Miniature high performance twist pin Connectors

Micro-D & Nano-D, Rectangular & Circular

www.axon-cable.com
RECTANGULAR MICRO-D CONNECTORS

GENERAL INFORMATION

- Micro-D glossary of terms ........................................ 22
- D-Line® connector mating guide ................................. 23
- Micro-D general characteristics ................................. 24
- Micro-D REACH & RoHS compliance ....................... 25
- Micro-D contact arrangements
  - Male rectangular connector ................................. 26
  - Female rectangular connector ............................ 27
- Micro-D weights ..................................................... 28
- Micro-D wire codes ............................................... 29
- Micro-D colour codes .............................................. 30
- Micro-D rear panel mounting guide ......................... 32
- Micro-D front panel mounting guide ....................... 33
- Micro-D panel cutouts ............................................ 34

MIL-DTL-83513

Micro-D QPL - CAGE CODE: OKOJ2

M83513 /01 & /02
- Solder cup connector - Metal shell ........................... 38
M83513 /03 & /04
- Pigtail connector - Metal shell .............................. 40
M83513 /06 & /07
- Solder cup connector - Plastic shell ........................ 42
M83513 /08 & /09
- Pigtail connector - Plastic shell ............................ 44
M83513 /10 TO /15
- PCB connector - Narrow profile - Right angle
  0.100" pitch - Metal shell ..................................... 46
- PCB layout for QPL narrow profile ....................... 48
M83513 /16 TO /21
- PCB connector - Standard profile - Right angle
  0.100" pitch - Metal shell ..................................... 50
- PCB layout for QPL standard profile ................... 52
M83513 /22 TO /27
- PCB connector - Straight - 0.100" pitch - Metal shell .... 54
- PCB layout for QPL Straight - 0.100" pitch ............. 56
M83513 /28 TO /33
- PCB connector - Straight - 0.075" pitch - Metal shell .... 58
- PCB layout for QPL Straight - 0.075" pitch ............. 60

MILITARY CROSS REFERENCE CHART ................................. 417
PIGTAIL, SOLDER CUP, PCB, SAVERS & MICROSTRIP CONNECTORS

RECTANGULAR CONNECTORS
- Pigtail connector - Metal shell ............................................. 64
- Pigtail connector - Low profile - Metal shell ......................... 66
- Pigtail connector - Plastic shell ............................................ 68
- Solder cup connector - Metal shell ......................................... 70
- Solder cup connector - Low profile - Metal shell .................... 72
- Solder cup connector - Plastic shell ......................................... 74

PCB RECTANGULAR CONNECTORS
- PCB connectors overview .......................................................... 76
- CBR (Condensed Board Right Angle) type - 0.100" pitch
  Metal shell ................................................................. 78
- CBR (Condensed Board Right Angle) type - 0.100" pitch
  Plastic shell ................................................................. 80
  PCB layout for CBR type ......................................................... 82
- CBP (Condensed Board Right Angle) type - 0.100" pitch
  Low profile - Metal shell ..................................................... 86
- CBP (Condensed Board Right Angle) type - 0.100" pitch
  Low profile - Plastic shell .................................................. 88
  PCB layout for CBP type ......................................................... 90
- BR (Board Right Angle) type - 0.100" pitch - Metal shell ......... 92
  PCB layout for BR type ......................................................... 94
- BS (Board Straight) type - 0.100" pitch - Metal shell ............. 98
- BS (Board Straight) type - 0.100" pitch - Plastic shell .......... 100
  PCB layout for BS type ......................................................... 102
- CBR (Condensed Board Right Angle) type - 0.075" pitch
  Metal shell ................................................................. 106
  PCB layout for CBR 0.075" type ........................................... 108
- CBR (Condensed Board Right Angle) type - 0.075" pitch
  Metal shell - Based on BS MIL standard layout .................. 112
  PCB layout for CBR 0.075" type
  Based on BS MIL standard layout ........................................ 114
- BS (Board Straight) type - 0.075" pitch - Metal shell ......... 116
- BS (Board Straight) type - 0.075" pitch - Plastic shell .......... 118
  PCB layout for BS 0.075" type – MIL standard layout .......... 120
  PCB layout for BS 0.075" type – Specific layout – Plugs ...... 122
  PCB layout for BS 0.075" type – Specific layout – Receptacles... 124

CONNECTOR SAVERS
- One piece design - Metal or plastic shell ............................ 126
- One piece design - Low profile - Metal shell ......................... 127
- Back to back assembly - Metal or plastic shell .................... 128
- Back to back assembly - Low profile - Metal shell ............... 129
MICROSTRIP CONNECTORS
- Pigtail & solder cup assemblies ........................................... 130
- PCB connector ................................................................. 132
- Microstrip general information ............................................ 134
  PCB layout for microstrip connector – 0.050" pitch ................. 137

HIGH DENSITY CONNECTORS .................................................. 140

COMBO-D CONNECTORS .......................................................... 142

COMBO-D GENERAL INFORMATION
- Rectangular Combo Micro-D connectors .................................. 142
- Contact arrangements .......................................................... 143
- Coaxial and power contacts and cables .................................... 144
- General characteristics ......................................................... 147

PCB COMBO CONNECTORS
- PCB connectors ................................................................. 148
- Board Straight type (BS) - 0.075" pitch .................................... 149
- Condensed Board Right angle (CBR) - 0.100" pitch ................... 153

PIGTAIL COMBO CONNECTORS
- Male and female pigtail connectors ....................................... 157

SPECIAL COMBO CONNECTORS .................................................. 160

HERMETIC CONNECTORS ......................................................... 164
- Introduction to hermetic connectors ....................................... 164
- Rear panel mounting guide .................................................... 165
- Hermetic connectors ............................................................ 166

NON-MAGNETIC CONNECTORS ................................................ 170

Non-magnetic Micro-D interconnect solutions ............................ 170

PIGTAIL CONNECTORS
- Non-magnetic metal shell connectors ...................................... 172
- Non-magnetic low profile metal shell connectors ..................... 173
- Non-magnetic plastic shell connectors ..................................... 174

PCB CONNECTORS
- PCB connectors overview ...................................................... 175
- Non-magnetic PCB connectors .............................................. 176
120 WAY CONNECTORS

- 120 way Micro-D connectors ........................................ 178
- 120 way connectors for cable and harnesses .................. 181
- Surface mount PCB card edge connectors ....................... 182
- BS connector ................................................................ 183
- Connector saver ............................................................ 183
- PCB layouts .................................................................. 184

ACCESSORIES

BACKSHELL
- Micro-D EMI-backshell .................................................. 186
- AXOCLAMP® EMI band termination ............................... 189

HARDWARE
- Removable jackscrews .................................................. 190
- Removable jackposts ..................................................... 192
- Rear panel mount jackposts for pigtails connectors .......... 193
- Removable jackposts for PCB connectors ....................... 194
- Rear panel mount jackposts for PCB connectors ............. 196
- Non-removable hardware .............................................. 198
- Float mount inserts ...................................................... 199
- U-clip mounting jackscrews ......................................... 200

MICRO-D & NANO-D ASSEMBLY KIT ................................. 201
COMBO MICRO-D CONNECTORS

COMBO-D GENERAL INFORMATION
- Rectangular Combo Micro-D connectors .......................... 142
- Contact arrangements ............................................... 143
- Coaxial and power contacts and cables .......................... 144
- General characteristics ............................................. 147

PCB COMBO CONNECTORS
- PCB connectors ...................................................... 148
- Board Straight type (BS) - 0.075" pitch .......................... 149
- Condensed Board Right angle (CBR) - 0.100" pitch ............. 153

PIGTAIL COMBO CONNECTORS
- Male and female pigtail connectors ............................ 157

SPECIAL COMBO CONNECTORS ........................................ 160
Continuous miniaturisation in electronics makes it ever more challenging to route power and RF signals through very small connectors.

The ideal solution is the AXON’ Combo Micro-D. These special, hybrid connectors accommodate a mixture of power and coaxial cables, along with regular signal wires, all in one compact body.

They are available in 2 types and 3 different styles.

▶ PCB connectors

▶ BS TYPE
- Board Straight connector for flexible and rigid printed circuit boards,
- Various tail lengths available.

▶ CBR TYPE
- Condensed Board Right angle connector for flexible and rigid printed circuit boards,
- Various tail lengths available.

▶ Pigtail connectors
- With coaxial cables (different types and sizes available),
- Connectors are backpotted to protect contacts,
- A mixed arrangement with coaxial and power cables is also possible.
CONTACT ARRANGEMENTS

Combo Micro-D connectors use two types of contacts in two sizes:
- 2.2 mm and 3 mm diameter coaxial contacts.
- 2.2 mm and 3 mm diameter power contacts.

Arrangements can vary depending on the number and the size of the coaxial, power and signal contacts.
AXON® standard combo Micro-D connectors are available with four different mating faces.

MALE MATING FACE

C1/P1: 4 CONTACTS Ø3MM IN A 51 WAY MICRO-D SHELL

FEMALE MATING FACE

C3/P3: 2 CONTACTS Ø3MM + 21 SIGNALS IN A 51 WAY MICRO-D SHELL

C10/P10: 4 CONTACTS Ø2.2MM + 20 SIGNALS IN A 51 WAY MICRO-D SHELL

C8/P8: 4 CONTACTS Ø2.2MM IN A 25 WAY MICRO-D SHELL
AXON® uses micro-miniature high frequency and high power contacts to provide the optimum performance within the smallest available space. Two contacts sizes are available: 2.2 mm and 3.0 mm.

AXON® also offers coaxial contacts in 2 different impedances - 50Ω and 75Ω - and power contacts in different current ratings, from 5A to 20A.

Their characteristics are detailed below:

### COAXIAL CONTACTS

<table>
<thead>
<tr>
<th>CONTACT TYPE mm (inch)</th>
<th>MEDIA</th>
<th>CONTACT IMPEDANCE</th>
<th>INSULATION RESISTANCE (contacts only)</th>
<th>SWR (contacts only)</th>
<th>FREQUENCY (max.) for the final assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 3.00 0.118</td>
<td>PCB</td>
<td>50 Ω AND 75 Ω</td>
<td>10¹ Ω / 250 Vrms (*)</td>
<td>&lt; 1.05 + 0.04 F (GHz) (*)</td>
<td>3 GHz</td>
</tr>
<tr>
<td>Ø 3.00 0.118</td>
<td>Coaxial cable</td>
<td>50 Ω AND 75 Ω</td>
<td>10¹ Ω / 250 Vrms</td>
<td>&lt; 1.05 + 0.04 F (GHz)</td>
<td>6 GHz (depending on cable)</td>
</tr>
<tr>
<td>Ø 2.20 0.086</td>
<td>PCB</td>
<td>50 Ω</td>
<td>10¹ Ω / 250 Vrms (*)</td>
<td>&lt; 1.05 + 0.04 F (GHz) (*)</td>
<td>1 GHz</td>
</tr>
<tr>
<td>Ø 2.20 0.086 (†)</td>
<td>Coaxial cable</td>
<td>50 Ω</td>
<td>10¹ Ω / 250 Vrms</td>
<td>&lt; 1.05 + 0.04 F (GHz)</td>
<td>3 GHz (depending on cable)</td>
</tr>
</tbody>
</table>

(*)The above values depend on the impedance of the PCB the connector is connected to.

