



## M Series

Underwater Connectors







### Presentation

The M Series connectors meet the highest standards of safety for deep immersion. It is currently used in many applications: from oil and gas industry service to renewable energy generation system and military submarines.

The M Series feature a large range of shell styles, layouts or insulator materials. No matter you need to convey signal information or high power we have the right product or we can make it.

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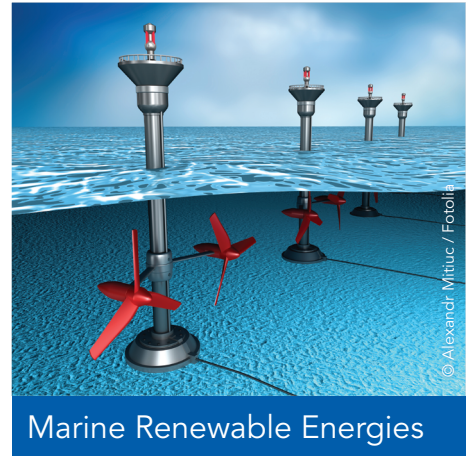
# MARINE SERIES

M Series

# Overview

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## Typical applications



## Features & Benefits

### FIELD PROVEN

#### Extensively Used in Underwater Application

Oil and Gas services: Geophysics, inspection or instrumentation  
ROVs and AUVs  
Military marine: Submarines, torpedoes or vessels  
Marine Renewable Energy: Tidal turbine, farm architecture...

### ROBUST

#### Designed for Harsh Environment

Repairable connectors with removable inserts  
No stress on O-rings by conical coupling interface  
Extreme resistance to pull-out or transverse forces, vibrations and shocks  
Double sealing security thanks to two O-rings in coupling interface

### PERFOR- MANCES

#### High Performance Levels

Withstanding 500 cycles mating/unmating  
Standard watertightness products tested at 200 bars  
Up to 300 bars for the overmolded versions  
Up to 1000 bars for the oil filled versions

### LARGE OFFER

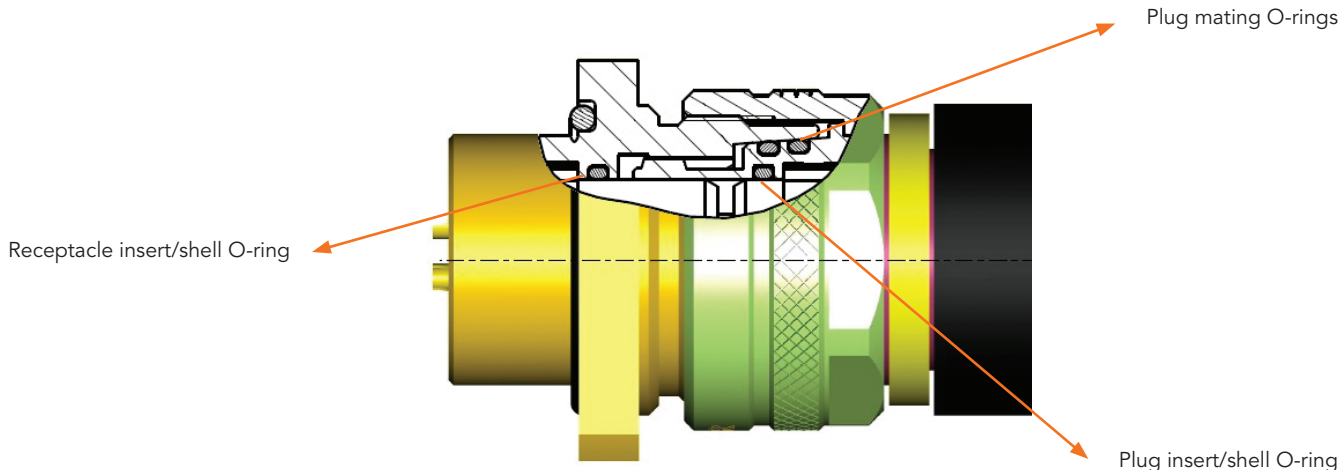
#### Standard and Special Products

Contacts: Signal, high speed (optical, triax...), high power  
Wide range of body styles and sizes  
Single, double watertightness or overmolded on cable termination

## Features & Benefits

### Sealed and reliable connectors

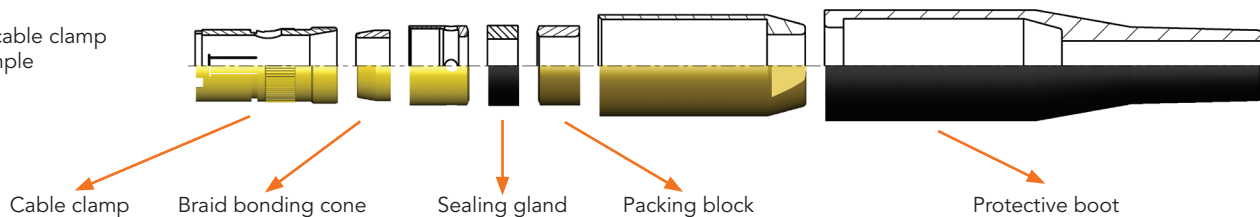
- ▶ O-ring for insert to shell sealing on both plug and receptacle
- ▶ Redundancy with 2 O-rings on plug taper seat for plug to receptacle sealing
- ▶ Conical coupling interface to reduce the stress on O-rings



### High performance sealing and mechanical retention

- ▶ **Standard watertightness: Perfect sealing on cable jacket** is achieved with the compression of a pressure gland integrated into the plug's backshell. Robust cable clamp ensures the **mechanical retention of the cable** and a removable protective boot is added on the backshell for additional sealing and cable support.

M type cable clamp set example



2 cable clamp sets are presented on page 25 and 26:

A type: Without 360° braid termination

M type: With 360° braid termination

- ▶ **Plugs for cable overmold (SA type): Increased pressure rating.** Shell shape enables excellent resin adhesion on PUR and Neoprene® jackets.


- ▶ **Double watertightness\*:** The solution for cables with outer and inner sheaths. Compared with standard watertightness plugs, an integrated compound housing allows the sealing between the inner sheath and the shell. The sealing on the outer sheath is made with a pressure gland. It provides an extra protection in case of water ingress due to outer jacket damage.

- ▶ **Pressure Balanced Oil Filled\*:** Special shell for pressure balanced oil filled harnesses.

\*Please consult us

## Features & Benefits

### High grade materials for long term immersion

- ▶ Shells are manufactured from Nickel Aluminium Bronze which has been specifically developed for underwater applications and is proven to be highly corrosion resistant in sea water. This material has excellent electrical conductivity properties and is extremely robust and long lasting.
- ▶ Good resistance to biological fouling
- ▶ Insulators are made of PTFE or PCTFE which features near zero water absorption and excellent electrical insulating properties.
- ▶ O-rings are made from Nitrile for excellent fluid compatibility (sea water, mineral oil...) and long durability.
- ▶ Contacts are gold over nickel plated brass.
- ▶ RoHS compliant. 

### Easy wiring and installation

- ▶ Scoop proof: No risk of damaging contacts during the coupling operation when using a female plug and a male receptacle.
- ▶ Removable insulators: To allow easy wiring and replacement in case of wiring mistakes or servicing.



## Standard range page 15 to 38

### Receptacles

- ▶ RER: Jam nut
- ▶ REC: Square flange
- ▶ RECSC: Cable connecting

### Feedthrough

- ▶ TER: Jam nut feedthrough
- ▶ TEC: Square flange feedthrough

### Pressure sealing caps

- ▶ BER: For receptacles, in-line receptacles and feedthroughs
- ▶ BEF: For plugs

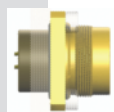
### Plugs

- ▶ FED: Plug
- ▶ FED (SA or SB): Plug for cable overmolding

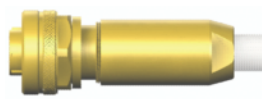
### In-line receptacles

- ▶ PCE: In-line receptacle
- ▶ PCE (SA or SB): In-line receptacle for external overmolding

