MP Series
Modular Plastic connectors

LEMO

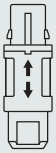
LEMO Solutions
Portfolio

1 ORIGINALS

Your configurable solution

- Self-Latching Push-Pull locking
- Wide & modular range
- Broad application reach
- Indoor & outdoor

Series	B, K, T
	S, E



2 REDEL

Your medical preferred solution

- Medical and Industrial grade plastics
- Device ergonomics
- Electrical safety
- High density & modularity

Series	P
	SP
	MP

3 OPTIMA

Your optimised solution

- Compact & miniature
- Lightweight & low-profile
- High vibration resistance
- IP68 & MIL-STD tested

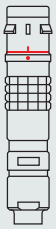
Series	M
	F

4 SUPREME

Your extreme solution

- High/Low pressure
- Radiation & corrosion
- High Voltage
- Regulated environments

Series	N
	W
	Y



5 SPECIALTIES

Your specialised solution

- Industry standards
- Special configurations
- Historical products

Series	3K.93C.Y, 00 Nim-Camac
	H, V, 2G/2C, R, ...

6 CABLES

Your unique cable solution

- Design expertise
- In house prototype to production
- Custom cables
- Conductive & hybrid

Series	Technical cables
	Biocompatibility
	Automation & high-flex
	Retractile coil cords
	Ruggedised

SERVICES

- Cable assembly services (single-end, double-end, custom harness, overmolding, ...)
- Custom solution (connector, cable, device)
- Signal integrity end-to-end services

Introduction

This catalogue provides a complete description of the innovative **MP** Series product - The **M**odular **P**lastic Series to complement the REDEL connector family. The MP series goes beyond the traditional connectors allowing customers to Configure, Design and Build their own custom connector easily in a modular way from a broad range of standard modules.

This series features a wide choice of standard modules for power, signal, data, fibre optic and fluidic connectivity that can be combined into one single connector to address an extensive range of applications. The flexible and interchangeable design allows the customer to transition easily to different configurations for future generations of their products without an interface design change.

This innovative product is designed to target an evolving heterogeneous market segment where there are connectivity challenges for demanding applications in the medical, test and measurements, security and industries amongst others.

The aim of LEMO is to provide highly reliable and quality innovative solutions to its customers by providing complete interconnect solutions to help them to reduce their maintenance and downtime in their applications. The LEMO quality arises from years of expertise in design, manufacturing, cable assemblies and quality system where the connectors have full traceability from raw materials to final products.

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Product safety notice & disclaimers

Please read and follow all instructions specified on the last page or on our website carefully and consult all relevant national and international safety regulations for your application. Improper handling, cable assembly, or wrong use of connectors can result in hazardous situations.

LEMO products and services are provided “as is.” LEMO makes no warranties or representations with regard to LEMO product & services or use of them, express, implied or statutory, including for accuracy, completeness, or security.

In no event shall LEMO be liable for any direct, indirect, punitive, incidental, special consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of LEMO’s products.

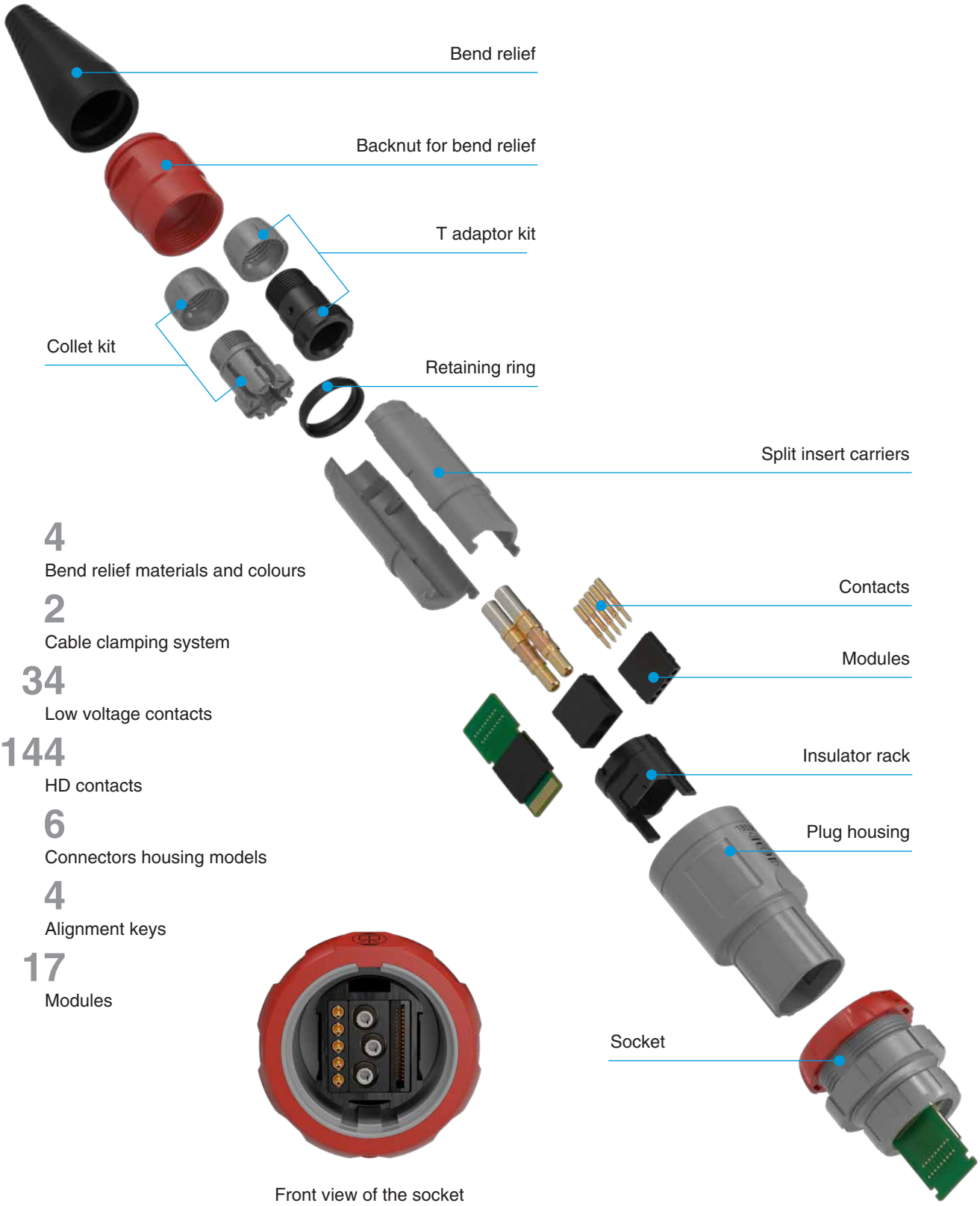
REDEL MP Series
One connector, infinite possibilities

The REDEL MP Series goes beyond traditional connectors with a new modular insert concept to combine power, signal, data, fibre optic and fluidic in a single connector.

The REDEL MP Series also introduces high contact density modules, an innovation that allows up to 144 contacts in a compact connector by using the Card Edge concept. These HD modules can be further customised with the integration of intelligence, such as an EEPROM.

The clip-in assembly modules of the REDEL MP allow for quick and easy assembly and disassembly with minimum tooling. Its expandable and interchangeable design allows LEMO to be at the forefront in an ever-evolving technological landscape. Full cable assembly options are also available.

The modular MP system



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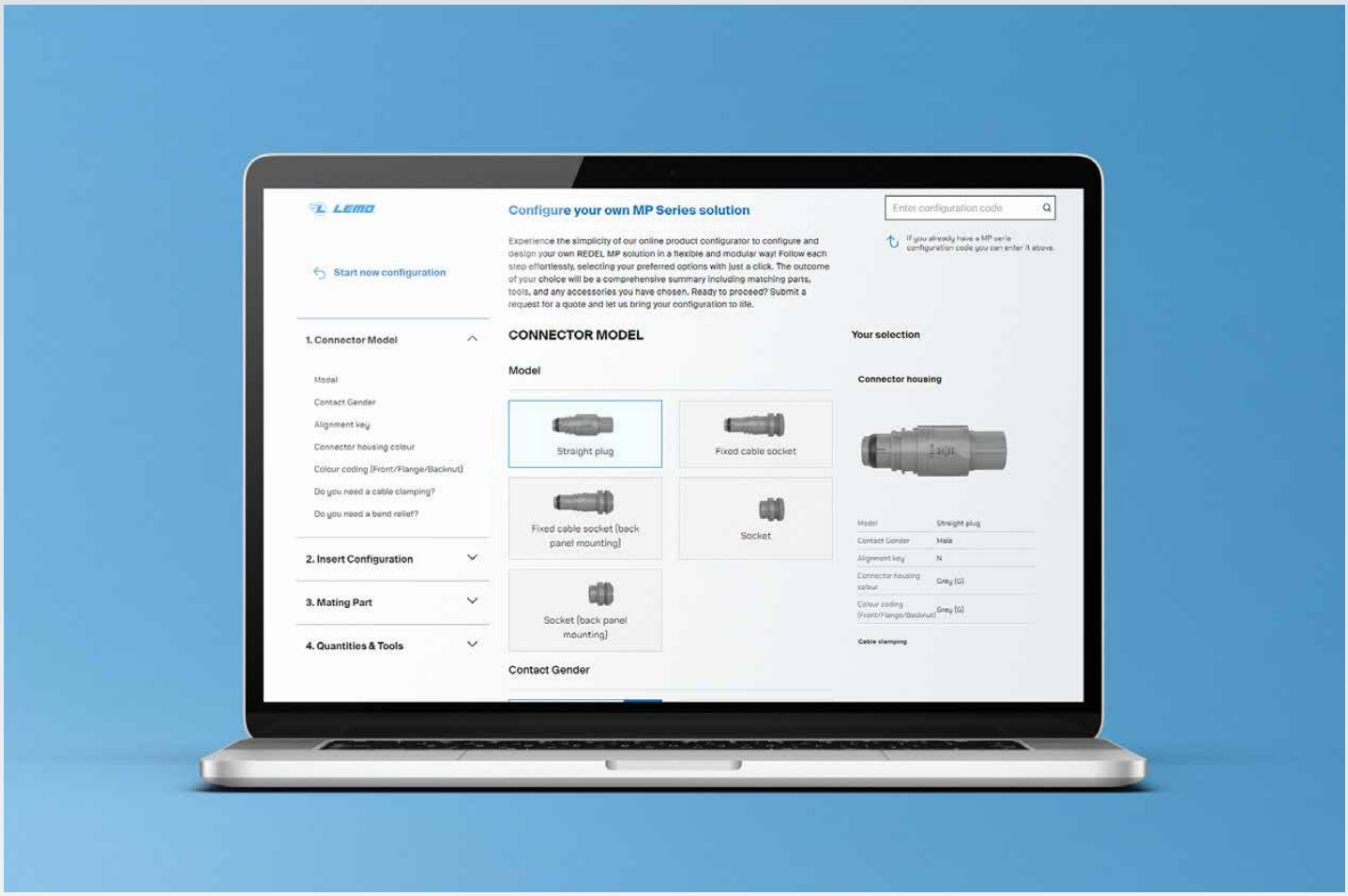
Front view of the socket

MP Series Online Configurator

Configure your own REDEL MP solution in an intuitive and modular way.

The online product configurator allows you to easily customize your connector solution to meet your specific requirements while offering a step-by-step guide through various options.



Select & request offers

Once your MP solution is configured, you can promptly request a quote. You will also receive a complete article number, allowing you to access your configuration at any time.

Scan the QR code or use the following link to access the online configurator.

Link to the Online Configurator

Technical characteristics for connector housing and insulator

Materials

Component	Material (Standard)
Connector housing, collet, insulating spacer, split insert carrier, retaining ring, T adaptor, front nut, collet nut, retaining nut, notched nut, backnut	PPSU
Male, female, blank insulator and insulator rack	PEEK, LCP

Electrical performance

Characteristics	Value	IEC international
Insulation resist. (at ambient temp.)	10^{12} Ω	IEC 60512-2:1985
Electrostatic Discharge (ESD)	15 kV	IEC 61000-4-2
Current rating	Depending on insert (see page 12)	IEC 60512-3:1973

Mechanical performance

Characteristics	Value	IEC international
Average mating force	10 N [1)]	IEC 60512-13-1:1996
Average latch retention force	130 N [2)]	IEC 60512-8:1993
Endurance	> 2000 cycles	IEC 60512-5:1992
Max. nut tightening Torque	1 Nm	–
Max. collet nut tightening Torque	0.65 Nm	–

Note: [1)] depending on insert.
[2)] may be lower after sterilisation and mating cycles.