### POWER CONTACTS

<table>
<thead>
<tr>
<th>CONTACT TYPE mm (inch)</th>
<th>AWG</th>
<th>CONTACT RESISTANCE</th>
<th>CURRENT (max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 3.00 0.118</td>
<td>20</td>
<td>6 mΩ max.</td>
<td>5A</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>6 mΩ max.</td>
<td>8A</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>6 mΩ max.</td>
<td>10A</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>6 mΩ max.</td>
<td>15A</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>6 mΩ max.</td>
<td>20A</td>
</tr>
<tr>
<td>Ø 2.20 0.086</td>
<td>20</td>
<td>6 mΩ max.</td>
<td>5A</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>6 mΩ max.</td>
<td>8A</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>6 mΩ max.</td>
<td>10A</td>
</tr>
</tbody>
</table>

### Coaxial cable specification

<table>
<thead>
<tr>
<th>CONTACT DIAMETER mm (inch)</th>
<th>IMPEDANCE</th>
<th>COAXIAL CABLE AVAILABLE</th>
<th>NOMINAL DIAMETER mm (inch)</th>
<th>AXON® P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø3.00 0.118</td>
<td>50 Ω</td>
<td>AX086 RG316</td>
<td>2.50 .098</td>
<td>PS31437 RG316</td>
</tr>
<tr>
<td></td>
<td>75 Ω</td>
<td>RG179</td>
<td>2.66 .105</td>
<td>RG179</td>
</tr>
<tr>
<td>Ø2.20 0.086</td>
<td>50 Ω</td>
<td>AX047 RG178</td>
<td>1.50 .059</td>
<td>PS35846 RG178</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.90 .075</td>
<td></td>
</tr>
</tbody>
</table>
AX047 and AX086 coaxial cable specification

CABLE CONSTRUCTION

<table>
<thead>
<tr>
<th>VERSION</th>
<th>MATERIAL</th>
<th>Ø mm (inch)</th>
<th>MATERIAL</th>
<th>Ø mm (inch)</th>
<th>MATERIAL</th>
<th>Ø mm (inch)</th>
<th>MATERIAL</th>
<th>Ø mm (inch)</th>
<th>MATERIAL</th>
<th>Ø mm (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX047</td>
<td>SPC*</td>
<td>0.25 0.010</td>
<td>PTFE</td>
<td>0.82 0.033</td>
<td>SPC* TAPE</td>
<td>POLYESTER</td>
<td>SPC*</td>
<td>1.17 0.046</td>
<td>FEP*</td>
<td>1.50 0.029</td>
</tr>
<tr>
<td>AX086</td>
<td>SPC*</td>
<td>0.51 0.020</td>
<td>PTFE</td>
<td>1.66 0.065</td>
<td>SPC* TAPE</td>
<td>POLYESTER</td>
<td>SPC*</td>
<td>2.17 0.085</td>
<td>FEP*</td>
<td>2.50 0.106</td>
</tr>
</tbody>
</table>

* Silver Plated Copper

ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>AX047</th>
<th>AX086</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPEDANCE (ohms)</td>
<td>50 ± 2</td>
<td>50 ± 1</td>
</tr>
<tr>
<td>CAPACITANCE (pF/m)</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>INSERTION LOSS @ 23°C @ 18 GHz (dB/m)</td>
<td>6.6</td>
<td>3.45</td>
</tr>
</tbody>
</table>

ELECTRICAL CHARACTERISTICS OF A PIGTAIL WITH COAXIAL CONTACT SIZE 3.0 MM

The performances mentioned in the following table have been obtained with the configuration below.

<table>
<thead>
<tr>
<th>COMBO WITH S3 CONTACTS AND RG316</th>
<th>COMBO WITH S3 CONTACTS AND AX086</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. VSWR DC-6 GHz</td>
<td>1.40</td>
</tr>
<tr>
<td>Max. attenuation at 1 GHz (dB)</td>
<td>1.04</td>
</tr>
<tr>
<td>Max. attenuation at 2 GHz (dB)</td>
<td>1.52</td>
</tr>
<tr>
<td>Max. attenuation at 4 GHz (dB)</td>
<td>2.26</td>
</tr>
<tr>
<td>Max. attenuation at 6 GHz (dB)</td>
<td>2.88</td>
</tr>
</tbody>
</table>
RGxxx coaxial cable specification

CABLE CONSTRUCTION

<table>
<thead>
<tr>
<th>VERSION</th>
<th>1 - CONDUCTOR</th>
<th>2 - DIELECTRIC</th>
<th>3 - SHIELDING</th>
<th>4 - JACKET</th>
<th>IMPEDANCE (Ωmm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MATERIAL</td>
<td>Ø mm (inch)</td>
<td>MATERIAL</td>
<td>Ø mm (inch)</td>
<td>MATERIAL</td>
</tr>
<tr>
<td>RG178</td>
<td>SPC*</td>
<td>0.30 .0118</td>
<td>PTFE</td>
<td>0.85 .033</td>
<td>SPC* Braid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEP</td>
</tr>
<tr>
<td>RG179</td>
<td>SPC*</td>
<td>0.30 .0118</td>
<td>PTFE</td>
<td>1.60 .063</td>
<td>SPC* Braid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEP</td>
</tr>
<tr>
<td>RG316</td>
<td>SPC*</td>
<td>0.51 .02</td>
<td>PTFE</td>
<td>1.06 .042</td>
<td>SPC* Braid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FEP</td>
</tr>
</tbody>
</table>

*: Silver Plated Copper

Power cable specification

For pigtails with power contacts, we recommend PTFE-insulated wire AXON' reference Exx19, xx being the AWG of the wire.

<table>
<thead>
<tr>
<th>WIRE DESIGNATION</th>
<th>MATERIAL</th>
<th>AWG</th>
<th>CONDUCTOR</th>
<th>AREA mm² (SQ IN)</th>
<th>RESISTANCE Ø100M (Ω/100FT)</th>
<th>INSULATION</th>
<th>TEMPERATURE RATING</th>
<th>VOLTAGE RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1219</td>
<td>SPC*</td>
<td>12</td>
<td>19x0.455</td>
<td>0.49</td>
<td>0.58</td>
<td>EXTRUDED PTFE</td>
<td>-90°C / +200°C</td>
<td>600 V ac</td>
</tr>
<tr>
<td>E1419</td>
<td>SPC*</td>
<td>14</td>
<td>19x0.360</td>
<td>0.71</td>
<td>0.92</td>
<td>EXTRUDED PTFE</td>
<td>-90°C / +200°C</td>
<td>600 V ac</td>
</tr>
<tr>
<td>E1619</td>
<td>SPC*</td>
<td>16</td>
<td>19x0.300</td>
<td>0.96</td>
<td>1.3</td>
<td>EXTRUDED PTFE</td>
<td>-90°C / +200°C</td>
<td>600 V ac</td>
</tr>
<tr>
<td>E1819</td>
<td>SPC*</td>
<td>18</td>
<td>19x0.254</td>
<td>1.29</td>
<td>1.9</td>
<td>EXTRUDED PTFE</td>
<td>-90°C / +200°C</td>
<td>600 V ac</td>
</tr>
<tr>
<td>E2019</td>
<td>SPC*</td>
<td>20</td>
<td>19x0.203</td>
<td>1.69</td>
<td>2.9</td>
<td>EXTRUDED PTFE</td>
<td>-90°C / +200°C</td>
<td>600 V ac</td>
</tr>
</tbody>
</table>

*: Silver Plated Copper
## General Characteristics

### Electrical & Mechanical Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Specification</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Contact Current Rating</strong></td>
<td>3 A max.</td>
<td>EIA-364-70</td>
</tr>
<tr>
<td><strong>Signal Contact Resistance</strong></td>
<td>8 mΩ max.</td>
<td>EIA-364-06</td>
</tr>
<tr>
<td><strong>Insulation Resistance</strong></td>
<td>5000 MΩ min. 500 Vc</td>
<td>EIA-364-21</td>
</tr>
<tr>
<td><strong>Dielectric Withstanding Voltage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Sea Level 0 m</td>
<td>600 Vc</td>
<td>EIA-364-20</td>
</tr>
<tr>
<td>- Altitude 21 km (70,000 ft)</td>
<td>150 Vc</td>
<td></td>
</tr>
<tr>
<td><strong>VSWR</strong></td>
<td>Depending on contact and coaxial cable</td>
<td></td>
</tr>
<tr>
<td><strong>Insertion Loss</strong></td>
<td>Depending on contact and coaxial cable</td>
<td></td>
</tr>
<tr>
<td><strong>Contact Engaging and Separation Force</strong></td>
<td>170 g max. 6 oz</td>
<td>EIA-364-37</td>
</tr>
<tr>
<td><strong>Contact Retention (Signal Lines)</strong></td>
<td>2.26 kg (5 lbs) for 5 seconds min.</td>
<td>EIA-364-29</td>
</tr>
<tr>
<td><strong>Durability</strong></td>
<td>500 mating cycles min.</td>
<td>EIA-364-09</td>
</tr>
<tr>
<td><strong>Temperature Ranges</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- With coaxial contacts</td>
<td>-55°C / +125°C</td>
<td>EIA-364-28</td>
</tr>
<tr>
<td>- With power contacts</td>
<td>-55°C / +150°C</td>
<td>TEST CONDITION IV</td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>20 g's - No discontinuity &gt;1µs</td>
<td>EIA-364-27 - TEST CONDITION E</td>
</tr>
<tr>
<td><strong>Shock</strong></td>
<td>50 g's - No discontinuity &gt;1µs</td>
<td>EIA-364-26 - TEST CONDITION B</td>
</tr>
<tr>
<td><strong>Salt Spray</strong></td>
<td>48 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Insulation resistance &gt; 1 MΩ</td>
<td>EIA-364-31 - METHOD IV</td>
</tr>
</tbody>
</table>

## Material & Finish

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Contact</strong></td>
<td>Male Contact (Twist Pin)</td>
<td>Copper and Beryllium Copper</td>
</tr>
<tr>
<td><strong>Female Contact</strong></td>
<td>Copper Alloy</td>
<td></td>
</tr>
<tr>
<td><strong>Coaxial Contact and Power Contact</strong></td>
<td>Spring Loaded Parts</td>
<td>Beryllium Copper</td>
</tr>
<tr>
<td><strong>Insulator</strong></td>
<td>Other Metal Parts</td>
<td>Copper Alloy</td>
</tr>
<tr>
<td><strong>Metal Shell</strong></td>
<td></td>
<td>PTFE</td>
</tr>
<tr>
<td><strong>Plastic Shell / Insert / PCB Tray</strong></td>
<td>Liquid Crystal Polymer, 30% Loaded Glass Fibre</td>
<td>Yellow Chromate Over Cadmium : In accordance with SAE-AMS-QQ-P-416, Type II, Class 3</td>
</tr>
<tr>
<td><strong>Hardware</strong></td>
<td>Stainless Steel, 300 Series</td>
<td>Passivation in accordance with SAE-AMS2700</td>
</tr>
<tr>
<td><strong>Encapsulant</strong></td>
<td>Epoxy Resin</td>
<td></td>
</tr>
<tr>
<td><strong>Insulated Wire (Signal Lines)</strong></td>
<td>PTFE Insulated Silver Plated Copper</td>
<td>In accordance with NEMA-HP3</td>
</tr>
<tr>
<td><strong>Uninsulated Wire (Signal Lines)</strong></td>
<td>Gold Plated Solid Copper Wire</td>
<td>In accordance with A-A-59551</td>
</tr>
</tbody>
</table>
## PCB Connectors

### Metal Shell
- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature: 125°C with coaxial contacts, 150°C with power contacts.
- Several tail lengths available.

