M Series
Connectors ratchet coupling

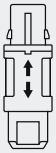
LEMO Solutions
Portfolio

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 trusted medical 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

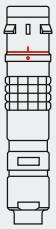
Series	M
	F
	D

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

Understanding LEMO's product selection benefits:

Standard versus **Special**.

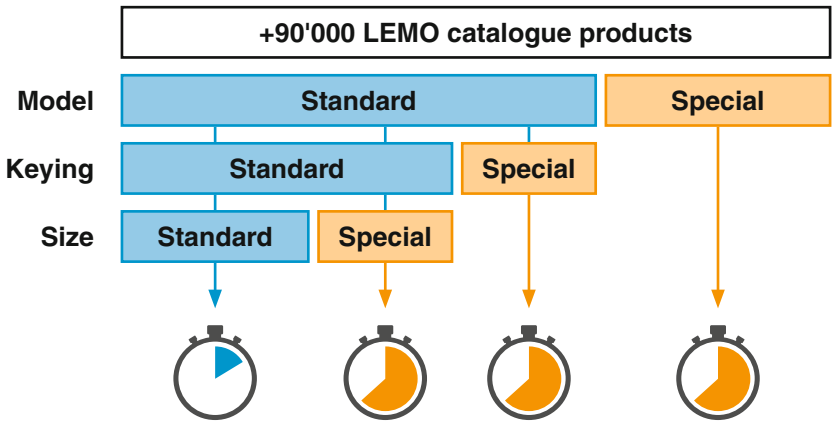
LEMO has a +75 years history of developing custom connectivity solutions. Our very broad offering of models combined with our modular insert design results in a range of over 90'000 connector solutions. This vast product portfolio enables you to select the ideal connector configuration to suit almost any specific requirement in the most demanding markets, including yours.

In this product catalogue we have structured our product offering into two categories:

- **STANDARD** products (in blue) – Most commonly used products for which we can ensure the best availability and shorter lead times.
- **SPECIAL** products (in orange) – More niche products designed for customers with specific requirements. For these products a minimum order quantity (MOQ) will apply, prices might be higher and lead times are typically longer.

And this differentiation between **STANDARD** and **SPECIAL** applies on three different levels:

1. **MODEL** – Outershell / Backshell shape
2. **KEYING** – Alignment key for differentiated mating
3. **SIZE** – Physical dimensions of the connector



Only if Model + Keying + Size are all within the STANDARD product offering, you will have the best availability and shorter lead time. We recommend you find as much as possible the right solution for your connectivity challenge within our standard product offer.
For all other, special products, we recommend you contact your local LEMO representative to discuss your overall project's life span and long-term needs, so we can align your forecast with applicable MOQ quantities.

By clearly distinguishing between Standard and Special products, LEMO ensures maximum flexibility while still offering the perfect solution to fully meet our customer needs.

Introduction

This catalogue provides a complete description of the LEMO M series portfolio. M series connectors are lightweight triple-start ratchet coupling type connectors designed for avionics, military, security, motorsport and heavy duty applications.

The M series is a COTS (Commercial Off-The-Shelf) product, that fulfills the harshest MIL-DTL-38999 requirements in a more compact and lightweight package. It features a very wide range of configurable options to fulfill every applications.

The LEMO engagement for supplying innovative solutions which meets users highest expectations translates through the M series in a highly reliable interconnect solution that helps our customers reduce their maintenance and downtime in critical applications.

The LEMO quality arises from years of expertise in design, manufacturing and quality system where all single M series connectors get identified with a laser engraved part number and production batch number for full traceability from raw materials to fully assembled product.

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.

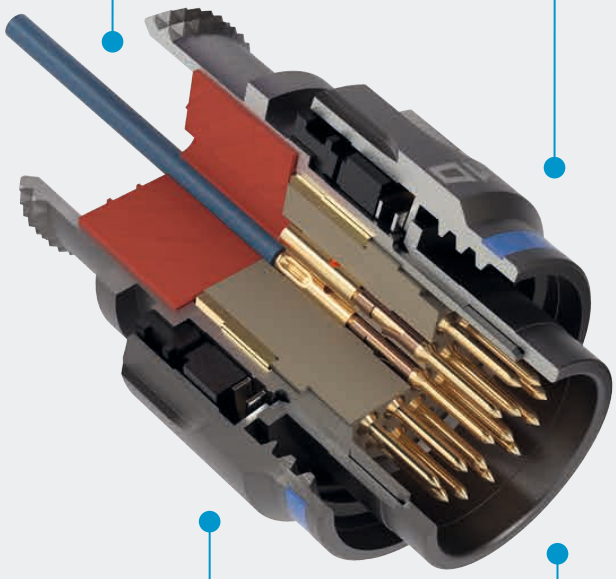
Table of contents

OPTIMA's M Series
Ligthweight and low-profile ratchet coupling connector

The LEMO **M Series** has been designed to meet the demands for applications where **space, weight, and durability** are critical. Designed with a robust **ratchet coupling mechanism**, it delivers secure, reliable connections in **high-vibration** environments, making it an exceptional choice for **UAV, aerospace, military, motorsport** and other demanding industries.

Built to withstand most demanding requirements, the M Series meets and **exceeds MIL-DTL-38999** standards in a more **compact and lightweight** design.

LEMO's M Series offers a wide range of configurations, including **multipole** combinations, **high-speed data** transfer, **high-frequency coaxial** options, **high-power** capabilities, and advanced **fibre optic** solutions.



Grommet or potting: Ensures consistent electrical connectivity in vibrating environments

Ratchet coupling: Provides a secure and reliable connection in high shock and vibration environment

Exceed MIL-DTL-38999 standards: Offer higher endurance cycles in a lighter and more compact design

Watertight and Vacuumtight in unmated condition: Enhance protection for sensitive equipment in harsh environment

Lightweight and compact design: Optimized to save weight and space for aerospace applications

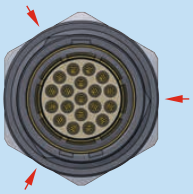
Dark and non reflective surface treatment: ideal choice for defense and security application

Extended temperature range (-55°C/+200°C): Allows deployment in a wide operational scenarios according to military & aerospace MIL-DTL-38999 standards

LEMO's ratchet 3/4 turn connection system

This highly robust 3/4 turn screw locking system is recognized worldwide for the most demanding applications as a safe, secure and quick screw mating system. Its special ratchet mechanisms provides ultra high reliability in the most severe vibrations environments, shocks or pull on the cables.

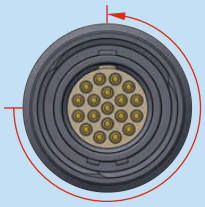
Triple start thread



Triple start thread

- Very fast coupling nut engagement in the socket
- Stable thread engagement making tilted nut engagement impossible

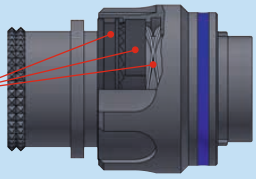
3/4 turn locking



3/4 turn locking

- Quick and fast connection requiring less than a full turn for complete mating
- Full mating possible with a single hand movement

Spring loaded ratchet system



Spring loaded ratchet on locking nut

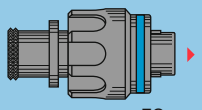
- Secure mating in high vibration environments
- No specific mating torque required to secure
- No tools required; hand torquing force is sufficient to secure

MM 0M 1M 2M 3M TM 4M LM 5M

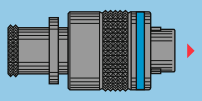
M series (standard models)

Standard models (page 12)

Straight plugs

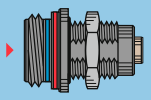


FG•

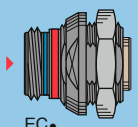


FM•

Sockets

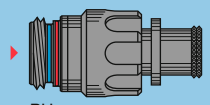


EG•

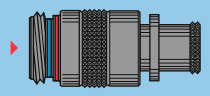


EC•

Free cable sockets

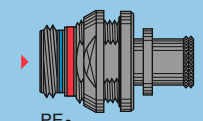


PH•



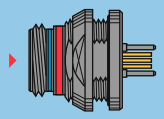
PM•

Fixed cable socket



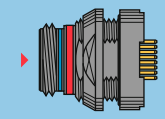
PE•

Watertight socket



HE•

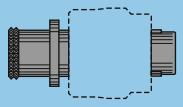
Vacuumtight socket



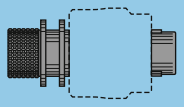
HY•

Standard backshell (page 11)

Mold stop

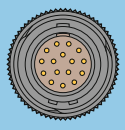


Heatshrink molded shapes

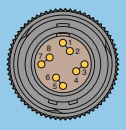


Configurations

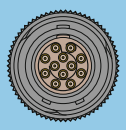
Multipole (page 22)



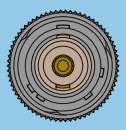
High Speed (page 30)



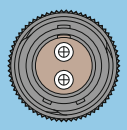
Coaxial (page 34)



High Power (page 39)



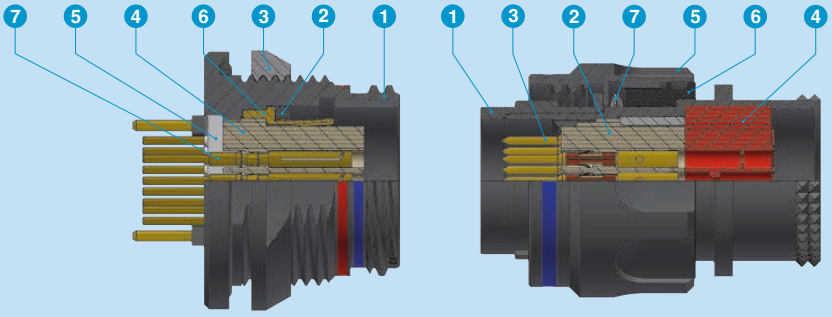
Fibre Optic (page 44)



Part section showing internal components

Socket

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



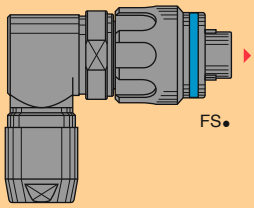
Straight plug

1. outer shell
2. insulator
3. male contact
4. rear seal
5. coupling nut
6. ratchet locking nut
7. spring

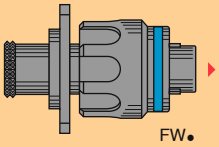
M series (special models and special backshell)

Special models (page 18)

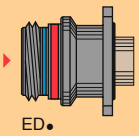
Elbow plug



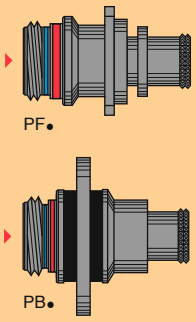
Straight plug



Socket

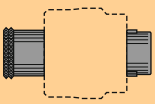


Fixed cable sockets

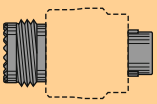


Special backshell (page 45)

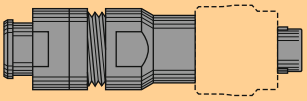
Straight



MIL-DTL-38999M (series III)

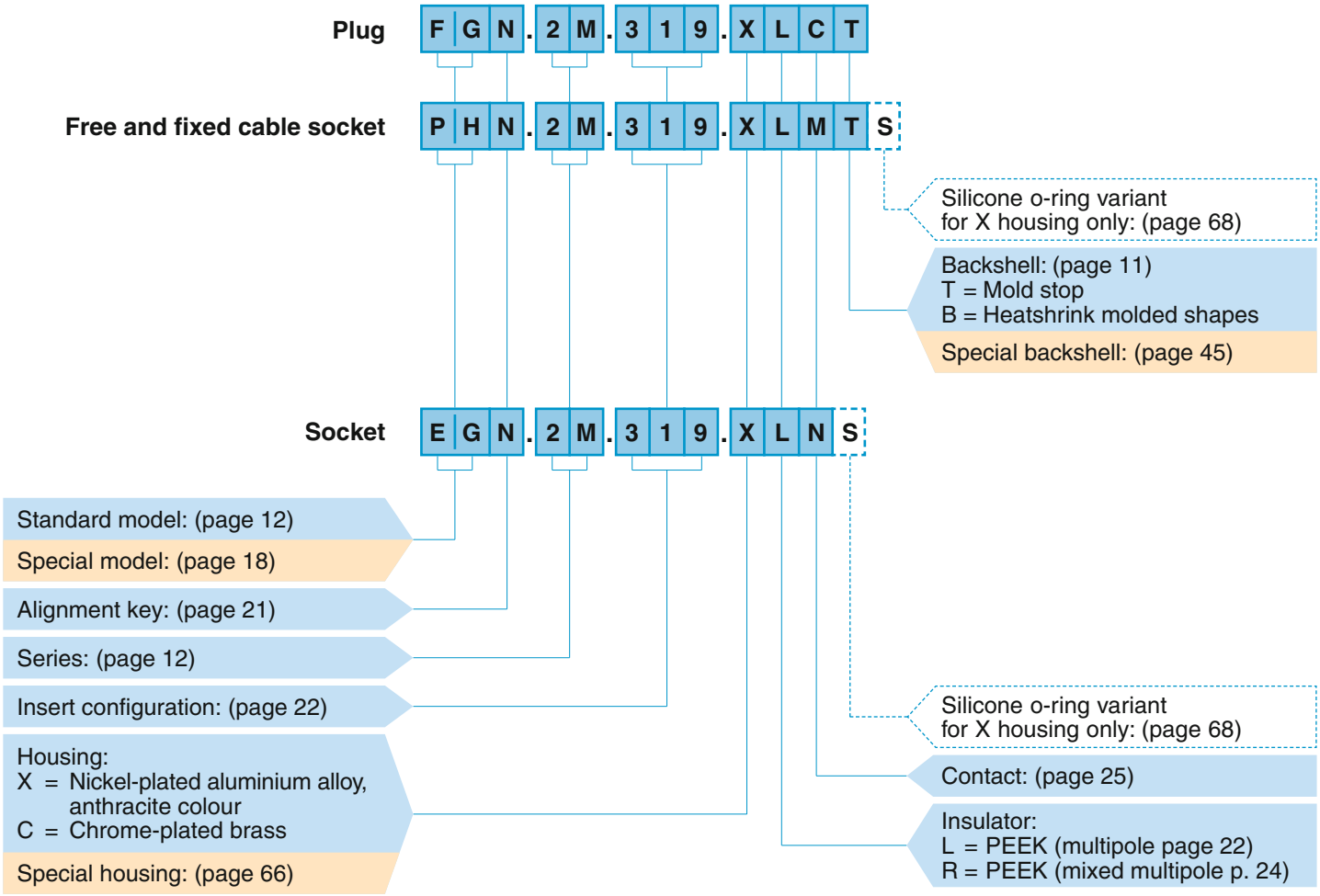


Cable collet backshell



Part numbering system

Standard models part numbering system



FGN.2M.319.XLCT = straight plug with key (N), arctic grip, 2M series, multipole type with 19 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, male crimp contacts and mold stop.

PHN.2M.319.XLMT = free cable socket with key (N), arctic grip, 2M series, multipole type with 19 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female crimp contacts and mold stop.

EGN.2M.319.XLN = socket, nut fixing, with key (N), 2M series, multipole type with 19 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female print contacts.

Others part numbering system

- **Watertight** (page 16)
- **Vacuumtight** (page 17)
- **High Speed** (page 26)
- **Coaxial** (page 33)
- **High Power** (page 37)
- **Fibre Optic** (page 42)

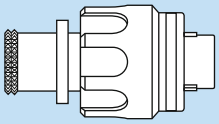
Standard models

Locking nuts

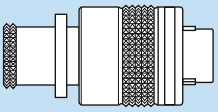
M Series connectors offer 2 different versions for coupling nut allowing to adapt ergonomics according to use cases.

- The Artic grip offers maximum ergonomics enabling easy manipulation even with gloves from size 0M to 5M.
- The Knurled grip is offer in size MM to 2M for most applications as it offers a good level of grip whilst keeping a very compact overall plug diameter.

Arctic grip (0M-5M)



Knurled grip (MM-2M)

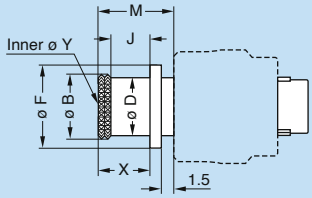


Backshell

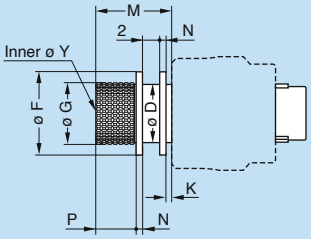
M Series connectors offers 2 different standard backshell allowing for various cable assembly attachments.

- The Mold stop offers a special geometry enabling over molding termination for a clean and rugged cable assembly finish.
- The Heatshrink molded shape offers the matching geometry to guarantee a perfect fit with heat shrink molded boots (see page 51).

Mold stop T



Heatshrink molded shapes B



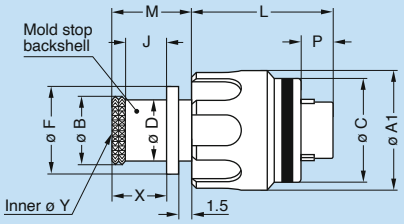
See page 51 for heatshrink boot

Series	Standard backshell dimensions (mm)										
	B	D	F	G	J	K	M	N	P	X	Y
MM	6.4	5.6	7.8	6.0	4.2	0.7	8.8	0.55	5.0	5.8	4.7
0M	8.8	8.0	10.7	8.4	5.1	0.7	9.7	0.60	5.8	6.7	6.6
1M	10.5	9.7	12.4	10.1	5.1	0.7	9.7	0.60	5.8	6.7	8.3
2M	14.0	13.0	15.5	13.4	5.1	0.7	10.1	0.80	5.8	7.1	11.6
3M	16.0	15.0	17.5	15.4	5.1	0.7	10.1	0.80	5.8	7.1	13.6
TM	17.9	16.7	19.8	17.1	5.2	0.8	10.6	1.00	5.8	7.6	14.6
4M	20.7	19.5	22.6	19.9	5.2	0.8	10.6	1.00	5.8	7.6	17.6
LM	23.9	22.7	25.8	23.1	5.2	0.8	10.6	1.00	5.8	7.6	20.6
5M	29.7	28.5	31.4	28.9	5.2	0.8	10.6	1.00	5.8	7.6	26.6

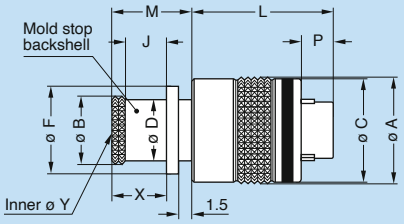
● Standard
● Special

F●● Straight plug, key (N or H to X) with knurled or arctic grip and mold stop

FG●



FM●

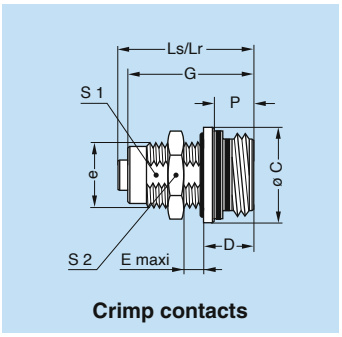


Reference		Dimensions (mm)											
Model	Series	A	A1	B	C	D	F	J	L	M	P	X	Y
FM●	**MM**	11.1	–	6.4	10.7	5.6	7.8	4.2	15.5	8.8	5.5	5.8	4.7
F●●	**0M**	13.1	14.4	8.8	12.7	8.0	10.7	5.1	17.4	9.7	3.9	6.7	6.6
F●●	**1M**	14.6	15.9	10.5	14.2	9.7	12.4	5.1	17.4	9.7	3.9	6.7	8.3
F●●	**2M**	17.6	18.9	14.0	17.2	13.0	15.5	5.1	17.4	10.1	3.9	7.1	11.6
FG●	**3M**	–	20.9	16.0	19.2	15.0	17.5	5.1	17.4	10.1	3.9	7.1	13.6
FG●	**TM**	–	23.4	17.9	22.0	16.7	19.8	5.2	21.0	10.6	3.4	7.6	14.6
FG●	**4M**	–	25.9	20.7	24.5	19.5	22.6	5.2	21.0	10.6	3.4	7.6	17.6
FG●	**LM**	–	29.4	23.9	28.0	22.7	25.8	5.2	21.0	10.6	3.4	7.6	20.6
FG●	**5M**	–	34.9	29.7	33.5	28.5	31.4	5.2	21.0	10.6	3.4	7.6	26.6

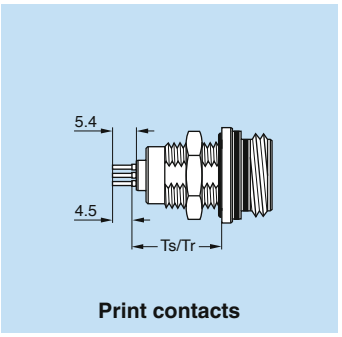
● Standard
● Special

Note: for heatshrink molded shapes backshell see page 11 and for special backshell see page 45.

EG● Socket, nut fixing, key (N or H to X)



Crimp contacts



Print contacts

Reference		Dimensions (mm)											
Model	Series	C	D	e	E	G	Ls	Lr	P	S1	S2	Ts	Tr
EG●	MM	10.7	5.2	M7x0.5	4.5	13.8	15.0	15.0	3.7	6.3	9.0	10.7	–
EG●	0M	12.7	6.8	M9x0.6	5.0	16.8	18.3	18.3	5.3	8.2	11.0	12.4	–
EG●	1M	14.2	6.8	M11x1.0	4.5	16.8	18.3	18.3	5.3	9.5	13.0	12.4	–
EG●	2M	17.2	6.8	M14x1.0	4.5	16.8	18.3	18.3	5.3	12.5	17.0	12.4	–
EG●	3M	19.2	6.8	M16x1.0	4.0	16.8	18.3	18.3	5.3	14.5	19.0	12.4	–
EG●	TM	22.0	9.4	M18x1.0	4.0	18.9	20.0	21.9	7.9	16.5	22.0	11.5	13.4
EG●	4M	24.5	9.4	M21x1.0	4.0	18.9	20.0	21.9	7.9	19.5	25.0	11.5	13.4
EG●	LM	28.0	9.4	M24x1.0	4.0	18.9	20.0	21.9	7.9	22.5	30.0	11.5	13.4
EG●	5M	33.5	9.4	M30x1.0	4.0	18.9	20.0	21.9	7.9	28.5	36.0	11.5	13.4

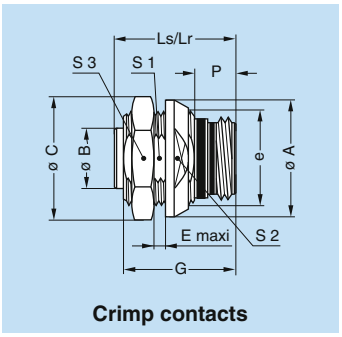
Panel cut-out (page 59).

PCB drilling pattern (page 60).

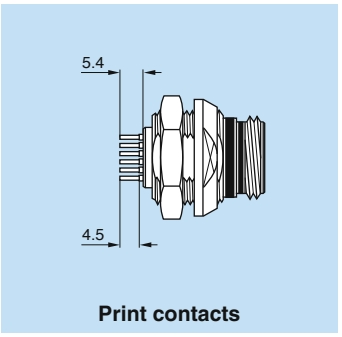
● Standard
● Special

Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).

EC● Socket with two nuts, key (N or H to X) (these models are not IP68 due to the absence of panel sealing)



Crimp contacts



Print contacts

Reference		Dimensions (mm)											
Model	Series	A	B	C	E	e	G	Ls	Lr	P	S1	S2	S3
EC●	MM	14.0	2.85	13.5	5.0	M10x0.50	13.8	15.0	15.0	3.7	9.0	11.0	12.0
EC●	0M	17.0	4.72	18.2	5.0	M13x0.75	16.8	18.3	18.3	5.3	11.5	14.0	16.0
EC●	1M	18.0	5.95	19.2	5.0	M14x1.00	16.8	18.3	18.3	5.3	12.5	16.0	17.0
EC●	2M	21.0	8.95	21.5	4.0	M17x1.00	16.8	18.3	18.3	5.3	15.5	18.0	19.0
EC●	3M	23.0	10.95	25.0	4.0	M19x1.00	16.8	18.3	18.3	5.3	17.5	20.0	22.0
EC●	TM	27.0	12.30	28.0	2.5	M22x1.00	18.9	20.0	21.9	7.9	20.5	23.0	25.0
EC●	4M	29.0	13.95	34.0	2.5	M24x1.00	18.9	20.0	21.9	7.9	22.5	25.0	30.0
EC●	LM	33.0	17.95	36.0	2.5	M28x1.00	18.9	20.0	21.9	7.9	26.5	29.0	32.0
EC●	5M	38.0	22.90	41.0	2.5	M33x1.00	18.9	20.0	21.9	7.9	31.5	34.0	37.0

Panel cut-out (page 59).

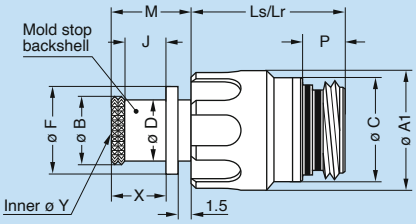
PCB drilling pattern (page 60).

● Standard
● Special

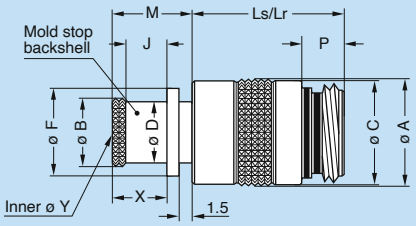
Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).

