

310 SERIES

Underwater Fibre Optic Dry Mate Connectors



310 Series Page 3

Underwater Connector & Cable Specialists

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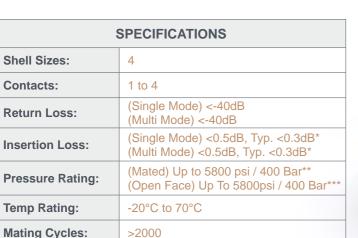
Introduction

Connector Overview

Designed and manufactured specifically for subsea & harsh environment applications, the 310 Series connector utilises physical contact fibre optic technology.

Its piston and face mounted coupling O-rings provide dependable and easy to maintain sealing.

Cable plugs are factory fitted to a choice of bespoke cables or oil filled tubes, whilst Flanged and Bulkhead Receptacles provide openface "fail safe" pressure resistance and come as standard with a choice of fibre optic tails.





- Typical values against master connector.
- ** Pressure rating subject to shell material and termination method.
- *** Open face pressure rating is a safety "fail safe" feature only, the connector must be used mated or with pressure sealing caps.



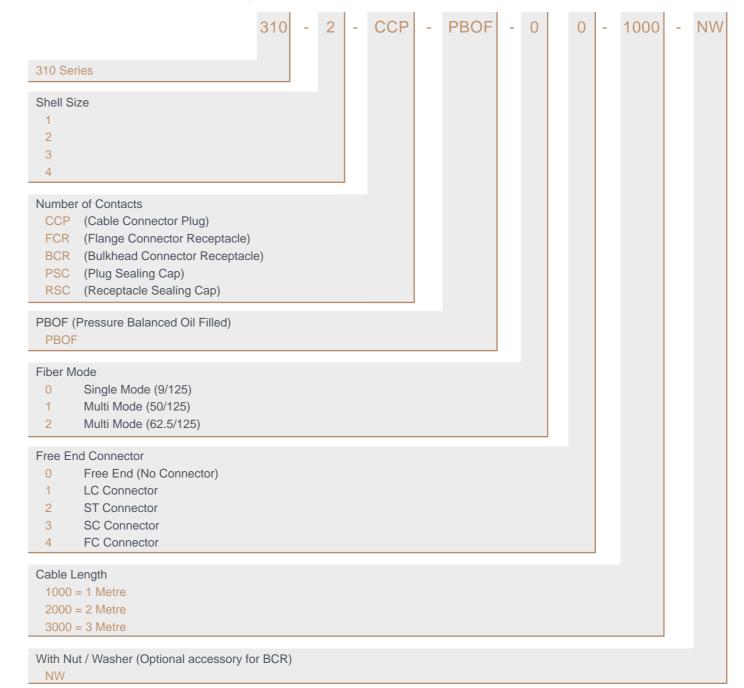
| MATERIALS | | | | | | | |
|--|--|--|--|--|--|--|--|
| Connector Shell: 316L S/Stl as standard. Also available in Titanium, PEEK, Super Duplex, Inconel, Monel & Aluminium. | | | | | | | |
| Coupling Nut: | Nickel Ali Bronze as standard. Also available in Titanium, PEEK, Inconel, Monel & Aluminium. | | | | | | |
| Contacts: | Brass CZ112 with Zirconia Ceramic Ferrule. | | | | | | |







Connector Part Numbering



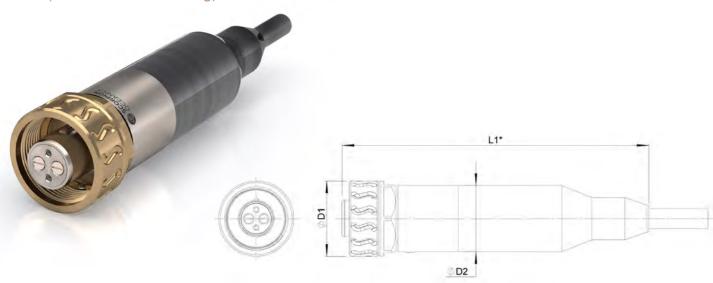
| PART NUMBER EXAMPLES | | | | | | | |
|----------------------|--|--|--|--|--|--|--|
| Description: | 310 Series: Size 2, PBOF Plug to PBOF Plug c/w 2Mtr SM (9/125) Fibres. | | | | | | |
| Part Number: | 310-2-CCP-CCP-PBOF-00-2000 | | | | | | |
| Description: | 310 Series: Size 3, Flanged Receptacle c/w 3Mtr MM (62.5/125) Fibres with SC Connectors. | | | | | | |
| Part Number: | 310-3-FCR-23-3000 | | | | | | |

