

BIRNS *Aquamate* LLC

ELECTRICAL CONNECTORS FOR
HARSH ENVIRONMENTS AND
SPECIAL APPLICATIONS



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We are committed to the continuous improvement and expansion of our products and services. This section will include the latest news and major updates.

Release 2024-02-15

New Series

XSJJ – we have added the MSXJJ and XSJJ Glass Reinforced Epoxy series. Compatible to market standards.

New Products

RM – we have expanded to include VSG-PBCLM and XSG-BCL-HP-SS

OM – added Over Mold page. Includes OM versions for SC, MC, TC, HD MCLP, FAWL FAWM

55 series – added RFT, 100 Amp single pin sub series

New Technologies

Non Magnetic – We have developed non magnetic versions of our connectors with ratings < 0.25 Nanoteslas (nT)

Catalog Updates

MC – Added 13 contact face configuration

Application Guidelines – Added 1/2”-20 UNF, Added GRE closing torque

FAWL FAWM LPM – Added 12.5MM option for bulkheads

Ethernet – Updated specification and compatibility

| General Specification | | | |
|---|--|-----------------------|---|
| Build | | Electrical | |
| Contacts | Gold plated per MIL-G 45204 Type II, Grade C, Class 0 | Insulation | >250 megaohm |
| Pin | Phosphor Bronze | Contacts | <0.01 ohm, |
| Sockets | Beryllium Copper | Volt Rating Cables | 300v |
| Location Pin | 316 Stainless | Volt Rating BH Wires | 600v for Teflon bulkhead leads. |
| In-line cable | 60cm | Application | |
| BH leads | 30cm | Pressure Rating Mated | >600 bar |
| O-rings | Buna-N | Wet Mated Series: | Nano, TC, MC, SC, LP, Metal Shell, FAWL/M, HD |
| Mold | Neoprene, PU | Depth Open Face* | Diving Depth |
| Bulkhead | 316 Stainless, | Temperature | -5C - +65C |
| Bulkhead Extended options | Titanium Gr. 5, Nickel Aluminum Bronze, PEEK, Aluminum | Matings | >750 Cycles |
| *Wet mated connectors have been tested open face to depths far exceeding diving depth. High open face pressures may damage the connector. | | | |

| Series | Contact Number And Gauge Range | |
|----------------------|--------------------------------|----------------------|
| | AWG 20 | AWG 18 |
| MH | 2 | |
| Nano | 2,4 | |
| TC Tiny Connector | 2,3,4,5 7 (AWG 22) | |
| MC Mini Connector | 5,6,8,9,10,12,13,16,18,21 | 2,3,4 |
| SC Standard Circular | 25 | 2,3,4,5,6,8,10,12,16 |
| LP Low Profile | 12 | 2,3,4,6,7,9 |
| Metal Shell 1500 | 5,6,8 | 2,3,4 |
| Metal Shell 2000 | 10,12 | 2,3,4 |
| Metal Shell 2400 | | 6,8,10 |
| FAWL, FAWM | 5,8,10 | 2,3,4 |
| LPM | 5,6,7,8 | 3,4 |

| Series | Contact Number And Gauge Range | | | |
|---------------|--------------------------------|-------------|--------|---------|
| | AWG 18 | AWG 16 | AWG 12 | AWG 4 |
| Penetrator | 2,3,4,5,6,7,8 | | | |
| RM Size A | 1 | | | |
| RM Size G | 1,2,3,4,5,6 | | | |
| RM Size K | | 2,3,4,5,6,8 | | |
| 55 Size 1500 | 4,6,8 | 2,3 | | |
| 55 Size 2000 | 13,21 | 3,4,6,8 | | 1 [RFT] |
| 55 Size 2400 | 20 | 12,10 | | |
| HD Heavy Duty | | | | 2,3,4 |

| Wire Current Rating Per AWG And Number Of Conductors | | | | | | | | | | | | | |
|--|----------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| | Number Of Conductors | | | | | | | | | | | | |
| | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #12 | #13 | #16 | #20 |
| 20 AWG | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| 18 AWG | 8 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 16 AWG | 12 | 10 | 9 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 5 |
| 14 AWG | 18 | 15 | 14 | 13 | 12 | 11 | 11 | 10 | 10 | 9 | 9 | 8 | 8 |
| 12 AWG | 23 | 20 | 18 | 17 | 16 | 15 | 14 | 14 | 13 | 12 | 12 | 11 | 10 |
| 10 AWG | 29 | 25 | 23 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 15 | 14 | 13 |
| 8 AWG | 41 | 35 | 32 | 29 | 28 | 26 | 25 | 24 | 23 | 21 | 21 | 19 | 18 |
| 6 AWG | 53 | 45 | 41 | 38 | 35 | 34 | 32 | 31 | 29 | 28 | 27 | 25 | 23 |
| 4 AWG | 70 | 61 | 55 | 50 | 47 | 45 | 43 | 41 | 39 | 37 | 36 | 33 | 31 |
| 2 AWG | 93 | 81 | 73 | 67 | 63 | 60 | 57 | 54 | 52 | 49 | 48 | 44 | 41 |

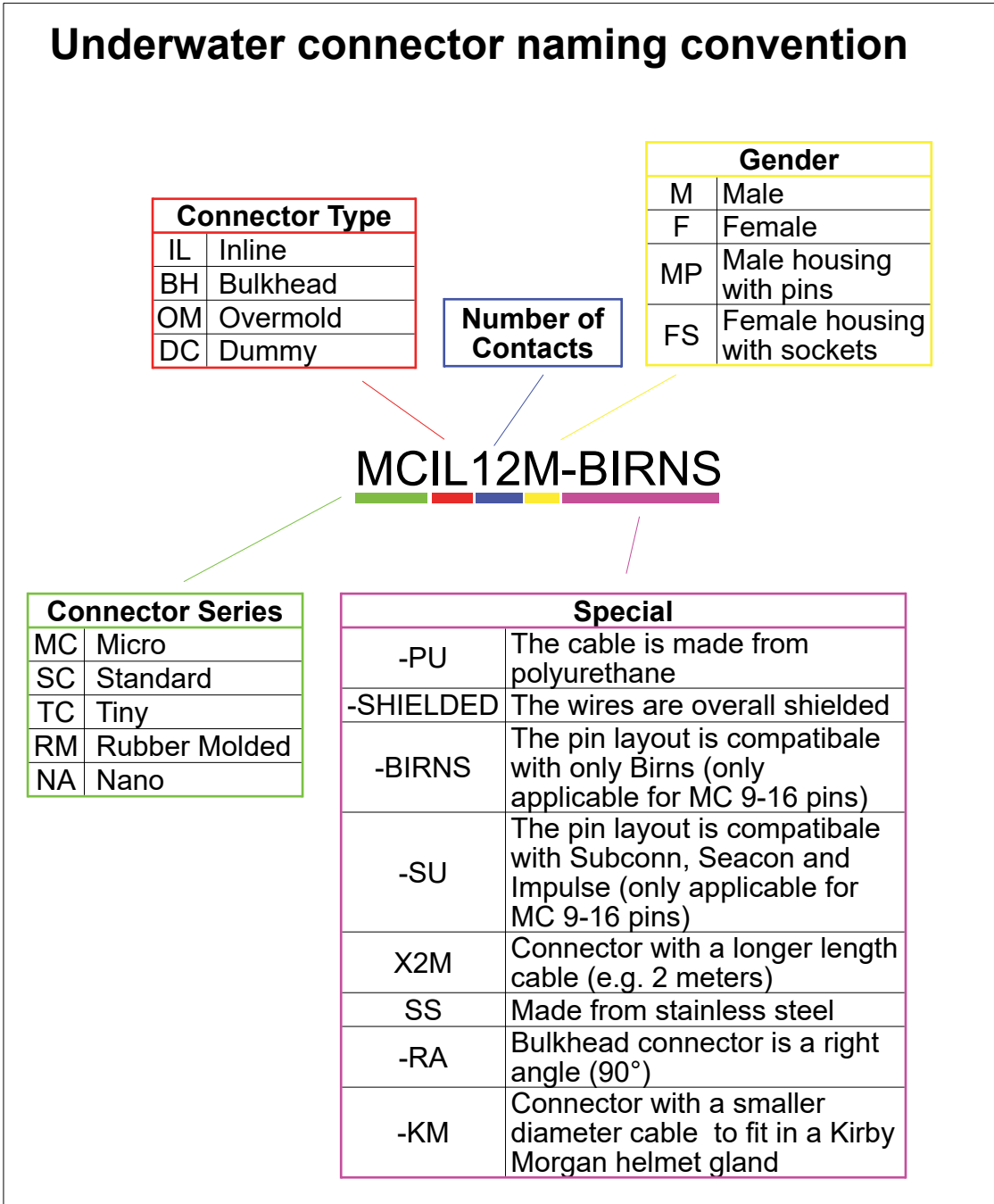
| Current Correction | | |
|---------------------|------|-------------------|
| Ambient Temperature | | |
| °C | °F | Correction Factor |
| 10 > | 50 > | 1.2 |
| 20 | 68 | 1.1 |
| 30 | 86 | 1 |
| 40 | 104 | 0.9 |
| 50 | 122 | 0.75 |
| 60 | 140 | 0.58 |
| 65 | 149 | 0.47 |
| 70 | 158 | 0.33 |
| Cable Length | | |
| m (ft) | | Correction Factor |
| 15.2 m (50 ft) | | 0.7 |

For example, an 18 AWG x 2 pin connector will have an 8-amp rating per wire, @ 50 C ambient temperature multiply by 0.75. The number of conductors refers to electrically loaded conductors.

| Standard Color Code | | | | | |
|---------------------|--------|---------|--------------|---------|--------------|
| Wire 1 | Black | Wire 11 | Black/White | Wire 21 | White/Green |
| Wire 2 | White | Wire 12 | Black/Red | Wire 22 | White/Orange |
| Wire 3 | Red | Wire 13 | Black/Green | Wire 23 | White/Blue |
| Wire 4 | Green | Wire 14 | Black/Orange | Wire 24 | White/Brown |
| Wire 5 | Orange | Wire 15 | Black/Blue | | |
| Wire 6 | Blue | Wire 16 | Black/Brown | | |
| Wire 7 | Brown | Wire 17 | Black/Yellow | | |
| Wire 8 | Yellow | Wire 18 | Black/Gray | | |
| Wire 9 | Gray | Wire 19 | Black/Violet | | |
| Wire 10 | Violet | Wire 20 | White/Red | | |

These color codes may vary and are for reference only. Customers must always check pin / wire alignment before terminating. For Ethernet color coding see the Ethernet section.

| Manufacturer Compatibility Table | | | | | | | | | | |
|----------------------------------|--|-----|----|-----|--------------|----------------|------|----|------|---|
| | SC | MC | LP | LPM | FAWL FAWM | METAL SHELL | 5500 | RM | XSJJ | Legend |
| SUBCONN | YG | YG* | YG | NA | NA | YG | NA | NA | NA | YG YES GUARANTEED Y YES L LIKELY N NO NA NOT APPLICABLE |
| SEACON | Y | Y | Y | N | YG | NA | L | YG | YG | |
| IMPULSE | Y | Y | Y | YG | N | NA | NA | L | NA | |
| BURTON | NA | NA | NA | NA | NA | NA | YG | NA | NA | |
| * | For MC 9-16 add suffix "-SU" or "-BIRNS" | | | | | | | | | |



| Locking Sleeve clarification Table | | | |
|------------------------------------|------------|--------------------------|------------------------|
| Series | Contacts | Inline | On Bulkhead |
| MC Series | 2-8 | NS-MLS-MC with NS-FLS-MC | NS-FLS-MC |
| | 9-18 Birns | NS-MLS-A with NS-FLS-A | FLS-MCA |
| | 9-16 SU | NS-MLS-A with NS-FLS-A | NS-MLS-A with NS-FLS-A |
| SC Series | 21 | MLS-B with FLS-B | MLS-B with FLS-B |
| | 2-5 | NS-MLS-A with NS-FLS-A | NS-MLS-A with NS-FLS-A |
| | 6-10 | MLS-B with FLS-B | MLS-B with FLS-B |
| | 12-16 | MLS-C with FLS-C | MLS-C with FLS-C |
| RM Series | 2-8 | MLS-G with FLS-G | FLS-G |
| TC Series | 2-7 | MLS-TC with FLS-TC | FLS-TC |
| NANO Series | 2-4 | NA-MLS with NA-FLS | NA-FLS |
| BCR Series | SC 2-4 | - | NS-FLS-A |
| | MC10-12 SU | - | NS-FLS-A |
| | SC 6-10 | - | NS-FLS-B |

i It is common practice to use a Male locking sleeve on a Male connector and a Female locking Sleeve on a Female connector

