# Circular Connectors

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# Circular Connectors

A range of high reliability, rugged, RoHS-compliant Circular Connectors to meet the high standards of MIL-DTL-5015, priced to be cost-effective for commercial and industrial applications.

These connectors are designed for use in harsh environments. The high specification connectors are Cadmium-free and Hexavalent-Chromium-free to satisfy the requirements of RoHS (unlike the military standard version of MIL-DTL-5015). The connector range features free plugs, panel mount and cable connector orientations, in a number of popular shell and layout types. Pin and socket contacts can be selected in either side of a mating pair.

## Features

- Intermateable with MIL-DTL-5015
- Low cost, highly durable & rugged connector system
- Solder termination
- Full environmental sealing with the use of backshells and sealing gaskets, exceeds IP67

- Threaded and polarised coupling
- Zinc Cobalt alloy black shells, for RoHS compliance
- COTS applications where MIL spec is not mandatory

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# Circular Connectors Specification

## ⦂ Materials

| | |
|---|---|
| Outer shell: | Aluminium Alloy base material, Zinc Cobalt Alloy, Black finish |
| Inner contacts: | Copper Alloy, Silver finish |
| Insulator, Grommet: | Synthetic Rubber |

## ⦂ Electrical

| | |
|---|---|
| Current: | 13A |
| **Working voltage** | |
| 10SL shell: | 500V AC, 700V DC |
| 12S shell: | 500V AC, 700V DC |
| 14S shell: | 200V AC, 250V DC |
| **Voltage proof** | |
| 10SL shell: | 2,000V AC |
| 12S shell: | 2,000V AC |
| 14S shell: | 1,000V AC |
| Insulation resistance: | 5,000MΩ min |

## ⦂ Mechanical

| | |
|---|---|
| Durability: | 500 operations |

## ⦂ Environmental

| | |
|---|---|
| Operating temperature: | -55°C to +125°C |
| Vibration sensitivity: | 10Hz to 500Hz, 98m/s$^2$ (10G) |
| Shock severity: | 490m/s$^2$ (50G) for 11ms |
| Water resistance (sealing): | 1.8m for 48 hours – exceeds IP67 |

## ⦂ Wire Detail

16 to 22 AWG

7.50
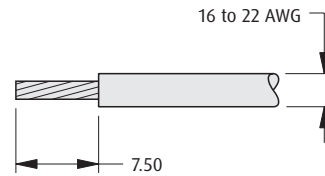
# Pin Numbering & Spacing

⦂ Views are shown onto the mating face of each connector type.

| | 10SL SHELL | | 12S SHELL | 14S SHELL | |
|---|---|---|---|---|---|
| | **2 CONTACT (10SL-4)** | **3 CONTACT (10SL-3)** | **2 CONTACT (12S-3)** | **4 CONTACT (14S-2)** | **6 CONTACT (14S-6)** |
| **FEMALE** | 2.31 4.62 B A | 2.31 4.62 1.35 A C B 2.67 | 2.64 5.28 A B | 2.29 4.57 A D B C 2.29 4.57 | 7.01 3.51 4.06 A B F C E D 8.13 2.29 4.57 |
| **MALE** | 2.31 4.62 A B | 2.31 4.62 1.35 C A B 2.67 | 2.64 5.28 B A | 2.29 4.57 D A C B 2.29 4.57 | 7.01 3.51 4.06 A B F C E D 8.13 2.29 4.57 |

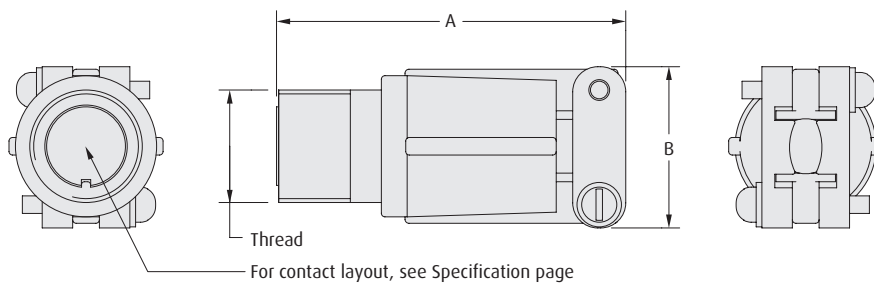All dimensions in mm.

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# Circular Connectors

## Cable Connector & Straight Plug

- Male & female circular connectors intermateable with MIL-DTL-5015.
- Rugged connector system for harsh environments.
- Exceeds IP67.
- Recommended wire strip length is 7.5mm.

### CABLE CONNECTOR



Thread

For contact layout, see Specification page

| SHELL SIZE | THREAD | A max | B max |
|---|---|---|---|
| **10SL-3** | 5/8-24UNEF | 54.10 | 22.76 |
| **10SL-4** | 5/8-24UNEF | 54.10 | 22.76 |
| **12S-3** | 3/4-20UNEF | 54.10 | 22.76 |
| **14S-2** | 7/8-20UNEF | 54.10 | 25.94 |
| **14S-6** | 7/8-20UNEF | 54.10 | 25.94 |

- Connector Kit includes internal sealing grommet (not shown here).