## Typical harness



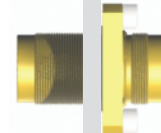
▶ REC



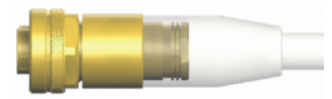
▶ FED



▶ FED



▶ TEC



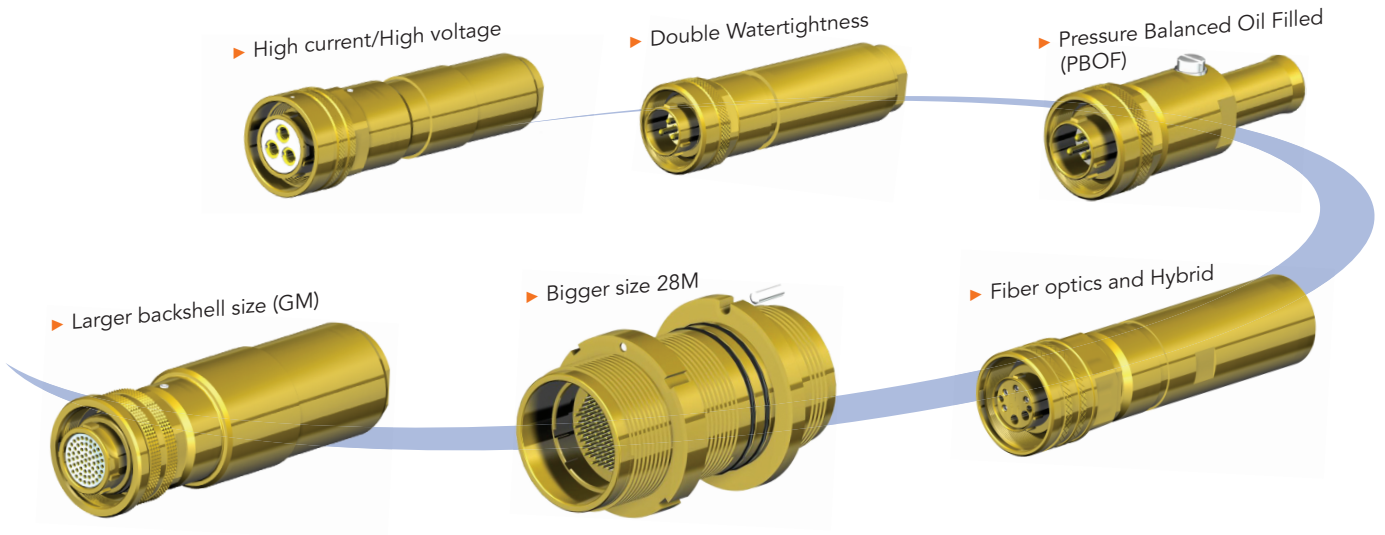
▶ FED (SA)

overview

## Range extension page 42 to 48

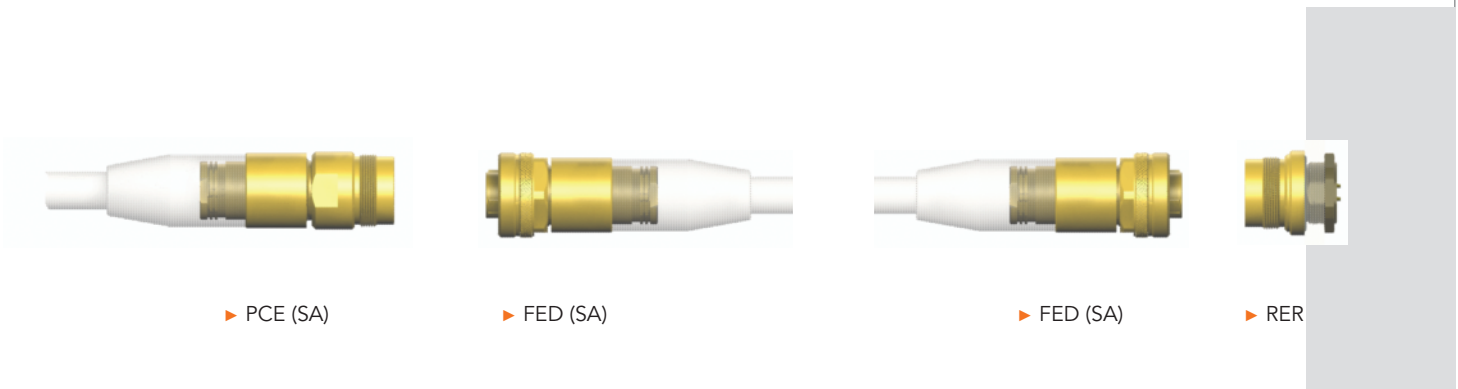
### Various possibilities of range extension & shell variant from standard series

▶ The only limit is your imagination, Consult us!



Overview

examples



Receptacles



REC



RER

Cable Receptacles



RECSC



RDECSC\*

Feedthroughs



TEC

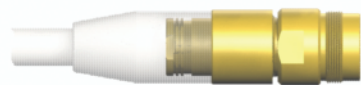


TER

In-Line Receptacles



PCE



PCE (SA or SB)



PCDE\*



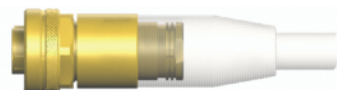
PCE (PBOF)\*

Pressure Balanced Oil Filled

FED



FED (SA/SB)

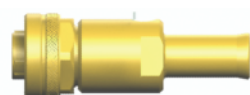


Plugs

FDED\*



FED (PBOF)\*



Pressure Balanced Oil Filled

\*Contact us for more information

# MARINE SERIES

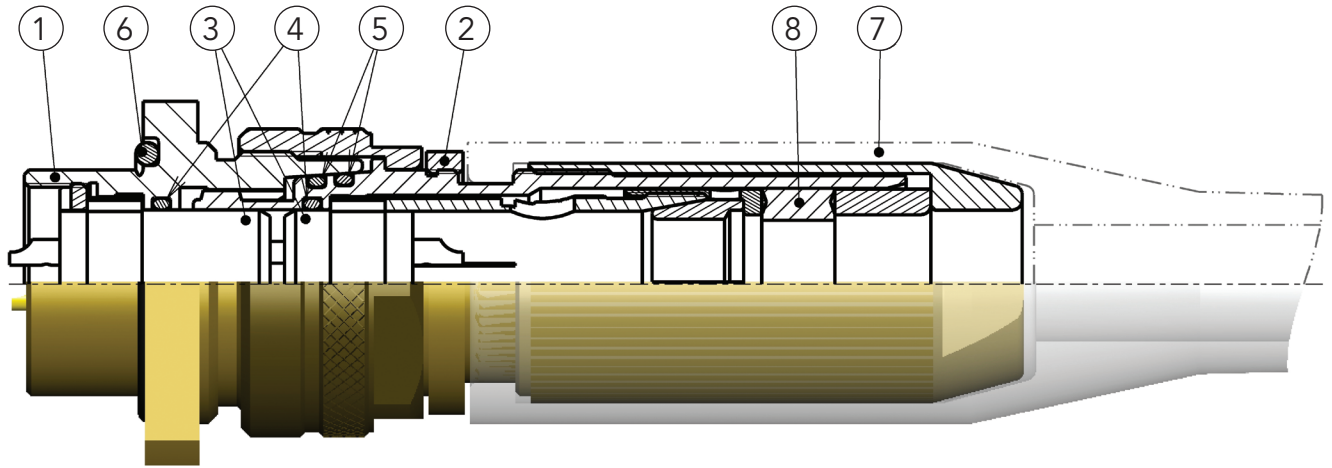
## M Series

# Standard Range

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## Product description

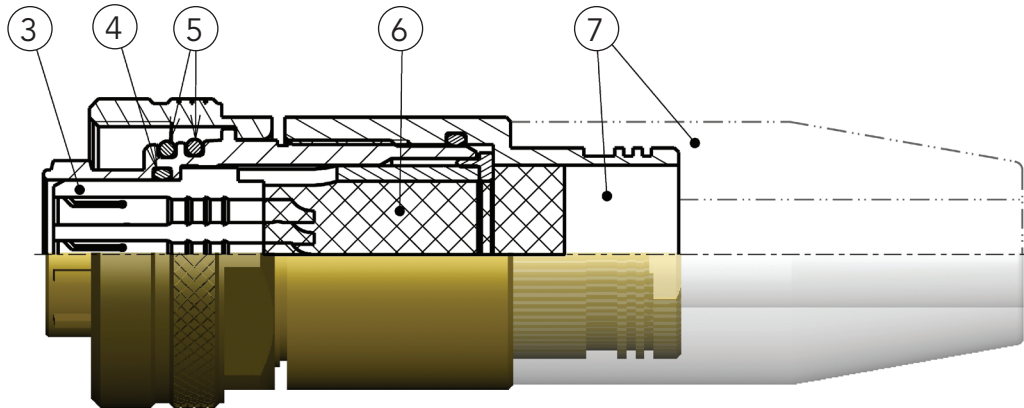
### Standard watertightness: Straight plug + Receptacle (mated)



1. Receptacle
2. Plug
3. Insert with sealed contact
4. Insert/Shell O 'Ring seal

5. Plug/Receptacle taper seat with O'Ring seal
6. Panel/Receptacle O'Ring
7. Removable protective boot
8. Cable outer sheath/Plug watertightness by packing seal

### Plug for cable overmolding: FED SA and SB type



3. Insert with sealed contact
4. Insert/Shell O 'Ring seal
5. Plug/Receptacle taper seat with O'Ring seal

6. Potting housing
7. Outer sheath cable/Plug watertightness by customer over molding
8. Backshell/Plug watertightness by O'Ring seal





## Description

- Marine connectors
- Screw coupling
- Sealing between plug and receptacles performed by 2 O-rings
- Standard watertightness: Sealing on cable achieved by packing washers
- Plugs for over molding (SA/SB): Sealing on cable is given by overmolding

