



SubConn[®]
DEPENDABILITY AT EVERY LEVEL

Underwater and harsh environment connectors

4th
edition

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SubConn and the MacArtney Underwater Technology Group have been supplying the world's leading range of underwater pluggable electrical connectors to the demanding underwater industry for more than 40 years.

Introduction General information and background about SubConn® and the MacArtney Underwater Technology Group. 4-7	SubConn® Circular series The Circular series forms the basis of the technology that characterises most SubConn® products available today. First introduced in 1978, these connectors are available in various standard sizes and figurations. 9-21	SubConn® Micro Circular series Based on the original SubConn® Circular series, SubConn® Micro connectors were developed to suit the increasingly more compact design of underwater instruments, equipment and systems. 23-35
SubConn® Low Profile series The SubConn® Low Profile series is designed to offer connectivity for underwater systems and equipment where space is restricted or a more compact solution is required. 37-49	SubConn® Micro Low Profile series The SubConn® Micro Low Profile series was developed to suit the increasingly more compact design of underwater instruments, equipment and systems requiring restricted space or a compact solution. 51-55	SubConn® Metal Shell series The SubConn® Metal Shell series represents an alternative to Circular series bulkhead connectors where an even more rugged, resilient and protected underwater connectivity solution is required. 57-63
SubConn® Power series The SubConn® Power series is designed to offer a high performance and dependable connector solution to accommodate the ever growing power requirements of underwater system operators and industries. 65-71	SubConn® Ethernet series The SubConn® Ethernet series marked the first highspeed underwater communications system to offer true Ethernet type performance. Accommodates the demand for Gigabit data speed. 73-87	SubConn® Coax series The SubConn® Coax connector series is primarily used for facilitating the transmission of HD video signal within and between underwater systems and for interfacing HD video based equipment. 89-93
SubConn® Specials SubConn® holds extensive experience and expertise in supplying special connector solutions for multiple specific applications like pool cleaning or oceanographic sensors. 94-95	SubConn® Penetrator series The SubConn® Penetrator series is a fixed installation alternative to inline and bulkhead connectors. SubConn® Penetrators are primarily used for applications, direct signal and power feedthrough emphasising. 97-101	SubConn® polyurethane cables As standard, the majority of SubConn® connectors are supplied with chloroprene rubber cables, while the Ethernet and Coax series feature polyurethane (PUR) cables as standard, together with a vast majority of special connectors. 103-107
SubConn® additional accessories The SubConn® connectors are available with a full range of accessories held in stock with MacArtney. 109-113	Technical information Abbreviation list, mounting specifications, connector body material, recommended torque on different thread sizes, qualification and acceptance test, general information, handling instructions, corrosion and debonding information. 115-129	Index Page-indexed table of contents. 132-133

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About SubConn®

Easily recognisable by their red locking sleeves and with a track record of more than 40 years at the service of maritime equipment operators worldwide, SubConn® underwater mateable and harsh environment connectors are open face rated and regarded as an industry-standard connectivity solution within most marine markets.

SubConn® connectors have always relied on a cost-effective, simple and rugged contact design. At present, millions of SubConn® connectors are deployed throughout the world to interface and interconnect a countless range of marine and underwater applications within offshore oil and gas, military, ocean science, geophysical, renewable, fishery, and nuclear sectors. To meet our customers' needs, the SubConn® range has seen ongoing development over its entire lifespan. This way, SubConn® applications span from shallow water use to prolonged deployment under harsh conditions, at some of the deepest ocean locations on earth.

SubConn® connectors are manufactured in the USA at our modern production facilities in Burwell and Ord, Nebraska.

Standard, special and custom connectors

We recognise the fact that connectors are a component product which, in many cases, functions as an integral part of larger-scale cable systems or instrumentation solutions. With this in mind, uncompromising quality, dependability, flexibility and local availability are key factors building the success of SubConn® connectors. We pride ourselves on our wide range of standard connector solutions regularly extended to meet new individual or generic industry requirements and standards.

The SubConn® concept has been adapted to produce a number of special application and custom connectors in addition to the standard product range of rubber moulded circular and low profile connectors. These range from the successful high power connectors for subsea applications, field installable and oil filled harness connectors, geophysical telemetry connectors for transition zone applications, glass sphere modified connectors, proximity switches and a complete range of compatible metal shell bulkhead, flange mount connectors and penetrators. This way, product development and specialised engineering have played an important role in the growth of our company and product range.

We hope you will regard this catalogue as a useful tool for facilitating the selection of the right connector solution to suit your requirements. In case you do not find a suitable solution within our standard range, please do not hesitate to contact us.

About MacArtney

MacArtney is a global supplier of underwater technology solutions specialising in the design, manufacture, sale and service of a wide range of systems to offshore oil and gas operators, subsea surveyors, the renewable energy sector, ocean science institutes, divers and navies across the world. We offer an extensive variety of advanced products and system solutions spanning from subsea cables and connectors to state-of-the-art integrated packages, including fibre optic telemetry, underwater cameras and lights, oceanographic instruments, marine winch systems and remotely operated towed vehicles. All the products supplied are designed and tested to provide high quality, efficiency and reliable performance in the challenging underwater environment.

MacArtney and SubConn®

In 1978 the MacArtney Group signed an exclusive agreement with the US based original equipment manufacturer, Loup Valley Machining and Manufacturing, to market and sell SubConn® underwater mateable electrical connectors on the global market.

Four decades later, MacArtney is a major shareholder and supports the entire SubConn® range of products which is supplied to numerous customers and users throughout the world. MacArtney holds large quantities of connectors in stock and with multiple operations present at strategic locations in the Americas, Europe, Asia Pacific, coupled with exclusive representative agreements with marine technology companies all over the world, MacArtney enables unlimited and instant access to SubConn® connectors at local as well as global levels.

MacArtney is ISO 9001 certified and closely involved in developing and testing the SubConn® range.

MacArtney SubConn® applications

Over the years, SubConn® products have been the primary provider of connectivity infrastructure to MacArtney underwater technology systems and solutions. SubConn® connectors are used on MacArtney EMO and NEXUS multiplexers, LUXUS cameras and lights, FOCUS and TRIAXUS remotely operated towed vehicles (ROTV), MacArtney MERMAC and CORMAC winch and handling systems and CEMAC offshore cable handling equipment. SubConn® connectors are also used for slip rings, underwater instrumentation systems, large-scale systems and solution packages for ocean science applications, and challenging offshore oil and gas, subsea, renewable energy, civil engineering, and defence, fisheries and diving projects.

Quote

"SubConn® products earn a good reputation with their long-term reliable performance. After more than a decade of promotion and market testing, SubConn® has been widely accepted by Chinese customers and become the standard model selection in China's Marine Industry."

*Zhang Yi, General Manager
SeaTech China Co., Ltd.*

SubConn® Circular series



The SubConn® Circular series forms the basis of the technology that characterises most SubConn® products available today. First introduced in 1978, these connectors are widely recognised as a dependable and rugged connectivity solution for underwater and harsh marine environment applications. SubConn® Circular connectors are available in various standard size configurations with 1 to 25 contacts.

The SubConn® Circular series offers the ability to combine signal and power within a single connector. SubConn® Circular connectors are manufactured from high-grade chloroprene rubber with different types of body material and feature a high depth rating. The connectors are available in different standard shell sizes with contacts rated at 600 V up to 10 A. SubConn® Circular connectors are available in bulkhead, inline, Pressure Balanced Oil Filled (PBOF) and field installable overmould versions. All bulkhead connectors come with colour coded or numbered teflon (PTFE) leads.

For easy integration with systems and equipment, SubConn® Circular connectors are available with dedicated cables, locking sleeves, pressure proof dummy connectors and other accessories. All SubConn® cables are manufactured from flexible and water-resistant chloroprene rubber or polyurethane (PUR). The characteristic SubConn® locking sleeves are manufactured from injection moulded polyoxymethylene (POM) or stainless steel and come with stainless steel retaining snap rings.

Applications

- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Underwater camera, video and lighting systems
- Ocean bottom seismic systems
- Diving systems and equipment

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® Circular

Mini 1 contact

Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

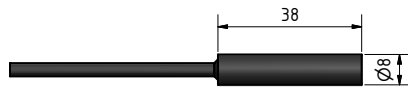
Connector body	Chloroprene rubber
Contacts	Gold plated brass UNS - C36000
Locking sleeves	POM
Inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber

Inline cable colour code

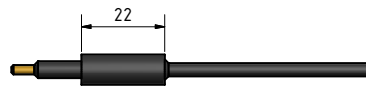
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Nominal cable outside diameter (OD)

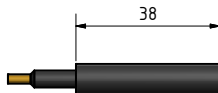
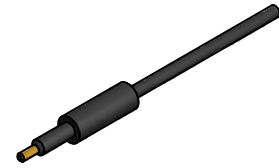
Chloroprene rubber cable 0.142", 3.6 mm



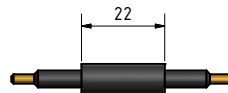
ILM1F



ILM1M



OMM1F



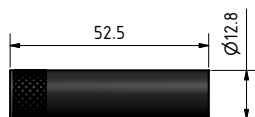
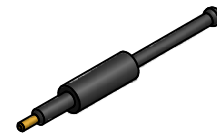
OMM1M



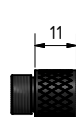
DCM1F



DCM1M



DLSM1-F



DLSM1-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Circular

2, 3, 4 and 5 contacts

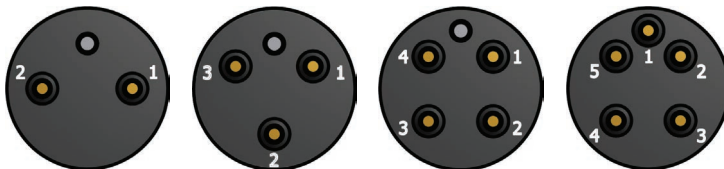
Connector specifications

Voltage rating	600 V DC/AC rms
2 contacts current rating	10 A per contact (max 20 A per connector)
3, 4 and 5 contacts current rating	10 A per contact (max 30 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
2, 3 and 4 conductor inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
5 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber
Bulkhead and PBOF leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)



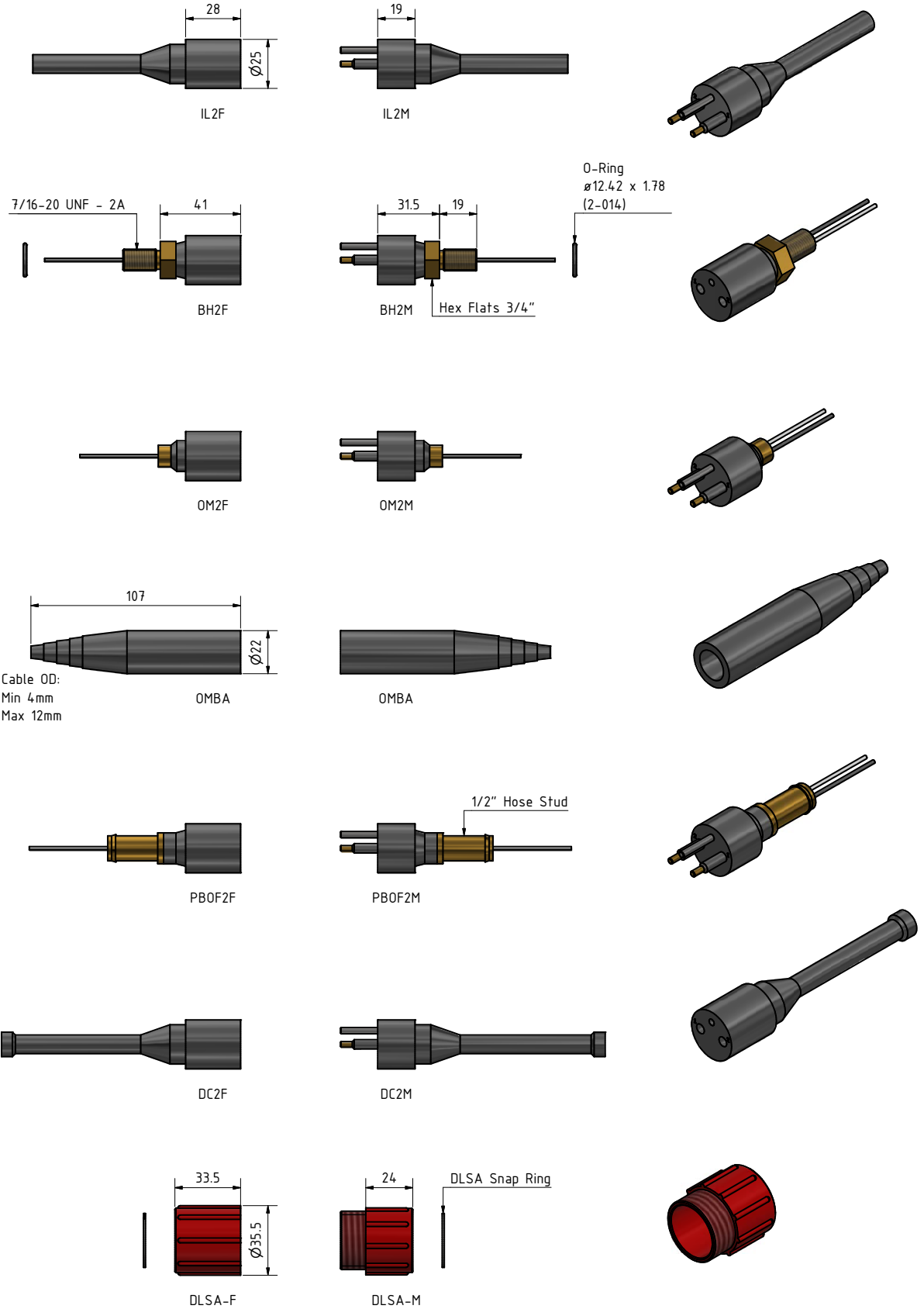
Inline cable colour code

1 Black	4 Green
2 White	5 Orange
3 Red	

(3 conductor cable colour code: 1 black, 2 white, 3 green)

Nominal cable outside diameter (OD)

2 conductor cable 0.365", 9.3 mm
3 conductor cable 0.385", 9.8 mm
4 conductor cable 0.410", 10.4 mm
5 conductor cable 0.465", 11.8 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Circular Splitconn

2 contacts

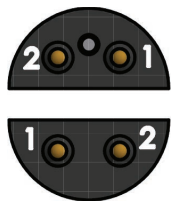
Connector specifications

Voltage rating	600 V DC/AC rms
2 contacts current rating	10 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Connector body	Chloroprene rubber
Contacts	Gold plated brass UNS - C36000
Location pin	Stainless steel AISI 303
Locking sleeves	POM
Snap rings	Stainless steel AISI 302
2 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber

Face view (male)



Inline cable colour code

- 1 Black
- 2 White

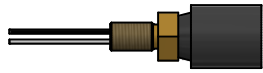
Nominal cable outside diameter (OD)

2 conductor cable 0.276", 7 mm



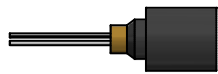
For more information
see page 12/13

IL4F



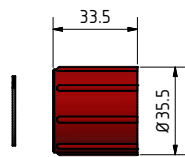
For more information
see page 12/13

BH4F



For more information
see page 12/13

OM4F



DLSA-F



ILS2M-1



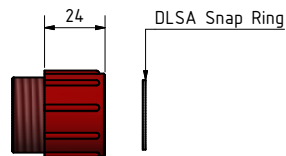
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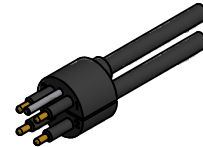
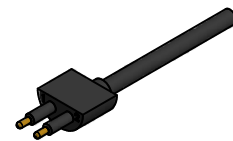
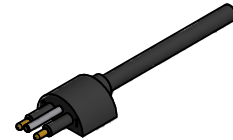
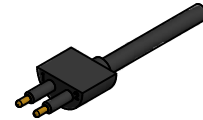
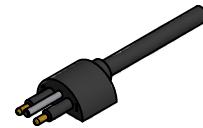
DCS2M-1



DCS2M



DLSA-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Circular

6, 8 and 10 contacts

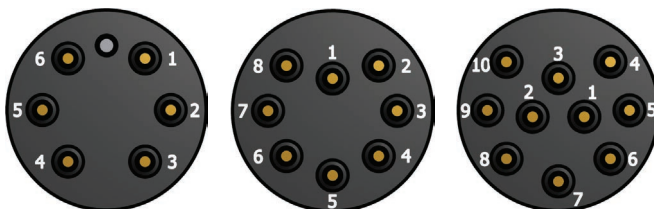
Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 50 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
6 and 8 conductor inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
10 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber
Bulkhead and PBOF leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)

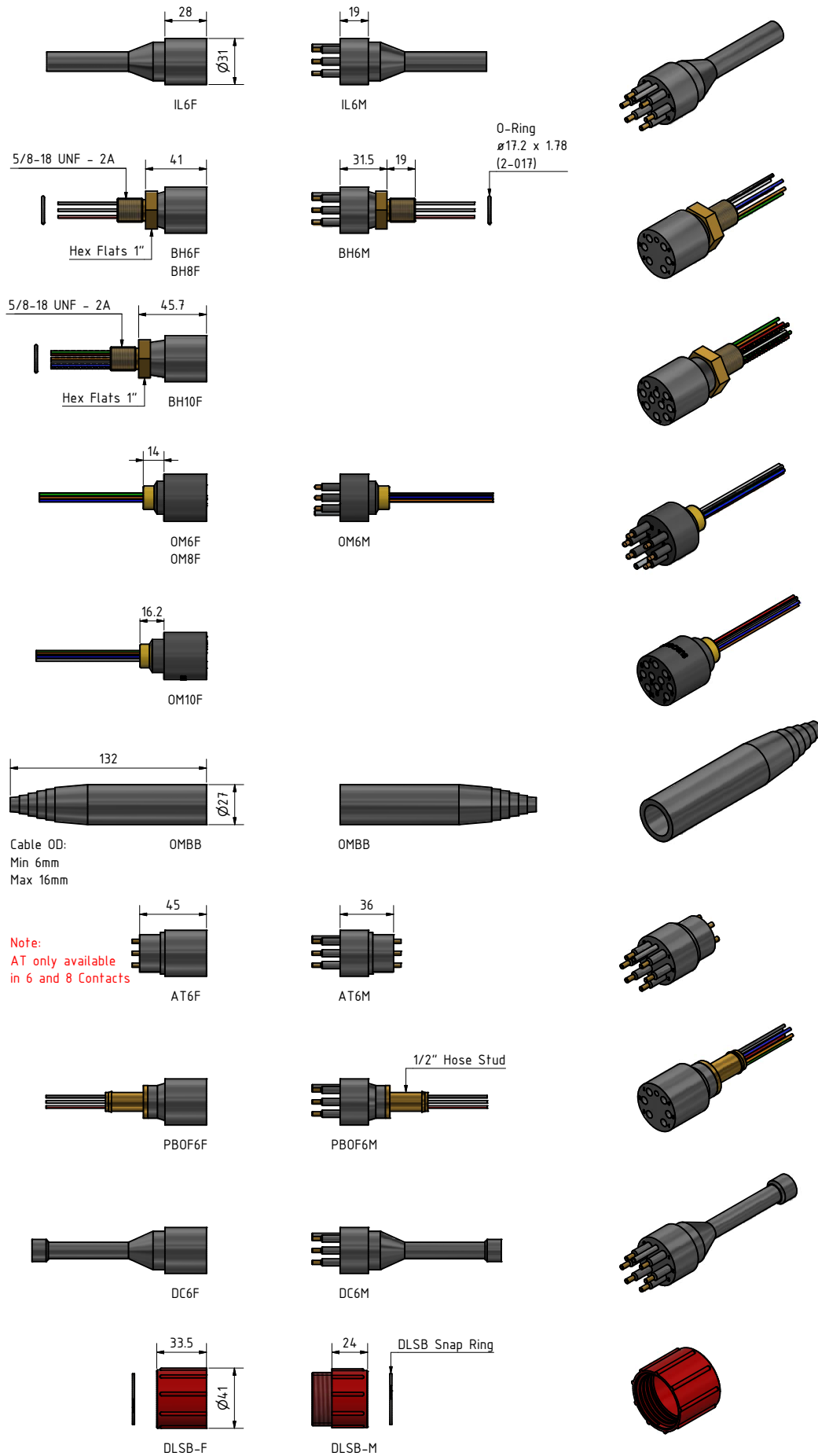


Inline cable colour code

1 Black	4 Green	7 White/black	10 Orange/black
2 White	5 Orange	8 Red/black	
3 Red	6 Blue	9 Green/black	

Nominal cable outside diameter (OD)

6 conductor cable 0.520", 13.2 mm
8 conductor cable 0.555", 14.1 mm
10 conductor cable 0.605", 15.4 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Circular Right Angle

6, 8 and 10 contacts

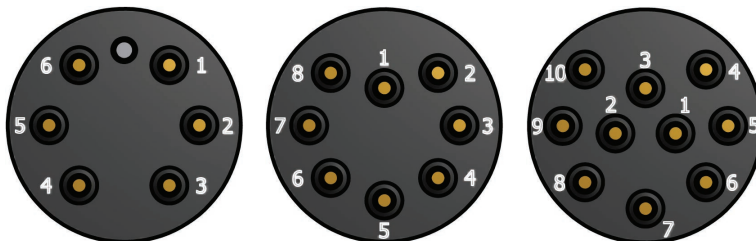
Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 50 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Connector body	Chloroprene rubber
Contacts	Brass UNS - C36000
Location pin	AISI 303
Locking sleeves	POM or stainless steel
Snap rings	AISI 302
6 and 8 conductor inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
10 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber

Face view (male)

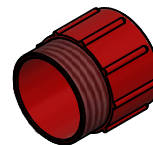
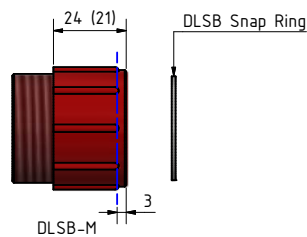
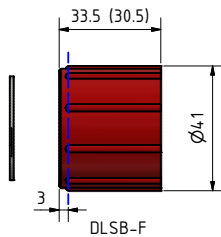
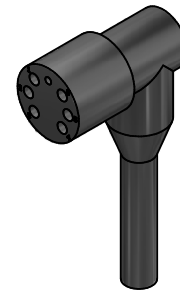
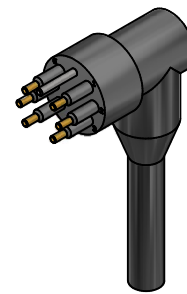
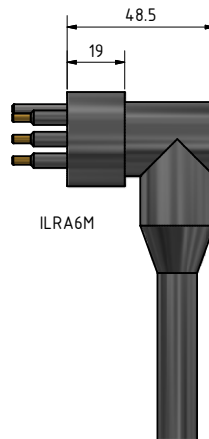
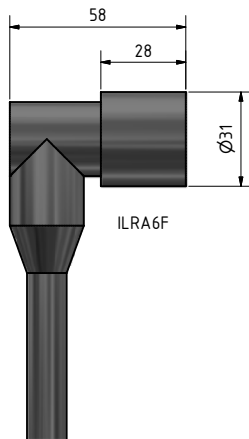


Inline cable colour code

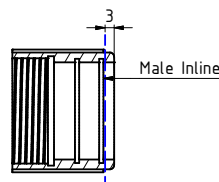
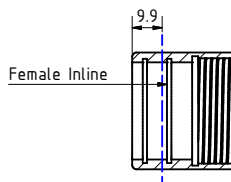
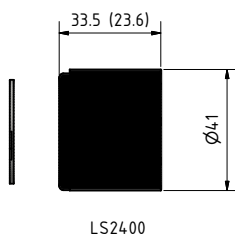
1 Black	3 Red	5 Orange	7 White/black	9 Green/black
2 White	4 Green	6 Blue	8 Red/black	10 Orange/black

Nominal cable outside diameter (OD)

6 conductor cable 0.520", 13.2 mm
8 conductor cable 0.555", 14.1 mm
10 conductor cable 0.605", 15.4 mm



Note:
Locking Sleeve has
to be modified to 30.5/21
to fit this RA connector



Note:
When used with Metal Shell
2400 Locking Sleeve has
to be modified to 23.6/30.5
to fit this RA connector

Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Circular

12, 16 and 25 contacts

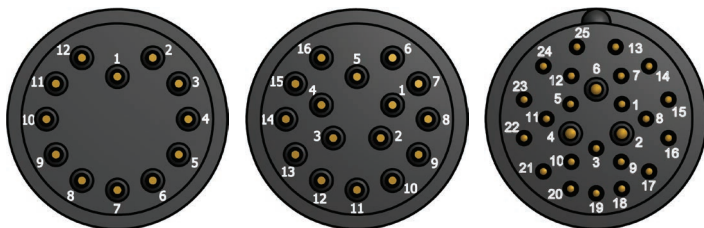
Connector specifications

Voltage rating	600 V DC/AC rms
12 and 16 contacts current rating	10 A per contact (max 60 A per connector)
25 contacts current rating	3 power contacts 10 A per contact, 22 signal contacts 5 A per contact (max 60 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
12 and 16 contacts connector design depth rating	1,400 bar, 20,000 psi
12, 16 and 25 contacts conn. qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
12 and 16 contacts	Gold plated brass UNS - C36000
25 contacts	Contact 2, 4 and 6: gold plated brass UNS - C36000 Contact 1, 3, 5, 7 - 25: gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
12 and 16 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber
25 conductor inline cable (2 ft, 60 cm)	3 x 18 AWG, 0.82 mm ² , 22 x 20 AWG, 0.52 mm ² polyurethane
12 and 16 contact bulkhead and PBOF leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
25 contact bulkhead and PBOF leads (1 ft, 30 cm)	3 x 18 AWG, 0.82 mm ² , 22 x 22 AWG, 0.33 mm ² white tagged PTFE
12 and 16 contact OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)



Inline cable colour code for 12 and 16 conductor

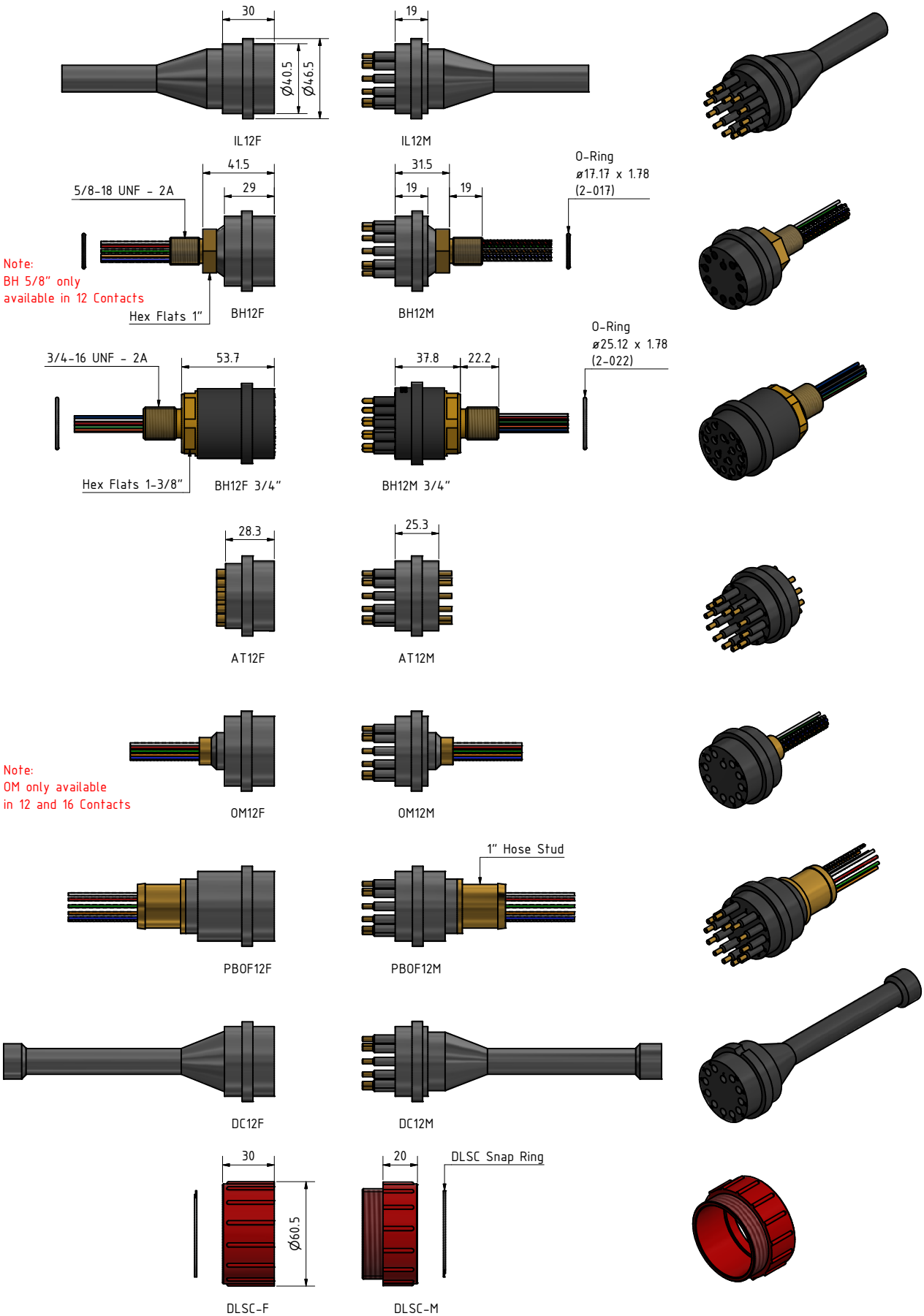
1 Black	5 Orange	9 Green/black	13 Red/white
2 White	6 Blue	10 Orange/black	14 Green/white
3 Red	7 White/black	11 Blue/black	15 Blue/white
4 Green	8 Red/black	12 Black/white	16 Black/red

Inline cable colour code for 25 conductor

1 Orange	6 Brown-18 AWG	11 Blue	16 White/grey	21 White/green/black
2 Black-18 AWG	7 Yellow	12 White/yellow	17 White/brown/black	22 White/blue/black
3 Grey	8 White/black	13 White/green	18 White/red/black	23 White/brown
4 Red-18 AWG	9 White	14 White/blue	19 White/orange/black	24 White/red
5 Green	10 Purple	15 White/purple	20 White/yellow/black	25 White/orange

Nominal cable outside diameter (OD)

12 conductor cable 0.605", 15.4 mm
16 conductor cable 0.704", 17.9 mm
25 conductor cable 0.589", 15.0 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"We standard fit the SubConn® range of connectors in all of our underwater sensor solutions. Whether the sensor is depth rated to 1,000, 6,000 or 11,000 meters - we trust SubConn® to provide a long-lasting and dependable connection solution."

