

# HARSH ENVIRONMENT RATCHET COUPLING M SERIES CONNECTOR



## Rapid ratchet coupling mechanism

The M Series connector offers a new innovative design for motorsport applications and military systems. Made of high-strength aluminium, this connector is one of the lightest and most compact connector of the LEMO range. A ratchet screw system enables quick and secure coupling of the connectors. The arctic grip makes it easy to manipulate the connector while wearing winter gloves or when the connector is located in a difficult to access area.

### Features

- Ratchet-coupling mechanism
- Quick mating: 1/2 turn to seat
- Compact design for space savings
- Oil and fuel resistant
- High vibration and shock resistance (gunfire test)
- 360° screening for full EMC shielding
- Sealed to IP68 when mated
- Colour coding / keying
- Requires 2x the coupling force to unmate
- Scoop proof
- Reverse sex configuration possible



## Technical Characteristics

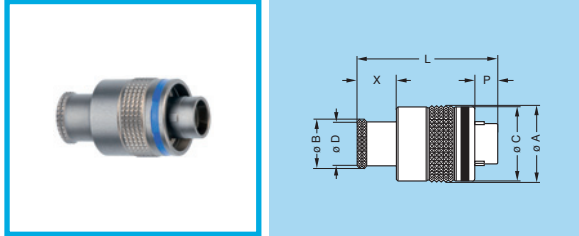
Characteristics	Value	Standard
Endurance	3000 cycles	IEC 60512-5 test 9a
Operating temperature	-50°C/+200°C	-
Resistance to vibration	10-2000Hz, 15g	IEC 60512-4 test 6d
Shock resistance	100g, 6ms	IEC 60512-6 test 6c
Salt spray corrosion test	144h	IEC 60512-6 test 11f
Protection index (at 2m, 30') <sup>1)</sup>	IP68	IEC 60529
Gunfire	satisfied	MIL STD-810-E

## Material and treatment

Characteristics	Value	Surface treatment
Outershell, coupling nut	Aluminium (AA 6262A)	Ni (5 µm) <sup>2)</sup>
Earthing crown	Bronze (UNS C 54400)	Au (1.5 µm)
Ratchet	PEEK graphite	-
Insulator	PEEK	-
Contacts	Brass/Bronze	Ni (3 µm) + Au (1 µm)
Gaskets	FPM + FVMQ	-
Sealing resin	Epoxy	-

Note: 1) at 1.8m/15h. 2) Anthracite colour.

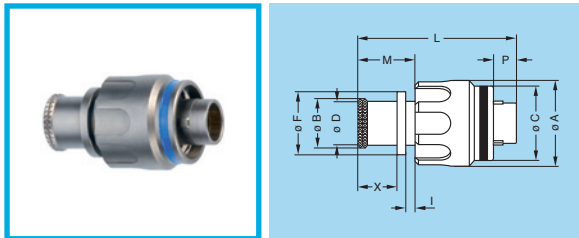
## Models



### FM• Straight plug, key (N) or keys (P and U) with knurled grip

Reference		Dimensions (mm)							Weight max (g)
Model	Series	A	B	C	D	L	P	X	
FM•	0M	13.1	8.8	12.7	8.0	24.1	4.0	6.7	3.6
FM•	1M	14.6	10.5	14.2	9.7	24.1	4.0	6.7	5.8
FM•	2M	17.6	14.0	17.2	13.0	24.5	4.0	7.1	8.0

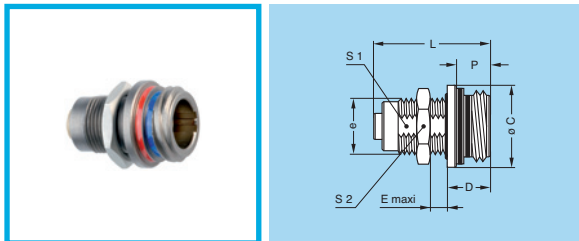
Part number example: FMN.1M.305.XLC



### FG• Straight plug, key (N) or keys (P and U) with arctic grip and optional mold stop

Reference		Dimensions (mm)										Weight max (g)
Model	Series	A	B	C	D	F	I	L	M	P	X	
FG•	0M	14.4	8.8	12.7	8.0	10.7	1.5	27.1	9.7	4.0	6.7	4.4
FG•	1M	15.9	10.5	14.2	9.7	12.4	1.5	27.1	9.7	4.0	6.7	5.8
FG•	2M	18.9	14.0	17.2	13.0	15.5	1.5	27.5	10.1	4.0	7.1	7.4

