Durable Industrial Connectors

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Durable, rugged double-row high performance connection systems, designed to meet the tough challenges of industrial application environments and cost requirements.

These rectangular connectors are supplied in a choice of contact pitches - 1.27mm pitch for board-to-board (Archer Kontrol), or 2mm pitch for cable-to-board (M225 Series). Shrouded and polarized connector bodies help withstand lateral and twisting forces, and protect unmated connector contacts.

- Increased operating temperature range: -55°C to +125°C
- Stocked in depth across Harwin’s authorized distributor network

**Durable Industrial Rectangular Connectors** provide an excellent connection system for a variety of demanding industrial environments.

- Industrial: factory and mobile machinery, control panels and sub-systems, drives, robotics and other automation
- Instrumentation: test equipment and portable hand-held devices
- Site Control: remote control devices, ground and machinery monitoring
- IOT installations, dataloggers, trackside monitoring equipment, vehicle control systems

**Archer Kontrol**

- Current rating of 1.2A per contact
- Vertical and Horizontal options in both male and female connectors - board-to-board connection for parallel/mezzanine, motherboard to daughterboard, or coplanar/edge-to-edge PCB layouts
- Variable stacking height options with multiple connector sizes in both genders

**M225 Connectors**

- Current rating of 3A per signal contact (all electrically loaded; 3.3A per individual contact)
- Cable-to-board connection, with vertical PCB mounted male
- Female crimp contacts on continuous strip for automated crimping
- Simple locking mechanism - push fixing pin fully home to expand and lock the rubber collar into the male connector
# Rectangular Connectors Product Features

<table>
<thead>
<tr>
<th>Designed for Automated Manufacturing</th>
<th>Polarization</th>
</tr>
</thead>
<tbody>
<tr>
<td>All board-to-board (Archer Kontrol) connectors are supplied in tape and reel, all female cable contacts (M225 Series) are available on continuous feed strip.</td>
<td>All rectangular connectors feature significant polarization features to prevent mis-mating in everyday use.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Archer Kontrol - PCB location and strain relief</th>
<th>M225 Series - Fast and easy locking system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both vertical and horizontal connectors feature location pegs to assist with SMT board placement, and additional strain relief is provided with SMT hold-down tabs.</td>
<td>Simple locking mechanism - push fixing pin fully home to expand and lock the rubber collar into the male connector.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Archer Kontrol - High speed data transmission</th>
<th>M225 Series - 3 points of contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data transmission rates of 3Gbit/s if the system is suitably designed, by analysis of insertion loss and near-end crosstalk (NEXT).</td>
<td>Improved signal integrity assurance with female Beryllium Copper contacts, giving vibration and shock resistance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Archer Kontrol - Wide choice of stacking heights</th>
<th>Rugged construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable stack heights for parallel / mezzanine PCB placement, from 8.00mm to 20.00mm. Right angle mother/daughterboard and co-planar orientations also possible.</td>
<td>Vibration resistant to 20G (Archer Kontrol) and 10G (M225 Series), suitable for operational temperatures from -55°C to +125°C.</td>
</tr>
</tbody>
</table>
Archer Kontrol Specification

**Materials**

- **Housings:** High Temperature Plastic UL94V-0
- **Contacts:** Phosphor Bronze
- **Retaining strap:** Brass
- **Finish:**
  - Contacts: Gold on contact area, Tin on tails
  - Retaining strap: Tin

**Electrical**

- **Current:** 1.2A max per contact
- **Voltage proof:** 500V AC for 1 minute
- **Contact resistance:** 25mΩ max
- **Insulation resistance:** 10GΩ min
- **Data rate:** Up to 3GBits/s

**Mechanical**

- **Durability:** 500 operations
- **Insertion force (max):** 0.8N per contact
- **Withdrawal force (min):** 0.2N per contact

**Environmental**

- **Operating temperature:** -55°C to +125°C
- **Vibration sensitivity:** 10Hz to 2000Hz, 1.52mm, 196m/s² (20G), duration 12h
- **Solderability:** 245°C for 5 seconds
- **Soldering heat resistance:** 260°C for 10 seconds

---

**Pin Numbering**

<table>
<thead>
<tr>
<th>FEMALE</th>
<th>MALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="FEMALE Pin Numbering" /></td>
<td><img src="image2" alt="MALE Pin Numbering" /></td>
</tr>
</tbody>
</table>

All dimensions in mm.
Archer Kontrol Mating Profiles

* Mating heights shown in fully mated condition. Product can be used up to 1.5mm separated and still perform to the same specifications.