Scorpion Oceanics holds a wide range of Electrical & Optical Cables sheathed in PU, PE & Neoprene together with oil resistant hose and equipment wire all ideally suited to the "310 Series" for the manufacture of stock and bespoke assemblies.



Connector Dimensions - Moulded

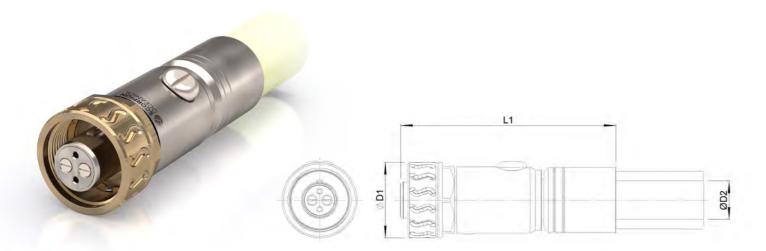
CCP (Cable Connector Plug)



| Shell Size | Part Number | L1mm (In) | ØD1mm (In) | ØD2mm (In) |
|------------|-----------------------------------|-----------------|----------------|----------------|
| 1 | 310-1-CCP-00-#### | 81.00 / (3.19) | 16.00 / (0.63) | 14.90 / (0.59) |
| 2 | 310-2-CCP-00-#### | 102.00 / (4.02) | 25.00 / (0.98) | 22.00 / (0.87) |
| 3 | 310-3-CCP-00-#### 105.00 / (4.13) | | 27.00 / (1.06) | 23.90 / (0.94) |
| 4 | 310-4-CCP-00-#### | 107.00 / (4.21) | 29.00 / (1.14) | 25.90 / (1.02) |

^{*} Moulded length is given as a typical guide and can be amended to suit different applications and cable types.

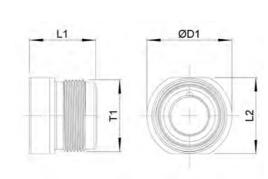
CCP-PBOF (Oil Filled Connector Plug)



| Shell Size | Part Number | L1mm (In) | ØD1mm (In) | ØD2mm (In) |
|------------|------------------------|----------------|----------------|----------------|
| 1 | 310-1-CCP-PBOF-00-#### | 61.00 / (2.40) | 16.00 / (0.63) | 9.53 / (0.38) |
| 2 | 310-2-CCP-PBOF-00-#### | 71.75 / (2.83) | 25.00 / (0.98) | 12.70 / (0.50) |
| 3 | 310-3-CCP-PBOF-00-#### | 77.20 / (3.04) | 27.00 / (1.06) | 12.70 / (0.50) |
| 4 | 310-4-CCP-PBOF-00-#### | 79.00 / (3.11) | 29.00 / (1.14) | 12.70 / (0.50) |

Connector Dimensions - Sealing Caps

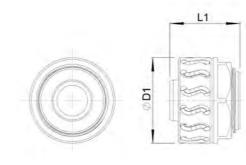
PSC (Plug Sealing Cap)





| Shell Size | Part Number | L1mm (In) | L2mm (In) A/F | ØD1mm (In) | T1 |
|------------|-------------|----------------|----------------|----------------|---------|
| 1 | 310-1-PSC | 19.50 / (0.77) | 15.00 / (0.59) | 16.00 / (0.63) | M12x1.0 |
| 2 | 310-2-PSC | 19.50 / (0.77) | 22.25 / (0.88) | 25.00 / (0.98) | M21x1.0 |
| 3 | 310-3-PSC | 19.50 / (0.77) | 24.00 / (0.95) | 27.00 / (1.06) | M23x1.0 |
| 4 | 310-4-PSC | 19.50 / (0.77) | 26.00 / (1.02) | 29.00 / (1.14) | M25x1.0 |

