Miniature high performance twist pin connectors

Micro-D & Nano-D, Rectangular & Circular

www.axon-cable.com

axon' cable & interconnect

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Introduction to Micro–D connectors

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Rectangular Micro–D connectors

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Space Micro–D & Nano–D connectors

CIRCULAR MICRO-D CONNECTORS

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Circular Micro–D connectors

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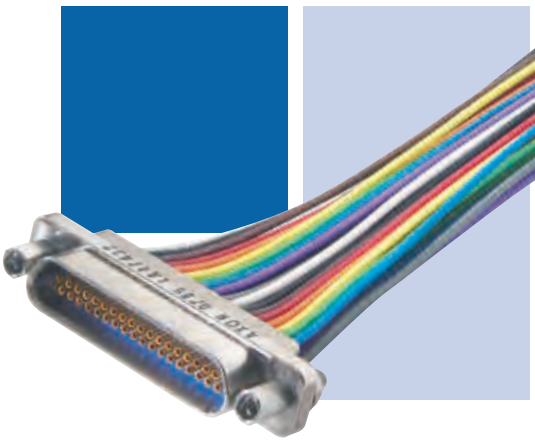
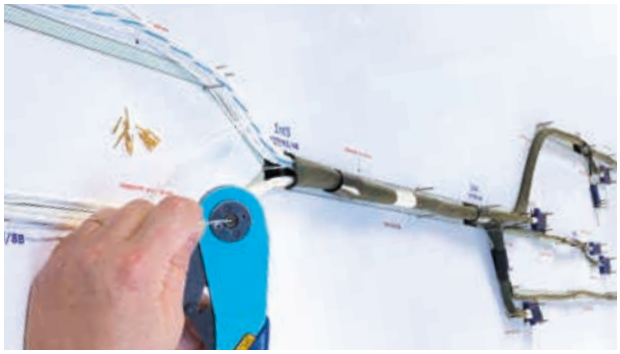


▲ ENGINEERING DEPARTMENT

D-Line® Connectors

ABOUT AXON'

Headquartered in the beautiful Champagne region of France, AXON' is a worldwide leader in specialist interconnect. The company excels in the design and manufacture of wires, cables, terminated harnesses and interconnect solutions for high technology applications.
With numerous manufacturing sites across Europe, North America and Asia and a comprehensive range of quality approvals, AXON' is able to locally design and build a world beating range of microminiature interconnect solutions tailored to your specific needs.



As a specialist in advanced interconnect solutions, AXON' CABLE has extensive experience in micro-miniature solutions based on the highly reliable Twist Pin contact technology, including:

- Pigtail and PCB connectors, metal or plastic bodies, regular or low profile versions.
- Solder cup connectors: metal or plastic bodies, regular or low profile.
- QPL qualified Micro-D to MIL-DTL-83513
- Micro-strip and saver connectors
- Combo Micro-D connectors: making it possible to put higher power or RF signals through Micro-D connectors.
- Hermetic connectors, typically used in the oil and gas industry, defence and scientific research.
- Non-magnetic connectors for oil and gas, scientific research, space and medical electronics.
- Nano-D connectors (0.635 mm contact spacing) for extreme miniaturization.
- Micro-D and Nano-D connectors specifically designed for space applications.
- Micro-D circular connectors.

MICRO-D: WEIGHT SAVING & ROBUSTNESS

By its very design, the **Micro-D** connector system meets all the requirements of robustness, durability, low contact resistance, high current, dielectric strength, shock and vibration. With **1.27 mm (.050")** **contact spacing**, Micro-D connectors, half the size of D-sub connectors, represent an excellent solution for saving both space and weight. In addition to a complete range of **QPL** qualified Micro-D connectors to **MIL-DTL-83513**, AXON' also offers Micro-D PCB connectors and cable assemblies in both metal and plastic bodied versions.

With its many possible configurations, Micro-D technology is perfectly suited to a multitude of systems where weight, miniaturization or signal transmission integrity is paramount: applications benefiting from this technology include everything from missiles and their guidance systems, through oil well drilling tools to medical devices, satellites and scientific research. For very specific applications such as medical MRI scanners or low magnetic field detection systems, AXON' has developed a range of **non-magnetic** connectors using new materials and surface treatments, avoiding ferromagnetic materials. **Hermetic** connectors are also offered for applications where an enclosure needs to be fully sealed from the outside world.

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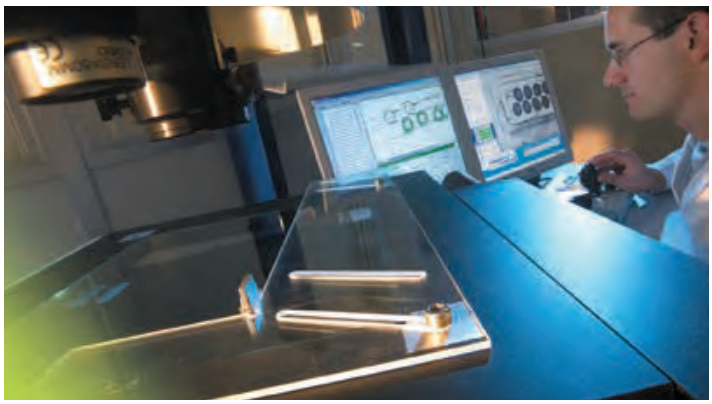


▲ METROLOGY LABORATORY

▲ CLEAN ROOM

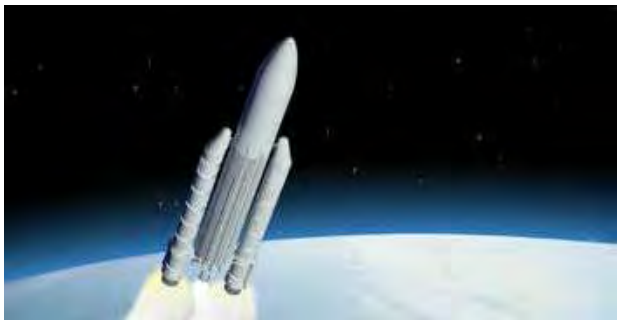
& assemblies

NANO-D: EXTREME MINIATURIZATION

In addition to circular and rectangular Micro-D connectors and assemblies, AXON' CABLE offers **Nano-D** connectors and jumpers based on the highly reliable Twist Pin contact technology. This is the connector of choice for any application requiring extreme miniaturization combined with high reliability, and is used in a variety of fields from military and medical devices to oil and gas exploration. Nanominiature connectors are based on the Nano-D technology with **0.635 mm (.025") contact spacing** and nanominiature shells. The performance of AXON's Nano-D is fully compliant to the MIL-DTL-32139 specification, giving a guarantee of interchangeability and intermateability between suppliers.

MINIATURE CONNECTORS FOR SPACE

AXON' CABLE has developed a range of Micro-D connectors suitable for the challenging requirements of on-board electronics in Space. The **Space Micro-D** range benefits from the expertise in the AXON' MIL-DTL-83513 D-shape connectors. Small, lightweight and reliable, AXON's Space Micro-D connectors are approved to **ESCC 3401/029 EPPL2**. In order to meet the necessarily high levels of quality and reliability they are produced with increased plating protection and manufactured in class 100 000 clean rooms. For extreme miniaturization in Space, AXON' also offers ESCC3401/086 EPPL2 approved **Space Nano-D** connectors.



QUALITY ASSURANCE

ISO 9001	EN 9100	ISO 14001	TS 16949	OHSAS 18001

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CIRCULAR MICRO-D: SMALL AND EASY TO USE

The **Circular Micro-D Connector** range benefits from the expertise in the AXON' D-Line® **MIL-DTL-83513** D-shape connectors and features **easy-to-use** connect and disconnect functionality. The MIL-DTL-83513 standard dictates the design and performance for Micro-D connectors. These small connectors meet the requirements of the most demanding applications and harsh environments. Military equipment, research centres and on-board electronics are just a few examples. Despite their high pin density, small size and lightweight bodies, the AXON' miniature circular connectors offer similar performances to their rectangular Micro-D cousins.

The standard range of Circular Micro-D connectors consists of 5 basic types:

- Metric thread connectors - MCAT.
- Three lug bayonet connectors - MCA3B.
- Triple start connectors (with anti-decoupling) - MCAC.
- Breakaway connectors - MCABK.
- Plastic shells - MCA.

AXON' also offers PCB connectors designed for out 4 types of metal shell connectors.

TWIST PIN CONTACT

At the heart of the AXON' Micro-D connector is the **Twist Pin contact** which by its design and performance enables the system to meet the most severe requirements - often significantly more so than stipulated in the MIL-DTL-83513 standard. It must be stated that even if meeting the standard, not all Micro-D contacts will behave in the same way when subjected to certain specific requirements. This is not the case for AXON's 100% vision inspected Twist Pin contact.

EXPERTISE IN CABLING AND ASSEMBLIES

AXON' CABLE specializes in the design and manufacture of custom designed **assemblies, interconnect systems** and complex **harnesses** often integrating several branches. The company has brought its expertise in the manufacture of precision conductors, wires, cables, cable assemblies and connectors together with its knowledge of overmoulding techniques and EMI protection to be able to offer optimally engineered solutions for the most challenging requirements.

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TWIST PIN CONTACT TECHNOLOGY

The male Micro-D contact is made up of 10 strands of beryllium-copper and copper alloy twisted together, welded then bumped. These sprung strands are in fact compressed during insertion into the turned female contact and therefore a high number of electrical contact points is permanently assured, while retaining flexibility and ease of insertion/ extraction.

The plating of these contacts is a minimum of 1.27 microns of gold in accordance with MIL-G-45204 type 2, class 1, and this gives additional operational security. Furthermore, the Twist Pin contact is auto-guided into its female contact, even if it is not centred in its recess.

As with all contacts conforming to MIL-DTL-83513, the AXON' Micro-D contacts accept as standard 24, 26, 28 and 30 AWG wires. In order to meet specific customer requests, AXON' can also offer solutions for large section wires up to 22 AWG and for miniature wires as small as 36 AWG.

▲ TWIST PIN CONTACTS

Twist pin performance versus MIL-DTL-83513 specification

CHARACTERISTIC	AXON' TWIST PIN	MIL REQUIREMENT
NUMBER OF CONTACT POINTS WITH FEMALE CONTACT	7	No requirement
CONTACT RESISTANCE (FOLLOWING TEST §3.5.6)	Max 3 mΩ (under 3 A)	8 mΩ (under 2.5 A)
VIBRATION (NO DISCONTINUITY > 1 µs)	200 g*	20 g*
SHOCK (NO DISCONTINUITY > 1 µs)	500 g*	50 g*
CRIMPING	22 to 36 AWG	24 to 26 AWG

*: Vibration & shock values depending on test profiles.

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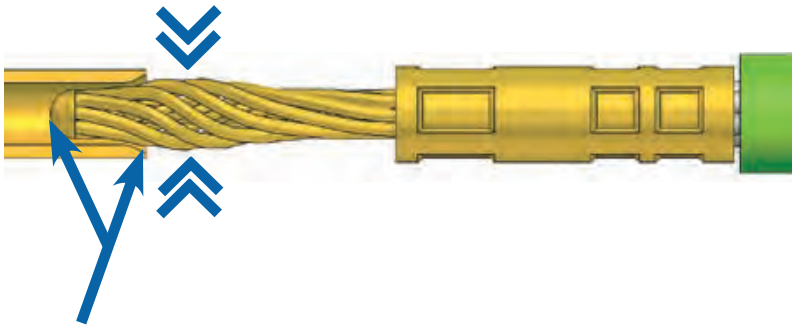
Before insertion

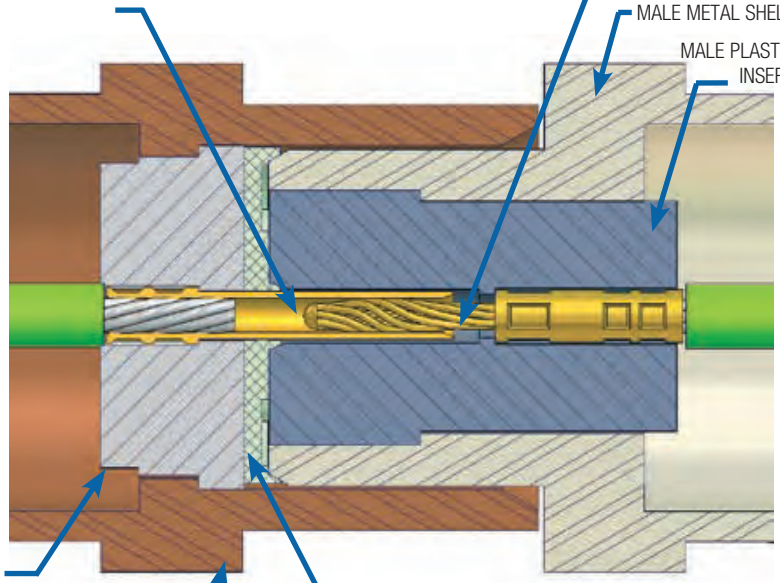
BUMP AREA WILL BE COMPRESSED INSIDE THE SOCKET DURING INSERTION

↳ INSERTION AND RETENTION PERFORMANCE OF THE TWIST-PIN AND SOCKET MATED PAIR



BOTH SOCKET CONTACT CHAMFER AND TWIST-PIN HEMISPHERICAL RADIUS CONTRIBUTE TO ENSURING ADEQUATE INSERTION EVEN IN CASE OF MISALIGNMENT

After insertion



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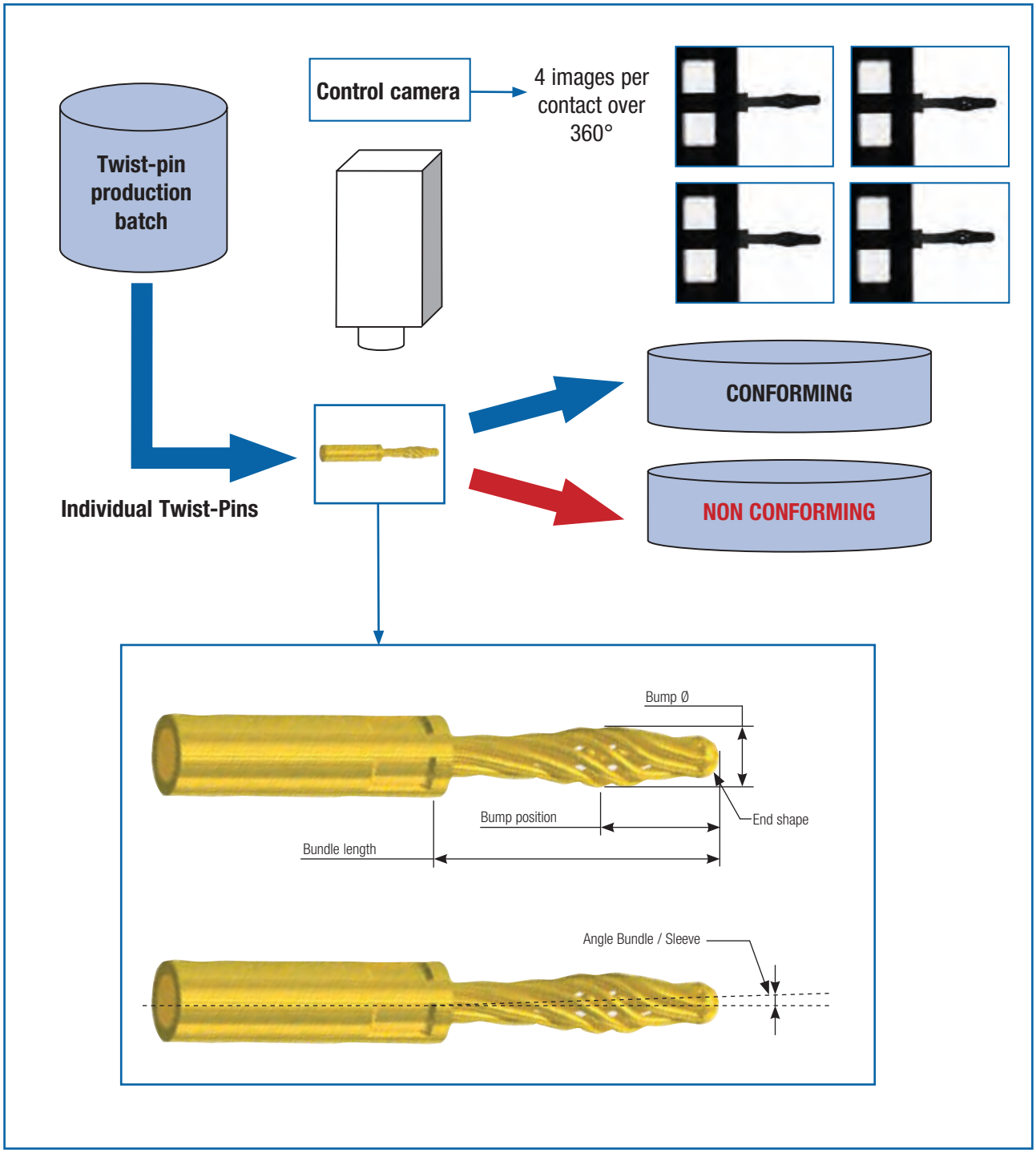
Quality innovation: 100% vision inspection of twist-pin contacts.

To ensure consistently high quality levels, AXON' carry out 100% automatic vision inspection of the shape and dimensions of every twist-pin produced.



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TEST & INSPECTION

Micro-D components

METAL SHELLS

- Dimensions measured with non-contact optical equipment.
- Plating thickness measured with X-ray spectrometer.

PLASTIC COMPONENTS

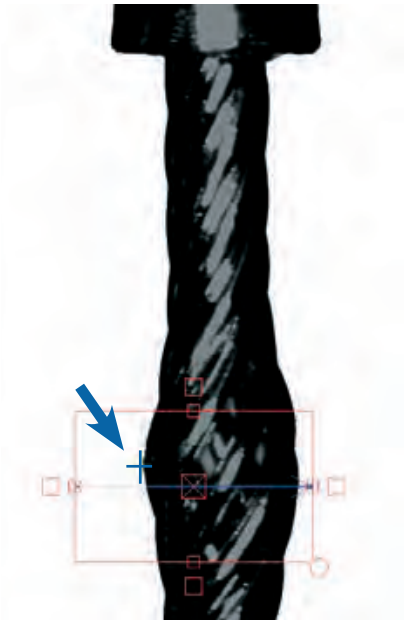
(shells, inserts, trays for PCB connectors,…).

- Dimensions measured with non-contact optical equipment.

CONTACTS

- Dimensions 100% controlled by precision automated vision inspection, see page 13.
- Plating thickness measured with X-ray spectrometer.
- Insertion and retention forces.
- Electrical resistance of mated contacts.

▲ PRECISION AUTOMATED VISION INSPECTION



▲ EXAMPLE OF CONTACT INSPECTION

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Micro-D assemblies

AXON' carries out electrical tests on all the manufactured Micro-D harnesses and connectors.

TYPICAL TESTS

FOR MICRO-D HARNESSES	FOR MICRO-D PCB CONNECTORS
- continuity. - insulation resistance.	- contact resistance. - insulation resistance. - dielectric strength.

If requested by the customer for special products, AXON' can carry out other tests such as:

- Transfer impedance Z_T for shielded harnesses.
- Insertion and return loss for Micro-D with coaxial contacts.
- Attenuation plots for filtered products.
- Waterproofness tests.
- X-ray inspection.
- Mating and de-mating tests.
- And other specific tests as required.

AXON' carries out sample inspection for visual and dimensional criteria. The goods are delivered with:
- a Certificate Of Compliance.
- a test report (on request).

AXON' maintains batch traceability records for 10 years (or more if required).
In order to guarantee a high quality level for each product, AXON' uses a wide variety of production tools, systems, machines and jigs.
These include optimized line design, poka yoke, standardized operations and TPM (Total Productive Maintenance).

▲ STIRRED MODE CHAMBER

▲ AUTOMATIC CONTINUITY & INSULATION RESISTANCE TEST

▲ X-RAY INSPECTION

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MIL-DTL-83513

Micro-D QPL - CAGE CODE: OKOJ2

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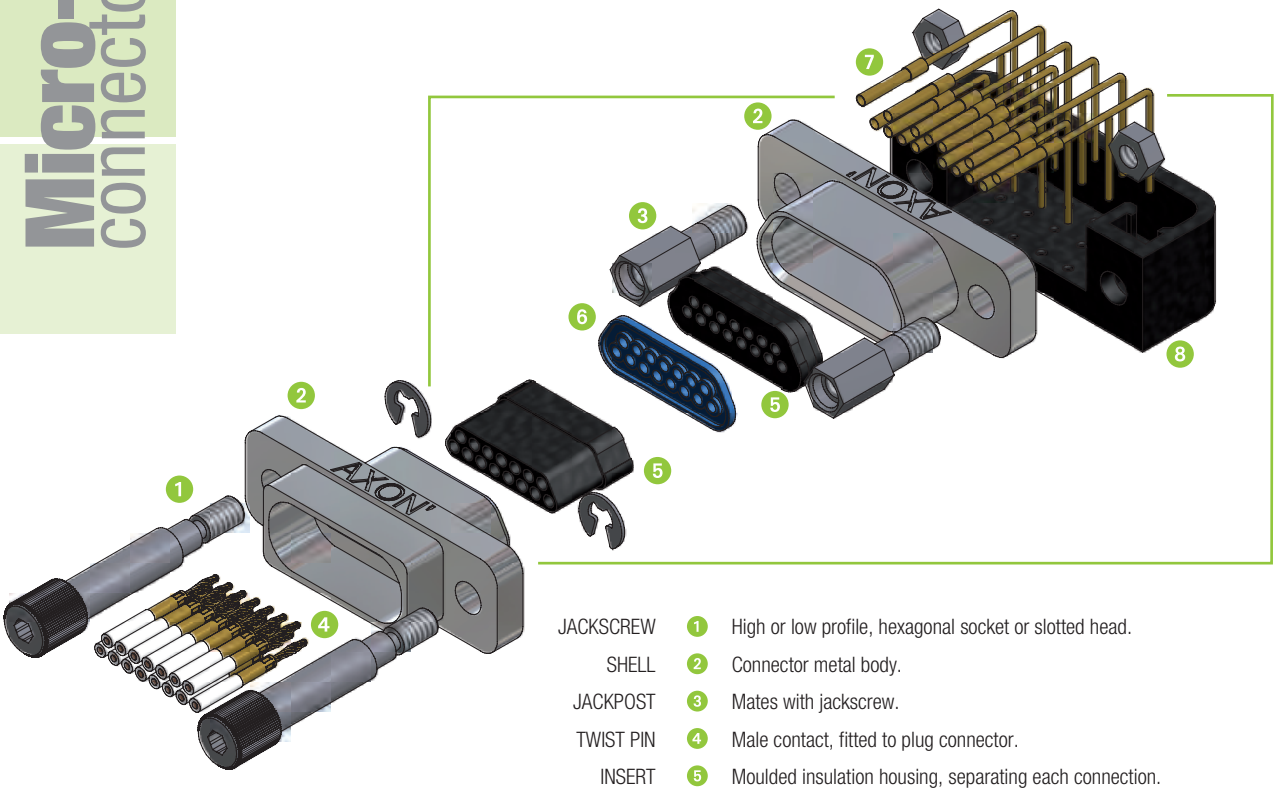
GLOSSARY OF TERMS



JACKSCREW	1	High or low profile, hexagonal socket or slotted head.
SHELL	2	Connector metal body.
JACKPOST	3	Mates with jackscrew.
TWIST PIN	4	Male contact, fitted to plug connector.
INSERT	5	Moulded insulation housing, separating each connection.
INTERFACIAL SEAL	6	Fitted to socket connector only.
SOCKET	7	Female contact, fitted to socket connector (also known as socket).
TRAY	8	Junction box used for PCB connectors only.

- Standard connector – Manufactured to the standard dimensions and specifications.
- Special connector – A standard connector modified to meet specific requirements.
- Custom made connector – Designed to meet specific customer requirements.
- Connector saver – Used to reduce wear and tear on equipment and systems while testing.
- BR connector – Board Right Angle connector.
- CBR connector – Condensed Board Right Angle connector.
- BS connector – Board Straight connector.
- Strip connector – Single row plastic connector with 1.27 mm spacing (.050").
- Pigtail connector – Connector with insulated or uninsulated wires.
- Cord – Cable harness with 2 connectors only.
- Jumper/ Extension cord – Cord with 1 plug and 1 receptacle connector of the same number of ways.
- Harness – Multi-branched cable assembly.
- LCP – Liquid Crystal Polymer.
- Potting – Epoxy compound used as an encapsulant.
- Solder cup connector – Connector with solder type contacts, usually used for prototyping.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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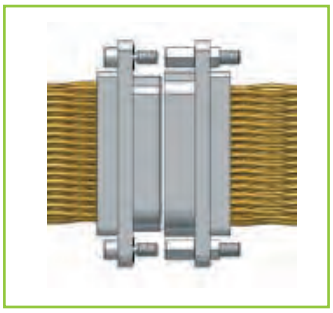
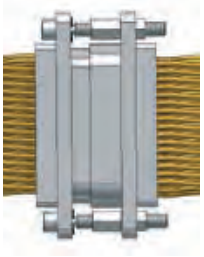
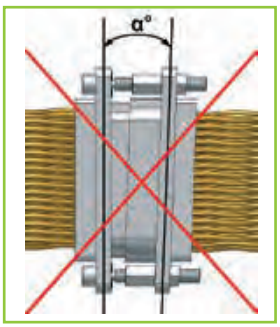
CONNECTOR MATING GUIDE

1- Align both connectors and start to insert the male D-shape into the female one.

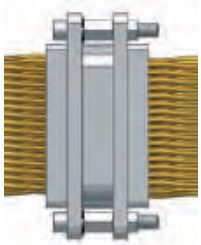


2- Screw each jackscrew down alternately by no more than approximately one turn. This is essential to ensure correct mating.





3- Tighten both jackscrews to the recommended torque values set out below.



RECOMMENDED TORQUE VALUES

- MICRO-D 9 to 69 way jackscrew: 0,28 N.m / 2.5 inch-pounds.

- MICRO-D 100 way jackscrew: 0,51 N.m / 4.5 inch-pounds.

- MICRO-D PCB mounting screws (inside threaded inserts):
  9 to 69 way with 2-56 UNC 2A screws: 0.14 N.m / 1.25 inch-pounds
  100 way with 4-40 UNC 2A screws: 0.34 N.m / 3 inch-pounds

- NANO-D 9 to 51 way jackscrew: 0,11 N.m / 1 inch-pounds.

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GENERAL CHARACTERISTICS

per MIL-DTL-83513*

AXON's range of Micro-D connectors which is covered by the MIL-DTL-83513* standard, is ideally suited to equipment and applications where weight, miniaturisation and long term performance are required. It is available:

- in 10 contact arrangements (9 to 100 contacts) for rectangular Micro-D connectors,
- and 2 to 40 contacts for microstrips.

Electrical & mechanical characteristics

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	3 A max.	EIA-364-70
CONTACT RESISTANCE	8 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 m - ALTITUDE 21 km (70,000 ft)	 600 VAC 150 VAC	EIA-364-20
CONTACT ENGAGING AND SEPARATION FORCE	170 g max. (6 oz) 14 g min. (0.5 oz)	EIA-364-37
CONNECTOR MATING AND DE-MATING FORCE	283 g (10 oz) x number of contacts max.	EIA-364-13
CONTACT RETENTION	2.26 kg (5 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	500 mating cycles min.	EIA-364-09
TEMPERATURE RANGES - STANDARD - HIGH TEMP	 -55°C / +150°C -55°C / +200°C	
VIBRATION	20 g's - No discontinuity >1µs	EIA-364-28 - TEST CONDITION IV
SHOCK	50 g's - No discontinuity >1µs	EIA-364-27 - TEST CONDITION E
SALT SPRAY	48 hours	EIA-364-26 - TEST CONDITION B
HUMIDITY	Insulation resistance > 1MΩ	EIA-364-31 - METHOD IV

Material & Finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.00005") MINI), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27µM (0.00005") TO 3.81µM (0.00015"))
FEMALE CONTACT	COPPER ALLOY	
SOLDER CUP	BRASS	GOLD PLATING OVER NICKEL UNDERPLATING
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061	YELLOW CHROMATE OVER CADMIUM IN ACCORDANCE WITH SAE-AMS-QQ-P-416, TYPE II, CLASS 3 ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0005 INCH MIN. BLACK ZINC NICKEL OVER NICKEL UNDERPLATE
	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
PLASTIC SHELL / INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
INTERFACIAL SEAL	FLUOROSILICONE RUBBER	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	EPOXY RESIN	
INSULATED WIRE	PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH NEMA-HP3 PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/11 ETFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33	
UNINSULATED WIRE	GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551 TIN PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551	

*: ISSUE **G** AT TIME OF GOING TO PRESS

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REACH & RoHS COMPLIANCE

RoHS compliance

AXON' CABLE has been pro-actively implementing measures for many years to ensure compliance with the European Directive 2011/65/EU which came into force on 21st July 2011. The Directive prohibits the use of Hazardous Substances such as lead, mercury, hexavalent chromium, cadmium, bromine compounds (PBB and PBDE) and various phtalates. It relates to all components of products which are used in the manufacture of electrical and electronic equipment.

As a cable and connector manufacturer, AXON' has taken actions to ensure compliance with directive 2000/53/EC applicable since 21st October 2000.

COMPONENT SPECIFIC RoHS COMPLIANCE

COMPONENT	MATERIAL	FINISH	RoHS STATUS
PIN CONTACT (TWIST PIN)	COPPER + BERYLLIUM COPPER	GOLD	RoHS Compliant
SOCKET CONTACT	COPPER ALLOY	GOLD	RoHS Compliant
PLASTIC SHELL	LIQUID CRYSTAL POLYMER	N/A	RoHS Compliant
METAL SHELL	ALUMINIUM ALLOY TYPE 6061	YELLOW CHROMATE OVER CADMIUM	~~RoHS Compliant~~ *
	*** ELECTROLESS NICKEL & BLACK ZINC NICKEL ARE THE BEST ROHS ALTERNATIVES**		
	ALUMINIUM ALLOY TYPE 6061	ELECTROLESS NICKEL	RoHS Compliant
	ALUMINIUM ALLOY TYPE 6061	BLACK ZINC NICKEL	RoHS Compliant
	STAINLESS STEEL 300 SERIES	PASSIVATION	RoHS Compliant
PLASTIC INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER	N/A	RoHS Compliant
INTERFACIAL SEAL	FLUOROSILICONE RUBBER	N/A	RoHS Compliant
HARDWARE	STAINLESS STEEL 300 SERIES	PASSIVATION	RoHS Compliant
"STANDARD" SERIES PCB TERMINATION	SOLID COPPER WIRE	GOLD	RoHS Compliant
	SOLID COPPER WIRE	NOT LEADED TIN 97% MAX TIN	RoHS Compliant
MIL VERSION PCB TERMINATION	SOLID COPPER WIRE	LEADED TIN 97% MAX TIN	~~RoHS Compliant~~
ENCAPSULANT	EPOXY RESIN 150°C VERSION	N/A	RoHS Compliant
	EPOXY RESIN 200°C VERSION	N/A	RoHS Compliant

Application of REACH

The new EU regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) came into force in June 2007. The regulation concerns the authorised use of chemicals. It requires manufacturers and importers to register substances and their use with the European Chemical Agency (ECHA).

AXON' CABLE is known as a "downstream user" with respect to the REACH regulation, and a manufacturer of "Articles". AXON' CABLE products are not intended to release any undesired substance under normal and reasonable operations of use.

To this day AXON' CABLE have not identified any component containing any SVHC in their product range.

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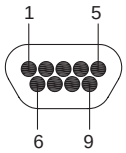
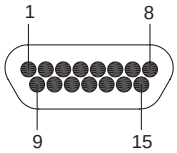
CONTACT ARRANGEMENTS

Mating face of male rectangular connector

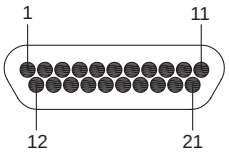
- 1.27 mm (.050") contact spacing.
- 1.09 mm (.043") spacing between rows.



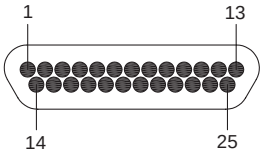
9 CONTACTS



15 CONTACTS



21 CONTACTS



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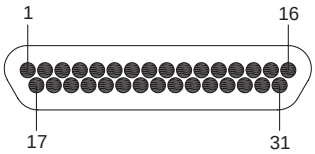
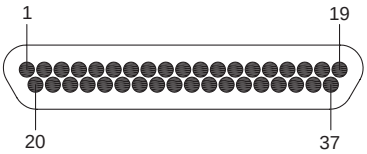
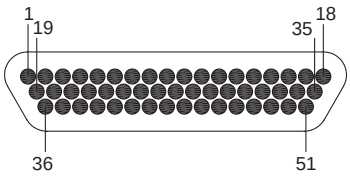


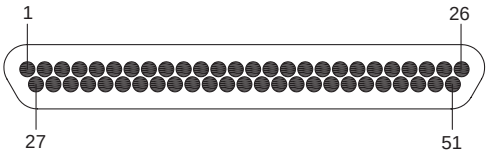
31 CONTACTS



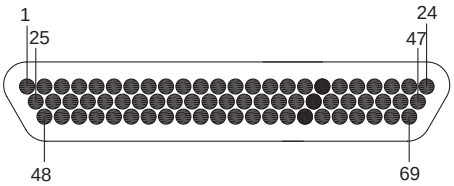
37 CONTACTS



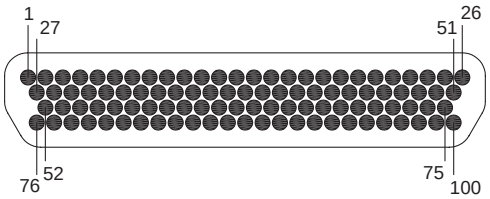
51 CONTACTS



51 CONTACTS DOUBLE ROW (51DR)



69 CONTACTS



100 CONTACTS

120 CONTACTS: SEE PAGE 178 OR 302
OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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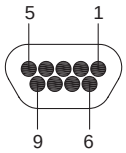
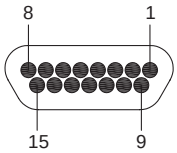
CONTACT ARRANGEMENTS

Mating face of female rectangular connector

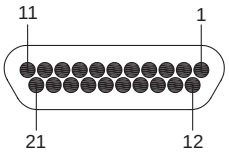
- 1.27 mm (.050") contact spacing.
- 1.09 mm (.043") spacing between rows.



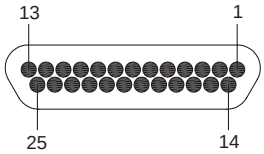
9 CONTACTS



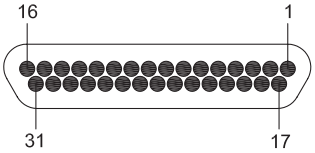
15 CONTACTS



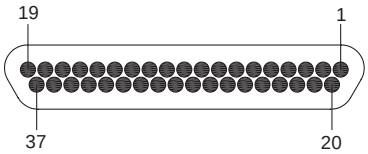
21 CONTACTS



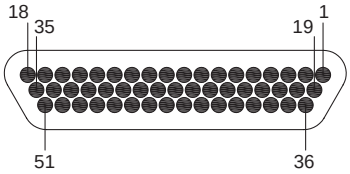
25 CONTACTS



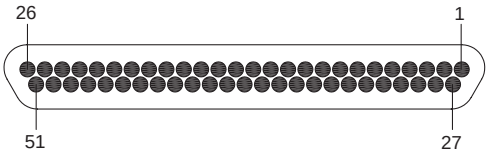
31 CONTACTS



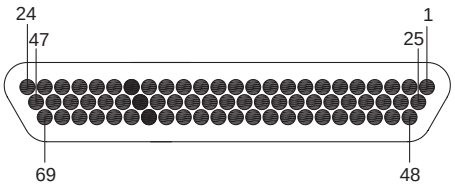
37 CONTACTS



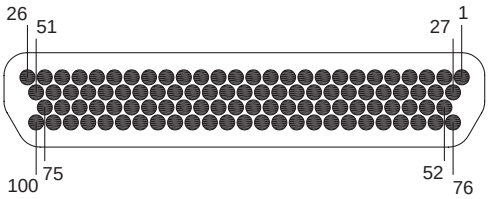
51 CONTACTS



51 CONTACTS DOUBLE ROW (51DR)



69 CONTACTS



100 CONTACTS

120 CONTACTS: SEE PAGE 178 OR 302
OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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MICRO-D WEIGHTS

MICRO-D ALUMINIUM CONNECTOR WEIGHTS IN GRAMS[1]								
NB OF CONTACT	GENDER	SOLDER CUP[2]	PIGTAIL[3]	PCB CBR .100" pitch[4]	PCB CBR .075" pitch[4]	PCB BR .100" pitch[4]	PCB BS .100" pitch[4]	PCB BS .075" pitch[4]
9	MALE	1.8	1.6	3.6	3.6	5.5	4.2	3.9
	FEMALE	1.8	1.6	3.6	3.5	5.5	4.2	3.9
15	MALE	2.4	2.1	4.4	4.4	6.7	4.8	4.7
	FEMALE	2.3	2.0	4.3	4.3	6.6	4.7	4.6
21	MALE	3.0	2.6	5.2	5.0	7.5	5.9	5.4
	FEMALE	2.9	2.5	5.1	4.9	7.4	5.8	5.3
25	MALE	3.4	2.9	5.6	5.5	7.9	6.3	5.8
	FEMALE	3.2	2.7	5.5	5.4	7.8	6.2	5.7
31	MALE	3.9	3.3	7.1	6.3	9.2	7.4	6.6
	FEMALE	3.8	3.2	6.9	6.1	9.0	7.2	6.4
37	MALE	4.6	3.9	8.1	7.2	10.7	8.6	7.4
	FEMALE	4.4	3.7	7.8	6.9	10.4	8.3	7.1
51DR	MALE	5.9	5.0	10.1	9.1	13.6	12.1	8.4
	FEMALE	5.7	4.7	10.0	8.9	13.4	12.0	8.3
51	MALE	5.3	4.6	10.4	9.0	13.6	9.4	8.1
	FEMALE	5.2	4.4	10.1	8.7	13.4	9.1	7.8
69	MALE	6.9	5.9	13.5	11.1	15.1	13.3	9.7
	FEMALE	6.4	5.5	13.0	10.6	14.6	12.8	9.2
100	MALE	9.5	7.2	25.0	19.7	26.8	24.0	18.4
	FEMALE	8.9	6.5	24.3	19.0	26.1	23.3	17.7

MICRO-D STAINLESS STEEL WEIGHT ADDERS IN GRAMS[1]			
NB OF CONTACT	GENDER	SOLDER CUP & PIGTAIL	PCB
9	MALE	2.2	1.8
	FEMALE	2.1	1.7
15	MALE	2.6	2.1
	FEMALE	2.5	2.0
21	MALE	3.0	2.4
	FEMALE	2.8	2.3
25	MALE	3.2	2.6
	FEMALE	3.0	2.5
31	MALE	3.6	3.0
	FEMALE	3.4	2.7
37	MALE	4.0	3.3
	FEMALE	3.8	3.0
51DR	MALE	4.9	4.0
	FEMALE	4.6	3.7
51	MALE	4.1	3.4
	FEMALE	3.7	3.0
69	MALE	4.7	3.8
	FEMALE	4.2	3.4
100	MALE	6.3	5.3
	FEMALE	5.7	4.7

NOTES
1 - NOMINAL WEIGHT SHOWN. ADD 10% FOR MAXIMUM WEIGHT.
2 - SOLDER CUPS: CONNECTOR WEIGHT DOES NOT INCLUDE THE HARDWARE WEIGHT.
3 - PIGTAILS: CONNECTOR WEIGHT DOES NOT INCLUDE HARDWARE AND WIRE WEIGHTS. SEE TABLE PAGE 29 FOR WIRE WEIGHT CALCULATION.
4 - PCB CONNECTORS: NOMINAL WEIGHT INCLUDES THE HARDWARE WEIGHT.

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WIRE CODES

Nominal dimensions are used throughout this chapter.

Solid uninsulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT g/m	CONDUCTOR					
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/ 1000 ft)
G	GPC2501	1.45	GOLD PLATED COPPER	25	1x0.455 1x.018	0.455 .018	0.163 .000252	11 33.5
T	TPCL2401	1.81	TIN PLATED COPPER	24	1x0.510 1x.0201	0.510 .0201	0.205 .000317	9 27.4
T (FOR PCB)	GPC2501 RoHS SOLDER DIPPED TIN	1.81	GOLD PLATED COPPER AND TIN LEAD-FREE (97% TIN MAX.)	24	1x0.510 1x.0201	0.510 .0201	0.205 .000317	11 33.5

Insulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT g/m	CONDUCTOR						INSULATION		TEMPERATURE RATING	VOLTAGE RATING
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/ 1000 ft)	MATERIAL	Ø mm (inch)		
1	E 2607	2.70	SPC **	26	7x0.160 7x.0063	0.480 .0189	0.141 .000219	12.8 39.0	EXTRUDED PTFE	1.00 .039	-90°C/ +200°C	600 VAC
3	M22759/11-26*	2.82	SPC **	26	19x0.102 19x.0040	0.504 .020	0.154 .000239	12.6 38.4	EXTRUDED PTFE	0.96 .038	-90°C/ +200°C	600 VAC
4	E 2619	3.00	SPC **	26	19x0.102 19x.0040	0.504 .020	0.154 .000239	12 36.6	EXTRUDED PTFE	1.00 .039	-90°C/ +200°C	600 VAC
6	E 2807	2.00	SPC **	28	7x0.127 7x.0050	0.381 .015	0.088 .000136	20.1 61.3	EXTRUDED PTFE	0.90 .035	-90°C/ +200°C	600 VAC
8	E 3007	1.50	SPC **	30	7x0.102 7x.0040	0.304 .012	0.057 .000088	31 94.5	EXTRUDED PTFE	0.80 .031	-90°C/ +200°C	600 VAC
A	E 2407	3.60	SPC **	24	7x0.203 7x.0080	0.609 .024	0.228 .000353	8 24.4	EXTRUDED PTFE	1.10 .043	-90°C/ +200°C	600 VAC
C	E 2419	4.10	SPC **	24	19x0.127 19x.0050	0.634 .025	0.239 .000370	7.6 23.2	EXTRUDED PTFE	1.15 .045	-90°C/ +200°C	600 VAC
E	M22759/33-26	2.08	HIGH STRENGTH SPCA ***	26	19x0.102 19x.0040	0.483 .019	0.154 .000239	14.7 44.8	CROSSLINKED EXTRUDED MODIFIED ETFE	0.81 .032	-90°C/ +200°C	600 VAC
F	E 2607*	2.70	SPC **	26	7x0.160 7x.0063	0.480 .0189	0.141 .000219	12.8 39.0	EXTRUDED PTFE	1.00 .039	-90°C/ +200°C	600 VAC

*: ONLY FOR COLOUR CODE V
**: SILVER PLATED COPPER
***: SILVER PLATED COPPER ALLOY

OTHER WIRE TYPES AVAILABLE ON REQUEST

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COLOUR CODES

Colour codes F and L

All the wires have the same colour.
Available with all wire types.

COLOUR CODE	COLOUR
F	YELLOW
L	WHITE

OTHER COLOURS AVAILABLE ON REQUEST.

Colour code W

Also called 10 colour repeat. (10 colours repeated in sequence) as per MIL-DTL-83513. Available with all wire types.

PIN NUMBER	MIL-STD-681 NUMBER	COLOUR
1	0	BLACK
2	1	BROWN
3	2	RED
4	3	ORANGE
5	4	YELLOW
6	5	GREEN
7	6	BLUE
8	7	VIOLET
9	8	GREY
10	9	WHITE
11	0	BLACK
12	1	BROWN
13	2	RED
14	3	ORANGE
15	4	YELLOW
16	5	GREEN
17	6	BLUE
18	7	VIOLET
19	8	GREY
20	9	WHITE
21	0	BLACK

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Colour code V

Only available with 2607 AWG wires (Micro-D wire code F) and 2619 AWG wires (Micro-D wire code 3).

Colours and coloured stripes as per MIL-STD-681 system (except the appropriate colour code is the contact number minus 1).

Only available for Micro-D connectors with 51 contacts or less.

CONTACT NUMBER	MIL-STD-681 NUMBER	BASE COLOUR	FIRST STRIPE	SECOND STRIPE
1	0	BLACK	-	-
2	1	BROWN	-	-
3	2	RED	-	-
4	3	ORANGE	-	-
5	4	YELLOW	-	-
6	5	GREEN	-	-
7	6	BLUE	-	-
8	7	VIOLET	-	-
9	8	GREY	-	-
10	9	WHITE	-	-
11	90	WHITE	BLACK	-
12	91	WHITE	BROWN	-
13	92	WHITE	RED	-
14	93	WHITE	ORANGE	-
15	94	WHITE	YELLOW	-
16	95	WHITE	GREEN	-
17	96	WHITE	BLUE	-
18	97	WHITE	VIOLET	-
19	98	WHITE	GREY	-
20	901	WHITE	BLACK	BROWN
21	902	WHITE	BLACK	RED
22	903	WHITE	BLACK	ORANGE
23	904	WHITE	BLACK	YELLOW
24	905	WHITE	BLACK	GREEN
25	906	WHITE	BLACK	BLUE
26	907	WHITE	BLACK	VIOLET
27	908	WHITE	BLACK	GREY
28	912	WHITE	BROWN	RED
29	913	WHITE	BROWN	ORANGE
30	914	WHITE	BROWN	YELLOW
31	915	WHITE	BROWN	GREEN
32	916	WHITE	BROWN	BLUE
33	917	WHITE	BROWN	VIOLET
34	918	WHITE	BROWN	GREY
35	923	WHITE	RED	ORANGE
36	924	WHITE	RED	YELLOW
37	925	WHITE	RED	GREEN
38	926	WHITE	RED	BLUE
39	927	WHITE	RED	VIOLET
40	928	WHITE	RED	GREY
41	934	WHITE	ORANGE	YELLOW
42	935	WHITE	ORANGE	GREEN
43	936	WHITE	ORANGE	BLUE
44	937	WHITE	ORANGE	VIOLET
45	938	WHITE	ORANGE	GREY
46	945	WHITE	YELLOW	GREEN
47	946	WHITE	YELLOW	BLUE
48	947	WHITE	YELLOW	VIOLET
49	948	WHITE	YELLOW	GREY
50	956	WHITE	GREEN	BLUE
51	957	WHITE	GREEN	VIOLET

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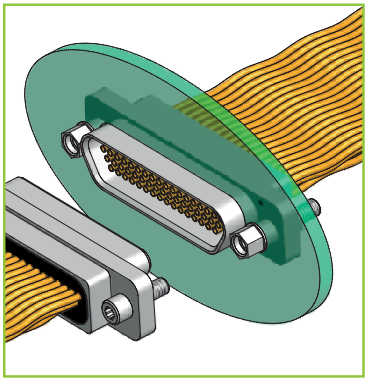
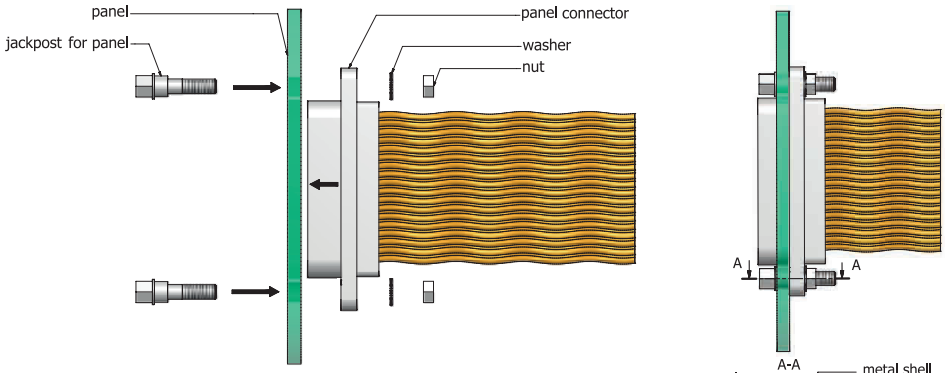
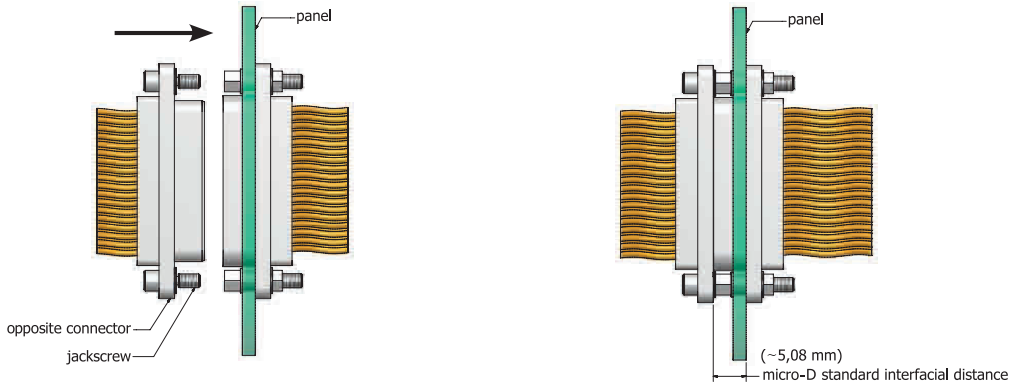
REAR PANEL MOUNTING GUIDE

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







Dimensions are given in millimetres (inches).

HARDWARE CODE	Px	P1	P2	P3	P4	P5
PANEL THICKNESS -0.0 /+0.2 (-.000 /+.008)	mm	0.8	1.2	1.6	2	2.4
	inch	.031	.047	.062	.079	.094
KIT PART NUMBER	9-69 way	MDAHMP01	MDAHMP02	MDAHMP03	MDAHMP04	MDAHMP05
	100 way	MDAHMP11	MDAHMP12	MDAHMP13	MDAHMP14	MDAHMP15
DIM. A	mm	0.7	1.1	1.5	1.9	2.3
	inch	.028	.043	.059	.075	.091

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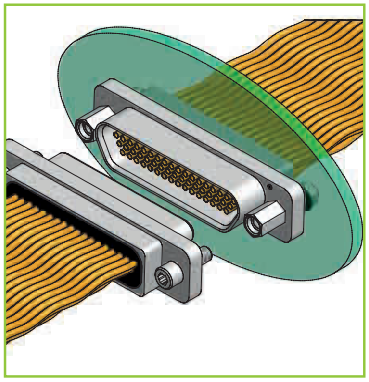
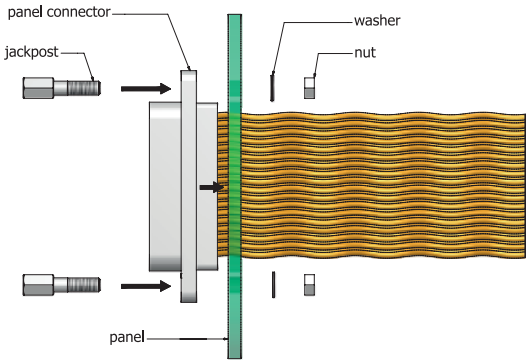
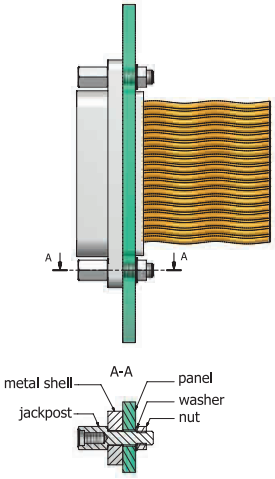
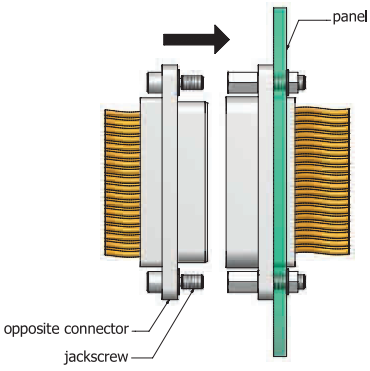
FRONT PANEL MOUNTING GUIDE

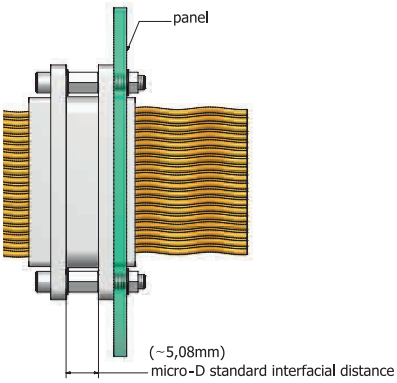
- 2 sizes of hardware: one version for all shell sizes for 9 to 69 way and a separate version for the 100 way shell size.
- 1 kit consists of 2 posts, 2 washers and 2 nuts.
- Material: 300 series stainless steel passivated.











KIT PART NUMBER	9-69 way	MDAHM507
	100 way	MDAHM517

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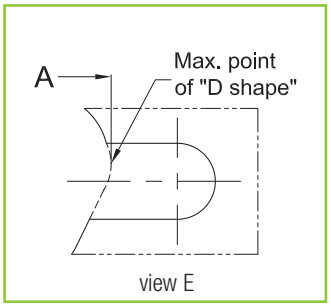
PANEL CUTOUTS



Metal shell & Plastic shell

9 TO 69 CONTACTS

FIGURE 1
FRONT MOUNT

Dimensions are in millimetres (inches).

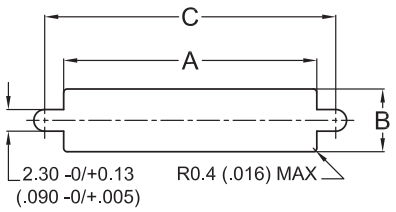
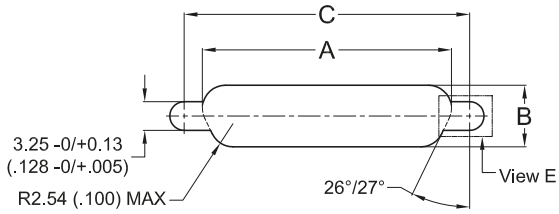


FIGURE 2
REAR MOUNT



Metal shell

100 CONTACTS

FIGURE 1
FRONT MOUNT

Dimensions are in millimetres (inches).

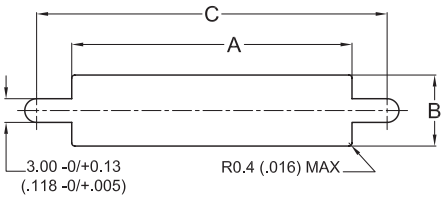
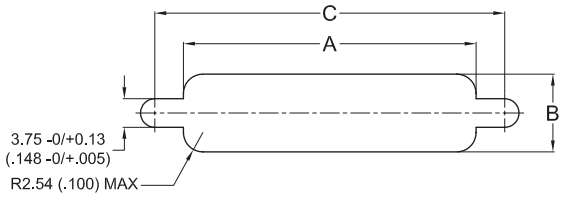


FIGURE 2
REAR MOUNT



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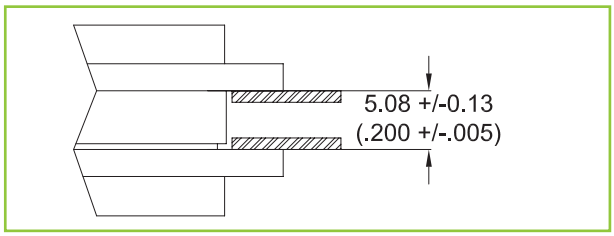
Dimensions

Dimensions are in millimetres (inches)

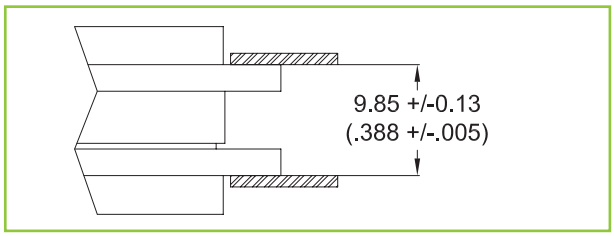
LAYOUT	FIGURE N°	A -0/ +0.1 (-0 /+.004)	B -0/ +0.1 (-0 /+.004)	C -0/ +0.13 (-0 /+.005)	A -0/ +0.1 (-0 /+.004)	B -0/ +0.1 (-0 /+.004)	C -0/ +0.13 (-0 /+.005)
		METAL SHELLS			PLASTIC SHELLS		
9	1	10.26 (.404)	6.96 (.274)	14.48 (.570)	10.46 (.412)	4.50 (.177)	14.48 (.570)
	2	10.36 (.408)	6.55 (.258)	14.48 (.570)	9.78 (.385)	5.66 (.223)	14.48 (.570)
15	1	14.07 (.554)	6.96 (.274)	18.29 (.720)	14.27 (.562)	4.50 (.177)	18.29 (.720)
	2	14.20 (.559)	6.55 (.258)	18.29 (.720)	13.59 (.535)	5.66 (.223)	18.29 (.720)
21	1	17.88 (.704)	6.96 (.274)	22.10 (.870)	18.08 (.712)	4.50 (.177)	22.10 (.870)
	2	18.00 (.709)	6.55 (.258)	22.10 (.870)	17.40 (.685)	5.66 (.223)	22.10 (.870)
25	1	20.42 (.804)	6.96 (.274)	24.64 (.970)	20.62 (.812)	4.50 (.177)	24.64 (.970)
	2	20.55 (.809)	6.55 (.258)	24.64 (.970)	19.94 (.785)	5.66 (.223)	24.64 (.970)
31	1	24.23 (.954)	6.96 (.274)	28.45 (1.120)	24.43 (.962)	4.50 (.177)	28.45 (1.120)
	2	24.36 (.959)	6.55 (.258)	28.45 (1.120)	23.75 (.935)	5.66 (.223)	28.45 (1.120)
37	1	28.04 (1.104)	6.96 (.274)	32.26 (1.270)	28.24 (1.112)	4.50 (.177)	32.26 (1.270)
	2	28.17 (1.109)	6.55 (.258)	32.26 (1.270)	27.56 (1.085)	5.66 (.223)	32.26 (1.270)
51 DR	1	36.93 (1.454)	6.96 (.274)	41.15 (1.620)	-	-	-
	2	37.03 (1.458)	6.55 (.258)	41.15 (1.620)	-	-	-
51	1	26.77 (1.054)	8.00 (.315)	31.00 (1.220)	26.97 (1.062)	5.71 (.225)	31.00 (1.220)
	2	26.90 (1.059)	7.64 (.301)	31.00 (1.220)	26.29 (1.035)	6.73 (.264)	31.00 (1.220)
69	1	34.39 (1.354)	8.00 (.315)	38.62 (1.520)	-	-	-
	2	34.49 (1.358)	7.64 (.301)	38.62 (1.520)	-	-	-
100	1	36.73 (1.446)	9.25 (.364)	45.85 (1.805)	-	-	-
	2	37.06 (1.459)	10.31 (.406)	45.85 (1.805)	-	-	-

Panel mounting dimensions

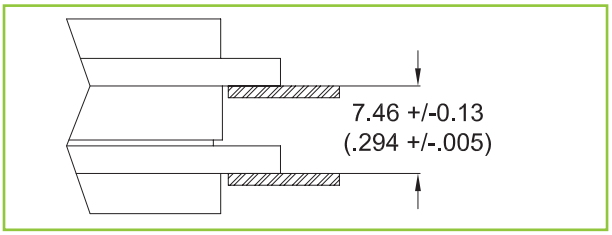
Dimensions are in millimetres (inches).



Rear mount of male and female connectors.



Front mount of male and female connectors.



Front mount of male connector and rear mount of female connector, or vice versa.

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MIL-DTL-83513 CONNECTORS

Micro-D QPL - CAGE CODE: 0K0J2

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

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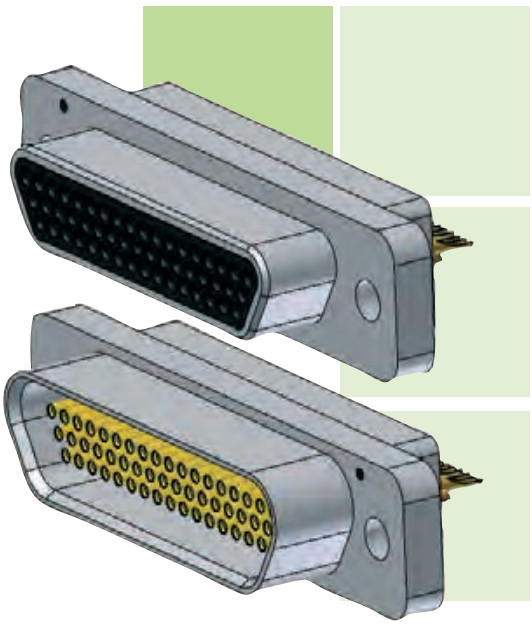

MIL-DTL-83513 /01 & /02

SOLDER CUP CONNECTOR

METAL SHELL

- Metal shell recommended for environmental and EMI applications.
- Ideal for prototyping or where pigtail type connectors cannot be used.

CAGE CODE: 0K0J2

M83513/ 01- G N

IDENTIFICATION CODE

SERIES

M83513/: QPL series.

TYPE

01-: Pin connector, metal shell.
02-: Socket connector, metal shell.

NUMBER OF CONTACTS

A: 9.
B: 15.
C: 21.
D: 25.
E: 31.
F: 37.
G: 51.
H: 100.

See pages 26 & 27 for contact arrangements.

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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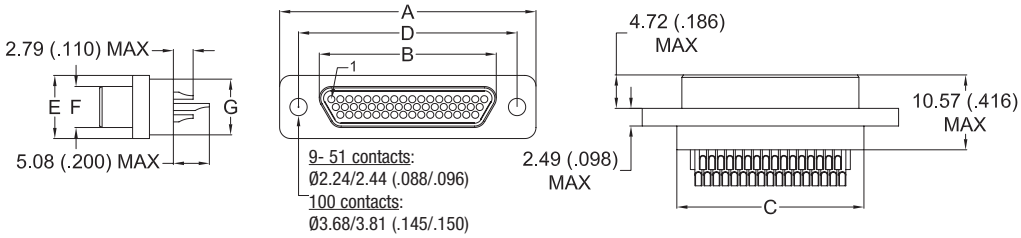
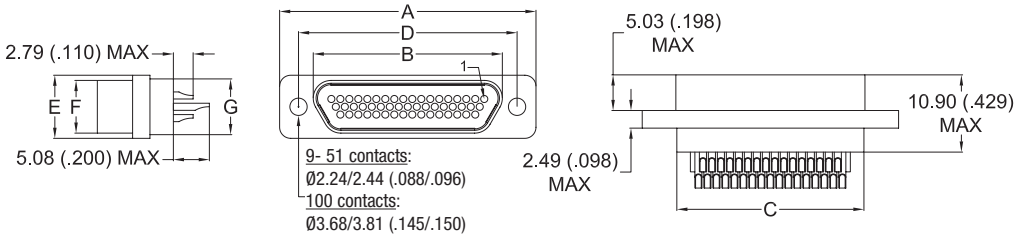
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.69 .775	8.48 .334	10.16 .400	9.91 .390	14.35 .565	7.57 .298	4.69 .185	6.35 .250	6.86 .270
15 P / 15 S	23.50 .925	12.29 .484	14.00 .551	13.72 .540	18.16 .715	7.57 .298	4.69 .185	6.35 .250	6.86 .270
21 P / 21 S	27.31 1.075	16.10 .634	17.81 .701	17.53 .690	21.97 .865	7.57 .298	4.69 .185	6.35 .250	6.86 .270
25 P / 25 S	29.85 1.175	18.64 .734	20.35 .801	20.07 .790	24.51 .965	7.57 .298	4.69 .185	6.35 .250	6.86 .270
31 P / 31 S	33.66 1.325	22.45 .884	24.16 .951	23.88 .940	28.32 1.115	7.57 .298	4.69 .185	6.35 .250	6.86 .270
37 P / 37 S	37.47 1.475	26.26 1.034	27.96 1.101	27.69 1.090	32.13 1.265	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51 P / 51 S	36.20 1.425	24.99 .984	26.70 1.051	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.44 .293	7.87 .310
100 P / 100 S	54.86 2.160	35.15 1.384	38.86 1.451	36.37 1.432	45.72 1.800	9.75 .384	6.88 .271	8.46 .333	9.14 .360

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea Level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

SEE PAGE 24 FOR MORE INFORMATION

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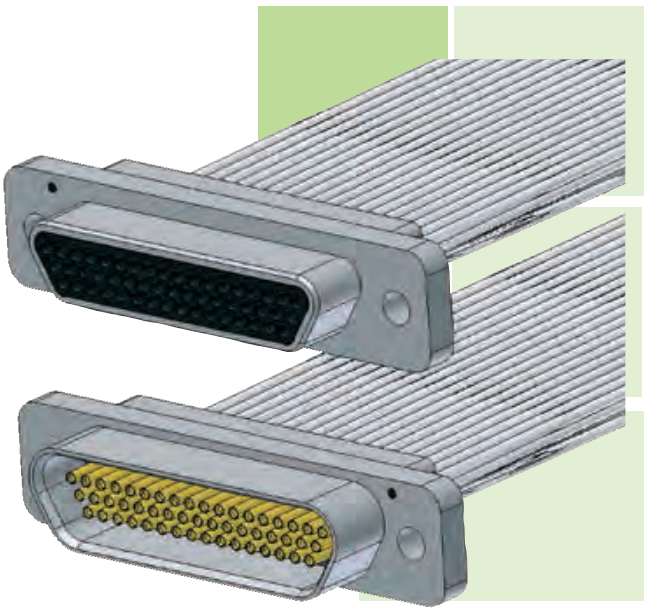

MIL-DTL-83513 /03 & /04

PIGTAIL CONNECTOR

METAL SHELL

- Metal shell recommended for environmental and EMI applications.
- Supplied pre-wired and fully potted.

CAGE CODE: 0K0J2

M83513/	03-	G	01	N

IDENTIFICATION CODE

SERIES

M83513/: QPL series.

TYPE

03-: Pin connector, metal shell.
04-: Socket connector, metal shell.

NUMBER OF CONTACTS

A: 9.
B: 15.
C: 21.
D: 25.
E: 31.
F: 37.
G: 51.
H: 100.

See pages 26 & 27 for contact arrangements.

WIRE TYPE

M22759/11-26
PTFE Insulated.
01: 46 cm (18") white.
02: 92 cm (36") white.
03: 46 cm (18") 10 colour repeat.
04: 92 cm (36") 10 colour repeat.
13: 183 cm (72") white.
14: 183 cm (72") 10 colour repeat.

M22759/33-26
Irradiated ETFE insulated.
09: 46 cm (18") white.
10: 92 cm (36") white.
11: 46 cm (18") 10 colour repeat.
12: 92 cm (36") 10 colour repeat.
15: 183 cm (72") white.
16: 183 cm (72") 10 colour repeat.

See page 30 for colour codes & page 29 for wire types.

SOLID UNINSULATED
05: 13 mm (0.5") gold plated.
06: 26 mm (1") gold plated.
07: 13 mm (0.5") tin plated.
08: 26 mm (1") tin plated.

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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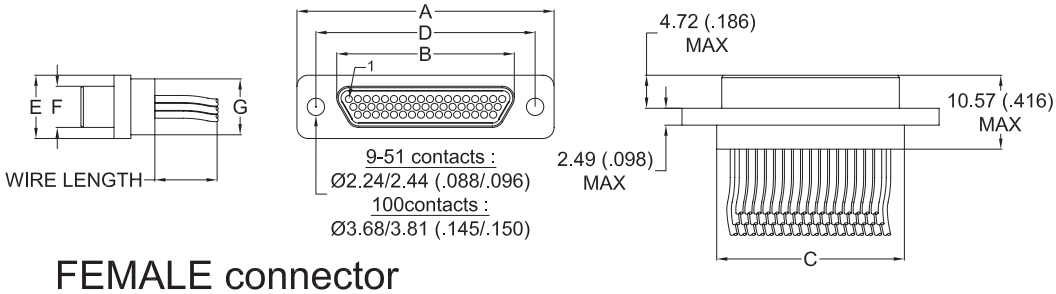
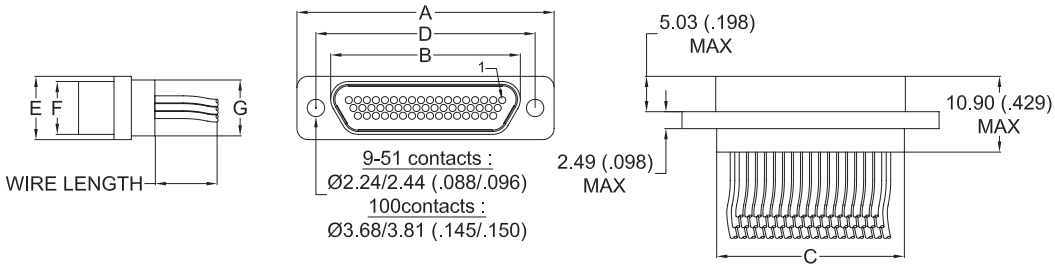
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.69 .775	8.48 .334	10.16 .400	9.91 .390	14.35 .565	7.57 .298	4.69 .185	6.35 .250	6.86 .270
15 P / 15 S	23.50 .925	12.29 .484	14.00 .551	13.72 .540	18.16 .715	7.57 .298	4.69 .185	6.35 .250	6.86 .270
21 P / 21 S	27.31 1.075	16.10 .634	17.81 .701	17.53 .690	21.97 .865	7.57 .298	4.69 .185	6.35 .250	6.86 .270
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37 P / 37 S	37.47 1.475	26.26 1.034	27.96 1.101	27.69 1.090	32.13 1.265	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51 P / 51 S	36.20 1.425	24.99 .984	26.70 1.051	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.44 .293	7.87 .310
100 P / 100 S	54.86 2.160	35.15 1.384	36.86 1.451	36.37 1.432	45.72 1.800	9.75 .384	6.88 .271	8.46 .333	9.14 .360

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 Mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 Series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

SEE PAGE 24 FOR MORE INFORMATION

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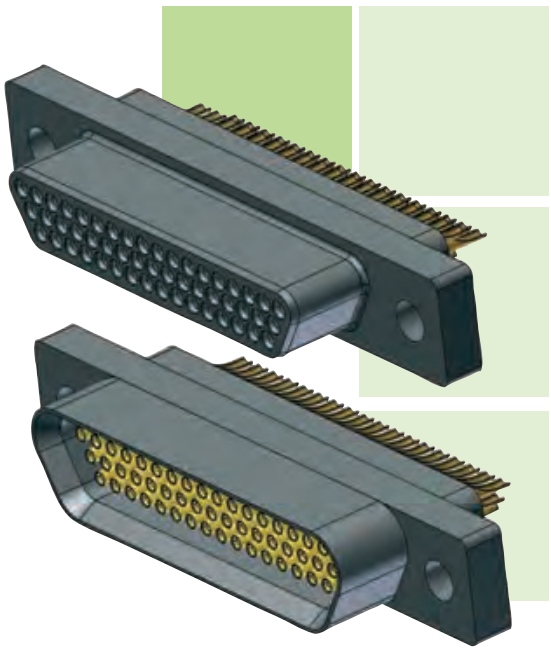

MIL-DTL-83513 /06 & /07

SOLDER CUP CONNECTOR

PLASTIC SHELL

- Ideal for prototyping
or where pigtail type connectors
cannot be used.

CAGE CODE: 0K0J2

M83513/ 06- G

IDENTIFICATION CODE

SERIES

M83513/: QPL series.

TYPE

06-: Pin connector, plastic shell.
07-: Socket connector, plastic shell.

NUMBER OF CONTACTS

A: 9.
B: 15.
C: 21.
D: 25.
E: 31.
F: 37.
G: 51.

See pages 26 & 27 for contact arrangements.

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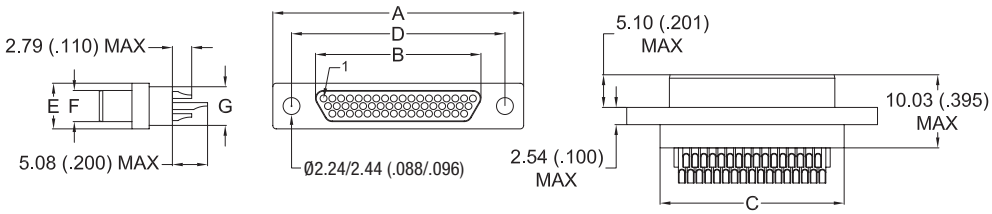
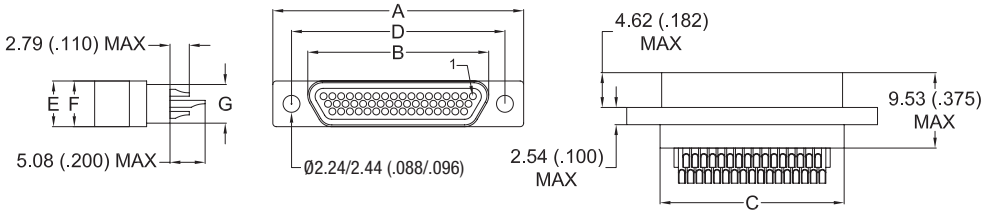
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E max.	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.41 .292	9.65 .380	10.11 .398	14.35 .565	5.53 .218	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.22 .442	13.46 .530	13.92 .548	18.16 .715	5.53 .218	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.03 .592	17.27 .680	17.73 .698	21.97 .865	5.53 .218	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.57 .692	19.81 .780	20.27 .798	24.51 .965	5.53 .218	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.38 .842	23.62 .930	24.08 .948	28.32 1.115	5.53 .218	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.19 .992	27.43 1.080	27.89 1.098	32.13 1.265	5.53 .218	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.92 .942	26.16 1.030	26.62 1.048	30.86 1.215	6.60 .260	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 Kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

SEE PAGE 24 FOR MORE INFORMATION

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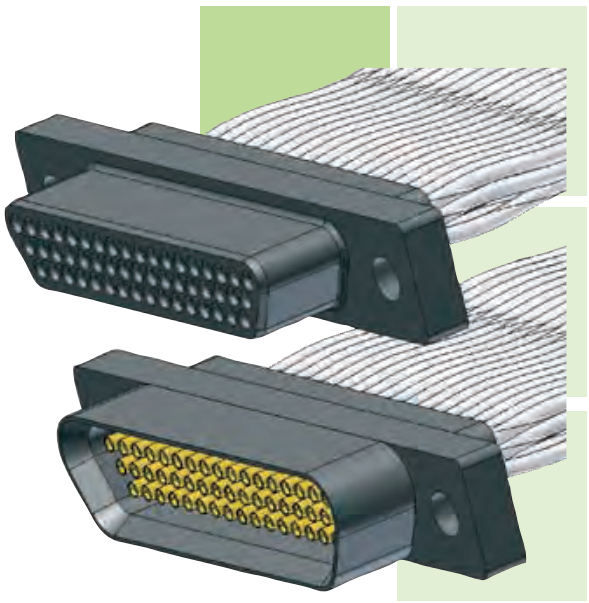

MIL-DTL-83513 /08 & /09

PIGTAIL CONNECTOR

PLASTIC SHELL

- Supplied pre-wired and fully potted.