### Identification Code

<table>
<thead>
<tr>
<th>SERIES</th>
<th>MDCA</th>
<th>P3</th>
<th>S</th>
<th>-</th>
<th>CBR</th>
<th>P</th>
<th>G</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTOR TYPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: Cadmium aluminium shell / Z: Black zinc nickel aluminium shell.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: Nickel aluminium shell.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Contact Arrangement

- **C1 or P1**: 4 contacts S3 - 51 way shell.
- **C3 or P3**: 2 contacts S3 + 21 signals - 51 way shell.
- **C8 or P8**: 4 contacts S2.2 - 25 way shell.
- **C10 or P10**: 4 contacts S2.2 + 20 signals - 51 way shell.

Cx: coaxial contact; Px: power contact.

### Connector Gender
- S: Receptacle connector.

### Electrical Characteristics of the Combo Contacts

<table>
<thead>
<tr>
<th>Coaxial contacts (S3)</th>
<th>Power contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>50: 50Ω.</td>
<td>- Power contacts.</td>
</tr>
<tr>
<td>75: 75Ω.</td>
<td></td>
</tr>
</tbody>
</table>

### Coaxial Contact (S2.2)
- 50: 50Ω.

### PCB Version

**with coaxial contacts:**
- **75S**: Board straight connector, 0.075” pitch for signal lines.

**with power contacts:**
- **CBR**: Condensed board right 0.100” pitch for signal lines.

### Hardware
- **B**: No hardware.
- **P**: Jackposts.
- **Px (x: 1 to 5)**: Panel mount jackposts.
- **T**: Threaded inserts installed.
- **W**: Jackpost and threaded inserts installed.
- **Wx (x: 1 to 5)**: Panel mount jackposts and threaded inserts installed.

See pages 190 to 200 for hardware description.

### Conductor Type (for signals)
- **G**: Gold plated solid conductor AWG25.
- **T**: Tin plated solid conductor AWG24.
- **Blank**: For contact arrangements without signal contacts (C1/P1 or C8/P8).

### Tail Length
- **1**: 2.80mm (0.110”).
- **2**: 3.80mm (0.150”).
- **3**: 4.80mm (0.190”).
BOARD STRAIGHT TYPE (BS) 0.075" PITCH
(with coaxial contacts only)

► In a 51 way shell

► FEMALE PCB CONNECTOR (C3 CONFIGURATION)
  2 COMBO CONTACTS (3.0 mm) + 21 SIGNALS

DIMENSIONS
Dimensions are in millimetres (inches).

PCB LAYOUT

For coaxial contact:
c: center - s: shield
In a 51 way shell

- FEMALE PCB CONNECTOR (C1 CONFIGURATION)
- 4 COMBO CONTACTS (3.0 mm)

**DIMENSIONS**
Dimensions are in millimetres (inches).

**PCB LAYOUT**
For coaxial contact:
- **c**: center
- **s**: shield
In a 51 way shell

- FEMALE PCB CONNECTOR (C10 CONFIGURATION)
- 4 COMBO CONTACTS (2.2 mm) + 20 SIGNALS

**DIMENSIONS**

Dimensions are in millimetres (inches).

**PCB LAYOUT**

For coaxial contact:

- c: center - s: shield
In a 25 way shell

- FEMALE PCB CONNECTOR (C8 CONFIGURATION)
- 4 COMBO CONTACTS (2.2 mm)

DIMENSIONS
Dimensions are in millimetres (inches).

PCB LAYOUT

For coaxial contact:
c: center - s: shield
CONDENSED BOARD RIGHT ANGLE (0.100" PITCH)
(coaxial and power combo contacts)

▶ In a 51 way shell

- **FEMALE PCB CONNECTOR (C3/P3 CONFIGURATIONS)**
  - 2 COMBO CONTACTS (3.0 mm) + 21 SIGNALS

**DIMENSIONS**
Dimensions are in millimetres (inches).

**PCB LAYOUT**

**FRONT FACE OF THE FLANGE**

- with coaxial contacts (C3)
- For coaxial contact:
  - **c**: center - **s**: shield

**FRONT FACE OF THE FLANGE**

- with power contacts (P3)

**VIEW A**

**VIEW B**
In a 51 way shell

- FEMALE PCB CONNECTOR (C1/P1 CONFIGURATIONS)
- 4 COMBO CONTACTS (3.0 mm)

### DIMENSIONS
Dimensions are in millimetres (inches).

**VIEW A**

- **FRONT FACE OF THE FLANGE**
  - Dimensions: 38.45 (1.436) MAX, 30.86 ± 0.13 (1.215 ± 0.005), 26.70 (1.051) MAX
  - Total length: 8.32 (0.326) MAX, 7.62 (0.223) MAX

**VIEW B**

- **FRONT FACE OF THE FLANGE**
  - Dimensions: 30.85 (1.215) MAX, 2.54 (0.100) TYP
  - Total length: 3.08 (0.120) MAX, 2.54 (0.100) TYP

**PCB LAYOUT**

- **WITH COAXIAL CONTACTS (C1)**
  - Dimensions: 7.62 (0.300), 1.27 (0.050) REF
  - Total length: 6.05 (0.236) REF

- **WITH POWER CONTACTS (P1)**
  - Dimensions: 30.85 (1.215), 0.08 (0.003) REF
  - Total length: 2.54 (0.100) TYP

For coaxial contact:
- **c**: center - **s**: shield

www.axon-cable.com
- In a 51 way shell
- **FEMALE PCB CONNECTOR (C10/P10 CONFIGURATIONS)**
  4 COMBO CONTACTS (2.2 mm) + 20 SIGNALS

**DIMENSIONS**
Dimensions are in millimetres (inches).

**PCB LAYOUT**

**FRONT FACE OF THE FLANGE**

**A**

**VIEW A**

**B**

**VIEW B**

For coaxial contact:
- **c**: center
- **s**: shield

**with coaxial contacts (C10)**

**with power contacts (P10)**

---

[Dimensions and PCB layout diagrams are depicted here, showing various viewpoints and dimensions for the connector configurations.]
In a 25 way shell

**FEMALE PCB CONNECTOR (C8/P8 CONFIGURATIONS)**

4 COMBO CONTACTS (2.2 mm)

**DIMENSIONS**

Dimensions are in millimetres (inches).

**PCB LAYOUT**

FRONT FACE OF THE FLANGE

**VIEW A**

FRONT FACE OF THE FLANGE

**VIEW B**

- with coaxial contacts (C8)
- with power contacts (P8)

For coaxial contact:
- c: center
- s: shield
**Pigtail connectors**

**METAL SHELL**
- High performance metal connectors
- Operating temperature: 125°C with coaxial contacts, 150°C with power contacts.

### IDENTIFICATION CODE

<table>
<thead>
<tr>
<th>SERIES</th>
<th>MDCA</th>
<th>C1</th>
<th>P</th>
<th>A</th>
<th>020</th>
<th>L</th>
<th>8</th>
<th>L</th>
<th>050</th>
<th>M</th>
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<tbody>
<tr>
<td>CONNECTOR TYPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: Cadmium aluminium shell</td>
<td>Z: Black zinc nickel aluminium shell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2: Nickel aluminium shell</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CONTACT ARRANGEMENTS
- C1 or P1: 4 contacts S3 - 51 way shell.
- C3 or P3: 2 contacts S3 + 21 signals - 51 way shell.
- C8 or P8: 4 contacts S2.2 - 25 way shell.
- C10 or P10: 4 contacts S2.2 + 20 signals - 51 way shell.
- Cx: coaxial contact  - Px: power contact.

### CONNECTOR GENDER
- P: Plug connector - S: Receptacle connector.

### CABLE TYPE FOR COMBO LINES

<table>
<thead>
<tr>
<th>Coaxial cable (S3)</th>
<th>Power cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: AX036 (50Ω).</td>
<td>A: AWG12 (only for S3).</td>
</tr>
<tr>
<td>B: RG316 (50Ω).</td>
<td>B: AWG14 (only for S3).</td>
</tr>
<tr>
<td>C: RG179 (75Ω).</td>
<td>C: AWG16 (recommended for S2.2).</td>
</tr>
<tr>
<td>D: AWG18 (recommended for S2.2).</td>
<td></td>
</tr>
<tr>
<td>E: AWG20 (recommended for S2.2).</td>
<td></td>
</tr>
<tr>
<td>Coaxial cable (S2.2)</td>
<td>Power lines (xxx=AWG)</td>
</tr>
<tr>
<td>A: AX047 (50Ω).</td>
<td></td>
</tr>
<tr>
<td>C: RG178 (50Ω).</td>
<td></td>
</tr>
</tbody>
</table>

### WIRE LENGTH FOR COMBO LINES (in cm)

<table>
<thead>
<tr>
<th>L (in cm)</th>
<th>L ≤ 10</th>
<th>10 &lt; L ≤ 100</th>
<th>L &gt; 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLERANCE</td>
<td>-0 / +0.5</td>
<td>-0 / +3</td>
<td>-0 / +5</td>
</tr>
<tr>
<td>in cm</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
</tr>
</tbody>
</table>

### COLOUR CODE FOR COMBO LINES
- Coaxial lines: C: Brown (mandatory for and only for coaxial lines).
- Power: F: All yellow - L: All white.
- W: 10 color repeat (see page 30 for colour code).

### WIRE LENGTH FOR SIGNAL LINES

<table>
<thead>
<tr>
<th>L (in cm)</th>
<th>L ≤ 10</th>
<th>10 &lt; L ≤ 100</th>
<th>L &gt; 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLERANCE</td>
<td>-0 / +0.5</td>
<td>-0 / +3</td>
<td>-0 / +5</td>
</tr>
<tr>
<td>in cm</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
</tr>
</tbody>
</table>

### COLOUR CODE FOR SIGNAL LINES
- Power: F: All yellow - L: All white.
- W: 10 color repeat (see page 30 for colour code).

### WIRE TYPE FOR SIGNAL LINES

<table>
<thead>
<tr>
<th>L (in cm)</th>
<th>L ≤ 10</th>
<th>10 &lt; L ≤ 100</th>
<th>L &gt; 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLERANCE</td>
<td>-0 / +0.5</td>
<td>-0 / +3</td>
<td>-0 / +5</td>
</tr>
<tr>
<td>in cm</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
<td>1 cm = 0.394”</td>
</tr>
</tbody>
</table>

### HARDWARE
- B: No hardware.
- C: U-clips with low profile socket hex head jackscrews (removable).
- D: U-clips with low profile slot head jackscrews (removable).
- E: Low profile socket hex head jackscrews (removable).
- F: Low profile slot head jackscrews (removable).
- FR: Flat mount, rear panel mount (non removable).
- Px (x: 1 to 5): Panel mount jackscrews.
- T: High profile slot head jackscrews (removable).
- P: Jackposts (removable).
- K: High profile socket hex head jackscrews (non removable).
- L: High profile socket hex head jackscrews (non removable).
- F: Float mount, front panel mount (non removable). See pages 190 to 200 for hardware description.

*METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS*

**Dimensions**

Dimensions are in millimetres (inches).

**Male connector**

**Combination**

- **COMBO 25 4 COAX S2.2 + 20 SIGN MALE PIGTAIL (C3)**
- **COMBO 51 4 COAX S2.2 + 20 SIGN MALE PIGTAIL (C1)**
- **COMBO 51 4 COAX S3 + 21 SIGN MALE PIGTAIL (C3)**

<table>
<thead>
<tr>
<th>Male Pigtail</th>
<th>A ± 0.25 (±.010)</th>
<th>B max Male</th>
<th>C -0.46/+0.25 (-.018/+.010)</th>
<th>D ± 0.13 (±.005)</th>
<th>E ± 0.25 (±.010)</th>
<th>F max</th>
<th>G max</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 or P1</td>
<td>36.20</td>
<td>24.99</td>
<td>26.42</td>
<td>30.86</td>
<td>8.66</td>
<td>5.79</td>
<td>7.87</td>
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<tr>
<td></td>
<td>1.425</td>
<td>0.984</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.228</td>
<td>.310</td>
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<tr>
<td>C3 or P3</td>
<td>36.20</td>
<td>24.99</td>
<td>26.42</td>
<td>30.86</td>
<td>8.66</td>
<td>5.79</td>
<td>7.87</td>
</tr>
<tr>
<td></td>
<td>1.425</td>
<td>0.984</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.228</td>
<td>.310</td>
</tr>
<tr>
<td>C8 or P8</td>
<td>29.85</td>
<td>18.64</td>
<td>20.07</td>
<td>24.51</td>
<td>7.57</td>
<td>4.69</td>
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<td>.790</td>
<td>.965</td>
<td>.238</td>
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<td>.270</td>
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<td>24.99</td>
<td>26.42</td>
<td>30.86</td>
<td>8.66</td>
<td>5.79</td>
<td>7.87</td>
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<tr>
<td></td>
<td>1.425</td>
<td>0.984</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.228</td>
<td>.310</td>
</tr>
</tbody>
</table>
### DIMENSIONS

Dimensions are in millimetres (inches).

**FEMALE connector**

<table>
<thead>
<tr>
<th>FEMALE PIGTAIL</th>
<th>A ± 0.25 (±.010)</th>
<th>B max</th>
<th>C -0.46/+0.25 (-.018/+.010)</th>
<th>D ± 0.13 (±.005)</th>
<th>E ± 0.25 (±.010)</th>
<th>F max</th>
<th>G max</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 or P1</td>
<td>36.20</td>
<td>26.70</td>
<td>26.42</td>
<td>30.86</td>
<td>8.66</td>
<td>7.44</td>
<td>7.87</td>
</tr>
<tr>
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<td>1.425</td>
<td>1.101</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.293</td>
<td>.310</td>
</tr>
<tr>
<td>C3 or P3</td>
<td>36.20</td>
<td>26.70</td>
<td>26.42</td>
<td>30.86</td>
<td>8.66</td>
<td>7.44</td>
<td>7.87</td>
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<td>1.101</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.293</td>
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<td>C8 or P8</td>
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<td>20.35</td>
<td>20.07</td>
<td>24.51</td>
<td>7.57</td>
<td>6.35</td>
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<tr>
<td>C10 or P10</td>
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<td>26.70</td>
<td>26.42</td>
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<td>8.66</td>
<td>7.44</td>
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<td>1.101</td>
<td>1.040</td>
<td>1.215</td>
<td>.341</td>
<td>.293</td>
<td>.310</td>
</tr>
</tbody>
</table>
SPECIAL COMBO CONNECTORS

AXON® can develop on request special Combo Micro-D connectors based on all the standard shell sizes from 9 to 100 ways, or based on special shells such as the 120 way version or other custom configurations.

Combo Micro-D connectors can be offered as pigtails, as part of a complex harness or as PCB connectors, in either straight (BS style) or right angle versions (BR and CBR styles).

Some examples of special designs:

Other possible arrangements

25 WAY

2 COMBO CONTACTS SIZE 2.2 mm + 9 SIGNALS

100 WAY

4 COMBO CONTACTS SIZE 3 mm + 20 SIGNALS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST 
Some examples of possible designs

- 2 POWER COMBO CONTACTS + 3 SIGNALS
- 4 POWER COMBO CONTACTS + 7 SIGNALS

- 8 COAXIAL COMBO CONTACTS + 16 SIGNALS IN A 120 WAY MICRO-D CONNECTOR

- 5 COAXIAL COMBO CONTACTS
- 2 POWER COMBO S2.2 + 2 COAXIAL COMBO S3 CONTACTS + 40 SIGNALS, INTEGRATED IN A HARNESS

- LOW PROFILE COMBO IN A 31 WAY SHELL
- COMBO CBR WITH REDUCED DEPTH
HERMETIC CONNECTORS

- Introduction to hermetic connectors .................................................. 164
- Rear panel mounting guide ................................................................. 165
- Hermetic connectors ........................................................................... 166
INTRODUCTION TO HERMETIC CONNECTORS

Hermetic connectors are used in applications where an enclosure needs to be isolated from the outside environment. Panel feed through is the main application for this type of connector.

In the vast majority of applications, the use of a hermetic encapsulant offers sufficient levels of hermeticity at a reasonable price. Only extreme environments require glass-to-metal sealing.

Furthermore, AXON® fully tests its hermetic Micro-D solutions to provide reliability and satisfaction to its customers. Helium leak rate is the most common and most reliable method to quantify a small leak.

Based on its expertise, AXON® can also design tailor-made connectors to fit your application needs.

**ELECTRICAL & MECHANICAL PERFORMANCES**

<table>
<thead>
<tr>
<th>TECHNOLOGY CODE</th>
<th>HERMETIC ENCAPSULANT WITH SILICONE GASKET</th>
<th>HERMETIC ENCAPSULANT WITH FKM GASKET</th>
<th>GLASS-TO-METAL SEAL</th>
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<tbody>
<tr>
<td>MDH1</td>
<td>$1.10^{-9}$ mbar·l·s$^{-1}$</td>
<td>$1.10^{-8}$ mbar·l·s$^{-1}$</td>
<td>$&lt;1.10^{-11}$ mbar·l·s$^{-1}$</td>
</tr>
<tr>
<td>MDH2</td>
<td>$-55^\circ$C / +125$^\circ$C</td>
<td>$-30^\circ$C / +125$^\circ$C</td>
<td>$-55^\circ$C / +200$^\circ$C**</td>
</tr>
<tr>
<td>CURRENT RATING</td>
<td>3 A MAX</td>
<td>3 A MAX</td>
<td>3 A MAX</td>
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<td></td>
</tr>
<tr>
<td>SERVICE TEMPERATURE RANGE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Leak rates are measured by helium leak detection.
**Temperature range can be increased depending on application.

Other type of seals can also be offered.

By mounting the flange to the panel, all AXON® hermetic Micro-D connectors can be used to maintain low or high pressure vacuum seals.

They are fully compatible with standard Micro-D connectors. A wide range of products is already available however custom interconnect solutions can be designed for specific panel cut-outs and thicknesses. Please contact us for any specific hermetic applications.

For other operating performances please refer to MIL-DTL-83513
REAR PANEL MOUNTING GUIDE

HERMETIC FEED THROUGH CONNECTORS

Micro-D hermetic feed through is only available as rear panel mount connectors. Specific jackposts are used to secure the feed through on the panel.

- Recommended Ra for panel surface: <0.8 µm
- Recommended torque (jackposts): 0.35 N.m
- Connector parts and panel must be cleaned off before mounting for better performances
- Design is made to be used without vacuum grease
RECTANGULAR CONNECTORS

HERMETIC CONNECTOR

METAL SHELL
- High performance hermetic metal connector and PTFE wire.
- Male Twist Pin or female connector.
- 9 to 100 contacts.
- According to MIL-DTL-83513.

IDENTIFICATION CODE

SERIES
MDH: Micro-D Hermetic series.

HERMETIC TECHNOLOGY
1: Hermetic potting fluorinated silicone gasket.
2: Hermetic potting FKM gasket.
Glass-To-Metal seal on request.

NUMBER OF CONTACTS
09, 15, 21, 25, 31, 37, 51, 100.
See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER
P: Male (pin contacts).
S: Female (socket contacts).

TERMINATION TYPE
For colour codes F, L, W
1: E 2607, AWG 26, 7 strands, 600V.
4: E 2619, AWG 26, 19 strands, 600V.
6: E 2807, AWG 26, 7 strands, 600V.
8: E 3007, AWG 30, 7 strands, 600V.
A: E 2407, AWG 24, 7 strands, 600V.
C: E 2419, AWG 24, 19 strands, 600V.
E: M2759/33, AWG 26,19 strands, 600V.

See page 29 for wire types.

COLOUR CODE
F: All yellow.
L: All white.
W: 10 colour repeat.
BLANK: If wire type is G or FS.
See page 30 for colour code.

WIRE LENGTH (in cm)
Attention! Wire length in centimetres - (1cm = 10mm = 0.394”).
BLANK: If wire type is FS.

HARDWARE
B: No hardware.
Px (x=1 to 5): Panel mount jackposts.
See pages 190 to 200 for hardware description.

For other design or glass to metal sealed version, please consult us.

### Hermetic Connectors

Dimensions are in millimetres (inches).