*Ben Grant, Managing Director
Impact Subsea Ltd*

SubConn® Micro Circular series



To accommodate market demands for ever more flexible, dependable and cost-efficient underwater connectivity solutions, SubConn® Micro connectors are available.

The SubConn® Micro Circular series has enhanced sealing capability and utilise a uniform contact size and design. Based on the original SubConn® Circular series, SubConn® Micro Circular connectors were developed to suit the increasingly more compact design of underwater instruments, equipment and systems.

The SubConn® Micro Circular connectors are available in different standard shell sizes, with 1 to 21 contacts rated at 300 V from 5 to 10 A. SubConn® Micro Circular connector are available in bulkhead, inline, Pressure Balanced Oil Filled (PBOF) and field installable over mould versions. All bulkhead connectors come with colour coded or numbered Teflon (PTFE) leads.

The SubConn® Micro Circular connectors are manufactured from high-grade neoprene and a variety of body material options and feature a high ocean depth rating. The SubConn® Micro Circular connectors have enhanced sealing capability and utilise a uniform contact size and design.

Applications

- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Underwater camera, video and lighting systems
- Ocean bottom seismic systems
- Diving systems and equipment

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® Micro Circular

1 contact

Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

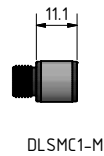
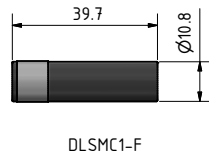
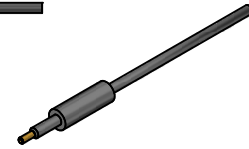
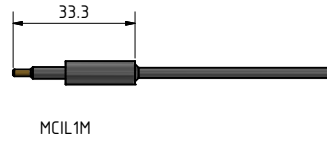
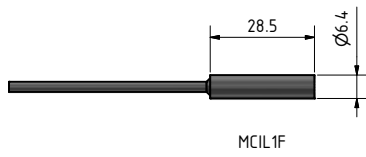
Connector body	Chloroprene rubber
Contacts	Female socket in gold plated brass UNS - C36000 Male pin in gold plated beryllium copper
Inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber

Inline cable colour code

1 Black

Nominal cable outside diameter (OD)

Chloroprene rubber cable 0.100", 2.54 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Circular

2, 3, 4, 5, 6 and 8 contacts and G2 2, 3 and 4 contacts

Connector specifications

Voltage rating	300 V DC/AC rms
2, 3 and 4 contacts current rating	10 A per contact (max 20 A per connector)
5, 6 and 8 contacts current rating	5 A per contact (max 20 A per connector)
G2 2, 3 and 4 contacts current rating	5 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
PEEK bulkhead body	PEEK-30
2, 3 and 4 contacts	Gold plated brass UNS - C36000
5, 6, 8 contacts and G2 2, 3 and 4 contacts	Female sockets in gold plated brass - UNS C36000
	Male pins in gold plated beryllium copper
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	ABS or stainless steel
Snap rings	Stainless steel AISI 302
2, 3 and 4 conductor inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber
5, 6 and 8 conductor inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm ² chloroprene rubber
G2 2, 3 and 4 conductor inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm ² chloroprene rubber
2, 3 and 4 contact bulkhead and PBOF leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
5, 6 and 8 contact bulkhead and PBOF leads (1 ft, 30 cm)	22 AWG, 0.33 mm ² coloured PTFE
G2 2, 3 and 4 contact bulkhead and PBOF leads (1ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
OM leads (3", 7 cm)	20 AWG, 0.52 mm ² coloured PTFE

Face view (male)



Inline cable colour code

1 Black	3 Red	5 Orange	7 White/black
2 White	4 Green	6 Blue	8 Red/black

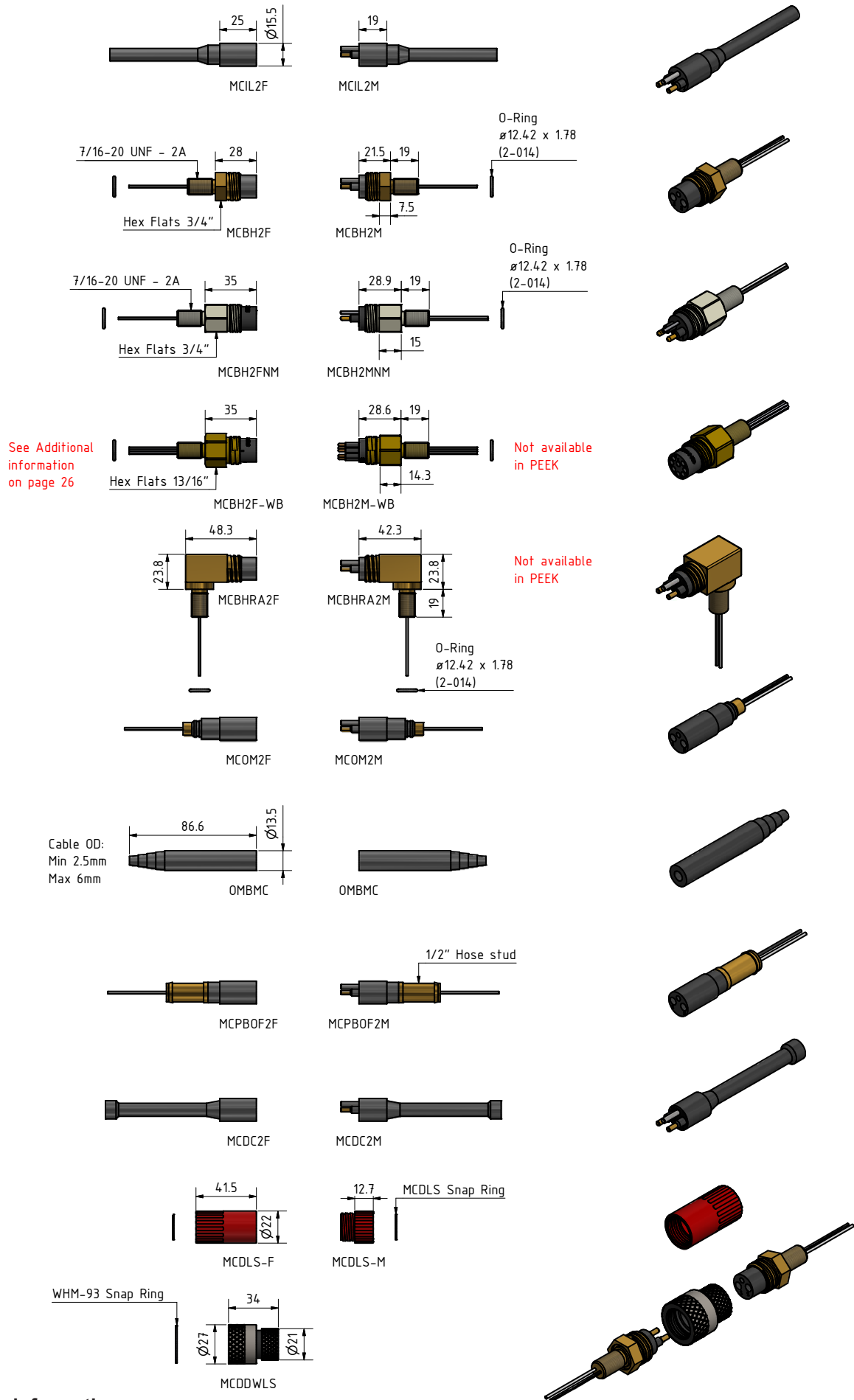
** (3 conductor cable colour code: 1 black, 2 white, 3 green)

Nominal cable outside diameter (OD)

2 conductor cable 0.340", 8.6 mm	G2 2 conductor cable 0.230", 6.1 mm	5 conductor cable 0.312", 7.9 mm
3 conductor cable 0.360", 9.1 mm	G2 3 conductor cable 0.250", 6.4 mm	6 conductor cable 0.315", 8.0 mm
4 conductor cable 0.385", 9.8 mm	G2 4 conductor cable 0.260", 6.6 mm	8 conductor cable 0.363", 9.2 mm

Additional information

Micro 2, 3 and 4 contacts in G2 version have the same contact size as 5, 6 and 8 contacts and are available as water blocked (WB).



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Circular Double O-ring

2, 3, 4, 5, 6 and 8 contacts and G2 2, 3 and 4 contacts

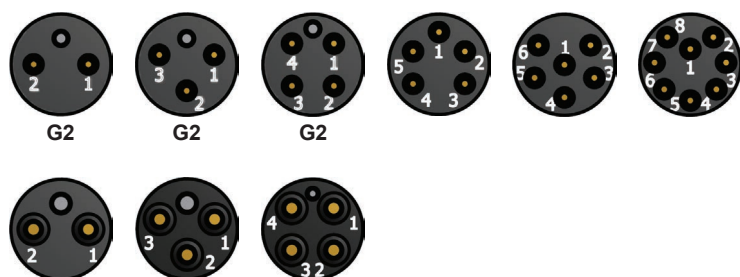
Connector specifications

Voltage rating	300 V DC/AC rms
2, 3 and 4 contacts current rating	10 A per contact (max 20 A per connector)
5, 6 and 8 contacts current rating	5 A per contact (max 20 A per connector)
G2 2, 3 and 4 contacts connector current rating	5 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body with 20 mm hex flats	Brass, titanium or anodised aluminium
Bulkhead body with 22 mm hex flats	Anodised aluminium or stainless steel
Bulkhead RA body	Aluminium or titanium
2, 3 and 4 contacts	Gold plated brass UNS - C36000
5, 6, 8 contacts and G2 2, 3 and 4 contacts	Female sockets in gold plated brass UNS C36000
	Male pins in gold plated beryllium copper
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	ABS or stainless steel
Snap rings	Stainless steel AISI 302
2, 3 and 4 contact bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
5, 6 and 8 contact bulkhead leads (1 ft, 30 cm)	22 AWG, 0.33 mm ² coloured PTFE
G2 2, 3 and contact 4 bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE

Face view (male)



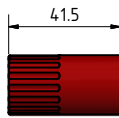
For more information
see page 26/27

MCIL2M
MCOM2M
MCPB0F2M
MDC2M

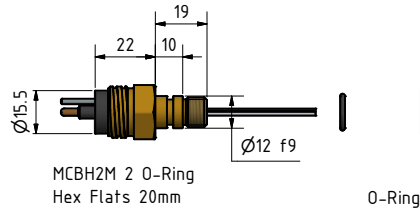
For more information
see page 26/27

MCIL2F
MCOM2F
MCPB0F2F
MDC2F

MCDLS Snap Ring



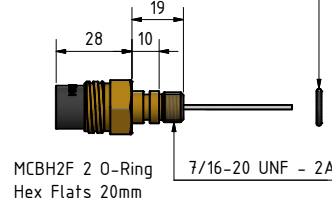
MCDLS-F



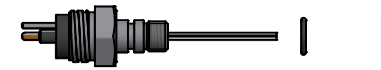
MCBH2M 2 O-Ring
Hex Flats 20mm

O-Ring
ø9.25 x 1.78
(2-012)

O-Ring
ø13.34 x 1.8
(5-1014)



MCBH2F 2 O-Ring
Hex Flats 20mm

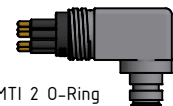


MCBH2MSS 2 O-Ring
Hex Flats 22mm



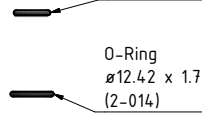
MCBH2FSS 2 O-Ring
Hex Flats 22mm

MCBHRA8MTI 2 O-Ring



O-Ring
ø9.25 x 1.78
(2-012)

O-Ring
ø12.42 x 1.78
(2-014)



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Circular

10, 12 and 16 contacts

Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A per contact (max 30 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0,01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm ² chloroprene rubber
Bulkhead and PBOF leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
OM leads (3", 7 cm)	20 AWG, 0.52 mm ² coloured PTFE

Face view (male)

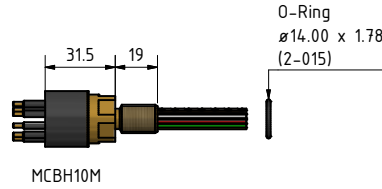
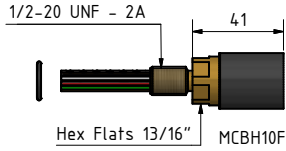
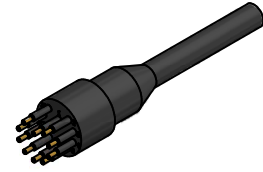
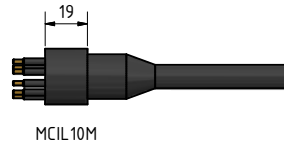
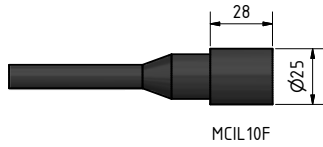


Inline cable colour code

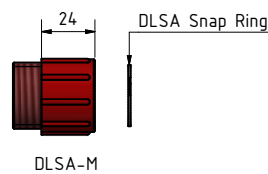
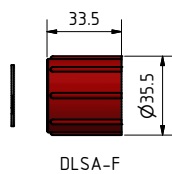
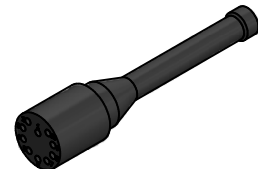
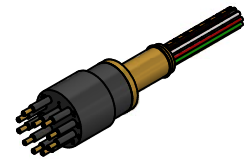
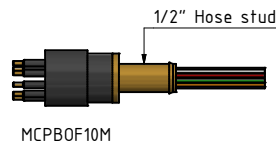
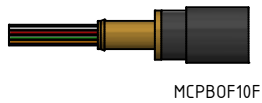
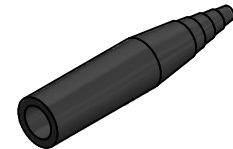
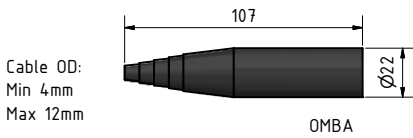
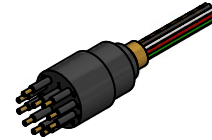
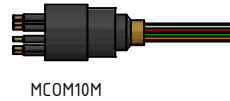
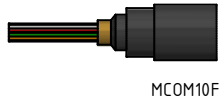
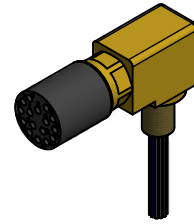
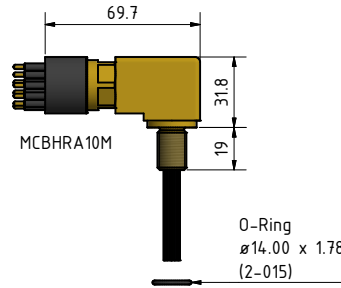
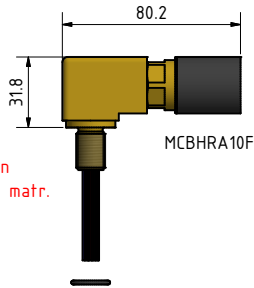
1 Black	5 Orange	9 Green/black	13 Red/white
2 White	6 Blue	10 Orange/black	14 Green/white
3 Red	7 White/black	11 Blue/black	15 Blue/white
4 Green	8 Red/black	12 Black/white	16 Black/red

Nominal cable outside diameter (OD)

10 conductor cable 0.406", 10.3 mm
12 conductor cable 0.436", 11.0 mm
16 conductor cable 0.472", 12.0 mm



Note:
RA Body are
not available in
Ti, AS & PEEK matr.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Circular Double O-ring

10, 12 and 16 contacts

Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A per contact (max 30 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, titanium, anodised aluminium or stainless steel
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE

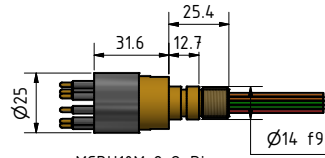
Face view (male)



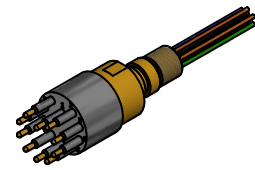


For more information
see page 30/31

MCIL10F
MCOM10F
MCPBOF10F
MCDC10F



MCBH10M 2 O-Ring
Key Flats 22mm

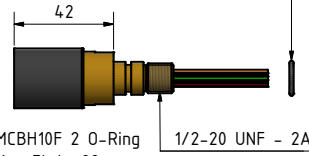


O-Ring
Ø10.82 x 1.78
(2-013)

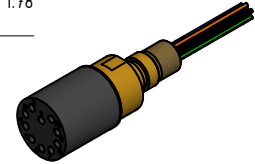


For more information
see page 30/31

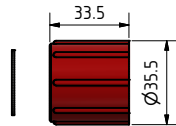
MCIL10M
MCOM10M
MCPBOF10M
MCDC10M



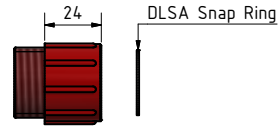
MCBH10F 2 O-Ring
Key Flats 22mm



O-Ring
Ø15.6 x 1.78
(2-016)



DLSA-F



DLSA-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Circular

21 contacts

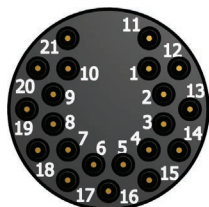
Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A per contact (max 40 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm² PUR
Bulkhead and PBOF leads (1 ft, 30 cm)	20 AWG, 0.52 mm² white tagged PTFE
OM leads (3", 7 cm)	20 AWG, 0.52 mm² white tagged PTFE

Face view (male)

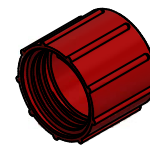
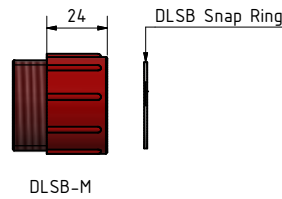
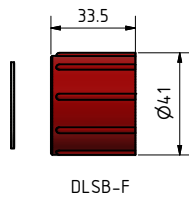
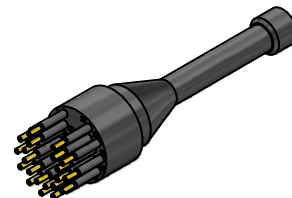
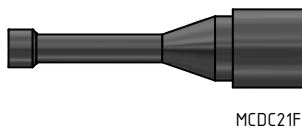
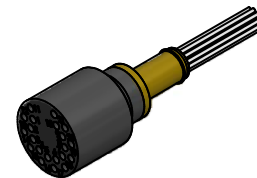
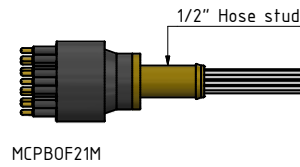
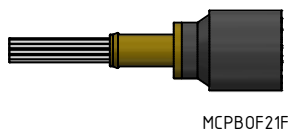
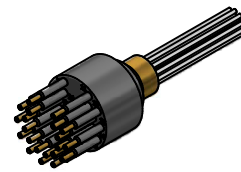
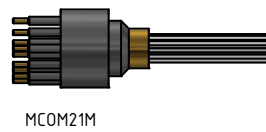
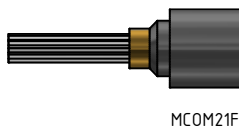
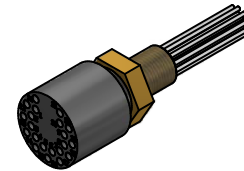
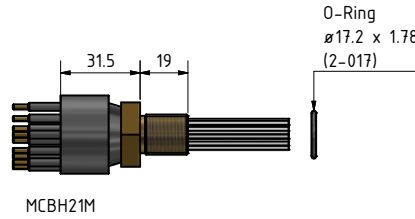
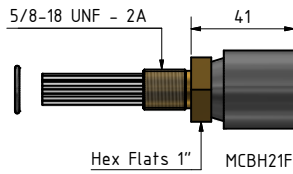
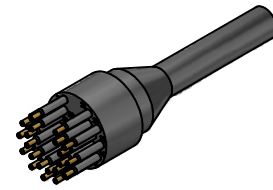
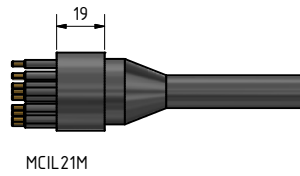
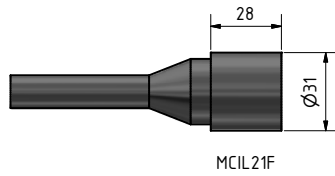


Inline cable colour code

1 Grey	7 White/black	13 White/green	19 White/orange/black
2 Purple	8 White	14 White/blue	20 White/yellow/black
3 Blue	9 White/brown	15 White/purple	21 White/green/black
4 Green	10 White/red	16 White/grey	
5 Yellow	11 White/orange	17 White/brown/black	
6 Orange	12 White/yellow	18 White/red/black	

Nominal cable outside diameter (OD)

21 conductor cable 0.578", 14.70 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"SubConn Inc. continues to be a reliable vendor for all of our connector needs."

*Ellen Orlando
EdgeTech*

SubConn® Low Profile series



The SubConn® Low Profile series is designed to offer connectivity for underwater systems and equipment where space is restricted or a more compact solution is required. By means of the low profile layout users are able to assemble design optimised, streamlined and effective underwater systems with sensors, sonar heads and other types of equipment producing less drag.

SubConn® Low Profile connectors are manufactured from high-grade rubber with different types of body material available. They feature the same contact sizes as the Circular series and are available with 2 to 9 contacts rated at 600 V up to 10 A. The series includes bulkhead, inline and field installable overmould versions featuring a high depth rating.

For easy integration with systems and equipment SubConn® Low Profile series connectors are available with dedicated cables, rubber straps and pressure-proof dummy connectors. All SubConn® cables are manufactured from flexible and water-resistant chloroprene rubber.