## Technical features

### Mechanical

- **Shell:**  
Nickel aluminium bronze
- **Insulator:**  
PTFE (T)  
PCTFE (K)  
Other materials are available upon request (Peek, Silicone, PBTFV)
- **O-rings:**  
Nitrile elastomer
- **Contacts:**  
Brass
- **Contacts plating:**  
Gold over nickel plated
- **Packing washers and Protection boot:**  
Neoprene Elastomer
- **Endurance:**  
500 mating/unmating operations
- **Shock:**  
Static acceleration of 120g on each axis
- **Vibration:**  
From 0,1 to 1 Hz: amplitude = 25 mm  
From 1 to 5 Hz: acceleration = 0.1 g  
From 5 to 22 Hz: amplitude = 1 mm  
From 22 to 50 Hz: acceleration = 2 g  
Duration: 1 hour on each axis

### Electrical

- **Voltage rating (Vrms)**

Voltage Category	SOURIAU recommended service voltage (Vrms 50 Hz)	Dielectric Withstanding Voltage (Vrms 50Hz)
Service 0	350	1000
Service 1	600	1500
Service 2	1000	2300
Service 3	1500	3200
Service 4	5000	10000
Service 5	7000	15000

- **Insulation resistance:**  
Unmated connectors :  $\geq 10^4$  M $\Omega$   
Mated connectors :  $\geq 5 \times 10^3$  M $\Omega$  on 500 Vcc
- **Shielding:**  
Connectors mated: Resistance between the receptacle plate and the plug's cable braid :  $\leq 10$  m $\Omega$

- **Current rating and contact resistance:**

Shell size	Contact size	Current rating per contact (A)	Contact resistance (m $\Omega$ )
9M 10M 14M 20M 24M	20	7	$\leq 4$
	16	14	$\leq 3$
	14	20	$\leq 2.5$
	12	26	$\leq 2$
	6	65	$\leq 1$
	2	115	$\leq 0.6$
24M	120 MC	600	$\leq 0.03$
10M 14M	High voltage	14	$\leq 3$
20M	High voltage	20	$\leq 2.5$
10M	Coaxial 50 $\Omega$	20	$\leq 2.5$
	Coaxial 75 $\Omega$	7	$\leq 4$
10M	Triaxial 50 $\Omega$	7	$\leq 4$
20M	Coaxial 50 $\Omega$		
10M	Triaxial 75 $\Omega$	4	$\leq 5$
20M	Coaxial 75 $\Omega$		
14M	Coaxial 50 $\Omega$	40	$\leq 1.5$
	Triaxial 50 $\Omega$	26	$\leq 2$
	Triaxial 75 $\Omega$	14	$\leq 3$

## Environmental

- **Operating temperature range:**

- 20°C to + 70°C

- **Watertightness**

- Mated:

Type	Standard	SA/SB
<b>Operating pressure</b>	≤ 100 bar	≤ 300 bar
<b>Test</b>	200 bar	Pressure following customer spec.

- Unmated:

Type	PTFE inserts	PCTFE inserts
<b>Operating pressure</b>	30 bar	60 bar <sup>(1)</sup>
<b>Test pressure</b>	40 bar	75 bar <sup>(2)</sup>

(1) Size 9M 50 bar

(2) Size 9M 60 bar

- **Salt spray**

- 10 x (24h + 24h) alternate salt spray according to EN60068-2-11
- 500h continuous salt spray according to NFC93422

- **Fluids Resistance**

- Oil, alcohol, petrol, diesel fuel, sea water
- Various gases (natural, butane, propane, Freon)
- Various acids (acetic, boric, citric)

## Ordering information

Product builder			
N°	Criteria	Choices	Pages
1	Wires type and gauge	Minimum contact size	21
2	Number of contact to connect	Contacts layout	22
3	Electrical characteristics	Layout and shell size	17
4	Cable diameters	Size checking	25
5	External pressure	Sealing type	18
6	Unmated pressure	Insert material	18
7	Cable type and construction/Braid termination	Cable clamp set	25
8	General configuration	Shell type	12 and 13

Recommendations
<p><b>Standard watertightness M Series connectors</b></p> <p>Watertightness is given by a packing-block. Watertightness performances will depend on cable quality:</p> <ul style="list-style-type: none"> <li>. Hardness (shore A hardness &gt; 70 is recommended)</li> <li>. Cylindricity and circularity</li> <li>. Roughness</li> <li>. Cable outer diameter tolerance (maximum tolerance of 1 mm on outer diameter is recommended)</li> </ul> <p>Wiring chamber potting operation is necessary for pressure higher than 30 bar. See page 38 for potting tools.</p> <p><b>Overmolded plugs</b></p> <p>Watertightness is achieved by resin overmolding. Conductor insulation and jacket material (preferably Neoprene® or Polyurethane) of specified cable determines overmold material specification. Watertightness is determined by the adhesion of the overmold material to the cable.</p>

Standard Range

## M Series connectors part numbers

Basic Series	PCE	M	14M	T	04 12	A	105
<b>Shell type</b> <b>RER:</b> Jam-nut receptacle <b>REC:</b> Screws mounting receptacle <b>FED:</b> Straight plug <b>PCE:</b> In-line receptacle <b>RECSC:</b> Screws mounting cable connecting receptacle <b>TER:</b> Jam-nut feedthrough <b>TEC:</b> Screws mounting feedthrough							
<b>Type of contacts</b> <b>M:</b> Pin contact <b>F:</b> Socket contacts <b>1:</b> Pin/Socket (for TEC and TER feedthroughs only)							
<b>Shell size</b> 9M, 10M, 14M, 20M, 24M							
<b>Insert material</b> <b>T:</b> PTFE or <b>K:</b> PCTFE							
<b>Contact layouts</b> See layout tables page 22							
<b>Cable clamp code</b> <b>Standard watertightness:</b> : (nothing for RER, REC, TER & TEC) <b>A:</b> Without 360° braid termination <b>M:</b> With 360° braid termination <b>Overmolding:</b> (nothing for RER, REC, TER & TEC) <b>SA:</b> Without 360° braid termination <b>SB:</b> With 360° braid termination							
<b>Maximum cable outer diameter</b> (in tenth of mm, adjusted at upper five tenth). Example: For a 9.2mm outer diameter cable, the code is 095. <b>Cable code for coaxial, tri-axial, high voltage</b> (Please consult us for coding) Nothing for RER, REC, TER & TEC							

## Pressure sealing cap part numbers

Basic Series	BER	C	14M
<b>Cap type</b> <b>BER:</b> For receptacles, in-line receptacles and feedthroughs <b>BEF:</b> For plugs			
<b>Cable clamp set</b> <b>C:</b> With cord <b>-:</b> Without cord (no mention)			
<b>Shell size</b> 9M, 10M, 14M, 20M, 24M			

## Contacts - Size 2 to 20

Shell size	Contact size	Ø A (mm) Active contact OD	Ø F (mm) Contact Termination OD	Gauge AWG	Section (mm <sup>2</sup> )	Definition
9M	20	1,02	0,9	26 to 22	0,14 to 0,38	
	16	1,59	1,2	24 to 20	0,21 to 0,60	
10M 14M 20M 24M	20	1,02	0,9	26 to 22	0,14 to 0,38	
	16	1,59	1,4	22 to 18	0,38 to 0,93	
	14	1,92	1,87	18 to 16	0,93 to 1,34	
	12	2,38	2,3	16 to 14	1,34 to 1,91	
	6	5	6,2	8 to 6	8,98 to 13,4	
	2	7	9	4 to 2	21,8 to 34,5	

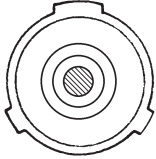
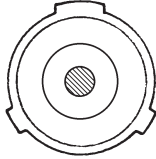
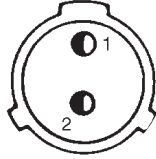


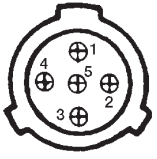
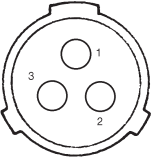

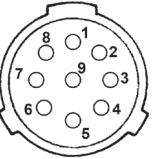
## Contacts - Coaxial, triaxial

Shell size	Contact size	Ø A (mm)	Ø F (mm)	Recommended cable (Please consult us)	Definition
10M	Coaxial 50Ω	1,93	2,4	KX 4 - KX 15 - NFC 93550 RG 213 U - RG 58 CU MIL C 17 F	
	Coaxial 75Ω	1,02	1,5	KX 6A - KX 8 - NF C 93550 RG 59 BU - RG 11 AU MIL C 17 F	
14M	Coaxial 50Ω	3,98	3	KX 13 - NF C 93550 MIL C 17 F - RG 217U <sup>(1)</sup>	
10M	Triaxial 50Ω	0,9	1,2	KX 15 - NF C 93550 MIL C 17 F - RG 58 CU <sup>(1)</sup>	
20-24M	Coaxial 50Ω				
20-24M	Coaxial 75Ω	0,7	0,8	KX 6A - NF C 93550 MIL C 17 F - RG 59 BU	
14M	Triaxial 50Ω	3	2,6	Depending on the cable clamp accessories, please consult us <sup>(1)</sup>	
	Triaxial 75Ω	1,59	1,4		

