

# SEACON®

UNDERWATER ELECTRICAL AND FIBER OPTIC CONNECTORS



## OPTI-CON



UNDERWATER OPTICAL HYBRID DRY-MATE CONNECTORS



MANAGEMENT SYSTEM APPROVED IN ACCORDANCE WITH ISO 9001.



SECTION	PAGE
<b>OPTI-CON</b>	
Introduction .....	OPT 2
Availability .....	OPT 2
Testing .....	OPT 2
Part Number System .....	OPT 2
General Information.....	OPT 2
Dimension Details:	
OPT-BCR .....	OPT 3
OPT-FCR .....	OPT 3
OPT-CCR .....	OPT 4
OPT-CCP .....	OPT 4
OPT-CCP-PBOF-R/A .....	OPT 5
OPT-PSR .....	OPT 6
OPT-PSP .....	OPT 6
OPT-DSR .....	OPT 6
OPT-DSP .....	OPT 6
Interface Details .....	OPT 7
Contact Configurations .....	OPT 8

**INTRODUCTION**

With an increase in the use of fiber optics throughout the subsea industry, SEACON (europe) Ltd is pleased to introduce its standard, dry-mate, fiber optic hybrid connector range.

**OPTI-CON** is a unique design that allows the customer to choose any combination of optical and electrical configurations to suit their particular needs. The manufacture of all parts in house ensures that each connector is supplied with the highest of standards. This connector range is manufactured from 316L Stainless Steel as standard, but other materials are available upon request.

**AVAILABILITY**

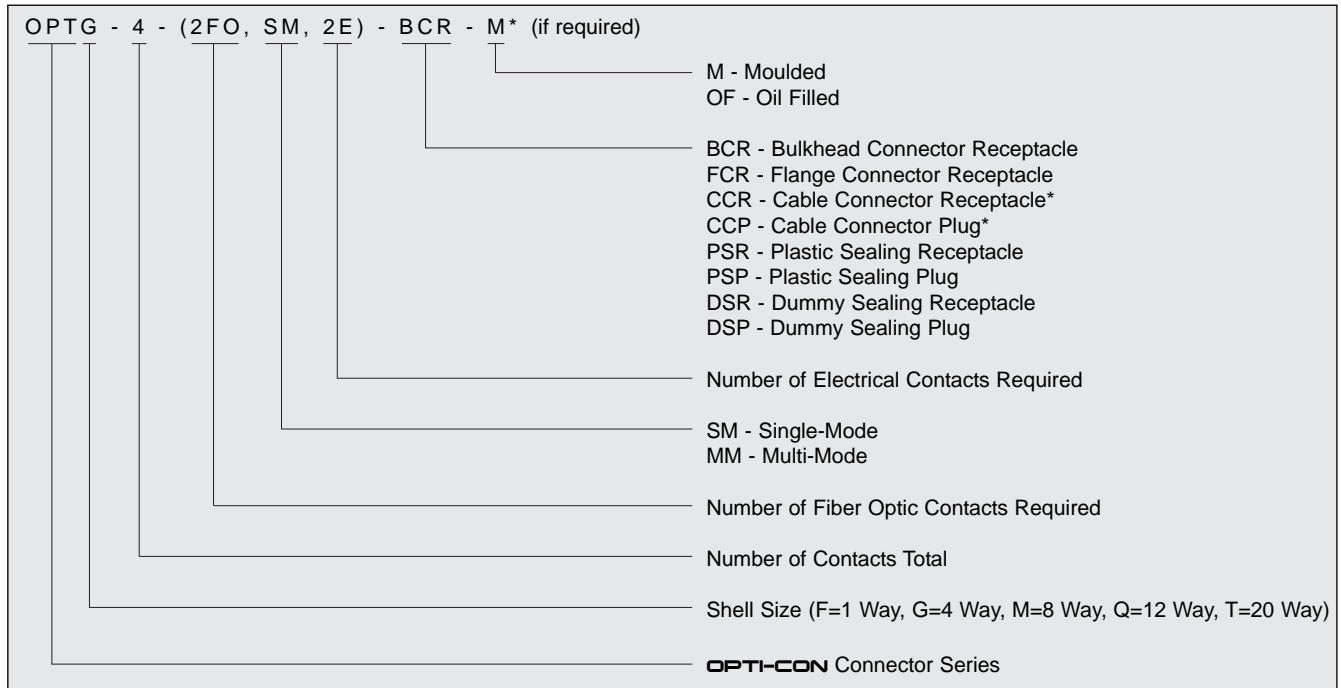
**OPTI-CON** offers interchangeable electric or optic contacts and is available in 5 shell sizes from 1 to 20 contact configurations, oil filled or over-molded to any type of cable (subject to test sample). Pressure rated to 7,500 psi (5,200m water depth) this series is offered in a variety of fiber types from single-mode to multi-mode (9/125, 50/125 or 62.5/125) with optical insertion losses of <0.5dB, typically <0.3dB.