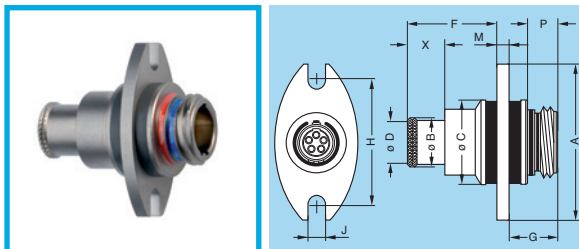
Part number example: FGN.1M.305.XLCT



### EG• Fixed socket, nut fixing, key (N) or keys (P and U)

Reference		Dimensions (mm)								Weight max (g)
Model	Series	C	D	e	E	L	P	S1	S2	
EG•	0M	12.7	6.8	M9x0.6	5.0	18.1	5.3	8.2	11.0	2.7
EG•	1M	14.2	6.8	M11x1.0	4.5	18.1	5.3	9.5	13.0	3.3
EG•	2M	17.2	6.8	M14x1.0	4.5	18.1	5.3	12.5	17.0	4.5

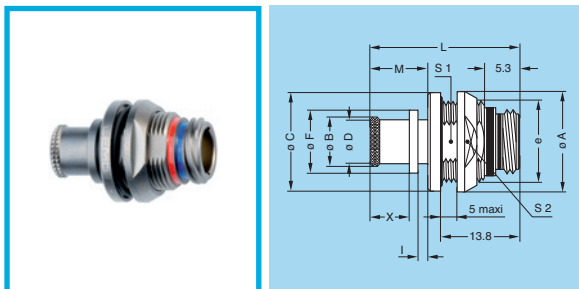
Part number example: EGN.1M.305.XLM



### PB• Fixed socket with antivibration flange, key (N) or keys (P and U), 2 holes fixing

Reference		Dimensions (mm)										
Model	Series	A	B	C	D	F	G	H	J	M	P	X
PB•	0M	27.0	8.8	14.5	8.0	15.3	8.3	21.4	3.3	2.0	5.3	6.7
PB•	1M	29.0	10.5	16.5	9.7	15.3	8.3	23.4	3.3	2.0	5.3	6.7
PB•	2M	32.0	14.0	19.5	13.0	15.7	8.3	26.4	3.3	2.0	5.3	7.1

Part number example: PBN.1M.305.XLM



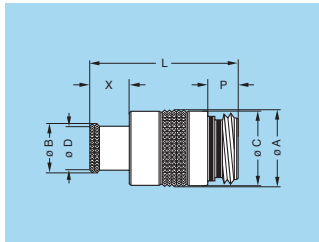
### PE• Fixed socket, nut fixing, key (N) or keys (P and U) and mold stop (back panel mounting)

Reference		Dimensions (mm)										
Model	Series	A	B	C	D	e	F	L	M	S1	S2	X
PE•	0M	17	8.8	16.8	8.0	M13x0.75	10.7	25.6	9.7	11.5	14	6.7
PE•	1M	18	10.5	17.8	9.7	M14x1.00	12.4	25.6	9.7	12.5	16	6.7
PE•	2M	21	14.0	20.8	13.0	M17x1.00	15.5	26.0	10.1	15.5	18	7.1

Note: the dimension «L» is the same as the FG• models.