Applications

- Remotely Operated Vehicle (ROV) systems and instrumentation bottles
- Oceanographic systems, equipment and instrumentation solutions
- Defence systems and equipment
- Offshore oil and gas, renewable energy and subsea systems
- Underwater camera, video and lighting systems
- Diving systems and equipment

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® Low Profile

2 contacts

Connector specifications

Single contact rating	600 V DC/AC rms
Current rating	10 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)

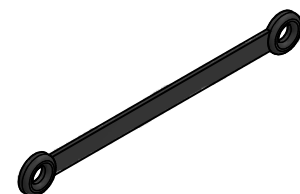
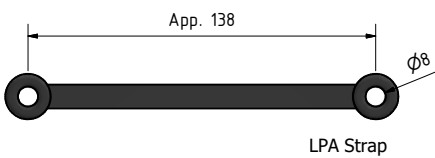
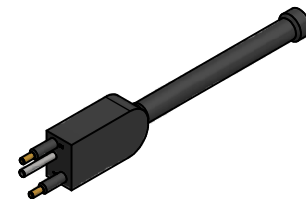
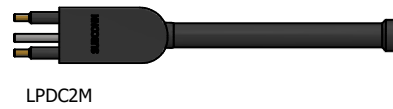
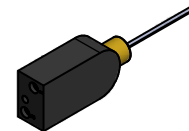
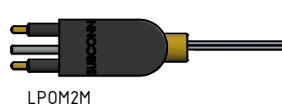
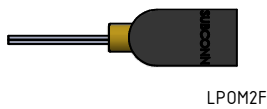
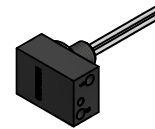
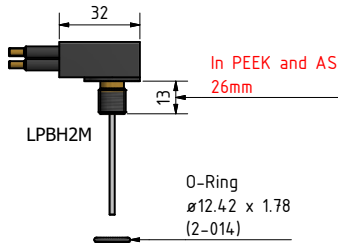
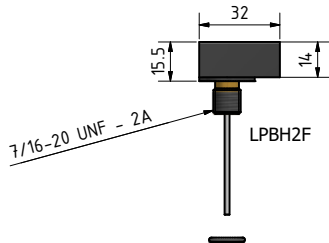
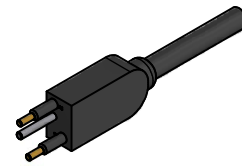
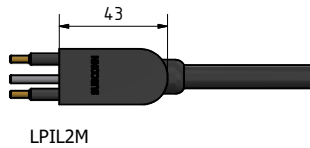
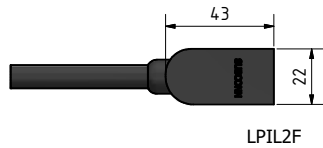


Inline cable colour code

- 1 Black
- 2 White

Nominal cable outside diameter (OD)

2 conductor cable 0.365", 9.3 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Low Profile

3 and 4 contacts

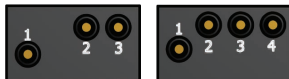
Connector specifications

Single contact rating	600 V DC/AC rms
3 contacts current rating	10 A per contact (max 30 A per connector)
4 contacts current rating	10 A per contact (max 40 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)



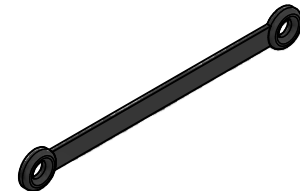
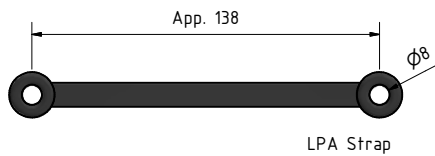
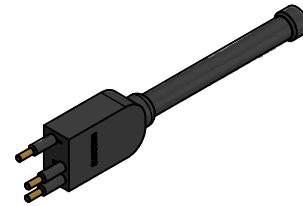
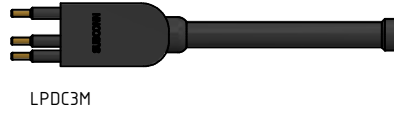
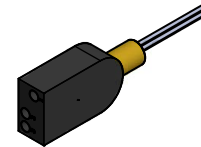
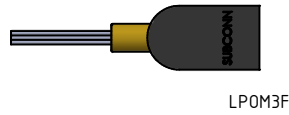
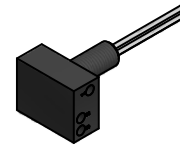
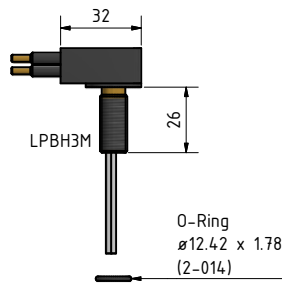
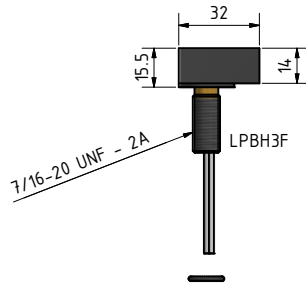
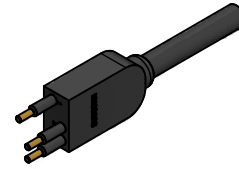
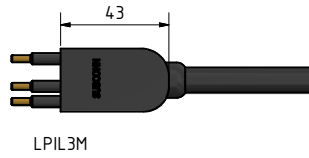
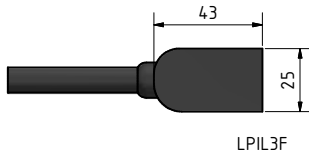
Inline cable colour code

1 Black	2 White	3 Red	4 Green
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(3 conductor cable colour code: 1 black, 2 white, 3 green)

Nominal cable outside diameter (OD)

3 conductor cable 0.385", 9.8 mm
4 conductor cable 0.410", 10.4 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Low Profile

5 contacts

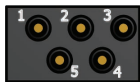
Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 40 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	18 AWG, 0.82 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)

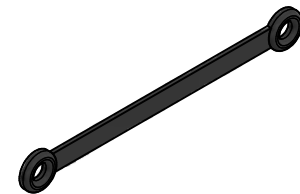
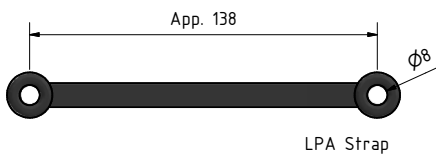
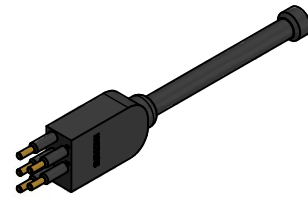
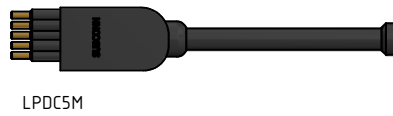
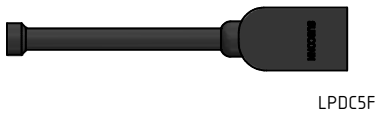
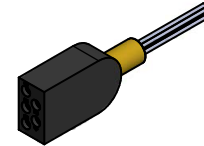
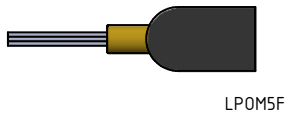
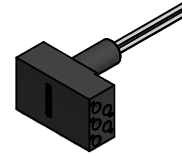
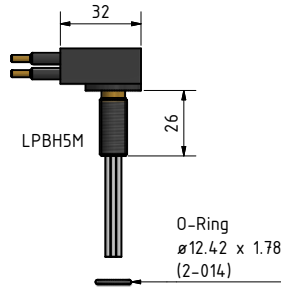
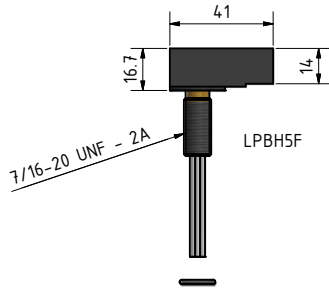
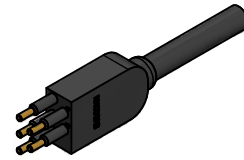
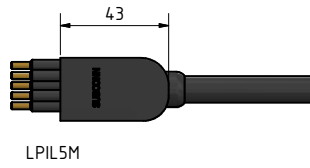
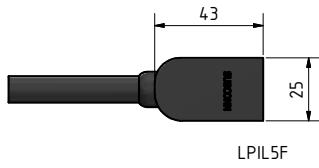


Inline cable colour code

1 Black	4 Orange
2 Red	5 Yellow
3 Blue	

Nominal cable outside diameter (OD)

5 conductor cable 0.328", 8.4 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Low Profile

7 contacts

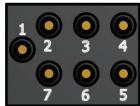
Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 40 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)

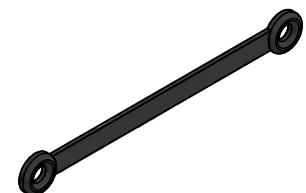
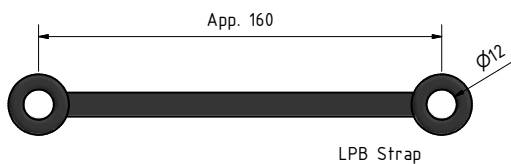
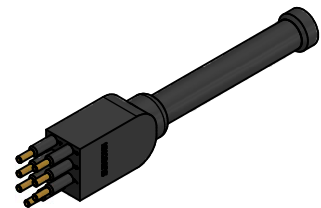
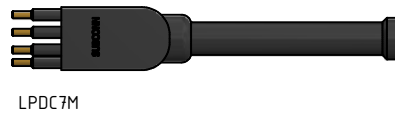
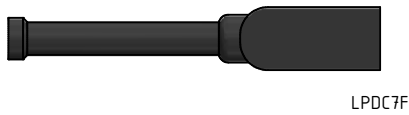
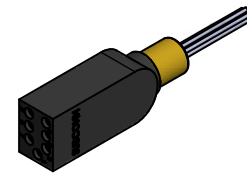
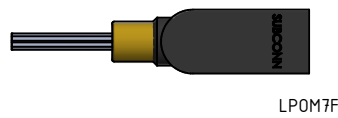
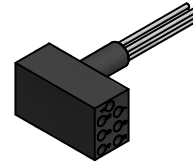
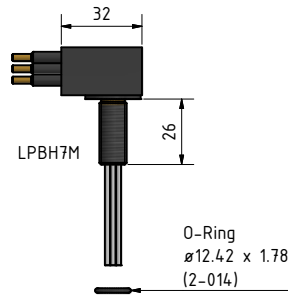
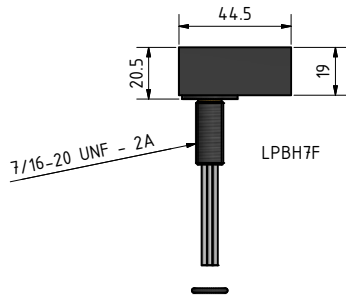
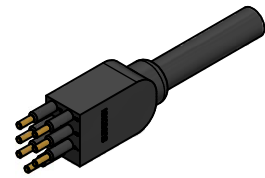
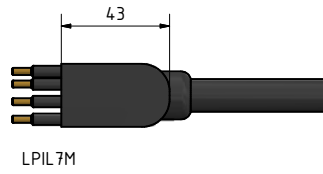
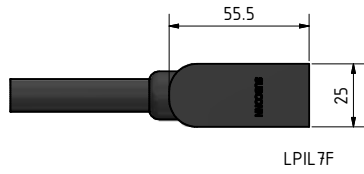


Inline cable colour code

1 Black	3 Red	5 Orange	7 White/black
2 White	4 Green	6 Blue	

Nominal cable outside diameter (OD)

7 conductor cable 0.520", 13.2 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Low Profile

9 contacts

Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 40 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² coloured PTFE
OM leads (3", 7 cm)	18 AWG, 0.82 mm ² coloured PTFE

Face view (male)

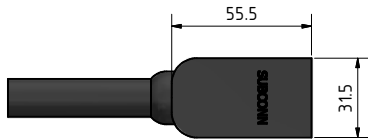


Inline cable colour code

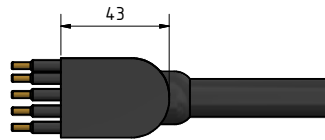
1 Black	4 Green	7 White/black
2 White	5 Orange	8 Red/black
3 Red	6 Blue	9 Green/black

Nominal cable outside diameter (OD)

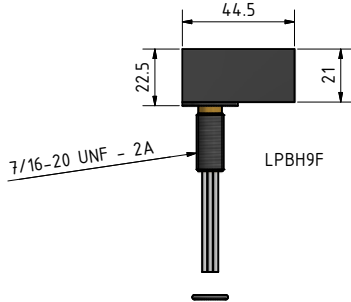
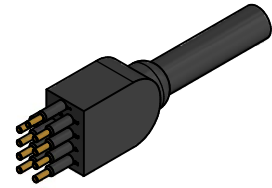
9 conductor cable 0.590", 15.0 mm



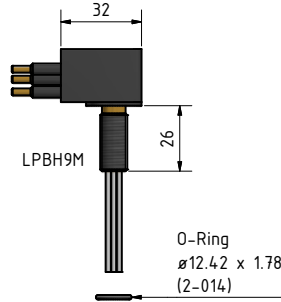
LPIL9F



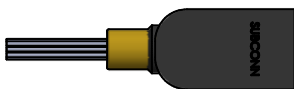
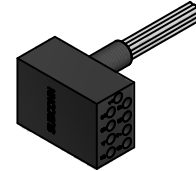
LPIL9M



LPBH9F



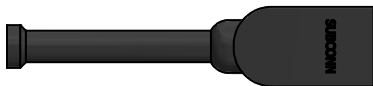
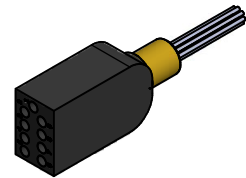
LPBH9M



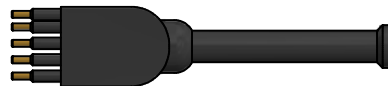
LPOM9F



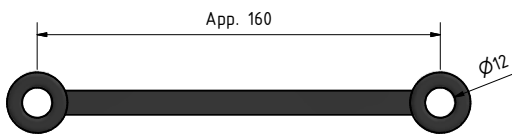
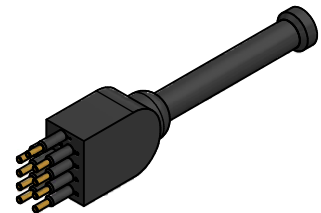
LPOM9M



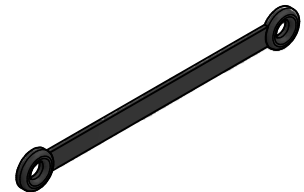
LPDC9F



LPDC9M



LPB Strap



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Low Profile Reed Switch

2 contacts

Connector specifications

Reed switch glass body type	HE559-ND
Switch voltage rating	200 V DC
Contact rating	10 W max
Switch current rating	500 mA
Operation time	0.6 ms (maximum)
Release time	0.2 ms (maximum)
Capacitance	0.20 pF (typical)
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Depth rating	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass or stainless steel
Contacts	Gold plated brass UNS - C36000
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	16 AWG, 1.31 mm ² chloroprene rubber

Face view (male)

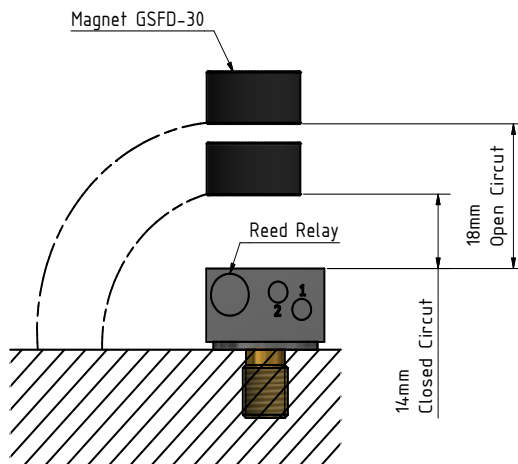
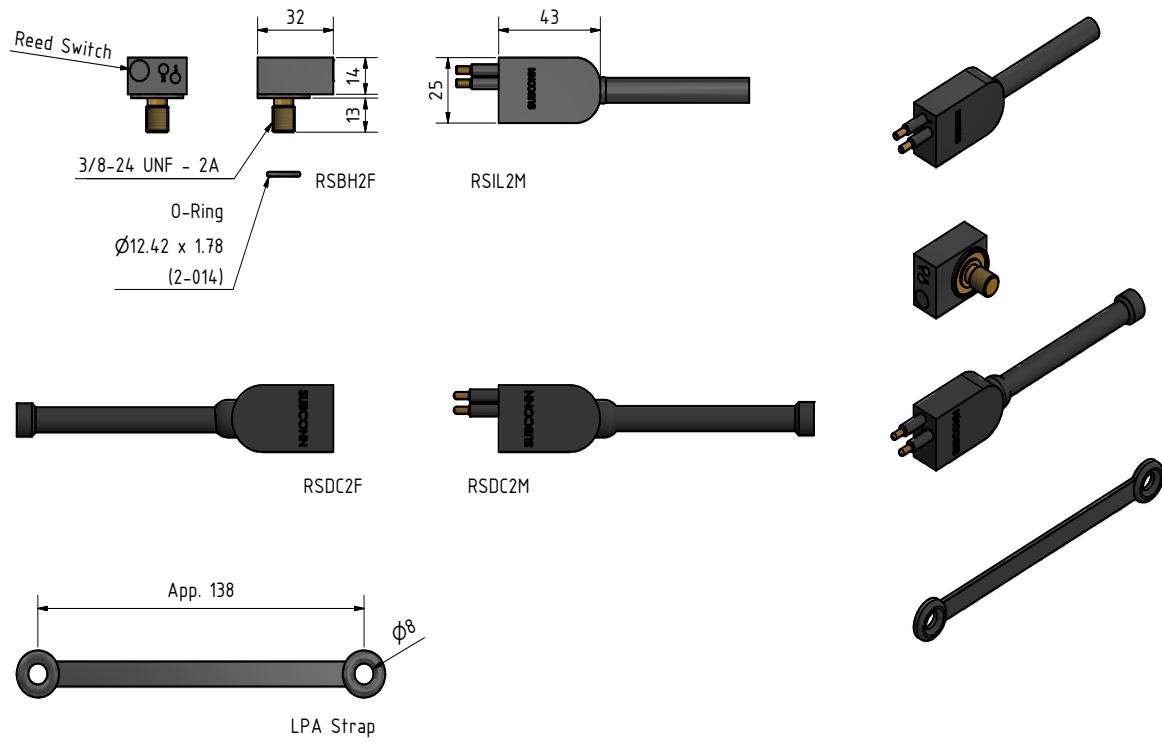


Inline cable colour code

- 1 Black
- 2 White

Nominal cable outside diameter (OD)

2 conductor cable 0.365", 9.3 mm



Drawing information

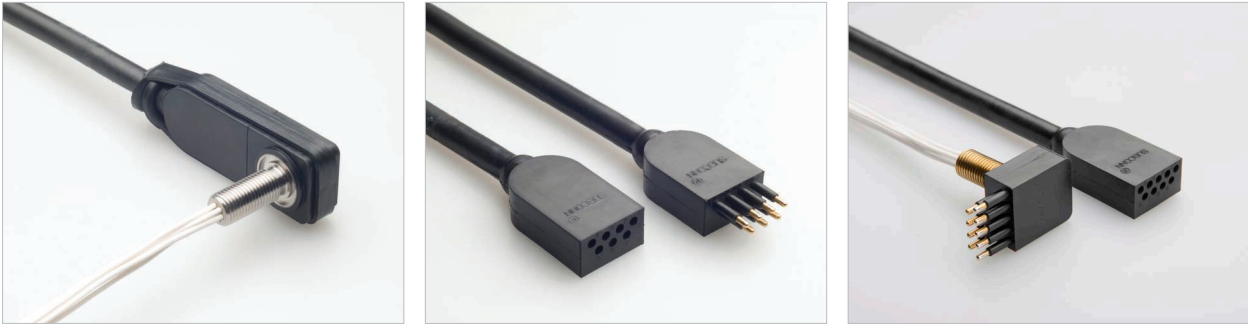
Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)

Quote

"Cabled infrastructures offer unprecedented opportunity for ocean monitoring and innovative scientific experiments in the deep sea. High reliability and high availability of power and data distribution systems are the key for success"

*Mario Sedita, Giuseppe Cannizzaro and Nunzio Randazzo
INFN*

SubConn® Micro Low Profile series



The SubConn® Micro Low Profile series was developed to suit the increasingly more compact design of underwater instruments, equipment and systems where space is restricted or a more compact solution is required.

By means of the low profile layout users are able to assemble design optimised, streamlined and effective underwater systems with sensors, sonar heads and other types of equipment producing less drag.

SubConn® Micro Low Profile connectors are manufactured from high-grade rubber with different types of body material available. They feature the same contact sizes as the Micro series and are available in 3, 7 and 9 contacts rated at 300 V up to 5 A. The series includes bulkhead, inline and some field installable overmould versions featuring a high depth rating.

For easy integration with systems and equipment SubConn® Micro Low Profile series connectors are available with dedicated cables, rubber straps and pressure-proof dummy connectors. All SubConn® cables are manufactured from flexible and water-resistant chloroprene rubber.

Applications

- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Underwater camera, video and lighting systems
- Ocean bottom seismic systems
- Diving systems and equipment

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® Micro Low Profile

3 contacts

Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A per contact (max 10 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass or stainless steel
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE

Face view (male)

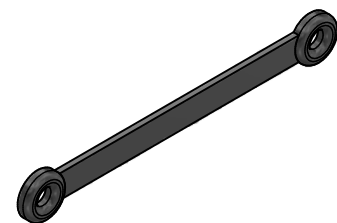
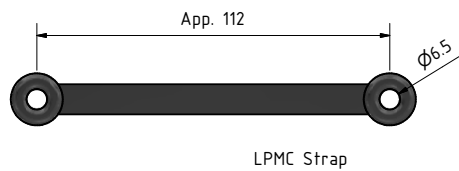
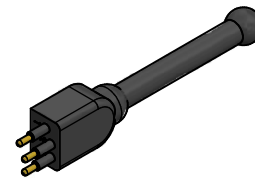
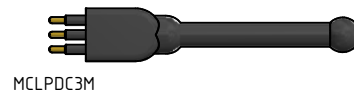
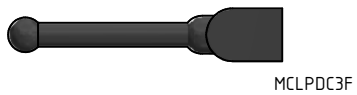
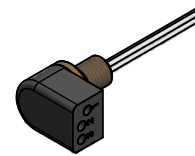
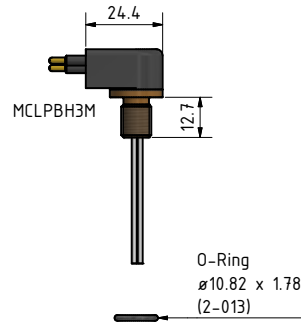
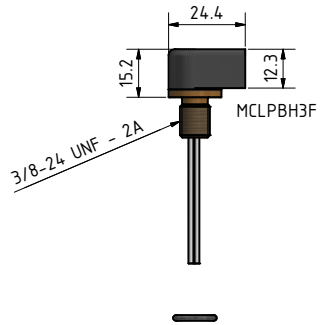
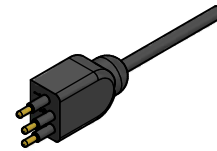
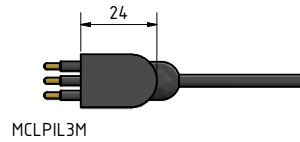
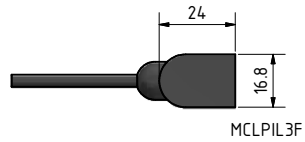


Inline cable colour code

- 1 Black
- 2 White
- 3 Red

Nominal cable outside diameter (OD)

3 conductor cable 0.250", 6.35 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Micro Low Profile

7 and 9 contacts

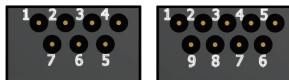
Connector specifications

Voltage rating	300 V DC/AC rms
Current rating	5 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking strap	Chloroprene rubber
Inline cable (2 ft, 60 cm)	20 AWG, 0.52 mm ² chloroprene rubber
Bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
OM leads (3", 7 cm)	20 AWG, 0.52 mm ² coloured PTFE

Face view (male)



Inline cable colour code

1 Black	3 Red	5 Orange	7 White/black	9 Green/black
2 White	4 Green	6 Blue	8 Red/black*	10 Orange/black**

* Micro 7 contacts connector uses an 8 conductor cable (only 7 conductors are used)

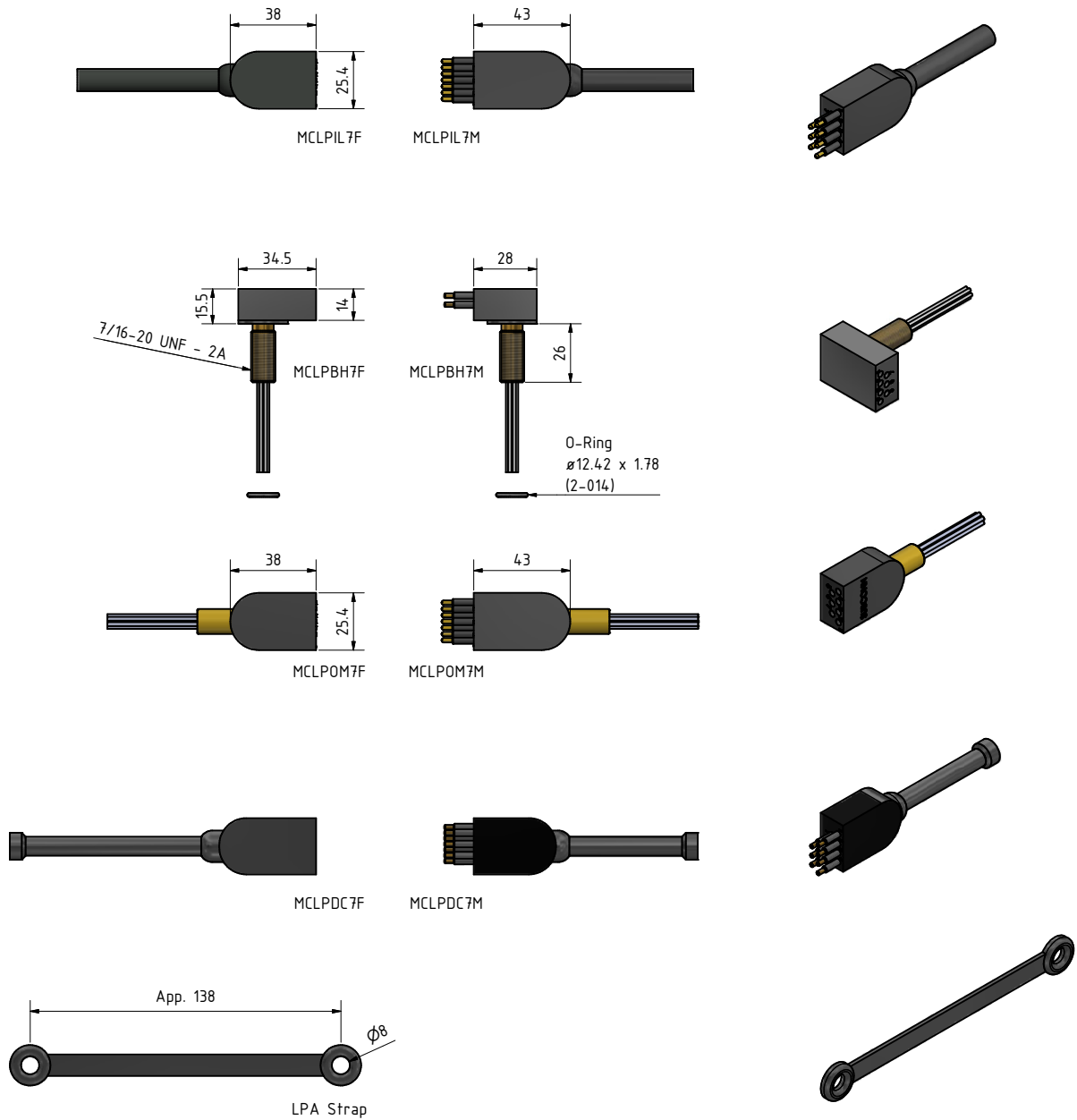
** Micro 9 contacts connector uses a 10 conductor cable (only 9 conductors are used)

Nominal cable outside diameter (OD)

8 conductor cable 0.363", 9.2 mm

10 conductor cable 0.406", 10.3 mm

7 and 9 conductor cables are not available, therefore 8 and 10 conductor cables are to be used



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"The SubConn® brand has been extensively used by Valeport for both shallow and deep water product applications. Knowing it is universally accepted worldwide within the industry is important to us."

*Kevin Edwards, Sales & Marketing Manager
Valeport Limited*

SubConn® Metal Shell series



The SubConn® Metal Shell series represents an alternative to Circular series bulkhead connectors where an even more rugged, resilient and protected underwater connectivity solution is required.

SubConn® Metal Shell series connectors are manufactured from stainless steel and are available in three different shell sizes compatible with industry standards. Flange mountable and bulkhead (male and female) connectors are available as standard equipment and connector configuration ranges from 2 to 12 contacts rated at 300 to 600 V up to 5 to 10 A. SubConn® Metal Shell connectors are manufactured to mate with compatible standard inline and dummy connectors.

The connectors feature an integrated locking ring thread on the body and a special polyoxymethylene (POM) or stainless steel locking sleeve is used on all connectors. SubConn® Metal Shell connectors come with numbered teflon (PTFE) leads and feature a high depth rating.

