

# SEACON<sup>®</sup>

UNDERWATER ELECTRICAL AND FIBER OPTIC CONNECTORS



## MINI-CON/ Micro MINI-CON

UNDERWATER ELECTRICAL DRY-MATE CONNECTORS

**S E A C O N**®



# MINI-CON

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UNDERWATER ELECTRICAL DRY-MATE CONNECTORS

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**INTRODUCTION**

SEA CON®'s well established MINI-CON range was originally developed for the purpose of supplying small diameter, high density and high pressure connectors. Dry mateable, this connector series is manufactured from 316 Stainless Steel as standard, although other materials are available upon request including Titanium and Monel™. The inserts are manufactured from Glass Reinforced Epoxy (GRE) with copper alloy, gold plated contacts although glass sealed inserts are also available for high pressure applications. The MINI-CON series also offers optical and hybrid versions along with PBOF, PBOF-HP (High Pressure), reversed miniature inserts and self wiping miniatures. For more information please refer to pages 4-5 of this brochure.

**AVAILABILITY**

With the introduction of the MIN-D and MIN-E connectors, the MINI-CON connector series is now available in 13 shell sizes with 1 to 203 contacts including coax and has a pressure rating of upto 20,000 psi (approximately 45,000 ft/13,700m).

**APPLICATIONS**

The MINI-CON range has been supplied to numerous Naval programs and has become the connector choice for a number of navies around the world. Other applications include drilling systems, umbilical links and ROV's.

**TESTING**

Before the MINI-CON series was first introduced, it underwent type approval testing and since then the range has been subjected to additional testing for specific projects or programs, some of which are listed below:

**Environmental**

- Salt Spray (Corrosion)
  - Tested in accordance with MIL-STD-202, Method 101.
- Humidity (Steady State)
  - Tested in accordance with MIL-STD-202, Method 103.
- Thermal Shock
  - Tested in accordance with MIL-STD-202, Method 107.
- Hydrostatic Pressure
  - Tested in accordance with MIL-STD-1344, Method 1006.

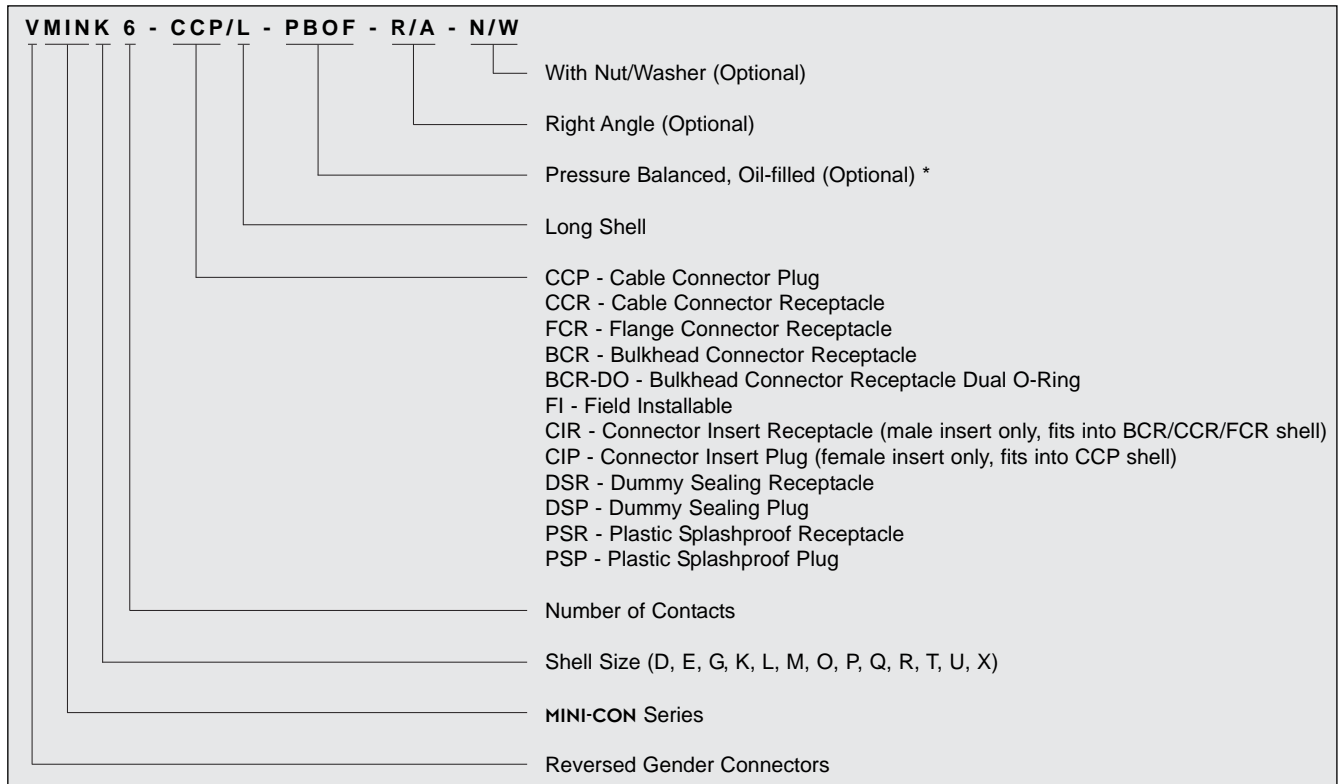
**Physical**

- Underwater Explosion Shock
  - Tested in accordance with MIL-S-901, High Impact, Heavy Weight.
- Vibration (Mechanical)
  - Tested in accordance with MIL-STD-167, Type 1.

**Electrical**

- Dielectric Withstanding Voltage
  - Tested in accordance with MIL-STD-202, Method 301.
- Insulation Resistance
  - Tested in accordance with MIL-STD-202, Method 302.

**PART NUMBER SYSTEM - EXAMPLE**



GENERAL INFORMATION

COMPONENT	MATERIAL
BULKHEAD BODY (BCR/FCR)	316 Stainless Steel
CCP BODY	316 Stainless Steel c/w CA630 engaging nut
CONTACT INSERT	Glass filled epoxy per B/A XS-2748
ELECTRICAL CONTACTS	Copper alloy gold plated per MIL-G-45204
ENGAGING NUT*	CA630
O-RING	Nitrile (formerly known as Buna N)

CATEGORY	VALUE
MATED PRESSURE	Varies by product up to 20,000 psi Mated and potted depending on shell material
VOLTAGE	600 VDC as standard although higher voltage ratings are available. Please contact SEA CON® for further information
CURRENT RATING	Up to 23 amps dependent on contact size and cable

OPTIONS:

- Pressure Balanced Oil Filled (PBOF).
- Higher voltages.
- Field installable boots.
- Coax and fiber optic hybrids.
- Custom keying.
- Connector/cable terminations.
- Pigtails on bulkhead connectors.
- Pressure Balanced Oil Filled (PBOF) termination and assembly.
- Open face pressure ratings and testing.
- Available in alternative materials: Aluminum, Titanium, Monel™, PEEK (Polyetheretherketone) etc.

NOTES:

- Connectors are designed for installation on one atmosphere vessels. Please contact SEA CON® for recommendations if using compensated vessels.

STANDARD MINI-CON CONFIGURATIONS

The below table shows our standard configurations that are more cost effective and more readily available. For further details please contact SEA CON®.

CONNECTOR	G	K	M	O
BCR	10#22; 7#20	19#22; 10#20; 4#16	37#22; 26#20; 3#14; 4#10; 10#16	On Request
CCP	10#22; 7#20	19#22; 10#20; 4#16	37#22; 26#20; 3#14; 4#10; 10#16	56#22; 44#20
CCPL	On Request	19#22; 10#20; 4#16	37#22; 26#20; 3#14; 4#10; 10#16	On Request
FCR	10#22; 7#20	19#22; 10#20; 4#16	37#22; 26#20; 3#14; 4#10; 10#16	56#22; 44#20
FCRL	On Request	19#22; 10#20; 4#16	37#22; 26#20; 3#14; 4#10; 10#16	On Request

REVERSED MINI-CON CONNECTORS (V-MIN)

The "V" before the MIN prefix in the Part Numbering System (see page 3) represents a reversed miniature insert. Many of our bulkhead connectors are available with sockets instead of pins and the corresponding cable plugs have pins instead of sockets.

Reversed MINI-CON's are an option for applications that require design of cabling/harnessing systems to be electrically sound with respect to "power on" safety requirements.

NOTE:

Reversal of sockets and pins may not be required as the pins in the standard bulkhead connectors are recessed approximately one quarter of an inch (1/4"). Please refer to the contact configurations page for further information or contact SEA CON® for recommendations on your specific application.

FIBER OPTIC MINI-CON CONNECTORS

As organizations in the subsea industry continue to develop more applications with fiber optic technology in mind, there has been a dramatic increase in the quality and complexity of electro-optic connector configurations required to suit these applications. Multi-channel hybrid connectors are finding increased usage in sonar and surveillance systems, real time video applications, ROV's/AUV's and geophysical search equipment to name but a few of the industries taking advantage of the latest fiber optic connection technology.

In order to serve the changing needs of its customers, SEA CON® has developed a complete range of fiber optic products built to withstand a variety of environmental conditions, including hydrostatic pressure, thermal and explosive shock and vibration. As well as developing fiber optics for specific customer requirements, SEA CON® has added fiber optic capabilities to existing electrical connector designs including the MINI-CON range. For further information please see the MINI-CON fiber optic contact configurations on page 20 and our Optical Hybrid Dry-Mate products section.

SELF WIPING MINI-CON CONNECTORS

We have developed self wiping connectors to meet two requirements. First, the rubber wipers at each socket location help clean the respective insulator around each male pin. This can help to remove contaminants or moisture that would otherwise lead to a low insulation resistance fault. Second, these connectors have a longer arcing path because of the wiper section and therefore can be rated for much higher voltages than would otherwise be possible in a connector of the same diameter. Please contact SEA CON® for additional information and availability.

MINI-CON PBOF

The time proven MINI-CON PBOF connector system has been upgraded. The new line which is called the MINI-CON-PBOF-HP (High Pressure) has actually been in service with some of our customers for the last fifteen years. At this time, it is replacing the traditional MINI-CON PBOF across the board. The HP version will intermate with all previous MINI-CON PBOF connectors but some components are different from before. For this reason, if you need replacement connector components, please contact SEA CON® for those needs. For new applications, the HP connectors will be delivered.

As with previous MINI-CON PBOF connectors, the HP design utilizes a high contact density layout. The HP style transfers the load without a valve by bearing on the insert. This is similar to a valve type system in that the force from the high pressure fluid in the hose is transferred to the bulkhead connector. We realize that our customers have many different applications for this type of system. Please contact us with your requirements and we can quote the appropriate bulkhead connector for your application.

**HIGH PRESSURE CONNECTORS**

The MINI-CON series can be manufactured with Titanium or high strength material shells which will increase the mated pressure rating to 20,000 psi mated. For high open face pressure ratings, most MINI-CON bulkhead connectors can be manufactured with a Glass Sealed Contact Insert Receptacle (CIR). These inserts consist of gold plated pins, compression glass sealed in a type 316 Stainless Steel contact web. Our standard glass sealed MINI-CON's are rated at 10,000 psi, open face, or greater depending on the particular connector. These inserts are a direct replacement for our standard epoxy inserts and may be ordered separately. They may be used in the Titanium shells mentioned above, or in standard shells. Please contact SEA CON® for further information on ratings.

**FIELD INSTALLATION**

Most of the MINI-CON CCP & CCR connectors are available for field installation. This capability is accomplished by installing our field installation boot as shown on the drawing of page 10. The boot is molded of neoprene compound and is designed for sealing onto the cable and the connector shell. In order for the boot to accomplish its sealing task, the cable must be completely round, solid and free of any nicks, indentations or voids. Optional hose clamps prevent accidentally dislodging the boot. When ordering the field installable boot please specify the exact cable diameter as the hole in the boot is made specifically according to the cable diameter to allow a proper compression fit.

