.7	0.90	0.90	4.0
Fibre optic Hybrid +LV	[illegible]	11+1LV 1FO[4]	0.7	0.8	•	-	-	0.7	0.70	0.70	3.0
Fluidic Hybrid +LV	[illegible]	3 fluid + 3 LV	0.9	-	-	•	-	3.0	1.90	1.90	8.0

Note: 1 depending on specific application and related standard, more restrictive operating voltage may apply.
We suggest operating voltage = 1/3 test voltage, see page 68.
2 shortest distance in air between two conductive parts.
3 shortest distance along the surface of the insulating material between two conductive parts.
4 fibre optic contact must be ordered separately (see page 61). **F2 contact for [illegible] and F1 contact for [illegible].**
5 for a given AWG, the diameter of some stranded conductor design is larger than the solder cup diameter (see page 58).
6 configuration [illegible] uses «C» type coaxial contact.

Contact type

Select the type of contact: solder or crimp?

Plug

Type	Male
solder	W
crimp	Y

Socket

Type	Female
solder	W
crimp	Y
press	N

When should I use crimp rather than solder contacts ?

Soldering
- recommended for small volumes
- requires little amount of tooling (soldering iron)
- requires more time

Crimping
- recommended for large volumes
- no heat is required to make the connection
- for contacts with high density
- for use in high temperature environment
- requires extra tooling (crimping tools)

Colour coding

	Colours							
	grey	blue	yellow	black	red	green	brown	white
Reference	G	A	J	N	R	V	M	B
RAL code	7035	5007	1016	9005	3001	6024	8003	9003

Note: the RAL colours are indicative and depend on raw material and production process. Colour may differ.

Easy identification with the assistance of colour coding. Outershell is only available in grey, black or white (see page 55).

Accessories

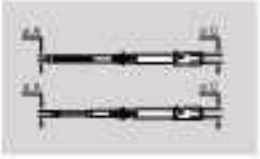
FGG-EGG Insulator for crimp contacts

Contact configuration	Insulator part number	
	For plug	For socket
324	FGG.3P.324.CNL	EGG.3P.424.CNL
310	FGG.3P.310.CNL	EGG.3P.410.CNL
314	FGG.3P.314.CNL	EGG.3P.414.CNL

FGG-EGG Crimp contacts, kit with the number of contacts in a tube

Contact configuration	ø A (mm)	ø C (mm)	Contact part number	
			Male	Female
324	0.9	1.1	FGG.3P.324.ZZY	EGG.3P.424.ZZY
310	0.9	1.1	FGG.3P.310.ZZY	EGG.3P.410.ZZY
314	0.9	1.1	FGG.3P.314.ZZY	EGG.3P.414.ZZY

FGG-EGG Earthing contacts



Type	ø A (mm)	ø C (mm)	Contact part number	
			Male	Female
308 – 318	0.9	2.3	FGG.3P.001.ZZY	EGG.3P.001.ZZY
314 – 318	0.9	2.3	FGG.3P.002.ZZY	EGG.3P.002.ZZY
708 – 808	0.9	2.3	FGG.3P.003.ZZY	EGG.3P.003.ZZY
304 – 324	0.9	2.3	FGG.3P.004.ZZY	EGG.3P.004.ZZY
506 – 526	0.9	2.3	FGG.3P.005.ZZY	EGG.3P.005.ZZY

GEB Plastic nut

Part number	Mat.	Colours
GEB.3P.000.UN	PBT	white
GEB.3P.000.UG	PBT	grey
GEB.3P.000.UN	PBT	black

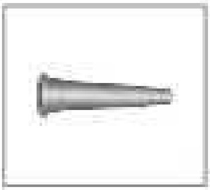
EBG Finishing cover

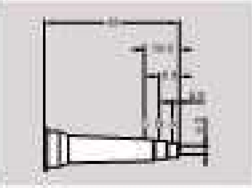
Part number	Mat.	Colours
EBG.3P.000.UB	PBT	white
EBG.3P.000.UG	PBT	grey
EBG.3P.000.UN	PBT	black

Note: a finishing cover is supplied with all EBG fixed sockets with a square flange. Models EBG sockets, with a square flange, can also be mounted without using the fixing screws.