Inline

Inline (M or F) locking sleeve (M or F)



Inline (M or F) locking sleeve (M or F)



Bulkhead

MC (Except size 9-16 SU, 21)
RM
TC
NANO
BCR

Inline (M or F) Female locking sleeve



Bulkhead (M or F) No locking sleeve



Bulkhead

MC (Only size 9-16 SU, 21)
SC

Inline or Bulkhead (M or F) locking sleeve (M or F)

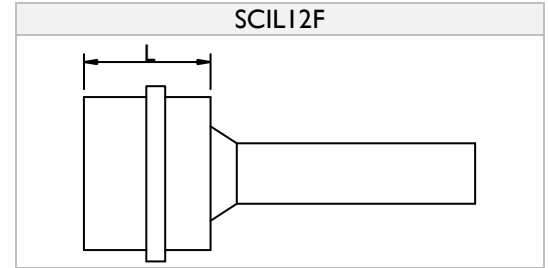
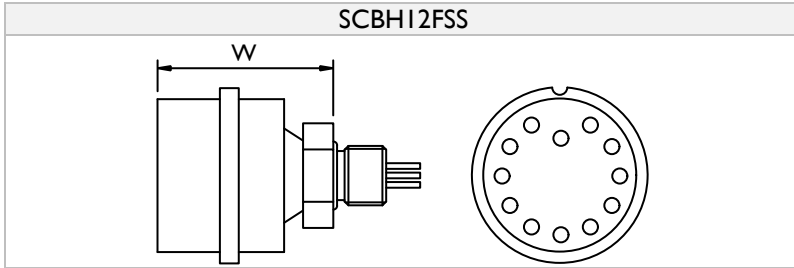
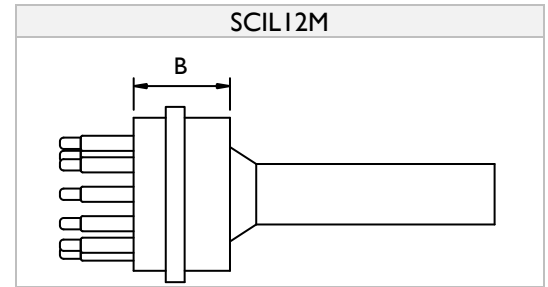
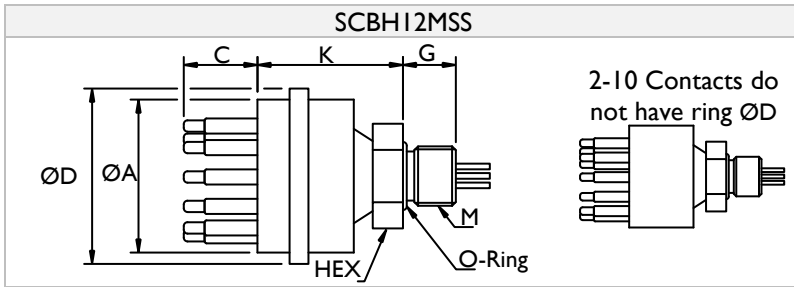


Bulkhead (M or F) locking sleeve (M or F)

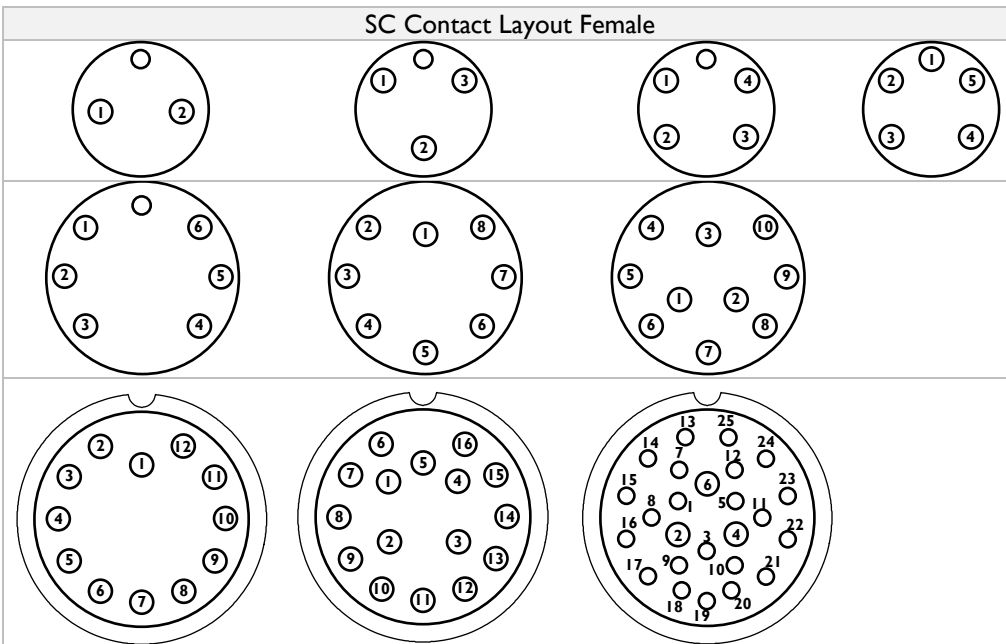


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STANDARD CIRCULAR (SC)



| #Contacts | ØA[mm] | B[mm] | C[mm] | ØD[mm] | K[mm] | G[mm] | L[mm] | W[mm] | M[Thread] | HEX[mm] | O-Ring | Locking Sleeve |
|-----------|--------|-------|-------|--------|-------|----------|-------|-------|-------------|---------|--------|----------------|
| 2,3,4,5 | 25 | 19 | 19.5 | NA | 36 | 14 or 19 | 28.5 | 45 | 7/16-20 UNF | 19 | 2-014 | FLS-A, MLS-A |
| 6,8,10 | 32 | 19 | 19.5 | NA | 41 | 14 or 19 | 28.5 | 50 | 5/8-18 UNF | 24 | 2-017 | FLS-B, MLS-B |
| 12,16,25 | 40.5 | 25.5 | 19.5 | 46 | 38.5 | 14 or 19 | 28.5 | 45 | 5/8-18 UNF | 24 | 2-017 | FLS-C, MLS-C |



| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 7.5 | 18 |
| 3 | 8.1 | |
| 4 | 9 | |
| 5 | 12.2 | |
| 6 | 12.3 | |
| 8 | 13.5 | |
| 10 | 15 | |
| 12 | 16 | |
| 16 | 18 | |
| 25 | 20 | |

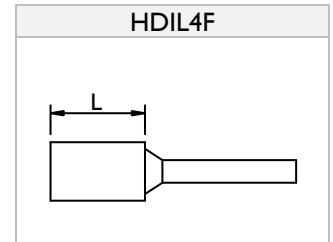
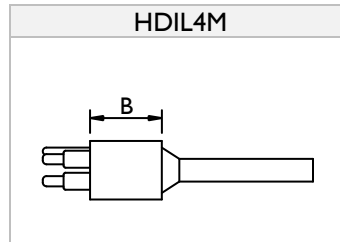
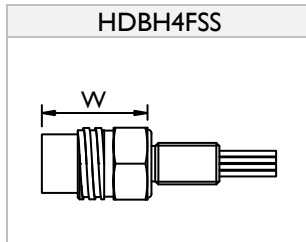
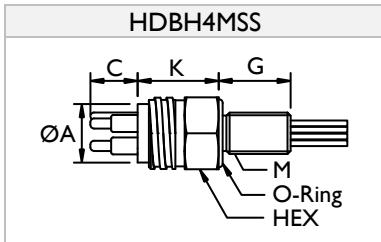


| SC Part Number Format | | | | |
|-----------------------|-----------------------|--------------|----------------------------------|--|
| SC | BH | 4 | M | SS |
| Series SC | Type*: BH, IL, DC, OM | Contact Num. | Gender F - Female M - Male | Options SS - Stainless Steel TT - Titanium |

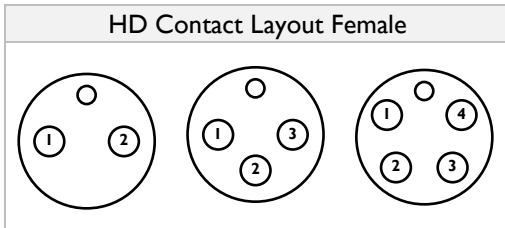
* BH – Bulkhead, IL – Inline, DC – Dummy, OM - Over Mold

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HEAVY DUTY (HD)



| # Contacts | A [mm] | B [mm] | C [mm] | K [mm] | G [mm] | L [mm] | W mm | M [Thread] | HEX [mm] | O-Ring [Nitrile] | Locking Sleeve |
|------------|--------|--------|--------|--------|----------|--------|------|------------|----------|------------------|--------------------|
| 2,3,4 | 25 | 19 | 14 | 30 | 14 or 19 | 28 | 39 | 5/8-18 UNF | 24 | 2-017 | FLS-MCA MLS-MCA |



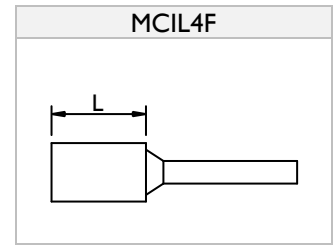
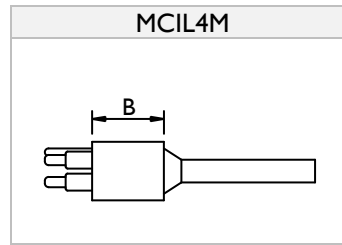
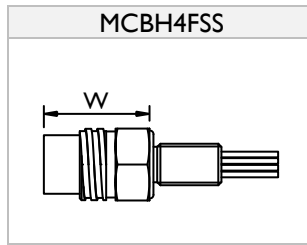
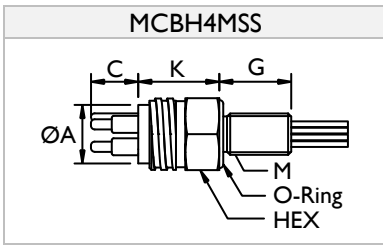
| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 15.2 | |
| 3 | 16.1 | 12 |
| 4 | 17 | |

HD Part Number Format

| HD | BH | 4 | M | SS |
|--------|--|--------------|------------------------|---------------------------------------|
| Series | Type | Contact Num. | Gender | Options |
| HD | BH - bulkhead IL - inline DC - dummy OM - over mold | | F - female M - male | SS - stainless steel TT - titanium |

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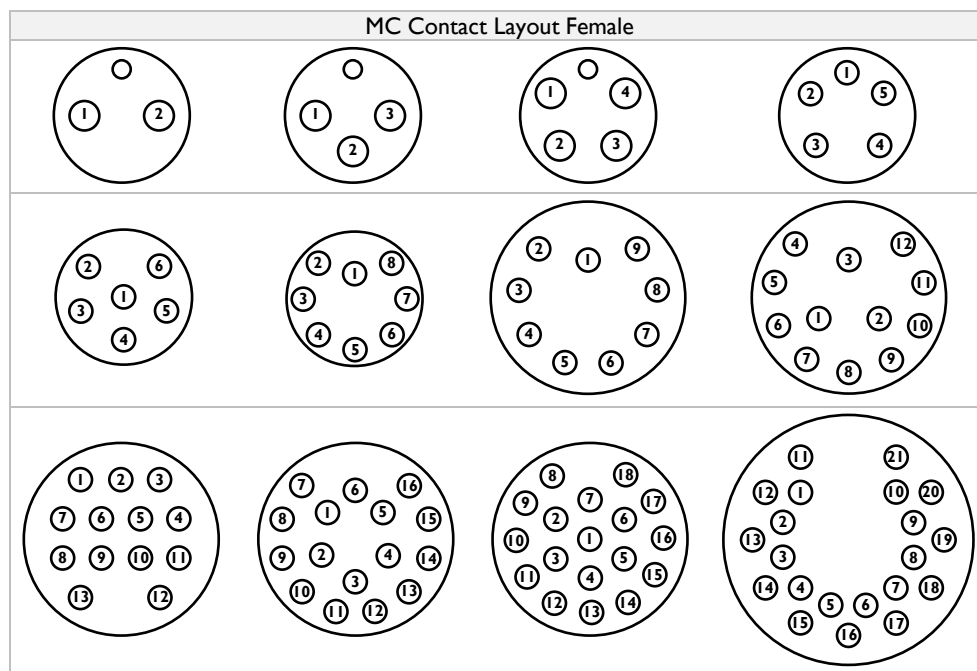
MINI CONNECTOR (MC)



| # Contacts | A [mm] | B [mm] | C [mm] | K [mm] | G [mm] | L [mm] | W [mm] | M[Thread] | HEX[mm] | O-Ring | Locking Sleeve |
|-------------------|--------|--------|--------|--------|----------|--------|--------|-------------|---------|--------|--------------------|
| 2,3,4,5,6,8 | 16 | 19 | 12.5 | 21.5 | 19 | 25 | 28 | 7/16-20 UNF | 19 | 2-014 | FLS-MC MLS-MC |
| *9,10,12,13,16,18 | 25 | 19 | 14 | 30 | 14 or 19 | 28.5 | 39 | 5/8-18 UNF | 24 | 2-017 | FLS-MCA MLS-MCA |
| 21 | 32 | 19 | 14 | 41 | 14 or 19 | 28.5 | 50 | 5/8-18 UNF | 24 | 2-017 | FLS-B MLS-B |

*9,10,12,16 BIRNS configuration. See "SU" for Subconn configuration.