CAGE CODE: 0K0J2

M83513/	08-	G	01

IDENTIFICATION CODE

SERIES

M83513/: QPL series.

TYPE

08-: Pin connector, plastic shell.
09-: Socket connector, plastic shell.

NUMBER OF CONTACTS

A: 9.
B: 15.
C: 21.
D: 25.
E: 31.
F: 37.
G: 51.

See pages 26 & 27 for contact arrangements.

WIRE TYPE

M22759/11-26
PTFE Insulated.
01: 46 cm (18") white.
02: 92 cm (36") white.
03: 46 cm (18") 10 colour repeat.
04: 92 cm (36") 10 colour repeat.
13: 183 cm (72") white.
14: 183 cm (72") 10 colour repeat.

M22759/33-26
Irradiated ETFE insulated.
09: 46 cm (18") white.
10: 92 cm (36") white.
11: 46 cm (18") 10 colour repeat.
12: 92 cm (36") 10 colour repeat.
15: 183 cm (72") white.
16: 183 cm (72") 10 colour repeat.

See page 30 for colour codes & page 29 for wire type.

SOLID UNINSULATED
05: 13 mm (0.5") gold plated.
06: 26 mm (1") gold plated.
07: 13 mm (0.5") tin plated.
08: 26 mm (1") tin plated.

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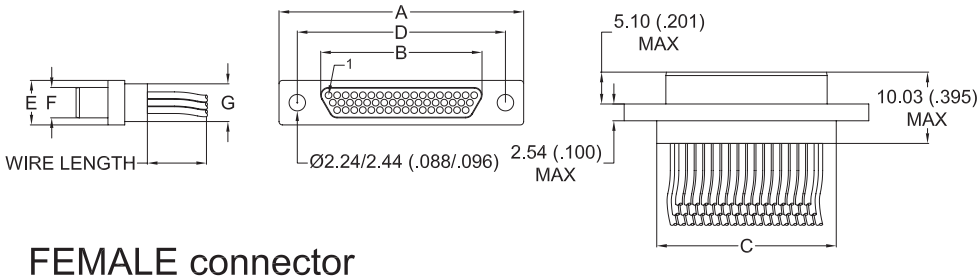
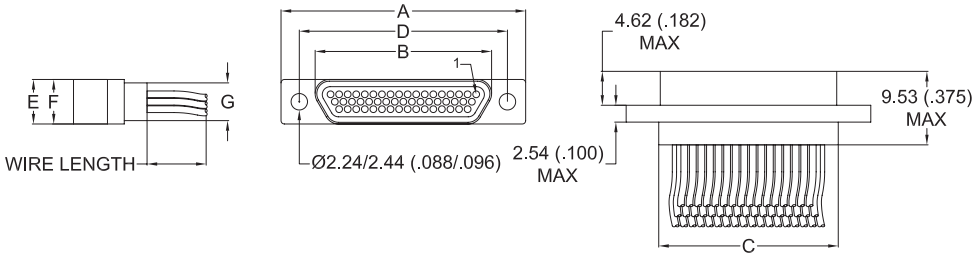
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E max.	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.41 .292	9.65 .380	10.11 .398	14.35 .565	5.53 .218	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.22 .442	13.46 .530	13.92 .548	18.16 .715	5.53 .218	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.03 .592	17.27 .680	17.73 .698	21.97 .865	5.53 .218	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.57 .692	19.81 .780	20.27 .798	24.51 .965	5.53 .218	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.38 .842	23.62 .930	24.08 .948	28.32 1.115	5.53 .218	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.19 .992	27.43 1.080	27.89 1.098	32.13 1.265	5.53 .218	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.92 .942	26.16 1.030	26.62 1.048	30.86 1.215	6.60 .260	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 pounds)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

SEE PAGE 24 FOR MORE INFORMATION

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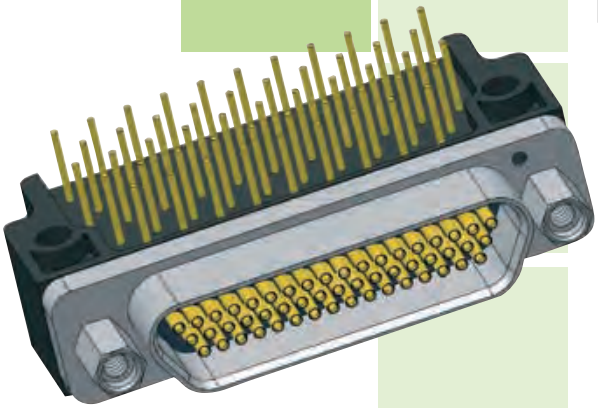

MIL-DTL-83513 /10 TO /15

PCB CONNECTOR

NARROW PROFILE RIGHT ANGLE 0.100" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Most frequently used connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0K0J2

IDENTIFICATION CODE

M83513/	14-G	03	N	P

SERIES

M83513/: QPL series.

TYPE

10-A: Pin connector, metal shell, 9 contacts.
10-B: Pin connector, metal shell, 15 contacts.
10-C: Pin connector, metal shell, 21 contacts.
10-D: Pin connector, metal shell, 25 contacts.
10-E: Pin connector, metal shell, 31 contacts.
10-F: Pin connector, metal shell, 37 contacts.
11-G: Pin connector, metal shell, 51 contacts.
12-H: Pin connector, metal shell, 100 contacts.
13-A: Socket connector, metal shell, 9 contacts.
13-B: Socket connector, metal shell, 15 contacts.
13-C: Socket connector, metal shell, 21 contacts.
13-D: Socket connector, metal shell, 25 contacts.
13-E: Socket connector, metal shell, 31 contacts.
13-F: Socket connector, metal shell, 37 contacts.
14-G: Socket connector, metal shell, 51 contacts.
15-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").
Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed for 10-A to 11-G and 13-A to 14-G only.
W: Jackpost and threaded inserts installed for 10-A to 11-G and 13-A to 14-G only.
U: Threaded inserts installed. For 12-H and 15-H only.
Y: Jackpost and threaded installed. For 12-H and 15-H only.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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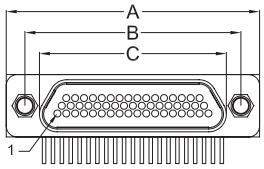
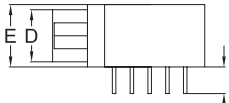
DIMENSIONS

Dimensions are in millimetres (inches).

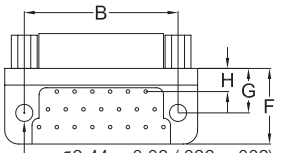
FEMALE connector





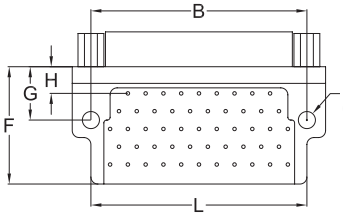
SEE MIL REFERENCE

9-25 way connectors



Ø2.44 ± 0.08 (.096± .003)
or THD INSERT 2-56 UNC 2B

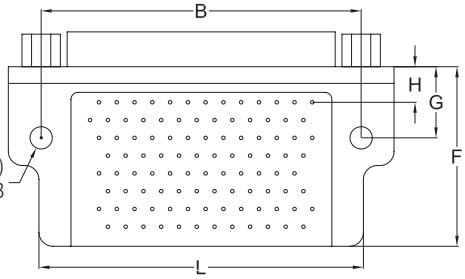
31-51 way connectors



Ø2.44 ± 0.08 (.096± .003)
or THD INSERT 2-56 UNC 2B

Ø3.18 ± 0.08 (.125± .003)
or THD INSERT 4-40 UNC 2B

100 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 48 & 49

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)	L max.
			Male	Female	Male	Female					
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.87 .310	10.80 .425	6.35 .250	5.84 .230	-
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.87 .310	10.80 .425	6.35 .250	3.30 .130	-
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.87 .310	10.80 .425	6.35 .250	3.30 .130	-
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.87 .310	10.80 .425	6.35 .250	3.30 .130	-
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .884	24.16 .951	4.69 .185	6.35 .250	7.87 .310	13.34 .525	6.35 .250	3.30 .130	27.69 1.090
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.87 .310	13.34 .525	6.35 .250	3.30 .130	30.23 1.190
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.76 .345	16.76 .660	7.62 .300	3.81 .150	31.24 1.230
100 P / 100 S	55.11 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	10.29 .405	25.65 1.010	10.16 .400	5.08 .200	46.36 1.825

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	AWG24 gold plated copper, solder dipped in 63/37 tin-lead
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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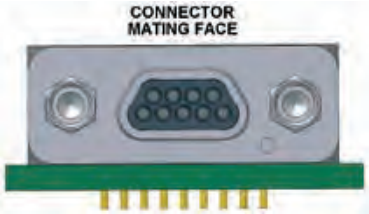
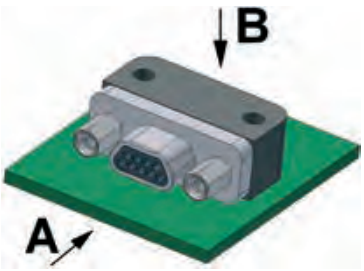
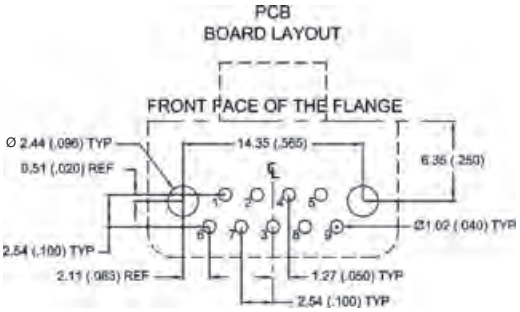
PCB LAYOUT FOR NARROW PROFILE, RIGHT ANGLE 0.100" PITCH - MALE CONNECTORS

VIEW A

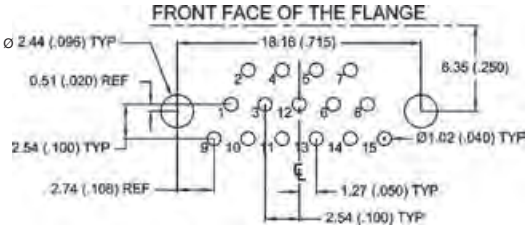




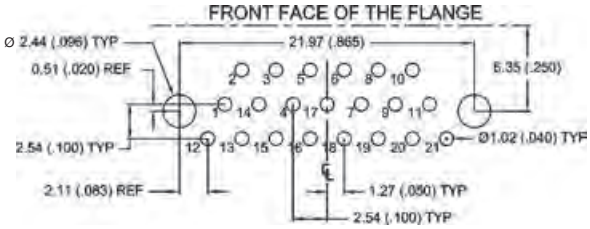
9 CONTACTS - VIEW B



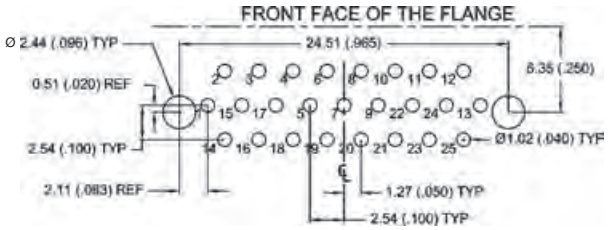
15 CONTACTS - VIEW B



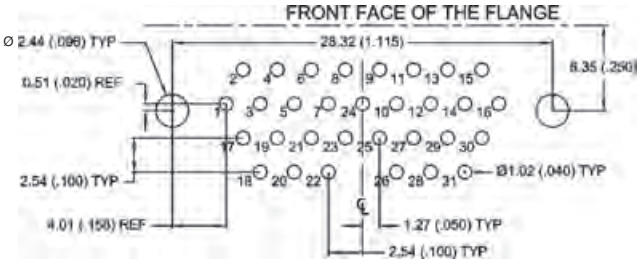
21 CONTACTS - VIEW B



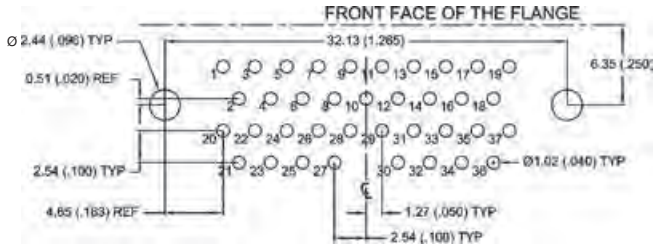
25 CONTACTS - VIEW B



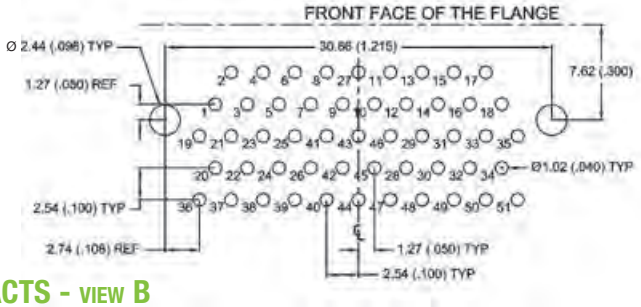
31 CONTACTS - VIEW B



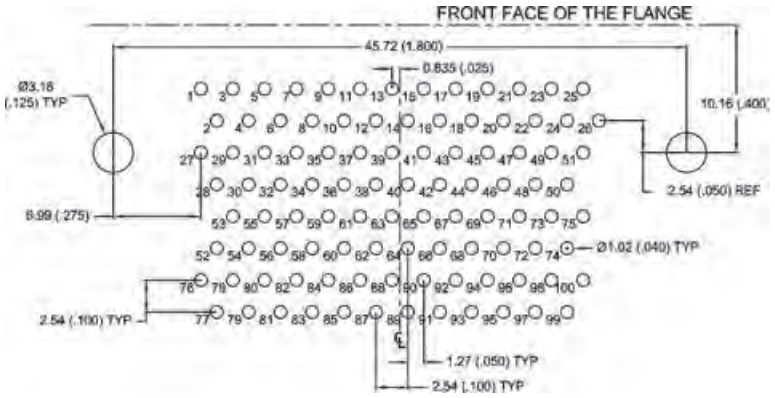
37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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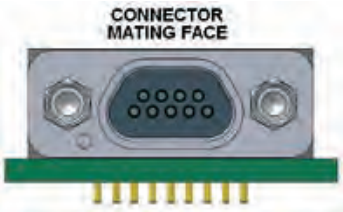
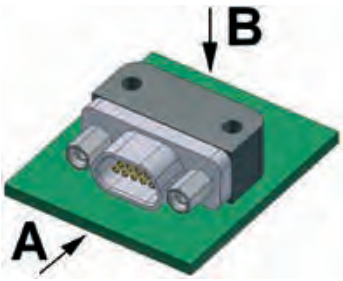
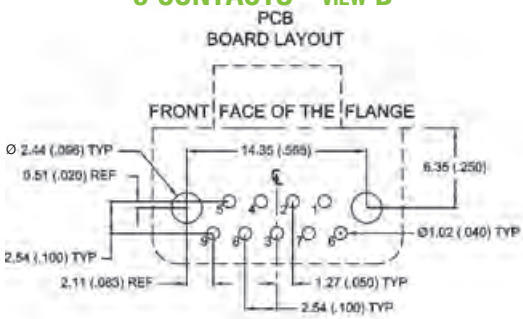
PCB LAYOUT FOR NARROW PROFILE, RIGHT ANGLE 0.100" PITCH - FEMALE CONNECTORS

VIEW A

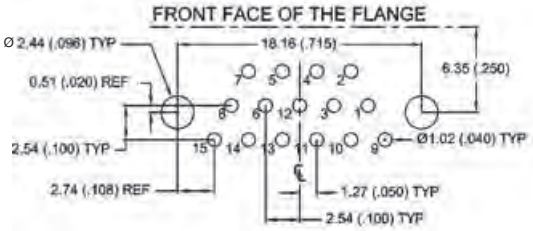




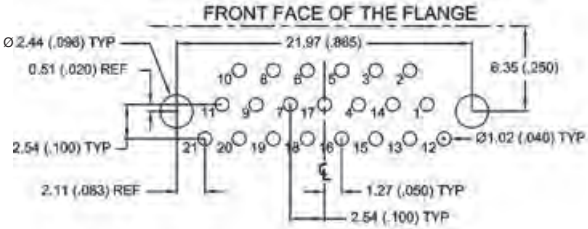
9 CONTACTS - VIEW B



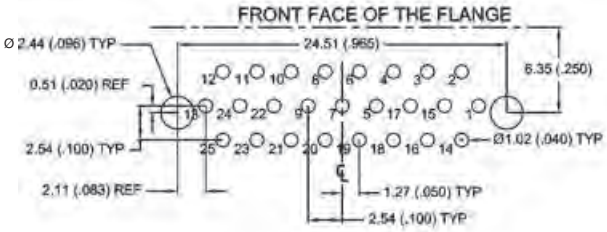
15 CONTACTS - VIEW B



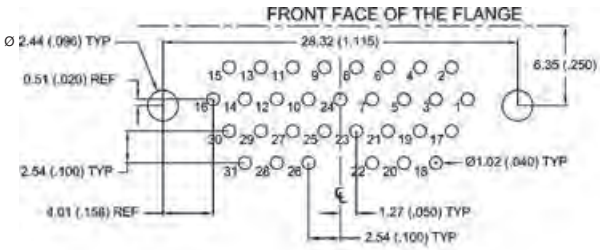
21 CONTACTS - VIEW B



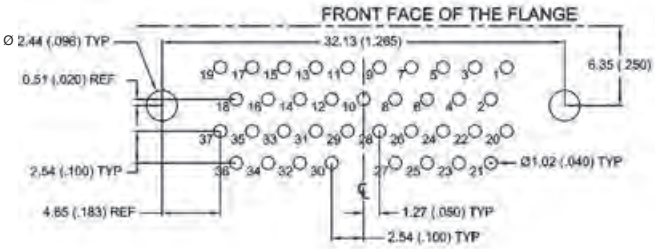
25 CONTACTS - VIEW B



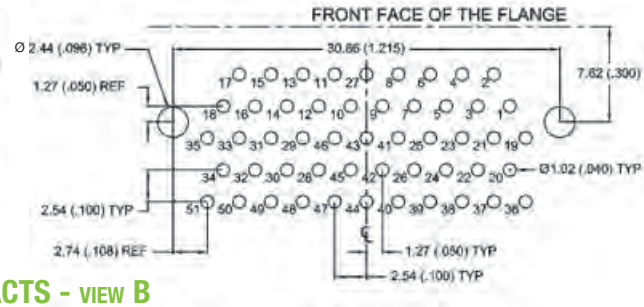
31 CONTACTS - VIEW B



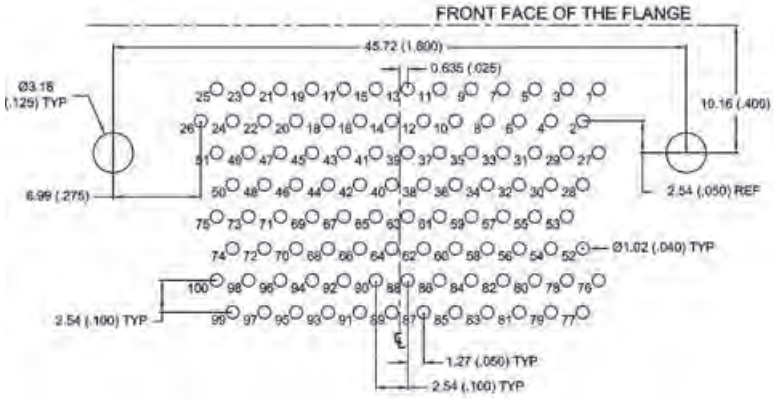
37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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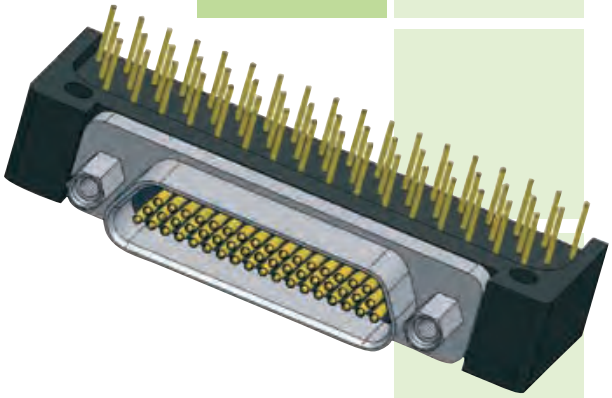

PCB CONNECTOR

STANDARD PROFILE RIGHT ANGLE 0.100" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Board right angle connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0KOJ2

IDENTIFICATION CODE

M83513/	20-G	03	N	P

SERIES

M83513/: QPL series.

TYPE

16-A: Pin connector, metal shell, 9 contacts.
16-B: Pin connector, metal shell, 15 contacts.
16-C: Pin connector, metal shell, 21 contacts.
16-D: Pin connector, metal shell, 25 contacts.
16-E: Pin connector, metal shell, 31 contacts.
16-F: Pin connector, metal shell, 37 contacts.
17-G: Pin connector, metal shell, 51 contacts.
18-H: Pin connector, metal shell, 100 contacts.
19-A: Socket connector, metal shell, 9 contacts.
19-B: Socket connector, metal shell, 15 contacts.
19-C: Socket connector, metal shell, 21 contacts.
19-D: Socket connector, metal shell, 25 contacts.
19-E: Socket connector, metal shell, 31 contacts.
19-F: Socket connector, metal shell, 37 contacts.
20-G: Socket connector, metal shell, 51 contacts.
21-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").
Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed. For 16-A to 17-G and 19-A to 20-G only.
W: Jackpost and threaded inserts installed for 16-A to 17-G and 19-A to 20-G only.
U: Threaded inserts installed. For 18-H and 21-H only.
Y: Jackpost and threaded inserts installed. For 18-H and 21-H only.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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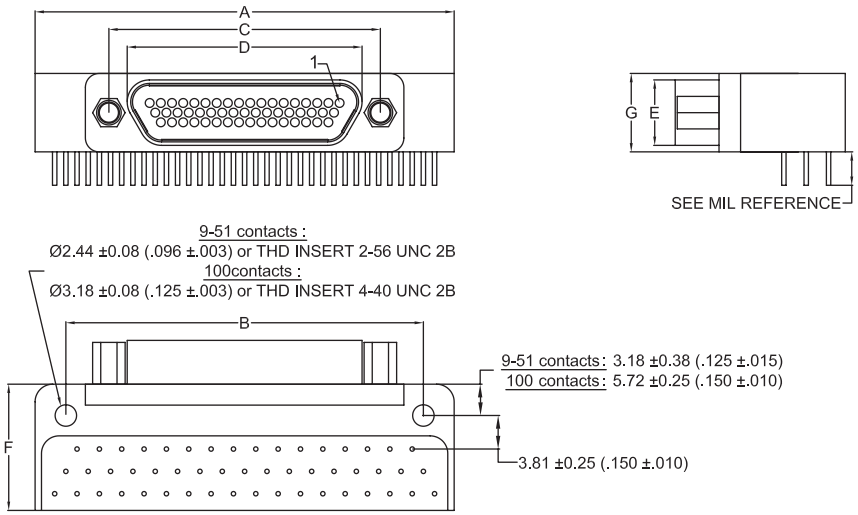
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



SEE CONTACT LAYOUT ON PCB PAGES 52 & 53

	A max.	B ± 0.18 (±.007)	C ± 0.13 (±.005)	D max.		E max.		F max.	G ± 0.25 (±.010)
				Male	Female	Male	Female		
9 P / 9 S	35.31 1.390	29.21 1.150	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	11.81 .465	7.87 .310
15 P / 15 S	39.12 1.540	33.02 1.300	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	11.81 .465	7.87 .310
21 P / 21 S	42.93 1.690	36.83 1.450	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	11.81 .465	7.87 .310
25 P / 25 S	45.47 1.790	39.37 1.550	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	11.81 .465	7.87 .310
31 P / 31 S	51.82 2.040	45.72 1.800	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	11.81 .465	7.87 .310
37 P / 37 S	59.44 2.340	53.34 2.100	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	11.81 .465	7.87 .310
51 P / 51 S	47.63 1.875	40.64 1.600	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	14.35 .565	8.76 .345
100 P / 100 S	70.61 2.780	63.50 2.500	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	19.43 .765	10.29 .405

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	AWG24 gold plated copper, solder dipped in 63/37 tin-lead
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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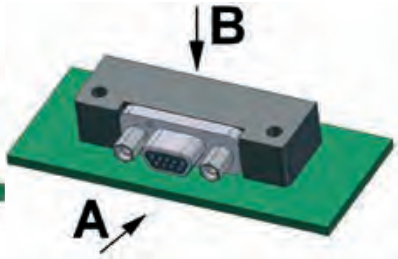
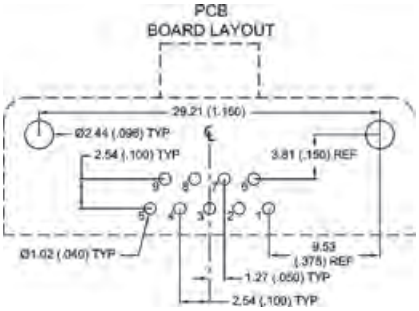
PCB LAYOUT FOR STANDARD PROFILE, RIGHT ANGLE 0.100" PITCH - MALE CONNECTORS

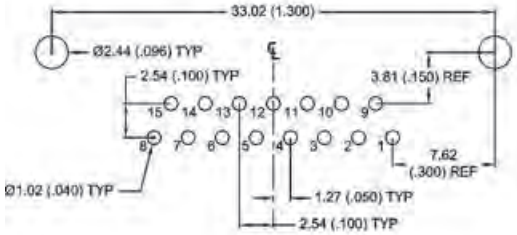
VIEW A



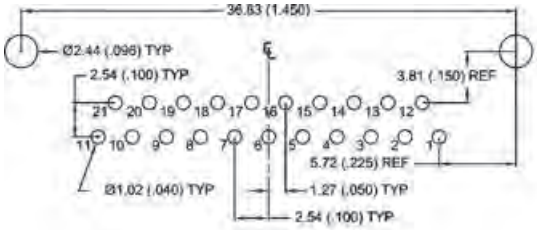
9 CONTACTS - VIEW B



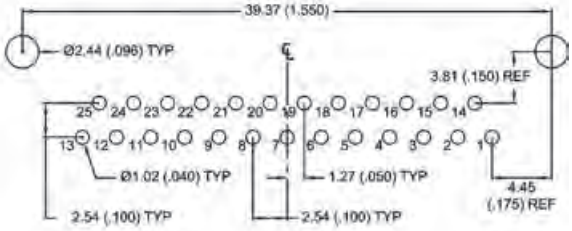
15 CONTACTS - VIEW B



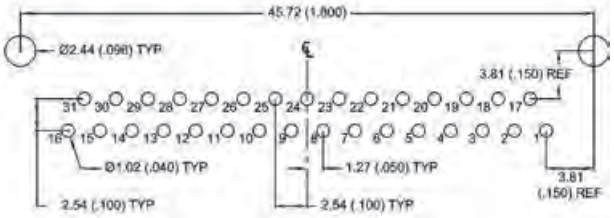
21 CONTACTS - VIEW B



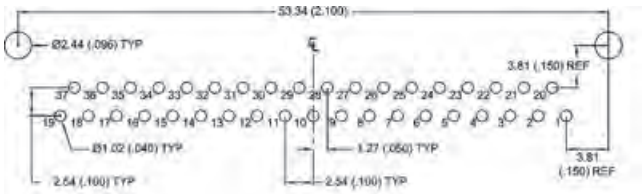
25 CONTACTS - VIEW B



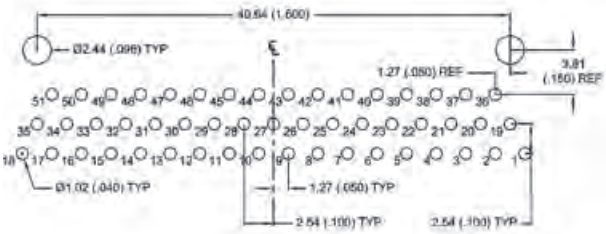
31 CONTACTS - VIEW B



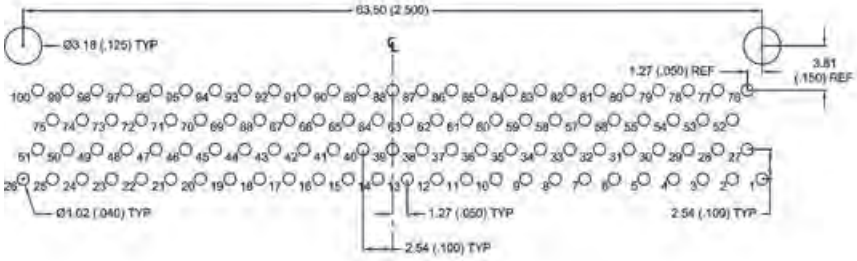
37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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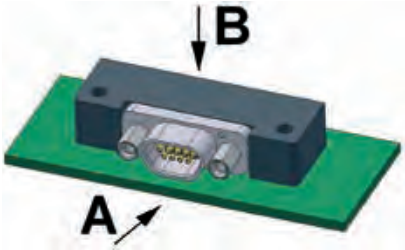
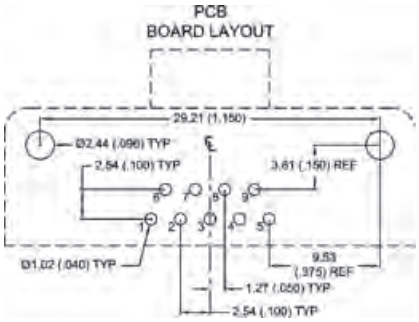
PCB LAYOUT FOR STANDARD PROFILE, RIGHT ANGLE 0.100" PITCH - FEMALE CONNECTORS

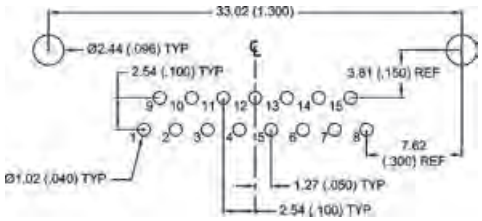
VIEW A



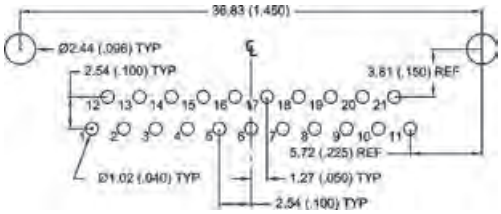
9 CONTACTS - VIEW B



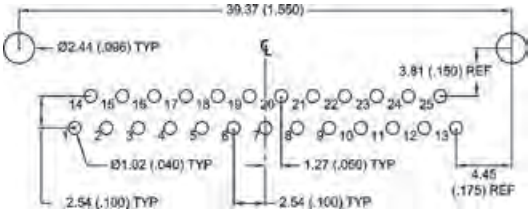
15 CONTACTS - VIEW B



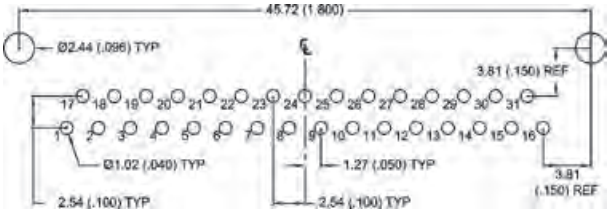
21 CONTACTS - VIEW B



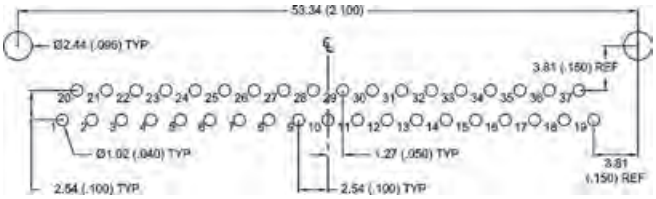
25 CONTACTS - VIEW B



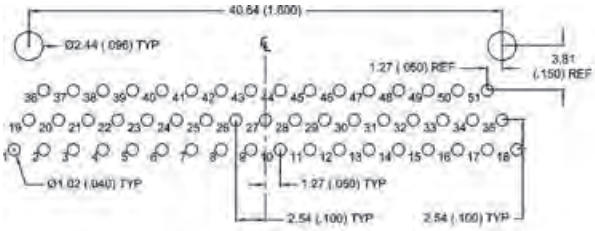
31 CONTACTS - VIEW B



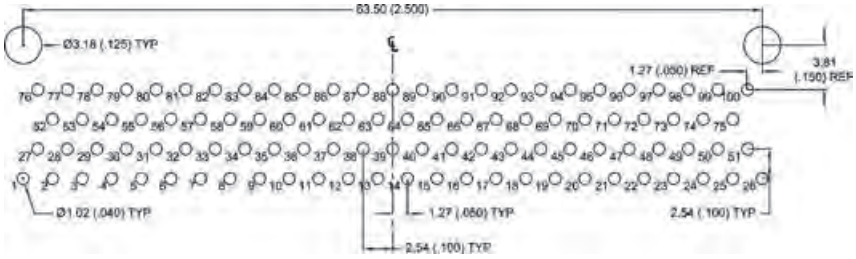
37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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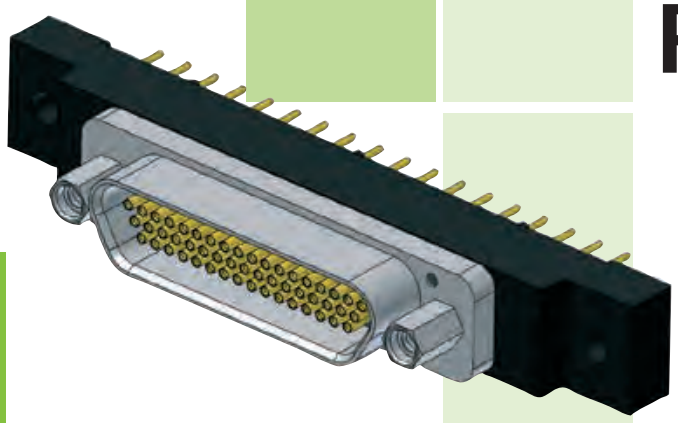

MIL-DTL-83513 /22 TO /27

PCB CONNECTOR

STRAIGHT
0.100" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Board straight connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0K0J2

IDENTIFICATION CODE

M83513/	26-G	03	N	P

SERIES

M83513/: QPL series.

TYPE

22-A: Pin connector, metal shell, 9 contacts.
22-B: Pin connector, metal shell, 15 contacts.
22-C: Pin connector, metal shell, 21 contacts.
22-D: Pin connector, metal shell, 25 contacts.
22-E: Pin connector, metal shell, 31 contacts.
22-F: Pin connector, metal shell, 37 contacts.
23-G: Pin connector, metal shell, 51 contacts.
24-H: Pin connector, metal shell, 100 contacts.
25-A: Socket connector, metal shell, 9 contacts.
25-B: Socket connector, metal shell, 15 contacts.
25-C: Socket connector, metal shell, 21 contacts.
25-D: Socket connector, metal shell, 25 contacts.
25-E: Socket connector, metal shell, 31 contacts.
25-F: Socket connector, metal shell, 37 contacts.
26-G: Socket connector, metal shell, 51 contacts.
27-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").
Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed for 22-A to 23-G and 25-A to 26-G only.
W: Jackpost and threaded inserts installed for 22-A to 23-G and 25-A to 26-G only.
U: Threaded inserts installed. For 24-H and 27-H only.
Y: Jackpost and threaded inserts installed. For 24-H and 27-H only.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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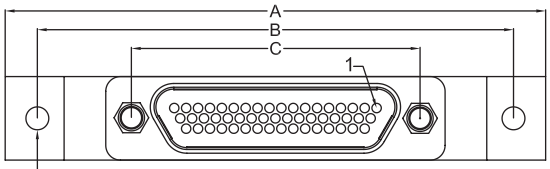
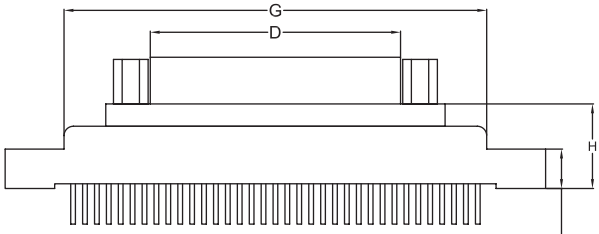
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



9-51 contacts:
Ø2.44 ± 0.08 (.096± .003) or THD INSERT 2-56 UNC 2B
100 contacts
Ø3.18 ± 0.08 (.125± .003) or THD INSERT 4-40 UNC 2B



9-51 contacts: 4.20 (.165)
100 contacts: 7.70 (.303)

SEE CONTACT LAYOUT ON PCB PAGES 56 & 57

	A max.	B ± 0.18 (±.007)	C ± 0.13 (±.005)	D max.		E max.		F max.	G max.	H max.
				Male	Female	Male	Female			
9 P / 9 S	35.31 1.390	29.21 1.150	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	19.94 .785	9.02 .355
15 P / 15 S	35.31 1.390	29.21 1.150	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	24.00 .945	9.02 .355
21 P / 21 S	42.93 1.690	36.83 1.450	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.82 .308	29.72 1.170	9.02 .355
25 P / 25 S	44.20 1.740	38.10 1.500	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	32.39 1.275	9.02 .355
31 P / 31 S	51.82 2.040	45.72 1.800	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.82 .308	40.01 1.575	9.02 .355
37 P / 37 S	59.44 2.340	53.34 2.100	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.82 .308	47.63 1.875	9.02 .355
51 P / 51 S	57.66 2.270	50.80 2.000	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.92 .351	45.09 1.775	9.02 .355
100 P / 100 S	82.55 3.250	71.12 2.800	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	11.68 .460	65.66 2.585	13.97 .550

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	AWG24 gold plated copper, solder dipped in 63/37 tin-lead
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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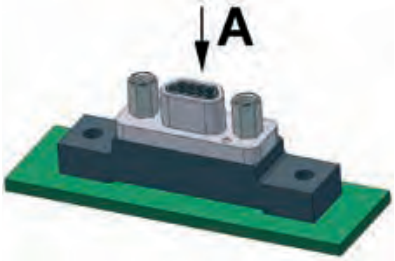
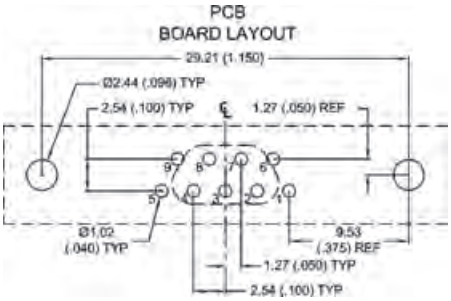
MIL-DTL-83513 /22 TO /27

PCB LAYOUT FOR STRAIGHT 0.100" PITCH - MALE CONNECTORS

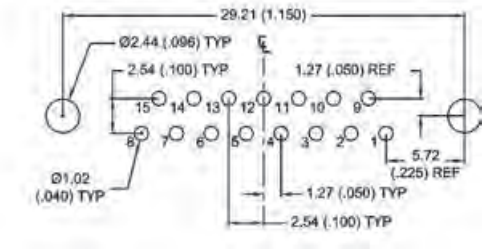
VIEW A



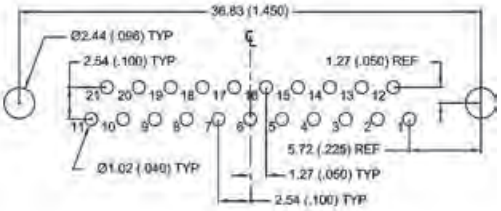
9 CONTACTS - VIEW A



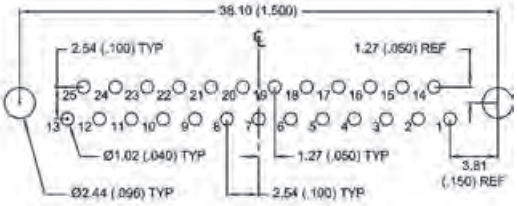
15 CONTACTS - VIEW A



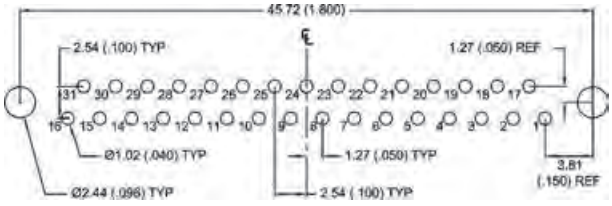
21 CONTACTS - VIEW A



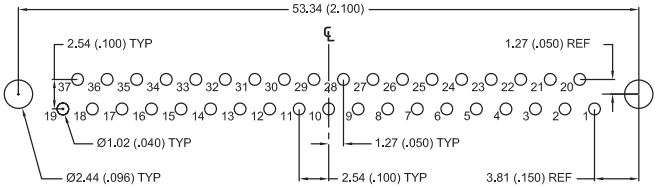
25 CONTACTS - VIEW A



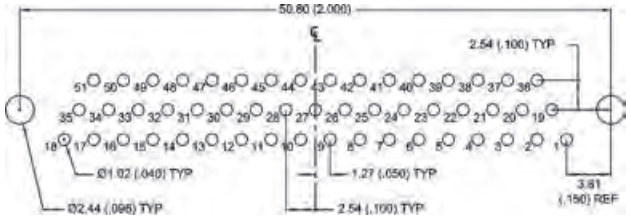
31 CONTACTS - VIEW A



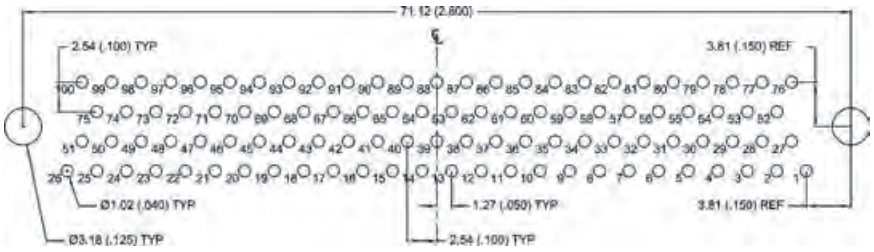
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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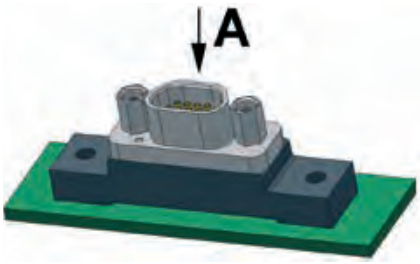
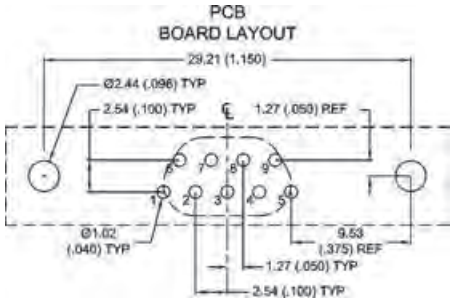
PCB LAYOUT FOR STRAIGHT, 0.100" PITCH - FEMALE CONNECTORS

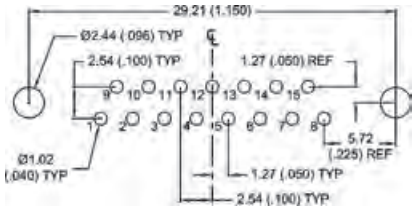
VIEW A



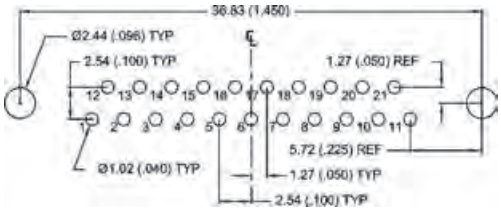
9 CONTACTS - VIEW A



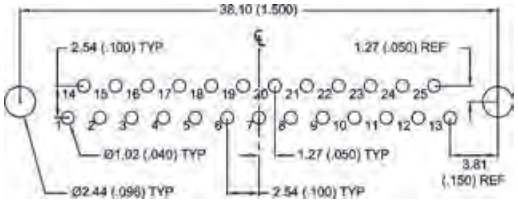
15 CONTACTS - VIEW A



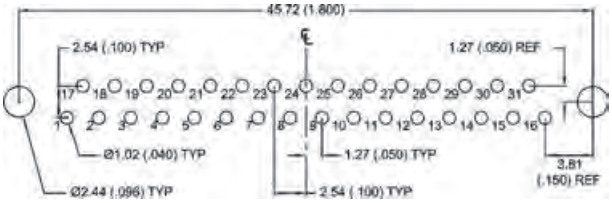
21 CONTACTS - VIEW A



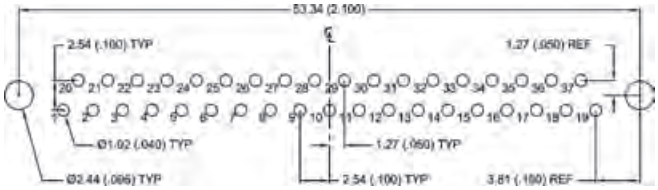
25 CONTACTS - VIEW A



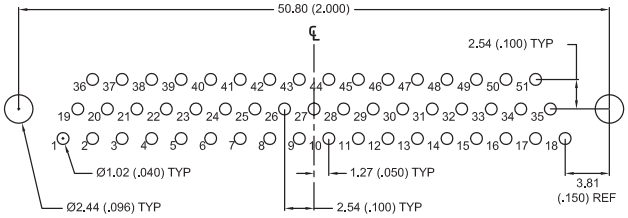
31 CONTACTS - VIEW A



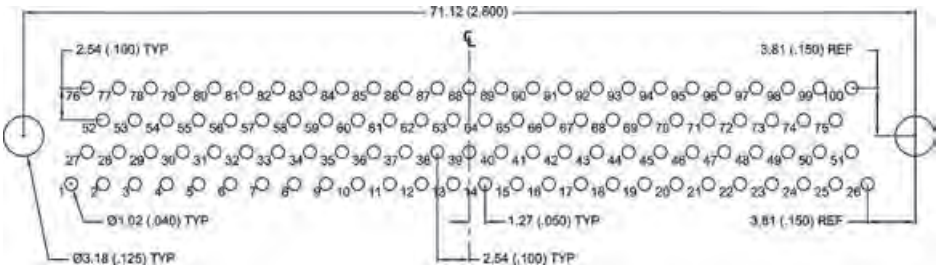
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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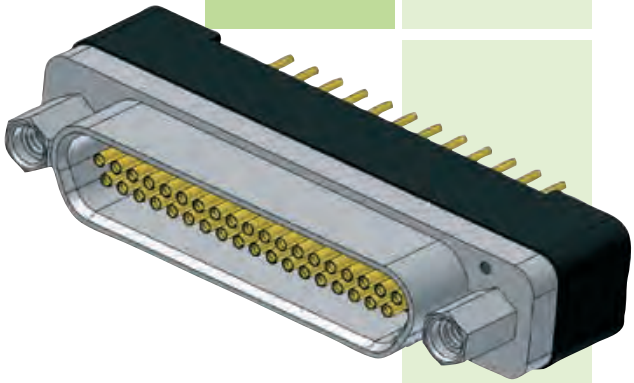

MIL-DTL-83513 /28 TO /33

PCB CONNECTOR

STRAIGHT
0.075" PITCH

METAL SHELL

- Only available in metal shell version.
- Environmentally sealed.
- Board straight connector for flexible and rigid printed circuit boards.
- Several tail lengths available.

CAGE CODE: 0KOJ2

IDENTIFICATION CODE

M83513/	31-F	03	N	W

SERIES

M83513/: QPL series.

TYPE

28-A: Pin connector, metal shell, 9 contacts.
28-B: Pin connector, metal shell, 15 contacts.
28-C: Pin connector, metal shell, 21 contacts.
28-D: Pin connector, metal shell, 25 contacts.
28-E: Pin connector, metal shell, 31 contacts.
28-F: Pin connector, metal shell, 37 contacts.
29-G: Pin connector, metal shell, 51 contacts.
30-H: Pin connector, metal shell, 100 contacts.
31-A: Socket connector, metal shell, 9 contacts.
31-B: Socket connector, metal shell, 15 contacts.
31-C: Socket connector, metal shell, 21 contacts.
31-D: Socket connector, metal shell, 25 contacts.
31-E: Socket connector, metal shell, 31 contacts.
31-F: Socket connector, metal shell, 37 contacts.
32-G: Socket connector, metal shell, 51 contacts.
33-H: Socket connector, metal shell, 100 contacts.

See pages 26 & 27 for contact arrangements.

TERMINATION LENGTH

01: 2.80 mm (.109").
02: 3.56 mm (.140").
03: 4.37 mm (.172").
Tolerance ± 0.13 mm (.005").

SHELL FINISH

C: Cadmium plating.
N: Nickel plating.
P: Passivated stainless steel.

HARDWARE CODE

N: No jackpost or threaded insert.
P: Jackpost installed.
T: Threaded inserts installed. For 28-A to 29-G and 31-A to 32-G only.
W: Jackpost and threaded inserts installed for 28-A to 29-G and 31-A to 32-G only.
U: Threaded inserts installed. For 30-H and 33-H only.
Y: Jackpost and threaded inserts installed. For 30-H and 33-H only.

Hardware Code **P**: Long jackpost and thru-hole

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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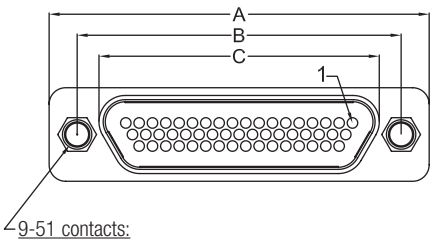
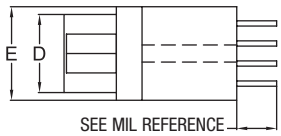
DIMENSIONS

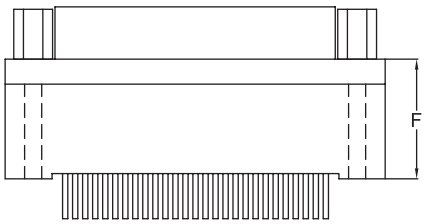
Dimensions are in millimetres (inches).

FEMALE connector





9-51 contacts:
Ø2.24/2.44 (.088/.096) or THD INSERT 2-56 UNC 2B
100 contacts
Ø3.68/3.81 (.145/.150) or THD INSERT 4-40 UNC 2B



SEE CONTACT LAYOUT ON PCB PAGES 60 & 61

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.
			Male	Female	Male	Female		
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.87 .310	9.02 .355
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.87 .310	9.02 .355
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.87 .310	9.02 .355
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.87 .310	9.02 .355
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.87 .310	9.02 .355
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.87 .310	9.02 .355
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	10.16 .400	9.02 .355
100 P / 100 S	55.12 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	12.95 .510	10.92 .430

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	AWG24 gold plated copper, solder dipped in 63/37 tin-lead
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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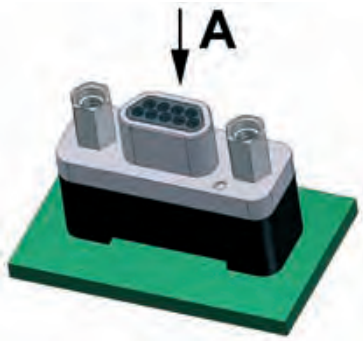
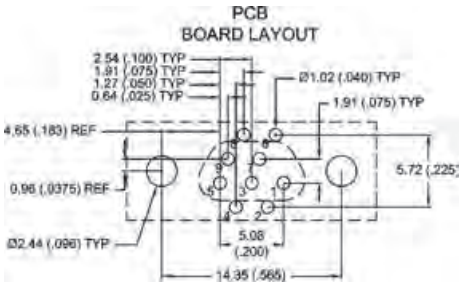
MIL-DTL-83513 /28 TO /33

PCB LAYOUT FOR QPL STRAIGHT 0.075" PITCH - MALE CONNECTORS

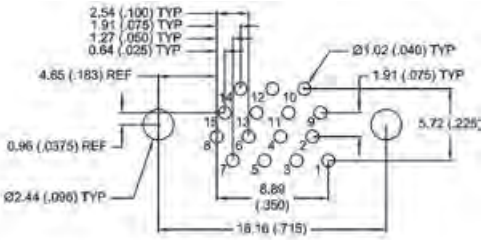
VIEW A



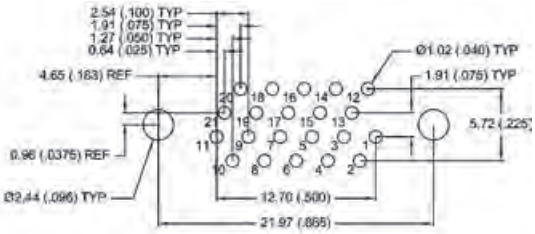
9 CONTACTS - VIEW A



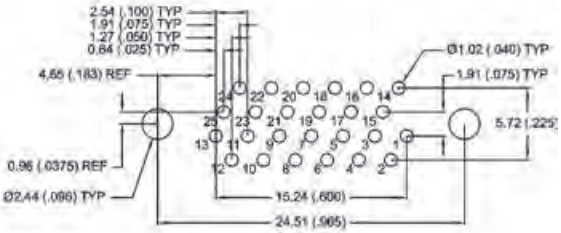
15 CONTACTS - VIEW A



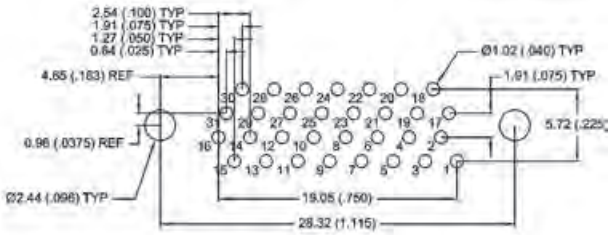
21 CONTACTS - VIEW A



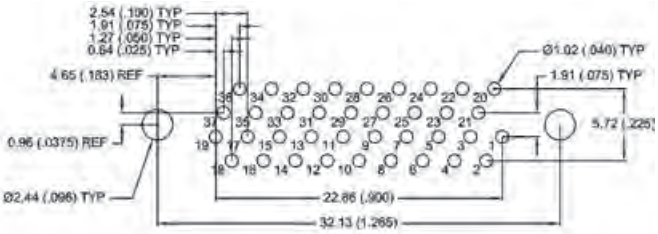
25 CONTACTS - VIEW A



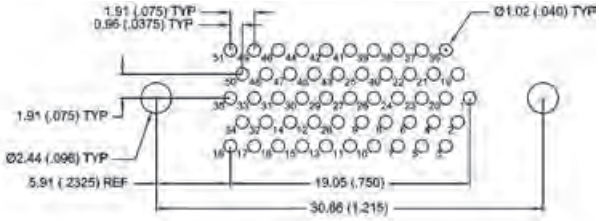
31 CONTACTS - VIEW A



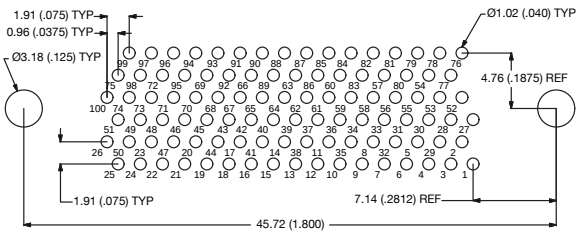
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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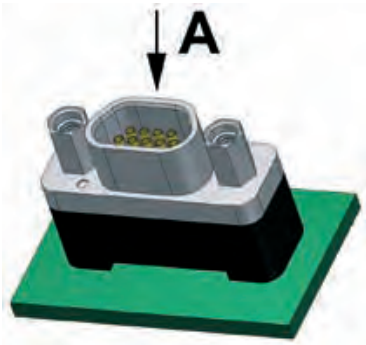
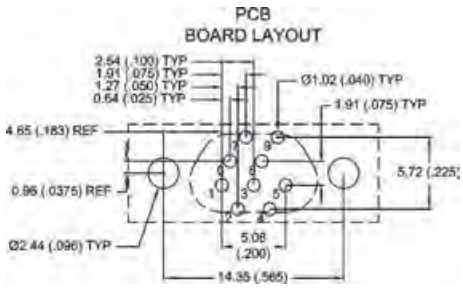
PCB LAYOUT FOR QPL STRAIGHT 0.075" PITCH - FEMALE CONNECTORS

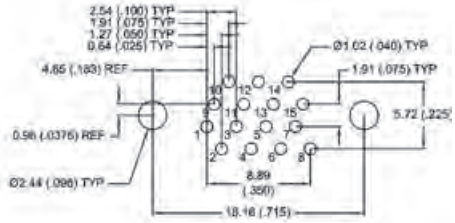
VIEW A



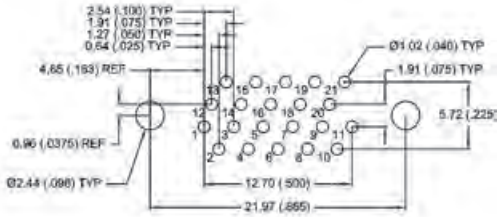
9 CONTACTS - VIEW A



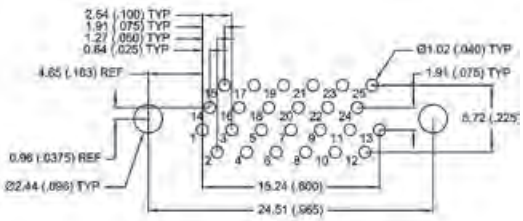
15 CONTACTS - VIEW A



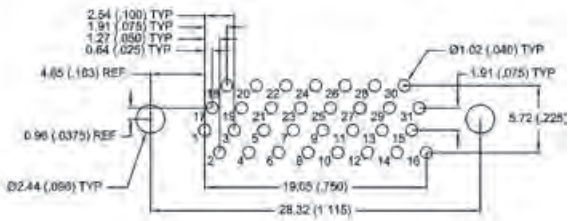
21 CONTACTS - VIEW A



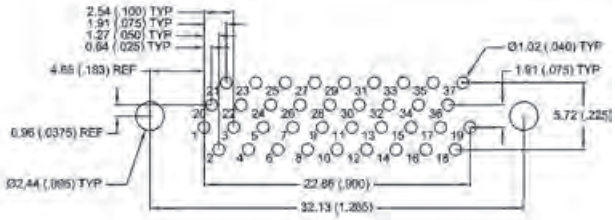
25 CONTACTS - VIEW A



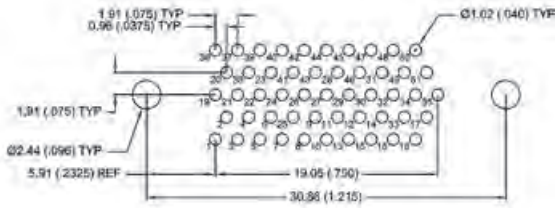
31 CONTACTS - VIEW A



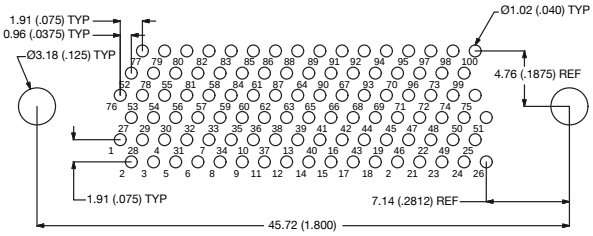
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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PIGTAILS, 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
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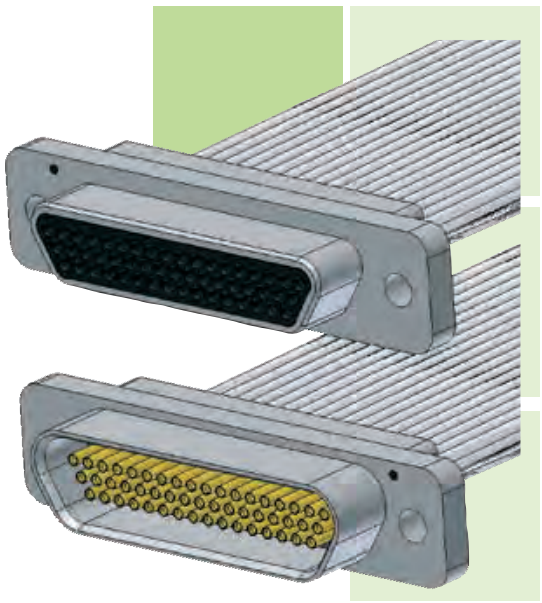

RECTANGULAR CONNECTORS

PIGTAIL CONNECTOR

METAL SHELL

- High performance metal connector and PTFE wire.
- Environmentally sealed.
- Operating temperature: 150°C or 200°C.
- 9 to 100 contacts.

IDENTIFICATION CODE

MDA 2 51 S 4 L 050 B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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).

WIRE 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 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
G: AWG 25 gold plated.
T: AWG 24 tin plated.
See page 29 for wire types.

COLOUR CODE
F: All yellow.
L: All white.
BLANK: If wire type is G or T.
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").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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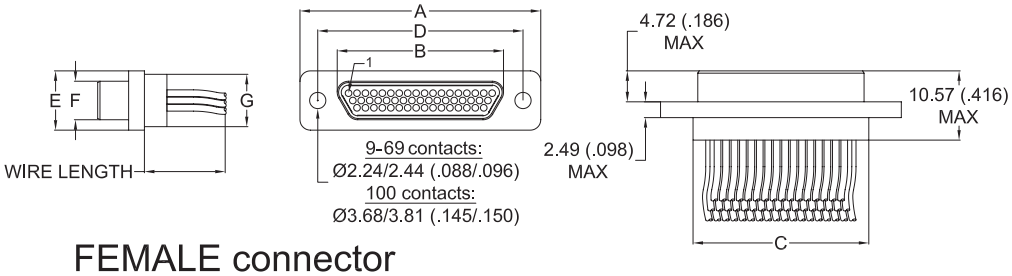
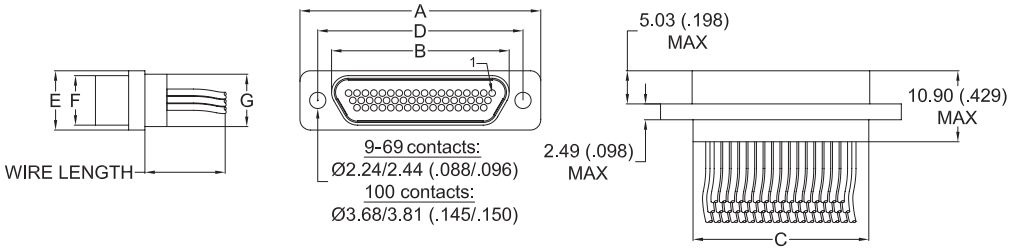
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.69 .775	8.48 .334	10.16 .400	9.91 .390	14.35 .565	7.57 .298	4.69 .185	6.35 .250	6.86 .270
15 P / 15 S	23.50 .925	12.29 .484	14.00 .551	13.72 .540	18.16 .715	7.57 .298	4.69 .185	6.35 .250	6.86 .270
21 P / 21 S	27.31 1.075	16.10 .634	17.81 .701	17.53 .690	21.97 .865	7.57 .298	4.69 .185	6.35 .250	6.86 .270
25 P / 25 S	29.85 1.175	18.64 .734	20.35 .801	20.07 .790	24.51 .965	7.57 .298	4.69 .185	6.35 .250	6.86 .270
31 P / 31 S	33.66 1.325	22.45 .884	24.16 .951	23.88 .940	28.32 1.115	7.57 .298	4.69 .185	6.35 .250	6.86 .270
37 P / 37 S	37.47 1.475	26.26 1.034	27.96 1.101	27.69 1.090	32.13 1.265	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51DR P / 51DR S	46.36 1.825	35.15 1.384	36.83 1.450	36.58 1.440	41.02 1.615	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51 P / 51 S	36.20 1.425	24.99 .984	26.70 1.051	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.44 .293	7.87 .310
69 P / 69 S	43.82 1.725	32.61 1.1284	34.29 1.350	34.04 1.340	38.48 1.515	8.66 .341	5.79 .228	7.44 .293	7.87 .310
100 P / 100 S	54.86 2.160	35.15 1.384	36.86 1.451	36.37 1.432	45.72 1.800	9.75 .384	6.88 .271	8.46 .333	9.14 .360

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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RECTANGULAR CONNECTORS

PIGTAIL CONNECTOR

LOW PROFILE METAL SHELL

- High performance metal connector and PTFE wire.
- Operating temperature: 150°C or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

MDA 2 L51 S 4 L 050 B

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium aluminium shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS

L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.

See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER

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

WIRE 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 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: E 2607, AWG 26, 7 strands, 600V.

Solid uninsulated wires
G: AWG 25 gold plated
T: AWG 24 tin plated

See page 29 for wire types.

COLOUR CODE

F: All yellow.
L: All white.
BLANK: If wire type is G or T.
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").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L >100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE

B: No hardware.
C: U-clips with low profile hex socket head jackscrews (removable).
D: U-clips with low profile slot head jackscrews (removable).
M: Low profile hex socket head jackscrews (removable).
N: High profile hex socket head jackscrews (removable).
S: Low profile slot head jackscrews (removable).
T: High profile slot head jackscrews (removable).
P: Jackposts (removable).
Px (x: 1 to 5): Panel mount jackposts.
K: High profile slot head jackscrews (non removable).
L: Low profile hex socket head jackscrews (non removable).
F: Float mount, front panel mount (non removable).
FR: Float mount, rear panel mount (non removable).

See pages 190 to 200 for hardware description.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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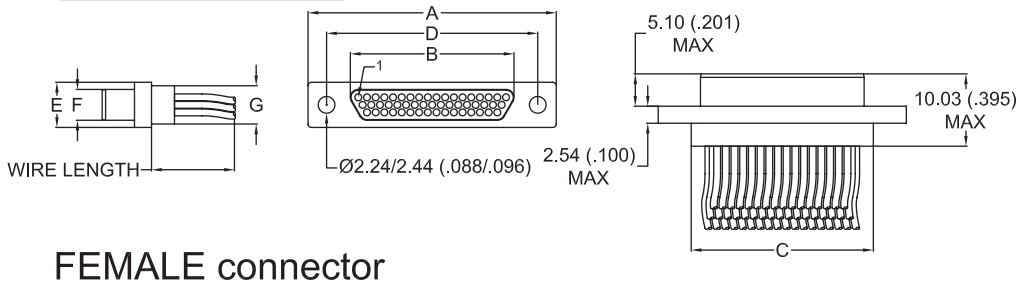
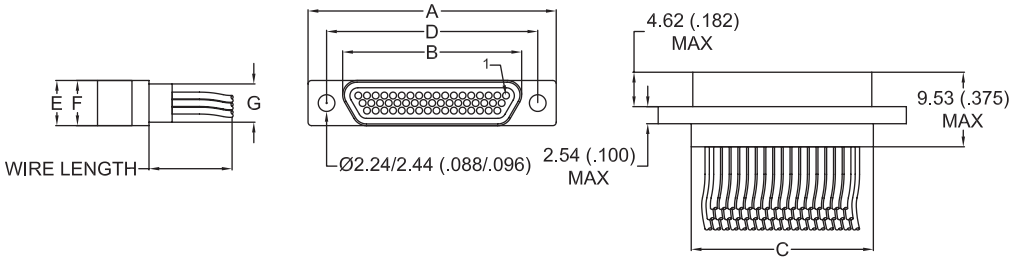
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.47 .294	9.65 .380	10.11 .398	14.35 .565	5.28 .208	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.28 .444	13.46 .530	13.92 .548	18.16 .715	5.28 .208	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.09 .594	17.27 .680	17.73 .698	21.97 .865	5.28 .208	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.63 .694	19.81 .780	20.27 .798	24.51 .965	5.28 .208	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.44 .844	23.62 .930	24.08 .948	28.32 1.115	5.28 .208	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.25 .994	27.43 1.080	27.89 1.098	32.13 1.265	5.28 .208	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.98 .944	26.16 1.030	26.62 1.048	30.86 1.215	6.35 .250	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0,5 oz)
CONTACT RETENTION	2,26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's - No discontinuity > 1µs
SHOCK	50g's - No discontinuity > 1µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULENT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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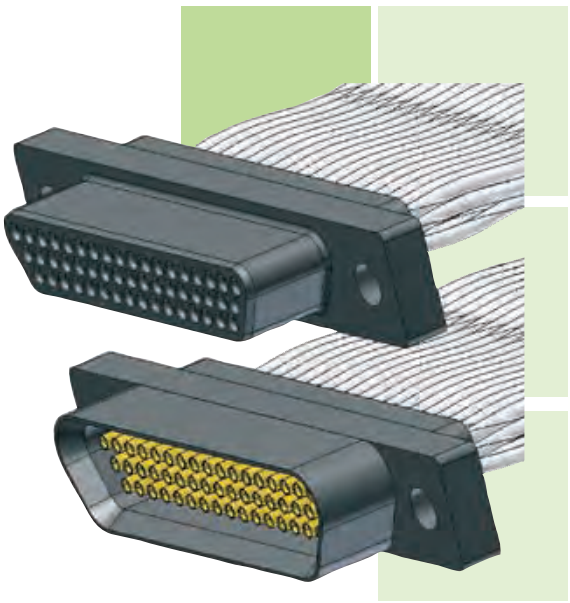

RECTANGULAR CONNECTORS

PIGTAIL CONNECTOR

PLASTIC SHELL

- Low cost plastic connector.
- Operating temperature: 150°C or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

MDA P 51 S 4 L 050 B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP 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).

WIRE 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 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
G: AWG 25 gold plated.
T: AWG 24 tin plated.
See page 29 for wire types.

COLOUR CODE
F: All yellow.
L: All white.
BLANK: If wire type is G or T.
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").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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

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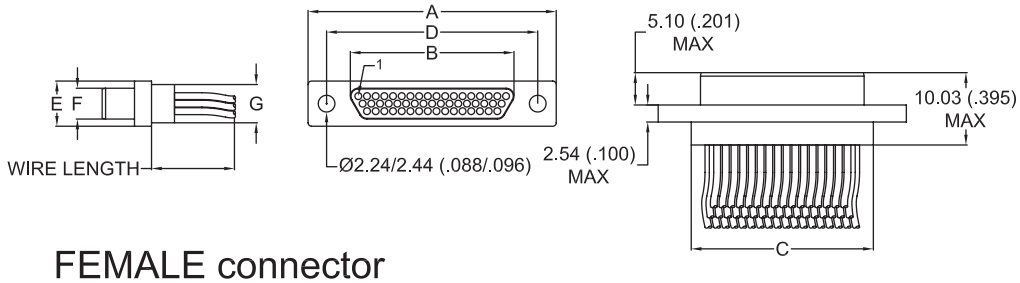
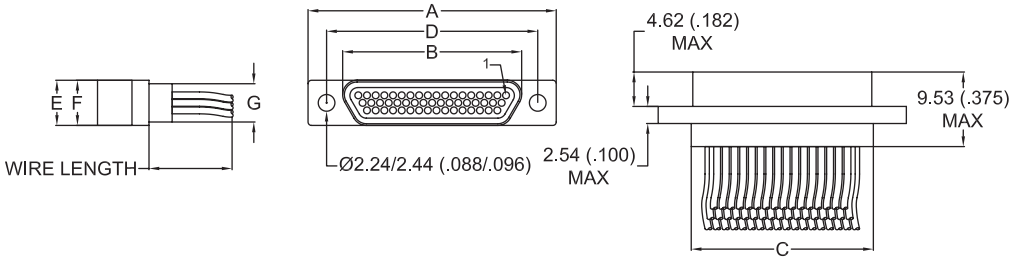
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.41 .292	9.65 .380	10.11 .398	14.35 .565	5.28 .208	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.22 .442	13.46 .530	13.92 .548	18.16 .715	5.28 .208	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.03 .592	17.27 .680	17.73 .698	21.97 .865	5.28 .208	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.57 .692	19.81 .780	20.27 .798	24.51 .965	5.28 .208	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.38 .842	23.62 .930	24.08 .948	28.32 1.115	5.28 .208	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.19 .992	27.43 1.080	27.89 1.098	32.13 1.265	5.28 .208	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.92 .942	26.16 1.030	26.62 1.048	30.86 1.215	6.35 .250	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper Alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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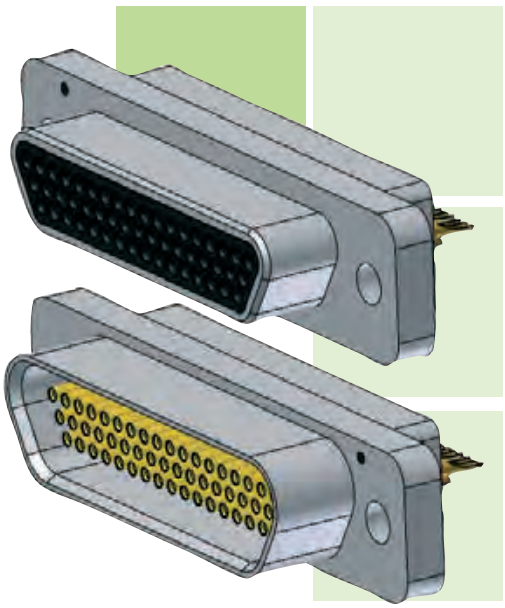

RECTANGULAR CONNECTORS

SOLDER CUP CONNECTOR

METAL SHELL

- High performance metal connector and solder cup contacts.
- Environmentally sealed.
- Ideal for prototyping or where pigtail type connectors cannot be used.
- Operating temperature: 150°C or 200°C.
- 9 to 100 contacts.

IDENTIFICATION CODE

MDA 2 51 S FS B

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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).