**TESTING**

Due to the modular nature of the **OPTI-CON** series, testing has been conducted to simulate the extremes of operation, this means carrying out the qualification four times on each assembly as the options are: -

- Electrical contact.
- Multi-mode optical contact.
- Single-mode optical contact.
- Mixed optical (single and multi-mode) and electrical contacts.
  
- The electrical contacts have been tested to 1,000 VDC with regard to shell and other conductors with a minimum Insulation Resistance of 1,000 megohms.
- Mated single-mode optical contacts have been tested to 10,000 psi, including cycling, with recorded dB losses well under the 0.3dB acceptance. (Typically 0.2dB).
- Mated multi-mode optical contacts have been tested to 10,000 psi, including cycling, with recorded dB losses well under the 0.3dB acceptance. (Typically 0.2dB).
- Mated electrical contacts have been pressure tested to 10,000 psi, including cycling, with no degradation in performance.

**PART NUMBER SYSTEM - EXAMPLE**



The above example would be the part number required to order a 4 way **OPTI-CON** connector. It would be a "G" size, would have 2 optical contacts (SM or MM to be specified), it would have 2 electrical contacts and would be a bulkhead receptacle shell style. Oil filled hoses CCP and CCR connectors will be supplied as standard. If molded versions are required "-M" must be added to the end of the part number and a sample of cable supplied for test purposes. Where ST or other style of connectors are required to be attached onto the BCR or FCR tails the style required and the length would need to be specified and would be priced accordingly. Standard shell material is 316L Stainless Steel with NES833 engaging nut although other materials are available upon request. Preferred material should be specified at time of enquiry.

**GENERAL INFORMATION**

COMPONENT	MATERIAL
<b>BULKHEAD BODY (BCR/FCR)</b>	316L SS
<b>CCP BODY</b>	316L SS with Aluminum Bronze engaging nut per NES 833
<b>CCR BODY</b>	316L SS
<b>ELECTRICAL CONTACTS</b>	Aluminum Bronze per NES 833 GRE overmolded contact size 20 AWG
<b>OPTICAL CONTACTS</b>	Single or multi-mode with insertion losses of <0.5dB typically <0.3dB
<b>O-RING</b>	Nitrile (formerly known as Buna N)

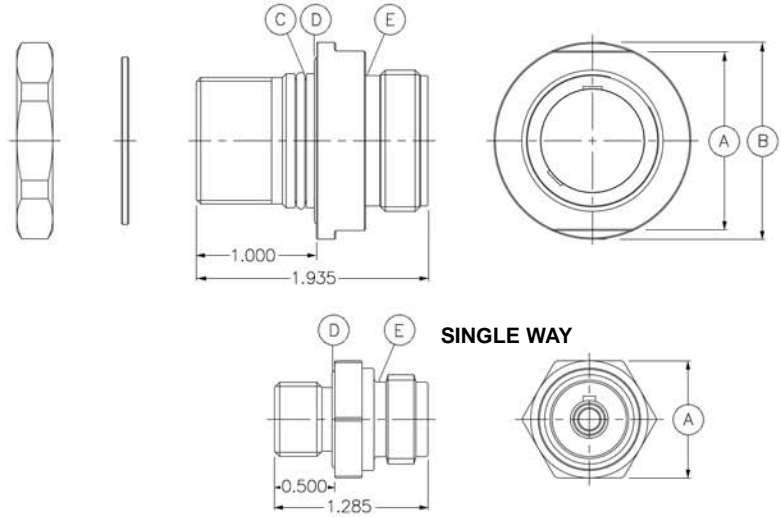
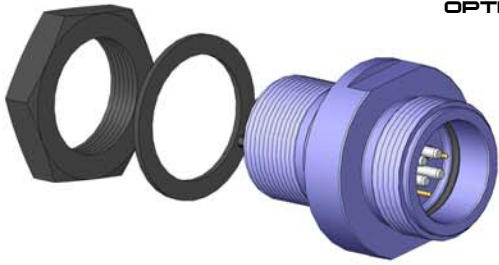
CATEGORY	VALUE
<b>MATED PRESSURE</b>	7,500 psi (5,200m water depth)
<b>VOLTAGE RATING</b>	600 VDC @ 4 amps
<b>TEMPERATURE RATING</b>	-50°C to +70°C (-58°F to 158°F)
<b>TYPICAL OPTICAL RETURN LOSS</b>	<-50dB @1310 and 1550nm using single-mode fiber
<b>LENGTH</b>	Up to 30m maximum hose length at additional cost