Environmental performance

Characteristics	Value	IEC international
Ingress Protection Index (mated)	IP 50	IEC 60529:2001
Min. & Max. operating temperature	-50°C/+170°C [1)]	IEC 60068-1:1988
Humidity resistance (up to 60 deg)	95%	IEC 60068-1:1988
Steam sterilisation	135°C at 2.3 bar compliant [2)]	EN 60601-1:2006
Steam sterilisation cycles	20 cycles [2)]	–

Note: [1)] maximum temperature is valid for connector housing with all the modules except for HD modules. Maximum temperature for connector with HD modules is 140°C.
[2)] not compatible with TPU bend relief.

MP series

The REDEL MP Series are modular plastic push-pull connectors that address market segments and applications where high and changing connectivity challenges are needed.

The choice of available standard modules combined with the ease of assembly and disassembly, provides a highly configurable and flexible connectivity solution.

Various MP models of plugs, sockets, free and fixed cable sockets offer further choice to our customers to build system level solutions.

The colour coding, different keying for mating parts, choice of cable collet adaptors and bend reliefs, further enhance the customization possibilities of our offering. The connector housing material made in proprietary polyphenylsulfone (PPSU), enables several sterilisation cycles of the product. Some of the key features and benefits are listed below.

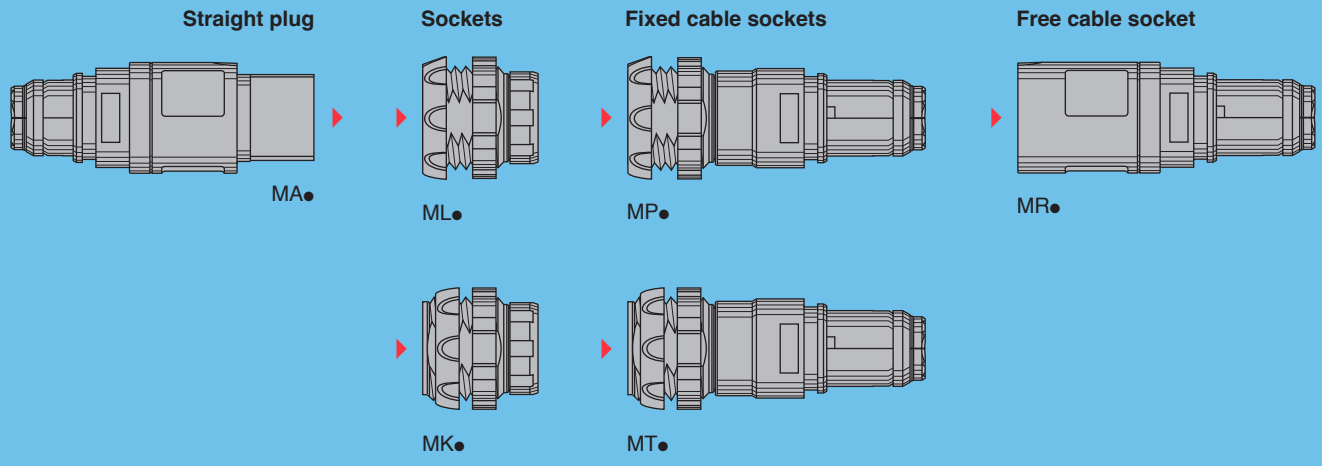
Features & Benefits

– Plastic shell made of proprietary polyphenylsulfone (PPSU)
– Choice of power, signal, data, fibre optic and fluidic module in one connector
– Internal Push-Pull locking mechanism for improved safety and cleanability
– Space saving design with high density – up to 144 contacts
– Quick and easy clip-in/clip-out assembly
– Expandable and future proof connectivity
– Integration of custom intelligence
– Excellent electrical safety (touch & scoop proof)
– ESD tested in support to IEC 60601 certification
– Extensive sterilisation cycles

Applications

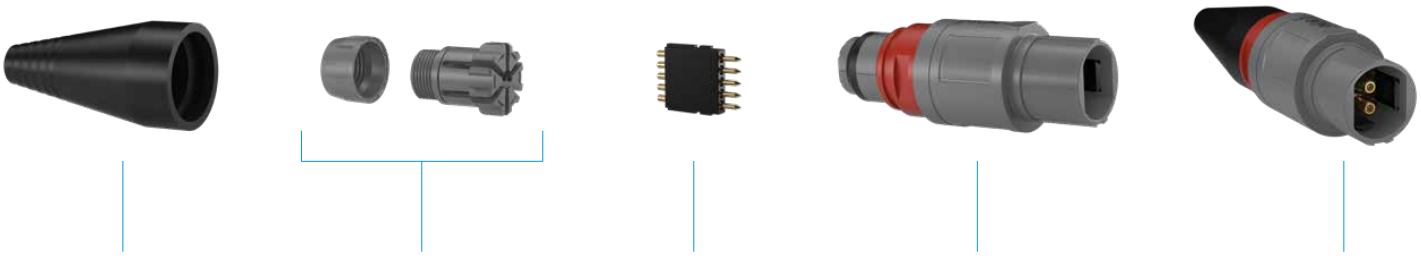
– Medical
– Test & measurements
– Industrial

Models (page 9)



Main sub components and setup of the REDEL MP products

Straight plug

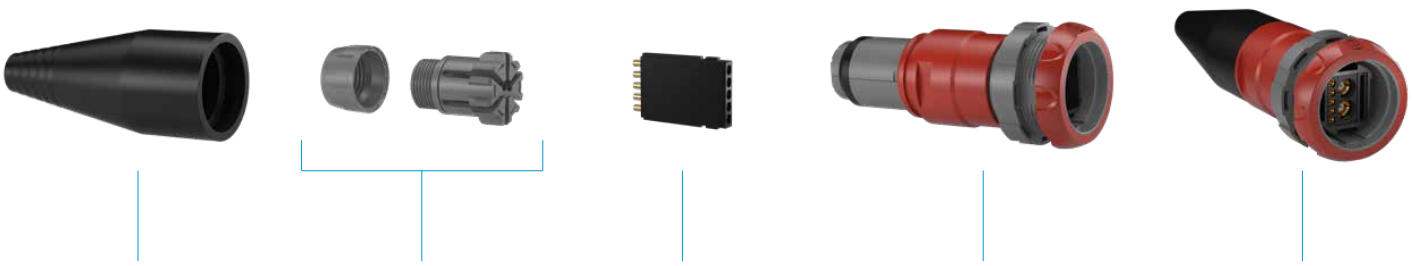


Bend relief (option) + Collet kit (option) + Modules and contacts + Connector housing = Straight plug

Socket

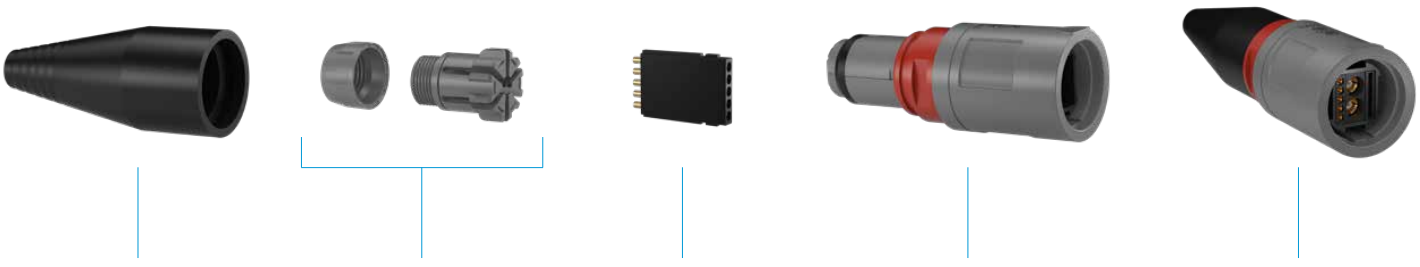
Modules and contacts + Connector housing = Socket

Fixed cable socket



Bend relief (option) + Collet kit (option) + Modules and contacts + Connector housing = Fixed cable socket

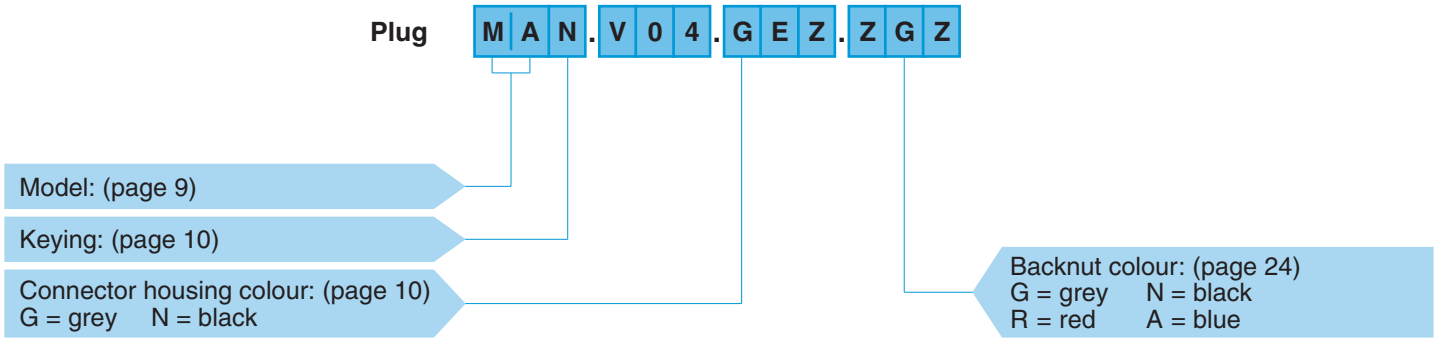
Free cable socket



Bend relief (option) + Collet kit (option) + Modules and contacts + Connector housing = Free cable socket

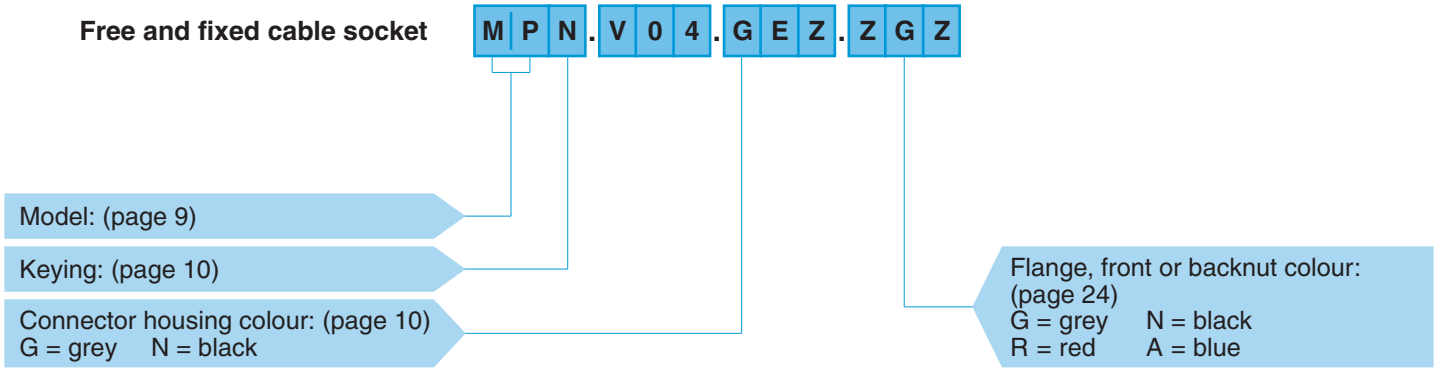
Part numbering system of the connector housing sub-assembly

Plug



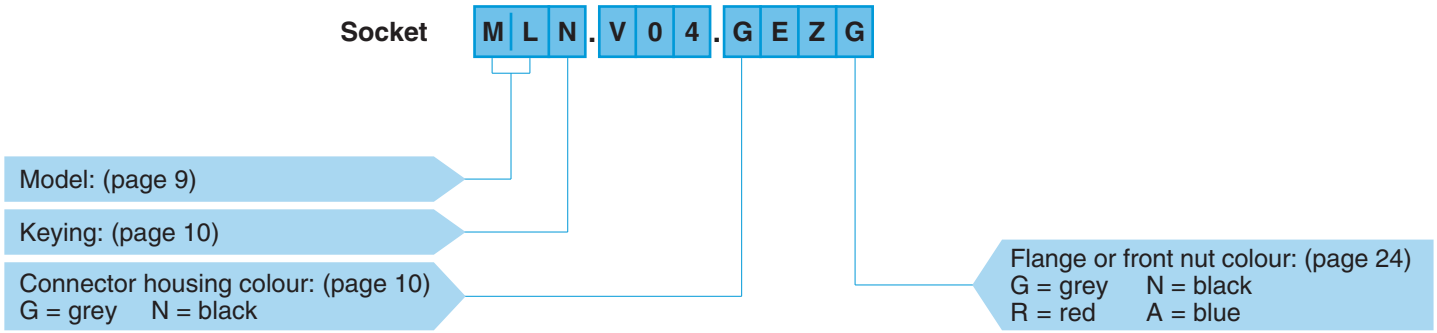
MAN.V04.GEZ.ZGZ = Straight plug with cable fixing and alignment key (N), grey connector housing (G), black PEEK insulator and grey backnut (G).