SOLDER CUP

HARDWARE

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

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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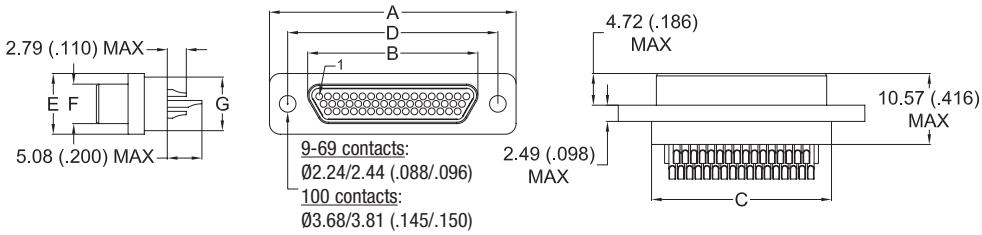
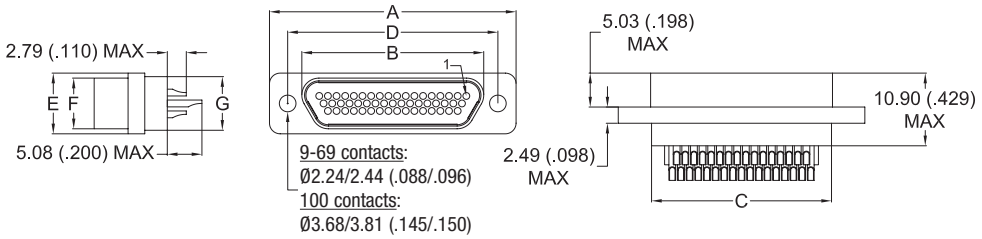
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.69 .775	8.48 .334	10.16 .400	9.91 .390	14.35 .565	7.57 .298	4.69 .185	6.35 .250	6.86 .270
15 P / 15 S	23.50 .925	12.29 .484	14.00 .551	13.72 .540	18.16 .715	7.57 .298	4.69 .185	6.35 .250	6.86 .270
21 P / 21 S	27.31 1.075	16.10 .634	17.81 .701	17.53 .690	21.97 .865	7.57 .298	4.69 .185	6.35 .250	6.86 .270
25 P / 25 S	29.85 1.175	18.64 .734	20.35 .801	20.07 .790	24.51 .965	7.57 .298	4.69 .185	6.35 .250	6.86 .270
31 P / 31 S	33.66 1.325	22.45 .884	24.16 .951	23.88 .940	28.32 1.115	7.57 .298	4.69 .185	6.35 .250	6.86 .270
37 P / 37 S	37.47 1.475	26.26 1.034	27.96 1.101	27.69 1.090	32.13 1.265	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51DR P / 51DR S	46.36 1.825	35.15 1.384	36.83 1.450	36.58 1.440	41.02 1.615	7.57 .298	4.69 .185	6.35 .250	6.86 .270
51 P / 51 S	36.20 1.425	24.99 .984	26.70 1.051	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.44 .293	7.87 .310
69 P / 69 S	43.82 1.725	32.61 1.284	34.29 1.350	34.04 1.340	38.48 1.515	8.66 .341	5.79 .228	7.44 .293	7.87 .310
100 P / 100 S	54.86 2.160	35.15 1.384	36.86 1.451	36.37 1.432	45.72 1.800	9.75 .384	6.88 .271	8.46 .333	9.14 .360

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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RECTANGULAR CONNECTORS

SOLDER CUP CONNECTOR

LOW PROFILE METAL SHELL

- High performance metal connector and solder cup contacts.
- Ideal for prototyping or when pigtail type connectors cannot be used.
- Operating temperature: 150°C or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

MDA 2 L51 S FS B

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS

L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.
See pages 26 & 27 for contact arrangements.

CONNECTOR GENDER

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

SOLDER CUP

HARDWARE

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

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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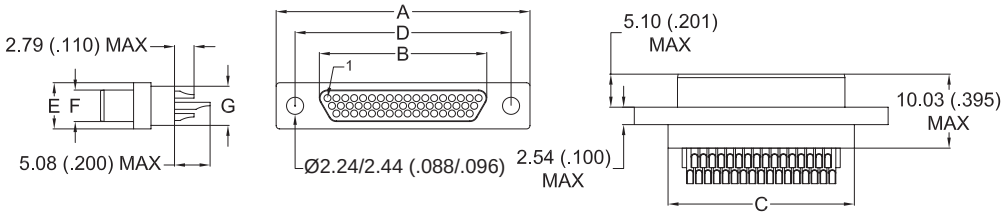
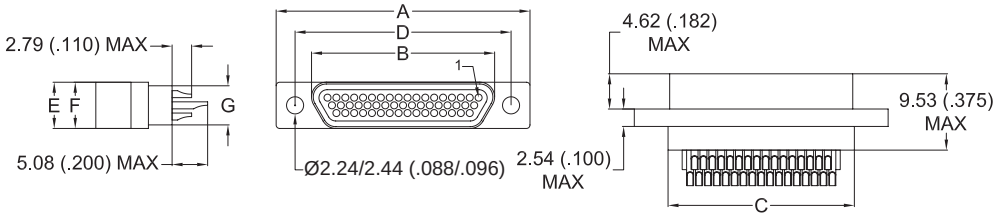
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.47 .294	9.65 .380	10.11 .398	14.35 .565	5.28 .208	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.28 .444	13.46 .530	13.92 .548	18.16 .715	5.28 .208	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.09 .594	17.27 .680	17.73 .698	21.97 .865	5.28 .208	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.63 .694	19.81 .780	20.27 .798	24.51 .965	5.28 .208	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.44 .844	23.62 .930	24.08 .948	28.32 1.115	5.28 .208	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.25 .994	27.43 1.080	27.89 1.098	32.13 1.265	5.28 .208	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.98 .944	26.16 1.030	26.62 1.048	30.86 1.215	6.35 .250	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0,5 oz)
CONTACT RETENTION	2,26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's - No discontinuity > 1µs
SHOCK	50g's - No discontinuity > 1µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULENT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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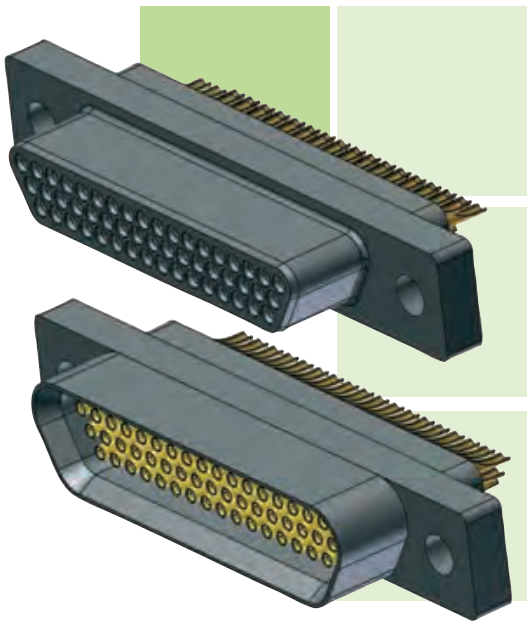

RECTANGULAR CONNECTORS

SOLDER CUP CONNECTOR

PLASTIC SHELL

- Low cost plastic connector and solder cup contacts.
- Ideal for prototyping or where pigtail type connectors cannot be used.
- Operating temperature: 150°C or 200°C.
- 9 to 51 contacts.

IDENTIFICATION CODE

MDA P 51 S FS B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP 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).

SOLDER CUP

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

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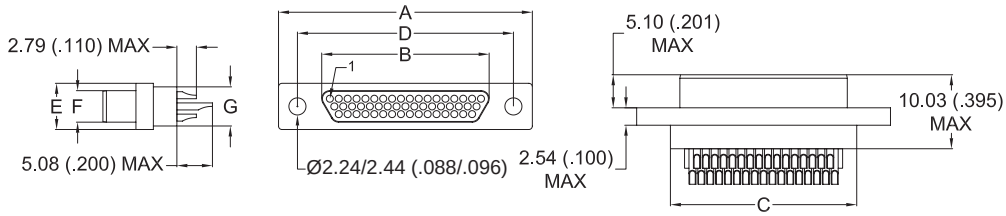
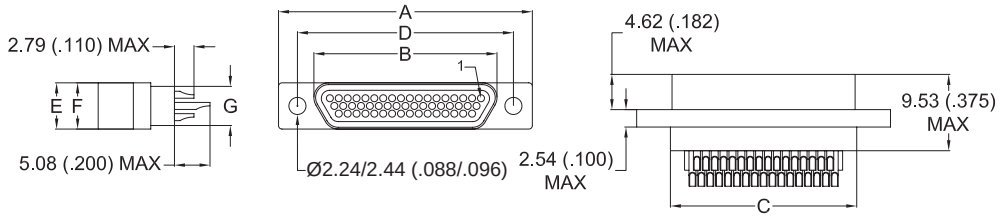
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



	A ± 0.25 (±.010)	B max.		C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
9 P / 9 S	19.76 .778	7.41 .292	9.65 .380	10.11 .398	14.35 .565	5.28 .208	3.40 .134	5.53 .218	4.39 .173
15 P / 15 S	23.57 .928	11.22 .442	13.46 .530	13.92 .548	18.16 .715	5.28 .208	3.40 .134	5.53 .218	4.39 .173
21 P / 21 S	27.38 1.078	15.03 .592	17.27 .680	17.73 .698	21.97 .865	5.28 .208	3.40 .134	5.53 .218	4.39 .173
25 P / 25 S	29.92 1.178	17.57 .692	19.81 .780	20.27 .798	24.51 .965	5.28 .208	3.40 .134	5.53 .218	4.39 .173
31 P / 31 S	33.73 1.328	21.38 .842	23.62 .930	24.08 .948	28.32 1.115	5.28 .208	3.40 .134	5.53 .218	4.39 .173
37 P / 37 S	37.54 1.478	25.19 .992	27.43 1.080	27.89 1.098	32.13 1.265	5.28 .208	3.40 .134	5.53 .218	4.39 .173
51 P / 51 S	36.27 1.428	23.92 .942	26.16 1.030	26.62 1.048	30.86 1.215	6.35 .250	4.50 .177	6.60 .260	5.59 .220

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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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 connector) for flexible and rigid printed circuit boards.

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

PCB CONNECTORS 0.100" PITCH

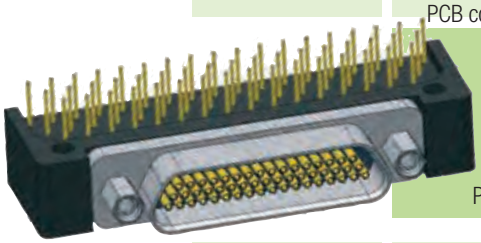
BS 0.100" Vertical mount

Available from 9 to 100 ways
Available in metal and plastic shell
PCB code: **BS**

Pages 98 & 100

BR 0.100" Right Angle mount

Available from 9 to 100 ways
Available in metal shell
PCB code: **BR**



Page 92

CBR 0.100" Condensed Right Angle mount

Available from 9 to 100 ways
Available in metal and plastic shell
PCB code: **CBR**

Pages 78 & 80

CBP 0.100" Condensed Right Angle mount low profile

Available from 9 to 51 ways
Available in metal and plastic shell
PCB code: **CBP**

Pages 86 & 88

PCB CONNECTORS 0.075" PITCH

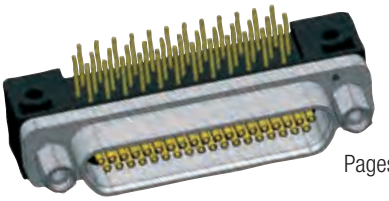
BS 0.075" Vertical mount

Available from 9 to 100 ways
Available in metal and plastic shell
PCB code: **75SA / 75SB**

Pages 116 & 118

CBR 0.075" Condensed Right Angle mount

Available from 9 to 100 ways
Available in metal shell
PCB code: **75RB / 75RC**



Pages 106 & 112

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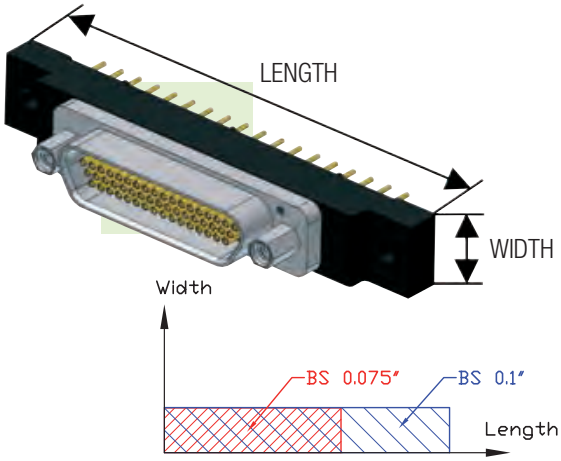
PCB CONNECTOR VERSIONS
Differences in length and width

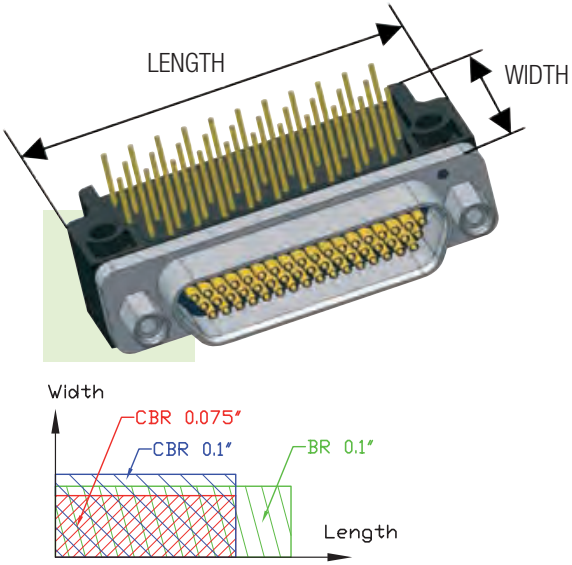
Example of the 51 way connectors

The main advantage of the Micro-D PCB connectors with a pitch of 0.075 inch in comparison to the 0.1 inch version is to save space on the PCB layout.

VERTICAL CONNECTOR

The 0.075" BS version has more or less the same width as the 0.100" BS version but is shorter in length.





RIGHT ANGLE CONNECTOR

The 0.100" CBR connector is a little wider, but substantially shorter than the 0.100" BR connector.

The 0.075" CBR connector is more or less the same length as the 0.100" CBR version, but is narrower in width in comparison to both the CBR and even the BR connectors in the 0.100" format.

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea Level: 600 VAC Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061,300 series stainless steel or LCP, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber (metal version)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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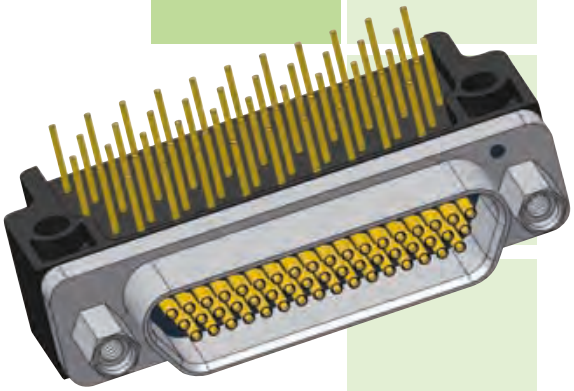

PCB RECTANGULAR CONNECTORS

CBR TYPE

0.100" PITCH

METAL SHELL

- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA 2 51 S CBR P G 3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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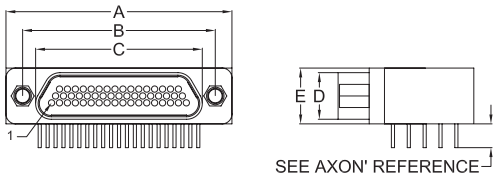
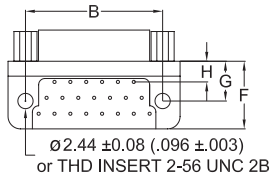
DIMENSIONS

Dimensions are in millimetres (inches).

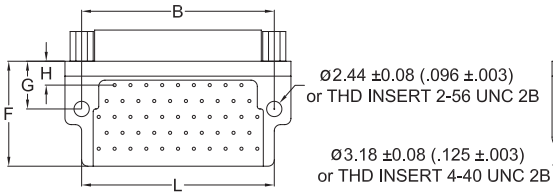
FEMALE connector



9-25 way connectors

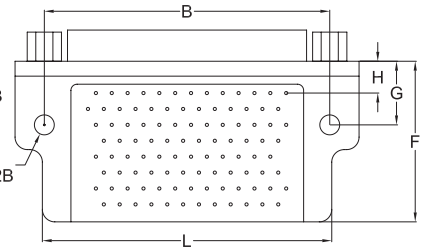


31-69 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 82 TO 85

100 way connectors



	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)	L max.
			Male	Female	Male	Female					
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	10.80 .425	6.35 .250	5.84 .230	-
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	10.80 .425	6.35 .250	3.30 .130	-
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.82 .308	10.80 .425	6.35 .250	3.30 .130	-
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	10.80 .425	6.35 .250	3.30 .130	-
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.82 .308	13.34 .525	6.35 .250	3.30 .130	27.69 1.090
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.82 .308	13.34 .525	6.35 .250	3.30 .130	30.23 1.190
51DR P / 51DR S	46.61 1.835	41.02 1.615	35.15 1.384	36.83 1.450	4.69 .185	6.35 .250	7.82 .308	13.34 .525	6.35 .250	3.30 .130	39.12 1.540
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.92 .351	16.76 .660	7.62 .300	3.81 .150	31.24 1.230
69 P / 69 S	44.07 1.735	38.48 1.515	32.61 1.284	34.29 1.350	5.79 .228	7.44 .293	8.92 .351	19.05 .750	7.62 .300	3.81 .150	38.86 1.530
100 P / 100 S	55.11 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	10.01 .394	25.65 1.010	10.16 .400	5.08 .200	46.36 1.825

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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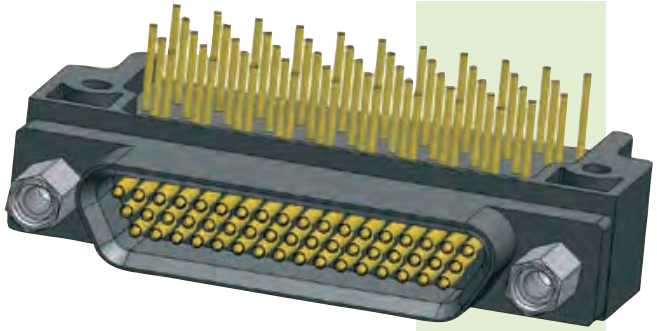

PCB RECTANGULAR CONNECTORS

CBR TYPE

0.100" PITCH

PLASTIC SHELL

- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature: 150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA L 51 S CBR P G 3

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP 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).

PCB VERSION
CBR: 0.100" Condensed Board Right Angle.

HARDWARE
B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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
G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

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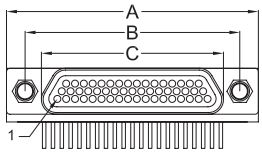
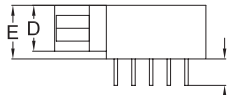
DIMENSIONS

Dimensions are in millimetres (inches).

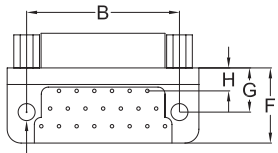
FEMALE connector





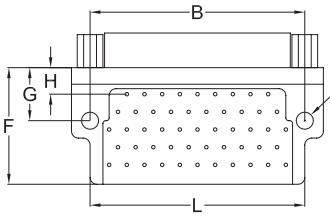
SEE AXON' REFERENCE

9-25 way connectors



Ø2.44 ±0.08 (.096 ±.003)
or THD INSERT 2-56 UNC 2B

31-51 way connectors



Ø2.44 ±0.08 (.096 ±.003)
or THD INSERT 2-56 UNC 2B

SEE CONTACT LAYOUT ON PCB PAGES 82 TO 85

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)	L max.
			Male	Female	Male	Female					
9 P / 9 S	19.94 .785	14.35 .565	7.41 .292	9.65 .380	3.40 .134	5.53 .218	6.80 .268	10.80 .425	6.35 .250	5.84 .230	-
15 P / 15 S	23.75 .935	18.16 .715	11.22 .442	13.46 .530	3.40 .134	5.53 .218	6.80 .268	10.80 .425	6.35 .250	3.30 .130	-
21 P / 21 S	27.56 1.085	21.97 .865	15.03 .592	17.27 .680	3.40 .134	5.53 .218	6.80 .268	10.80 .425	6.35 .250	3.30 .130	-
25 P / 25 S	30.10 1.185	24.51 .965	17.57 .692	19.81 .780	3.40 .134	5.53 .218	6.80 .268	10.80 .425	6.35 .250	3.30 .130	-
31 P / 31 S	33.91 1.335	28.32 1.115	21.38 .842	23.62 .930	3.40 .134	5.53 .218	6.80 .268	13.34 .525	6.35 .250	3.30 .130	27.69 1.090
37 P / 37 S	37.72 1.485	32.13 1.265	25.19 .992	27.43 1.080	3.40 .134	5.53 .218	6.80 .268	13.34 .525	6.35 .250	3.30 .130	30.23 1.190
51 P / 51 S	36.45 1.435	30.86 1.215	23.92 .942	26.16 1.030	4.50 .177	6.60 .260	7.90 .311	16.76 .660	7.62 .300	3.81 .150	31.24 1.230

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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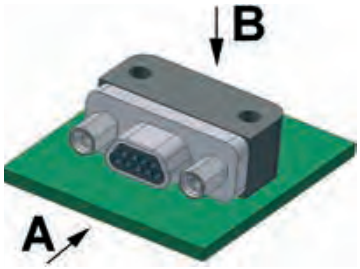
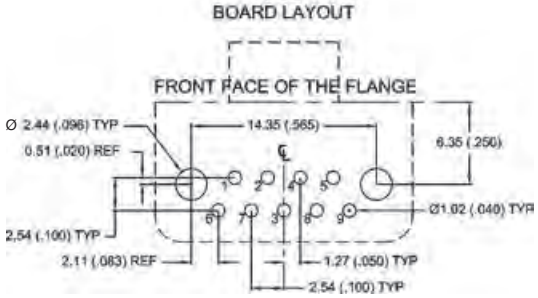
PCB LAYOUT FOR CBR TYPE 0.100" PITCH - MALE CONNECTORS

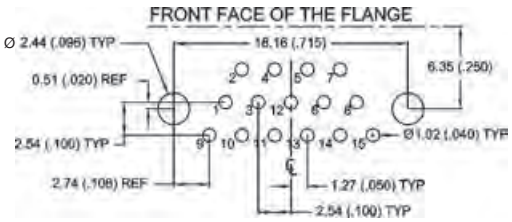
VIEW A



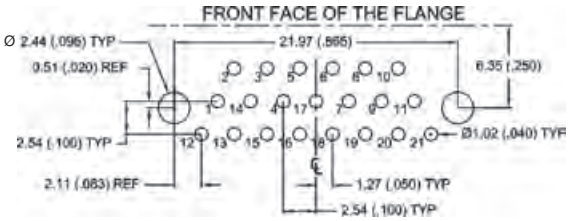
9 CONTACTS - VIEW B



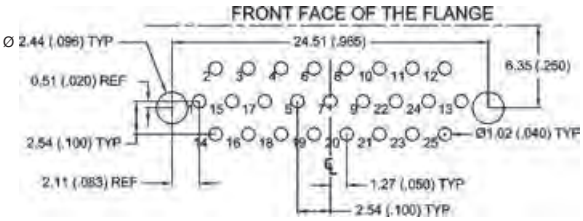
15 CONTACTS - VIEW B



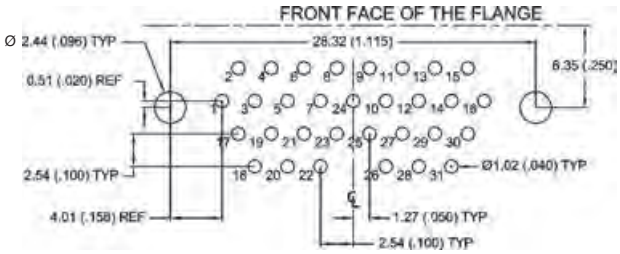
21 CONTACTS - VIEW B



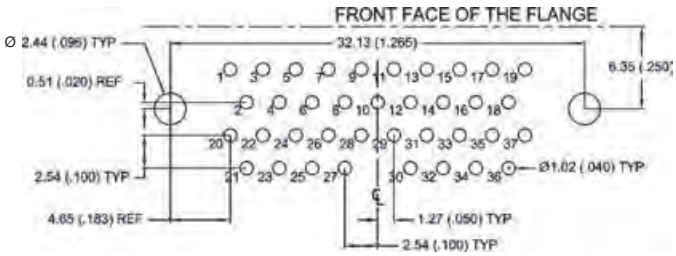
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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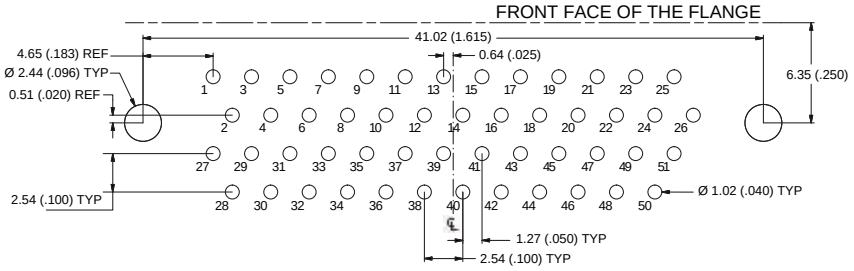
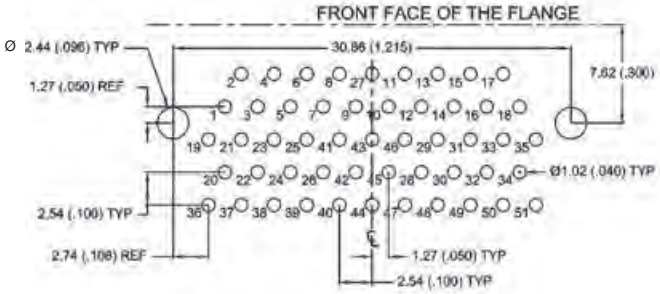
PCB LAYOUT FOR CBR TYPE 0.100" PITCH - MALE CONNECTORS

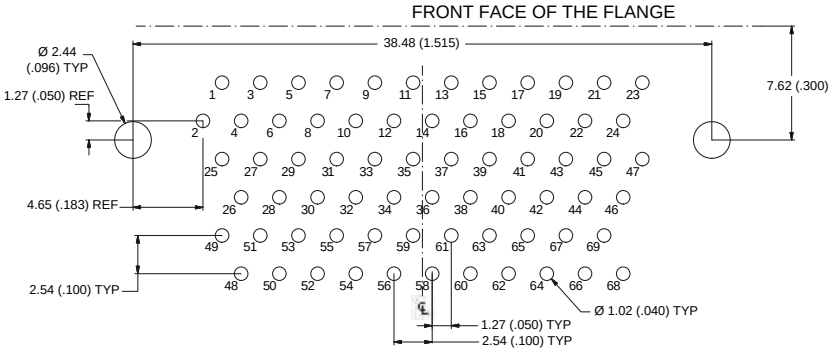
51 CONTACTS (DOUBLE ROW) - VIEW B



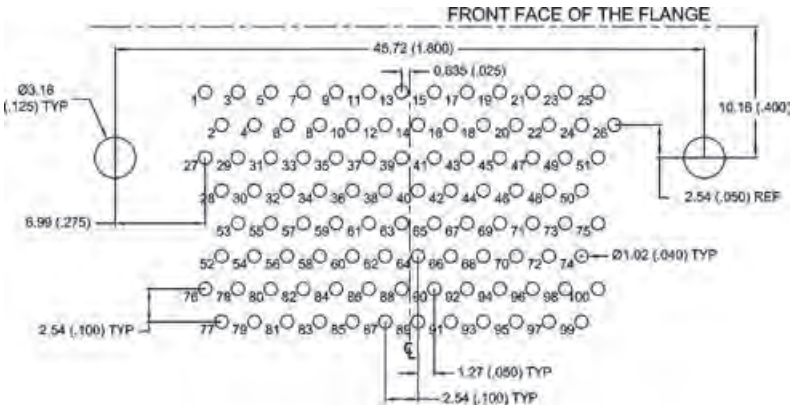
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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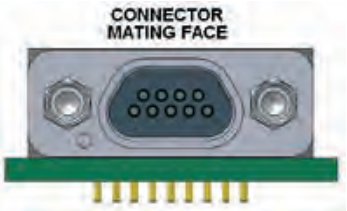
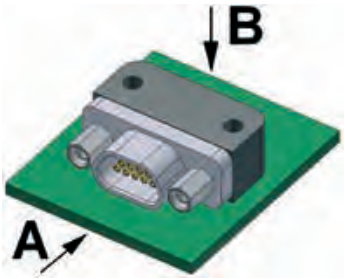
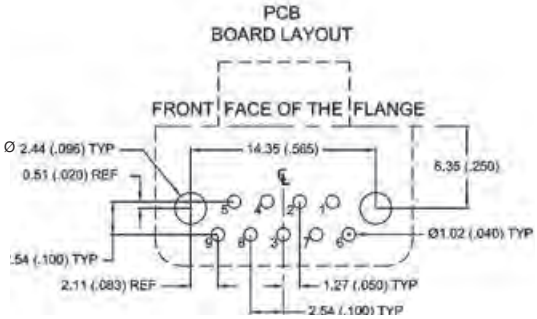
PCB LAYOUT FOR CBR TYPE 0.100" PITCH - FEMALE CONNECTORS

VIEW A

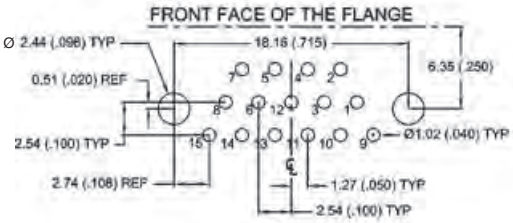




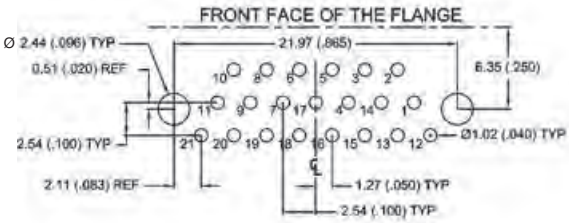
9 CONTACTS - VIEW B



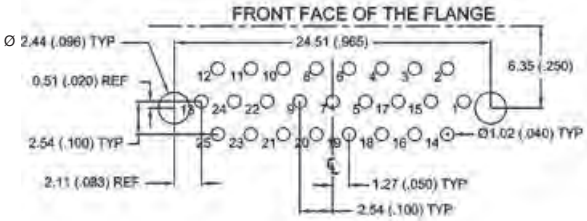
15 CONTACTS - VIEW B



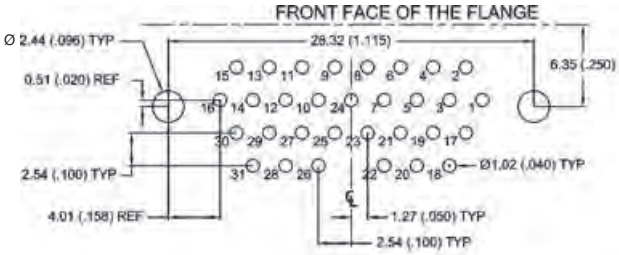
21 CONTACTS - VIEW B



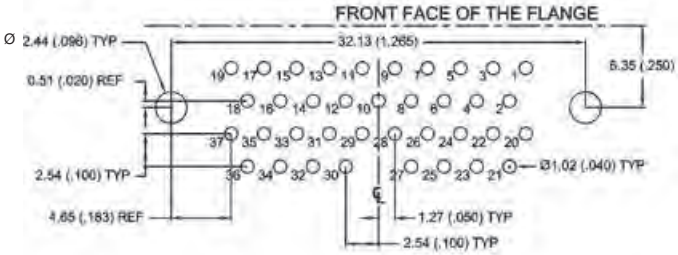
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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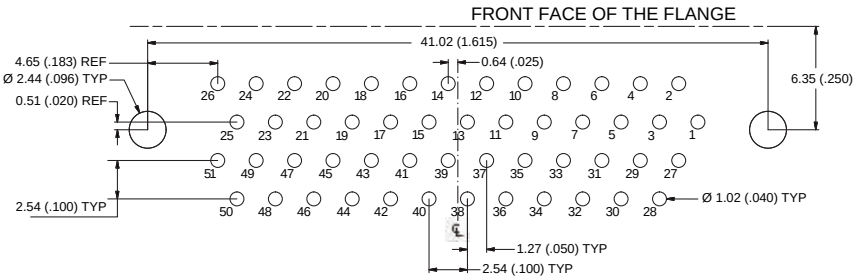
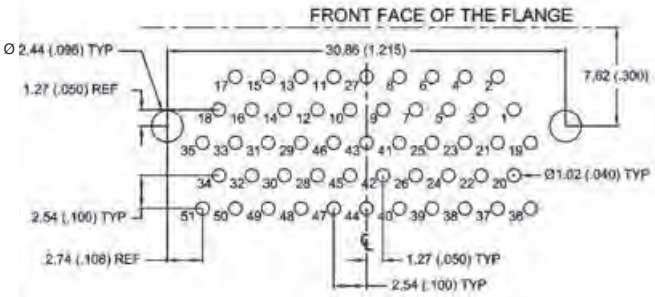
PCB LAYOUT FOR CBR TYPE 0.100" PITCH - FEMALE CONNECTORS

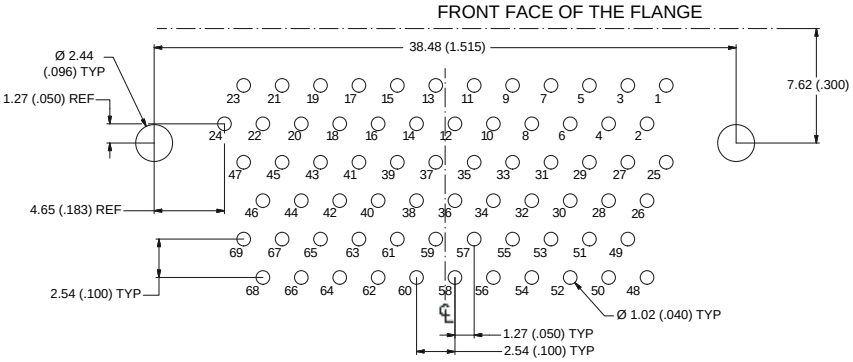
51 CONTACTS (DOUBLE ROW) - VIEW B



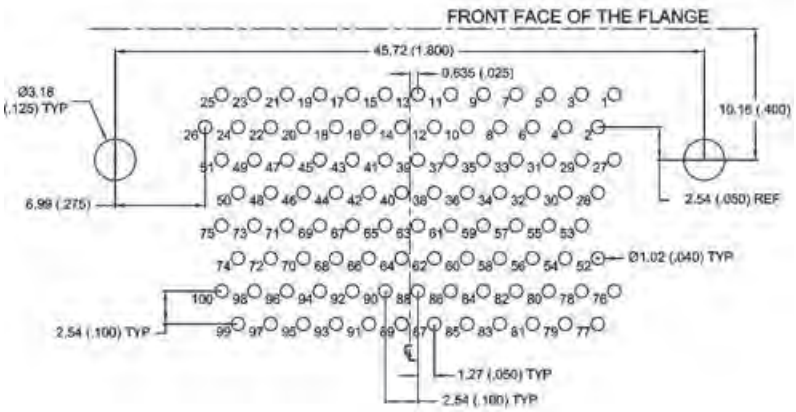
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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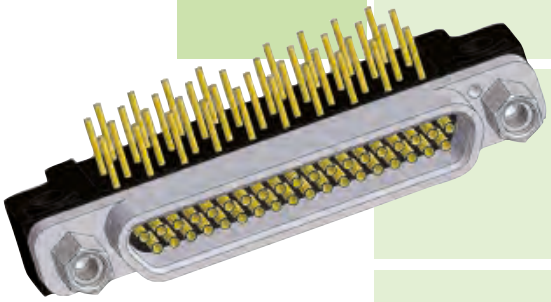

RECTANGULAR CONNECTORS

CBP TYPE

LOW PROFILE CBR 0.100" PITCH

METAL SHELL

- Low profile condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature: 150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA	2	L51	S	CBP	P	G	3

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS
L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.
See pages 26 & 27 for contact arrangements.

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

PCB VERSION
CBP: 0.100" Condensed Board Roght Angle, low profile.

HARDWARE
B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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
G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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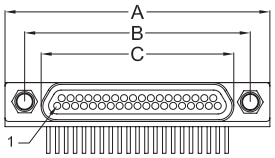
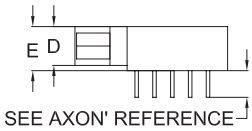
DIMENSIONS

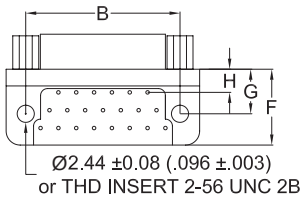
Dimensions are in millimetres (inches).

FEMALE connector

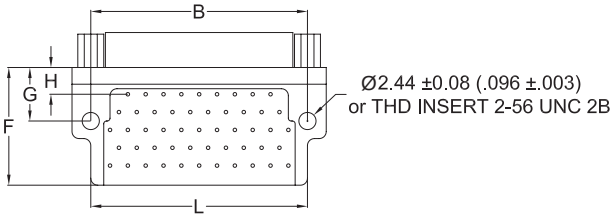




9-25 way connectors



31-51 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 90 & 91

	A ± 0.25 (±.010)	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)	L max.
			Male	Female	Male	Female					
9 P / 9 S	19.94 .785	14.35 .565	7.47 .294	9.65 .380	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	5.84 .230	-
15 P / 15 S	23.75 .935	18.16 .715	11.28 .444	13.46 .530	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
21 P / 21 S	27.56 1.085	21.97 .865	15.09 .594	17.27 .680	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
25 P / 25 S	30.10 1.185	24.51 .965	17.63 .694	19.81 .780	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
31 P / 31 S	33.91 1.335	28.32 1.115	21.44 .844	23.62 .930	3.40 .134	5.53 .218	5.70 .224	13.34 .525	6.35 .250	3.30 .130	27.69 1.090
37 P / 37 S	37.72 1.485	32.13 1.265	25.25 .994	27.43 1.080	3.40 .134	5.53 .218	5.70 .224	13.34 .525	6.35 .250	3.30 .130	30.23 1.100
51 P / 51 S	36.45 1.435	30.86 1.215	23.98 .944	26.16 1.030	4.50 .177	6.60 .260	6.81 .268	16.76 .660	7.62 .300	3.81 .150	31.24 1.230

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0,5 oz)
CONTACT RETENTION	2,26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's - No discontinuity > 1µs
SHOCK	50g's - No discontinuity > 1µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULENT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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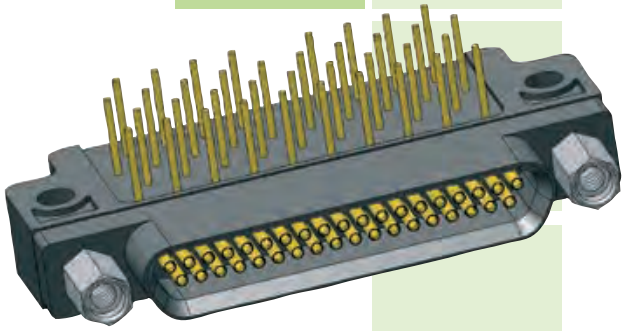

PCB RECTANGULAR CONNECTORS

CBP TYPE

LOW PROFILE CBR 0.100" PITCH

PLASTIC SHELL

- Low profile condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA L 37 S CBP P G 3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

P: LCP shell + potting 150°C.
L: LCP 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).

PCB VERSION

CBP: 0.100" Condensed Board Right Angle, low profile.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

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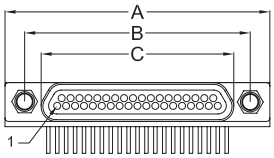
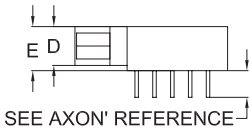
DIMENSIONS

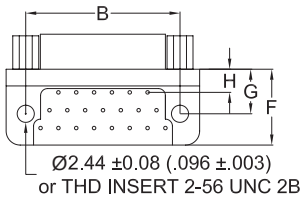
Dimensions are in millimetres (inches).

FEMALE connector

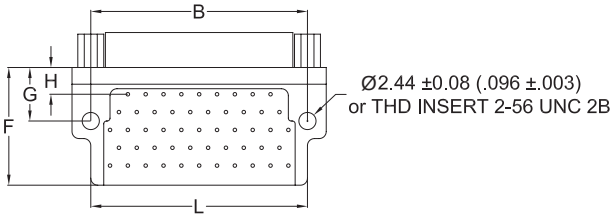




9-25 way connectors



31-51 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 90 & 91

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)	L max.
			Male	Female	Male	Female					
9 P / 9 S	19.94 .785	14.35 .565	7.41 .292	9.65 .380	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	5.84 .230	-
15 P / 15 S	23.75 .935	18.16 .715	11.22 .442	13.46 .530	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
21 P / 21 S	27.56 1.085	21.97 .865	15.03 .592	17.27 .680	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
25 P / 25 S	30.10 1.185	24.51 .965	17.57 .692	19.81 .780	3.40 .134	5.53 .218	5.70 .224	10.80 .425	6.35 .250	3.30 .130	-
31 P / 31 S	33.91 1.335	28.32 1.115	21.38 .842	23.62 .930	3.40 .134	5.53 .218	5.70 .224	13.34 .525	6.35 .250	3.30 .130	27.69 1.090
37 P / 37 S	37.72 1.485	32.13 1.265	25.19 .992	27.43 1.080	3.40 .134	5.53 .218	5.70 .224	13.34 .525	6.35 .250	3.30 .130	30.23 1.100
51 P / 51 S	36.45 1.435	30.86 1.215	23.92 .942	26.16 1.030	4.50 .177	6.60 .260	6.81 .268	16.76 .660	7.62 .300	3.81 .150	31.24 1.230

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, Gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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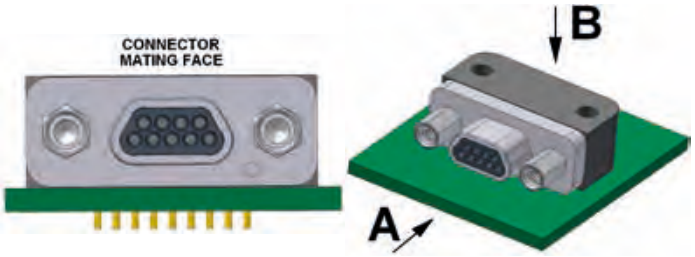
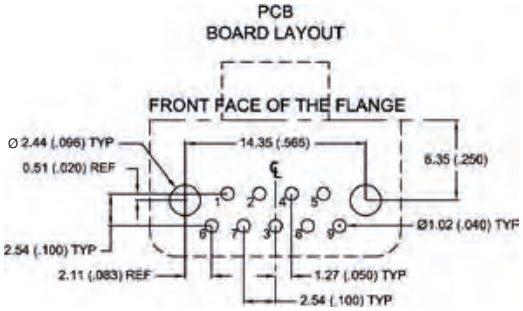
PCB LAYOUT FOR CBP TYPE 0.100" PITCH - MALE CONNECTORS

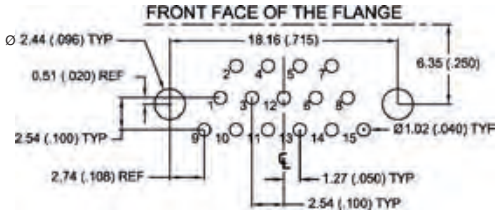
VIEW A



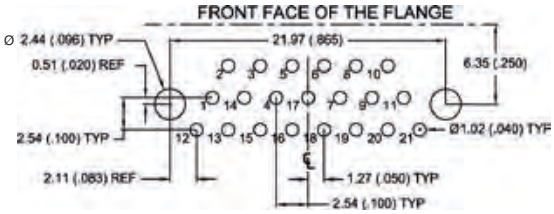
9 CONTACTS - VIEW B



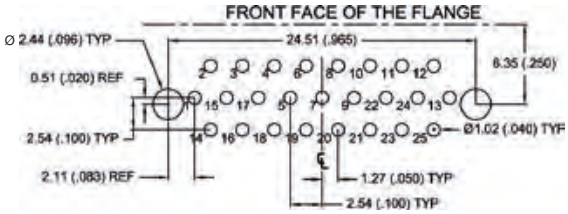
15 CONTACTS - VIEW B



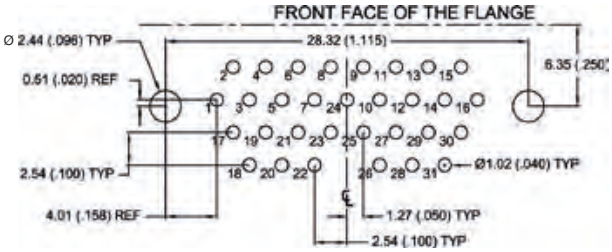
21 CONTACTS - VIEW B



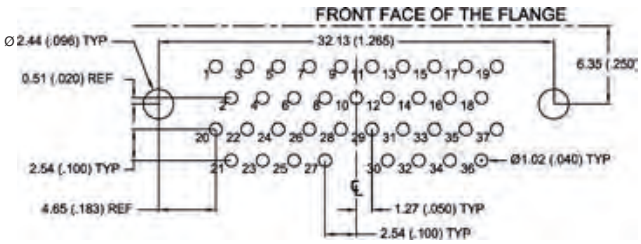
25 CONTACTS - VIEW B



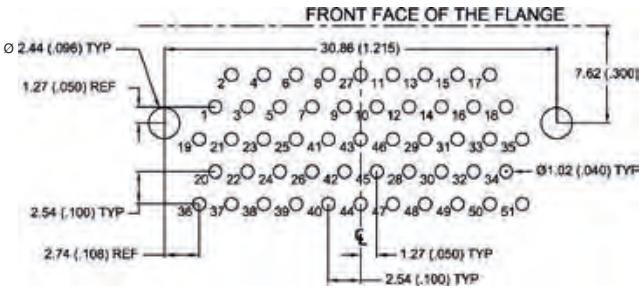
31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



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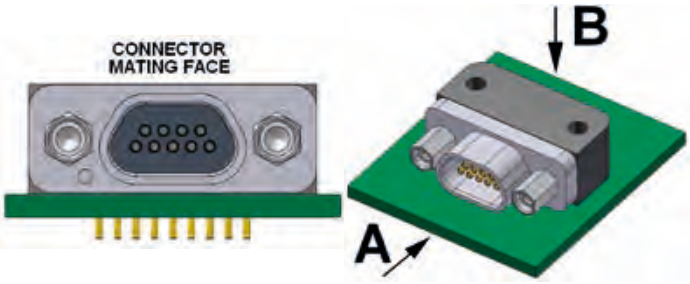
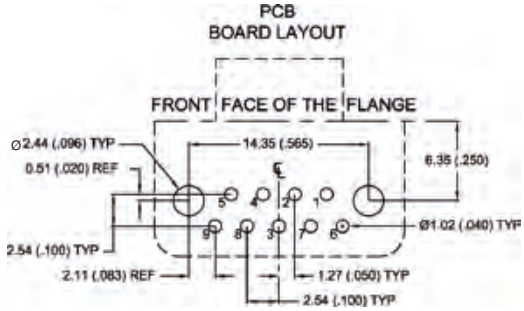
PCB LAYOUT FOR CBP TYPE 0.100" PITCH - FEMALE CONNECTORS

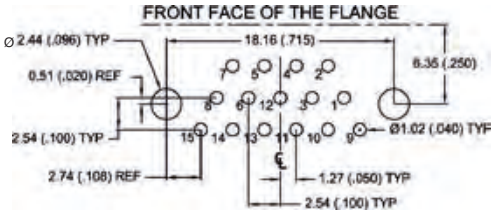
VIEW A



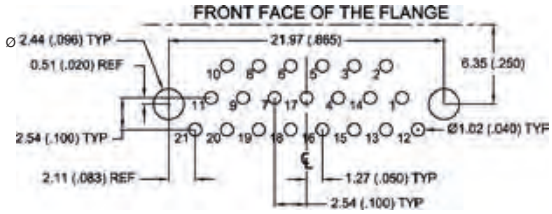
9 CONTACTS - VIEW B



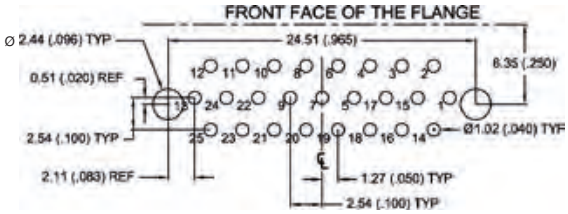
15 CONTACTS - VIEW B



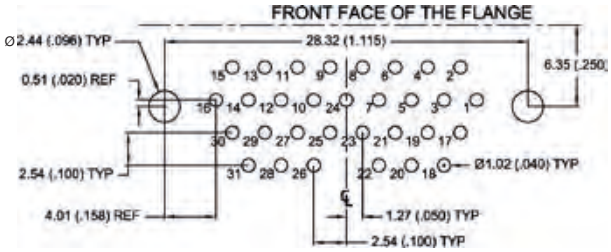
21 CONTACTS - VIEW B



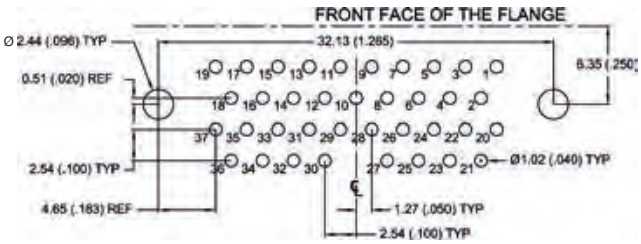
25 CONTACTS - VIEW B



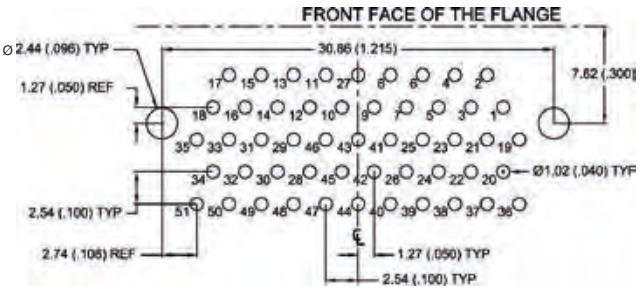
31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



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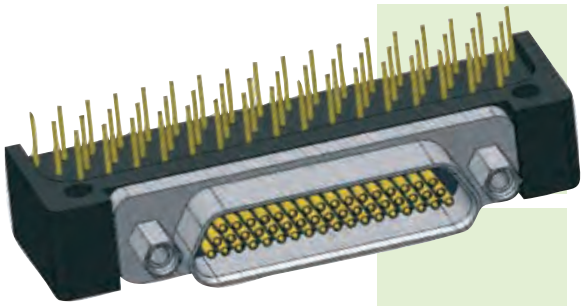

PCB RECTANGULAR CONNECTORS

BR TYPE

0.100" PITCH

METAL SHELL

- Board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature: 150°C or 200°C.
- Several tail lengths available.

PLEASE CONTACT US FOR CLASS P (PLASTIC) BR CONNECTORS.

IDENTIFICATION CODE

MDA 2 51 S BR P G 3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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

BR: 0.100" Board Right Angle.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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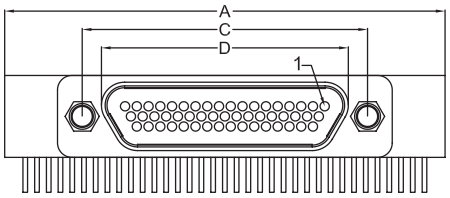
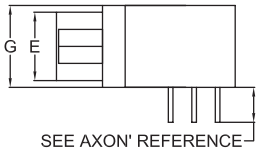
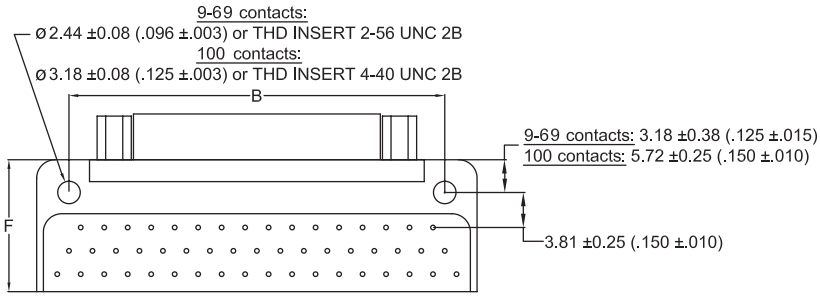
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector







SEE CONTACT LAYOUT ON PCB PAGES 94 TO 97

	A max.	B ± 0.18 (±.007)	C ± 0.13 (±.005)	D max.		E max.		F max.	G ± 0.25 (±.010)
				Male	Female	Male	Female		
9 P / 9 S	35.31 1.390	29.21 1.150	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	11.81 .465	7.87 .310
15 P / 15 S	39.12 1.540	33.02 1.300	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	11.81 .465	7.87 .310
21 P / 21 S	42.93 1.690	36.83 1.450	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	11.81 .465	7.87 .310
25 P / 25 S	45.47 1.790	39.37 1.550	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	11.81 .465	7.87 .310
31 P / 31 S	51.82 2.040	45.72 1.800	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	11.81 .465	7.87 .310
37 P / 37 S	59.44 2.340	53.34 2.100	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	11.81 .465	7.87 .310
51DR P / 51DR S	77.30 3.043	71.12 2.800	41.02 1.615	35.15 1.384	36.83 1.450	4.69 .185	6.35 .250	11.81 .465	7.87 .310
51 P / 51 S	47.63 1.875	40.64 1.600	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	14.35 .565	8.76 .345
69 P / 69 S	62.87 2.475	55.88 2.200	38.48 1.515	32.61 1.284	34.29 1.350	5.79 .228	7.44 .293	14.35 .565	8.76 .345
100 P / 100 S	70.61 2.780	63.50 2.500	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	19.43 .765	10.29 .405

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. x number of contacts
CONTACT SEPARATING FORCE	14 g min. x number of contacts
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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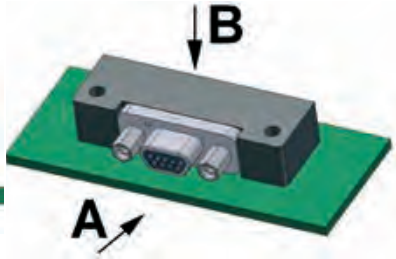
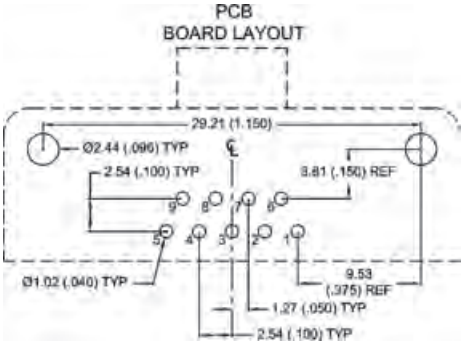
PCB LAYOUT FOR BR TYPE 0.100" PITCH - MALE CONNECTORS

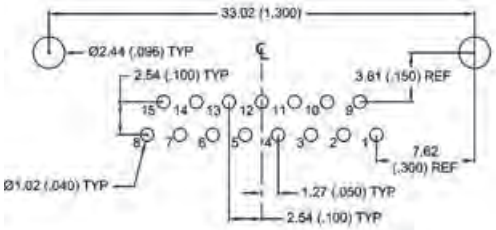
VIEW A



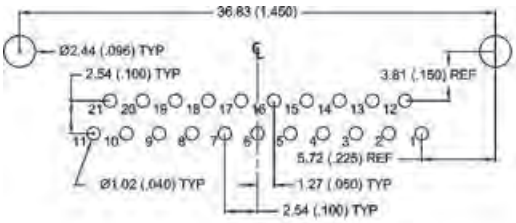
9 CONTACTS - VIEW B



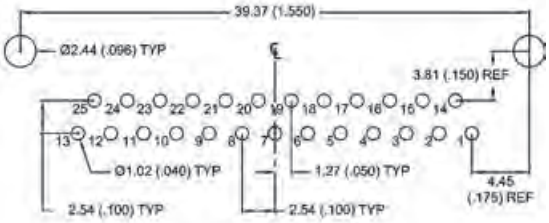
15 CONTACTS - VIEW B



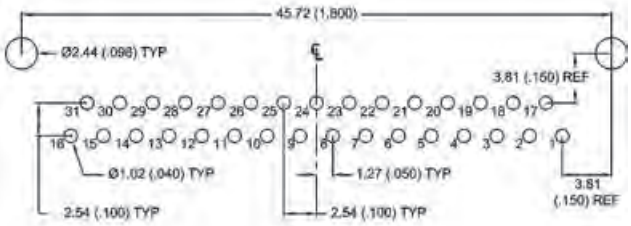
21 CONTACTS - VIEW B



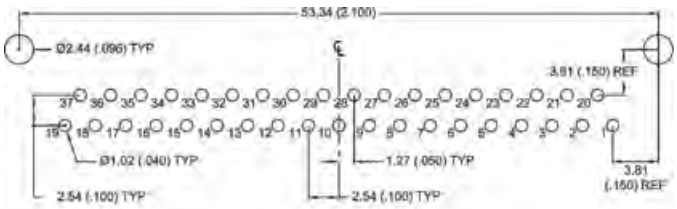
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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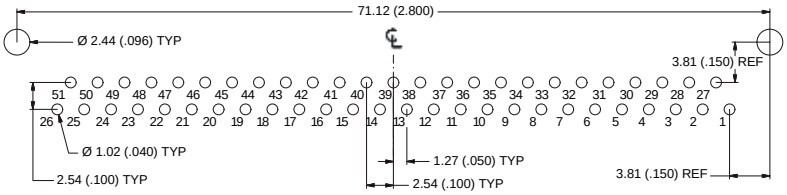
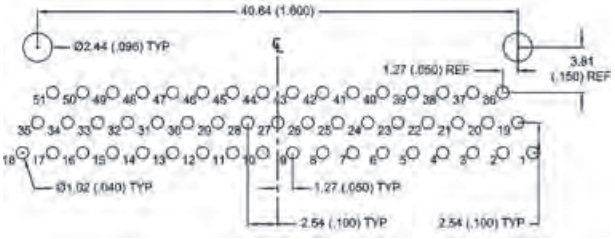
PCB LAYOUT FOR BR TYPE 0.100" PITCH - MALE CONNECTORS

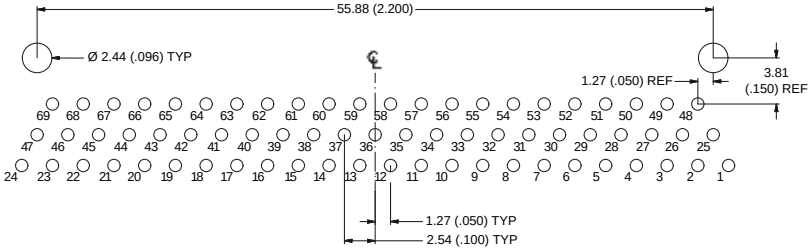
51 CONTACTS (DOUBLE ROW) - VIEW B



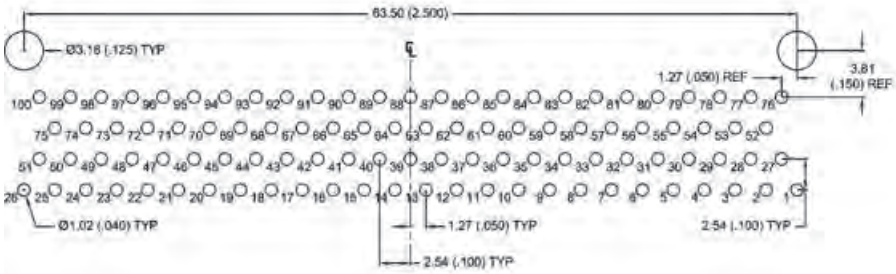
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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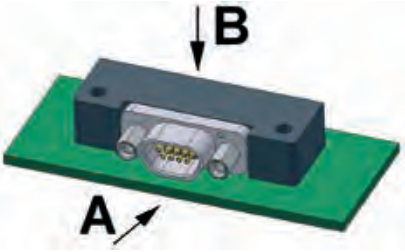
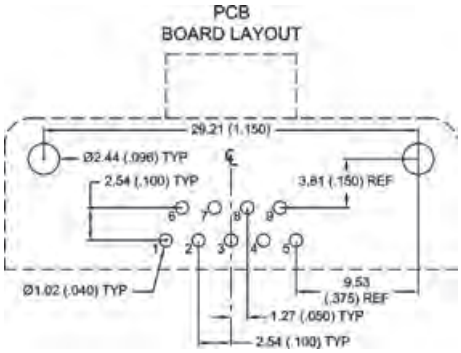
PCB LAYOUT FOR BR TYPE 0.100" PITCH - FEMALE CONNECTORS

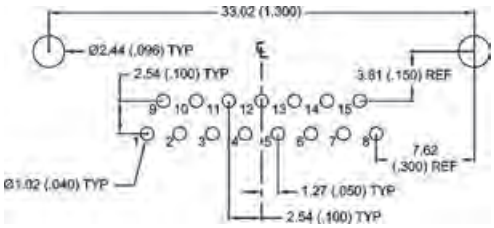
VIEW A



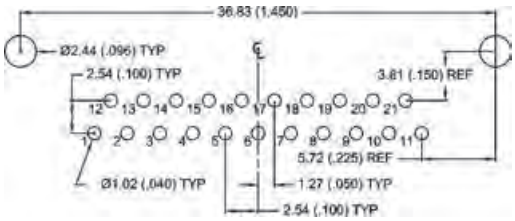
9 CONTACTS - VIEW B



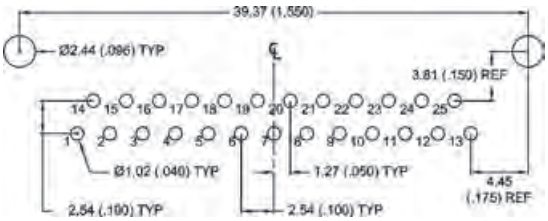
15 CONTACTS - VIEW B



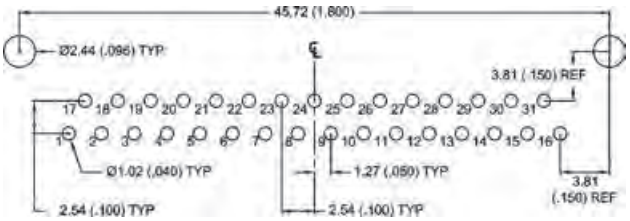
21 CONTACTS - VIEW B



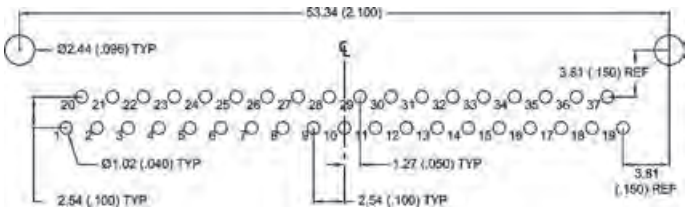
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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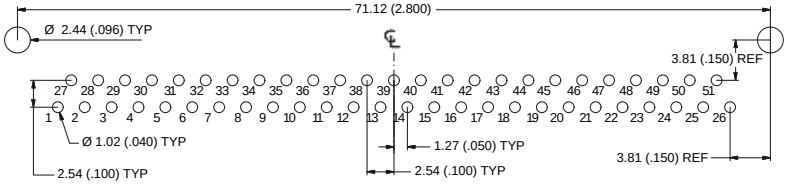
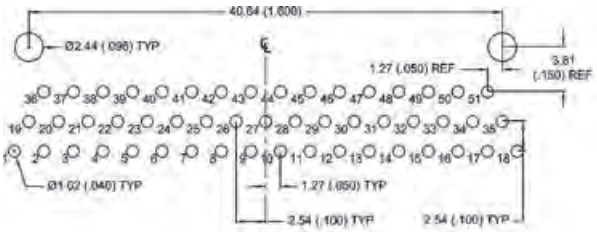
PCB LAYOUT FOR BR TYPE 0.100" PITCH - FEMALE CONNECTORS

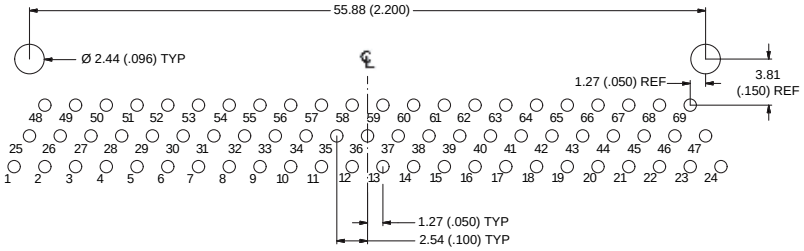
51 CONTACTS (DOUBLE ROW) - VIEW B



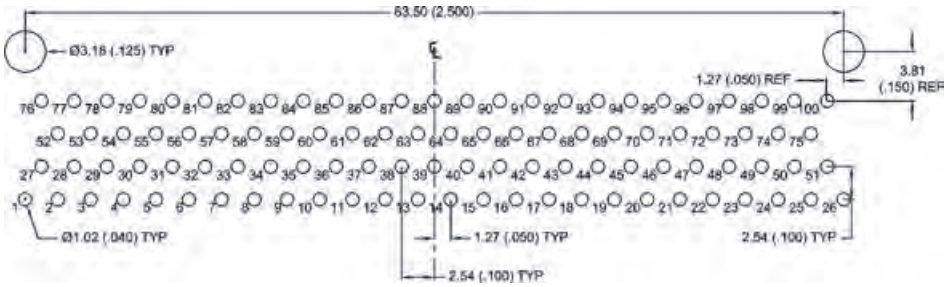
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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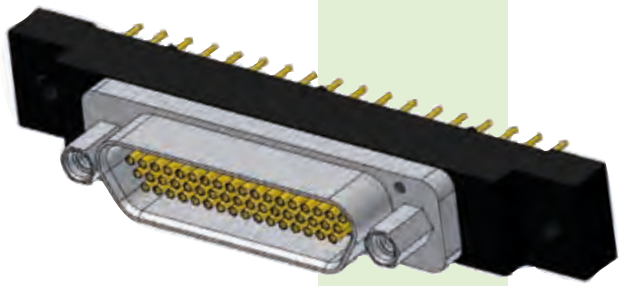

PCB RECTANGULAR CONNECTORS

BS TYPE

0.100" PITCH

METAL SHELL

- Board straight connector for flexible and rigid printed circuit boards.
- Operating temperature: 150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA	2	51	S	BS	P	G	3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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

BS: 0.100" Board Straight.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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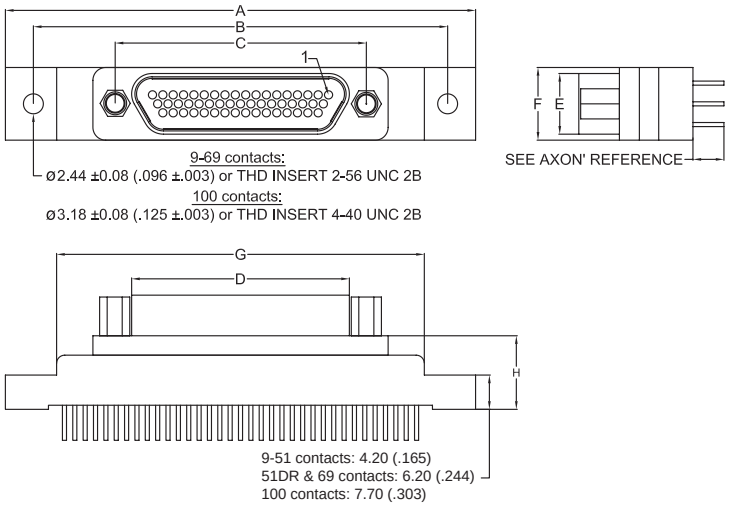
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



SEE CONTACT LAYOUT ON PCB PAGES 102 & 105

	A max.	B ± 0.18 (±.007)	C ± 0.13 (±.005)	D max.		E max.		F max.	G max.	H max.
				Male	Female	Male	Female			
9 P / 9 S	35.31 1.390	29.21 1.150	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	19.94 .785	9.02 .355
15 P / 15 S	35.31 1.390	29.21 1.150	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	24.00 .945	9.02 .355
21 P / 21 S	42.93 1.690	36.83 1.450	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.82 .308	29.72 1.170	9.02 .355
25 P / 25 S	44.20 1.740	38.10 1.500	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	32.39 1.275	9.02 .355
31 P / 31 S	51.82 2.040	45.72 1.800	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.82 .308	40.01 1.575	9.02 .355
37 P / 37 S	59.44 2.340	53.34 2.100	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.82 .308	47.63 1.875	9.02 .355
51DR P / 51DR S	77.30 3.043	71.12 2.800	41.02 1.615	35.15 1.384	36.83 1.450	4.69 .185	6.35 .250	7.82 .308	65.47 2.578	11.02 .434
51 P / 51 S	57.66 2.270	50.80 2.000	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.92 .351	45.09 1.775	9.02 .355
69 P / 69 S	72.90 2.870	66.04 2.600	38.48 1.515	32.61 1.284	34.29 1.350	5.79 .228	7.44 .293	8.92 .351	60.33 2.375	11.02 .434
100 P / 100 S	82.55 3.250	71.12 2.800	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	11.68 .460	65.66 2.585	13.97 .550

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km: 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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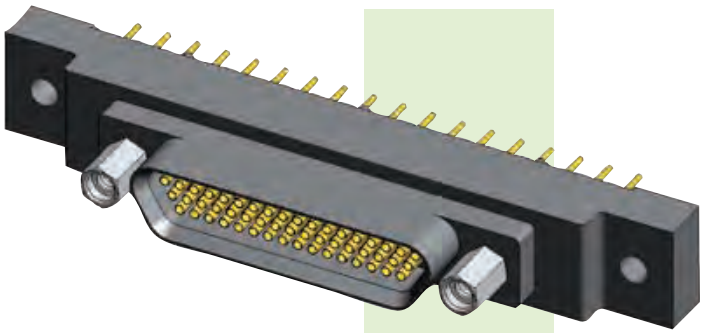

PCB RECTANGULAR CONNECTORS

BS TYPE

0.100" PITCH

PLASTIC SHELL

- Board straight connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA P 51 S BS P G 3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

P: LCP shell + potting 150°C.
L: LCP 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).