**NOTES:**

- \* Standard supply is hose, however if cable is required please supply sample or specification.

## OPTI-CON SERIES OPT-BCR

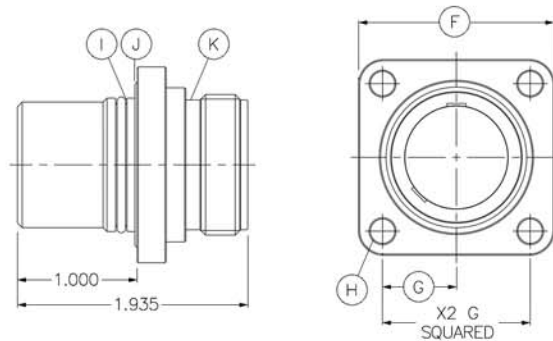
OPTI-CON Bulkhead Connector Receptacle  
Mates with OPT-CCP  
Dummy Connector: OPT-DSP



CONNECTOR	A - FLATS (INCHES)	B - Ø (INCHES)	C - O-RING	D - O-RING	E - O-RING (INTERNAL)
OPT-F-BCR-SINGLE-WAY	0.980	N/A	N/A	017	011
OPT-G-4-BCR	1.25	1.400	018	022	016
OPT-M-8-BCR	1.50	1.645	022	026	020
OPT-Q-12-BCR	2.00	2.145	029	031	028
OPT-T-20-BCR	2.25	2.520	032	034	031

## OPTI-CON SERIES OPT-FCR

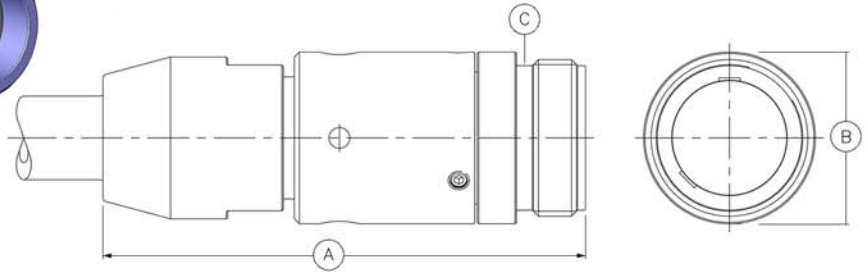
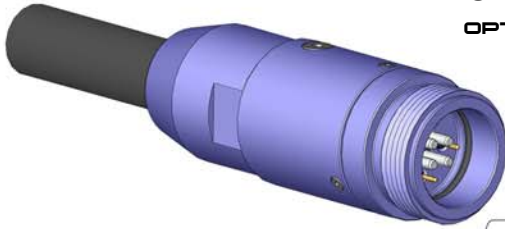
OPTI-CON Flange Connector Receptacle  
Mates with OPT-CCP  
Dummy Connector: OPT-DSP



CONNECTOR	F - SQUARE (INCHES)	G - (INCHES)	H - Ø (INCHES)	I - O-RING	J - O-RING	K - O-RING (INTERNAL)
OPT-F-FCR-SINGLE-WAY	1.180	0.425	0.167	012	017	011
OPT-G-4-FCR	1.400	0.540	0.167	018	022	016
OPT-M-8-FCR	1.645	0.620	0.206	022	026	020
OPT-Q-12-FCR	2.145	0.825	0.245	029	031	028
OPT-T-20-FCR	2.520	1.000	0.245	032	034	031