Free and fixed cable socket



MPN.V04.GEZ.ZGZ = Fixed cable socket with cable fixing and alignment key (N), grey connector housing (G), black PEEK insulator and grey fixed flange and backnut (G).

Socket



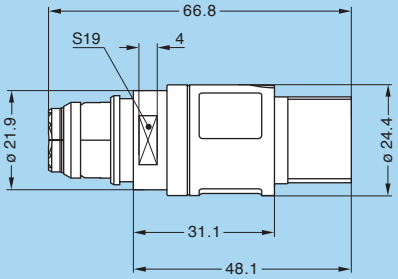
MLN.V04.GEZG = Socket with nut fixing and alignment key (N), grey connector housing (G), black PEEK insulator, grey fixed flange (G).

Part number to be ordered separately:

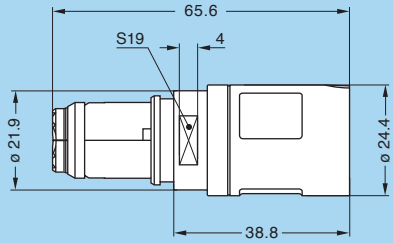
– For the modules: (pages 12 to 16)
– For the collet/cable adaptor: (page 23)
– For the bend relief: (page 26)

Models

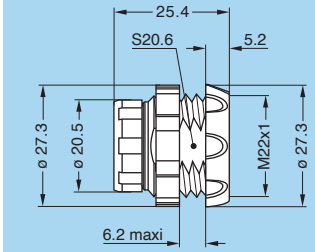
MAN.V04.GEZ.ZGZ Straight plug, key (N) or keys (P, S and T), cable clamping



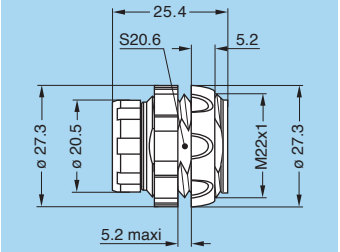
MRN.V04.GEZ.ZGZ Free cable socket, key (N) or keys (P, S and T), cable clamping



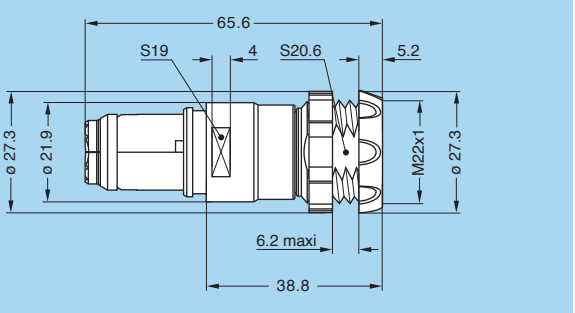
MLN.V04.GEZG Socket, key (N) or keys (P, S and T), nut fixing (front panel mounting)



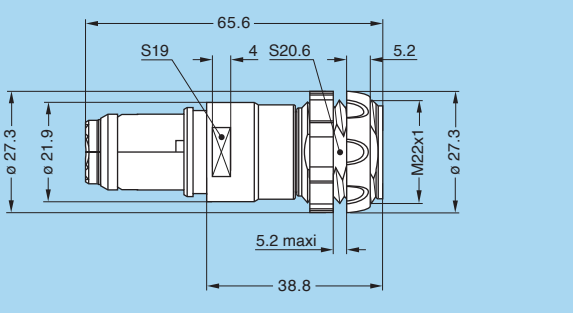
MKN.V04.GEZG Socket, key (N) or keys (P, S and T), with two nuts (back panel mounting)



MPN.V04.GEZ.ZGZ Fixed cable socket, key (N) or keys (P, S and T), nut fixing and cable clamping (front panel mounting)

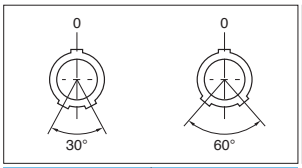
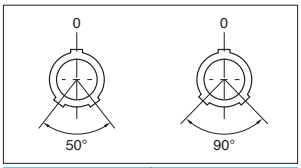


MTN.V04.GEZ.ZGZ Fixed cable socket, key (N) or keys (P, S and T), with two nuts and cable clamping (back panel mounting)



Alignment key

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

Keying (plug front view)				
Reference	**N**	**P**	**S**	**T**
Contact type for plug	male	male	female	female
Contact type for socket, free and fixed cable socket	female	female	male	male
Note	●	○	●	○

● First choice alternative ○ Special order alternative

Connector housing colour

The MP Series connector housing is available in two colours.

	Colours	
	grey	black
Reference	**G**	**N**
RAL code	7001	9005
Note	●	○

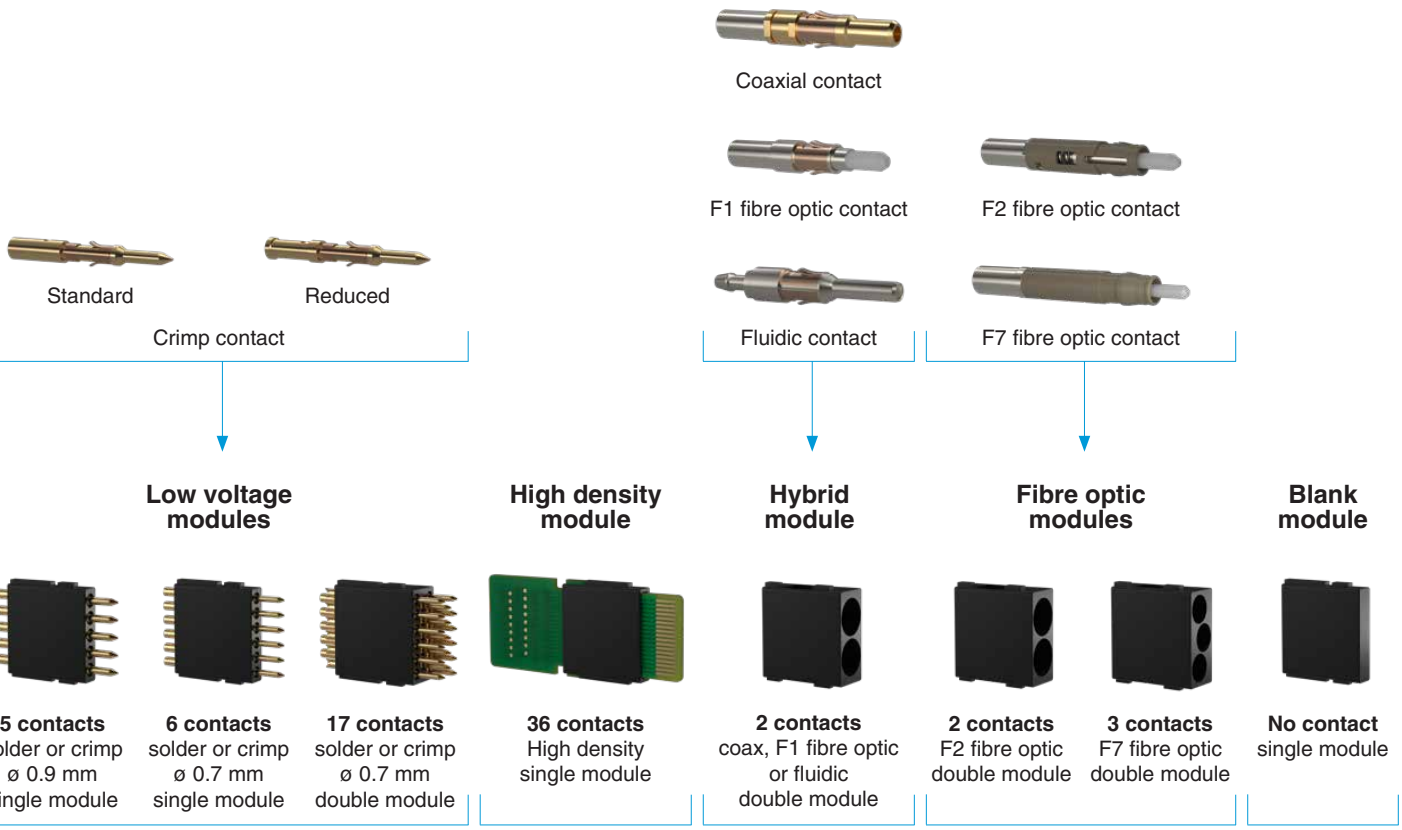
● First choice alternative ○ Special order alternative

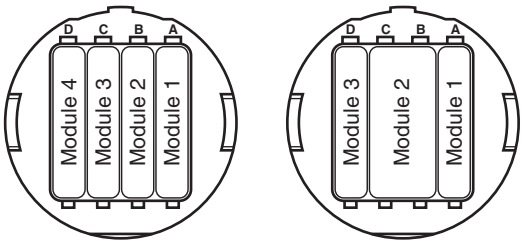
Note: the RAL colours are indicative and depend on raw material and production process. Colour may differ.

Available selection of modules

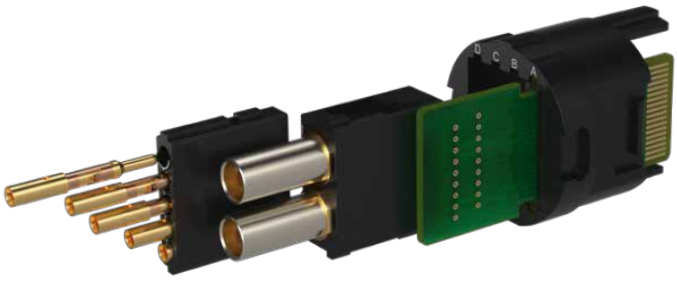
The MP series consists of various standard modules that can be integrated in the connector: low voltage, hybrid, high density (HD), fibre optic and fluidic. Depending on the requirements and the type of contacts needed, the module selected will occupy either a “Single” or a “Double” slot in the insulator rack.

The connectors can accommodate a set of any 4 single, 2 double or a mix of single and double modules in the insulator rack. A “blank” module is also available to fill any unused slots in the connector. An overview of the contacts and the different modules are shown below.