Standard Range

### Contact layouts

Size 9M		Layout caption
<p><b>0416</b></p>  <p>4#16 Service 2</p>	<p><b>0720</b></p>  <p>7#20 Service 1</p>	<p><b>Layout ID for part numbering</b></p>  <p>Number of contacts #Size Voltage Service Rating</p>

Size 10M					
<p><b>1TX50*</b></p>  <p>Triax#50Ω Service 1</p>	<p><b>1CX50*</b> <b>1CX75*</b></p>  <p>1Coax# 50Ω or 75Ω Service 1</p>	<p><b>0214</b></p>  <p>2#14 Service 2</p>	<p><b>0314</b></p>  <p>3#14 Service 2</p>	<p><b>0416</b></p>  <p>4#16 Service 2</p>	<p><b>0516</b></p>  <p>5#16 Service 1</p>
<p><b>0320</b></p>  <p>3#20 Service 2</p>	<p><b>0720</b></p>  <p>7#20 Service 1</p>	<p><b>0920</b></p>  <p>9#20 Service 0</p>			

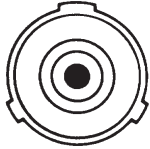
\*Please consult us for coax and triax layouts

Contact Type							
20	16	14	12	6	2	Coax.	Triax.

Contact layouts

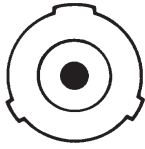
Size 14M

1TX50\*  
1TX75\*



1Triax  
50Ω#75  
Service 2

1CX50\*



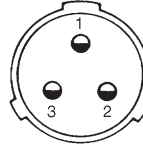
1Coax#50  
Service 2

0106



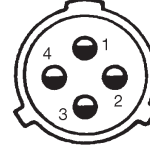
1#06  
Service 2

0312



3#12  
Service 2

0412



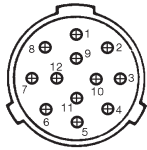
4#12  
Service 2

0714



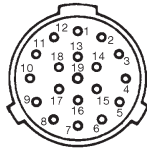
7#14  
Service 2

1216



12#16  
Service 2

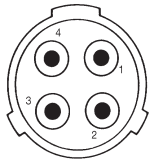
1920



19#20  
Service 1

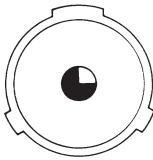
Size 20M

4C50\*  
4C77\*



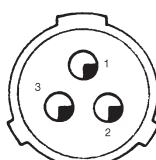
4Coax#50Ω or 75Ω  
Service 1

0102



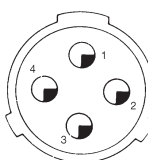
1#02  
Service 2

0306



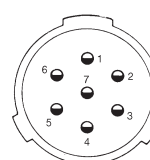
3#06  
Service 2

0406



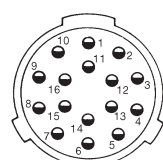
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Service 2

0712



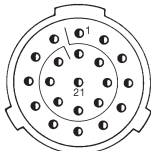
7#12  
Service 2

1612



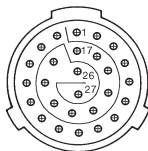
16#12  
Service 2

2114



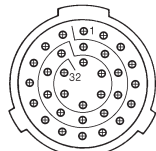
21#14  
Service 1

2716



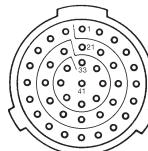
27#16  
Service 1

3216



32#16  
Service 1

4120



41#20  
Service 1

Contact Type



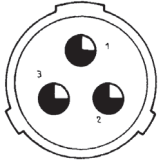
\*Please consult us for coax and triax layouts



## Contact layouts

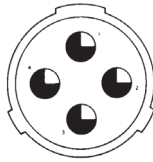
**Size 24M**

**0302**



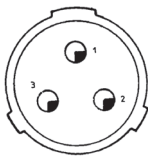
3#02  
Service 2

**0402**



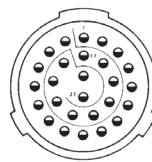
4#02  
Service 2

**0306**



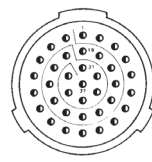
3#06  
Service 2

**2712**



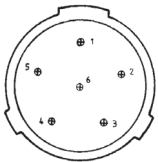
27#12  
Service 2

**3714**



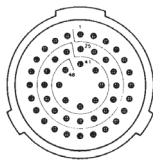
37#14  
Service 2

**0616**



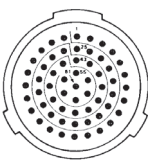
6#16  
Service 4

**4816**



48#16  
Service 1

**6116**



61#16  
Service 1

**Contact Type**



\*Please consult us for coax and triax layouts

## Cable clamp kits - Selection guide

Connectors	Cable Code	Description	Acceptable cable outer diameter				
			9M	10M	14M	20M	24M
Single Watertightness	A	Standard cable clamp without 360° shield termination	4-6.5	5-11	8-16	14-26	20-31
	M	Tapper cable clamp with 360° shield termination	4-6.5	5-10.5	9-16	12-24	18-32
External overmolding	SA	Overmolding backshell without 360° shield termination	< 6.5	< 10.5	< 16.5	< 24.5	< 32
	SB	Overmolding backshell with 360° shield termination	< 6	< 9	< 15	< 17.5	< 26.5

For coaxial, triaxial and high voltage contact layouts, please send us your cable datasheet to define the right cable clamp code

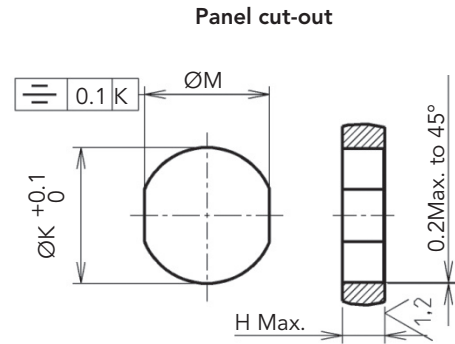
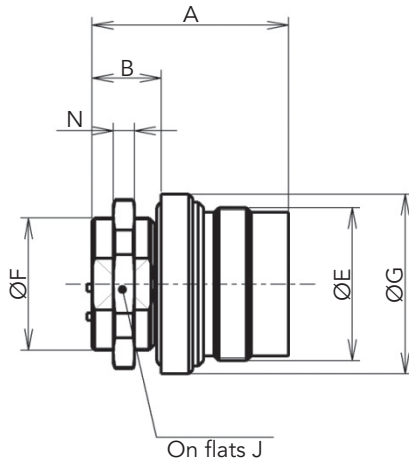
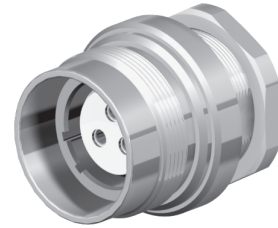
## Standard watertightness - Cable clamp kits

<b>BA</b>	Insulating ring	<b>JPE</b>	Rubber washer	<b>EEN</b>	Spacer nut	<b>DOS</b>	Outer sleeve
<b>CPI</b>	Collet clamp	<b>MDP</b>	Protective boot	<b>ESC</b>	Cabling spacer	<b>RGA</b>	Packing washer
<b>CSC</b>	Shielding taper	<b>PSC</b>	Cable collet	<b>RGR</b>	Packing block	<b>SCA</b>	Half collar (+ screws)

Cable clamp code	Grounding	Size	
A	No	9M	
		10M 14M 20M	
		24M	
M	Yes	9M	
		10M	
		14M	
		20M	
		24M	