### OPTI-CON SERIES OPT-CCR (HOSE SHOWN)

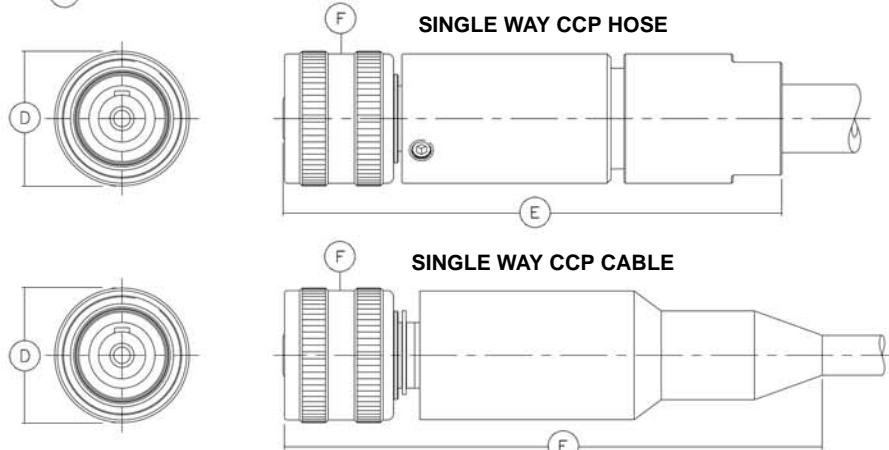
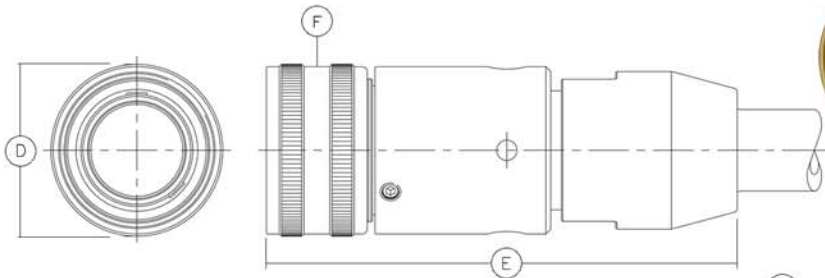
OPTI-CON Cable Connector Receptacle  
Mates with OPT-CCP  
Dummy Connector: OPT-DSP



CONNECTOR	A - (INCHES)*	B - Ø (INCHES)	C - O-RING (INTERNAL)	MAX CABLE O.D (INCHES)	HOSE NOMINAL I.D (INCHES)
OPT-F-CCR-SINGLE-WAY	3.16	0.860	011	0.256	0.250
OPT-G-4-CCR	3.12	1.050	017	0.433	0.250
OPT-M-8-CCR	3.64	1.295	021	0.678	0.375
OPT-Q-12-CCR	4.65	1.795	517	1.000	0.500
OPT-T-20-CCR	4.83	2.170	031	1.430	0.625