**PRESSURE RATINGS**

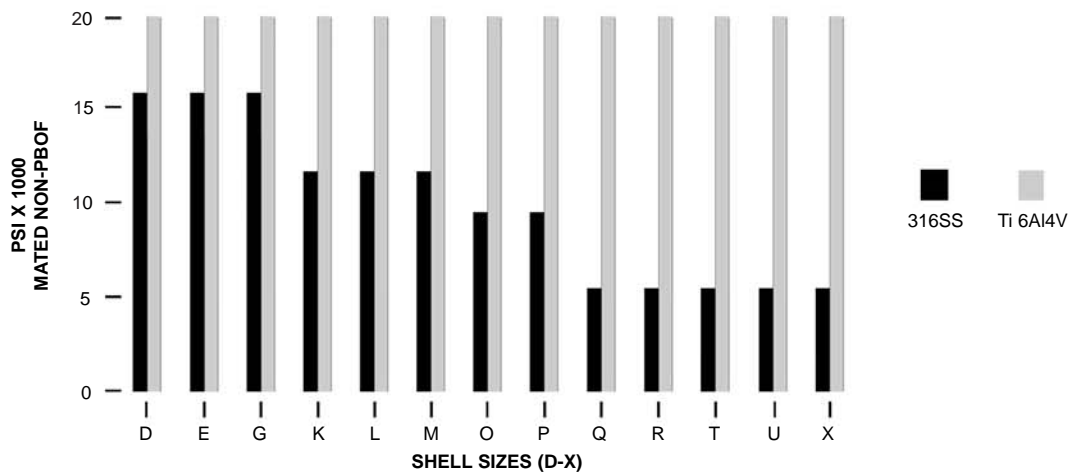
All MINI-CON connectors and dummies, when mated, are pressure rated as follows:

These pressure ratings are for our standard 316 Stainless Steel connectors. Higher ratings may be achieved with alternate materials. Please contact SEA CON® for further information.

**RECOMMENDED TIGHTENING TORQUE**

1. Only qualified technicians should perform engagement and torquing operations.
2. Torque values are maximum value. Valves given are for dry threads (non-lubricated). The BCR torque rating assumes a dry, metal customer housing. If a non-metallic housing is used, torque requirements will be lower. Consult SEA CON® for additional information.
3. Utilize inspection hole in engaging nuts to ensure complete engagement.
4. During engagement it may be necessary to use up to 50% of the engaging nut torque value.
5. After complete engagement a torque of upto the maximum listed value may be applied to ensure engaging nut will not disengage during use.

SIZE	NON-PBOF	PBOF
MIND	16,000	NOT AVAILABLE
MINE	16,000	NOT AVAILABLE
MING	16,000	3,000
MINK	12,000	3,000
MINL	12,000	3,000
MINM	12,000	3,000
MINO	10,000	3,000
MINP	10,000	2,000
MINQ	6,500	2,000
MINR	6,500	2,000
MINT	6,500	NOT AVAILABLE
MINU	6,500	NOT AVAILABLE
MINX	6,500	NOT AVAILABLE

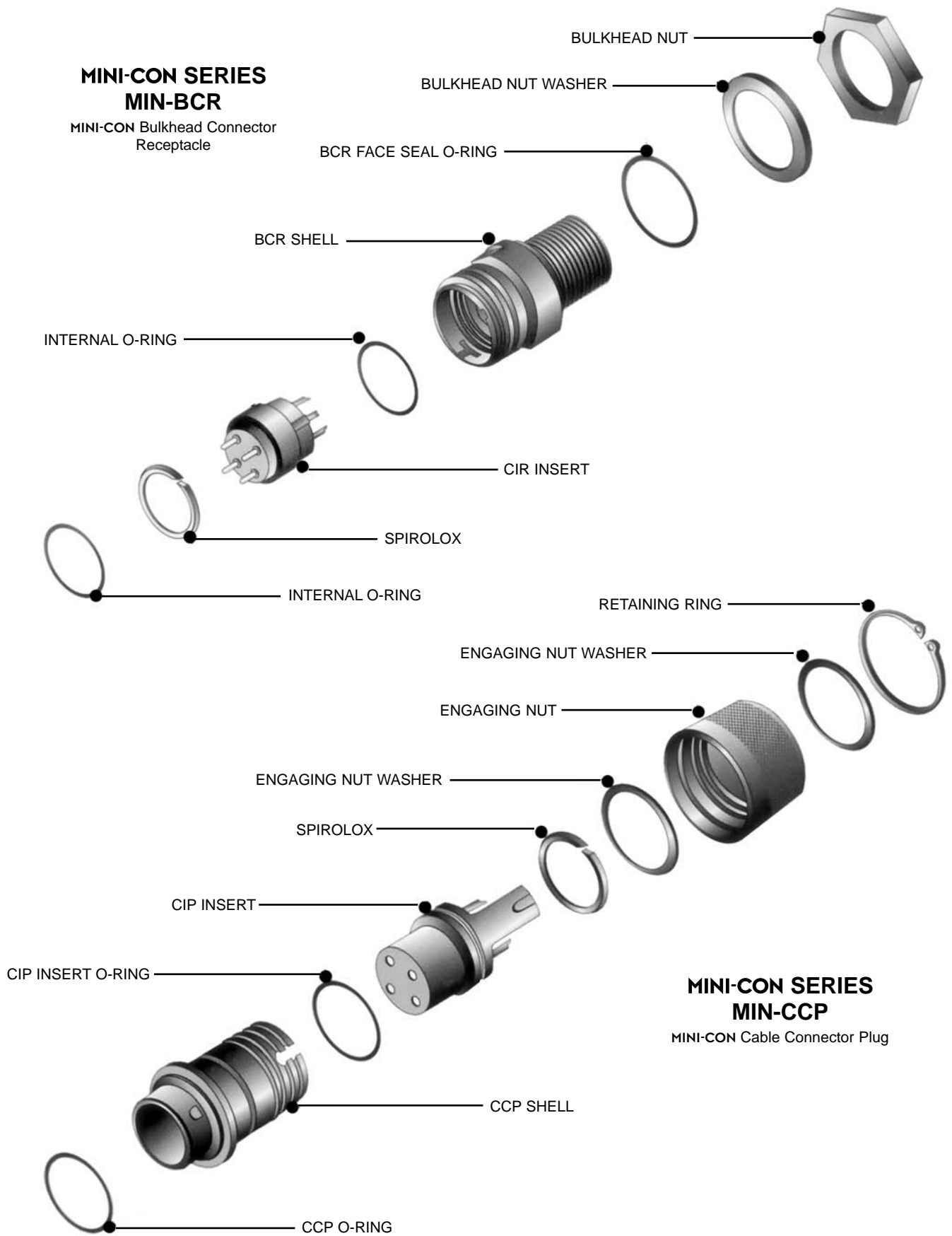


The above information is based on SEA CON® terminations which are available on request.

**NOTE:**

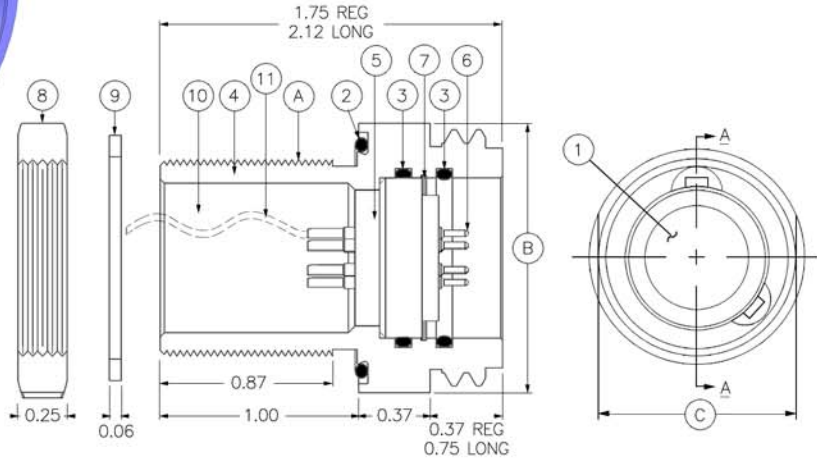
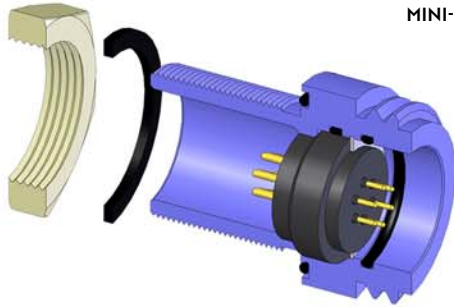
Connectors are designed for installation on one atmosphere vessels. Please contact SEA CON® for recommendations if using compensated vessels.

### MINI-CON SERIES EXPLODED VIEW



## MINI-CON SERIES MIN-BCR

MINI-CON Bulkhead Connector Receptacle  
Mates with MIN-CCP  
Dummy Connector: MIN-DSP



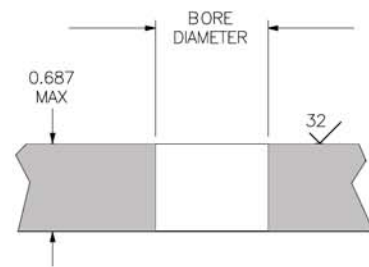
SECTION A-A

CONNECTOR	A - MOUNTING THREAD	B - Ø (INCHES)	2 - O-RING	7 - SPIROLOX	3 - O-RING	C - WRENCH FLATS (INCHES)	8 - HEX NUT ACROSS FLATS (INCHES)	8 - HEX NUT ACROSS POINTS (INCHES)	9 - WASHER OD (INCHES)
MIND-BCR	3/8-24 UNF-2A	0.75	2-013	VH-31	2-011	0.62	0.62	0.72	0.62
MINE-BCR	1/2-20 UNF-2A	0.87	2-015	VH-43	2-013	0.75	0.75	0.86	0.75
MING-BCR	5/8-24 UNEF-2A	1.00	2-018	UR50	2-014	0.87	0.88	1.00	0.88
MINK-BCR	3/4-20 UNEF-2A	1.12	2-019	UR62	2-016	1.00	1.00	1.16	1.00
MINL-BCR	7/8-20 UNEF-2A	1.25	2-021	UR75	2-018	1.12	1.13	1.31	1.13
MINM-BCR	1-20 UNEF-2A	1.37	2-023	UR81	2-019	1.25	1.25	1.44	1.25
MINO-BCR	1 1/8-16 UN-2A	1.62	2-026	UR106	2-023	1.50	1.50	1.75	1.50
MINP-BCR	1 1/4-16 UN-2A	1.75	2-028	UR118	2-025	1.62	1.63	1.88	1.63
MINQ-BCR	1 3/8-16 UN-2A	1.87	2-029	UR137	2-028	1.75	1.75	2.00	1.75
MINR-BCR	1 1/2-16 UN-2A	2.00	2-029	UR150	2-029	1.87	1.88	2.16	1.88
MINT-BCR	2-16 UN-2A	2.50	2-034	UR175	2-031	2.37	2.38	2.75	2.38
MINU-BCR	2 1/4-16 UN-2A	2.75	2-036	UR200	2-033	2.62	2.63	3.03	2.63
MINX-BCR	2 3/4-16 UN-2A	3.50	2-041	UR250	2-037	3.15	3.16	3.63	3.16

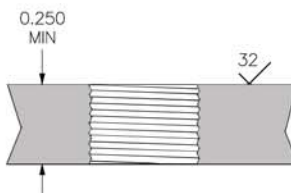
### BCR MOUNTING INFORMATION

SIZE	BORE Ø +0.015 -0.000 (INCHES)	BCR/L MOUNTING TORQUE* (INCH-POUNDS)
D	0.375	30-35
E	0.500	50-55
G	0.625	65-85
K	0.750	75-100
L	0.875	90-110
M	1.000	120-150
O	1.125	130-160
P	1.250	140-170
Q	1.375	150-180
R	1.500	170-220
T	2.000	210-250
U	2.250	220-260
X	2.750	240-280