P●● Free cable socket, key (N or H to X) with knurled or arctic grip and mold stop

PH●



PM●

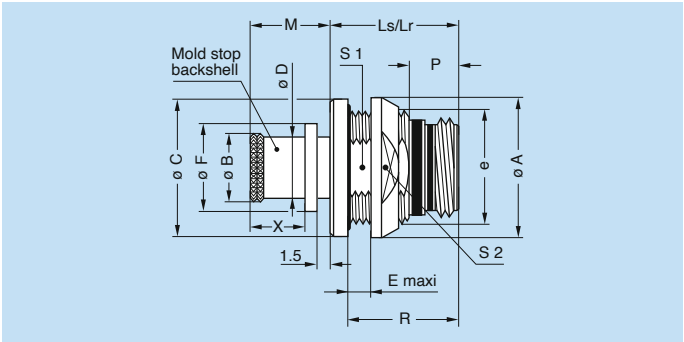


Reference		Dimensions (mm)												
Model	Series	A	A1	B	C	D	F	J	Ls	Lr	M	P	X	Y
PM●	**MM**	11.1	–	6.4	10.7	5.6	7.8	4.2	15.6	15.6	8.8	3.7	5.8	4.7
P●●	**0M**	13.1	14.4	8.8	12.7	8.0	10.7	5.1	18.9	18.9	9.7	5.3	6.7	6.6
P●●	**1M**	14.6	15.9	10.5	14.2	9.7	12.4	5.1	18.9	18.9	9.7	5.3	6.7	8.3
P●●	**2M**	17.6	18.9	14.0	17.2	13.0	15.5	5.1	18.9	18.9	10.1	5.3	7.1	11.6
PH●	**3M**	–	20.9	16.0	19.2	15.0	17.5	5.1	18.9	18.9	10.1	5.3	7.1	13.6
PH●	**TM**	–	23.4	17.9	22.0	16.7	19.8	5.2	20.6	20.6	10.6	7.9	7.6	14.6
PH●	**4M**	–	25.9	20.7	24.5	19.5	22.6	5.2	20.6	20.6	10.6	7.9	7.6	17.6
PH●	**LM**	–	29.4	23.9	28.0	22.7	25.8	5.2	20.6	20.6	10.6	7.9	7.6	20.6
PH●	**5M**	–	34.9	29.7	33.5	28.5	31.4	5.2	20.6	20.6	10.6	7.9	7.6	26.6

● Standard
● Special

Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).
For sheatshrink molded shapes backshell see page 11 and for special backshell see page 45.

PE● Fixed cable socket, nut fixing, key (N or H to X) and mold stop (back panel mounting)



Reference		Dimensions (mm)														
Model	Series	A	B	C	D	E	F	e	Ls	Lr	M	P	R	S1	S2	X
PE●	**MM**	14.0	6.4	13.8	5.6	4.0	7.8	M10x0.50	12.6	12.6	8.8	3.7	10.5	9.0	11.0	5.8
PE●	**0M**	17.0	8.8	16.8	8.0	5.0	10.7	M13x0.75	15.9	15.9	9.7	5.3	13.8	11.5	14.0	6.7
PE●	**1M**	18.0	10.5	17.8	9.7	5.0	12.4	M14x1.00	15.9	15.9	9.7	5.3	13.8	12.5	16.0	6.7
PE●	**2M**	21.0	14.0	20.8	13.0	5.0	15.5	M17x1.00	15.9	15.9	10.1	5.3	13.8	15.5	18.0	7.1
PE●	**3M**	23.0	16.0	22.8	15.0	5.0	17.5	M19x1.00	15.9	15.9	10.1	5.3	13.8	17.5	20.0	7.1
PE●	**TM**	27.0	17.9	25.8	16.7	4.0	19.8	M22x1.00	18.9	19.5	10.6	7.9	16.9	20.5	23.0	7.6
PE●	**4M**	29.0	20.7	27.8	19.5	4.0	22.6	M24x1.00	18.9	19.5	10.6	7.9	16.9	22.5	25.0	7.6
PE●	**LM**	33.0	23.9	31.8	22.7	4.0	25.8	M28x1.00	18.9	19.5	10.6	7.9	16.9	26.5	29.0	7.6
PE●	**5M**	38.0	29.7	36.8	28.5	4.0	31.4	M33x1.00	18.9	19.5	10.6	7.9	16.9	31.5	34.0	7.6

Panel cut-out (page 59).

● Standard
● Special

Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).
This model is not available with straight backshell (backshell not supplied).
For heatshrink molded shapes backshell see page 11 and for special backshell see page 45.

Watertight model (unmated)

Part numbering system

Socket **HEN.1M.305.XLNP**

- Model: HE
- Alignment key: (page 21)
- Series: (see below)
- Insert configuration: (page 22)
- Housing:
  X = Nickel-plated aluminium alloy, anthracite colour
  C = Chrome-plated brass
- Special housing: (page 66)
- Potting:
  P = Epoxy
  R = Silicone
- Contact: (page 25)
- Insulator:
  L = PEEK (multipole page 22)
  R = PEEK (mixed multipole p. 24)

HEN.1M.305.XLNP = socket, nut fixing, with key (N), 1M series, multipole type with 5 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female print contacts, watertight.

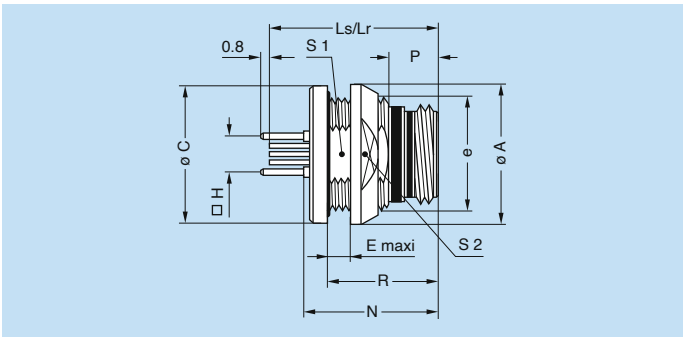
Environmental performance

Characteristics	Value	Potting	O-ring	Standard
Operating temperature	-20°C/+80°C	Epoxy	FKM	–
	-65°C/+180°C	Silicone	Silicone	EIA-364-32 1)

Characteristics	Value	Standard
Unmated ingress protection	IP68 (20 m, 2 h)	IEC 60529

Note: 1) Method A, condition IV (5 cycles) / RTCA DO-160G.

HE● Socket, nut fixing, key (N or H to X), printed circuit, watertight (back panel mounting)



Reference		Dimensions (mm)											
Model	Series	A	C	e	E	H	Ls	Lr	N	P	R	S1	S2
HE●	MM	14.0	13.8	M10x0.50	4.0	5.08	20.4	20.4	15.3	3.7	10.5	9.0	11.0
HE●	0M	17.0	16.8	M13x0.75	5.0	5.08	20.8	21.0	16.8	5.3	13.8	11.5	14.0
HE●	1M	18.0	17.8	M14x1.00	5.0	7.62	20.8	21.0	16.8	5.3	13.8	12.5	16.0
HE●	2M	21.0	20.8	M17x1.00	5.0	8.89	20.8	21.0	16.8	5.3	13.8	15.5	18.0
HE●	3M	23.0	22.8	M19x1.00	5.0	10.16	20.8	21.0	16.8	5.3	13.8	17.5	20.0
HE●	TM	27.0	25.8	M22x1.00	4.0	12.70	24.6	24.6	19.9	7.9	16.9	20.5	23.0
HE●	4M	29.0	27.8	M24x1.00	4.0	13.97	24.6	24.6	19.9	7.9	16.9	22.5	25.0
HE●	LM	33.0	31.8	M28x1.00	4.0	16.51	24.6	24.6	19.9	7.9	16.9	26.5	29.0
HE●	5M	38.0	36.8	M33x1.00	4.0	20.32	24.6	24.6	19.9	7.9	16.9	31.5	34.0

Panel cut-out (page 59).

PCB drilling pattern (page 60).

● Standard
● Special

Note: in MM series, the four external earth contacts are shorter.
Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).

H Y — Vacuumtight model (unmated)

Part numbering system

Socket H Y N . 1 M . 3 0 5 . X L H W G E

- Model: HY
- Alignment key: (page 21)
- Series: (see below)
- Insert configuration: (page 22)
- Housing:
  X = Nickel-plated aluminium alloy, anthracite colour
  C = Chrome-plated brass
- Special housing: (page 66)
- O-ring material: E = EPDM
- PCB fixation:
  G = 4 ground pins
  Z = 4 threaded holes
- Potting: Silicone
  W = Vacuumtight (100% tested)
- Contact: H = female/male print
- Insulator:
  L = PEEK (multipole page 22)
  R = PEEK (mixed multipole p. 24)

HYN.1M.305.XLHWGE = socket, nut fixing, with key (N), 1M series, multipole type with 5 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female print contacts, vacuumtight, with 4 ground pins and a EPDM o-ring.

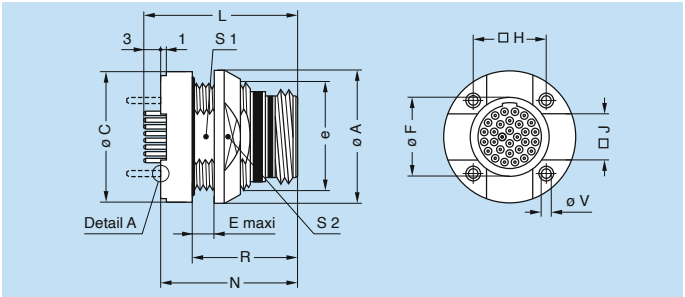
Environmental performance

Characteristics	Value	Standard
Operating temperature	-65°C/+180°C	EIA-364-32 [1]

Characteristics	Value	Standard
Leakage rate	< 10^{-7} mbar·l·s^{-1}	IEC 60512-2-17 test Qk

Note: [1] Method A, condition IV (5 cycles).

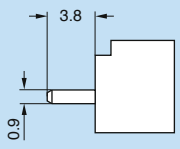
HY● **Socket, nut fixing, key (N or H to X), printed circuit, vacuumtight** (back panel mounting)



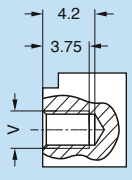
Reference		Dimensions (mm)												
Model	Series	A	C	e	E	F	H	J	L	N	R	S1	S2	V
HY●	MM	14.0	13.8	M10x0.50	4.0	5.7	6.35	3.0	19.1	16.1	10.5	9.0	11.0	M2x0.4
HY●	0M	17.0	16.8	M13x0.75	5.3	7.8	8.89	5.0	22.4	19.4	13.8	11.5	14.0	M2x0.4
HY●	1M	18.0	17.8	M14x1.00	5.3	8.8	10.16	5.5	22.4	19.4	13.8	12.5	16.0	M2x0.4
HY●	2M	21.0	20.8	M17x1.00	5.3	11.8	11.43	7.0	22.4	19.4	13.8	15.5	18.0	M2x0.4
HY●	3M	23.0	22.8	M19x1.00	5.3	13.8	12.70	8.0	22.4	19.4	13.8	17.5	20.0	M2x0.4
HY●	TM	27.0	25.8	M22x1.00	4.5	15.2	13.97	8.7	26.0	23.0	17.4	20.5	23.0	M3x0.5
HY●	4M	29.0	27.8	M24x1.00	4.5	16.8	15.24	9.5	26.0	23.0	17.4	22.5	25.0	M3x0.5
HY●	LM	33.0	31.8	M28x1.00	4.5	20.8	17.78	11.5	26.0	23.0	17.4	26.5	29.0	M3x0.5
HY●	5M	38.0	36.8	M33x1.00	4.5	25.9	21.59	14.0	26.0	23.0	17.4	31.5	34.0	M3x0.5

PCB fixation (Detail A)

G



Z



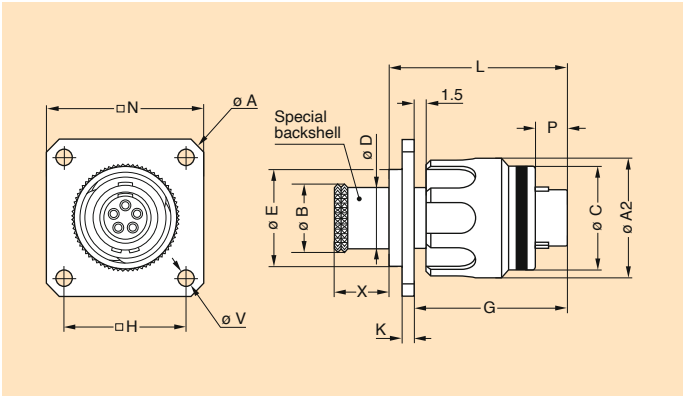
Note: special anti-vibration thread to be used with standard metric screws (not supplied).

Panel cut-out (page 59). PCB drilling pattern (page 62).

Special models

The M Series connector offer additional models in option to satisfy particular needs such as square flange or anti-vibration flange mounting.

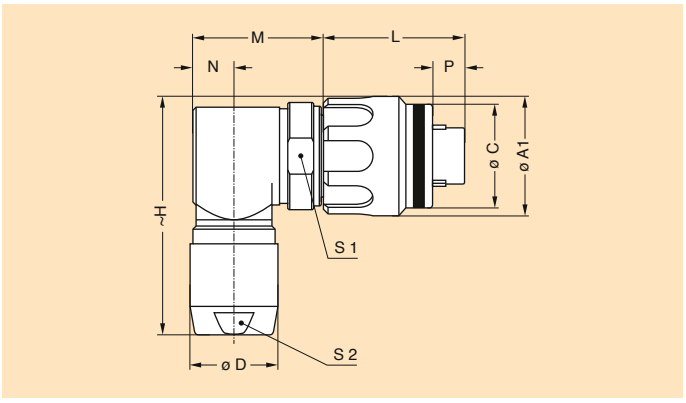
FW● Straight plug, key (N or H to X) with square flange
(these models are not IP68 due to the absence of panel sealing)



Reference		Dimensions (mm)													
Model	Series	A	A2	B	C	D	E	G	H	K	L	N	P	V	X
FW●	MM	21.5	12.0	6.4	10.7	5.6	9.5	17.0	12.0	1.5	20.3	17.0	5.5	2.7	5.8
FW●	0M	26.9	14.4	8.8	12.7	8.0	12.2	18.9	15.1	1.5	22.4	20.6	3.9	2.7	6.7
FW●	1M	31.4	15.9	10.5	14.2	9.7	13.7	18.9	18.3	1.5	22.4	23.8	3.9	3.3	6.7
FW●	2M	34.6	18.9	14.0	17.2	13.0	16.7	18.9	20.6	1.5	22.4	26.1	3.9	3.3	7.1
FW●	3M	34.6	20.9	16.0	19.2	15.0	18.7	18.9	20.6	1.5	22.4	26.1	3.9	3.3	7.1
FW●	TM	38.0	23.4	17.9	22.0	16.7	21.5	22.5	23.0	2.0	27.2	28.5	3.4	3.3	7.6
FW●	4M	40.3	25.9	20.7	24.5	19.5	24.0	22.5	24.6	2.0	27.2	30.1	3.4	3.3	7.6
FW●	LM	43.7	29.4	23.9	28.0	22.7	27.5	22.5	27.0	2.0	27.2	32.5	3.4	3.3	7.6
FW●	5M	47.0	34.9	29.7	33.5	28.5	33.0	22.5	29.4	2.0	27.2	37.0	3.4	3.3	7.6

Note: for heatshrink molded shapes backshell see page 11 and for special backshell see page 45.

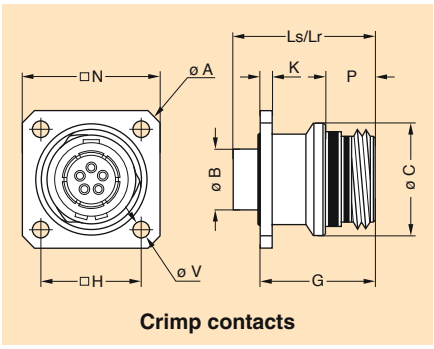
FS● Elbow plug, key (N or P, S, T and U) with arctic grip



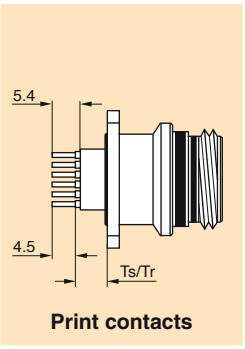
Reference		Dimensions (mm)								
Model	Series	A1	C	D	H	L	M	N	P	S1	S2
FS●	2M	18.9	17.2	13.9	37.7	17.4	20.5	6.5	3.9	16	12

Note: for special collet backshell see page 45.

ED● Socket, key (N or H to X) with square flange



Crimp contacts



Print contacts

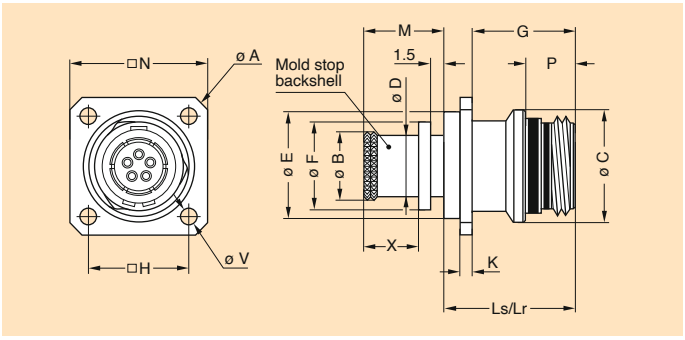
Reference		Dimensions (mm)												
Model	Series	A	B	C	G	H	K	Ls	Lr	N	P	Ts	Tr	V
ED●	MM	18.6	4.70	10.7	13.8	9.5	1.5	17.0	17.0	14.5	3.7	4.1	–	2.7
ED●	0M	20.6	4.72	12.7	14.3	11.0	1.5	18.3	18.3	16.0	5.3	4.9	–	2.7
ED●	1M	23.8	5.95	14.2	14.3	12.9	1.5	18.3	18.3	18.4	5.3	4.9	–	3.3
ED●	2M	26.9	8.95	17.2	14.3	15.1	1.5	18.3	18.3	20.6	5.3	4.9	–	3.3
ED●	3M	29.0	10.95	19.2	14.3	16.6	1.5	18.3	18.3	22.1	5.3	4.9	–	3.3
ED●	TM	31.4	12.30	22.0	16.5	18.3	2.0	20.0	21.9	23.8	7.9	4.4	6.3	3.3
ED●	4M	34.6	13.95	24.5	16.5	20.6	2.0	20.0	21.9	26.1	7.9	4.4	6.3	3.3
ED●	LM	38.0	17.95	28.0	16.5	23.0	2.0	20.0	21.9	28.5	7.9	4.4	6.3	3.3
ED●	5M	43.7	22.90	33.5	16.5	27.0	2.0	20.0	21.9	32.5	7.9	4.4	6.3	3.3

Panel cut-out (page 59).

PCB drilling pattern (page 60).

Note: Ls = standard gender, Lr = reverse gender (see p. 21 for standard/reverse gender options).

PF● Fixed cable socket, key (N or H to X) with square flange
(these models are not IP68 due to the absence of panel sealing)

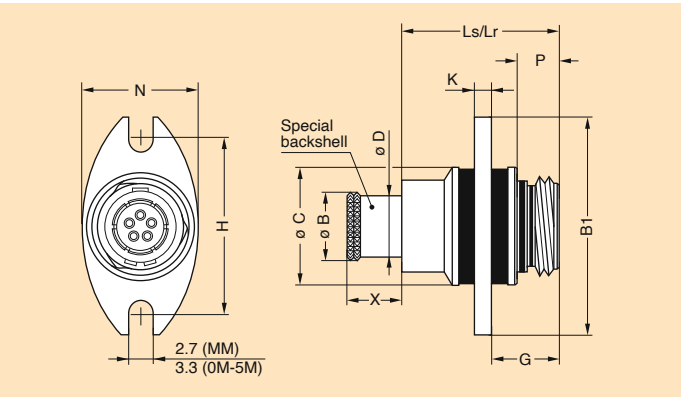


Reference		Dimensions (mm)																	
Model	Series	A	B	C	D	E	F	G	H	K	Ls	Lr	Ls[1)]	Lr[1)]	M	N	P	V	X
PF●	MM	18.6	6.4	10.7	5.6	7.8	7.8	12.3	9.5	1.5	15.6	15.6	–	–	8.8	14.5	3.7	2.7	5.8
PF●	0M	20.6	8.8	12.7	8.0	10.7	10.7	12.8	11.0	1.5	15.9	15.9	–	–	9.7	16.0	5.3	2.7	6.7
PF●	1M	23.8	10.5	14.2	9.7	12.4	12.4	12.8	12.9	1.5	15.9	15.9	17.5	17.5	9.7	18.4	5.3	3.3	6.7
PF●	2M	26.9	14.0	17.2	13.0	15.5	15.5	12.8	15.1	1.5	15.9	15.9	17.5	17.5	10.1	20.6	5.3	3.3	7.1
PF●	3M	29.0	16.0	19.2	15.0	17.5	17.5	12.8	16.6	1.5	15.9	15.9	17.5	17.5	10.1	22.1	5.3	3.3	7.1
PF●	TM	31.4	17.9	22.0	16.7	19.8	19.8	14.5	18.3	2.0	18.9	19.5	19.2	21.1	10.6	23.8	7.9	3.3	7.6
PF●	4M	34.6	20.7	24.5	19.5	22.6	22.6	14.5	20.6	2.0	18.9	19.5	19.2	21.1	10.6	26.1	7.9	3.3	7.6
PF●	LM	38.0	23.9	28.0	22.7	25.8	25.8	14.5	23.0	2.0	18.9	19.5	19.2	21.1	10.6	28.5	7.9	3.3	7.6
PF●	5M	47.0	29.7	33.5	28.5	33.0	31.4	14.5	29.4	2.0	18.9	19.5	19.2	21.1	10.6	37.0	7.9	3.3	7.6

Panel cut-out (page 59).

Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).
This model is not available with straight backshell (backshell not supplied). For heatshrink molded shapes backshell see page 11.
[1)] Dimensions for MIL-DTL-38999M (series III) backshell connector size code (backshell not supplied) (not available in MM and 0M size).

PB● Fixed cable socket, key (N or H to X) with antivibration flange
(these models are not IP68 due to the absence of panel sealing)



Reference		Dimensions (mm)															
Model	Series	B	B1	C	D	G	H	K	N	P	Ls	Lr	Ls[1)]	Lr[1)]	Ls[2)]	Lr[2)]	X
PB●	MM	6.4	21.0	11.3	5.6	6.7	16.2	1.5	12.5	3.7	15.6	15.6	15.6	15.6	–	–	5.8
PB●	0M	8.8	27.0	14.5	8.0	8.3	21.4	2.0	16.0	5.3	18.9	18.9	18.9	18.9	–	–	6.7
PB●	1M	10.5	29.0	16.5	9.7	8.3	23.4	2.0	18.0	5.3	18.9	18.9	18.9	18.9	18.5	18.5	6.7
PB●	2M	14.0	32.0	19.5	13.0	8.3	26.4	2.0	21.0	5.3	18.9	18.9	18.9	18.9	18.5	18.5	7.1
PB●	3M	16.0	35.0	21.5	15.0	8.3	29.0	2.0	23.0	5.3	18.9	18.9	18.9	18.9	18.5	18.5	7.1
PB●	TM	17.9	38.5	24.5	16.7	11.0	32.5	2.0	26.0	7.9	20.6	22.5	20.6	20.6	20.2	21.1	7.6
PB●	4M	20.7	41.0	27.5	19.5	11.0	35.0	2.0	29.0	7.9	20.6	22.5	20.6	20.6	20.2	21.1	7.6
PB●	LM	23.9	44.0	30.5	22.7	11.0	38.0	2.0	32.0	7.9	20.6	22.5	20.6	20.6	20.2	21.1	7.6
PB●	5M	29.7	51.0	37.5	28.5	11.0	45.0	2.0	39.0	7.9	20.6	22.5	20.6	20.6	20.2	21.1	7.6

Panel cut-out (page 59).

Note: Ls = standard gender, Lr = reverse gender (see page 21 for standard/reverse gender options).
For heatshrink molded shapes backshell see page 11 and for special backshell see page 45.
[1)] Dimensions for mold stop and heatshrink molded shapes backshell option.
[2)] Dimensions for MIL-DTL-38999M (series III) backshell connector size code (backshell not supplied) (not available in MM and 0M size).

Alignment key

Alignment key and polarized keying system

M series connector model part numbers are composed of three letters. The LAST LETTER indicates the keys corresponding to a particular contact type.
For example, straight plugs with H, N, P, R, U or W keys, are fitted with male contacts; whereas with S, T, V or X keys, plugs are fitted with female contacts. Sockets with H, N, P, R, U or W keys, are fitted with female contacts; whereas with S, T, V or X keys, sockets are fitted with male contacts.

MM to 3M

Front view of a socket

Model	Colour code	Gender	Contact type		Nb of spurs
			Plug	Socket	
●●N	blue	standard	male	female	3
●●P	yellow	standard	male	female	3
●●U	green				
●●S	red	reverse[1)]	female	male	3
●●T	orange	reverse[1)]	female	male	3

TM to 5M

Front view of a socket

Model	Colour code	Gender	Contact type		Nb of spurs
			Plug	Socket	
●●W	blue	standard	male	female	5
●●H	green	standard	male	female	5
●●R	yellow				
●●X	red	reverse	female	male	5
●●V	orange	reverse	female	male	5

● Standard
● Special

Note: [1)] MM.303, HE●.1M.302 and 2M.316 not available in reverse gender.