### OPTI-CON SERIES OPT-CCP (HOSE SHOWN)

OPTI-CON Cable Connector Plug  
Mates with OPT-BCR  
Dummy Connector: OPT-DSR



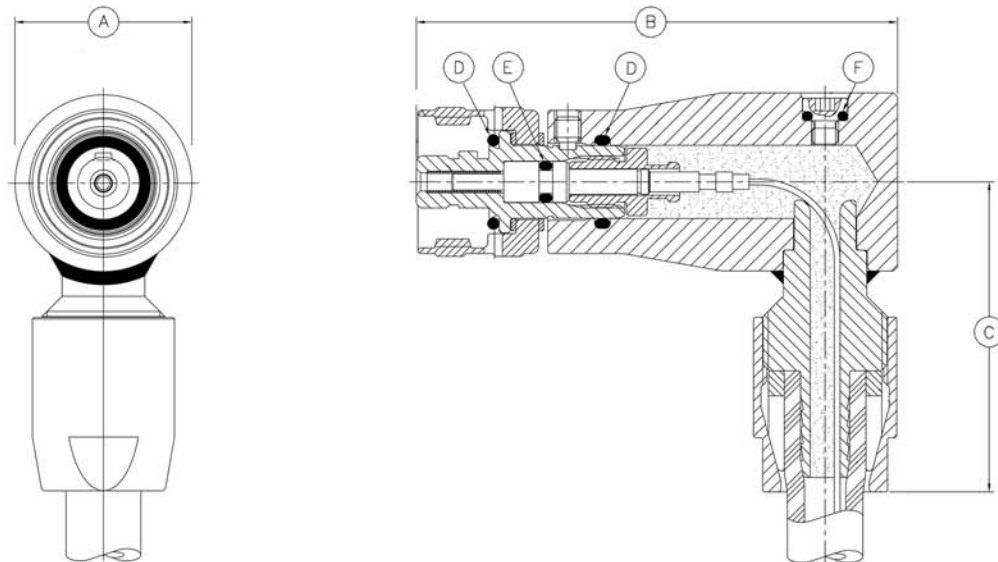
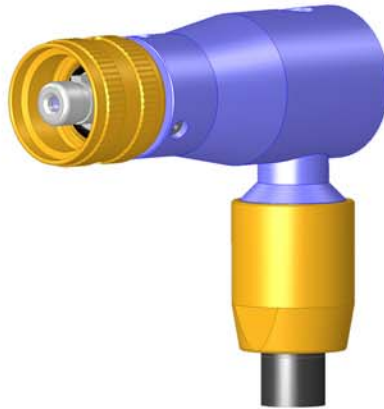
CONNECTOR	D - Ø (INCHES)	E - LENGTH (INCHES)	F - O-RING (INTERNAL)	MAX CABLE O.D (INCHES)	HOSE NOMINAL I.D (INCHES)
OPT-F-CCP CABLE SINGLE-WAY	0.895	3.60	013	0.256	-
OPT-F-CCP HOSE SINGLE-WAY	0.895	3.32*	013	-	0.250
OPT-G-4-CCP	1.085	3.13*	017	0.433	0.250
OPT-M-8-CCP	1.330	3.64*	021	0.678	0.375
OPT-Q-12-CCP	1.830	4.66*	517	1.000	0.500
OPT-T-20-CCP	2.205	4.84*	031	1.430	0.625

**NOTES:**

\* Length is longer for molded versions. Please contact SEA CON® for further details.

### OPTI-CON SERIES OPT-CCP-PBOF-R/A

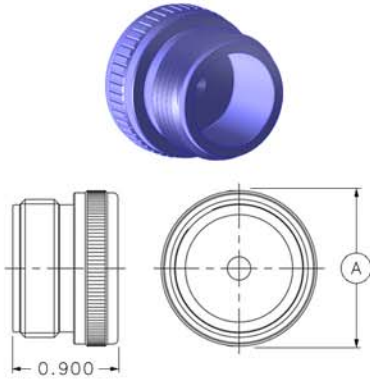
OPTI-CON Cable Connector Plug Pressure Balanced Oil Filled Right Angle  
Mates with OPT-BCR  
Dummy Connector: OPT-DSR



CONNECTOR	A - Ø (INCHES)	B - LENGTH (INCHES)	C - LENGTH (INCHES)	D - O-RING	E - O-RING	F - O-RING
OPT-F-CCP-PBOF-R/A	0.895	2.89	1.86 APPROX.	013	006	007

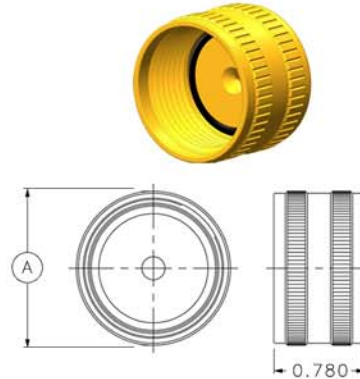
**OPTI-CON SERIES  
OPT-PSR (DUST/SHIPPING CAPS)**

OPTI-CON Plastic Sealing Receptacle  
Mates with OPT-CCP



**OPTI-CON SERIES  
OPT-PSP (DUST/SHIPPING CAPS)**

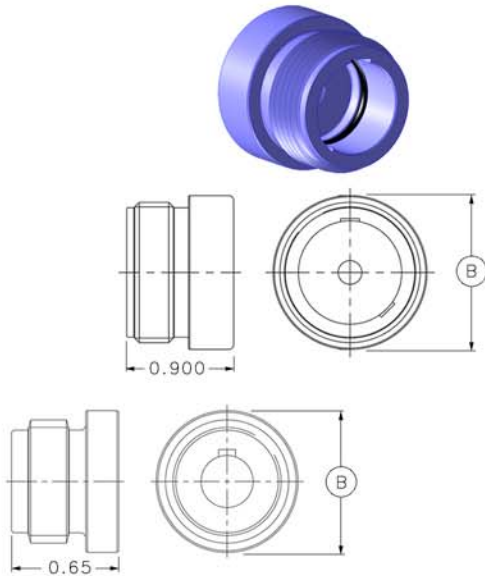
OPTI-CON Plastic Sealing Plug  
Mates with OPT-BCR/FCR/CCR