*13 Typically Ethernet. Compatible with MCXX13-SU but with 'BIRNS' type body.



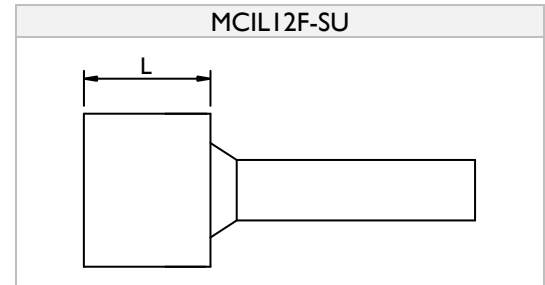
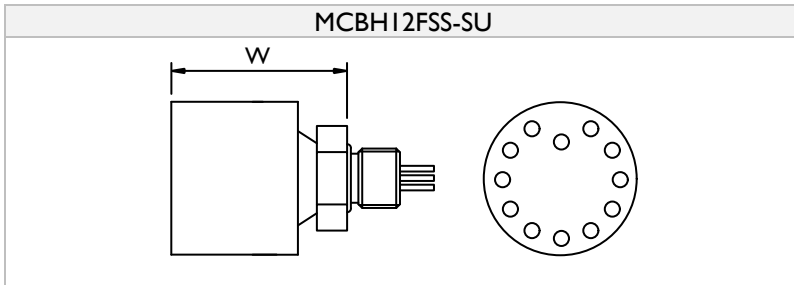
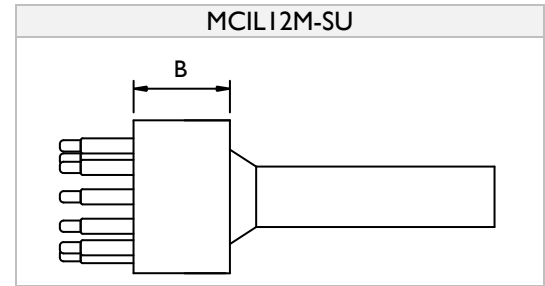
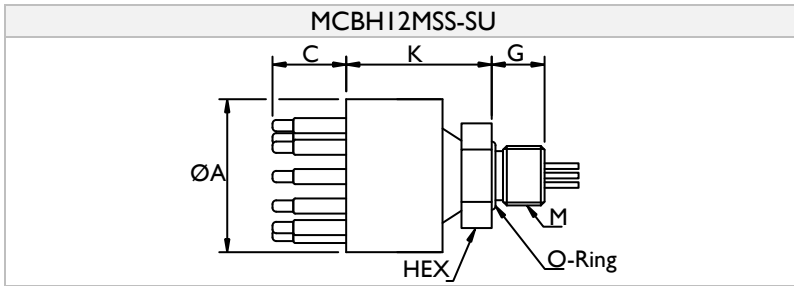
| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 8 | 18 |
| 3 | 9.4 | |
| 4 | 10 | |
| 5 | 8 | |
| 6 | 8 | 20 |
| 8 | 10 | |
| 9 | 10 | |
| 10 | 10.5 | |
| 12 | 9 | |
| 16 | 10.5 | |
| 18 | 10.5 | |
| 21 | - | |

| MC Part Number Format | | | | | |
|-----------------------|--|--------------|------------------------|---|------------------|
| MC | BH | 8 | M | SS | -RA |
| Series | Type | Contact Num. | Gender | Options | Option |
| MC | BH - bulkhead IL - inline DC - dummy OM - over mold | | F - female M - male | SS - stainless steel TT - titanium PK - peek AL - aluminum | RA - right angle |



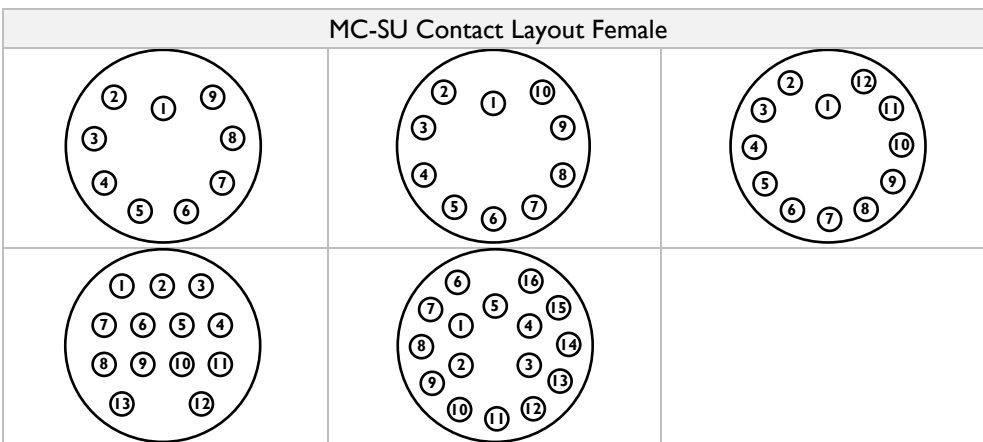
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MINI CONNECTOR SUBCONN CONFIGURATION (MC-SU)



| #Contacts | ØA[mm] | B[mm] | C[mm] | K[mm] | G[mm] | L[mm] | W[mm] | M[Thread] | HEX[mm] | O-Ring | Locking Sleeve |
|--------------------|--------|-------|-------|-------|----------|-------|-------|------------|---------|--------|----------------|
| 9, 10, 12, 13*, 16 | 25 | 19 | 19.5 | 36 | 14 or 19 | 28 | 45 | 1/2-20 UNF | 24 | 2-017 | FLS-A, MLS-A |

*13 Typically Ethernet. Compatible with MCXX13-BIRNS but with 'SU' type body.



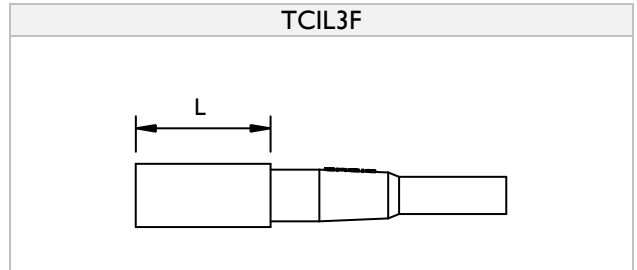
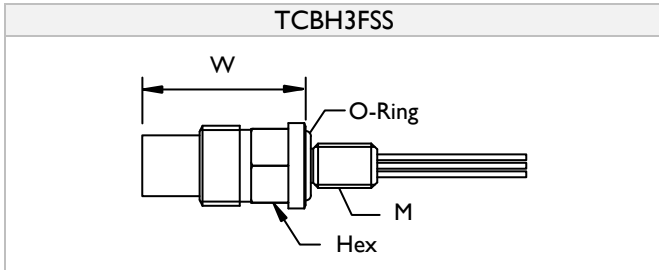
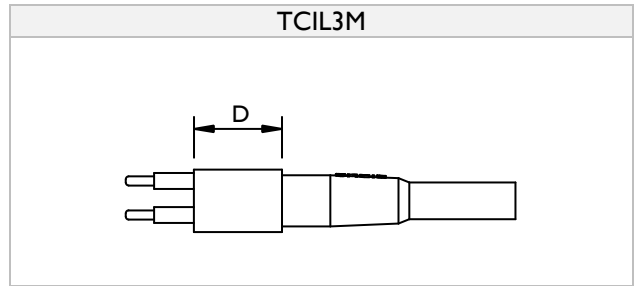
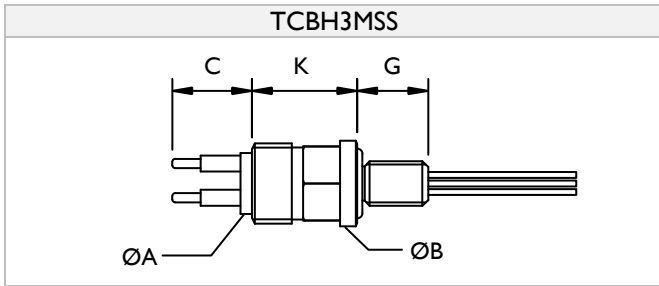
| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 9 | 10 | 20 |
| 10 | 10.5 | |
| 12 | 11 | |
| 16 | 12 | |

| MC-SU Part Number Format | | | | | |
|--------------------------|--|--------------|------------------------|---------------------------------------|-------------------------------|
| MC | BH | 9 | M | SS | -SU |
| Series | Type | Contact Num. | Gender | Options | Configuration |
| MC | BH - Bulkhead IL - Inline DC - Dummy OM - Over mold | | F - Female M - Male | SS - Stainless Steel TT - Titanium | SU - Subconn BIRNS - Birns |

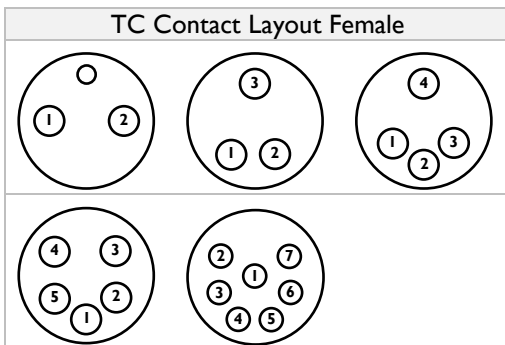
Order with the 'SU' suffix. For example MCIL9F-SU

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TINY CONNECTOR (TC)



| # Contacts | ØA [mm] | ØB [mm] | D [mm] | C [mm] | K [mm] | G [mm] | L [mm] | W [mm] | M [Thread] | HEX [mm] | O-Ring [Nitrile] | Locking Sleeve |
|------------|---------|---------|--------|--------|--------|--------|--------|--------|----------------|----------|------------------|----------------|
| 2,3,4,5,7 | 11 | 15 | 15.5 | 12 | 20.5 | 12.5 | 23.5 | 28.5 | 5/16-24 2A UNF | 13 | 2-012 | FLS-TC MLS-TC |