Colour coding

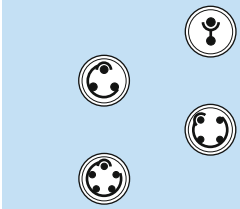
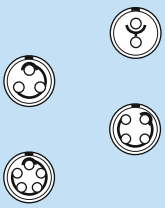
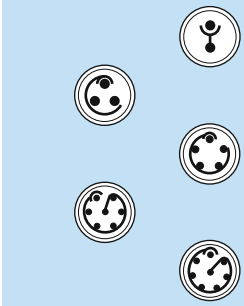
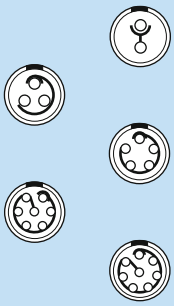
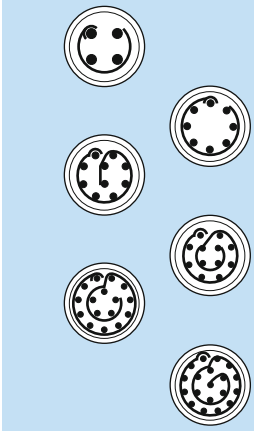
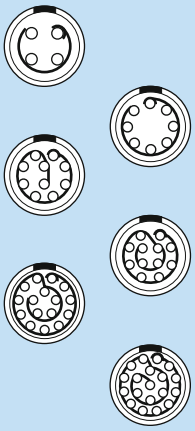
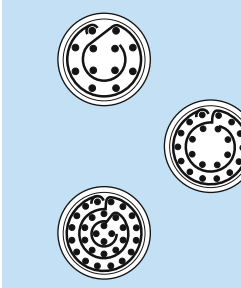
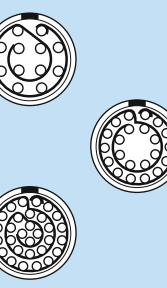
M Series connector attributes a colour code for each alignment key thus allowing for easy identification of matching plugs and sockets within the system.

Nickel-plated version ("X" and "F" housing)

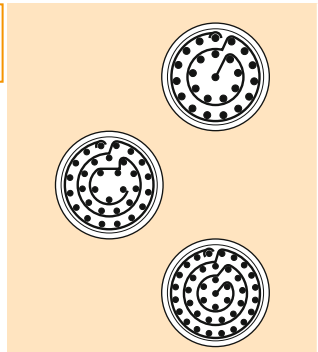
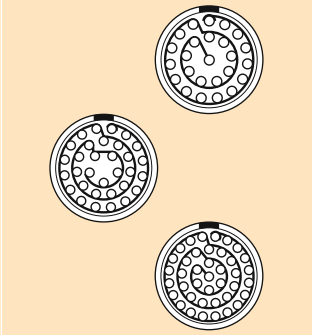
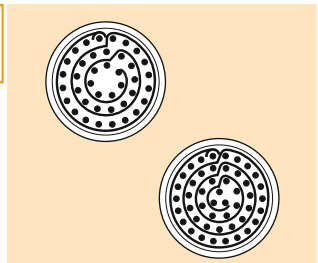
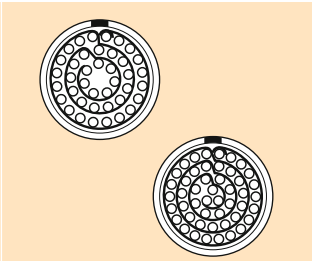
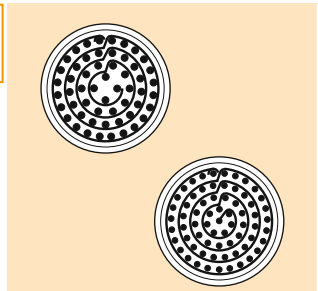
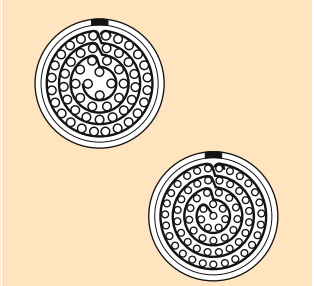
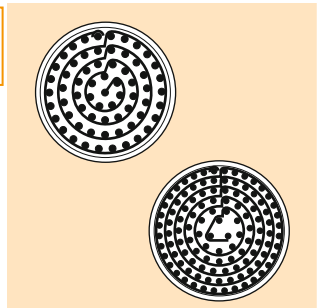
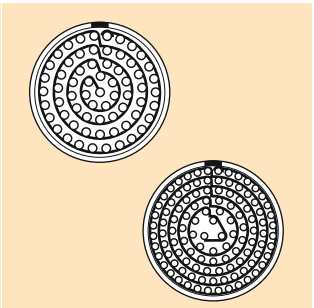
Chrome-plated version ("C" housing)

Multipole insert configuration

Multipole

	Male insert	Female insert	Reference	Number of contacts	ø A (mm)	Contact type: Crimp	Contact type: Print (straight)[3]	AWG	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Rated current (A)[2]
MM			303	3	0.5	●	●	28-30-32	1.15	0.95	3.0
			304	4	0.5	●	●	28-30-32	0.95	0.90	2.0
0M			302	2	0.9	●	●	20-22-24	1.45	1.00	10.0
			303	3	0.9	●	●	20-22-24	1.70	1.40	8.0
			304	4	0.7	●	●	22-24-26	1.35	0.90	7.0
			305	5	0.7	●	●	22-24-26	1.25	1.00	6.5
1M			302	2	1.3	●	●	16-18-20	1.55	1.10	19.0
			303	3	1.3	●	●	16-18-20	1.05	0.95	15.5
			305	5	0.9	●	●	20-22-24	1.30	1.30	9.0
			307	7	0.7	●	●	22-24-26	1.45	1.20	7.0
			308	8	0.7	●	●	22-24-26	1.30	1.10	5.0
2M			304	4	1.3	●	●	16-18-20	1.55	1.35	15.5
			308	8	0.9	●	●	20-22-24	1.95	1.10	10.0
			310	10	0.9	●	●	20-22-24	1.80	1.20	8.0
			312	12	0.7	●	●	22-24-26	1.65	1.15	7.0
			316	16	0.7	●	●	22-24-26	1.20	1.00	4.5
			319	19	0.7	●	●	22-24-26	1.20	1.00	4.0
3M			312	12	0.9	●	●	20-22-24	1.40	1.25	6.0
			322	22	0.7	●	●	22-24-26	1.25	1.15	4.0
			330	30	0.7	●	●	22-24-26	1.10	1.00	3.5

Multipole

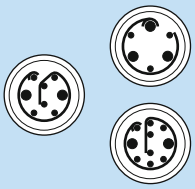
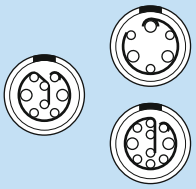
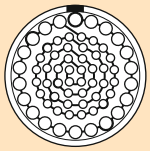
	Male insert	Female insert	Reference	Number of contacts	ø A (mm)	Contact type: Crimp	Contact type: Print (straight)[3]	AWG	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Rated current (A)[2]
TM			325	25	0.9	●	●	20-22-24	1.10	1.25	5.0
			332	32	0.7	●	●	22-24-26	1.25	1.20	3.5
			340	40	0.7	●	●	22-24-26	1.05	1.20	3.0
4M			340	40	0.7	●	●	22-24-26	1.20	1.35	3.5
			348	48	0.7	●	●	22-24-26	1.10	1.35	3.0
LM			355	55	0.9	●	●	20-22-24	1.65	1.95	3.5
			368	68	0.7	●	●	22-24-26	1.40	1.65	2.5
5M			366	66	0.9	●	●	20-22-24	1.60	1.70	3.0
			114	114	0.7	●	●	22-24-26	1.37	1.34	2.0

Note:
[1] test voltage according to IEC 60512-4-1 test 4a. Altitude correction factor is given in IEC 60664-1 § 6.8.
[2] the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).
[3] for EG●, EC●, ED●, HE●, HY● socket.

● Standard ● Special

Mixed multipole insert configuration

Mixed multipole

	Male insert	Female insert	Reference	Number of contacts	ø A (mm)	Contact type: Crimp	Contact type: Print (straight)[3]	AWG	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Rated current (A)[2]
1M			304	2 2	0.7 1.3	●	●	22-24-26 16-18-20	1.20 1.45	1.30 2.00	11.0 18.5
2M			306	3 3	0.7 1.3	●	●	22-24-26 16-18-20	1.55 2.05	1.40 1.35	10.5 18.0
			308	6 2	0.7 1.3	●	●	22-24-26 16-18-20	1.95 1.75	1.40 1.60	7.0 23.0
			310	8 2	0.7 1.3	●	●	22-24-26 16-18-20	1.35 1.90	1.35 1.15	6.0 23.0
3M			316	10 6	0.7 1.3	●	●	22-24-26 16-18-20	0.90 1.35	0.95 1.15	2.0 11.0
5M			366	44 22	0.7 1.3 [4]	●	●	22-24-26	1.65 1.95	2.70 1.80	3.0 6.0

Note:
[1] test voltage according to IEC 60512-4-1 test 4a. Altitude correction factor is given in IEC 60664-1 § 6.8.
[2] the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).
[3] for EG●, EC●, ED●, HE●, HY● socket.
[4] reduced crimp barrel.

● Standard ● Special

Multipole contacts

Spare parts contacts can be ordered separately using references listed in this chapter.
All connectors are delivered with their contacts.

Reference	Contact type
C	Male crimp with standard crimp barrel (fig. 1)
B	Male crimp with reduced crimp barrel (fig. 2)
D	Male straight print

Reference	Contact type
M	Female crimp with standard crimp barrel (fig. 1)
P	Female crimp with reduced crimp barrel (fig. 2)
N	Female straight print

● Standard ● Special

Crimp contacts for plugs, free or fixed sockets

Fig. 1

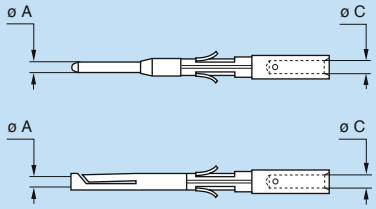
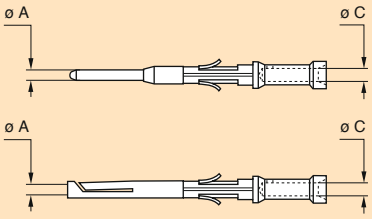


Fig. 2



Note: in order to satisfy crimp pull-test requirements to the IEC 60352-2 standard, the use of single strand cables should be avoided.

Dimension of crimp barrels

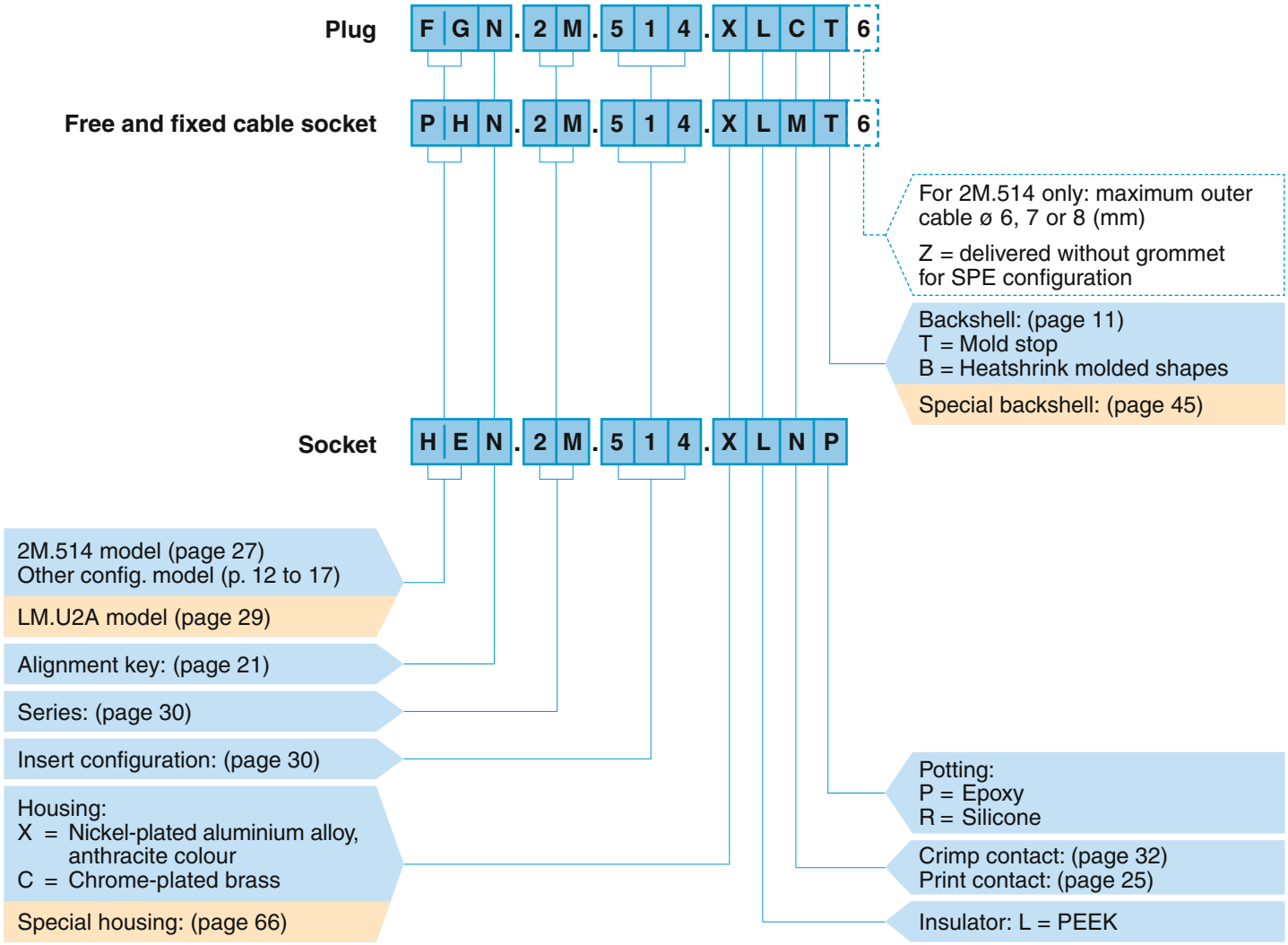
	Contact			Ref. contact type		Conductor				Part number	
	ø A (mm)	ø C (mm)	Form per fig.	Male	Female	AWG min.	AWG max.	Section (mm²) min.	Section (mm²) max.	For male contacts	For female contacts
MM	0.5	0.42	1	C	M	32	28	0.035	0.090	FGG.00.554.ZZC	EGG.00.654.ZZM
0M to 3M	1.3	1.60	1	C	M	20	16	0.616	1.433	FGN.0M.565.ZZC	EGN.0M.665.ZZM
	0.9	1.10	1	C	M	24	20	0.204	0.616	FGN.0M.560.ZZC	EGN.0M.660.ZZM
	0.9	0.87	2	B	P	26	22	0.128	0.382	FGN.0M.561.ZZC	EGN.0M.661.ZZM
	0.7	0.87	1	C	M	26	22	0.128	0.382	FGN.0M.555.ZZC	EGN.0M.655.ZZM
	0.7	0.44	2	B	P	32	28	0.032	0.092	FGN.0M.556.ZZC	EGN.0M.656.ZZM
TM to 5M	1.3	1.60	1	C	M	20	16	0.616	1.433	FGN.0M.565.ZZC	EGN.0M.665.ZZM
	0.9	1.10	1	C	M	24	20	0.204	0.616	FGN.0M.560.ZZC[1)]	EGW.TM.660.ZZM
	0.9	0.87	2	B	P	26	22	0.128	0.382	FGN.0M.561.ZZC	EGW.TM.661.ZZM
	0.7	0.87	1	C	M	26	22	0.128	0.382	FGN.0M.555.ZZC	EGW.TM.655.ZZM
	0.7	0.44	2	B	P	32	28	0.032	0.092	FGN.0M.556.ZZC	EGW.TM.656.ZZM

Note: [1)] the low voltage male contact part number for the High Power configuration 5M.G33 is FGN.0M.560.ZZCY. For female contact the part number is EGW.TM.660.ZZM.

● Standard ● Special

High Speed models

Part numbering system



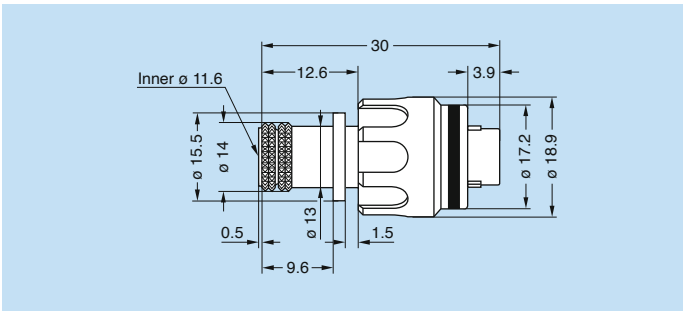
FGN.2M.514.XLCT6 = straight plug with key (N), arctic grip, 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, male crimp contacts and mold stop.

PHN.2M.514.XLMT6 = free cable socket with key (N), arctic grip, 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female crimp contacts and mold stop.

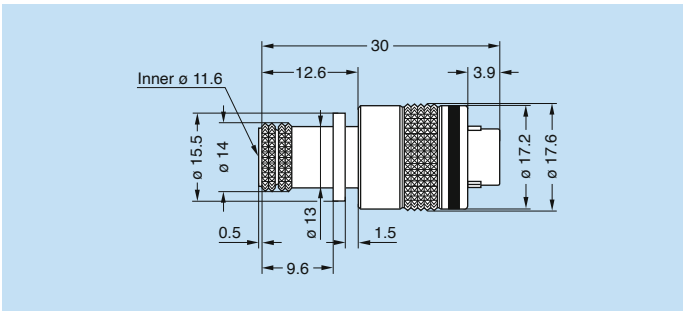
HEN.2M.514.XLNP = socket, nut fixing, with key (N), 2M series, multipole type with 8 contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female print contacts, watertight, epoxy potting.

	USB	Ethernet	
Protocol	**USB 2.0**	**2.5G Base T1 / SPE**	**1000 Base T4**
IEEE standard	–	IEEE 802.3ch	IEEE 802.3ab
Max data transfer speed	480 Mb/s	2.5 Gb/s	10 Gb/s at 250 MHz
Number of twisted pairs	–	1	4
Cable specification	USB 2.0	SPE	CAT 6
Serie	1M & LM	0M	2M
Insert configuration	307, 308 & U2A	511	514

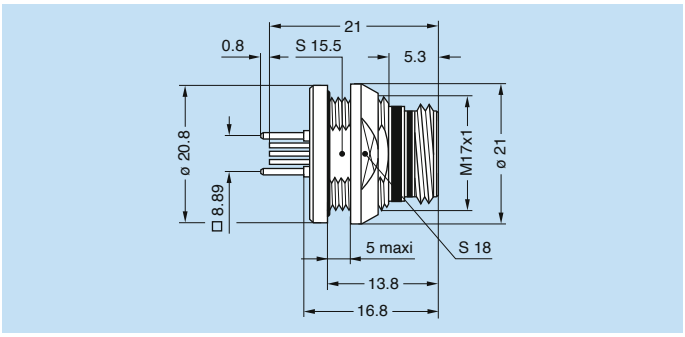
FG●.2M.514.●L●T● Straight plug, key (N or P and U) with arctic grip and mold stop



FM●.2M.514.●L●T● Straight plug, key (N or P and U) with knurled grip and mold stop

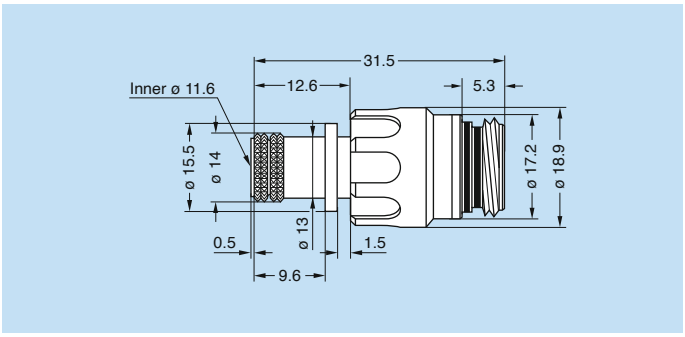


HE●.2M.514.●L●● Socket, nut fixing, key (N or P and U) for printed circuit, watertight, (back panel mounting)

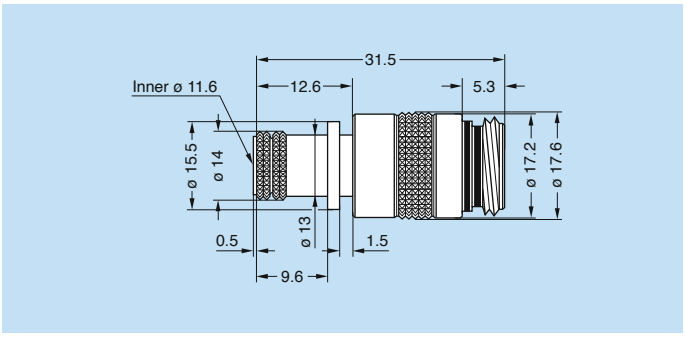


Note: see page 59 for panel cut-out and page 60 for PCB drilling pattern. For HE● environmental performance see page 68.

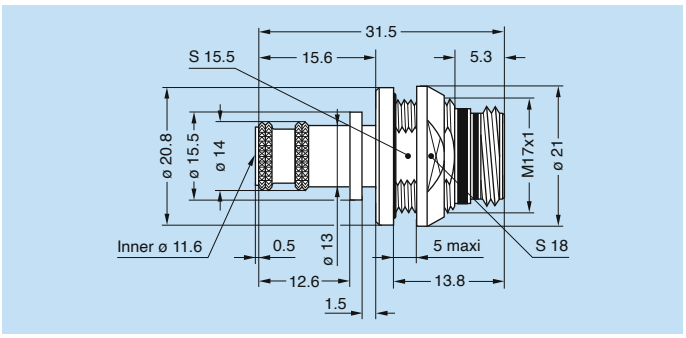
PH●.2M.514.●L●T● Free cable socket, key (N or P and U) with arctic grip and mold stop



PM●.2M.514.●L●T● Free cable socket, key (N or P and U) with knurled grip and mold stop

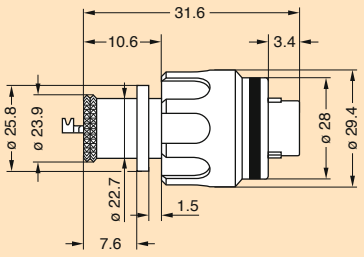


PE●.2M.514.●L●T● Fixed cable socket, key (N or P and U) with mold stop (back panel mounting)

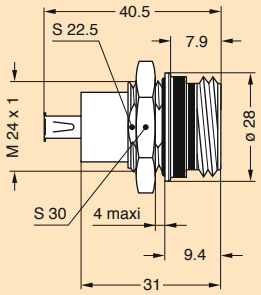


Those configurations meet the USB 2.0 (480 Mb/s) data transfer requirements using USB Type A inserts.

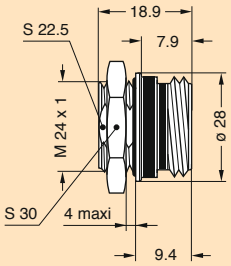
FG●.LM.U2A.XPAT Straight plug, key (W or H and R) with arctic grip and mold stop



EG●.LM.U2A.XPP Socket, nut fixing, key (W or H and R), female to female



EG●.LM.U2A.XPL Socket, nut fixing, key (W or H and R)



Note: see page 59 for panel cut-out.

High Speed insert configuration

High Speed

	Male insert	Reference	Protocol	Max data transfer speed	Number of twisted pair	Number of contacts	Contact ø (mm)	Solder contact	Crimp contact	Print (straight)	AWG	Test voltage (kV DC)[1] Contact-contact	Test voltage (kV DC)[1] Contact-shell	Rated current (A)[2]
0M	 **PoDL**[4]	**511**[3]	2.5G base T1	2.5 Gb/s	1	2	0.7	–	●	●	22-24-26	1.90	1.20	9
1M		**307**	USB 2.0	480 Mb/s	–	7	0.7	–	●	●	22-24-26	1.02	0.85	7
		308	USB 2.0	480 Mb/s	–	8	0.7	–	●	●	22-24-26	0.92	0.78	5
2M		**514**	1000 base T4	10 Gb/s	4	8	0.7	–	●	●	–	1.13	1.06	8
LM		**U2A**	USB 2.0	480 Mb/s	–	4	0.7	●	–	–	–	0.85	0.67	n.a.

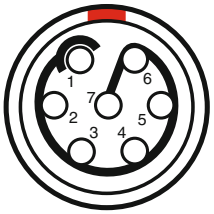
Note:
1) test voltage according to IEC 60512-4-1 test 4a. Altitude correction factor is given in IEC 60664-1 § 6.8.
2) the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).
3) plug and free cable socket are delivered without grommet for SI reason.
4) Power over Data Line up to 50W according standard 802.3bu.