Applications

- Mating rugged flange mounted connectors with inline harness cables and connectors
- Defence systems and equipment
- Remotely Operated Vehicle (ROV) systems
- Oceanographic systems, equipment and instrumentation solutions
- Underwater camera, video and lighting systems
- Ocean bottom cable and seismic systems
- Slip ring assemblies

Options

- Customer specified connector body material
- Customised mating harness cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Electromechanical stress terminations
- Certified pressure testing to specific ocean depths

SubConn® Metal Shell 1500

2, 3, 4, 5, 6 and 8 contacts and G2 2, 3 and 4 contacts

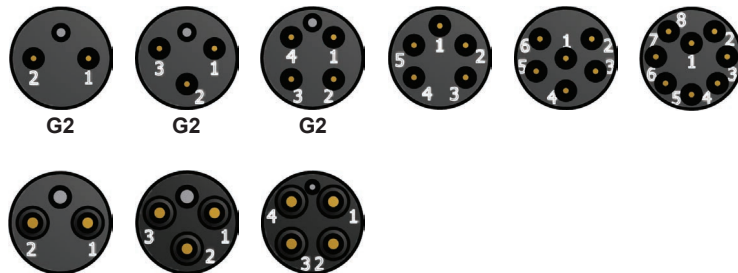
Connector specifications

Voltage rating	300 V DC/AC rms
2, 3 and 4 contacts current rating	10 A per contact (max 20 A per connector)
5, 6 and 8 contacts current rating	5 A per contact (max 20 A per connector)
G2 2, 3 and 4 contacts current rating	5 A per contact (max 20 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Connector body	Chloroprene rubber
Connector housing	Stainless steel AISI 316 (other materials on request)
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
Location pin	Stainless steel AISI 303
Locking sleeves	ABS or stainless steel
Snap rings	Stainless steel AISI 302
2, 3 and 4 contact bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE
5, 6 and 8 contact bulkhead leads (1 ft, 30 cm)	22 AWG, 0.33 mm ² coloured PTFE
G2 2, 3 and 4 contact bulkhead leads (1 ft, 30 cm)	20 AWG, 0.52 mm ² coloured PTFE

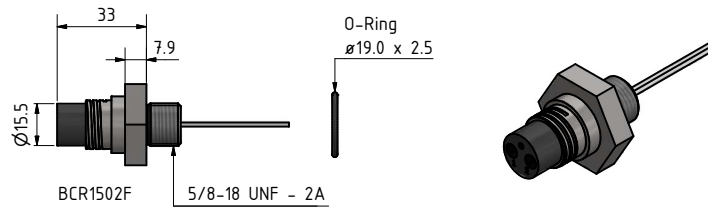
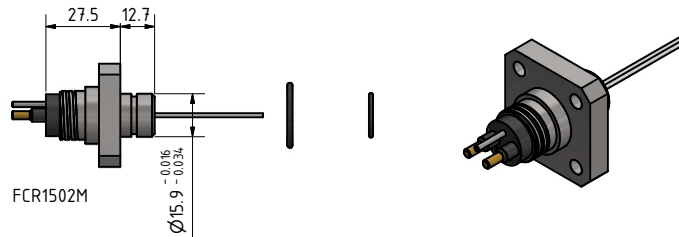
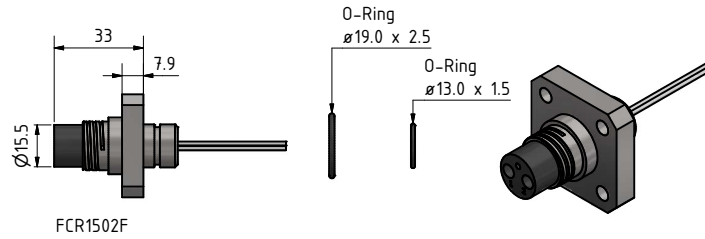
Face view (male)





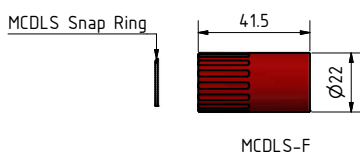
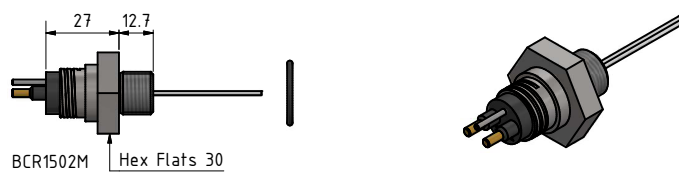
For more information
see page 26/27

MCIL2F
MCOM2F
MCPB0F2F
MCDC2F



For more information
see page 26/27

MCIL2M
MCOM2M
MCPB0F2M
MCDC2M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Metal Shell 2000

2, 3, 4 contacts and Micro 10 and 12 contacts

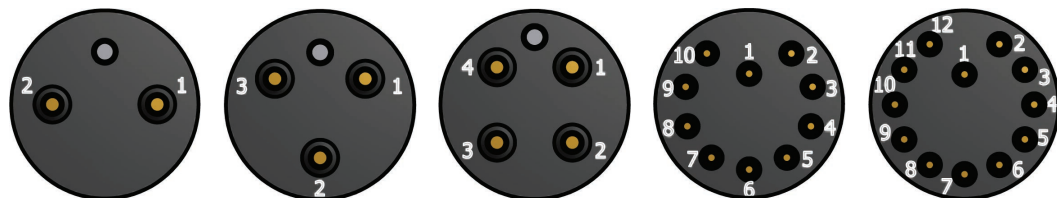
Connector specifications

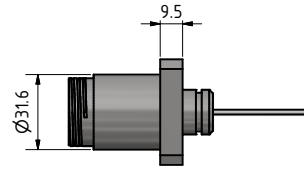
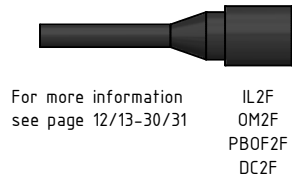
2, 3 and 4 contacts voltage rating	600 V DC/AC rms
10 and 12 contacts voltage rating	300 V DC/AC rms
2, 3 and 4 contacts current rating	10 A per contact (max 30 A per connector)
10 and 12 contacts current rating	5 A per contact (max 30 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

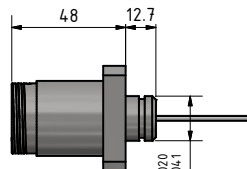
Connector body	Chloroprene rubber
Connector housing	Stainless steel AISI 316 (other materials on request)
2, 3 and 4 contacts	Brass UNS - C36000
10 and 12 contacts	Female sockets in gold plated brass UNS - C36000
Location pin	Male pins in gold plated beryllium copper
O-rings	Stainless steel AISI 303
Locking sleeves	Nitrile
Snap rings	POM or stainless steel
2, 3 and 4 contact bulkhead leads (1 ft, 30 cm)	Stainless steel AISI 302
10 and 12 contact bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm² white tagged PTFE
	20 AWG, 0.52 mm² white tagged PTFE

Face view (male)

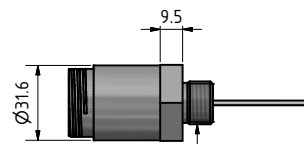




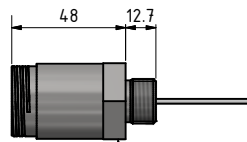
FCR2002F



FCR2002M



BCR2002F



BCR2002M

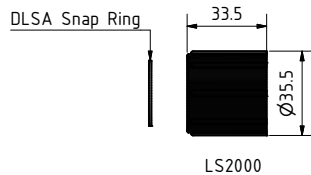
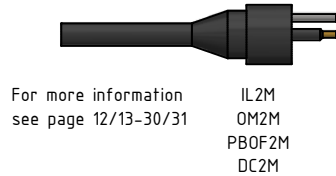
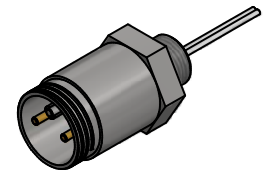
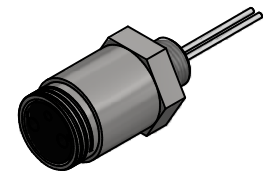
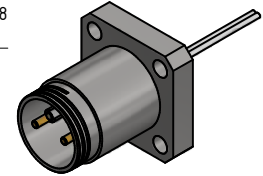
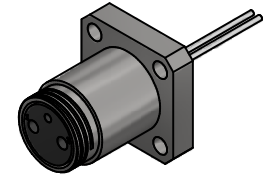
O-Ring
Ø22.22 x 2.62

O-Ring
Ø15.6 x 1.78
(2-016)

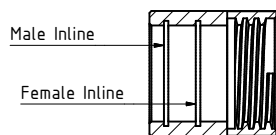
O-Ring
Ø22.22 x 2.62

3/4-16 UNF - 2A

Hex Flats 32



Snap ring placement



With male inline connector - snap ring in outer groove

With female inline connector - snap ring in inner groove

Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Metal Shell 2400

6, 8 and 10 contacts

Connector specifications

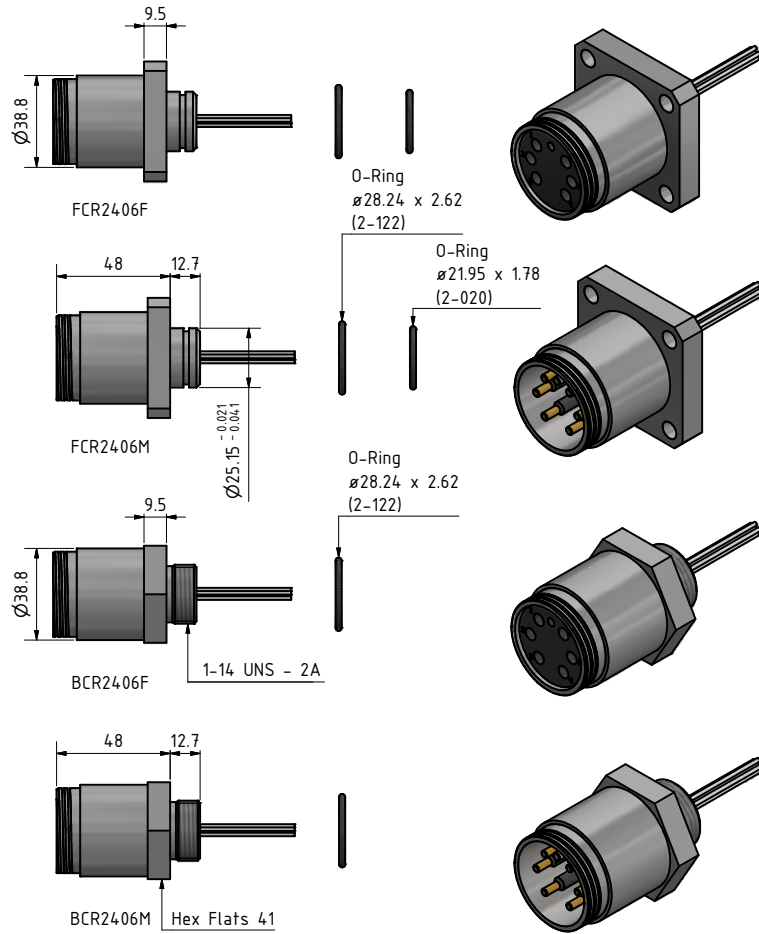
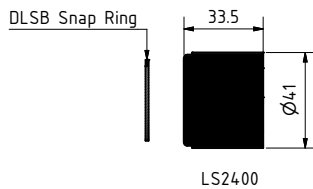
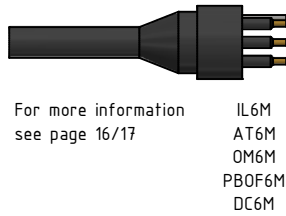
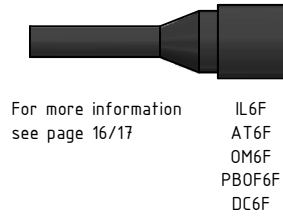
Voltage rating	600 V DC/AC rms
Current rating	10 A per contact (max 50 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

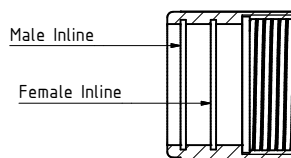
Connector body	Chloroprene rubber
Connector housing	Stainless steel AISI 316 (other materials on request)
Contacts	Brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Bulkhead leads (1 ft, 30 cm)	18 AWG, 0.82 mm ² white tagged PTFE

Face view (male)





Snap ring placement



With male inline connector - snap ring in outer groove

With female inline connector - snap ring in inner groove

Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"At Baggerbedrijf de Boer - Dutch Dredging, we know that working with mother nature requires environmental concern and safety and we try to live up to the latest standards in this field. As part of this effort, we use SubConn® connectors to provide connectivity and optimal reliability for our dredging equipment operating in harsh marine environments."

*Casper Schilder, Technical Purchase Manager
Baggerbedrijf de Boer - Dutch Dredging*

SubConn® Power series



The SubConn® Power series offers a high-performance, dependable connector solution to accommodate the ever growing power requirements of underwater system operators and industries. The series comprises five standard connectors, supported by a number of custom-made solutions.

All based on the proven SubConn® connector and contact design, the SubConn® Power series includes a single contact power connector, three battery charging connectors (2, 3 and 4 contacts) and a 4-contact high power connector. The single contact power connector is designed for use with a selection of cable sizes and can be operated at up to 3 kV and 250 A. The battery charging connectors are suitable for 600 V up to 25 A per contact. The 4-contact high power connector is suitable for 600 V at 50 A per contact and is supplied in standard SubConn® bulkhead, inline, Pressure Balanced Oil Filled (PBOF) (except 1 pin version) and field installable overmould versions.

For easy integration with systems and equipment, SubConn® Power series connectors are available with dedicated cables, polyoxymethylene (POM) or stainless steel locking sleeves and pressure-proof dummy connectors. All standard SubConn® cables for the SubConn® Power series are of the flexible and water-resistant chloroprene rubber.

Applications

- Power supply for offshore oil and gas, renewable energy and subsea systems
- Power supply for remotely operated vehicles (ROV) and subsea trenching machines
- Marine battery pack charging
- Power supply for underwater pump units
- Hazardous environment power supply

Options

- Customised harness cables and direct moulding to compatible polyurethane (PUR) cables
- Customer specified connector body material and cable lengths
- Field installable versions for all SubConn® Power series connectors
- Certified pressure testing to specific ocean depths

SubConn® Power

1 contact

Connector specifications

Voltage rating	
inline and bulkhead (1 KV version)	1 KV DC/AC rms
Current rating	
inline, overmould and bulkhead (1 KV version)	250 A
Voltage rating	
overmould and bulkhead (3 KV version)*	3 KV DC/AC rms
Current rating of OM and BH (3 KV version)	90 A
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel or titanium
Contacts	Brass UNS - C36000
Adapter	Brass UNS - C36000
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	1/0 AWG, 53.46 mm ² chloroprene rubber

Inline cable colour code

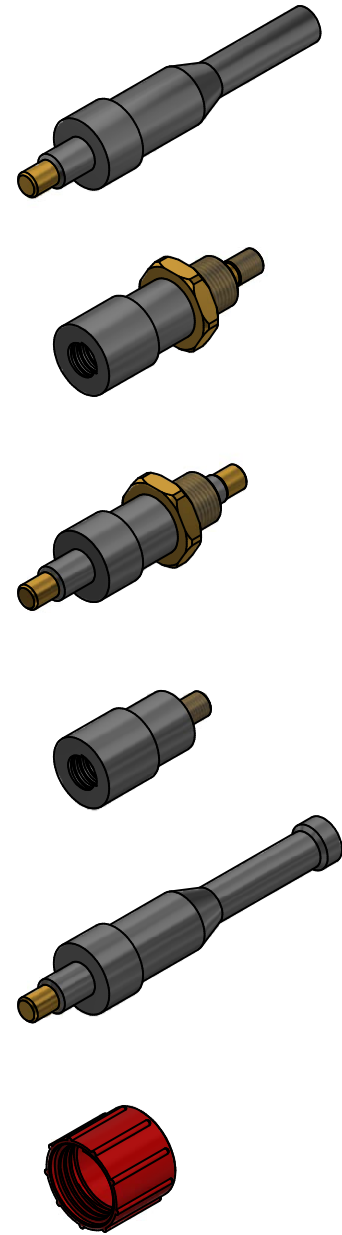
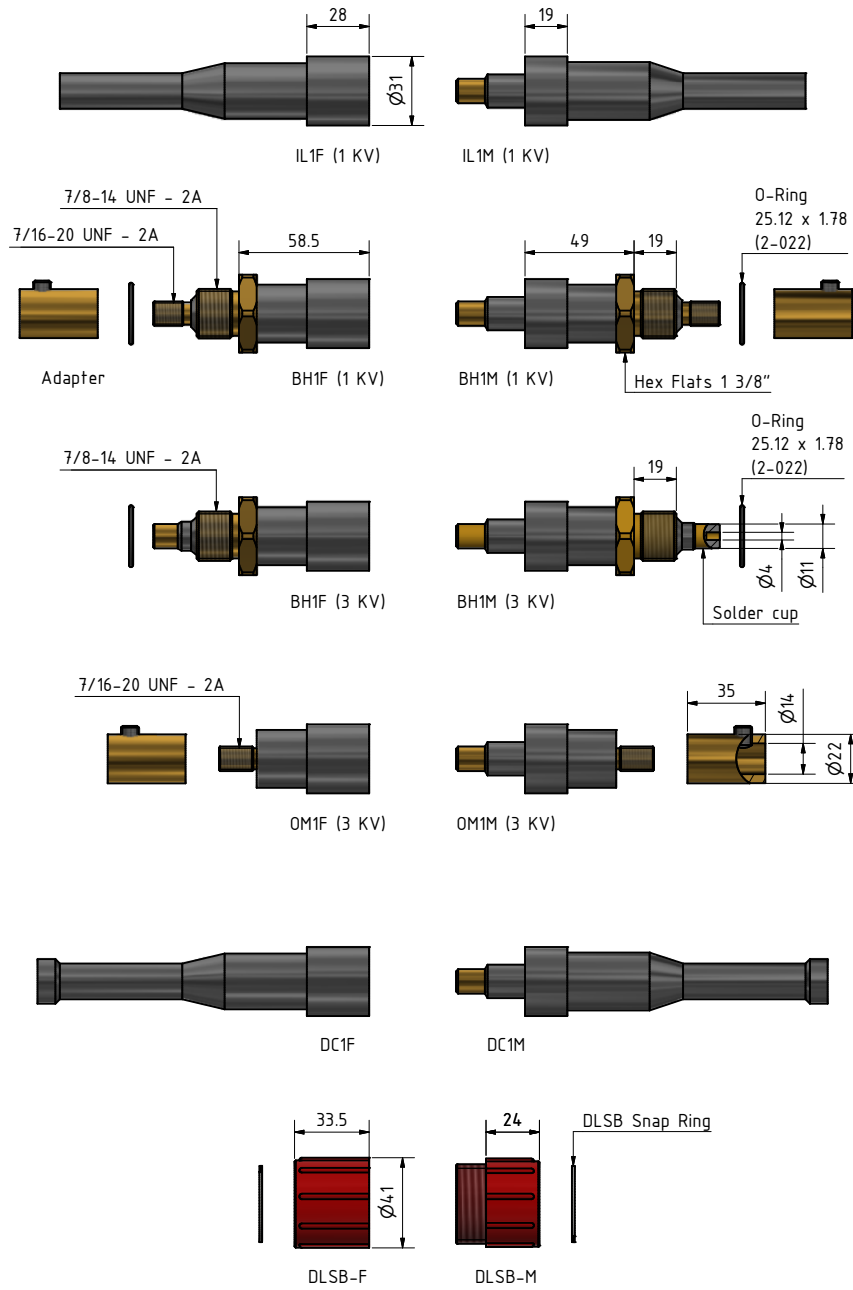
1 Black

Nominal cable outside diameter (OD)

1 conductor cable 0.6" to 0.85", 15.0 mm to 22.0 mm

Additional information

* Only if the bulkhead is mounted in non-conducting oil



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Power Battery

2, 3 and 4 contacts

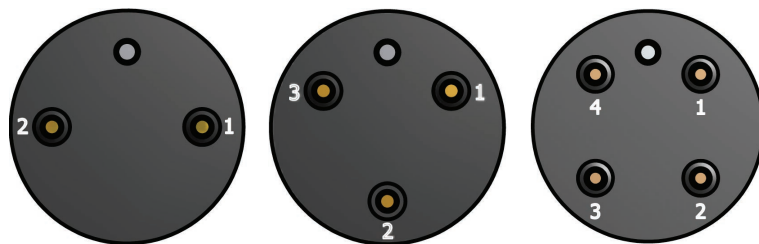
Connector specifications

Voltage rating	600 V DC/AC rms
Current rating	25 A per contact (max 50 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0,01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Gold plated brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
2 and 3 conductor inline cable (2 ft, 60 cm)	10 AWG, 5.26 mm ² chloroprene rubber
4 conductor inline cable (2 ft, 60 cm)	12 AWG, 3.30 mm ² chloroprene rubber
2 and 3 contact bulkhead and PBOF leads (1 ft, 30 cm)	10 AWG, 5.26 mm ² white tagged PTFE
2 and 3 contact OM leads (3", 7 cm)	10 AWG, 5.26 mm ² white tagged PTFE
4 contact bulkhead and PBOF leads (1 ft, 30 cm)	12 AWG, 3.31 mm ² white tagged PTFE
4 contact OM leads (3", 7 cm)	12 AWG, 3.31 mm ² white tagged PTFE

Face view (male)



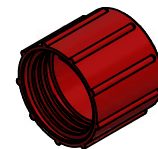
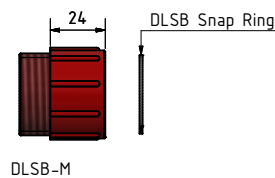
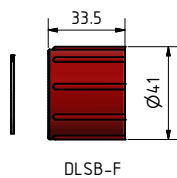
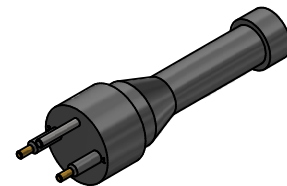
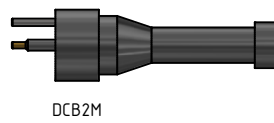
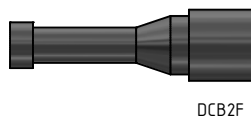
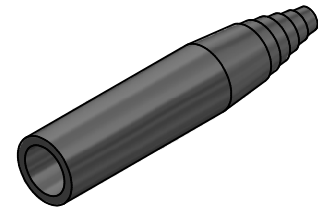
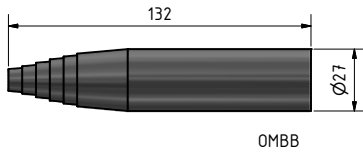
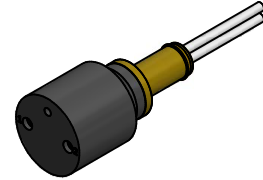
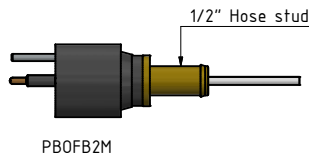
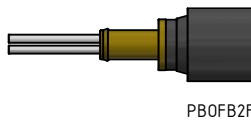
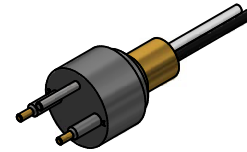
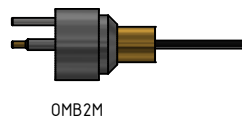
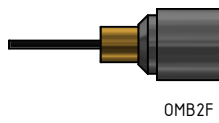
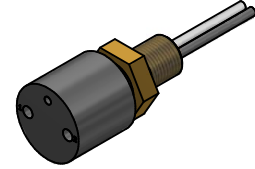
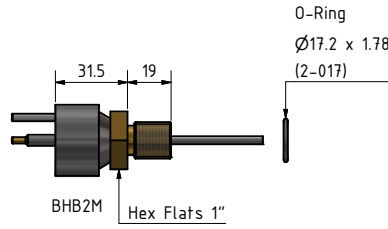
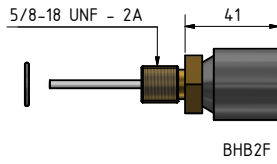
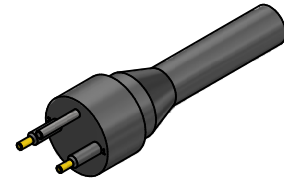
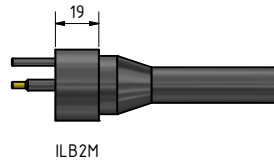
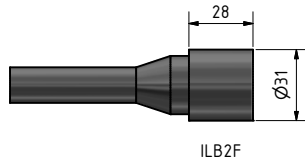
Inline cable colour code

1 Black	2 White	3 Red	4 Green
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(3 conductor cable colour code: 1 black, 2 white, 3 green)

Nominal cable outside diameter (OD)

2 conductor cable 0.640", 16.3 mm
3 conductor cable 0.671", 17.0 mm
4 conductor cable 0.660", 16.8 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® High Power

4 contacts

Connector specifications

Voltage rating	600 V DC/AC rms
Current rating (water)	50 A per contact (max 200 A per connector)
Current rating (air)	28 A per contact (max 112 A per connector)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Design depth rating	1,400 bar, 20,000 psi
Qualified pressure tested	800 bar, 11,600 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium or anodised aluminium
Contacts	Brass UNS - C36000
Location pin	Stainless steel AISI 303
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	8 AWG, 8.36 mm ² chloroprene rubber
Bulkhead and PBOF leads (1 ft, 30 cm)	10 AWG, 5.26 mm ² tagged PTFE
OM leads (3", 7 cm)	10 AWG, 5.26 mm ² tagged PTFE

Face view (male)

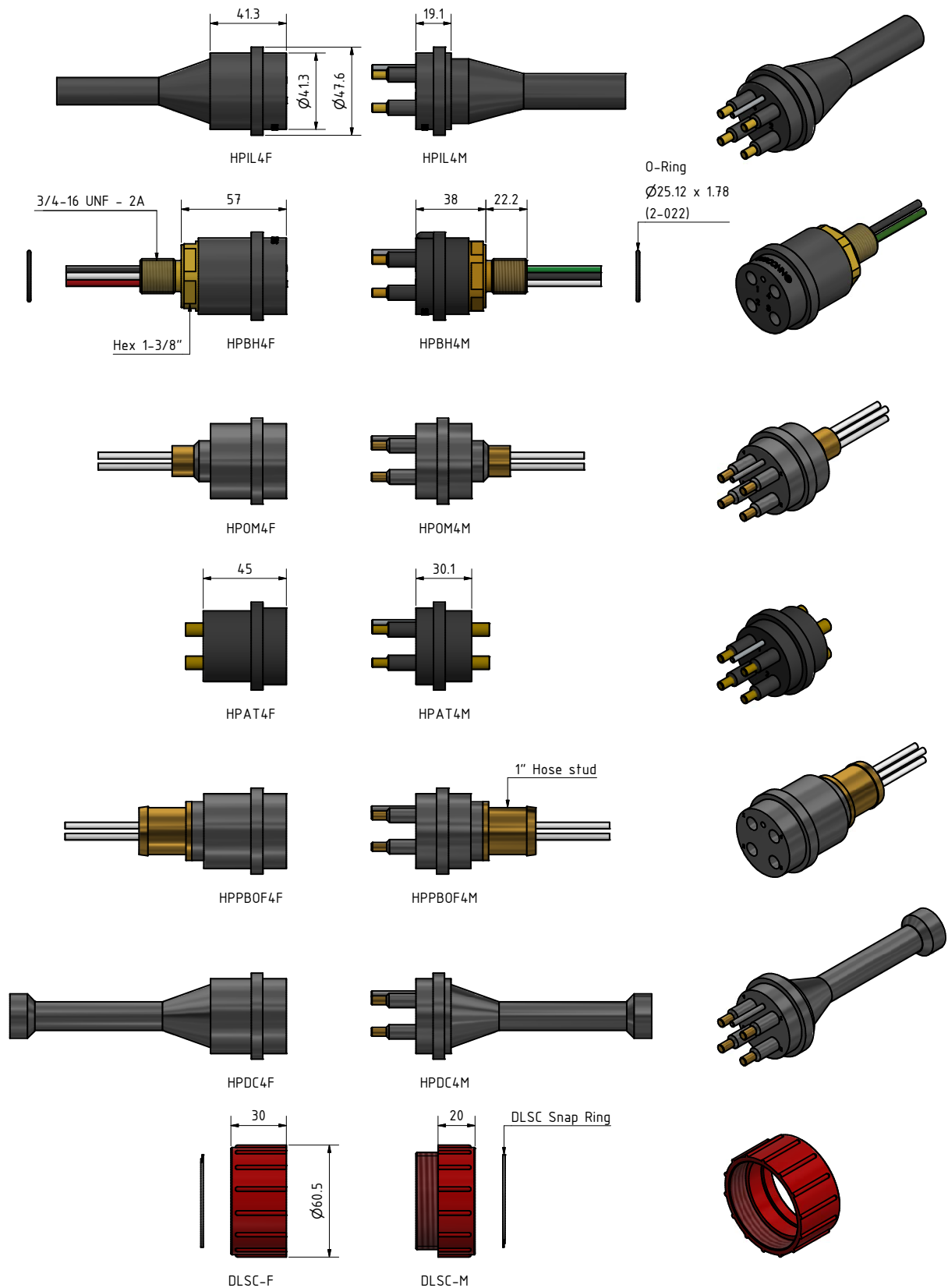


Inline cable colour code

1 Black	2 White	3 Red	4 Green
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Nominal cable outside diameter (OD)

4 conductor cable 0.715", 18.2 mm



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"Over the years, LH-Camera has, with great satisfaction, used more than a thousand SubConn® connectors in the production of underwater cameras and lights. It is vital for us that our products will operate in harsh environments."

*Brian Hansen COO
LH-Camera Denmark*

SubConn® Ethernet series



The SubConn® Ethernet series marked the first high speed underwater communications system to offer true Ethernet type performance. The series is developed and manufactured to accommodate the demand for gigabit data speed, signal and power for increasingly capable and compact underwater systems. The series includes different types of Ethernet and combined power and Ethernet connector options in circular, metal shell and low profile configurations.

All SubConn® Ethernet connectors are capable of Gigabit speed performance and feature a high depth rating. Utilising a reconfigured version of the proven SubConn® contact and socket design, SubConn® Ethernet connectors are set to maximise data flow while eliminating cross talk and noise. With power contacts rated for 600 V at 4 A, SubConn® combined power and Ethernet connectors allow signal and power supply to be unified in one high performance solution.

SubConn® Ethernet connectors are available with specially designed SubConn® Ethernet or combined power and Ethernet cables capable of Gigabit speed data transfer up to a distance of 75 metres. This flexible and water-resistant cable is manufactured from polyurethane (PUR). SubConn® Ethernet connectors come with colour-coded leads and are available in bulkhead, inline, Pressure Balanced Oil Filled (PBOF) and field installable overmould versions, together with injection moulded polyoxymethylene (POM) or stainless steel locking sleeves.