#### Dimensions

**Female Connector**
- **A** (Max): 10.00 (.394)
- **D** (Max): 2.49 (.098)

**Male Connector**
- **A** (Max): 10.00 (.394)
- **D** (Max): 2.49 (.098)

#### Table

<table>
<thead>
<tr>
<th>Contacts</th>
<th>A ± 0.25 (±.010)</th>
<th>B max.</th>
<th>C max.</th>
<th>D ± 0.13 (±.005)</th>
<th>E ± 0.25 (±.010)</th>
<th>F max.</th>
<th>G max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 P / 9 S</td>
<td>23.20 (.913)</td>
<td>8.48 (.334)</td>
<td>10.16 (.400)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>14.35 (.565)</td>
<td>.56 (.022)</td>
</tr>
<tr>
<td>15 P / 15 S</td>
<td>27.00 (1.063)</td>
<td>12.29 (.484)</td>
<td>14.00 (.551)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>18.16 (.715)</td>
<td>.492</td>
</tr>
<tr>
<td>21 P / 21 S</td>
<td>30.81 (1.213)</td>
<td>16.10 (.634)</td>
<td>17.81 (.701)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>21.97 (.865)</td>
<td>.492</td>
</tr>
<tr>
<td>25 P / 25 S</td>
<td>33.40 (1.315)</td>
<td>18.64 (.734)</td>
<td>20.35 (.801)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>24.51 (.965)</td>
<td>.492</td>
</tr>
<tr>
<td>31 P / 31 S</td>
<td>37.16 (1.463)</td>
<td>22.45 (.884)</td>
<td>24.16 (.961)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>28.32 (1.115)</td>
<td>.492</td>
</tr>
<tr>
<td>37 P / 37 S</td>
<td>41.00 (1.614)</td>
<td>26.26 (1.034)</td>
<td>27.96 (1.101)</td>
<td>4.69 (.185)</td>
<td>6.35 (.250)</td>
<td>32.13 (1.265)</td>
<td>.492</td>
</tr>
<tr>
<td>51 P / 51 S</td>
<td>39.70 (1.563)</td>
<td>24.99 (0.984)</td>
<td>26.70 (1.051)</td>
<td>5.79 (2.28)</td>
<td>7.44 (.293)</td>
<td>30.86 (1.215)</td>
<td>.535</td>
</tr>
<tr>
<td>100 P / 100 S</td>
<td>59.70 (2.350)</td>
<td>35.15 (1.384)</td>
<td>36.86 (1.451)</td>
<td>6.88 (2.71)</td>
<td>8.46 (.333)</td>
<td>45.72 (1.800)</td>
<td>1.618</td>
</tr>
</tbody>
</table>
NON-MAGNETIC CONNECTORS

Non-magnetic Micro-D interconnect solutions ................. 170

PIGTAIL CONNECTORS
● Non-magnetic metal shell connectors..................... 172
● Non-magnetic low profile metal shell connectors ......... 173
● Non-magnetic plastic shell connectors .................. 174

PCB CONNECTORS
● PCB connectors overview .................................. 175
● Non-magnetic PCB connectors ............................. 176
Interest in powerful magnetic fields and accurate magnetic sensors has significantly increased in high-tech industries over the past decades. Various applications (MRI, low magnetic field detection systems, etc...) now use these complex phenomena, but accurately measuring a magnetic field is challenging. The difficulty comes mainly from interference caused by any ferromagnetic material surrounding the probes. At the same time, systems using such magnetic fields are spreading and components tend to be closer to each other, further increasing magnetic interference.

A standard Micro-D connector made to the requirements of MIL-DTL-83513 contains materials such as austenitic stainless steel, which can easily be magnetized. To avoid interference from interconnects, AXON® has developed a new product range: non-magnetic Micro-D connectors.

These connectors have limited or no influence on magnetic field lines, improving the reliability of magnetic measurements, even down to nanoTesla level, $10^{-4}$ times lower than the Earth’s magnetic field. AXON’s non-magnetic Micro-D connectors have been designed using new materials and surface treatments, avoiding ferromagnetic materials. The manufacturing process has also been developed to keep them “as clean as possible” magnetically.

**MAGNETIC TESTING**

In order to further enhance and test its non-magnetic product range, AXON® has developed its own test equipment and procedure, based on recognized standards, to characterize and quantify the magnetic influence of connectors on their environment.

The first step is to measure the initial magnetic state of the Unit Under Test (UUT) using a three-axis probe. Then a high magnetic field of 0.5T (Earth’s magnetic field is about 50µT in Europe), is applied to the UUT. Finally, the intensity of the field is gradually decreased to nil, and the residual magnetism level of the UUT is measured with the three-axis probe. As a result of this procedure, the influence of a strong magnetic field on the UUT is known.

To minimize the possibility of magnetic interference from the surrounding area, the tests are carried out in a specially-constructed facility (see figure 1) which is made from magnetically neutral materials. Additionally a magnetic shield is used to shield the item tested from the Earth’s magnetic field (see figures 2 & 3).
For a material studied in a magnetostatic state, a link between the physical quantities of the Maxwell’s equations can be simplified to:

\[ B = \mu_0 (H+M) \]

Where \( B \) is the magnetic flux density generated by the material in Tesla (T), \( \mu_0 \) is the magnetic permeability of vacuum in Henry per meter (H/m), \( H \) is the magnetic field intensity generated by the environment in Ampere per meter (A/m), \( M \) is the sum of the magnetic moments of the material or magnetization in Ampere per meter (A/m).

If the item is perfectly non-magnetic, \( M = 0 \). So if the magnetic field generated by the environment is also nil (\( H = 0 \)), the measured magnetic flux density \( B \) is also nil.

**Relationship between physical quantities commonly used:**

1 Oersted = \( \frac{10^4}{4\pi} \) A/m

1 T = 10^4 Gauss = 10^6 Gamma

### General Performances

| Residual Magnetic Level | NMB*: ≤ 200 nT residual magnetism level  
NMC*: ≤ 20 nT residual magnetism level  
NMD*: on request: ≤ 2 nT residual magnetism level |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature range</td>
<td>-55°C / +200°C</td>
</tr>
<tr>
<td>Current rating</td>
<td>3 A max</td>
</tr>
</tbody>
</table>

*: NMB, NMC & NMD levels are defined by NASA GSFC S-311 for non-magnetic subminiature connectors and adapted to the dimensions of microminiature connectors.

### Material & Finish

- **Shell**: Aluminium alloy 6061 with custom non-magnetic plating or titanium
- **Moulded Insulator**: Liquid Crystal Polymer (LCP)
- **Interfacial Seal**: Fluorosilicone rubber
- **Pin Contact**: Copper and beryllium copper, gold over nickel plating (custom non-magnetic plating)
- **Socket Contact**: Copper alloy, gold over nickel plating (custom non-magnetic plating)
- **Encapsulant**: Epoxy resin
- **Hardware**: Titanium TA6V and beryllium copper
- **Solid uninsulated wires & PCB terminals**: AWG 25 Silver Plated Copper

**Lower Magnetism Level**: Please contact us for a 2 nT residual magnetism level or for other magnetic requirements
NON-MAGNETIC CONNECTOR

METAL SHELL
- For strong magnetic field environments.
- Minimal magnetic disturbance.
- High performance metal connector and PTFE wire.
- Environmentally sealed.
- Operating temperature: 125 or 200°C.
- 9 to 100 contacts.

IDENTIFICATION CODE

SERIES
MDN: Micro-D Non-magnetic series.

CONNECTOR TYPE
1A: < 200 nT - Nickel aluminium shell + potting 125°C.
1B: < 200 nT - Nickel aluminium shell + potting 200°C.
2A: < 20 nT - Titanium shell + potting 125°C.
2B: < 20 nT - Titanium shell + potting 200°C.
Contact us for < 2 nT connectors.

NUMBER OF CONTACTS
09, 15, 21, 25, 31, 37, 51DR, 51, 69, 100.
See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER
P: Male (pin contacts).
S: Female (socket contacts).

TERMINATION TYPE
For colour codes F, L, W
1: E 2607, AWS 26, 7 strands, 600V.
4: E 2619, AWS 26, 19 strands, 600V.
6: E 2607, AWS 28, 7 strands, 600V.
8: E 3007, AWS 30, 7 strands, 600V.
A: E 2407, AWS 24, 7 strands, 600V.
C: E 2419, AWS 24, 19 strands, 600V.
E: M22759/33, AWS 26, 19 strands, 600V.
3: M22759/11, AWS26, 19 strands, 600V.
5: E2607, AWS26, 7 strands, 600V.
6: E 2807, AWS 28, 19 strands, 600V.
8: E 3007, AWS 30, 19 strands, 600V.
F: E 2607, AWS 26, 19 strands, 600V.
S: AWG 25 silver plated.
FS: Solder cup.
See page 29 for wire types.

COLOUR CODE
F: All yellow.
L: All white.
W: 10 colour repeat.
V: MIL-STD-681 striped (only for wire types 3 and F).
See page 30 for colour code.

WIRE LENGTH (in cm)
Attention! Wire length in centimetres - (1cm = 10mm = 0.394”).
BLANK: If termination type is FS.

HARDWARE
B: No hardware.
P: Titanium jackposts (removable).
M: Titanium non-magnetic low profile hex socket head jackscrews (removable).
N: Titanium non-magnetic high profile hex socket head jackscrews (removable).
Px: (x: 1 to 5); Titanium panel mount jackposts.
See pages 190 to 200 for hardware description.
NON-MAGNETIC CONNECTOR

LOW PROFILE METAL SHELL
- For strong magnetic field environments.
- Minimal magnetic disturbance.
- High performance metal connector and PTFE wire.
- Environmentally sealed.
- Operating temperature: 125 or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

SERIES
- MDN: Micro-D Non-magnetic series.

CONNECTOR TYPE
- 1A: < 200 nT - Nickel aluminium shell + potting 125°C.
- 1B: < 200 nT - Nickel aluminium shell + potting 200°C.
- 2A: < 20 nT - Titanium shell + potting 125°C.
- 2B: < 20 nT - Titanium shell + potting 200°C.
Contact us for < 2 nT connectors.

NUMBER OF CONTACTS
See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER
- P: Male (pin contacts).
- S: Female (socket contacts).

TERMINATION TYPE
- For colour code V only
  - 3: M22759/11, AWG26, 19 strands, 600V.
  - F: E2607, AWG26, 7 strands, 600V.
- Solid uninsulated wires
- S: AWG 25 silver plated.
FS: Solder cup.
See page 29 for wire types.

COLOUR CODE
- F: All yellow.
- L: All white.
- W: 10 colour repeat.
- V: MIL-STD-681 striped (only for wire types 3 and F).
See page 30 for colour code.

WIRE LENGTH (in cm)
- Attention! Wire length in centimetres - (1cm = 10mm = 0.394").
- BLANK: If termination type is FS.

HARDWARE
- B: No hardware.
- P: Titanium jackposts (removable).
- M: Titanium non-magnetic low profile hex socket head jackscrews (removable).
- N: Titanium non-magnetic high profile hex socket head jackscrews (removable).
- Px (x: 1 to 5): Titanium panel mount jackposts.
See pages 190 to 200 for hardware description.
NON-MAGNETIC CONNECTOR

PLASTIC SHELL
- For strong magnetic field environments.
- Minimal magnetic disturbance.
- High performance plastic connector and PTFE wire.
- Environmentally sealed.
- Operating temperature: 125 or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

<table>
<thead>
<tr>
<th>MDN</th>
<th>P</th>
<th>51</th>
<th>S</th>
<th>4</th>
<th>L</th>
<th>050</th>
<th>B</th>
</tr>
</thead>
</table>

**SERIES**
MDN: Micro-D Non-magnetic series.

**CONNECTOR TYPE**
P: < 20 nT - Plastic shell + potting 125°C.
L: < 20 nT - Plastic shell + potting 200°C.

**NUMBER OF CONTACTS**
09, 15, 21, 25, 31, 37, 51.
See pages 26 & 27 for contact arrangements.

**CONNECTOR GENDER**
P: Male (pin contacts).
S: Female (socket contacts).

**TERMINATION TYPE**
For colour codes F, L, W
1: E 2607, AWG 26, 7 strands, 600V.
4: E 2619, AWG 26, 19 strands, 600V.
6: E 2607, AWG 28, 7 strands, 600V.
8: E 3007, AWG 30, 7 strands, 600V.
A: E 2407, AWG 24, 7 strands, 600V.
C: E 2419, AWG 24, 19 strands, 600V.
E: M22759/33, AWG 26, 19 strands, 600V.

For colour code V only
3: M22759/11, AWG26, 19 strands, 600V.
F: E2607, AWG26, 7 strands, 600V.
Solid uninsulated wires
S: AWG 25 silver plated.

FS: Solder cup.
See page 29 for wire types.