Rear view of the male insulator rack and modules



Male insulator rack and modules

Modules (to be ordered separately)

Low voltage modules

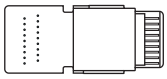
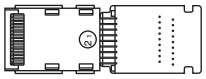
	Male module	Female module	Number of contacts	Contact ø (mm)	Contact type: Solder	Contact type: Crimp [1]	AWG max.-min.	Test voltage (kV DC) [2] Contact-contact	Air clearance min. [2] (mm) Creepage distance min. [3] (mm)	Contact resistance (mΩ)	Rated current (A) [2]
	Solder contacts										
	Crimp contacts										
Single module	MOM.M05.ZLA1 	MOF.M05.ZLL1 	5	0.9	●	–	max. 22	1.80	0.85	≤4.8	4.5
Single module	MOM.M05.ZLC1 	MOF.M05.ZLM1 	5	0.9	–	●	20 22 24	2.00	1.17	≤4.8	4.5
Single module	MOM.M05.ZLB1 	MOF.M05.ZLP1 	5	0.9	–	●	22 24 26	2.00	1.17	≤4.8	4.5
Single module	MOM.M06.ZLA1 	MOF.M06.ZLL1 	6	0.7	●	–	max. 22	1.28	0.65	≤6.1	4.0
Single module	MOM.M06.ZLC1 	MOF.M06.ZLM1 	6	0.7	–	●	22 24 26	1.70	1.07	≤6.1	4.0
Single module	MOM.M06.ZLB1 	MOF.M06.ZLP1 	6	0.7	–	●	28 30 32	1.70	1.07	≤6.1	4.0

Low voltage modules

	Male module	Female module	Number of contacts	Contact ø (mm)	Contact type: Solder	Contact type: Crimp [1]	AWG max.-min.	Test voltage (kV DC) [2] Contact-contact	Air clearance min. [2] (mm) Creepage distance min. [3] (mm)	Contact resistance (mΩ)	Rated current (A) [2]
	Solder contacts										
	Crimp contacts										
Double module	**MOM.M17.ZLA2** 	**MOF.M17.ZLL2** 	17	0.7	●	–	max. 22	1.00	0.59	≤.6.1	3.0
	MOM.M17.ZLC2 	**MOF.M17.ZLM2** 	17	0.7	–	●	22 24 26	1.27	1.07	≤.6.1	3.0
	MOM.M17.ZLB2 	**MOF.M17.ZLP2** 	17	0.7	–	●	28 30 32	1.27	1.07	≤.6.1	3.0

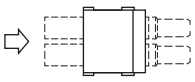
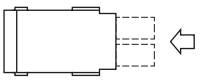
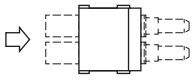
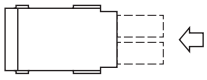
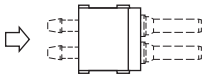
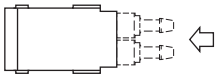
Note: [1] crimp contacts are delivered in a plastic tube with the module.
[2] see calculation method, caution and suggested standard on page 34.
[3] shortest distance along the surface of the insulating material between two conductive parts.

High density modules

	Male module	Female module	Number of contacts	Contact type	Test voltage (kV DC) [1] Contact-contact	Creepage distance (mm)	Contact resistance (mΩ)	Rated current (A) [1]
	 HD contacts							
Single module	**MOM.H36.ZBA1-0001** 	**MOF.H36.ZBL1-0001** 	36	HD	0.75	0.2	≤ 250	0.4

Note: [1] see calculation method, caution and suggested standard on page 34.

Hybrid: coax, F1 fibre optic or fluidic modules

	Male module	Female module	Number of contacts	Contact type	Impedance (Ω)	Test voltage (kV DC) [1] contact-screen	Rated current (A) [1]
	 Coax contacts						
	 Fibre optic contacts						
	 Fluidic contacts						
Double module	**MOM.MI.2TC.JLN2** 	**MOF.MI.2TC.JLN2** 	2	C Coax	50	2.2	4.0
			2	C Coax	75	1.2	1.0
			2	F1 Fibre optic	–	–	–
			2	P1 Fluidic	–	–	–

Note: [1] see calculation method, caution and suggested standard on page 34.

The hybrid module can accommodate the **coax, F1 fibre optic, fluidic contacts** as well as a mix of these contacts. Contact LEMO for details if needed.

The coax, F1 fibre optic and fluidic contacts must be ordered separately. See details on pages 18 to 20.

F2 and F7 fibre optic modules

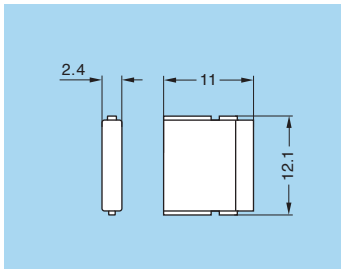
	Male module	Female module	Number of contacts	Contact type
	Fibre optic contacts			
Double module	MOM.FO.2F2.JLN2 	MOF.FO.2F2.JLN2 	2	F2
	MOM.FO.3F7.JLN2 	MOF.FO.3F7.JLN2 	3	F7

Note: [1] see calculation method, caution and suggested standard on page 34.

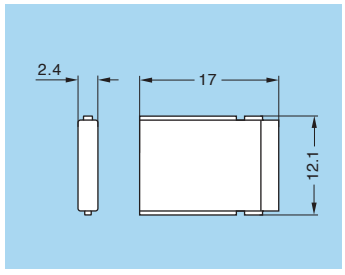
The F2 and F7 fibre optic contacts must be ordered separately. See details on pages 21 and 22.

Blank modules

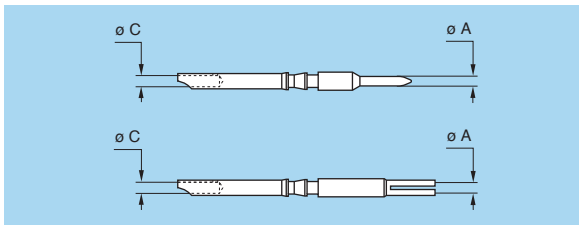
MOM.FI.ZZZ.JLN1 Male module



MOF.FI.ZZZ.JLN1 Female module



Low voltage solder contacts (included)

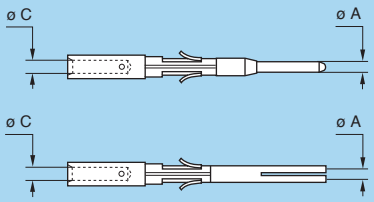


Contact type	Contact		Conductor					
			Solid		Stranded			
					AWG		Section (mm²)	
	ø A (mm)	ø C (mm)	AWG max.	Section max. (mm²)	min.	max.	min.	max.
Solder	0.7	0.80	22	0.34	–	22[1)]	–	0.340
	0.9	0.80	22	0.34	–	22[1)]	–	0.340

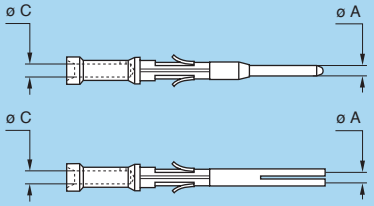
Note: [1)] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter. Make sure that the maximum conductor diameter is smaller than ø C.

Low voltage crimp contacts (to be ordered separately)

Standard crimp barrel (fig. 1)



Reduced crimp barrel (fig. 2)



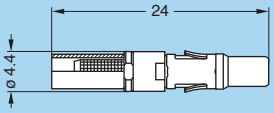
Contact type	Contact			Conductor						Part number	
				Solid		Stranded					
						AWG		Section (mm²)			
	ø A (mm)	ø C (mm)	Form per fig.	AWG max.	Section max. (mm²)	min.	max.	min.	max.	For male contact	For female contact
Crimp	0.7	0.80	1	–	–	26	22[1)]	0.128	0.382	**MAN.520.ZZC**	**MLN.620.ZZM**
	0.7	0.45	2	–	–	32	28	0.032	0.092	**MAN.521.ZZC**	**MLN.621.ZZM**
	0.9	1.10	1	–	–	24	20	0.204	0.616	**MAN.535.ZZC**	**MLN.635.ZZM**
	0.9	0.80	2	–	–	26	22[1)]	0.128	0.382	**MAN.536.ZZC**	**MLN.636.ZZM**

Note: [1)] for a given AWG, the diameter of some stranded conductor designs is larger than the solder cup diameter. Make sure that the maximum conductor diameter is smaller than ø C.

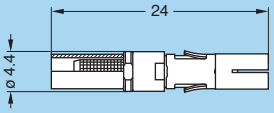
In order to satisfy crimp pull-test requirements to the IEC 60352-2 standard, the use of single strand cables should be avoided.
Crimping tools and positioners part numbers are given on page 27.

Coaxial contacts - Type C (to be ordered separately)

FFS.2B Male coax contact

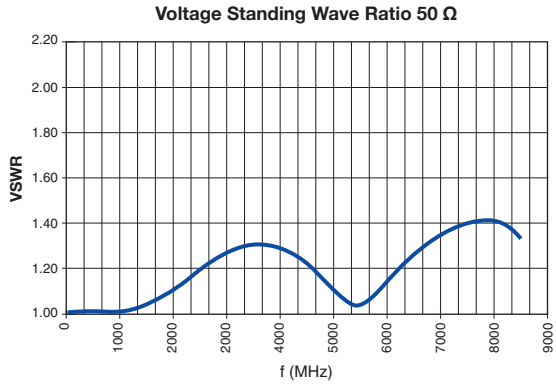


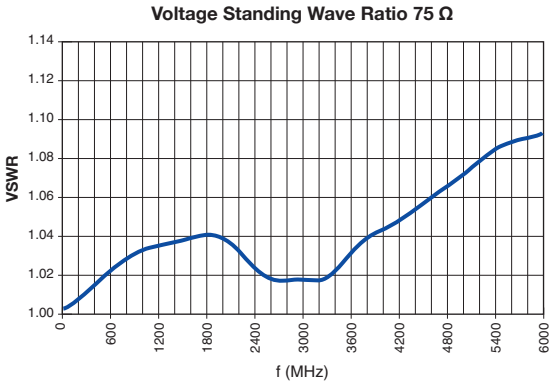
PSS.2B Female coax contact



Impedance (Ω)	Dielectric max. (mm)	Sheath max. (mm)	Part number		Recommended cable
			For male contact	For female contact	
75	1.60	3.0	**FFS.2B.275.ZTCE31**	**PSS.2B.275.ZTME31**	RG179B/U
	2.00	3.6	**FFS.2B.275.ZTCE37**	**PSS.2B.275.ZTME37**	DRAKA 0.41/1.9AF
50	0.87	2.0	**FFS.2B.250.ZTCE24**	**PSS.2B.250.ZTME24**	RG178B/U, RG196A/U
	1.50	2.8	**FFS.2B.250.ZTCE30**	**PSS.2B.250.ZTME30**	RG174A/U, RG188A/U, RG316/U
	1.50	2.6	**FFS.2B.250.ZTCE31**	**PSS.2B.250.ZTME31**	RG179B/U, RG187A/U

Typical performance of the coax contact





F1 fibre optic contacts (to be ordered separately)

Technical Characteristics

Material and treatment

Component	Material	Surface treatment (µm)	
		Cu	Ni
Body and holder	Alloy CuNiZn	without treatment	
Ferrule	Alloy CuNiZn or ceramic	without treatment	
Spring	Stainless steel	without treatment	
Clip	Cu-Be	without treatment	
Crimp ferrule	Cu 99	0.5	3
Alignment tube	Alloy CuNiZn	without treatment	

Note: further details are available in the dedicated FO catalogue (link to the catalogue).

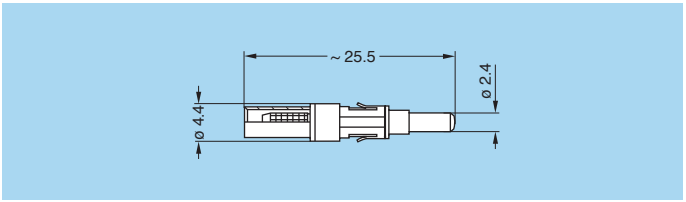
Mechanical and Environmental

Characteristic	Value	Standard
Mating durability	1000 cycles	IEC 61300-02-02
Damp heat steady state	up to 95% at 60°C	IEC 61300-02-19
Temperature range	-40°C/+80°C	IEC 61300-02-17/18
Cable retention	100 N	IEC 61300-02-04

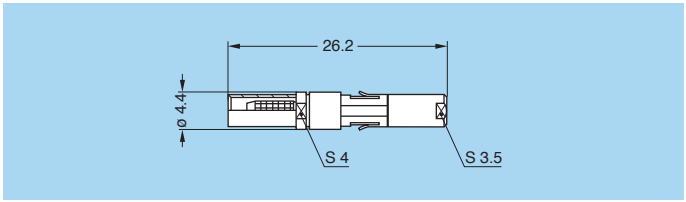
Optical

Characteristic	Value	Standard	Method
Average insertion loss fibre 200/230 µm	1.13 dB	IEC 61300-03-04	Insertion Method B

FFS.F1 Male F1 fibre optic contact



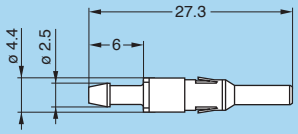
PSS.F1 Female F1 fibre optic contact



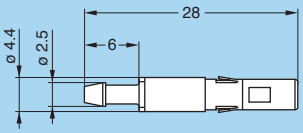
Core/cladding	Ferrule hole ø (µm)	Fibre type	Part number	
			For male contact	For female contact
100/140	144	Silica	**FFS.F1.FB1.ACE30**	**PSS.F1.FB1.ACE30**
200/230	235	HCS	**FFS.F1.GB1.ACE30**	**PSS.F1.GB1.ACE30**
400/430	435	HCS	**FFS.F1.JB1.AAE30**	**PSS.F1.JB1.AAE30**
500	500	Polymer	**FFS.F1.NA1.AAE30**	**PSS.F1.NA1.AAE30**
1000	1100	Polymer	**FFS.F1.RB1.AAE30**	**PSS.F1.RB1.AAE30**

P1 fluidic contacts (to be ordered separately)

FGG.P1.150.ACV Male fluidic contact



EGG.P1.150.ACV Female fluidic contact



Note: contact fluidic with return valve.
Contact recommended for gaseous fluid but not for liquid. For more information about tubing consult LEMO fluidic contact catalogue (link to the catalogue).