Note: all dimensions are in millimeters

GMA Bend relief





Part Number	Col.	Cable ø (mm)	
		min	max
[illegible]	–	3.0	3.9
	A	4.0	4.9
	B	5.0	5.9
	C	6.0	7.0

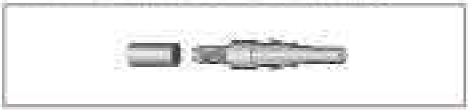
Material: Black thermoplastic rubber

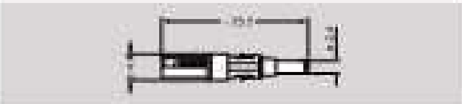
Note: The cable entry of the F/G plugs can be fitted with a flexible bend relief which can accommodate cables of 3 to 7 mm in diameter. The adjustment to the diameter is done by cutting the conical end. The bend relief is secured inside the nut. The cable must have a sheath with a large enough diameter in order to be held by the clamping system.

Fibre optic contact

For the hybrid type LV + fibre optic, fibre optic contacts must be ordered separately.

FFS.F1 Male F1 Fibre Optic Contact for plug

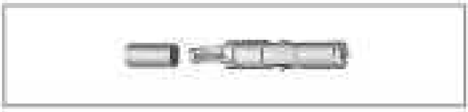


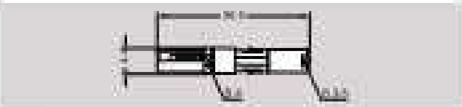


Reference	Ferrule inside ø (µm)	Fibre type
[illegible]	235	HCS
[illegible]	320	HCS
[illegible]	430	HCS
[illegible]	640	HCS
[illegible]	1100	Polymer

Note: other ferrule inside diameter, consult us.

FSS.F1 Female F1 Fibre Optic Contact for socket

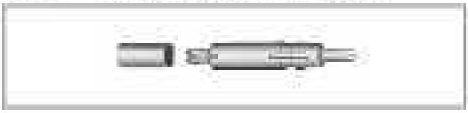


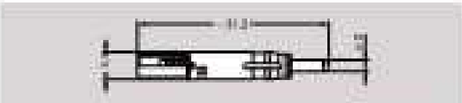


Reference	Ferrule inside ø (µm)	Fibre type
[illegible]	235	HCS
[illegible]	330	HCS
[illegible]	470	HCS
[illegible]	640	HCS
[illegible]	1100	Polymer

Note: other ferrule inside diameter, consult us.

FFS.F2 Male F2 Fibre Optic Contact for plug

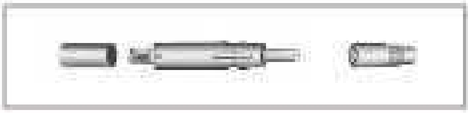


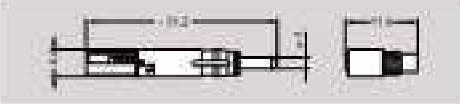


Reference	Ferrule inside ø (µm)	Fibre type
[illegible]	125	9/125
[illegible]	126	9/125
[illegible]	126	50/125
[illegible]	126	62.5/125
[illegible]	141	100/140

Note: all dimensions are in millimetres.

PSS.F2 Female F2 Fibre Optic Contact for socket





Reference	Ferrule inside ø (µm)	Fibre type
[illegible]	125	9/125
[illegible]	125	9/125
[illegible]	125	50/125
[illegible]	128	62.5/125
[illegible]	144	100/140

Note: all dimensions are in millimetres.

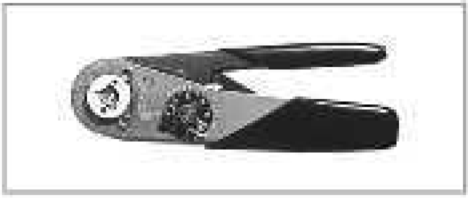
Recommended coaxial cables

Group* 1	Group* 2	Group* 3	Type
•			RG 174A/U
	•		RG 178B/U
		•	RG 179B/U
		•	RG 187A/U
•			RG 188A/U
	•		RG 196A/U
•			RG 316/U

Note: * the cable group number corresponding to the cable must be written in the relevant position of the part number (see page [illegible]).