● Standard ● Special

USB 2.0 recommended layout for Nett Warrior / STANAG 4695 protocol compatibility

Thoses multipole configurations meets USB 2.0 (480 Mb/s) data transfer requirements when terminated regarding following layout:

1M.307



Socket top view

Pin ID	Power ports	PAN / EUD ports
1	USB- / SM Bus Clock	USB-
2	Not connected	CC line
3	Power (10-20 VDC, 10A max)	Power (10-20 VDC, 10A max)
4	Ground	Ground
5	Power (5 VDC)	Power (5 VDC)
6	USB+ / SM Bus Data	USB+
7	NC / USB drain wire / Ground	NC / USB drain wire / Ground

1M.308

Socket top view

Pin ID	Power ports	PAN / EUD ports
1	USB- / SM Bus Clock	USB-
2	Not connected	CC line
3	Power (10-20 VDC, 10A max)	Power (10-20 VDC, 10A max)
4	Ground	Ground
5	Power (5 VDC)	Power (5 VDC)
6	Not connected	Not connected
7	USB+ / SM Bus Data	USB+
8	NC / USB drain wire / Ground	NC / USB drain wire / Ground

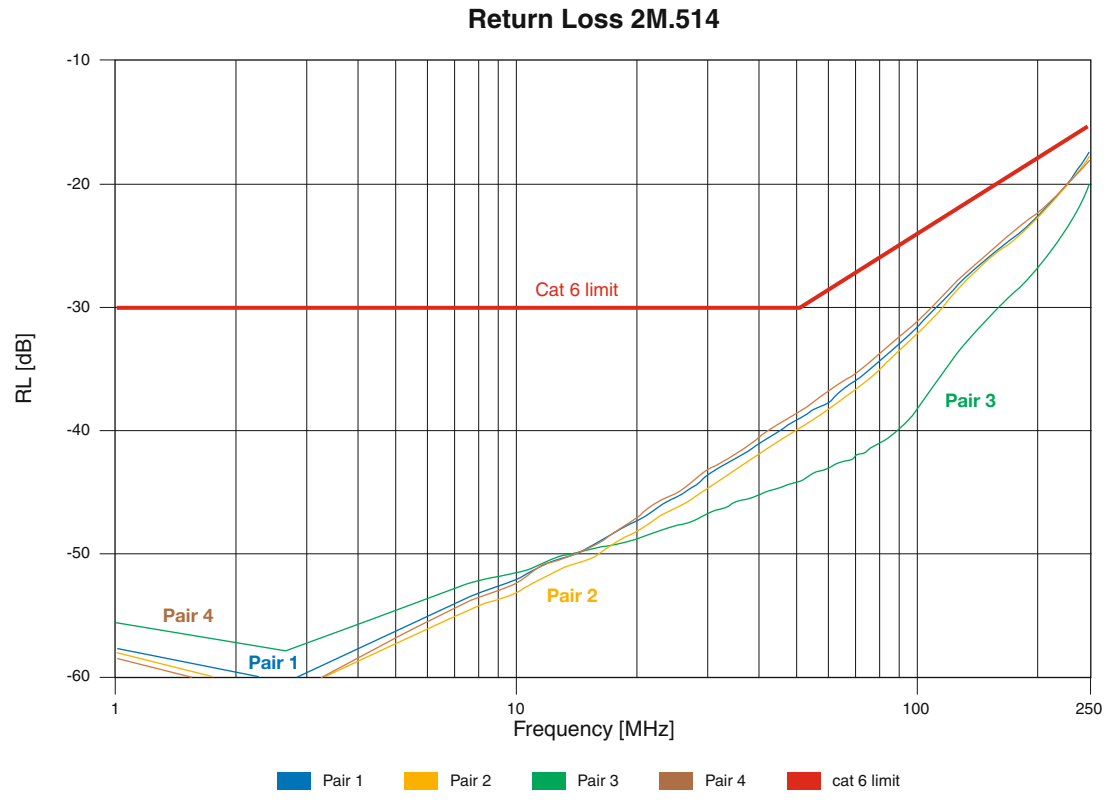
High Speed contacts

Spare parts contacts can be ordered separately using references listed in this chapter.
All connectors are delivered with their contacts.

Dimension of crimp barrels High Speed ethernet cat6

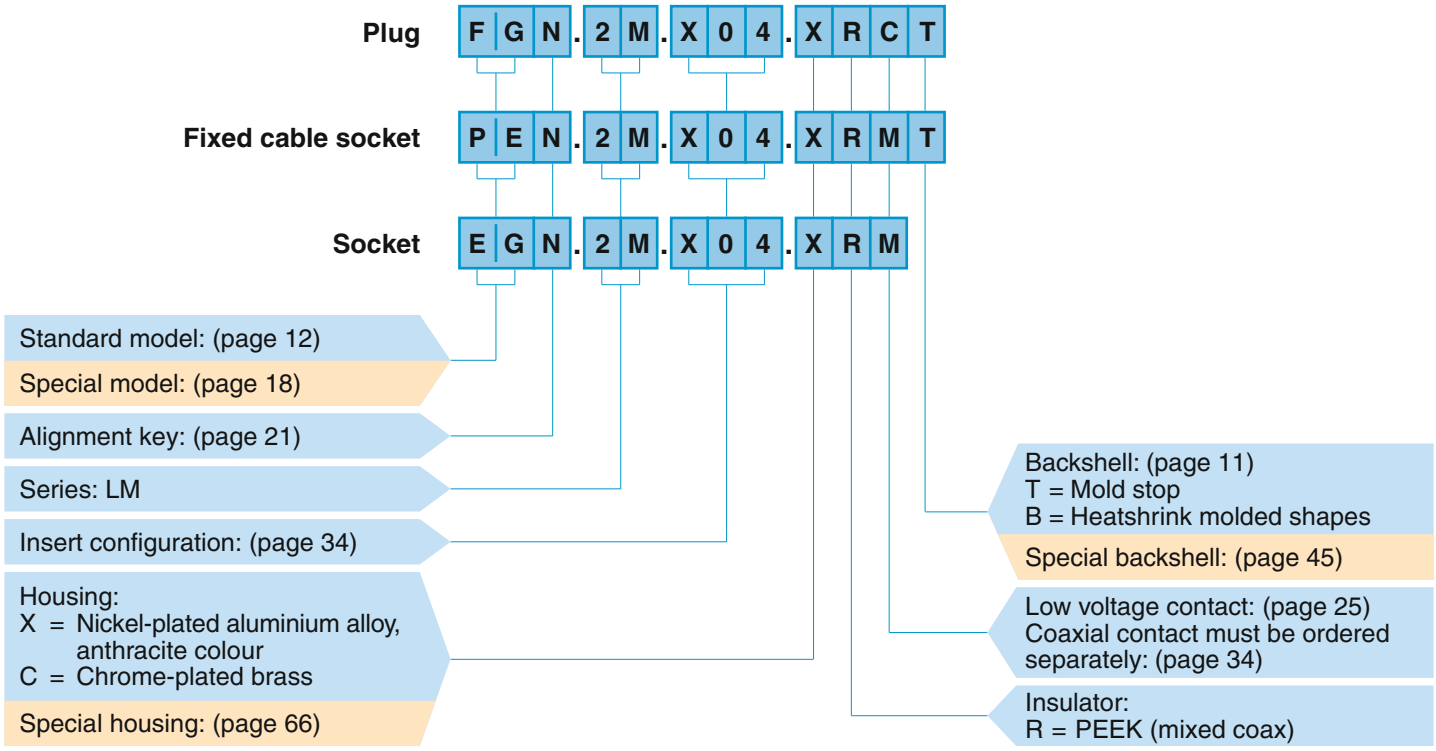
	Contact			Ref. contact type		Conductor				Part number	
	ø A (mm)	ø C (mm)	Form per fig.	Male	Female	AWG min.	AWG max.	Section (mm²) min.	Section (mm²) max.	For male contacts	For female contacts
2M.514	0.7	0.87	1	C	M	26	22	0.128	0.382	FGN.2M.558.ZZC	EGN.2M.658.ZZM
0M to 3M	1.3	1.60	1	C	M	20	16	0.616	1.433	FGN.0M.565.ZZC	EGN.0M.665.ZZM
	0.9	1.10	1	C	M	24	20	0.204	0.616	FGN.0M.560.ZZC	EGN.0M.660.ZZM
	0.9	0.87	2	B	P	26	22	0.128	0.382	FGN.0M.561.ZZC	EGN.0M.661.ZZM
	0.7	0.87	1	C	M	26	22	0.128	0.382	FGN.0M.555.ZZC	EGN.0M.655.ZZM
	0.7	0.44	2	B	P	32	28	0.032	0.092	FGN.0M.556.ZZC	EGN.0M.656.ZZM

● Standard ● Special

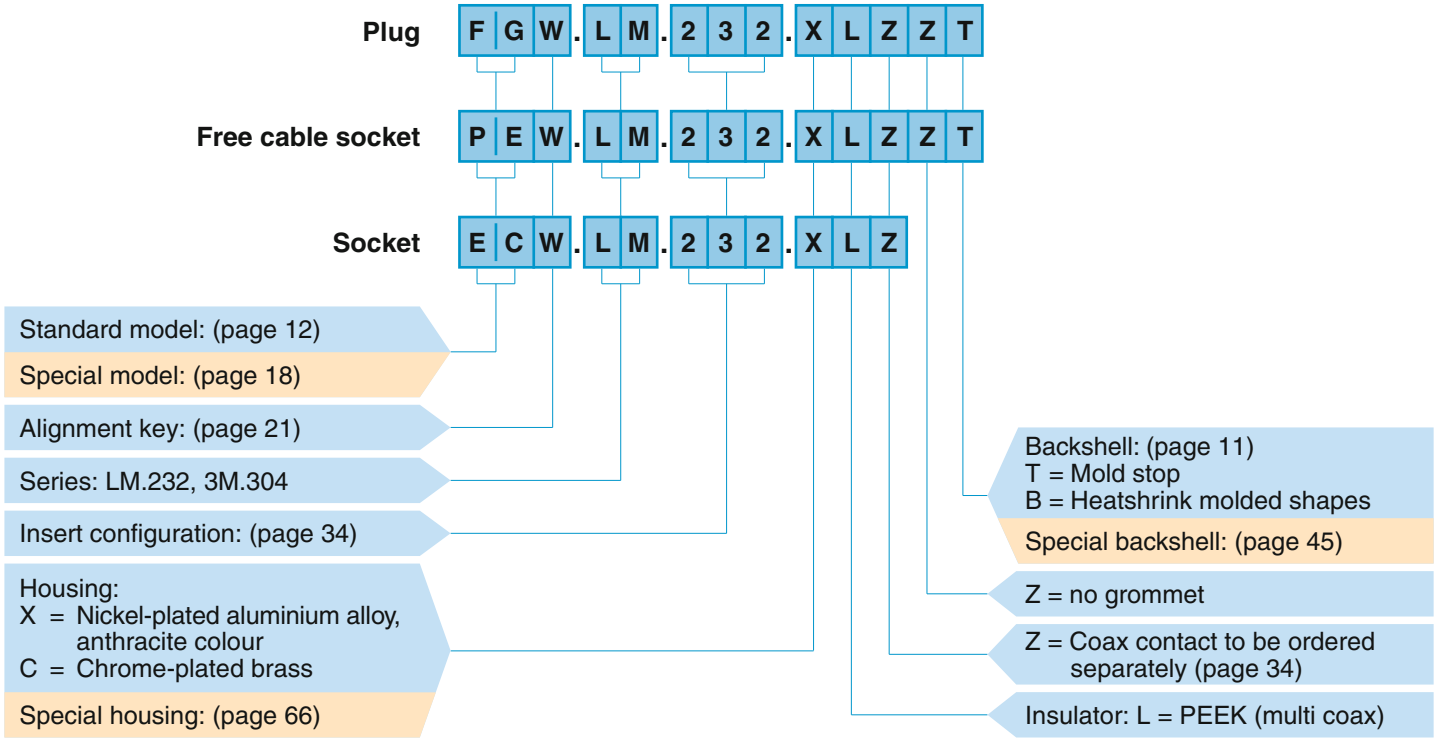


Coaxial models

Mixed coax part numbering system

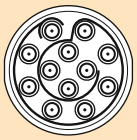
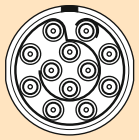


Multi coax part numbering system



Coaxial insert configuration

Mixed coax and multi coax

	Male insert	Female insert	Reference	Coax				Low voltage						
				Number of contacts	Impedance (Ω)	Type	Cable type	Number of contacts	Contact ø (mm)	Crimp contact	AWG	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Rated current (A)[2]
2M			X04	1	75	C	RG 179	2 2	0.9 1.3	●	22-24-26 16-18-20	0.75	1.05	10 7
				1	50	C	RG 316 /U	2 2	0.9 1.3	●	22-24-26 16-18-20	0.75	1.05	10 7
3M			204	4	50	0R	RG 316 /U	–	–	–	–	–	–	–
LM			232	12	50	0R	RG 316 /U	–	–	–	–	–	–	–

Note: coaxial contacts must be ordered separately.
[1] test voltage according to IEC 60512-4-1 test 4a. Altitude correction factor is given in IEC 60664-1 § 6.8.
[2] the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).

● Standard ● Special

Coaxial contacts

Coaxial contacts must be ordered separately using references listed in this chapter.

Coaxial contacts part number

Reference	Type	Impedance (Ω)	Part number		Contact fixing	Conductor fixing & screen	Conductor ø maxi	Dielectric ø maxi	Sheath ø maxi	Max frequency (GHz)[1]	VSWR	Test voltage (kV DC)	Rated current (A)	Recommended cable
			For male contacts	For female contacts										
2M.X04	C	50	**FFS.2B.250.ZTCE30**	**PSS.2B.250.ZTME30**	clip	crimp	0.58	1.65	3.0	6.0	<1.30	2.26	2.0	RG 316 /U
		75	**FFS.2B.275.ZTCE31**	**PSS.2B.275.ZTME31**	clip	crimp	0.40	1.60	3.0	6.0	<1.20	1.20	1.0	Belden 179DT
		75	**FVS.2B.275.ZTCE31**	**PVS.2B.275.ZTME31**	screw	crimp	0.40	1.60	3.0	17.5	<1.35	1.20	1.0	Belden 179DT
		75	**FFS.2B.275.ZTCE37**	**PSS.2B.275.ZTME37**	clip	crimp	0.40	2.00	3.6	25.0	<1.20	1.20	1.0	Draka 0.41/1.19AF
3M.204	0R	50	**FGG.0R.250.ZLME28**	**EGG.0R.250.ZLCE28**	clip	crimp	0.54	1.54	2.8	8.0	<1.25	1.34	2.5	LMR-100A or Multiflex_86
LM.232										26.5	<1.50			

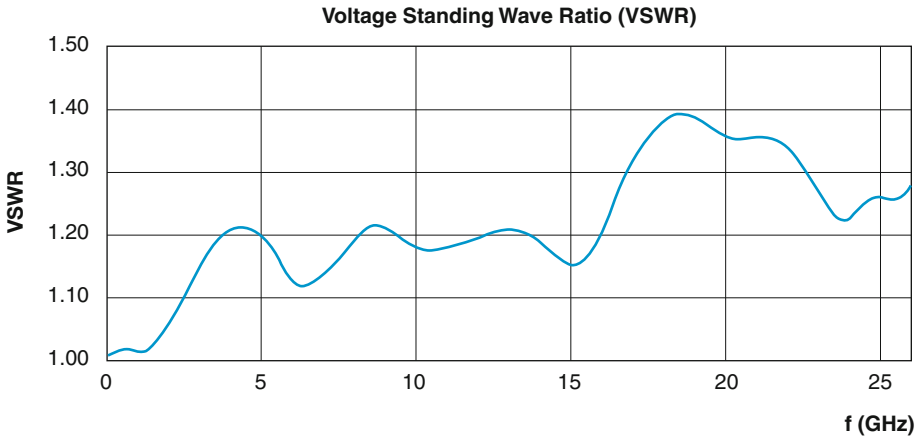
Note: [1] recommended cable Times microwave LMR-100A or Multiflex_86 to reach 26.5 GHz.

Typical VSWR performance curve

Coaxial contact type 0R 50 Ohms:
Enable to reach a frequency up to 8 GHz with a VSWR of 1.2 and up to 26.5 GHz with a VSWR of 1.5 when terminated with 1 meter Times microwaves LMR100 or Multiflex_86.

Male coax contact
FGG.0R.250.ZLME28

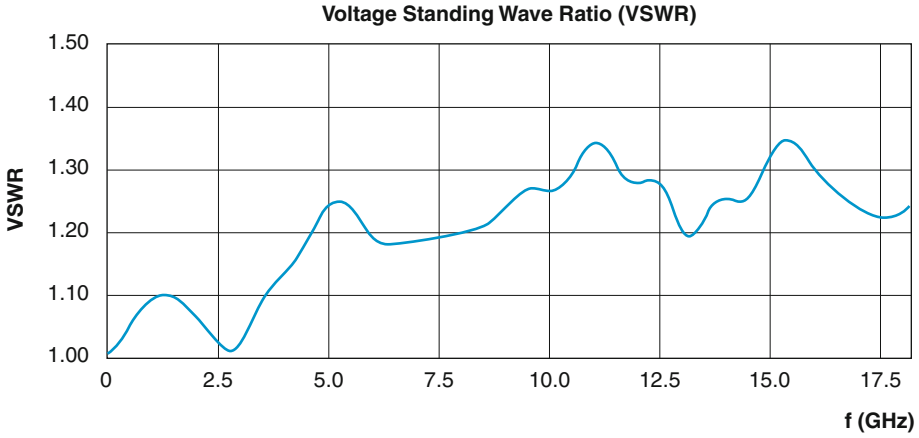
Female coax contact
EGG.0R.250.ZLCE28



Coaxial contact type C 75 Ohms:
Enable to reach a frequency up to 17.5 GHz with a VSWR of 1.35 when terminated with 1 meter cable RG 179.

Male coax contact
FVS.2B.275.ZTCE31

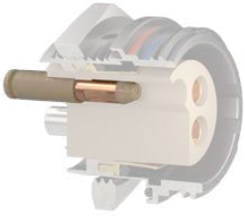
Female coax contact
PVS.2B.275.ZTME31



Dummy contacts

The use of a dummy contact allows sealing of unused cavities in both LM.232 (12x coax) and 3M.204 (4x coax) configurations, enabling greater flexibility in system design.
A single dummy contact is compatible with both plug and socket connectors and provides enhanced protection up to IP50 or up to IP68 when potted.

FGG.2B.247.LLZ **Dummy contacts**



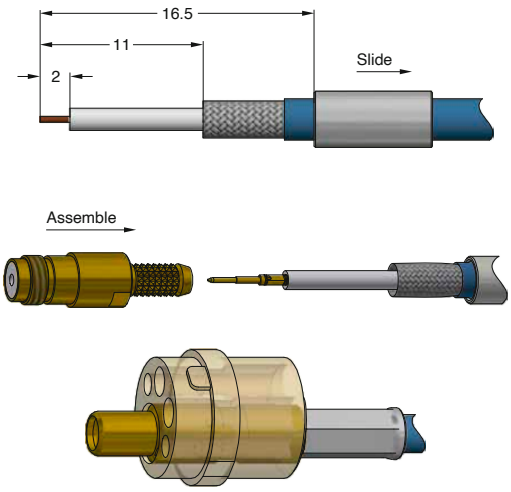
Tooling and cable instruction for coaxial contact

Reference	Coaxial contact part number		Tooling reference		
	For male contacts	For female contacts	Crimping tool with die	Spanner for tightening the contact	Extractor
2M.X04	FFS.2B.250.ZTCE30	PSS.2B.250.ZTME30	**DPE.99.103.8K**	**DCP.99.040.TC**	**DCC.91.CP1.LAG**
	FFS.2B.275.ZTCE31	PSS.2B.275.ZTME31	**DPE.99.083.8K**	**DCP.99.040.TC**	**DCC.91.CP1.LAG**
	FVS.2B.275.ZTCE31	PVS.2B.275.ZTME31	**DPE.99.082.8KY**	**DCP.99.040.TC**	**DCC.91.075.2LA**
	FFS.2B.275.ZTCE37	PSS.2B.275.ZTME37	**DPE.99.083.8K**	**DCP.99.040.TC**	**DCC.91.CP1.LAG**
3M.204 LM.232	FGG.0R.250.ZLME28	EGG.0R.250.ZLCE28	**DPE.99.003.1K**	**DPC.91.701.V**	**DCC.91.C0R.LAG**

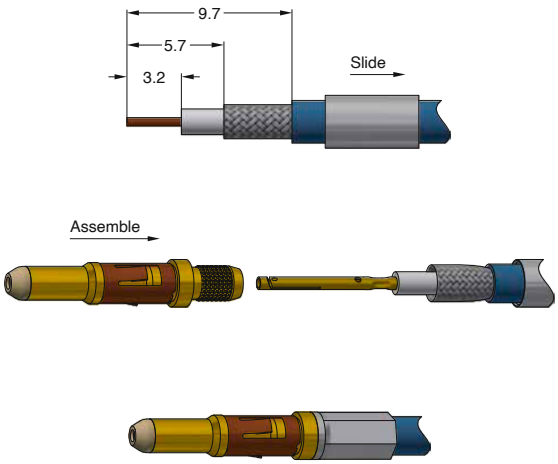
● Standard ● Special

Cable instruction for coaxial contact

Coaxial contact type C 75 Ohm screw fixing



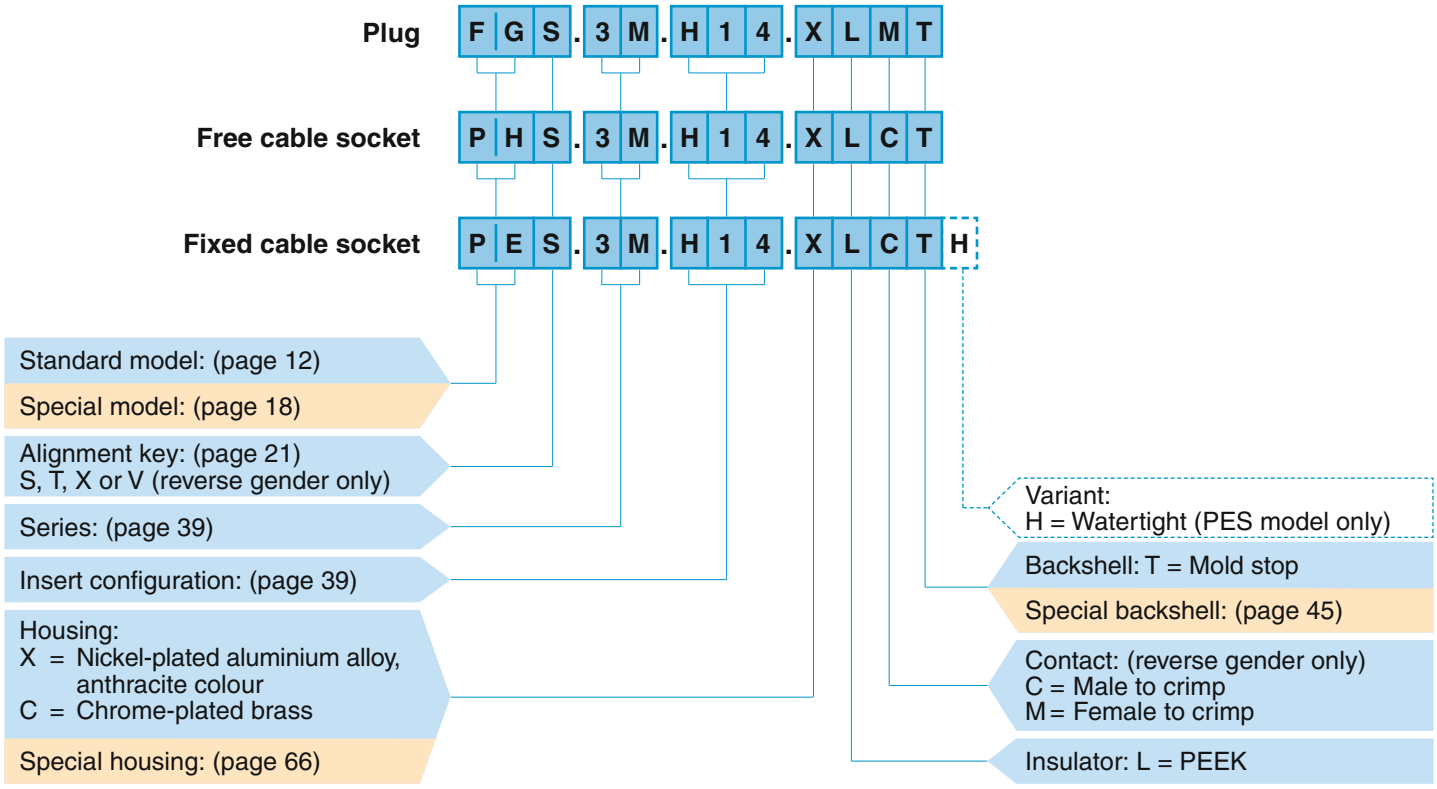
Coaxial contact type 0R 50 Ohm clip fixing



Detailed instructions for coax contact cable assembly can be found in the cable instruction drawings.

High Power models

Part numbering system

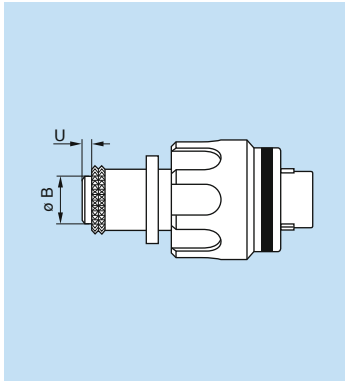


FGS.3M.H14.XLMT = straight plug with key (S), arctic grip, 3M series, high power contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, female crimp contacts and mold stop.

PHS.3M.H14.XLCT = free cable socket with key (S), knurled grip, 3M series, high power contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, male crimp contacts and mold stop.

PES.3M.H14.XLCTH = fixed cable socket with key (S), 3M series, high power contacts, outer shell in anthracite nickel-plated aluminium alloy, PEEK insulator, male crimp contacts, mold stop, watertight.

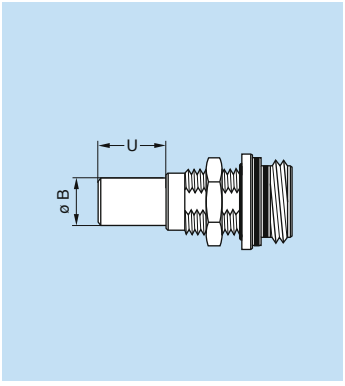
FG● Straight plug, key (S or T, V and X) with arctic grip and mold stop



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	2.5
TM.H15	12.3	2.5
4M.H16	14.0	2.5
LM.H18	18.0	7.0
5M.H18	22.9	7.0
5M.H34/G33	22.9	–

Note: all others dimensions can be found on standard models (page 12).

EG●/EC● Socket, nut fixing, key (S or T, V and X)

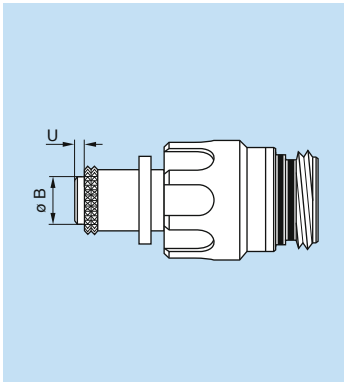


Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	11.7
TM.H15	12.3	13.1
4M.H16	14.0	13.1
LM.H18	18.0	17.6
5M.H18	22.9	17.6
5M.H34/G33	22.9	10.6

Note: all others dimensions can be found on standard models (page 13).