Part number example: PEN.1M.305.XLMT

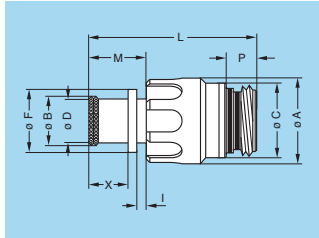




**PM• Free socket, key (N) or keys (P and U) with knurled grip**

Reference		Dimensions (mm)						
Model	Series	A	B	C	D	L	P	X
PM•	0M	13.1	8.8	12.7	8.0	25.6	5.3	6.7
PM•	1M	14.6	10.5	14.2	9.7	25.6	5.3	6.7
PM•	2M	17.6	14.0	17.2	13.0	26.0	5.3	7.1

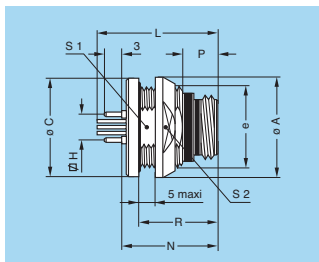
Part number example: PMN.1M.305.XLM



**PH• Free socket, key (N) or keys (P and U) with arctic grip and optional mold stop**

Reference		Dimensions (mm)									
Model	Series	A	B	C	D	F	I	L	M	P	X
PH•	0M	14.4	8.8	12.7	8.0	10.7	1.5	28.6	9.7	5.3	6.7
PH•	1M	15.9	10.5	14.2	9.7	12.4	1.5	28.6	9.7	5.3	6.7
PH•	2M	18.9	14.0	17.2	13.0	15.5	1.5	29.0	10.1	5.3	7.1

Part number example: PHN.1M.305.XLMT



**HE• Fixed socket, nut fixing, key (N) or keys (P and U) for printed circuit, watertight (back panel mounting)**

Reference		Dimensions (mm)									
Model	Series	A	C	e	H	L	N	P	R	S1	S2
HE•	0M	17.0	16.8	M13x0.75	5.08	20.8	16.8	5.3	13.8	11.5	14.0
HE•	1M	18.0	17.8	M14x1.00	7.62	20.8	16.8	5.3	13.8	12.5	16.0
HE•	2M	21.0	20.8	M17x1.00	8.89	20.8	16.8	5.3	13.8	15.5	18.0

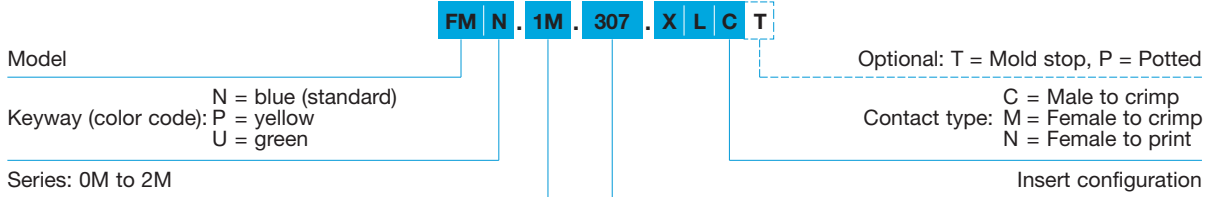
Part number example: HEN.1M.305.XLNP

**Insert configuration and electrical characteristics**

	Male crimp contacts for plug		Female crimp contacts for sockets		Reference	Number of contacts	ø A (mm)	Contact type		AWG	Test voltage (kV rms) <sup>1)</sup> Contact-contact	Test voltage (kV rms) <sup>1)</sup> Contact-shell	Rated current (A)
	Diagram	Diagram	Crimp	Print (straight) <sup>2)</sup>									
<b>0M</b>					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
<b>1M</b>					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
<b>2M</b>					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
					319	19	0.7	•	•	22-24-26	1.55	0.95	5.0

Note: 1) Test voltage according to IEC 60512-2 test 4a. 2) For HE• socket.