Tooling

DPC.91.701.V Crimping tool

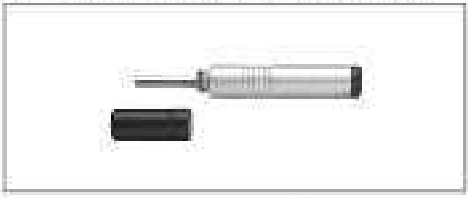


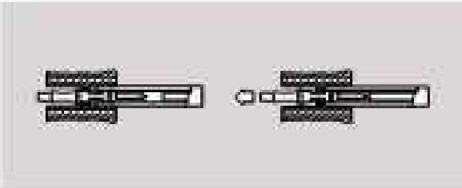
DCE Positioners for crimp contacts

male

female

DCF Automatic extraction tools for crimp contacts





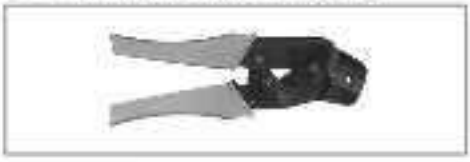
Contact type	Conductor (mm)	Contact ø AWG	Positioner part number		Selector No. Setting	Part number extractor
			Male	Female		For male contact and female contact
208	0.9	20-22-24	DCE.91.083.PMC	DCE.91.083.PWM	6-5-5	DCF.91.083.SLT
216	0.9	20-22-24	DCE.91.083.PMC	DCE.91.083.PWM	6-6-6	DCF.91.083.SLT
212	0.9	20-22-24	DCE.91.083.PMC	DCE.91.083.PWM	6-6-6	DCF.91.083.SLT

Note: This model is used for male and female contacts.
The variance in conductor stranding diameter for the minimum AWG is such that some can have a cross section which is not sufficient to guarantee crimping as per IEC 60352-2 standard. All dimensions are in millimetres.

DCC Extraction tool for coax contact type »C«

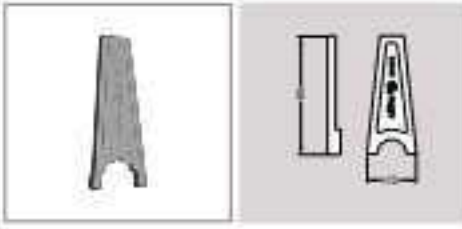
Part number	Contact type
DCC.91.004.SUH	004

DPE Crimping tool for coax contact type »C«



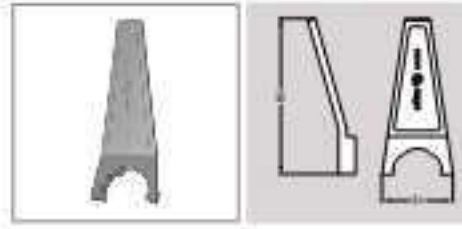
Part number	Cable group
DPE.99.100.99	1-4
DPE.99.101.99	3

DCP.91.019.HN Spanners with notch for securing the collet nut



Material: Black polyamide

DCP.91.026.HN Spanners for securing the socket nut



Material: Black polyamide

DCS Polishing tool for fibre optic contact

Part number	Contact type
DCS.91.F2.xxx	F2
DCS.91.F3.xxx	F1

Note: all dimensions are in millimeters

DRV.91.CF2.PN F2 contact fibre optic work station

DPE.99.524.337K Crimp tool for fibre optic contact F1 and F2 type

DCC.91.312.5LA Extraction/installation tool for fibre optic contact F1 and F2 type

DCS Microscope adaptor for fibre optic contact

Ref. Number	Contact type
DCS.91.042.IF.02	F2
DCS.91.042.IF.04	F1

WST Epoxy curing oven for fibre optic contact

Part Number	Voltage
WST.FR.230.VA	230 volts
WST.FR.110.VA	110 volts

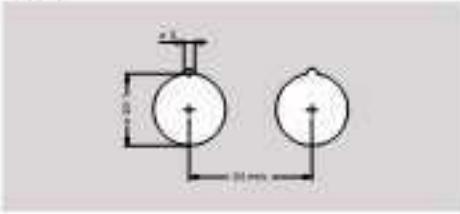
WST.FB.G00.301 Fibre inspection microscope

DCS.91.F23.LA Cleaning tool for F2 contact

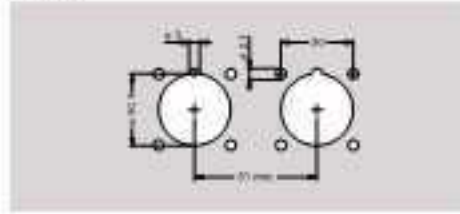
DCS.F2.035.PN F2 contact alignment device installation/extraction tool

Panel hole

For EGG

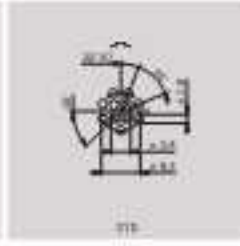


For EBG



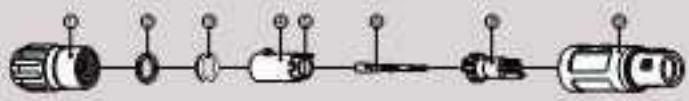
PCB drilling pattern

For straight contacts



Assembly instructions

Solder LV contacts



1. Strip the cable according to the lengths given in the table. Tin the conductors. In case of a screened cable separate the braid and twist it apart as shown.