● Standard ● Special

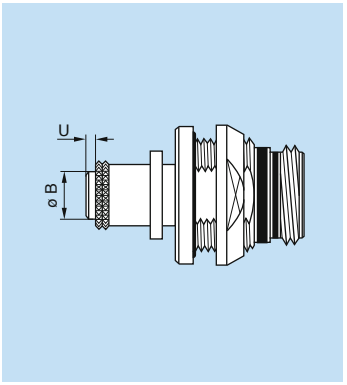
PH● Free cable socket, key (S or T, V and X) with arctic grip and mold stop



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	2.5
TM.H15	12.3	1.9
4M.H16	14.0	1.9
LM.H18	18.0	6.4
5M.H18	22.9	6.4
5M.H34/G33	22.9	–

Note: all others dimensions can be found on standard models (page 14).

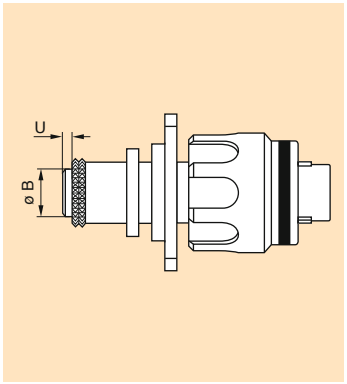
PE● Fixed cable socket, key (S or T, V and X) and mold stop



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	2.5
TM.H15	12.3	1.9
4M.H16	14.0	1.9
LM.H18	18.0	6.4
5M.H18	22.9	6.4
5M.H34/G33	22.9	–

Note: all others dimensions can be found on standard models (page 15).

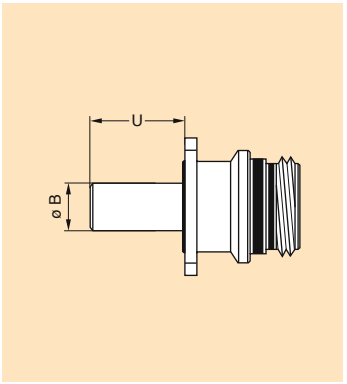
FW● Straight plug, key (S or T, V and X), square flange with arctic grip and mold stop



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	–
TM.H15	12.3	–
4M.H16	14.0	–
LM.H18	18.0	0.8
5M.H18	22.9	0.8
5M.H34/G33	22.9	–

Note: all others dimensions can be found on special models (page 18).

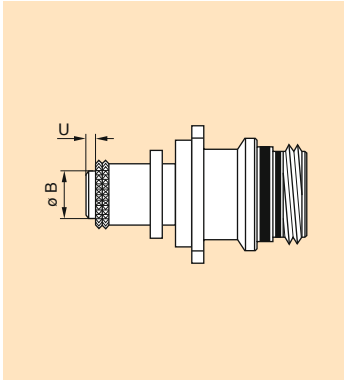
ED● Socket, key (S or T, V and X)



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	14.2
TM.H15	12.3	15.5
4M.H16	14.0	15.5
LM.H18	18.0	20.0
5M.H18	22.9	20.0
5M.H34/G33	22.9	13.0

Note: all others dimensions can be found on special models (page 19).

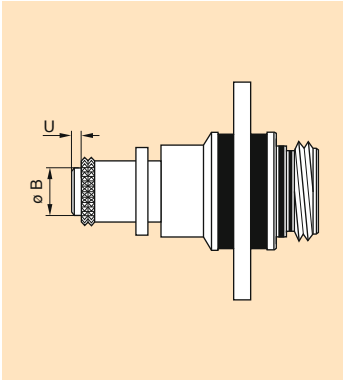
PF● Fixed cable socket, key (S or T, V and X) and mold stop



Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	2.5
TM.H15	12.3	1.9
4M.H16	14.0	1.9
LM.H18	18.0	6.4
5M.H18	22.9	6.4
5M.H34/G33	22.9	–

Note: all others dimensions can be found on special models (page 19).

PB● Fixed cable socket, key (S or T, V and X) with antivibration flange and mold stop



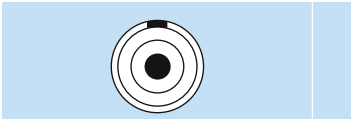
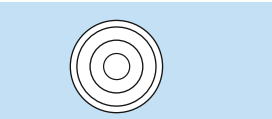
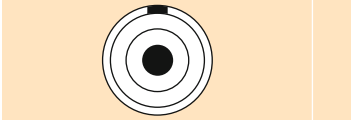
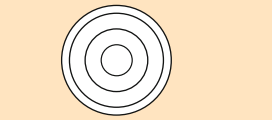
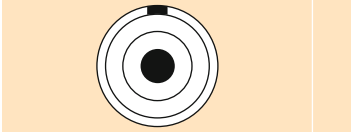
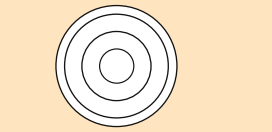
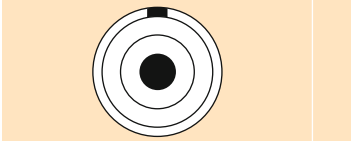
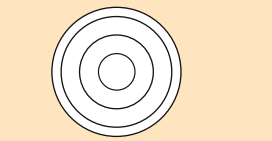
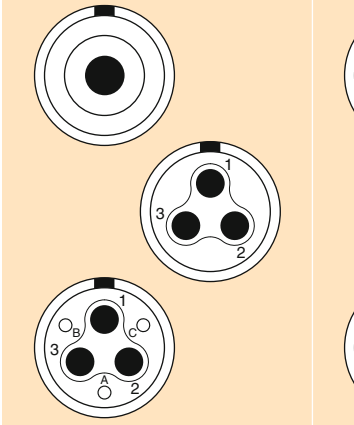
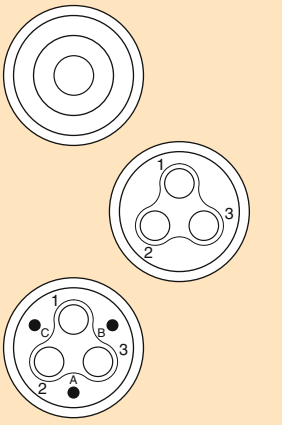
Reference	Dim. (mm)	
	ø B	U
3M.H14	11.0	2.5
TM.H15	12.3	1.9
4M.H16	14.0	1.9
LM.H18	18.0	6.4
5M.H18	22.9	6.4
5M.H34/G33	22.9	–

Note: all others dimensions can be found on special models (page 20).

● Standard ● Special

High Power insert configuration

High Power

	Male insert	Female insert	Reference	Number of contacts	Contact ø (mm)	Crimp contact	Wire section (mm²)	Crimp (max.) (AWG)	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Max. rated current (A) at 25°C ambient temperature[2]	Rated current (A)[3]
3M			H14	1	4.0	●	10	8	–	4.7	160	78
TM			H15	1	5.0	●	16	6	–	4.5	205	106
4M			H16	1	6.0	●	25	4	–	4.4	270	138
LM			H18	1	8.0	●	35	2	–	4.7	340	183
5M			H18	1	8.0	●	50	1	–	4.0	430	228
			H34	3	4.0	●	10	8	9.0	4.7	140[4]	52
			G33	3 (HP) 3 (LV)	4.0 0.9[5]	● ●	10 [6]	8 20-24	9.0 1.5	4.7 1.5	140[4] –	52 3

Warning: According to application safety standard, the maximum operating voltage must be determined considering both connector and cable electrical characteristics.

● Standard ● Special

Note:
1) test voltage according to IEC 60512-4-1 test 4a; test voltage for connector only. Altitude correction factor is given in IEC 60664-1 § 6.8.
2) see derating curves for more information.
3) the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).
4) rated current per contact (on all contact) simultaneously.
5) sequential connection: first mate/last break High Power contacts.
6) see LV contacts dimensions on page 25.

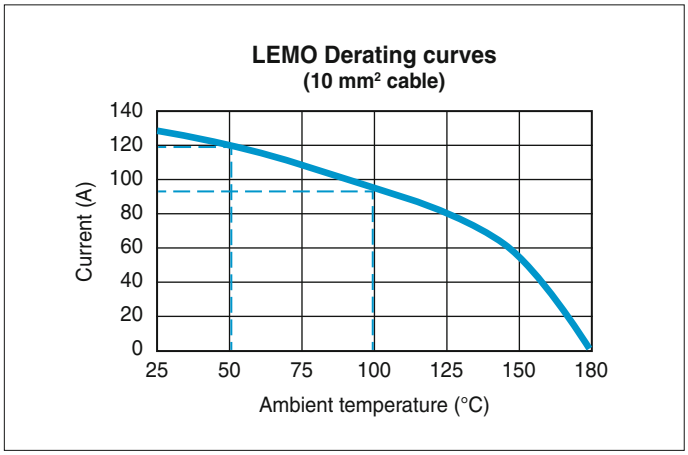
Both plugs and sockets provide IP2X finger protection to comply with the IEC61032 standard.

Derating curves

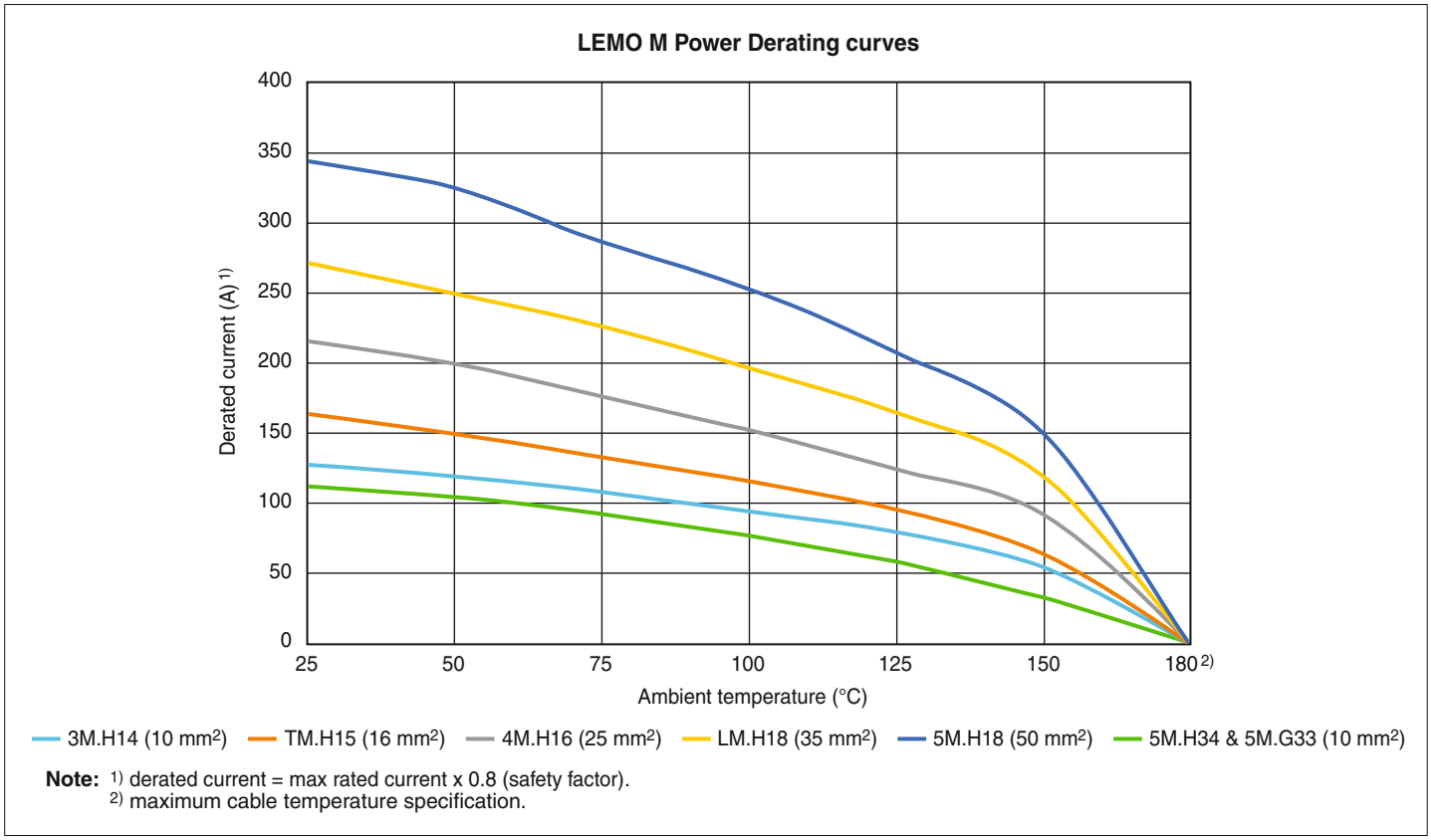
The derating curve is a current-carrying capacity curve showing which currents may flow continuously via the connector subject to various ambient temperatures. It includes a safety factor (0.8) to protect from spikes and factor uncertainties in temperature measurement.

For example, ambient temperature for connectors on e-Formula 1 batteries is around 50°C. At that temperature, the current that can go through a 10 mm² cable is 120A; it is 130A at 25°C and goes down to 95A at 100°C (see chart on the side).

It's therefore important to always clarify the ambient operating temperature & required current to select the right high-power connector. Note that the limiting factor is often the cable and not the connector, so special attention is required in selecting the cable too.



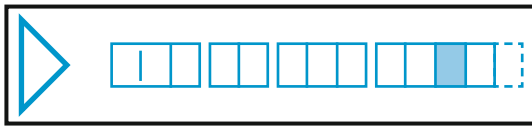
The chart below was built based on the maximum derated current until a temperature rise of 180°C was reached. It is intended as a guide only, when used with the stated cable sizes on the plug and socket. It's the designer's responsibility to consider all physical and environmental factors which may affect de-rating. Please feel free to contact your LEMO representative to assist in selecting appropriate connector solutions.



Note: 1) derated current = max rated current x 0.8 (safety factor).
2) maximum cable temperature specification.

Recommended cables

Brand	Reference	Wire section		Max temp.	Colour	Outer ø (mm)	Shielded	Operating voltage
		mm²	AWG					
COROPLAST	9-2611/10	10	8	180°C	RAL 2003	8.8	Yes	600 VAC / 1000 VDC
COROPLAST	9-2611/16	16	6	180°C	RAL 2003	10.2	Yes	600 VAC / 1000 VDC
COROPLAST	9-2611/25	25	4	180°C	RAL 2003	12.2	Yes	600 VAC / 1000 VDC
COROPLAST	9-2611/35	35	2	180°C	RAL 2003	14.4	Yes	600 VAC / 1000 VDC
COROPLAST	9-2611/50	50	1	180°C	RAL 2003	15.8	Yes	600 VAC / 1000 VDC



High Power contacts

Spare parts contacts can be ordered separately using references listed in this chapter.
All connectors are delivered with their contacts.

Dimension of crimp barrels High Power

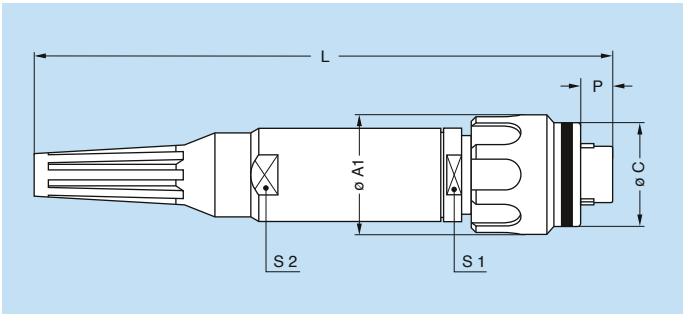
Series	Contact ø (mm)	Ref. contact type		Wire section		Part number	
		Male	Female	mm²	AWG	For male contacts	For female contacts
3M/5M [1)]	4.0	C	M	10	8	FGG.3M.P04.ZZC	EGG.3M.P04.ZZM
TM	5.0	C	M	16	6	FGG.TM.P05.ZZC	EGG.TM.P05.ZZM
4M	6.0	C	M	25	4	FGG.4M.P06.ZZC	EGG.4M.P06.ZZM
LM	8.0	C	M	35	2	FGG.LM.P08.ZZC	EGG.LM.P08.ZZM
5M	8.0	C	M	50	1	FGG.5M.P08.ZZC	EGG.5M.P08.ZZM

● Standard
● Special

Note: [1)] for 5M.H34 and 5M.G33 configurations.

Fibre Optic models

FG● Straight plug with arctic or knurled grip and bend relief (contact to be ordered separately, see page 44)

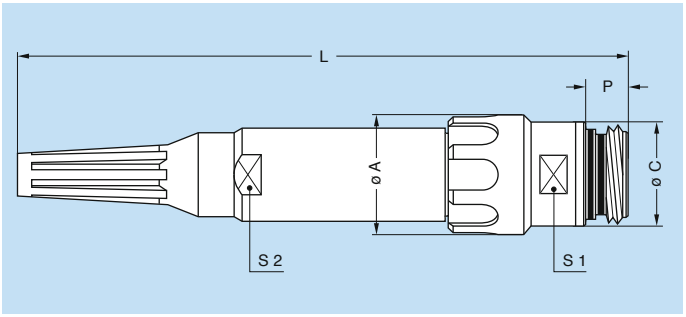


Part number	Dimensions (mm)						
	A	A1	C	L	P	S1	S2
FGS.2M.03A.XLZT●●Z	17.6	18.9	17.2	100.6	3.9	14.0	14.0
FGN.3M.95B.XLCT●●Z	19.6	20.9	19.2	103.3	3.9	16.0	16.0
FGW.5M.03W.XLZT●●Z	34.0	34.9	33.5	148.4	3.4	29.0	29.0

● Standard ● Special

Note: ●● cable adaptor diameter defined upon request.
The bend relief must be ordered separately (see page 53).

PH● Free cable socket with arctic or knurled grip and bend relief (contact to be ordered separately, see page 44)

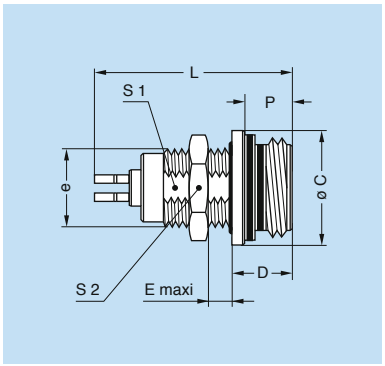


Part number	Dimensions (mm)						
	A	A1	C	L	P	S1	S2
PHS.2M.03A.XLZT●●Z	17.6	18.9	17.2	105.8	5.3	16.0	14.0
PHN.3M.95B.XLMT●●Z	19.6	20.9	19.2	113.3	5.3	18.0	16.0
PHW.5M.03W.XLZT●●Z	34.0	34.9	33.5	155.2	7.9	32.0	29.0

● Standard ● Special

Note: ●● cable adaptor diameter defined upon request.
The bend relief must be ordered separately (see page 53).

EG● **Socket, nut fixing** (contact to be ordered separately, see page 44)

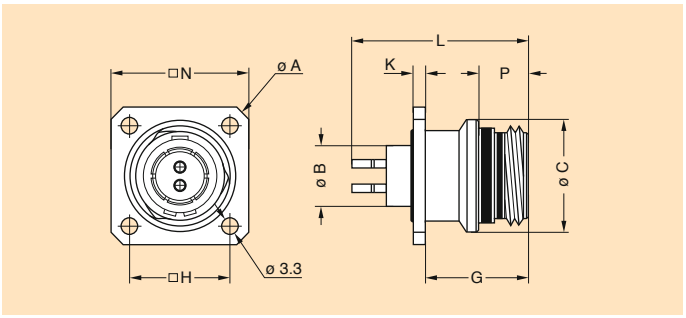


Part number	Dimensions (mm)							
	C	D	e	E	L	P	S1	S2
EGS.2M.03A.XLZ	17.2	6.8	M14x1.0	4.5	28.9	5.3	12.5	17.0
EGN.3M.95B.XLM	19.2	6.8	M16x1.0	4.0	32.2	5.3	14.5	19.0
EGW.5M.03W.XLZ	33.5	9.4	M30x1.0	4.0	30.8	7.9	28.5	36.0

Panel cut-out (page 59).

● Standard ● Special

ED● **Socket with square flange** (contact to be ordered separately, see page 44)

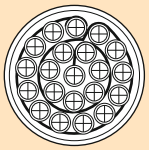
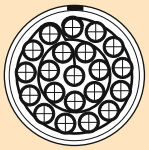


Part number	Dimensions (mm)								
	A	B	C	G	H	K	L	N	P
EDS.2M.03A.XLZ	26.9	8.95	17.2	12.8	15.1	1.5	28.9	20.6	5.3
EDN.3M.95B.XLM	29.0	10.95	19.2	12.8	16.6	1.5	32.2	22.1	5.3
EDW.5M.03W.XLZ	43.7	22.90	33.5	14.5	27.0	2.0	30.8	32.5	7.9

Panel cut-out (page 59).

Fibre Optic insert configuration

Multi fibre and Hybrid fibre optic + low voltage

	Male insert	Female insert	Reference	Number of F7 FO contacts	Low voltage contact						
					Number of contacts	ø A (mm)	Contact type	Crimp contact			
							Crimp	Test voltage (kV rms)[1] Contact-contact	Test voltage (kV rms)[1] Contact-shell	Rated current (A)[2]
2M			03A	2	–	–	–	–	–	–
3M			95B	4	4	0.9	●	1.00	0.80	8.0
5M			03W	21	–	–	–	–	–	–

Note: contacts must be ordered separately (see below).
[1] test voltage according to IEC 60512-4-1 test 4a. Altitude correction factor is given in IEC 60664-1 § 6..
[2] the specified rated current can be applied simultaneously to all the contacts. It corresponds to an average temperature rise of 40°C of the connector (measured according to IEC 60512-5-1 test 5a).

● Standard ● Special

F7 Fibre Optic contacts

The choice of the ferrule hole diameter is dependent upon the fibre cladding size. LEMO offers a range of ferrule hole diameters to suit the users' specific requirements.

Series	Contact part number	
	For straight plug	For free/fixed cable socket
2M	**PSS.F7.●●●.LCE23**	**FFS.F7.●●●.LCE23**
3M	**FFS.F7.●●●.LCE23**	**PSS.F7.●●●.LCL23**
5M	**FFS.F7.●●●.LCE23**	**PSS.F7.●●●.LCE23**

Note: the «●●●»indicates the reference of the ferrule hole diameter.

Reference	ø Core/Cladding (µm)	Ferrule hole diameter (µm)
125	9/125 (singlemode)	125
126	50/125 or 62.5/125 (multimode)	126
128	50/125 or 62.5/125 (multimode)	128

● Standard ● Special

FFS.F7 Male F7 Fibre Optic contact

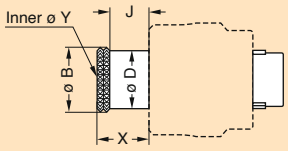
PSS.F7 Female F7 Fibre Optic contact

Special backshell

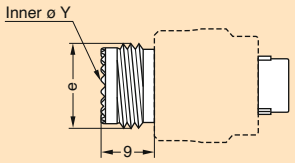
In addition to standard mold stop and standard heatshrink molded shapes backshell, M Series connectors offers 3 different special backshell allowing for various cable assembly attachments.

- The straight backshell offers a simple design allowing to either use a crimp ring or a spring for shielding attachment.
- The MIL-DTL-38999M (series III) offers the matching screw geometry allowing the use of standard D38999 compatible backshells.
- Cable collet version allow the assembly of the connector with a standard collet or a collet for bend relief without the need of heat-shrink or additional tools.

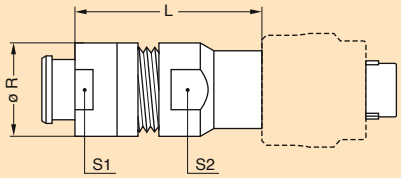
Straight



MIL-DTL-38999M (series III) M



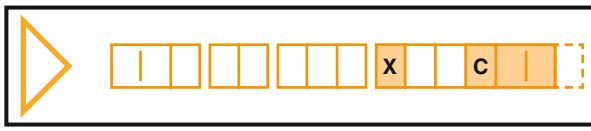
Cable collet backshell C Z



See page 50 for bend relief

Series	Backshell variant dimensions (mm)										
	B	D	e	J	L	R	S1	S2	X	Y	Code [1]
MM	6.4	5.6	–	4.2	–	–	–	–	5.8	4.7	–
0M	8.8	8.0	–	5.1	–	–	–	–	6.7	6.6	–
1M	10.5	9.7	M12x1.0	5.1	30.0	12.5	11.0	11.0	6.7	8.3	A
2M	14.0	13.0	M15x1.0	5.1	31.0	15.5	14.0	14.0	7.1	11.6	B
3M	16.0	15.0	M18x1.0	5.1	32.5	17.5	16.0	16.0	7.1	13.6	C
TM	17.9	16.7	M18x1.0	5.2	–	–	–	–	7.6	14.6	C
4M	20.7	19.5	M22x1.0	5.2	37.7	22.6	21.0	21.0	7.6	17.6	D
LM	23.9	22.7	M25x1.0	5.2	–	–	–	–	7.6	20.6	E
5M	29.7	28.5	M31x1.0	5.2	–	–	–	–	7.6	26.6	G

Note: [1] MIL-DTL-38999M (series III) backshell connector size code (backshell not supplied) (not available in MM and 0M size).

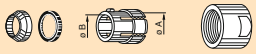


Special backshell

LEMO offer a choice of M series collets for size 1M, 2M, 3M, 4M in aluminium. The assembly of the connector can be finalised with a cable collet or a collet for bend relief.