### THROUGH BORE OPTION



### THREADED MOUNTING OPTION



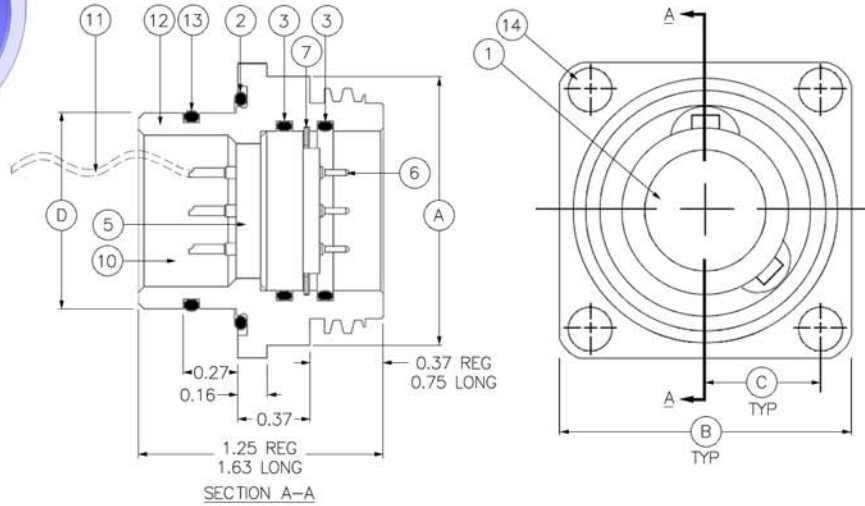
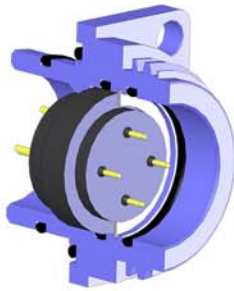
### NOTES:

- \* Torque specified is for dry metal threads.
- For contact configurations please refer to pages 16-20.
- When ordering MIN-BCR you receive: 2, 3, 4, 5, 6, 7. Please refer to the MINI-CON master parts and materials list on page 15.
- Nut and washer are optional.
- Bore must be perpendicular to spot face.
- Spotface diameter to be equal or greater than the connector diameter.
- If threaded mount is used, lead thread chamfer is not to exceed diameter shown in bore column.



## MINI-CON SERIES MIN-FCR

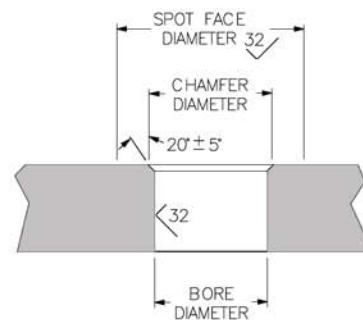
MINI-CON Flange Connector Receptacle  
Mates with MIN-CCP  
Dummy Connector: MIN-DSP



CONNECTOR	A - Ø (INCHES)	B - SQUARE (INCHES)	C - MOUNTING HOLE LOCATION (INCHES)	D - Ø (INCHES)	13 - O-RING	7 - SPIROLOX	2 - O-RING	SOCKET HEAD CAPSCREW	3 - O-RING
MIND-FCR	0.75	0.87	0.335	0.373	2-010	VH-31	2-013	4-40 UNC-2A	2-011
MINE-FCR	0.87	1.00	0.387	0.498	2-012	VH-43	2-015	4-40 UNC-2A	2-013
MING-FCR	1.00	1.12	0.453	0.685	2-015	UR50	2-018	4-40 UNC-2A	2-014
MINK-FCR	1.12	1.25	0.510	0.748	2-016	UR62	2-019	6-32 UNC-2A	2-016
MINL-FCR	1.25	1.37	0.562	0.873	2-018	UR75	2-021	6-32 UNC-2A	2-018
MINM-FCR	1.37	1.50	0.593	0.998	2-020	UR81	2-023	8-32 UNC-2A	2-019
MINO-FCR	1.62	1.75	0.723	1.123	2-022	UR106	2-026	8-32 UNC-2A	2-023
MINP-FCR	1.75	1.87	0.777	1.248	2-024	UR118	2-028	8-32 UNC-2A	2-025
MINQ-FCR	1.87	2.00	0.831	1.373	2-026	UR137	2-029	10-24 UNC-2A	2-028
MINR-FCR	2.00	2.12	0.884	1.498	2-028	UR150	2-029	10-24 UNC-2A	2-029
MINT-FCR	2.50	2.62	1.043	1.998	2-032	UR175	2-034	1/4-20 UNC-2A	2-031
MINU-FCR	2.75	2.87	1.113	2.248	2-034	UR200	2-036	1/4-20 UNC-2A	2-033
MINX-FCR	3.50	3.62	1.470	2.748	2-038	UR250	2-041	3/8-16 UNC-2A	2-037

### FCR MOUNTING INFORMATION

SIZE	BORE Ø +0.002 -0.000 (INCHES)	CHAMFER Ø ±0.010 (INCHES)	SPOTFACE Ø ±0.015 * (INCHES)	SPOTFACE Ø ±0.015 ** (INCHES)
D	0.375	0.425	0.69	1.18
E	0.500	0.550	0.87	1.37
G	0.687	0.727	1.00	1.56
K	0.750	0.800	1.12	1.75
L	0.875	0.915	1.25	1.87
M	1.000	1.040	1.31	2.12
O	1.125	1.175	1.50	2.44
P	1.250	1.290	1.62	2.62
Q	1.375	1.425	1.81	2.81
R	1.500	1.540	1.87	3.00
T	2.000	2.050	2.50	3.75
U	2.250	2.290	2.75	4.00
X	2.750	2.800	3.31	5.06

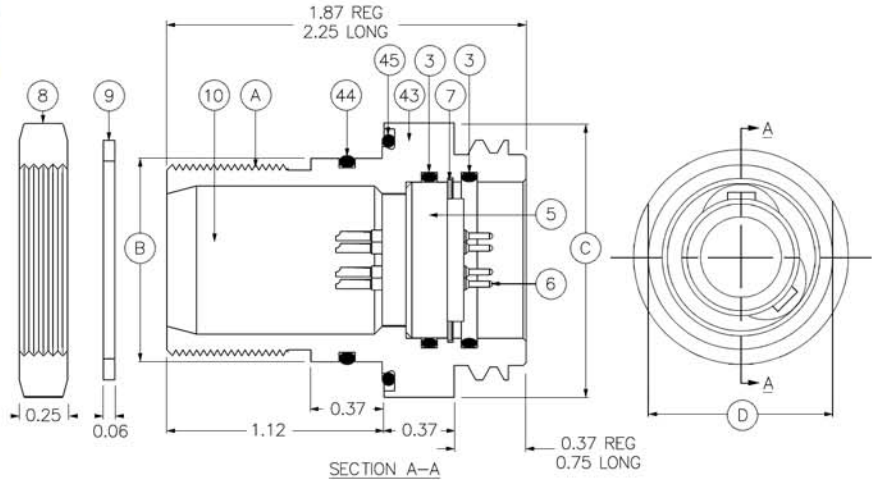
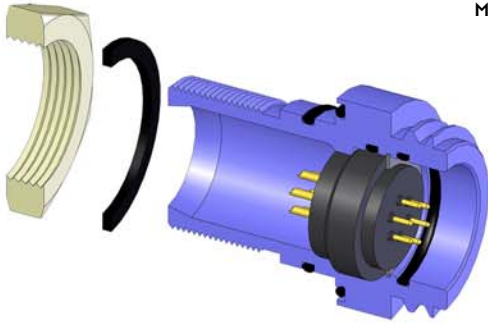


**NOTES:**

- For contact configurations please refer to pages 16-20.
- When ordering MIN-FCR you receive: 2, 3, 5, 6, 7, 12, 13. Please refer to the MINI-CON master parts and materials list on page 15.
- Screw caps are not included.
- \* This dimension is to be used if spotface is less than or equal to 0.001 inches deep.
- \*\* This dimension is to be used if spotface is greater than 0.001 inches deep.
- Chamfer is to be 20° ± 5°.
- Bore must be perpendicular to spot face.

## MINI-CON SERIES MIN-BCR-DO (DUAL O-RING)

MINI-CON Bulkhead Connector Receptacle  
Mates with MIN-CCP  
Dummy Connector: MIN-DSP

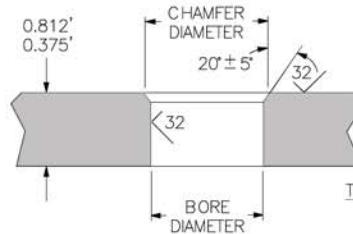


CONNECTOR	A - MOUNTING THREAD	B - Ø (INCHES)	C - SQUARE (INCHES)	D - MOUNTING HOLE LOCATION (INCHES)	44 - O-RING	45 - O-RING	3 - O-RING	7 - SPIROLOX	8 - HEX NUT ACROSS FLATS (INCHES)	8 - HEX NUT ACROSS POINTS (INCHES)	9 - WASHER OD (INCHES)
MIND-BCR-DO	3/8-24 UNF-2A	0.435	0.81	0.68	2-011	2-015	2-011	VH-31	0.62	0.72	0.62
MINE-BCR-DO	1/2-20 UNF-2A	0.498	0.93	0.81	2-013	2-017	2-013	VH-43	0.75	0.86	0.75
MING-BCR-DO	5/8-24 UNEF-2A	0.685	1.06	0.93	2-015	2-019	2-014	UR50	0.87	1.00	0.88
MINK-BCR-DO	3/4-20 UNEF-2A	0.810	1.18	1.06	2-017	2-020	2-016	UR62	1.00	1.16	1.00
MINL-BCR-DO	7/8-20 UNEF-2A	0.935	1.31	1.18	2-019	2-022	2-018	UR75	1.12	1.31	1.13
MINM-BCR-DO	1-20 UNEF-2A	1.060	1.43	1.31	2-021	2-024	2-019	UR81	1.25	1.44	1.25
MINO-BCR-DO	1 1/8-16 UN-2A	1.185	1.68	1.56	2-023	2-027	2-023	UR106	1.50	1.75	1.50
MINP-BCR-DO	1 1/4-16 UN-2A	1.310	1.81	1.68	2-025	2-029	2-025	UR118	1.62	1.88	1.63
MINQ-BCR-DO	1 3/8-16 UN-2A	1.435	1.93	1.81	2-027	2-030	2-028	UR137	1.75	2.00	1.75
MINR-BCR-DO	1 1/2-16 UN-2A	1.623	2.06	1.93	2-029	2-031	2-029	UR150	1.87	2.16	1.88
MINT-BCR-DO	2-16 UN-2A	2.123	2.62	2.43	2-033	2-035	2-031	UR175	2.37	2.75	2.38
MINU-BCR-DO	2 1/4-16 UN-2A	2.373	3.00	2.68	2-035	2-037	2-033	UR200	2.75	3.03	2.63
MINX-BCR-DO	2 3/4-16 UN-2A	2.873	3.62	3.22	2-039	2-041	2-037	UR250	3.25	3.63	3.16

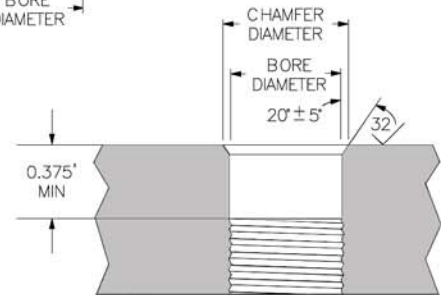
### BCR-DO MOUNTING INFORMATION

SIZE	BORE Ø +0.002 -0.000 (INCHES)	CHAMFER Ø ±0.010 (INCHES)	BCR/L MOUNTING TORQUE (INCH-POUNDS)
D	0.437	0.487	30-35
E	0.562	0.612	50-55
G	0.687	0.737	65-85
K	0.812	0.862	75-100
L	0.937	0.987	90-110
M	1.062	1.112	120-150
O	1.187	1.237	130-160
P	1.312	1.362	140-170
Q	1.437	1.487	150-180
R	1.625	1.675	170-220
T	2.125	2.175	210-250
U	2.375	2.425	220-260
X	2.875	2.925	240-280

#### THROUGH BORE OPTION



#### THREADED MOUNTING OPTION

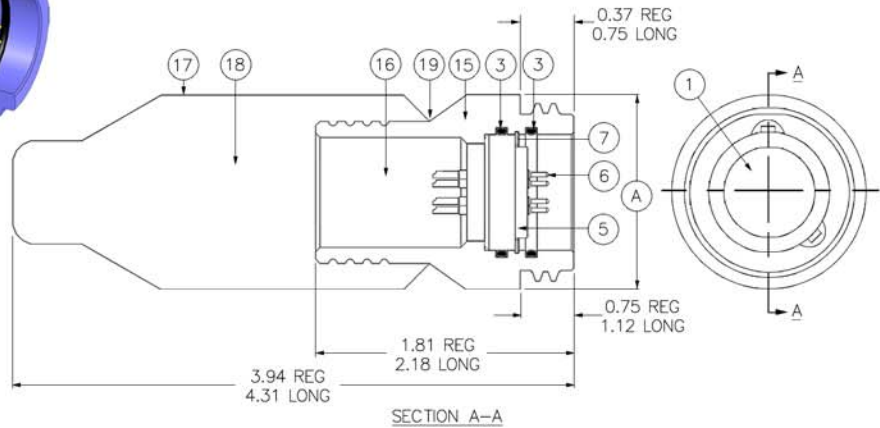
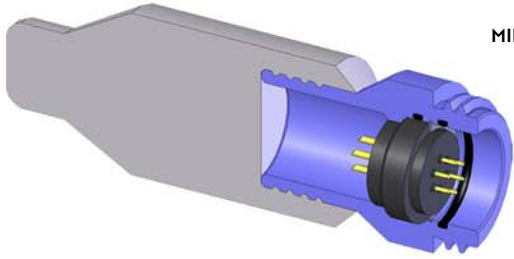


**NOTES:**

- For contact configurations please refer to pages 16-20.
- When ordering MIN-BCR-DO you receive: 2, 3, 5, 6, 7, 12, 43, 44, 45. Please refer to the MINI-CON master parts and materials list on page 15.
- Nut and washer are optional.
- Bore must be perpendicular to spot face.
- Spotface diameter to be equal or greater than the connector diameter.
- If threaded mount is used, thread must be concentric with bore.