<table>
<thead>
<tr>
<th>FEMALE</th>
<th>VERTICAL SMT</th>
<th>HORIZONTAL SMT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.25mm HEIGHT</td>
<td>9.05mm HEIGHT</td>
</tr>
<tr>
<td>MALE</td>
<td>VERTICAL SMT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.75mm HEIGHT</td>
<td>8.25mm HEIGHT</td>
</tr>
<tr>
<td></td>
<td>8.25mm HEIGHT</td>
<td>9.50</td>
</tr>
<tr>
<td></td>
<td>9.85mm HEIGHT</td>
<td>11.10</td>
</tr>
<tr>
<td></td>
<td>HORIZONTAL SMT</td>
<td>15.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.65</td>
</tr>
</tbody>
</table>

All dimensions in mm.
Archer Kontrol Connectors

Female Vertical Surface Mount

- Suitable for parallel board-to-board (mezzanine stacking) or motherboard-to-daughterboard configurations.
- Choice of three height options.
- Polarized and shrouded housing design.
- Location pegs and tape & reel packaging for automated assembly processes.

VERTICAL

<table>
<thead>
<tr>
<th>A</th>
<th>B + 6.35</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0.635 x (Total No. of contacts - 2)</td>
</tr>
<tr>
<td>C</td>
<td>B + 4.42</td>
</tr>
<tr>
<td>D</td>
<td>B + 3.02</td>
</tr>
</tbody>
</table>

HOW TO ORDER

```
M55 - 60 X XX 42 R
```

- **SERIES CODE**
- **CONNECTOR HEIGHT**
  - 0  H = 6.25mm
  - 1  H = 9.05mm
  - 2  H = 13.65mm

- **PACKAGING**
  - R  Tape & Reeled

- **FINISH**
  - 42 Gold + Tin

- **TOTAL NO. OF CONTACTS**
  - 12, 16, 20, 26, 32, 40, 50, 68, 80

All dimensions in mm.
Archer Kontrol Connectors

Female Horizontal Surface Mount

- Suitable for coplaner (edge-to-edge) or motherboard-to-daughterboard configurations.
- Hold-down SMT retaining straps for additional retention to the board.
- Polarized and shrouded housing design.
- Location pegs and tape & reel packaging for automated assembly processes.

### Calculation

<table>
<thead>
<tr>
<th></th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B + 6.35</td>
</tr>
<tr>
<td>B</td>
<td>0.635 x (Total No. of contacts - 2)</td>
</tr>
<tr>
<td>C</td>
<td>B + 4.42</td>
</tr>
<tr>
<td>D</td>
<td>B + 3.02</td>
</tr>
</tbody>
</table>

### Recommended PC Board Pattern

- Recommended PC Board Pattern

### How to Order

**Series Code**

- M55 - 610 XX 42 R

**Packaging**

- R Tape & Reeled

**Finish**

- 42 Gold + Tin

**Total No. of Contacts**

- 12, 16, 20, 26, 32, 40, 50, 68, 80

All dimensions in mm.
Archer Kontrol Connectors

Male Vertical Surface Mount

- Suitable for parallel board-to-board (mezzanine stacking) or motherboard-to-daughterboard configurations.
- Choice of three height options.
- Polarized and shrouded housing design.
- Location pegs and tape & reel packaging for automated assembly processes.

VERTICAL

<table>
<thead>
<tr>
<th>CALCULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
</tbody>
</table>

HOW TO ORDER

**M55 - 70 X XX 42 R**

- **SERIES CODE**
  - R: Tape & Reeled

- **CONNECTOR HEIGHT**
  - 0: H = 6.75mm
  - 1: H = 8.25mm
  - 2: H = 9.85mm

- **FINISH**
  - 42: Gold + Tin

- **TOTAL NO. OF CONTACTS**
  - 12, 16, 20, 26, 32, 40, 50, 68, 80

All dimensions in mm.
Archer Kontrol Connectors

Male Horizontal Surface Mount

- Suitable for coplaner (edge-to-edge) or motherboard-to-daughterboard configurations.
- Hold-down SMT retaining straps for additional retention to the board.
- Polarized and shrouded housing design.
- Location pegs and tape & reel packaging for automated assembly processes.