Cable collet

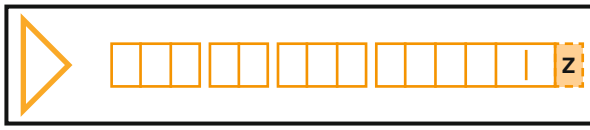
C type



	Reference		Collet ø		Cable ø		Notes
	Type	Code	ø A	ø B	max.	min.	
1M	C	15	1.6	–	1.5	1.3	
	C	20	2.2	–	2.0	1.6	
	C	25	3.2	–	2.5	2.1	
	C	30	3.2	–	3.0	2.6	
	C	35	4.2	–	3.5	3.1	
	C	40	4.2	–	4.0	3.6	
	C	45	5.2	–	4.5	4.1	
	C	50	5.2	–	5.0	4.6	
	C	55	6.2	6.2	5.5	5.1	
	C	60	6.2	6.2	6.0	5.6	
	C	65	7.2	6.7	6.5	6.1	
2M	C	15	2.2	–	1.5	1.3	
	C	20	2.2	–	2.0	1.6	
	C	25	3.2	–	2.5	2.1	
	C	30	3.2	–	3.0	2.6	
	C	35	4.2	–	3.5	3.1	
	C	40	4.2	–	4.0	3.6	
	C	45	5.2	–	4.5	4.1	
	C	50	5.2	–	5.0	4.6	
	C	55	6.2	–	5.5	5.1	
	C	60	6.2	–	6.0	5.6	
	C	65	7.2	–	6.5	6.1	
	C	70	7.2	–	7.0	6.6	
	C	75	8.2	8.2	7.5	7.1	
	C	80	8.2	8.2	8.0	7.6	
	C	85	9.2	8.6	8.5	8.1	
3M	C	30	3.2	–	3.0	2.6	
	C	35	4.2	–	3.5	3.1	
	C	40	4.2	–	4.0	3.6	
	C	45	5.2	–	4.5	4.1	
	C	50	5.2	–	5.0	4.6	
	C	55	6.2	–	5.5	5.1	
	C	60	6.2	–	6.0	5.6	
	C	65	7.2	–	6.5	6.1	

	Reference		Collet ø		Cable ø		Notes
	Type	Code	ø A	ø B	max.	min.	
3M	C	30	3.2	–	3.0	2.6	
	C	35	4.2	–	3.5	3.1	
	C	40	4.2	–	4.0	3.6	
	C	45	5.2	–	4.5	4.1	
	C	50	5.2	–	5.0	4.6	
	C	55	6.2	–	5.5	5.1	
	C	60	6.2	–	6.0	5.6	
4M	C	50	6.3	–	5.0	4.8	
	C	55	6.3	–	5.5	5.1	
	C	60	6.3	–	6.0	5.6	
	C	65	7.3	–	6.5	6.1	
	C	70	7.3	–	7.0	6.6	
	C	75	8.3	–	7.5	7.1	
	C	80	8.3	–	8.0	7.6	
	C	85	9.3	–	8.5	8.1	
	C	90	9.3	–	9.0	8.6	
	C	95	10.8	–	9.5	9.1	
	C	10	10.8	–	10.5	9.6	
	C	11	12.3	–	12.0	10.6	
	C	12	13.8	13.8	12.8	12.1	
	C	13	13.8	13.8	13.5	12.9	
	C	14	15.3	15.3	14.0	13.6	
	C	15	15.3	15.3	15.0	14.1	1)

Note: all dimensions are in millimetres.
1) the inner diameter of the largest bend relief available is 14.5 mm.



Special backshell

The bend relief collet is designated by a «Z» in the part numbering system.

Cable collet for bend relief variant

	Collet for bend relief			Need to be ordered
				Bend relief
	Ref.	Collet		Need to be ordered separately (see page 50)
		Type	Code	
1M	Z	C	15 to 65	GMA.1B.●●●.●●
2M	Z	C	15 to 85	GMA.2B.●●●.●●
3M	Z	C	30 to 10	GMA.3B.●●●.●●
4M	Z	C	50 to 15	GMA.4B.●●●.●●

Note: all dimensions are in millimetres.

Accessories

B●● Blanking caps IP68 ratchet secured (watertight)

Model

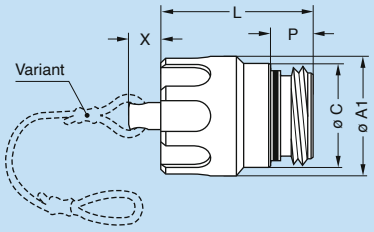
B G | | | 1 0 0 | | |

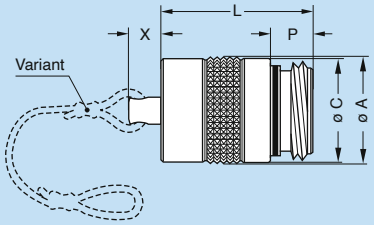
B M | | | 1 0 0 | | |

B G | | | 2 0 0 | | |

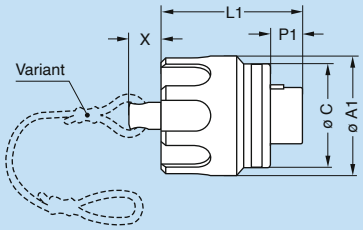
B M | | | 2 0 0 | | |

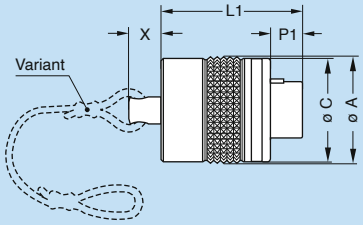
For plugs





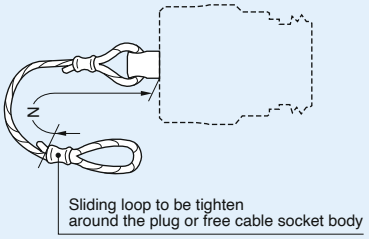
For sockets and free or fixed cable sockets



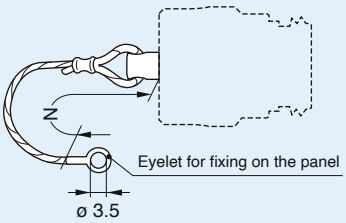


Variant

F | | | | | | | |

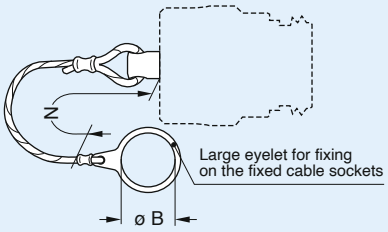


E | | | | | | | |



K | | | | | | | |

(for EC●/PE●/HE●/HY● models)

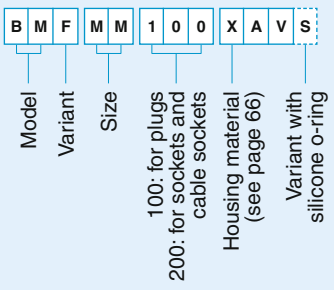


Part number for plugs	Dimensions (mm)								Dim. (mm)		Part number for sockets and free or fixed cable sockets
	A	A1	C	L	L1	P	P1	X	B	N[1)]	
BM●.MM.100.●AV	11.1	12.0	10.7	13.8	15.5	3.7	5.5	4.0	10.1	60	BM●.MM.200.●AZ
B●●.0M.100.●AV	13.1	14.4	12.7	18.6	17.4	5.3	3.9	6.0	13.1	85	B●●.0M.200.●AZ
B●●.1M.100.●AV	14.6	15.9	14.2	18.6	17.4	5.3	3.9	6.0	14.1	85	B●●.1M.200.●AZ
B●●.2M.100.●AV	17.6	18.9	17.2	18.6	17.4	5.3	3.9	6.0	17.2	85	B●●.2M.200.●AZ
BG●.3M.100.●AV	19.6	20.9	19.2	18.6	17.4	5.3	3.9	6.0	19.2	120	BG●.3M.200.●AZ
BG●.TM.100.●AV	22.5	23.4	22.0	21.1	21.0	7.9	3.4	10.0	22.2	120	BG●.TM.200.●AZ
BG●.4M.100.●AV	25.0	25.9	24.5	21.1	21.0	7.9	3.4	10.0	24.2	120	BG●.4M.200.●AZ
BG●.LM.100.●AV	28.5	29.4	28.0	21.1	21.0	7.9	3.4	10.0	28.2	150	BG●.LM.200.●AZ
BG●.5M.100.●AV	34.0	34.9	33.5	21.1	21.0	7.9	3.4	10.0	33.2	150	BG●.5M.200.●AZ

Note: 1) the tolerance on this dimension is ± 5 mm.

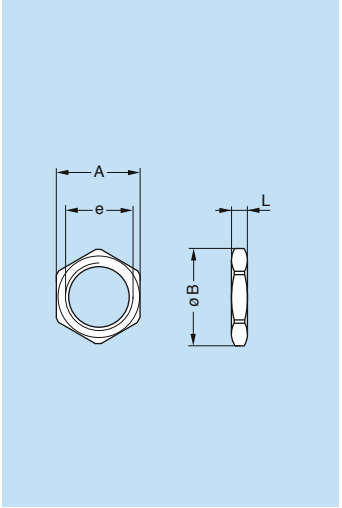
● Standard ● Special

Part Numbering Example



Note:
Lanyard material: Stainless steel
Eyelet material: Nickel-plated brass

GEA Hexagonal nuts for EC● model



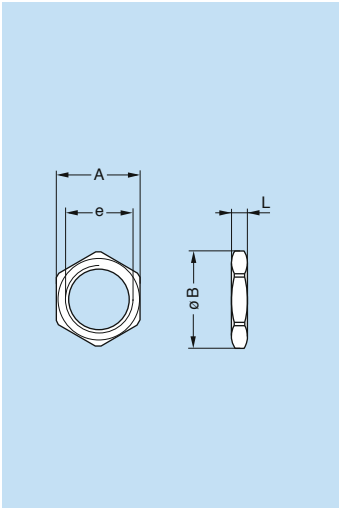
Part number	Series	Dimensions (mm)			
		A	B	e	L
GEA.MM.241.RL	MM	12.0	13.5	M10x0.50	2.5
GEA.0M.241.RL	0M	16.0	18.2	M13x0.75	2.5
GEA.0E.240.RL	1M	17.0	19.2	M14x1.00	2.5
GEA.2M.241.RL	2M	19.0	21.5	M17x1.00	3.0
GEA.3M.241.RL	3M	25.0	22.0	M19x1.00	3.0
GEA.TM.241.RL	TM	25.0	28.0	M22x1.00	3.0
GEA.4M.241.RL	4M	30.0	34.0	M24x1.00	3.0
GEA.LM.241.RL	LM	32.0	36.0	M28x1.00	3.0
GEA.5M.241.RL	5M	37.0	41.0	M33x1.00	3.0

● Standard ● Special

● Material: Nickel-plated aluminium alloy

Note: see page 59 for torque values.

GEA Hexagonal nuts for EG● model



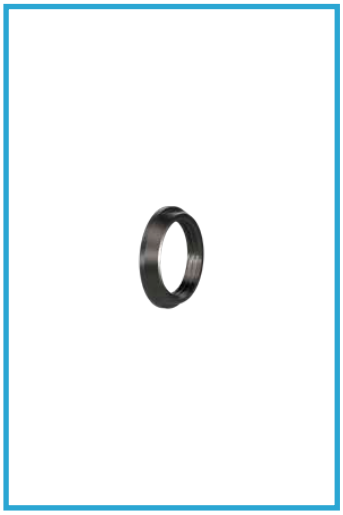
Part number	Series	Dimensions (mm)			
		A	B	e	L
GEA.00.240.RL	MM	9.0	10.2	M7x0.50	2.0
GEA.0S.240.RL	0M	11.0	12.4	M9x0.60	2.0
GEA.1M.240.RL	1M	13.0	14.5	M11x1.00	2.5
GEA.0E.240.RL	2M	17.0	19.2	M14x1.00	2.5
GEA.1E.240.RL	3M	19.0	21.5	M16x1.00	3.0
GEA.3S.240.RL	TM	22.0	25.0	M18x1.00	3.0
GEA.4M.240.RL	4M	25.0	28.0	M21x1.00	4.0
GEA.3E.240.RL	LM	30.0	34.0	M24x1.00	5.0
GEA.5M.240.RL	5M	36.0	40.5	M30x1.00	5.0

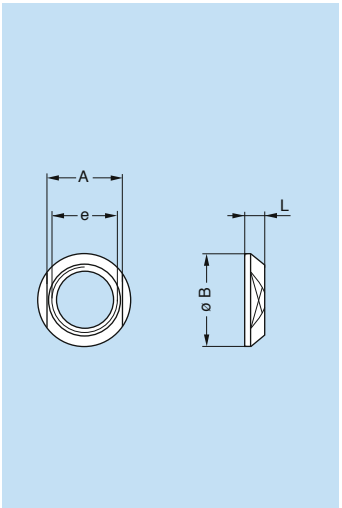
● Standard ● Special

● Material: Nickel-plated aluminium alloy

Note: see page 59 for torque values.

GEC Conical nut for models EC●, HE●, HY●, PE●





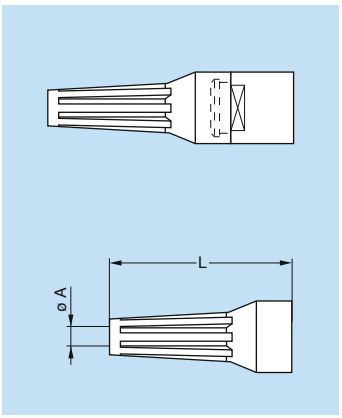
Part number	Series	Dimensions (mm)			
		A	B	e	L
GEC.MM.240.RN	MM	11.0	14.0	M10x0.50	2.5
GEC.0M.240.RN	0M	14.0	17.0	M13x0.75	3.2
GEC.0E.240.RN	1M	16.0	18.0	M14x1.00	3.0
GEC.2M.240.RN	2M	18.0	21.0	M17x1.00	3.2
GEC.3M.240.RN	3M	20.0	23.0	M19x1.00	3.2
GEC.TM.240.RN	TM	23.0	27.0	M22x1.00	5.0
GEC.4M.240.RN	4M	25.0	29.0	M24x1.00	5.0
GEC.LM.240.RN	LM	29.0	33.0	M28x1.00	5.0
GEC.5M.240.RN	5M	34.0	38.0	M33x1.00	5.0

● Standard ● Special

● Material: Nickel-plated aluminium alloy (anthracite colour)

Note: see page 55 for insert conical nut tightening tools and page 59 for torque values.

GM● Bend relief (TPU)



A bend relief made from thermoplastic polyurethane elastomer can be fitted over LEMO plugs and fixed or free cable sockets that are supplied with nut for fitting such bend relief.
Use the part numbers shown below to order this accessory separately.

Main characteristics

- Material: TPU (Thermoplastic Polyurethane)
- Temperature range in dry atmosphere: -40°C +80°C

Part number	Series	Bend relief		Cable ø	
		A	L	min.	max.
GMA.1B.025.DG	1M	2.5	30	2.5	2.9
GMA.1B.030.DG		3.0	30	3.0	3.4
GMA.1B.035.DG		3.5	30	3.5	3.9
GMA.1B.040.DG		4.0	30	4.0	4.4
GMA.1B.045.DG		4.5	30	4.5	4.9
GMA.1B.054.DG		5.4	30	5.4	6.0
GMA.1B.065.DG [1]		6.5	30	6.5	7.0
GMA.2B.040.DG	2M	4.0	36	4.0	4.5
GMA.2B.045.DG		4.5	36	4.5	5.0
GMA.2B.050.DG		5.0	36	5.0	5.5
GMA.2B.060.DG		6.0	36	6.0	6.5
GMA.2B.070.DG		7.0	36	7.0	7.7
GMA.2B.080.DG [1]		7.8	36	7.8	8.8

Part number	Series	Bend relief		Cable ø	
		A	L	min.	max.
GMA.3B.050.DG [1]	3M	4.5	42	4.5	5.2
GMA.3B.060.DG		6.0	42	6.0	6.9
GMA.3B.070.DG		7.0	42	7.0	7.9
GMA.3B.080.DG		8.0	42	8.0	8.9
GMA.3B.090.DG		9.0	42	9.0	10.0
GMA.4B.080.DG [1]	4M	8.0	60	8.0	9.0
GMA.4B.010.DG [1]		10.0	60	10.0	10.9
GMA.4B.011.DG [1]		11.0	60	11.0	11.9
GMA.4B.012.DG [1]		12.0	60	12.0	13.0
GMA.4B.013.DG [1]		13.5	60	13.5	14.5

● Standard ● Special

Note: all dimensions are in millimetres.

Note: [1] Design may differ from other bend relief, model without stripes.
The last letter «G» of the part number indicates the grey colour of the bend relief. For ordering a bend relief with another colour, see table above and replace the letter «G» by the letter of the required colour.

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

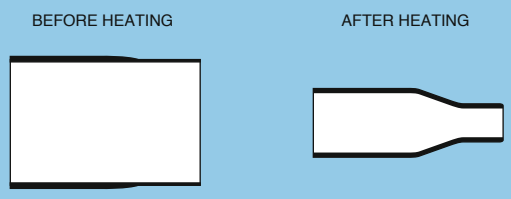
Ref.	Colour
A	blue
B	white
G	grey

Ref.	Colour
J	yellow
M	brown
N	black

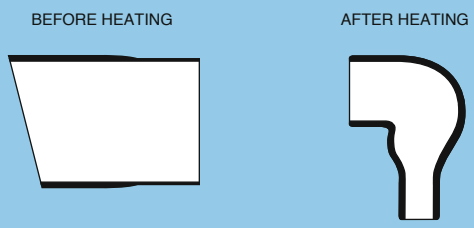
Ref.	Colour
R	red
S	orange
V	green

Standard heatshrink boot

Straight boot



Elbow boot



Series	Straight Part number Raychem® 1)	Note	Cable ø min. (mm)
MM	**203 W 301-25-0**	2)	2.2
0M-2M	**202 A 111-25/86**	3)	3.8
2M-4M	**202 A 121-25/86**	3)	5.3
4M-5M	**202 A 142-25/86**	3)	7.4

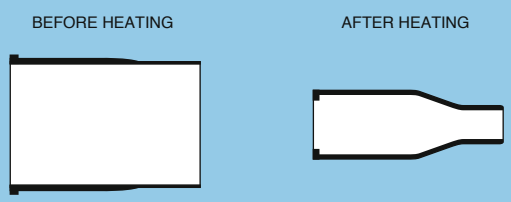
Series	Elbow 90° Part number Raychem® 1)	Note	Cable ø min. (mm)
MM	**223 W 301-25-0**	2)	2.2
0M-2M	**222 A 111-25/86**	3)	3.8
2M-4M	**222 A 121-25/86**	3)	5.3
4M-5M	**222 A 142-25/86**	3)	7.4

● Standard ● Special

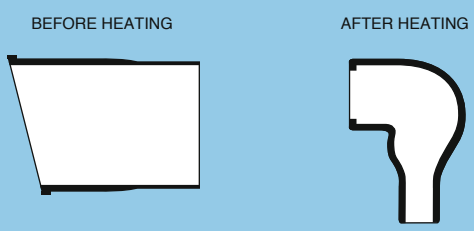
Note:
1) to be ordered directly from manufacturer.
2) elastomer resistant to fluids. We recommend a thermosetting sealant with this type of boot.
3) modified elastomer resistant to fluids with hot melt sealant.

Lipped heatshrink boot (for use with molded shapes, see page 11)

Lipped straight boot



Lipped elbow boot



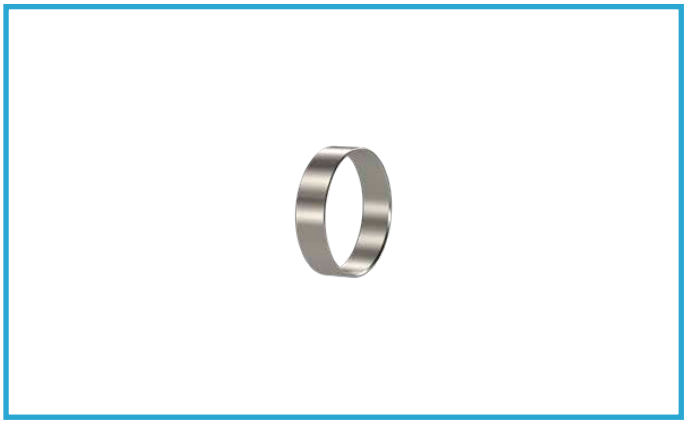
Series	Straight Part number Raychem® 1)	Cable ø min. (mm)
MM	**204 W 201-25/225**	1.5
0M	**204 W 221-25/225**	2.1
1M-2M	**202 F 211-50-22**	6.6
3M-4M	**202 F 221-50-22**	7.6
LM	**202 F 232-50-22**	8.9
5M	**202 F 242-50-22**	10.2

Series	Elbow 90° Part number Raychem® 1)	Cable ø min. (mm)
MM	**224 W 201-25/225**	1.5
0M	**224 W 221-25/225**	2.1
1M-2M	**222 F 211-50**	6.6
3M-4M	**222 F 221-50**	7.6
LM	**222 F 232-50**	8.9
5M	**222 F 242-50**	10.2

● Standard ● Special

Note: 1) to be ordered directly from manufacturer.

FGN Crimp ring for overmolding



The crimp rings are used to crimp the outershield of cables before overmolding.
It ensures the best possible ground contact and fixture between the cable screen and the connector backshell.
This solution is adapted to volume assembly, and when using pressure overmolding.

Part number	Outer ø (mm)	Crimping tool with dies	Kit with two dies
FGN.0M.160.DN	10.0	DPD.99.010.1K	DPD.99.010.1KZ
FGN.1M.160.DN	11.8	DPD.99.012.0K	DPD.99.012.0KZ
FGN.2M.160.DN	15.3	DPD.99.015.8K	DPU.99.015.8K

FGN Constant force spring clips

A range of constant force spring clips are available for use with M Series connectors, which permits repair of cable terminations without having to discard any of the existing braid shield system. When used in conjunction with LEMO heatshrink boots, a fully sealed termination is achieved.

An additional benefit of the constant force spring is that it provides excellent resistance to shock or vibration due to its self-tensioning properties.

Part number	Series	Number of wraps	Width (mm)
FGN.0M.185.AZ	0M / 1M / 2M	4.3 / 3.5 / 2.6	4.0
FGN.3M.185.AZ	3M / TM	2.5 / 2.3	4.0
FGN.5M.185.AZ	4M / LM / 5M	1.8 / 1.5 / 1.2	4.0

● Standard ● Special

Tie-wrap

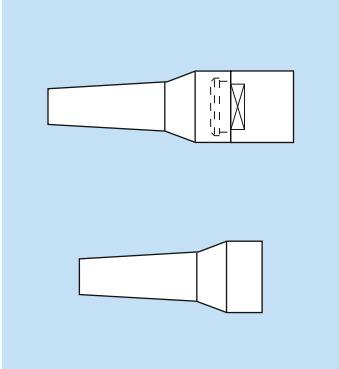
Tie wrap are used to ensure the best possible ground contact and fixture between the cable screen and the connector backshell. The tie wrap are delivered by set of 100 pieces.

	Part number		
	TIE-DEX® [1]		AXON® [1]
Tie wrap	**A31089**	**A30199** [2]	**AXCL 02**

Note:
[1] to be ordered directly from manufacturer.
[2] for MM series.

Accessories for Fibre Optic

GMA **Bend relief** (for M series fibre optic model only)



Part number (Polyurethane)	Series	Part number (Silicone)
GMA.2B.0••.DG	2M	**GMA.2B.0••.RG**
GMA.3B.0••.DG	3M	**GMA.3B.0••.RG**
GMA.4B.0••.DG	5M	**GMA.4B.0••.RG**

Note: please see unipole/multipole catalogue for bend relief dimensions. The last letter «G» of the part number indicates the grey colour of the bend relief. For ordering a bend relief with another colour, see table on the right and replace the letter «G» by the letter of the required colour.

A bend relief can be fitted over LEMO plugs and sockets supplied with a specific collet nut.

These bend relieves are available in different colours and two different materials. TPU (Thermoplastic Polyurethane) is the standard choice for most apllications. Silicone elastomer VMQ option can be selected where the applications required a wide temperature range (silicone material keeps a good flexibility over the full temperature range).

Main characteristics

- Material: TPU (Thermoplastic Polyurethane)
- Temperature range in dry atmosphere: -40°C +80°C

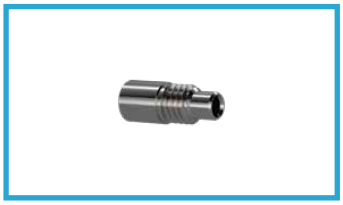
- Material: Silicone elastomer VMQ
- Temperature range in dry atmosphere: -60°C +200°C
- Temperature range in water steam: +140°C

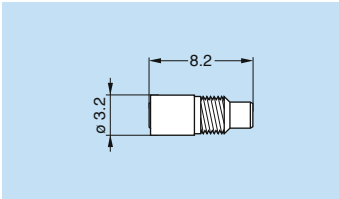
Ref.	Colour
A	blue
B	white
G	grey

Ref.	Colour
J	yellow
M	brown
N	black

Ref.	Colour
R	red
S	orange
V	green

PSS.F7.290.NZZ **Alignment device for F7 Fibre Optic contact**





Alignment device are supplied as default with all female fibre optic contacts, this item is a spare accessory for maintenance purposes.

Note: alignment device should be ordered as replacement item.

Tooling

DPC Manual crimping tool

Part number
DPC.91.701.V

According to specification MIL-C-22520/7-01.
For LEMO contacts ø 0.5-0.7-0.9-1.3 mm

DCE Positioners for crimp contacts

Male

Female

These positioners are suitable for use with both manual and pneumatic crimping tools according to the MIL-C-22520/7-01 standard.