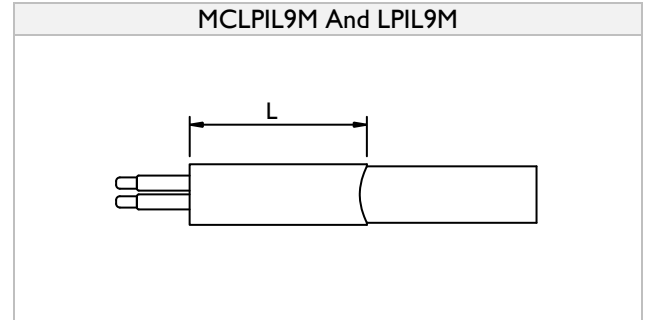
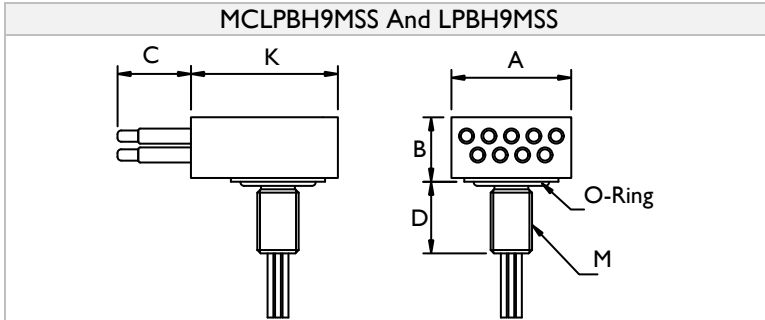


| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 5.6 | 20 |
| 3 | 6.5 | |
| 4 | 5.5 | |
| 5 | 5.8 | 22 |
| 7 | 6.0 | |

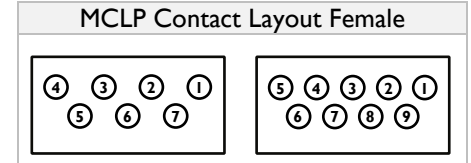
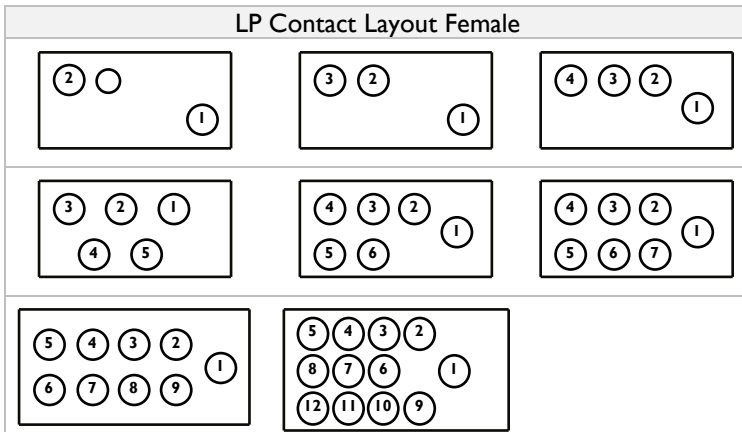
| TC Part Number Format | | | | |
|-----------------------|--|--------------|------------------------|--|
| TC | BH | 3 | M | SS |
| Series | Type | Contact Num. | Gender | Options |
| TC | BH - bulkhead IL - inline DC - dummy OM - over mold | | F - female M - male | SS - stainless steel TT - titanium PK - PEEK |

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LOW PROFILE (LP) AND MINI LOWPROFILE (MCLP)



| # Contacts | A [mm] | B [mm] | C [mm] | L [mm] | K [mm] | W [mm] | M [Thread] | O-Ring | Locking Strap |
|------------|--------|--------|--------|--------|--------|----------|-------------|--------|---------------|
| LP 2 | 22 | 14 | 19.5 | 42 | 32 | | | | LPBH-RS |
| LP 3,4,5 | 25 | 14 | 19.5 | 42 | 32 | | | | LPBH-RS |
| LP 6,7 | 25 | 19 | 19.5 | 45 | 44 | 19 Or 25 | 7/16-20 UNF | 2-014 | LPBH-RS |
| LP 9,12 | 31.5 | 21 | 19.5 | 45 | 45 | | | | LPBH-RS |
| MCLP 7,9 | 25 | 14 | 12.5 | 42 | 32 | | | | MCLP-RS |



| # Contacts | LP | | MCLP | |
|------------|--------------|-----|--------------|-----|
| | Cable OD[mm] | AWG | Cable OD[mm] | AWG |
| 2 | 6 | | | |
| 3 | 6.7 | | | |
| 4 | 7 | 18 | NA | NA |
| 5 | 7.5 | | | |
| 6 | 7.5 | | | |
| 7 | 8 | 18 | 8.5 | 20 |
| 9 | 9.5 | | 10 | |
| 12 | 10 | 20 | NA | |

LP And MCLP Part Number Format

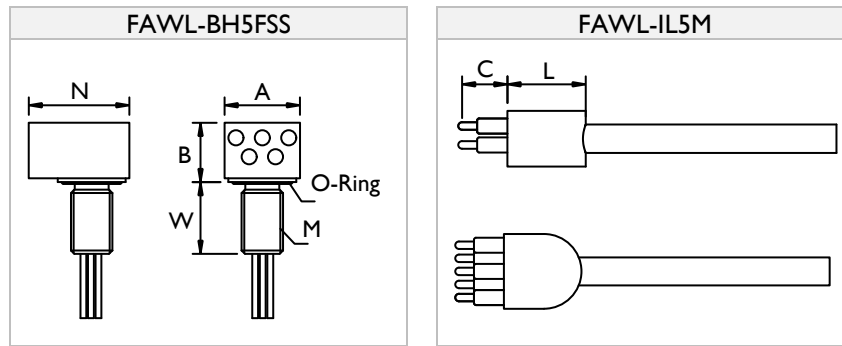
| MCLP | BH | 7 | M | SS | _19MM |
|--------|-------|--------------|------------|-----------------------|------------------|
| Series | Type* | Contact Num. | Gender | Options | BH Thread Length |
| LP | BH | | F - Female | SS - Stainless Steel | 19MM |
| MCLP | IL | | M - Male | TT - Titanium | 25MM |
| | DC | | | Leave Empty For Brass | |
| | OM | | | | |

* BH – Bulkhead, IL – Inline, DC – Dummy, OM - Over Mold

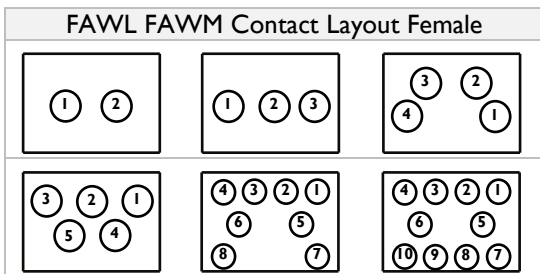


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FAWL FAWM



| # Contacts | A[mm] | B[mm] | C[mm] | L[mm] Male | N [mm] Female | W[mm] | M[Thread] | O-Ring | Locking Strap |
|--------------|-------|-------|-------|------------|---------------|--------------|-------------|--------|---------------|
| 2,3,4,5 FAWL | 20.5 | 14.7 | 14 | 21 | 31 | 12.5, 19, 25 | 7/16-20 UNF | 2-014 | FAWM-RS |
| 8,10 FAWM | 21 | 18 | 14 | 25.5 | 35.5 | 12.5, 19, 25 | 7/16-20 UNF | 2-014 | FAWM-RS |



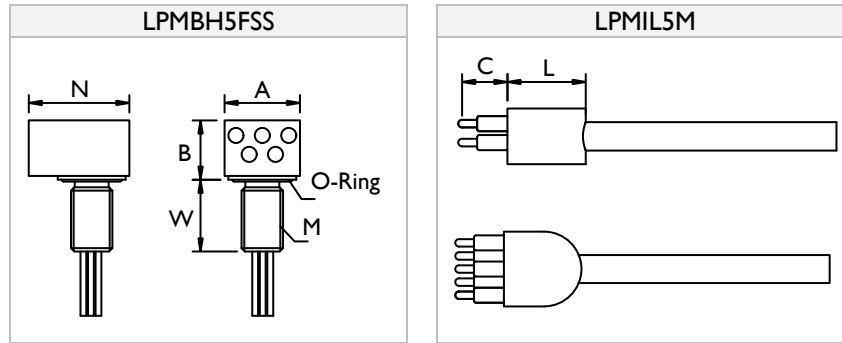
| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 6 | 18 |
| 3 | 6.7 | |
| 4 | 7 | |
| 5 | 7.5 | 20 |
| 8 | 9.5 | |
| 10 | 10 | |

| FAWL FAWM Part Number Format | | | | | |
|------------------------------|----------------|--------------|------------|----------------------|---------------|
| FAWL | -BH | 2 | M | SS | _19MM |
| Series | Type | Contact Num. | Gender | Options | Thread Length |
| FAWL | BH - bulkhead | | F - female | SS - stainless steel | 12.5MM |
| FAWM | IL - inline | | M - male | | 19MM |
| | DC - dummy | | | | 25MM |
| | OM - over mold | | | | Only for BH |

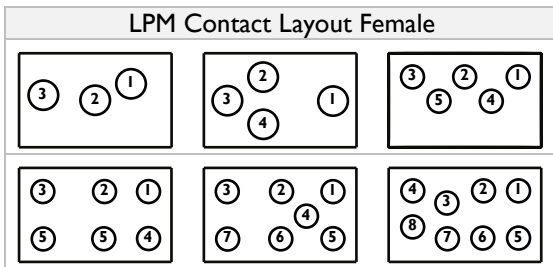


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LPM



| # Contacts | A [mm] | B [mm] | C [mm] | L [mm] Male | N [mm] Female | W [mm] | M[Thread] | O-Ring | Locking Strap |
|-------------|--------|--------|--------|----------------|---------------|--------------|-------------|--------|---------------|
| 3,4,5,6,7,8 | 20.5 | 16.7 | 19 | 21 | 32.5 | 12.5, 19, 25 | 7/16-20 UNF | 2-014 | FAWM-RS |



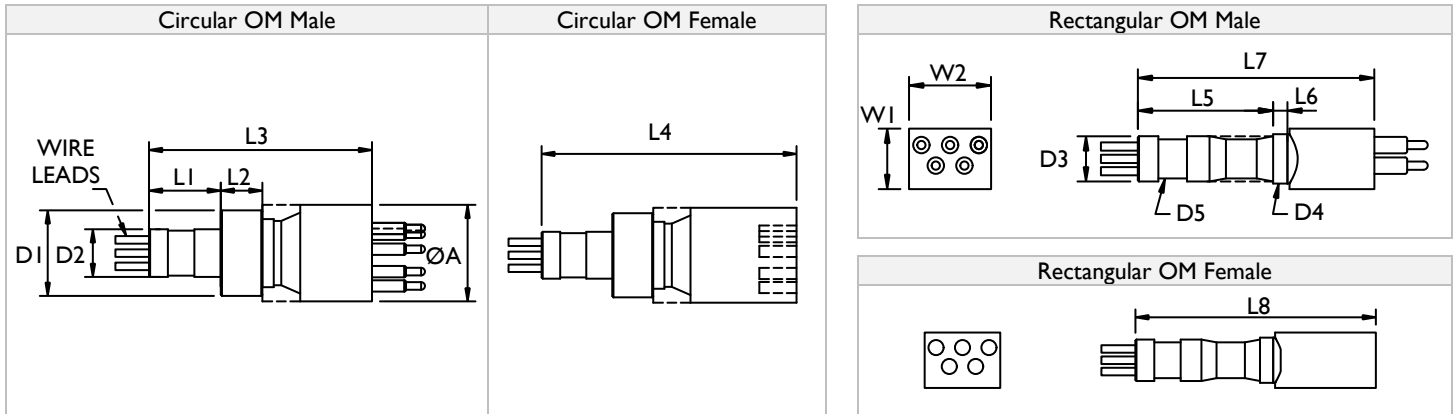
| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 3 | 9.4 | 18 |
| 4 | 10 | |
| 5 | 8 | 20 |
| 6 | 8 | |
| 7 | 9 | |
| 8 | 10 | |

LPM Part Number Format

| Series | Type | Contact Num. | Gender | Options | Thread Length |
|--------|----------------|--------------|------------|----------------------|---------------|
| LPM | -BH | 3 | M | SS | 19MM |
| | BH - bulkhead | | F - female | SS - stainless steel | 12.5MM |
| | IL - inline | | M - male | | 19MM |
| | DC - dummy | | | | 25MM |
| | OM - over mold | | | | Only for BH |

