



SEACON EX-MATE Explosion Proof Connectors

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Provide Safe and Robust Connectivity
Solutions for Hazardous Areas

SEACON EX-MATE Explosion Proof Connectors

Safe and Robust Connectivity Solutions for Hazardous Areas

KEY FEATURES

- Wet mateable in depths of up to 50m
- Designed around existing SEA-MATE connector range
- 4 shell sizes (G, K, L, M)
- 2 to 37 contact configurations
- Interchangeable inserts
- Incorporates ATEX approved glanding system
- Testing achieved ATEX certification to II 2G Ex d IIB T6 amb -40°C to +55°C
- Suitable for applications including Topsides Floating Production Storage and Offloading (FPSO), Drilling Vessels



In recent years there has been an increased requirement for connectors to operate in hazardous environments and many applications now require quick and safe disconnection of connectors to be used in these environments.

The EX-MATE connector is designed around TE Connectivity (TE)'s SEACON SEA-MATE wet-pluggable connector range and can be wet mated in depths of up to 50m in addition to its suitability for use in explosive environments. It is also available in 4 shell sizes (G, K, L, M) between 2 & 37 contact configurations. However like the SEA-MATE connector, this series has interchangeable inserts so can be adapted to a number of pin configurations. In addition, the EX-MATE connector incorporates an ATEX - IECEx approved glanding system for the cable which is encapsulated within the over mold, making it suitable for a range of hazardous environments.

TE Components . . . TE Technology . . . TE Know-how . . .

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APPLICATION

- Topside FPSO
- Drilling Vessels

SPECIFICATIONS

- **Mated Pressure:** Up to 7,500 psi (5,200m water depth).
- **Open Face Pressure:** Up to 7,500 psi (5,200m water depth).
- **Voltage Rating:** 600 VDC/440 VAC.
- **Current Rating:** Up to 10 amps (G size).
Up to 4.3 amps (K, L & M sizes).
Cable selection will need to meet the requirements of EN 60079-14.

MATERIALS

- **Bulkhead Body (BCR/FCR):** 316L stainless steel. Ferralium version also available.
- **CCP Body:** 316L Stainless Steel c/w Aluminum Bronze NES 833 engaging nut. Ferralium version also available.
- **Connector Inserts:** Glass Reinforced Epoxy (GRE).
- **Electrical Contacts:** Brass CZ124 gold plated as per MIL-G-45204.
- **O-Ring (Bulkhead/FCR):** Nitrile.

TESTING

The EX-MATE connector has undergone testing at an independent testing house and has achieved ATEX certification to II 2G Ex d IIB T6 amb -40°C +55°C. Full ATEX - IECEx testing information is available upon request.

EX-MATE Connectors

Ordering Information

Family Designator	_____	EXX - X - XXX
Shell Size	_____	
Number of Contacts Total	_____	
Connector Type	_____	

EX-MATE Connector
G
K
L
M
BCR Bulkhead Connector Receptacle
CCR Cable Connector Receptacle
CCP Cable Connector Plug

Notes:

- Connectors are designed for installation on 1 atmosphere vessels. For all other applications please contact TE.



IP68 Certified

Approved to IP Code (Ingress Protection) 68. This international standard classifies the level of protection provided against intrusion of dust and water in electrical enclosures.

In order to meet the requirements of the IP68 standard sample connectors were subjected to various tests as per the agreed program including pressure testing to 100m.





ATEX - IECEx Certification Guide

Zoning Definitions

Zones		Definitions
Gas	Dust	
0	20	A place in which an explosive atmosphere is continually present
1	21	A place in which an explosive atmosphere is likely to occur in normal operation occasionally
2	22	A place in which an explosive atmosphere is not likely to occur in normal operation, but if it does, only occurs for short periods

Categories

ATEX & IECEx Cat	Typical zone suitability
1G	Equipment suitable for zone 0
1D	Equipment suitable for zone 20
2G	Equipment suitable for zone 1
2D	Equipment suitable for zone 21
3G	Equipment suitable for zone 2
3D	Equipment suitable for zone 22

Types of Protection

GAS Type of Protection	ATEX Code	Standard
General requirements		EN 60079-0
Intrinsic safety	Ex ia & ib	EN 60079-11
Increased safety	Ex e	EN 60079-7
Flameproof	Ex d	EN 60079-1
Pressurization	Ex p	EN 60079-2
Powder filling	Ex q	EN 60079-5
Encapsulation	Ex ma & mb	EN 60079-18
Oil immersion	Ex o	EN 60079-6
Type n	Ex n	EN 60079-15

Temperature

T-Class	Max. °C
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

II 2G Ex d IIB T6

Groups

I	Electrical equipment intended for use in mines susceptible to firedamp
II	Electrical equipment intended for use in places with an explosive gas atmosphere other than mines susceptible to firedamp
III	Electrical equipment intended for use in places with an explosive dust atmosphere other than mines susceptible to firedamp