**COLOUR CODE**
F: All yellow.
L: All white.
W: 10 colour repeat.
V: MIL-STD-681 striped (only for wire types 3 and F).
See page 30 for colour code.

**WIRE LENGTH (in cm)**
Attention! Wire length in centimetres - (1cm = 10mm = 0.394”).
BLANK: If termination is FS.

**TOLERANCE**

<table>
<thead>
<tr>
<th>L in cm (inches)</th>
<th>L ≤ 10</th>
<th>10 &lt; L ≤ 50</th>
<th>L &gt; 50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0 / +0.5</td>
<td>-0 / +3</td>
<td>-0 / +5</td>
</tr>
<tr>
<td></td>
<td>-0 / +0.200</td>
<td>-0 / +1.180</td>
<td>-0 / +1.970</td>
</tr>
</tbody>
</table>

**HARDWARE**
B: No hardware.
P: Titanium jackposts (removable).
M: Titanium non-magnetic low profile hex socket head jackscrews (removable).
N: Titanium non-magnetic high profile hex socket head jackscrews (removable).
Px (x: 1 to 5): Titanium panel mount jackposts.
See pages 190 to 200 for hardware description.
PCB CONNECTORS

OVERVIEW

AXON’ Micro-D Printed Circuit Board connectors are designed for interconnection of PCB’s inside-the-box to external cables.
AXON’ Micro-D PCB connectors are available in two layouts (0.100” pitch and 0.075” pitch) and in two configurations (vertical mount and right angle mount connectors) for flexible and rigid printed circuit boards.

NOTE: typically, the PCB connector tends to be female, however male versions are equally available.

NON-MAGNETIC PCB CONNECTORS 0.100” PITCH

CBR 0.100”
Condensed Right Angle mount
Available from 9 to 100 ways
Available in metal shell
PCB code: CBR
See pages 78 to 85*

CBP 0.100”
Condensed Right Angle mount low profile
Available from 9 to 51 ways
Available in metal and plastic shell
PCB code: CBP
See pages 86 to 91*

NON-MAGNETIC PCB CONNECTORS 0.075” PITCH

BS 0.075”
Vertical mount
Available from 9 to 100 ways
Available in metal and plastic shell
PCB code: 75SB
See pages 116 to 125*

CBR 0.075”
Condensed Right Angle mount
Available from 9 to 100 ways
Available in metal shell
PCB code: 75RB
See pages 178 to 184*

*: Non-magnetic PCB connectors have the same dimensions and PCB layouts as standard PCB connectors.
Construction of the references on the next page.
NON-MAGNETIC PCB CONNECTOR

- For strong magnetic field environments.
- Minimal magnetic disturbance.
- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature: 125 or 200°C.
- Several tail lengths available.
- 9 to 100 contacts (up to 51 for plastic connectors).

IDENTIFICATION CODE

<table>
<thead>
<tr>
<th>SERIES</th>
<th>MDN</th>
<th>1A</th>
<th>51</th>
<th>S</th>
<th>CBR</th>
<th>P</th>
<th>S</th>
<th>3</th>
</tr>
</thead>
</table>

MDN: Micro-D Non-magnetic series.

CONNECTOR TYPE

1A: < 200 nT - Nickel aluminium shell + potting 125°C.
1B: < 200 nT - Nickel aluminium shell + potting 200°C.
2A: < 20 nT - Titanium + potting 125°C.
2B: < 20 nT - Titanium + potting 200°C.
P: < 20 nT - Plastic shell + potting 125°C.
L: < 20 nT - Plastic shell + potting 200°C.
Contact us for < 2 nT connectors.

NUMBER OF CONTACTS

09, 15, 21, 25, 31, 37, 51DR*, 51, 69*, 100*.
See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER

P: Male (pin contacts).
S: Female (socket contacts).

PCB VERSION

CBR: 0.100" Condensed Board Right Angle**.
CBP: 0.100" Condensed Right Angle Low Profile***.
75RB: 0.075" Condensed Board Right Angle**.
75SB: 0.075" Board Straight.

HARDWARE

B: No hardware.
P: Titanium jackposts (removable).
Px (x: 1 to 5): Titanium panel mount jackposts.
See pages 190 to 200 for hardware description.

CONDUCTOR TYPE

S: Silver plated solid conductor AWG 25.

TAIL LENGTH

1: 2.80 mm (0.110”).
2: 3.80 mm (0.150”).
3: 4.80 mm (0.190”).
4: 6.35 mm (0.250”).
5: 3.25 mm (0.127”).
6: 3.56 mm (0.140”).
7: 4.37 mm (0.172”).

Tolerance: ± 0.38 mm (0.015”).
Other lengths available on request.

*: not for plastic shell connectors.
**: only for standard profile metal shells.
***: only for plastic and low profile metal shells.
120 WAY MICRO-D CONNECTORS

- 120 way Micro-D connectors ........................................ 178
- 120 way connectors for cable and harnesses .................. 181
- Surface mount PCB card edge connectors ...................... 182
- BS connector ................................................................... 183
- Connector saver .............................................................. 183
- PCB layouts ................................................................. 184
An enduring trend in the electronics industry is the continuing drive towards miniaturisation. This leads in turn to ever greater cabling densities with an ever larger number of signals required within limited space constraints. In answer to these challenges, AXON' CABLE has developed a range of 120 way Micro-D connectors. They are available as pigtailed or within assemblies but can equally be supplied as PCB connectors in either surface mount or through hole format. Connector savers are part of the range.

These connectors can be used for any applications where severe environmental conditions and high density cabling are critical. Keying hardware is an option.

AXON' can offer specific numbers of contacts for custom designed applications. Specific designs are not contained within the MIL specification but AXON’s solutions remain fully compatible with the MIL-DTL-83513 standard as far as performance and construction are concerned.

Contact arrangements

1.27 mm (.050") contact spacing.
1.27 mm (.050") spacing between two rows.
References

<table>
<thead>
<tr>
<th>DESIGNATION</th>
<th>REFERENCE</th>
<th>COMMENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 WAY PLUG CONNECTOR FOR CABLE OR ASSEMBLY</td>
<td>P562620</td>
<td>Wire, length and colour type to be defined</td>
<td>181</td>
</tr>
<tr>
<td>120 WAY SOCKET CONNECTOR FOR CABLE OR ASSEMBLY</td>
<td>P562621</td>
<td>Wire, length and colour type to be defined</td>
<td>181</td>
</tr>
<tr>
<td>120 WAY SOCKET SURFACE MOUNT PCB CONNECTOR</td>
<td>P562622</td>
<td>Can only be mated with pigtail plug</td>
<td>182</td>
</tr>
<tr>
<td>120 WAY PLUG BOARD STRAIGHT PCB CONNECTOR</td>
<td>P562623</td>
<td></td>
<td>183</td>
</tr>
<tr>
<td>120 WAY CONNECTOR S A Y E R</td>
<td>P562624</td>
<td></td>
<td>183</td>
</tr>
</tbody>
</table>

The AXON® 120 way Micro-D connector can be ordered with standard wires and colours (see pages 29 & 30). For more AXON® 120 way Micro-D connectors references, please contact our engineering department.

Keying Hardware

| SPECIAL 120 WAY MALE HARDWARE KIT WITH KEYWAY: J | SPECIAL 120 WAY FEMALE HARDWARE KIT WITH KEYWAY: H |
Electrical & mechanical characteristics

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>SPECIFICATIONS</th>
<th>TEST METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT RATING</td>
<td>2.5 A max @ 23°C</td>
<td>EIA-364-70</td>
</tr>
<tr>
<td>CONTACT RESISTANCE</td>
<td>8 mΩ max.</td>
<td>EIA-364-06</td>
</tr>
<tr>
<td>INSULATION RESISTANCE</td>
<td>5000 MΩ min. @ 500 Vac</td>
<td>EIA-364-21</td>
</tr>
<tr>
<td>DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 M - ALTITUDE 21 KM (70,000 FT)</td>
<td>250 Vac 100 Vac</td>
<td>EIA-364-20</td>
</tr>
<tr>
<td>CONTACT ENGAGING AND SEPARATION FORCE</td>
<td>170 g max. (6 oz) / 14 g min. (0.5 oz)</td>
<td>EIA-364-37</td>
</tr>
<tr>
<td>CONNECTOR MATING AND DE-MATING FORCE</td>
<td>283 g (10 oz) X 120</td>
<td>EIA-364-13</td>
</tr>
<tr>
<td>CONTACT RETENTION</td>
<td>2.26 kg (5 lbs) for 5 seconds min.</td>
<td>EIA-364-29</td>
</tr>
<tr>
<td>DURABILITY</td>
<td>500 mating cycles min.</td>
<td>EIA-364-09</td>
</tr>
<tr>
<td>TEMPERATURE RANGE</td>
<td>-55°C / +150°C</td>
<td></td>
</tr>
<tr>
<td>VIBRATION</td>
<td>20 g’s - No discontinuity &gt;1µs</td>
<td>EIA-364-28</td>
</tr>
<tr>
<td>SHOCK</td>
<td>50 g’s - No discontinuity &gt;1µs</td>
<td>EIA-364-27</td>
</tr>
<tr>
<td>SALT SPRAY</td>
<td>48 hours</td>
<td>EIA-364-26</td>
</tr>
<tr>
<td>HUMIDITY</td>
<td>Insulation resistance &gt; 1MΩ</td>
<td>EIA-364-31</td>
</tr>
</tbody>
</table>

Materials & finish

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>MATERIAL</th>
<th>FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE CONTACT (TWIST PIN)</td>
<td>COPPER AND BERYLLIUM COPPER</td>
<td>GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (0.050&quot;) MIN, CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-280 CLASS 2 (0.050&quot;) TO 3.81µM (0.150&quot;)</td>
</tr>
<tr>
<td>FEMALE CONTACT</td>
<td>COPPER ALLOY</td>
<td></td>
</tr>
<tr>
<td>METAL SHELL</td>
<td>ALUMINIUM ALLOY, TYPE 6061</td>
<td>ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, 0.005 INCH MIN.</td>
</tr>
<tr>
<td>INSERTS</td>
<td>LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94% IN ACCORDANCE WITH MIL-M-24519 (200°C)</td>
<td></td>
</tr>
<tr>
<td>HARDWARE</td>
<td>STAINLESS STEEL, 300 SERIES</td>
<td>PASSIVATION IN ACCORDANCE WITH SAE-AMS2700</td>
</tr>
<tr>
<td>ENCAPSULANT</td>
<td>EPOXY RESIN</td>
<td></td>
</tr>
<tr>
<td>UNSULATED WIRE</td>
<td>AWG 28/1 SOLID COPPER WIRE</td>
<td>GOLD PLATED IN ACCORDANCE WITH A-A-59551</td>
</tr>
</tbody>
</table>
120 way male and female connectors for cable and harnesses

Both male and female connectors can be assembled with various wire sizes in shielded and unshielded forms. High speed variants can also be produced, using controlled impedance shielded twisted pairs which allow data rates of up to 880 Mbps. For space applications, these connectors are assembled in a class 100,000 clean room, and can be terminated with ESA ESCC (European Space Agency) approved wires.
Surface Mount PCB
Card Edge Connectors

Surface Mount (SMT) connectors have two rows of 28 AWG gold plated leads at 0.635 mm (.025") pitch spacing to terminate to PCB’s by soldering. Lugs on either side of the connector allow for mechanical clamping onto the PCB.