## Shell dimensions

### RER - Jam-nut receptacle, watertight mounting



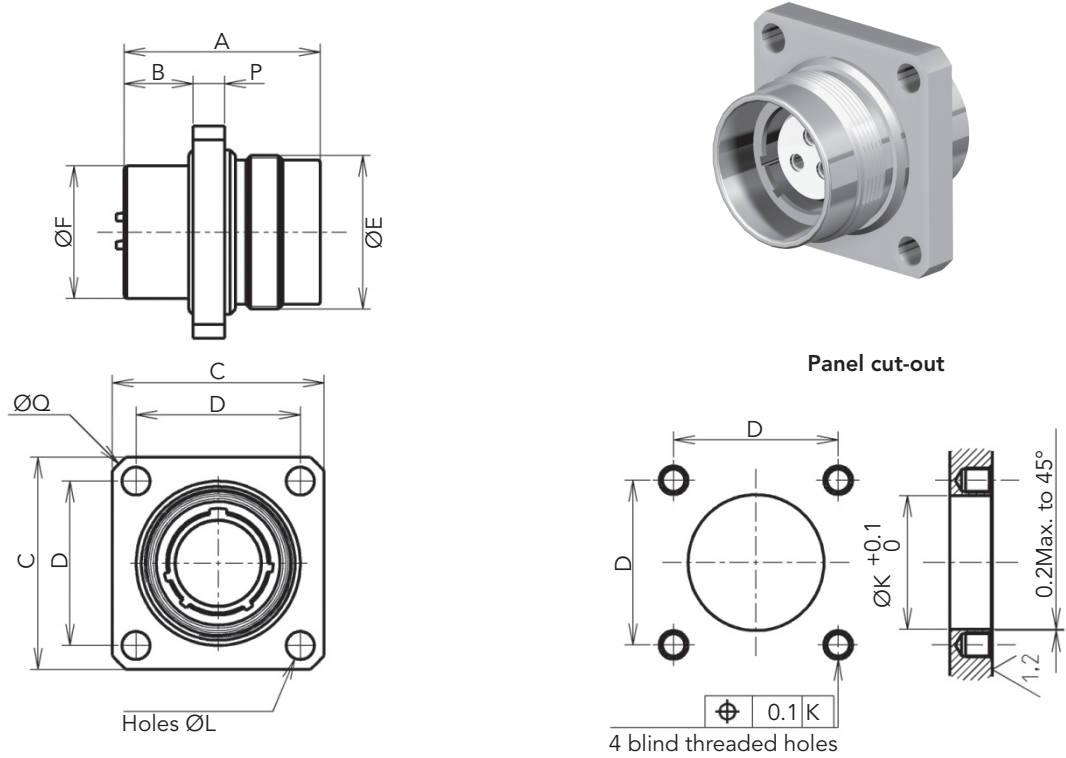
Shell size	9M	10M	14M	20M	24M
A	22	37	37	49,5	58
B	7	14	13	17	20
Ø E (ISO)	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
Ø F (ISO)	M13 x 0.7	M18 x 0.75	M25 x 0.75	M36 x 1	M46 x 1.5
Ø G	20	25	34	46	64
H Max.	4	10	9	12	14
On flats J	15	22	30	41	56
Ø K	13.2	18.2	25.2	36.2	46.2
M	12.2	16.2	23.2	33.2	42.2
N	3	4	4	5	6
Average mass (g)*	Consult us	63	110	282	Consult us

\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

## Shell dimensions

### REC - Square flange receptacle, watertight mounting



Shell size	9M	10M	14M	20M	24M
A	22	37	37	49.5	58
B	6.3	14	13	17	20
C	29	32	40	52	76
D	20	24	31	42	60
Ø E (ISO)	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
Ø F	13	18	25	36	46
Ø K	13.2	18.2	25.2	36.2	46.2
Ø L	4.5	4.3	5.3	6.3	8.5
P	4	5	6	8	9
Ø Q Max.	40.5	42.5	53.5	69.5	100.5
R (ISO)	M4	M4	M5	M6	M8
Average mass (g)*	Consult us	78	133	337	739

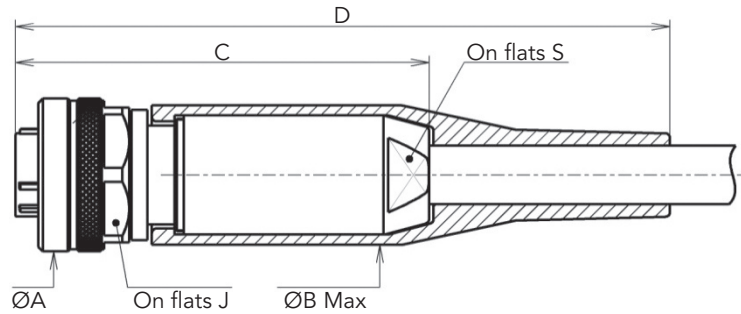
\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

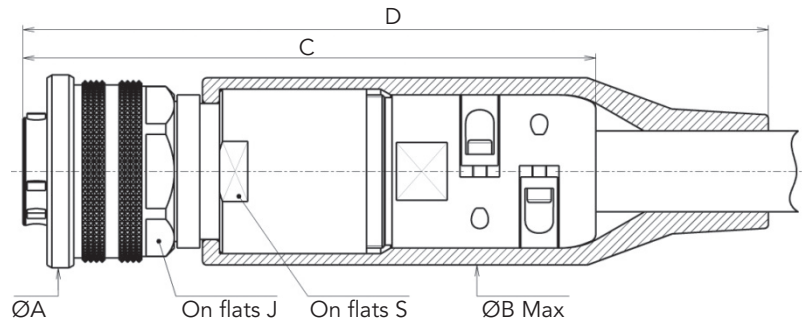
## Shell dimensions

### FED - Straight plug

Shell size: 9M - 10M - 14M - 20M



Shell size: 24M



Shell size	9M	10M	14M	20M	24M
Ø A	20	25	34	46.5	68
Ø B Max.	19	23	32	45	66
C	53	73	92	115	205
D	79	110	144	186	315
On flats J	17.46 (11/16")	22	30	42	54
On flats S	12	16	20	30	54
Average mass (g)*	Consult us	141	334	822	3170

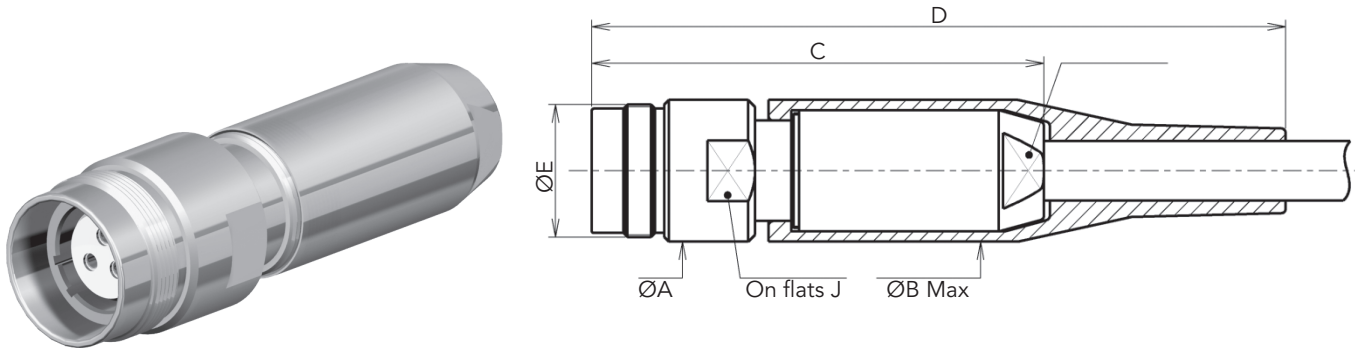
\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

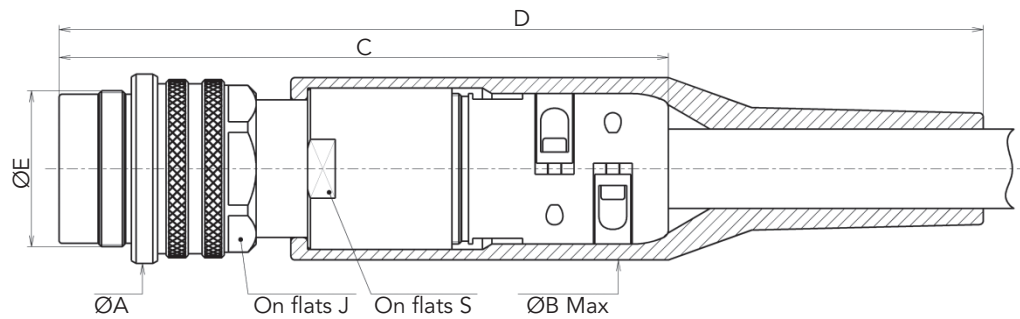
## Shell dimensions

### PCE - In-line receptacle

Shell size: 9M - 10M - 14M - 20M



Shell size: 24M



Shell size	9M	10M	14M	20M	24M
Ø A	19	23	31	43	68
Ø B Max.	20	23	32	45	66
C	57	82	100	127	220
D	84	120	153	198	335
Ø E (ISO)	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
On flats J	17	20	28	38	54
On flats S	12	16	20	30	54
Average mass (g)*	Consult us	160	359	888	3491