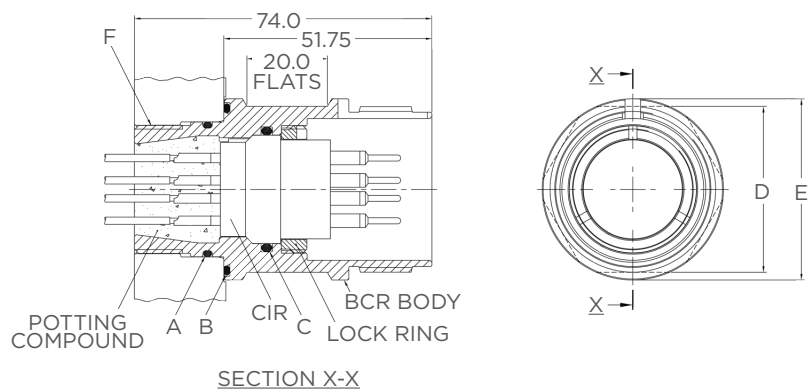
Gas Groups

IIA	Propane
IIB	Ethylene
IIC	Hydrogen / Acetylene



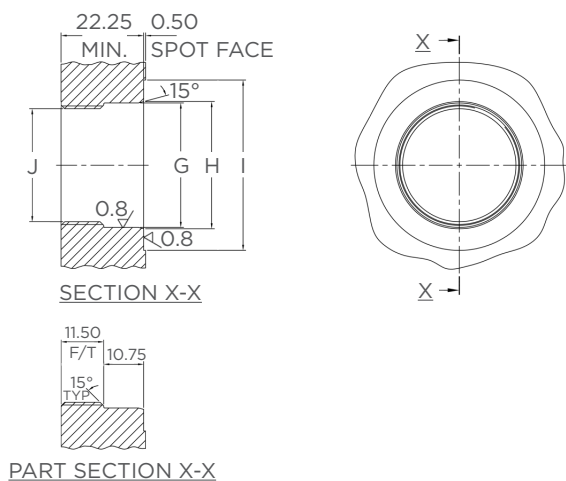
EX-BCR

Bulkhead Connector Receptacle



Shell Size	A O-Ring	B O-Ring	C O-Ring	D Hex Flats (mm)	E Ø (mm)	F Thread	Part Number
G	019	024	2-115	31.75	35.56	M22x1.5p 6g	EXG-X-BCR
K	025	029	2-121	41.28	45.10	M32x1.5p 6g	EXK-X-BCR
L	519	032	2-127	50.80	54.60	M40x1.5p 6g	EXL-X-BCR
M	134	035	2-133	60.32	64.15	M50x1.5p 6g	EXM-X-BCR

Mounting Information

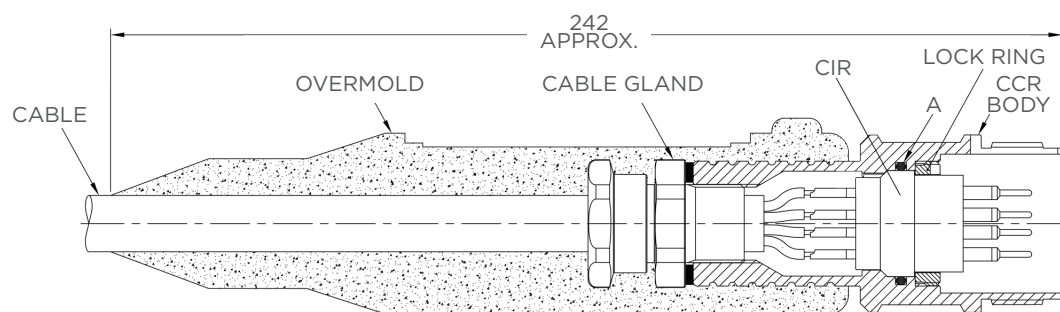
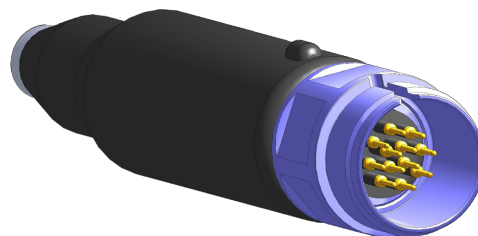


Shell Size	G Ø (mm)	H Min. Ø (mm)	I Min. Ø (In)	J Thread
G	24.05 24.10	24.84	37.00	M22x1.5p 6H
M	33.58 33.63	34.36	46.00	M32x1.5p 6H
Q	43.10 43.15	43.90	56.00	M40x1.5p 6H
T	52.63 52.68	53.52	65.00	M50x1.5p 6H