Configuration	Dimensions (mm)	
	L	T
[illegible]	13.5	2.5
[illegible]	13.5	2.5

2. Slide the retaining nut ①, the washer ②, the seal ③ and the clamping sleeve ④. In case of a screened cable solder the braid into the earthing contact ⑤.

3. In case of a screened cable introduce the earthing contact ⑤ into the insert ⑥. Check that contact is correctly located and remains in position when given a gentle pull.
Solder conductors into contacts, making sure that neither solder nor flux gets onto the insulator or cable insulation.

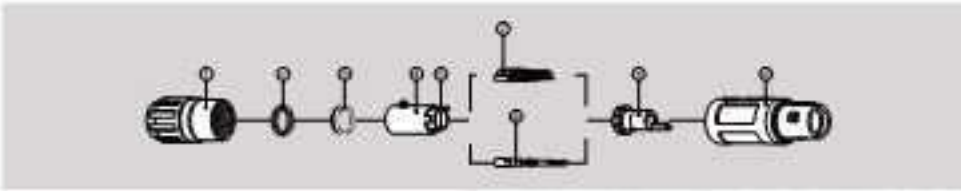
4. Slide the clamping sleeve ④ forward and locate tag ⑦ into one of the insulator slot according to the selected polarization code. Make sure that same code is used for plug and socket.
Tight the screw of the clamping sleeve ④ to secure the cable. Slide washer and seal against clamping sleeve.

5. Push the whole assembly into the shell ⑧ whilst turning it to insure that the tag ⑨ is correctly located in the inside slot of the shell. Tighten the retaining nut ① to the maximum torque of 1.2 Nm.

– Socket mounting nut or screws = 2.3 Nm.

For PSU only:
We recommend ONLY the use of VTVG-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Crimp LV contacts



1. Strip the cable according to the lengths given in the table. Tin the conductors. In case of a screened cable separate the braid and twist it apart as shown.

Configuration	Dimensions (mm)	
	L	T
09, 10, 22, 23	19.1	6.4

2. Slide the retaining nut ①, the washer ②, the seal ③ and the clamping sleeve ④.
In case of a screened cable solder the braid into the earthing contact ⑤.

3. Fix the appropriate positioner (table page 51) in the crimping tool. Set selector to the number corresponding to the conductor AWG as indicated on the positioner label. Fit conductor into contact ⑦ and make sure it is visible through the inspection hole in the crimp barrel. Slide conductor-contact combination into the open crimping tool; make sure that the contact is fully pushed into the positioner. Close the tool. Remove from crimping tool and check that conductor is secure in contact and shows in inspection hole.

4. Now arrange contact-conductor combinations according to the insert marking and locate them into the insert ⑥. Check that all contacts are correctly located and remain in position when given a gentle pull. In case of a screened cable introduce the earthing contact ⑤ into the insert ⑥. Check that contact is correctly located and remains in position when given a gentle pull.

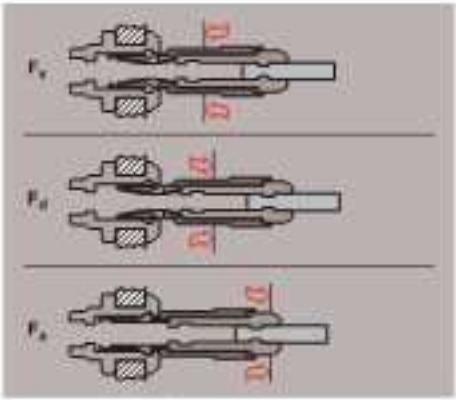
5. Slide the clamping sleeve ④ forward and locate tag ⑧ into one of the insulator slot according to the selected polarization code. Make sure that same code is used for plug and socket.
Tight the screw of the clamping sleeve ⑨ to secure the cable. Slide washer and seal against clamping sleeve.