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OVER MOLD (OM)



| Circular OM connectors | | | | | | | | | |
|------------------------|-------|---------------|---------------------------|----------|---------|----------|------|----|--------------|
| Series | # | Contact Range | Interface Dimensions [mm] | | | | | | Ref Diameter |
| | | | D1 | D2 | L1 | L2 | L3 | L4 | ØA [mm] |
| TC | TCOM# | 2 to 7 | 9-0.1 | 8-0.1 | 10±0.25 | 6.7±0.25 | 31.7 | 40 | 11 |
| | | 2 to 8 | 13.4-0.1 | 10.8-0.1 | 20±0.25 | 15±0.25 | 55 | 60 | 16 |
| MC | MCOM# | 9 to 18 | 22.6-0.05 | 12.6-0.1 | 19±0.25 | 11-0.1 | 56.5 | 66 | 25 |
| | | 21 | 25-0.1 | 15.8-0.1 | 19±0.25 | 11-0.1 | 56.7 | 66 | 32 |
| SC | SCOM# | 2 to 5 | 22.6-0.05 | 10.9-0.1 | 19±0.25 | 10.1-1 | 55.6 | 65 | 25 |
| | | 6 to 10 | 25-0.1 | 15.8-0.1 | 19±0.25 | 11-0.1 | 56.7 | 66 | 32 |
| | | 12 to 25 | 25-0.1 | 15.8-0.1 | 19±0.25 | 11-0.1 | 66 | 69 | 40.5 |
| HD | HDOM# | 2 to 4 | 22.6-0.05 | 12.6-0.1 | 19±0.25 | 11-0.1 | 56.5 | 66 | 25 |

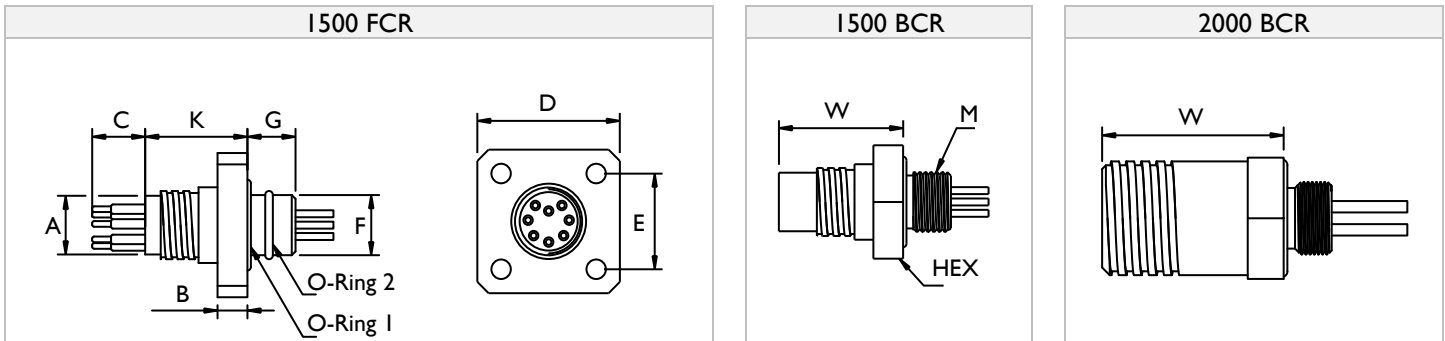
Leads: 10 CM

| Rectangular OM connectors | | | | | | | | | | | |
|---------------------------|----------|---------------|---------------------------|---------|----------|--------|------|------|---------------------------|------|----------|
| Series | # | Contact Range | Interface Dimensions [mm] | | | | | | Reference Dimensions [mm] | | |
| | | | D3 | D4 | L5 | L6 | L7 | L8 | W1 | W2 | D5 |
| LP | LPOM# | 2 | 11-0.1 | 12-0.05 | 22.2±0.1 | 4±0.1 | 71.2 | 71.2 | 14 | 22 | 10-0.1 |
| | | 3,4,5 | 11-0.1 | 12-0.05 | 22.2±0.1 | 4±0.1 | 71.2 | 71.2 | 14 | 25 | 10-0.1 |
| | | 6,7 | 13.4-0.1 | 16-0.05 | 20±0.1 | 10±0.1 | 81 | 81 | 19 | 25 | 13.4-0.1 |
| | | 9,12 | 13.4-0.1 | 16-0.05 | 20±0.1 | 10±0.1 | 81 | 81 | 21 | 31.5 | 13.4-0.1 |
| MCLP | MCLPOM | 7,9 | 11-0.1 | 12-0.05 | 22.2±0.1 | 4±0.1 | 71.2 | 71.2 | 14 | 25 | 10-0.1 |
| FAWL | FAWL-OM# | 2,3,4,5 | 11-0.1 | 12-0.05 | 33±0.1 | 4±0.1 | 58 | 68 | 14.7 | 20.5 | 10-0.1 |
| FAWM | FAWM-OM# | 8,10 | 12-0.1 | 15-0.05 | 33.5±0.1 | 4±0.1 | 63 | 73 | 18 | 21 | 11-0.1 |

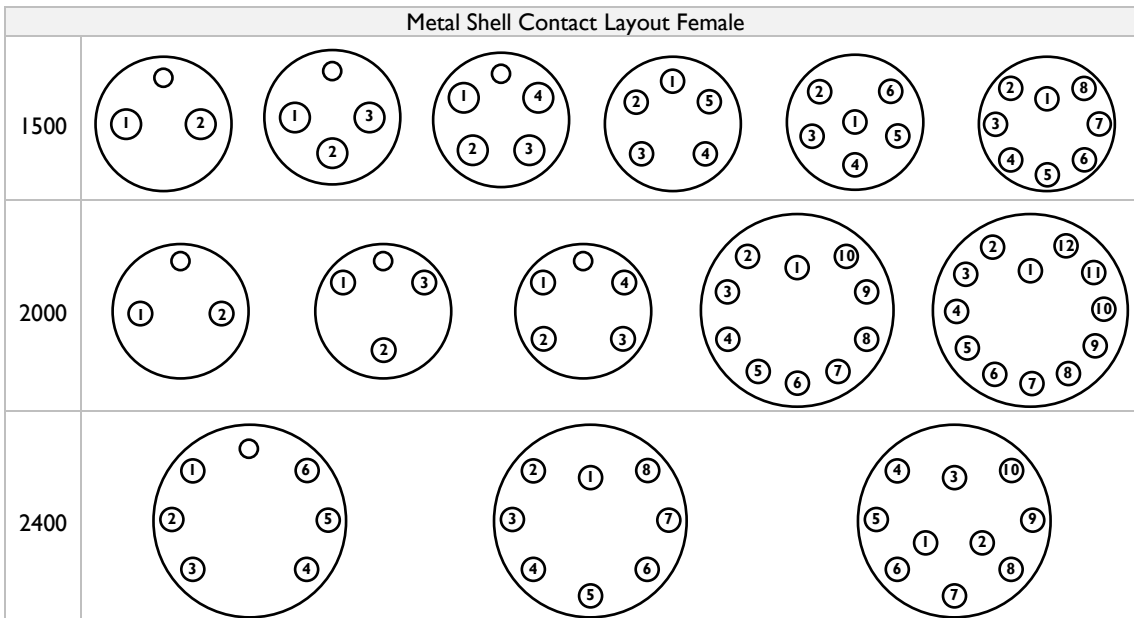
Leads: 10 CM

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METAL SHELL (MS)



| Shell Size | O-Ring 1 | O-Ring 2 | HEX [mm] | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | W [mm] | M [mm] [Thread] |
|------------|----------|----------|----------|--------|--------|--------|--------|--------------------------|----------------------|--------|--------|-----------------|
| 1500 | 2-017 | 2-014 | 30 | ∅ 15.5 | 7.9 | 12.5 | 38.1 | 25.4 4 Holes x ∅ 5.2 | ∅ 15.884 ∅ 15.866 | | 33 | 5/8-18 UNF 2A |
| 2000 | 2-018 | 2-016 | 32 | ∅ 31.6 | 9.5 | NA | 44.4 | 31.75 4 Holes x ∅ 6.7 | ∅ 18.780 ∅ 18.759 | 12.7 | 48 | 3/4-16 UNF 2A |
| 2400 | 2-122 | 2-020 | 41 | ∅ 38.8 | 9.5 | NA | 50.8 | 38.1 4 Holes x ∅ 6.7 | ∅ 25.130 ∅ 25.110 | | 48 | 1-14 UNS 2A |

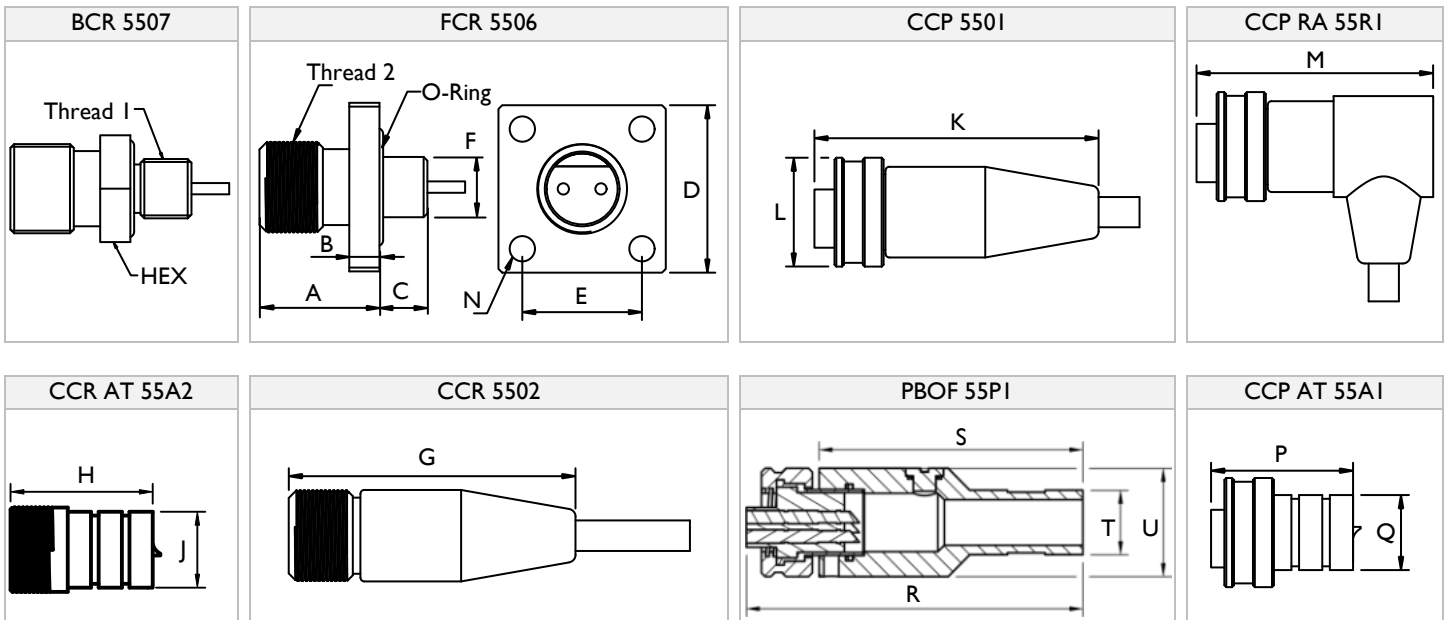


| Series | Contact Num. VS. AWG | |
|--------|----------------------|--------|
| | AWG 20 | AWG 18 |
| 1500 | 5,6,8 | 2,3,4 |
| 2000 | 10,12 | 2,3,4 |
| 2400 | | 6,8,10 |

| Metal Shell Part Number Format | | | | |
|--------------------------------|------------|--------------|------------------------|---------------------------|
| FCR | 15 | 02 | M | SS |
| Type | Size | Contact Num. | Gender | Options |
| FCR - flange BCR - hex | 15, 20, 24 | | F - female M - male | SS - stainless steel only |