### MINI-CON SERIES MIN-CCR

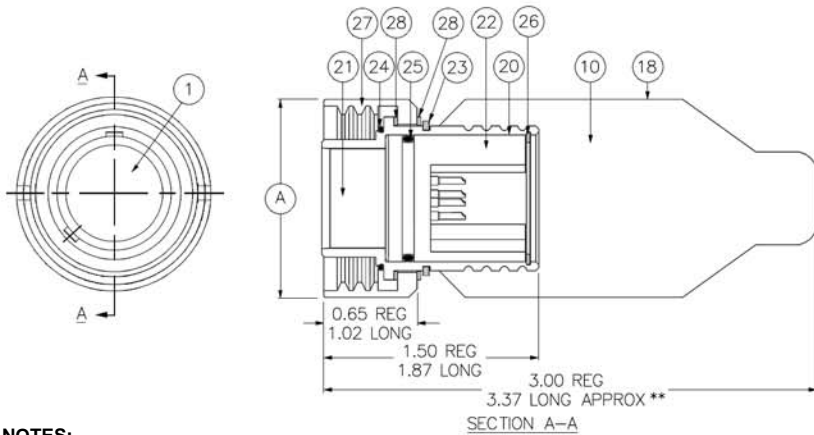
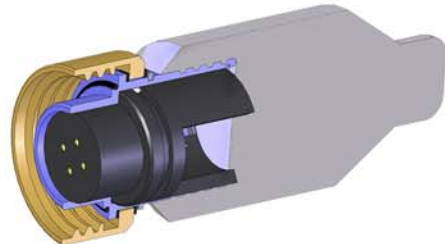
MINI-CON Cable Connector Receptacle  
Mates with MIN-CCP  
Dummy Connector: MIN-DSP



CONNECTOR	A - Ø (INCHES)	3 - O-RING	7 - SPIROLOX	23 - RETAINING RING	24 - O-RING	25 - O-RING	26 - SPIROLOX	R/A HEIGHT (INCHES)	REAR SHELL OD (INCHES)
MIND-CCR* / CCP	0.75	2-011	VH-31	D1400-0120	2-012	2-010	VH-37	2.25	0.473***
MINE-CCR* / CCP	0.87	2-013	VH-43	D1400-0150	2-014	2-012	UR50	2.25	0.595***
MING-CCR / CCP	1.00	2-014	UR50	5100-68	2-015	2-013	UR56	2.63/3.00	0.687
MINK-CCR / CCP	1.12	2-016	UR62	5100-78	2-017	2-015	UR68	2.63/3.00	0.781
MINL-CCR / CCP	1.25	2-018	UR75	5100-87	2-019	2-016	UR75	2.63/3.00	0.875
MINM-CCR / CCP	1.37	2-019	UR81	5100-100	2-020	2-018	UR87	2.81/3.18	1.000
MINO-CCR / CCP	1.62	2-023	UR106	5100-118	2-024	2-020	UR100	2.81/3.18	1.187
MINP-CCR / CCP	1.75	2-025	UR118	5100-131	2-027	2-022	UR112	3.00/3.37	1.312
MINQ-CCR / CCP	1.87	2-028	UR137	5100-150	2-028	2-025	UR131	3.00/3.37	1.500
MINR-CCR / CCP	2.00	2-029	UR150	5100-156	2-029	2-026	UR137	3.19/3.56	1.562
MINT-CCR / CCP	2.50	2-031	UR175	5100-187	2-032	2-029	UR162	varies w/cable	1.875
MINU-CCR / CCP	2.75	2-033	UR200	5100-206	2-033	2-023	UR187	varies w/cable	2.062
MINX-CCR / CCP	3.50	2-037	UR250	5100-268	2-038	2-033	UR212	varies w/cable	2.687

### MINI-CON SERIES MIN-CCP

MINI-CON Cable Connector Plug  
Mates with MIN-BCR/FCR/CCR  
Dummy Connector: MIN-DSR



**NOTES:**

- For contact configurations please refer to pages 16-20.
- For maximum cable O.D please refer to page 15.
- When ordering MIN-CCR you receive: 3, 5, 6, 7, 15. When ordering MIN-CCP you receive: 20, 21, 22, 23, 24, 25, 26, 27, 28. Please refer to the MINI-CON master parts and materials list on page 15.
- \* BCR may be used as a CCR. CCR is not available at this time for the MIND and MINE sizes.
- \*\* Will vary with cable size.
- \*\*\* CCP's only. CCR's is TBA.
- Molding is optional.
- Field Installable Boot is available and cable diameter must be specified at time of order.

# PRODUCT NEWS

## MINI-CON DUMMY CONNECTORS



### INTRODUCTION

As part of our continuous improvement process, the **SEA CON**<sup>®</sup> Group consistently reviews its product ranges through both customer feedback and internal improvements. It is via these processes that **SEA CON**<sup>®</sup> identified a design enhancement to the **MINI-CON** dry-mate connector range.

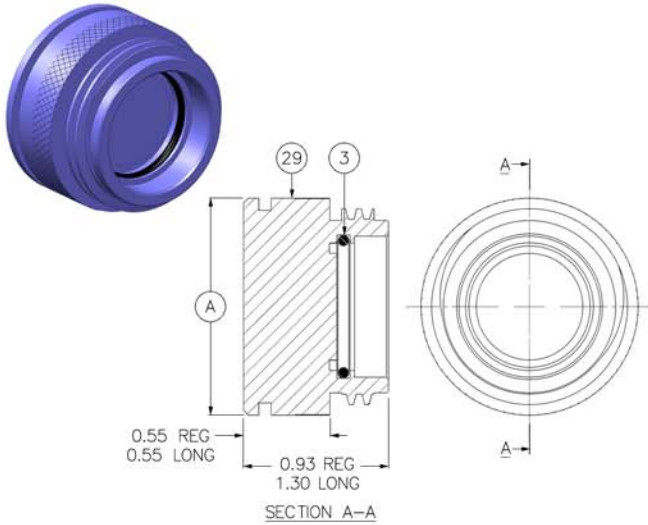
### DESIGN FEATURES

The design change is associated with the dummy connectors. With more and more customers requiring a lanyard attached to the dummy connectors to prevent loss, the DSP/DSR/PSP & PSR have been lengthened slightly and a groove added so that a lanyard can be wrapped around the groove and secured with a crimp fitting. Customers will be provided with a simple crimp fitting for use when attaching the other end of the wire to the cable or whatever equipment the customer chooses to use.

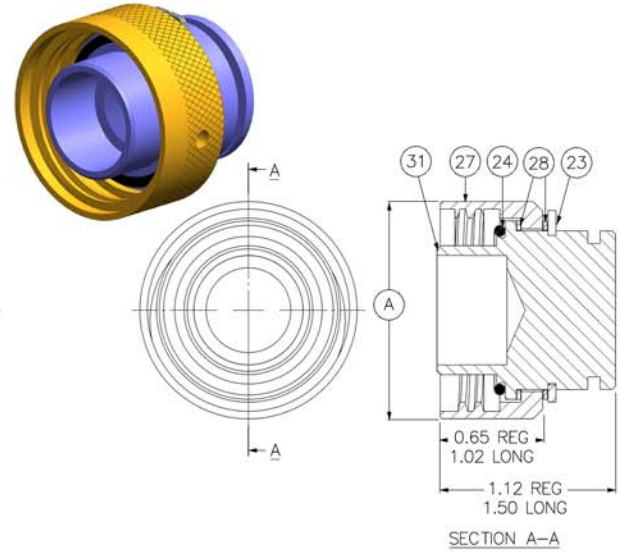
The up-graded design will become standard and available once existing stock of previous parts has been depleted. Dummies do not automatically come with lanyards, please specify at order placement.

For more details please contact +1 (619) 562-7071 or [seacon@seaconworldwide.com](mailto:seacon@seaconworldwide.com)

**MINI-CON SERIES  
MIN-DSR (DSRL - LONG)**  
MINI-CON Dummy Sealing Receptacle  
Mates with MIN-CCP (CCPL)

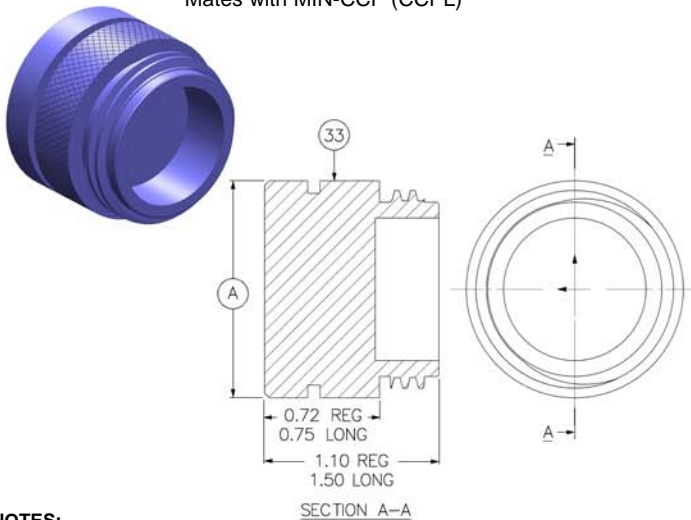


**MINI-CON SERIES  
MIN-DSP (DSPL - LONG)**  
MINI-CON Dummy Sealing Plug  
Mates with MIN-BCR/FCR/CCR (BCRL/FCRL/CCRL)

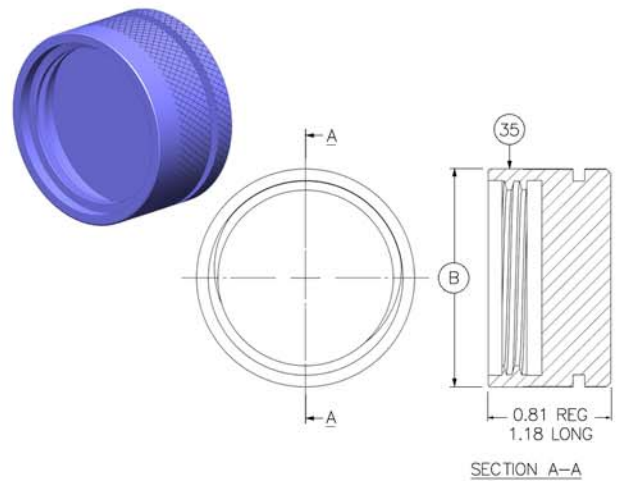


DUMMY / SPLASHPROOF CONNECTOR SIZE	A - Ø (INCHES)	B - Ø (INCHES)	3 - O-RING	23 - RETAINING RING*	24 - O-RING
MIND	0.75	0.81	2-011	5100-46	2-012
MINE	0.87	0.93	2-013	5100-59	2-014
MING	1.00	1.06	2-014	5100-68	2-015
MINK	1.12	1.20	2-016	5100-78	2-017
MINL	1.25	1.31	2-018	5100-87	2-019
MINM	1.37	1.44	2-019	5100-100	2-020
MINO	1.62	1.68	2-023	5100-118	2-024
MINP	1.75	1.81	2-025	5100-131	2-027
MINQ	1.87	1.94	2-028	5100-150	2-028
MINR	2.00	2.12	2-029	5100-156	2-029
MINT	2.50	2.62	2-031	5100-187	2-032
MINU	2.75	2.87	2-033	5100-206	2-033
MINX	3.50	3.62	2-037	5100-268	2-038