### STRAIGHT PLUG



Thread

For contact layout, see Specification page
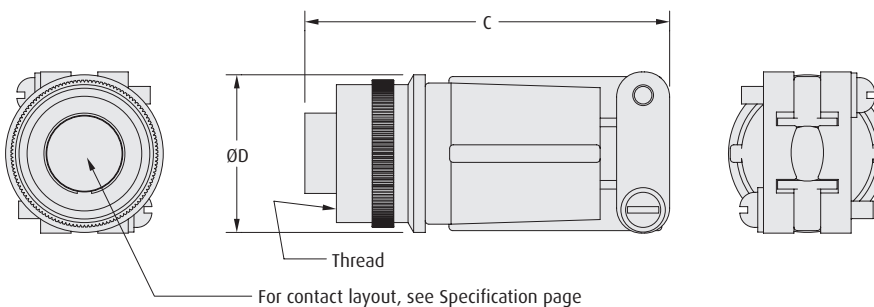
| SHELL SIZE | THREAD | C max | ØD max |
|---|---|---|---|
| **10SL-3** | 5/8-24UNEF | 54.10 | 24.10 |
| **10SL-4** | 5/8-24UNEF | 54.10 | 24.10 |
| **12S-3** | 3/4-20UNEF | 54.10 | 25.30 |
| **14S-2** | 7/8-20UNEF | 55.91 | 28.53 |
| **14S-6** | 7/8-20UNEF | 55.91 | 28.53 |

- Connector Kit includes internal sealing grommet and rear rubber bushing (not shown here).

### HOW TO ORDER

C90 - 310XX XXXX-X X

**SERIES CODE**

| TYPE | |
|---|---|
| **3101F** | Cable connector with backshell |
| **3106F** | Straight plug with backshell |

| CONTACT GENDER | |
|---|---|
| **P** | Male |
| **S** | Female |

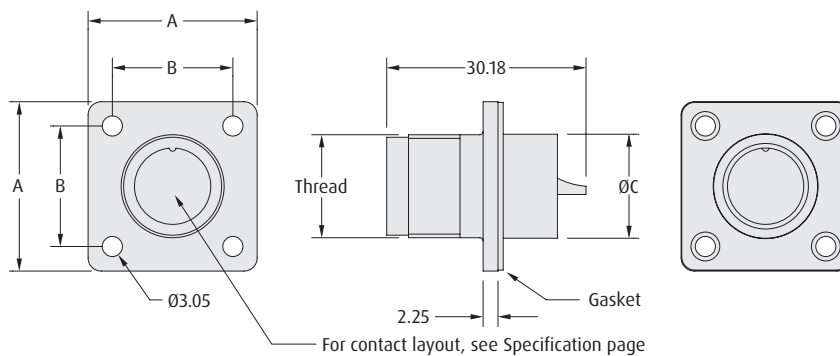| SHELL SIZE | |
|---|---|
| **10SL-3** | Thread 5/8-24UNEF, 3 contacts |
| **10SL-4** | Thread 5/8-24UNEF, 2 contacts |
| **12S-3** | Thread 3/4-20UNEF, 2 contacts |
| **14S-2** | Thread 7/8-20UNEF, 4 contacts |
| **14S-6** | Thread 7/8-20UNEF, 6 contacts |

All dimensions in mm.

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# Circular Connectors

## Panel Mount Connector, Receptacle Style

- Male & female circular connectors intermateable with MIL-DTL-5015.
- Features screw holes for panel mounting.
- Gaskets provide panel mount sealing, and can be used either side of the flange.
- Mates with C90-3106F Straight Plug connectors shown on previous page.

### MALE CONTACT



Ø3.05

30.18

Thread

ØC

2.25

Gasket

For contact layout, see Specification page
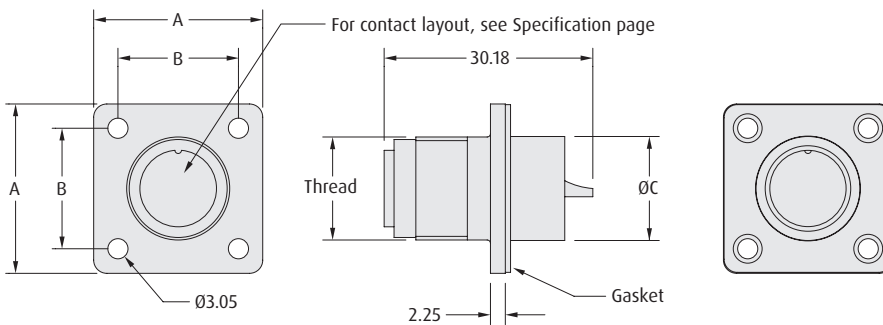
| SHELL SIZE | THREAD | A | B | ØC |
|---|---|---|---|---|
| **10SL-3** | 5/8-24UNEF | 25.65 | 18.25 | 15.75 |
| **10SL-4** | 5/8-24UNEF | 25.65 | 18.25 | 15.75 |
| **12S-3** | 3/4-20UNEF | 28.02 | 20.62 | 17.17 |
| **14S-2** | 7/8-20UNEF | 30.40 | 23.02 | 18.92 |
| **14S-6** | 7/8-20UNEF | 30.40 | 23.02 | 18.92 |