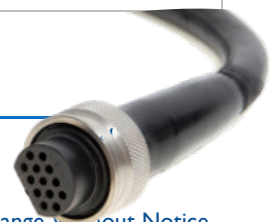
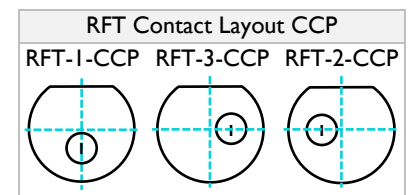
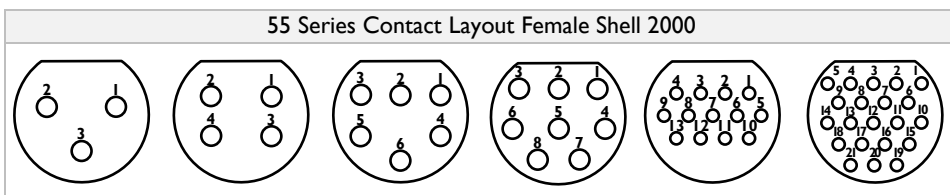
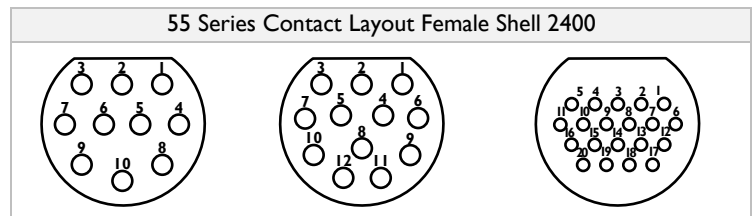
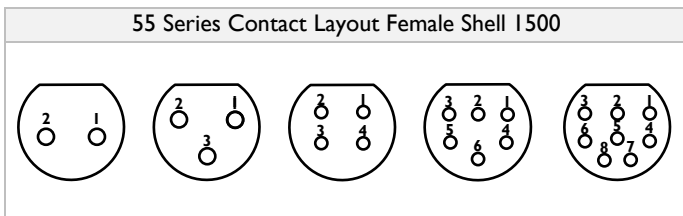
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5500 SERIES



| Shell Size | O-Ring | Thread 1 | Thread 2 | HEX [mm] | A[mm] | B[mm] | C[mm] | D[mm] | E[mm] | F[mm] | G[mm] | H[mm] | J[mm] |
|------------|--------|------------|----------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 15 | 2-116 | 5/8-18 UNF | 15/16-20 | 28.4 (1.12 IN.) | 31.8 | 8 | 12.7 | 38 | 25.4 | 17.2 | 75 | 37.3 | 19.8 |
| 20 | 2-118 | 3/4-16 UNF | 1-1/4-9 | 31.8 (1.25 IN.) | 38 | 9.5 | 12.7 | 44.5 | 31.8 | 18.9 | 128 | 40.4 | 27 |
| RFT | | | | | | | | | | | 95 | | |
| 24 | 2-122 | 1-14 UNF | 1-1/2-9 | 38.1 (1.5 IN.) | 38.1 | 9.5 | 12.7 | 50.8 | 38.1 | 25.15 | 128 | 42.7 | 33.5 |

| Shell Size | K [mm] | L [mm] | M [mm] | N [mm] | P [mm] | Q [mm] | R [mm] | S [mm] | T [mm] | U [mm] |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 15 | 75 | 27.7 | 70 | 5.2 | 39.4 | 17.3 | 96.52 | 69.85 | 17.07 | 28.45 |
| 20 | 128 | 38 | 85 | 7 | 42 | 27.7 | 102.62 | 74.68 | 17.07 | 38.1 |
| RFT | 95 | | | | | | | | | |
| 24 | 128 | 44.5 | 100 | 7.4 | 42.2 | 33.6 | 106.43 | 81.79 | 17.07 | 44.45 |



5500 SERIES Ordering Table

| | | | | | |
|-----------|--|---|------------------------|------------------|-------------------|
| 55 | 0 | I | -20 | 03 | -0003 |
| Series | A - Attachable C - Cap (dust cap) P - Pressure Balanced (oil filled) R - Right Angle 0 - 600V Standard | Type: 1 - CCP 2 - CCR 6 - FCR 7 - BCR | Size 15 20 24 | Contact count | Length In Feet |



RFT Ordering Table

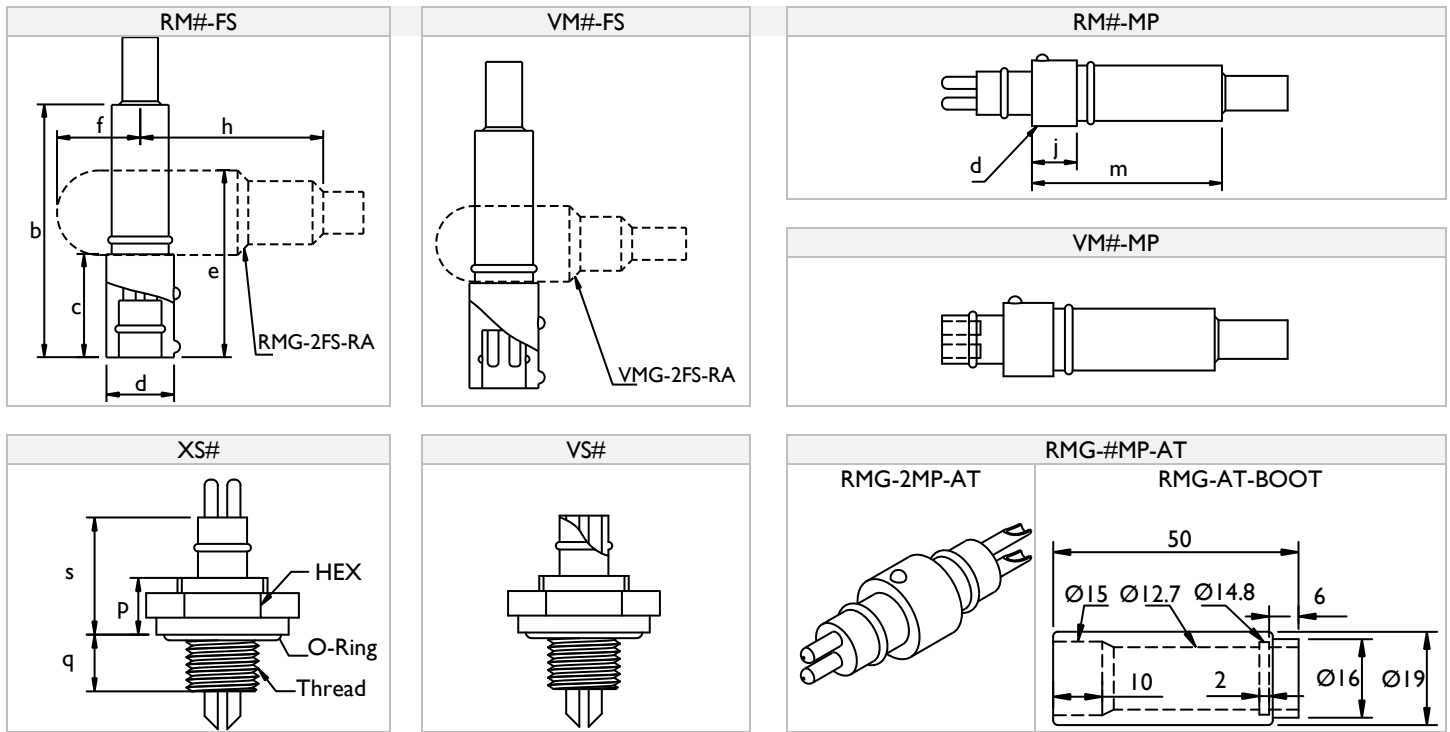
| | | | |
|------------|--|-----------------------------------|-------------|
| RFT | -I | -CCP | -DC |
| Series | 1 - Pin Position 1 2 - Pin Position 2 3 - Pin Position 3 | Type: CCP CCR FCR BCR | DC Dummy |

| Example | Description | Legacy Ref. |
|-----------|---|-------------|
| RFT-1-CCP | RFT Cable Connector Plug POSITION 1 | RFTF-1 |
| RFT-2-CCP | RFT Cable Connector Plug POSITION 2 | RFTF-2 |
| RFT-3-CCP | RFT Cable Connector Plug POSITION 3 | RFTF-3 |
| RFT-1-CCR | RFT Cable Connector Receptacle POSITION 1 | RFTM-1 |
| RFT-2-CCR | RFT Cable Connector Receptacle POSITION 2 | RFTM-2 |
| RFT-3-CCR | RFT Cable Connector Receptacle POSITION 3 | RFTM-3 |
| RFT-1-BCR | RFT Bulkhead Connector Receptacle POS 1 | NA |
| RFT-2-BCR | RFT Bulkhead Connector Receptacle POS 2 | NA |

| Series | Contact Num. VS. AWG | | |
|--------------|----------------------|-------|---------|
| | AWG4 | AWG18 | AWG16 |
| 55 Size 1500 | | 4,6,8 | 2,3 |
| 55 Size 2000 | | 13,21 | 3,4,6,8 |
| RFT | I | | |
| 55 Size 2400 | | 20 | 12,10 |

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RUBBER MOLDED (RM)

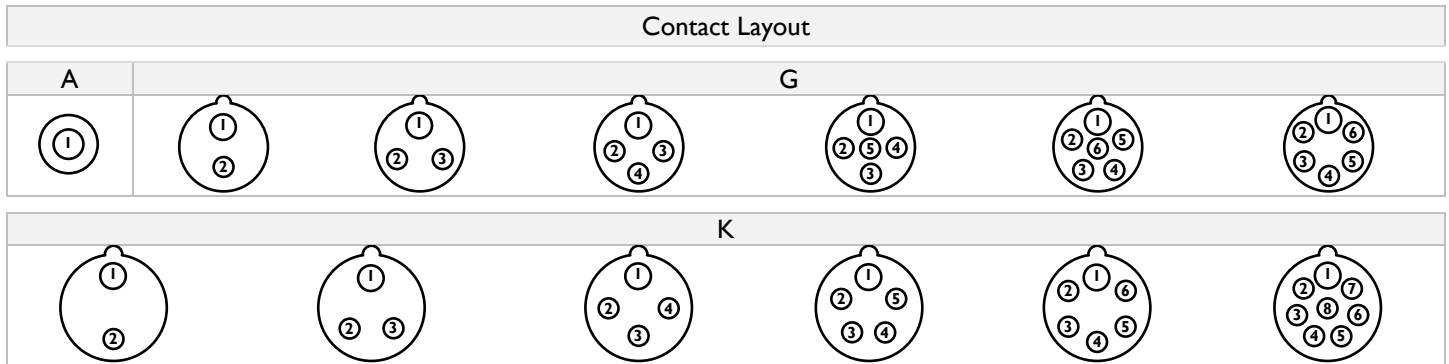


| Cable Connector RM and VM, Dimensions in [mm] | | | | | | | | |
|---|------|------|-----|-----|----|-----|----|------|
| Size | -FS | | | | | -MP | | |
| | b | c | e | f | h | Ød | j | m |
| A | 65 | 36 | N/A | 8.9 | 28 | 8 | 16 | 49.5 |
| G | 73.5 | 28.5 | 54 | 19 | 47 | 19 | 13 | 58.5 |
| K | 68 | 41 | 68 | 19 | 47 | 27 | 19 | 46 |