PCB VERSION

BS: 0.100" Board Straight.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

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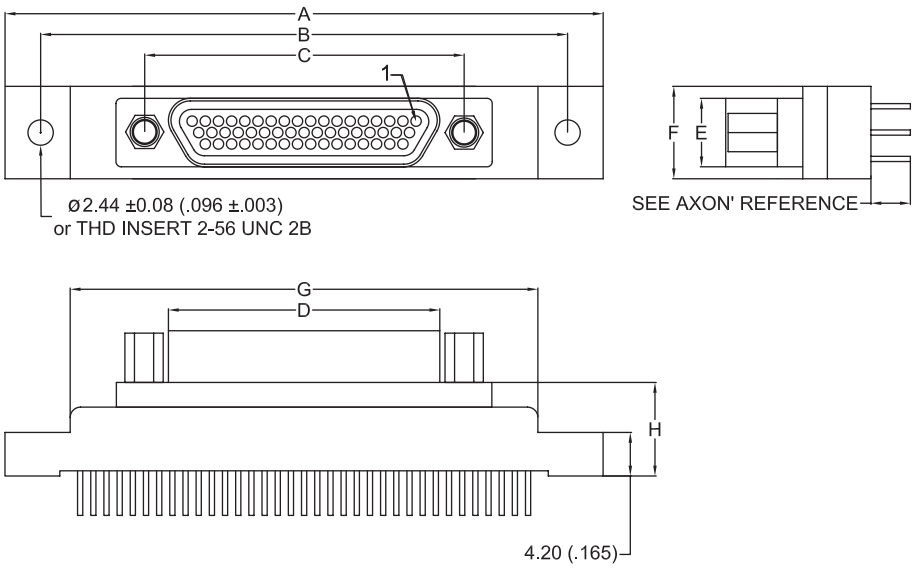
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



SEE CONTACT LAYOUT ON PCB PAGES 102 & 105

	A max.	B ± 0.18 (±.007)	C ± 0.13 (±.005)	D max.		E max.		F max.	G max.	H max.
				Male	Female	Male	Female			
9 P / 9 S	35.31 1.390	29.21 1.150	14.35 .565	7.41 .292	9.65 .380	3.40 .134	5.53 .218	7.82 .308	22.48 .885	9.02 .355
15 P / 15 S	35.31 1.390	29.21 1.150	18.16 .715	11.22 .442	13.46 .530	3.40 .134	5.53 .218	7.82 .308	24.00 .945	9.02 .355
21 P / 21 S	42.93 1.690	36.83 1.450	21.97 .865	15.03 .592	17.27 .680	3.40 .134	5.53 .218	7.82 .308	30.10 1.185	9.02 .355
25 P / 25 S	44.20 1.740	38.10 1.500	24.51 .965	17.57 .692	19.81 .780	3.40 .134	5.53 .218	7.82 .308	32.39 1.275	9.02 .355
31 P / 31 S	51.82 2.040	45.72 1.800	28.32 1.115	21.38 .842	23.62 .930	3.40 .134	5.53 .218	7.82 .308	40.01 1.575	9.02 .355
37 P / 37 S	59.44 2.340	53.34 2.100	32.13 1.265	25.19 .992	27.43 1.080	3.40 .134	5.53 .218	7.82 .308	47.63 1.875	9.02 .355
51 P / 51 S	57.66 2.270	50.80 2.000	30.86 1.215	23.92 .942	26.16 1.030	4.50 .177	6.60 .260	8.92 .351	45.09 1.775	9.02 .355

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, Gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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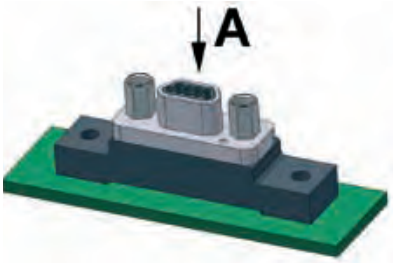
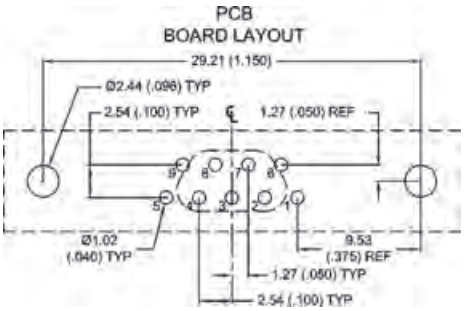
PCB LAYOUT FOR BS TYPE 0.100" PITCH - MALE CONNECTORS

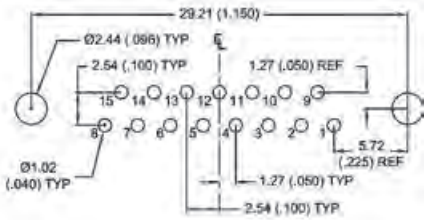
VIEW A



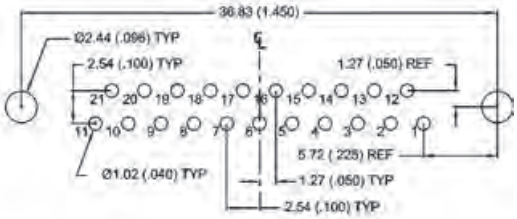
9 CONTACTS - VIEW A



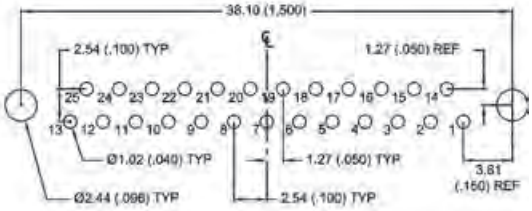
15 CONTACTS - VIEW A



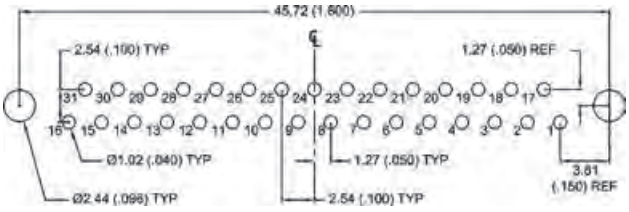
21 CONTACTS - VIEW A



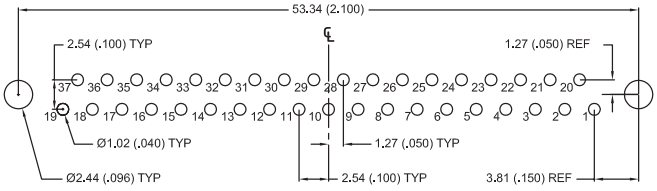
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



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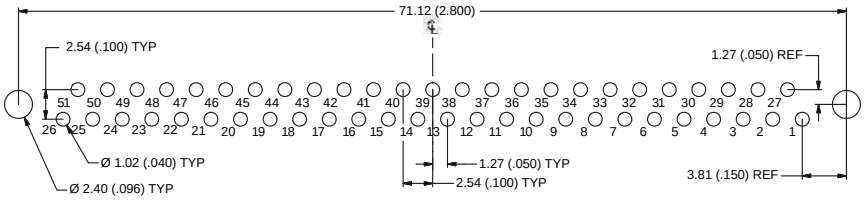
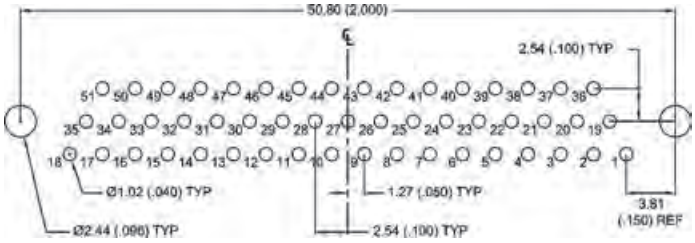
PCB LAYOUT FOR BS TYPE 0.100" PITCH - MALE CONNECTORS

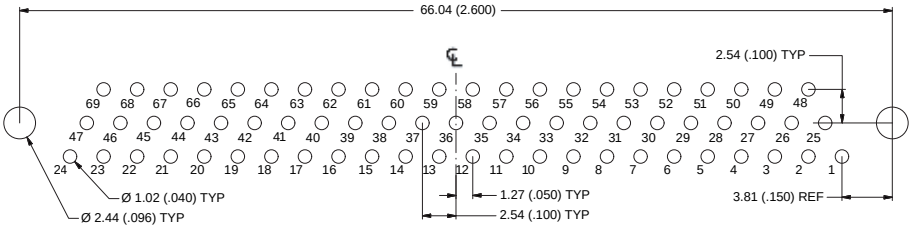
51 CONTACTS (DOUBLE ROW) - VIEW A



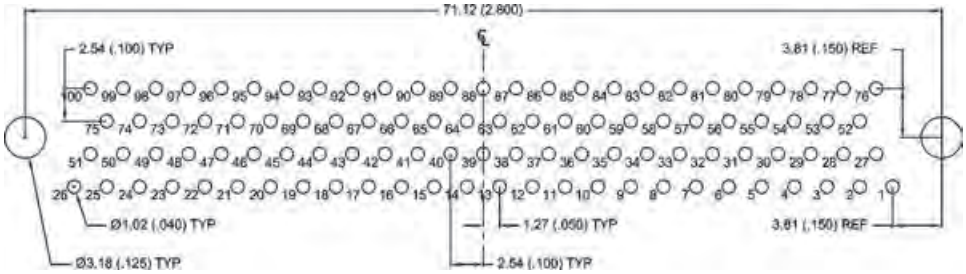
51 CONTACTS - VIEW A



69 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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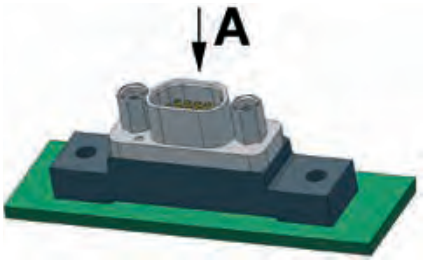
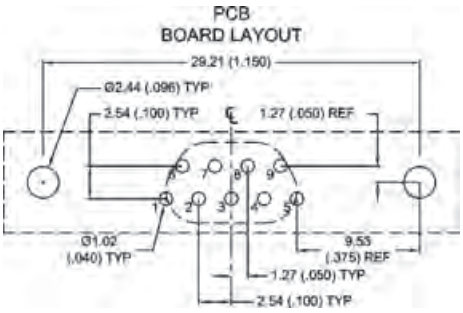
PCB LAYOUT FOR BS TYPE 0.100" PITCH - FEMALE CONNECTORS

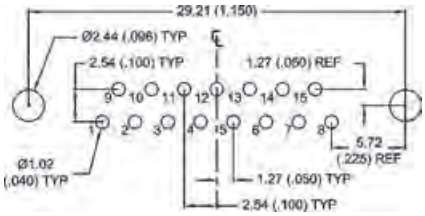
VIEW A



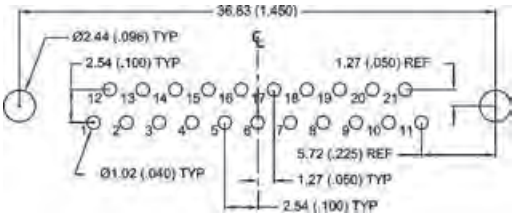
9 CONTACTS - VIEW A



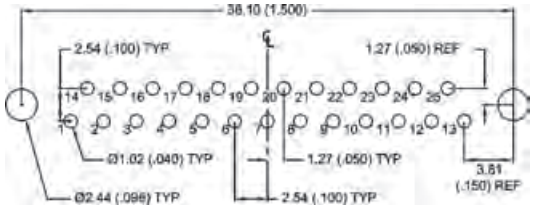
15 CONTACTS - VIEW A



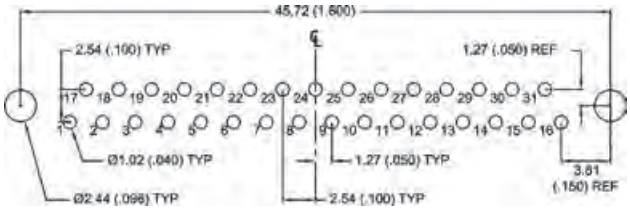
21 CONTACTS - VIEW A



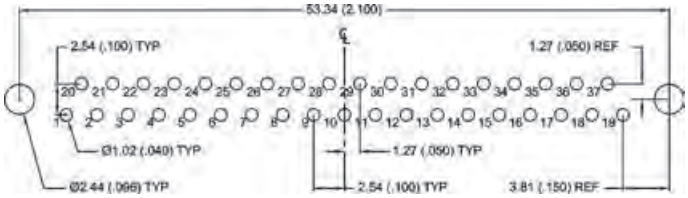
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



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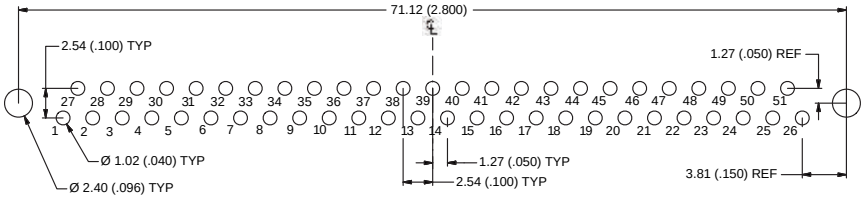
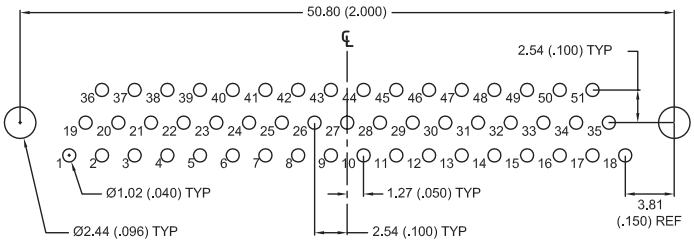
PCB LAYOUT FOR BS TYPE 0.100" PITCH - FEMALE CONNECTORS

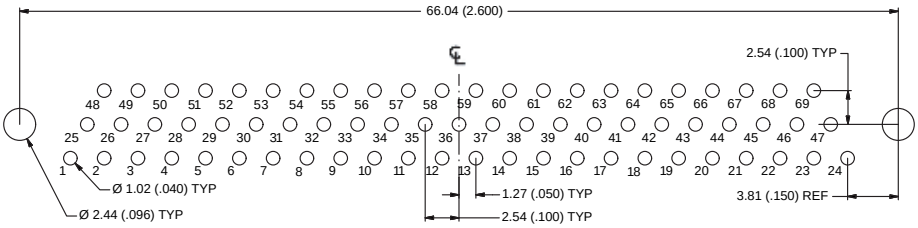
51 CONTACTS (DOUBLE ROW) - VIEW A



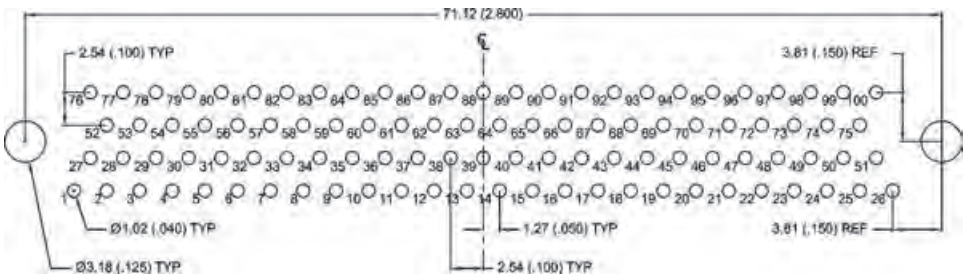
51 CONTACTS - VIEW A



69 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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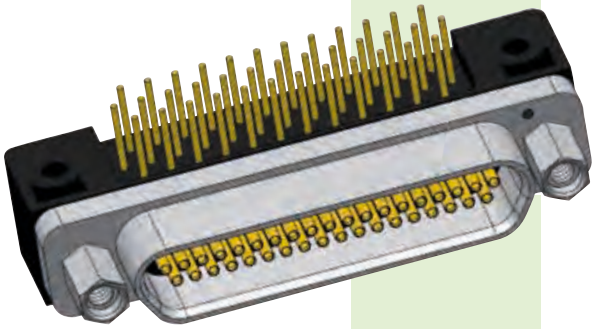

PCB RECTANGULAR CONNECTORS

CBR TYPE

0.075" PITCH

METAL SHELL

- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

PLEASE CONTACT US FOR A PLASTIC VERSION OF 0.075" RIGHT ANGLE CONNECTOR.

IDENTIFICATION CODE

MDA 2 51 S 75RB P G 3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

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

75RB: 0.075" pitch condensed board right angle specific layout.
Other option available 75RC see page 112.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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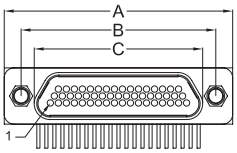
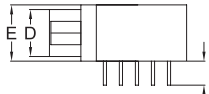
DIMENSIONS

Dimensions are in millimetres (inches).

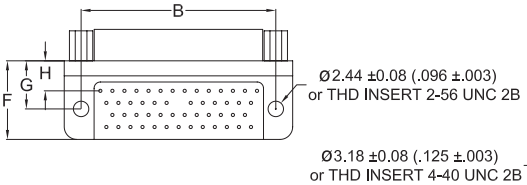
FEMALE connector



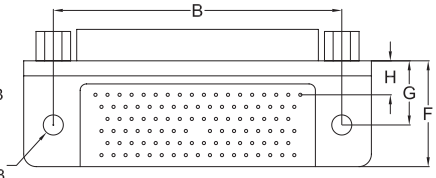


SEE AXON' REFERENCE

9-69 way connectors



100 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 108 TO 111

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)
			Male	Female	Male	Female				
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	5.40 .213
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
51DR P / 51DR S	46.61 1.835	41.02 1.615	35.15 1.384	36.83 1.450	4.69 .185	6.35 .250	7.82 .308	10.16 .400	6.35 .250	4.45 .175
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.92 .351	12.45 .490	7.62 .300	4.76 .188
69 P / 69 S	44.07 1.735	38.48 1.515	32.61 1.284	34.29 1.350	5.79 .228	7.44 .293	8.92 .351	12.45 .490	7.62 .300	4.76 .188
100 P / 100 S	55.12 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	10.01 .394	16.76 .660	10.16 .400	5.40 .213

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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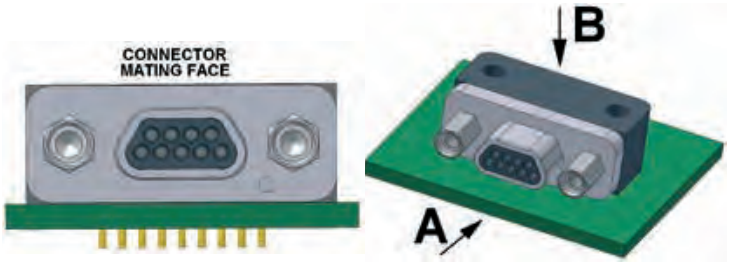
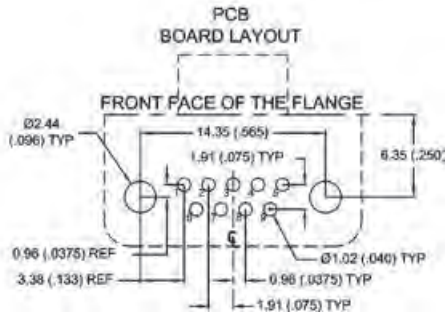
PCB LAYOUT FOR CBR TYPE 0.075" PITCH - MALE CONNECTORS

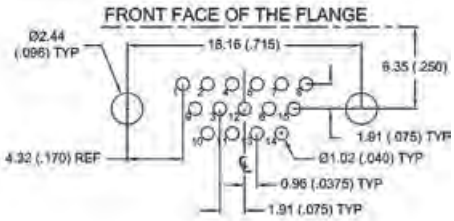
VIEW A



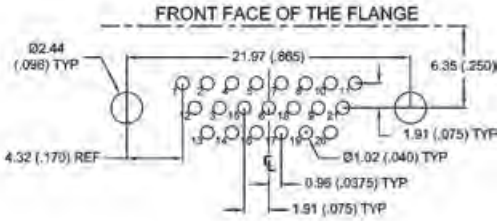
9 CONTACTS - VIEW B



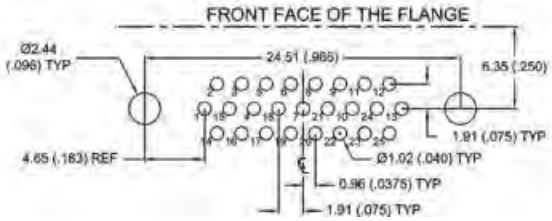
15 CONTACTS - VIEW B



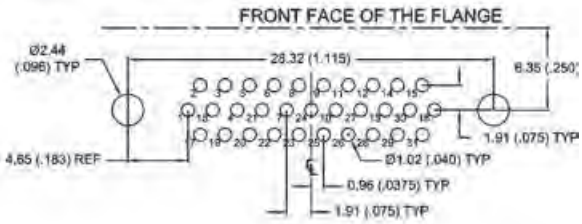
21 CONTACTS - VIEW B



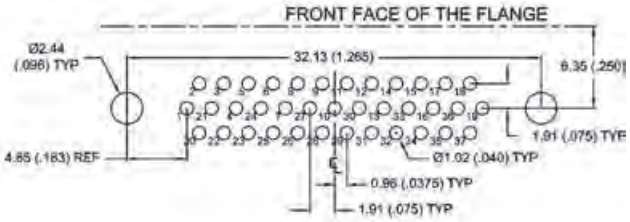
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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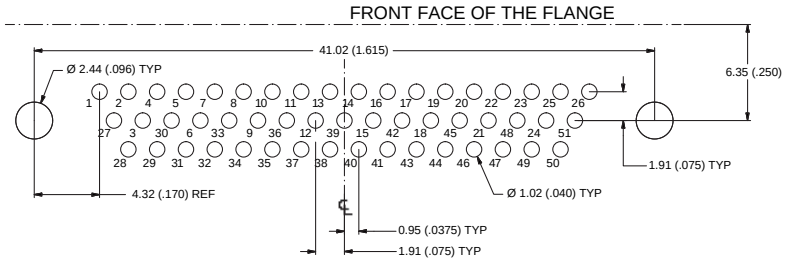
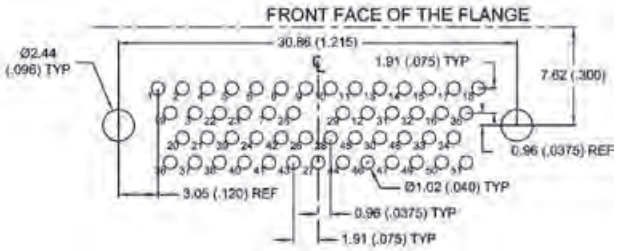
PCB LAYOUT FOR CBR TYPE 0.075" PITCH - MALE CONNECTORS

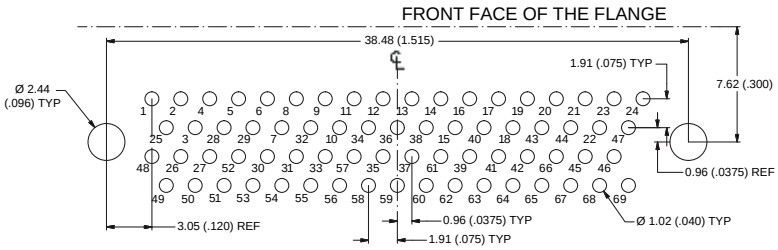
51 CONTACTS (DOUBLE ROW) - VIEW B



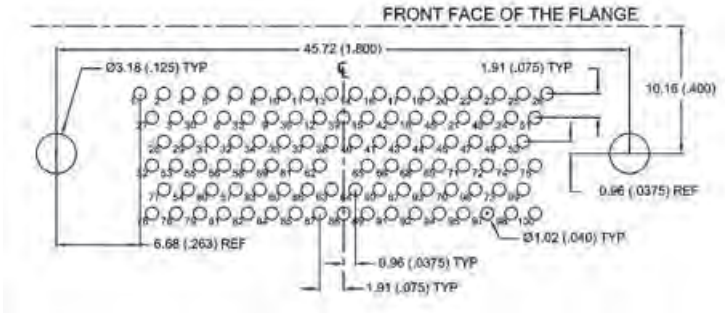
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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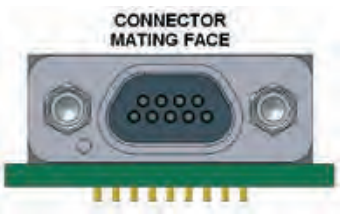
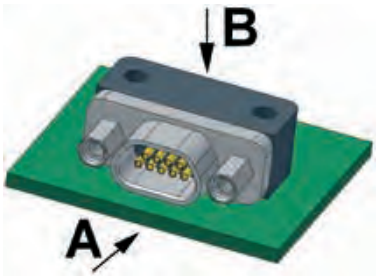
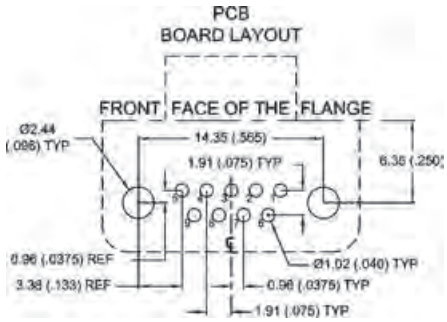
PCB LAYOUT FOR CBR TYPE 0.075" PITCH - FEMALE CONNECTORS

VIEW A

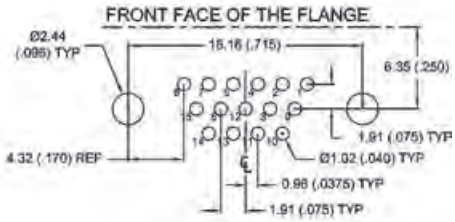




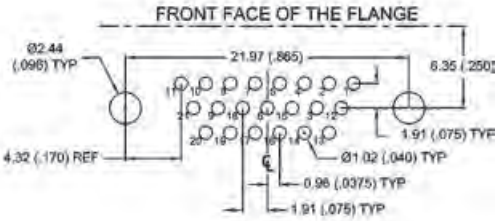
9 CONTACTS - VIEW B



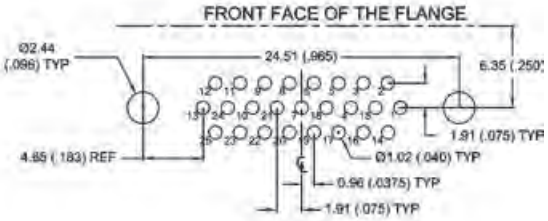
15 CONTACTS - VIEW B



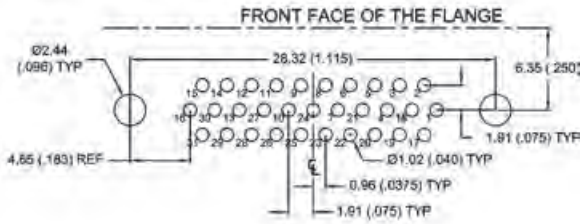
21 CONTACTS - VIEW B



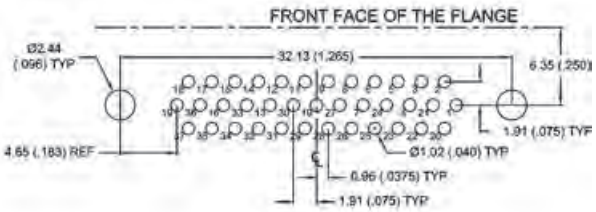
25 CONTACTS - VIEW B



31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



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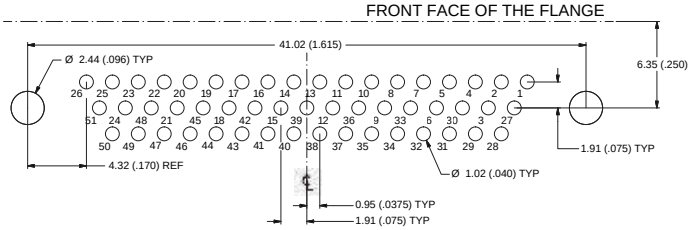
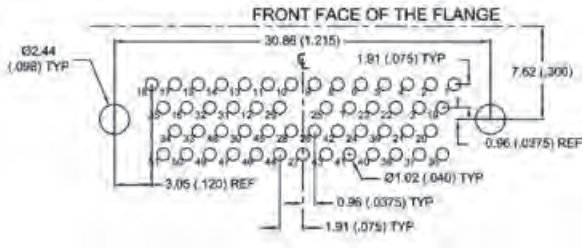
PCB LAYOUT FOR CBR TYPE 0.075" PITCH - FEMALE CONNECTORS

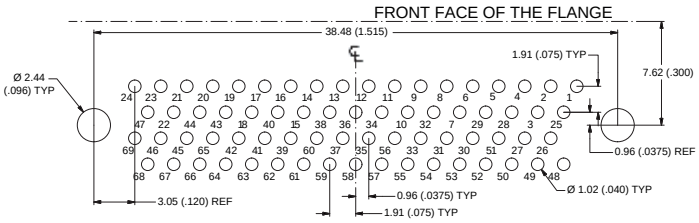
51 CONTACTS (DOUBLE ROW) - VIEW B



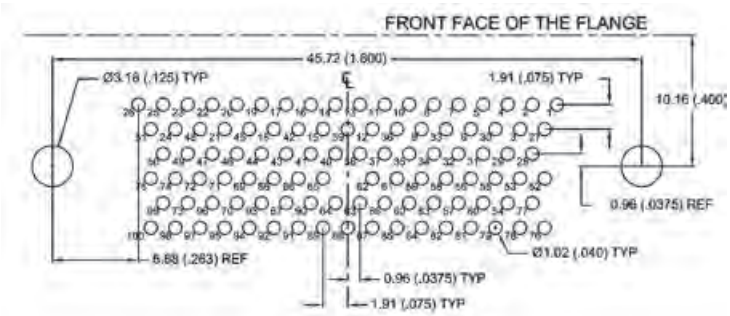
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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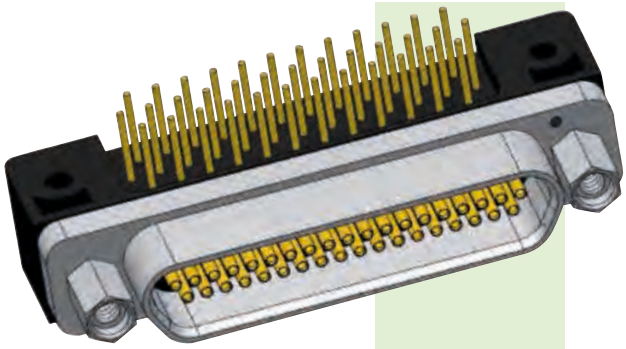

PCB RECTANGULAR CONNECTORS

CBR TYPE

0.075" PITCH

METAL SHELL BASED ON BS MIL STANDARD LAYOUT

- Condensed board right angle connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

PLEASE CONTACT US FOR A PLASTIC VERSION OF 0.075" RIGHT ANGLE CONNECTOR.

IDENTIFICATION CODE

MDA	2	51	S	75RC	P	G	3

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS

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

CONNECTOR GENDER

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

PCB VERSION

75RC: 0.075" pitch condensed board right angle based on BS MIL standard layout.
Other option available 75RB see page 106.

HARDWARE

B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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

G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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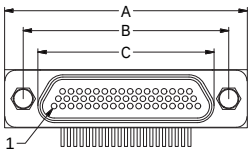
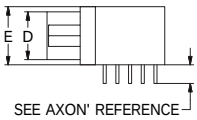
DIMENSIONS

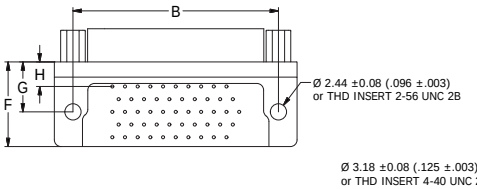
Dimensions are in millimetres (inches).

FEMALE connector

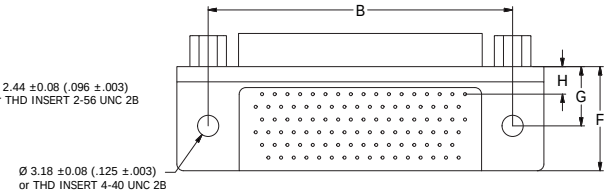




9-51 way connectors



100 way connectors



SEE CONTACT LAYOUT ON PCB PAGES 114 TO 115

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.	G ± 0.25 (±.010)	H ± 0.25 (±.010)
			Male	Female	Male	Female				
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.82 .308	10.60 .417	6.35 .250	3.49 .138
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	8.92 .351	12.90 .508	7.49 .295	3.68 .145
69 P / 69 S	44.07 1.735	38.48 1.515	32.61 1.284	34.29 1.350	5.79 .228	7.44 .293	8.92 .351	12.90 .508	7.49 .295	3.68 .145
100 P / 100 S	55.12 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	10.01 .394	15.80 .622	8.89 .350	4.13 .163

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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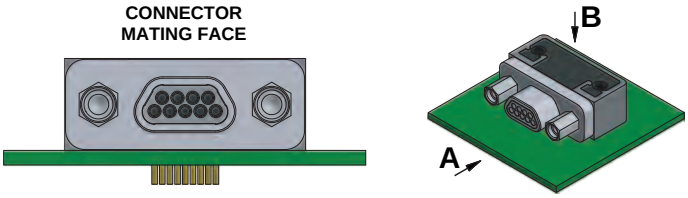
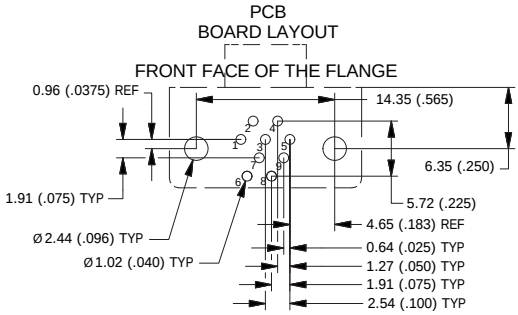
PCB LAYOUT FOR CBR TYPE - 0.075" PITCH
BASED ON BS MIL STANDARD LAYOUT - MALE CONNECTORS

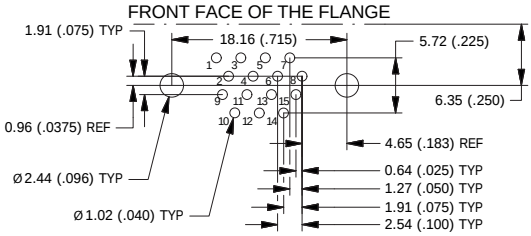
VIEW A



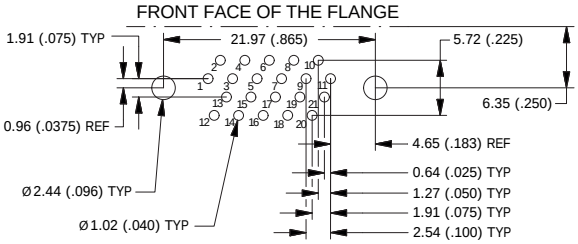
9 CONTACTS - VIEW B



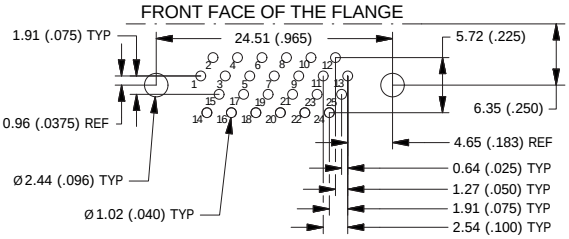
15 CONTACTS - VIEW B



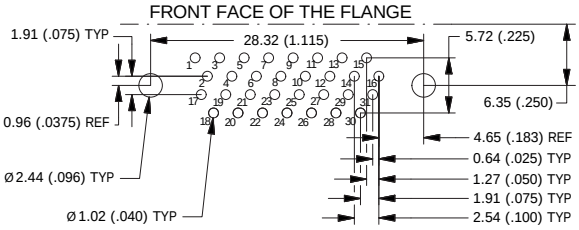
21 CONTACTS - VIEW B



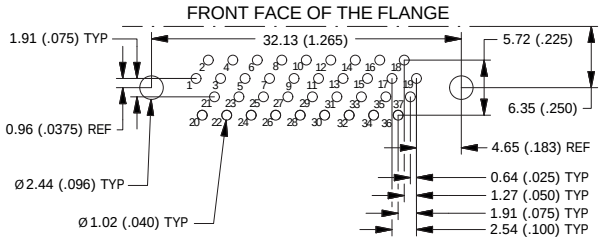
25 CONTACTS - VIEW B



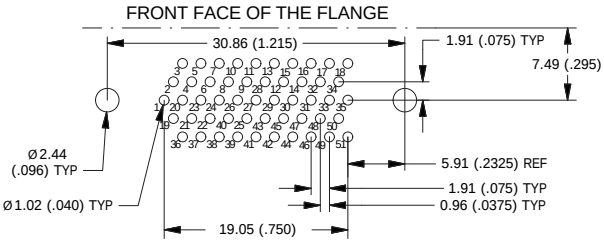
31 CONTACTS - VIEW B



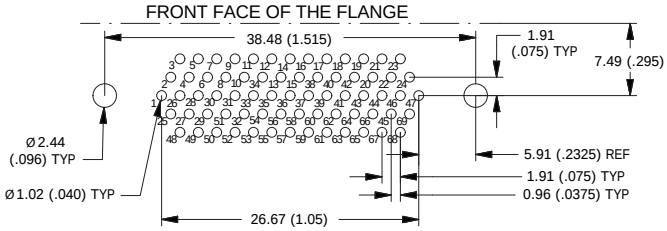
37 CONTACTS - VIEW B



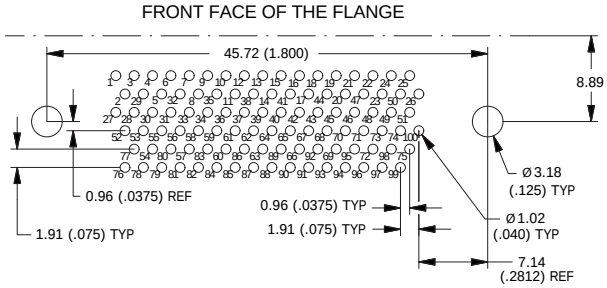
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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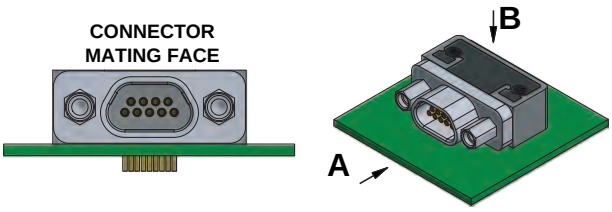
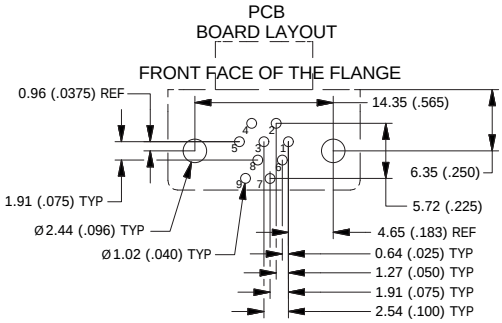
PCB LAYOUT FOR CBR TYPE - 0.075" PITCH BASED ON BS MIL STANDARD LAYOUT - FEMALE CONNECTORS

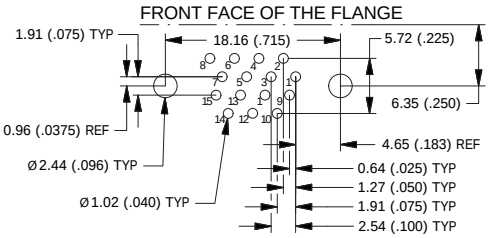
VIEW A



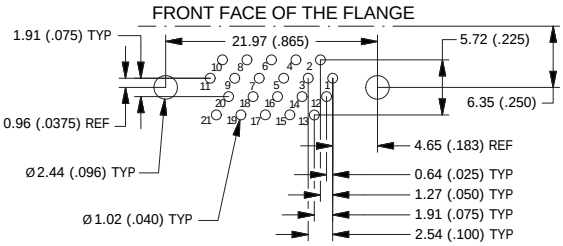
9 CONTACTS - VIEW B



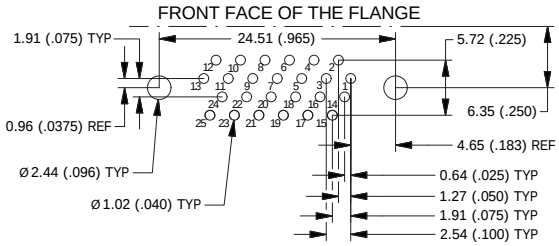
15 CONTACTS - VIEW B



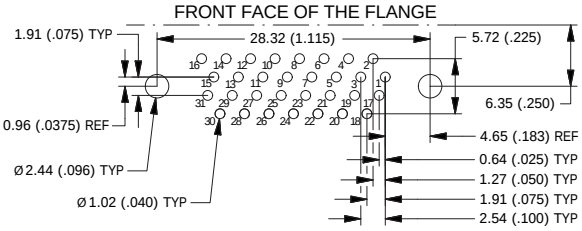
21 CONTACTS - VIEW B



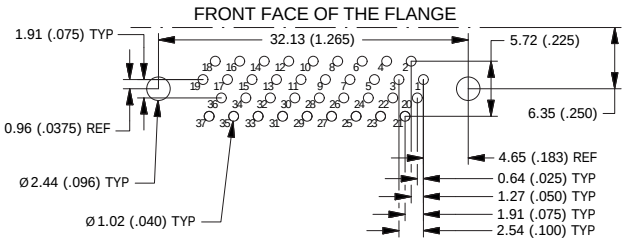
25 CONTACTS - VIEW B



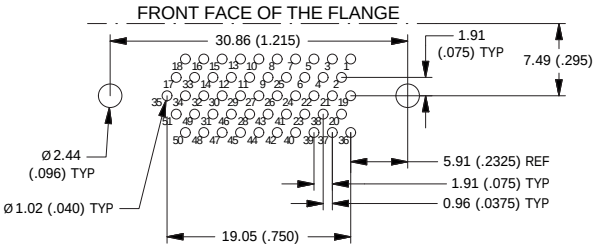
31 CONTACTS - VIEW B



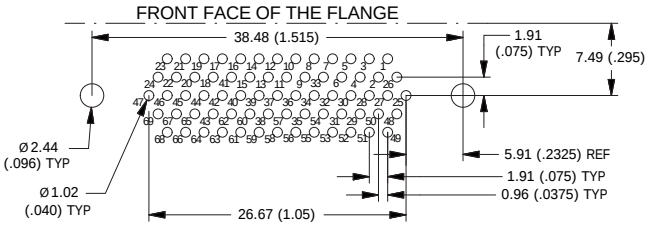
37 CONTACTS - VIEW B



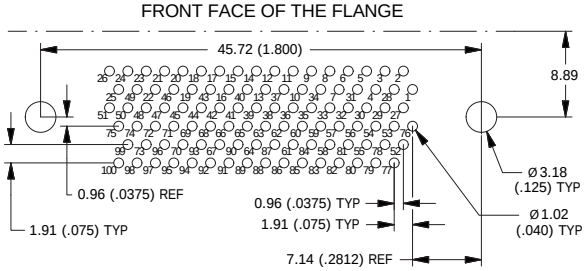
51 CONTACTS - VIEW B



69 CONTACTS - VIEW B



100 CONTACTS - VIEW B



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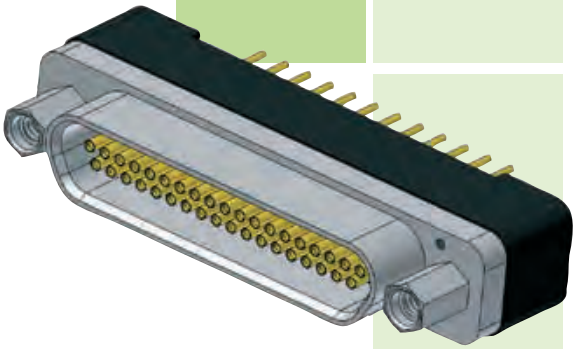

PCB RECTANGULAR CONNECTORS

BS TYPE

0.075" PITCH

METAL SHELL

- Board straight connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA 2 37 S 75SB P G 3

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51DR***, **51**, **69***, **100**.
***: 51DR & 69 ways are available for 75SB PCB version only**
See pages 26 & 27 for contact arrangements.

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

PCB VERSION
75SA: 0.075" pitch board straight MIL standard layout.
75SB: 0.075" pitch board straight specific layout.

HARDWARE
B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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
G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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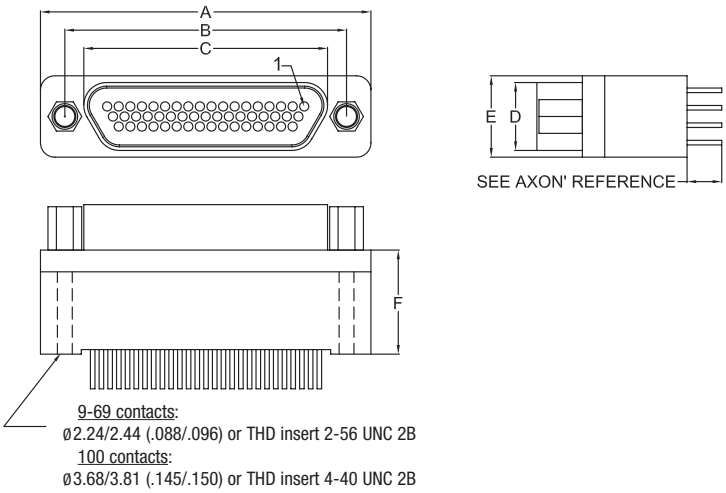
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



SEE CONTACT LAYOUT ON PCB PAGES 120 TO 125

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.
			Male	Female	Male	Female		
9 P / 9 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.87 .310	9.02 .355
15 P / 15 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.87 .310	9.02 .355
21 P / 21 S	27.56 1.085	21.97 .865	16.10 .634	17.81 .701	4.69 .185	6.35 .250	7.87 .310	9.02 .355
25 P / 25 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.87 .310	9.02 .355
31 P / 31 S	33.91 1.335	28.32 1.115	22.45 .883	24.16 .951	4.69 .185	6.35 .250	7.87 .310	9.02 .355
37 P / 37 S	37.72 1.485	32.13 1.265	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	7.87 .310	9.02 .355
51DR P / 51DR S	46.61 1.835	41.02 1.615	35.15 1.384	36.83 1.450	4.69 .185	6.35 .250	7.87 .310	9.02 .355
51 P / 51 S	36.45 1.435	30.86 1.215	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	10.16 .400	9.02 .355
69 P / 69 S	44.07 1.735	38.48 1.515	32.61 1.284	34.29 1.350	5.79 0.228	7.44 .293	10.16 .400	9.02 .355
100 P / 100 S	55.12 2.170	45.72 1.800	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	12.95 .510	10.92 .430

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel, see ordering info for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
INTERFACIAL SEAL	Fluorosilicone rubber
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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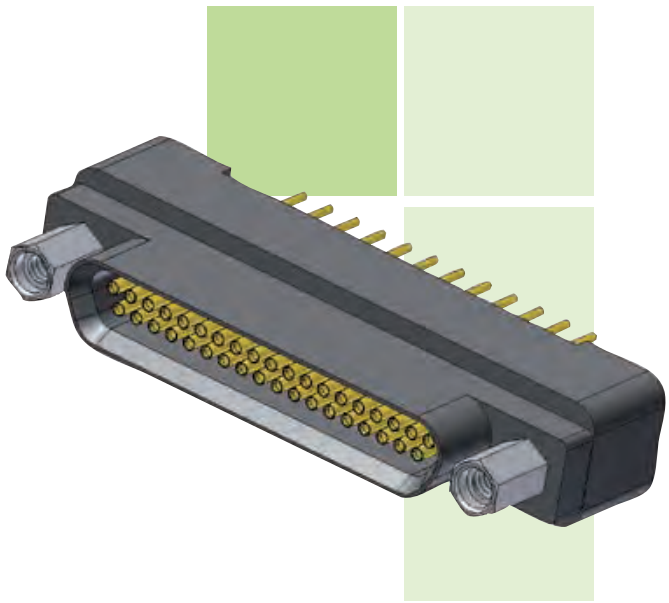

PCB RECTANGULAR CONNECTORS

BS TYPE

0.075" PITCH

PLASTIC SHELL

- Board straight connector for flexible and rigid printed circuit boards.
- Operating temperature:150°C or 200°C.
- Several tail lengths available.

IDENTIFICATION CODE

MDA	P	37	S	75SB	P	G	3

SERIES
MDA: Micro-D AXON' standard series.

SHELL TYPE
P: LCP shell + potting 150°C.
L: LCP 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).

PCB VERSION
75SA: 0.075" pitch board straight MIL standard layout.
75SB: 0.075" pitch board straight specific layout.

HARDWARE
B: No hardware.
P: Jackposts.
Px (x: 1 to 5): Panel mount jackposts.
T: Threaded inserts installed.
W: Jackposts 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
G: Gold plated solid conductor AWG 25.
T: Tin plated solid conductor AWG 24.
See page 29 for conductor types.

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.

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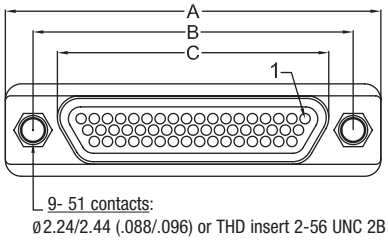
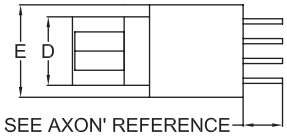
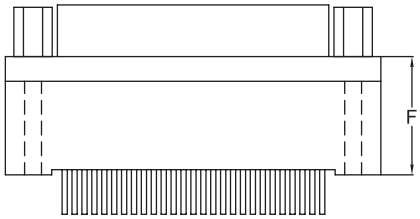
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector







SEE CONTACT LAYOUT ON PCB PAGES 120 TO 125

	A max.	B ± 0.13 (±.005)	C max.		D max.		E max.	F max.
			Male	Female	Male	Female		
9 P / 9 S	19.94 .785	14.35 .565	7.41 .292	9.65 .380	3.40 .134	5.53 .218	7.87 .310	9.07 .357
15 P / 15 S	23.75 .935	18.16 .715	11.22 .442	13.46 .530	3.40 .134	5.53 .218	7.87 .310	9.07 .357
21 P / 21 S	27.56 1.085	21.97 .865	15.03 .592	17.27 .680	3.40 .134	5.53 .218	7.87 .310	9.07 .357
25 P / 25 S	30.10 1.185	24.51 .965	17.57 .692	19.81 .780	3.40 .134	5.53 .218	7.87 .310	9.07 .357
31 P / 31 S	33.91 1.335	28.32 1.115	21.38 .842	23.62 .930	3.40 .134	5.53 .218	7.87 .310	9.07 .357
37 P / 37 S	37.72 1.485	32.13 1.265	25.19 .992	27.43 1.080	3.40 .134	5.53 .218	7.87 .310	9.07 .357
51 P / 51 S	36.45 1.435	30.86 1.215	23.92 .942	26.16 1.030	4.50 .177	6.60 .260	10.16 .400	9.07 .357

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, Gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
MOULDED TRAY	Liquid Crystal Polymer (LCP)
PCB TERMINALS	See ordering info for PCB terminals material
HARDWARE	300 series stainless steel, passivated

SEE PAGE 24 FOR MORE INFORMATION

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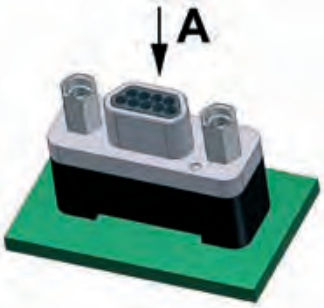
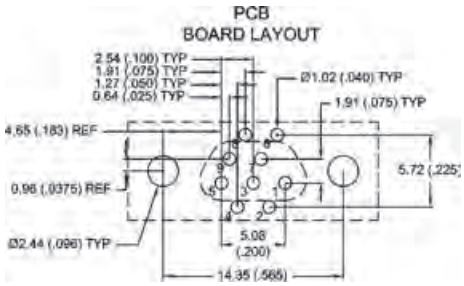
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SA
MIL STANDARD LAYOUT - MALE CONNECTORS

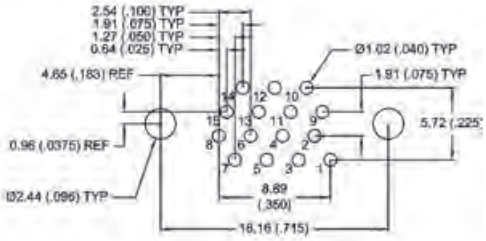
VIEW A



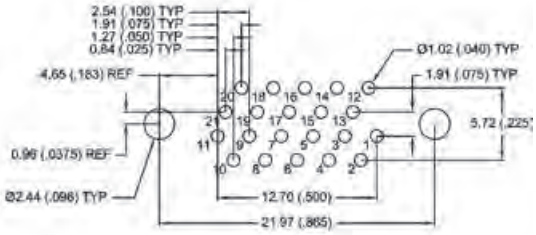
9 CONTACTS - VIEW A



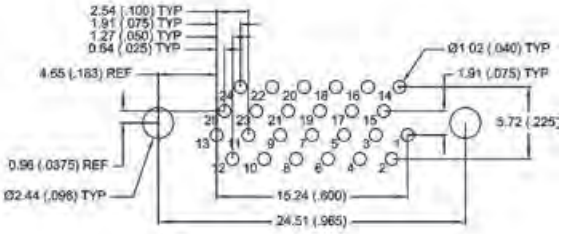
15 CONTACTS - VIEW A



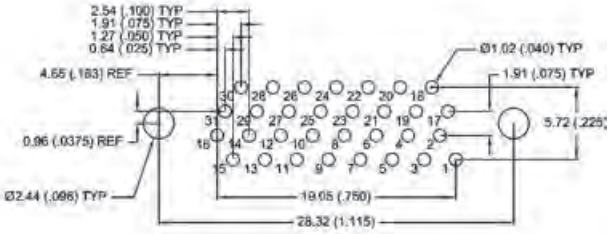
21 CONTACTS - VIEW A



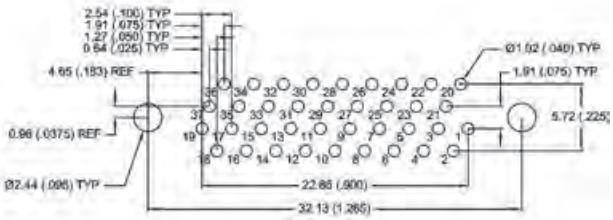
25 CONTACTS - VIEW A



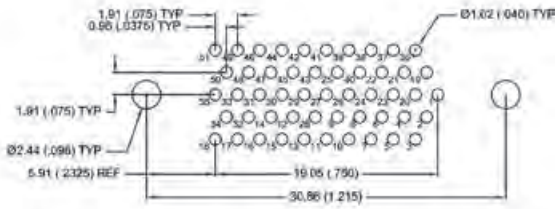
31 CONTACTS - VIEW A



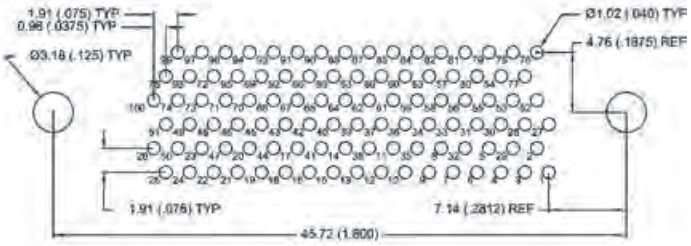
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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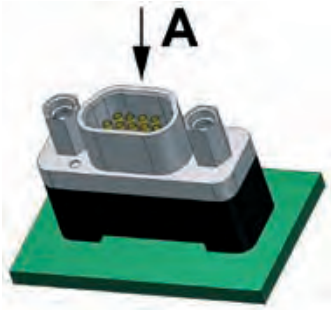
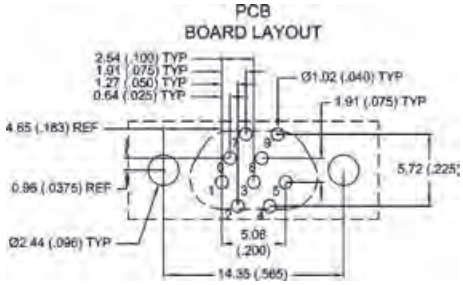
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SA
MIL STANDARD LAYOUT - FEMALE CONNECTORS

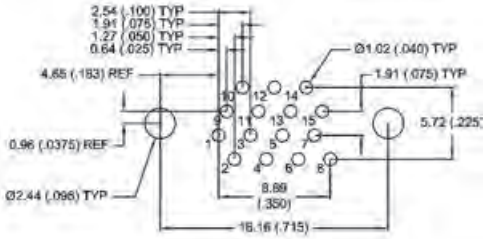
VIEW A



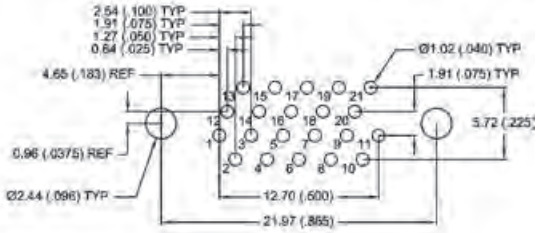
9 CONTACTS - VIEW A



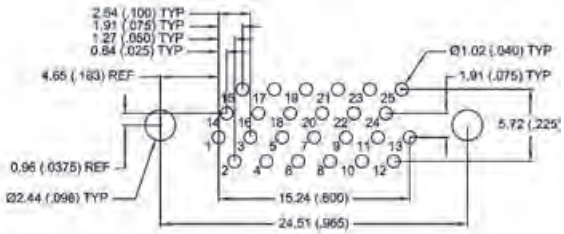
15 CONTACTS - VIEW A



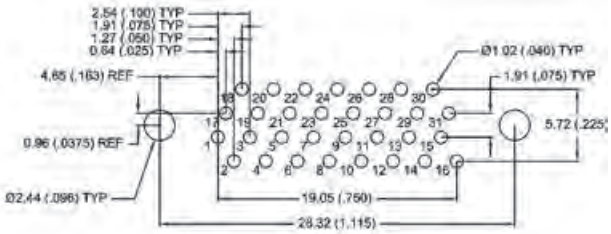
21 CONTACTS - VIEW A



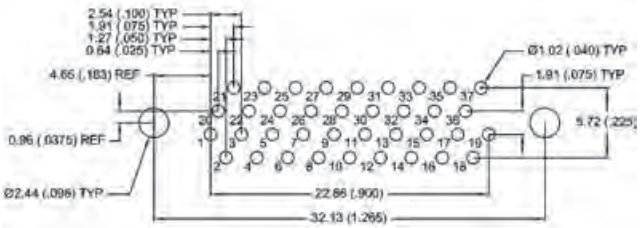
25 CONTACTS - VIEW A



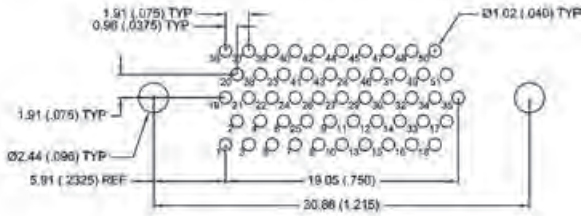
31 CONTACTS - VIEW A



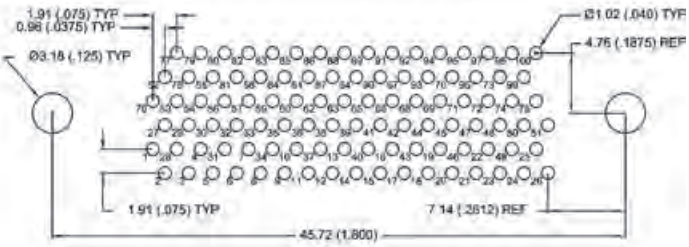
37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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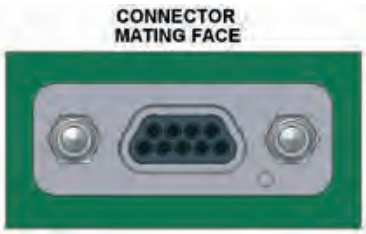
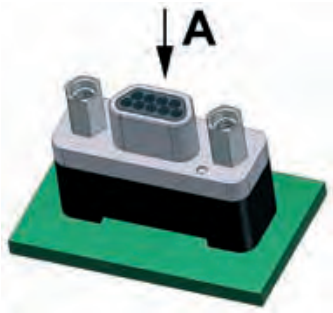
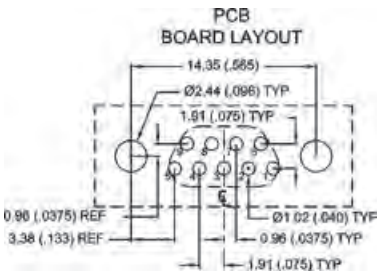
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SB
SPECIFIC LAYOUT - MALE CONNECTORS

VIEW A

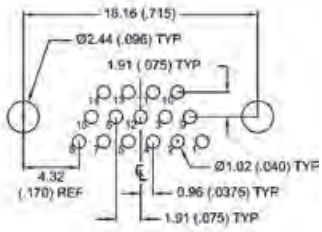




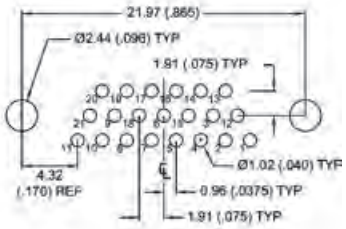
9 CONTACTS - VIEW A



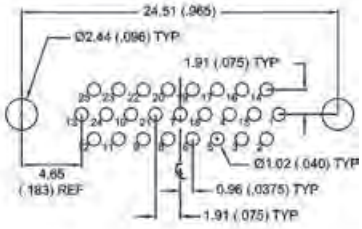
15 CONTACTS - VIEW A



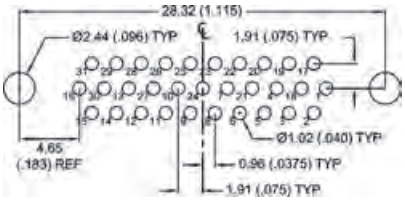
21 CONTACTS - VIEW A



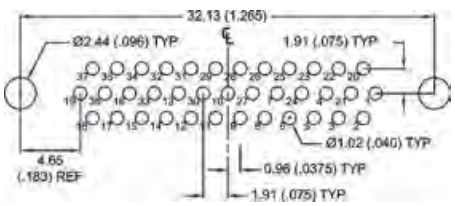
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



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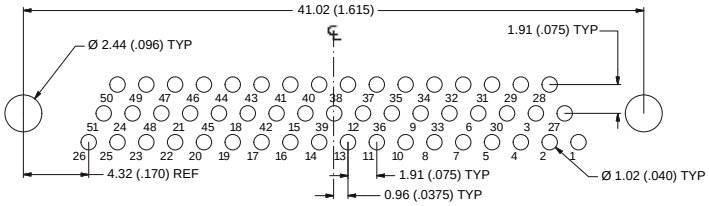
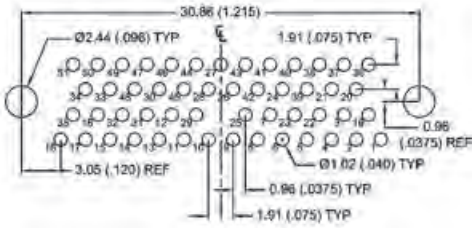
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SB
SPECIFIC LAYOUT - MALE CONNECTORS

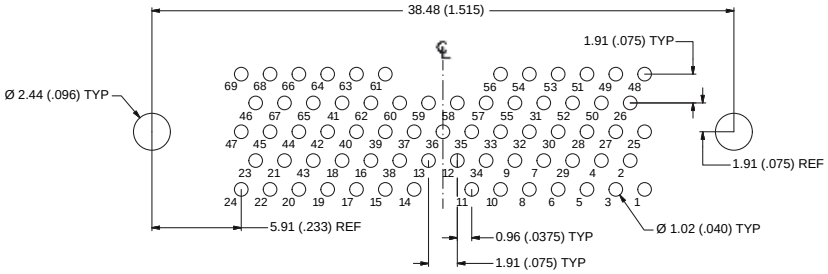
51 CONTACTS (DOUBLE ROW) - VIEW A



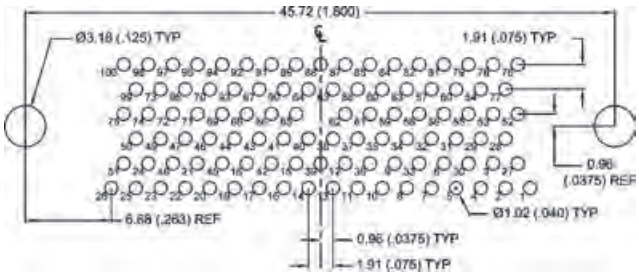
51 CONTACTS - VIEW A



69 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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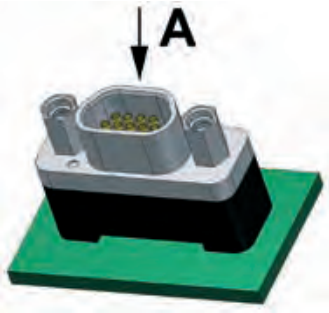
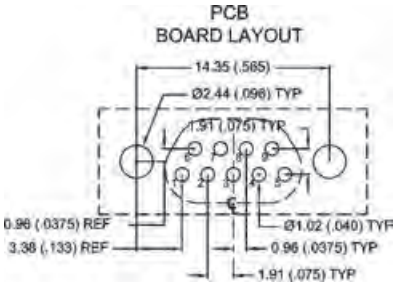
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SB
SPECIFIC LAYOUT - FEMALE CONNECTORS

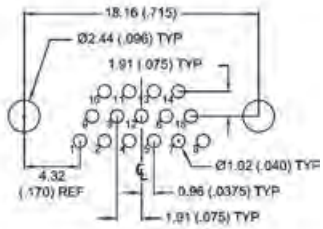
VIEW A



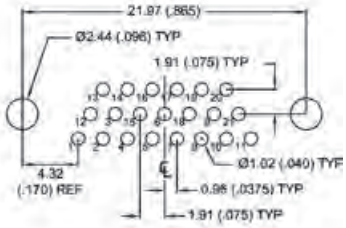
9 CONTACTS - VIEW A



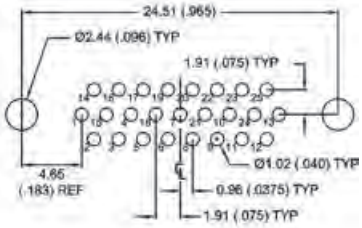
15 CONTACTS - VIEW A



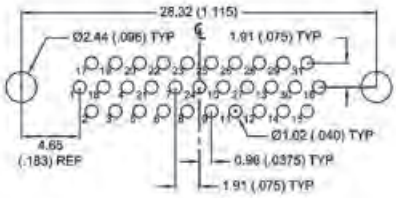
21 CONTACTS - VIEW A



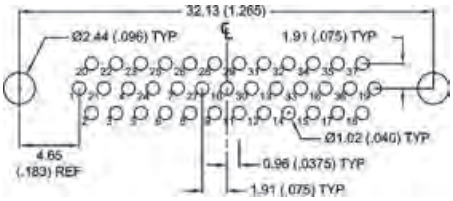
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



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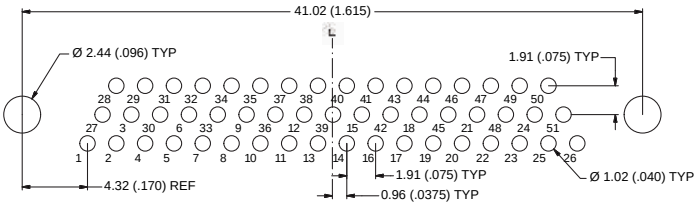
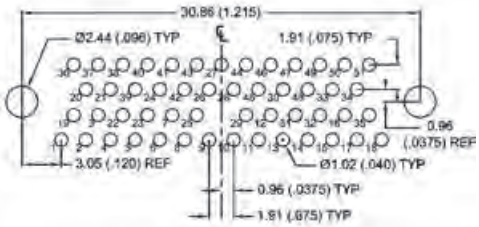
PCB LAYOUT FOR BS TYPE - 0.075" PITCH - 75SB
SPECIFIC LAYOUT - FEMALE CONNECTORS

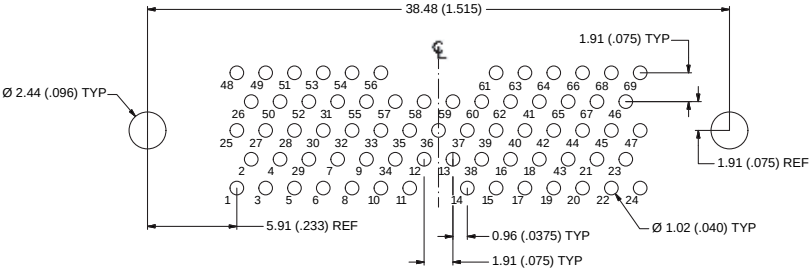
51 CONTACTS (DOUBLE ROW) - VIEW A



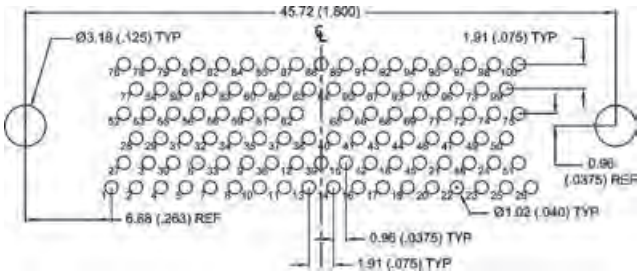
51 CONTACTS - VIEW A



69 CONTACTS - VIEW A



100 CONTACTS - VIEW A



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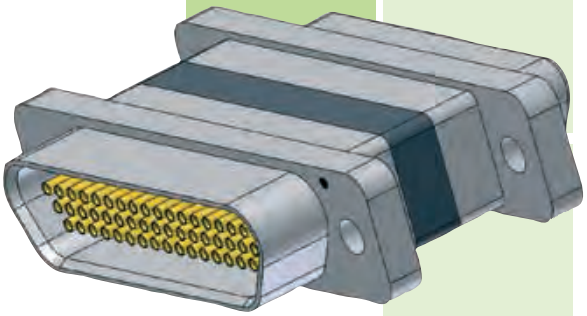
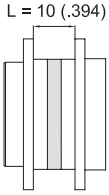




CONNECTOR SAVERS

CONNECTOR SAVER

ONE PIECE DESIGN

METAL OR PLASTIC SHELL

- One piece design version L = 10 mm (.394") between flanges.
- Ideal for applications requiring many mating / demating cycles.
- Reduces wear and tear on systems and test equipment.
- Operating temperature: 150°C or 200°C.

IDENTIFICATION CODE

MDA 2 51 CS 1 B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP shell + potting 200°C.
1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

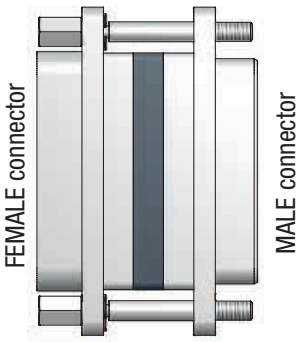
NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51DR***, **51**, **69***, **100***.
**: 51DR, 69 & 100 way only available for 1, Z, 2, 3 & S connector types.*
See pages 26 & 27 for contact arrangements.

PRODUCT TYPE
CS: Connector saver (plug to receptacle connector).

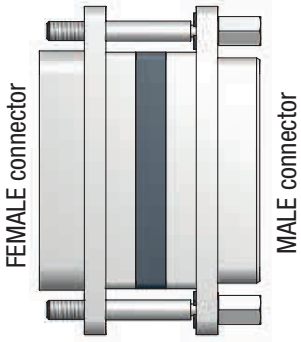
ONE PIECE DESIGN ASSEMBLY
1: One piece design assembly.
L = 10 mm (.394").

HARDWARE
B: No hardware.
P1: Removable long jackposts on the female connector.
P2: Removable long jackposts on the male connector.

HARDWARE P1 TYPE



HARDWARE P2 TYPE



METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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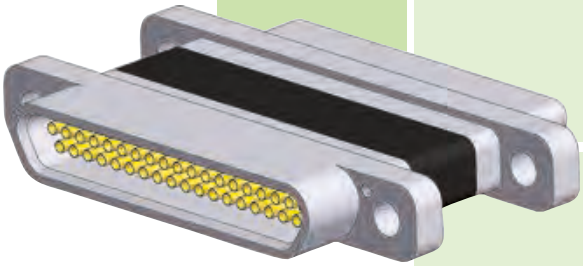
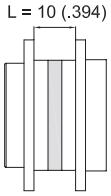




CONNECTOR SAVERS

CONNECTOR SAVER

ONE PIECE DESIGN

LOW PROFILE METAL SHELL

- One piece design version L = 10 mm (.394") between flanges.
- Ideal for applications requiring many mating / demating cycles.
- Reduces wear and tear on systems and test equipment.
- Operating temperature: 150°C or 200°C.

IDENTIFICATION CODE

MDA 2 L51 CS 1 B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

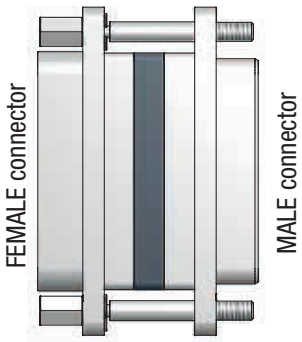
NUMBER OF CONTACTS
L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.
See pages 26 & 27 for contact arrangements.

PRODUCT TYPE
CS: Connector saver (plug to receptacle connector).

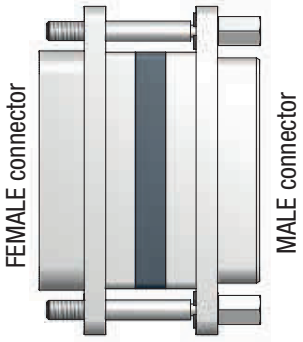
ONE PIECE DESIGN ASSEMBLY
1: One piece design assembly.
L = 10 mm (.394").

HARDWARE
B: No hardware
P1: Removable long jackposts on the female connector.
P2: Removable long jackposts on the male connector.

HARDWARE P1 TYPE



HARDWARE P2 TYPE



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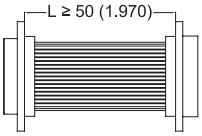

CONNECTOR SAVERS

CONNECTOR SAVER

BACK TO BACK ASSEMBLY

METAL OR PLASTIC SHELL

- Back to back assembly version (L ≥ 50 mm / 1.970") between flanges
- Ideal for applications requiring many mating / demating cycles.
- Reduces wear and tear on systems and test equipment.
- Operating temperature: 150°C or 200°C.

IDENTIFICATION CODE

MDA	P	51	CS	010	1	L	B	B

SERIES

MDA: Micro-D AXON' standard series.

CONNECTOR TYPE

1: Cadmium aluminium shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
P: LCP shell + Potting 150°C. **2**: Nickel aluminium shell + Potting 150°C.
L: LCP shell + Potting 200°C. **3**: Nickel aluminium shell + Potting 200°C.
S: Passivated stainless steel shell + Potting 200°C.

NUMBER OF CONTACTS

09, **15**, **21**, **25**, **31**, **37**, **51DR***, **51**, **69***, **100***.
**: 51DR, 69 & 100 way only available for 1, Z, 2, 3 & S connector types.*
See pages 26 & 27 for contact arrangements.

PRODUCT TYPE

CS: Connector saver (receptacle to plug connector).
DP: Dual Pin connector (plug to plug connector).
DS: Dual Socket connector (receptacle to receptacle connector).

BACK TO BACK ASSEMBLY - LENGTH (in cm)

Attention! Wire length in centimetres (1 cm = 10 mm = .394").

L in cm (inches)	5 ≤ L ≤ 10 (1.97≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

WIRE TYPE

1: E2607, AWG 26, 7 strands - 600 V. **A**: E2407, AWG 24, 7 strands - 600 V.
4: E2619, AWG 26, 19 strands - 600 V. **C**: E 2419, AWG 24, 19 strands - 600 V.
6: E2807, AWG 28, 7 strands - 600 V. **E**: M22759/33, AWG 26, 19 strands - 600 V.
8: E3007, AWG 30, 7 strands - 600 V. ***See page 29 for wire types.***

COLOUR CODE

F: All yellow - **L**: all white.

1st CONNECTOR HARDWARE

(for CS 1st connector is the female one).
B: No hardware.
C: U-clips with low profile hex.socket head jackscrew (removable).
D: U-clips with low profile slot head jackscrew (removable).
M: low profile hex.socket head jackscrews (removable).
N: high profile hex.socket head jackscrews (removable).
P: Jackposts (removable).
Px (x: 1 to 5): Panel mount jackposts.
S: low profile slot head jackscrews (removable).
T: high profile slot head jackscrews (removable).
See pages 190 to 200 for hardware description.

2nd CONNECTOR HARDWARE

(for CS 2nd connnector is the male one).
See 1st connector hardware for the list of choices.

Other hardware available on request

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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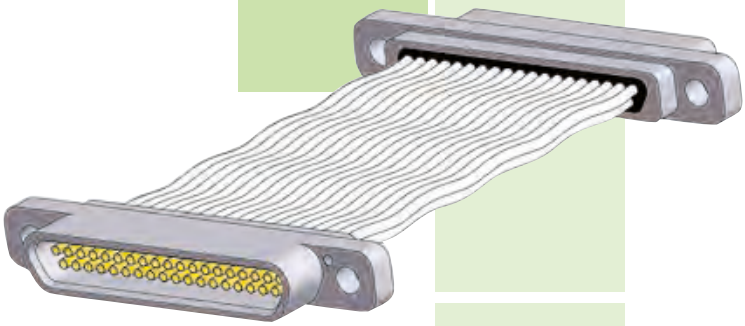

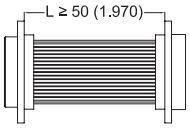

CONNECTOR SAVERS

CONNECTOR SAVER

BACK TO BACK ASSEMBLY

LOW PROFILE METAL SHELL

- Back to back assembly version (L ≥ 50 mm / 1.970") between flanges.
- Ideal for applications requiring many mating / demating cycles.
- Reduces wear and tear on systems and test equipment.
- Operating temperature: 150°C or 200°C.

IDENTIFICATION CODE

MDA	2	L51	CS	010	1	L	B	B

SERIES
MDA: Micro-D AXON' standard series.

CONNECTOR TYPE
1: Cadmium aluminium shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminium shell + potting 150°C.
3: Nickel aluminium shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS
L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.
See pages 26 & 27 for contact arrangements.

PRODUCT TYPE
CS: Connector Saver (receptable to plug connector).
DP: Dual Pin connector (plug to plug connector).
DS: Dual Socket connector (receptacle to receptacle connector).

BACK TO BACK ASSEMBLY - LENGTH (in cm)
Attention! Wire length in centimetres (1cm = 10mm = .394").

L in cm (inches)	5 ≤ L ≤ 10 (1.97 ≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches3	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

WIRE TYPE
1: E 2607, AWG 26, 7 strands - 600V.
4: E 2619, AWG 26, 19 strands - 600V.
6: E 2807, 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.
See page 29 for wire types.

COLOUR CODE
F: All yellow. - **L**: All white.

1st CONNECTOR HARDWARE
(For CS 1st connector is the female one).
B: No hardware.
C: U-clips with low profile hex socket head jackscrews (removable).
D: U-clips with low profile slot head jackscrews (removable).
M: Low profile hex socket head jackscrews (removable).
N: High profile hex socket head jackscrews (removable).
P: Jackposts (removable).
Px (x: 1 to 5): Panel mount jackposts.
S: Low profile slot head jackscrews (removable).
T: High profile slot head jackscrews (removable).
See pages 190 to 200 for hardware description.

2nd CONNECTOR HARDWARE
(For CS 1st connector is the female one).
See 1st connector hardware for the list of choices.