RSC (Receptacle Sealing Cap)





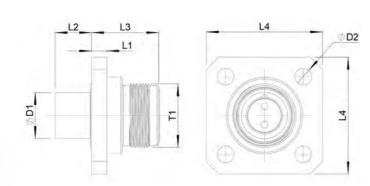
| Shell Size | ze Part Number L1mm (In) | | ØD1mm (In) |
|------------|--------------------------|----------------|----------------|
| 1 | 310-1-RSC | 20.50 / (0.81) | 16.00 / (0.63) |
| 2 | 310-2-RSC | 20.50 / (0.81) | 25.00 / (0.98) |
| 3 | 310-3-RSC | 20.50 / (0.81) | 27.00 / (1.06) |
| 4 | 310-4-RSC | 20.50 / (0.81) | 29.00 / (1.14) |



Connector Dimensions – Mounted Receptacles

FCR (Flanged Connector Receptacle)

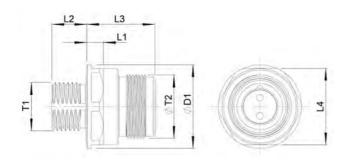




| Shell Size | Part Number | L1mm (In) | L2mm (In) | L3mm (In) | L4mm (In) A/F | ØD1mm (In) | ØD2mm (In) | T1 |
|------------|-------------------|---------------|----------------|----------------|----------------|----------------|---------------|---------|
| 1 | 310-1-FCR-00-#### | 4.00 / (0.16) | 14.50 / (0.57) | 21.00 / (0.83) | 22.00 / (0.87) | 9.60 / (0.38) | 3.20 / (0.13) | M12x1.0 |
| 2 | 310-2-FCR-00-#### | 5.00 / (0.20) | 12.00 / (0.47) | 22.00 / (0.87) | 38.10 / (1.50) | 15.00 / (0.59) | 5.50 / (0.22) | M21x1.0 |
| 3 | 310-3-FCR-00-#### | 5.50 / (0.22) | 11.50 / (0.45) | 22.50 / (0.89) | 44.45 / (1.75) | 19.00 / (0.75) | 7.15 / (0.28) | M23x1.0 |
| 4 | 310-4-FCR-00-#### | 5.50 / (0.22) | 11.50 / (0.45) | 22.50 / (0.89) | 44.45 / (1.75) | 19.00 / (0.75) | 7.15 / (0.28) | M25x1.0 |

BCR (Bulkhead Connector Receptacle)

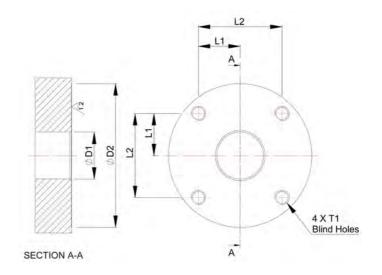




| S | hell Size | Part Number | L1mm (In) | L2mm (In) | L3mm (In) | L4mm (In) A/F | ØD1mm (In) | T1 | T2 |
|---|-----------|-------------------|---------------|----------------|----------------|----------------|----------------|------------------|---------|
| | 1 | 310-1-BCR-00-#### | 5.50 / (0.22) | 13.00 / (0.51) | 22.50 / (0.89) | 17.00 / (0.67) | 18.50 / (0.73) | 7/16 - 20 UNF-2A | M12x1.0 |
| | 2 | 310-2-BCR-00-#### | 5.50 / (0.22) | 11.50 / (0.45) | 22.50 / (0.89) | 25.15 / (0.99) | 27.50 / (1.08) | 5/8 - 18 UNF-2A | M21x1.0 |
| | 3 | 310-3-BCR-00-#### | 5.50 / (0.22) | 11.50 / (0.45) | 22.50 / (0.89) | 28.00 / (1.10) | 29.50 / (1.16) | 3/4 - 16 UNF-2A | M23x1.0 |
| | 4 | 310-4-BCR-00-#### | 5.50 / (0.22) | 11.50 / (0.45) | 22.50 / (0.89) | 30.00 / (1.18) | 31.50 / (1.24) | 3/4 - 16 UNF-2A | M25x1.0 |