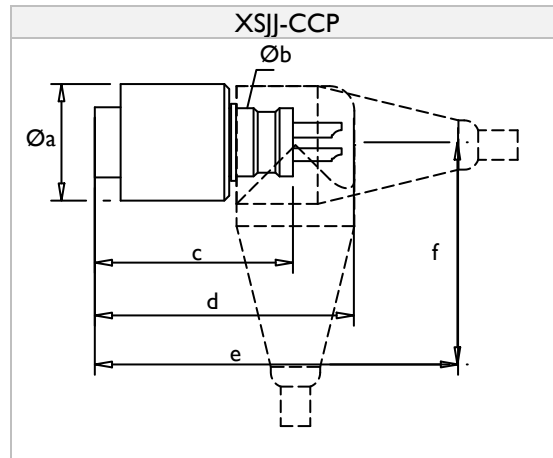
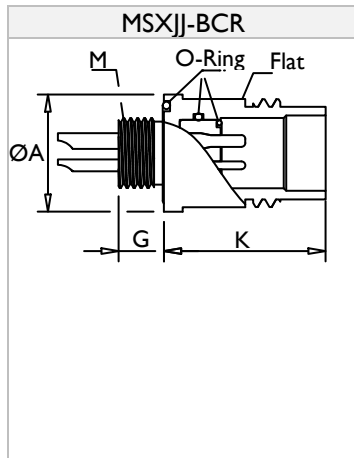
| Bulkhead Connector VS and XS | | | | | | | | | | |
|------------------------------|----------------------------|--------------------|--------------------|------|------|------|--------|----------------|----------|--|
| Size | Bulkhead Type | Designator | Dimensions in [mm] | | | | O-Ring | Thread | Locking | |
| | | | p | q | s | HEX | | | Sleeve | |
| A | Solder Cups | VS#-BCL XS#-BCL | 4.6 | 15.7 | 14.5 | 11.2 | 2-012 | 5/16-24 UNF-2A | FLS-A-RM | |
| | Wire Leads | VSG-PBCLM | 14 | 12.7 | 30 | 23.9 | 2-017 | 1/2-20 UNF-2A | | |
| G | Wire Leads - High Pressure | XSG-BCL-HP-SS | 21 | 10 | 37 | | | | FLS-G | |
| K | Solder Cups | VS#-BCL | 16 | 16 | 32 | 35 | 2-213 | 3/4-16 UNF-2A | | |
| | | XS#-BCL | 16 | 25.4 | 28.6 | 41 | 2-217 | 1-14 NS-2A | FLS-K | |

| Mating Options | |
|-----------------|----------------------------|
| Cable Connector | Mating Bulkhead Connectors |
| RM#-FS | RM#-MP |
| | XS#-BCL |
| | XS#-PBCLM |
| VM#-FS | VM#-MP |
| | VS#-BCL |
| | VS#-PBCLM |

| Size | Contact Num. VS. AWG | |
|------|----------------------|-------|
| | AWG18 | AWG16 |
| A | 1 | |
| G | 1,2,3,4,5,6 | |
| K | 2,3,4,5,6,8 | |

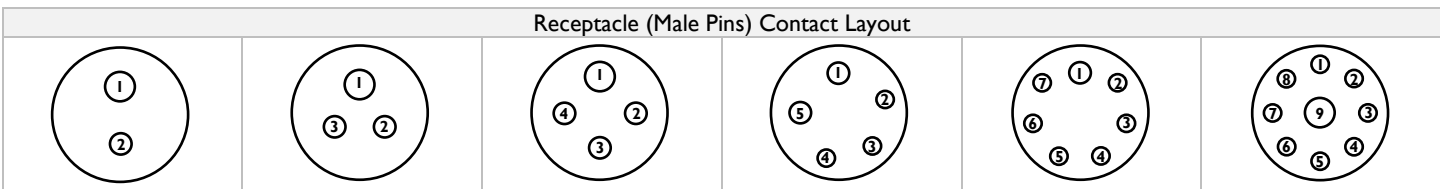


| RM Part Number Format | | | | | |
|-----------------------|------|-----------|--------------------|------------------------|--|
| RM | G | -6 | FS | -AT | -BCL |
| Type | Size | Contacts. | Gender | Options | XS And VS Bulkheads |
| cable connector | A | | FS – female Socket | AT – attachable | BCL – solder cups |
| RM | G | | MP – male plug | RA – right angle | |
| VM | K | | FSD – FS dummy | RADIAL – | PBCLM – wires, availability: |
| Bulkhead connector | | | MPD – MP dummy | #6 pin only see layout | VSG-2-PBCLM |
| XS | | | | | VSG-3-PBCLM |
| VS | | | | | VSG-4-PBCLM |
| | | | | | BCL-HP-SS – wires, high pressure availability: |
| | | | | | XSG-2-BCL-HP-SS |
| | | | | | XSG-3-BCL-HP-SS |
| | | | | | XSG-4-BCL-HP-SS |
| | | | | | XSG-5-BCL-HP-SS |
| | | | | | XSG-6-BCL-HP-SS |



| MSXJJ-BCR | | | | | |
|-----------|-----|------|------|----------------|-------------------------|
| ØA | G | K | Flat | M[Thread] | O-Ring |
| 23.8 | 9.2 | 32.8 | 22 | 9/16-18 UNF-2A | 5-254 2-015 5-058 |

| XSJJ-CCP | | | | | |
|-----------------------------|------|------|---------------|----|----|
| Unterminated connector [mm] | | | Molding* [mm] | | |
| Øa | Øb | c | d | e | f |
| 23.6 | 13.8 | 40.2 | 67 | 86 | 50 |

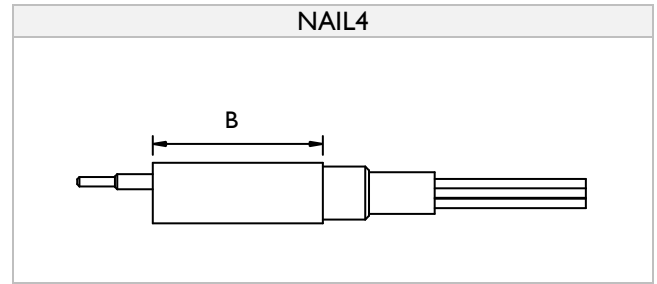
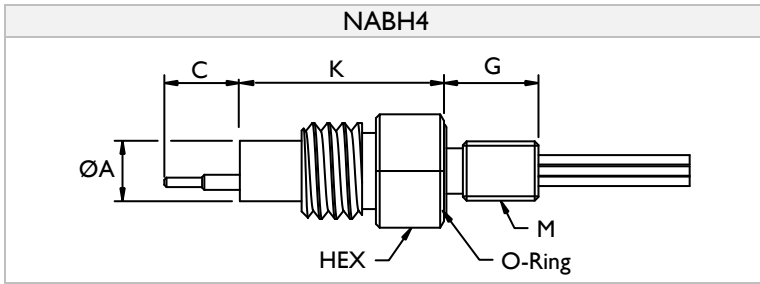


| XS GRE Part Number Format | | |
|--|-----------------------------|---|
| MSXJJ | -2 | -BCR |
| Sub family XSJJ MSXJJ | Contacts 2 | Type BCR Bulkhead Connector Receptacle CCR Cable Connector Receptacle CCP Cable Connector Plug |
| Future availability* XSEE, MSXEE, XSL, MSXL XSM, MSXM | Future availability* 3-9 | |

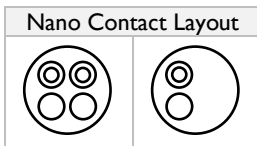
*Future Availability, inquire for options

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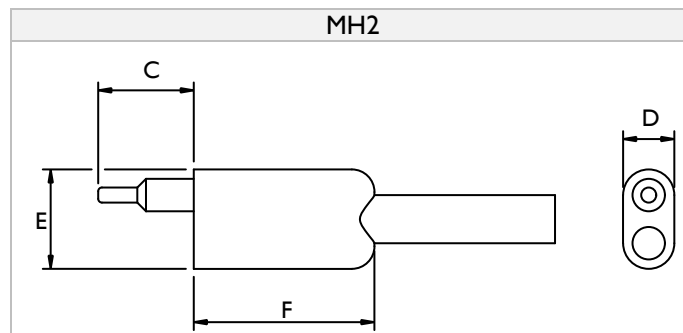
HERMAPHRODITIC



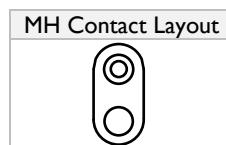
| # Contacts | A [mm] | B [mm] | C [mm] | K [mm] | G [mm] | M[Thread] | HEX[mm] | O-Ring | Locking Sleeve |
|------------|--------|--------|--------|--------|--------|----------------|---------|--------|----------------|
| 2,4 | 10 | 22.5 | 11 | 25 | 12.5 | 5/16-24 2A UNF | 15 | 2-012 | FLS-NA, MLS-NA |



| NANO Data Table | | |
|--------------------|-------|-------|
| Number of contacts | 2 | 4 |
| PN cable connector | NAIL2 | NAIL4 |
| PN bulkhead | NABH2 | NABH4 |
| AWG | 20 | |



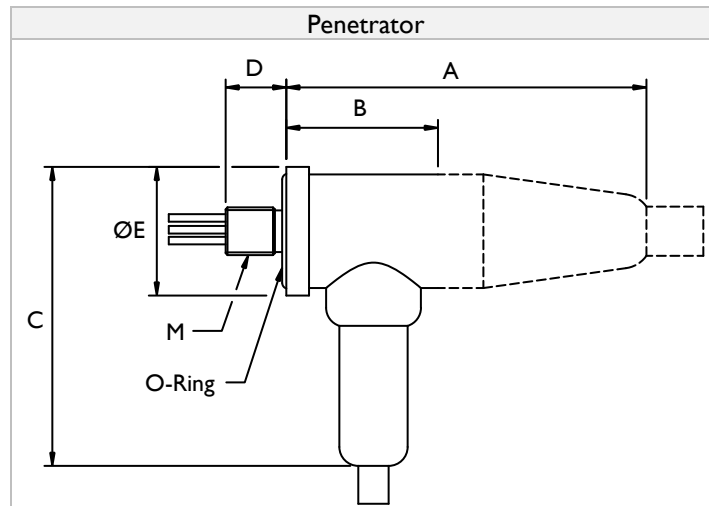
| # Contacts | C [mm] | D [mm] | E [mm] | F [mm] |
|------------|--------|--------|--------|--------|
| 2 | 12.7 | 6.8 | 13.2 | 24 |



| MH Data Table | |
|-----------------------------------|--------|
| Number of contacts | 2 |
| Cable dim [mm] | 6.4 |
| Ordering number single cable lead | MH2 |
| Ordering number dual cable lead | MH2-DW |
| AWG | 20 |

BIRNS Aquamate LLC

PENETRATOR (PN)



| | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | O-Ring [Nitrile] | M Thread |
|--------|--------|--------|--------|--------|--------|------------------|---------------|
| Size B | 63.5 | 28.2 | 60.5 | 16 | 25.4 | 2-017 | 1/2-20 UNF-2A |
| Size C | 106 | 36 | 67 | 25 | 38 | 2-213 | 3/4-16 UNF-2A |

| # Contacts | Cable OD [mm] | AWG |
|------------|---------------|-----|
| 2 | 7.5 | 18 |
| 3 | 8.1 | |
| 4 | 9 | |
| 5 | 12 | |
| 6 | 12.3 | |
| 7 | 13 | |
| 8 | 13.5 | |

Penetrator Part Number Format

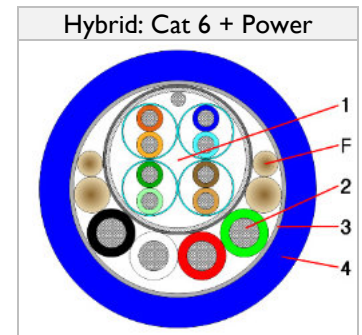
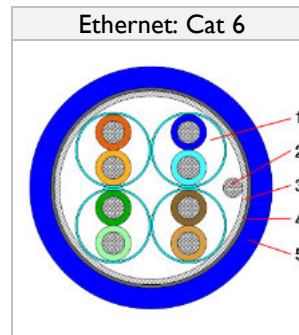
| PN | -B | -6 | -RA |
|--------|----------------|---|-----------------------------|
| Series | Size B C | Contact Num. Size B - 1,2, 3, 4, 6, 8,9 Size C - 1,2, 3, 4, 6, 8,9,10 | Options RA - right angle |

BIRNS *Aquamate LLC*

ETHERNET



| Cable Build | | |
|---------------------|-----------------------------|-----------------------|
| | Ethernet: Cat 6 | Hybrid: Cat 6 + Power |
| 1 | twisted pairs shielded 100% | Cat6 Cable |
| 2 | Drain AWG26 | 4 x AWG18 |
| 3 | Outer braid 80% coverage | |
| 4 | Non-woven tape | 12mm OD. |
| 5 | 8mm OD. | NA |
| F | NA | Filler |
| Jacket Material: TP | | |



| Compatibility | | | |
|-----------------|--------------|----------------|---------------|
| Birns Aq. | Ref Company | Ref PN | Compatibility |
| SCXX8-ETH | | DXX8X | NO |
| MCLPXX9-ETH | Subconn | DLPXX9X | YES |
| MCXX13-ETHI3 | | DXX13X | YES |
| 550X-1508-ETH | Eaton Burton | 550X-1508-EXXX | YES |
| 550X-2013-ETHI3 | | 550X-2013-EXXX | YES |

* MCBH13-BIRNS-ETHI3 threading differs from MCBH13-SU-ETHI3. See [MC page](#).