6. Push the whole assembly into the shell ⑩ whilst turning it to insure that the tag ⑧ is correctly located in the inside slot of the shell. Tighten the retaining nut ① to the maximum torque of 1.2 Nm.

– Socket mounting nut or screws = 2.3 Nm

For PSU only:
We recommend ONLY the use of VTVC-6 Clear Vibra-tite or ThreeBond 1401 to secure the connector backnut. The use of other materials could result in damage to the connector.
The only recommended chemical cleaner is Isopropyl Alcohol.

Mechanical latching characteristics



F_e: average latching force

F_d: average unmating force with axial pull on the outer release sleeve

F_a: average retention force for straight pull on the collet nut

PSU shell material

Force (N)	Series		
	1P	2P	3P
Fe	5.0	5.5	7.5
Fd	3.0	3.5	17.5
Fa	100	150	170

PEI shell material

Force (N)	Series	
	1P	2P
Fe	4.5	6.0
Fd	2.5	9.0
Fa	120	180

Notes: 1N = 0.102 kg
Mechanical endurance: 1000 cycles

Notes: The forces were measured on PSU outer shells not fitted with contacts. The mechanical endurance represents the number of cycles after which the latching system is still effective (1 cycle = 1 latching/unlatching - 300 cycles per hour). The values were measured according to the standard IEC 60512-7, test 11a.

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.e. (mm)	Contact resistance (mΩ)
	1000 cycles
0.5	< 6.5
0.7	< 6.5
0.9	< 6.5
1.2	< 2.5
1.5	< 2.5
2.0	< 2.5

Note: 1) 21 days at 95% RH according to IEC 60068-2-3

Insulation resistance between the contacts and contact/shell

(measured according to IEC 60512-2 test 3a)

Insulating material	Marquis
	PEEK
new	> 10^{11} Ω
after humidity test[1]	> 10^{10} Ω

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 matod 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.

Technical tables

Table of American Wire Gauge

AWG	Construction		ø wire max.		Wire section	
	Strand no.	AWG/ strand	(mm)	(in)	(mm^2)	(sq in)
0	259	34	11.277	0.444	52.90	0.0820
1	817	36	9.703	0.382	41.40	0.0641
2	259	34	8.89	0.35	33.00	0.0514
4	133	35	6.8986	0.274	21.5925	0.0335
6	133	37	5.5118	0.217	13.5665	0.0211
8	168	30	4.4450	0.175	8.5127	0.0132
9	133	29	4.3942	0.173	8.6053	0.0133
10	105	30	3.9500	0.13	5.3204	0.0092
10	37	26	3.9218	0.116	4.7367	0.0073
10	1	10	3.6195	0.103	3.2618	0.0050
12	37	28	3.3134	0.091	2.8765	0.0046
12	19	28	3.3833	0.093	3.0047	0.0048
12 *	7	20	3.5400	0.10	3.6021	0.0056
12	1	12	3.0828	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 *	7	22	2.0828	0.082	2.2704	0.0035
14	1	14	1.6530	0.065	2.0620	0.0032
16 *	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	1.2220	0.0019
16 *	7	24	1.5494	0.061	1.4330	0.0022
16	1	16	1.3208	0.052	1.3076	0.0020
18 *	65	36	1.2700	0.05	0.8236	0.0013
18 *	42	34	1.2700	0.05	0.8447	0.0013
18	19	30	1.3208	0.052	0.8607	0.0013
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	0.8228	0.0013
20 *	42	36	1.0160	0.04	0.5320	$8.2x10^{-4}$
20	19	32	1.0414	0.041	0.5162	0.0010
20	10	30	1.0160	0.04	0.5067	$7.9x10^{-4}$
20	7	28	0.9906	0.039	0.5601	$8.7x10^{-4}$
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 *	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	0.1520	$2.4x10^{-4}$
26	7	34	0.5080	0.02	0.1409	$2.2x10^{-4}$
26	1	26	0.4318	0.017	0.1281	$2.0x10^{-4}$
28 *	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	0.0566	$8.8x10^{-5}$
30	1	30	0.2794	0.011	0.0507	$7.9x10^{-5}$
32	7	40	0.2794	0.011	0.0361	$5.3x10^{-5}$
32	1	32	0.2286	0.009	0.0324	$5.0x10^{-5}$
34	1	34	0.1930	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	0.079	0.003	0.0049	$7.9x10^{-6}$