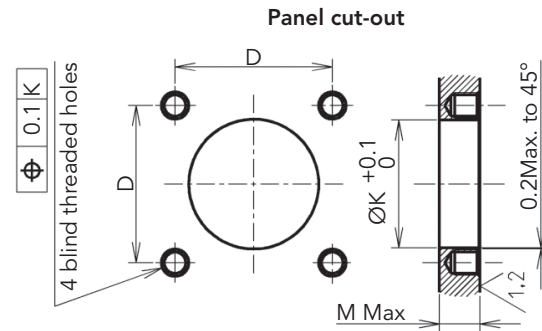
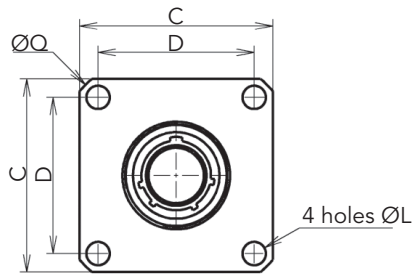
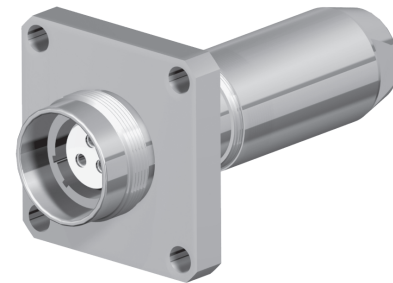
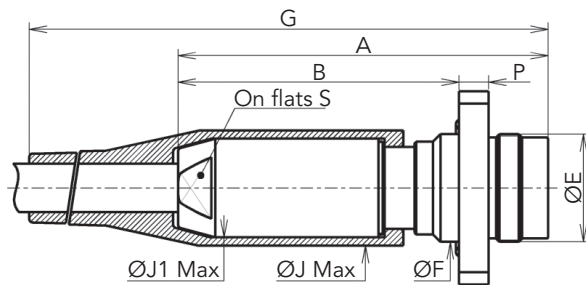
\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)



## Shell dimensions

### RECSC - Square flange cable connecting receptacle



Shell size	9M	10M	14M	20M	24M
A	57	82	100	127	220
B	42	58	76	97	170
C	32	40	52	76	96
D	24	31	42	60	70
Ø E	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
Ø F	18	22	29	41	69
G	84	120	153	198	335
H Max.	10	12	12	20	/
Ø J Max.	20	23	32	45	66
Ø J1 Max.	17	20	27	39	54
Ø K	18.2	22.2	29.2	41.2	69.2
Ø L	4.3	5.3	6.3	8.5	12.5
P	4	8	8	9	12
Ø Q Max.	42.5	53.5	69.5	100.5	119.5
R	M4	M5	M6	M8	M12
On flats J	12	16	20	30	54
Average mass (g)*	Consult us	224	462	Consult us	3074

\*Average mass estimated by CAD

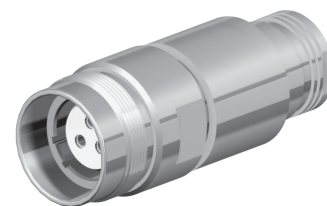
Note: All dimensions are in millimeters (mm)

## Shell dimensions

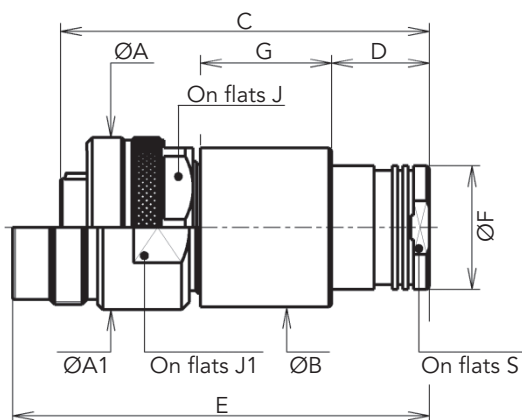
### FED Plug and PCE in-line receptacles for cable overmolding - SA and SB versions



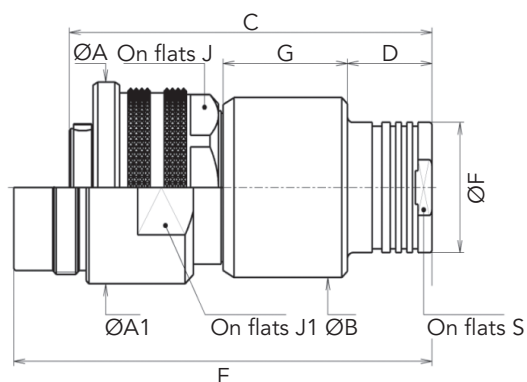
FED



PCE



Shell size: 9M - 10M - 14M - 20M



Shell size: 24M

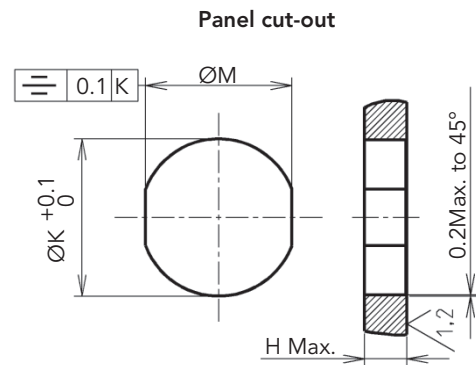
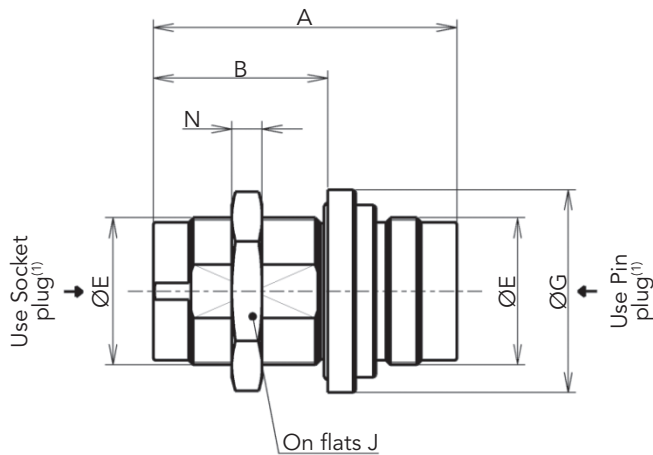
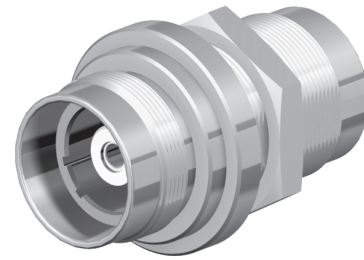
Shell size	9M	10M	14M	20M	24M
Ø A / Ø A1	20/19	25/23	34/31	46/43	68/68
Ø B	17.5	22	30	42	58
C	45	63	73	88	132
D	15.5	15.5	18.5	20.5	30.5
E	49	73	83	100	151
Ø F	14	17.5	23.5	32	42
G	11	20	25	29.5	45
On flats J / On flats J1	17.46/17	22/20	30/28	42/38	54/54
S sur plats / On flats S	12	15	21	29	38
Average mass (g)*	Consult us	Consult us	195/220	454/Consult us	1335/1569

\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

## Shell dimensions

### TER - Jam-nut feedthrough



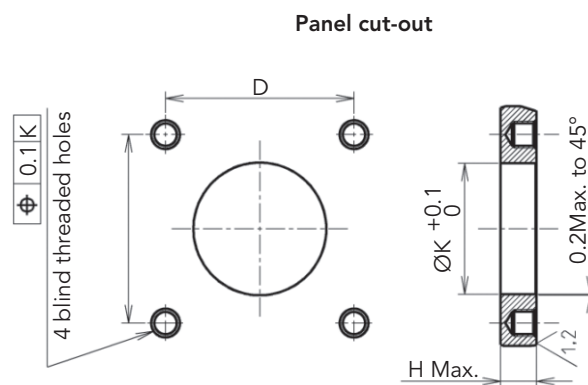
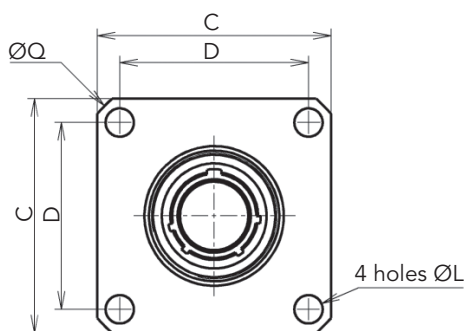
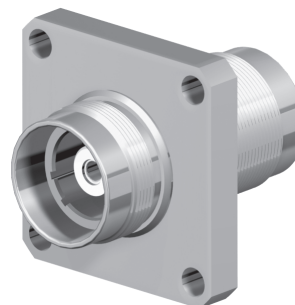
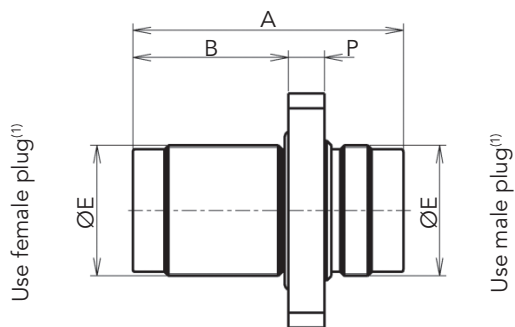
Shell size	9M	10M	14M	20M	24M
A	50	60	60	82	98
B	34.5	35.5	34.5	47.5	57
Ø E (ISO)	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
Ø G	23	28	40	52	70
H Max.	19	16	13	22	23
On flats J	20	24	34	46	63
Ø K	17.2	21.2	29.2	41.2	56.2
M	14.2	19.2	27.2	39.2	50.2
N	4	4	6	5	8
Average mass (g)*	Consult us	113	222	Consult us	Consult us