Contact		Positioners part number	
Contact ø	Size	For male contacts	For female contacts
1.3	0M-5M	DCE.91.130.5MVC	DCE.91.130.5MVM
0.9	0M-3M	DCE.91.090.5MVC	DCE.91.090.3MVM
	TM-5M	DCE.91.090.5MVC[1)]	DCE.91.09T.5MVM
0.7	0M-3M	DCE.91.070.5MVC	DCE.91.070.3MVM
	2M.514	DCE.91.072.MVCM	DCE.91.072.MVCM
	TM-5M	DCE.91.070.5MVC	DCE.91.07T.5MVM
0.5	MM	DCE.91.050.0VC	DCE.91.050.0VM

● Standard ● Special

Note: [1)] the positioner part number for male contact for the serie 5M.G33 is DCE.91.090.5MVCY.

DCC Manual extractors for crimp contacts

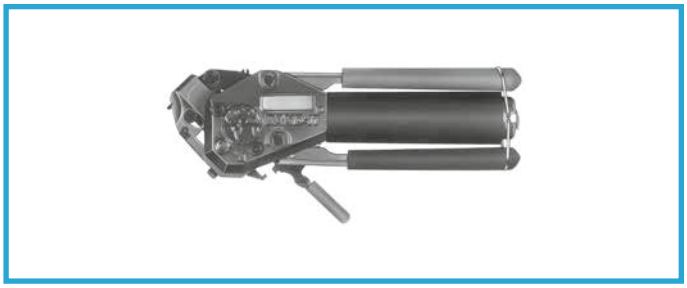
Contact ø	Part number
1.3	DCC.13.15B.LAG
0.9	DCC.09.05B.LAG
0.7	DCC.07.04B.LAG
0.5	DCC.05.02B.LAG

Note: this model is used for male and female contacts.

DCV Female contact insertion tool

Contact ø	Part number
1.3	DCV.13.05M.LA
0.9	DCV.09.05M.LA
0.7	DCV.07.05M.LA
0.5	DCV.05.05M.LA

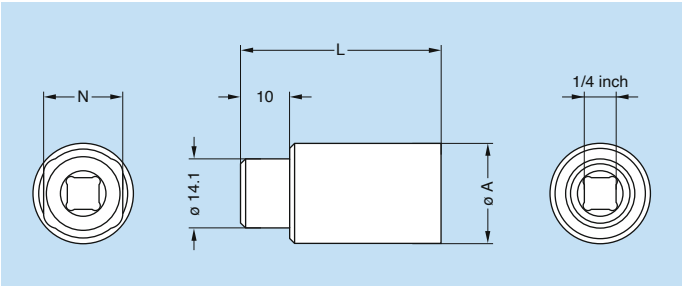
Banding tool



	Part number	
	TIE-DEX® [1]	AXON® [1]
Banding tool	**A30199**	**ACDBS100**

Note: [1] to be ordered directly from manufacturer.

DCM Insert conical nut tightening tools for models EC●, HE●, HY●, PE●



Part number	Series	Dimensions (mm)			Torque (Nm)
		A	L	N	
DCM.65.110.AZ	MM	16.4	33.0	11.1	1.0
DCM.65.140.AZ	0M	19.1	33.0	14.1	1.0
DCM.65.160.AZ	1M	20.4	41.0	16.1	1.5
DCM.65.180.AZ	2M	23.4	41.0	18.1	2.0
DCM.65.200.AZ	3M	26.4	41.0	20.1	2.5
DCM.65.230.AZ	TM	29.6	46.0	23.1	4.0
DCM.65.250.AZ	4M	31.6	46.0	25.1	5.0
DCM.65.290.AZ	LM	35.6	46.0	29.1	6.5
DCM.65.340.AZ	5M	40.1	47.0	34.1	8.0

Note: for standard 1/4 inch tools adaptor. See conical nut on page 49.

● Standard ● Special

Tooling for coaxial

DPE Crimping tool with die

Part number
DPE.99.103.8K
DPE.99.083.8K
DPE.99.003.1K

DCP Spanner for tightening the contact

Part number
DCP.99.040.TC

DPC Manual crimping tool

Part number
DPC.91.701.V

According to specification MIL-C-22520/7-01.
For LEMO contacts ø 0.5-0.7-0.9-1.3 mm

DCC Extractor

Part number
DCC.91.CP1.LAG
DCC.91.C0R.LAG

Tooling for High Power

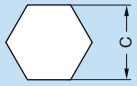
Standard crimping tool for High Power contacts

Series	Contact ø (mm)	Wire section		Crimping tool Klauke [1) 2)]		
		mm²	AWG	K05	K06	K35/4
3M	4.0	10	8	●	●	●
TM	5.0	16	6	●	●	●
4M	6.0	25	4	●	●	●
LM	8.0	35	2		●	●
5M	8.0	50	1		●	●

● Standard ● Special

Note:
[1)] for cable lugs and connector standard type.
[2)] to be ordered directly from manufacturer.

Chamber hexagonal crimp dimensions for High Power contacts

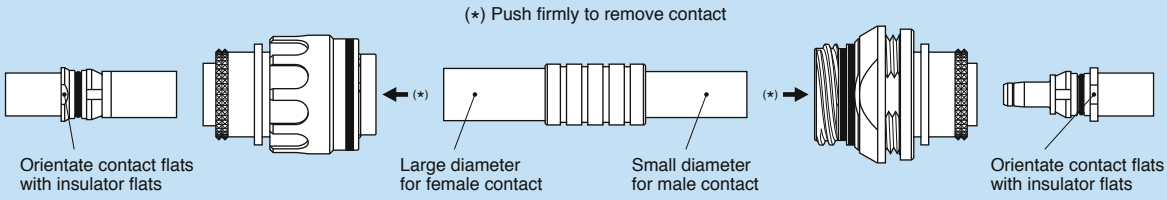


Series	Contact ø (mm)	Wire section		Chamber crimp
		mm²	AWG	Dimension C (mm)
3M	4.0	10	8	5.6
TM	5.0	16	6	6.6
4M	6.0	25	4	7.8
LM	8.0	35	2	10.0
5M	8.0	50	1	11.0

● Standard ● Special

DCC Extraction tools for High Power contacts

Extractors part number for male and female contacts	Series	Contact ø (mm)
DCC.91.43H.PLC	3M.H14, 5M.H34, 5M.G33	4.0
DCC.91.5TH.PLC	TM.H15	5.0
DCC.91.64H.PLC	4M.H16	6.0
DCC.91.8LH.PLC	LM.H18	8.0
DCC.91.85H.PLC	5M.H18	8.0



Tooling for Fibre Optic

DCP Set of flat spanners for collet nuts

Part number	Series
DCP.2M.110.TN	2M
DCP.3M.110.TN	3M
DCP.5M.110.TN	5M

Note: for width across flats, see page 41.

DCS.F7.035.PN F7 contact alignment device tool

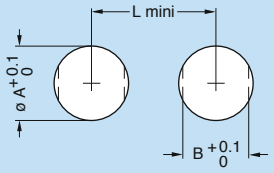
Simple tool with two threaded end for installation/extraction of the F7 contact alignment device.

See also F7 tooling in the F7 Fibre Optic catalog.

Panel cut-outs

Cut-outs

EG●-EC●-HE●-HY●-PE●

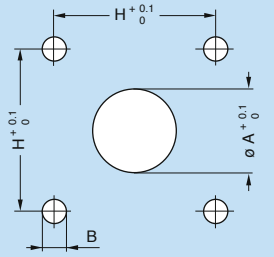


Series	EG●			EC●/HE●/HY●/PE●		
	ø A	B	L	ø A	B	L
MM	7.1	6.4	12.5	10.1	9.1	16.0
0M	9.1	8.3	14.5	13.1	11.6	20.0
1M	11.1	9.6	17.2	14.1	12.6	21.0
2M	14.1	12.6	20.5	17.1	15.6	24.0
3M	16.1	14.6	23.0	19.1	17.6	27.0
TM	18.1	16.6	27.0	22.1	20.6	31.5
4M	21.1	19.6	30.0	24.1	22.6	35.5
LM	24.1	22.6	32.0	28.1	26.6	36.5
5M	30.1	28.6	41.0	33.1	31.6	41.0

Mounting nut torque (on panel)

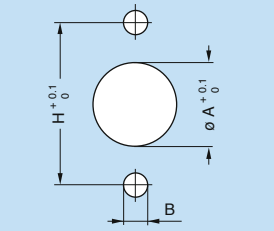
Series	Torque (Nm)
MM	1.0
0M	1.0
1M	1.5
2M	2.0
3M	2.5
TM	4.0
4M	5.0
LM	6.5
5M	8.0

ED●-FW●-PF●



Series	ED●			FW●			PF●		
	ø A	B	H	ø A	B	H	ø A	B	H
MM	5.0	M2.5	9.5	9.6	M2.5	12.0	7.9	M2.5	9.5
0M	5.1	M2.5	11.0	12.3	M2.5	15.1	10.8	M2.5	11.0
1M	6.1	M3.0	12.9	13.8	M3.0	18.3	12.5	M3.0	12.9
2M	9.1	M3.0	15.1	16.8	M3.0	20.6	15.6	M3.0	15.1
3M	11.1	M3.0	16.6	18.8	M3.0	20.6	18.1	M3.0	16.6
TM	12.5	M3.0	18.3	21.6	M3.0	23.0	19.9	M3.0	18.3
4M	14.1	M3.0	20.6	24.1	M3.0	24.6	22.7	M3.0	20.6
LM	18.1	M3.0	23.0	27.6	M3.0	27.0	25.9	M3.0	23.0
5M	23.2	M3.0	27.0	33.1	M3.0	29.4	33.1	M3.0	29.4

PB●

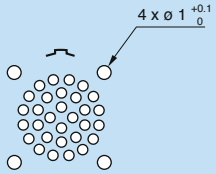


Series	PB●		
	ø A	B	H
MM	11.8	M2.5	16.2
0M	15.0	M3.0	21.4
1M	17.0	M3.0	23.4
2M	20.0	M3.0	26.4
3M	22.0	M3.0	29.0
TM	25.0	M3.0	32.5
4M	28.0	M3.0	35.0
LM	31.0	M3.0	38.0
5M	38.0	M3.0	45.0

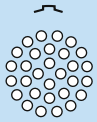
HE●, EG●, EC● and ED● models PCB drilling pattern

Socket with straight print contact

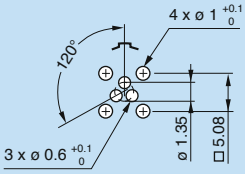
For HE● models



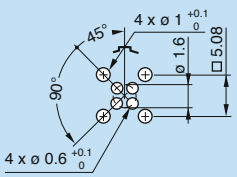
For EG●, EC● and ED● models



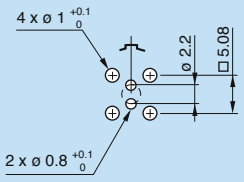
MM.303



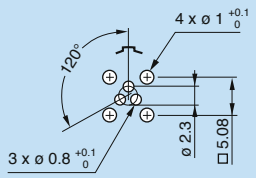
MM.304



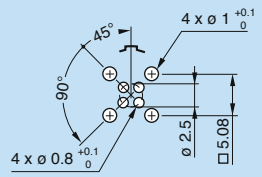
0M.302



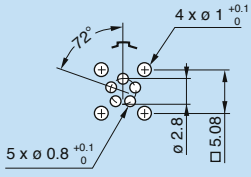
0M.303



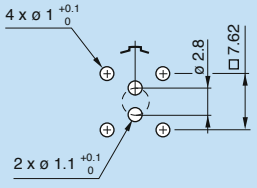
0M.304



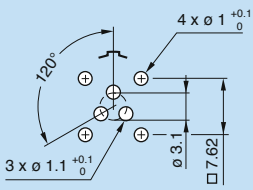
0M.305



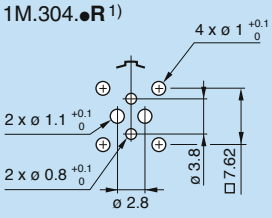
1M.302



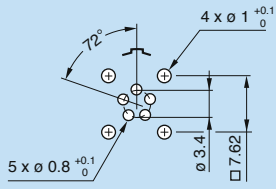
1M.303



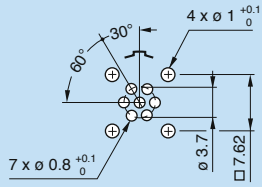
1M.304.●R [1)]



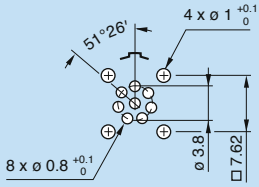
1M.305



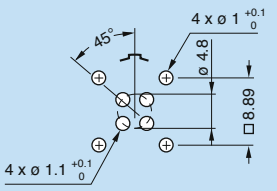
1M.307



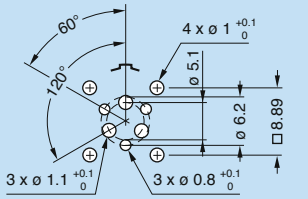
1M.308



2M.304



2M.306.●R [1)]



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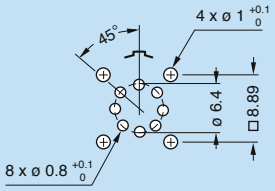
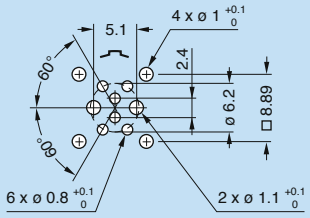
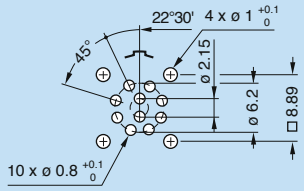


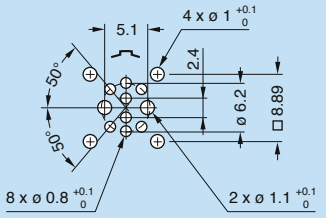
2M.308.●R [1)]



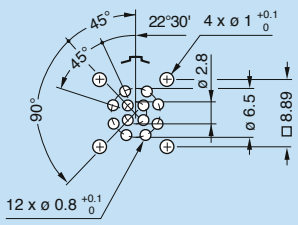
2M.310



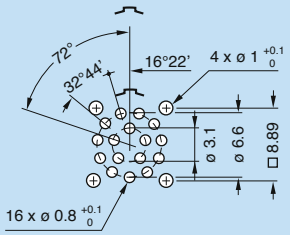
2M.310.●R [1)]



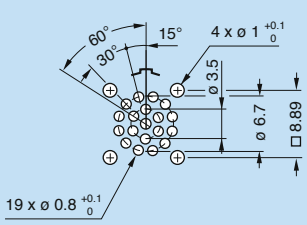
2M.312



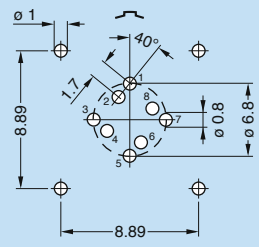
2M.316



2M.319

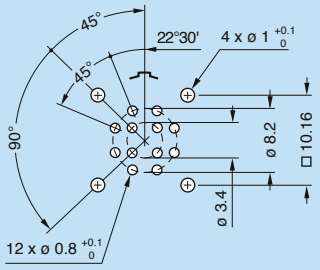


2M.514 (HE●) (top view) [2)]

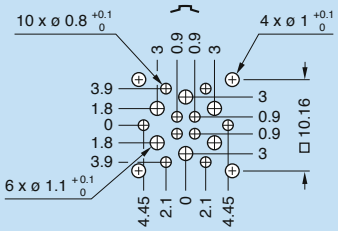


Note: [1)] special mixed multipole configurations, refer to page 24 for details. [2)] contact numbering is for female contact version only.

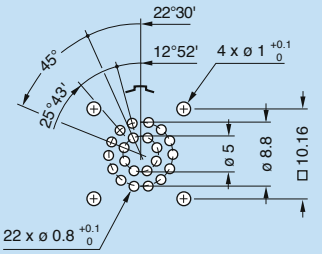
3M.312



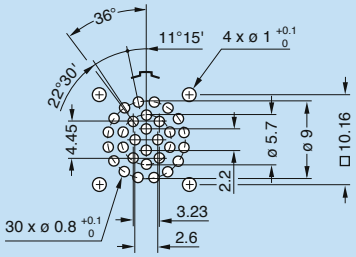
3M.316.●R [1)]



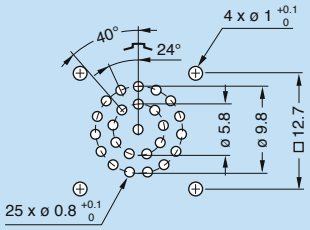
3M.322



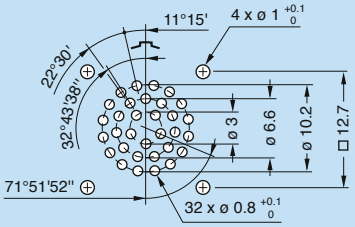
3M.330



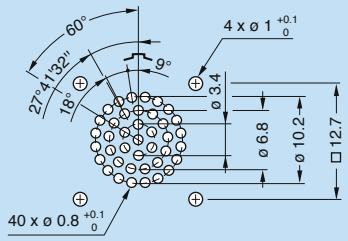
TM.325



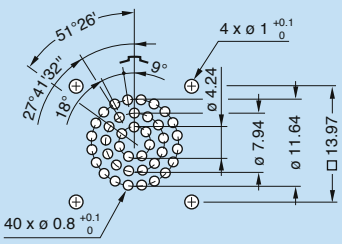
TM.332



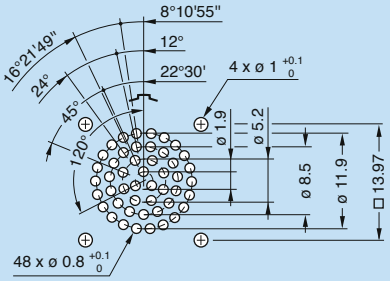
TM.340



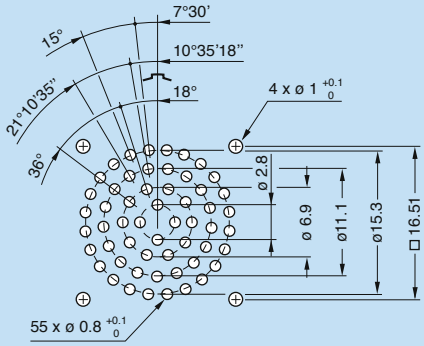
4M.340



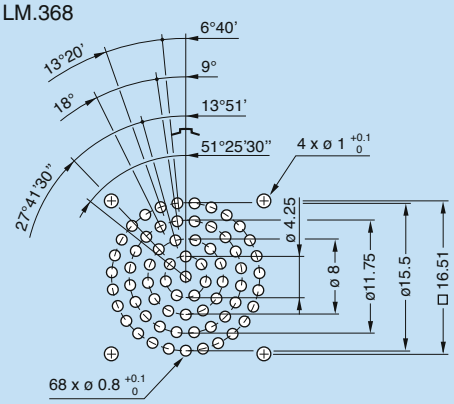
4M.348



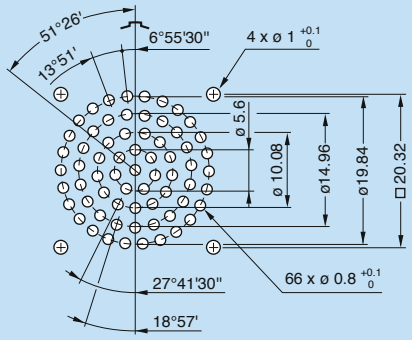
LM.355



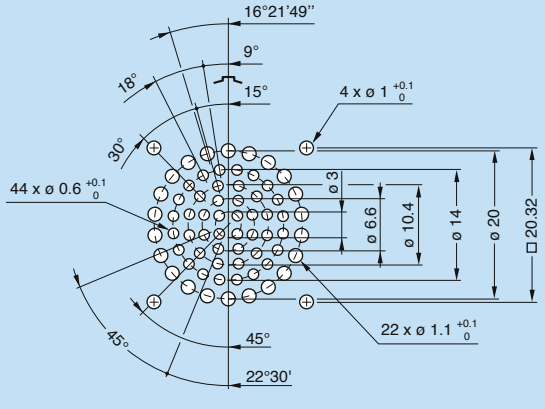
LM.368



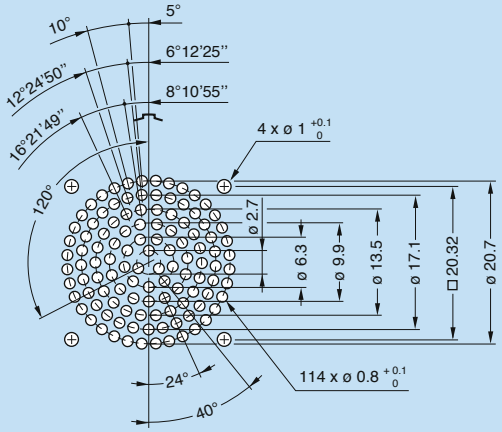
5M.366



5M.366.●R [1)]



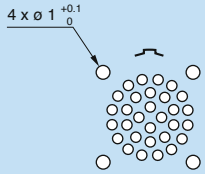
5M.114



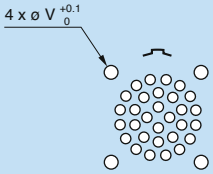
HY● model PCB drilling pattern

Socket with straight print contact

For HY● models (with ground pin)

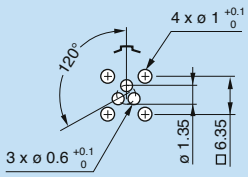


For HY● models (with threaded holes)

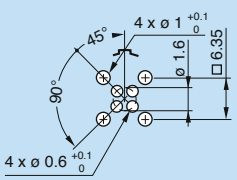


Series	ø V (mm)
MM to 3M	2.1
TM to 5M	3.1

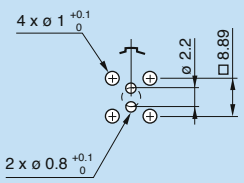
MM.303



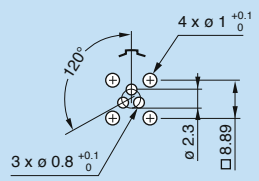
MM.304



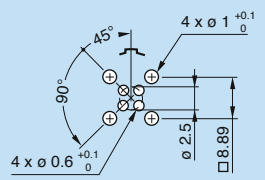
0M.302



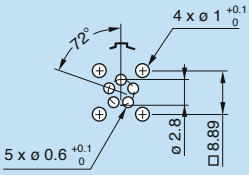
0M.303



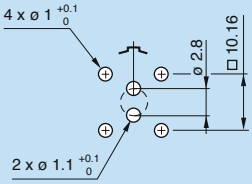
0M.304



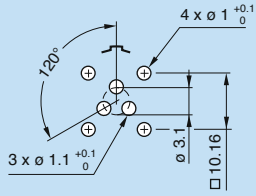
0M.305



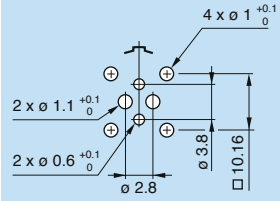
1M.302



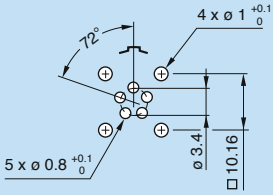
1M.303



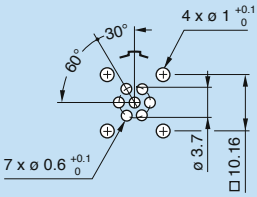
1M.304.●R [1)]



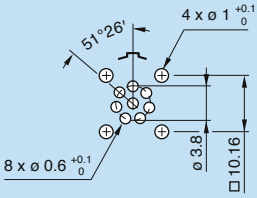
1M.305



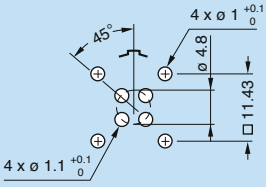
1M.307



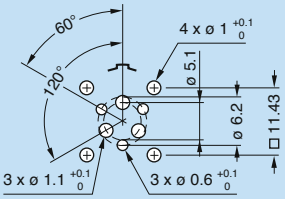
1M.308



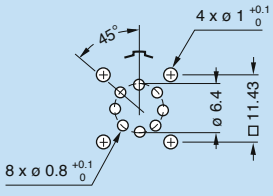
2M.304



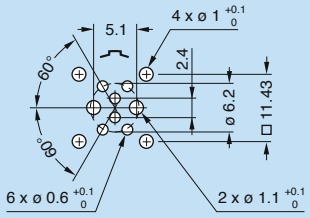
2M.306.●R [1)]



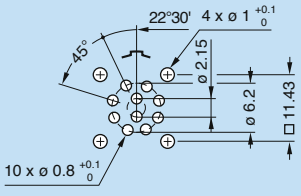
2M.308



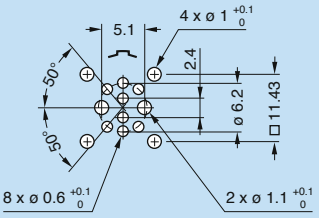
2M.308.●R [1)]



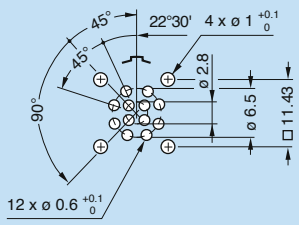
2M.310



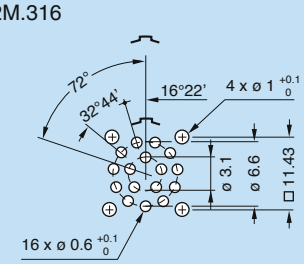
2M.310.●R [1)]



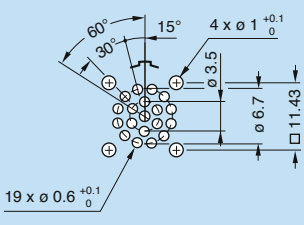
2M.312



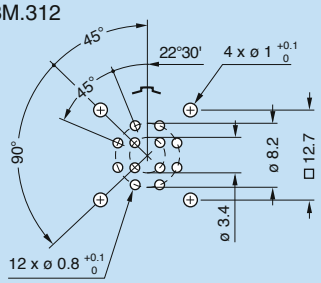
2M.316



2M.319

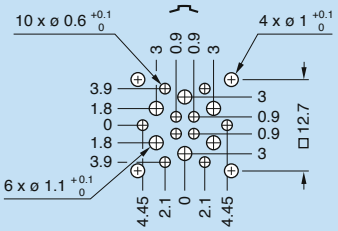


3M.312

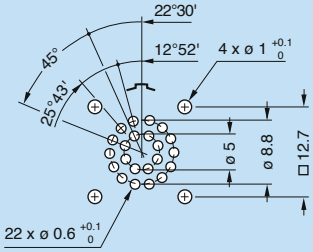


Note: [1)] special mixed multipole configurations, refer to page 24 for details.