AVAILABLE VERSIONS

- Female style to mate with a male pigtail or assembly connector.
- Male and female styles to mate together (this option has a longer shell to retain the keying hardware system).
- Female style for panel mount.

FEMALE SMT
to mate to a male cable connector.

P562622

SEE CONTACT LAYOUT ON PCB PAGE 308
**BS Connector**

The BS version is similar to the straight PCB connector style of the MIL standard. Available in male version only.

**Connector saver**

Connector savers have been developed to protect expensive equipment. Typical applications include test equipment and space-grade instruments.
PCB layout

FEMALE SMT (SURFACE MOUNT STYLE) CONNECTOR

BS VERSION (MALE ONLY)
MICRO-D ACCESSORIES

BACKSHELL
- Micro-D EMI-backshell .......................................................... 186
- AXOCLAMP® EMI band termination ................................. 189

HARDWARE
- Removable jackscrews .................................................. 190
- Removable jackposts ....................................................... 192
- Rear panel mount jackposts for pigtais connectors .......... 193
- Removable jackposts for PCB connectors ......................... 194
- Rear panel mount jackposts for PCB connectors .............. 196
- Non-removable hardware ........................................ 198
- Float mount inserts ...................................................... 199
- U-clip mounting jackscrews ........................................ 200

MICRO-D & NANO-D ASSEMBLY KIT ................................. 201
ACCESSORIES

MICRO-D EMI BACKSHELL

- Micro-D aluminium backshell for EMI termination.
- Supplied with stainless steel hardware.
- Various entry sizes & shapes.
- Available for standard and micro AXOCLAMP® band termination.
- Shell size from 9 to 100.

IDENTIFICATION CODE

<table>
<thead>
<tr>
<th>SERIES</th>
<th>STYLE TYPE</th>
<th>CONNECTOR SIZE</th>
<th>ENTRY SIZE</th>
<th>ENTRY TYPE</th>
<th>MATERIAL</th>
<th>PLATING OPTION</th>
<th>HARDWARE OPTION</th>
<th>RECOMMENDED TORQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXON</td>
<td>F 37 05 E 1 C F</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**SERIES**

09, 15, 21, 25, 31, 37, 51DR, 51, 69, 100.

**ENTRY SIZE**

From O1 to 11.

See page 188 for dimensions.

Other entry sizes available on request.

**ENTRY TYPE**

E: Elliptical.
BLANK: Circular.

**MATERIAL**

1: Aluminium.

Other materials available on request.

**PLATING OPTION**

C: Electroless nickel per SAE-AMS-2404, class 4, (13 µm / 0.0005 min).
CHP: Hi Phos electroless nickel plate to SAE-AMS-2404, class 4 (25.4 µm / 0.01" min), 10% P min.
Z: Black zinc nickel over nickel under plate.
Y: Yellow chromate over cadmium per QQ-P-416, type II, class 3.

**HARDWARE OPTION**

F: Female jackpost (panel mount jackposts on request)
BLANK: Male jackscrew

**RECOMMENDED TORQUE**

9 to 69 way jackscrew: 0.28 N.m / 2.5 inch-pounds.
100 way jackscrew: 0.51 N.m / 4.5 inch-pounds.
9 to 69 way jackpost: 0.35 N.m / 3.1 inch-pounds.
100 way jackpost: 0.55 N.m / 4.9 inch-pounds.
### DIMENSIONS
Dimensions are in millimetres (inches).

#### STYLE U: TOP ENTRY

![Diagram of STYLE U: TOP ENTRY](image)

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td>9</td>
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<td>51</td>
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#### STYLE Z: SIDE ENTRY

![Diagram of STYLE Z: SIDE ENTRY](image)

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<th>C</th>
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<th>E</th>
<th>F</th>
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#### STYLE F: 45° ENTRY

![Diagram of STYLE F: 45° ENTRY](image)

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<th>F</th>
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<td>9.00</td>
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<tr>
<td>69</td>
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<td>38.48</td>
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<td>11.00</td>
<td>21.00</td>
<td>25.00</td>
<td>38.00</td>
</tr>
</tbody>
</table>

**Axon Cable & Interconnect**

## Elliptical Entry

### Elliptical Entry Styles U and Z

<table>
<thead>
<tr>
<th>Entry Size</th>
<th>Shell Size</th>
<th>J</th>
<th>K</th>
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</thead>
<tbody>
<tr>
<td>04 E</td>
<td>09-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
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<td>15-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>06 E</td>
<td>25-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>07 E</td>
<td>37-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>08 E*</td>
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<tr>
<td>09 E</td>
<td>100</td>
<td>7.80</td>
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</table>

*: Caution! Entries for 51DR are the same as for 37 way shells.

### Elliptical Entry Style F

<table>
<thead>
<tr>
<th>Entry Size</th>
<th>Shell Size</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 E</td>
<td>21-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>05 E</td>
<td>25-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>06 E</td>
<td>37-100</td>
<td>5.80</td>
<td>.228</td>
</tr>
<tr>
<td>07 E*</td>
<td>51-100</td>
<td>6.80</td>
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<td>08 E</td>
<td>100</td>
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<tr>
<td>09 E</td>
<td>100</td>
<td>7.80</td>
<td>.307</td>
</tr>
</tbody>
</table>

*: Caution! Entries for 51DR are the same as for 37 way shells.

## Circular Entry

### Circular Entry Styles U and F

<table>
<thead>
<tr>
<th>Entry Size</th>
<th>Shell Size</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>09-100</td>
<td>1.60</td>
</tr>
<tr>
<td>02</td>
<td>09-100</td>
<td>3.20</td>
</tr>
<tr>
<td>03</td>
<td>09-100</td>
<td>4.80</td>
</tr>
<tr>
<td>04*</td>
<td>51-100</td>
<td>6.40</td>
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<tr>
<td>05</td>
<td>100</td>
<td>8.00</td>
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</table>

*: Caution! Entries for 51DR are the same as for 37 way shells.

### Circular Entry Style Z

<table>
<thead>
<tr>
<th>Entry Size</th>
<th>Shell Size</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>09-100</td>
<td>1.60</td>
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<tr>
<td>02</td>
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<td>3.20</td>
</tr>
<tr>
<td>03</td>
<td>09-100</td>
<td>4.80</td>
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<tr>
<td>04</td>
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</tr>
<tr>
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<td>07</td>
<td>25-100</td>
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<tr>
<td>11</td>
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</tbody>
</table>
AXOCLAMP® EMI BAND TERMINATION

Material: stainless steel AISI 316.

360° shield termination for connectors can be carried out with a patented metal band called AXOCLAMP®. This ensures the continuity of shielding efficiency at the cable / connector junction.

IDENTIFICATION CODE

<table>
<thead>
<tr>
<th>AXCL</th>
<th>01</th>
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<tbody>
<tr>
<td>AXOCLAMP®</td>
<td>BAND TYPES</td>
</tr>
<tr>
<td>AXOCLAMP®</td>
<td>01: standard</td>
</tr>
<tr>
<td></td>
<td>03: microband double wrapped</td>
</tr>
</tbody>
</table>

The standard version is coiled but straight AXOCLAMP® can be delivered on request (reference example AXC03D). Minimum quantity: 100 pieces per reference.

DIMENSIONS

Dimensions are in millimetres (inches).

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>AXOCLAMP® STANDARD</th>
<th>AXOCLAMP® MICROBAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFERENCE</td>
<td>AX CL 01</td>
<td>AX CL 03</td>
</tr>
<tr>
<td>DIMENSION A</td>
<td>375 (14.764)</td>
<td>200 (7.874)</td>
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<tr>
<td>DIMENSION B</td>
<td>9 (.364)</td>
<td>5.2 (.205)</td>
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<tr>
<td>DIMENSION C</td>
<td>10 (.394)</td>
<td>5.5 (.217)</td>
</tr>
<tr>
<td>DIMENSION D</td>
<td>5.9 (.232)</td>
<td>3 (.118)</td>
</tr>
<tr>
<td>DIMENSION E</td>
<td>0.5 (.020)</td>
<td>0.35 (.014)</td>
</tr>
<tr>
<td>MINIMUM DIAMETER*</td>
<td>10 (.394)</td>
<td>5 (.197)</td>
</tr>
<tr>
<td>MAXIMUM DIAMETER*</td>
<td>40 (.157)</td>
<td>15 (.591)</td>
</tr>
</tbody>
</table>

*: Minimum and maximum diameter of the rear funnel on which the AXOCLAMP® can be mounted.

For other dimensions, please consult us.

BANDING TOOLS

<table>
<thead>
<tr>
<th>MANUAL HAND TOOL</th>
<th>CLAMPING VALUES</th>
<th>PNEUMATIC CLAMPING TOOL</th>
<th>RECOMMENDED BANDING VALUES*</th>
<th>CALIBRATION DEVICE</th>
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</thead>
<tbody>
<tr>
<td>AXOCLAMP® AX CL 01</td>
<td>A 40199</td>
<td>100-180 LBS</td>
<td>A 35199</td>
<td>160</td>
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<tr>
<td>AXOCLAMP® AX CL 03</td>
<td>A 30199</td>
<td>60-100 LBS</td>
<td>A 35599</td>
<td>90</td>
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</table>

*: Banding values are given for information only.
HARDWARE

Removable jackscrews according to MIL-DTL-83513/05

FOR PIGTAIL & SOLDER CUP CONNECTORS ONLY.
- 2 sizes of hardware: one version for shell sizes from 9 to 69 ways and another version for the 100-way shell size.
- 1 kit consists of 2 screws and 2 e-rings.
- Hex socket head or slot head.
- Material: passivated 300 series stainless steel.

Note
1st line: kit part number (to be used for ordering).
2nd line: military specification number.
3rd line: hardware code for pigtail connector.
Dimensions are given in millimetres (inches).

9-69 WAY HARDWARE

KIT PART NUMBER: MDAHM502
According to M83513/05-02
Hardware code: M

KIT PART NUMBER: MDAHM503
According to M83513/05-03
Hardware code: N

KIT PART NUMBER: MDAHM505
According to M83513/05-05
Hardware code: S

KIT PART NUMBER: MDAHM506
According to M83513/05-06
Hardware code: T
100 WAY HARDWARE

KIT PART NUMBER: MDAHM512
According to M83513/05-12
Hardware code: M

KIT PART NUMBER: MDAHM513
According to M83513/05-13
Hardware code: N

KIT PART NUMBER: MDAHM515
According to M83513/05-15
Hardware code: S

KIT PART NUMBER: MDAHM516
According to M83513/05-16
Hardware code: T

- RECOMMENDED TORQUE
  - 9 to 89 way jackscrew: 0.28 N.m / 2.5 inch-pounds.
  - 100 way jackscrew: 0.51 N.m / 4.5 inch-pounds.
Removable jackposts according to MIL-DTL-83513/05

- 2 sizes of hardware: one version for shell sizes from 9 to 69 ways and another version for the 100-way shell size.
- 1 kit consists of 2 posts, 2 washers and 2 nuts.
- Material: passivated 300 series stainless steel.

Note
1st line: kit part number (to be used for ordering).
2nd line: military specification number.
3rd line: Hardware code.
Dimensions are given in millimetres (inches).