Other hardware available on request

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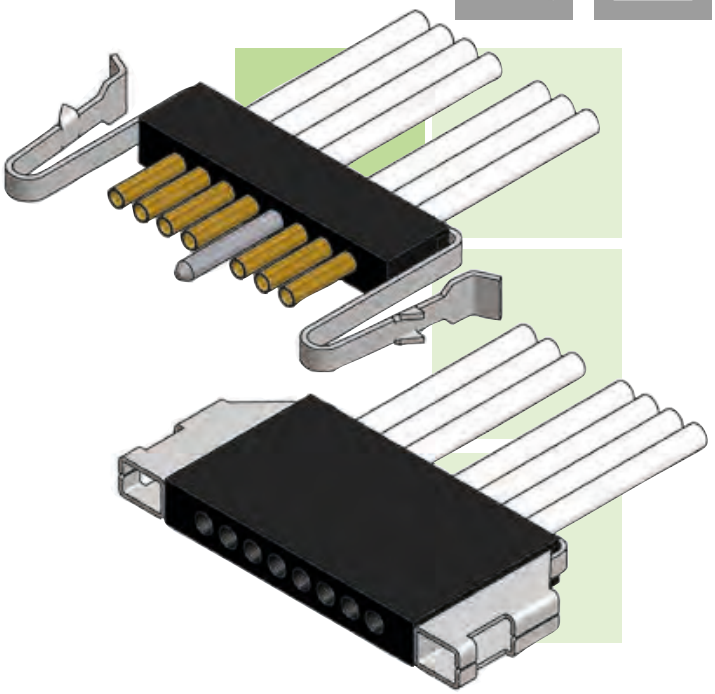

MICROSTRIP CONNECTORS

PIGTAIL & SOLDER CUP ASSEMBLIES

1.27 mm (0.050") PITCH

- Single row plastic connector for space and weight saving applications.
- Guide pin(s) or latch(es) available on female connector (blank cavity(ies) or latch box(es) on male connector).

IDENTIFICATION CODE

MSA P 1 07 S B 4 L 050 G06 L2E

SERIES
MSA: Micro Strip AXON' standard series.

STRIP TYPE
P: LCP shell + potting 150°C.
L: LCP shell + potting 200°C.

NUMBER OF ROWS: 1.

NUMBER OF ELECTRICAL CAVITIES: 02 TO 40.
Mechanical cavities are used for polarization, must not be counted here but can reduce the maximum number of available electrical cavities (see page 134).

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

MOUNTING HOLE OPTION
A: With mounting holes.
B: No mounting holes.

TERMINATION / WIRE 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 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
G: AWG 25 gold plated.
T: AWG 24 tin plated.
FS: solder cup.
See page 29 for wire types.

COLOUR CODE
F: All yellow.
L: All white.
V: MIL-STD-681 striped (for wire types 3 and F only).

Blank: If wire type is G, T or FS.
W: 10 colour repeat.
See page 30 for colour code.

WIRE LENGTH (in cm)
BLANK: if wire type is **FS**.
Attention! Wire length in centimetres (1cm = 10 mm = .394").

L in cm (inches)	5 ≤ L ≤ 10 (1.97≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

POLARIZATION
Blank: None.
G2E: Guide pin / guide hole both ends.
GCE: Guide pin / guide hole centered.
GXX: Guide pin / guide hole in xx position.
L2E: Latch spring / latch box both ends.
LCE: Latch spring / latch box centered.
LXX: Latch spring / latch box in xx position.

IF NEEDED, YOU CAN COMBINE SEVERAL HARDWARE OPTIONS

EXAMPLES:
- 2 GUIDE-PINS OR LATCH-SPRINGS AT 2 PARTICULAR POSITIONS: MSAP109SB4L025 **G02 G08** (OR **L02 L08**)
- 1 GUIDE-HOLE CENTERED + 1 LATCH-BOX AT A PARTICULAR POSITION: MSAP112PAR2T3 **GCE L07**
- 1 GUIDE-PIN CENTERED + LATCH-SPRINGS BOTH ENDS: MSAL117SACF012 **GCE L2E**

ONLY 2 RULES TO BUILD YOUR P/N:
- DEFINE ALL GUIDE PIN CODES FIRST, FOLLOWED BY LATCH CODES
- DEFINE STANDARD CODES (G2E / GCE / L2E / LCE) FIRST, FOLLOWED BY SPECIFIC POSITION CODES (GXX / LXX) AFTERWARDS

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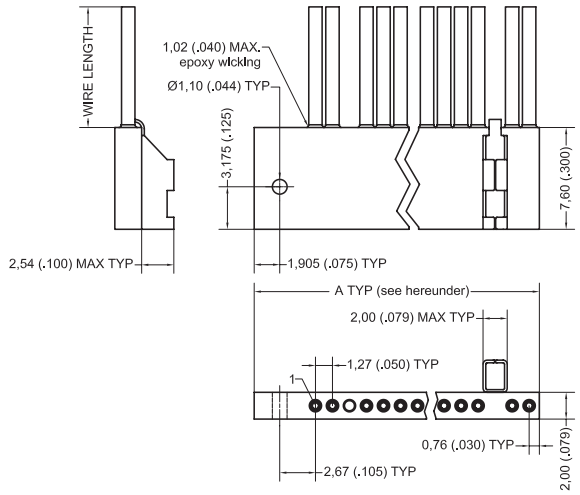
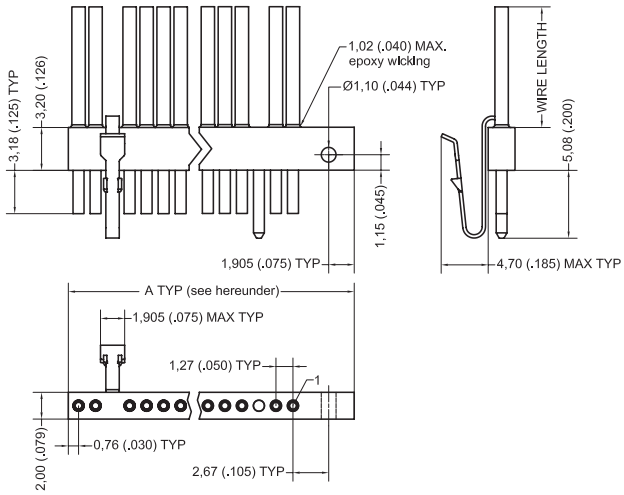
DIMENSIONS

Dimensions are in millimetres (inches).

MALE MICRO STRIP CONNECTOR



FEMALE MICRO STRIP CONNECTOR



TO DETERMINE CONNECTOR WIDTH A ± 0.3 mm (.012")	
	EXAMPLE: 11 CAVITY STRIP WITH MOUNTING HOLES
MULTIPLY the number of mechanical cavities in one row by 1.27 mm (.050")	11 x 1.27 = 13.97
ADD 0.25 mm (.010")	+ 0.25 = 14.22
ADD 7.62 mm (.300") if mounting hole option is selected	+ 7.62 = 21.84

For detailed information concerning microstrip connectors, see pages 134 to 136.

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft):150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.

MATERIAL & FINISH	
SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and Beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin
GUIDE PIN	300 series stainless steel, passivated
LATCH	Beryllium copper, nickel plating

SEE PAGE 24 FOR MORE INFORMATION

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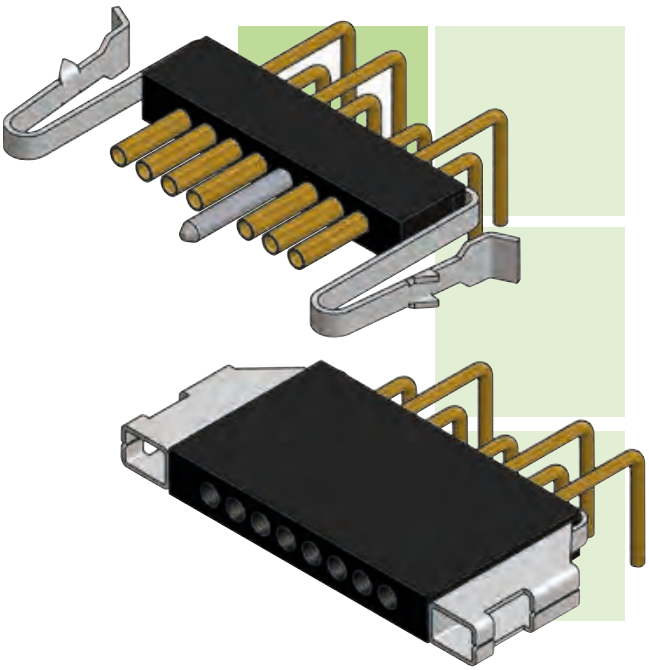

MICROSTRIP CONNECTORS

PCB CONNECTOR

1.27 mm (0.050") PITCH

- Single row plastic connector for space and weight saving applications.
- Guide pin(s) or latch(es) available on female connector (blank cavity(ies) or latch box(es) on male connector).

IDENTIFICATION CODE

MSA P 1 07 S B R3 G 2 G06 L2E

SERIES
MSA: Micro Strip AXON' standard series.

STRIP TYPE
P: LCP shell + potting 150°C.
L: LCP shell + potting 200°C.

NUMBER OF ROWS: **1**.

NUMBER OF ELECTRICAL CAVITIES: **02** TO **40**.
Mechanical cavities are used for polarization, must not be counted here but can reduce the maximum number of available electrical cavities (see page 134).

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

MOUNTING HOLE OPTION
A: with mounting holes.
B: No mounting holes.

VERSION TYPE
S1: Straight.
S2: Straight, 2.54 mm (0.100") offset.
R1: Right-angle in line.
R2: Right-angle, 1.27 mm (0.50") offset.
R3: Right-angle, 2.54 mm (0.100") offset.

CONDUCTOR TYPE
G: Solid conductor 25 AWG, gold plated.
T: Solid conductor 24 AWG, tin plated.
See page 29 for wire types.

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").
Tolerance: ± 0.38 mm (0.015").
Other lengths upon request.

POLARIZATION
BLANK: NONE.
G2E: GUIDE PIN / GUIDE HOLE BOTH ENDS.
GCE: GUIDE PIN / GUIDE HOLE CENTERED.
GXX: GUIDE PIN / GUIDE HOLE IN XX POSITION.
L2E: LATCH SPRING / LATCH BOX BOTH ENDS.
LCE: LATCH SPRING / LATCH BOX CENTERED.
LXX: LATCH SPRING / LATCH BOX IN XX POSITION.

IF NEEDED, YOU CAN COMBINE SEVERAL HARDWARE OPTIONS

EXAMPLES:
- 2 GUIDE-PINS OR LATCH-SPRINGS AT 2 PARTICULAR POSITIONS: MSAP109SB4L025 **G02 G08** (OR **L02 L08**)
- 1 GUIDE-HOLE CENTERED + 1 LATCH-BOX AT A PARTICULAR POSITION: MSAP112PAR2T3 **GCE L07**
- 1 GUIDE-PIN CENTERED + LATCH-SPRINGS BOTH ENDS: MSAL117SACF012 **GCE L2E**

ONLY 2 RULES TO BUILD YOUR P/N:
- DEFINE ALL GUIDE PIN CODES FIRST, FOLLOWED BY LATCH CODES
- DEFINE STANDARD CODES (G2E / GCE / L2E / LCE) FIRST, FOLLOWED BY SPECIFIC POSITION CODES (GXX / LXX) AFTERWARDS

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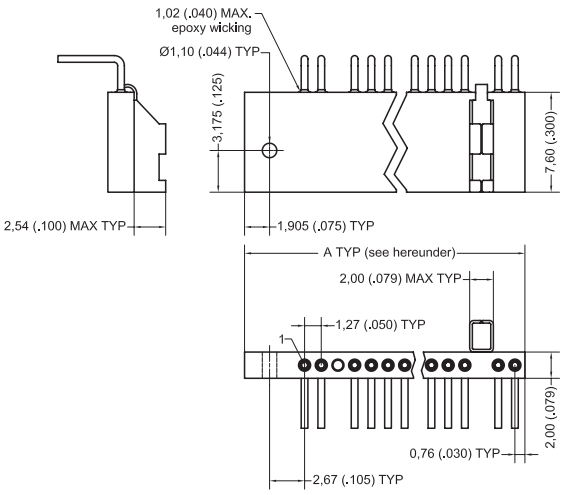
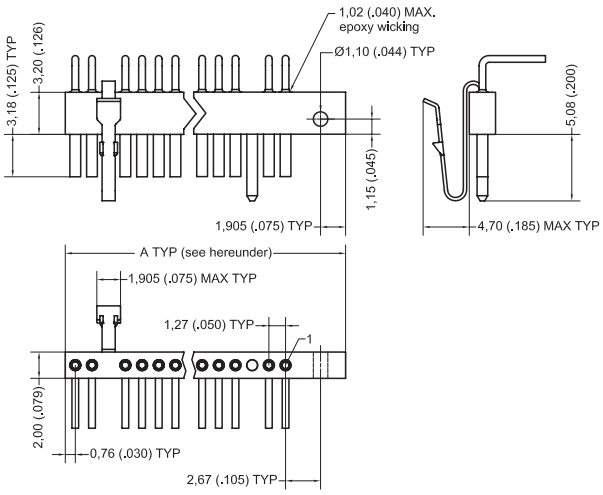
DIMENSIONS

Dimensions are in millimetres (inches).

MALE MICRO STRIP CONNECTOR



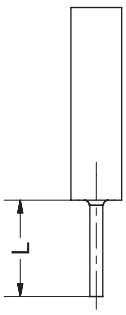
FEMALE MICRO STRIP CONNECTOR



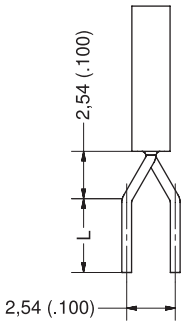
SEE CONTACT LAYOUT ON PCB PAGES 137 / 138 / 139.

TO DETERMINE CONNECTOR WIDTH A ± 0.3 mm (.012")	EXAMPLE: 11 CAVITY STRIP WITH MOUNTING HOLES
MULTIPLY the number of mechanical cavities in one row by 1.27 mm (.050")	11 x 1.27 = 13.97
ADD 0.25 mm (.010")	+ 0.25 = 14.22
ADD 7.62 mm (.300") if mounting hole option is selected	+ 7.62 = 21.84

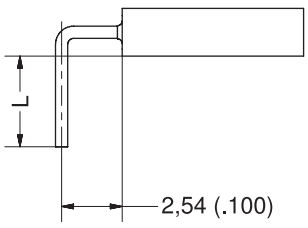
➡ For detailed information concerning microstrip connectors, see pages 134 to 136.



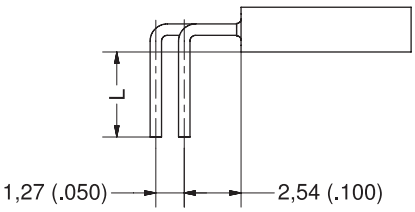
VERSION S1
STRAIGHT



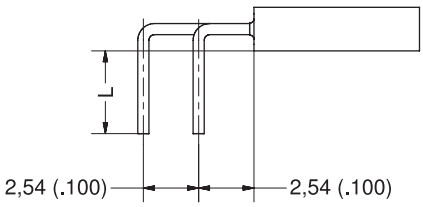
VERSION S2
STRAIGHT, .100" OFFSET



VERSION R1
RIGHT ANGLE, IN LINE



VERSION R2
RIGHT ANGLE, .050" OFFSET



VERSION R3
RIGHT ANGLE, .100" OFFSET

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MICROSTRIP GENERAL INFORMATION

➨ All cavities used, whether for electrical (pin or socket) contacts or for hardware options, (guide pin or latch) are considered as mechanical positions.

- G2E & L2E: 2 mechanical positions to count.
- GCE & LCE: 1 mechanical position to count.
- Gxx & Lxx: 1 mechanical position to count for each occurrence.

NB: If G2E or L2E are chosen, first and last cavities cannot be used for another polarization option (ex: if L2E is chosen, guide pin in position 1 is not possible)

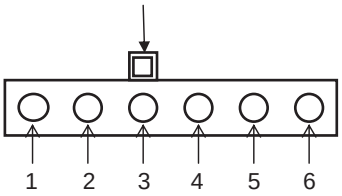
➨ When specifying the number of ways, only electrical positions (cavities containing pin or socket contacts) are counted.
Example: a 7 way strip with 2 latches at the end and a guide pin would have 10 mechanical positions, but would still be called a 7 way connector.

TO DETERMINE CONNECTOR WIDTH A ± 0.3 mm (.012")	
	EXAMPLE: 11 CAVITY STRIP WITH MOUNTING HOLES
MULTIPLY the number of mechanical cavities in one row by 1.27 mm (.050")	11 x 1.27 = 13.97
ADD 0.25 mm (.010")	+ 0.25 = 14.22
ADD 7.62 mm (.300") if mounting hole option is selected	+ 7.62 = 21.84

➨ To determine hardware location number for centered hardware (GCE / LCE):

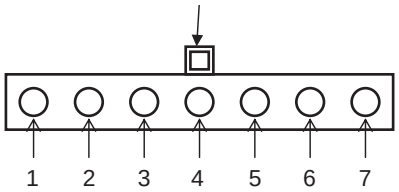
- Divide the total number of mechanical cavities by two.
- Round to the next whole number if result is a fraction.

LATCH BOX WITH FILLED CAVITY



6/2 = 3
> HARDWARE IN CAVITY N°3

LATCH BOX WITH FILLED CAVITY



7/2 = 3.5
> HARDWARE IN CAVITY N°4

➨ Hardware options

POLARIZATION BY GUIDE PIN
The guide pin is inserted into the female connector, and there is a guide hole in the opposite cavity in the male connector.

LATCHED RETENTION
The latch spring is mounted on the female connector, with the corresponding latch box installed on the male connector. When the first and/or last mechanical positions are chosen for the latches they will be mounted on the connector edges, making the connector wider but not longer. For all other positions the latches will be mounted on top of the connector, directly above the corresponding mechanical position. Wherever a latch is fitted the corresponding cavity will be filled, and therefore mechanical only in function.

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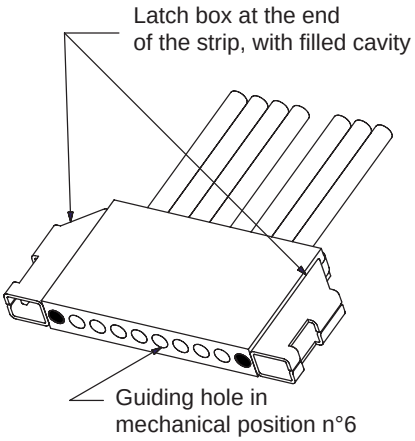
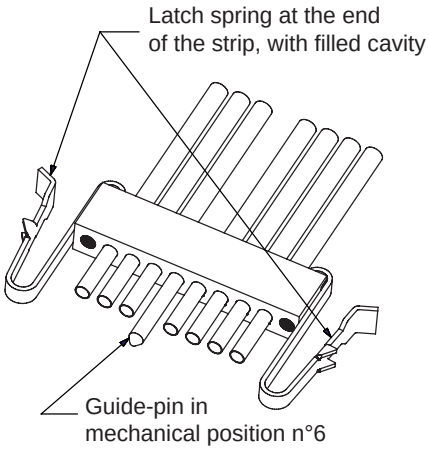
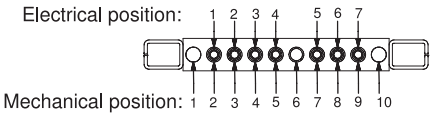
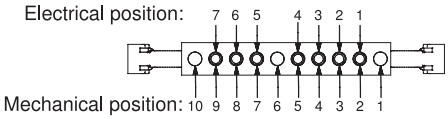
EXAMPLES



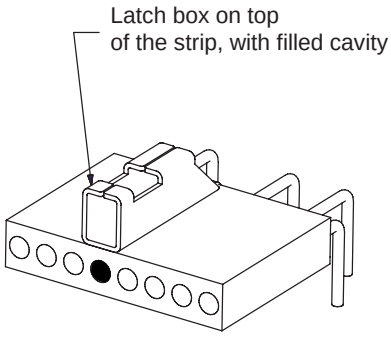


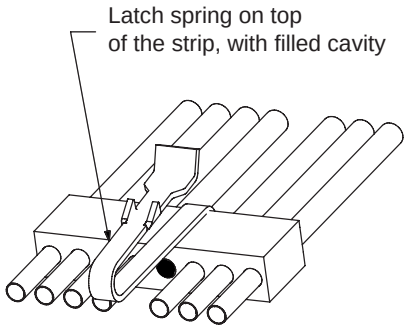


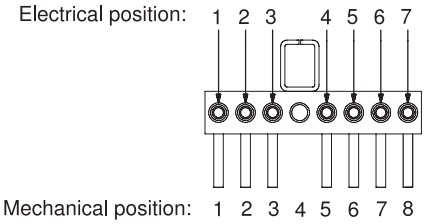
P/N : MSA P 1 07 P B xxxxx G06 L2E



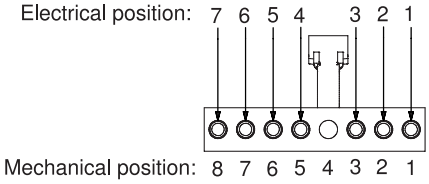
P/N : MSA P 1 07 S B xxxxx G06 L2E







P/N : MSA P 1 07 P B R3 xx L04



P/N : MSA P 1 07 S B xxx L04

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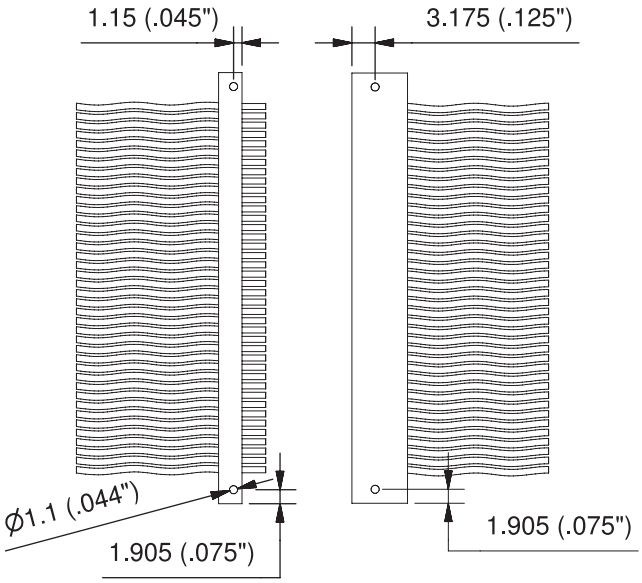
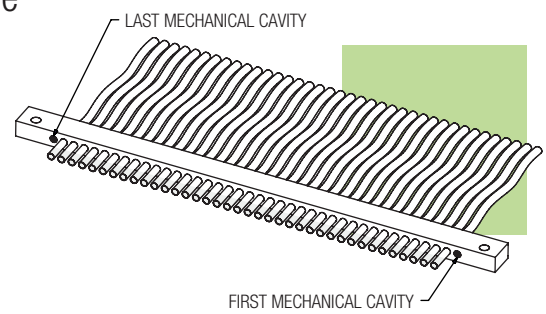
MOUNTING HOLES OPTION

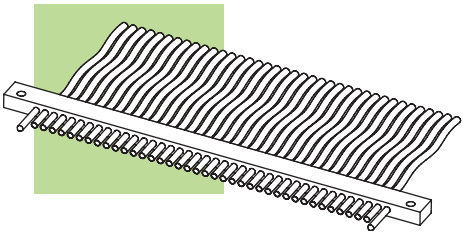
Position of holes



Special case: mounting holes + hardware

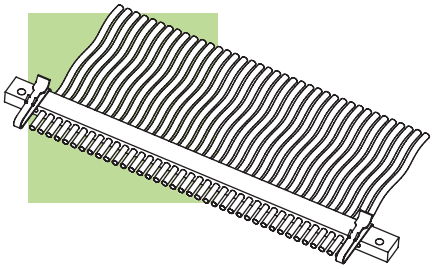
When mounting holes are selected, first and last mechanical cavities are "after the holes area".





EXAMPLE WITH **GUIDE PIN**

Hardware code G2E
Guide pin / guide holes to be in first and last mechanical cavities.



EXAMPLE WITH **LATCHING**

Hardware code L2E
Latch spring / latch box to be above first and last mechanical cavities, not on the edges of the strip.

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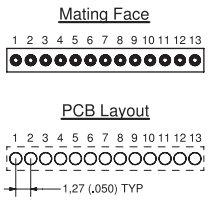
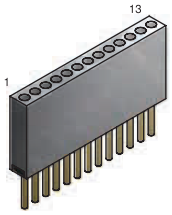
PCB LAYOUT FOR MICROSTRIP CONNECTORS

VERSION S1: STRAIGHT

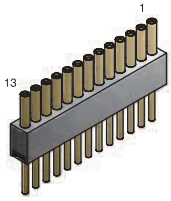
EXAMPLE OF A 13 WAY CONNECTOR

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**

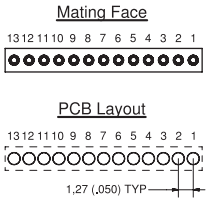




MSA P 1 13 P B S1 G 2

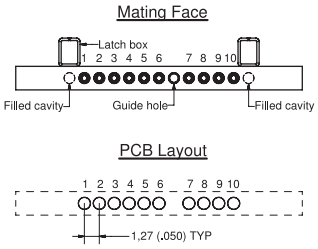


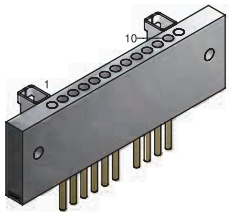
MSA P 1 13 S B S1 G 2



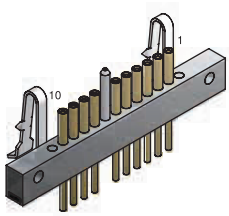
EXAMPLE OF A 10 WAY CONNECTOR WITH GUIDE-PIN, LATCHES AND MOUNTING HOLES

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**

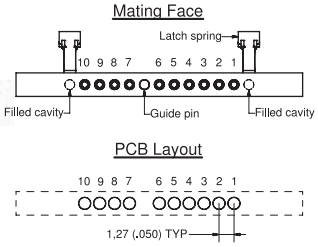




MSA P 1 10 P A S1 G 2 G08 L2E



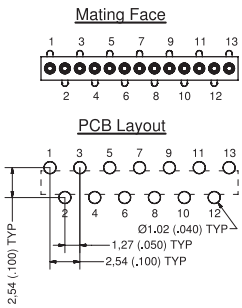
MSA P 1 10 S A S1 G 2 G08 L2E

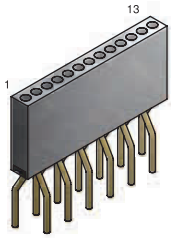


VERSION S2: STRAIGHT - .100" OFFSET

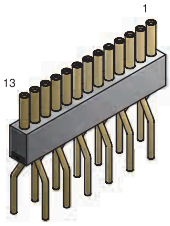
EXAMPLE OF A 13 WAY CONNECTOR

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**

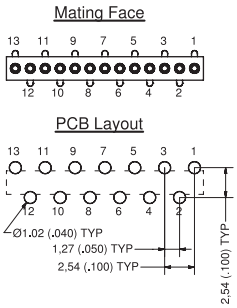




MSA P 1 13 P B S2 G 2

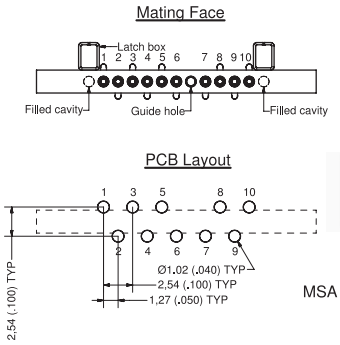


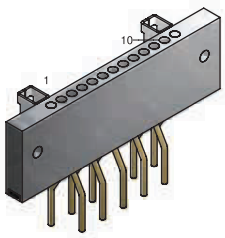
MSA P 1 13 S B S2 G 2



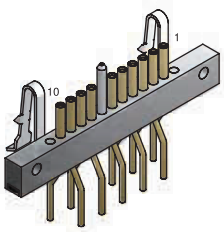
EXAMPLE OF A 10 WAY CONNECTOR WITH GUIDE-PIN, LATCHES AND MOUNTING HOLES

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**

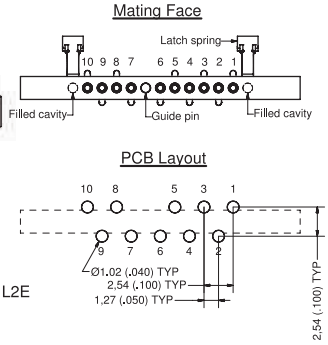




MSA P 1 10 P A S2 G 2 G08 L2E



MSA P 1 10 S A S2 G 2 G08 L2E



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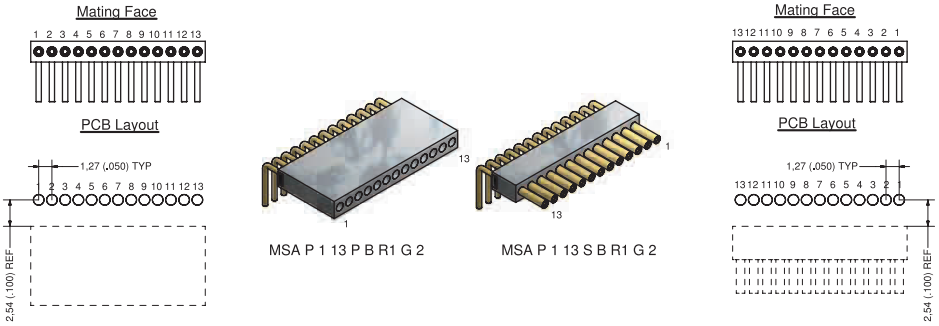
PCB LAYOUT FOR MICROSTRIP CONNECTORS

VERSION R1: RIGHT ANGLE IN LINE

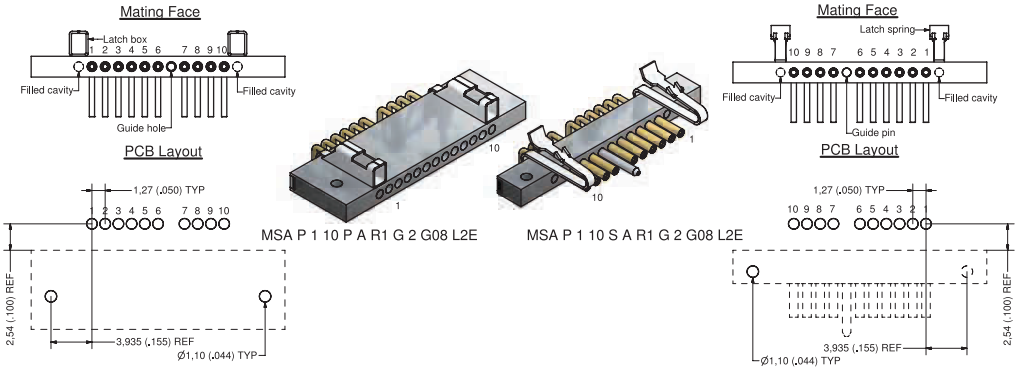
EXAMPLE OF A 13 WAY CONNECTOR

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



EXAMPLE OF A 10 WAY CONNECTOR WITH GUIDE-PIN, LATCHES AND MOUNTING HOLES

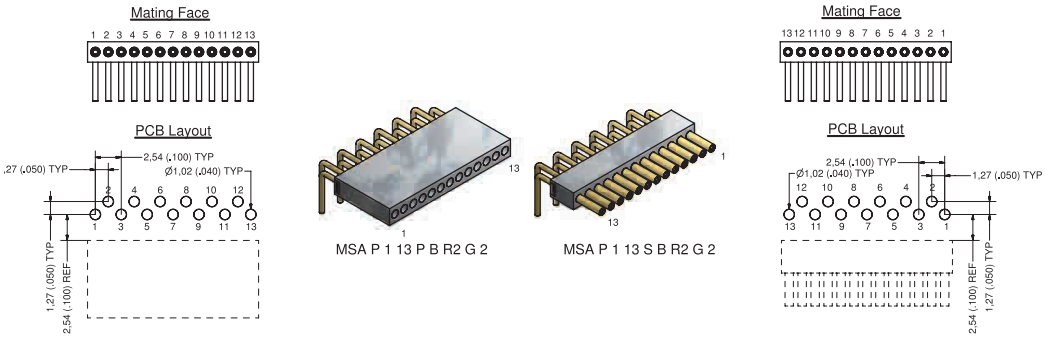
MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



VERSION R2: RIGHT ANGLE, .050" OFFSET

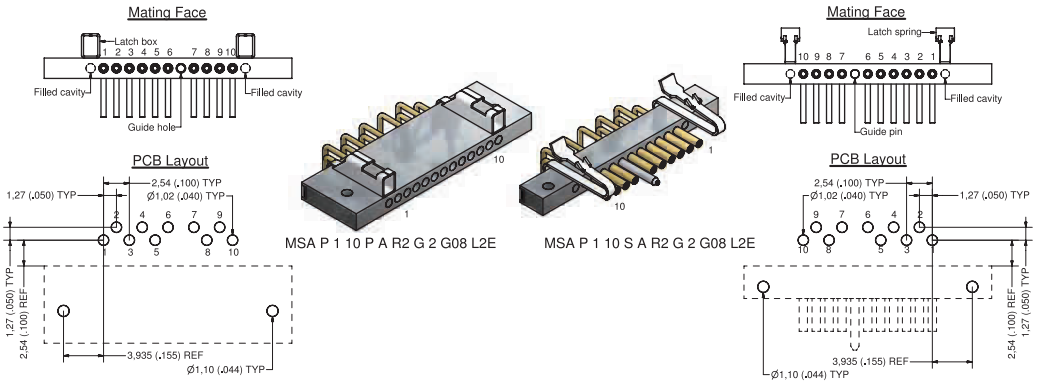
EXAMPLE OF A 13 WAY CONNECTOR

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



EXAMPLE OF A 10 WAY CONNECTOR WITH GUIDE-PIN, LATCHES AND MOUNTING HOLES

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



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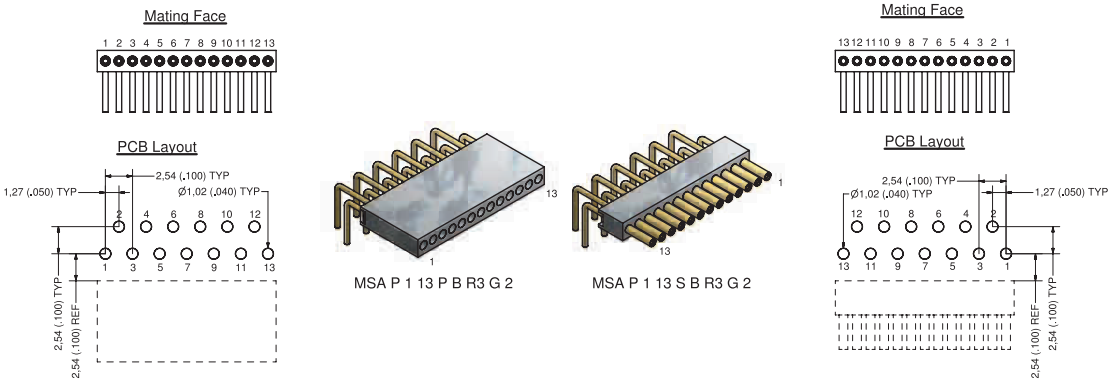
PCB LAYOUT FOR MICROSTRIP CONNECTORS

VERSION R3: RIGHT ANGLE .100" OFFSET

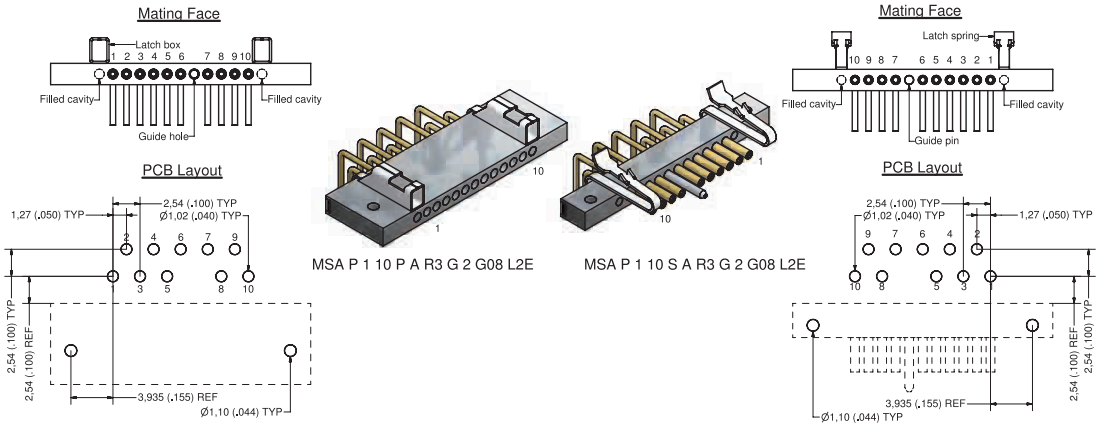
EXAMPLE OF A 13 WAY CONNECTOR

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



EXAMPLE OF A 10 WAY CONNECTOR WITH GUIDE-PIN, LATCHES AND MOUNTING HOLES

MALE MICROSTRIP CONNECTOR | **FEMALE MICROSTRIP CONNECTOR**



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HIGH DENSITY CONNECTORS

NANO-D PITCH

As the need for increased miniaturisation is becoming even greater, AXON' has developed an ultra-high density solution within the existing micro connector size. By putting nano contacts and nano pitch spacing into an existing micro shell, extremely compact connectors with very high pin counts can be produced in circular, rectangular, plastic and metal forms.

Optimal cabling density is achieved in a rectangular ultra high density connector made with Nano-D contacts and spacing inside a standard Micro-D shell size. Such a connector can accommodate a very large amount of pins while retaining excellent Micro-D reliability.

Most electrical and environmental performances are comparable to those of standard Nano-D connectors (250 VAC, 200°C), combined with the robustness and shielding efficiency of the Micro-D metal shell which is compatible with all the hardware types available for Micro-D pigtails.

This same process can be applied to most of the standard and special Micro-D range, making it possible to have ultra high density versions of PCB connectors, wide flange versions, circular, rectangular and combo style versions with a mix of Micro-D and Nano-D contacts.

▲ RECTANGULAR HIGH DENSITY MICRO-D CONNECTORS

▶ High density range

All versions are available with 28, 52 or 86 contacts.
Please find detailed information about this product range in the Nano-D chapter of the catalogue (page 282)

PIGTAILS

BOARD STRAIGHT TYPE (BS) 0.050" PITCH

CONDENSED BOARD RIGHT ANGLE TYPE (CBR) 0.050" PITCH

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COMBO MICRO-D CONNECTORS

COMBO-D GENERAL INFORMATION

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- Contact arrangements 143
- Coaxial and power contacts and cables 144
- General characteristics 147

PCB COMBO CONNECTORS

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- 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

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RECTANGULAR COMBO MICRO-D CONNECTORS

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

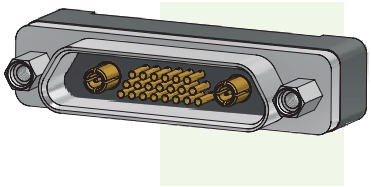
The ideal solution is the AXON' Combo Micro-D. These special, hybrid connectors accommodate a mixture of power and coaxial cables, along with regular signal wires, all in one compact body.

They are available in 2 types and 3 different styles.

PCB connectors

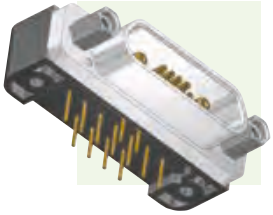
BS TYPE

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



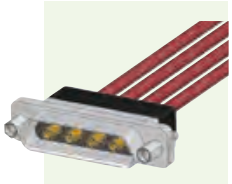
CBR TYPE

- 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.



▲ COMBO MICRO-D WITH Ø2.2MM CONTACT

▲ COMBO MICRO-D WITH Ø3MM CONTACT

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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.

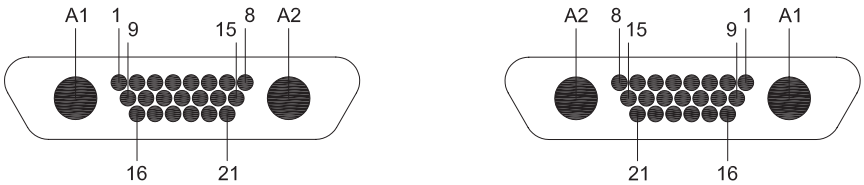
Arrangements can vary depending on the number and the size of the coaxial, power and signal contacts.

AXON' standard combo Micro-D connectors are available with four different mating faces.

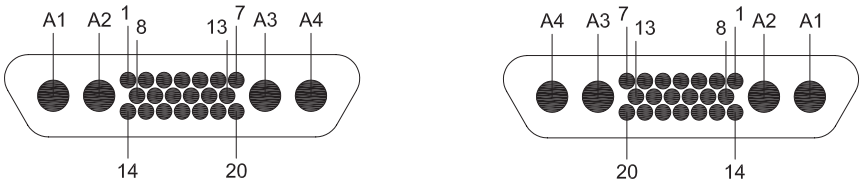
MATING FACE VIEW

MALE MATING FACE	FEMALE MATING FACE

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



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

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COAXIAL & POWER CONTACTS & CABLES

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					
CONTACT TYPE mm (inch)	MEDIA	CONTACT IMPEDANCE	INSULATION RESISTANCE (contacts only)	SWR (contacts only) (Standing Wave Ratio)	FREQUENCY (max.) (for the final assembly)
Ø 3.00 0.118	PCB	50 Ω AND 75 Ω	10^6 MΩ / 250 VRMS (*)	< 1.05 + 0.04 F (GHz) (*)	3 GHz
Ø 3.00 0.118	Coaxial cable	50 Ω AND 75 Ω	10^6 MΩ / 250 VRMS	< 1.05 + 0.04 F (GHz)	6 GHz (depending on cable)
Ø 2.20 0.086	PCB	50 Ω	10^6 MΩ / 250 VRMS (*)	< 1.05 + 0.04 F (GHz) (*)	1 GHz
Ø 2.20 0.086 (*)	Coaxial cable	50 Ω	10^6 MΩ / 250 VRMS	< 1.05 + 0.04 F (GHz)	3 GHz (depending on cable)

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

POWER CONTACTS			
CONTACT TYPE mm (inch)	AWG	CONTACT RESISTANCE	CURRENT (max.)
Ø 3.00 0.118	20	6 mΩ max.	5A
	18	6 mΩ max.	8A
	16	6 mΩ max.	10A
	14	6 mΩ max.	15A
	12	6 mΩ max.	20A
Ø 2.20 0.086	20	6 mΩ max.	5A
	18	6 mΩ max.	8A
	16	6 mΩ max.	10A

Coaxial cable specification

CONTACT DIAMETER mm (inch)	IMPEDANCE	COAXIAL CABLE AVAILABLE	NOMINAL DIAMETER mm (inch)	AXON' P/N
Ø3.00 0.118	50 Ω	AX086 RG316	2.50 .098 2.59 .102	P531437 RG316
	75 Ω	RG179	2.66 .105	RG179
Ø2.20 0.086	50 Ω	AX047 RG178	1.50 .059 1.90 .075	P535846 RG178

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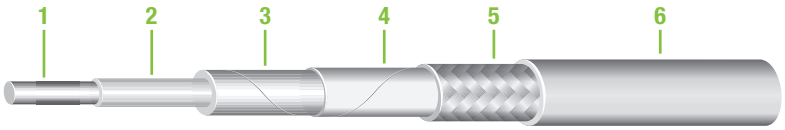
AX047 and AX086 coaxial cable specification

CABLE CONSTRUCTION



	1 - CONDUCTOR		2 - DIELECTRIC		3 - SHIELDING	4 - TAPE	5 - SHIELDING		6 - JACKET	
VERSION	MATERIAL	Ø mm (inch)	MATERIAL	Ø mm (inch)	MATERIAL	MATERIAL	MATERIAL	Ø mm (inch)	MATERIAL	Ø mm (inch)
AX047	SPC*	0.25 .010	PTFE	0.82 .033	SPC* TAPE	POLYESTER	SPC* BRAID	1.17 .046	FEP	1.50 .059
AX086	SPC*	0.51 .020	PTFE	1.66 .065	SPC* TAPE	POLYESTER	SPC* BRAID	2.17 .085	FEP	2.50 .098

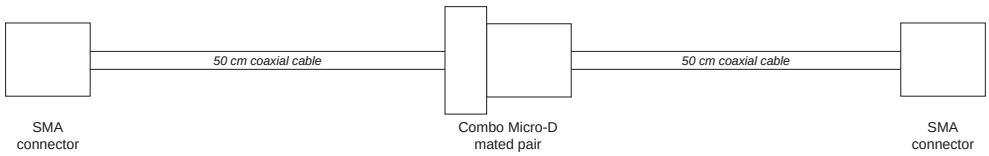
* Silver Plated Copper

ELECTRICAL CHARACTERISTICS

	AX047	AX086
IMPEDANCE (ohms)	50 ± 2	50 ± 1
CAPACITANCE (pF/m)	97	97
INSERTION LOSS @ 23°C @ 18 GHz (dB/m)	6.6	3.45

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.



	COMBO WITH S3 CONTACTS AND RG316	COMBO WITH S3 CONTACTS AND AX086
Max. VSWR DC-6 GHz	1.40	1.35
Max. attenuation at 1 GHz (dB)	1.04	0.87
Max. attenuation at 2 GHz (dB)	1.52	1.25
Max. attenuation at 4 GHz (dB)	2.26	1.80
Max. attenuation at 6 GHz (dB)	2.88	2.24

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RGxxx coaxial cable specification

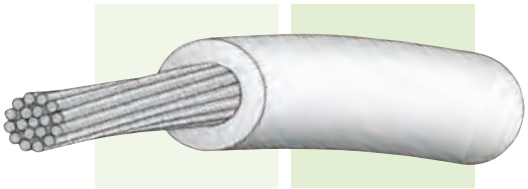
CABLE CONSTRUCTION

VERSION	1 - CONDUCTOR		2 - DIELECTRIC		3 - SHIELDING		4 - JACKET		IMPEDANCE (Ohms)
	MATERIAL	Ø mm (inch)	MATERIAL	Ø mm (inch)	MATERIAL	Ø mm (inch)	MATERIAL	Ø mm (inch)	
RG178	SPC*	0.30 .0118	PTFE	0.85 .033	SPC* Braid	1.30 .051	FEP	1.90 .0354	50
RG179	SPC*	0.30 .0118	PTFE	1.60 .063	SPC* Braid	2.05 .080	FEP	2.66 .105	75
RG316	SPC*	0.51 .02	PTFE	1.06 .042	SPC* Braid	1.97 .076	FEP	2.59 .102	50

*: 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.



WIRE DESIGNATION	CONDUCTOR						INSULATION		TEMPERATURE RATING	VOLTAGE RATING
	MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (SQ IN)	RESISTANCE Ω/100M (Ω/1000FT)	MATERIAL	Ø mm (inch)		
E1219	SPC*	12	19x0.455 19x.018	2.273 .09	3.10 .0048	0.58 1.77	EXTRUDED PTFE	2.85 .112	-90°C / +200°C	600 VAC
E1419	SPC*	14	19x0.360 19x.014	1.803 .07	1.94 .00300	0.92 2.8	EXTRUDED PTFE	2.35 .0925	-90°C / +200°C	600 VAC
E1619	SPC*	16	19x0.300 19x.012	1.500 .06	1.34 .00207	1.3 3.96	EXTRUDED PTFE	2.1 .083	-90°C / +200°C	600 VAC
E1819	SPC*	18	19x0.254 19x.010	1.269 .05	0.96 .0015	1.9 5.9	EXTRUDED PTFE	1.75 .070	-90°C / +200°C	600 VAC
E2019	SPC*	20	19x0.203 19x.008	1.009 .04	0.62 .00096	2.9 8.84	EXTRUDED PTFE	1.50 .060	-90°C / +200°C	600 VAC

*: Silver Plated Copper

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GENERAL CHARACTERISTICS

Electrical & mechanical characteristics

CHARACTERISTICS	SPECIFICATION	TEST METHOD
SIGNAL CONTACT CURRENT RATING	3 A max.	EIA-364-70
SIGNAL CONTACT RESISTANCE	8 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 m - ALTITUDE 21 km (70,000 ft)	 600 VAC 150 VAC	EIA-364-20
VSWR	Depending on contact and coaxial cable	
INSERTION LOSS	Depending on contact and coaxial cable	
CONTACT ENGAGING AND SEPARATION FORCE (SIGNAL LINES)	170 g max. (6 oz) 14 g min. (0.5 oz)	EIA-364-37
CONTACT RETENTION (SIGNAL LINES)	2.26 kg (5 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	500 mating cycles min.	EIA-364-09
TEMPERATURE RANGES - WITH COAXIAL CONTACTS - WITH POWER CONTACTS	 - 55°C / +125°C - 55°C / +150°C	
VIBRATION	20 g's - No discontinuity >1µs	EIA-364-28 -TEST CONDITION IV
SHOCK	50 g's - No discontinuity >1µs	EIA-364-27 -TEST CONDITION E
SALT SPRAY	48 hours	EIA-364-26 -TEST CONDITION B
HUMIDITY	Insulation resistance > 1MΩ	EIA-364-31 - METHOD IV

Material & Finish

COMPONENT		MATERIAL	FINISH
SIGNAL CONTACT	MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.00005") MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27µM (0.00005") TO 3.81µM (0.00015"))
	FEMALE CONTACT	COPPER ALLOY	
COAXIAL CONTACT AND POWER CONTACT	SPRING LOADED PARTS	BERYLLIUM COPPER	GOLD PLATING
	OTHER METAL PARTS	COPPER ALLOY	GOLD PLATING
	INSULATOR	PTFE	
METAL SHELL		ALUMINIUM ALLOY, TYPE 6061	YELLOW CHROMATE OVER CADMIUM : IN ACCORDANCE WITH SAE-AMS-QQ-P-416, TYPE II, CLASS 3 ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0005 INCH MIN. BLACK ZINC NICKEL OVER NICKEL UNDERPLATE
		STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
PLASTIC SHELL / INSERT / PCB TRAY		LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94V0, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE		STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT		EPOXY RESIN	
INSULATED WIRE (SIGNAL LINES)		PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH NEMA-HP3 PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/11 ETFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33	
UNINSULATED WIRE (SIGNAL LINES)		GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551 TIN PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551	

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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

MDCA	2	P3	S	-	CBR	P	G	1

SERIES

MDCA: Micro-D Combo AXON'.

CONNECTOR TYPE

1: Cadmium aluminium shell / **Z**: Black zinc nickel aluminium shell.
2: Nickel aluminum shell.

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

Coaxial contacts (S3)
50: 50Ω.
75: 75Ω.

Coaxial contact (S2.2)
50: 50Ω.

Power contacts
-: Power contacts.

PCB VERSION

with coaxial contacts:
75S: Board straight connector, 0.075" pitch for signal lines.
CBR: Condensed board right 0.100" 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").

METAL CONNECTORS ARE SUPPLIED WITH ANTI-STATIC PROTECTIVE DUST CAPS

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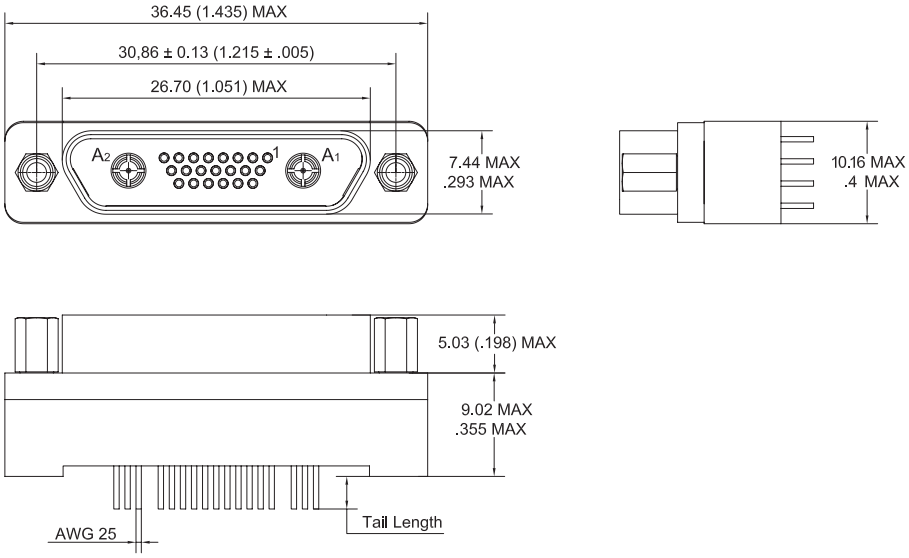
BOARD STRAIGHT TYPE (BS) 0.075" PITCH (with coaxial contacts only)

In a 51 way shell

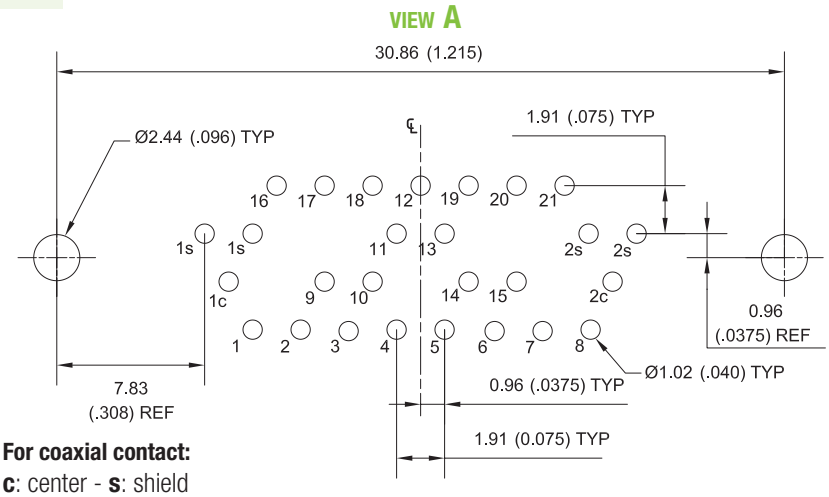
- FEMALE PCB CONNECTOR (C3 CONFIGURATION)
  2 COMBO CONTACTS (3.0 mm) + 21 SIGNALS

DIMENSIONS

Dimensions are in millimetres (inches).



PCB LAYOUT



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

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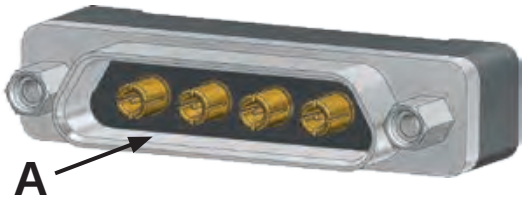
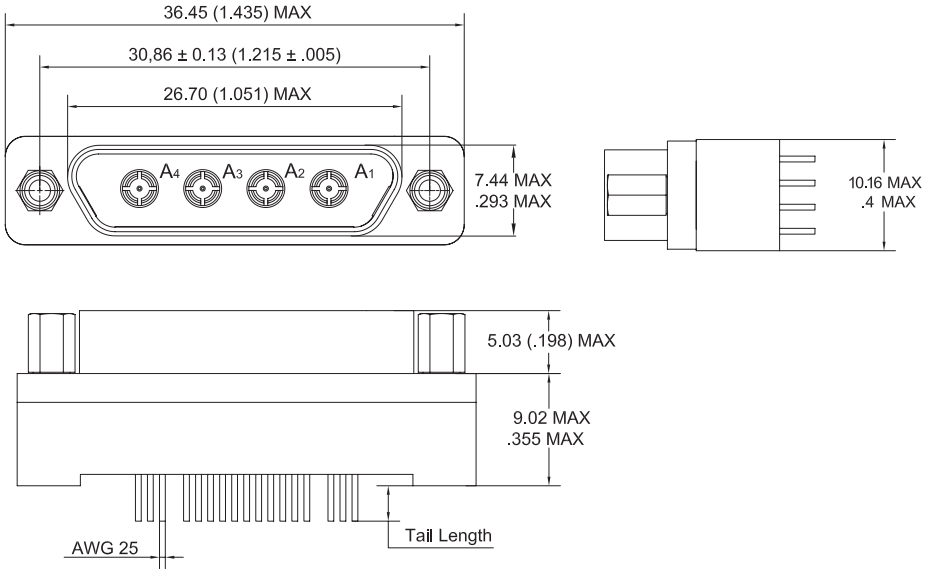
In a 51 way shell

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



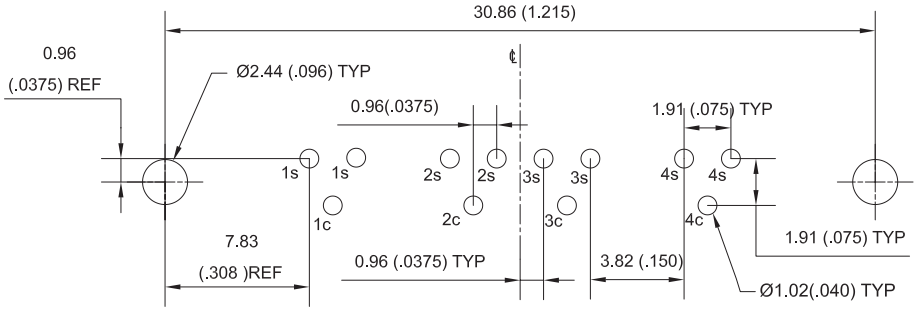
DIMENSIONS

Dimensions are in millimetres (inches).



PCB LAYOUT

VIEW A



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

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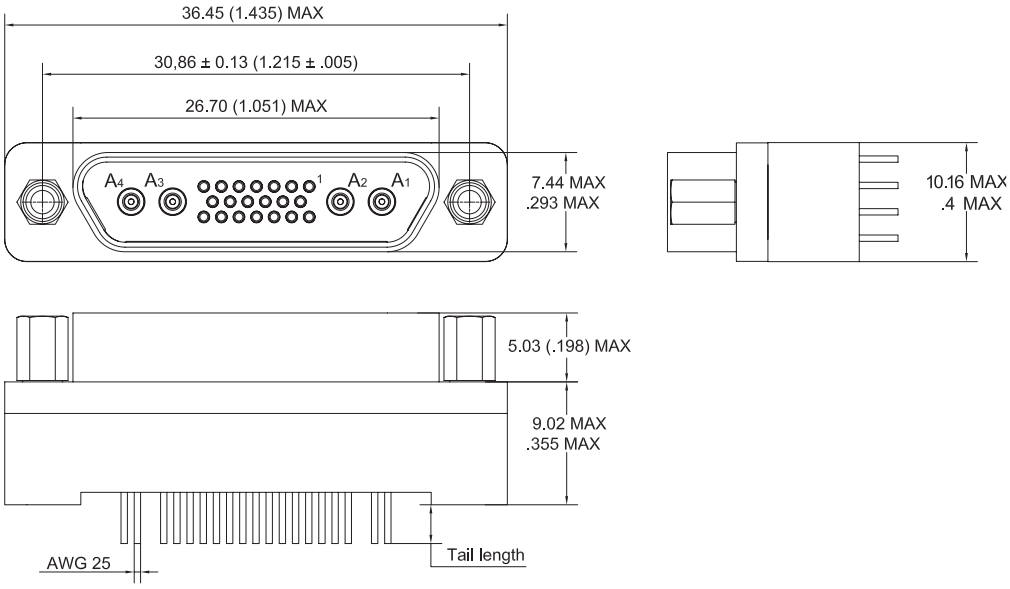
In a 51 way shell

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

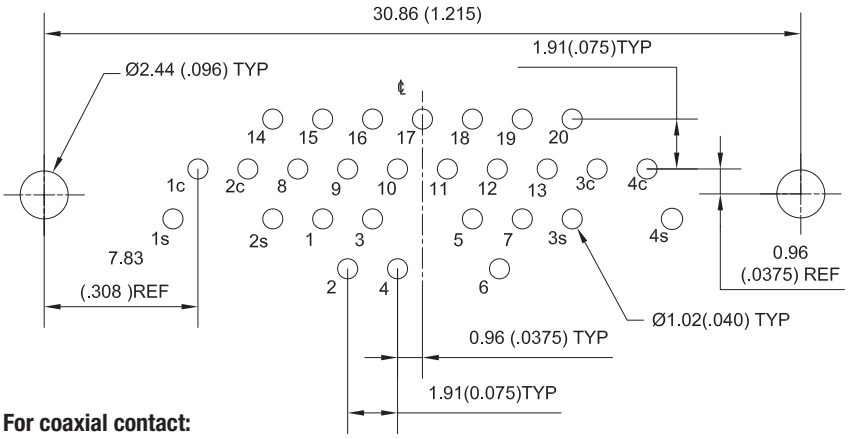
DIMENSIONS

Dimensions are in millimetres (inches).



PCB LAYOUT

VIEW A



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

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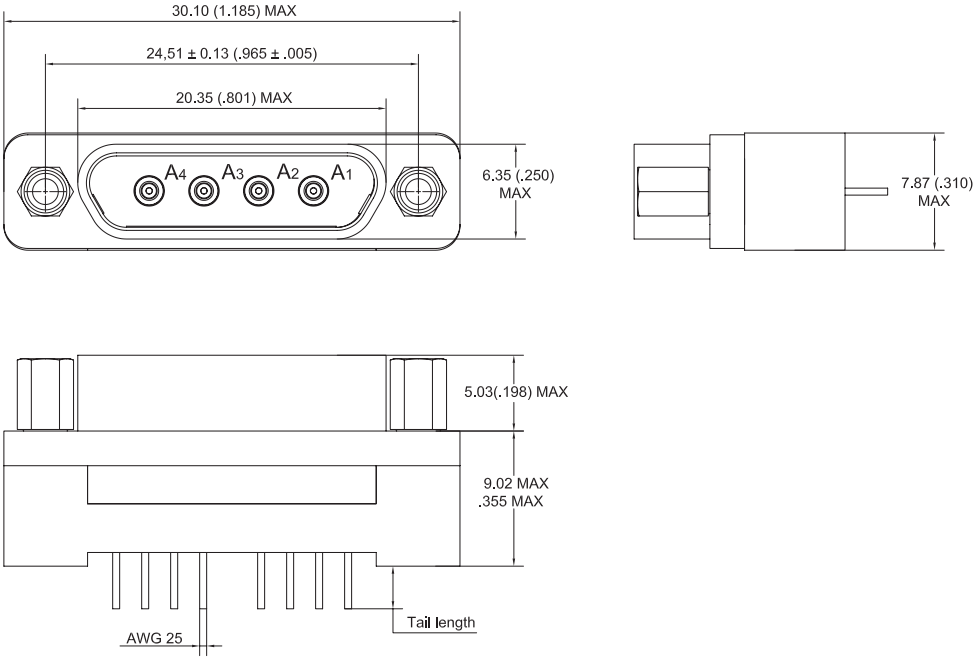
In a 25 way shell

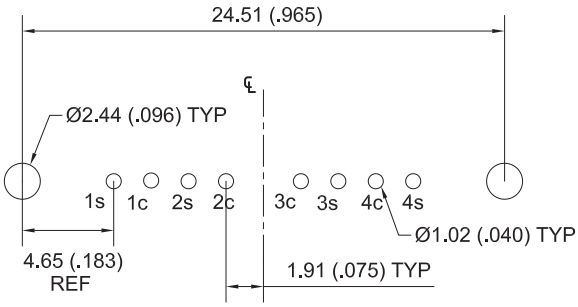
FEMALE PCB CONNECTOR (C8 CONFIGURATION)
4 COMBO CONTACTS (2.2 mm)

DIMENSIONS
Dimensions are in millimetres (inches).



PCB LAYOUT

VIEW A



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

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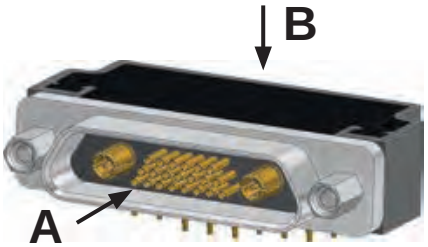
CONDENSED BOARD RIGHT ANGLE (0.100" PITCH) (coaxial and power combo contacts)

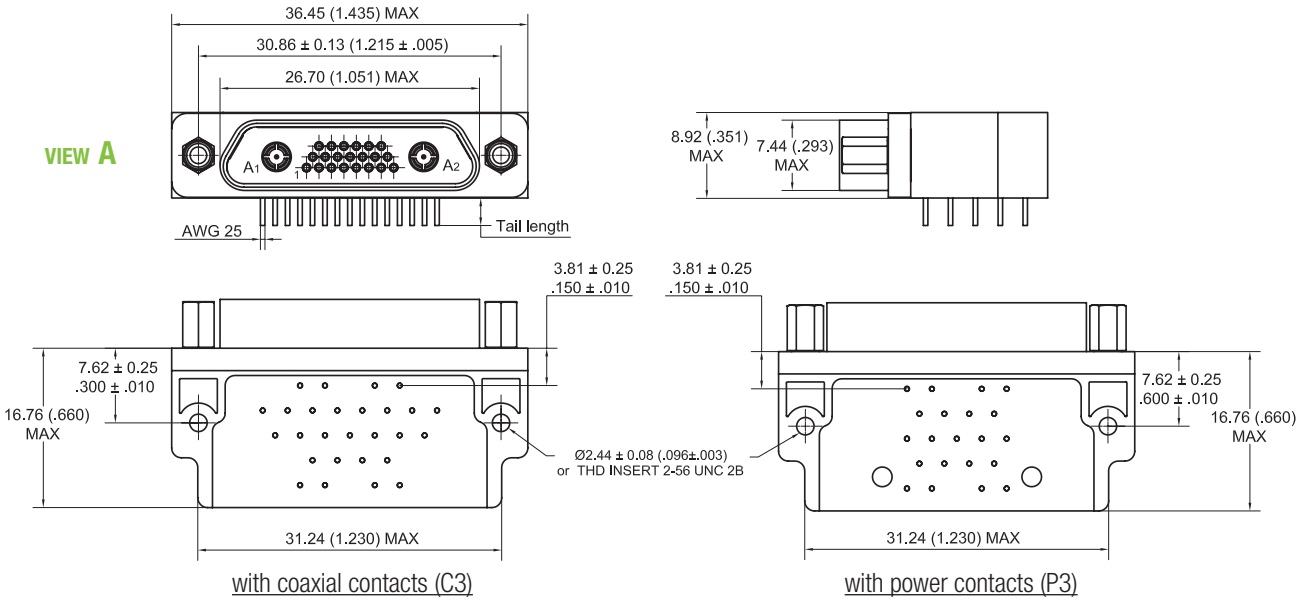
In a 51 way shell

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



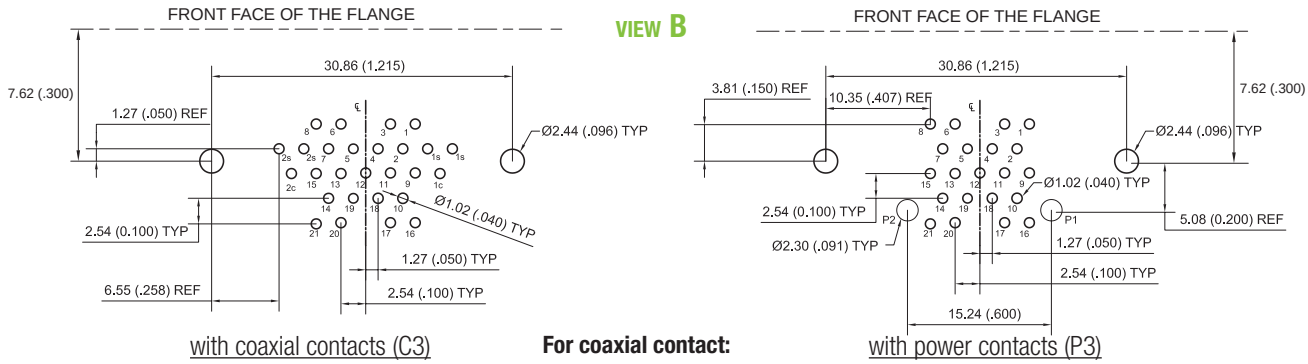
DIMENSIONS

Dimensions are in millimetres (inches).



with coaxial contacts (C3) — with power contacts (P3)

PCB LAYOUT



with coaxial contacts (C3)

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

with power contacts (P3)

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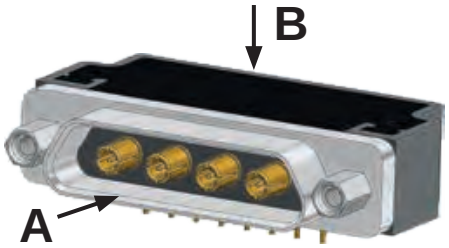
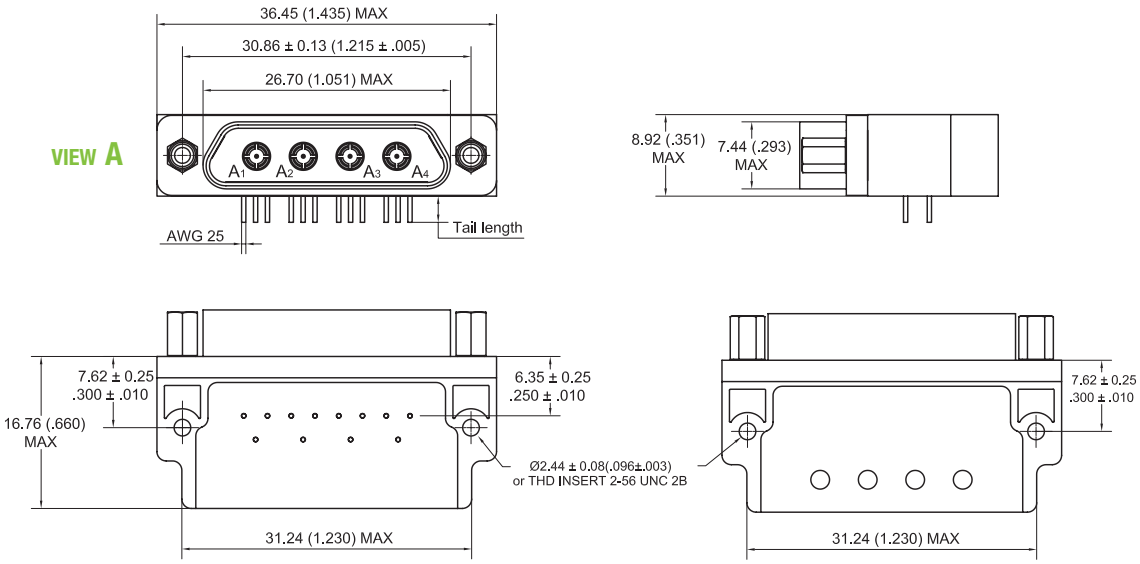
In a 51 way shell

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



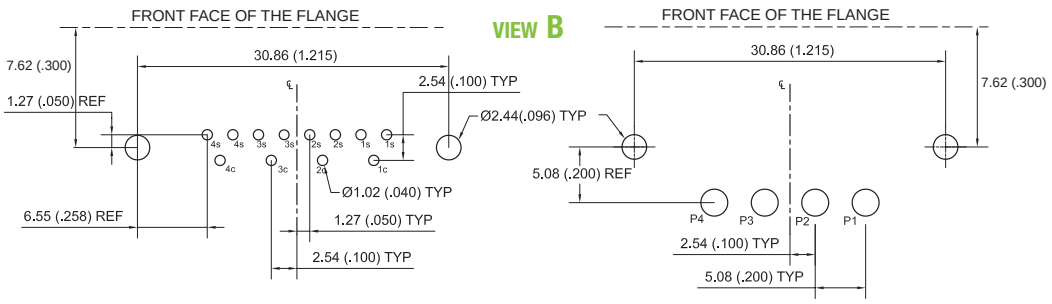
DIMENSIONS

Dimensions are in millimetres (inches).



with coaxial contacts (C1) | with power contacts (P1)

PCB LAYOUT



with coaxial contacts (C1)

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

with power contacts (P1)

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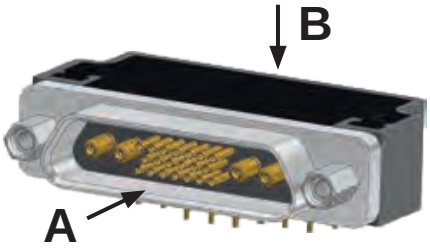
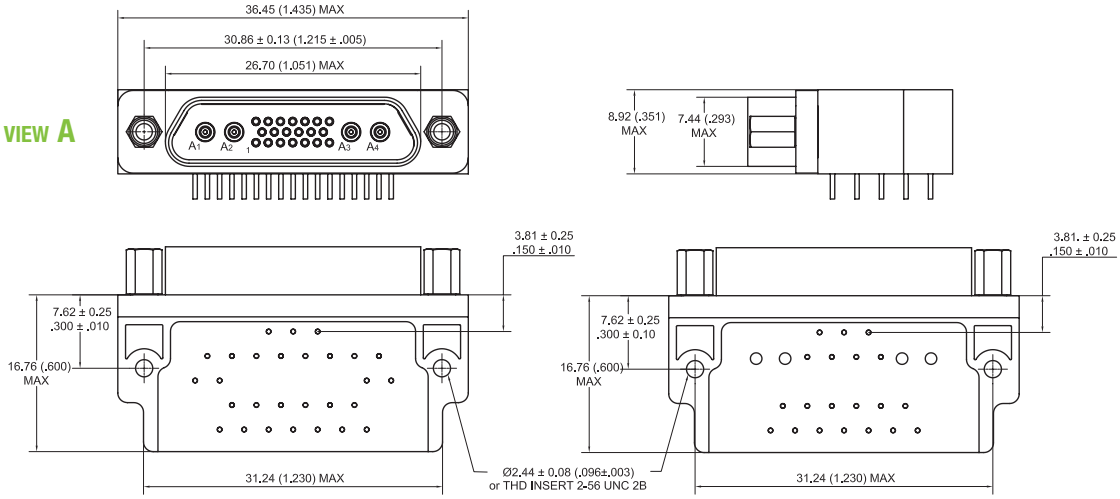
In a 51 way shell

FEMALE PCB CONNECTOR (C10/P10 CONFIGURATIONS)
4 COMBO CONTACTS (2.2 mm) + 20 SIGNALS



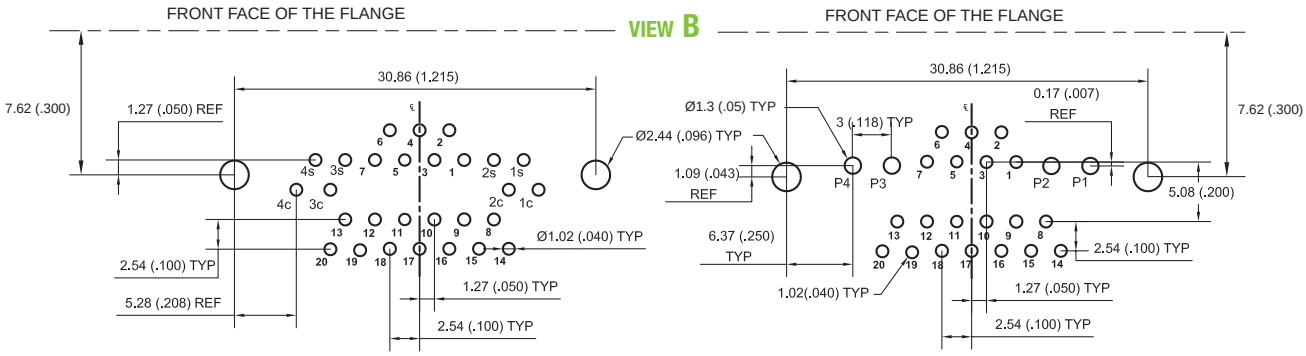
DIMENSIONS

Dimensions are in millimetres (inches).



with coaxial contacts (C10) | with power contacts (P10)

PCB LAYOUT



with coaxial contacts (C10)

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

with power contacts (P10)

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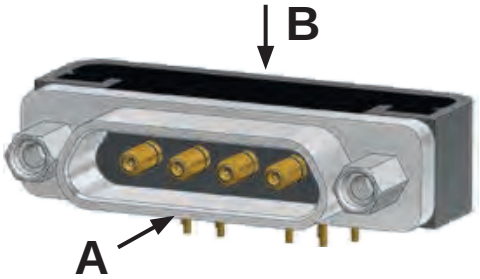
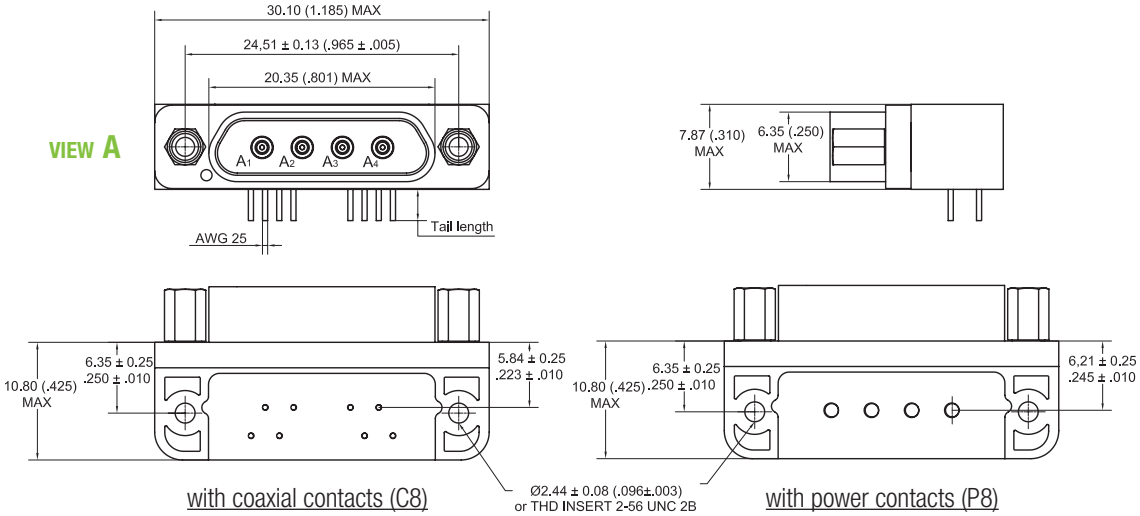
In a 25 way shell

FEMALE PCB CONNECTOR (C8/P8 CONFIGURATIONS)
4 COMBO CONTACTS (2.2 mm)



DIMENSIONS

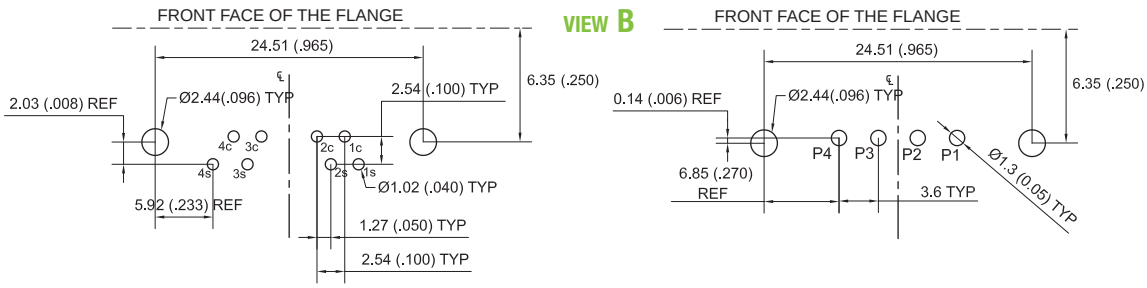
Dimensions are in millimetres (inches).



with coaxial contacts (C8)

with power contacts (P8)

PCB LAYOUT



with coaxial contacts (C8)

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

with power contacts (P8)

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Pigtail connectors

METAL SHELL

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

IDENTIFICATION CODE

MDCA 2 C1 P A 020 L 8 L 050 M

SERIES

MDCA: Micro-D Combo AXON'.