Applications

- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Oceanographic systems, equipment and instrumentation solutions
- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Underwater camera and video systems
- Underwater control systems

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® Ethernet Circular

8 contacts

Connector specifications

Voltage rating	250 V DC/AC rms
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (3.3 ft, 100 cm)	4 pair 24 AWG, 0.20 mm ² PUR
Bulkhead and PBOF leads (3.3 ft, 100 cm)	CAT 5E patch cable incl. RJ 45 connector (not installed)
OM leads (3") , 7 cm	CAT 5E patch cable

Face view (male)



Inline cable colour code

1-2 Brown, Brown/white*	5-6 Orange, Orange/white*
3-4 Blue, Blue/white*	7-8 Green, Green/white*

* Twisted pairs

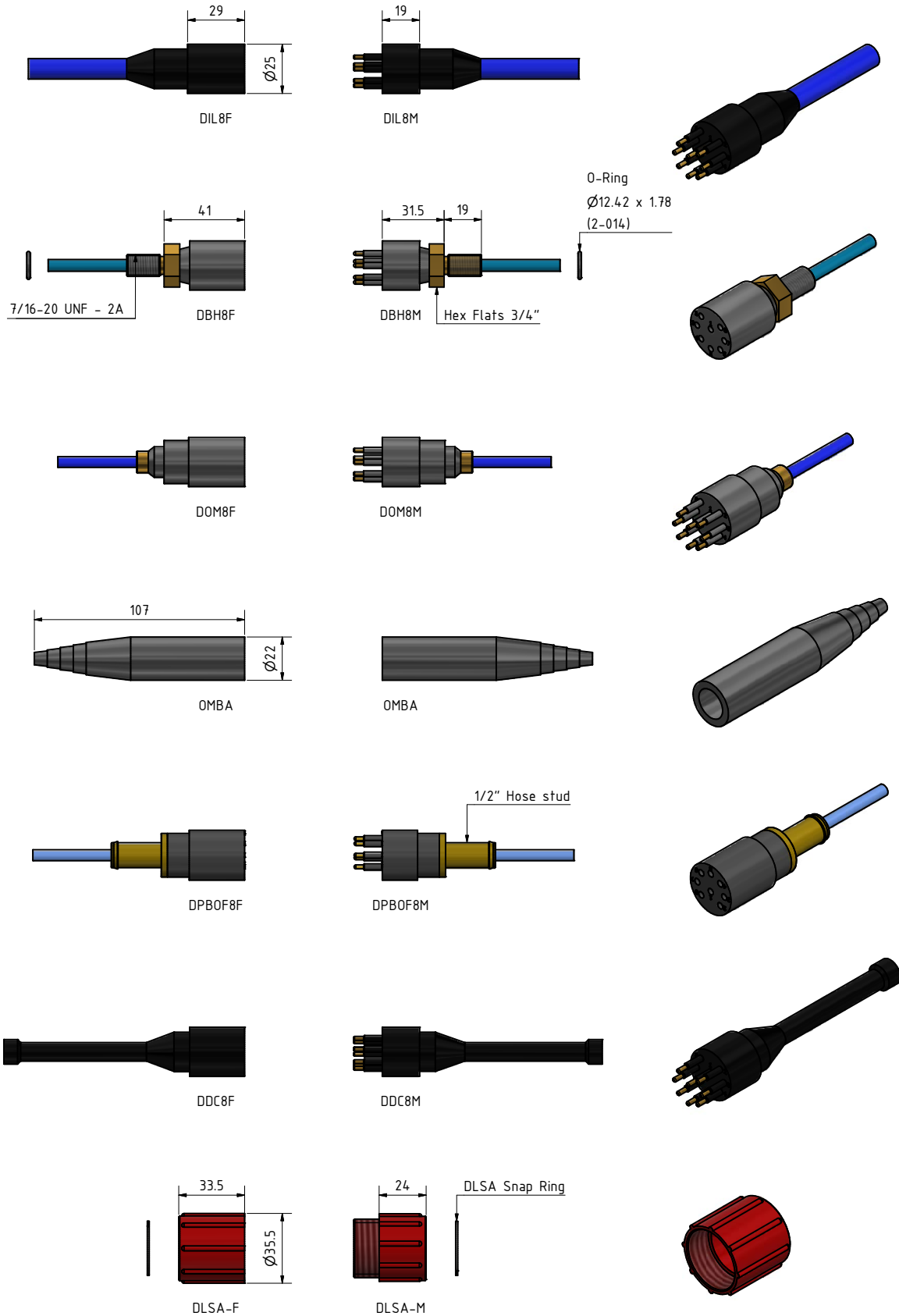
Nominal cable outside diameter (OD)

PUR cable 0.410", 10.4 mm

Additional information

Inline connector is available in shallow water version.

Standard RJ45 cannot be mounted on inline cable and will require a RJ45 Phoenix connector or equivalent.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Power Ethernet Circular

13 contacts

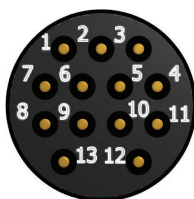
Connector specifications

Voltage rating	600 V DC/AC rms
Voltage rating on data wire	250 V DC/AC rms
Current rating on power wire	4 A per contact (max 16 A per connector)
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (3.3 ft, 100 cm)	4 pair 24 AWG, 0.20 mm ² PUR Power conductors 4 x 18 AWG, 0.82 mm ² Screen: Tinned copper braid
Bulkhead and PBOF leads (3.3 ft, 100 cm)	CAT 5E patch cable, 5 x 20 AWG, 0.52 mm ² coloured PTFE incl. RJ 45 connector (not installed)
OM leads (3", 7 cm)	CAT 5E patch cable, 5 x 20 AWG, 0.52 mm ² coloured PTFE

Face view (male)



Inline cable colour code

1 Black	4-5 Brown, Brown/white*	10-11 Green, Green/white*
2 Screen (orange wire on bulkhead)	6-7 Blue, Blue/white*	12 Red
3 White	8-9 Orange, Orange/white*	13 Green

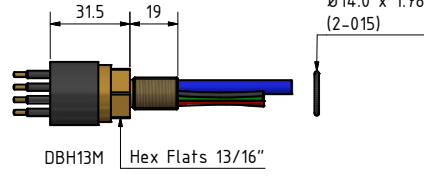
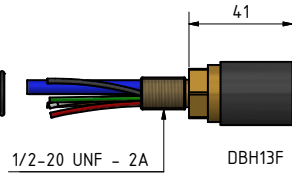
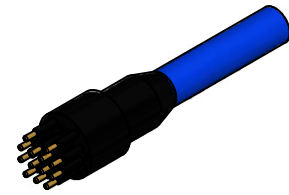
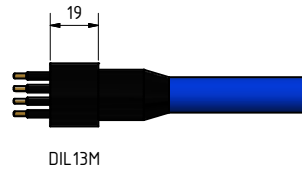
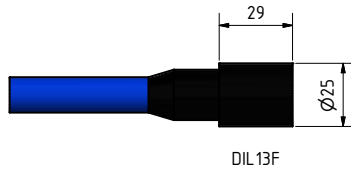
* Twisted pairs

Nominal cable outside diameter (OD)

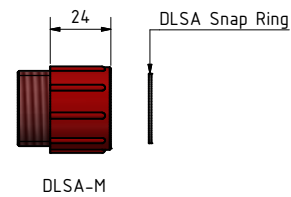
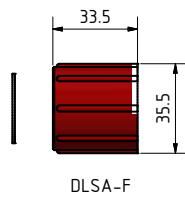
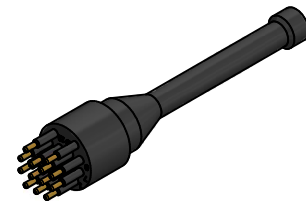
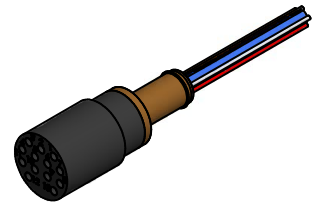
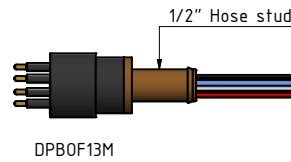
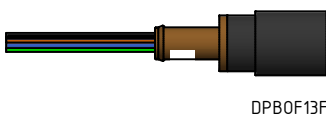
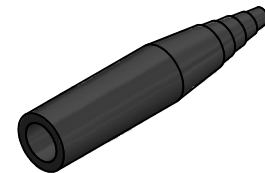
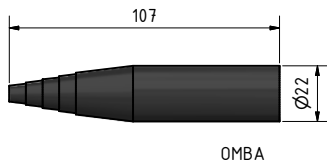
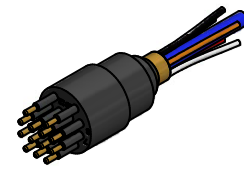
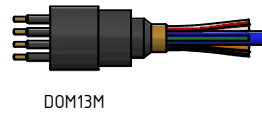
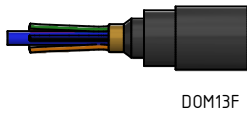
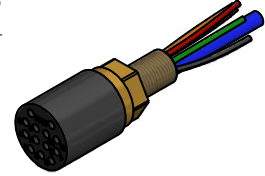
PUR cable 0.550", 13.97 mm

Additional information

Standard RJ45 cannot be mounted on inline cable and will require a RJ45 Phoenix connector or equivalent.



O-Ring
Ø14.0 x 1.78
(2-015)



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Ethernet Circular

Double O-ring, 8 and 13 contacts

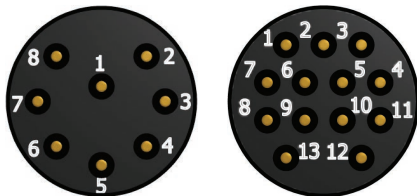
Connector specifications

Voltage rating	600 V DC/AC rms (13 contacts only)
Voltage rating on data wire	250 V DC/AC rms
Current rating on power wire	4 A per contact (max 16 A per connector) (13 contacts only)
Data rate	1 Gbit/s
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Bulkhead leads (3.3 ft, 100 cm)	CAT 5E patch cable, 5 x 20 AWG, 0.52 mm ² coloured PTFE (13 contacts only)
	incl. RJ 45 connector (not installed)

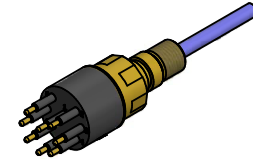
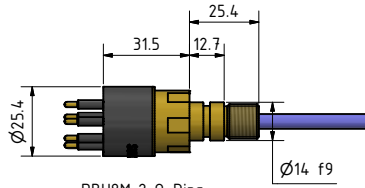
Face view (male)





For more information
see page 74/75

DIL8F
DOM8F
DPB0F8F
DDC8F

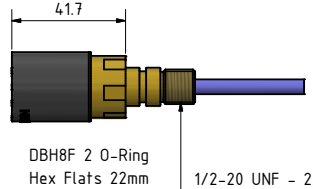


O-Ring
Ø10.82 x 1.78
(2-013)

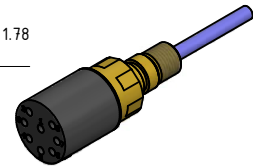


For more information
see page 74/75

DIL8M
DOM8M
DPB0F8M
DDC8M

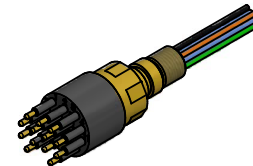


O-Ring
Ø15.6 x 1.78
(2-016)



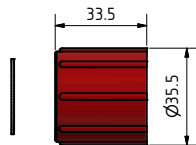
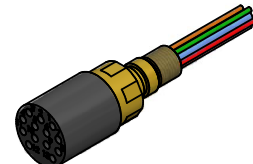
For more information
see page 76/77

DIL13F
DOM13F
DPB0F13F
DDC13F

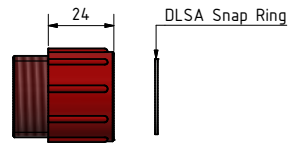


For more information
see page 76/77

DIL13M
DOM13M
DPB0F13M
DDC13M



DLSA-F



DLSA-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Ethernet Low Profile

9 contacts

Connector specifications

Voltage rating	250 V DC/AC rms
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium, anodised aluminium or PEEK
Contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking straps	Chloroprene rubber
Inline cable (3.3 ft, 100 cm)	4 pair 24 AWG, 0.20 mm ² PUR Screen: Tinned copper braid
Bulkhead leads (3.3 ft, 100 cm)	CAT 5E patch cable incl. RJ 45 connector (not installed)

Face view (male)



Inline cable colour code

1-2 Brown, Brown/white*	7-8 Green, Green/white*
3-4 Blue, Blue/white*	9 Screen (orange wire on bulkhead)
5-6 Orange, Orange/white*	

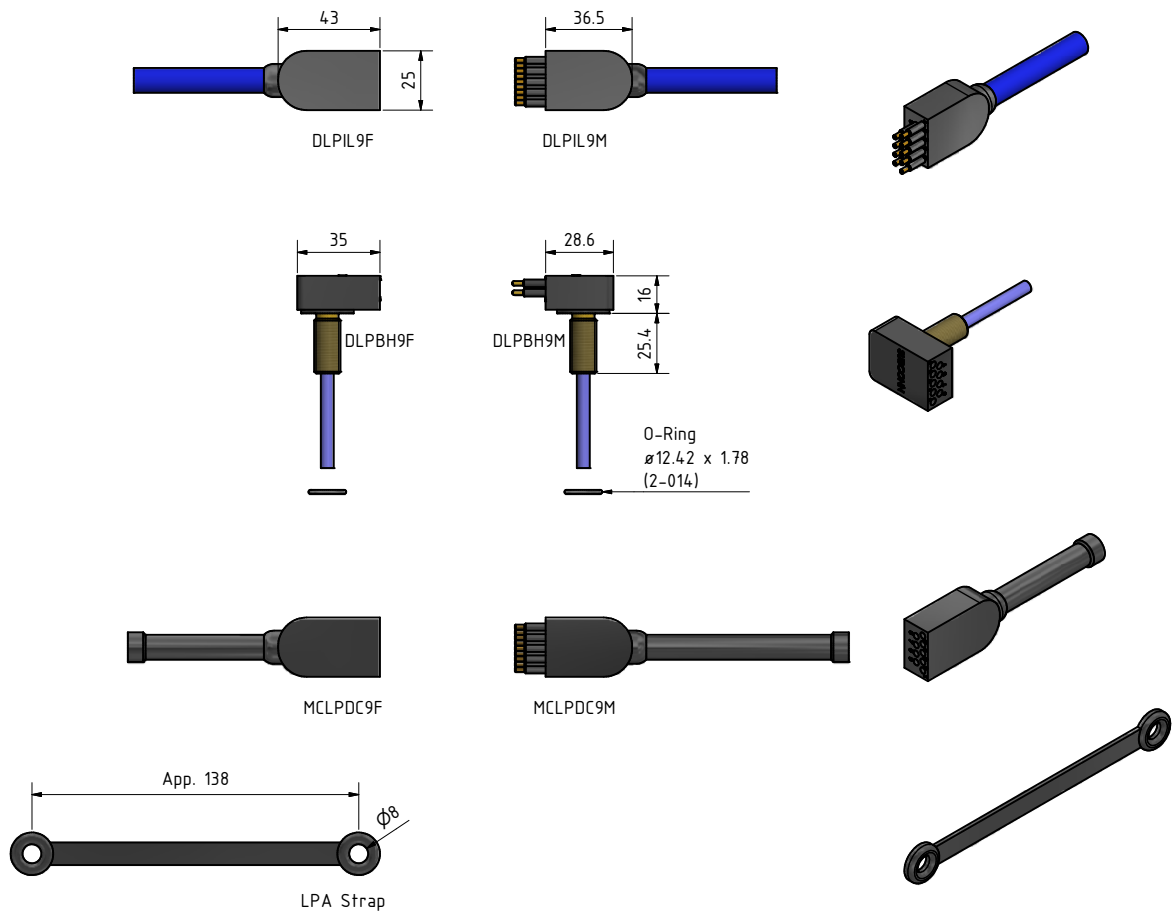
* Twisted pairs

Nominal cable outside diameter (OD)

PUR cable 0.410", 10.4 mm

Additional information

Standard RJ45 cannot be mounted on inline cable and will require a RJ45 Phoenix connector or equivalent.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Power Ethernet Low Profile

13 contacts

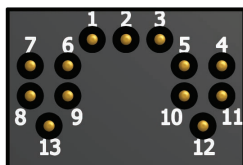
Connector specifications

Voltage rating	600 V DC/AC rms
Voltage rating on data wire	250 V DC/AC rms
Current rating on power wire	4 A per contact (max 16 A per connector)
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi
Depth rating PEEK	300 bar, 4,350 psi

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel or titanium
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking straps	Chloroprene rubber
Inline cable (3.3 ft, 100 cm)	4 pair 24 AWG, 0.20 mm² PUR
	Power conductors 4 x 18 AWG, 0.82 mm²
	Screen: Tinned copper braid
Bulkhead leads (3.3 ft, 100 cm)	CAT 5E patch cable, 5 x 20 AWG, 0.52 mm² coloured PTFE incl. RJ 45 connector (not installed)

Face view (male)



Inline cable colour code

1 Black	4-5 Brown, Brown/white*	10-11 Green, Green/white*
2 Screen (orange wire on bulkhead)	6-7 Blue, Blue/white*	12 Red
3 White	8-9 Orange, Orange/white*	13 Green

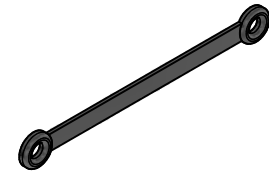
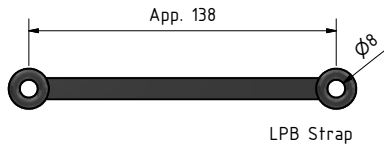
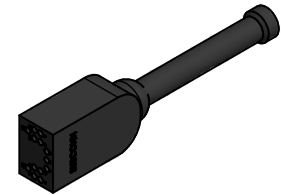
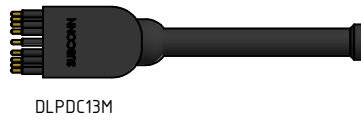
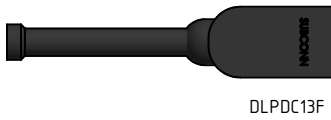
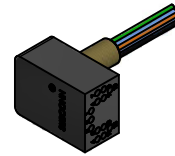
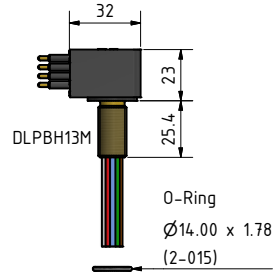
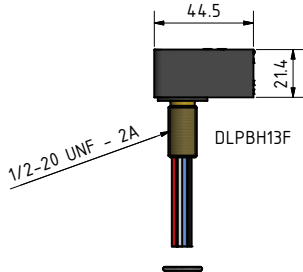
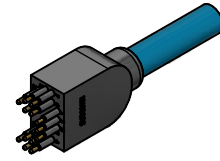
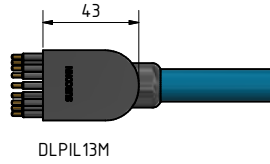
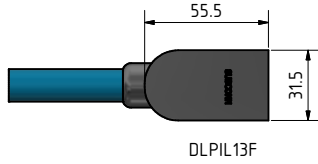
* Twisted pairs

Nominal cable outside diameter (OD)

PUR cable 0.550", 13.97 mm

Additional information

Standard RJ45 cannot be mounted on inline cable and will require a RJ45 Phoenix connector or equivalent.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Ethernet Metal Shell 2000

8 contacts

Connector specifications

Voltage rating	250 V DC/AC rms
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi

Material specifications

Connector body	Chloroprene rubber
Connector housing	Stainless steel AISI 316 (other materials on request)
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Bulkhead leads (3.3 ft, 100 cm)	CAT 5E patch cable incl. RJ 45 connector (not installed)

Face view (male)



Wire colour code

1-2 Brown, Brown/white*	5-6 Orange, Orange/white*
3-4 Blue, Blue/white*	7-8 Green, Green/white*

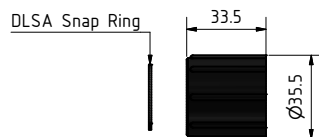
* Twisted pairs



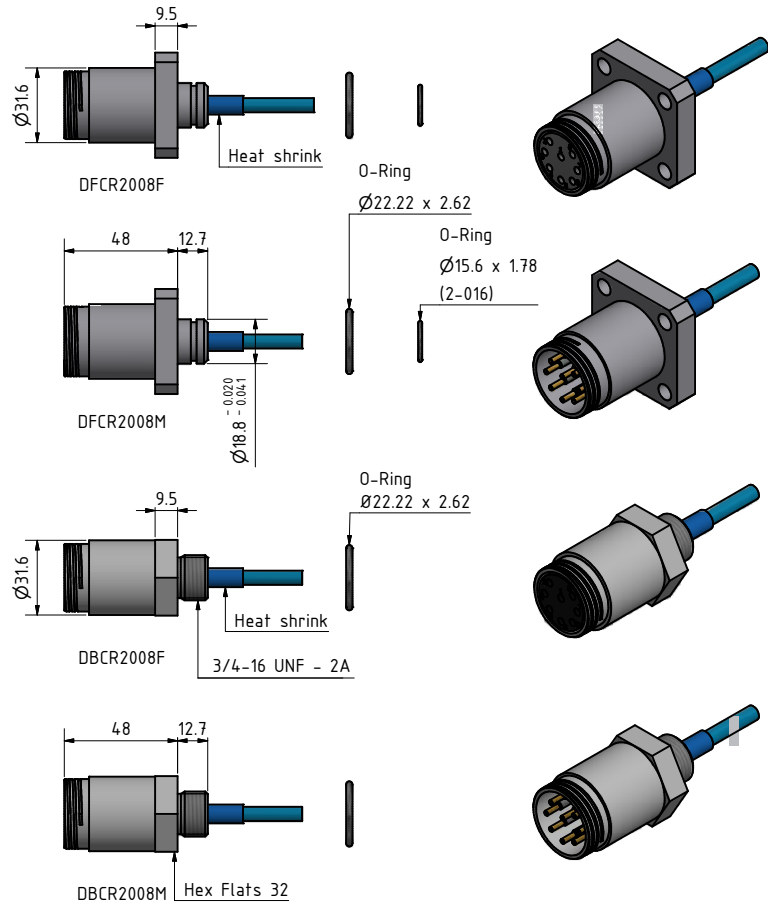
For more information see page 74/75 DIL8F



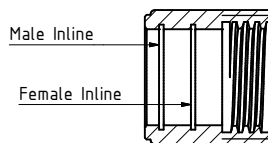
For more information see page 74/75 DIL8M



LS2000



Snap ring placement



With male inline connector - snap ring in outer groove

With female inline connector - snap ring in inner groove

Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Ethernet Metal Shell 2000

13 contacts

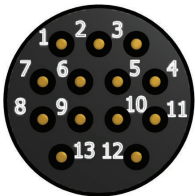
Connector specifications

Voltage rating	600 V DC/AC rms
Voltage rating on data wire	250 V DC/AC rms
Current rating on power wire	4 A per contact (max 16 A per connector)
Data rate	1 Gbit/s (up to 75 m)
Insulation resistance	> 200 Mohm
Contact resistance	< 0.01 ohm
Wet matings	> 500 (open face rated)
Temperature rating (water)	- 4 to 60°C, 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	600 bar, 8,700 psi

Material specifications

Connector body	Chloroprene rubber
Connector housing	Stainless steel AISI 316 (other materials on request)
Contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Bulkhead leads (3.3 ft, 100 cm)	CAT 5E patch cable, 4 x 20 AWG, 0.52 mm² coloured PTFE incl. RJ 45 connector (not installed)

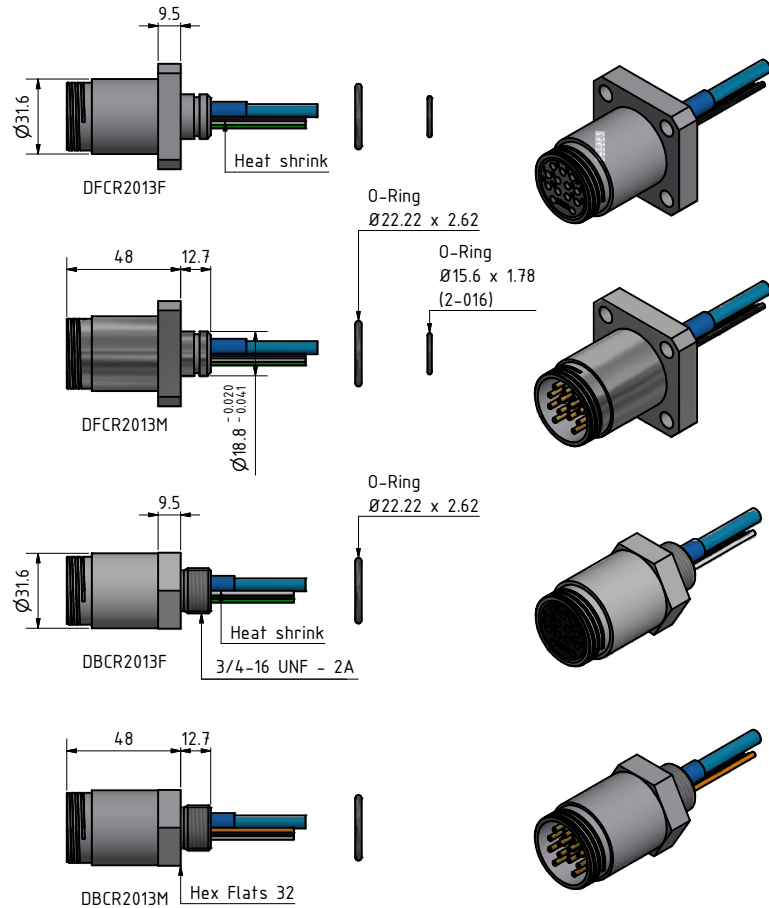
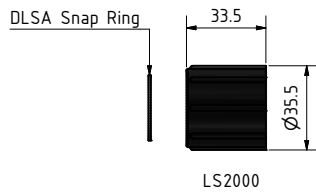
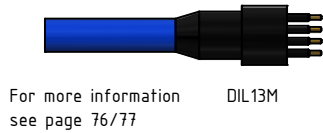
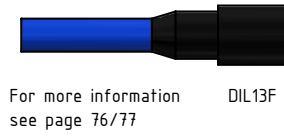
Face view (male)



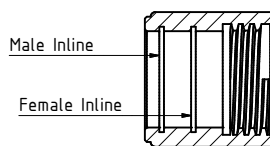
Wire colour code

1 Black	4-5 Brown, Brown/white*	10-11 Green, Green/white*
2 Screen (orange wire on bulkhead)	6-7 Blue, Blue/white*	12 Red
3 White	8-9 Orange, Orange/white*	13 Green

* Twisted pairs



Snap ring placement



With male inline connector - snap ring in outer groove

With female inline connector - snap ring in inner groove

Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Quote

"I'm very happy to learn about the company's expansion and faster delivery times. I love the product and recommend your systems whenever I can to the people here at WHOI. Thank you very much."

*Stephen Gagnon
WHOI*

SubConn® Coax series



The SubConn® Coax series is primarily used for facilitating the transmission of high-definition (HD) video signal within and between underwater systems and for interfacing HD video based equipment such as cameras and telemetry systems. The SubConn® Coax connectors feature a high depth rating and fully harness the rugged quality and basic SubConn® design that has been trusted by marine industry operators for decades.

The SubConn® Coax series embraces two primary connector models including a coax-only connector option and a combined coax and electric connector option with six electric contacts for handling power and signal on interfaced equipment. The latter option enables users to fully control and power equipment using only a single connector, hereby allowing for design optimisation of underwater systems. Both connector types are available with an impedance of 50 or 75 ohm.

SubConn® Coax connectors are dry mate only and cannot take open face pressure.

SubConn® Coax connectors come with colour-coded leads and are often supplied with dummy connectors and injection moulded polyoxymethylene (POM) or stainless steel locking sleeves (required). In addition, SubConn® Coax connectors are available with specially designed SubConn® coax- or combined power and coax cable manufactured from flexible and water-resistant polyurethane (PUR).