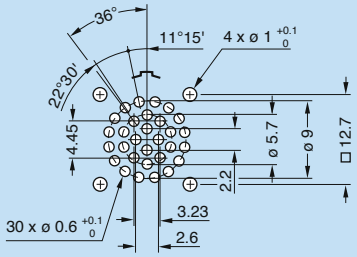
3M.316.●R [1)]



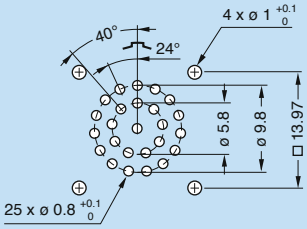
3M.322



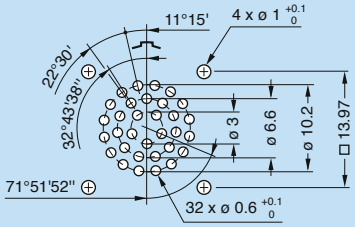
3M.330



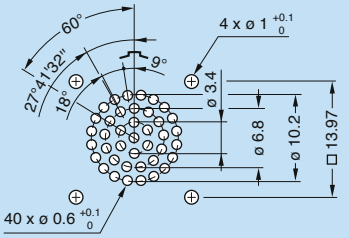
TM.325



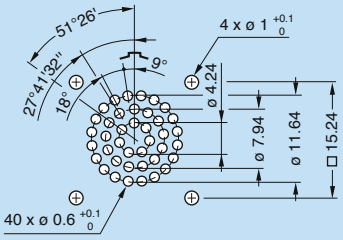
TM.332



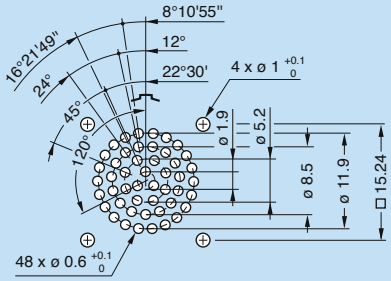
TM.340



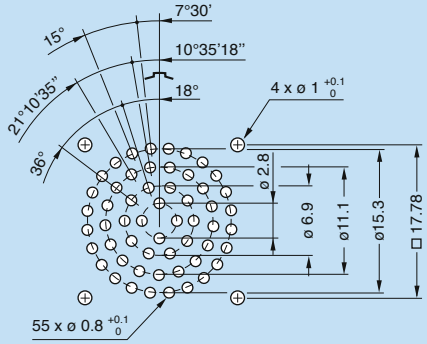
4M.340



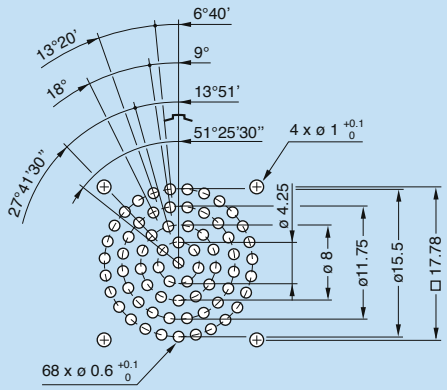
4M.348



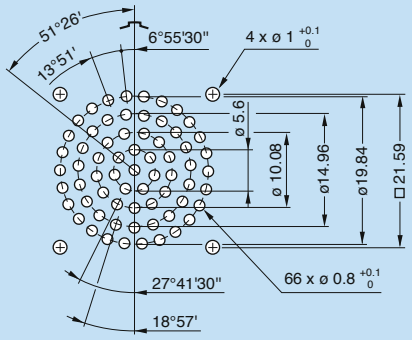
LM.355



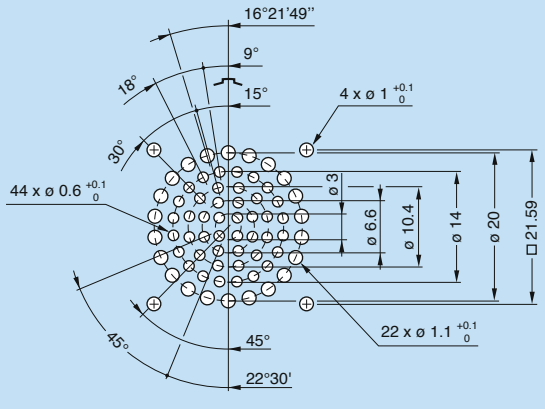
LM.368



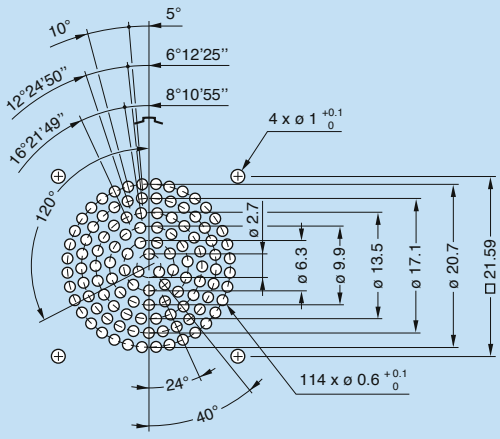
5M.366



5M.366.●R [1)]

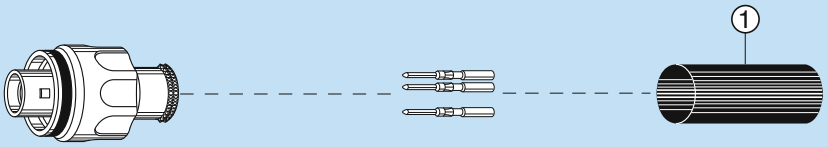


5M.114

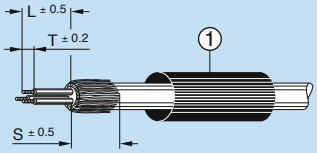


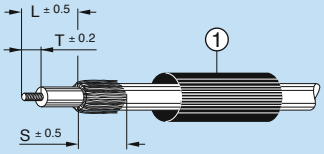
Assembly instructions

For cable mounted models



① heatshrink boot option to be ordered separately





① heatshrink boot to be placed on cable if desired

Cable preparation

- Remove cable jacket and resses the shield onto the cable (shield can be temporary fixed using adhesive tape).
- Strip the cable elements using the dimensions specified in the table below. Dimensions must be selected according to the backshell variant in use.

Multipole

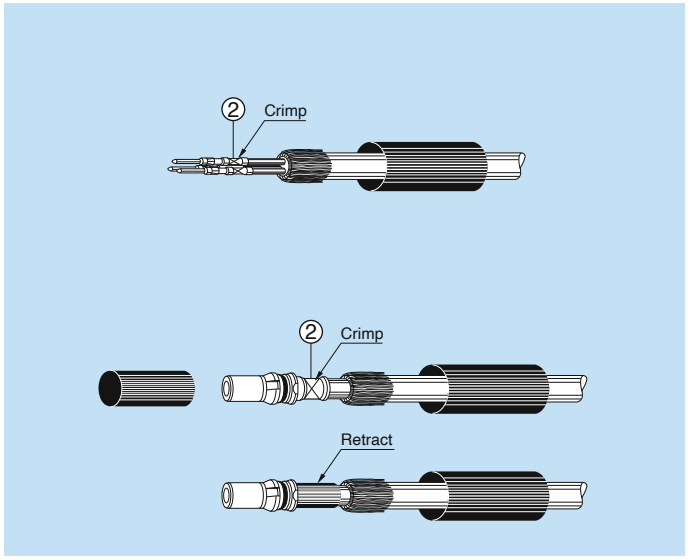
Series	Cable stripping length [1)] [2)] (mm)					
	P●● / FG● / FM●			FW●		
	L	S	T [3)]	L	S	T [3)]
MM	16	18	3.0	21	18	3.0
0M	16	18	3.5	21	18	3.5
1M	16	18	3.5	21	18	3.5
2M	18	20	3.5	23	20	3.5
3M	18	20	3.5	23	20	3.5
TM	20	23	3.5	26	23	3.5
4M	20	23	3.5	26	23	3.5
LM	20	23	3.5	26	23	3.5
5M	20	23	3.5	26	23	3.5

Note:
[1)] indicative values, may need to be adapted according to your cable construction and specific pin allocation.
[2)] for mixed, high speed, USB 2.0, fibre optic models please contact technical support for specific stripping length.
[3)] for 1.3 mm contact «T» = 4 mm (1M.302/1M.303/2M.304).

High Power

Reference	Cable stripping length [1)] (mm)					
	P●● / FG●			FW●		
	L	S	T	L	S	T
3M.H14	24.0	33	10	24.0	27	10
TM.H15	24.0	33	10	24.0	27	10
4M.H16	24.0	33	12	24.0	27	12
LM.H18	27.0	39	13	27.0	33	13
5M.H18	27.0	39	13	27.0	33	13
5M.H34	24.0	30	10	24.0	25	10
5M.G33	24.0 27.5 [2)]	30 30	10 3.5	24.0 27.5 [2)]	25 25	10 3.5 [2)]

Note:
[1)] indicative values, may need to be adapted according to your cable construction and specific pin allocation.
[2)] low power contact.



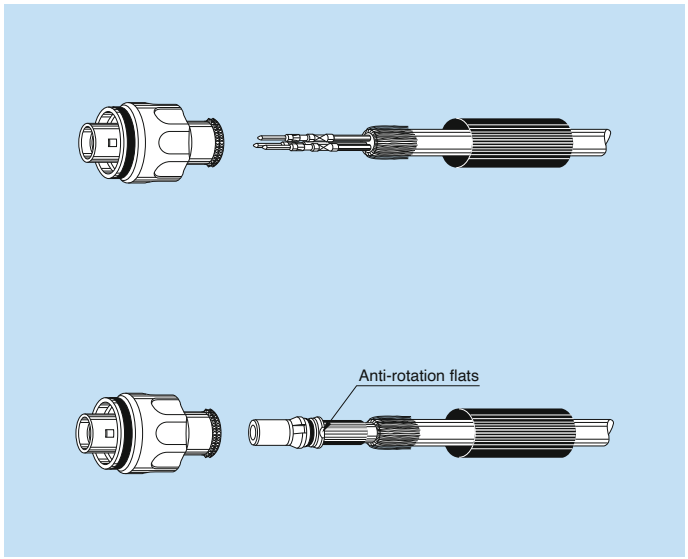
Contact crimping

Multipole versions

- Fix the appropriate positioner onto the crimping tool (see page 54).
- Set the tool selector on the corresponding AWG. Crimping tool setting can be found on the positioner label.
- Insert the conductor into the contact barrel ②; make sure that the conductor is visible through the contact's inspection hole.
- Slide the conductor-contact assembly into the crimping tool and push the contact fully into the positioner.
- Proceed with crimping and check that conductor is securely crimped in the contact. Also check that the conductor is still visible in the contact inspection hole.

• High Power versions

- Select the appropriate crimping tool (see page 57).
- Insert the conductor into the contact barrel ②.
- Slide the conductor-contact assembly into the crimping tool.
- Proceed with crimping and check that conductor is securely crimped in the contact. Also check that all conductor strands are securely fixed into the contact barrel.
- Place the supplied heatshrink tube to cover the crimped zone and cable inner jacket.
- Retract the heatshrink tube in the desired position using a heat gun.



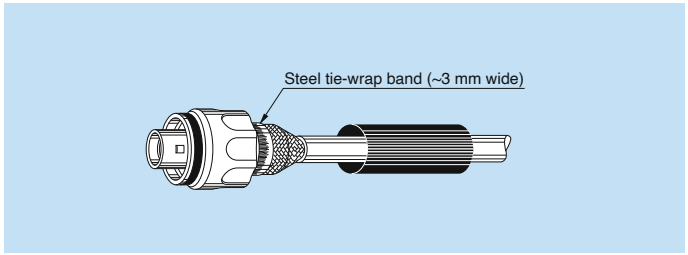
Contact insertion

Multipole versions

- Arrange the conductor-contact assemblies according to the desired pin layout.
- Push the contact firmly into the insulator until mechanical click can be felt. The use of tweezers can facilitate contact insertion.
- Check that all contacts are correctly located in the insulator by verifying:
  1) the alignment of the contacts at the front of the insulator.
  2) by gently pulling on each conductor to verify that they are properly secured into the insulator.
- In case a crimp contact must be disassembled from insulator extraction tool can be found on page 54.

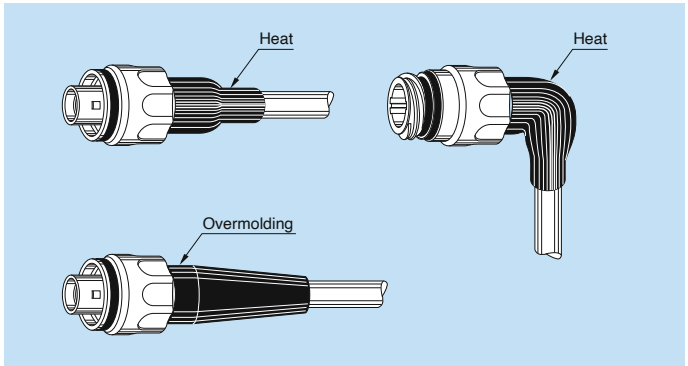
High Power versions

- Arrange the conductor-contact assemblies according to the desired pin layout (multipole only).
- Insert the contact into the insulator, aligning the anti-rotation flats of the contact with the corresponding anti-rotation lugs inside the insulator.
- Push the contact firmly into the insulator until mechanical click can be felt.
- Check that the contact is correctly secured by gently pulling on the conductor.



Braid connection

- Bring the braid around the backshell of the connector.
- Position the braid fixing accessory (tie-wrap or constant force spring clips, to be ordered separately).
- Proceed to braid fixing accessory installation using the dedicated tool.
- Recess the excess braid over the braid fixing accessory and trim the excess length.



Bend relief installation

Heatshrink boot versions

- Position the heatshrink boot (to be ordered separately) over the backshell by taking special care of keeping the braid in position under the boot.
- Gently retract the heatshrink boot using a heat gun.

Overmolding versions

- For overmolding versions previous steps like contact insertion might need special preparation according to overmolding process in use. Contact us for details on specific overmolding preparation.

Note: the elbow version in not recommended for High Power versions.

Technical characteristics

Materials and treatments

Component	Shell material code [1]			Material (Standard)
	X	C	F	
Outer shell, conical nut, coupling nut	● [2]			Aluminium alloy
		●		Brass
			● [2]	Brass
Earthing crown			●	Bronze or special brass
Hexagonal nut		●	●	Brass
	●			Aluminium alloy
Male crimp contact			●	Brass
Female crimp contact		●		Bronze
Clips		●		Cu-Be or special steel
Insulator		●		PEEK
Ratchet		●		Special PEEK
O-ring	●			FPM/FKM
	●	●	●	EPDM (HY●)
	●	●	●	Silicone
Sealing resin	●	●	●	Epoxy
	●	●	●	Silicone
Cable rear seal	●	●	●	Fluorosilicone
Spring		●		Stainless steel

● Standard ● Special

Note: standards for surface treatment are as follows: chrome-plated SAE AMS 2460; nickel-plated SAE AMS QQ N 290 or MIL DTL 32119; gold-plated ISO 27874.

[1] X = Nickel-plated aluminium alloy.
C = Chrome-plated brass.
F = Nickel-plated brass.

[2] anthracite colour.

Housing compatibility

LEMO recommends using matching housings to maintain optimal corrosion resistance and overall connector performance. Mixing different housing materials may compromise durability in harsh environments.

Electrical performance

Characteristics	Value	IEC international	MIL-spec tests
Insulation resist. (at ambient temp.) 1)	> 10^{12} Ω, > 10^{10} Ω (after humidity)	IEC 60512-3-1 test 3a	EIA-364-21
Dielectric withstanding volt. (sea level)	See insert configuration	IEC 60512-4-1 test 4a	EIA-364-20
Contact resistance 3)	See table below	IEC 60512-2-1 test 2a	EIA-364-06
Current rating	See insert configuration	IEC 60512-5-1 test 5a	
Shell to shell conductivity 2)	< 1.5m Ω	IEC 60512-2-6	EIA-364-83
Shielding effectiveness, low frequency 2)	≥ 80 dB up to 1GHz		EIA-364-66
Shielding effectiveness, high frequency 2)	≥ 70 dB (3GHz), ≥ 58 dB (6GHz), ≥ 40 dB (10GHz)		EIA-364-66

Contact resistance 3) IEC 60512-2 test 2a								Value
0.5	0.7	0.9	1.3	4.0	5.0	6.0	8.0	ø A (mm)
≤ 8.3	≤ 5.7	≤ 4.2	≤ 2.9	≤ 0.3	≤ 0.25	≤ 0.2	≤ 0.2	mΩ

Note:
1) after humidity test: 21 days at 95% RH according to IEC 60068-2. Insulation resistance measured between the contacts and contact/shell.
2) no shell to shell conductivity for anodized aluminium versions (shielding and conductivity values do not apply).
3) after 3000 mating cycles and the salt spray test according to IEC 60068-2-11 test Ka.

Mechanical performance

Characteristics	Value	IEC international	MIL-spec tests
Endurance	3000 cycles	IEC 60512-5 test 9a	EIA-364-09
Gunfire vibration	25 to 2000 Hz, 3 axis (Apache helicopter)		MIL-STD-810F method 519.5
Vibration-Sine 1) 2)	30 g, 3 axis, 12 hr		MIL-STD-202 method 204-G
Vibration-Random 2)	50-2000 Hz, 37.8 g rms-3 axes; 4h amb	IEC 60512-6-4	EIA-364-28 test cond. V letter I
Shock 2)	300 g - 3 msec	IEC 60512-6-3	EIA-364-27 condition D
Acceleration	50 g acceleration		MIL-STD-1344 - 2011-1, A
Torque	See table below		

Note: 1) amplitude: 30g. Frequency: 10 to 2000 Hz. Time per axis: 4 hours (X, Y, Z). 2) no signal discontinuity above 1 µs.

Plug mating/unmating torque

Series	Coupling torque tightning (N.cm)	Coupling torque untightning (N.cm)
MM	8	4
0M	4	5
1M	10	11
2M	20	14
3M	34	29

Series	Coupling torque tightning (N.cm)	Coupling torque untightning (N.cm)
TM	26	30
4M	26	25
LM	48	43
5M	91	54

Note: indicative values, tightening torque may vary depending on insert configuration.

Environmental performance

Characteristics	Shell material	Value			
		-55°C/+200°C [1]	-20°C/+200°C [1]	-20°C/+80°C	-65°C/+180°C
Standard models operating temperature	Code X	F●●, P●● [2]	E●●, P●●	HE●	HE● [2], HY●
	Code X [2], C or F	F●●, E●●, P●●	–	HE●	HE● [2], HY●

Note:
[1] for short periods of use.
[2] variant with silicone resin and/or o-ring.

Characteristics	Value	IEC international	MIL-spec tests
Ingress protection index (mated)	IP68 (at 20 m, 2 h)	IEC 60529	
Fungus	Satisfied - by material analysis		MIL-STD 810F-508.5
Flammability	60 sec. front and back face		EIA-364-104A
Fluid contamination [1]	Fuels, gasoline, hydraulic oils, solvents, de-icing		MIL-STD-810F method 504
Sand and dust [2]	6 h, 55°C, blowing < 150 µm dust		MIL-STD 810F-510.4
Lightning strike	10 K amps - 6 times		EIA-364-75
Altitude-low temp [3]	-65°C; 40'000 feet and 400 VAC		EIA-364-105A
Salt fog [4]	48 hours (shell material code X)	IEC 60068-2-11 test Ka	EIA-364-26
	> 1000 hours (shell material code C or F)	IEC 60068-2-11 test Ka	EIA-364-26
Thermal shock (standard models)	5 cycles: -65°C to +150°C	IEC 60512-11-4	EIA-364-32 test condition IV
Altitude immersion	No moisture on contacts		EIA-364-03
Humidity	21 days at 95%	IEC 60068-2	EIA-364-31 method IV
Safety	IP2X finger protection for high power connectors	IEC 60529	

Note: [1] connectors immersed at both 70°C and 25°C according to specification. Connectors are then inspected, no visual signs of damage seen. Fuels: Kerosene, JP4, (Nato F40) at 70°C +/- 2°C. Gasoline: ASTM 4814. Hydraulic oils: Mineral oil based MIL-H-5606. Solvents: Isopropanol. De-icing fluids: 25% ethylene glycol.
[2] no signs of damage, connectors opened and closed without difficulty. Dust or sand was not inside connector.
[3] wired mated connectors = no voltage breakdown, shell to all contacts (connected together) w/400 VAC after 1 hour at -65° C at 40'000 feet altitude.
[4] corrosion resistance. Inspection: salt deposits shall be removed by gentle wash in running water with light brushing using soft brush.

Note

Note

Product safety notice & Disclaimers

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://web.lemo.com/img/resources/quality/LEMO-Prop-65-compliance-declaration.pdf

8. UL RECOGNITION
LEMO connectors are components recognized by the Underwriters Laboratories (UL), facilitating the UL approval of the complete system (including LEMO connector, cable and your equipment).

9. REACH AND ROHS
LEMO connector specifications comply with the requirements of the RoHS directive (2011/65/EU) and REACH regulation (1907/2006/EU) of the European Parliament and latest amendments. These REACH and ROHS regulations specify the restrictions of the use of hazardous substances in LEMO products marketed in Europe.

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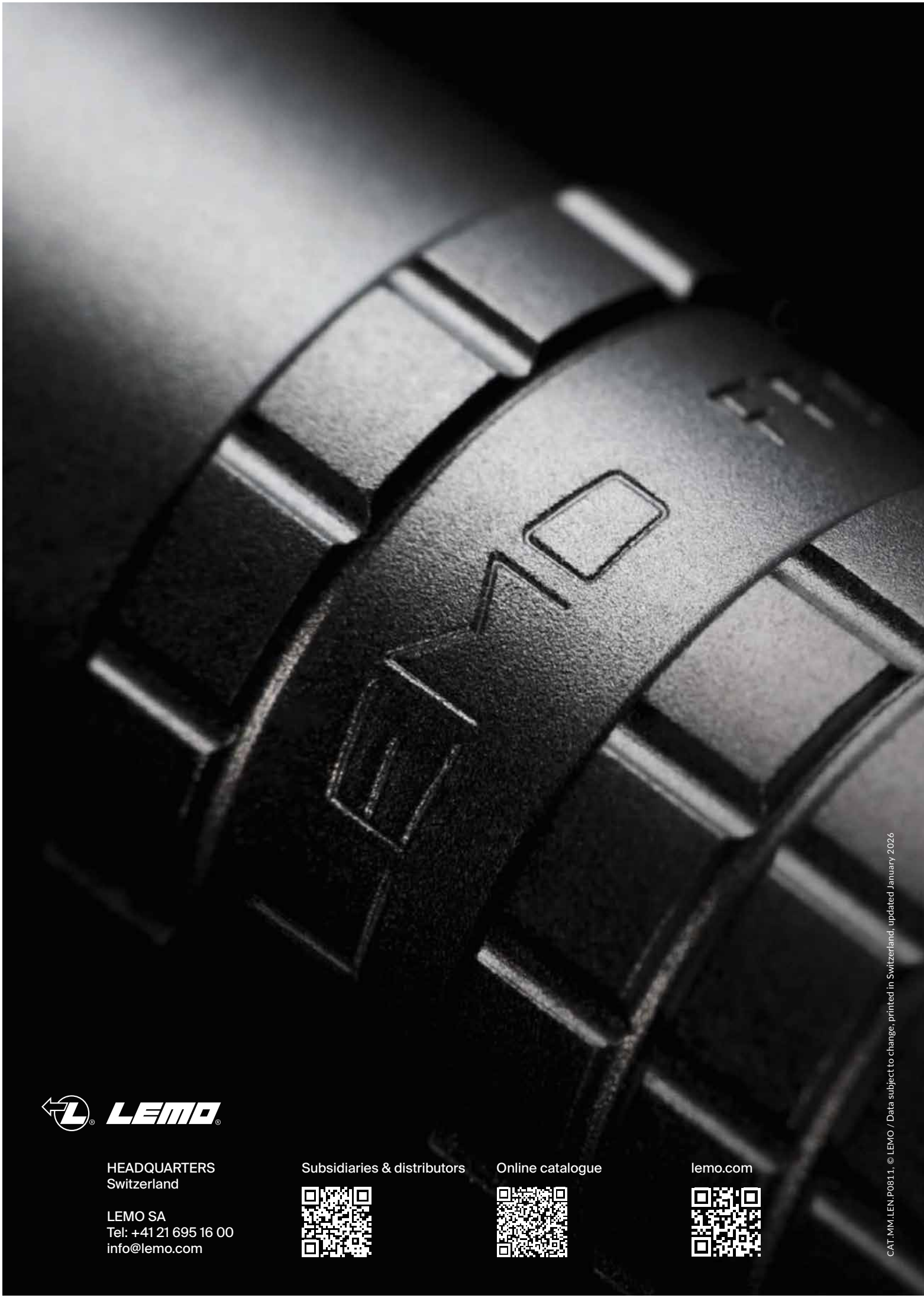

LEMO

HEADQUARTERS
Switzerland

LEMO SA
Tel: +41 21 695 16 00
info@lemo.com

Subsidiaries & distributors

Online catalogue

lemo.com