CONNECTOR TYPE

1: Cadmium aluminium shell / **Z**: Black zinc nickel aluminium shell.
2: Nickel aluminum shell.

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

Coaxial cable (S3)
A: AX086 (50Ω).
B: RG316 (50Ω).
C: RG179 (75Ω).

Coaxial cable (S2.2)
A: AX047 (50Ω).
C: RG178 (50Ω).

Power cable
A: AWG12 (only for S3).
B: AWG14 (only for S3).
C: AWG16 (recommanded for S2.2).
D: AWG18 (recommanded for S2.2).
E: AWG20 (recommanded for S2.2).
Wires type Exx19 for power lines (xx=AWG)

WIRE LENGTH FOR COMBO LINES (in cm)

Attention! Wire length in centimeters (1cm = 10mm = 0.394").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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 TYPE FOR SIGNAL LINES

1: E 2607, AWG 26, 7 strands, 600V.
4: E 2619, AWG 26, 19 strands, 600V.
6: E 2807, 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.

COLOUR CODE FOR SIGNAL LINES

F: All yellow. - **L**: All white. - **W**: 10 color repeat ***(see page 30 for colour code)***.

WIRE LENGTH FOR SIGNAL LINES (in cm)

Attention! Wire length in centimeters (1cm = 10mm = 0.394").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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).
M: Low profile socket hex head jackscrews (removable).
N: High profile socket hex head jackscrews (removable).
S: low profile slot head jackscrews (removable).
FR: Float mount, rear panel mount (non removable).
Px (x: 1 to 5): Panel mount jackposts.
T: High profile slot head jackscrews (removable).
P: Jackposts (removable).
K: High profile slot head jackscrews (non removable).
L: Low 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

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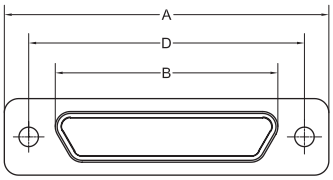
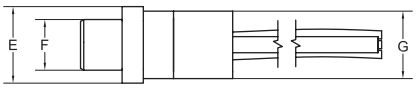
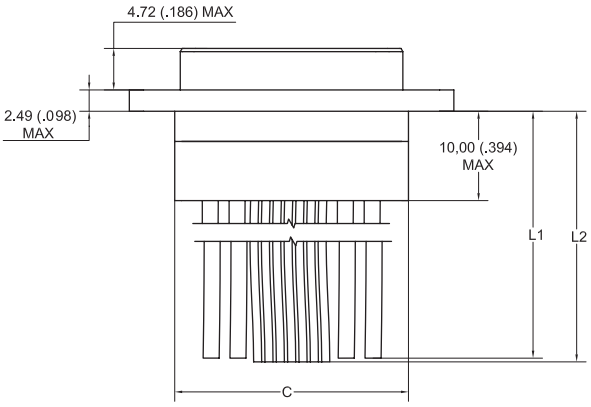
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



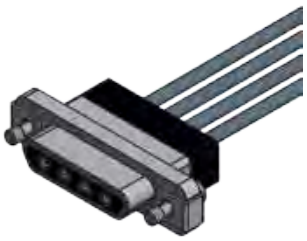




L1 and L2 wires length

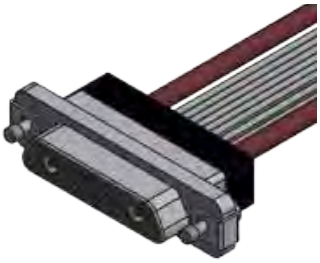
MALE PIGTAIL	A ± 0.25 (±.010)	B max Male	C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max Male	G max
C1 or P1	36.20 1.425	24.99 .984	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.87 .310
C3 or P3	36.20 1.425	24.99 .984	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.87 .310
C8 or P8	29.85 1.175	18.64 .734	20.07 .790	24.51 .965	7.57 .298	4.69 .185	6.86 .270
C10 or P10	36.20 1.425	24.99 .984	26.42 1.040	30.86 1.215	8.66 .341	5.79 .228	7.87 .310

▲ COMBO 51 4 COAX S2.2 + 20 SIGN MALE PIGTAIL (C10)



▲ COMBO 25 4 COAX S2.2 MALE PIGTAIL (C8)

▲ COMBO 51 4 COAX S3 MALE PIGTAIL (C1)



▲ COMBO 51 2 COAX S3 + 21SIGN MALE PIGTAIL (C3)

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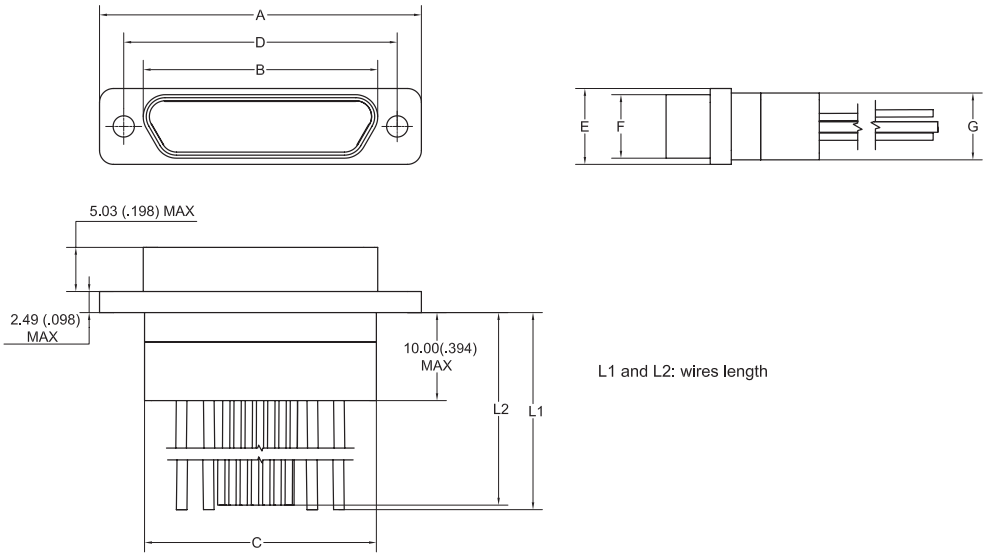
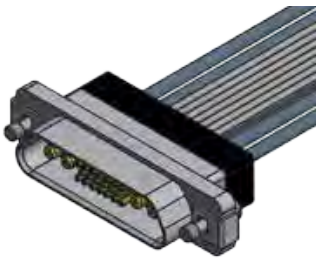
DIMENSIONS

Dimensions are in millimetres (inches).

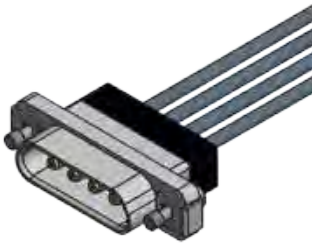
FEMALE connector



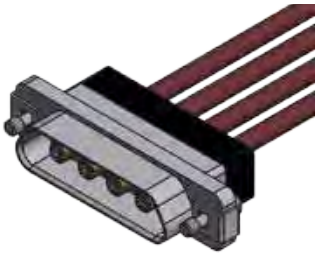
FEMALE PIGTAIL	A ± 0.25 (±.010)	B max Female	C -0.46/+0.25 (-.018/+.010)	D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max Female	G max
C1 or P1	36.20 1.425	26.70 1.101	26.42 1.040	30.86 1.215	8.66 .341	7.44 .293	7.87 .310
C3 or P3	36.20 1.425	26.70 1.101	26.42 1.040	30.86 1.215	8.66 .341	7.44 .293	7.87 .310
C8 or P8	29.85 1.175	20.35 .801	20.07 .790	24.51 .965	7.57 .298	6.35 .250	6.86 .270
C10 or P10	36.20 1.425	26.70 1.101	26.42 1.040	30.86 1.215	8.66 .341	7.44 .293	7.87 .310



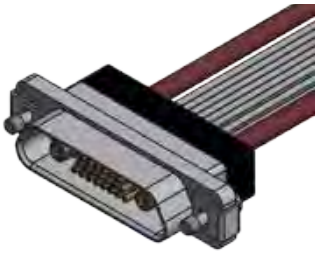
▲ COMBO 51 4 COAX S2.2 + 20 SIGN FEMALE PIGTAIL (C10)



▲ COMBO 25 4 COAX S2.2 FEMALE PIGTAIL (C8)



▲ COMBO 51 4 COAX S3 FEMALE PIGTAIL (C1)



▲ COMBO 51 2 COAX S3 + 21 SIGN FEMALE PIGTAIL (C3)

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SPECIAL
COMBO CONNECTORS

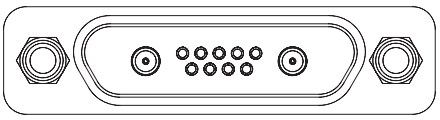
AXON' can develop on request special Combo Micro-D connectors based on all the standard shell sizes from 9 to 100 ways, or based on special shells such as the 120 way version or other custom configurations.

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:

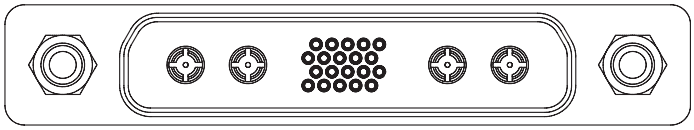
Other possible arrangements

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

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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

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HERMETIC CONNECTORS

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

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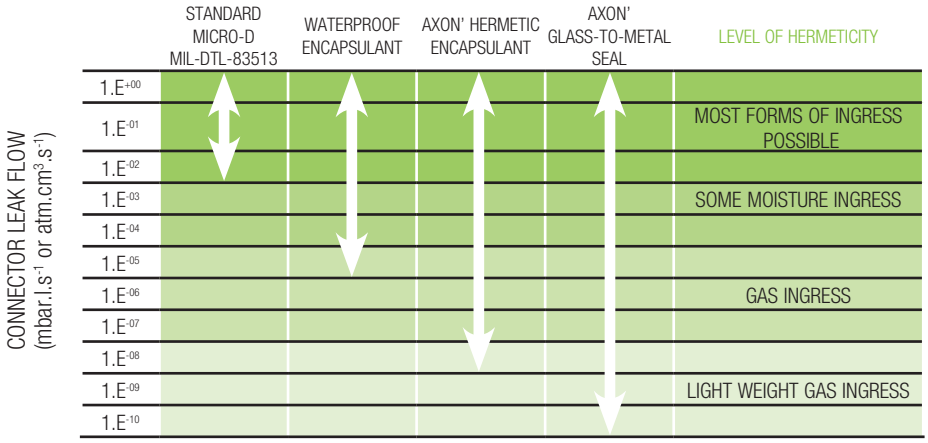
INTRODUCTION TO HERMETIC CONNECTORS

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

TECHNOLOGY CODE	HERMETIC ENCAPSULANT WITH SILICONE GASKET MDH1	HERMETIC ENCAPSULANT WITH FKM GASKET MDH2	GLASS-TO-METAL SEAL *on request*
MAXIMUM LEAK RATE*	1.10^{-5} mbar.l.s^{-1}	1.10^{-8} mbar.l.s^{-1}	< 1.10^{-11} mbar.l.s^{-1}
SERVICE TEMPERATURE RANGE	-55°C / +125°C	-30°C / +125°C	-55°C / +200°C**
CURRENT RATING	3 A MAX	3 A MAX	3 A MAX

*: 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

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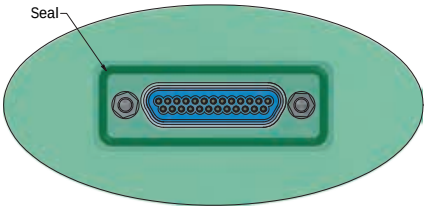
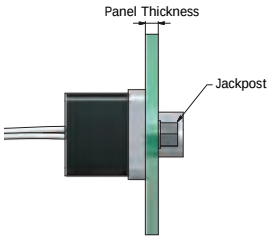
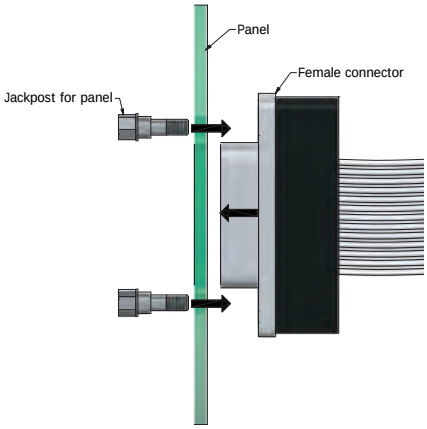
REAR PANEL MOUNTING GUIDE

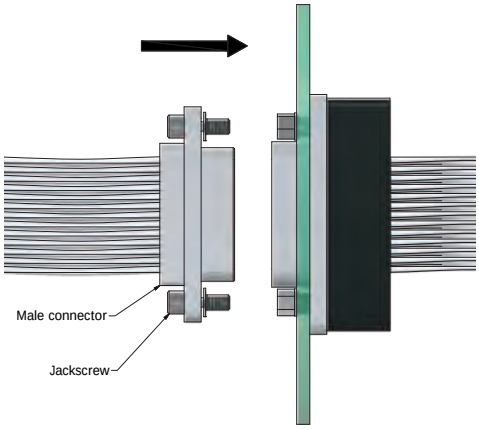
HERMETIC FEED THROUGH CONNECTORS

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.

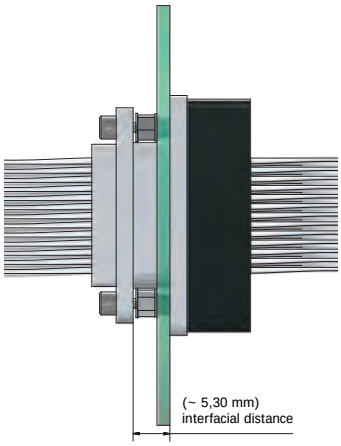








- Recommended Ra for panel surface: <0.8 µm
- Recommended torque (jackposts): 0.35 N.m
- Connector parts and panel must be cleaned off before mounting for better performances
- Design is made to be used without vacuum grease



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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

MDH	1	51	S	4	L	050	B

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
Solid uninsulated wires
G: AWG 25 gold plated.
FS: Solder cup.

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 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.

See page 29 for wire types.

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

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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.

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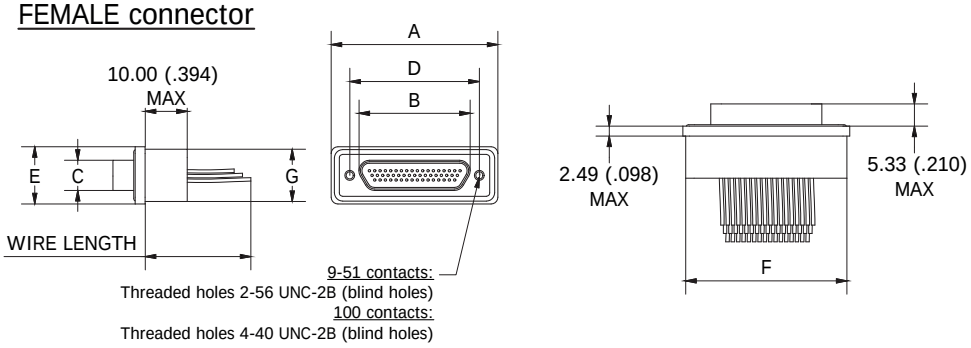
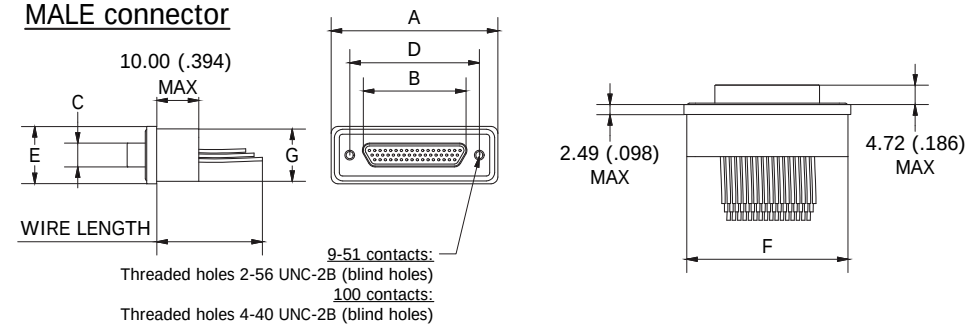
DIMENSIONS

Dimensions are in millimetres (inches).

FEMALE connector



MALE connector



	A ± 0.25 (±.010)	B max.		C max.		D ± 0.13 (±.005)	E ± 0.25 (±.010)	F max.	G max.
		Male	Female	Male	Female				
9 P / 9 S	23.20 .913	8.48 .334	10.16 .400	4.69 .185	6.35 .250	14.35 .565	12.50 .492	22.50 .886	12.00 .472
15 P / 15 S	27.00 1.063	12.29 .484	14.00 .551	4.69 .185	6.35 .250	18.16 .715	12.50 .492	26.30 1.035	12.00 .472
21 P / 21 S	30.81 1.213	16.10 .634	17.81 .701	4.69 .185	6.35 .250	21.97 .865	12.50 .492	30.10 1.185	12.00 .472
25 P / 25 S	33.40 1.315	18.64 .734	20.35 .801	4.69 .185	6.35 .250	24.51 .965	12.50 .492	32.70 1.287	12.00 .472
31 P / 31 S	37.16 1.463	22.45 .884	24.16 .951	4.69 .185	6.35 .250	28.32 1.115	12.50 .492	36.50 1.437	12.00 .472
37 P / 37 S	41.00 1.614	26.26 1.034	27.96 1.101	4.69 .185	6.35 .250	32.13 1.265	12.50 .492	40.30 1.586	12.00 .472
51 P / 51 S	39.70 1.563	24.99 .984	26.70 1.051	5.79 .228	7.44 .293	30.86 1.215	13.60 .535	39.00 1.536	13.00 .512
100 P / 100 S	59.70 2.350	35.15 1.384	36.86 1.451	6.88 .271	8.46 .333	45.72 1.800	15.70 1.618	59.00 2.323	14.50 .571

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NON-MAGNETIC CONNECTORS

Non-magnetic Micro-D interconnect solutions 170

PIGTAIL CONNECTORS

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- Non-magnetic low profile metal shell connectors 173
- Non-magnetic plastic shell connectors 174

PCB CONNECTORS

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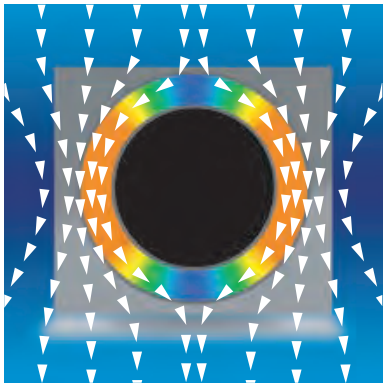
NON-MAGNETIC MICRO-D INTERCONNECT SOLUTIONS

▲ **FIGURE 1**: Location of magnetic test facility (30m away from possible interference)

▲ **FIGURE 2**: This item's initial magnetic state is being measured using a three-axis probe, whilst protected by the magnetic shield



▲ **FIGURE 3**: Diagram showing the effect of the magnetic shield on the Earth's magnetic field. In white, the magnetic field lines. In color, the intensity of the magnetic field within the shield, red for high intensity and blue for low intensity. The black area in the center is the area used to measure the initial magnetic state of the item.

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).

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NON-MAGNETIC MICRO-D INTERCONNECT SOLUTIONS

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),
μ_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:

$$1 \text{ Oersted} = \left(\frac{10^3}{4\pi}\right) \text{A/m}$$

$$1 \text{ T} = 10^4 \text{ Gauss} = 10^9 \text{ Gamma}$$

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
Operating temperature range	-55°C / +200°C
Current rating	3 A max

*: 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

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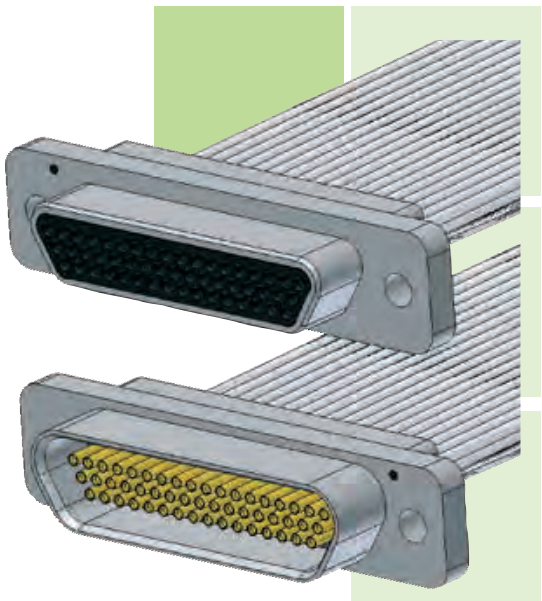

NON-MAGNETIC CONNECTOR

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

MDN 1A 51 S 4 L 050 B

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, AWG 26, 7 strands, 600V.
4: E 2619, AWG 26, 19 strands, 600V.
6: E 2807, 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.
BLANK: If wire type is S or FS.
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.

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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.

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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

MDN	1A	L51	S	4	L	050	B

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
L09, **L15**, **L21**, **L25**, **L31**, **L37**, **L51**.
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 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.
BLANK: If wire type is S or FS.
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.

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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.

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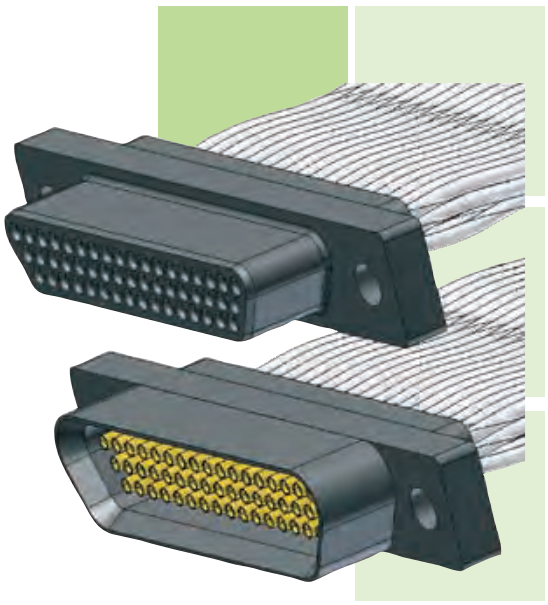
NON-MAGNETIC CONNECTOR



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

MDN	P	51	S	4	L	050	B

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 2807, 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.
BLANK: If wire type is S or FS.
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.

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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.

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PCB CONNECTORS OVERVIEW

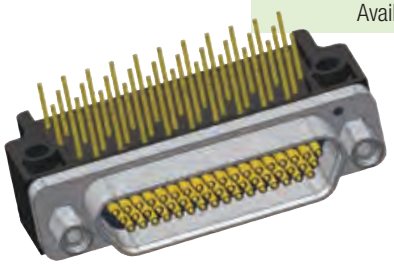
AXON' Micro-D Printed Circuit Board connectors are designed for interconnection of PCB's inside-the-box to external cables.
AXON' Micro-D PCB connectors are available in two layouts (0.100" pitch and 0.075" pitch) and in two configurations (vertical mount and right angle mount connectors) for flexible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

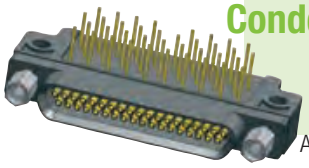
Available from 9 to 100 ways
Available in metal shell
PCB code: **CBR**

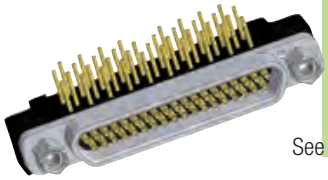


See pages 78 to 85*.

CBP 0.100" Condensed Right Angle mount low profile

Available from 9 to 51 ways
Available in metal and plastic shell
PCB code: **CBP**



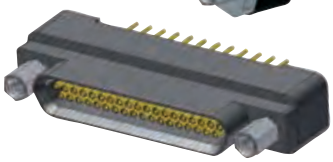


See pages 86 to 91*.

NON-MAGNETIC PCB CONNECTORS 0.075" PITCH

BS 0.075" Vertical mount

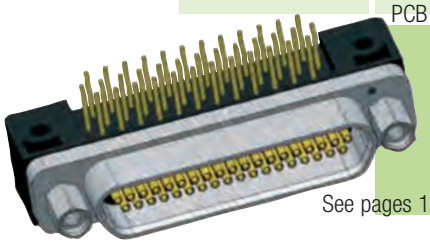
Available from 9 to 100 ways
Available in metal and plastic shell
PCB code: **75SB**



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.

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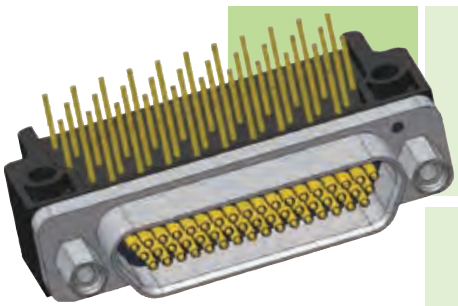

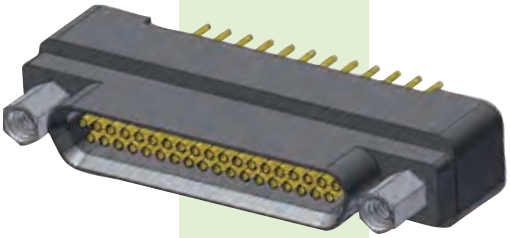

NON-MAGNETIC PCB CONNECTOR

- 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

MDN	1A	51	S	CBR	P	S	3

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 + 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***.
L09*, **L15***, **L21***, **L25***, **L31***, **L37***, **L51***.
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.

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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

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120 WAY MICRO-D CONNECTORS

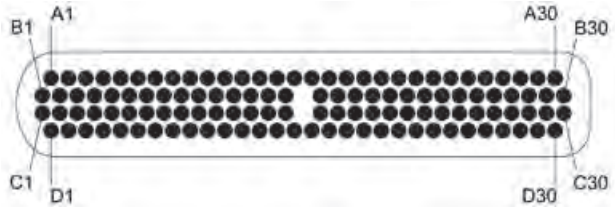
An enduring trend in the electronics industry is the continuing drive towards miniaturisation. This leads in turn to ever greater cabling densities with an ever larger number of signals required within limited space constraints. In answer to these challenges, AXON' CABLE has developed a range of 120 way Micro-D connectors. They are available as pigtails 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.

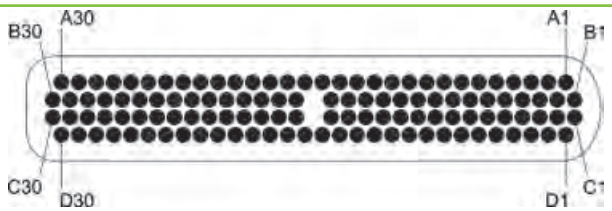
AXON' can offer specific numbers of contacts for custom designed applications. Specific designs are not contained within the MIL specification but AXON's solutions remain fully compatible with the MIL-DTL-83513 standard as far as performance and construction are concerned.

▲ 120 WAY MICRO-D CARD EDGE CONNECTOR

Contact arrangements



MATING FACE OF THE 120 WAY MALE CONNECTOR



MATING FACE OF THE 120 WAY FEMALE CONNECTOR

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

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References

DESIGNATION	REFERENCE	COMMENTS	PAGE
120 WAY PLUG CONNECTOR FOR CABLE OR ASSEMBLY	P562620	Wire, length and colour type to be defined	181
120 WAY SOCKET CONNECTOR FOR CABLE OR ASSEMBLY	P562621	Wire, length and colour type to be defined	181
120 WAY SOCKET SURFACE MOUNT PCB CONNECTOR	P562622	Can only be mated with pigtail plug	182
120 WAY PLUG BOARD STRAIGHT PCB CONNECTOR	P562623		183
120 WAY CONNECTOR SAVER	P562624		183

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

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Electrical & mechanical characteristics

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

Materials & finish

COMPONENTS	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.050") MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27µM (0.050") TO 3.81µM (0.150"))
FEMALE CONTACT	COPPER ALLOY	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0005 INCH MIN.
INSERTS	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	EPOXY RESIN	
UNINSULATED WIRE	AWG 2801 SOLID COPPER WIRE	GOLD PLATED IN ACCORDANCE WITH A-A-59551

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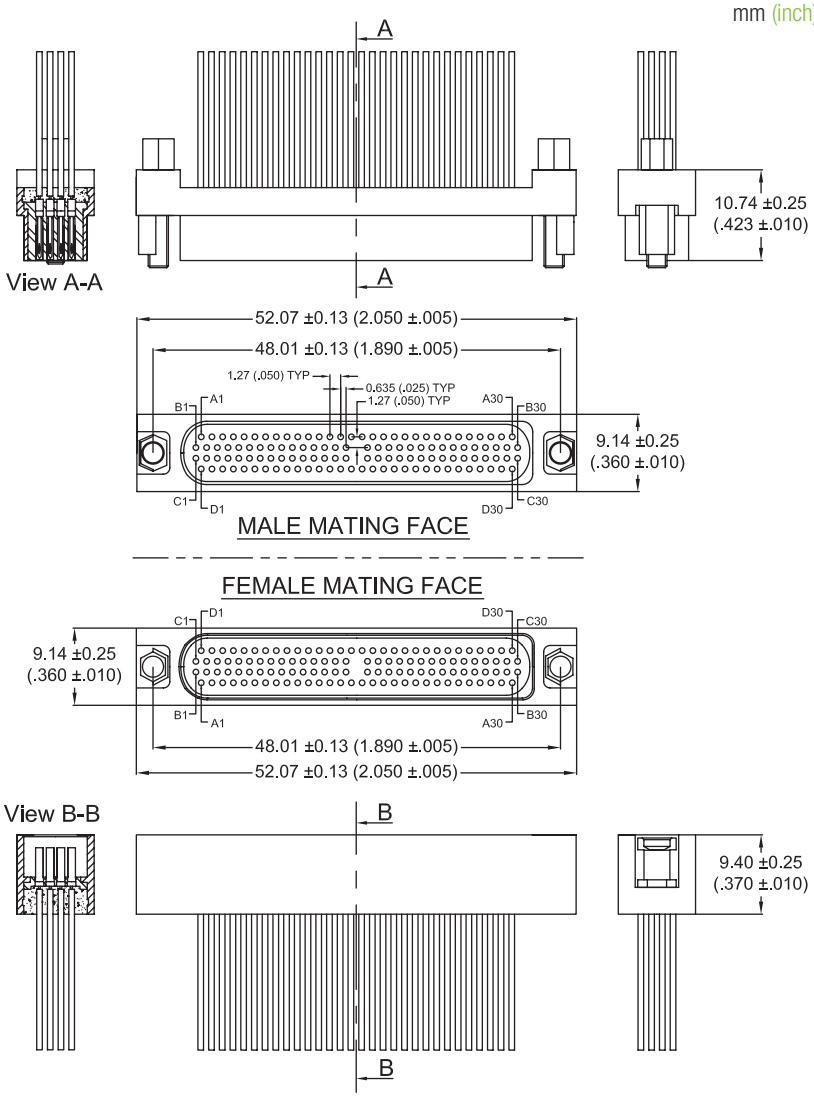
120 way male and female connectors for cable and harnesses

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.

P562620
P562621

mm (inch)



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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

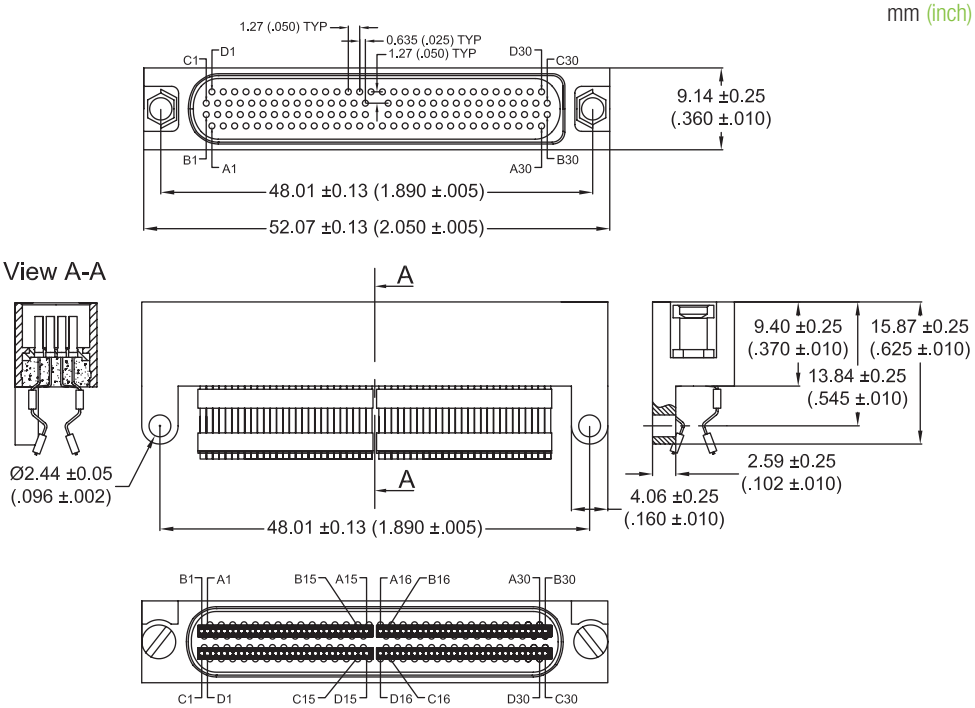
- Female style to mate with a male pigtail or assembly connector.
- Male and female styles to mate together (this option has a longer shell to retain the keying hardware system).
- Female style for panel mount.

FEMALE SMT

to mate to a male cable connector.

P562622

mm (inch)



SEE CONTACT LAYOUT ON PCB PAGE 308

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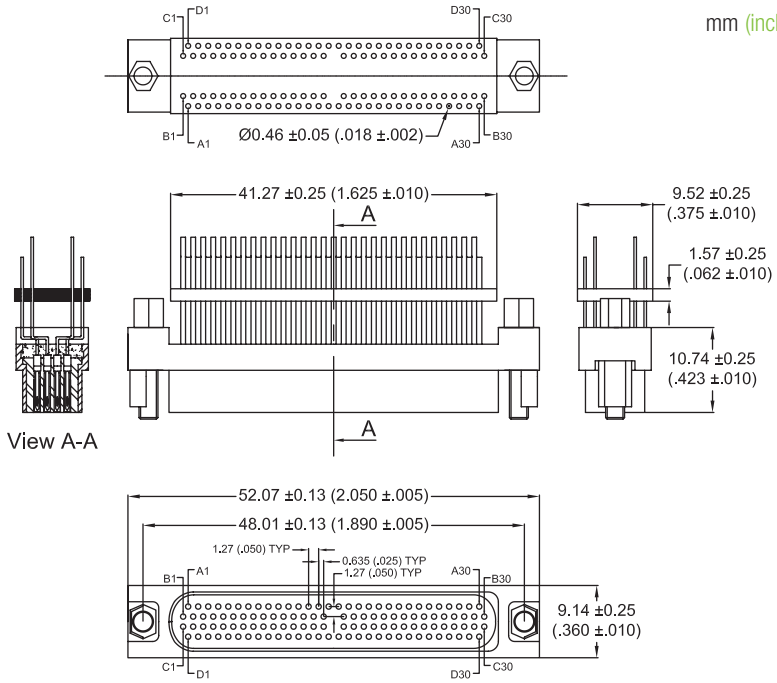
BS Connector

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

P562623

mm (inch)



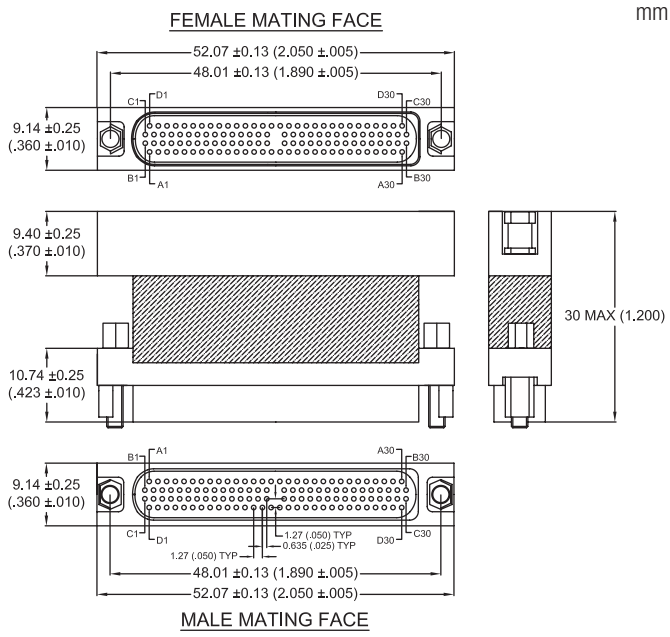
SEE CONTACT LAYOUT ON PCB PAGE 308

Connector saver

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

P562624

mm (inch)



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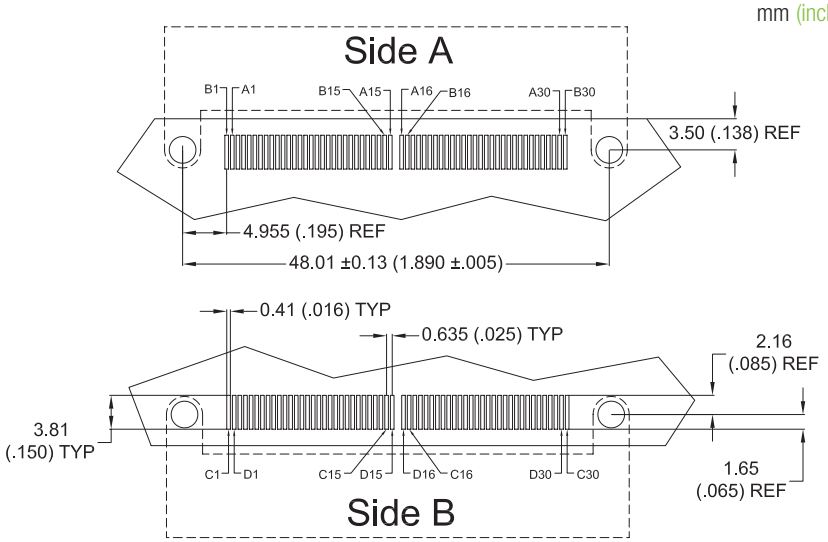
PCB layout

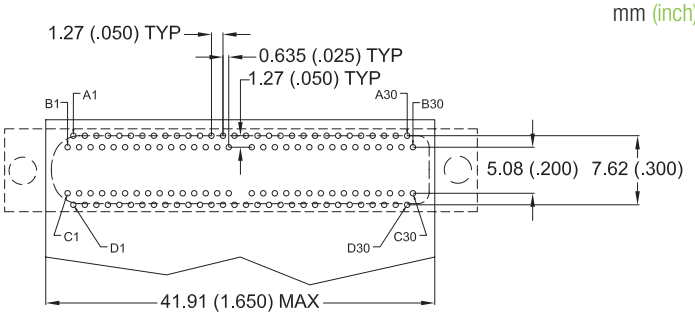
FEMALE SMT (SURFACE MOUNT STYLE) CONNECTOR

mm (inch)



BS VERSION (MALE ONLY)

mm (inch)



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MICRO-D ACCESSORIES

BACKSHELL

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

HARDWARE

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- 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
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MICRO-D & NANO-D ASSEMBLY KIT 201

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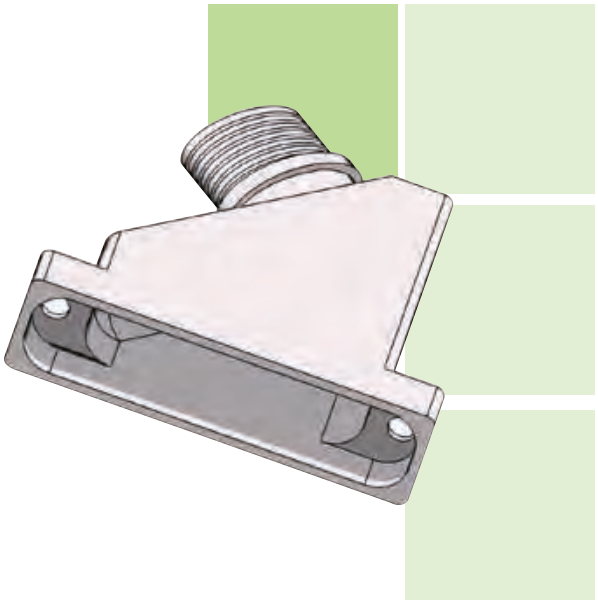


ACCESSORIES

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

AXON	F	37	05	E	1	C	F

SERIES

STYLE TYPE
U: Top entry.
Z: Side entry.
F: 45° entry.

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

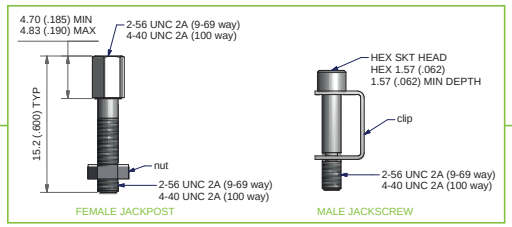
ENTRY SIZE
From **01** to **11**,
See page 188 for dimensions.
Other entry sizes available on request.

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/.0005 min).
CHP: Hi Phos electroless nickel plate to SAE-AMS-2404, class 4 (25.4µm /.001" 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



RECOMMANDED 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.

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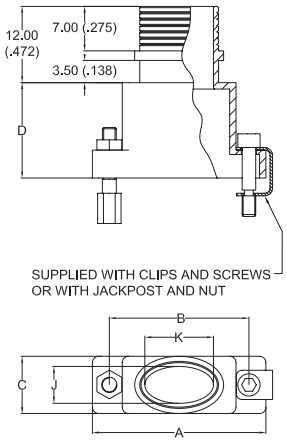
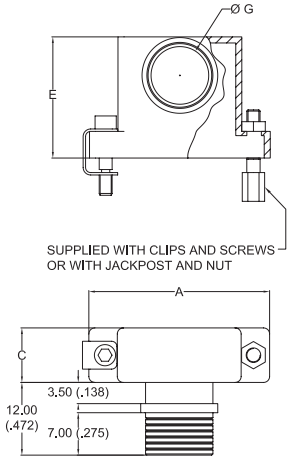
DIMENSIONS

Dimensions are in millimetres (inches).

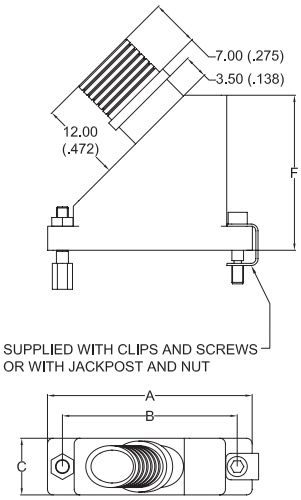
STYLE U: TOP ENTRY



STYLE Z: SIDE ENTRY



STYLE F: 45° ENTRY



SHELL SIZE	A	B	C	D	E	F
9	19.70 .776	14.35 .565	9.00 .354	10.00 .394	15.00 .591	21.00 .827
15	23.40 .921	18.16 .715	9.00 .354	12.00 .472	16.50 .650	23.00 .906
21	27.30 1.075	21.97 .865	9.00 .354	14.00 .551	18.00 .709	25.00 .984
25	29.85 1.175	24.51 .965	9.00 .354	16.00 .630	20.00 .787	27.00 1.063
31	33.70 1.327	28.32 1.115	9.00 .354	17.00 .669	21.00 .827	28.00 1.102
37	37.50 1.476	32.13 1.265	9.00 .354	18.00 .709	22.00 .866	29.00 1.142
51DR	46.30 1.823	41.02 1.615	9.00 .354	19.00 .748	23.00 .906	30.00 1.181
51	36.10 1.421	30.86 1.215	10.00 .394	19.00 .748	23.00 .906	30.00 1.181
69	43.75 1.722	38.48 1.515	10.00 .394	20.00 .787	24.00 .945	31.00 1.220
100	55.00 2.165	45.72 1.800	11.00 .433	21.00 .827	25.00 .984	38.00 1.496

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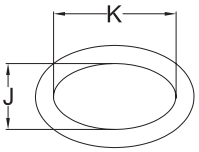
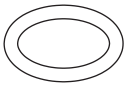
ELLIPTICAL ENTRY

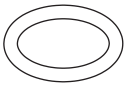


ELLIPTICAL ENTRY
STYLES U AND Z



ENTRY SIZE	SHELL SIZE	J	K
04 E	09-100	5.80 .228	7.00 .276
05 E	15-100	5.80 .228	10.80 .425
06 E	25-100	5.80 .228	15.20 .598
07 E	37-100	5.80 .228	20.10 .791
08 E*	51-100	6.80 .268	22.80 .898
09 E	100	7.80 .307	26.00 1.024

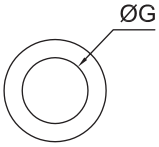
ELLIPTICAL ENTRY
STYLE F



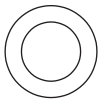
ENTRY SIZE	SHELL SIZE	J	K
04 E	21-100	5.80 .228	7.00 .276
05 E	25-100	5.80 .228	10.80 .425
06 E	37-100	5.80 .228	15.20 .598
07 E*	51-100	6.80 .268	17.70 .697
08 E	100	7.80 .307	20.60 .811
09 E	100	7.80 .307	26.00 1.024

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

CIRCULAR ENTRY



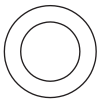
CIRCULAR ENTRY
STYLES U AND F



ENTRY SIZE	SHELL SIZE	G
01	09-100	1.60 .063
02	09-100	3.20 .126
03	09-100	4.80 .189
04*	51-100	6.40 .252
05	100	8.00 .315

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

CIRCULAR ENTRY
STYLE Z



ENTRY SIZE	SHELL SIZE	G
01	09-100	1.60 .063
02	09-100	3.20 .126
03	09-100	4.80 .189
04	09-100	6.40 .252
05	15-100	8.00 .315
06	21-100	9.50 .374
07	25-100	11.10 .437
08	31-100	12.70 .500
09	37-100	14.30 .563
10*	51-100	15.90 .626
11	100	17.50 .689

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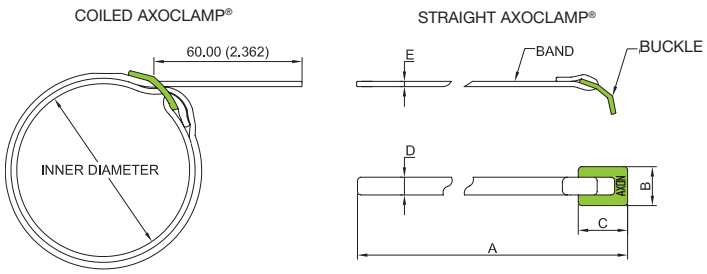
AXOCLAMP® EMI BAND TERMINATION

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

AXCL	01
AXOCLAMP®	BAND TYPES 01: standard 03: microband double wrapped

The standard version is coiled but straight AXOCLAMP® can be delivered on request (reference example AXCL03D). Minimum quantity: 100 pieces per reference.

DIMENSIONS

Dimensions are in millimetres (inches).

SPECIFICATIONS	AXOCLAMP® STANDARD	AXOCLAMP® MICROBAND
REFERENCE	**AX CL 01**	**AX CL 03**
DIMENSION A	375 (14.764)	200 (7.874)
DIMENSION B	9 (.364)	5.2 (.205)
DIMENSION C	10 (.394)	5.5 (.217)
DIMENSION D	5.9 (.232)	3 (.118)
DIMENSION E	0.5 (.020)	0.35 (.014)
MINIMUM DIAMETER*	10 (.394)	5 (.197)
MAXIMUM DIAMETER*	40 (1.575)	15 (.591)

*: Minimum and maximum diameter of the rear funnel on which the AXOCLAMP® can be mounted.
For other dimensions, please consult us.

BANDING TOOLS

	MANUAL HAND TOOL	CLAMPING VALUES	PNEUMATIC CLAMPING TOOL	RECOMMANDED BANDING VALUES*	CALIBRATION DEVICE
AXOCLAMP® AX CL 01	A 40199	100-180 LBS	A 35199	160	A 50099
AXOCLAMP® AX CL 03	A 30199	60-100 LBS	A 35599	90	A 50099

*: Banding values are given for information only.

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HARDWARE

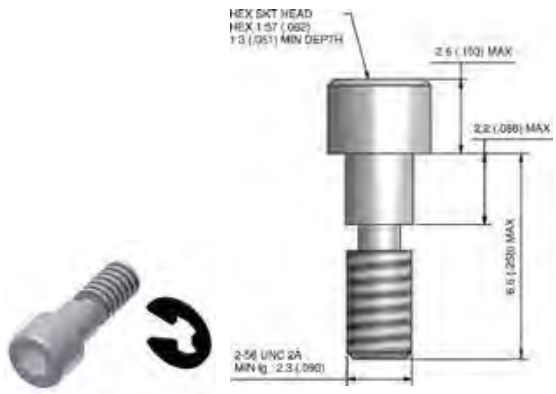
Removable jackscrews according to MIL-DTL-83513/05

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.

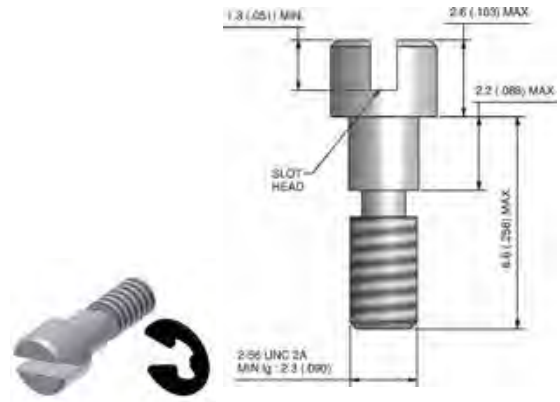
Note
1st line: kit part number (to be used for ordering).
2nd line: military specification number.
3rd line: hardware code for pigtail connector.
Dimensions are given in millimetres (inches).

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**

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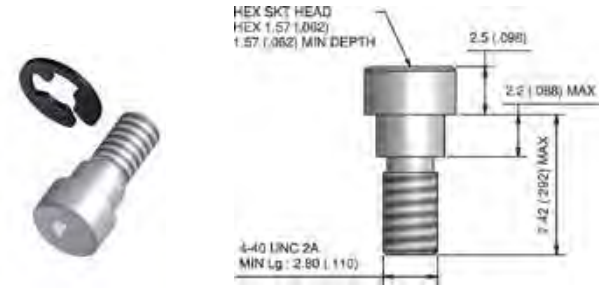
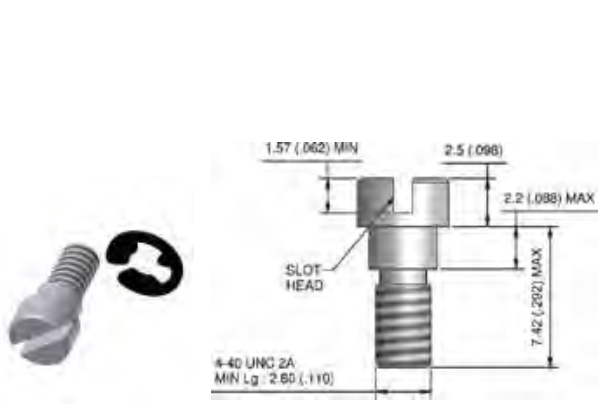
100 WAY HARDWARE

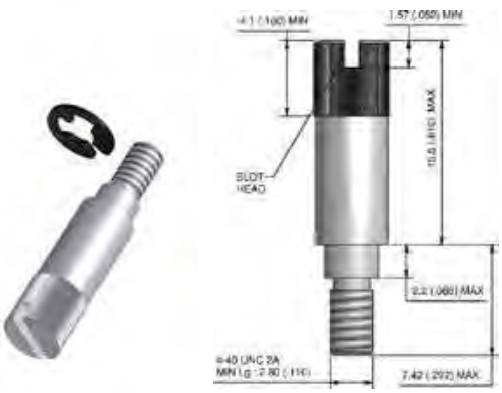


KIT PART NUMBER: **MDAHM512**
According to M83513/05-12
Hardware code: **M**

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 69 way jackscrew: 0.28 N.m / 2.5 inch-pounds.
- 100 way jackscrew: 0.51 N.m / 4.5 inch-pounds.

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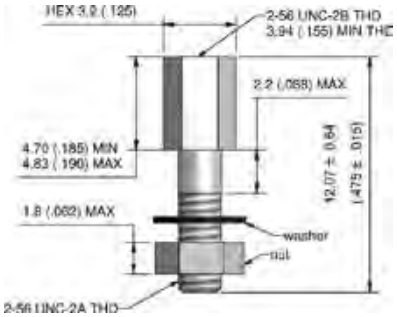
HARDWARE

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.

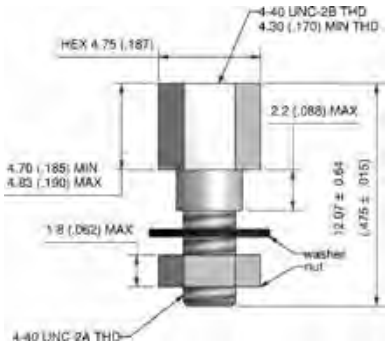
Note
1st line: kit part number (to be used for ordering).
2nd line: military specification number.
3rd line: Hardware code.
Dimensions are given in millimetres (inches).

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**

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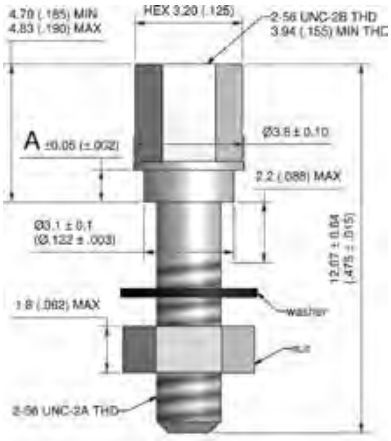
Rear panel mount jackposts for pigtails

- 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.

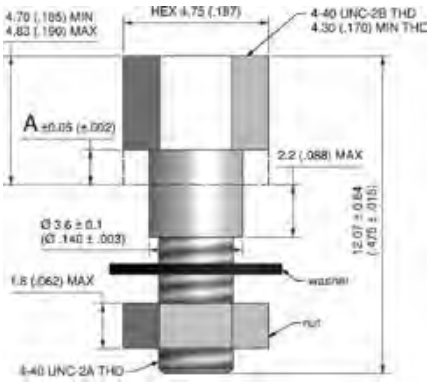
Dimensions are given in millimetres (inches).

HARDWARE CODE	Px	P1	P2	P3	P4	P5
PANEL THICKNESS -0.0 /+0.2 (-.000 /+.008)	mm	0.8	1.2	1.6	2	2.4
	inch	.031	.047	.062	.079	.094
KIT PART NUMBER	9-69 way	MDAHMP01	MDAHMP02	MDAHMP03	MDAHMP04	MDAHMP05
	100 way	MDAHMP11	MDAHMP12	MDAHMP13	MDAHMP14	MDAHMP15
DIM. A	mm	0.7	1.1	1.5	1.9	2.3
	inch	.028	.043	.059	.075	.091

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.

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HARDWARE

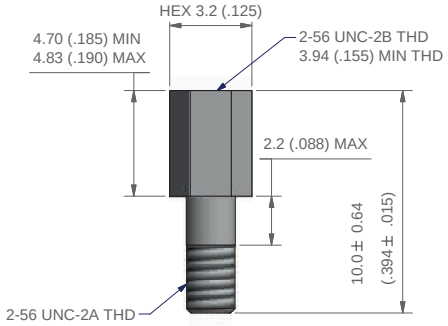
Removable jackposts for PCB connectors

- 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.

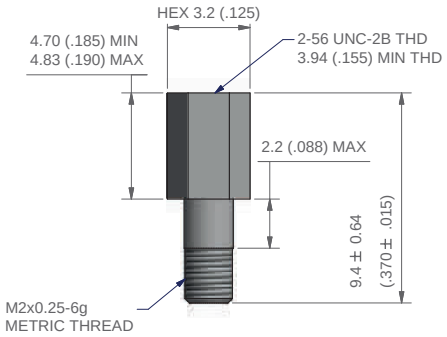
Dimensions are given in millimetres (inches).

HARDWARE CODE		P	
KIT PART NUMBER	9-69 way	BS or BR	MDAHM507SPCB
		CBR or CBP	MDAHM507SM2PCB
	100 way	BS, BR or CBR 0.075"	MDAHM517SPCB
		CBR 0.100"	MDAHM517SLPCB

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**

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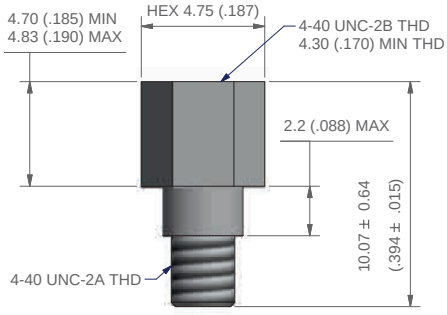
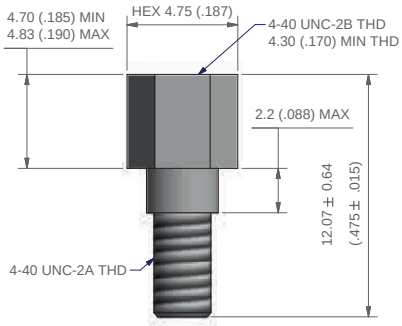
100 WAY HARDWARE



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



KIT PART NUMBER: **MDAHM517SLPCB**
Based on M83513/05-17
Hardware code: **P**

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.

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HARDWARE

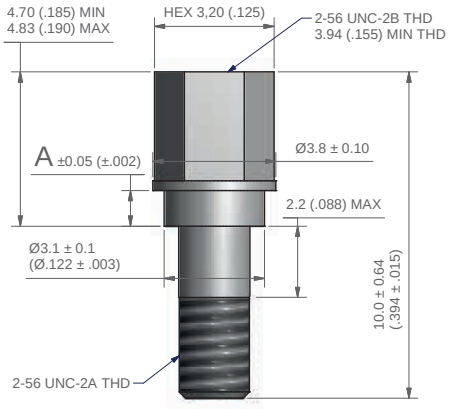
Rear panel mount jackposts for PCB connectors

- 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.

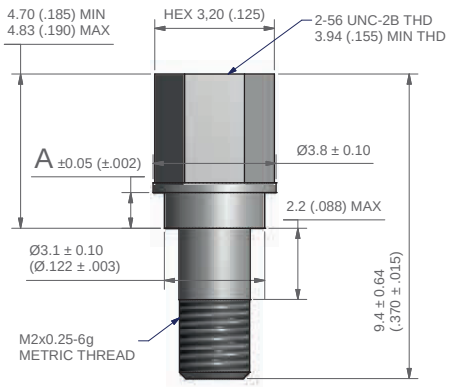
Dimensions are given in millimetres (inches).

HARDWARE CODE	Px	P1	P2	P3	P4	P5
PANEL THICKNESS -0.0 /+0.2 (-.000 /+.008)	mm	0.8	1.2	1.6	2	2.4
	inch	.031	.047	.062	.079	.094
9-69 way	BS or BR	MDAHMSP01	MDAHMSP02	MDAHMSP03	MDAHMSP04	MDAHMSP05
	CBR or CBP	MDAHMSM2P01	MDAHMSM2P02	MDAHMSM2P03	MDAHMSM2P04	MDAHMSM2P05
100 way	BS, BR or CBR 0.075"	MDAHMSP11	MDAHMSP12	MDAHMSP13	MDAHMSP14	MDAHMSP15
	CBR 0.100"	MDAHMSLP11	MDAHMSLP12	MDAHMSLP13	MDAHMSLP14	MDAHMSLP15
DIMENSIONS A	mm	0.7	1.1	1.5	1.9	2.3
	inch	.028	.043	.059	.075	.091

9-69 WAY HARDWARE



KIT PART NUMBER: **MDAHMSP0x**
Hardware code: **Px**



KIT PART NUMBER: **MDAHMSM2P0x**
Hardware code: **Px**

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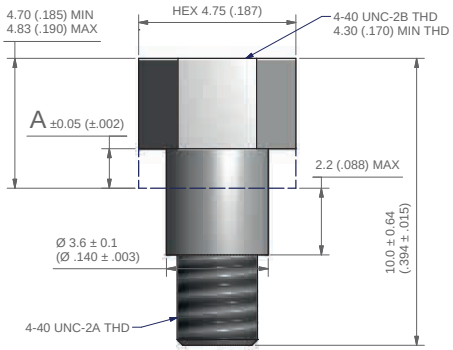
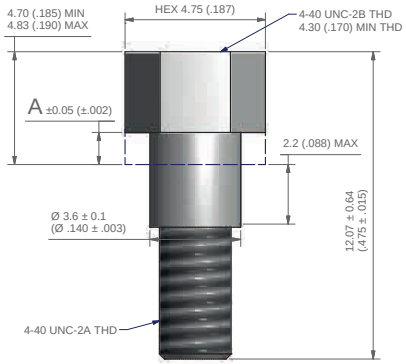
100 WAY HARDWARE



KIT PART NUMBER: **MDAHMSP1x**
Hardware code: **Px**



KIT PART NUMBER: **MDAHMSLP1x**
Hardware code: **Px**

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.

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HARDWARE

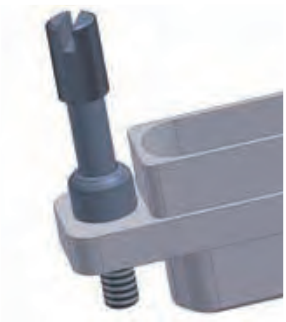
Non removable hardware

FOR PIGTAIL & SOLDER CUP CONNECTORS ONLY.

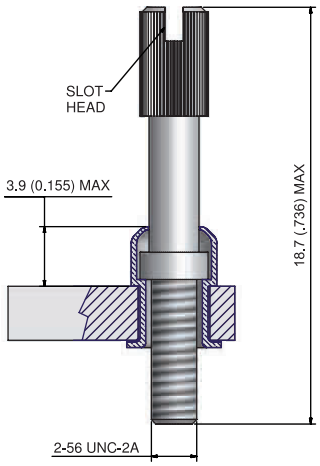
- Hardware is factory installed.
- Cannot be supplied in kit form.
- Material: passivated 300 series stainless steel.

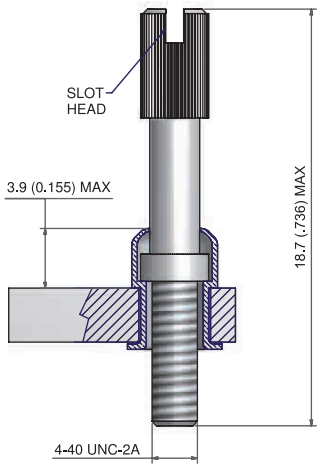
9-69 WAY HARDWARE	100 WAY HARDWARE

LONG JACKSCREW (SLOT HEAD)



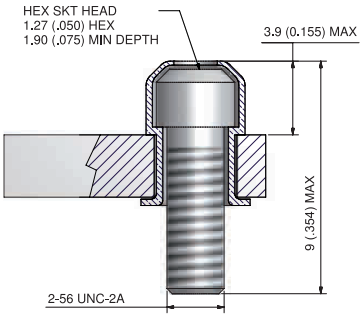
HARDWARE CODE: K

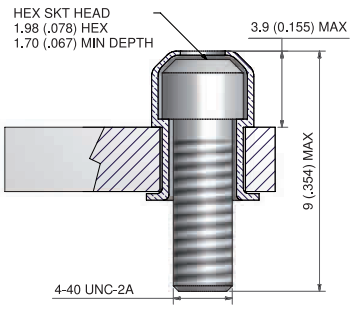




SHORT JACKSCREW (HEX SOCKET HEAD)

HARDWARE CODE: L





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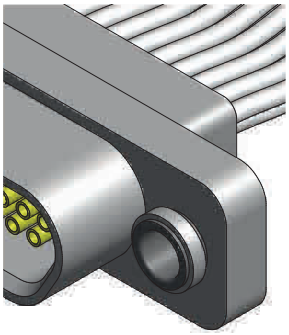
Float mount inserts

TO BE USED TO FIX CONNECTORS ON A SYSTEM WITH SCREWS.
FOR PIGTAIL & SOLDER CUP CONNECTORS ONLY.

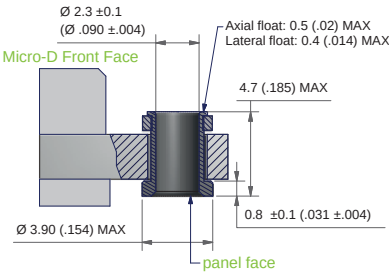
- Hardware is factory installed.
- Cannot be supplied in kit form.
- Material: passivated 300 series stainless steel.

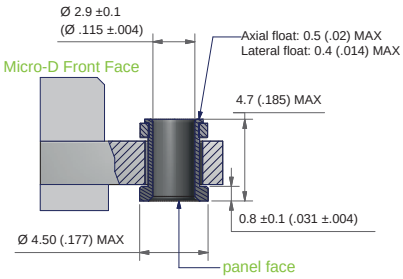
	9-69 WAY HARDWARE	100 WAY HARDWARE

FRONT PANEL MOUNT

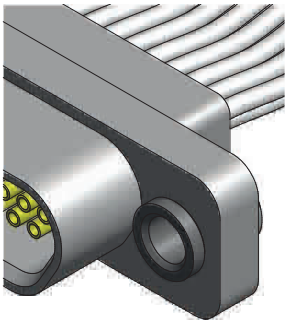


HARDWARE CODE: F

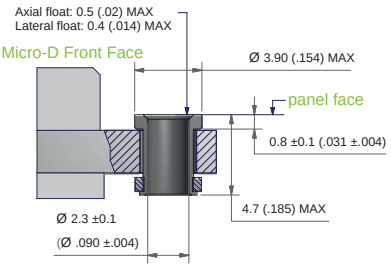


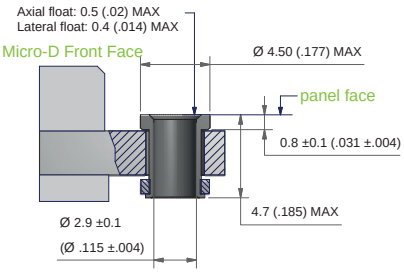


REAR PANEL MOUNT



HARDWARE CODE: FR





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HARDWARE

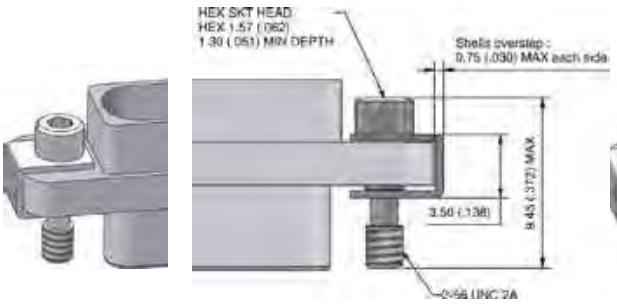
U-clip mounting jackscrews

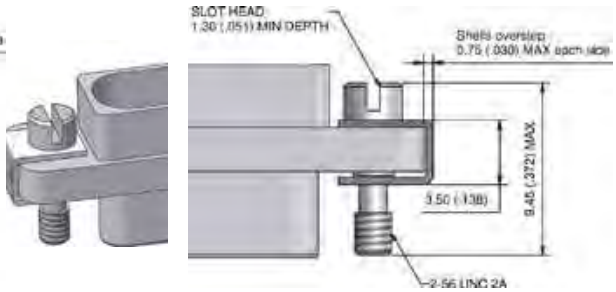
FOR PIGTAIL & SOLDER CUP CONNECTOR ONLY.

- 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

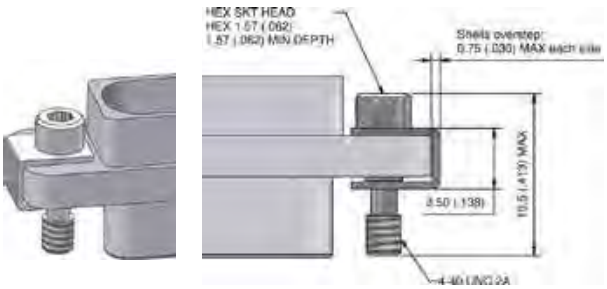


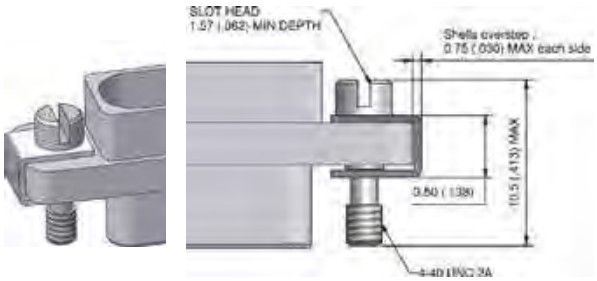


KIT PART NUMBER: **MDAHM008**
Hardware code: **C**

KIT PART NUMBER: **MDAHM009**
Hardware code: **D**

100 WAY HARDWARE





KIT PART NUMBER: **MDAHM018**
Hardware code: **C**

KIT PART NUMBER: **MDAHM019**
Hardware code: **D**

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.

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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.

▲ 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)

ITEM	MICRO-D KIT (P541268) for Micro-D connectors (9 to 120 way)	MICRO-D / NANO-D KIT (P536692) for Nano-D connectors & Micro-D connectors (9 to 69 way)
1	Torque screwdriver	Torque screwdriver
2	3/16" spanner	0.050" bit for hex screw
3	5/32" spanner	1/16" bit for hex screw
4	1/8" spanner	5/32" spanner
5	Bit for slotted head screw	1/8" spanner
6	0.050" bit for hex screw	1/8" Socket
7	1/16" bit for hex screw	Bit for slotted head screw
8	5/64" bit for hex screw	Insertion tool
9	1/8" socket	Socket adaptor
10	3/16" socket	
11	100-way de-mating tool	
12	Socket adaptor	
13	Assembly tool	

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RECTANGULAR CONNECTORS FOR CABLES

- Single row pigtail & jumper 254

PCB RECTANGULAR CONNECTORS

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NANO-D CONNECTORS

0.635 mm (.025") CONTACT SPACING

In addition to the standard range of Micro-D connectors and assemblies, AXON' is able to offer Nano-D connectors and assemblies based on the highly reliable Twist Pin contact technology. Such solutions are ideal for applications including aerospace, military, industrial, medical or off-shore which require extreme miniaturisation, space or weight saving and reliability.
AXON' Nano-D connectors meet the requirements of MIL-DTL-32139.