F2 fibre optic contacts (to be ordered separately)

Technical Characteristics

Material and Treatment

Component	Material	Surface treatment (µm)	
		Cu	Ni
Body	PEEK	without treatment	
Ferrule	Ceramic	without treatment	
Holder	Alloy CuNiZn	without treatment	
Crimp holder	Brass	0.5	3
Spring	Stainless steel	without treatment	
Crimp ferrule	Cu 99	0.5	3
Support	Alloy CuNiZn	without treatment	
Alignment tube	Ceramic	without treatment	

Optical

Characteristics	Value	Standard	Method
Average insertion loss fibre 9/125 µm	0.10 dB	IEC 61300-03-04	Insertion Method B
Average insertion loss fibre 50/125 µm	0.25 dB	IEC 61300-03-04	Insertion Method B
Return loss fibre 9/125 µm (UPC)	≥45 dB	IEC 61300-03-06	Branching Device Met.
Return loss fibre 9/125 µm (Hand polish)	~30 dB	IEC 61300-03-06	Branching Device Met.

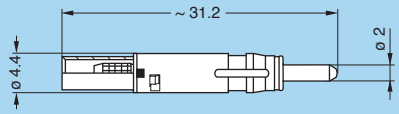
Mechanical and Environmental

Characteristic	Value	Standard
Mating durability	10,000 cycles	IEC 61300-02-02
Damp heat steady state	up to 95% at 60°C	IEC 61300-02-19
Temperature range	-40°C/+80°C	IEC 61300-02-17/18
Cable retention	100 N	IEC 61300-02-04

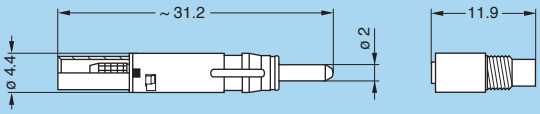
Characteristic	Value	Standard
Impact (Method A)	1 m [1)]	IEC 61300-02-12
Shock (3 cycles in 2 directions)	100 g, 10-50 ms; 20 g 6-9 ms	IEC 61300-02-09

Note: [1)] onto concrete floor.
Further details are available in the dedicated FO catalogue (link to the catalogue).

FFS.F2 Male F2 fibre optic contact



PSS.F2 Female F2 fibre optic contact



Ferrule hole ø (µm)	Part number		Cable fixing type
	For male contact	For female contact	
125	**FFS.F2.BA2.LCE30**	**PSS.F2.BA2.LCE30**	Crimp
	FFS.F2.BA2.LCT10	**PSS.F2.BA2.LCT10**	Epoxy
125.5	**FFS.F2.BX2.LCE30**	**PSS.F2.BX2.LCE30**	Crimp
	FFS.F2.BX2.LCT10	**PSS.F2.BX2.LCT10**	Epoxy
126	**FFS.F2.BB2.LCE30**	**PSS.F2.BB2.LCE30**	Crimp
	FFS.F2.BB2.LCT10	**PSS.F2.BB2.LCT10**	Epoxy

F7 fibre optic contacts (to be ordered separately)

Technical Characteristics

Material and Treatment

Component	Material	Surface treatment (µm)	
		Cu	Ni
Body	PEEK	without treatment	
Ferrule	Ceramic	without treatment	
Holder	Alloy CuNiZn	without treatment	
Crimp holder	Brass	0.5	3
Spring	Stainless steel	without treatment	
Crimp ferrule	Cu 99	0.5	3
Support	Alloy CuNiZn	without treatment	
Alignment tube	Ceramic	without treatment	

Optical

Characteristics	Value	Standard	Method
Average insertion loss fibre 9/125 µm	0.18 dB	IEC 61300-03-04	Method 2
Average insertion loss fibre 50/125 µm	0.25 dB	IEC 61300-03-04	Method 2
Return loss fibre 9/125 µm (UPC)	≥45 dB	IEC 61300-03-06	Coupler Method
Return loss fibre 9/125 µm (Hand polish)	>25 dB	IEC 61300-03-06	Coupler Method

Mechanical and Environmental

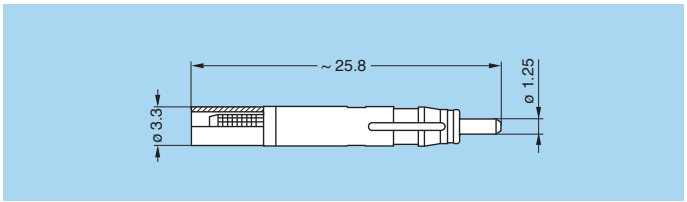
Characteristic	Value	Standard
Mating durability	> 1000 cycles	IEC 61300-02-02
Damp heat steady state	up to 93% HR [1]	IEC 61300-02-19
Temperature range	-40°C/+85°C	IEC 61300-02-17/18
Cable retention	100 N	IEC 61300-02-04

Characteristic	Value	Standard
Vibration (3 axes) (2 hrs)	100 to 2000 Hz	–
Change of temperature	-40 to +75°C	IEC 61300-02-22
Temperature/humidity	-10 to +65°C [2]	IEC 61300-02-21

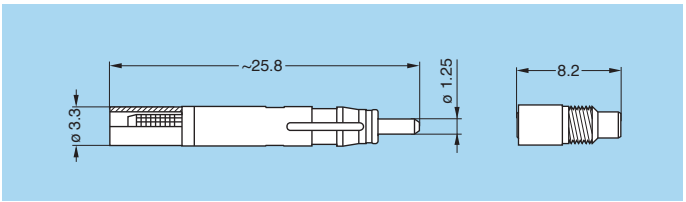
Note: [1] at 40°C. [2] at 93% RH.

Note: further details are available in the dedicated F7 catalogue (link to the catalogue).

FFS.F7 Male F7 fibre optic contact



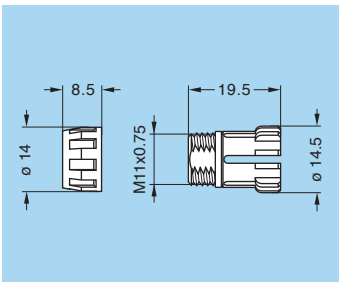
PSS.F7 Female F7 fibre optic contact



Ferrule hole ø (µm)	Note	Part number	
		For male contact	For female contact
125	Tight jacket	**FFS.F7.125.LCE23**	**PSS.F7.125.LCE23**
	Buffer	**FFS.F7.125.LCT10**	**PSS.F7.125.LCT10**
126	Tight jacket	**FFS.F7.126.LCE23**	**PSS.F7.126.LCE23**
	Buffer	**FFS.F7.126.LCT10**	**PSS.F7.126.LCT10**

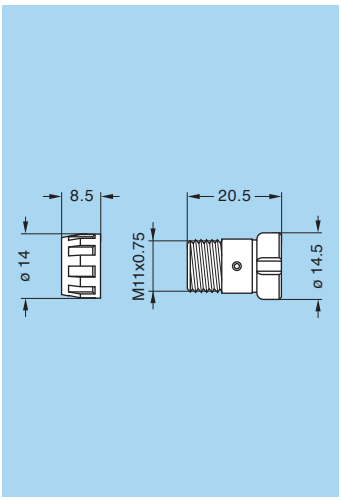
Collet / Cable adaptor (to be ordered separately)

MAN Collet kit



Part number	Collet ø (mm)
MAN.740.RGG	2.1 - 4.0
MAN.760.RGG	4.1 - 6.0
MAN.780.RGG	6.1 - 8.0

MAN T adaptor kit (for potting)



Part number	T adaptor cable ø (mm)
MAN.800.RNG	custom [1]
MAN.830.RNG	2.0 - 3.0
MAN.840.RNG	3.0 - 4.0
MAN.850.RNG	4.0 - 5.0
MAN.860.RNG	5.0 - 6.0
MAN.870.RNG	6.0 - 7.0
MAN.880.RNG	7.0 - 8.0

Note: [1] blank without drilled hole. Customers will have the option to drill the appropriate diameter as per their needs.

Flange, front or backnut colour

	Colours			
	grey	blue	black	red
Reference	**G**	**A**	**N**	**R**
RAL code	7001	5015	9005	3020
Note	●	○	○	○

● First choice alternative ○ Special order alternative

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

The MP Series connectors allows for a colour coding for easy identification between plug, socket and free or fixed cable socket in a system configuration. The colour code depends on the models shown below.

The bend relief must be ordered separately (see page 26).

Backnut colour on plug

Backnut colour on free cable socket

Fixed flange nut colour on socket

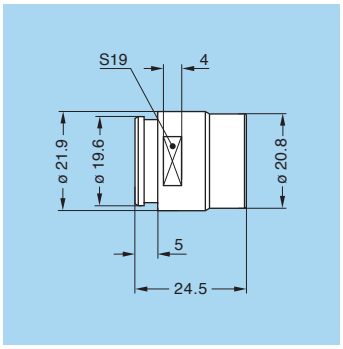
Front nut colour on socket

Fixed flange and backnut colour on fixed cable socket

Front and backnut colour on fixed cable socket

Accessories

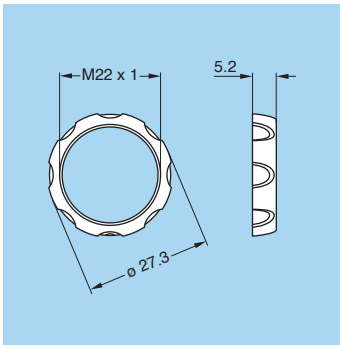
MAM Backnut for bend relief



Part number	Colours	Note
MAM.130.RG	grey	●
MAM.130.RR	red	○
MAM.130.RN	black	○
MAM.130.RA	blue	○

● First choice alternative ○ Special order alternative

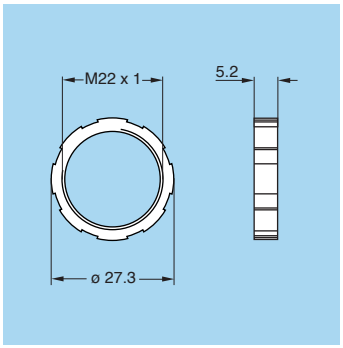
MKN Front nut (only for MK● socket and MT● fixed cable socket)



Part number	Colours	Note
MKN.220.RG	grey	●
MKN.220.RR	red	○
MKN.220.RN	black	○
MKN.220.RA	blue	○

● First choice alternative ○ Special order alternative

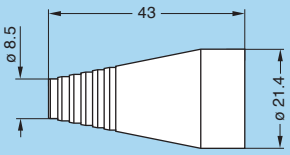
MLN Notched nut



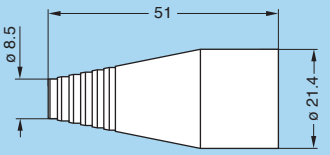
Part number	Colour
MLN.240.RG	grey

GM● **Bend relief** (to be ordered separately)

GMF



GMP



Material	Temperature range		Colours	Bend relief part number	Bend relief part number	Note
	in dry atmosphere	in water steam		For plug	For cable socket	
TPU (Thermoplastic polyurethane) non-sterilization version	-40°C/+80°C	not compatible	black	**GMF.MP.140.DN**	**GMP.MP.140.DN**	●
			grey	**GMF.MP.140.DG**	**GMP.MP.140.DG**	○
TPV (Thermoplastic vulcanizates) sterilization possible Steam sterilization: 20 cycles ETO sterilization: 3 cycles	-50°C/+135°C	-50°C/+135°C	black	**GMF.MP.140.SN**	**GMP.MP.140.SN**	●
			grey	**GMF.MP.140.SG**	**GMP.MP.140.SG**	○

Note: the minimum cable diameter is 6.2 mm. See cable assembly instructions.