### HORIZONTAL

<table>
<thead>
<tr>
<th>A</th>
<th>B + 6.35</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0.635 x (Total No. of contacts - 2)</td>
</tr>
<tr>
<td>C</td>
<td>B + 4.42</td>
</tr>
<tr>
<td>D</td>
<td>B + 4.02</td>
</tr>
</tbody>
</table>

### HOW TO ORDER

**SERIES CODE**

**M55 - 710 XX 42 R**

**PACKAGING**

- R Tape & Reeled

**FINISH**

- 42 Gold + Tin

**TOTAL NO. OF CONTACTS**

- 12, 16, 20, 26, 32, 40, 50, 68, 80

All dimensions in mm.
## M225 Connectors Specifications

### Materials
- **Housings, Pins:** High Temperature Plastic, UL94V-0
- **Contacts**
  - Female: Beryllium Copper, Tin finish
  - Male: Phosphor Bronze, Tin finish
- **Rubber Locking Collar:** Fluoroelastic Polymer

### Electrical
- **Current**
  - Individual contacts in isolation: 3.3A max (at 25°C)
  - 2.6A max (at 85°C)
  - All contacts simultaneously: 3.0A max (at 25°C)
  - 2.2A max (at 85°C)
- **Working voltage:** 800V DC or AC peak
- **Voltage proof:** 1,200V DC or AC peak
- **Contact resistance:** 25mΩ max
- **Insulation resistance:** 100MΩ min

### Mechanical
- **Durability:** 50 operations
- **Insertion force (max):** 2.8N per contact
- **Withdrawal force (min):** 0.2N per contact

### Environmental
- **Environmental classification:** 55/125/56 days at 95% RH
- **Operational temperature:** -55°C to +125°C
- **Vibration sensitivity:** 10Hz to 20000Hz, 0.75mm, 98m/s² (10G), duration 6 hours
- **Bump severity:** 390m/s² (40G), 4000 ±10 bumps
- **Shock severity:** 981m/s² (100G), for 6ms
- **Acceleration severity:** 490m/s² (50G)

*Tested with fixing pins fully engaged

### Pin Numbering

#### FEMALE
- No. 1 contact mark

#### MALE
- No. 1 contact mark

### Mating Profile

All dimensions in mm.
**M225 Connectors**

### Female Crimp Housings

- Female crimp housing kits - contacts are ordered separately (shown on following page).
- Housings are supplied fitted with the rubber locking collars, and supplied with loose fixing pins. Collars and pins only needed to be ordered separately if spares are required.

<table>
<thead>
<tr>
<th>HOUSING</th>
<th>CALCULATION</th>
<th>SPARE RUBBER LOCKING COLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ A = B + 12 ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ B = \text{Total no. of contacts} - 2 ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[ C = B + 7 ]</td>
<td></td>
</tr>
</tbody>
</table>

- Housing Kit includes 2 x Rubber Locking Collars (fitted) and 2 x Fixing Pins (loose).

### How to Order

- **ORDER CODE**
  - M225-0500098
- **ORDER CODE**
  - M225-0600098

- **SERIES CODE**
  - M225 - 455 XX 98
- **NO. OF CONTACTS**
  - 10, 20, 26, 34, 50

All dimensions in mm.
## M225 Connectors

### Female Crimp Contacts

- Crimp contacts must be ordered separately, see previous pages for applicable housings.
- Crimp contacts are available loose, or in continuous reeled format for automated crimping.

### CRIMP CONTACTS

<table>
<thead>
<tr>
<th>CRIMP CONTACTS</th>
<th>HAND CRIMP TOOL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reeled</strong></td>
<td><img src="image" alt="Crimp Tool" /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Instruction" /></td>
</tr>
<tr>
<td></td>
<td><strong>ORDER CODE</strong>  Z80-255</td>
</tr>
<tr>
<td><strong>Loose</strong></td>
<td><img src="image" alt="Removal Tool" /></td>
</tr>
<tr>
<td></td>
<td><strong>ORDER CODE</strong>  Z80-258</td>
</tr>
</tbody>
</table>

### WIRE STRIPPING DETAIL

- Ø1.10 max
- 2.70-3.00

### HOW TO ORDER

- **SERIES CODE**
- **TYPE**
  - 253 Female Crimp 22-24 AWG, Reeled
  - 254 Female Crimp 26-28 AWG, Reeled
  - 283 Female Crimp 22-24 AWG, Loose
  - 284 Female Crimp 26-28 AWG, Loose
- **FINISH**
  - 46 Tin

All dimensions in mm.
M225 Connectors

Male Vertical Throughboard

- Polarized housings.
- Fully shrouded contacts.