Mounted Receptacle Interface Machining Detail

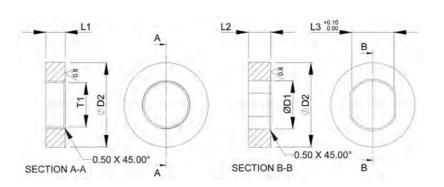
FCR (Flanged Connector Receptacle)



| Shell Size | L1mm (In) | L2mm (In) | ØD1mm (In) | ØD2mm (In) | T1 |
|------------|----------------|----------------|----------------|----------------|--------|
| 1 | 8.00 / (0.32) | 16.00 / (0.63) | 10.00 / (0.39) | 30.50 / (1.20) | M3x0.5 |
| 2 | 12.70 / (0.50) | 25.40 / (1.00) | 15.50 / (0.61) | 49.00 / (1.93) | M5x0.8 |
| 3 | 15.90 / (0.63) | 31.80 / (1.25) | 19.50 / (0.77) | 58.50 / (2.30) | M6x1.0 |
| 4 | 15.90 / (0.63) | 31.80 / (1.25) | 19.50 / (0.77) | 58.50 / (2.30) | M6x1.0 |

General tolerance of ±0.10 applies to all dimensions unless otherwise stated.

BCR (Bulkhead Connector Receptacle)



| Shell Size | L1mm (In) Min. | L2mm (In) Max. | L3mm (In) +0.1 A/F | ØD1mm (In) | ØD2mm (In) | T1 | Installation Torque Nm (inch-lb) |
|------------|----------------|----------------|--------------------|----------------|----------------|------------------|----------------------------------|
| 1 | 9.50 / (0.37) | 9.00 / (0.35) | 9.70 / (0.38) | 11.30 / (0.45) | 19.00 / (0.75) | 7/16 - 20 UNF-2B | 9.60 / (85)* |
| 2 | 11.50 / (0.45) | 7.5 / (0.30) | 14.20 / (0.56) | 16.10 / (0.63) | 28.00 / (1.10) | 5/8 - 18 UNF-2B | 14.12 / (125)* |
| 3 | 11.50 / (0.45) | 7.5 / (0.30) | 17.20 / (0.68) | 19.25 / (0.76) | 30.00 / (1.18) | 3/4 - 16 UNF-2B | 18.64 / (165)* |
| 4 | 11.50 / (0.45) | 7.5 / (0.30) | 17.20 / (0.68) | 19.25 / (0.76) | 32.00 / (1.26) | 3/4 - 16 UNF-2B | 18.64 / (165)* |

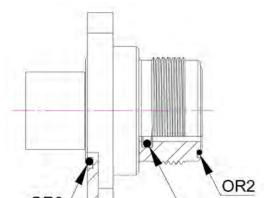
General tolerance of ± 0.10 applies to all dimensions unless otherwise stated.

^{*} Value based on installation into suitable parent material and dry metal threads.



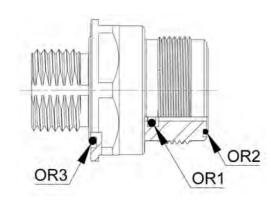
Connector O-Rings

FCR (Flanged Connector Receptacle)

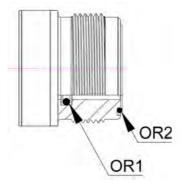


OR1

BCR (Bulkhead Connector Receptacle)



RSC (Receptacle Sealing Cap)



| Shell Size | OR1 | OR2 | OR3 |
|------------|--------------------|--------------------|--------------------|
| 1 | Ø6.00ID x Ø1.50CS | N/A | Ø13.00ID x Ø1.00CS |
| 2 | Ø12.00ID x Ø1.50CS | Ø15.00ID x Ø1.00CS | Ø18.00ID x Ø1.50CS |
| 3 | Ø14.00ID x Ø1.50CS | Ø16.50ID x Ø1.00CS | Ø22.00ID x Ø1.50CS |
| 4 | Ø16.00ID x Ø1.50CS | Ø18.50ID x Ø1.00CS | Ø21.89ID x Ø2.62CS |

All measurements in mm.