Applications

- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Underwater camera, video and lighting systems
- Underwater telemetry systems
- Antenna applications
- Diving systems and equipment

Options

- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

SubConn® HF Coax

50 ohm Coax and Coax/Electric

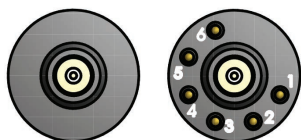
Connector specifications

Voltage rating on electric contacts	300 V DC/AC rms									
Current rating on electric contacts	5 A per contact (max 20 A per connector)									
Voltage rating on coax insert only	800 V, max nominal voltage acc. to MIL									
Frequency*	0.3 GHz	0.6 GHz	0.9 GHz	1.2 GHz	1.5 GHz	1.8 GHz	2.1 GHz	2.4 GHz	2.7 GHz	3.0 GHz
Attenuation*	5.0 dB	7.7 dB	9.9 dB	11.6 dB	13.4 dB	15.3 dB	17.3 dB	19.3 dB	21 dB	22.5 dB
Recommended max frequency	3.0 GHz									
Insulation resistance	> 200 Mohm									
Contact resistance	< 0.01 ohm									
Wet matings	N/A (dry mating only)									
Temperature rating (water)	- 4 to 60°C, 25 to 140°F									
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F									
Storage temperature rating	- 40 to 60°C, - 40 to 140°F									
Qualified pressure tested	600 bar, 8,700 psi									

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium or anodised aluminium
Power contacts	Female sockets in gold plated brass UNS - C36000 Male pins in gold plated beryllium copper
Coax contacts	Gold plated contacts
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	PUR jacket cable with RG58 coax or RG58 coax and 6 x 20 AWG, 0.52 mm ² conductors RG316 coax RG316 coax and 6 x 20 AWG, 0.52 mm ² coloured PTFE
Coax bulkhead leads (3.3 ft, 100 cm)	
Coax and 6-contact bulkhead leads (3.3 ft, 100 cm)	

Face view (male)



Inline cable colour code

1 Black	3 Red	5 Orange
2 White	4 Green	6 Blue

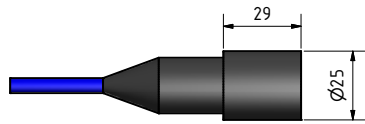
Nominal cable outside diameter (OD)

RG58 PUR cable 0.220", 5.59 mm
RG58 and 6-conductor PUR cable 0.382", 9.70 mm

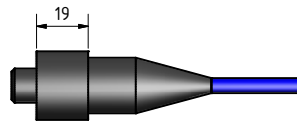
Additional information

*All frequency and attenuation values are based on a 10 meter cable assembly test including 2 bulkhead connectors (50 ohm).
BNC connector for RG316 coax leads use Amphenol 031-315-RFX or equivalent.
BNC connector for RG58 coax cable use Amphenol 112116 or equivalent.

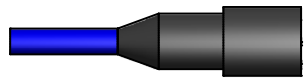
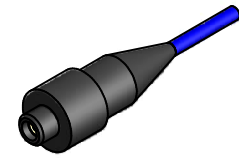
SubConn® Coax connectors are dry mate only, and cannot take open face pressure.
Locking sleeves are required. No greasing in the actual coax part.
Minimum bending radius on inline cable is 100 mm.



HF50CXILF



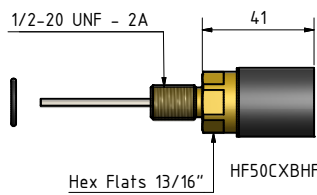
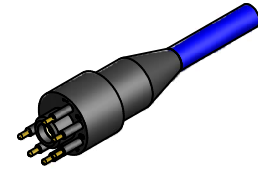
HF50CXILM



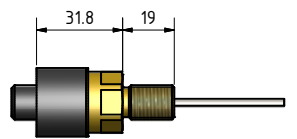
HF50CXIL6F



HF50CXIL6M

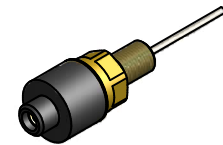


HF50CXBHF

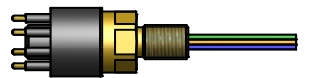


HF50CXBHM

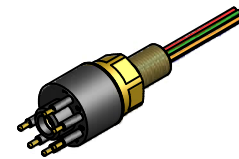
O-Ring
Ø14.00 x 1.78
(2-015)



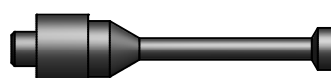
HF50CXBH6F



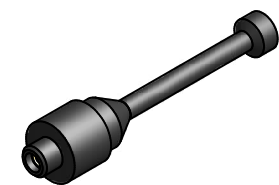
HF50CXBH6M



HF50CXDCF



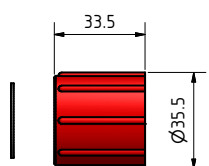
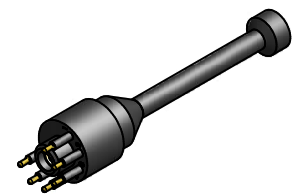
HF50CXDCM



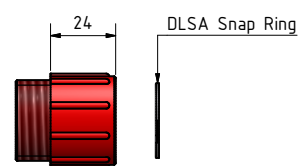
HF50CXDC6F



HF50CXDC6M



DLSA-F



DLSA-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® HF Coax

75 ohm Coax and Coax/Electric

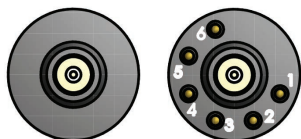
Connector specifications

Voltage rating on electric contacts	300 V DC/AC rms							
Current rating on electric contacts	5 A per contact (max 20 A per connector)							
Voltage rating on coax insert only	930 V, max nominal voltage acc. to MIL							
Frequency*	0.9 GHz	1.2 GHz	1.5 GHz	1.8 GHz	2.1 GHz	2.4 GHz	2.7 GHz	3.0 GHz
Attenuation*	6.3 dB	7.4 dB	8.6 dB	9.9 dB	11.3 dB	12.8 dB	14.5 dB	15.7 dB
Recommended max frequency	3.0 GHz							
Insulation resistance	> 200 Mohm							
Contact resistance	< 0.01 ohm							
Wet matings	N/A (dry mating only)							
Temperature rating (water)	- 4 to 60°C, 25 to 140°F							
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F							
Storage temperature rating	- 40 to 60°C, - 40 to 140°F							
Qualified pressure tested	600 bar, 8,700 psi							

Material specifications

Connector body	Chloroprene rubber
Bulkhead body	Brass, stainless steel, titanium or anodised aluminium
Power contacts	Female sockets in gold plated brass UNS - C36000
	Male pins in gold plated beryllium copper
Coax contacts	Gold plated contacts
O-rings	Nitrile
Locking sleeves	POM or stainless steel
Snap rings	Stainless steel AISI 302
Inline cable (2 ft, 60 cm)	PUR jacket cable with Mini-RG59 coax or Mini-RG59 coax and 6 x 20 AWG, 0.52 mm ² conductors
Coax bulkhead leads (3.3 ft, 100 cm)	RG179 coax
Coax and 6-contact bulkhead leads (3.3 ft, 100 cm)	RG179 coax and 6 x 20 AWG, 0.52 mm ² coloured PTFE

Face view (male)



Inline cable colour code

1 Black	3 Red	5 Orange
2 White	4 Green	6 Blue

Nominal cable outside diameter (OD)

Mini-RG59 PUR cable 0.220", 5.59 mm
 Mini-RG59 and 6-conductor PUR cable 0.382", 9.70 mm

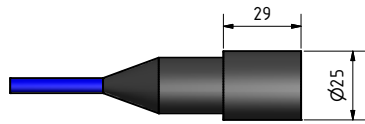
Additional information

*All frequency and attenuation values are based on a 10 meter cable assembly test including 2 bulkhead connectors (75 ohm).
 BNC connector for RG179 coax leads use Amphenol 112133 or equivalent.
 BNC connector for Mini-RG59 coax cable use Belden 1855ABHD3 or equivalent.

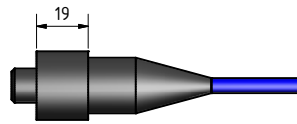
SubConn® Coax connectors are dry mate only, and cannot take open face pressure.

Locking sleeves are required. No greasing in the actual coax part.

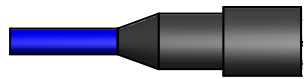
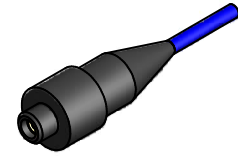
Minimum bending radius on inline cable is 100 mm.



HF75CXILF



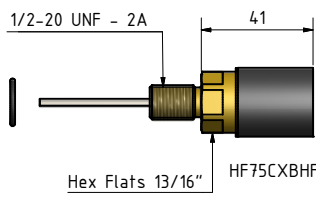
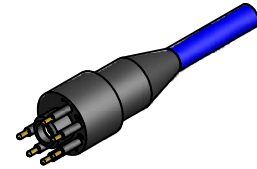
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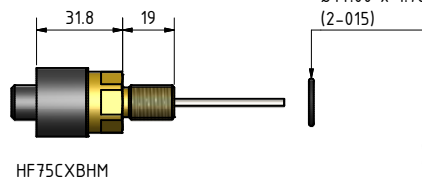
HF75CXIL6F



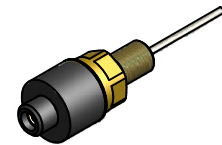
HF75CXIL6M



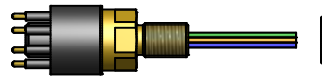
HF75CXBHF



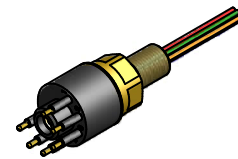
HF75CXBHM



HF75CXBH6F



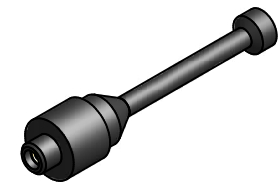
HF75CXBH6M



HF75CXDCF



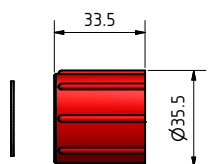
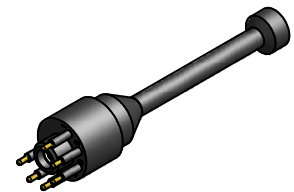
HF75CXDCM



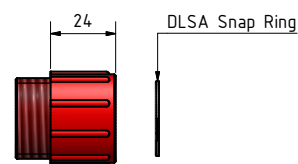
HF75CXDC6F



HF75CXDC6M



DLSA-F



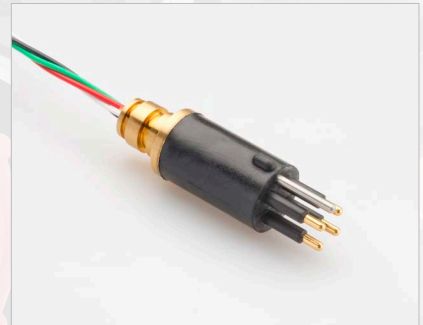
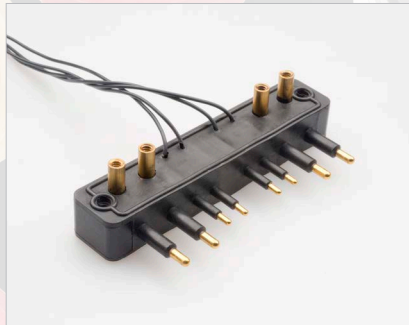
DLSA-M



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)





SubConn® Specials

SubConn Inc. holds extensive experience and expertise in supplying special connector solutions for a broad range of specific customer applications ranging from swimming pool cleaning equipment, through oceanographic sensors to advanced naval systems.

All SubConn® Specials are based on the proven SubConn® contact design and effectively address almost any underwater challenge. SubConn® Specials perfectly integrate with existing or newly developed customer systems and over the years, several SubConn® Specials have progressed to become the standard connectivity solution for specific applications.

SubConn Inc. and MacArtney engineers are always keen to address any unique and complex connectivity challenge faced by system developers and operators. All design and solution enquiries are welcome and supported by a process of knowledge sharing and dialogue. SubConn® aims to craft and deliver a cutting-edge solution.

SubConn® Specials can also be supplied as complete connectivity solutions with dedicated chloroprene rubber or polyurethane (PUR) cables, custom mouldings, assemblies, locking sleeves, snap ring or strap based locking systems and dummy connectors.





Applications

- Offshore oil and gas, renewable energy and subsea systems
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Remotely Operated Vehicle (ROV) and Remotely Operated Towed Vehicle (ROTV) systems
- Underwater camera, video and lighting systems
- Underwater telemetry systems
- Diving systems and equipment
- Other wet environment, marine and underwater applications

Specials[®]
uuoCqns

Options

- Customised connectors and cable assembly designs
- Customised harness cables and direct moulding to selected polyurethane (PUR) cables
- Customer specified cable, wire leads and bulkhead thread lengths
- Customer specified connector body material
- Certified pressure testing to specific ocean depths

Quote

"In Graaltech we believe that the right partnerships are one of the keys to success; SubConn® is the longtime partner for our AUV projects."

Andrea Pellegrini, Graaltech

SubConn® Penetrator series



The SubConn® Penetrator series is a fixed installation alternative to inline and bulkhead connectors. SubConn® Penetrators are primarily used for applications placing emphasis on direct signal and power feedthrough above the flexibility provided by a mateable connector interface.

SubConn® Penetrators are manufactured from chloroprene rubber and based on industry standard bulkhead threads which can be delivered in different materials. The series comprises five to six standard shell sizes in straight or right angle configurations. This allows for an extensive combination of solutions.

SubConn® Penetrator designs are not strictly limited to the standard versions and custom solutions can be delivered. For instance, it is possible to combine power and signal within a single unit.

All SubConn® Penetrators are water blocked to 800 bar and are often delivered with dedicated SubConn® cables made from flexible and water-resistant chloroprene rubber or polyurethane (PUR).

Applications

- Remotely Operated Vehicle (ROV) and subsea trencher systems
- Underwater camera, video and lighting systems
- Diving systems and equipment
- Defence systems and equipment
- Oceanographic systems, equipment and instrumentation solutions
- Ocean bottom cable and seismic systems
- Underwater telemetry systems

Options

- Customer specified penetrator body material
- Chloroprene and polyurethane (PUR) cables and mouldings
- Customised body designs
- Certified pressure testing to specific ocean depths

SubConn® Penetrator

Water Blocked Straight

Connector specifications

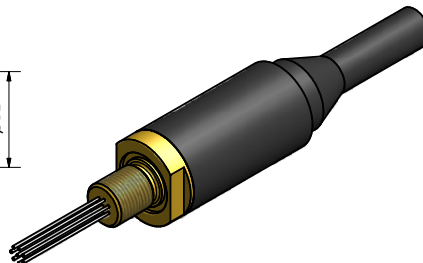
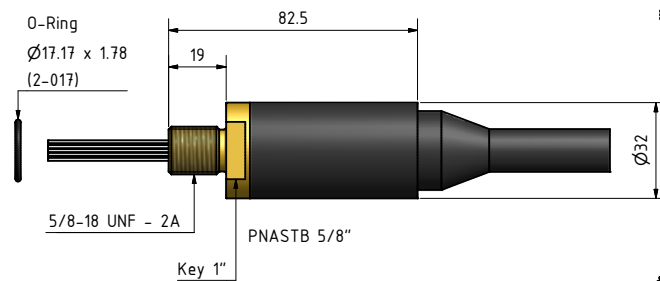
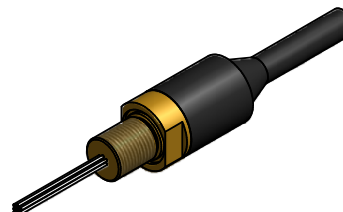
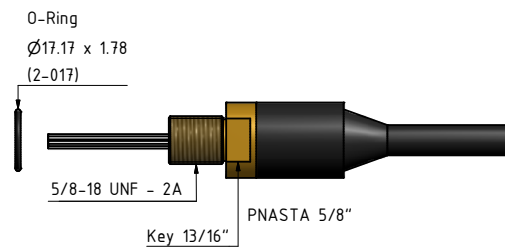
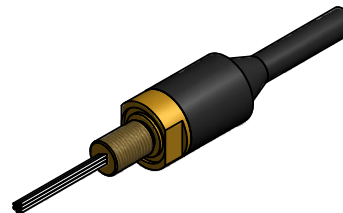
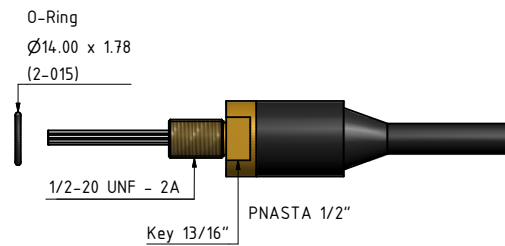
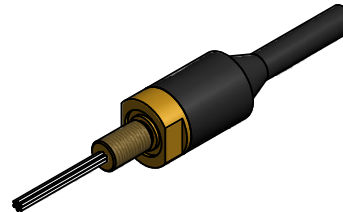
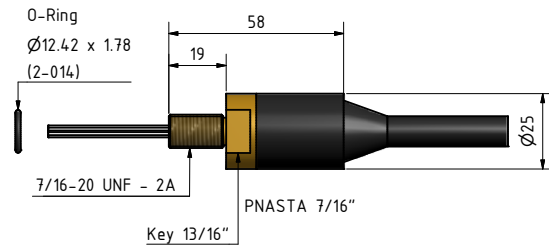
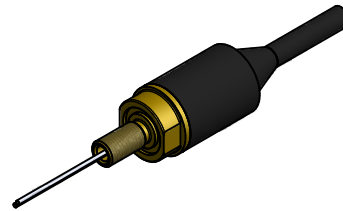
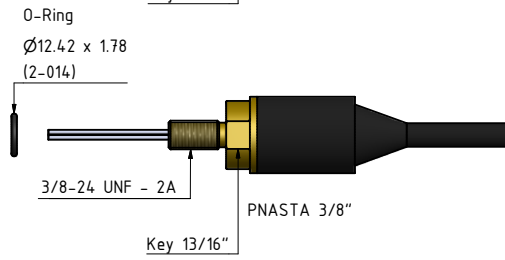
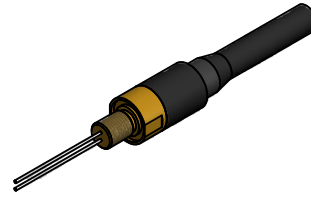
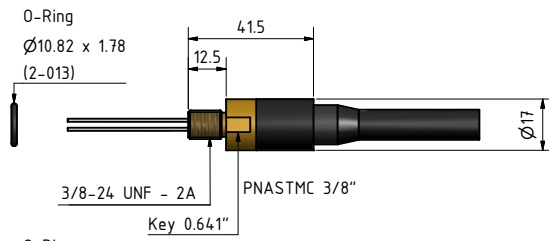
Voltage rating (all penetrators)	300/600 V DC/AC rms (depends on cable)
Current rating	Depends on wire and conductor size
Insulation resistance	> 200 Mohm
Temperature rating (water)	- 4 to 60°C, - 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Penetrator body	Chloroprene rubber
Penetrator metal part	Brass, stainless steel
Wire and conductor size	18 AWG, 0.82 mm ² to 22 AWG, 0.33 mm ² (depends on wire quantity)
Penetrator wire leads (30 cm, 1 ft)	PTFE
Cable outside diameter	Depends on penetrator and cable type
O-rings	Nitrile
Inline cable length	Customer specified
Inline cable type	Customer specified (SubConn® cables only)

Inline cable colour code

Depends on corresponding SubConn® connector and cable type.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



SubConn® Penetrator

Water Blocked Right Angle

Connector specifications

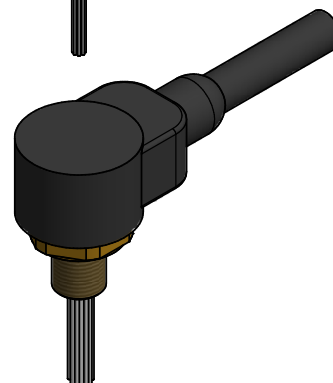
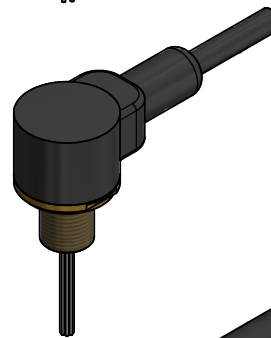
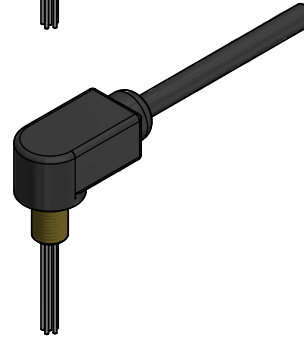
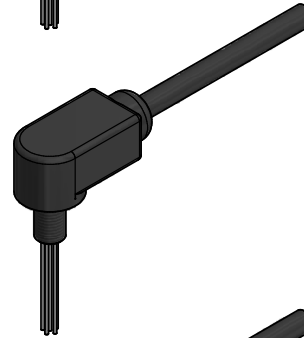
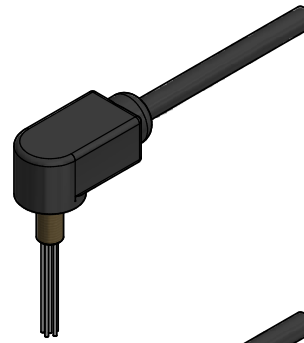
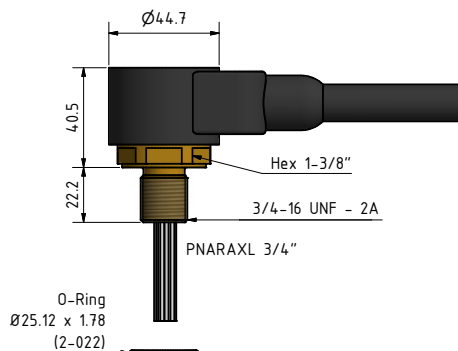
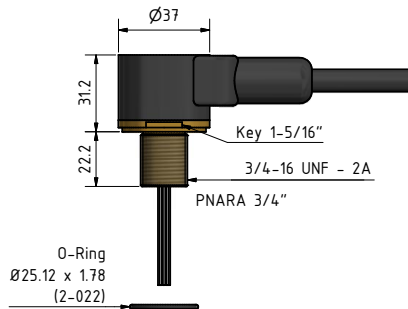
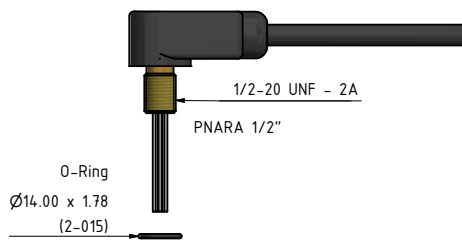
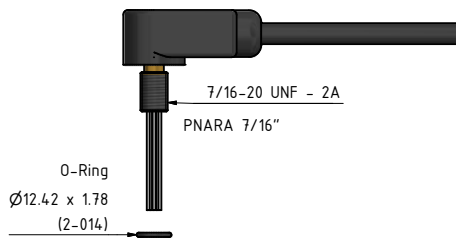
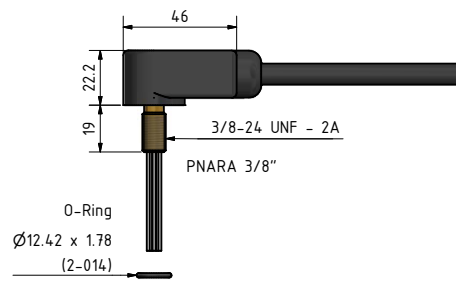
Voltage rating (all penetrators)	300/600 V DC/AC rms (depends on cable)
Current rating	Depends on wire and conductor size
Insulation resistance	> 200 Mohm
Temperature rating (water)	- 4 to 60°C, - 25 to 140°F
Temperature rating (air)	- 40 to 60°C, - 40 to 140°F
Storage temperature rating	- 40 to 60°C, - 40 to 140°F
Qualified pressure tested	800 bar, 11,600 psi

Material specifications

Penetrator body	Chloroprene rubber
Penetrator metal part	Brass, stainless steel
Wire and conductor size	18 AWG, 0.82 mm ² to 22 AWG, 0.33 mm ² (depends on wire quantity)
Penetrator wire leads (30 cm, 1 ft)	PTFE
Cable outside diameter	Depends on penetrator and cable type
O-rings	Nitrile
Inline cable length	Customer specified
Inline cable type	Customer specified (SubConn® cables only)

Inline cable colour code

Depends on corresponding SubConn® connector and cable type.



Drawing information

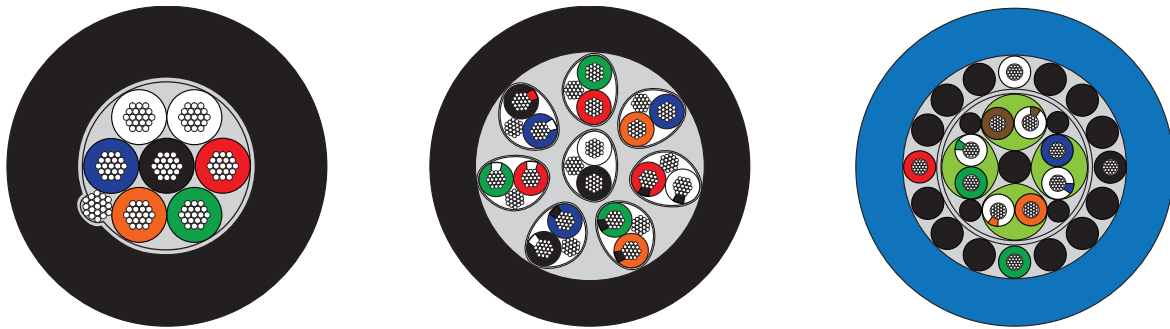
Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)

Quote

"Marine Survey has sold SubConn® connectors to the Swedish market since the eighties. We have met many satisfied customers who during these years have used SubConn® connectors regularly. High quality and secure deliveries are important components in the SubConn® business."

*Cecilia Drougge
Marine Survey & Consulting AB*

SubConn® polyurethane cables



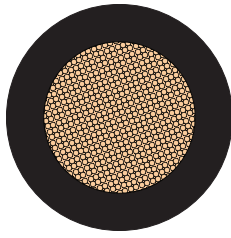
All SubConn® connectors and penetrators can be supplied with dedicated underwater cables of various types and conductor configurations. As standard, the majority of SubConn® connectors is supplied with chloroprene rubber cables, while the Ethernet and Coax series, among others, feature polyurethane (PUR) cables as standard.

All SubConn® connector products can also be delivered with special PUR type cables that are specifically designed, manufactured and tested for use with SubConn® connectors.

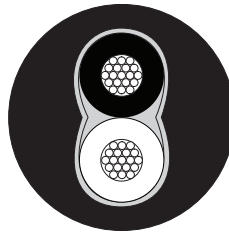
SubConn holds the entire range of rugged, special PUR cables in stock including several different power and signal conductor combinations and dimensions.

When procured in conjunction with SubConn® connectors or penetrators, this broad range of special cable options allows the customer to assemble the optimal underwater connectivity solution for any task or application.

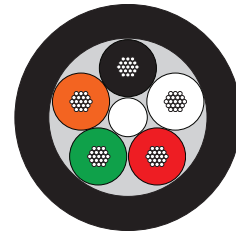
Furthermore, SubConn is among the few companies within the industry mastering the advanced technique of moulding rubber connectors to PUR cables, hereby allowing customers to obtain even more flexible, efficient and rugged connectivity solutions.