**MINI-CON SERIES  
MIN-PSR (PSRL - LONG)**  
MINI-CON Plastic Splashproof Receptacle  
Mates with MIN-CCP (CCPL)



**MINI-CON SERIES  
MIN-PSP (PSPL - LONG)**  
MINI-CON Plastic Splashproof Plug  
Mates with MIN-BCR/FCR/CCR (BCRL/FCRL/CCRL)

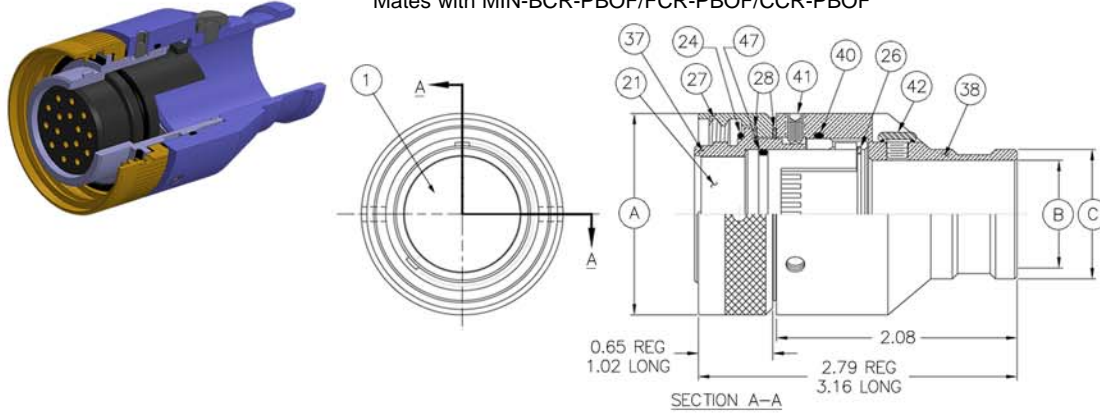


**NOTES:**

- When ordering MIN-DSR (DSRL) you receive: 3, 29. When ordering MIN-DSP (DSPL) you receive: 23, 24, 27, 28, 31. Please refer to the MINI-CON master parts and materials list on page 15.
- Please contact SEA CON® for appropriate dummy connectors for use on compensated systems or PBOF connectors.
- Splashproof connectors are not designed for submergence.
- \* High Grade Stainless Steel.

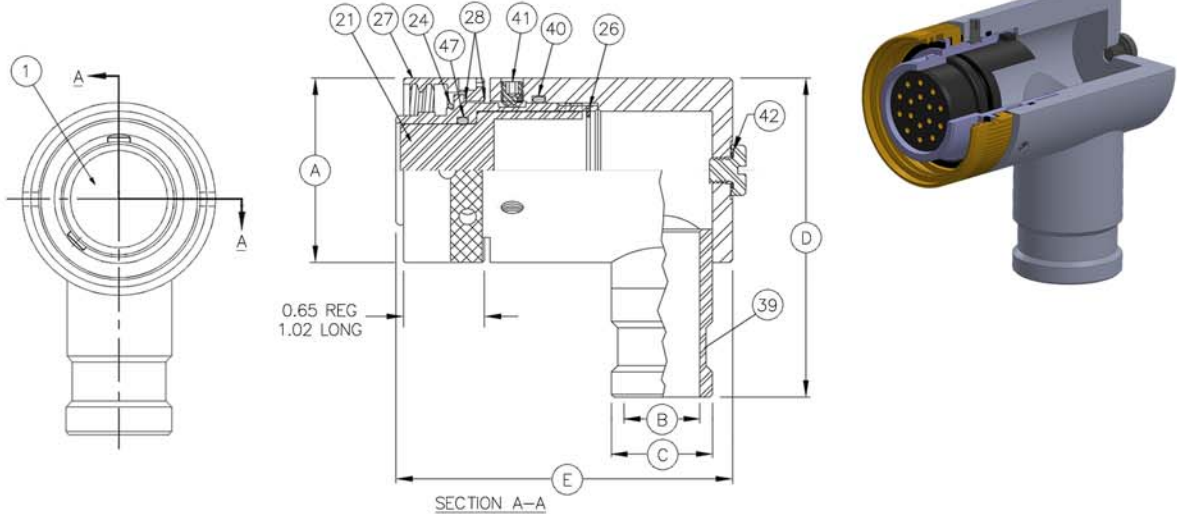
### MINI-CON SERIES MIN-CCP-PBOF-HP

MINI-CON Cable Connector Plug Pressure Balanced Oil Filled High Pressure  
Mates with MIN-BCR-PBOF/FCR-PBOF/CCR-PBOF



### MINI-CON SERIES MIN-CCP-PBOF-HP-R/A

MINI-CON Cable Connector Plug Pressure Balanced Oil Filled High Pressure Right Angle  
Mates with MIN-BCR-PBOF/FCR-PBOF/CCR-PBOF



CONNECTOR	A - INCHES	B - INCHES	C - INCHES	D - INCHES	D - INCHES STD / LONG	24 - O-RING	47 - O-RING	26 - SPIROLOX	40 - O-RING	RECOMMENDED TUBE I.D. SIZE
MING-CCP / CCP-RA	1.00	0.50	0.62	2.20	2.37 / 2.75	2-015	2-012	UR56	2-017	0.50
MINK-CCP / CCP-RA	1.12	0.50	0.62	2.20	2.37 / 2.75	2-017	2-014	UR68	2-116	0.50
MINL-CCP / CCP-RA	1.25	0.56	0.75	2.37	2.50 / 2.87	2-019	2-016	UR75	2-020	0.63
MINM-CCP / CCP-RA	1.37	0.56	0.75	2.37	2.50 / 2.87	2-020	2-017	UR87	2-022	0.63
MINO-CCP / CCP-RA	1.62	0.94	1.12	3.00	3.03 / 3.40	2-024	2-020	UR100	2-025	1.00
MINP-CCP / CCP-RA	1.75	0.94	1.12	3.00	3.03 / 3.40	2-027	2-022	UR112	2-027	1.00
MINQ-CCP / CCP-RA	1.87	1.06	1.25	3.20	3.15 / 3.52	2-028	2-025	UR131	2-029	1.13
MINR-CCP / CCP-RA	2.00	1.06	1.25	3.20	3.15 / 3.52	2-029	2-026	UR137	5-009	1.13

**MINI-CON PBOF**

The time proven MINI-CON PBOF connector system has been upgraded. The new line which is called the MINI-CON-PBOF-HP (High Pressure) has actually been in service with some of our customers for the last eighteen years. At this time, it is replacing the traditional MINI-CON PBOF across the board. The HP version will intermate with all previous MINI-CON PBOF connectors but some components are different from before. For this reason, if you need replacement connector components, please contact SEA CON® for those needs. For new applications, the HP connectors will be delivered.

As with previous MINI-CON PBOF connectors, the HP design utilizes a high contact density layout. The HP style transfers the load without a valve by bearing on the insert. This is similar to a valve type system in that the force from the high pressure fluid in the hose is transferred to the bulkhead connector. We realize that our customers have many different applications for this type of system. Please contact us with your requirements and we can quote the appropriate bulkhead connector for your application.

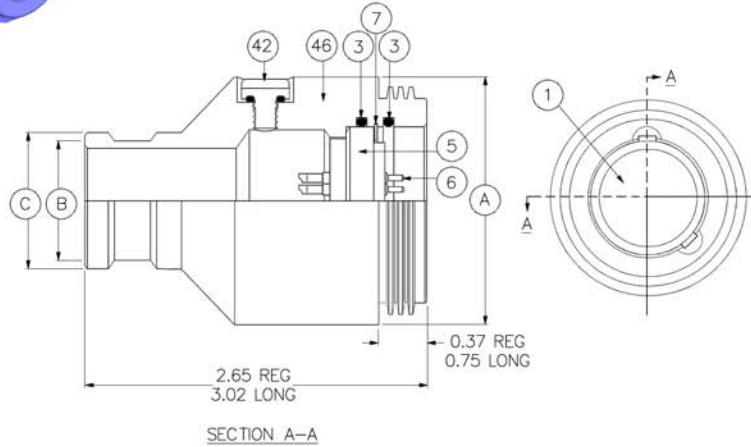
Please contact SEA CON® for appropriate dummy connectors for use with MINI-CON PBOF connectors.

**NOTES:**

- For contact configurations please refer to pages 16-20.
- When ordering MIN-CCP-PBOF you receive: 21, 22, 24, 25, 26, 27, 28, 37, 38, 39, 40, 41, 42, 47. When ordering MIN-CCP-PBOF-R/A you receive: 21, 22, 24, 25, 26, 27, 28, 38, 39, 40, 41, 42. Please refer to the MINI-CON master parts and materials list on page 15.
- Tubing, wiring and oil filling is optional.

## MINI-CON SERIES MIN-CCR-PBOF-HP

MINI-CON Cable Connector Receptacle Pressure Balanced Oil Filled High Pressure  
Mates with MIN-CCP-PBOF/CCP-PBOF-R/A



PART	A - INCHES	B - INCHES	C - INCHES	7 - SPIROLOX	3 - O-RING	RECOMMENDED TUBE I.D. SIZE
MING-CCR-PBOF	1.00	0.50	0.62	UR50	2-014	0.50
MINK-CCR-PBOF	1.12	0.50	0.62	UR62	2-016	0.50
MINL-CCR-PBOF	1.25	0.56	0.75	UR75	2-018	0.62
MINM-CCR-PBOF	1.37	0.56	0.75	UR81	2-019	0.62
MINO-CCR-PBOF	1.62	0.94	1.12	UR106	2-023	1.00
MINP-CCR-PBOF	1.75	0.94	1.12	UR118	2-025	1.00
MINQ-CCR-PBOF	1.87	1.06	1.25	UR137	2-028	1.12
MINR-CCR-PBOF	2.00	1.06	1.25	UR150	2-029	1.12

### MINI-CON PBOF

The time proven MINI-CON PBOF connector system has been upgraded. The new line which is called the MINI-CON-PBOF-HP (High Pressure) has actually been in service with some of our customers for the last eighteen years. At this time, it is replacing the traditional MINI-CON PBOF across the board. The HP version will intermate with all previous MINI-CON PBOF connectors but some components are different from before. For this reason, if you need replacement connector components, please contact SEA CON® for those needs. For new applications, the HP connectors will be delivered.

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Please contact SEA CON® for appropriate dummy connectors for use with MINI-CON PBOF connectors.

### NOTES:

- For contact configurations please refer to pages 16-20.
- When ordering MIN-CCR-PBOF you receive: 3, 5, 6, 7, 42, 46. Please refer to the MINI-CON master parts and materials list on page 15.
- Tubing, wiring and oil filling is optional.