CONNECTOR	A - Ø (INCHES)
OPT-F-PSR/PSP SINGLE-WAY	0.900
OPT-G-4-PSR/PSP	1.085
OPT-M-8-PSR/PSP	1.330
OPT-Q-12-PSR/PSP	1.830
OPT-T-20-PSR/PSP	2.205

**OPTI-CON SERIES  
OPT-DSR (FULL DEPTH SEALING CAPS)**

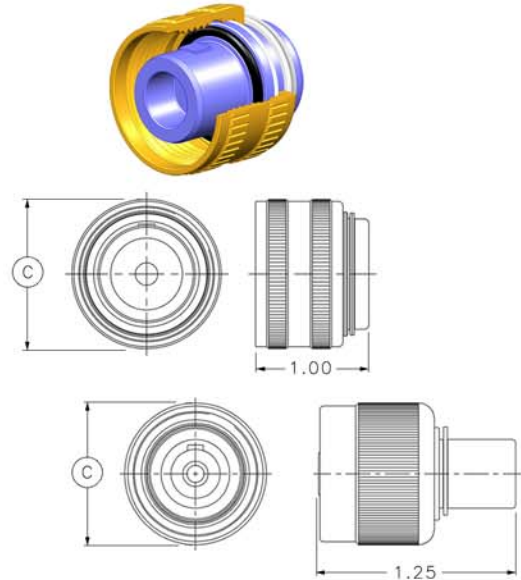
OPTI-CON Dummy Sealing Receptacle  
Mates with OPT-CCP



DSR SINGLE WAY

**OPTI-CON SERIES  
OPT-DSP (FULL DEPTH SEALING CAPS)**

OPTI-CON Dummy Sealing Plug  
Mates with OPT-BCR/FCR/CCR

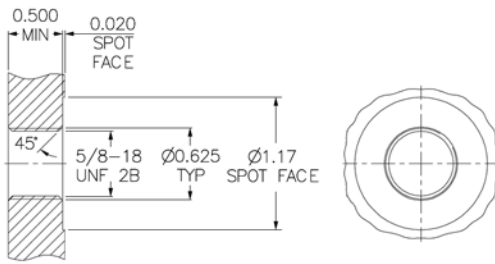


DSP SINGLE WAY

CONNECTOR	B - Ø (INCHES)	C - Ø (INCHES)
OPT-F-DSR/DSP SINGLE-WAY	0.860	0.900
OPT-G-4-DSR/DSP	1.050	1.085
OPT-M-8-DSR/DSP	1.295	1.330
OPT-Q-12-DSR/DSP	1.795	1.830
OPT-T-20-DSR/DSP	2.170	2.205

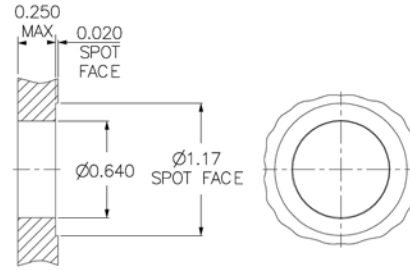
**OPTI-CON SERIES  
OPT-BCR SINGLE-WAY  
THREADED MOUNTING OPTION**

OPTI-CON Bulkhead Connector Receptacle  
Mates with OPT-CCP



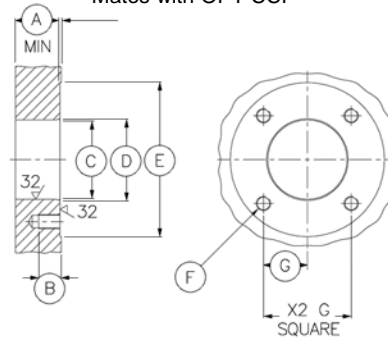
**OPTI-CON SERIES  
OPT-BCR SINGLE-WAY  
THROUGH BORE MOUNTING OPTION**

OPTI-CON Bulkhead Connector Receptacle  
Mates with CCP



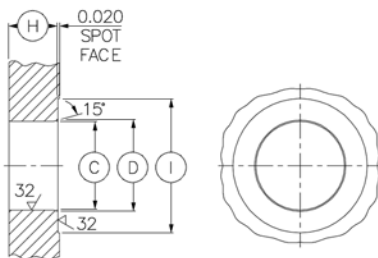
**OPTI-CON SERIES  
OPT-FCR  
MOUNTING OPTION**