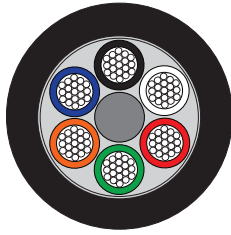
Type: P1C1/0#
1 conductor, 1/0 AWG
Nominal cable OD: 0.606", 15.4 mm



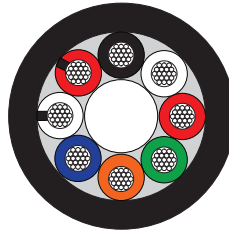
Type: P2C20#
2 conductors, 20 AWG
Nominal cable OD: 0.294", 7.47 mm



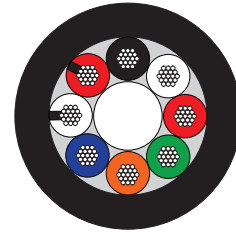
Type: P5C20#
5 conductors, 20 AWG
Nominal cable OD: 0.256", 6.50 mm



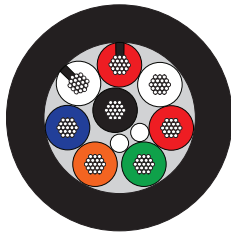
Type: P6C16#
6 conductors, 16 AWG
Nominal cable OD: 0.365", 9.28 mm



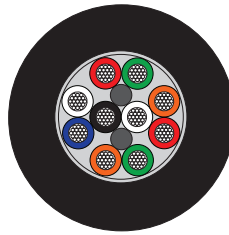
Type: P8C22#-a
8 conductors, 22 AWG
Nominal cable OD: 0.250", 6.35 mm



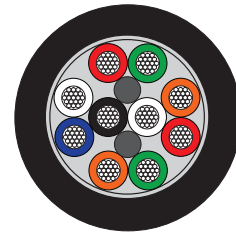
Type: P8C20#
8 conductors, 20 AWG
Nominal cable OD: 0.354", 9.00 mm



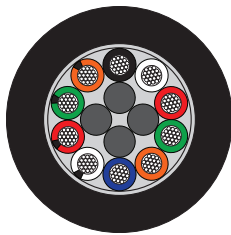
Type: P8C16#
8 conductors, 16 AWG
Nominal cable OD: 0.472", 11.9 mm



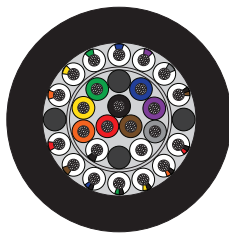
Type: P10C18#-a
10 conductors, 18 AWG
Nominal cable OD: 0.420", 10.67 mm



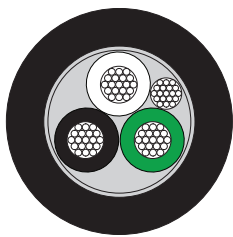
Type: P10C18#-b
10 conductors, 18 AWG
Nominal cable OD: 0.380", 9.65 mm



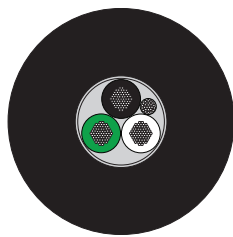
Type: P10C16#
10 conductors, 16 AWG
Nominal cable OD: 0.570", 14.48 mm



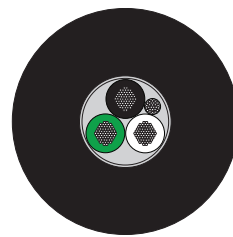
Type: P22C20#/3C18#
22 conductors, 20 AWG
3 conductors, 18 AWG
Nominal cable OD: 0.589", 15 mm



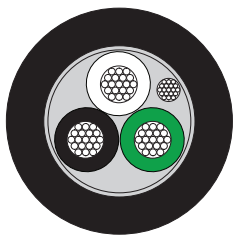
Type: P3C18# OS
 3 conductors, 18 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.259", 6.58 mm



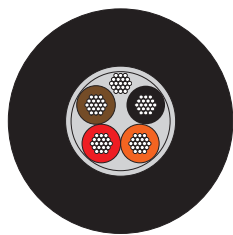
Type: P3C12# OS
 3 conductors, 12 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.450", 11.43 mm



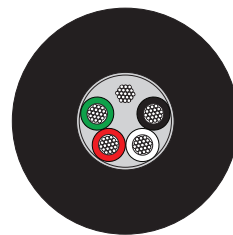
Type: P3C10# OS
 3 conductors, 10 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.500", 12.70 mm



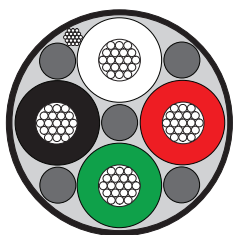
Type: P3C16# OS
 3 conductors, 16 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.285", 7.24 mm



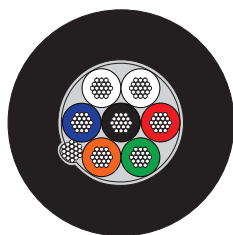
Type: P4C20# OS
 4 conductors, 20 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.315", 8.00 mm



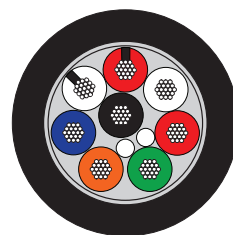
Type: P4C18# OS
 4 conductors, 18 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.325", 8.26 mm



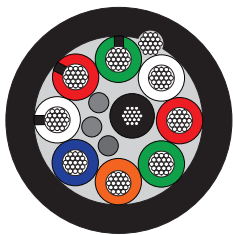
Type: P4C8# OS-PP
 4 conductors, 8 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.652", 16.55 mm



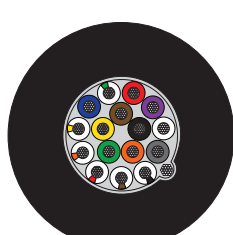
Type: P7C20# OS
 7 conductors, 20 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.315", 8.00 mm



Type: P8C16# OS
 8 conductors, 16 AWG
 Braided tinned copper shield
 Nominal cable OD: 0.438", 11.3 mm



Type: P9C20# OS
 9 conductors, 20 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.359", 9.12 mm



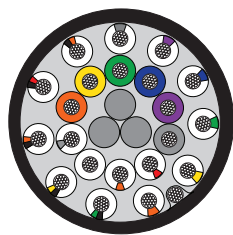
Type: P16C22# OS
 16 conductors, 22 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.415", 10.55 mm



Type: P16C20# OS
 16 conductors, 20 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.409", 10.40 mm

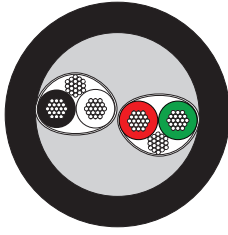


Type: P16C16# OS
 16 conductors, 16 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.560", 14.23 mm

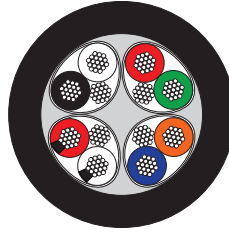


Type: P21C20# OS
 21 conductors, 20 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.578", 14.70 mm

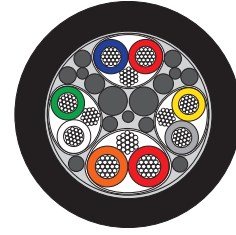
Shielded twisted pair cables



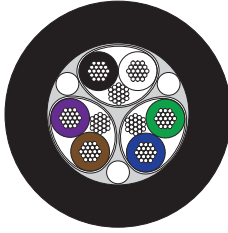
Type: P2TSP20#
2 twisted screened pairs, 20 AWG
Screens with foil and drain wire
Nominal cable OD: 0.335", 8.50 mm



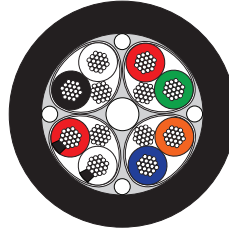
Type: P4TSP18#
4 twisted screened pairs, 18 AWG
Screens with foil and drain wire
Nominal cable OD: 0.500", 12.70 mm



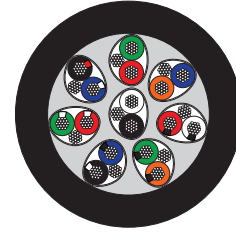
Type: P3TSP22#/1TSP18#
3 twisted screened pairs, 22 AWG
1 twisted screened pair, 18 AWG
Screens with foil and drain wire
Nominal cable OD: 0.400", 10.16 mm



Type: P3TSP20#
3 twisted pairs, 20 AWG
Screens with foil and drain wire
Nominal cable OD: 0.400", 10.16 mm

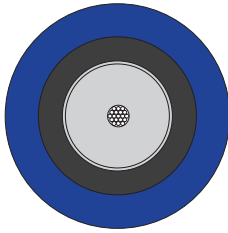


Type: P4TSP20#
4 twisted screened pairs, 20 AWG
Screens with foil and drain wire
Nominal cable OD: 0.409", 10.40 mm

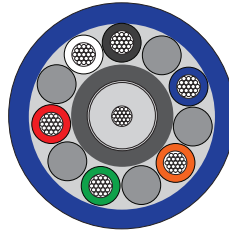


Type: P8TSP20#
8 twisted screened pairs, 20 AWG
Screens with foil and drain wire
Nominal cable OD: 0.508", 12.90 mm

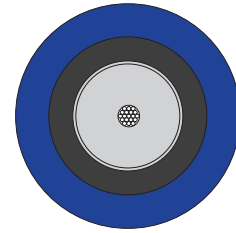
Coax cables



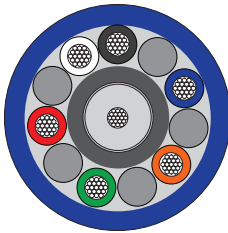
Type: P/HFCX75
1 Coax, 75 Ω
Nominal cable OD: 0.220", 5.59 mm



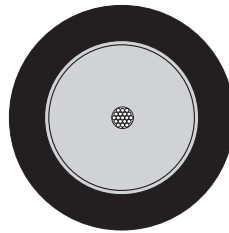
Type: P/HFCX75/6C20#
6 conductors, 20 AWG
1 Coax, 75 Ω
Nominal cable OD: 0.382", 9.70 mm



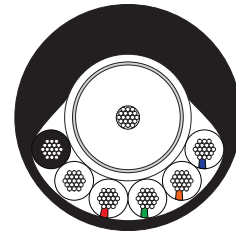
Type: P/HFCX50
1 Coax, 50 Ω
Nominal cable OD: 0.220", 5.59 mm



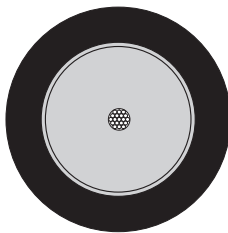
Type: P/HFCX50/6C20#
6 conductors, 20 AWG
1 Coax, 50 Ω
Nominal cable OD: 0.382", 9.70 mm



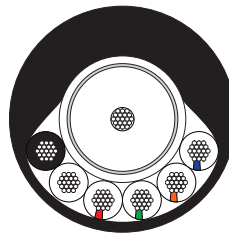
Type: PCX75
1 Coax, 75 Ω
Nominal cable OD: 0.305", 7.75 mm



Type: PVCX6C20# 75Ω
6 conductors, 20 AWG
1 Coax, 75 Ω
Nominal cable OD: 0.386", 9.80 mm

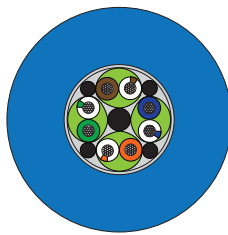


Type: PCX50
1 Coax, 50 Ω
Nominal cable OD: 0.291", 7.38 mm

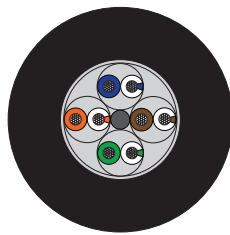


Type: PSCX6C20# 50Ω
6 conductors, 20 AWG
1 Coax, 50 Ω
Nominal cable OD: 0.386", 9.80 mm

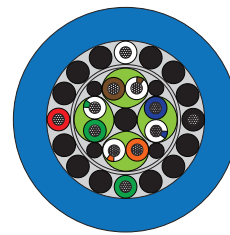
Ethernet cables



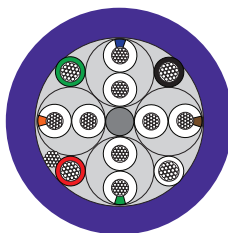
Type: D/P4TP24#
 4 twisted pairs, 24 AWG
 Overall copper braiding
 Nominal cable OD: 0.409", 10.40 mm



Type: D/P4TP24# SW
 4 twisted pairs, 24 AWG
 Shallow water version
 Nominal cable OD: 0.380", 9.65 mm
 Depth rating 300 m only

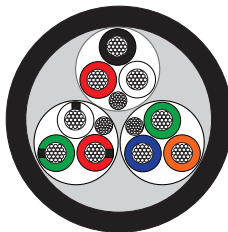


Type: D/P-P4TP24#/4C18#
 4 twisted pairs, 24 AWG
 Overall screen on TP with copper braiding
 4 conductors, 18 AWG
 Nominal cable OD: 0.550", 13.97 mm

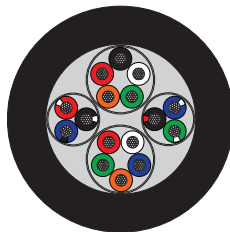


Type: D/P4TP22#/4C18# OS
 4 twisted pairs, 22 AWG
 4 conductors, 18 AWG
 Overall screen with foil and drain wire
 Nominal cable OD: 0.520", 13.2 mm

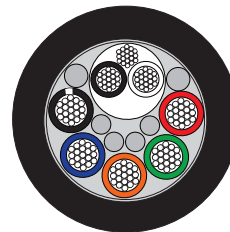
Other cables



Type: P3TST20#
 3 twisted triple, 20 AWG
 Screen with foil and drain wire
 Nom. cable OD: 0.410", 10.41 mm



Type: P2Quint22#/1Triple22#/1Triple20#
 2 twisted quint, 22 AWG
 1 twisted triple, 22 AWG
 1 twisted triple, 20 AWG
 Nom. cable OD: 0.430", 10.92 mm



Type: P1TSP20/5C20#
 1 twisted screened pair, 20 AWG
 Screen with foil and drain wire
 5 conductors, 20 AWG
 Nom. cable OD: 0.339", 8.62 mm



Type: P7TP22/2C18#
 7 twisted pairs, 22 AWG
 2 conductors, 18 AWG
 Nom. cable OD: 0.480", 12.20 mm

Quote

"Falmouth Scientific (FSI) has been using SubConn® connectors for many years on our standard current, wave, and tide meters, in our system solutions, and on many custom development projects. We can always rely on SubConn Inc. to provide a cost-effective product with exceptional quality and reliability."

Falmouth Scientific (FSI)

SubConn® additional accessories



SubConn Inc. and the MacArtney Underwater Technology Group have been supplying the world's leading range of underwater pluggable electrical connectors to the demanding underwater industry for decades.

All SubConn® accessories are held in stock with MacArtney. The connectors are available with a full range of accessories including locking sleeves, straps, snap rings, nuts, washers, o-rings, boots, grease and field splicing kit sets.

We aim to be accessible around the world and around the clock. World-wide office locations, an extensive distributor network spread across the globe and 24/7 phone service enable us to offer global access to local support.

Locking sleeves

Locking sleeves are available in a range of colours in POM or ABS and in stainless steel AISI 316.

DLSA-M/F



Red



Blue



Black



Green



Yellow



White

SSLSA-M/F



AISI 316

DLSB-M/F



Red



Blue



Black



Green

SSLSB-M/F



AISI 316

DLSC-M/F



Red



Blue

SSLSC-M/F



AISI 316

MCDLS-M/F



Red



Blue



Black



Green



Orange

MCSSLs-M/F



AISI 316

LS2000



Black

LS2400



Black

DLSM1-M/F



Black

MCDWLS



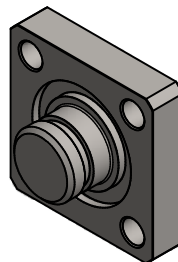
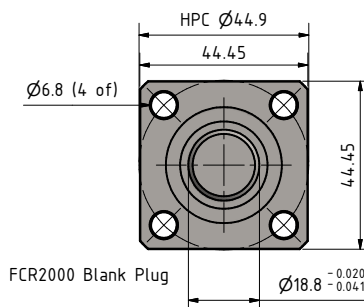
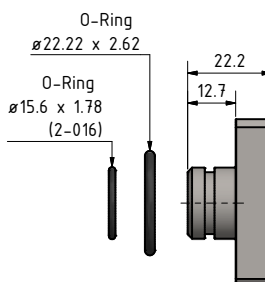
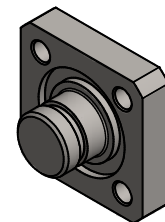
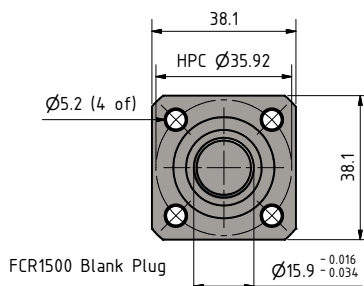
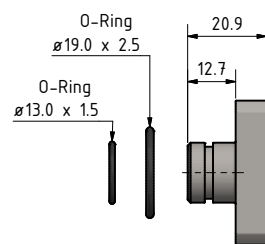
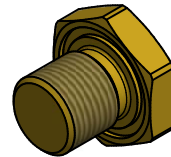
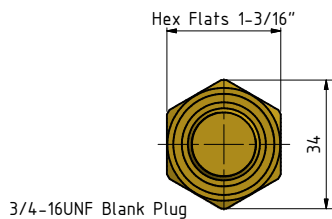
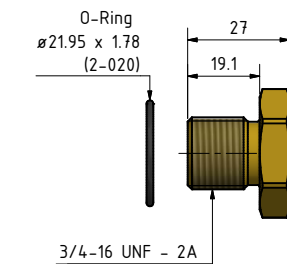
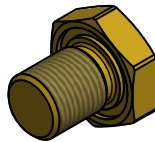
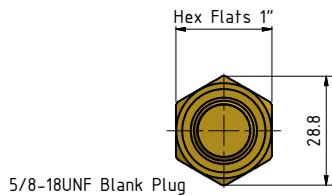
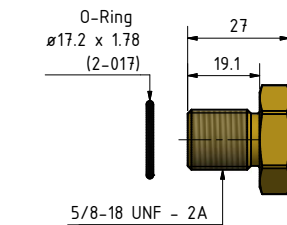
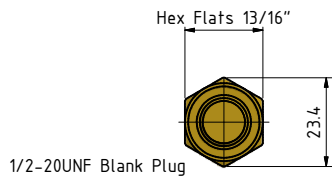
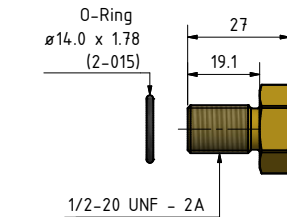
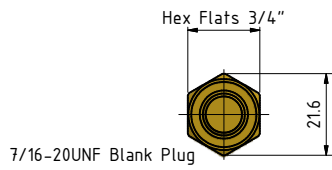
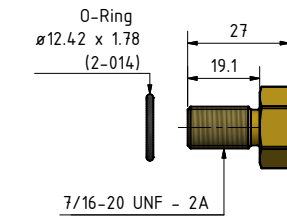
MCSSDWLS



AISI 316

Blank plugs

Blank plugs are available in stainless steel AISI 316 or brass UNS-C36000 (other materials on request).



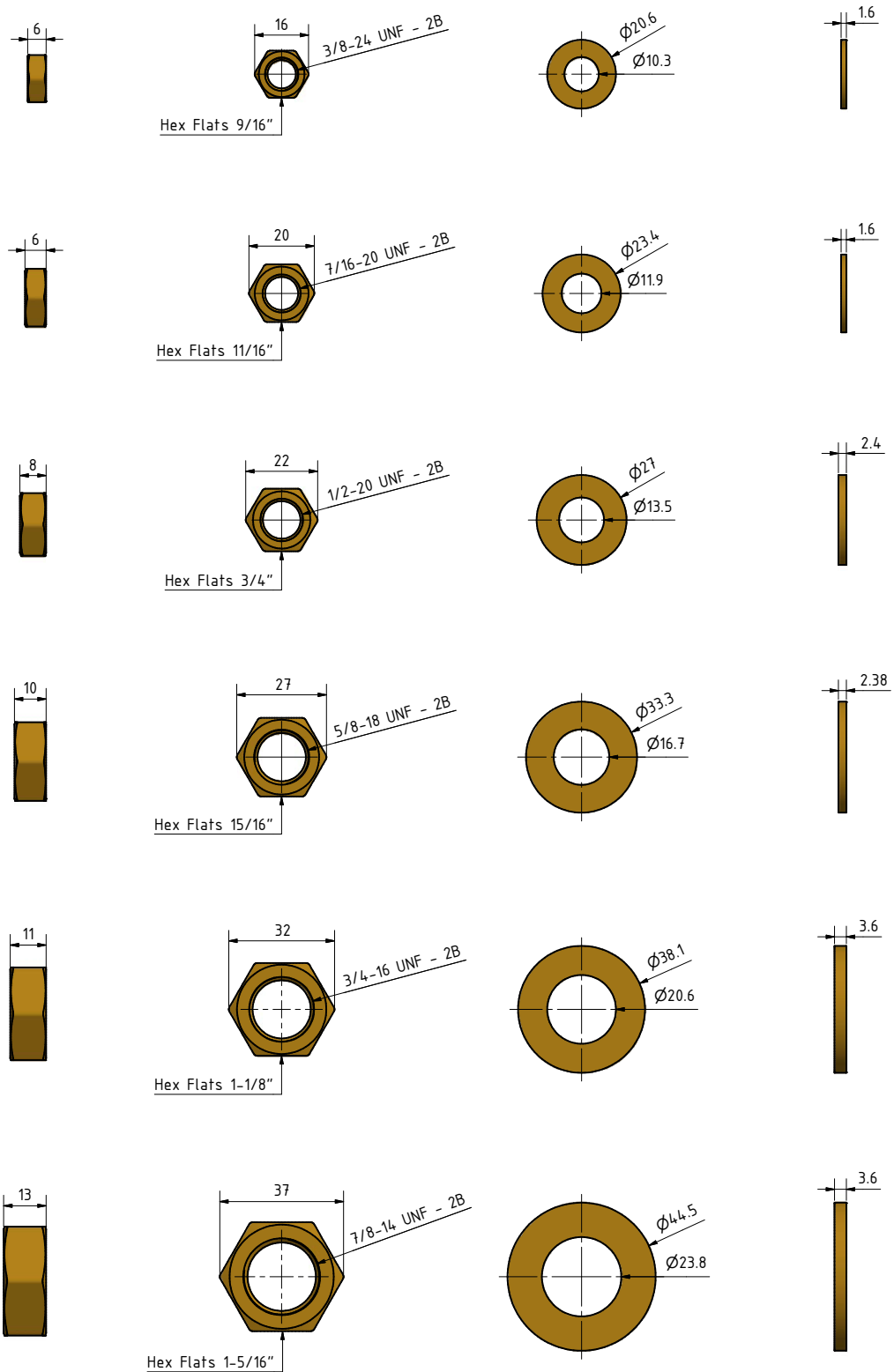
Drawing information

Dimensions in mm (1 mm = 0.03937 inch)
Threads in inches (1 inch = 25.4 mm)



Nuts and washers

Nuts and washers can be supplied in stainless steel AISI 316 or brass UNS-C36000.



Drawing information

Dimensions in mm (1 mm = 0.03937 inch)

Threads in inches (1 inch = 25.4 mm)

FSK assembly procedure

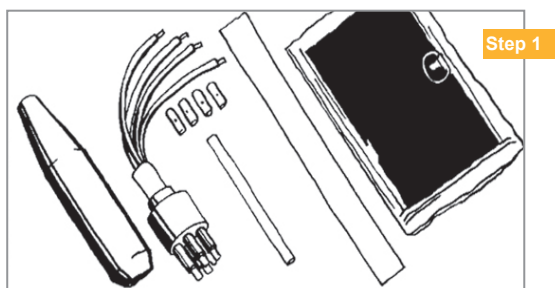
Introduction

The SubConn® OM series of connectors is supplied as a quick reliable and watertight solution for customers who require installation of standard SubConn® connectors on a non-standard cable or for quick, efficient field retermination.

The OM connector series mates with the compatible standard SubConn® series.

The connectors are produced with a tube brass body and 7 cm pigtail wires which are spliced and moulded to the cable using a pre-formed "Boot" and pre-packed ambient temperature curing polyurethane.

The end result is a professional, rugged and watertight termination rated to full ocean depth. The connector is available in 2 to 16 pin male and female configurations together with all the specials with the same shell size.



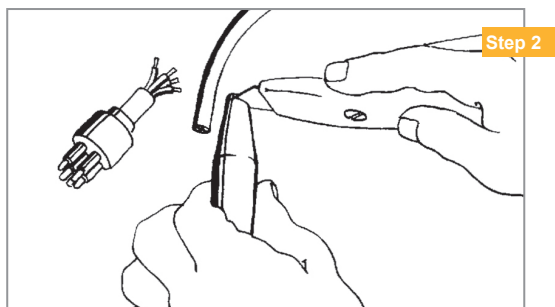
Step 1

Operational steps

1. Ensure that the correct materials are available for the planned job

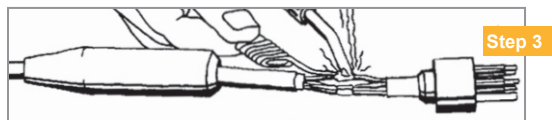
- The correct OM connector, e.g. OM6F (not included in the FSK)
- The correct "Boot" (e.g. OMBB)
- Adequate moulding material (e.g. 2131, 90 g from 3M)
- Primers (Scotchcast™ Resin Primer 5136 from 3M)*
- Acetone for degreasing*
- Crimp sleeve and heating gun
- Soldering iron, solder, side cutters, cable stripper and small paint brush

* Please notice that primers and acetone are not part of the delivery. You will need to purchase these items individually to be sent as dangerous goods or purchase them locally.



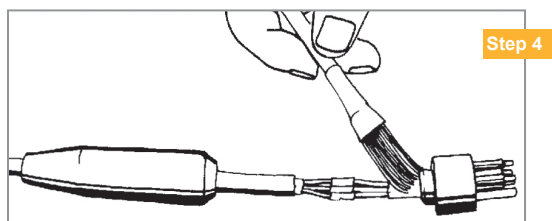
Step 2

2. Cut pigtail wires on OM connector to approx. 2 cm from the brass body. Trim back tapered cable entry on boot until the cable is a snug fit (approx. 0.5 mm less than cable diameter).



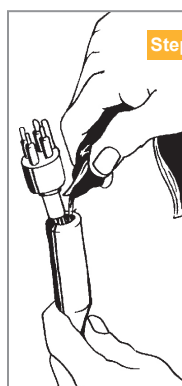
Step 3

3. Prepare cable to be connected by stripping 3 cm off the jacket. Solder or crimp cable wires to pigtail on OM connector and insulate using crimp sleeve, heat shrink, or electrical tape. The spliced conductors should be twisted together in the same direction as laid in the cable.

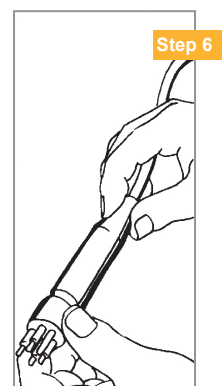


Step 4

4. Degrease all moulding surfaces including cable jacket, conductors and brass body with acetone and allow to dry. Apply appropriate primer to brass body conductors, cable jacket and neoprene base of connector with a small brush and allow to dry (approx. 30 min. at 20°C). Do not touch primed surfaces after primer application.



Step 5



Step 6

5. Select the appropriate polyurethane twin pack (e.g. 2131, 90 g for a single moulding) and mix the PUR material according to supplier instruction. Cut off the corner of the pack and squeeze the material into the boot as shown.

6. When the boot is full of material slide it up the cable until it fits tightly over the neoprene protrusion on the back of the connector. Push the cable into the boot about 2 mm and wipe off any excess visible polyurethane material. The connector will be ready for use after 12 hours at 20°C.

Safe handling procedures

To comply with recommended health and safety procedures; ensure the use of barrier creams, gloves and a clean, well-ventilated work area.

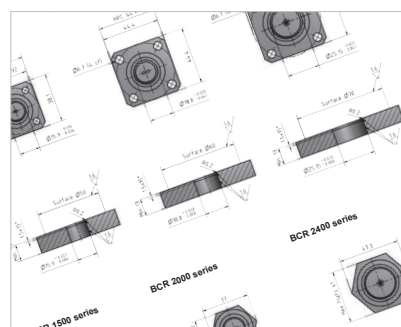
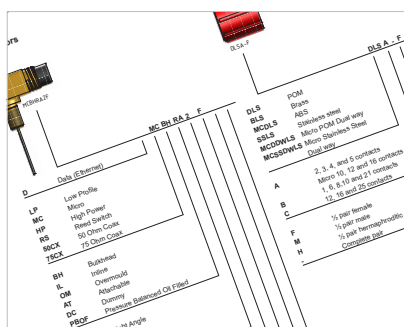
Quote

"Due to the high reliability and efficiency of SubConn® sealed connectors, BO "AKVAIRI-SPb" has become a regular supplier of sealed connectors for various research institutes. We made a decision to supply SubConn sealed connectors to our many different underwater projects within our markets.