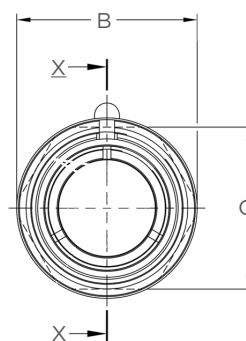


EX-CCR

Cable Connector Receptacle



SECTION X-X



Shell Size	A O-Ring	B Ø (mm)	C Hex Flats (mm)	Part Number
G	2-115	40.00	31.75	EXG-X-CCR
K	2-121	46.00	41.28	EXK-X-CCR
L	2-127	54.60	50.80	EXL-X-CCR
M	2-133	64.15	60.32	EXM-X-CCR

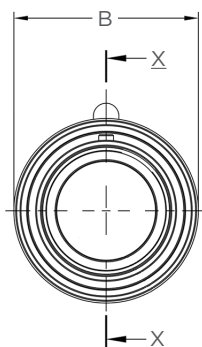
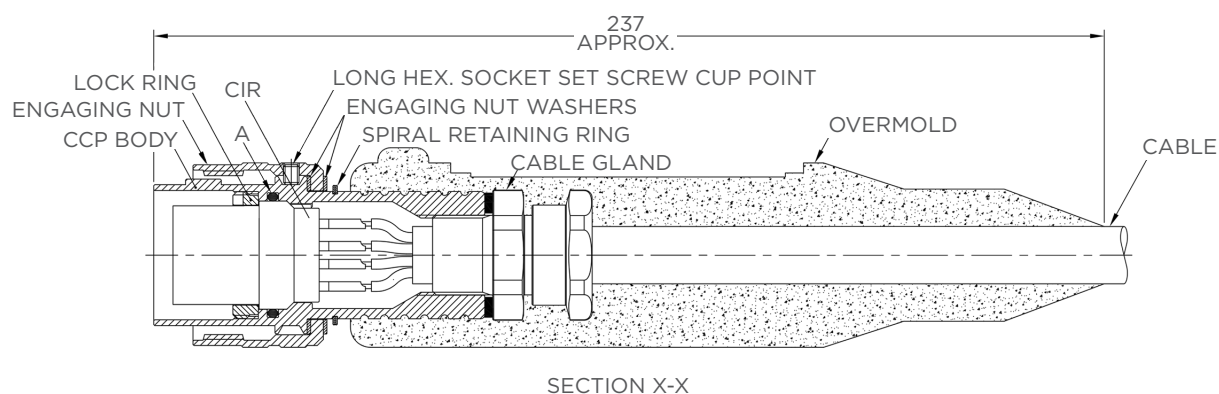
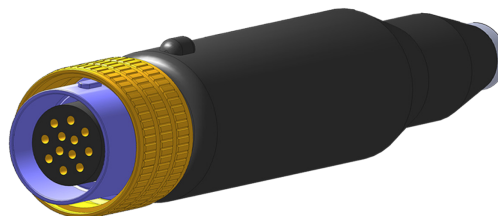
Notes:

- Cable selection will need to meet the requirements of EN 60079-14.



EX-CCP

Cable Connector Plug



Shell Size	A O-Ring	B Ø (mm)	Part Number
G	2-115	40.00	EXG-X-CCP
K	2-121	46.00	EXK-X-CCP
L	2-127	55.50	EXL-X-CCP
M	2-133	65.00	EXM-X-CCP

Notes:

- Cable selection will need to meet the requirements of EN 60079-14.



Contact Configurations

BCR Face View Only* - Not to Scale

G



EXG-2

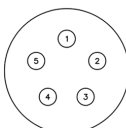


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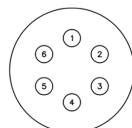


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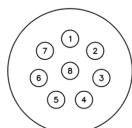
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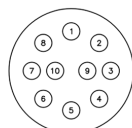
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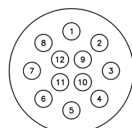
EXK-6



EXK-8

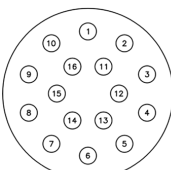


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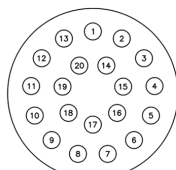


EXK-12

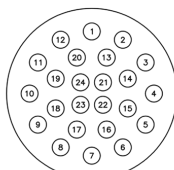
L



EXL-16

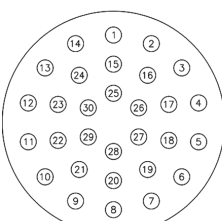


EXL-20

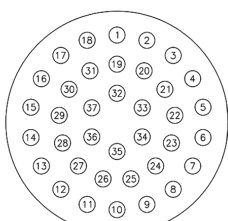


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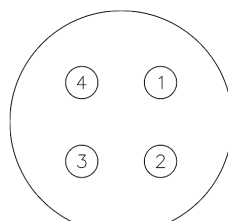
M



EXM-30



EXM-37



EXM-4SP-01

Notes:

- * For CCP face view contact configurations available please contact TE.