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
120x0.40	6.00	0.236	16.00	0.0248
7x1.72	4.80	0.192	16.00	0.0248
1x4.50	4.50	0.177	16.00	0.0248
49x0.40	4.70	0.185	10.00	0.0155
1x1.38	3.86	0.150	10.00	0.0155
1x3.60	3.60	0.141	10.00	0.0155
44x0.30	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
36x0.30	2.80	0.110	4.00	0.0062
7x0.80	2.58	0.098	4.00	0.0062
1x2.25	2.25	0.092	4.00	0.0062
50x0.25	2.15	0.084	2.50	0.0039
7x0.88	2.04	0.080	2.50	0.0039
1x1.78	1.78	0.070	2.50	0.0039
30x0.25	1.60	0.062	1.50	0.0023
7x0.52	1.54	0.061	1.50	0.0023
1x1.4	1.40	0.055	1.50	0.0023
32x0.20	1.30	0.051	1.00	0.0015
7x0.43	1.29	0.050	1.00	0.0015
1x1.13	1.15	0.045	1.00	0.0015
42x0.15	1.20	0.047	0.75	0.0011
24x0.20	1.15	0.045	0.75	0.0011
1x1.0	1.00	0.039	0.75	0.0011
19x0.15	0.85	0.027	0.50	$7.7x10^{-4}$
16x0.20	0.80	0.030	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	$3.9x10^{-4}$
7x0.20	0.60	0.023	0.22	$3.4x10^{-4}$
19x0.10	0.70	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: (*) not indicated in the standard

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

7. ⚠ **WARNING (Prop 65 State of California)**
   Proposition 65 requires businesses to provide warnings to Californians about significant exposures to chemicals that cause cancer, birth defects or other reproductive harm. LEMO products are exempt from proposition 65 warnings because they are manufactured, marketed, and sold solely for commercial and industrial use. For further information, please visit https://www.lemo.com/quality/LEMO-Prop-65-compliance-declaration.pdf.

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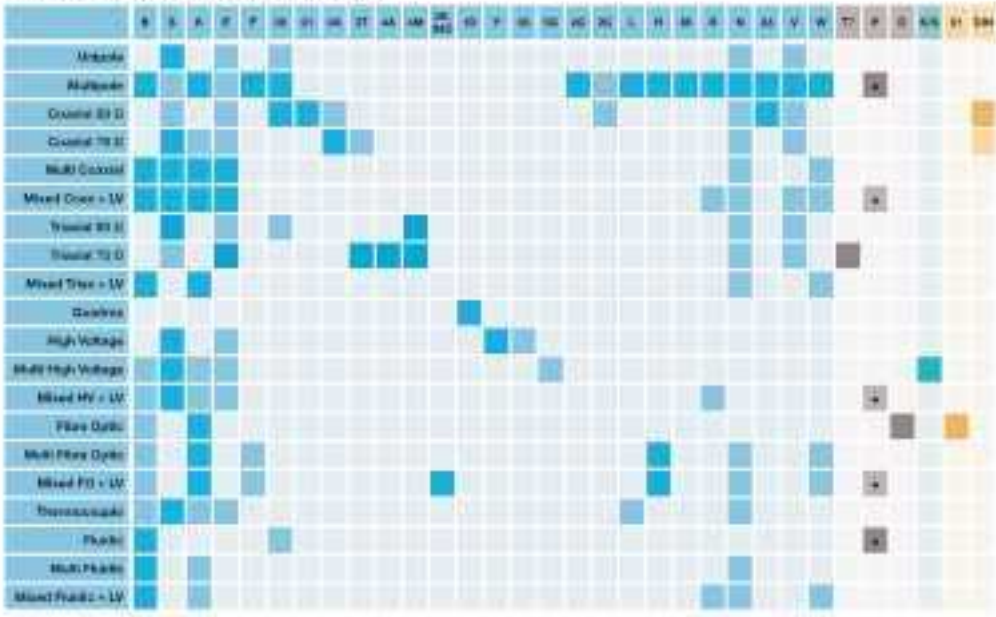

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LEMO HEADQUARTERS

SWITZERLAND
LEMO SA
Chemin des Champs-Courbes 28 - P.O. Box 194 - CH-1024 Ecublens
Tel: (+41 21) 695 16 00 - Fax (+41 21) 695 16 02 - e-mail: info@lemo.com