All O-rings are Nitrile 70 as standard.

Contact Configurations & Specifications

Shell Size 1



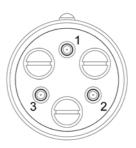
RL < -40.0dB IL <0.50dB, Typ. <0.30dB*

Shell Size 2



RL < -40.0dB IL <0.50dB, Typ. <0.30dB*

Shell Size 3



RL < -40.0dB IL <0.50dB, Typ. <0.30dB*

Shell Size 4



RL < -40.0dB IL <0.50dB, Typ. <0.30dB*

Notes:

Contact configuration shown is of front face of CCP.
Figures above are for both Single Mode and Multi Mode.
Figure above are typical for all OM / OS cable types.

* Typical values against master connector.



Installation & Maintenance Guide

To avoid risk of eye damage, only energise when connectors are fully mated.

Plug

The moulded plug should be inspected along the cable length to ensure there is no damage or deformation prior to use.

The moulding itself is bonded to both the cable and the connector shell and any inspection should not place undue stress on these areas as damage to the connector and conductors may be caused. The face and shoulder of the connector should be clean and dry prior to use. Do not pack the face of the connector with grease. In order to mate the plug to the receptacle, first align the keys on the plug to the keyways within the receptacle and lightly engage. Once the initial engagement is completed the connector should be mated with the engaging nut until fully hand tight.

No tooling is required to tighten the pair of connectors and overtightening may cause permanent damage. The correct engagement of the O-seal and mating faces can be observed through the witness holes in the sides of the engaging nut.

Receptacle

O-ring seals must be checked to ensure they are free from damage or deformation prior to use, the advised lubricant is Novagard G624 silicone grease. Oils or spray silicone should not be used as they can contain materials which will damage or prematurely age the O-seal material.

The groove in the rear face of the receptacle should be clean and free from dents or scratches. Lubricate the O-ring with a light coating of the advised silicone grease ensuring full coverage of the seal. Do not pack the seal groove with grease as this is detrimental to the seal operation.

After fitting the receptacle to the mating face, the securing hardware should be fitted hand tight before tightening to the advised torque. The fitted connector should sit perpendicular to the mated face. If there is any angular misalignment of the receptacle, loosen the securing hardware and re-inspect all faces before refitting.