MASTER PARTS AND MATERIALS LIST

ITEM	QTY	PART/DESCRIPTION	NOTES
1	-	INSERT FACE PATTERN	* 11
2	1	O-RING	* 6 * 13
3	AR	O-RING	* 6
4	1	MIN-BCR	* 1 * 13
5	1	MIN-CIR/ MIN-CIR-PBOF-HP	* 2
6	AR	CONTACT PINS	* 3 * 11
7	1	SPIROLOX	* 5
8	1	BULKHEAD HEX NUT (OPTIONAL)	* 5
9	1	BULKHEAD WASHER (OPTIONAL)	* 5
10	AR	EPOXY (OPTIONAL)	* 7
11	AR	HOOK-UP WIRE (OPTIONAL PIGTAILS)	* 8
12	1	MIN-FCR	* 1 * 13
13	1	O-RING	* 6
14	4	SOCKET CAP HEX SCREW (OPTIONAL)	* 5
15	1	MIN-CCR	* 1
16	AR	FILL COMPOUND REQUIRED	* 14
17	1	MIN-CCP/CCR FI BOOT (OPTIONAL)	* 4 * 12
18	AR	OVERMOLD (OPTIONAL)	* 4 * 12
19	2	NYLON CABLE TIE (OPTIONAL)	* 12
20	1	MIN-CCP	* 1 * 13
21	1	MIN-CIP / MIN-CIP-PBOF-HP	* 2
22	AR	CONTACT SOCKETS	* 3 * 11
23	1	RETAINING RING	* 5
24	1	O-RING	* 6 * 13
25	1	O-RING	* 6
26	1	SPIROLOX	* 5
27	1	ENGAGING NUT	* 10
28	2	ENGAGING NUT WASHER	* 9
29	1	MIN-DSR/MIN-DSRL	* 1
31	1	MIN-DSP/MIN-DSPL	* 1
33	1	MIN-PSR/MIN-PSRL	* 9
35	1	MIN-PSP/MIN-PSPL	* 9
37	1	MIN-CCP-PBOF-HP-FWD END	* 1
38	1	MIN-CCP-PBOF-AFT END	* 1
39	1	MIN-CCP-PBOF-R/A AFT END	* 1
40	1	O-RING	* 6
41	3	8-32 UNC-2A HEX SOCKET SET SCREW/CUP POINT	* 5
42	1	10-24 UNC-2A SLOTTED PAN HEAD SCREW WITH O-RING	* 5
43	1	MIN-BCR DUAL O-RING	* 1 * 13
44	1	O-RING	* 6
45	1	O-RING	* 6 * 13
46	1	MIN-CCR-PBOF	* 1
47	1	O-RING	* 6 * 13


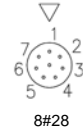
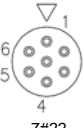
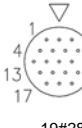




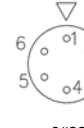
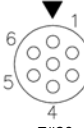
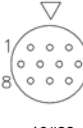









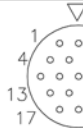












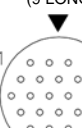







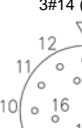


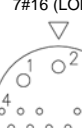

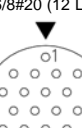
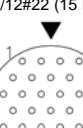








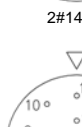




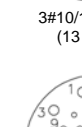

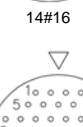
MAXIMUM CABLE O.D

TYPE OF CONNECTOR	MAXIMUM CABLE O.D.
MIND-CCP	3/8 (0.375)
MIND-CCR	1/2 (0.500)
MINE-CCP	3/8 (0.375)
MINE-CCR	1/2 (0.500)
MING-CCP	9/16 (0.562)
MING-CCP-R/A	5/8 (0.625)
MING-CCR	9/16 (0.562) CCP MOLD
MINK-CCP	7/8 (0.875)
MINK-CCP-R/A	5/8 (0.625)
MINK-CCR	7/8 (0.875) CCP MOLD
MINK-FCR-HP SIDE	3/8 (0.375)
MINK-FCR-HP SIDE R/A	1/2 (0.500)
MINL-CCP	1 (1.000)
MINL-CCP-R/A	5/8 (0.625)
MINL-CCR	1 (1.000) CCP MOLD
MINM-CCP	3/4 (0.750)
MINM-CCP-R/A	3/4 (0.750)
MINM-CCR	3/4 (0.750) CCP MOLD
MINO-CCP	1 1/4 (1.250)
MINO-CCP-R/A	3/4 (0.750)
MINO-CCR	1 1/4 (1.250) CCP MOLD
MINP-CCP	1 (1.000)
MINP-CCP-R/A	27/32 (0.843)
MINP-CCR	1 (1.000)
MINP-PNT-HP SIDE	-
MINQ-CCP	1 1/4 (1.250)
MINQ-CCP-R/A	7/8 (0.875)
MINQ-CCR	1 1/4 (1.250) CCP MOLD
MINR-CCP	1 1/4 (1.250)
MINR-CCP-R/A	1 (1.000)
MINR-CCR	1 1/4 (1.250) CCP MOLD
MINS-CCP	1 3/8 (1.375)
MINS-CCP-R/A	1 1/8 (1.125)
MINS-CCR	1 3/8 (1.375) CCP MOLD
MINT-CCP	1 1/2 (1.500)
MINT-CCP-R/A	1 1/4 (1.250)
MINT-CCR	1 1/2 (1.500) CCP MOLD
MINU-CCP	1 11/16 (1.687)
MINU-CCP-R/A	1 3/8 (1.375)
MINU-CCR	1 11/16 (1.687) CCP MOLD

NOTES:

- \* 1 Material: 316 Stainless Steel per ASTM A 484.
- \* 2 Material: Glass Reinforced Epoxy, SEA CON® XS-2748.
- \* 3 Material: Copper Alloy & Gold Plated per ASTM B 488.
- \* 4 Material: Neoprene Molding per SEA CON® X-5727.
- \* 5 Material: High Grade Stainless Steel.
- \* 6 Material: Nitrile (formerly known as Buna N).
- \* 7 Material: Epon 828/Ciba 840.
- \* 8 Material: Teflon® (registered trademark for Acetal Resin).
- \* 9 Material: Acetal per ASTM D 4181, Black.
- \* 10 Material: Copper Alloy 630 per ASTM B 150.
- \* 11 Reference face configurations for size of contacts and locations.
- \* 12 An overmold or field installable boot is optional on both the CCP and the CCR.
- \* 13 Dovetail groove to prevent loss of o-ring.
- \* 14 Not supplied.



SIZE	MINI-CON SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)															
D	 4#22	 8#28	E	 7#22	 19#28											
G	 3#16 (LONG)	 3#22	 4#22	 5#22	 6#22	 7#20	 10#22									
K	 4#16 (LONG)	 5#16 (LONG)	 6#20	 1#10/6#20 (7 LONG)	 2#14/6#22 (8 LONG)	 10#20	 2#14/8#20 (10 LONG)	 12#22	 6#20/10#22 (16)	 19#22						
L	 2#22/20 ohm COAX (LONG)	 2#20 HV	 1#22/20 ohm COAX 4#20 (5 LONG)	 3#10/3#22 (6 LONG)	 7#16 (LONG)	 3#14/6#22 (9 LONG)	 12#22	 2#16/6#20/8#22 (16 LONG)	 18#22	 18#20	 8#20/10#22 (18)	 6#20/14#22 (20)	 24#22			
M	 3#14 (LONG)	 4#10 (LONG)	 4#14 (LONG)	 7#16 (LONG)	 10#16 (LONG)	 4#16/8#20 (12 LONG)	 3#16/12#22 (15 LONG)	 16#22	 6#16/12#20 (18 LONG)	 3#16/19#22 (22 LONG)	 3#16/21#22 (24 LONG)	 25#20	 26#20	 37#22		
O	 2#14 HV	 4#14 (LONG)	 8#14 (LONG)	 12#20	 3#10/4#14/6#22 (13 LONG)	 3#10/1#14/9#22 (13 LONG)	 3#14/11#20 (14 LONG)	 14#16	 16#22	 4#10/12#22 (16B LONG)	 19#22 HV	 8#14/13#20 (21 LONG)	 44#20	 6#16/9#20/34#22 (49 LONG)	 52#22	 56#22

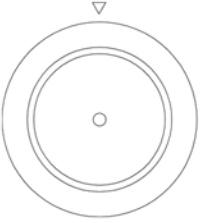
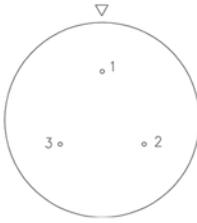
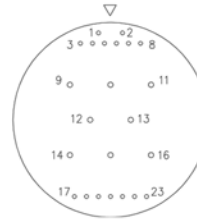
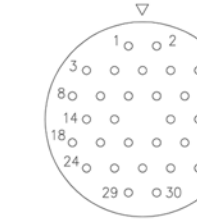
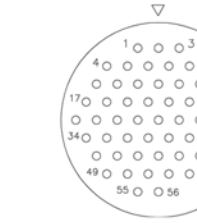
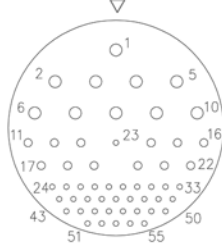
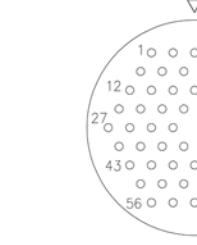
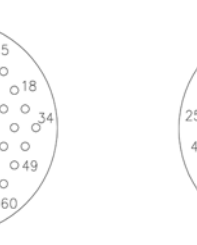
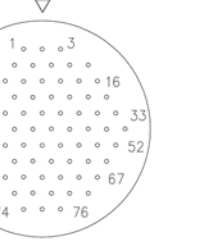
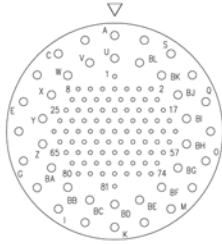
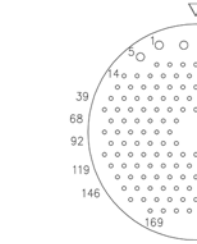
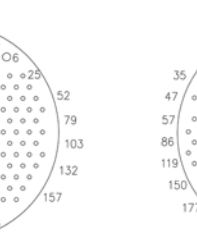
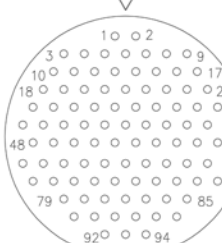
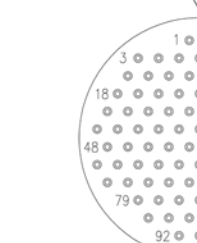
**NOTES:**

- ▼ Available as Glass Sealed style connectors.
- All configurations shown are the face view of the receptacle connector (BCR/FCR/CCR).
- 600 VDC is standard; many of the above can handle higher voltage ratings.
- Please contact SEACON® for specific voltage ratings.

SIZE	MINI-CON SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)						
P							
	4#14/2#20 (6 LONG)	1#16/5#22 (6 LONG)	7#10 (LONG)	25#16 (LONG)	1#22/20 ohm COAX 2#14/3#20/19#22 (25 LONG)	4#22/20 ohm COAX 29#22 (33 LONG)	
	3#16/36#20 (39 LONG)	40#20	41#20	3#16/48#22 (51 LONG)	28#20/24#22 (52 LONG)	57#20	
	10#20/54#22 (64)	76#22	79#22				
Q							
	3#14/2#16/13#22 (18 LONG)	24#20	26#16 (LONG)	56#20	90#22	10#20/82#22 (92)	106#22
R							
	3#22/20 ohm COAX 8#16 (11 LONG)	12#10 (LONG)	4 20 ohm COAX 9#16 (13A LONG)	15#10 (LONG)	16#14 HV (LONG)	20#16 (LONG)	4#10/18#16 (22 LONG)
	2#22/20 ohm COAX 2#10/24#16 (28 LONG)	30#16 (LONG)	8#10/24#22 (32A LONG)	32#16 (LONG)	37#16 (LONG)	44#16 (LONG)	45#20
	24#20/23#22 (47)	56#20	4#10/6#16/74#22 (84 LONG)	96#20	131#22		



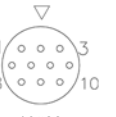
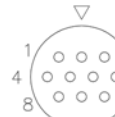

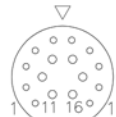
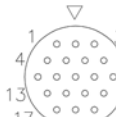









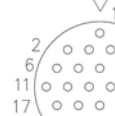
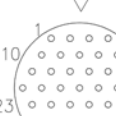
















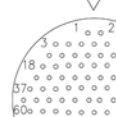
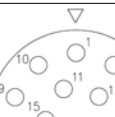


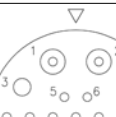


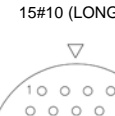
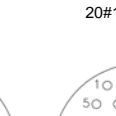

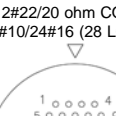
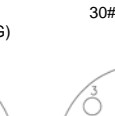
NOTES:

- ▼ Available as Glass Sealed style connectors.
- All configurations shown are the face view of the receptacle connector (BCR/FCR/CCR).
- 600 VDC is standard; many of the above can handle higher voltage ratings.
- Please contact SEACON® for specific voltage ratings.