\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

## Shell dimensions

### TEC - Square flange feedthrough



Shell size	9M	10M	14M	20M	24M
A	50	60	60	82	98
B	34.5	35.5	34.5	47.5	57
C	32	40	52	76	76
D	24	31	42	60	60
Ø E (ISO)	M17 x 1	M21 x 1	M29 x 1	M41 x 1	M56 x 1.5
H Max.	23	20	19	27	31
K	17.2	21.2	29.2	41.2	56.2
Ø L	4.3	5.3	6.3	8.5	8.5
P	4	6	8	9	12
Ø Q Max.	42.5	53.5	69.5	100.5	100.5
R (ISO)	M4	M5	M6	M8	M8
Average mass (g)*	Consult us	Consult us	299	Consult us	Consult us

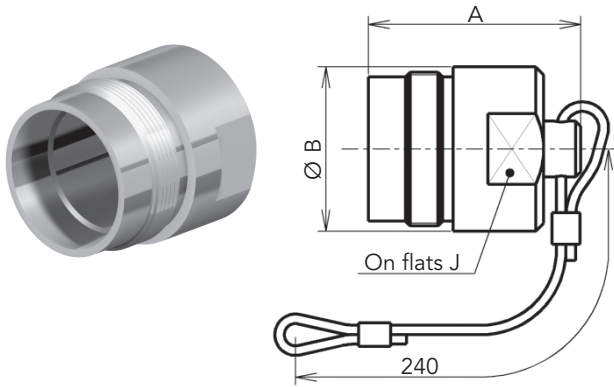
\*Average mass estimated by CAD

Note: All dimensions are in millimeters (mm)

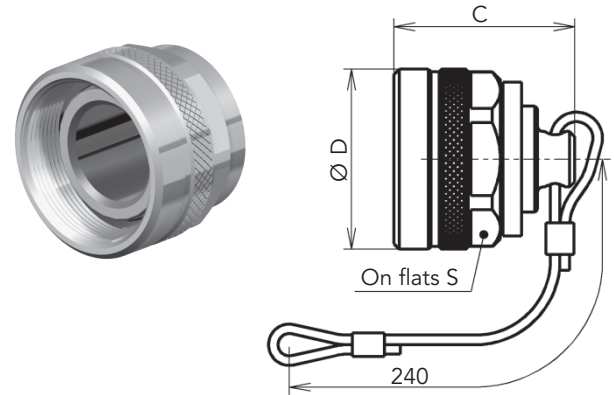
## Shell dimensions

### Pressure sealing caps

BEF - Cap for plug



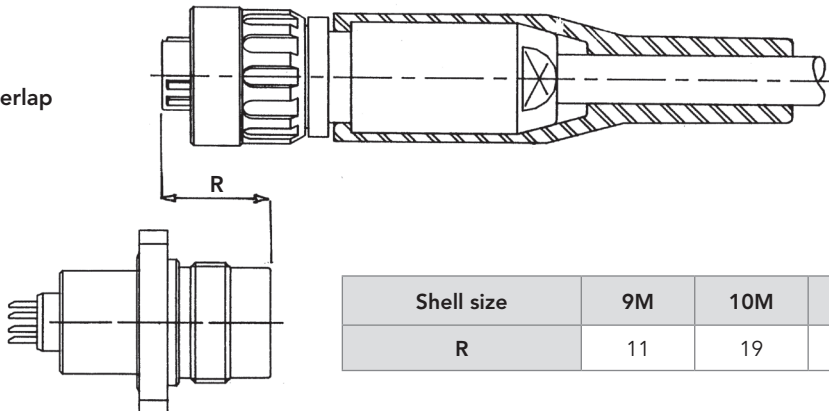
BER - Cap for receptacle



Shell size	9M	10M	14M	20M	24M
A	30	39	40	52.5	71
Ø B	19	23	31	43	64
C	27.5	34	34	47.5	69
Ø D	20	25	34	46.5	68
On flats J	17	20	28	38	54
On flats S	17,46	22	30	42	54

### Mated/Unmated connectors

R = Mated shells overlap



Shell size	9M	10M	14M	20M	24M
R	11	19	19	25	32

Note: All dimensions are in millimeters (mm)

## Insert + Contacts sub assemblies part numbers

<b>Insert + Contacts Sub Assembly</b>	<b>BIS</b>	<b>14M</b>	<b>T</b>	<b>04 12</b>	<b>M</b>
<b>Shell type:</b> 9M, 10M, 14M, 20M, 24M					
<b>Insert material</b> T: PTFE K: PCTFE for standard layouts					
<b>Contact layouts</b> See layout tables					
<b>Type of contacts</b> M: Pin contacts F: Socket contacts					

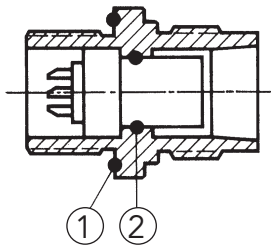
## Cable clamp kits part numbers

<b>Kit type: See page 26</b> RAE: Full cable clamp kit RAER: Cable clamp kit sub assembly	<b>RAE</b>	<b>14M</b>	<b>A</b>	<b>100</b>
<b>Shell size:</b> 9M, 10M, 14M, 20M, 24M				
<b>Cable clamp Code</b> <b>Standard watertightness:</b> (nothing for RER, REC, TER & TEC) A: Without 360° braid termination M: With 360° braid termination				
<b>Maximum cable outer diameter</b> (in tenth of mm, adjusted at upper five tenth). Example: For a 9.2mm outer diameter cable, the code is 095. <b>Cable code for coaxial, tri-axial, high voltage &amp; double watertightness</b> (consult us for coding)				

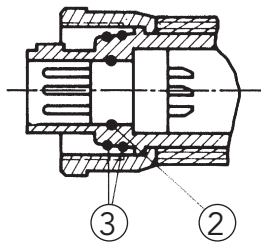
## O-rings part numbers

O-ring Type	9M	10M	14M	20M	24M
❶ Panel O-ring (for REC-RER)	09-01	10-01	14-01	20-01	24-01
❷ Insulator/Shell O-ring	09-02	10-02	14-02	20-02	24-02
❸ Taper seat O-rings	09-03	10-03	14-03	20-03	24-03
❹ Panel O-rings (for TEC-TER)	09-04	10-04	14-04	20-04	24-04
❺ Panel O-ring (for RECSC)	10-01	20-02	14-05	20-04	24-05

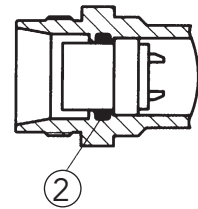
REC-RER Receptacles



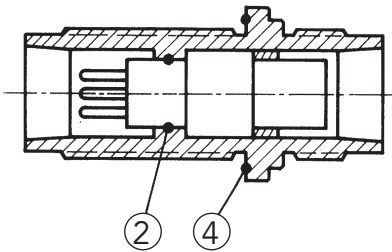
FED Plug



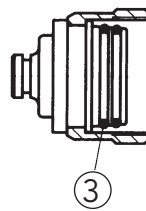
PCE Cable connecting plug



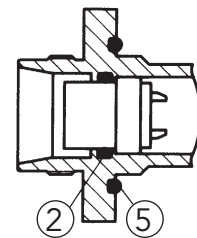
TEC-TER Bulkhead



BER Cap



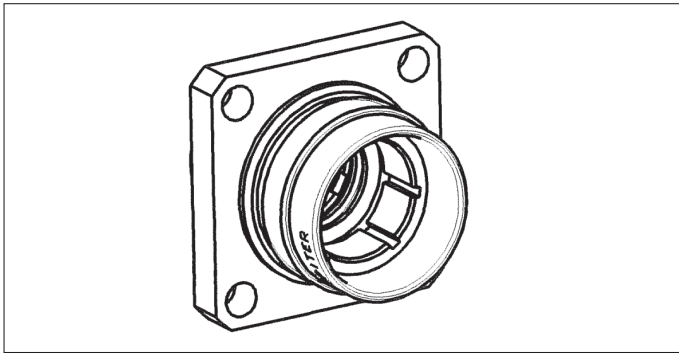
RECSC Square flange in-line receptacle



## Tools

### Plug wiring tools

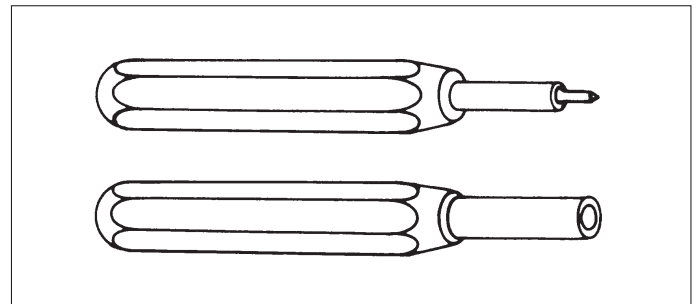
These tools are used to maintain correctly plugs during the final operation of wiring: tightening the tightening sleeve