Cleaning

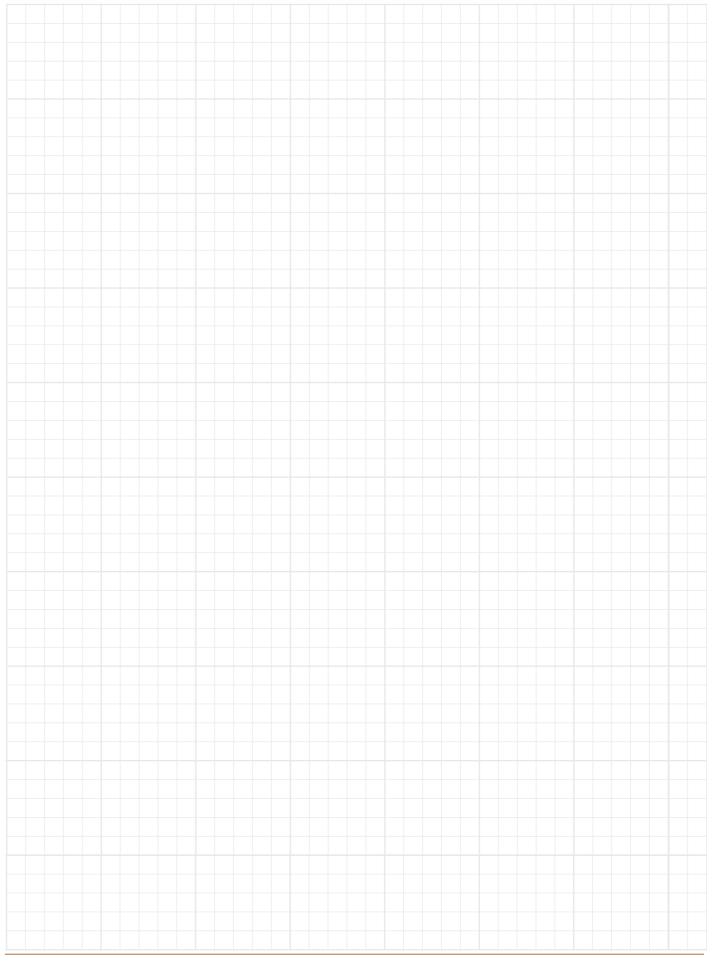
In order to clean the connectors, a soft bristle brush may be used with Isopropyl Alcohol on the external surfaces only. A gentle air blast can be used to facilitate the cleaning and also flash off the Isopropyl Alcohol.

No thinners or abrasives should be used to clean the connectors.

Attention must be paid to the mating surfaces of the connectors to ensure that no damage is caused and no debris left prior to re-greasing the O-rings. Optical connectors should be cleaned by a suitably qualified/competent employee with suitable optic cleaning accessories using Isopropyl Alcohol ensuring no debris or lint etc. remains in the mating interface. Optical interfaces should be free off all contamination.

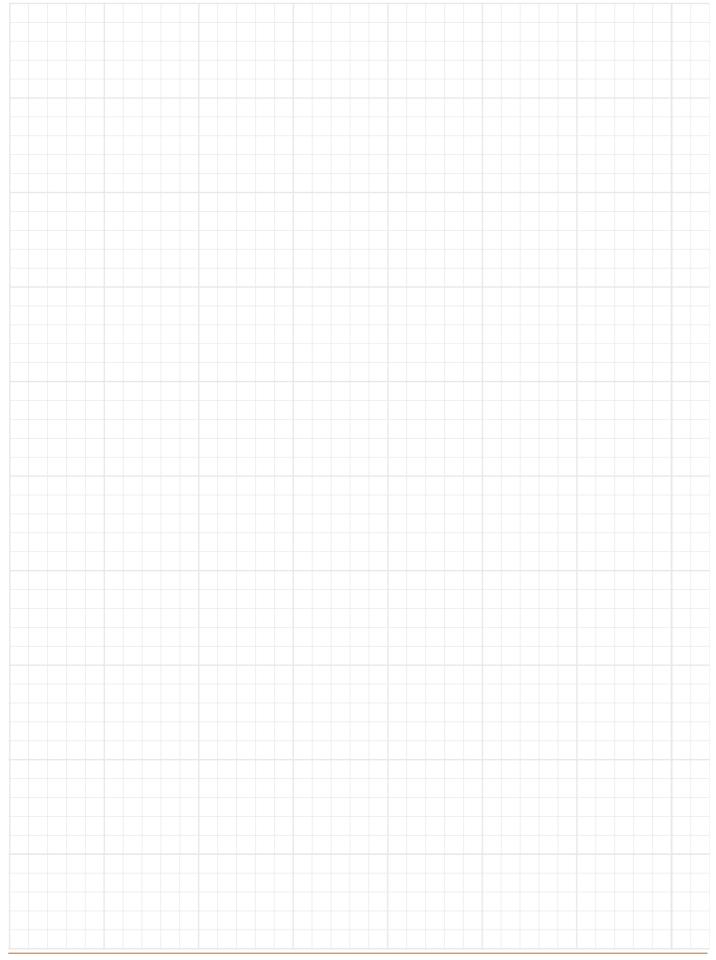


Notes





Notes







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