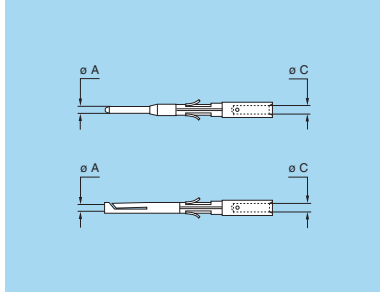
## Part Numbering System



### Part Number Example

FMN.1M.307.XLCT = Straight plug with key (N), 1M series, multipole type with 7 male crimp contacts, with mold stop.

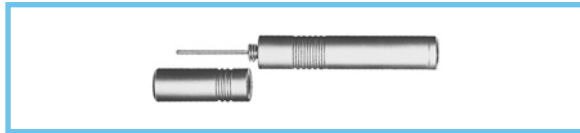
## Accessories



### FGG-EGG Crimp contacts

Connector		Part		Conductor				Part number	
Series	Type	ø A	ø C	AWG		Section (mm <sup>2</sup> )		male for plug	female for socket
				min	max	min.	max		
0M	302-303	0.9	1.10	24	20	0.25	0.50	FGN.0M.560.ZZC	EGN.0M.660.ZZM
	304-305	0.7	0.85	26	22	0.14	0.34	FGN.0M.555.ZZC	EGN.0M.655.ZZM
1M	305	0.9	1.10	24	20	0.25	0.50	FGN.0M.560.ZZC	EGN.0M.660.ZZM
	307-308	0.7	0.85	26	22	0.14	0.34	FGN.0M.555.ZZC	EGN.0M.655.ZZM
2M	308-310	0.9	1.10	24	20	0.25	0.50	FGN.0M.560.ZZC	EGN.0M.660.ZZM
	312-319	0.7	0.85	26	22	0.14	0.34	FGN.0M.555.ZZC	EGN.0M.655.ZZM

### DCF Extractors for crimp contacts



Contact ø	Extractors part number
0.9	DCF.93.090.4LT
0.7	DCF.93.070.4LT

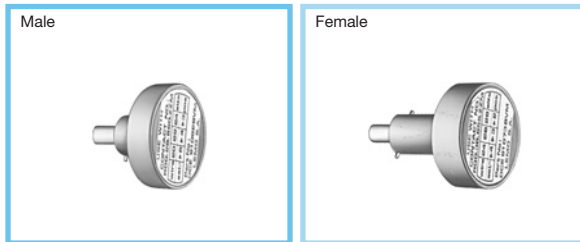
**Note:** this model is used for male and female contacts.

### Heatshrink boot

Supplier	Part Number		Note	Cable ø (mm)	
	Straight	Elbow 90°		min.	max
Raychem®	202 A 111-25/86	222 A 111-25/86	1)	3.8	11
	202 A 111-25	222 A 111-25	2)	3.8	11
Hellerman®	104-1-G	1108-1-G	2)	3.8	11

**Note:** 1) modified elastomer resistant to fluids with hot melt sealant.  
2) elastomer resistant to fluids. We recommend a thermosetting sealant with this type of boot.

## Tooling



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

### DCE Positioners for crimp contacts

Connector		Part		Positioners part number	
Series	Type	ø A	ø C	For male contacts	For female contacts
				0M	302-303
	304-305	0.7	0.85	DCE.91.070.MVC	DCE.91.070.MVM
1M	305	0.9	1.10	DCE.91.090.MVC	DCE.91.090.MVM
	307-308	0.7	0.85	DCE.91.070.MVC	DCE.91.070.MVM
2M	308-310	0.9	1.10	DCE.91.090.MVC	DCE.91.090.MVM
	312-319	0.7	0.85	DCE.91.070.MVC	DCE.91.070.MVM

### Tightening/Untightening torque (plug-socket)

Series	Torque (N.cm)	
	Tightening	Untightening
0M	2.8-3.9	4.6-5.9
1M	3.0-4.0	4.5-6.0
2M	7.0-12.0	9.0-14.0

### Mounting nut torque (on panel)

Series	Torque (N.m)
0M	1.0
1M	1.5
2M	2.0

## LEMO HEADQUARTERS

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

[www.lemo.com](http://www.lemo.com)