Different configurations

AXON's range of Nano-D connectors is available in several different configurations:

- Nano-D rectangular connectors for cables.
- Nano-D rectangular connectors for PCBs.
- EMI versions.
- High density Micro-D connectors.

Characteristics

- 0.635 mm (.025") contact spacing (double the density of a Micro-D).
- Number of ways: 9, 15, 21, 25, 31, 37 and 51.
- Single or double row.
- High reliability twist pin contacts.
- Metal shell construction with captivated hardware.

AXON' has also developed custom designed Nano-D connectors:
- High density circular Nano-D connectors.
- Single row Nano-D strip connectors.

Special Nano-D connectors available on request.

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REACH & RoHS COMPLIANCE

RoHS compliance

AXON' CABLE has been pro-actively implementing measures for many years to ensure compliance with the European Directive 2011/65/EU which came into force on 21st July 2011. The Directive prohibits the use of Hazardous Substances such as lead, mercury, hexavalent chromium, cadmium, bromine compounds (PBB and PBDE) and various phtalates. It relates to all components of products which are used in the manufacture of electrical and electronic equipment.

As a cable and connector manufacturer, AXON' has taken actions to ensure compliance with directive 2000/53/EC applicable since 21st October 2000.

COMPONENT SPECIFIC RoHS COMPLIANCE

COMPONENT	MATERIAL	FINISH	RoHS STATUS
PIN CONTACT (TWIST PIN)	PRECIOUS GOLD ALLOY	N/A	RoHS Compliant
SOCKET CONTACT	PRECIOUS GOLD ALLOY	N/A	RoHS Compliant
	BRASS	GOLD	
	COMERCIAL BRONZE	GOLD	
PLASTIC SHELL	LIQUID CRYSTAL POLYMER	N/A	RoHS Compliant
METAL SHELL	ALUMINIUM ALLOY TYPE 6061	ELECTROLESS NICKEL	RoHS Compliant
	STAINLESS STEEL 300 SERIES	PASSIVATION	RoHS Compliant
	TITANIUM	N/A	RoHS Compliant
PLASTIC INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER	N/A	RoHS Compliant
HARDWARE	STAINLESS STEEL 300 SERIES	PASSIVATION	RoHS Compliant
PCB TERMINATION	COPPER BASE ALLOY	GOLD	RoHS Compliant
ENCAPSULANT	EPOXY RESIN 150°C VERSION	N/A	RoHS Compliant
	EPOXY RESIN 200°C VERSION	N/A	RoHS Compliant

Application of REACH

The new EU regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) came into force in June 2007. The regulation concerns the authorised use of chemicals. It requires manufacturers and importers to register substances and their use with the European Chemical Agency (ECHA).

AXON' CABLE is known as a "downstream user" with respect to the REACH regulation, and a manufacturer of "Articles". AXON' CABLE products are not intended to release any undesired substance under normal and reasonable operations of use.

To this day AXON' CABLE have not identified any component containing any SVHC in their product range.

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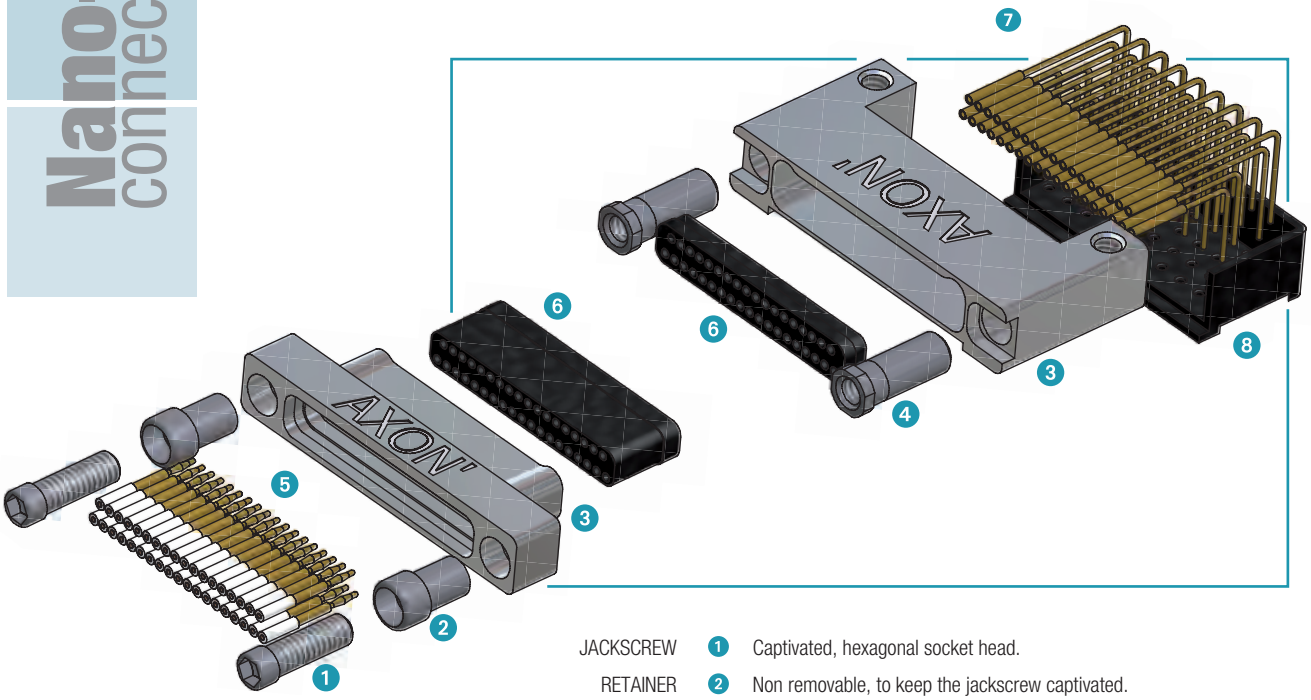
GLOSSARY OF TERMS



JACKSCREW	1	Captivated, hexagonal socket head.
RETAINER	2	Non removable, to keep the jackscrew captivated.
SHELL	3	Metal connector body.
THREADED INSERT	4	Non removable, mates with jackscrew.
TWIST PIN	5	Male contact, fitted to plug connector.
INSERT	6	Moulded insulation housing, separating each connection.
SOCKET	7	Female contact, fitted to socket connector (also known as socket).
TRAY	8	Junction box used for PCB connectors only.

Standard connector	Manufactured to the standard dimensions and specifications.
Special connector	A standard connector modified to meet specific requirements.
Custom made connector	Designed to meet specific customer requirements.
Connector saver	Used to reduce wear and tear on equipment and systems while testing.
CBR connector	Condensed Board Right Angle connector.
BS connector	Board Straight connector.
SMV connector	Surface Mount Vertical connector.
SMH connector	Surface Mount Horizontal connector.
Pigtail connector	Connector with insulated or uninsulated wires.
Cord	Cable harness with 2 connectors only.
Jumper/ Extension cord	Cord with 1 plug and 1 receptacle connector of the same number of ways.
Harness	Multi-branched cable assembly.
LCP	Liquid Crystal Polymer.
Potting	Epoxy compound used as an encapsulant.

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GENERAL CHARACTERISTICS

per MIL-DTL-32139*

AXON's range of Nano-D connectors which is covered by the MIL-DTL-32139* standard, is ideally suited to equipment and applications where weight, miniaturisation and long term performance are required. It is available in 7 contact arrangements (9 to 51 contacts) for rectangular Nano-D connectors.

Electrical & mechanical characteristics

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	1 A max.	EIA-364-70
CONTACT RESISTANCE	71 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 m - ALTITUDE 21 km (70,000 ft)	 250 VAC 100 VAC	EIA-364-20
CONTACT ENGAGING AND SEPARATION FORCE	141 g max. (5 oz) 11 g min. (0.4 oz)	EIA-364-37
CONNECTOR MATING AND DE-MATING FORCE	198 g (7 oz) x number of contacts max.	EIA-364-13
CONTACT RETENTION	0.9 kg (2 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	200 mating cycles min.	EIA-364-09
TEMPERATURE RANGES - STANDARD - HIGH TEMP	 -55°C / +150°C -55°C / +200°C	
VIBRATION	20 g's - No discontinuity >1µs	EIA-364-28 - TEST CONDITION IV
SHOCK	100 g's - No discontinuity >1µs	EIA-364-27 - TEST CONDITION G
SALT SPRAY	48 hours	EIA-364-26 - TEST CONDITION B
HUMIDITY	Insulation resistance > 1MΩ	EIA-364-31 - TEST CONDITION B (EXCLUDING STEPS 7A & 7B)**

Material & Finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
FEMALE CONTACT	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
	COMMERCIAL BRONZE IN ACCORDANCE WITH ASTM-B-135, B-140/140M, B-372 OR B-587	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µm MIN. (0.00005")), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27µm (0.00005") TO 3.81µm (0.00015"))
	BRASS IN ACCORDANCE WITH ASTM-B-453 OR 453M OR 16 OR 16M	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061 IN ACCORDANCE WITH SAE-AMS-QQ-A-200/8 OR ASTM-B-209	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS-2404, CLASS 4.
	TITANIUM IN ACCORDANCE WITH SAE-AMS-T-9046	NONE
	STAINLESS STEEL IN ACCORDANCE WITH SAE-A-276 OR 581 OR 581M OR 582 OR 582M	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
INSERT/ PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	EPOXY RESIN	
INSULATED WIRE	PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH NEMA-HP3	
UNINSULATED WIRE	GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551 OR GOLD PLATED SOLID COPPER BASED ALLOY IN ACCORDANCE WITH ASTM-B-194	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µm MIN. (0.00005")), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27µm (0.00005") TO 3.81µm (0.00015"))

*: ISSUE **A** AMENDMENT 4 AT THE TIME OF GOING TO PRESS
**: ACCORDING TO MIL-DTL-32139

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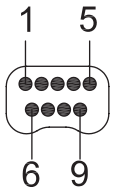
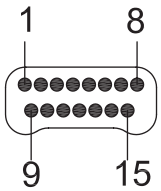
CONTACT ARRANGEMENTS (DUAL ROW)

Mating face of male rectangular connector

- 0.635 mm (.025") contact spacing.
- 1.016 mm (.040") spacing between rows.



9 CONTACTS



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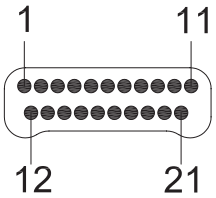

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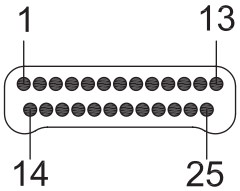

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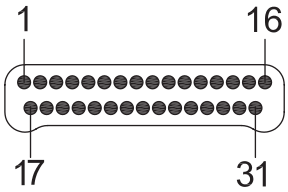

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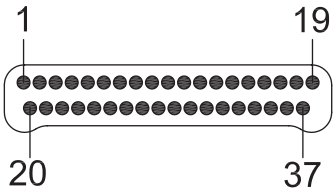

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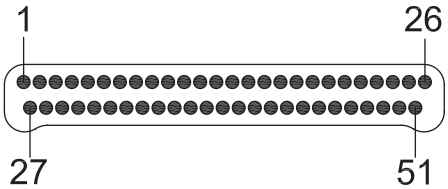

51 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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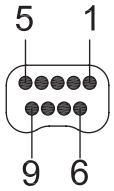
CONTACT ARRANGEMENTS (DUAL ROW)

Mating face of female rectangular connector

- 0.635 mm (.025") contact spacing.
- 1.016 mm (.040") spacing between rows.



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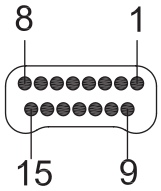

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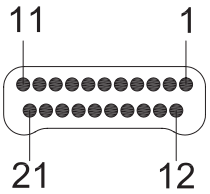

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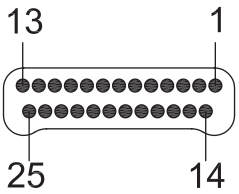

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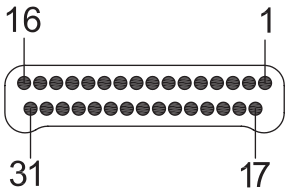

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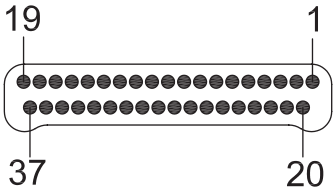

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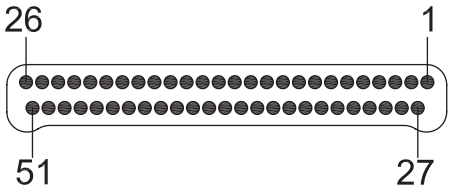

51 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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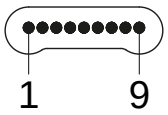
CONTACT ARRANGEMENTS (SINGLE ROW)

Mating face of male rectangular connector

0.635 mm (.025") contact spacing.



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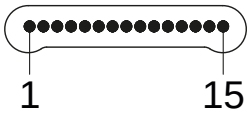

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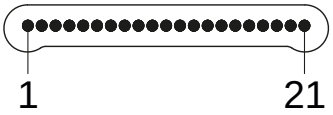

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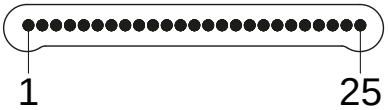

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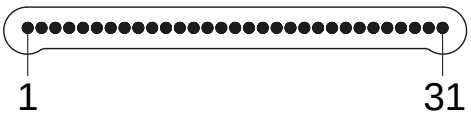

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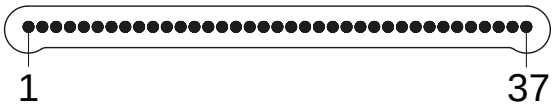

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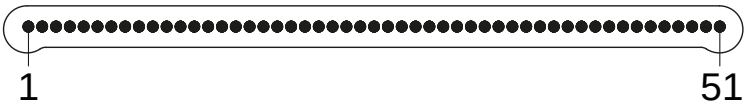

51 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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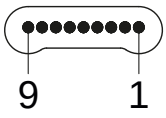
CONTACT ARRANGEMENTS (SINGLE ROW)

Mating face of female rectangular connector

0.635 mm (.025") contact spacing.



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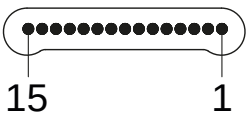

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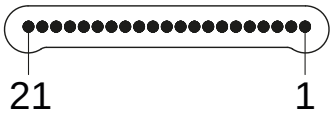

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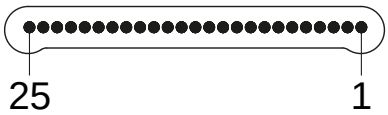

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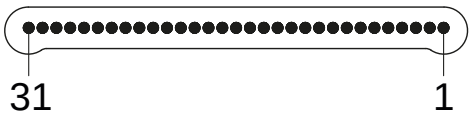

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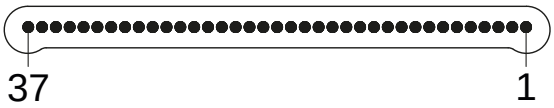

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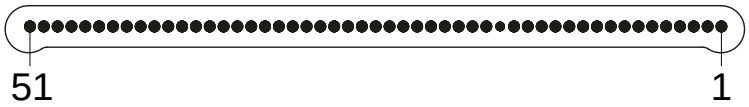

51 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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WIRE CODES

Nominal dimensions are used throughout this chapter.

Solid uninsulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT (g/m)	CONDUCTOR					
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/1000ft)
G	GPC3001	0.45	GOLD PLATED COPPER	30	1x0.254 1x0.010	0.254 .010	0.051 .00008	34.1 103.8

Insulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT (g/m)	CONDUCTOR						INSULATION		TEMPERATURE RATING	VOLTAGE RATING
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/1000ft)	MATERIAL	Ø mm (inch)		
1	ET 3007 (ONLY FOR ND1A & ND2A SERIES)	1.50	SPC*	30	7x0.102 7x.0040	0.304 .012	0.057 .000882	31 94.5	EXTRUDED PTFE	0.62 .024	-90°C/+200°C	250 VAC
1	UT 3007 (ONLY FOR MDHDA SERIES)	0.85	SPC*	30	7x0.102 7x.0040	0.304 .012	0.057 .000882	31 94.5	EXTRUDED PTFE	0.50 .020	-90°C/+200°C	160 VAC
2	ET 3207	1.20	SPC*	32	7x0.079 7x.0031	0.237 .009	0.034 .00005	52 158.5	EXTRUDED PTFE	0.57 .022	-90°C/+200°C	250 VAC
3	ET 3407	1.00	SPC*	34	7x0.063 7x.0025	0.189 .007	0.022 .00003	95 289.6	EXTRUDED PTFE	0.50 .020	-90°C/+200°C	250 VAC
4	ET 3607	0.80	SPC*	36	7x0.050 7x.0020	0.150 .006	0.014 .00006	150 457	EXTRUDED PTFE	0.48 .019	-90°C/+200°C	250 VAC

*: SILVER PLATED COPPER

OTHER WIRE TYPES AVAILABLE ON REQUEST - OTHER GAUGES ON SPECIAL REQUEST

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COLOUR CODES

Colour codes F and L

All the wires have the same colour.
Available with all wire types.

COLOUR CODE	COLOUR
F	YELLOW
L	WHITE

Other colours available on request.

Colour code W

Also called 10 colour repeat (10 colours repeated in sequence) as per MIL-DTL-32139. Available with all wire types.

PIN NUMBER	MIL-STD-681 NUMBER	COLOUR
1	0	BLACK
2	1	BROWN
3	2	RED
4	3	ORANGE
5	4	YELLOW
6	5	GREEN
7	6	BLUE
8	7	VIOLET
9	8	GREY
10	9	WHITE
11	0	BLACK
12	1	BROWN
13	2	RED
14	3	ORANGE
15	4	YELLOW
16	5	GREEN
17	6	BLUE
18	7	VIOLET
19	8	GREY
20	9	WHITE
21	0	BLACK

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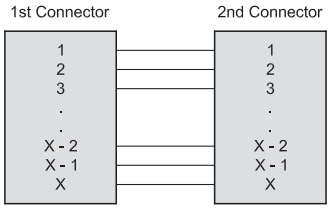
JUMPER WIRING (DUAL ROW)

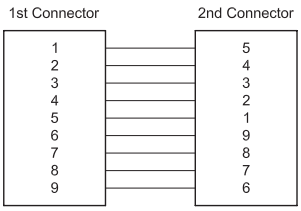
▲ NANO-D - JUMPER

DIRECT WIRING



X : Number of contacts

9 WAY INDIRECT WIRING



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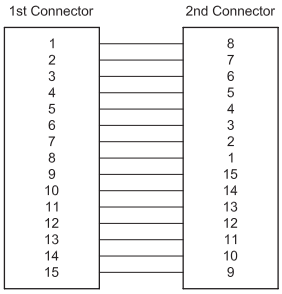

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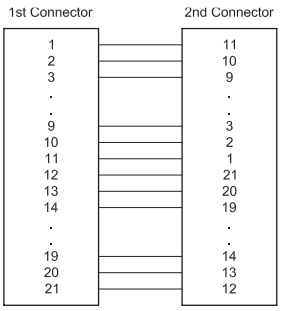

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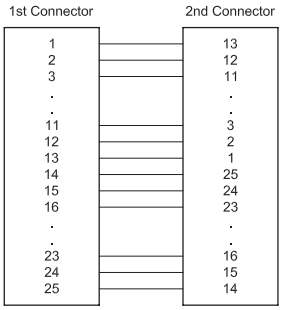

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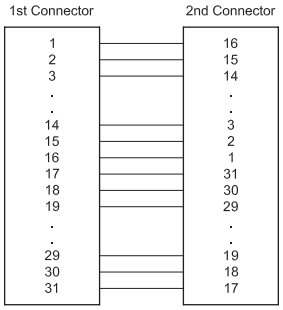

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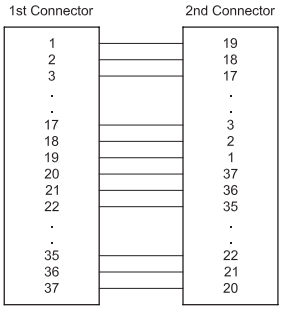
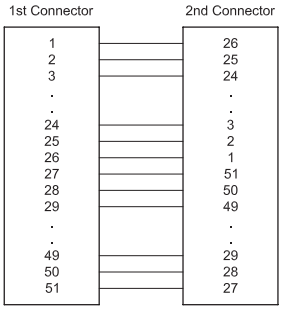


51 WAY INDIRECT WIRING



DIRECT WIRING

Direct Wiring is where every pin number is connected to the same pin number at the other end, e.g. pin 1 to pin 1, pin 2 to pin 2, and so on. If the two connectors are not of the same gender (i.e. one male, one female) this will result in physically straight or flat wiring with no crossovers. This is therefore the normal convention with opposing gender connectors.

INDIRECT WIRING

Indirect Wiring is usually requested where both connectors on the jumper are of the same gender (i.e. both male or both female).
In this case, if Direct Wiring was chosen it would result in many physical cross-overs of the wires (crossing from the leftmost pin on the top row to the rightmost, and the same on the bottom row). Indirect Wiring ensures that the physical position of the wires remains straight or flat, i.e. the leftmost pin on the top row of connector 1 will go to the leftmost pin on the top row of connector 2, and so on.

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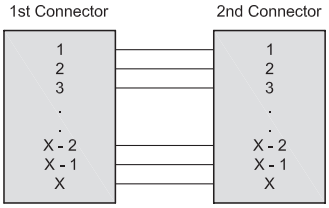
JUMPER WIRING (SINGLE ROW)

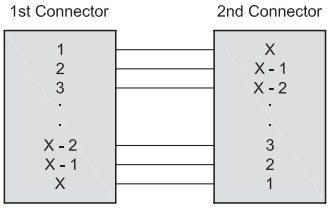
DIRECT WIRING



X : Number of contacts

Direct Wiring is where every pin number is connected to the same pin number at the other end, e.g. pin 1 to pin 1, pin 2 to pin 2, and so on. If the two connectors are not of the same gender (i.e. one male, one female) this will result in physically straight or flat wiring with no cross-overs. This is therefore the normal convention with opposing gender connectors.

INDIRECT WIRING



X : Number of contacts

Indirect Wiring is usually requested where both connectors on the jumper are of the same gender (i.e. both male or both female).
Indirect Wiring ensures that the physical position of the wires remains straight or flat, i.e. the leftmost pin of connector 1 will go to the leftmost pin of connector 2, and so on.

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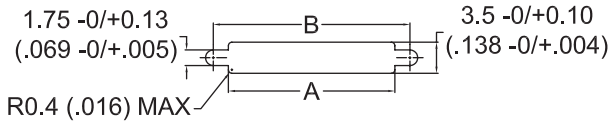
PANEL CUTOUTS

Dual row Rear Mount Nano-D connectors

Panel mount receptacle connector only (type M).

9 TO 51 CONTACTS

FIGURE 1
REAR MOUNT



Dimensions

Dimensions are in millimetres (inches)

LAYOUTS	A -0/ +0.1 (-0 /+.004)	B -0/ +0.1 (-0 /+.004)
9	9.90 .390	13.30 .523
15	11.80 .465	15.20 .598
21	13.71 .540	17.11 .673
25	14.98 .590	18.38 .723
31	16.88 .665	20.28 .800
37	18.79 .740	22.19 .873
51	23.23 .915	26.63 1.048

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DUAL ROW NANO-D CONNECTORS

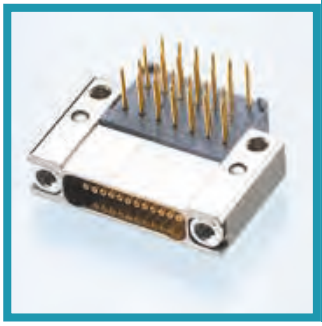
RECTANGULAR CONNECTORS FOR CABLES

- Dual row pigtail & jumper 220
- EMI range: Dual row pigtail & jumper 222

PCB RECTANGULAR CONNECTORS

- BS (Board Straight) type - 0.050" pitch receptacles 224
- BS (Board Straight) type - 0.050" pitch plugs 226
- CBR (Condensed Board Right Angle) type - 0.050" pitch receptacles. 228
- CBR (Condensed Board Right Angle) type - 0.050" pitch plugs 230
- SMV (Surface Mount Vertical) type - 0.025" pitch receptacles. 232
- SMV (Surface Mount Vertical) type - 0.025" pitch plugs 234
- SMH (Surface Mount Horizontal) type - 0.025" pitch receptacles. . . . 236
- SMH (Surface Mount Horizontal) type - 0.025" pitch plugs 238

PCB layout for BS type 240
PCB layout for CBR type 242
PCB layout for SMV type 244
PCB layout for SMH type 248



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RECTANGULAR CONNECTORS FOR CABLES

DUAL ROW PIGTAIL & JUMPER

- Reliability for micro-miniature operating systems.
- High performance metal connector and PTFE wire.
- Panel mount available for receptacle connector.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A 2 15 P S D 1 L 50 R P

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**. **Other versions available on request.**

1st CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector.
M: Panel mount receptacle connector.

2nd CONNECTOR TYPE
P: Plug connector.
M: Panel mount receptacle connector.
S: Receptacle connector.
W: No second connector - free wires.

CONNECTIONS (see jumper wiring on page 216)
D: Direct pin 1 to pin 1.
I: Indirect (usual for plug-plug jumper).
X: Pigtail.

WIRE CODE
1: ET 3007, AWG 30, 7 strands, 250 V.
2: ET 3207, AWG 32, 7 strands, 250 V.
3: ET 3407, AWG 34, 7 strands, 250 V.
4: ET 3607, AWG 36, 7 strands, 250 V.
Other versions available on request.

COLOUR CODE
L: White.
F: Yellow.
W: 10 colour repeat.
See page 215 for colour code

WIRE LENGTH (in cm)
Attention! Wire length in centimetres - (1cm = 10 mm = .394").

L in cm (inches)	2 ≤ L ≤10 (0.79≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE 1st CONNECTOR
P: Threaded hole #0-80 UNF
(non removable jackposts, recommended for receptacles).
R: Retractable short hex socket head jackscrews #0-80 UNF
(semi-captivated, recommended for plugs).
L: Short hex socket head jackscrews #0-80 UNF (captivated).
B: No hardware.

HARDWARE 2nd CONNECTOR
See above.
X: Pigtail.

IN BOLD: FACTORY STANDARD

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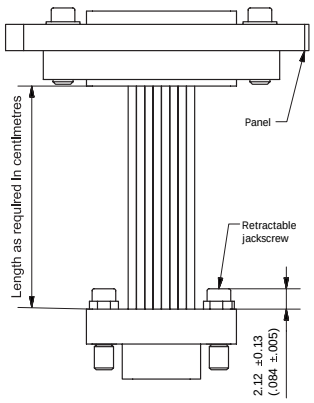
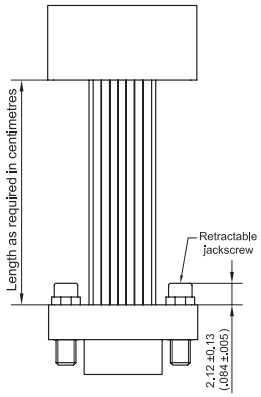
DIMENSIONS

Dimensions are in millimetres (inches).

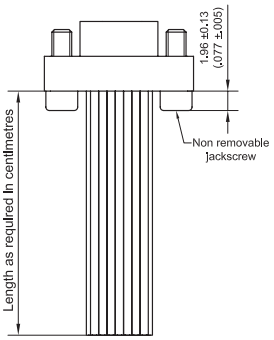
ND2A 2 15 M P D 2 L 20 PR



ND2A 2 15 S P D 2 L 20 PR



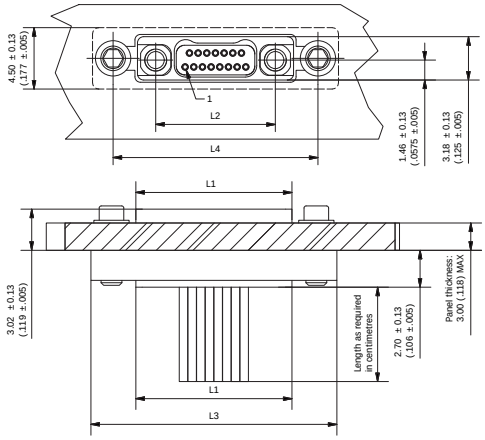
ND2A 2 15 P W X 2 L 20 PR



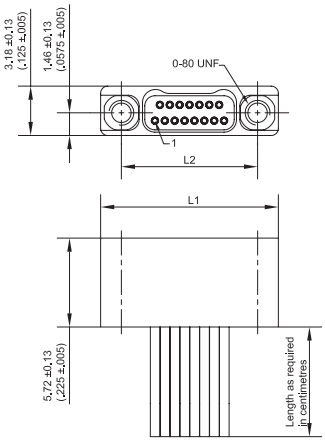
1 centimetre = 10 millimetres = 0.393 inch

1 inch = 25.4 millimetres = 2.54 centimetres

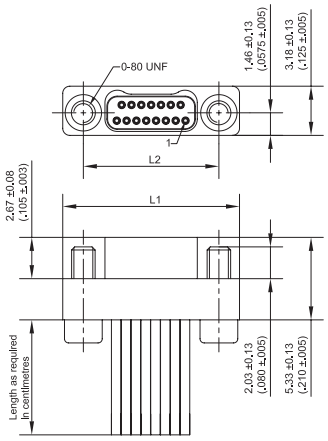
PANEL MOUNT RECEPTACLE



RECEPTACLE

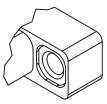


PLUG

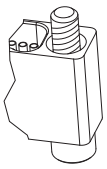


SPECIFIC HARDWARE CONFIGURATION

Treaded holes #0-80 UNF for plug shell (code: P)



Jackscrew #0-80 UNF for socket shell (code: R/L)



SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P / 9 S	9.53 .375	6.86 .270	16.10 .634	13.10 .516
15 P / 15 S	11.43 .450	8.76 .345	18.00 .709	15.00 .591
21 P / 21 S	13.34 .525	10.67 .420	19.91 .784	16.91 .666
25 P / 25 S	14.61 .575	11.94 .470	21.18 .834	18.18 .716
31 P / 31 S	16.51 .650	13.84 .545	23.09 .909	20.08 .791
37 P / 37 S	18.42 .725	15.75 .620	24.99 .984	21.99 .866
51 P / 51 S	22.86 .900	20.19 .795	29.43 1.159	26.43 1.041

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 or 300 series stainless steel or titanium alloy, see page 209 for finish
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Precious gold alloy
SOCKET CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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EMI RANGE

SHIELDED DUAL ROW PIGTAIL & JUMPER

- Reliability for micro-miniature operating systems.
- High performance metal connector and PTFE wire.
- Panel mount available for receptacle connector.
- For ultra miniature EMI requirements.
- 360° screen termination.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	P	S	EMI1	D	1	L	50	R	P

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**. **Other versions available on request.**

1st CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector.
M: Panel mount receptacle connector.

2nd CONNECTOR TYPE
P: Plug connector.
M: Panel mount receptacle connector.
S: Receptacle connector.
W: No second connector - free wires.

EMI FAMILY
EMI1: Shielded pigtail or harness, shield soldered to the backshell

CONNECTIONS (see jumper wiring on page 216)
D: Direct pin 1 to pin 1.
I: Indirect (usual for plug-plug jumper).
X: Pigtail.

WIRE CODE
1: ET 3007, AWG 30, 7 strands, 250 V.
2: ET 3207, AWG 32, 7 strands, 250 V.
3: ET 3407, AWG 34, 7 strands, 250 V.
4: ET 3607, AWG 36, 7 strands, 250 V.
Other versions available on request.

COLOUR CODE
L: White.
F: Yellow.
W: 10 colour repeat.
See page 215 for colour code.

WIRE LENGTH (in cm)
Attention! Wire length in centimetres - (1cm = 10 mm = .394").

L in cm (inches)	5 ≤ L ≤10 1.97≤ L ≤ 3.940	10 < L ≤ 100 3.940 < L ≤ 39.40	L > 100 39.40
TOLERANCE in cm (inches)	-0 / +0.5 -0 / +0.200	-0 / +3 -0 / +1.180	-0 / +5 -0 / +1.970

HARDWARE 1st CONNECTOR
P: Threaded hole #0-80 UNF (non removable jackposts).
R: Retractable short hex socket head jackscrews #0-80 UNF (semi-captivated).

HARDWARE 2nd CONNECTOR
See above.
X: Pigtail.

IN BOLD: FACTORY STANDARD

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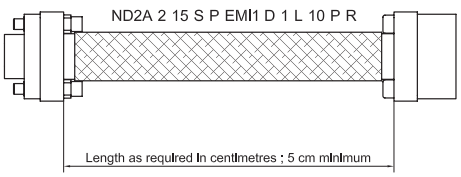
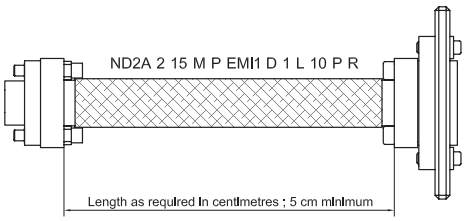
DIMENSIONS

Dimensions are in millimetres (inches).

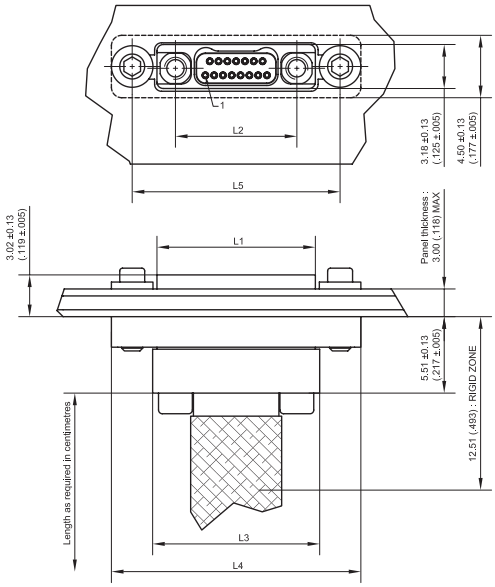




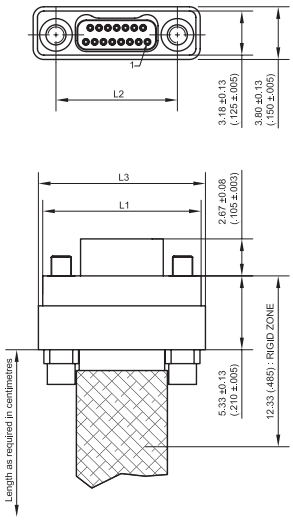
1 centimetre = 10 millimetres = 0,393 inch

1 inch = 25,4 millimetres = 2,54 centimetres

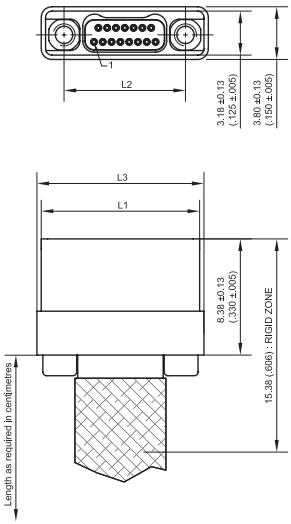
PANEL MOUNT RECEPTACLE



PLUG



RECEPTACLE



SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)	L5 ±0.13 (±.005)
9 P / 9 S	9.53 .375	6.86 .270	10.16 .400	16.10 .634	13.10 .516
15 P / 15 S	11.43 .450	8.76 .345	12.06 .475	18.00 .709	15.00 .591
21 P / 21 S	13.34 .525	10.67 .420	13.97 .550	19.91 .784	16.91 .666
25 P / 25 S	14.61 .575	11.94 .470	15.24 .600	21.18 .834	18.18 .716
31 P / 31 S	16.51 .650	13.84 .545	17.14 .675	23.09 .909	20.08 .791
37 P / 37 S	18.42 .725	15.75 .620	19.05 .750	24.99 .984	21.99 .866
51 P / 51 S	22.86 .900	20.19 .795)	23.49 .925	29.43 1.159	26.43 1.041

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see page 209 for finish
BACKSHELL	Aluminium alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Precious gold alloy
SOCKET CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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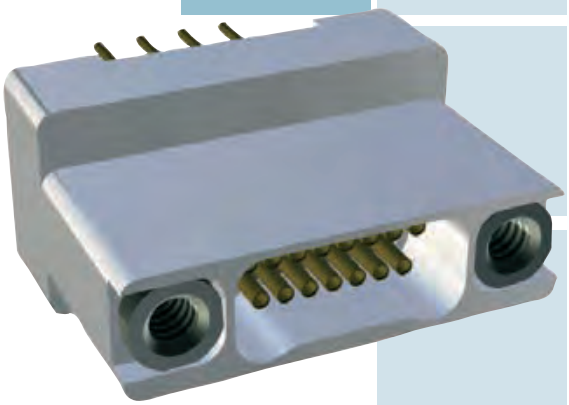

PCB RECTANGULAR CONNECTORS

BS TYPE

DUAL ROW VERTICAL PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A 2 15 S BS P G 1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
BS: AXON' Vertical PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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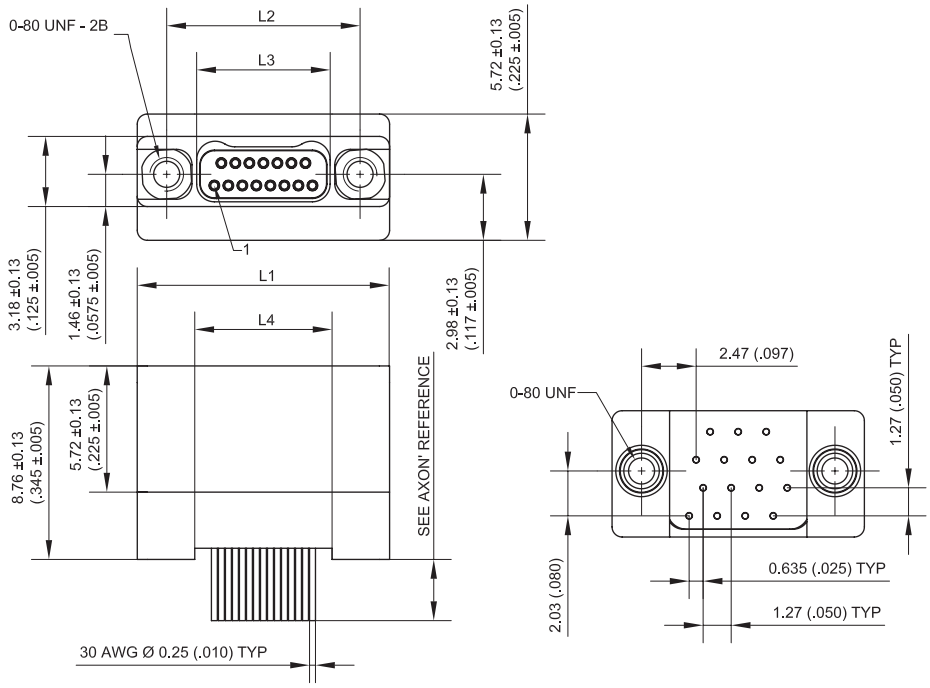
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGES 240

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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PCB RECTANGULAR CONNECTORS

BS TYPE

DUAL ROW VERTICAL PCB PLUG

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A 2 15 P BS P G 1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
BS: AXON' Vertical PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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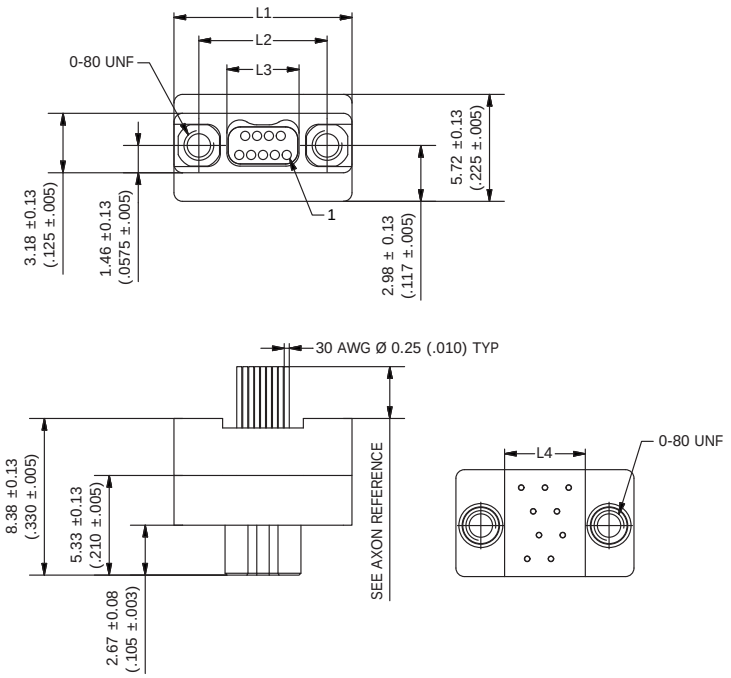
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 241

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	9.53 .375	6.86 .270	4.06 .160	4.32 .170
15 P	11.43 .450	8.76 .345	5.97 .235	6.22 .245
21 P	13.34 .525	10.67 .420	7.87 .310	8.13 .320
25 P	14.61 .575	11.94 .470	9.14 .360	9.40 .370
31 P	16.51 .650	13.84 .545	11.05 .435	11.30 .445
37 P	18.42 .725	15.75 .620	12.95 .510	13.21 .520
51 P	22.86 .900	20.19 .795	17.40 .685	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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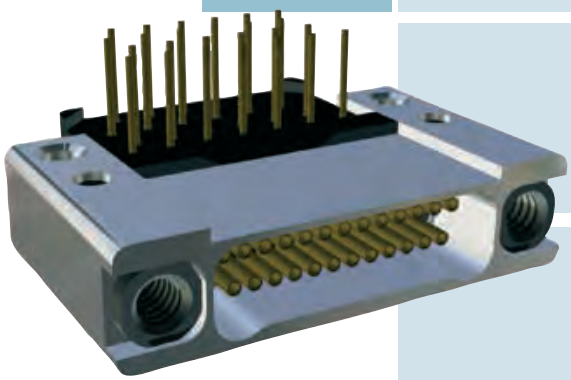

PCB RECTANGULAR CONNECTORS

CBR TYPE

DUAL ROW RIGHT ANGLE PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A | 2 | 15 | S | CBR | P | G | 1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
CBR: AXON' Right Angle PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
B: None.
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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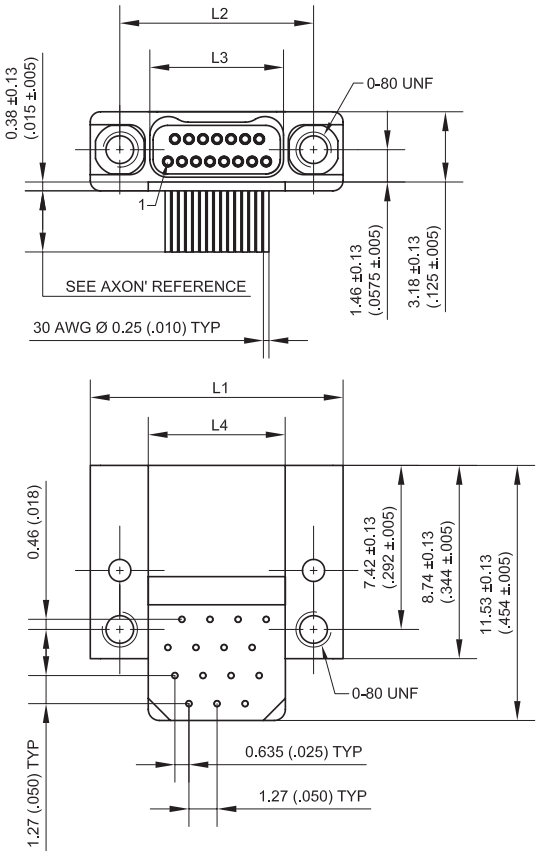
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 242

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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PCB RECTANGULAR CONNECTORS

CBR TYPE

DUAL ROW RIGHT ANGLE PCB PLUG

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	P	CBR	P	G	1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
CBR: AXON' Right Angle PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
B: None.
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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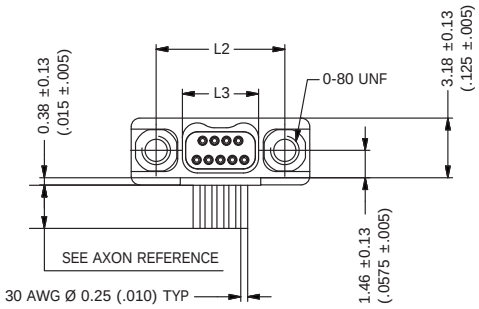
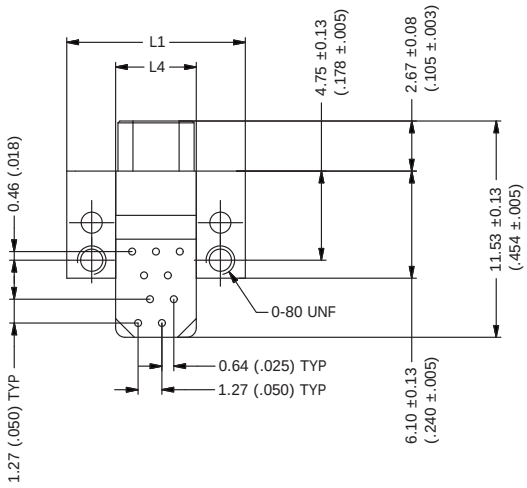
DIMENSIONS

Dimensions are in millimetres (inches).





SEE CONTACT LAYOUT ON PCB PAGE 243

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	9.53 .375	6.86 .270	4.06 .160	4.32 .170
15 P	11.43 .450	8.76 .345	5.97 .235	6.22 .245
21 P	13.34 .525	10.67 .420	7.87 .310	8.13 .320
25 P	14.61 .575	11.94 .470	9.14 .360	9.40 .370
31 P	16.51 .650	13.84 .545	11.05 .435	11.30 .445
37 P	18.42 .725	15.75 .620	12.95 .510	13.21 .520
51 P	22.86 .900	20.19 .795	17.40 .685	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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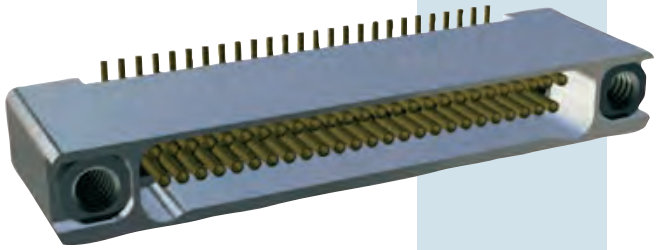
SMV TYPE

DUAL ROW VERTICAL SURFACE MOUNT PCB RECEPTACLE

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	S	SMV	P	G	1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
SMV: AXON' Vertical surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: 0.51 mm (0.020").
2: 1.02 mm (0.040").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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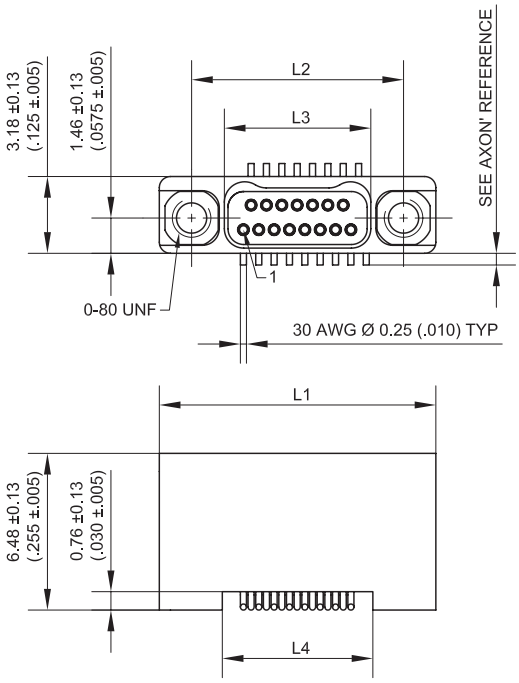
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGES 244 & 245

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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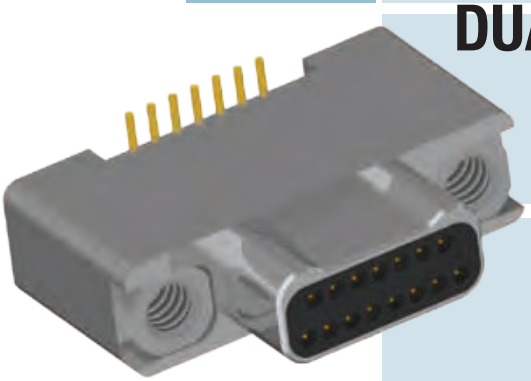
SMV TYPE

DUAL ROW VERTICAL SURFACE MOUNT PCB PLUG

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	P	SMV	P	G	1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
SMV: AXON' Vertical surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: 0.51 mm (0.020").
2: 1.02 mm (0.040").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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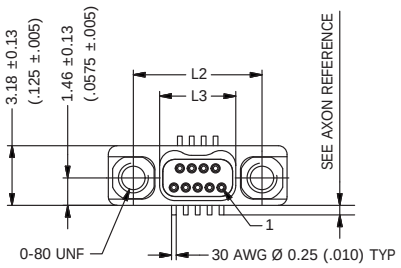
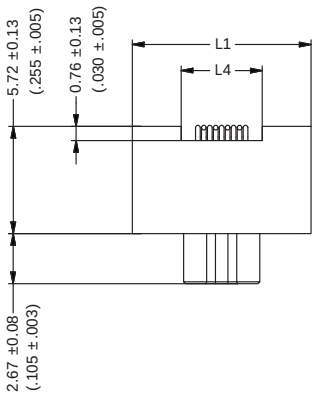
DIMENSIONS

Dimensions are in millimetres (inches).





SEE CONTACT LAYOUT ON PCB PAGES 246 & 247

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	9.53 .375	6.86 .270	4.06 .160	4.32 .170
15 P	11.43 .450	8.76 .345	5.97 .235	6.22 .245
21 P	13.34 .525	10.67 .420	7.87 .310	8.13 .320
25 P	14.61 .575	11.94 .470	9.14 .360	9.40 .370
31 P	16.51 .650	13.84 .545	11.05 .435	11.30 .445
37 P	18.42 .725	15.75 .620	12.95 .510	13.21 .520
51 P	22.86 .900	20.19 .795	17.40 .685	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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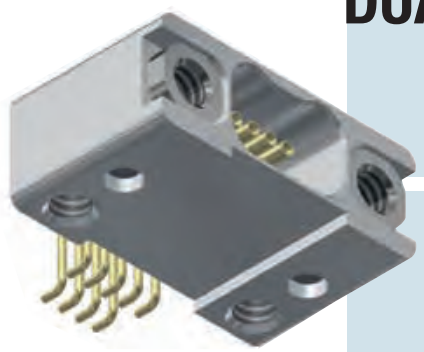
SMH TYPE

DUAL ROW HORIZONTAL SURFACE MOUNT PCB RECEPTACLE

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	S	SMH	P	G	1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
SMH: AXON' Horizontal surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: Standard ***(see page 237 for dimensions).***

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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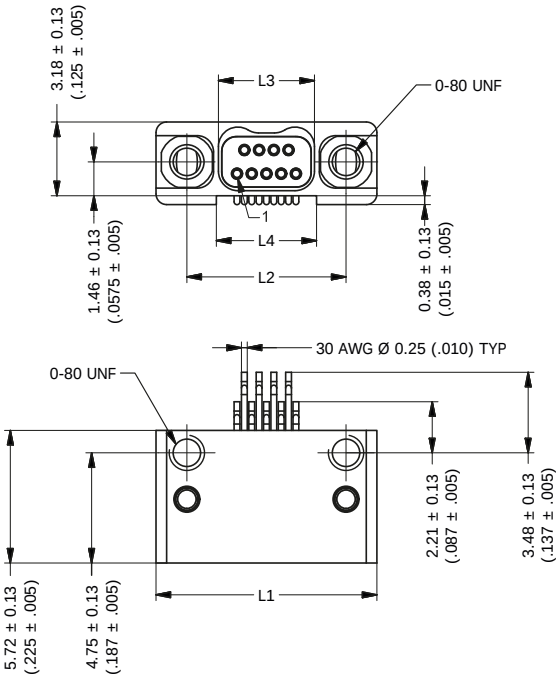
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGES 248 & 249

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
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31 S	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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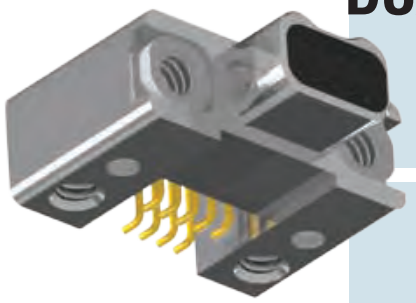
SMH TYPE

DUAL ROW HORIZONTAL SURFACE MOUNT PCB PLUG

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2A	2	15	P	SMH	P	G	1

SERIES
ND2A: Nano-D 2-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
SMH: AXON' Horizontal surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: Standard ***(see page 239 for dimensions).***

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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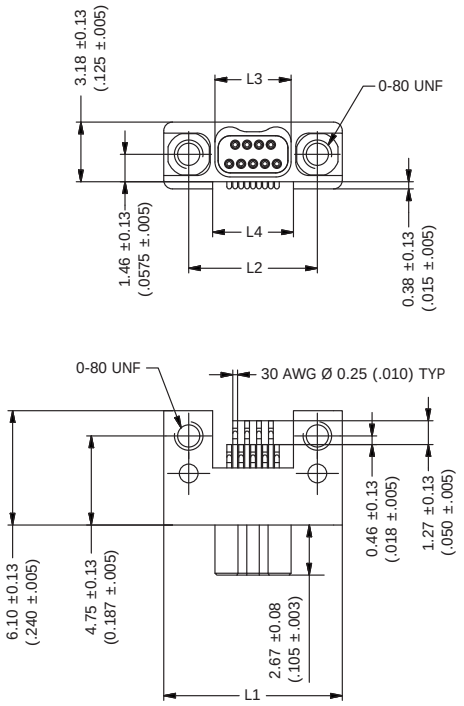
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 250 & 251

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	9.53 .375	6.86 .270	4.06 .160	4.32 .170
15 P	11.43 .450	8.76 .345	5.97 .235	6.22 .245
21 P	13.34 .525	10.67 .420	7.87 .310	8.13 .320
25 P	14.61 .575	11.94 .470	9.14 .360	9.40 .370
31 P	16.51 .650	13.84 .545	11.05 .435	11.30 .445
37 P	18.42 .725	15.75 .620	12.95 .510	13.21 .520
51 P	22.86 .900	20.19 .795	17.40 .685	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 209 FOR MORE INFORMATION

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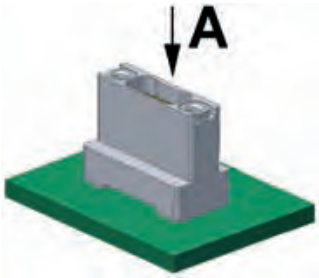
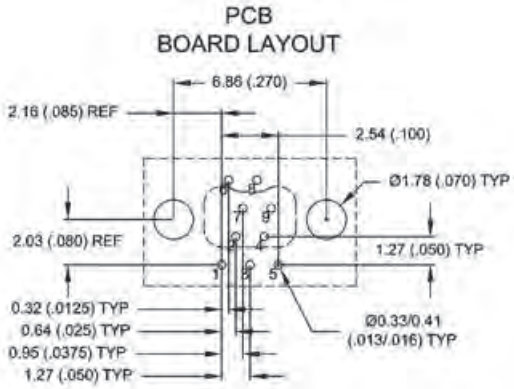
PCB LAYOUT FOR BS TYPE 0.050" PITCH - FEMALE CONNECTORS

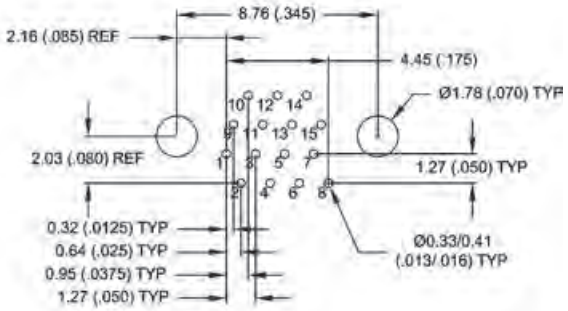
VIEW A



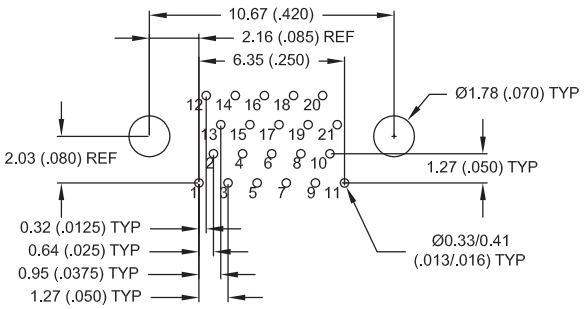
9 CONTACTS - VIEW A



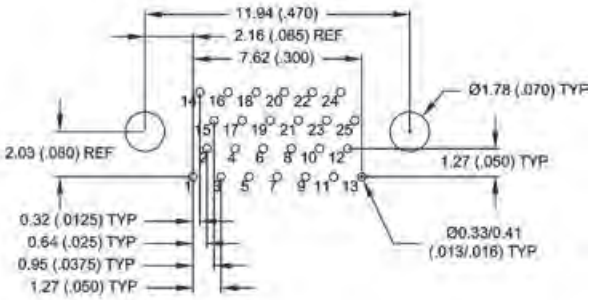
15 CONTACTS - VIEW A



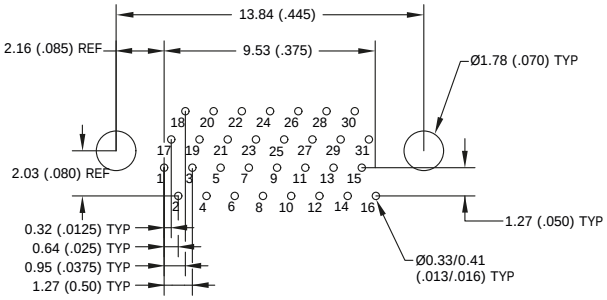
21 CONTACTS - VIEW A



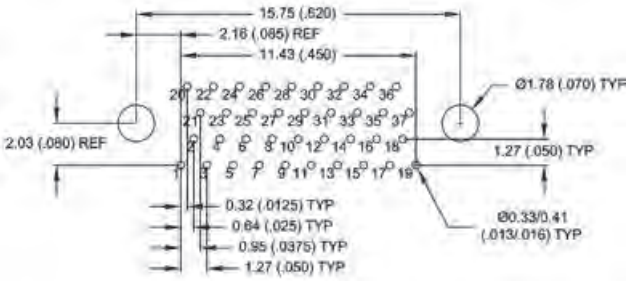
25 CONTACTS - VIEW A



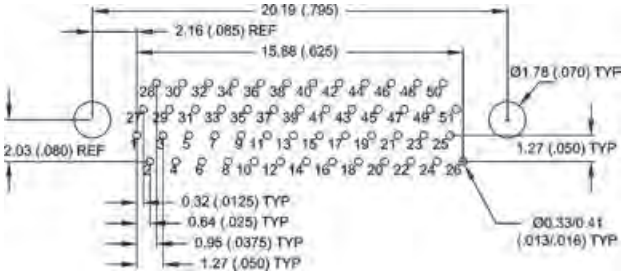
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



1.27 mm (0.05") contact spacing - 1.27 mm (0.05") spacing between rows - contact diameter: AWG 30

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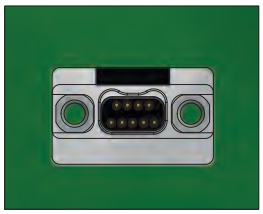
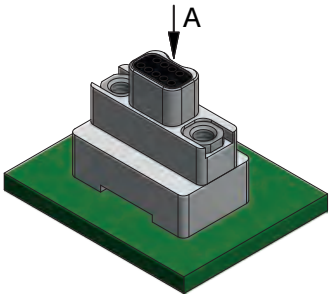
PCB LAYOUT FOR BS TYPE 0.050" PITCH - MALE CONNECTORS

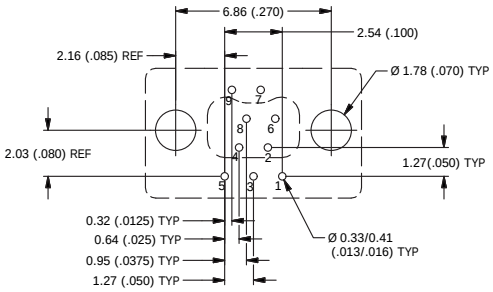
VIEW A

CONNECTOR
MATING FACE

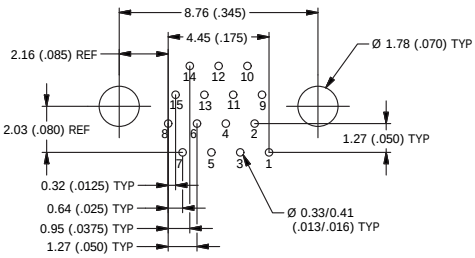




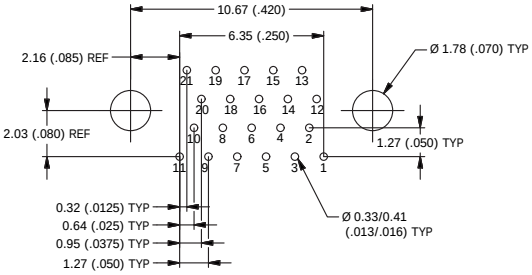
9 CONTACTS - VIEW A



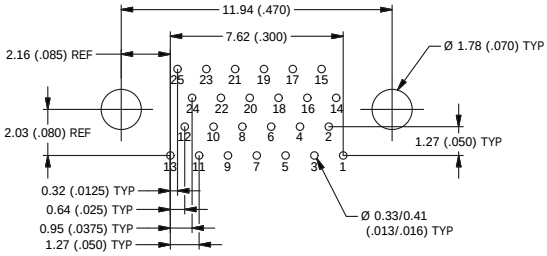
15 CONTACTS - VIEW A



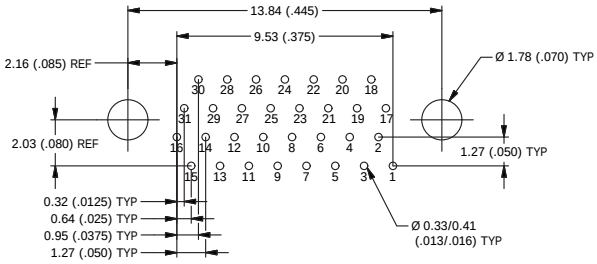
21 CONTACTS - VIEW A



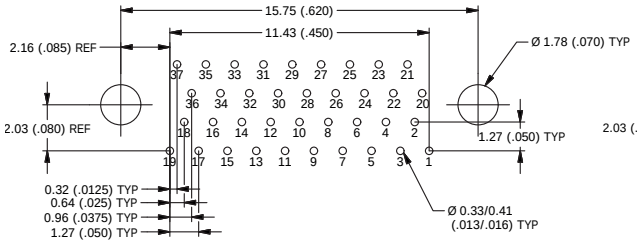
25 CONTACTS - VIEW A



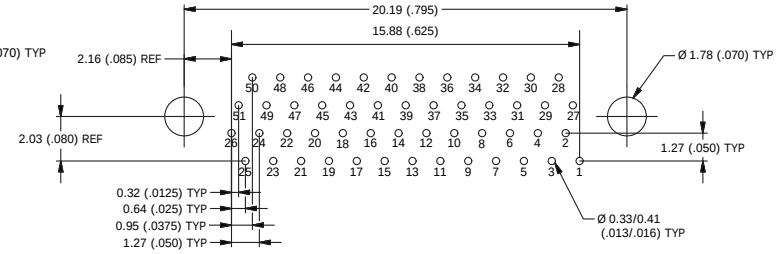
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



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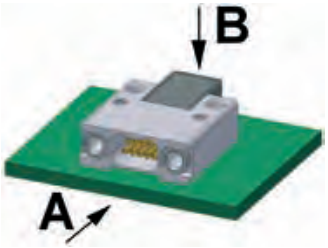
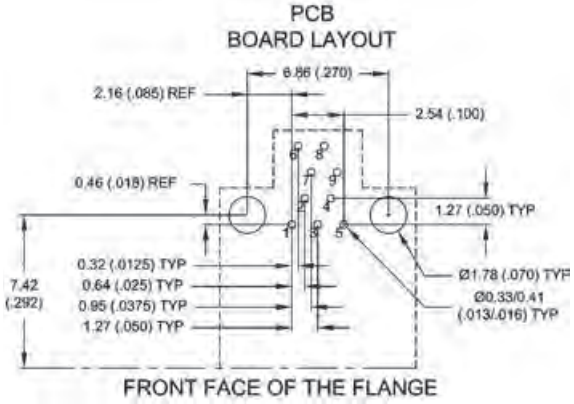
PCB LAYOUT FOR CBR TYPE 0.050" PITCH - FEMALE CONNECTORS

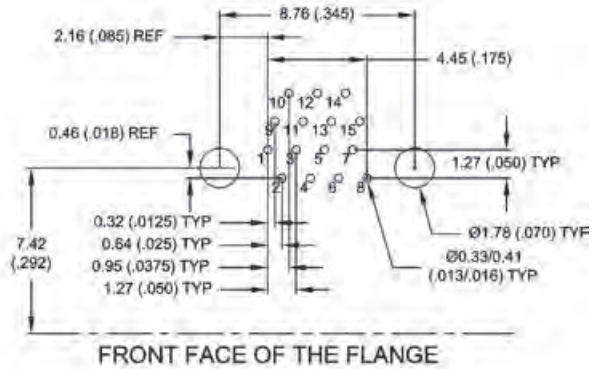
VIEW A



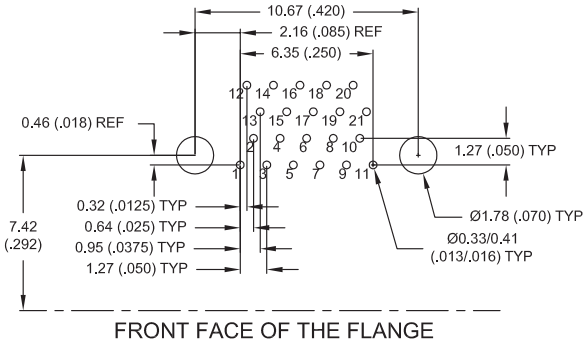
9 CONTACTS - VIEW B



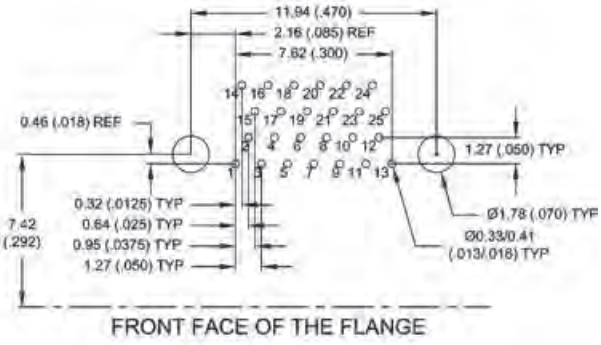
15 CONTACTS - VIEW B



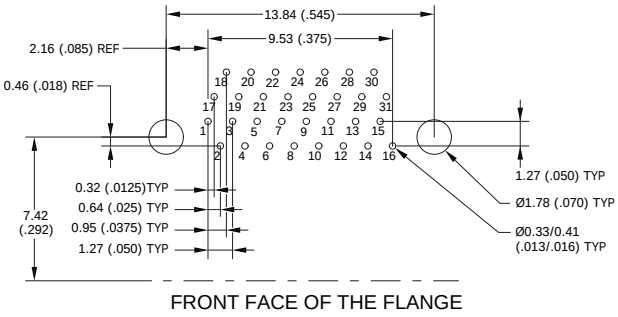
21 CONTACTS - VIEW B



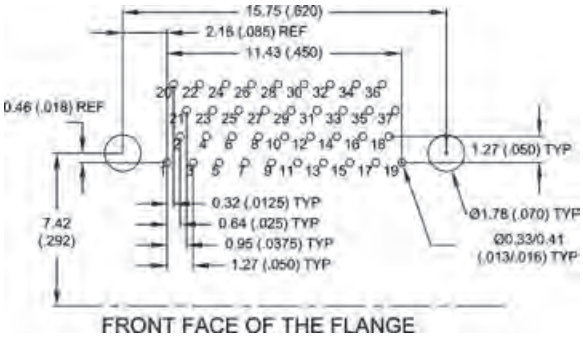
25 CONTACTS - VIEW B



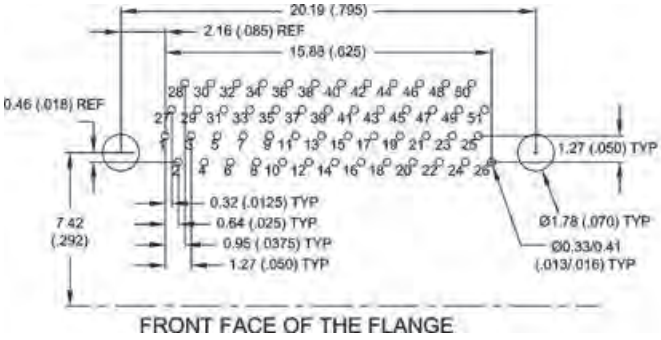
31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



1.27 mm (0.05") contact spacing - 1.27 mm (0.05") spacing between rows - contact diameter: AWG 30

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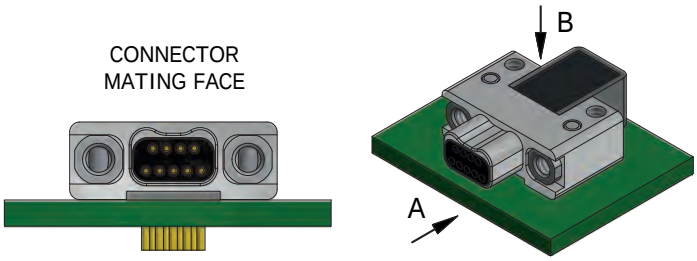
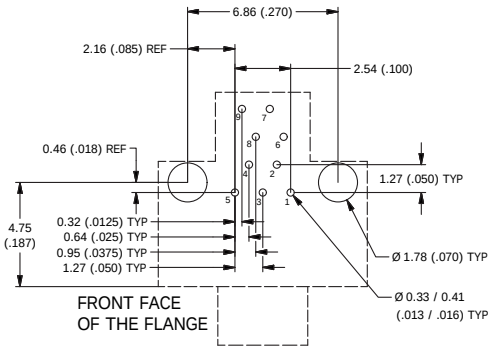
PCB LAYOUT FOR CBR TYPE 0.050" PITCH - MALE CONNECTORS

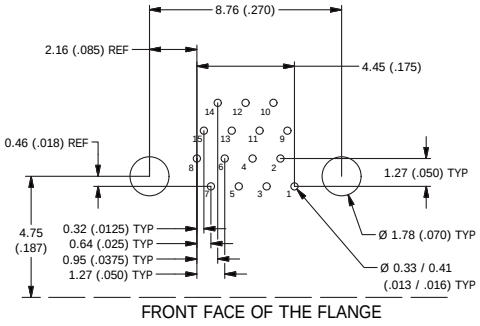
VIEW A



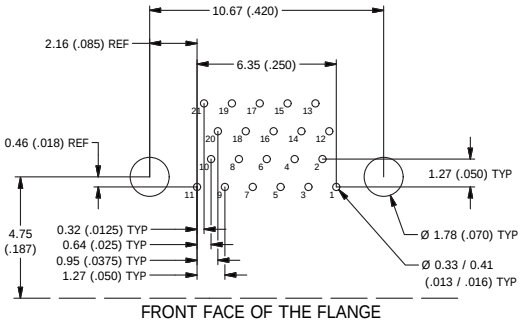
9 CONTACTS - VIEW B



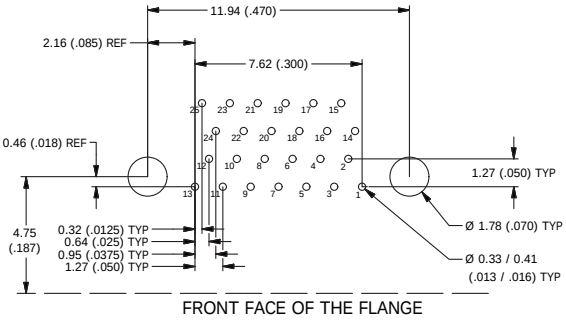
15 CONTACTS - VIEW B



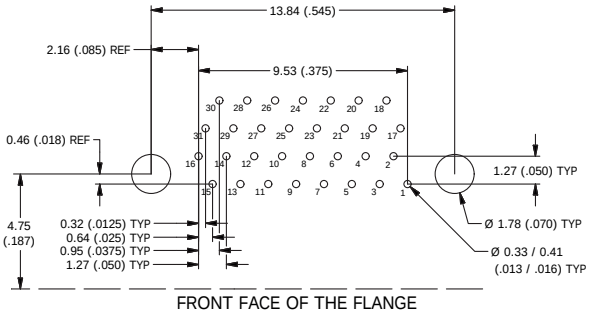
21 CONTACTS - VIEW B



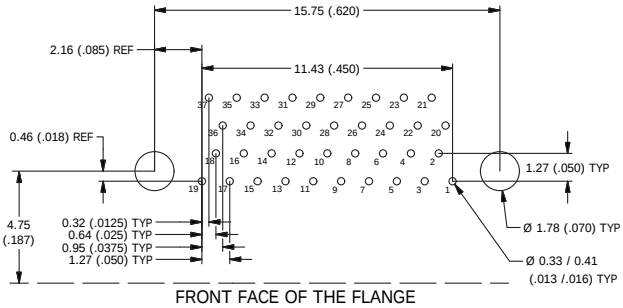
25 CONTACTS - VIEW B



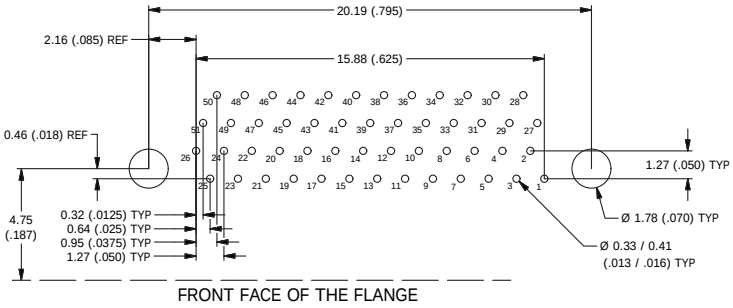
31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