9–69 WAY HARDWARE

KIT PART NUMBER: MDAHM507
According to M83513/05-07
Hardware code: P

100 WAY HARDWARE

KIT PART NUMBER: MDAHM517
According to M83513/05-17
Hardware code: P
Rear panel mount jackposts for pigtails

- 2 sizes of hardware: one version for all shell sizes for 9 to 69 way and another version for the 100 way shell size.
- 1 kit consists of 2 posts, 2 washers and 2 nuts.
- Material: passivated 300 series stainless steel.

Dimensions are given in millimetres (inches).

<table>
<thead>
<tr>
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<th>Px</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
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<tbody>
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<td>1.2</td>
<td>1.6</td>
<td>2.0</td>
<td>2.4</td>
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<td>.047</td>
<td>.062</td>
<td>.079</td>
<td>.094</td>
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<td>9-69 way</td>
<td>MDAHMP01</td>
<td>MDAHMP02</td>
<td>MDAHMP03</td>
<td>MDAHMP04</td>
<td>MDAHMP05</td>
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<td>MDAHMP13</td>
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<td>.059</td>
<td>.075</td>
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</tbody>
</table>

9-69 WAY HARDWARE

100 WAY HARDWARE

RECOMMENDED TORQUE

- 9 to 69 way jackpost: 0.35 N.m / 3.1 inch-pounds.
- 100 way jackpost: 0.55 N.m / 4.9 inch-pounds.
HARDWARE

Removable jackposts for PCB connectors

- 2 sizes of hardware: one version for shell sizes from 9 to 69 ways and another version for the 100-way shell size.
- Hardware kit depending on the PCB type (see table below).
- 1 kit consists of 2 posts.
- Material: passivated 300 series stainless steel.

Dimensions are given in millimetres (inches).

<table>
<thead>
<tr>
<th>KIT PART NUMBER</th>
<th>HARDWARE CODE</th>
<th>P</th>
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<tr>
<td></td>
<td>CBR or CBP</td>
<td>MDAHM507SM2PCB</td>
</tr>
<tr>
<td>100 way</td>
<td>BS, BR or CBR 0.075&quot;</td>
<td>MDAHM517SPCB</td>
</tr>
<tr>
<td></td>
<td>CBR 0.100&quot;</td>
<td>MDAHM517SLPCB</td>
</tr>
</tbody>
</table>

9-69 WAY HARDWARE

KIT PART NUMBER: MDAHM507SPCB
Based on M83513/05-07
Hardware code: P

KIT PART NUMBER: MDAHM507SM2PCB
Based on M83513/05-07
Hardware code: P
100 WAY HARDWARE

RECOMMENDED TORQUE

- 9 to 69 way jackpost: 0.35 N.m / 3.1 inch-pounds.
- 100 way jackpost: 0.55 N.m / 4.9 inch-pounds.

KIT PART NUMBER: MDAHM517SPCB
Based on M83513/05-17
Hardware code: P

KIT PART NUMBER: MDAHM517SLPCB
Based on M83513/05-17
Hardware code: P
Rear panel mount jackposts for PCB connectors

- 2 sizes of hardware: one version for shell sizes from 9 to 69 ways and another version for the 100-way shell size.
- Hardware kit depending on the PCB type (see table below).
- 1 kit consists of 2 posts.
- Material: passivated 300 series stainless steel.

Dimensions are given in millimetres (inches).

<table>
<thead>
<tr>
<th>HARDWARE CODE</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANEL THICKNESS</td>
<td>mm</td>
<td>.8</td>
<td>1.2</td>
<td>1.6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>inch</td>
<td>.031</td>
<td>.047</td>
<td>.062</td>
<td>.079</td>
</tr>
<tr>
<td>9-69 way</td>
<td>BS or BR</td>
<td>MDAHMSP01</td>
<td>MDAHMSP02</td>
<td>MDAHMSP03</td>
<td>MDAHMSP04</td>
</tr>
<tr>
<td></td>
<td>CBR or CBP</td>
<td>MDAHMSP201</td>
<td>MDAHMSP202</td>
<td>MDAHMSP203</td>
<td>MDAHMSP204</td>
</tr>
<tr>
<td>100 way</td>
<td>BS, BR or CBR 0.075&quot;</td>
<td>MDAHMSP11</td>
<td>MDAHMSP12</td>
<td>MDAHMSP13</td>
<td>MDAHMSP14</td>
</tr>
<tr>
<td></td>
<td>CBR 0.100&quot;</td>
<td>MDAHMSP211</td>
<td>MDAHMSP212</td>
<td>MDAHMSP213</td>
<td>MDAHMSP214</td>
</tr>
<tr>
<td>DIMENSIONS A</td>
<td>mm</td>
<td>0.7</td>
<td>1.1</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>inch</td>
<td>.028</td>
<td>.043</td>
<td>.059</td>
<td>.075</td>
</tr>
</tbody>
</table>

9-69 WAY HARDWARE

KIT PART NUMBER: MDAHMSP0x
Hardware code: Px

KIT PART NUMBER: MDAHMSP20x
Hardware code: Px
**100 WAY HARDWARE**

**RECOMMENDED TORQUE**

- 9 to 69 way jackpost: 0.35 N.m / 3.1 inch-pounds.
- 100 way jackpost: 0.55 N.m / 4.9 inch-pounds.

**Caution:** When PCB connectors are mounted on panels, the assembly can potentially be hyperstatic (producing stresses and strains) if the printed circuit board is mechanically linked to the panel.
Non removable hardware

For Pigtail & Solder Cup Connectors Only.
- Hardware is factory installed.
- Cannot be supplied in kit form.
- Material: passivated 300 series stainless steel.

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**Micro-D Accessories**

**HARDWARE**

**LONG JACKSCREW (SLOT HEAD)**

- Hardware code: K

**SHORT JACKSCREW (HEX SOCKET HEAD)**

- Hardware code: L

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**9-69 Way Hardware**

**100 Way Hardware**

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**Float mount inserts**

TO BE USED TO FIX CONNECTORS ON A SYSTEM WITH SCREWS. FOR PIGTAIL & SOLDER CUP CONNECTORS ONLY.
- Hardware is factory installed.
- Cannot be supplied in kit form.
- Material: passivated 300 series stainless steel.

### 9-69 WAY HARDWARE

**HARDWARE CODE: F**

### 100 WAY HARDWARE

**HARDWARE CODE: FR**

**Micro-D Front Face**

- Axial Float: 0.5 (0.02) MAX
- Lateral Float: 0.4 (0.014) MAX

- Ø 2.3 ±0.1 (Ø 0.090 ±0.004)
- Ø 3.90 (0.154) MAX

- 4.7 (0.185) MAX
- 0.8 ±0.1 (0.031 ±0.004)

**Micro-D Front Face**

- Axial Float: 0.5 (0.02) MAX
- Lateral Float: 0.4 (0.014) MAX

- Ø 2.9 ±0.1 (Ø 0.115 ±0.004)
- Ø 4.50 (0.177) MAX

- 4.7 (0.185) MAX
- 0.8 ±0.1 (0.031 ±0.004)
HARDWARE

U-clip mounting jackscrews

FOR PIGTAIL & SOLDER CUP CONNECTOR ONLY.

- 2 sizes of hardware: one version for shell sizes from 9 to 69 ways and another version for the 100-way shell size.
- 1 kit consists of 2 screws and 2 U-clips.
- Hex socket head or slot head.
- Material: passivated 300 series stainless steel.

Note
1st line: kit part number (to be used for ordering).
2nd line: Hardware code for pigtail connector.
Dimensions are given in millimetres (inches).

9-69 WAY HARDWARE

<table>
<thead>
<tr>
<th>KIT PART NUMBER</th>
<th>MDAHM008</th>
<th>KIT PART NUMBER</th>
<th>MDAHM009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware code</td>
<td>C</td>
<td>Hardware code</td>
<td>D</td>
</tr>
</tbody>
</table>

100 WAY HARDWARE

<table>
<thead>
<tr>
<th>KIT PART NUMBER</th>
<th>MDAHM018</th>
<th>KIT PART NUMBER</th>
<th>MDAHM019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware code</td>
<td>C</td>
<td>Hardware code</td>
<td>D</td>
</tr>
</tbody>
</table>

RECOMMENDED TORQUE

- 9 to 69 way jackscrew: 0.28 N.m / 2.5 inch-pounds.
- 100 way jackscrew: 0.51 N.m / 4.5 inch-pounds.
MICRO-D & NANO-D ASSEMBLY KIT

Installation, maintenance and general handling of miniature connectors integrated within your system requires specific tooling and operating procedures. AXON® offers 2 toolboxes with all the proper tools and instructions on how to safely handle Micro-D & Nano-D connectors. These toolboxes greatly simplify connector handling, thus aiding correct installation. This will guarantee the connector’s performance in terms of signal and power transmission, and of product life.

Characteristics

- Assembly kits consisting of universal tools for the assembly of rectangular Micro-D & Nano-D connectors and the majority of custom-designed connectors.
- Easy-to-mount components in any situation.
- Both toolboxes delivered with mounting / dismounting procedures: short instructions and a demonstration video (CD).
- Dedicated tooling with torque values as defined in the MIL-DTL-83513 & MIL-DTL-32139 standards: optimisation of fastener / hardware performance and enhanced connection reliability.
- Each assembly kit is equipped with a screwdriver with dedicated torque range. Our whole line of miniature connectors is covered by both screwdrivers. See table hereafter.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MICRO-D KIT (PS41268) for Micro-D connectors (9 to 120 way)</th>
<th>MICRO-D / NANO-D KIT (PS38692) for Nano-D connectors &amp; Micro-D connectors (9 to 69 way)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Torque screwdriver</td>
<td>Torque screwdriver</td>
</tr>
<tr>
<td>2</td>
<td>3/16&quot; spanner</td>
<td>0.050&quot; bit for hex screw</td>
</tr>
<tr>
<td>3</td>
<td>5/32&quot; spanner</td>
<td>1/16&quot; bit for hex screw</td>
</tr>
<tr>
<td>4</td>
<td>1/8&quot; spanner</td>
<td>5/32&quot; spanner</td>
</tr>
<tr>
<td>5</td>
<td>Bit for slotted head screw</td>
<td>1/8&quot; spanner</td>
</tr>
<tr>
<td>6</td>
<td>0.050&quot; bit for hex screw</td>
<td>1/8&quot; Socket</td>
</tr>
<tr>
<td>7</td>
<td>1/16&quot; bit for hex screw</td>
<td>Bit for slotted head screw</td>
</tr>
<tr>
<td>8</td>
<td>5/64&quot; bit for hex screw</td>
<td>Insertion tool</td>
</tr>
<tr>
<td>9</td>
<td>1/8&quot; socket</td>
<td>Socket adaptor</td>
</tr>
<tr>
<td>10</td>
<td>3/16&quot; socket</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>100-way de-mating tool</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Socket adaptor</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Assembly tool</td>
<td></td>
</tr>
</tbody>
</table>

MICRO-D ASSEMBLY KIT COMPACT AND LIGHTWEIGHT PACKAGE:
DIMENSIONS 270 x 230 x 80 mm (10.6" x 9" x 3.1") FOR A WEIGHT OF 750g (1.7 lb)