We are proud to work with you."

*Vasilevskaya Angelina
Sales Administrator - SubConn Sales
BO "AKVAIRI-SPb"*

Technical information

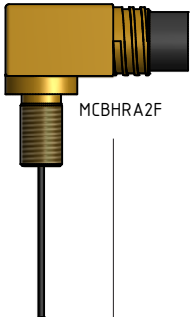


SubConn® connectors are designed, manufactured and tested for use in harsh marine environments. Operators are encouraged to read this section carefully and to follow the recommendations and instructions, in order to sustain the performance and extend the lifespan of their SubConn® connectors.

- Abbreviation list
- Recommended mounting hole
- Mounting specifications for Metal Shell
- Recommended torque on SubConn® connector thread sizes
- Mounting procedure for Low Profile strap
- SubConn® connector body material types
- Qualification test
- Test and acceptance criteria
- American wire gauge (AWG) to metric
- Conductor resistance of copper
- Formulas
- RoHs/Reach directive
- Rubber information
- Termination information
- Cable information
- Cable assembly information
- Hoses for pressure balanced oil filled connectors
- Recommended oil for pressure balanced systems
- Pressure PSI/BAR
- SubConn® handling instructions
- Galvanic series of metals in seawater
- Information on debonding and corrosion

Abbreviation list

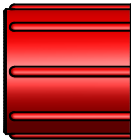
Connectors



MC BH RA 2 F

D	Data (Ethernet)
LP	Low Profile
MC	Micro
HP	High Power
RS	Reed Switch
HF	High Frequency
HF 50CX	50 ohm Coax
HF 75CX	75 ohm Coax
BH	Bulkhead
IL	Inline
OM	Overmould
AT	Attachable
DC	Dummy
PBOF	Pressure Balanced Oil Filled
RA	Right Angle
S	SplitConn
V	VentConn
B	Battery
M	Mini
2	Number of contacts
F	Female sockets
M	Male pins
H	Hermaphroditic
SS	Stainless Steel
AS	Anodised Aluminium
TI	Titanium
NM	Non Metallic
UNS32550	Super Duplex
G2	2nd Generation
WB	Water Blocked
2 O-ring	Double O-ring
GP	Gold plated contacts

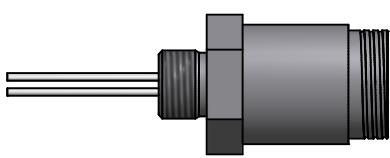
Locking sleeves (LS)



DLS A - F

DLS	POM
BLS	Brass
MCDLS	ABS
SSLS	Stainless steel
MCDDWLS	Micro POM Dual way
MCSSDWLS	Micro Stainless Steel Dual way
A	2, 3, 4, and 5 contacts Micro 10, 12 and 16 contacts
B	1, 6, 8,10 and 21 contacts
C	12, 16 and 25 contacts
F	½ pair female
M	½ pair male
H	½ pair hermaphroditic
-	Complete pair

Metal Shell connectors



BCR2002F

BCR 2002 F

D	Data (Ethernet)
BCR	Bulkhead connector receptable
FCR	Flange connector receptable
20xx	Shell size (series)
xx04	Number of contacts
F	Female socket
M	Male pins
AS	Anodized Aluminium
TI	Titanium
NM	Non Metallic

Locking sleeves (LS)



LS2000

LS 2000

LS	POM
SSLS	Stainless steel
2000	Shell size (series)
1500	Metal Shell series uses MCDLS locking sleeves

Abbreviation list

Penetrator - Straight



PNASTMC 3/8"

PNA ST MC 3/8"

Leads information:	
Length	
Size	
Quality	
PNA Penetrator	
ST	Straight
MC Micro size, OD 17 mm	
A	A-size, OD 25 mm
B	B-size, OD 32 mm
Thread sizes and length:	
MC	3/8"
A	3/8" / 7/16" / 1/2" or 5/8"
B	5/8"
All sizes are available in various thread length from 1/2" to 1.375"	
Body material:	
Std	Brass
SS	Stainless Steel
AS	Anodised Aluminium
TI	Titanium
Cable information:	
Length	
Size	
Type	

Penetrator - Right Angle



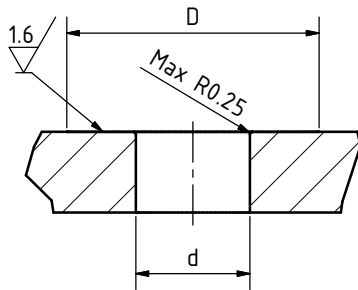
PNARA 3/8"

PNA RA XL 3/8" GS

Leads information:	
Length	
Size	
Quality	
PNA Penetrator	
RA	Right Angle
XL	Extra Large
Thread sizes and length:	
PNARA	3/8" / 7/16" or 1/2"
PNARA 3/4"	3/4"
XL	3/4"
All sizes are available in various thread length from 1/2" to 1.375"	
GS	Glass Spheres
Body material:	
Std	Brass
SS	Stainless Steel
AS	Anodised Aluminium
TI	Titanium
Cable information:	
Length	
Size	
Type	

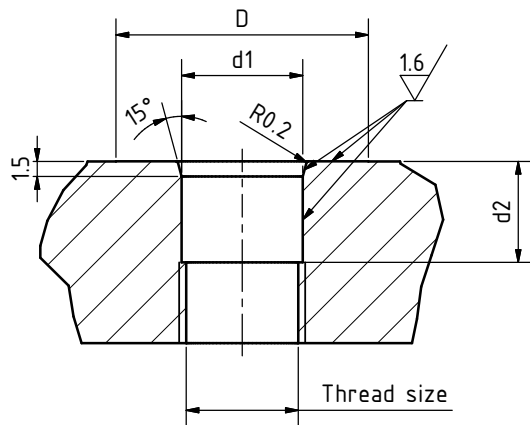
Recommended mounting hole

Single o-ring



Thread size	Hole size (d)	Tolerance	Surface size (D)
3/8"	ø 0.374", 9.5 mm	+/- 0.1	ø 0.984", 25.0 mm
7/16"	ø 0.445", 11.3 mm	+/- 0.1	ø 0.984", 25.0 mm
1/2"	ø 0.504", 12.8 mm	+/- 0.1	ø 0.984", 25.0 mm
5/8"	ø 0.629", 16.0 mm	+/- 0.1	ø 1.181", 30.0 mm
3/4"	ø 0.807", 20.5 mm	+/- 0.1	ø 1.574", 40.0 mm
1"	ø 1.024", 26.0 mm	+/- 0.1	ø 1.968", 50.0 mm
7/8"	ø 0.886", 22.5 mm	+/- 0.1	ø 1.574", 40.0 mm
1 1/2"	ø 1.516", 38.5 mm	+/- 0.1	ø 2.165", 55.0 mm

Double o-ring



Thread size	Hole size (d1)	Tolerance	Hole depth (d2)	Tolerance	Surface size (D)
7/16"	ø 0.47", ø12 mm	H8	ø 0.41", 10.5 mm	+/- 0.1	ø 0.984", 25.0 mm
1/2"	ø 0.55", ø14 mm	H8	ø 0.52", 13.2 mm	+/- 0.1	ø 0.984", 25.0 mm
5/8"	ø 0.685", ø17.4 mm	H8	ø 0.36", 9.2 mm	+/- 0.1	ø 1.181", 30.0 mm

Drawing information

Dimensions in mm (1 mm = 0.03937 inch).

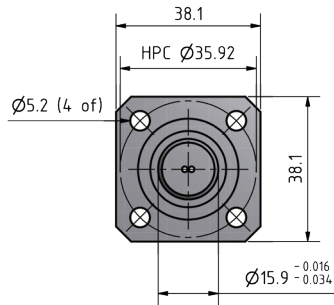
Threads in inches (1 inch = 25.4 mm)

Not mentioned tolerance is according to DS/ISO 2768-m

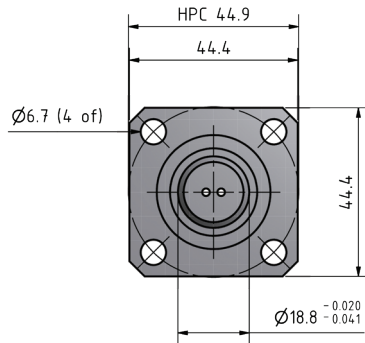


Mounting specifications for Metal Shell

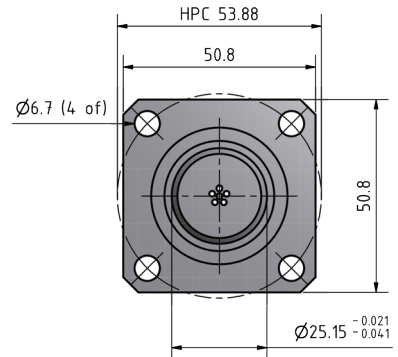
FCR 1500 series



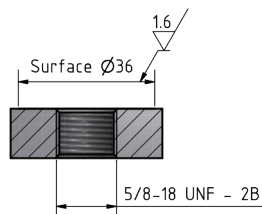
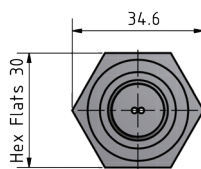
FCR 2000 series



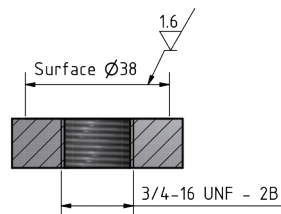
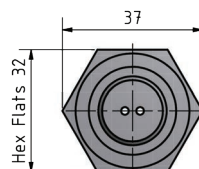
FCR 2400 series



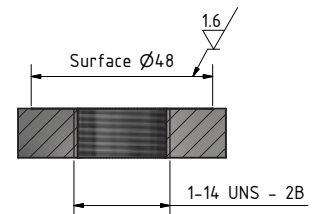
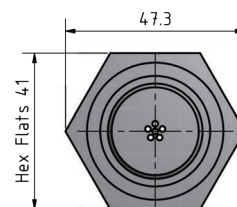
BCR 1500 series



BCR 2000 series



BCR 2400 series



Drawing information

Dimensions in mm (1 mm = 0.03937 inch). Threads in inches (1 inch = 25.4 mm)
Not mentioned tolerance is according to DS/ISO 2768-m

Recommended torque on SubConn® thread sizes

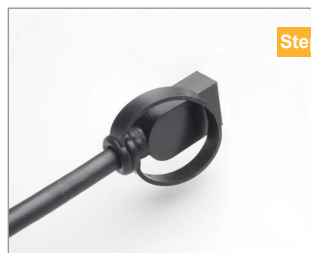
Type	Material	lb - ft	Rec. Torque - Nm
3/8" - 24 UNF	Brass, aluminium	2.9	4.0
	Stainless steel, titanium	4.4	6.0
	PEEK	1.5	2.0
7/16" - 20 UNF	Brass, aluminium	7.4	10.0
	Stainless steel, titanium	10.3	14.0
	PEEK	3.1	4.2
1/2" - 20 UNF	Brass, aluminium	11.0	15.0
	Stainless steel, titanium	15.5	21.0
	PEEK	3.8	5.2
5/8" - 18 UNF	Brass, aluminium	21.4	29.0
	Stainless steel, titanium	30.2	41.0
	PEEK	7.4	10.0
3/4" - 16 UNF	Brass, aluminium	32.4	44.0
	Stainless steel, titanium	46.5	63.0
	PEEK	11.0	15.0
7/8" - 14 UNF	Brass, aluminium	44.3	60.0
	Stainless steel, titanium	59.0	80.0
	PEEK	14.7	20.0
1" - 14 UNS	Brass, aluminium	55.0	75.0
	Stainless steel, titanium	74.0	100.0
	PEEK	18.5	25.0

A range of nuts and washers are available in stainless steel and brass for all thread-sizes mentioned above
Please consult the additional accessories list.

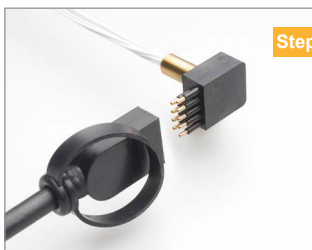
Mounting procedure for Low Profile strap



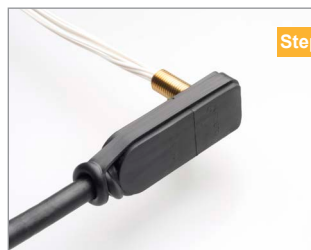
Step 1



Step 2



Step 3



Step 4

Quote

"Nautilus Marine Service has been using SubConn® connectors for many years on our VITROVEX deep sea glass enclosures. We appreciate their exceptional quality and reliability. Even for small purchase quantities, SubConn/MacArtney has always been very accommodating to meet our specific delivery demands and has turned into our preferred vendor for underwater connectors. We would not hesitate to recommend SubConn® connector solutions for deepwater applications."

*Steffen Pausch, Managing Director
Nautilus Marine Service*

SubConn® connector body material types

Brass	UNS-C36000
Aluminium	6061, hard anodised
Stainless steel	AISI 316
Titanium	Grades 5 (GR5)
PEEK	PEEK 30
Other materials available on request	
Contacts, gold plating	Electroless nickel per MIL-C-26074B, 0.0001"-0.00017" thickness Hard gold per ASTM B488-01, 0.000030" minimum thickness

Qualification test

Prior to production of a new connector type or connector range

Pressure test:

5 x cycle test 0 to 800 bar, holding time 10 minute per cycle
1 x 0 to 800 bar holding time 1 hour
Open face rated (Coax connectors excluded)

Electrical test during pressure test:

Continuity test Pin to pin

Insulation test between all contacts and body/tank
At 500 V DC
Minimum 200 Mohm

Electrical test after pressure test:

Continuity test Pin to pin

Insulation test between all contacts and body
At 500 V DC
Minimum 200 Mohm

High pot test At 2 x Voltage rating plus 1 KV

Test and acceptance criteria

Prior to shipment from factory

Visual test

Continuity test Pin to pin

Insulation test between all contacts and body
At 500 V DC
Minimum 200 Mohm

American wire gauge (AWG) to metric

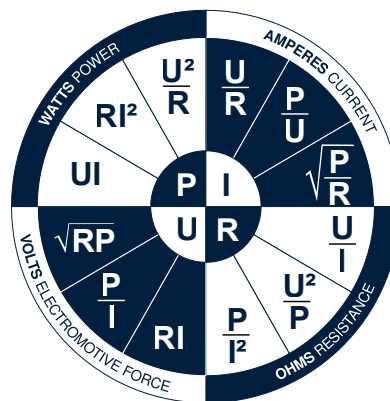
AWG	mm ²
000	85.03
00	67.40
0	53.46
1	42.39
2	33.61
3	26.65
4	24.14
5	16.76
6	13.29
7	10.55
8	8.36
9	6.63
10	5.26
11	4.17
12	3.31
13	2.63
14	2.08
15	1.65
16	1.31
17	1.04
18	0.82
19	0.65
20	0.52
21	0.41
22	0.33
23	0.26
24	0.20
25	0.16
26	0.13

Conductor resistance of copper

0.14 mm ²	145 ohm/km
0.22 mm ²	96.2 ohm/km
0.50 mm ²	39.0 ohm/km
0.75 mm ²	26.0 ohm/km
1.00 mm ²	19.5 ohm/km
1.34 mm ²	15.3 ohm/km
1.50 mm ²	13.3 ohm/km
2.00 mm ²	10.0 ohm/km
2.50 mm ²	7.98 ohm/km
4.00 mm ²	4.95 ohm/km
6.00 mm ²	3.30 ohm/km
10.00 mm ²	1.91 ohm/km
16.00 mm ²	1.21 ohm/km
25.00 mm ²	0.78 ohm/km
35.00 mm ²	0.55 ohm/km
50.00 mm ²	0.39 ohm/km

Approx. values

Formulas



Ohm's Law: Valid only for DC circuits

$$U = R \times I$$

$$P = U \times I$$

3 Phased AC power for electrical motor

$$P = U \times I \times \sqrt{3} \times \cos \Phi$$

U: Voltage (V), R: Resistance (ohm), I: Current (A), P: Power (W)

Need to know:

RoHs/Reach directive

SubConn® connectors are in general compliant to latest revision of RoHs and Reach directive.

Rubber

The measurements made on all rubber parts including 3D files are nominal values due to the fact that rubber shrinks during hardening.

Termination

- Maximum wire size for micro contacts is 18 AWG
- Maximum 2 screens or conductors can be terminated per contact

Cable

- Nominal static cable bending radius = 10 x cable OD
- Nominal dynamic cable bending radius = 15 x cable OD
- All special polyurethane (PUR) cable specifications can be found online at www.macartney.com

Cable assembly

- All cable assemblies are measured from rubber connector face to rubber connector face
- Our standard cable assembly tolerances
 - +/- 1,5" (38,1 mm) <3 m length and + - 3% >3 m
 - Lower tolerances need approval from the production
 - Min. assembly length 8" (203 mm)

Hoses for pressure balanced oil filled connectors

MacArtney holds a stock of recommended hoses for Pressure Balanced Oil Filled (PBOF) connectors.

- Versilon™ hose type C-210-A with 1/2" ID and 5/8" OD
- Versilon™ hose type C-210-A with 5/8" ID and 13/16" OD
- Versilon™ hose type C-210-A with 25.4 mm (1") ID and 31.8 mm (1 1/4") OD

Note: Please remember to order clamps at the same time as hoses.

Recommended oil for pressure balanced systems

- Recommended oil in oil compensated system
- DC 200/350 or PMX 200/350

Pressure PSI/BAR

	PSI	BAR
PSI	1	0.0689
BAR	14.5	1

SubConn® handling instructions

Follow these instructions carefully to ensure correct use of your SubConn® connectors.

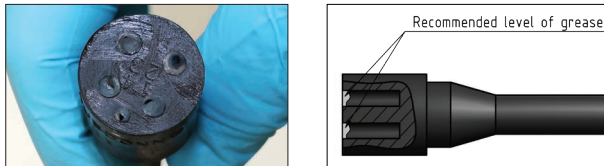
Handling

- Connectors must be greased with Molykote 44 Medium before every mating
- Always grease O-rings on BH, BCR and FCR connectors with Molykote 111
- Disconnect by pulling straight out, not at an angle
- Do not pull on the cable and avoid sharp bends at cable entry
- When using a bulkhead connector, ensure that there are no angular loads
- Make sure to apply the recommended torque when tightening bulkhead nuts (see page 117)
- SubConn® connectors should not be exposed to extended periods of heat or direct sunlight. If a connector becomes very dry, it should be soaked in fresh water before use

Greasing products

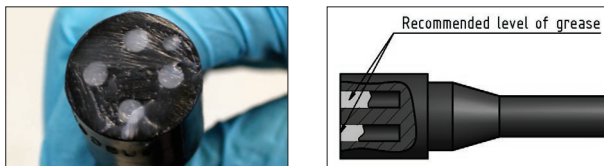


Greasing and mating above water (dry mate)



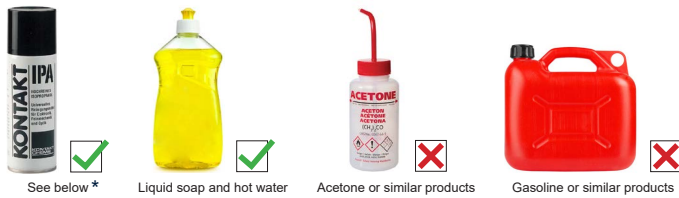
- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to minimum 1/10 of socket depth should be applied to the female connector
- The inner edge of all sockets should be completely covered, and a thin transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on pins and in sockets
- To confirm that grease has been sufficiently applied, de-mate and check for grease on every male pin. Then re-mate the connector

Greasing and mating under water (wet-mate)



- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to approximately 1/3 of socket depth should be applied to the female connector
- All sockets should be completely sealed, and a transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector and remove any excess grease from the connector joint

Cleaning products



- *General cleaning and removal of any accumulated sand or mud on a connector should be performed using spray based contact cleaner (isopropyl alcohol)
- New grease must be applied again prior to mating
- Always use Loctite 5910 to lock non-metallic (PEEK) connectors
- For locking metallic connectors, the use of Loctite 243 is recommended

Molykote 44

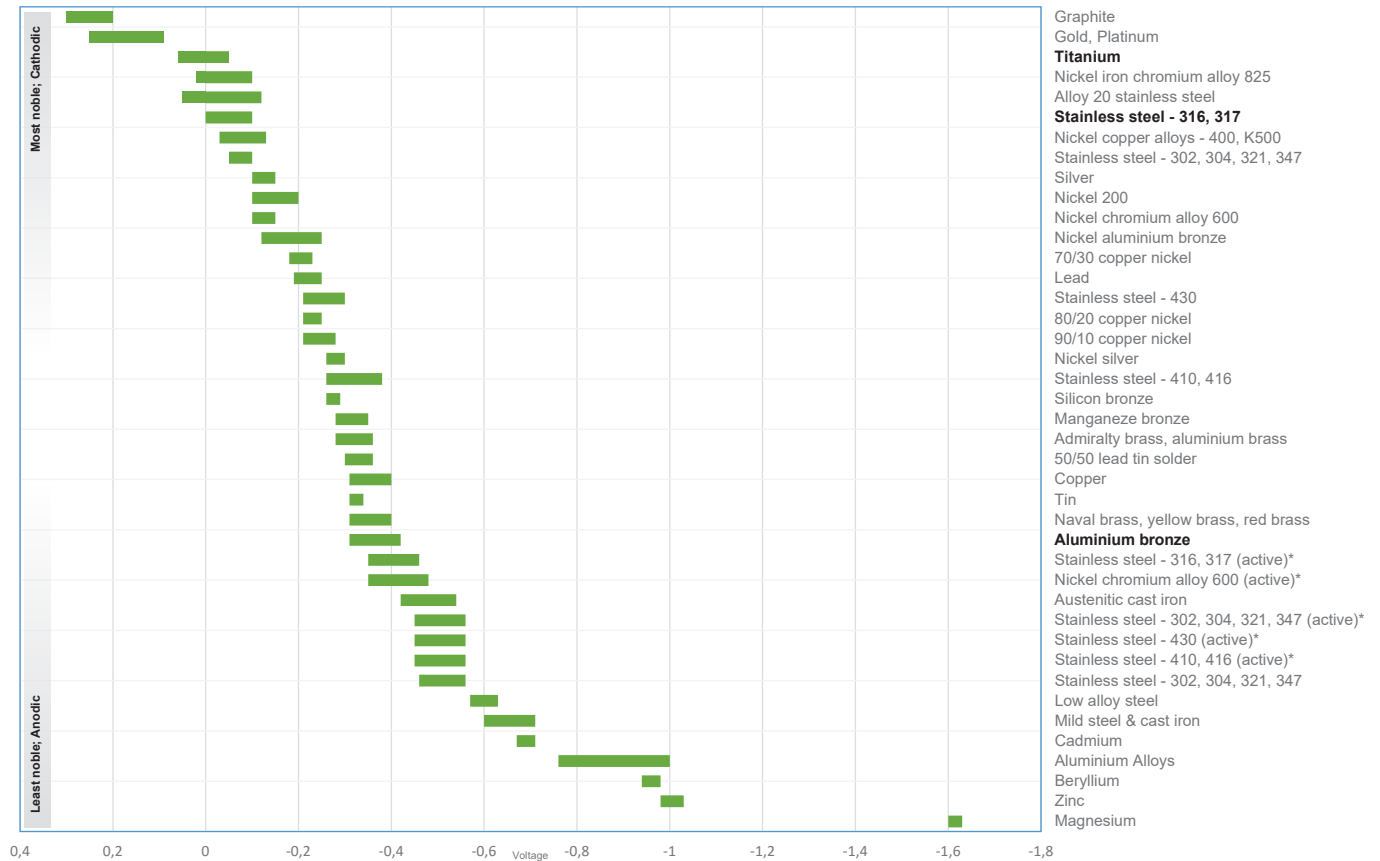
MacArtney offers Molykote 44 Medium in two sizes (10 ml and 100 ml), connectors must be greased with Molykote 44 Medium before every mating.

Scan to access
SubConn® greasing
and cleaning
instruction videos



Galvanic series of metals in seawater

The table shows how the various metals are been denoted noble and less noble.



- *Ranges in acidic water, e.g. in crevices, stagnant, low velocity or poorly aerated water
- The closer 2 metals in the table are to each other, the less prone they are to corrode
- The further away 2 metals in the table are, the greater the risk of corrosion of the less noble (anode)
- The higher the potential the more noble a specific material will be

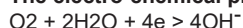
Example:

- Stainless steel AISI 304 is more noble than aluminum
- Stainless steel AISI 316 is more noble than AISI 304
- Titanium of any grade is more noble than AISI 316

Information on debonding and corrosion

The reason for the debonding of metal connectors with chloroprene rubber or polyurethane heads installed in a cathodically protected system is the natural development of hydroxide. Hydroxide is generated on the cathode when the polarity tension exceeds 400 mV (Cu/CuSo4) and the aqueous environment is of an alkaline character.

The electro-chemical process of hydroxide



Hydroxide causes a local increase in the pH value and paint/primer is generally broken down in highly alkaline environments. When an electrical connection has been made between the cathode and the anode, the usual electrochemical cathodic process begins; the generation of hydroxide - this is where the debonding begins.

When in contact with cathodic protection, the natural electrochemical sub-process of water disassociation creates gas bubbles of hydroxide or hydrogen. At this stage, it is almost impossible to detect the debonding of the polymer tongue from the metal surface. The cathodic sub-process will now be established under the polymers' surface, and a total debonding is impending.

The velocity of the debonding depends on the following conditions

- Blend potential (> -400 mV will induce the generation of hydroxide)
- Primer dielectric properties
- Medium alkalinity (a high level of alkalinity increases the number of reactive products)
- Medium temperature (a high temperature means a speedy reaction time and will often be able to neutralise a lower level of oxygen)
- Current intensity (a high current intensity increases the quantity of developed hydroxide)

In relation to the phenomenon of debonding, there is a considerable difference between a corrosion-resistant steel alloy and a brass alloy. Corrosion-resistant alloys such as stainless steel AISI 304 - 18/8, AISI 316 - 18/12/2.5, AISI 310 - 24/20 and smo254 achieve their rust resistance by means of an alloy characteristic film. This oxide alloy, which is only a few Ångström thick, is formed naturally when the metal surface comes into contact with oxygen or products rich in oxygen. Brass, which consists of copper (primary constituent) and zinc, is naturally resistant to seawater. The oxide film of the copper is somewhat thicker and bears a faint resemblance to ordinary copper oxide (CuOH) in its structure and size. The copper oxide is green and familiar to most.

If rust-resistant alloys are applied as a connecting material, the aforementioned oxide film must be removed before applying the primer. In those areas where the natural oxide film encounters a primed/treated surface, it may cause issues of interference. Specifically, the corrosion-resistant material will attempt to form its natural oxide film under the primer. In this way, the oxide film can lift off the primer, which is the same condition that can be observed in ordinary corrosion of iron constructions. When the electrolyte comes into contact with the rust-resistant surface as described above, the rust-resistant alloy will start to form its natural oxide film assuming that the oxide or oxidant elements are available. The result will be a quick debonding caused by the rust-resistant exposed surface's natural oxide formation.

The application of a more seawater resistant material than (for example) stainless steel AISI 316 will result in a more stable oxide formation.

Cathodic protection and galvanic conditions will advance and stabilise the formation of the protecting oxide film. This relation is not observed on brass connectors. Brass is (naturally) sufficiently electronegative to seawater, and so does not form an oxide film as with the rust-resistant alloys. Thus, brass alloys do not have the same secondary reaction pattern that characterises the corrosion-proof alloys. Consequently, oxidation of brass does not advance the debonding process.

Quote

"Achieving safe and reliable connection and sealing of instruments is a key to success in any survey operation. At deep water, high pressure and extreme temperature variations are serious issues. YMG uses SubConn® connectivity solutions as they warrant excellent performance and reliability under these harsh conditions.

Wish to emphasize that the long-term experience of using the MacArtney/SubConn® products by our engineers solidified our belief that it was the perfect choice for the most extensive range of tasks in our difficult work, particularly concerning the line of goods and quality."

*Dr. Andrey A Tarasenko, Chief Designer
(R&D and Science) with the Russian State Scientific Centre
Yuzhmorgeologiya (YMG)*

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MacArtney
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