<table>
<thead>
<tr>
<th>MALE</th>
<th>CALCULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B + 12</td>
</tr>
<tr>
<td>B</td>
<td>Total no. of contacts - 2</td>
</tr>
<tr>
<td>C</td>
<td>B + 7</td>
</tr>
</tbody>
</table>

Recommended PC Board Pattern

HOW TO ORDER

M225 - 520 XX 46

<table>
<thead>
<tr>
<th>SERIES CODE</th>
<th>FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>M225 - 520</td>
<td>46 Tin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL NO. OF CONTACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 26, 34, 50</td>
</tr>
</tbody>
</table>

All dimensions in mm.
Circular Connectors Introduction

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.

- Increased operating temperature range: -55°C to +125°C
- Stocked in depth across Harwin’s authorized distributor network

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 polarized coupling
- Zinc Cobalt alloy black shells, for RoHS compliance
- COTS applications where MIL spec is not mandatory
Circular Connectors Product Features

RoHS compliant alternative
The military version of these connectors requires a Hexavalent Chromium mixture in the black coating - the Harwin alternative uses a different Zinc Cobalt alloy which is just as durable.

Fully compatible with MIL-DTL-5015
All other material, dimensional and performance specifications are met. Connectors are fully compatible with MIL-DTL-5015 connectors.

Watertight connection
Exceeds IP67 sealing requirements - when mated and fitted with all gaskets and rubber bushings, capable of water immersion of 1.8m for 48 hours.

Simple solder cable assembly
All contacts are terminated in a solder cup design, for attachment to 16 to 22AWG cables.

Strong, durable body and backshell
Connector bodies are manufactured from a strong aluminium alloy, coated with a black zinc cobalt alloy for additional durability.

Ideal for COTS substitution
Meeting all the requirements for the existing military product, substitution for this RoHS alternative gives potential product cost savings.
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/s² (10G)
- **Shock severity:** 490m/s² (50G) for 11ms
- **Water resistance (sealing):** 1.8m for 48 hours – exceeds IP67

**Wire Detail**

**Pin Numbering & Spacing**
- Views are shown onto the mating face of each connector type.

<table>
<thead>
<tr>
<th>10SL SHELL</th>
<th>12S SHELL</th>
<th>14S SHELL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 CONTACT (10SL-4)</strong></td>
<td><strong>3 CONTACT (10SL-3)</strong></td>
<td><strong>2 CONTACT (12S-3)</strong></td>
</tr>
<tr>
<td>FEMALE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.31</td>
<td>2.31</td>
<td>2.64</td>
</tr>
<tr>
<td>4.62</td>
<td>6.28</td>
<td>5.28</td>
</tr>
<tr>
<td>MALE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.31</td>
<td>2.31</td>
<td>2.64</td>
</tr>
<tr>
<td>4.62</td>
<td>6.28</td>
<td>5.28</td>
</tr>
</tbody>
</table>

All dimensions in mm.
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

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>THREAD</th>
<th>A max</th>
<th>B max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10SL-3</td>
<td>5/8-24UNEF</td>
<td>54.10</td>
<td>22.76</td>
</tr>
<tr>
<td>10SL-4</td>
<td>5/8-24UNEF</td>
<td>54.10</td>
<td>22.76</td>
</tr>
<tr>
<td>12S-3</td>
<td>3/4-20UNEF</td>
<td>54.10</td>
<td>22.76</td>
</tr>
<tr>
<td>14S-2</td>
<td>7/8-20UNEF</td>
<td>54.10</td>
<td>25.94</td>
</tr>
<tr>
<td>14S-6</td>
<td>7/8-20UNEF</td>
<td>54.10</td>
<td>25.94</td>
</tr>
</tbody>
</table>