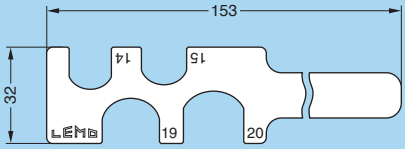
● First choice alternative ○ Special order alternative

Tooling

MOP.027.HN Spanner for notched nut

MOB.275.HN Tool for front nut (for MK● socket and MT● fixed cable socket)

DCP.91.142.0AK Spanners for backknut



Tooling for low voltage

DPC.91.701.V Manual crimping tool [1)]

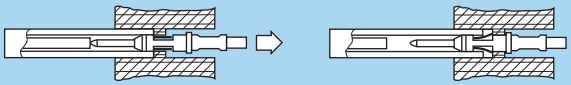
MOE Positioners for crimp contacts

Male

Female

Note: [1)] this manual crimping tool can be ordered at DANIELS.
Part number: MIL-C-22520/7-01.

DCC Manual extractors for crimp contacts



Contact ø (mm)	Positioners part number		Extractor part number
	For male contacts	For female contacts	
0.9	**MOE.090.VC**	**MOE.090.VM**	**DCC.09.05B.LAG**
0.7	**MOE.070.VC**	**MOE.070.VM**	**DCC.07.04B.LAG**

Note: 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.

Tooling for fibre optic

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

DPE.99.003.1K Crimping tool for fibre optic contact F7 type

DCC.91.F12.LAG Manual extractor for fibre optic contact F1 and F2 type

DCC.91.CF7.LAG Manual extractor for fibre optic contact F7 type

DCS.F2.035.PN
DCS.F7.035.PN F2 or F7 contact alignment device installation/extraction tool

WST.KI.125.34 Cleaning kit for fibre optic contact F1 and F2 type

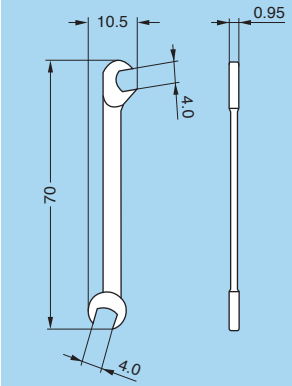
Tooling for fluidic

DCC.91.CP1.LAG Manual extractor for fluidic contact P1

Tooling for coax

DCC.91.CP1.LAG Manual extractor for coaxial contact 50 and 75Ω

DCP.99.040.TC Spanner for tightening the coax contact

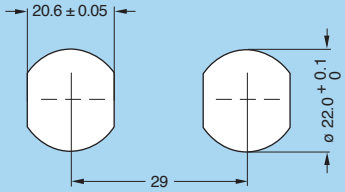


DPE Crimping tool with die

Part number	Part number		Recommended cable
	For male contact	For female contact	
DPE.99.083.8K	FFS.2B.275.ZTCE31	PSS.2B.275.ZTME31	RG179B/U
DPE.99.124.3K	FFS.2B.275.ZTCE37	PSS.2B.275.ZTME37	DRAKA 0.41/1.9AF
DPE.99.103.8K	FFS.2B.250.ZTCE24	PSS.2B.250.ZTME24	RG178B/U, RG196A/U
DPE.99.103.1K	FFS.2B.250.ZTCE30	PSS.2B.250.ZTME30	RG174A/U, RG188A/U, RG316/U
DPE.99.103.8K	FFS.2B.250.ZTCE31	PSS.2B.250.ZTME31	RG179B/U, RG187A/U

Panel cut-out

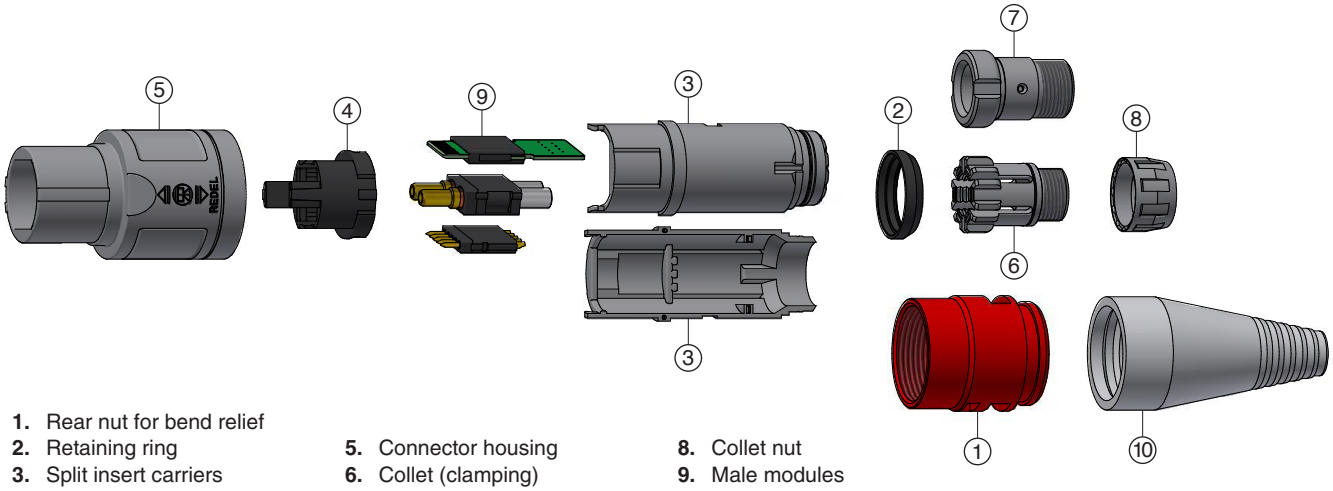
ML●, MK●, MP● and MT●



Note: Socket and fixed cable socket mounting nut torque = 1 Nm.
All dimensions are in millimeters.

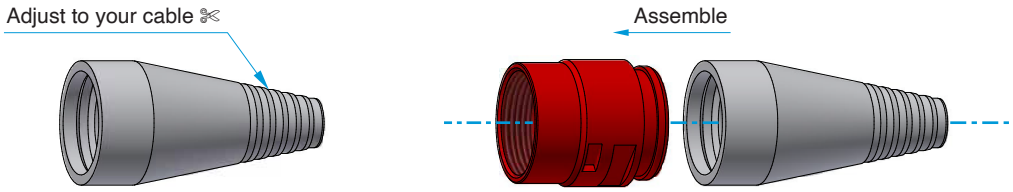
Connector assembly instructions

Straight plug hybrid module assembly instructions.

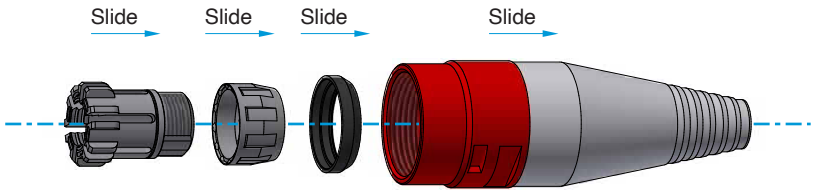


1. Rear nut for bend relief
2. Retaining ring
3. Split insert carriers
4. Male insulator
5. Connector housing
6. Collet (clamping)
7. Collet (T adaptor)
8. Collet nut
9. Male modules
10. Bend relief for plug

1

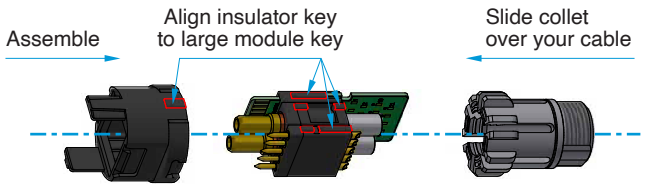


2



3

4



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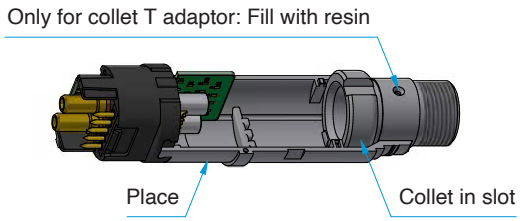
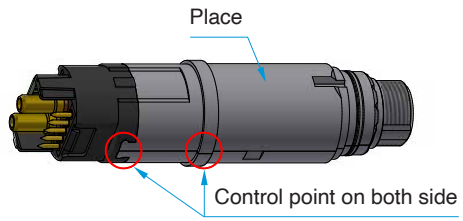
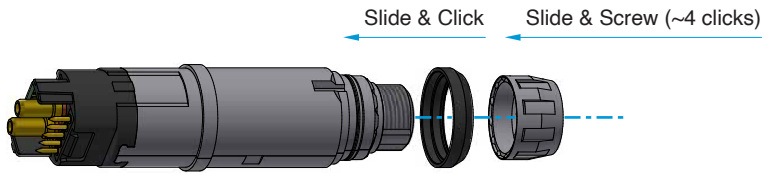

Only for collet T adaptor: Fill with resin
Place
Collet in slot

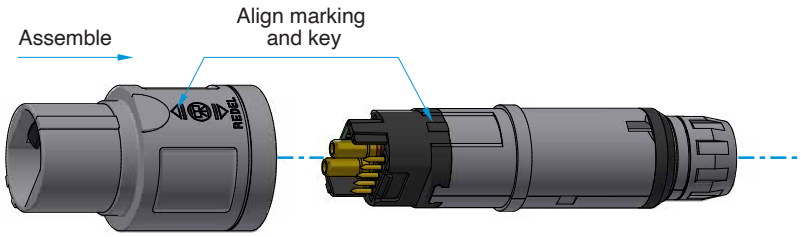
6


Place
Control point on both side

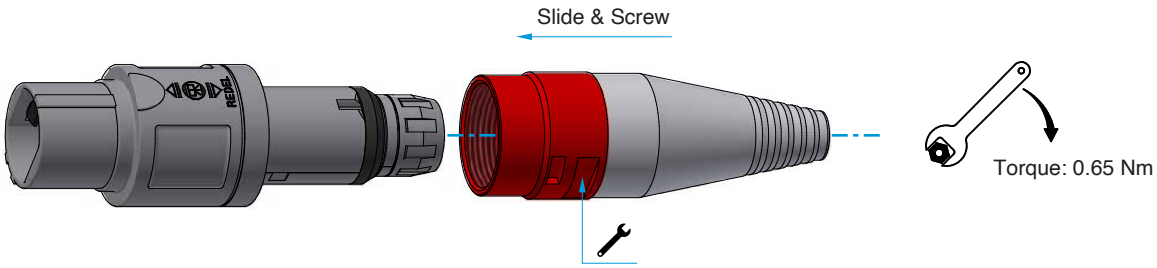
7


Slide & Click
Slide & Screw (~4 clicks)

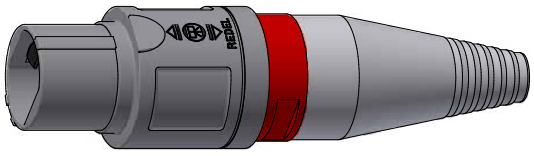
8


Assemble
Align marking
and key

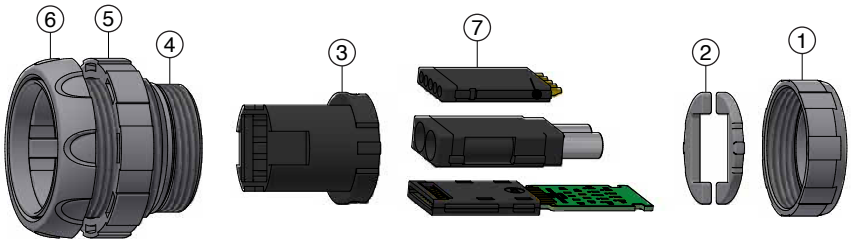
9


Slide & Screw
Torque: 0.65 Nm

10



Back mounting socket hybrid module assembly instructions.