Plug Size	Tool P/N
9M	MA1W6010B5
10M	MA2W6010B5
14M	MA3W6010B5
20M	MA4W6010B5
24M	MA5W6010B5

### Contact assembling tool

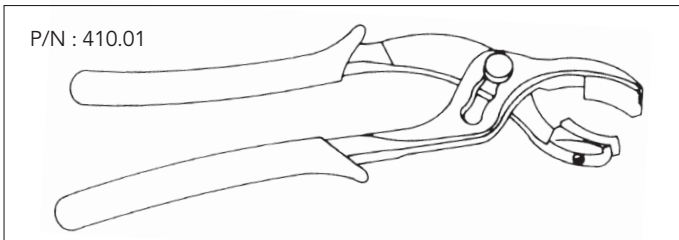
The removable contacts are held in the insert by a special nut, which can be screwed or unscrewed, using the tools below



Contact type	Tool P/N
Male size 6	OUT.BMV.20M.16MC
Female size 6	OUT.BFV.20M.16MC
Male size 2	OUT.BMV.20M.35MC
Female size 2	OUT.BFV.20M.35MC
10M triaxial 50 Ω - 75 Ω / 24M coaxial 50 Ω - 75 Ω Male and female	OUT.MC.04

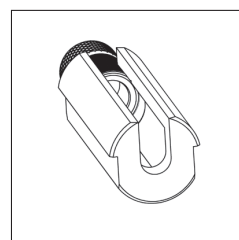
### Plastic jaw plier

This tool is used for holding the cable clamp while tightening the sleeve



### Potting tool

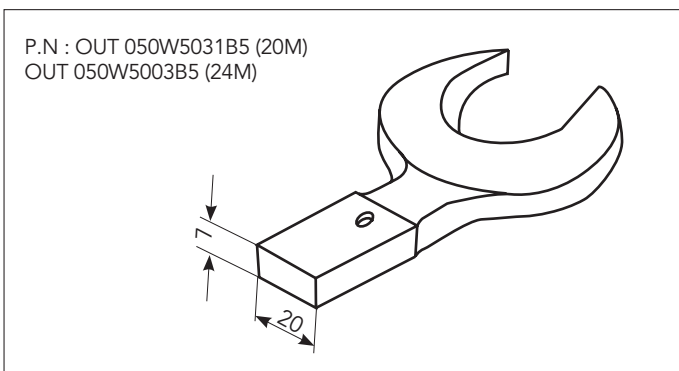
Used to fill with resin cabling spacers



Size	Tool P/N
10M	OUT330 10M
14M	OUT330 14M
20M	OUT330 20M
24M	MA5W4001A9

### End wrenches

Used to tighten coupling ring of size 20M or 24M with a torque wrench



The wiring and installation instruction for M Series connectors can be provided upon request.



## Notes

A large grid of empty cells for taking notes, consisting of 20 columns and 20 rows. The grid is composed of light gray lines forming a uniform pattern of squares across the central part of the page.

# MARINE SERIES

## M Series

# Range Extension

■ Double watertightness connectors.....	41
■ Oil filled connectors .....	42
■ Specific shell types .....	43
■ Optical M connectors.....	43
■ Size 28M and bigger shell sizes.....	44
■ High current/High voltage.....	44

## Product range extension

### Double Watertightness

The solution for the highest safety with double armored cables.

**A double watertightness solution:**

- . Sealing between the cable outer sheath and the backshell thanks to a sealing gland.
- . Sealing between the cable inner sheath and the backshell thanks to potting.

Provides an extra sealing protection in case of water ingress due to outer jacket damage

For more information, please consult us



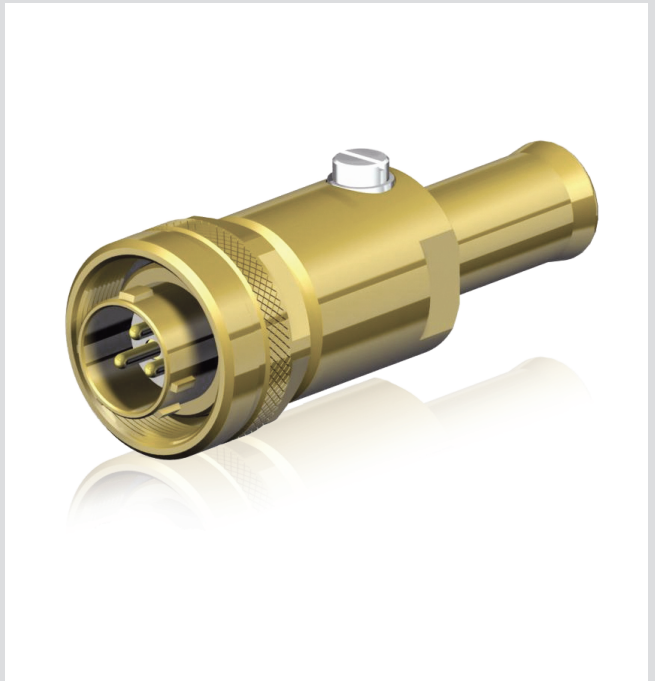
### PBOF: Oil Filled Plug and In-line Receptacle

The solution for very deep immersion with oil filled cables.

**High pressure withstand:**

- . Up to 1000 bars
- . Dielectric oil filling
- . Balances out the pressure difference
- . Water cannot enter the plug shell when the cable is damaged

For more information, please consult us



## Product range extension

### GM Range Larger Backshell Size

Plugs and in-line receptacle with magnified backshells for larger than standard cable mounting.

Size	10GM	14GM	20GM	24GM
Maxi cable OD(mm)	14	19	28,5	40

For more information, please consult us



### Optical M Connectors

Watertight up to 100bar for optical or hybrid connectors. Based on three existing shells, 14MO, 20MO and 24MO.

For more information, please consult us



## Product range extension

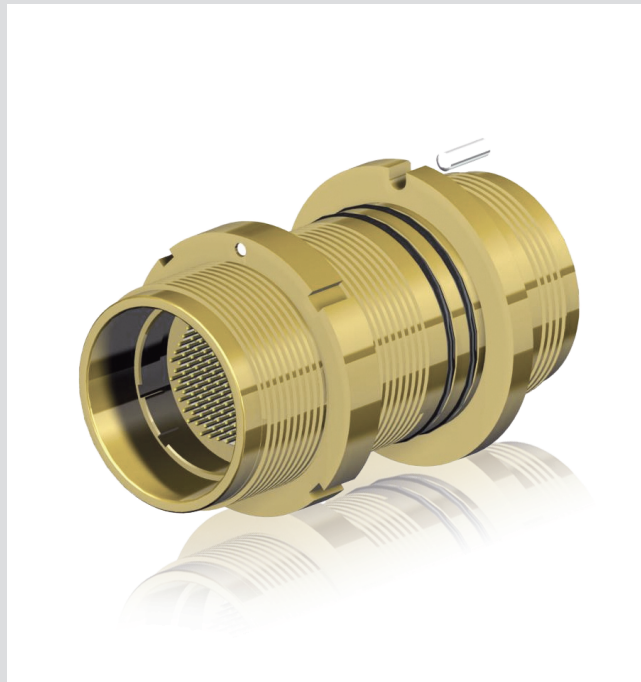
### Size 28

The biggest M Series connector size.

**Special layouts:**

- . Up to 126 contacts
- . Coax and hybrid layouts
- . High power. Up to 3 x 290A

For more information, please consult us



### High Current and High Voltage

High current and high voltage layouts can be available upon request.

**High voltage**

- . Up to 15 000VRMS (Dielectric Withstanding Voltage at 50 Hz)

**High current**

- . Up to 600A with 120 mm<sup>2</sup> contacts

For more information, please consult us





# MARINE SERIES



M Series

# Other Series

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## Other Series

### TP Series

Economic connectors similar to M Series with nickel plated brass shells and PA6/6 molded inserts.  
See specific catalog available online.

**Sealed:**

- . Down to 300 meters depth

**Large range:**

- . 4 shell sizes: 8TP, 10TP, 14TP and 20TP
- . Receptacles, cable receptacles, plugs and feedthroughs.
- . Signal, power, high voltage, coax and triax contacts

**Economic underwater solution**

RoHS compliant 



### U Series

Connectors similar to M Series with 316L stainless steel shells and FPM seals.  
See specific catalog.

**High pressure withstand:**

- . Down to 300 meters depth

**Robust:**

- . High corrosion resistant stainless steel shell (AISI 316L)
- . Robust screw coupling mechanism
- . High temperature resistance (up to 170°C with PTFE insulators)
- . Nylatron, Teflon or Tefzel insulators
- . Radiation withstanding (up to 100 MRads)

RoHS compliant 



## Other Series

### 8810 Series

Wet/underwater mateable connectors for deep immersion. See specific catalog available online.

**High pressure withstand:**

- . Down to 3000 meters depth

**Robust:**

- . Marine bronze shells
- . Robust screw coupling mechanism

RoHS compliant 



## Notes





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