### FEMALE CONTACT

For contact layout, see Specification page

30.18

Thread

ØC

Ø3.05

2.25

Gasket

### HOW TO ORDER

C90 - 3102R XXXX-X X

**SERIES CODE**

| TYPE | |
|---|---|
| **3102R** | Panel mount connector with gasket |

| CONTACT GENDER | |
|---|---|
| **P** | Male |
| **S** | Female |

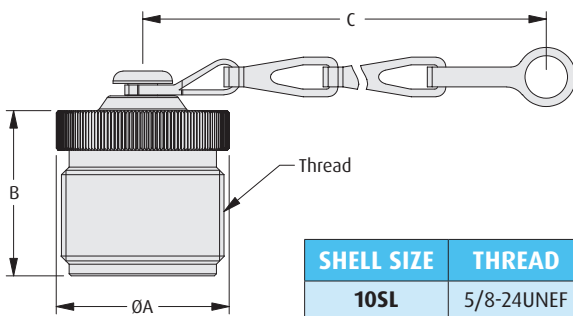| SHELL SIZE | |
|---|---|
| **10SL-3** | Thread 5/8-24UNEF, 3 contacts |
| **10SL-4** | Thread 5/8-24UNEF, 2 contacts |
| **12S-3** | Thread 3/4-20UNEF, 2 contacts |
| **14S-2** | Thread 7/8-20UNEF, 4 contacts |
| **14S-6** | Thread 7/8-20UNEF, 6 contacts |

All dimensions in mm.

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# Circular Connectors

## Dust Caps & Rubber Bushing

- Dust cap with external thread for use with Straight Plugs (C90-3106F).
- Dust cap with internal thread for use with Cable connectors (C90-3101F) and Panel Mount connectors (C90-3102R).
- Dust caps supplied fitted with chain.
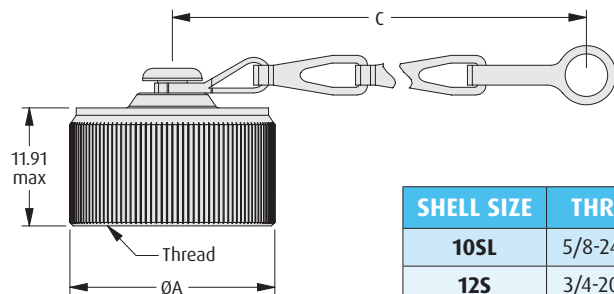- Rubber Bushing for use with Cable connectors (C90-3101F).

### DUST CAP – EXTERNAL THREAD

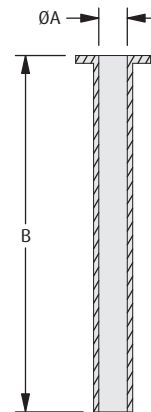| SHELL SIZE | THREAD | ØA max | B max | C |
|---|---|---|---|---|
| 10SL | 5/8-24UNEF | 17.45 | 16.66 | 101.60 |
| 12S | 3/4-20UNEF | 20.62 | 21.44 | 114.30 |
| 14S | 7/8-20UNEF | 23.80 | 21.44 | 114.30 |

### DUST CAP – INTERNAL THREAD

| SHELL SIZE | THREAD | ØA max | C |
|---|---|---|---|
| 10SL | 5/8-24UNEF | 20.70 | 101.60 |
| 12S | 3/4-20UNEF | 25.40 | 114.30 |
| 14S | 7/8-20UNEF | 28.57 | 114.30 |

### RUBBER BUSHING

| TYPE | ØA | B |
|---|---|---|
| 4 | 5.59 | 69.85 |
| 6 | 7.92 | 66.68 |

### HOW TO ORDER

**C90 - 2504X - XXXX**

SERIES CODE

| TYPE | |
|---|---|
| 2 | External thread |
| 3 | Internal thread |

| SIZE | |
|---|---|
| 10SL | For 10SL shell size |
| 12S | For 12SL shell size |
| 14S | For 14SL shell size |

### HOW TO ORDER

**C90 - 3420 - X**

SERIES CODE

| TYPE | |
|---|---|
| 4 | For 10SL shell size |
| 4 | For 12SL shell size |
| 6 | For 14SL shell size |

All dimensions in mm.

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