LEMO SUBSIDIARIES

AUSTRIA
LEMO Elektronik GesmbH
Lemböckgasse 49/E/6/3
1230 Wien
Tel: (+43 1) 914 23 20 0
Fax (+43 1) 914 23 20 11
sales@lemo.at

BRAZIL
LEMO Latin America Ltda
Av. José Rocha Bomfim
214 Salas 228 / 235
Condomínio Praça Capital
Ed. Chicago
Campinas / SP - Brasil 13080-650
Tel: +55 (11) 98899 4798
info-br@lemo.com

CANADA
LEMO Canada Inc
44 East Beaver Creek Road, unit 20
Richmond Hill, Ontario L4B 1G8
Tel: (+1 905) 889 56 78
Fax: (+1 905) 889 45 70
info-canada@lemo.com

CHINA / HONG KONG
LEMO Electronics (Shanghai) Co., Ltd
First Floor, Block E,
19 Jinbao Road, Pudong
Shanghai, China, 201206
Tel: (+86 21) 5899 7721
Fax: (+86 21) 5899 7727
cn.sales@lemo.com

DENMARK
LEMO Denmark A/S
Wandel Allé 16A
2200 Skovlunde
Tel: (+45) 45 20 44 00
Fax: (+45) 45 20 44 01
lemo-dk@lemo.com

FRANCE
LEMO France Sàrl
[illegible]
[illegible]
[illegible]
[illegible]
Tel: (+33 1) 60 94 60 94
Fax: (+33 1) 60 94 60 90
info-fr@lemo.com

GERMANY
LEMO Elektronik GmbH
Hanns-Schwindt-Str. 6
81829 München
Tel: (+49 89) 42 77 03
Fax: (+49 89) 420 21 92
info@lemo.de

HUNGARY
REDEL Elektronika Kft
Rezsőváros József u. 6/12
1201 Budapest
Tel: (+36 1) 421 47 10
Fax: (+36 1) 421 47 57
info-hu@lemo.com

ITALY
LEMO Italia srl
Viale Lombardia 25
20025 Milano
Tel: (+39 02) 66 71 10 46
Fax: (+39 02) 37 90 95 49
www.italemo.com

JAPAN
LEMO Japan Ltd
2-7-22, Nihonbashi
Minato-ku, Tokyo, 103-0073
Tel: (+81 3) 54 46 55 10
Fax: (+81 3) 54 46 55 11
lemoinfo@lemo.co.jp

MIDDLE EAST
LEMO Middle East Connectors LLC
Concorde Tower 5th Floor
Dubai Media City, P.O. Box 126732
Dubai, United Arab Emirates
Tel: +971 55 222 38 77
info-me@lemo.com

NETHERLANDS / BELGIUM
LEMO Connectors Nederland B.V.
Jacques Mesdagweg 6
2031 AD Haarlem
Tel: +31 23 539 07 61
info-nl@lemo.com

NORWAY / ICELAND
LEMO Norway A/S
Soerumsandvegen 63
1920 Soerumsand
Tel: (+47) 22 91 70 40
Fax: (+47) 22 91 70 41
info-no@lemo.com

SINGAPORE
LEMO Asia Pte Ltd
4 Leng Kee Road
#06-09 SIS Building
Singapore 159088
Tel: (+65) 6476 0672
Fax: (+65) 6474 0672
sg.sales@lemo.com

SPAIN / PORTUGAL
IBERLEMO SAU
Braill, 40, 08402 Granollers
Barcelona
Tel: (+34 93) 860 44 20
Fax: (+34 93) 879 10 77
iberlemo@lemo.com

SWEDEN / FINLAND
LEMO Nordic AB
Gustavslundsvägen 18, Box 5007
163 06 Spånga
Tel: (+46 8) 635 60 60
Fax: (+46 8) 635 60 61
info-se@lemo.com

SWITZERLAND
LEMO Verkauf AG
Grundstrasse 22 B, 6343 Rotkreuz
Tel: (+41 41) 790 49 40
ch.sales@lemo.com

UNITED KINGDOM
LEMO UK Ltd
12-20 North Street, Worthing
West Sussex, BN11 1DU
Tel: (+44 1903) 23 45 43
lemouk@lemo.com

USA
LEMO USA Inc
P.O. Box 2408
Rohnert Park, CA 94927-2408
Tel: (+1 707) 578 88 11
(+1 800) 444 53 66
Fax: (+1 707) 578 08 69
info-us@lemo.com

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