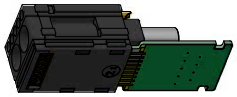
1. Retaining ring
2. Insulating spacer
3. Female insulator
4. Connector housing
5. Notched nut
6. Front nut
7. Female modules

1

Slide retaining ring over your cable

2

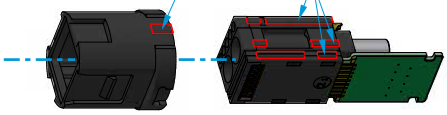
Assemble your modules in your female insulator



3

Assemble

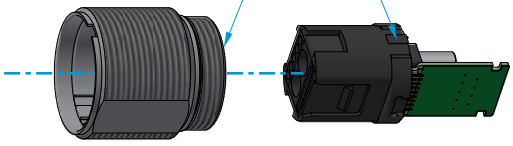
Align insulator key to large module key



4

Assemble

Align slot and key



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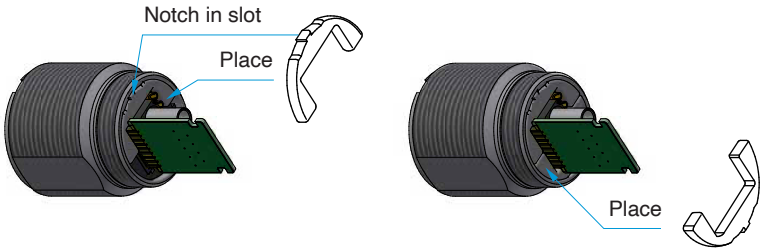
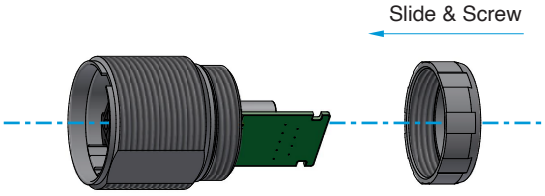
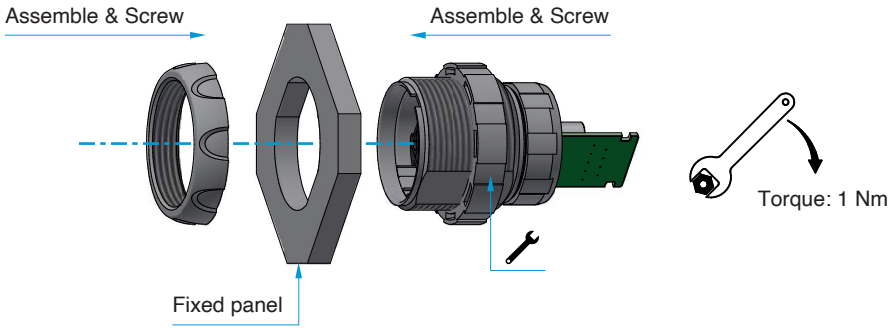

Notch in slot
Place
Place

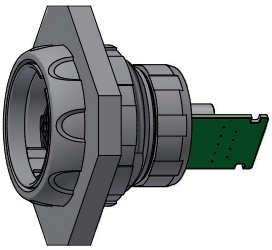
6


Slide & Screw

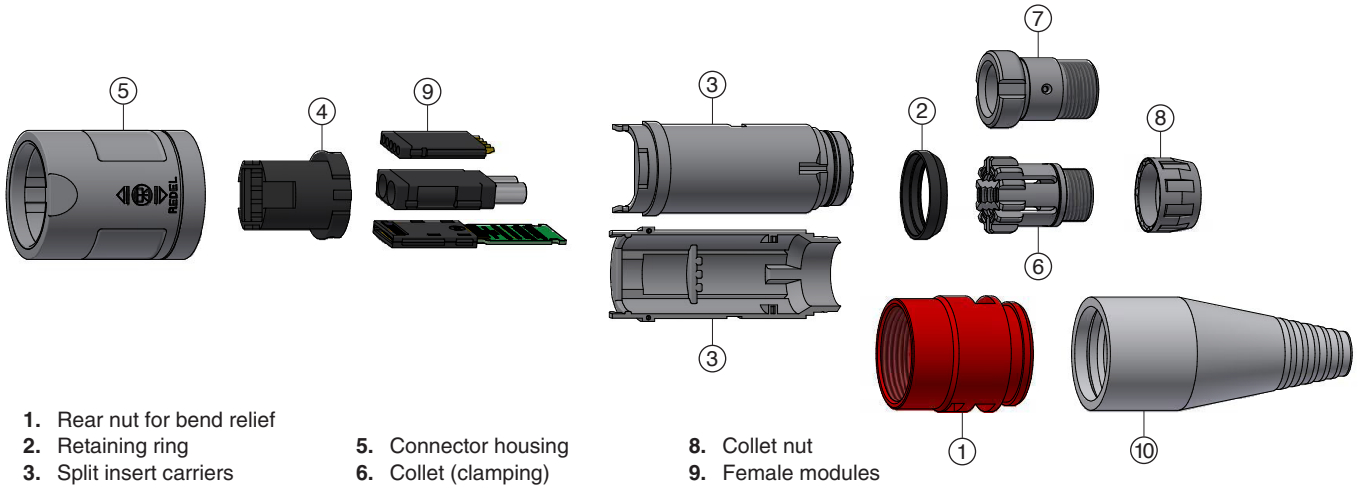
7


Assemble & Screw
Assemble & Screw
Torque: 1 Nm
Fixed panel

8

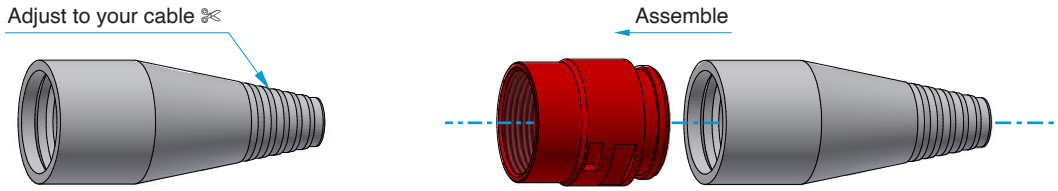


Free cable socket hybrid module assembly instructions.

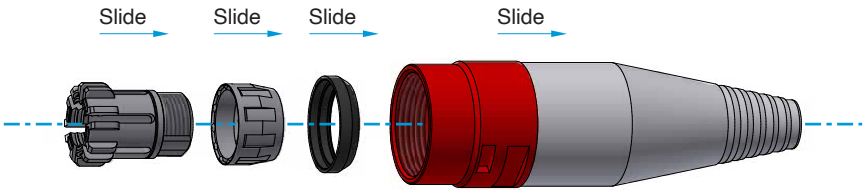


1. Rear nut for bend relief
2. Retaining ring
3. Split insert carriers
4. Female insulator
5. Connector housing
6. Collet (clamping)
7. Collet (T adaptor)
8. Collet nut
9. Female modules
10. Bend relief for free cable socket

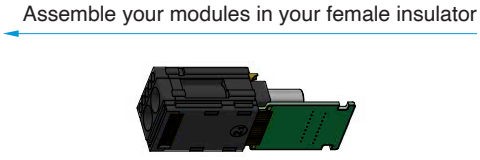
1



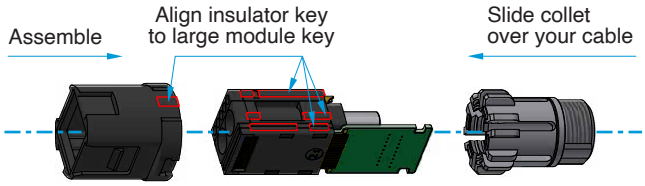
2



3



4



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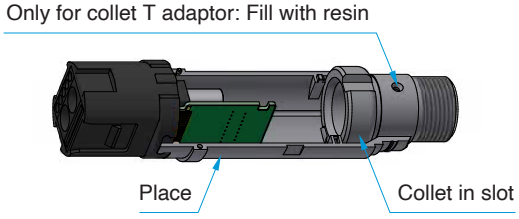

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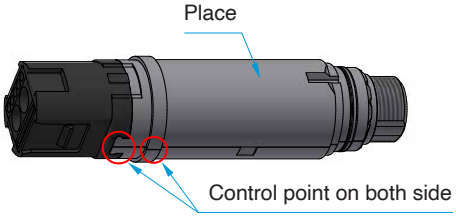
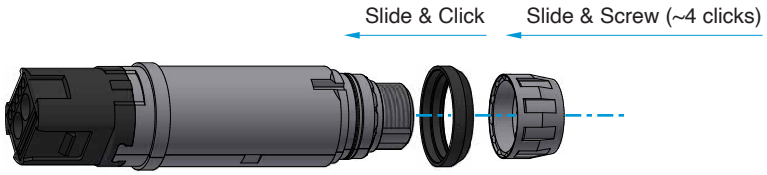
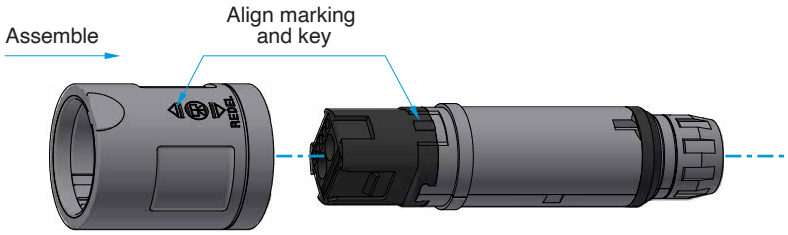


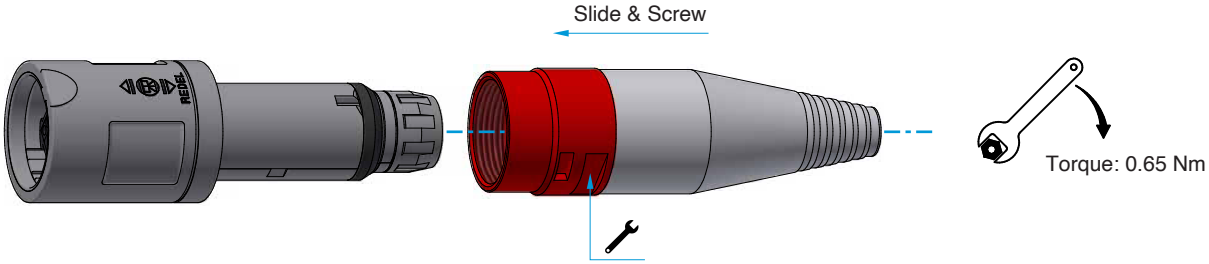
7



8



9



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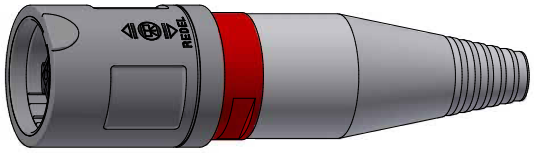


Cable assembly instructions

For cable assembly instructions please contact LEMO.

Calculation method

Test voltage

Test voltage (Ue) :
(measured according to the IEC 60512-2 test 4a standard)

It corresponds to 75% of the mean breakdown voltage.
Test voltage is applied at 500 V/s and the test duration is 1 minute.

This test has been carried out with a mated plug and socket, with power supply only on the plug end.

The operating voltage value definition is at the entire responsibility of the customer who defines this value according to the safety factors that they apply to their equipment and system.

Caution:
For a number of applications, safety requirements for electrical appliances are more severe with regard to operating voltage.
In such cases operating voltage is defined according to creepage distance and air clearance) between live parts. Please consult us for the choice of a connector by indicating the safety standard to be met by the product.

Voltage values are given in the table on insulator types for each series.
They correspond with values measured at sea level. They are adapted to all applications up to an altitude of 2000 m.

In case a device is used at a higher altitude, air clearance between live parts has to be multiplied by the following coefficients.
It means also that test voltage has to be divided by this coefficient.

altitude (m)	coefficient
2000	1.00
3000	1.14
4000	1.29
5000	1.48

Rated current

(measured according to IEC 60512-3 test 5a)

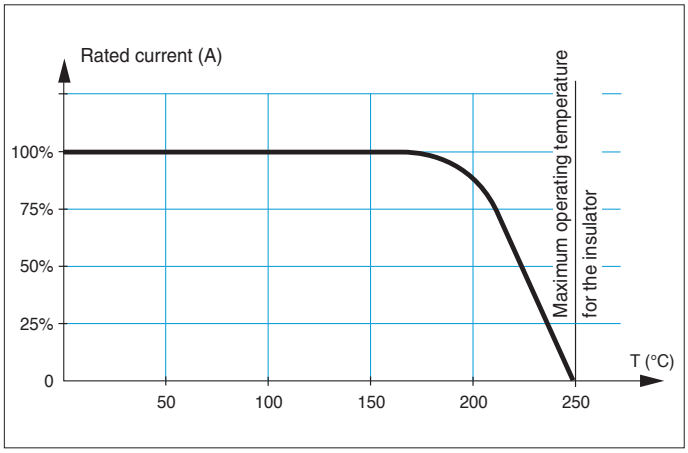
The specified rated current can be applied simultaneously to all the contacts.
It corresponds with an average temperature rise of 40°C of the connector.