SIZE	MINI-CON SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)				
<p><b>T</b></p>	 <p>RG8 COAX (LONG)</p>	 <p>3#22</p>	 <p>8#20/15#22 (23)</p>	 <p>30#16 (LONG)</p>	 <p>56#16 (LONG)</p>
	<p><b>U</b></p>	 <p>10#14/12#16/33#20 (55 LONG)</p>	 <p>60#16 HV (LONG)</p>	 <p>76#22</p>	 <p>87#20</p>
 <p>38#16/81#22 (119 LONG)</p>		 <p>6#16/170#22 (176)</p>	 <p>4#10/6#16/193#22 (203 LONG)</p>		
<p><b>X</b></p>		 <p>94#16 (LONG)</p>	 <p>94#20</p>		



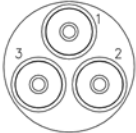
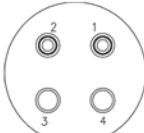
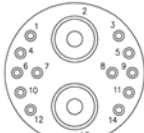
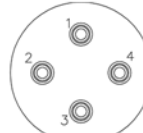
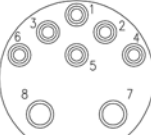




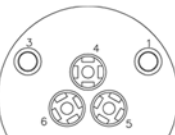
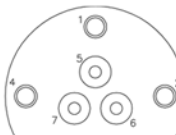


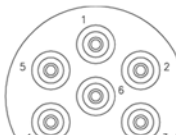
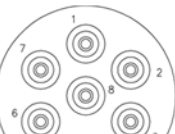
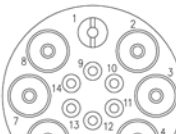
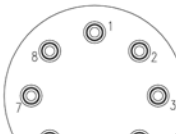




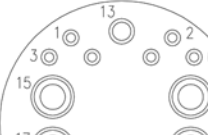
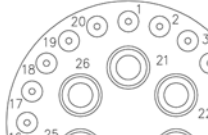
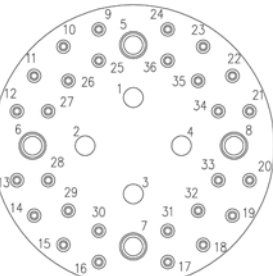
**NOTES:**

- All configurations shown are the face view of the receptacle connector (BCR/FCR/CCR).
- 600 VDC is standard; many of the above can handle higher voltage ratings.
- Please contact **SEA CON**® for specific voltage ratings.

SIZE	REVERSED MINI-CON SERIES (V-MIN) CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)											
<b>G</b>	 3#16 (LONG)	 7#20	 10#22	<b>K</b>	 10#20	 12#22	 6#20/10#22 (16)	 19#22				
<b>L</b>	 7#16 (LONG)	 18#22	 24#22									
<b>M</b>	 3#14 (LONG)	 4#10 (LONG)	 4#12 (LONG)	 7#16 (LONG)	 10#16 (LONG)	 3#16/21#22 (24 LONG)	 26#20	 37#22				
<b>O</b>	 4#14 (LONG)	 8#14 (LONG)	 12#20	 3#10/4#14/6#22 (13A LONG)	 3#10/1#14/9#22 (13 LONG)	 3#14/11#20 (14 LONG)	 16#22	 4#10/12#22 (16B LONG)	 8#14/13#20 (21 LONG)	 44#20	 6#16/9#20/34#22 (49 LONG)	 52#22
<b>P</b>	 7#10 (LONG)	 25#16 (LONG)	 4#22/20 ohm COAX /29#22 (33 LONG)	 76#22	<b>Q</b>			 106#22				
<b>R</b>	 15#10 (LONG)	 20#16 (LONG)	 2#22/20 ohm COAX 2#10/24#16 (28 LONG)	 30#16 (LONG)	 32#16 (LONG)	 8#10/24#22 (32A LONG)	 37#16 (LONG)	 44#16 (LONG)	 56#20	 4#10/6#16/74#22 (84 LONG)	 131#22 (LONG)	

**NOTES:**

- All configurations shown are the face view of the receptacle connector (BCR/FCR/CCR).
- 600 VDC is standard; many of the above can handle higher voltage ratings.
- Please contact SEACON® for specific voltage ratings.

SIZE	MINI-CON SERIES FIBER OPTIC CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)										
F	 1FO	M	 2FO	 3FO	O	 2FO/2#16	 2FO/12#20	 4FO			
	 2FO/6#16		 4FO	 3FO/3#16		 3FO/4#16	 1FO/16#16				
P	 3FO/3#10	 3FO/4#14 3FO/4#16	 4FO/2#10/4#16	 6FO	 6FO	R	 6FO/2#16	 7FO/6#16-PBOF	 8FO	 8FO/6#16	 8FO-PBOF
	 4FO/9#16/2#14	 4FO/5#16	 4FO/2#10/12#16	 6FO/20#20							
T	 4FO/4#10/28#20										

**NOTES:**

- Fiber Optic connectors available in the long shell size only.
- Please see the Dry-Mate Hybrid section of the catalog or contact SEACON® for further information.

**S E A C O N**®



# Micro MINI-CON

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UNDERWATER ELECTRICAL DRY-MATE CONNECTORS

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<b>Micro MINI-CON SERIES</b>	
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MM-BCR .....	MIN 24
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**INTRODUCTION**

To meet the ever increasing demand for smaller high density connectors, SEA CON® developed the Micro MINI-CON series. This miniature connector series incorporates all of the engineering concepts and design features of our highly successful MINI-CON range, but in a smaller configuration beginning at 1/2" in diameter.

In order to maintain the miniaturization and provide minimal wall thickness, special o-rings were developed to seal the interfaces on all plugs and receptacles. The inserts are retained in the connector shells using custom designed and manufactured retaining rings made of 17/4 PH Stainless Steel.

In many applications a flange mounted receptacle is preferred instead of a screw-in type. To fill this need, SEA CON® has developed a modular flange that adapts a standard BCR connector for use as an FCR. An added benefit of this design is the ability to clock the FCR in several orientations with respect to the bolt pattern. This can be however SEA CON® has designed a modular flange that fits over the screw-in type eliminating the need to purchase a separate shell, again without compromising performance.

**AVAILABILITY**

The Micro MIN-CON dry-mateable connector range is available in 6 different shell sizes ranging from 4 to 202 contacts with a pressure rating of 13,500 psi mated and is also available in a fiber optic configuration (please see our Optical Dry-Mate Hybrid section). In addition, this series also offers the option of right angles, over-molding of the cable plug, field installing the cable using boots or terminating with a Pressure Balanced Oil-Filled (PBOF) system.

**APPLICATIONS**

The Micro MINI-CON is suitable for a variety of applications including cameras and lights or any application where size is an issue.

**TESTING**

The Micro MINI-CON range of connectors have been subjected to the following testing:

**Environmental**

- Humidity (Steady State)
  - Tested in accordance with MIL-STD-202, Method 103.
- Thermal Shock
  - Tested in accordance with MIL-STD-202, Method 107.
- Mechanical Shock
  - Tested in accordance with MIL-S-901, Grade A, Class 1.
- Hydrostatic Pressure
  - Tested in accordance with MIL-STD-202, Method 1006.

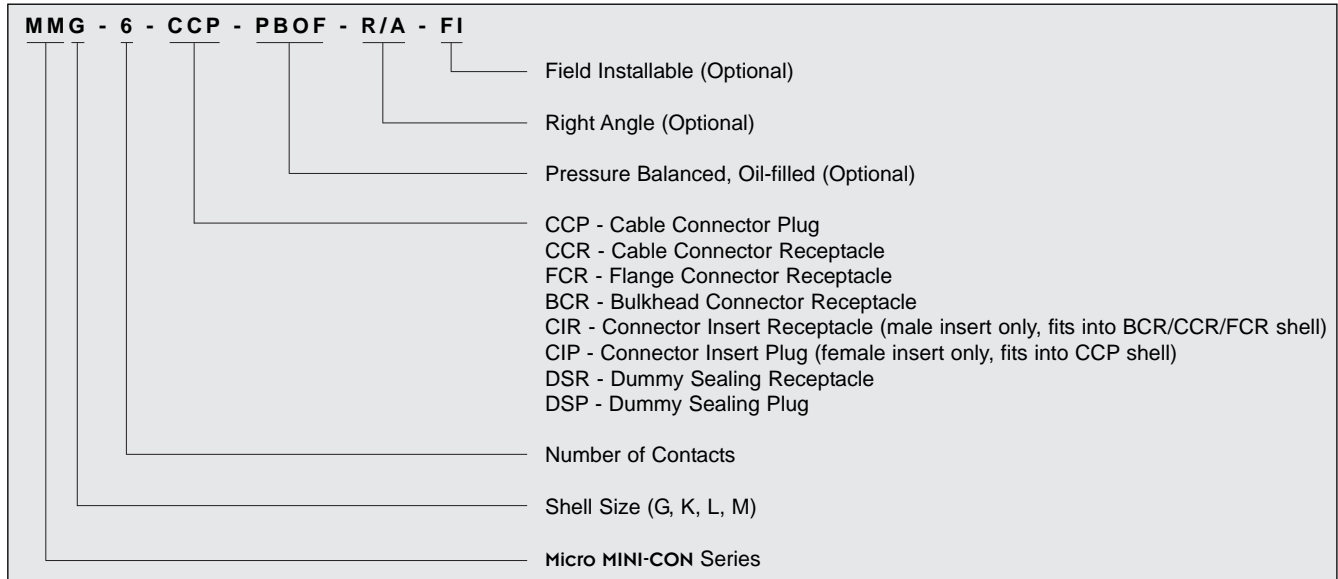
**Physical**

- Vibration
  - Tested in accordance with MIL-STD-202, Method 301.

**Electrical**

- Dielectric Withstanding Voltage
  - Tested in accordance with MIL-STD-202, Method 301.
- Insulation Resistance
  - Tested in accordance with MIL-STD-202, Method 302.

**PART NUMBER SYSTEM - EXAMPLE**



**GENERAL INFORMATION**

COMPONENT	MATERIAL
BULKHEAD BODY (BCR/FCR)	Ti6A14V
CCP BODY	Ti6A14V c/w Ti Grade 2 Engaging Nut
CONTACT INSERT	Glass Filled Epoxy MIL-G-24325
ELECTRICAL CONTACTS	Copper Alloy Gold Plated per MIL-G-45204
O-RINGS	Nitrile (formerly known as Buna N)

CATEGORY	VALUE
OPEN FACE PRESSURE	3,000 psi (inserted prepared)
MATED PRESSURE	Up to 13,500 psi mated and potted
VOLTAGE RATING	300 VDC although higher voltage ratings are available. Please contact SEA CON® for further information
CURRENT RATING	Up to 4 amps dependent on contact size and cable

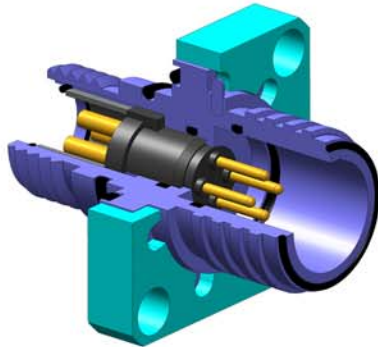
**OPTIONS:**

- Pressure Balanced Oil Filled (PBOF).
- Higher voltages.
- Available in alternative materials.
- Glass sealed CIR design available.