[MC page](#).

| Ethernet Part Number Format | |
|-------------------------------|--|
| Ethernet add "-ETH" | |
| Ethernet + Power add "-ETHI3" | |

| Series | Bulkheads | Cable Connector |
|---------|-----------------------|---------------------|
| MC | MCBH8FSS-ETH | MCIL8M-ETH |
| | MCBH13MSS-BIRNS-ETHI3 | MCIL13M-BIRNS-ETHI3 |
| | MCBH13MSS-SU-ETHI3 | MCIL13M-SU-ETHI3 |
| SC | SCBH8FSS-ETH | SCIL8M-ETH |
| | SCBH16MSS-ETHI3 | SCIL16F-ETHI3 |
| MCLP | MCLPBH9FSS-ETH | MCLPIL9M-ETH |
| FCR/BCR | FCR1508MSS-ETH | MCIL8F-ETH |
| LP | LPBH9FSS-ETH | LPIL9M-ETH |
| FAWM | FAWM-BH8MSS-ETH | FAWM-IL8F-ETH |
| | FAWM-BH10MSS-ETHI3 | FAWM-IL10F-ETHI3 |
| 5500 | 5506-2008-ETH | 5501-2008-ETH |
| | 5506-2013-ETHI3 | 5501-2013-ETHI3 |

ETHI3 Application:

Bulkhead and Over Mold: Cat6 + separate power leads.

Cable Connector: Hybrid cable, Cat6+power Integrated.

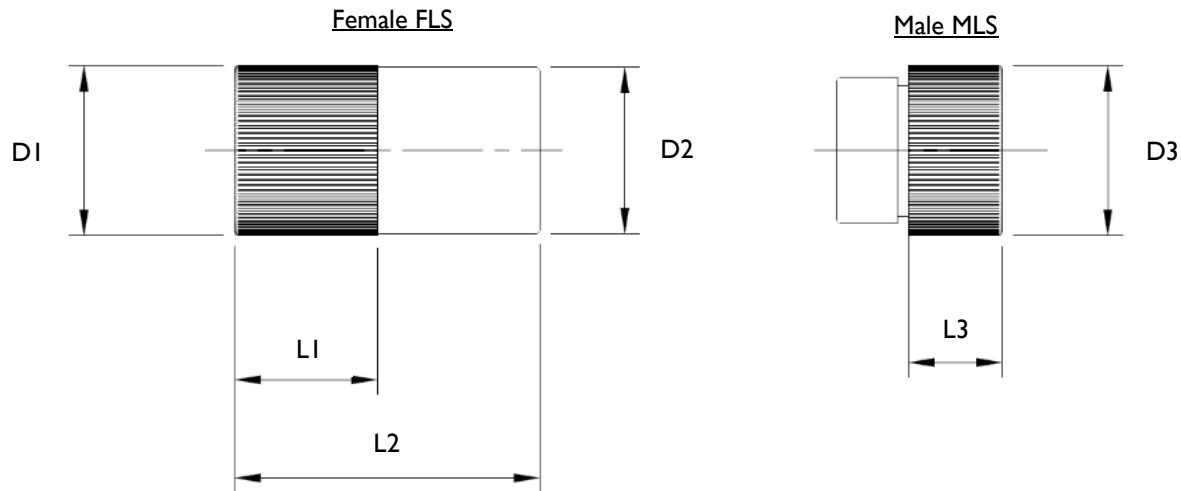
Over Mold - replace 'IL' with OM.

For instance, MCIL8F-ETH becomes MCOM8F-ETH

| Ethernet Specification | | |
|------------------------|---|-----------------------|
| Designator | -ETH | -ETHI3 |
| Type | Ethernet: Cat 6 | Hybrid: Cat 6 + Power |
| Power | NA | AWG18x4 |
| Volt Rating | 150v | 500v |
| Ethernet | Cat6 Patch AWG24 x 8 | |
| Data Rate | 1 Gbs up to 30 m. | |
| Cable OD | 8mm | 12mm |
| Bend Rad. | 6 x OD ≈ ~48mm | 6 x OD ≈ ~72mm |
| Standard Cable Length | Bulkhead / Cable Connector = 1M Over Mold connector = 0.1M | |
| RJ45 Jack | Simply45: S45-1755P, hookup: T568B Supplied without RJ45 jack. To order RJ45 jack: -Unterminated RJ45 use P/N: S45-1755P -Terminated* RJ45 use P/N: RJ45-TRM | |

*Do not pre-terminate RJ45 on bulkhead smaller than 5/8" thread.

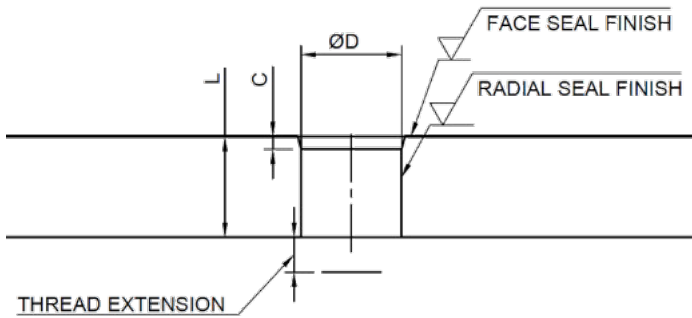
| Wire Color Code - Ethernet | | | |
|----------------------------|-------------------------|---------------|---------------|
| Wire # | Connector Contact Count | | |
| | 8 Wires | 9 Wires | 10+ Wires |
| 1 | Brown* | Brown* | Black |
| 2 | Light Brown* | Light Brown* | Screen |
| 3 | Blue* | Blue* | White |
| 4 | Light Blue* | Light Blue* | Brown* |
| 5 | Orange* | Orange* | Light Brown* |
| 6 | Light Orange* | Light Orange* | Blue* |
| 7 | Green* | Green* | Light Blue* |
| 8 | Light Green* | Light Green* | Orange* |
| 9 | | Screen | Light Orange* |
| 10 | | | Green* |
| 11 | | | Light Green* |
| 12 | | | Red |
| 13 | | | Green |
| 14+ | Standard color code | | |
| * | Twisted pairs | | |



| PN | Reference PN | Application | D1 [mm] | D2 [mm] | D3 [mm] | L1 [mm] | L2 [mm] | L3 [mm] |
|----------------------|--------------------|----------------------------|---------|---------|---------|---------|---------|---------|
| FLS-A MLS-A | DLSA-F DLSA-M | SC 2-5 MC-SU 9-16 | 34 | 33 | 34 | 16 | 32 | 23 |
| FLS-B MLS-B | DLSB-F DLSB-M | SC 6-10 | 40 | 39 | 39 | 16.5 | 32.5 | 23 |
| FLS-C MLS-C | DLSC-F DLSC-M | SC 12, 16, 25 | 59 | 59 | 59 | 30 | 30 | 19.5 |
| FLS-MC MLS-MC | MCDLS-F MCDLS-M | MC 2-8 METAL SHELL 1500 | 23 | 22.5 | 23 | 19.3 | 41.3 | 12.7 |
| FLS-MCA MLS-MCA | | MC 9-21 Birns HD 2-4 | 34 | 33 | 34 | 26.7 | 52.7 | 23 |
| FLS-TC MLS-TC | | TC | 17.3 | 16.5 | 16.5 | 20 | 36 | 10 |
| FLS-NA MLS-NA | | NANO | 17.3 | 16.5 | 16.5 | 20 | 40.5 | 15.5 |
| LS2000 | | METAL SHELL 2000 | 34 | 33 | NA | 16 | 32 | NA |
| LS2400 | | METAL SHELL 2400 | 40 | 39 | NA | 16.5 | 32.5 | NA |
| FLS-A-RM MLS-A-RM | A-FLS-D A-MLS-D | RM size A | 17 | 12.7 | 17 | 13.6 | 45.6 | 13.5 |
| FLS-G MLS-G | G-FLS-D G-MLS-D | RM size G | 28.5 | 27.5 | 28.5 | 22 | 34.7 | 11 |
| FLS-K MLS-K | K-FLS-D K-MLS-D | RM size K | 36 | 36 | 38.1 | 48 | 48 | 17.8 |

Note:
 Material: Delrin Black
 Available Stainless Steel: FLS-A-SS; FLS-MC-SS; MLS-MC-SS; LS2000-SS;

| Connector Mounting Configurations | | | |
|--|---|-------------------------------------|--|
| Straight Hole + Nut | Threaded Hole | Threaded Hole + Nut | Flange |
| | | | |
| Standard application, Enables orientation adjustment | Used in limited space / access application. Or if wall thickness prevents nut | Used to prevent accidental release. | Enables radial seal as well as face seal. Better connector orientation, accuracy and fastening access. More expensive. |



| Connector | D | | C [mm] | L [mm] |
|--------------|--------------------|---------------|---------------|--------|
| | Straight Hole [mm] | Threaded Hole | | |
| 5/16"-24 UNF | 8.12±0.1 | 5/16-24 UNF | 0.2 MAX x 45° | NA |
| 7/16"-20 UNF | 11.29±0.1 | 7/16-20 UNF | | |
| 1/2"-20 UNF | 12.88±0.1 | 1/2"-20 UNF | | |
| 5/8"-18 UNF | 16.05±0.1 | 5/8-18 UNF | | |
| 3/4"-16 UNF | 19.23±0.1 | 3/4-16 UNF | | |
| 1"-14 UNS | 25.58±0.1 | 1-14 UNS | | |
| FCR1500 | 15.9+0.027 | | 1.5 x 15° | 13 min |
| FCR2000 | 18.8+0.033 | NA | | |
| FCR2400 | 25.15+0.033 | | | |

FACE/ RADIAL SEAL FINISH
N7 (Ra 1.6) or better on O-ring contact surfaces.

| Closing Torque | | |
|----------------|-----------------------------|----|
| Thread | Stainless Steel Or Titanium | |
| | lb-ft | Nm |
| 5/16"-24 UNF | 3 | 4 |
| 7/16"-20 UNF | 9 | 13 |
| 1/2"-20 UNF | 14 | 19 |
| 5/8"-18 UNF | 27 | 37 |
| 3/4"-16 UNF | 42 | 57 |
| 1"-14 UNS | 67 | 90 |

*Brass or Aluminum 70% of listed
**PEEK or GRE 30% of listed

| Maintenance |
|---|
| Before mating use PTFE based lubricant such as Super Lube® by Synco (grease for O-rings and aerosol for connectors) For cleaning use contact cleaner (isopropyl alcohol) or soap and water. For longest life clean connectors after each job, dry, relubricate, and cover until ready for next job. |

DISTRIBUTORS

| Americas | | | | |
|---------------|---------|-------------------|---|---|
| North America | USA | New England | Electronic Sales Of New England | 33 Main St., Unit E Old Saybrook, CT 06475 sales@esalesne.com www.esalesne.com |
| | | Mid-Atlantic | Lindgren Associates, Inc. | 8711 Plantation Lane Manassas, VA. 20110 www.LindgrenAssociates.com |
| | | Gulf Coast | Cis Interconnect | 2580 Broadway ST. San Leon Texas 77539 www.cis-interconnect.com |
| | Canada | Axsub Inc. | 112, Montée Industrielle Rimouski, Québec, G5M 1B1 sales@axsub.com www.axsub.com | |
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| Western Europe | United Kingdom | Scorpion Oceanics Ltd. | Unit 2, Park Farm Gt. Chesterford Essex, CB10 1RN | www.scorpionoceanics.co.uk |
| | Holland | Seascope | De Hoogjens 22 4254 XW Sleenwijk | Info@seascapesubsea.com www.seascapesubsea.com www.novasub.com |
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| Israel | | |
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