STRAIGHT PLUG

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>THREAD</th>
<th>ØD</th>
</tr>
</thead>
<tbody>
<tr>
<td>10SL-3</td>
<td>5/8-24UNEF</td>
<td>22.04</td>
</tr>
<tr>
<td>10SL-4</td>
<td>5/8-24UNEF</td>
<td>22.04</td>
</tr>
<tr>
<td>12S-3</td>
<td>3/4-20UNEF</td>
<td>25.40</td>
</tr>
<tr>
<td>14S-2</td>
<td>7/8-20UNEF</td>
<td>28.30</td>
</tr>
<tr>
<td>14S-6</td>
<td>7/8-20UNEF</td>
<td>28.30</td>
</tr>
</tbody>
</table>

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

HOW TO ORDER

C90 - 310XX XXXX - X X

<table>
<thead>
<tr>
<th>SERIES CODE</th>
<th>TYPE</th>
<th>CONTACT GENDER</th>
<th>SHELL SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3101F</td>
<td>Cable connector with backshell</td>
<td>P</td>
<td>10SL-3 Thread 5/8-24UNEF, 3 contacts</td>
</tr>
<tr>
<td>3106F</td>
<td>Straight plug with backshell</td>
<td>S</td>
<td>10SL-4 Thread 5/8-24UNEF, 2 contacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12S-3 Thread 3/4-20UNEF, 2 contacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14S-2 Thread 7/8-20UNEF, 4 contacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14S-6 Thread 7/8-20UNEF, 6 contacts</td>
</tr>
</tbody>
</table>

All dimensions in mm.
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 (not shown).
- Mates with C90-3106F Straight Plug connectors shown on previous page.

MALE CONTACT

FEMALE CONTACT

HOW TO ORDER

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>THREAD</th>
<th>A</th>
<th>B</th>
<th>ØC</th>
</tr>
</thead>
<tbody>
<tr>
<td>10SL-3</td>
<td>5/8-24UNEF</td>
<td>25.40</td>
<td>18.25</td>
<td>15.75</td>
</tr>
<tr>
<td>10SL-4</td>
<td>5/8-24UNEF</td>
<td>25.40</td>
<td>18.25</td>
<td>15.75</td>
</tr>
<tr>
<td>12S-3</td>
<td>3/4-20UNEF</td>
<td>28.02</td>
<td>20.62</td>
<td>17.17</td>
</tr>
<tr>
<td>14S-2</td>
<td>7/8-20UNEF</td>
<td>30.40</td>
<td>23.02</td>
<td>18.92</td>
</tr>
<tr>
<td>14S-6</td>
<td>7/8-20UNEF</td>
<td>30.40</td>
<td>23.02</td>
<td>18.92</td>
</tr>
</tbody>
</table>

All dimensions in mm.
### 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

![Diagram of DUST CAP – EXTERNAL THREAD]

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>THREAD</th>
<th>ØA max</th>
<th>B max</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10SL</td>
<td>5/8-24UNEF</td>
<td>17.45</td>
<td>16.66</td>
<td>101.60</td>
</tr>
<tr>
<td>12S</td>
<td>3/4-20UNEF</td>
<td>20.62</td>
<td>21.44</td>
<td>114.30</td>
</tr>
<tr>
<td>14S</td>
<td>7/8-20UNEF</td>
<td>23.80</td>
<td>21.44</td>
<td>114.30</td>
</tr>
</tbody>
</table>

### RUBBER BUSHING

![Diagram of RUBBER BUSHING]

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ØA</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5.59</td>
<td>69.85</td>
</tr>
<tr>
<td>6</td>
<td>7.92</td>
<td>66.68</td>
</tr>
</tbody>
</table>

### DUST CAP – INTERNAL THREAD

![Diagram of DUST CAP – INTERNAL THREAD]

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>THREAD</th>
<th>ØA max</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10SL</td>
<td>5/8-24UNEF</td>
<td>20.70</td>
<td>101.60</td>
</tr>
<tr>
<td>12S</td>
<td>3/4-20UNEF</td>
<td>25.40</td>
<td>114.30</td>
</tr>
<tr>
<td>14S</td>
<td>7/8-20UNEF</td>
<td>28.57</td>
<td>114.30</td>
</tr>
</tbody>
</table>

### HOW TO ORDER

**C90 - 2504 X - XXXX**

- **SERIES CODE**
  - **TYPE**
    - 2  External thread
    - 3  Internal thread

**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.