Handling Procedures and Special Capabilities

Even though these procedures appear simple, only qualified technicians should perform the installation and maintenance.

Installation Procedures

- Ensure the bulkhead interface is machined in accordance with the manufacturer's recommendations and free from contaminants prior to fitting of the connector.
- Ensure the plug and receptacle connectors are free from contaminants prior to fitting.
- Apply a thin film of silicone compound (e.g. Novagard NG624) to the bulkhead receptacle connector 'o' seal prior to fitting.

Care and Maintenance

Once mated, the EX-MATE connector requires no maintenance. When stored, the connector should be protected with suitable dust caps.

Cable and Continuity Preservation

Avoid sharp bends in cables. Cables subjected to vibration or exposed to seawater drag should be adequately clamped to prevent conductor fatigue infringing cable minimum bend radius and ultimate failure.

Special Assemblies

TE maintains all facilities necessary to furnish complete underwater and environmental electrical connector/cable systems, including Research & Development, Engineering, Manufacturing, Quality Control and Pressure Testing. As well as supplying our standard 'off-the-shelf' items, we have the capability to design and manufacture SPECIAL CUSTOMIZED CONNECTORS AND CABLE ASSEMBLIES to suit your individual needs.

Connector Mating

The EX-MATE connector uses a series of three o-ring style seals molded into the bores of the CCP/BCP connector which form a pressure tight and electrically insulative barrier when the connector is mated.

The pin contact on the BCR/CCR has a molded and bonded rubber boot along a portion of its length which these seals bear on, completing the seal system.

With the seals being formed from a rubber compound, the behavior of these seals will be determined by their lubrication. If the connectors are not properly lubricated prior to mating the rubber surfaces tend to grip onto one another and damage can be caused to these surfaces. The connector will not function properly if the seals are not adequately lubricated prior to mating. The advised lubricant is Novagard NG624 silicone grease which is commonly available in tube form. Spray grease is not advised since some of the propellant can form a conductive layer which leads to issues with low Insulation resistance.

Water displacement products, thinners and mineral oil lubricants should not be used as they can cause degradation of the rubber compounds. For further advice on lubricants other than NG624 please contact the factory.



Handling Procedures and Special Capabilities

The grease should be wiped across the face of the connector (**Fig. 2**), this action naturally deposits a suitable amount of grease within each of the connector bores. The aim is not to fill the bores with grease but just to have the top portion of the bore filled. This grease will be drawn down the bore as the pin is mated.

The grease will attract dirt and debris if left exposed for a period and it is advised that the lubrication is done immediately prior to mating.

Align the key with the keyway down the shell of the BCR/CCR (**Fig. 4**) and slide the connector plug into the socket bore until the threads of the connectors come into contact (**Fig. 5**).

Ensuring that no rotation is transferred to the BCR/CCR (**Fig. 6**) connector, tighten the engaging nut to draw the connectors together. There is a definite stop once the connectors are fully mated and this ensures that only hand tight is needed to mate the connectors fully. A strap wrench can be employed on the very high density connectors to give increased purchase during the initial engagement if difficulty is found with the mating.



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6

Prior to de-mating a pair of connectors following deployment the outer surface should be free from surface water, dirt or debris. Ensure that the power is isolated prior to de-mating as not only is this a safety issue due to the exposed electrical contacts, it can cause significant damage to the electrical contacts if they are energized whilst mated/de-mated. It is not necessary to pull on the CCP/CCR cable/hose during the de-mating since the engaging nut will 'jack' the connectors apart. After ensuring that the connectors are free of debris or damage and prior to deployment fit the properly lubricated dummy connectors to ensure trouble free operation.

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US Inside Sales:

Phone: +1 619-562-7071

Email: elcajonsales@te.com

Phone: +1 979-865-8846

Email: bellvillesales@te.com

Phone: +1 401-637-4952

Email: eastcoastsales@te.com

UK Inside Sales:

Phone: +44 (0) 1493-652733

Email: gtyarmouthsales@te.com

France Inside Sales:

Phone: +33 2 43 61 45 45

Email: offshore-ckb@te.com

Brazil Inside Sales:

Phone: +55 21 3592-0920

Email: simone.carvalho@te.com

North America +1 800 522 6752

North America (Toll) +1 717 986 7777

EMEA/South Africa +800 0440 5100

EMEA (Toll) +31 73 624 6999

India (Toll-Free) +800 440 5100

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Consult TE for the latest dimensions and design specifications.

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