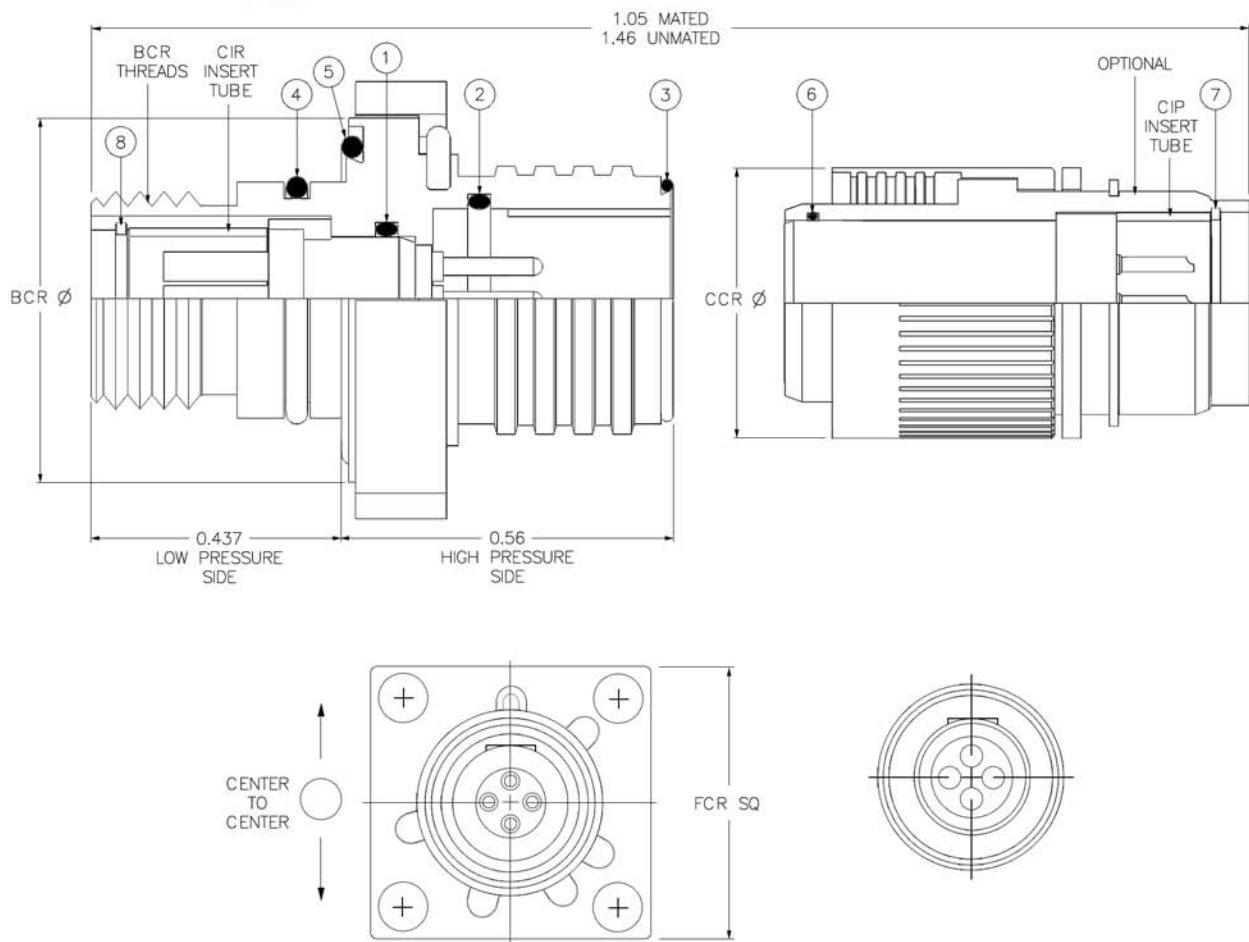
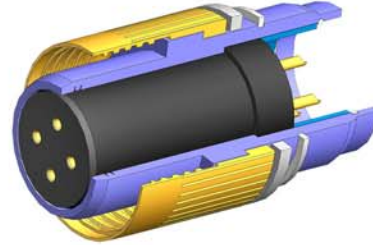
**Micro MINI-CON SERIES  
MM-BCR/FCR**

Micro MINI-CON Bulkhead Connector Receptacle/Flange Connector Receptacle  
Mates with MMG-CCP  
Dummy Connector: MMG-DSP



**Micro MINI-CON SERIES  
MM-CCP**

Micro MINI-CON Cable Connector Plug  
Mates with MMG-BCR/FCR/CCR  
Dummy Connector: MMG-DSR



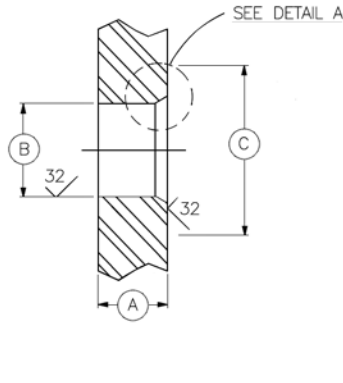
SIZE	OD BCR	OD ENGAGING NUT	FCR SQUARE	BCR THREADS	1 - O-RING	2 - O-RING	3 - O-RING	4 - O-RING	5 - O-RING	6 - O-RING	7 - RET RING CCP	8 - RET RING B/F/CCR
G*	0.625	0.500	0.750	0.375-24 UNF	SS-201	SS-301	SS-303	SS-302	SS-404	SS-201	MMRR-25	MMRR-25
K*	0.750	0.625	0.875	0.500-20 UNF	SS-301	SS-401	SS-403	SS-402	SS-601	SS-301	MMRR-35	MMRR-35
L*	0.875	0.750	1.000	0.593-18 UNF	SS-401	SS-501	SS-503	SS-502	SS-702	SS-401	MMRR-45	MMRR-45
M	1.000	0.875	1.125	0.687-20 UN	SS-602	SS-602	SS-603	SS-602	SS-801	SS-501	MMRR-61	MMRR-64

**NOTES:**

· \* Reverse load; insert loaded from the low pressure side as shown in drawing above. All other insert sizes are loaded from the high pressure side.

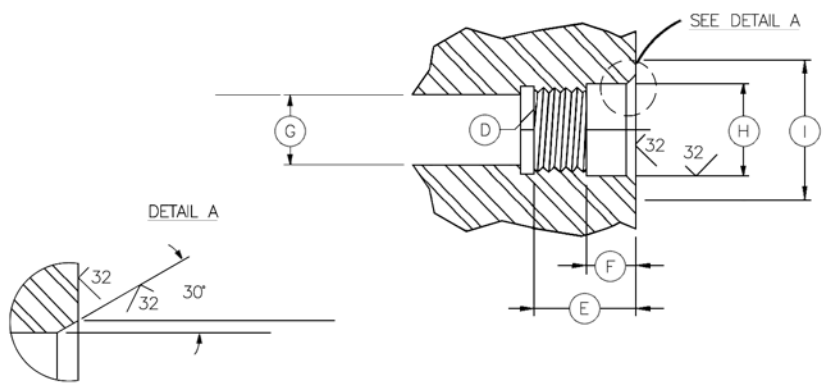
**Micro MINI-CON SERIES  
MM-BCR  
THROUGH BORE OPTION**

Micro MINI-CON Bulkhead Connector Receptacle



**Micro MINI-CON SERIES  
MM-BCR  
THREADED MOUNTING OPTION**

Micro MINI-CON Bulkhead Connector Receptacle

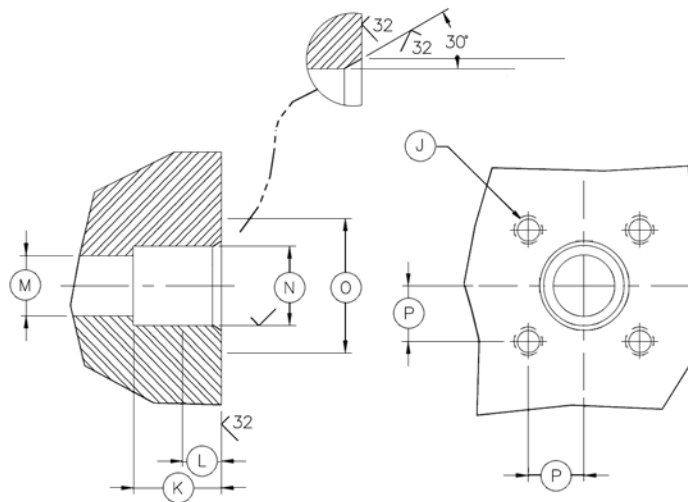


**BCR INTERFACE MOUNTING INFORMATION**

CONNECTOR	A - LENGTH	B - Ø	C - Ø	D - THREAD	E - LENGTH	F - Ø	G - Ø	H - Ø	I - Ø
MMG-BCR	0.250 0.156	0.408 0.407	0.62	0.375-24 UNF-2B	0.45	0.22	0.31	0.408 0.407	0.62
MMK-BCR	0.250 0.156	0.537 0.536	0.75	1/2-20 UNF-2A	0.45	0.22	0.37	0.537 0.536	0.75
MML-BCR	0.250 0.156	0.632 0.631	0.87	19/32-18 UNF-2B	0.45	0.22	0.45	0.632 0.631	0.87
MMM-BCR	0.310 0.200	0.711 0.710	1.00	0.687-20 UN-2B	0.510	0.29	N/A	0.711 0.710	1.00

**Micro MINI-CON SERIES  
MM-FCR  
MOUNTING DETAILS**

Micro MINI-CON Flange Connector Receptacle



**FCR INTERFACE MOUNTING INFORMATION**

CONNECTOR	J - THREAD	K - LENGTH	L - Ø	M - Ø	N - Ø	O - Ø	P - Ø
MMG-FCR	4 X 4-40 UNC-2B	0.45	0.20	0.31	0.408 0.407	0.62	0.286
MMK-FCR	4 X 4-40 UNC-2B	0.45	0.20	0.37	0.537 0.536	0.750	0.343
MML-FCR	4 X 4-40 UNC-2B	0.50	0.13	0.50	0.632 0.631	0.88	0.400
MMM-FCR	4 X 6-32 UNC-2B	0.52	0.20	0.50	0.711 0.710	1.00	0.438

SIZE	Micro MINI-CON SERIES CONTACT CONFIGURATIONS (MALE FACE VIEW ONLY - NOT TO SCALE)
G	<p>4#22      8#28      1FO*</p>
K	<p>1#28/2#20      7#22      12#28</p>
L	<p>14#22      37#28</p>
M	<p>26#22      26#28</p>

**NOTES:**

- All configurations shown are the face view of the Bulkhead Connector (BC).
- Standard bulkhead contacts are male.
- Numbers are for reference only.
- For custom configurations or special applications please contact **SEA CON®**.

• \* Micro MINI-CON fiber optic configuration.

## HANDLING PROCEDURES AND SPECIAL CAPABILITIES

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

Connectors are designed for installation on one atmosphere vessels. Contact **SEA CON®** for recommendations if using compensated vessels.

## INSTALLATION PROCEDURES

Torque values referenced assume installation into dry metal threads. Bulkhead connector receptacle (BCR) o-ring should be lubricated with an appropriate silicone grease before installing. This lubricant should be applied to form an adequate film. Excessive lubrication is detrimental to the operation of the connector. Care must be taken to ensure no grease or dirt is present on the face of the fiber optic contact. Cleaning of the contact is recommended using only suitable products. CCP o-ring should be greased as above with the same care being taken.

## CARE AND MAINTENANCE

Once mated the connector requires no maintenance. When stored all fiber contacts should be protected with suitable dust caps.

## CABLE AND CONTINUITY PRESERVATION

Avoid sharp bends in cables. Cables subjected to vibration and exposed to seawater drag should be adequately clamped to prevent fatigue and possible failure.

## SPECIAL ASSEMBLIES

**SEA CON®** maintains all facilities necessary to furnish complete underwater and environmental electrical connector/cable systems, including Research and 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.

All reasonable efforts have been taken to ensure that the information contained herein is accurate at the date of publication, but no representation or warranty as to the accuracy or completeness of such information is intended or to be implied by its inclusion herein. Any and all representations and warranties pertaining to the information and products referred to herein shall be set forth in **SEA CON®** standard sales order form. In addition, **SEA CON®** reserves the right to make changes to the contents hereof without notice, therefore it is suggested that at the time of inquiry, the appropriate sales office or factory be contacted directly for verification of published specifications and products availability.

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