OPTI-CON Flange Connector Receptacle  
Mates with OPT-CCP



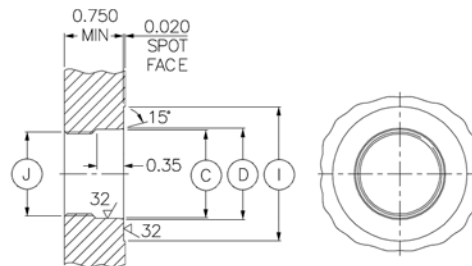
**OPTI-CON SERIES  
OPT-BCR  
THROUGH BORE MOUNTING OPTION  
UTILIZING BACK NUT AND WASHER**

OPTI-CON Bulkhead Connector Receptacle  
Mates with OPT-CCP



**OPTI-CON SERIES  
OPT-BCR  
THREADED MOUNTING OPTION**


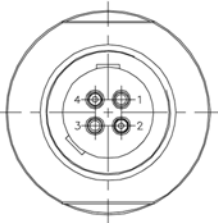
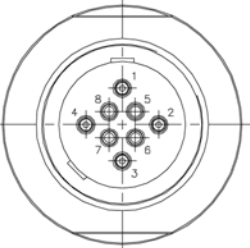
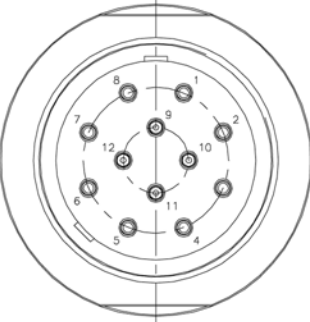
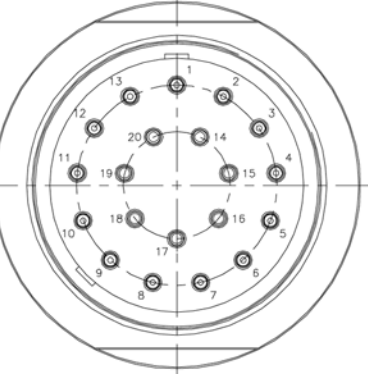
OPTI-CON Bulkhead Connector Receptacle  
Mates with OPT-CCP



**FCR / BCR INTERFACE THREADED MOUNTING INFORMATION**

CONNECTOR	A - (INCHES)	B - (INCHES)	C - Ø (INCHES)	D - Ø (INCHES)	E - SPOT FACE Ø (INCHES)	F - THREAD	G - (INCHES)	H - Ø (INCHES)	I - Ø (INCHES)	J - THREAD
OPT-G-4-FCR / BCR	0.480	0.30	0.868 0.870	0.900	1.875	M4	0.540	0.710 0.400	1.500	13/16-20 UNEF 2B
OPT-M-8-FCR / BCR	0.630	0.30	1.123 1.125	1.154	2.180	M5	0.620	0.620 0.400	1.700	1 1/16-20 UN 2B
OPT-Q-12-FCR / BCR	0.830	0.48	1.623 1.625	1.654	2.860	M6	0.825	0.620 0.400	2.200	1 9/16-20 UN 2B
OPT-T-20-FCR / BCR	0.830	0.48	1.998 2.000	2.029	3.380	M6	1.000	0.620 0.400	2.575	1 15/16-20 UN 2B

SIZE OPTI-CON SERIES BCR/FCR/CCR CONTACT CONFIGURATIONS AVAILABLE (MALE FACE VIEW ONLY - NOT TO SCALE)\*

<p>1</p>	 <p>OPT-F-1</p>
<p>4</p>	 <p>OPT-G-4</p>
<p>8</p>	 <p>OPT-M-8</p>
<p>12</p>	 <p>OPT-Q-12</p>
<p>20</p>	 <p>OPT-T-20</p>

NOTES:

· \* For female CCP face view contact configurations available please contact SEA CON®.

## HANDLING PROCEDURES AND SPECIAL CAPABILITIES



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Website: www.seaconphoenixllc.com

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

## 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 both the hose assembly and the tail ends of the BCR so that breakage of the fiber does not occur.

## SPECIAL ASSEMBLIES

SEACON (europe) Ltd 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 CUSTOMISED CONNECTORS AND CABLE ASSEMBLIES to suit your individual needs.

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