The current values are indicated in the table of insulator types in each series.
For use at higher temperatures acceptable rated current will be lower. It tends towards zero as the material is used at the maximum operating temperature accepted for the insulator.

In most case the current depend on the conductor dimension or on the printed circuit dimension.

Caution:
In general, connectors should not be unmated while live.

For connectors with PEEK insulator, maximum admissible current will follow the curve below depending on the operating temperature T.



Technical tables

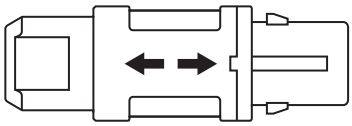
Table of American Wire Gauge

AWG	Construction		ø wire max		Wire section	
	Strand nb	AWG/ strand	(mm)	(in)	(mm^2)	(sq in)
0	259	24	11.277	0.444	52.90	0.0820
1	817	30	9.702	0.382	41.40	0.0641
2	259	26	8.89	0.35	33.20	0.0514
4	133	25	6.9596	0.274	21.5925	0.0335
6	133	27	5.5118	0.217	13.5885	0.0211
8	168	30	4.4450	0.175	8.5127	0.0132
8	133	29	4.3942	0.173	8.6053	0.0133
10	105	30	3.3020	0.13	5.3204	0.0082
10	37	26	2.9210	0.115	4.7397	0.0073
10	1	10	2.6162	0.103	5.2614	0.0082
12	37	28	2.3114	0.091	2.9765	0.0046
12	19	25	2.3622	0.093	3.0847	0.0048
12 [1)]	7	20	2.5400	0.10	3.6321	0.0056
12	1	12	2.0828	0.082	3.3081	0.0051
14	41	30	2.0574	0.081	2.0775	0.0032
14	19	27	1.8542	0.073	1.9413	0.0030
14 [1)]	7	22	2.0828	0.082	2.2704	0.0035
14	1	14	1.6510	0.065	2.0820	0.0032
16 [1)]	65	34	1.5748	0.062	1.3072	0.0020
16	26	30	1.5748	0.062	1.3174	0.0020
16	19	29	1.4986	0.059	1.2293	0.0019
16 [1)]	7	24	1.5494	0.061	1.4330	0.0022
16	1	16	1.3208	0.052	1.3076	0.0020
18 [1)]	65	36	1.2700	0.05	0.8234	0.0013
18 [1)]	42	34	1.2700	0.05	0.8447	0.0013
18	19	30	1.3208	0.052	0.9627	0.0015
18	16	30	1.2954	0.051	0.8107	0.0013
18	7	26	1.2700	0.05	0.8967	0.0014
18	1	18	1.0414	0.041	0.8229	0.0013

AWG	Construction		ø wire max		Wire section	
	Strand nb	AWG/ strand	(mm)	(in)	(mm^2)	(sq in)
20 [1)]	42	36	1.0160	0.04	0.5320	8.2×10^{-4}
20	19	32	1.0414	0.041	0.6162	0.0010
20	10	30	1.0160	0.04	0.5067	7.9×10^{-4}
20	7	28	0.9906	0.039	0.5631	8.7×10^{-4}
20	1	20	0.8382	0.033	0.5189	8.0×10^{-4}
22	19	34	0.8382	0.033	0.3821	5.9×10^{-4}
22	7	30	0.7874	0.031	0.3547	5.5×10^{-4}
22	1	22	0.6604	0.026	0.3243	5.0×10^{-4}
24 [1)]	42	40	0.6604	0.026	0.2045	3.2×10^{-4}
24	19	36	0.6858	0.027	0.2407	3.7×10^{-4}
24	7	32	0.6350	0.025	0.2270	3.5×10^{-4}
24	1	24	0.5588	0.022	0.2047	3.2×10^{-4}
26	19	38	0.5588	0.022	0.1540	2.4×10^{-4}
26	7	34	0.5080	0.02	0.1408	2.2×10^{-4}
26	1	26	0.4318	0.017	0.1281	2.0×10^{-4}
28 [1)]	19	40	0.4318	0.017	0.0925	1.4×10^{-4}
28	7	36	0.4064	0.016	0.0887	1.4×10^{-4}
28	1	28	0.3302	0.013	0.0804	1.2×10^{-4}
30	7	38	0.3302	0.013	0.0568	8.8×10^{-5}
30	1	30	0.2794	0.011	0.0507	7.9×10^{-5}
32	7	40	0.2794	0.011	0.0341	5.3×10^{-5}
32	1	32	0.2286	0.009	0.0324	5.0×10^{-5}
34	1	34	0.1693	0.007	0.0201	3.1×10^{-5}
36	1	36	0.127	0.005	0.0127	2.0×10^{-5}
38	1	38	0.1016	0.004	0.0081	1.3×10^{-5}
40	1	40	0.078	0.003	0.0049	7.5×10^{-6}

Note: [1)] not included in the standard

REDEL product family



- Medical and Industrial grade plastic
- Device ergonomics
- Electrical safety
- High density & modularity

LEMO REDEL's product family contains our three premium plastic series: the REDEL P Series, the REDEL SP Series, and the REDEL MP Series.

Over 5000 REDEL connectors

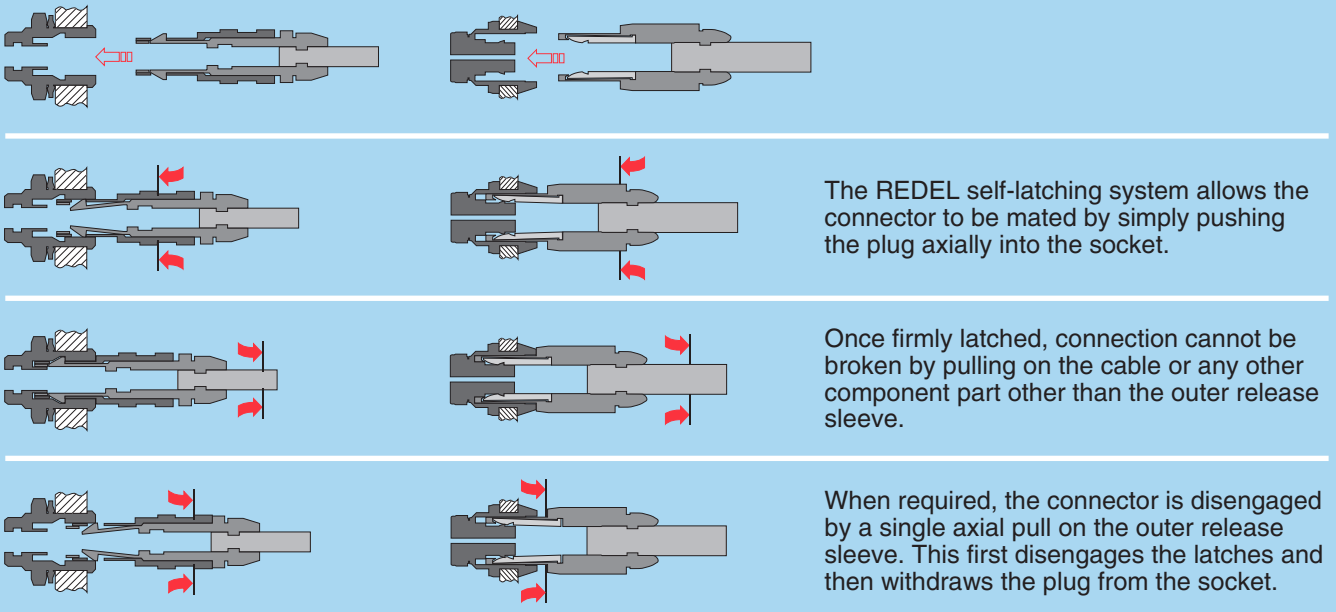
The modular design of the REDEL range provides over 5000 connectors from ø 14 mm to ø 21 mm, capable of handling cable diameters up to 9.5 mm and up to 144 contacts. This vast portfolio enables you to select the ideal connector configuration to suit almost any specific requirement in most markets, including medical devices, test and measurement instruments, machinery, audio video, telecommunications, defence and security.

Many contact configurations and safety features

LEMO's REDEL connectors offer a wide choice with numerous contact configurations: multipole contacts, coaxial, fibre optics and fluid connectors, so that signals, power, fluids, and light can all be transmitted with the highest reliability. Moreover, the added colour coding safety feature allows immediate visual confirmation of the compatibility of connectors.

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.
The REDEL product family provides two self-latching connection systems. The original push-pull mechanism is available in the P Series, while the internal push-pull is featured in the SP and MP Series.



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.

Product safety notice

PLEASE READ AND FOLLOW ALL INSTRUCTIONS 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 catalogue however these may be influenced by PC board design and / or wiring harnesses.
   The test voltage indicated in the catalogue 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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Note:

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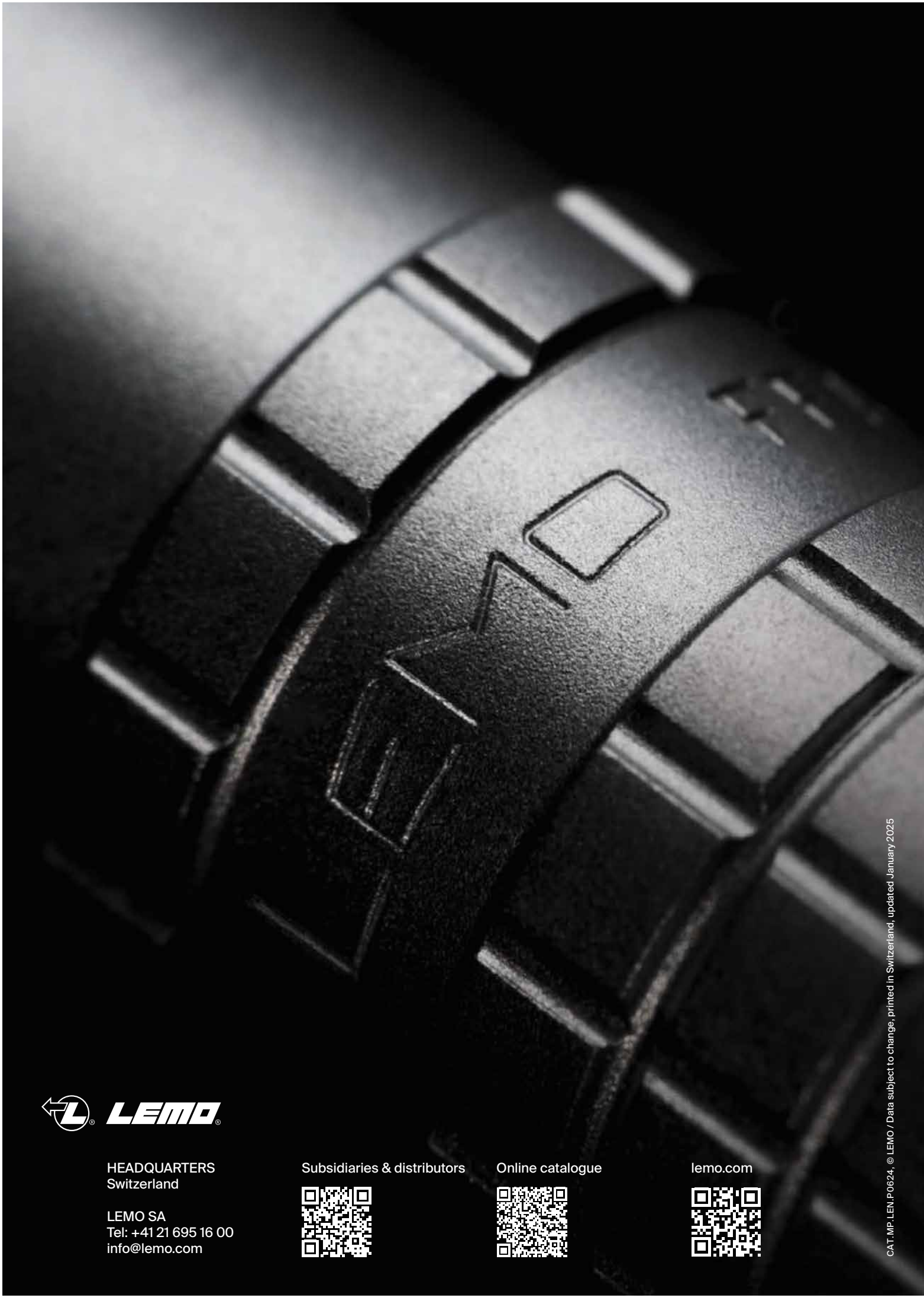

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