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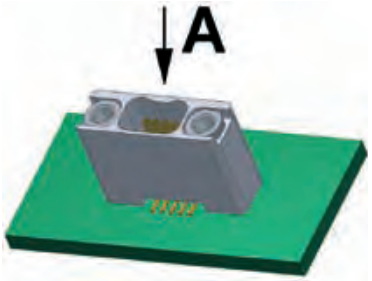
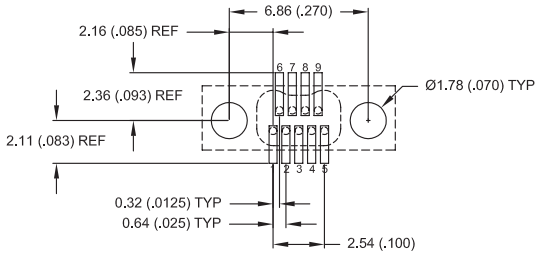
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - FEMALE CONNECTORS

VIEW A

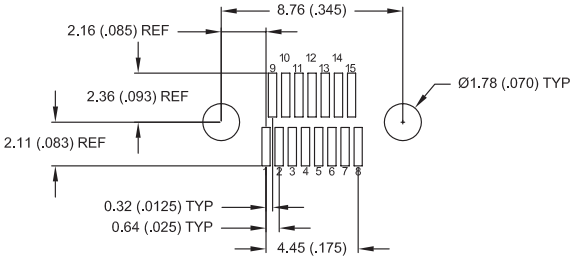


9 CONTACTS - VIEW A

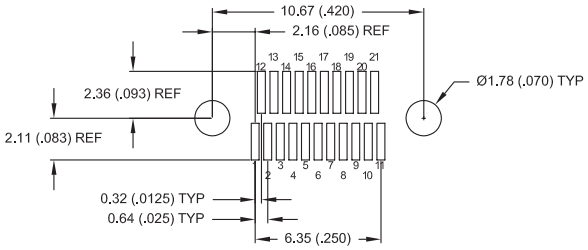
PCB
BOARD LAYOUT



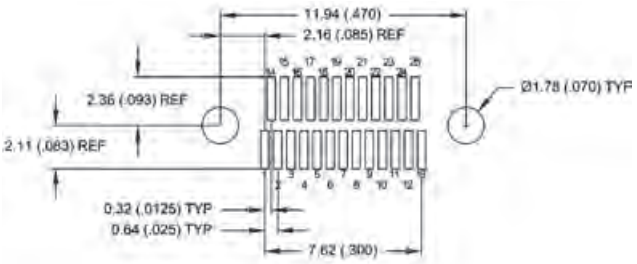
15 CONTACTS - VIEW A



21 CONTACTS - VIEW A



25 CONTACTS - VIEW A



0.635 mm (0.25") pad - contact diameter: AWG 30

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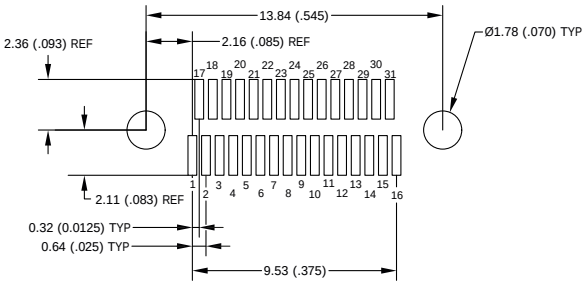
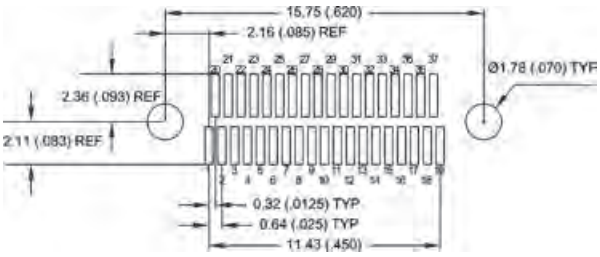
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - FEMALE CONNECTORS

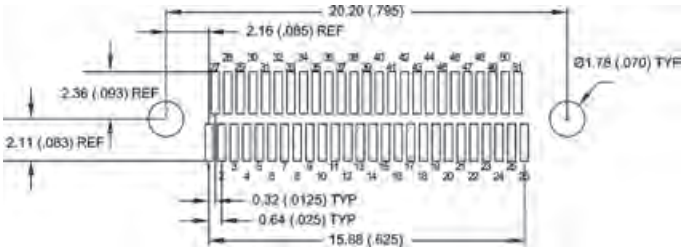
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A

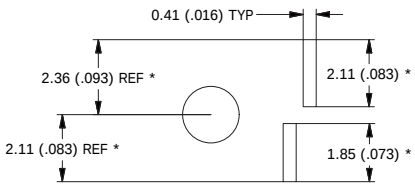


51 CONTACTS - VIEW A



LAYOUT

Suggested PAD configuration



*: For .040" tail length, add .020" to noted dimensions

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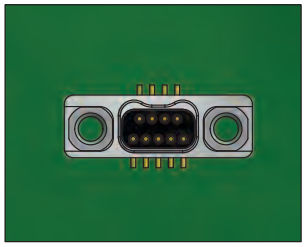
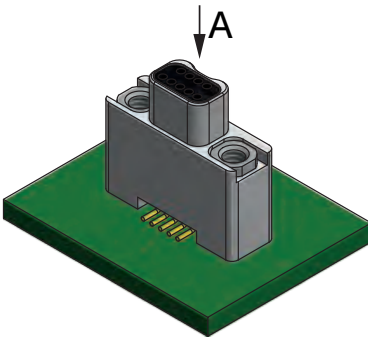
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - MALE CONNECTORS

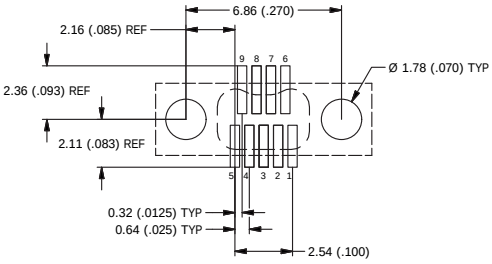
VIEW A

CONNECTOR
MATING FACE

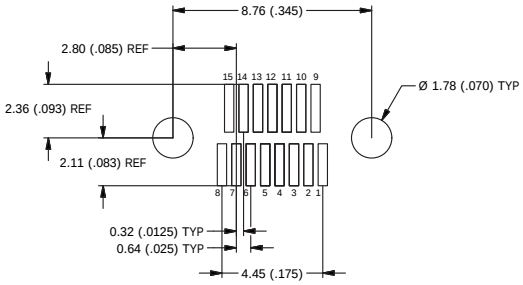




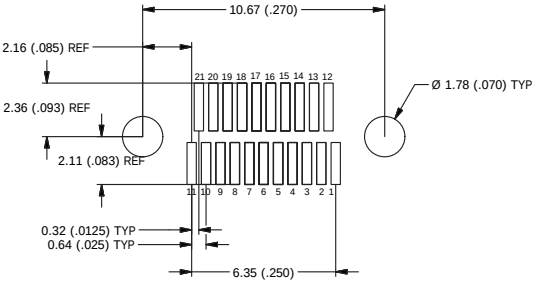
9 CONTACTS - VIEW A



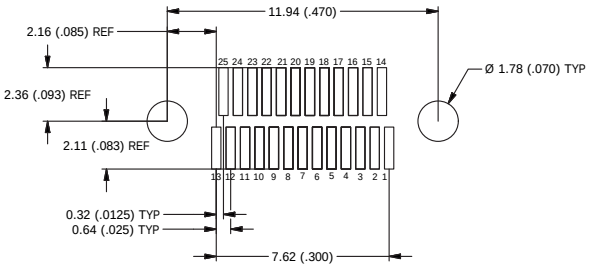
15 CONTACTS - VIEW A



21 CONTACTS - VIEW A



25 CONTACTS - VIEW A



0.635 mm (0.25") pad - contact diameter: AWG 30

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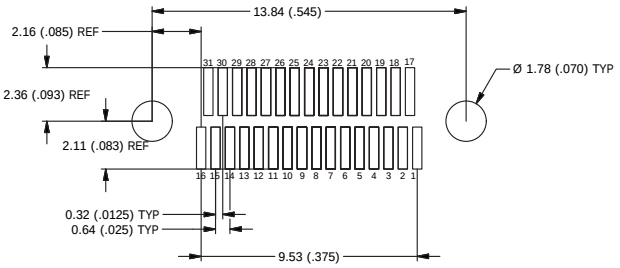
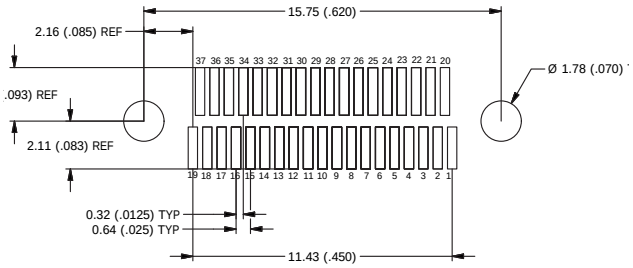
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - MALE CONNECTORS

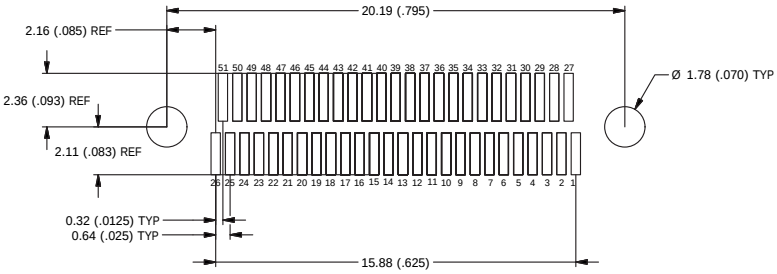
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A

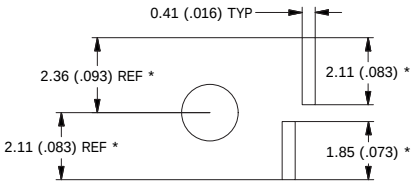


51 CONTACTS - VIEW A



LAYOUT

Suggested PAD configuration



*: For .040" tail length, add .020" to noted dimensions

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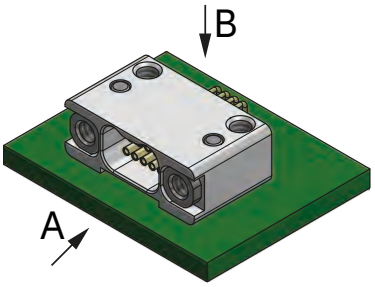
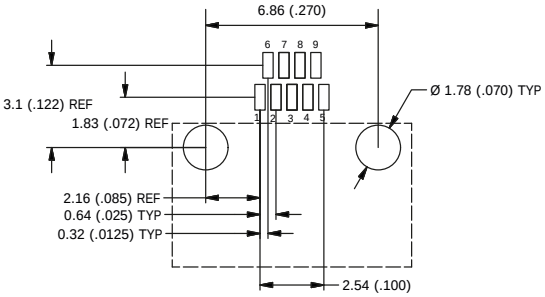
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - FEMALE CONNECTORS

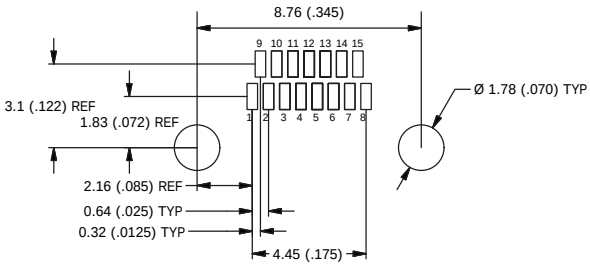
VIEW A



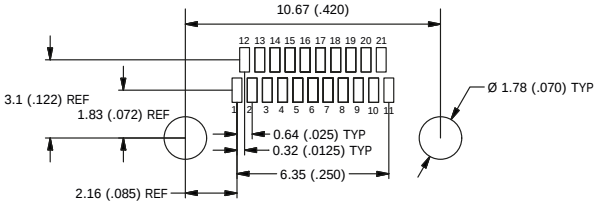
9 CONTACTS - VIEW A



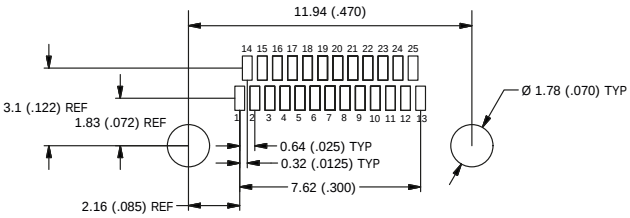
15 CONTACTS - VIEW A



21 CONTACTS - VIEW A



25 CONTACTS - VIEW A



0.635 mm (0.25") pad - contact diameter: AWG 30

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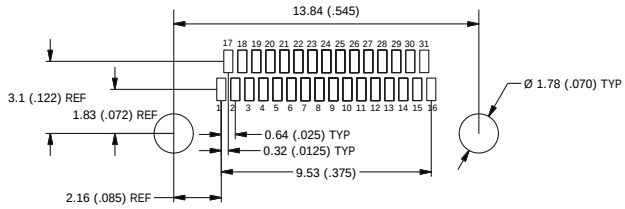
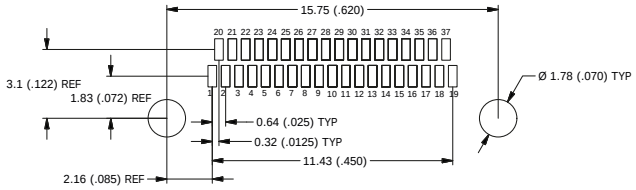
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - FEMALE CONNECTORS

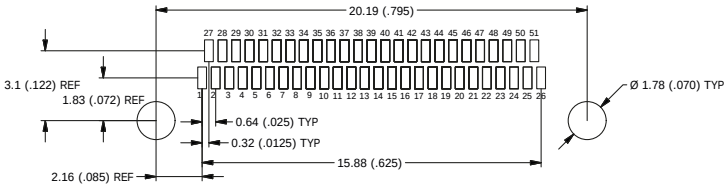
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A

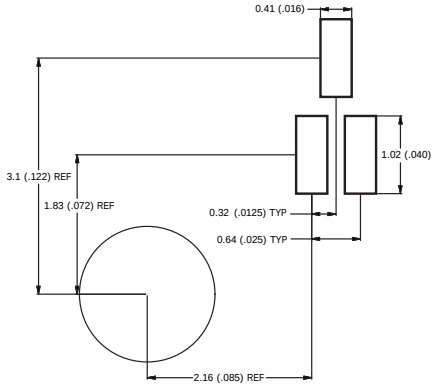


51 CONTACTS - VIEW A



LAYOUT

Suggested PAD configuration



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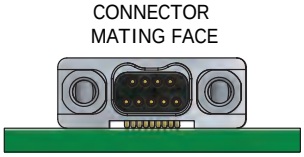
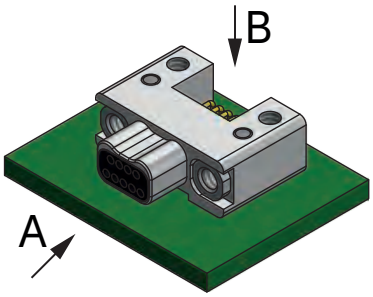
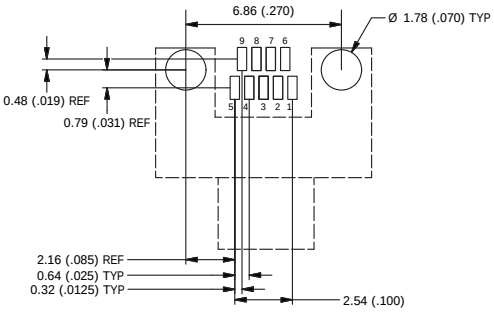
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - MALE CONNECTORS

VIEW A

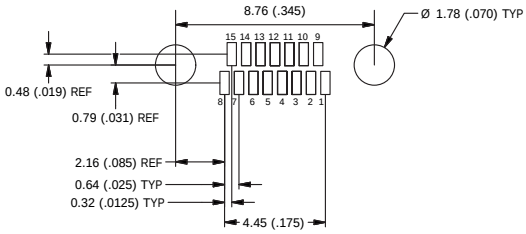




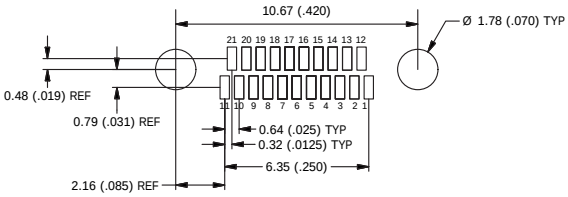
9 CONTACTS - VIEW A



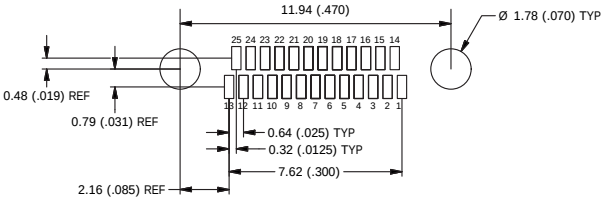
15 CONTACTS - VIEW A



21 CONTACTS - VIEW A



25 CONTACTS - VIEW A



0.635 mm (0.25") pad - contact diameter: AWG 30

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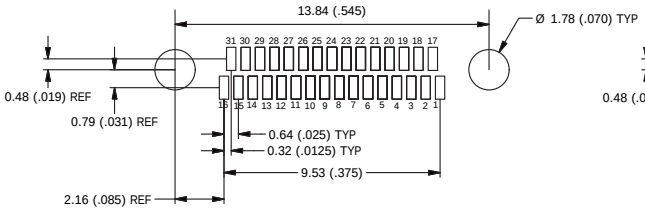
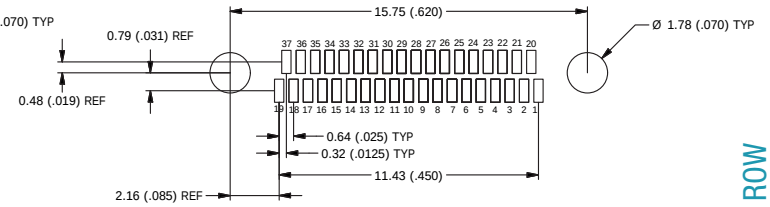
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - MALE CONNECTORS

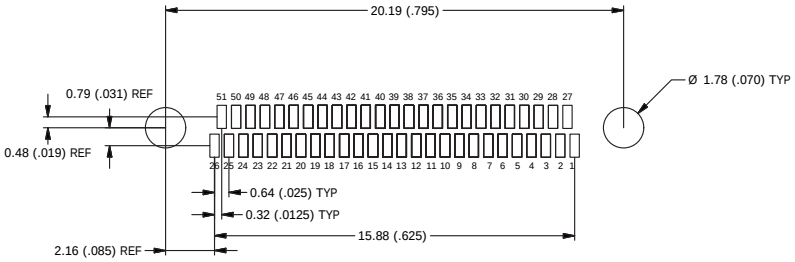
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A

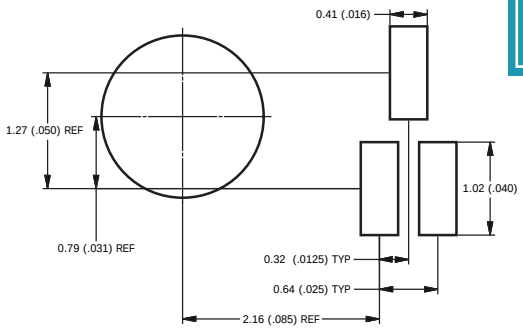


51 CONTACTS - VIEW A



LAYOUT

Suggested PAD configuration



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SINGLE ROW NANO-D CONNECTORS

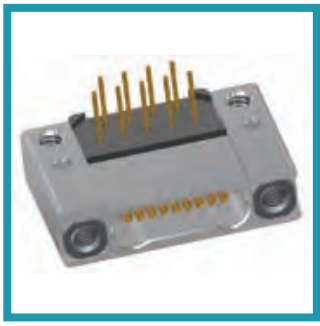
RECTANGULAR CONNECTORS FOR CABLES

- Single row pigtail & jumper 254

PCB RECTANGULAR CONNECTORS

- BS (Board Straight) type - 0.050" pitch receptacles 256
- BS (Board Straight) type - 0.050" pitch plugs 258
- CBR (Condensed Board Right Angle) type - 0.050" pitch receptacles. 260
- CBR (Condensed Board Right Angle) type - 0.050" pitch plugs 262
- SMV (Surface Mount Vertical) type - 0.025" pitch receptacles. 264
- SMV (Surface Mount Vertical) type - 0.025" pitch plugs 266
- SMH (Surface Mount Horizontal) type - 0.025" pitch receptacles. . . . 268
- SMH (Surface Mount Horizontal) type - 0.025" pitch plugs 270

PCB layout for BS type 272
PCB layout for CBR type 274
PCB layout for SMV type 276
PCB layout for SMH type 278



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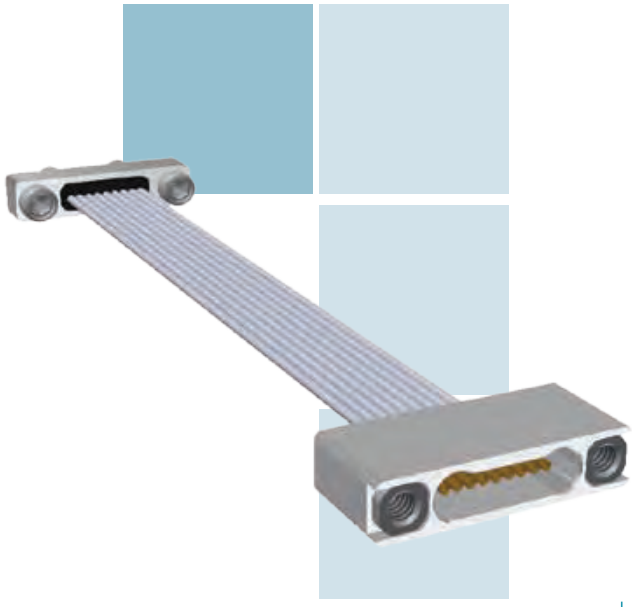
SINGLE ROW PIGTAIL & JUMPER



- Reliability for micro-miniature operating systems.
- High performance metal connector and PTFE wire.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	15	P	S	D	1	L	50	R	P

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**. **Other versions available on request.**

1st CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector.

2nd CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector.
W: No second connector - free wires.

CONNECTIONS (see jumper wiring on page 217)
D: Direct pin 1 to pin 1.
I: Indirect (usual for plug-plug jumper).
X: Pigtail.

WIRE CODE
1: ET 3007, AWG 30, 7 strands, 250 V.
2: ET 3207, AWG 32, 7 strands, 250 V.
3: ET 3407, AWG 34, 7 strands, 250 V.
4: ET 3607, AWG 36, 7 strands, 250 V.
Other versions available on request.

COLOUR CODE
L: White
F: Yellow.
W: 10 colour repeat.
See page 215 for colour code.

WIRE LENGTH (cm)
Attention! Wire length in centimetres - (1cm = 10 mm = .394").

L in cm (inches)	2 ≤ L ≤10 (0.79≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE 1st CONNECTOR
P: Threaded hole #0-80 UNF
(non removable jackposts, recommended for receptacles).
R: Retractable short hex socket head jackscrews #0-80 UNF
(recommended for plugs).
L: Short hex socket head jackscrews #0-80 UNF (captivated).
B: No hardware.

HARDWARE 2nd CONNECTOR
See above.
X: Pigtail.

IN BOLD: FACTORY STANDARD

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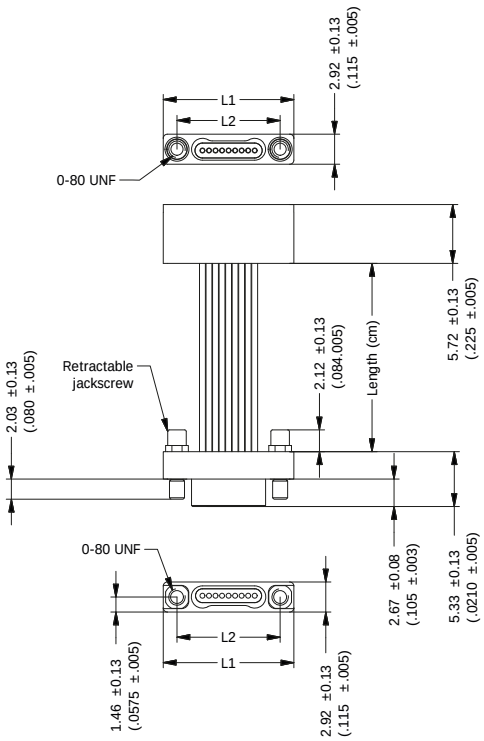
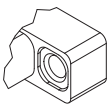
DIMENSIONS

Dimensions are in millimetres (inches).

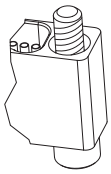


SPECIFIC HARDWARE CONFIGURATION

Treaded holes
#0-80 UNF
for plug shell
(code: P)



Jackscrew
#0-80 UNF
for socket shell
(code: R/L)



SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)
9 S / 9 P	12.70 .500	10.03 .395
15 S / 15 P	16.51 .650	13.84 .545
21 S / 21 P	20.32 .800	17.65 .695
25 S / 25 P	22.86 .900	20.19 .795
31 S / 31 P	26.67 1.050	24.00 .945
37 S / 37 P	30.48 1.200	27.81 1.095
51 S / 51 P	39.37 1.550	36.70 1.445

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
HARDWARE	300 series stainless steel, passivated

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PCB RECTANGULAR CONNECTORS

BS TYPE

SINGLE ROW VERTICAL PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	09	S	BS	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
BS: AXON' Vertical PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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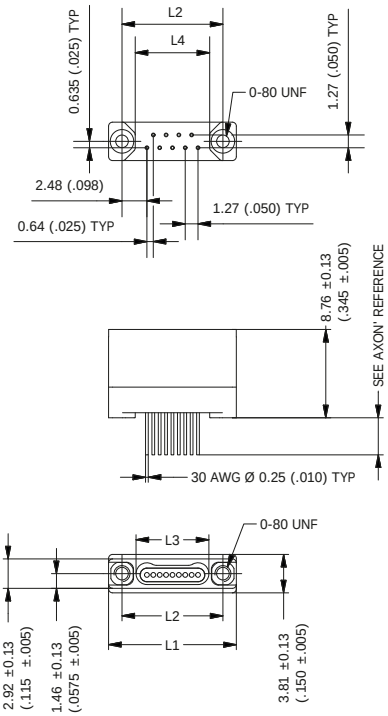
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 272

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	12.70 .500	10.03 .395	7.24 .285	7.37 .290
15 S	16.51 .650	13.84 .545	11.05 .435	11.18 .440
21 S	20.32 .800	17.65 .695	14.86 .585	14.99 .590
25 S	22.86 .900	20.19 .795	17.40 .685	17.53 .690
31 S	26.67 1.050	24.00 .945	21.21 .835	21.34 .840
37 S	30.48 1.200	27.81 1.095	25.02 .985	25.15 .990
51 S	39.37 1.550	36.70 1.445	33.91 1.335	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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PCB RECTANGULAR CONNECTORS

BS TYPE

SINGLE ROW VERTICAL PCB PLUG

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A 2 15 P BS P G 1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
BS: AXON' Vertical PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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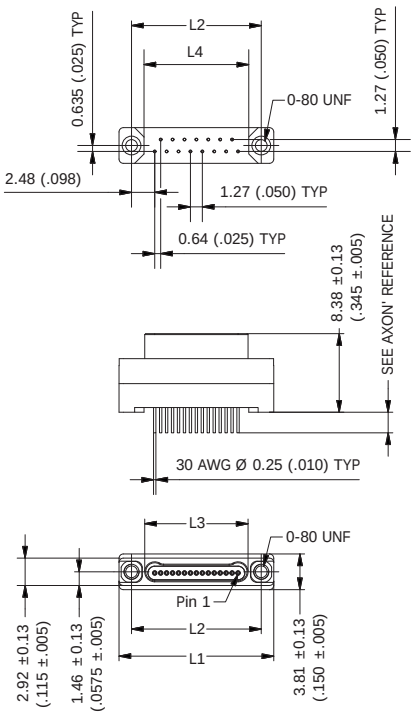
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 273

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	12.70 .500	10.03 .395	7.21 .284	7.37 .290
15 P	16.51 .650	13.84 .545	11.02 .434	11.18 .440
21 P	20.32 .800	17.65 .695	14.83 .584	14.99 .590
25 P	22.86 .900	20.19 .795	17.37 .684	17.53 .690
31 P	26.67 1.050	24.00 .945	21.18 .834	21.34 .840
37 P	30.48 1.200	27.81 1.095	24.99 .984	25.15 .990
51 P	39.37 1.550	36.70 1.445	33.88 1.334	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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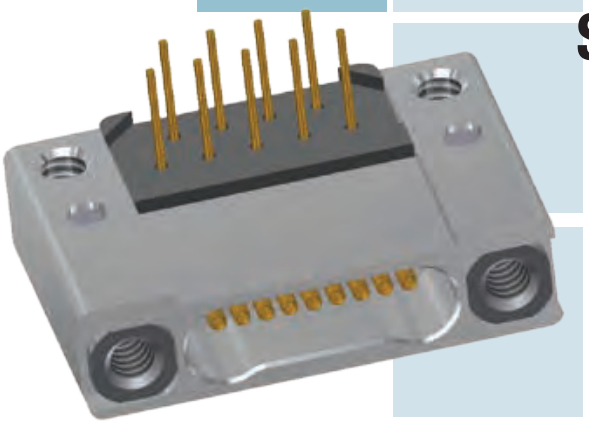

PCB RECTANGULAR CONNECTORS

CBR TYPE

SINGLE ROW RIGHT ANGLE PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A 2 09 S CBR P G 1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
CBR: AXON' Right Angle PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
B: None.
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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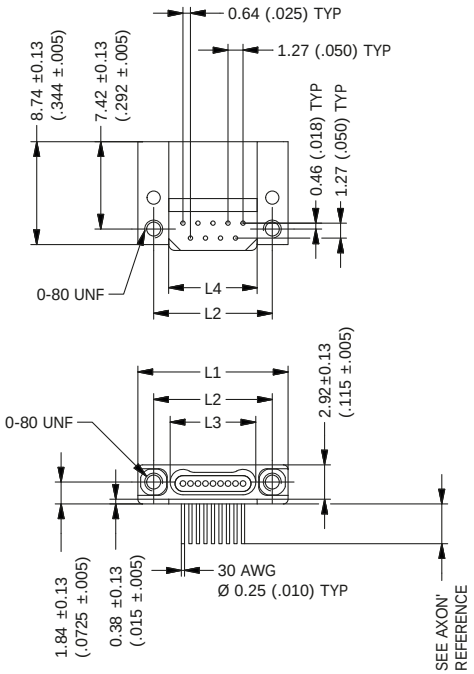
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 274

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	12.70 .500	10.03 .395	7.24 .285	7.37 .290
15 S	16.51 .650	13.84 .545	11.05 .435	11.18 .440
21 S	20.32 .800	17.65 .695	14.86 .585	14.99 .590
25 S	22.86 .900	20.19 .795	17.40 .685	17.53 .690
31 S	26.67 1.050	24.00 .945	21.21 .835	21.34 .840
37 S	30.48 1.200	27.81 1.095	25.02 .985	25.15 .990
51 S	39.37 1.550	36.70 1.445	33.91 1.335	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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CBR TYPE

SINGLE ROW RIGHT ANGLE PCB PLUG

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	15	P	CBR	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
CBR: AXON' Right Angle PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
B: None.
Other versions available on request.

TAIL PLATING
G: Gold.
Other tail plating available on request.

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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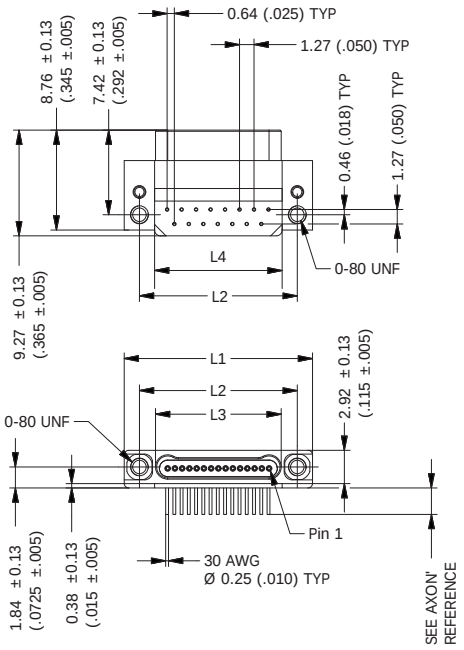
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 275

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	12.70 .500	10.03 .395	7.21 .284	7.37 .290
15 P	16.51 .650	13.84 .545	11.02 .434	11.18 .440
21 P	20.32 .800	17.65 .695	14.83 .584	14.99 .590
25 P	22.86 .900	20.19 .795	17.37 .684	17.53 .690
31 P	26.67 1.050	24.00 .945	21.18 .834	21.34 .840
37 P	30.48 1.200	27.81 1.095	24.99 .984	25.15 .990
51 P	39.37 1.550	36.70 1.445	33.88 1.334	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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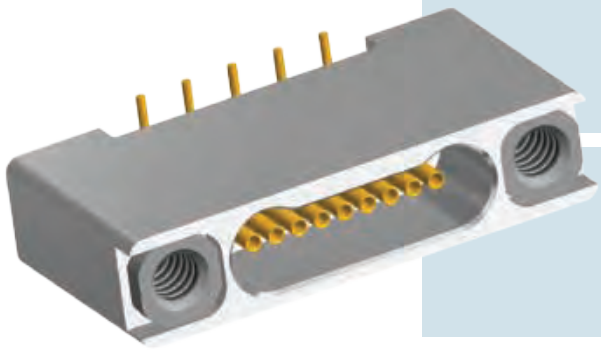
SMV TYPE

SINGLE ROW VERTICAL SURFACE MOUNT PCB RECEPTACLE

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	09	S	SMV	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
SMV: AXON' Vertical surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: 0.51 mm (0.020").
2: 1.02 mm (0.040").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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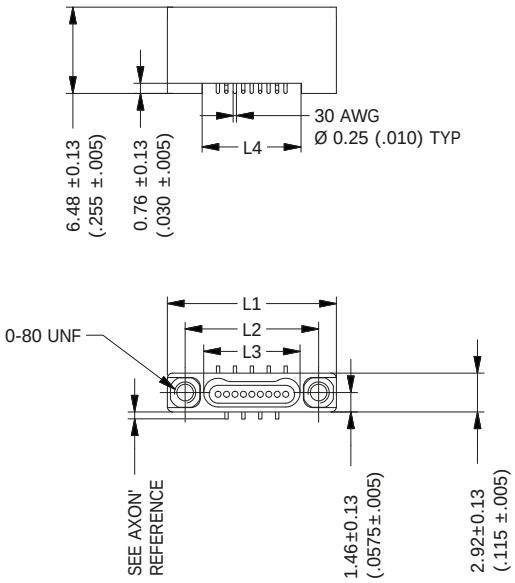
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 276

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	12.70 .500	10.03 .395	7.24 .285	7.37 .290
15 S	16.51 .650	13.84 .545	11.05 .435	11.18 .440
21 S	20.32 .800	17.65 .695	14.86 .585	14.99 .590
25 S	22.86 .900	20.19 .795	17.40 .685	17.53 .690
31 S	26.67 1.050	24.00 .945	21.21 .835	21.34 .840
37 S	30.48 1.200	27.81 1.095	25.02 .985	25.15 .990
51 S	39.37 1.550	36.70 1.445	33.91 1.335	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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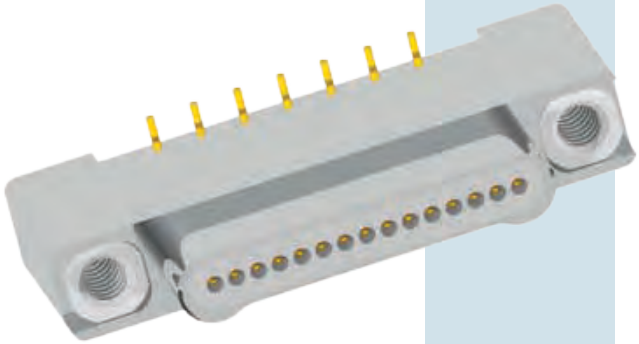
SMV TYPE

SINGLE ROW VERTICAL SURFACE MOUNT PCB PLUG

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Several tail lengths available.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	15	P	SMV	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
SMV: AXON' Vertical surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: 0.51 mm (0.020").
2: 1.02 mm (0.040").
Tolerance: ± 0.25 mm (0.010").

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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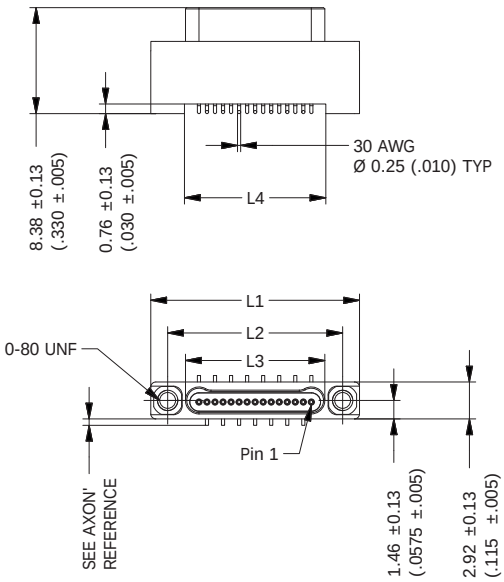
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 277

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	12.70 .500	10.03 .395	7.21 .284	7.37 .290
15 P	16.51 .650	13.84 .545	11.02 .434	11.18 .440
21 P	20.32 .800	17.65 .695	14.83 .584	14.99 .590
25 P	22.86 .900	20.19 .795	17.37 .684	17.53 .690
31 P	26.67 1.050	24.00 .945	21.18 .834	21.34 .840
37 P	30.48 1.200	27.81 1.095	24.99 .984	25.15 .990
51 P	39.37 1.550	36.70 1.445	33.88 1.334	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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SMH TYPE

SINGLE ROW HORIZONTAL SURFACE MOUNT PCB RECEPTACLE

0.025" PITCH

- Reliability for micro-miniature operating systems.
- Surface Mount.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	09	S	SMH	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
SMH: AXON' Horizontal surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: Standard.

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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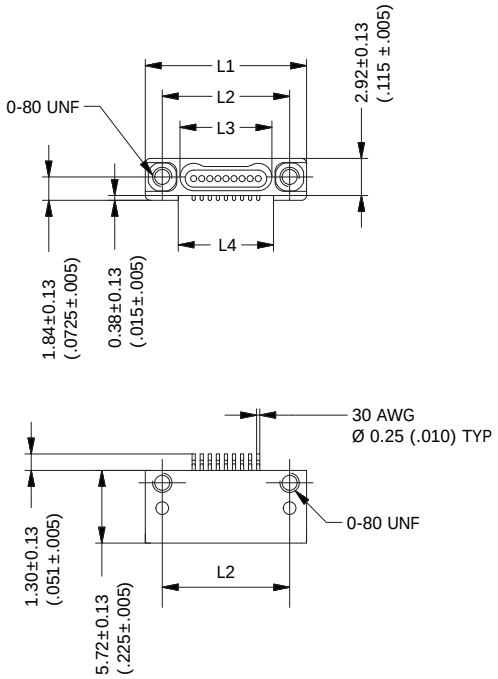
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 278

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	12.70 .500	10.03 .395	7.24 .285	7.37 .290
15 S	16.51 .650	13.84 .545	11.05 .435	11.18 .440
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25 S	22.86 .900	20.19 .795	17.40 .685	17.53 .690
31 S	26.67 1.050	24.00 .945	21.21 .835	21.34 .840
37 S	30.48 1.200	27.81 1.095	25.02 .985	25.15 .990
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SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
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CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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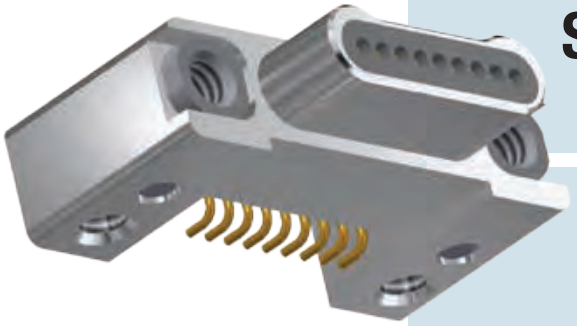
SMH TYPE

SINGLE ROW HORIZONTAL SURFACE MOUNT PCB PLUG

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Operating temperature: 150°C or 200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND1A	2	09	P	SMH	P	G	1

SERIES
ND1A: Nano-D 1-row AXON'.

CONNECTOR TYPE
2: Aluminium with electroless nickel plating and epoxy 150°C.
3: Aluminium with electroless nickel plating and epoxy 200°C.
Other materials available on request. (eg Titanium, Stainless Steel).

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.
Other versions available on request.

CONNECTOR TYPE
P: Plug connector.

FAMILY
SMH: AXON' Horizontal surface mount PCB connector.

HARDWARE
P: Threaded holes #0-80 UNF (non removable jackposts).
Other versions available on request.
B: None.

TAIL PLATING
G: Gold, AWG 30.
Other tail plating available on request.

TAIL LENGTH
1: Standard.

Connectors are supplied with
#0-80 UNF screws 1/4" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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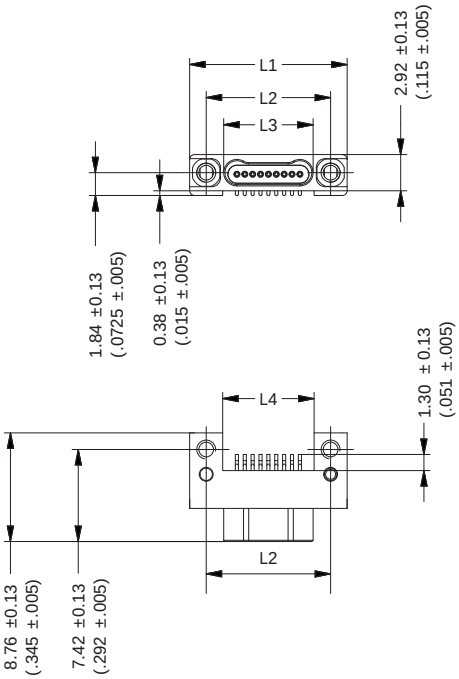
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 279

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P	12.70 .500	10.03 .395	7.21 .284	7.37 .290
15 P	16.51 .650	13.84 .545	11.02 .434	11.18 .440
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31 P	26.67 1.050	24.00 .945	21.18 .834	21.34 .840
37 P	30.48 1.200	27.81 1.095	24.99 .984	25.15 .990
51 P	39.37 1.550	36.70 1.445	33.88 1.334	34.04 1.340

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VAC
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	141 g max. (5 oz)
CONTACT SEPARATING FORCE	11 g min. (0.4 oz)
CONTACT RETENTION	0.9 kg (2 lbs)
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	100g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 or 300 series stainless steel or titanium alloy, see ordering for plating options
INSULATOR	Liquid Crystal Polymer (LCP) or PEEK
CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

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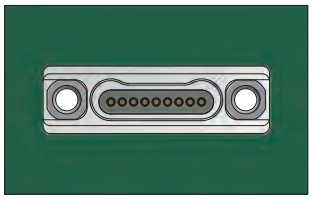
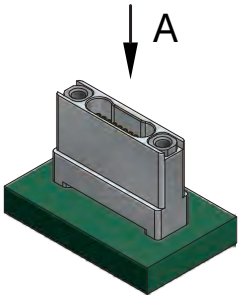
PCB LAYOUT FOR BS TYPE 0.050" PITCH - FEMALE CONNECTORS

VIEW A

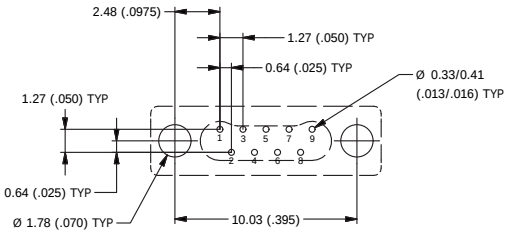
CONNECTOR
MATING FACE



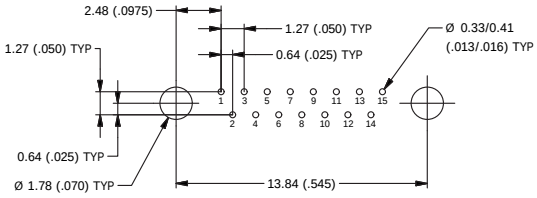


9 CONTACTS - VIEW A

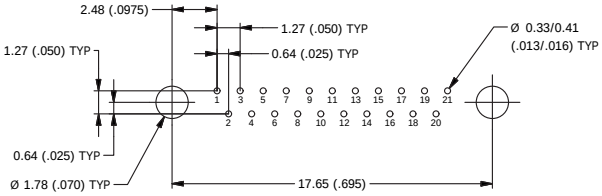
PCB
BOARD LAYOUT



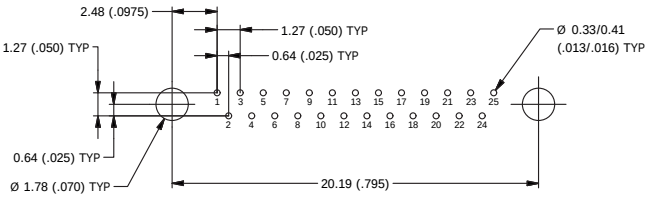
15 CONTACTS - VIEW A



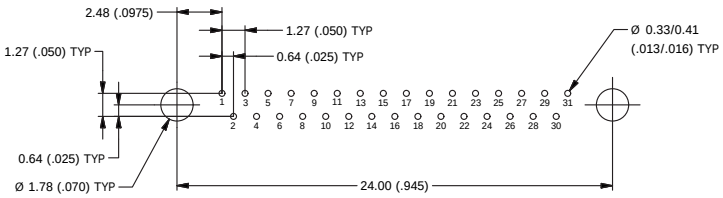
21 CONTACTS - VIEW A



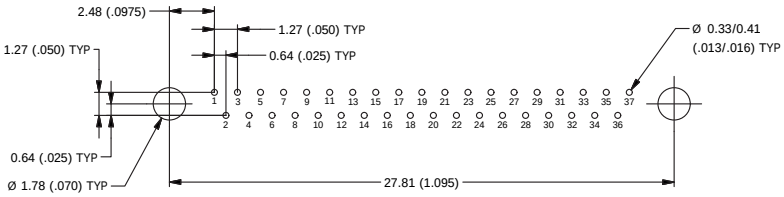
25 CONTACTS - VIEW A



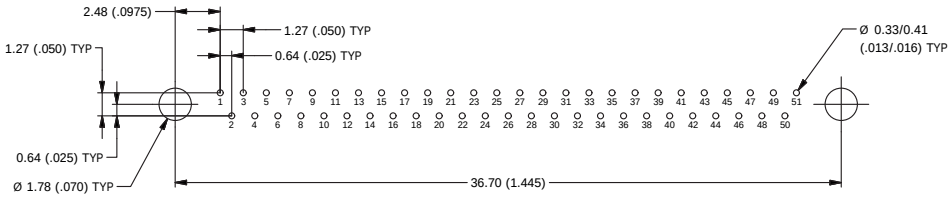
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



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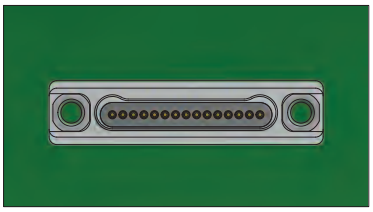
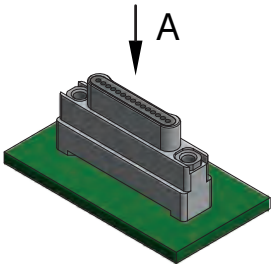
PCB LAYOUT FOR BS TYPE 0.050" PITCH - MALE CONNECTORS

VIEW A

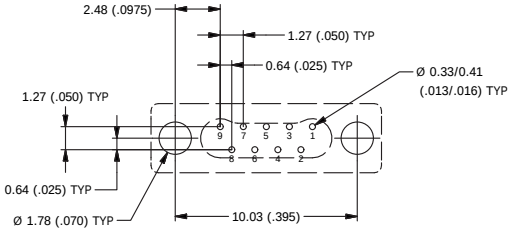
CONNECTOR
MATING FACE



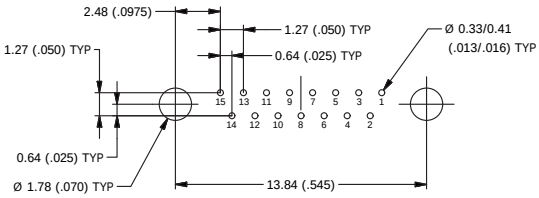


9 CONTACTS - VIEW A

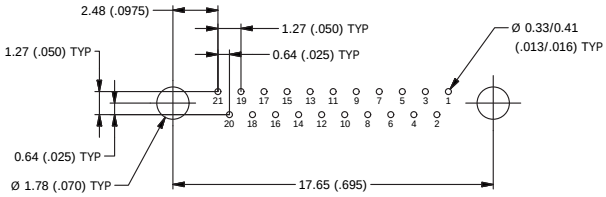
PCB
BOARD LAYOUT



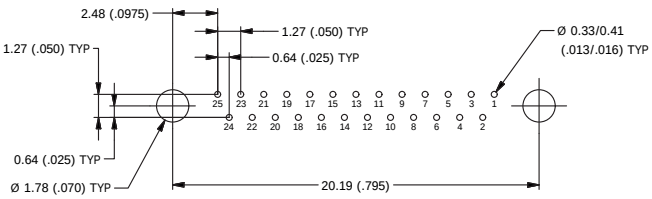
15 CONTACTS - VIEW A



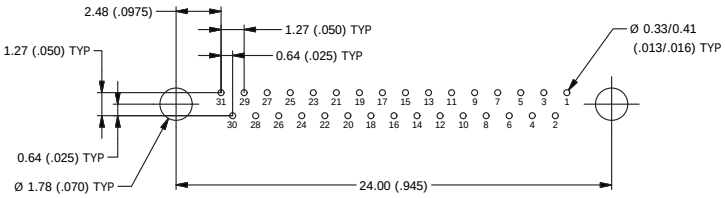
21 CONTACTS - VIEW A



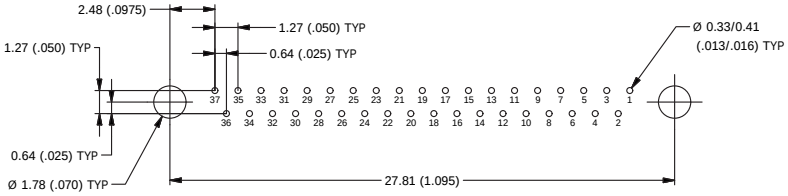
25 CONTACTS - VIEW A



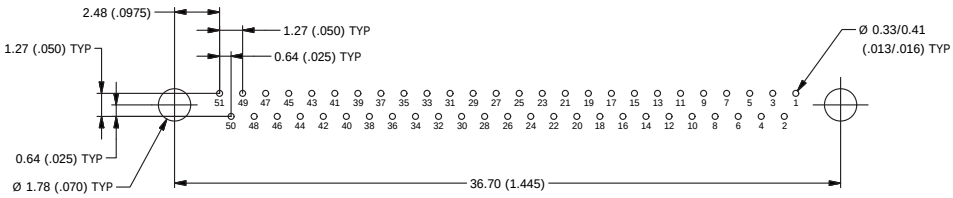
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



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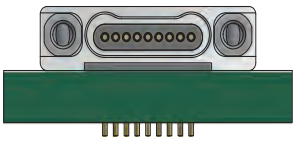
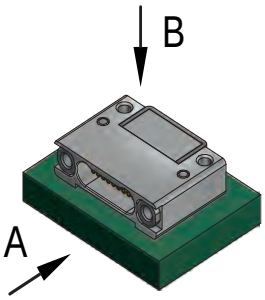
PCB LAYOUT FOR CBR TYPE 0.050" PITCH - FEMALE CONNECTORS

VIEW A

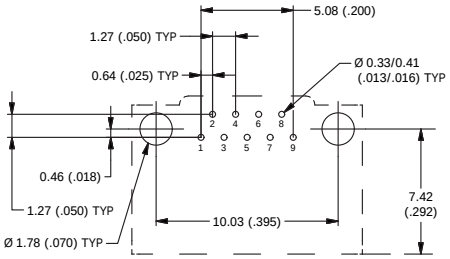
CONNECTOR MATING FACE





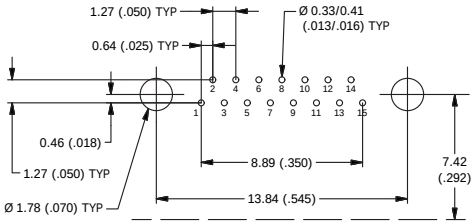
9 CONTACTS - VIEW A

PCB BOARD LAYOUT



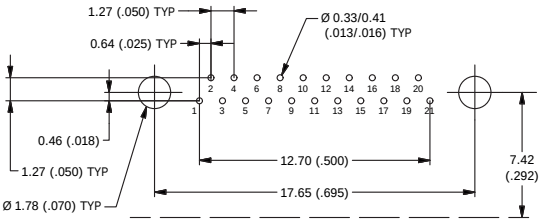
FRONT FACE OF THE FLANGE

15 CONTACTS - VIEW A



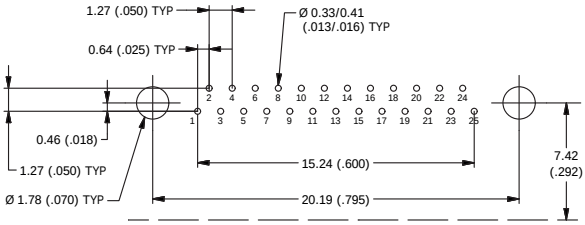
FRONT FACE OF THE FLANGE

21 CONTACTS - VIEW A



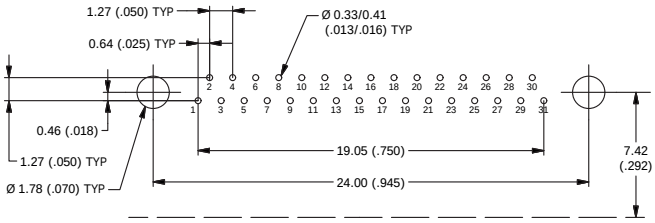
FRONT FACE OF THE FLANGE

25 CONTACTS - VIEW A



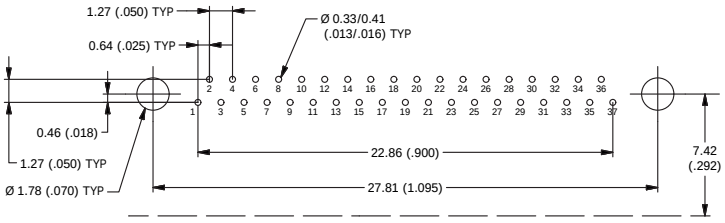
FRONT FACE OF THE FLANGE

31 CONTACTS - VIEW A



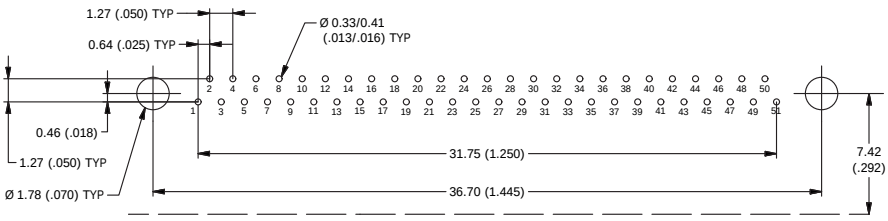
FRONT FACE OF THE FLANGE

37 CONTACTS - VIEW A



FRONT FACE OF THE FLANGE

51 CONTACTS - VIEW A



FRONT FACE OF THE FLANGE

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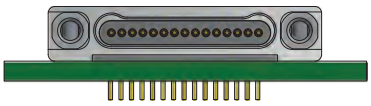
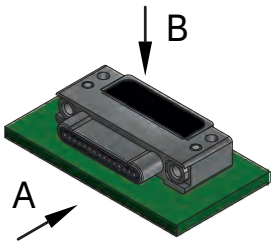
PCB LAYOUT FOR CBR TYPE 0.050" PITCH - MALE CONNECTORS

VIEW A

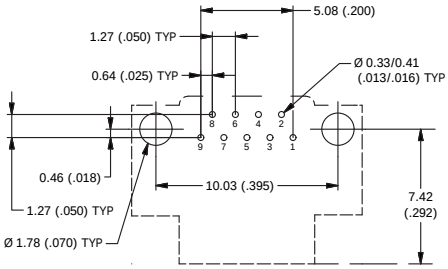
CONNECTOR
MATING FACE





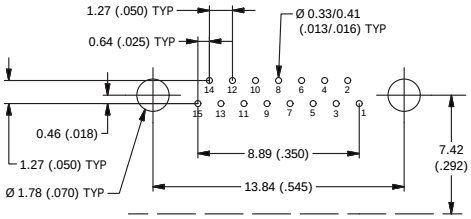
9 CONTACTS - VIEW A

PCB
BOARD LAYOUT



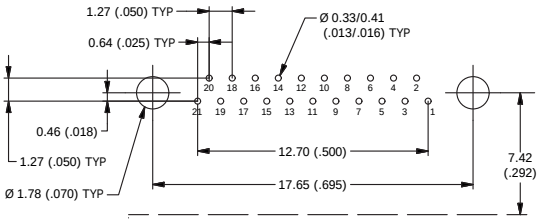
FRONT FACE OF THE FLANGE

15 CONTACTS - VIEW A



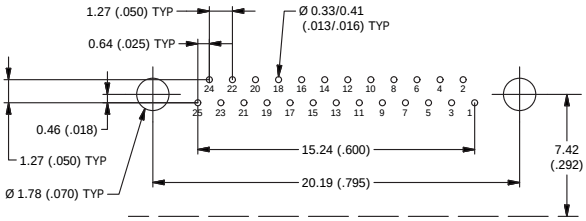
FRONT FACE OF THE FLANGE

21 CONTACTS - VIEW A



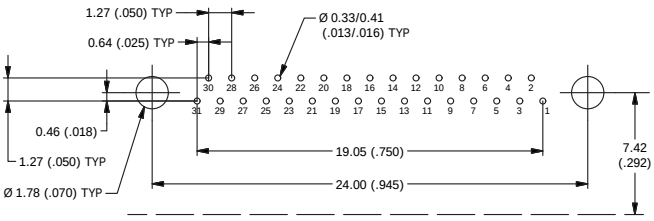
FRONT FACE OF THE FLANGE

25 CONTACTS - VIEW A



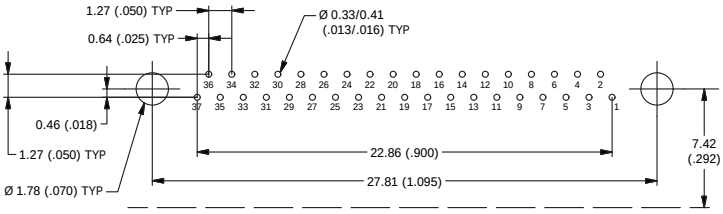
FRONT FACE OF THE FLANGE

31 CONTACTS - VIEW A



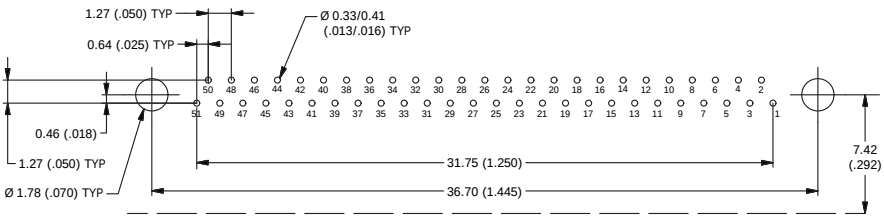
FRONT FACE OF THE FLANGE

37 CONTACTS - VIEW A



FRONT FACE OF THE FLANGE

51 CONTACTS - VIEW A



FRONT FACE OF THE FLANGE

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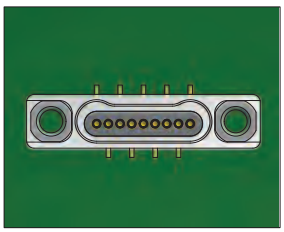
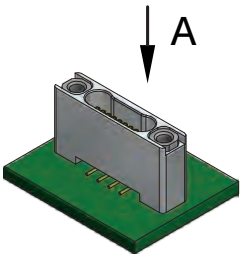
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - FEMALE CONNECTORS

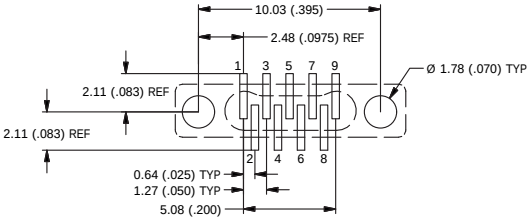
VIEW A



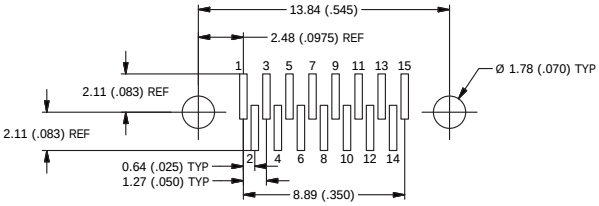


9 CONTACTS - VIEW A

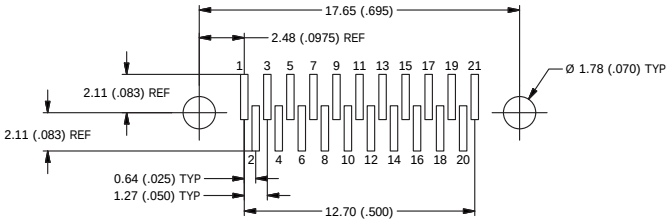
PCB
BOARD LAYOUT



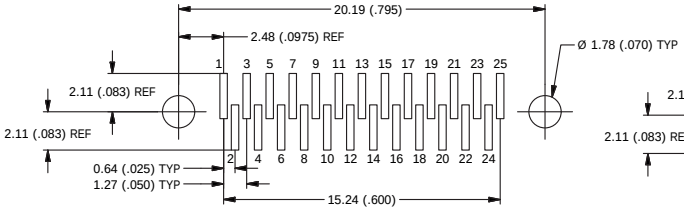
15 CONTACTS - VIEW A



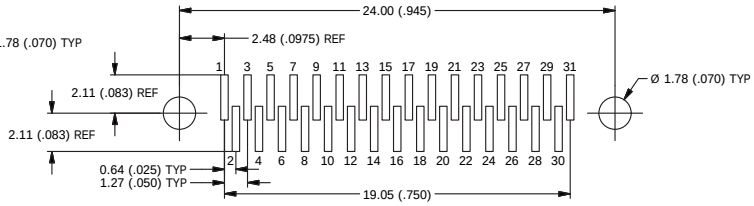
21 CONTACTS - VIEW A



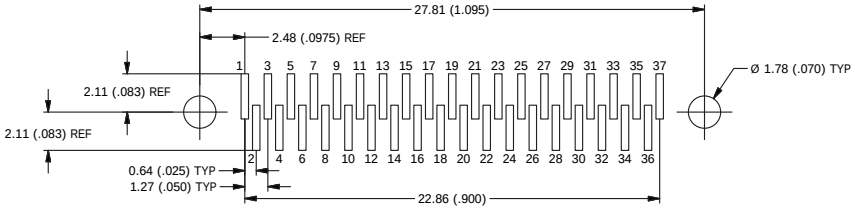
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A

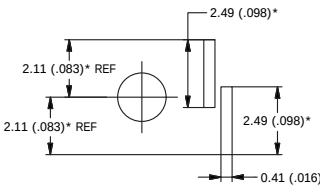


37 CONTACTS - VIEW A



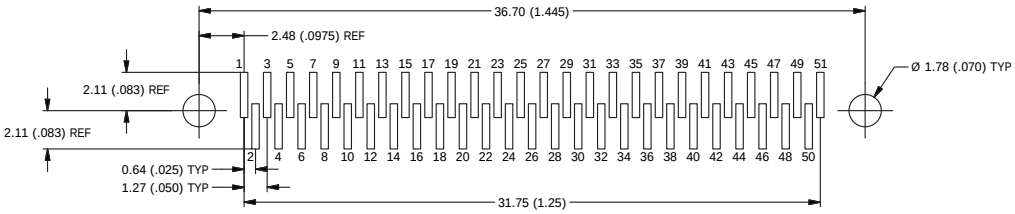
LAYOUT

FOOTPRINT/PAD configuration



*: For .040" tail length, add .020" to noted dimensions

51 CONTACTS - VIEW A



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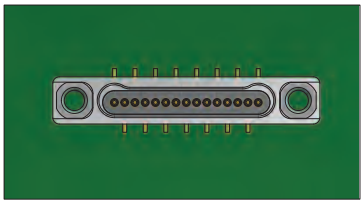
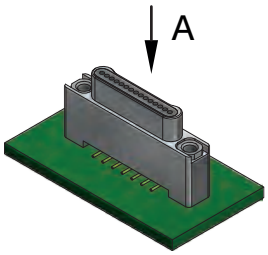
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - MALE CONNECTORS

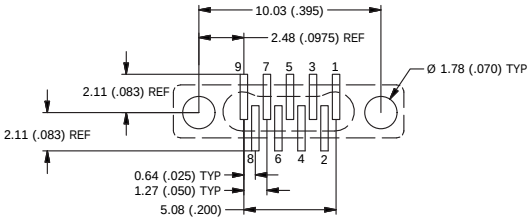
VIEW A



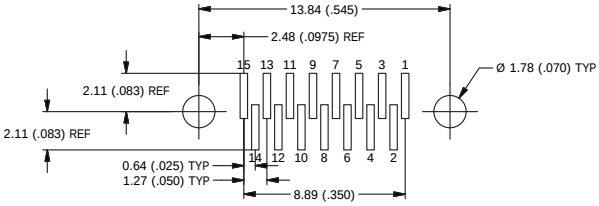


9 CONTACTS - VIEW A

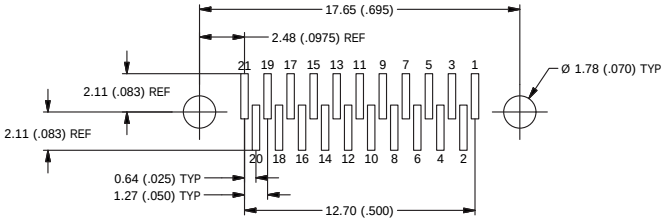
PCB
BOARD LAYOUT



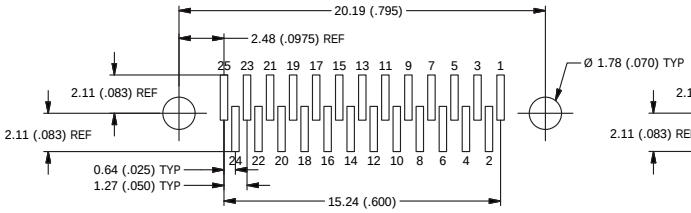
15 CONTACTS - VIEW A



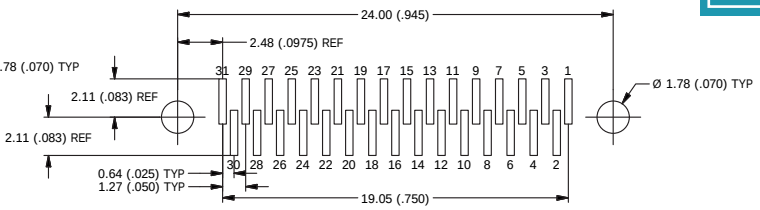
21 CONTACTS - VIEW A



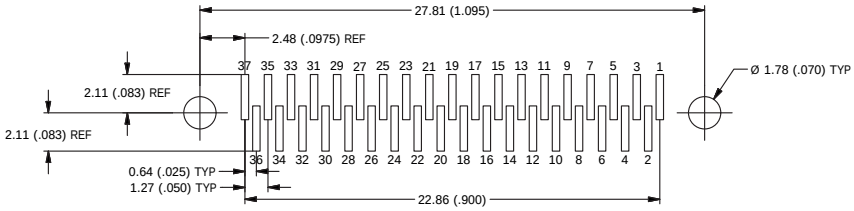
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A

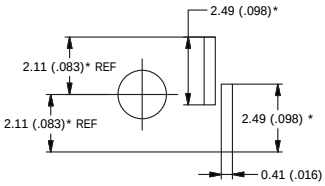


37 CONTACTS - VIEW A



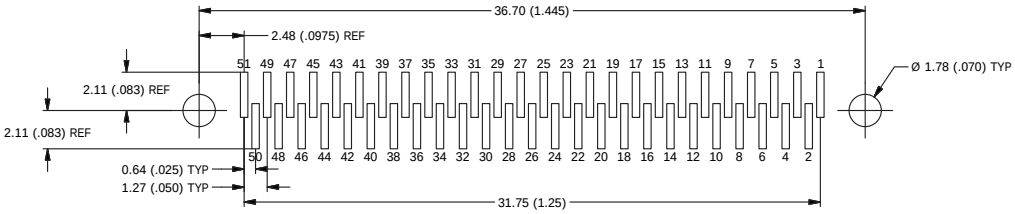
LAYOUT

FOOTPRINT/PAD configuration



*: For .040" tail length, add .020" to noted dimensions

51 CONTACTS - VIEW A



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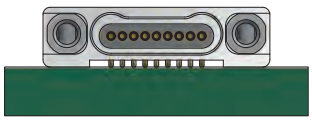
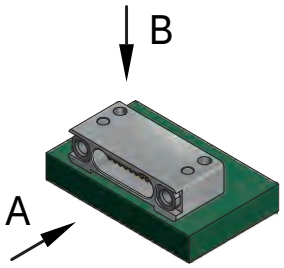
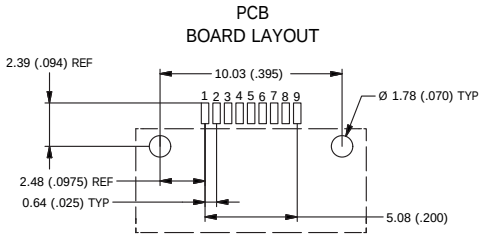
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - FEMALE CONNECTORS

VIEW A

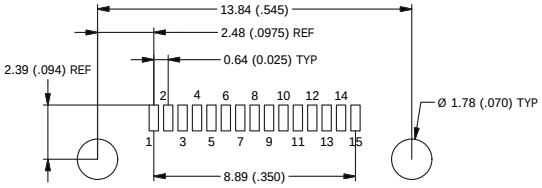




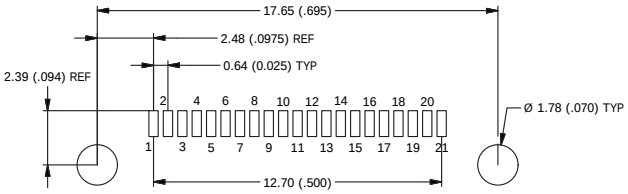
9 CONTACTS - VIEW A



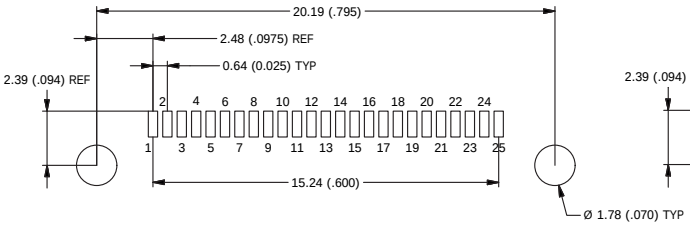
15 CONTACTS - VIEW A



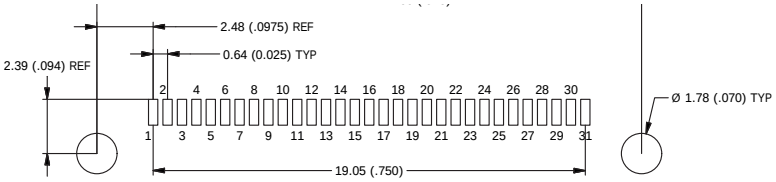
21 CONTACTS - VIEW A



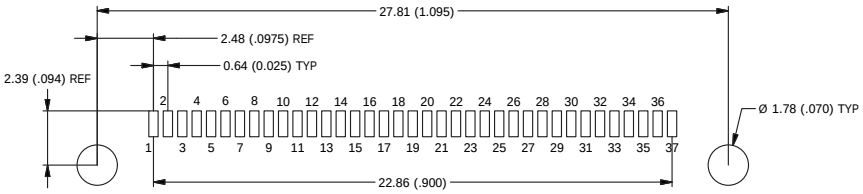
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A

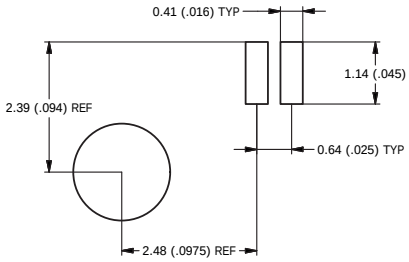


37 CONTACTS - VIEW A

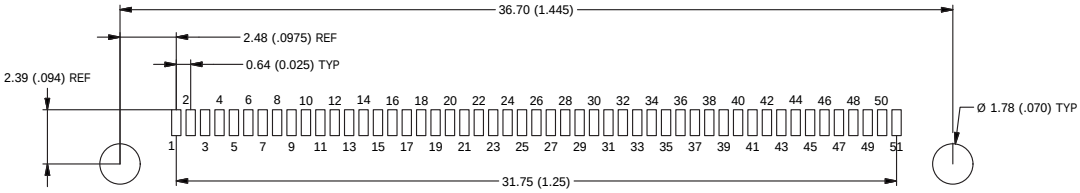


LAYOUT

Suggested PAD configuration



51 CONTACTS - VIEW A



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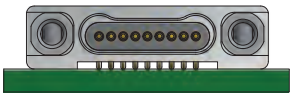
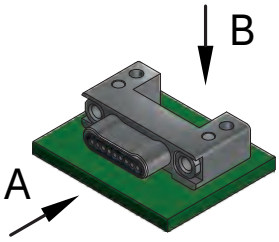
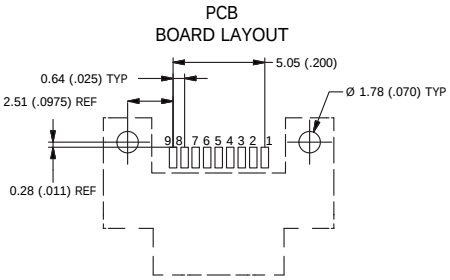
PCB LAYOUT FOR SMH TYPE 0.025" PITCH - MALE CONNECTORS

VIEW A

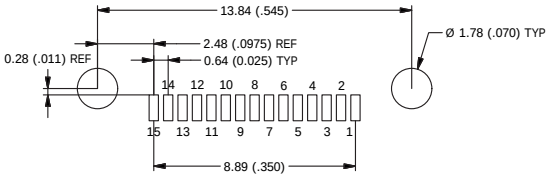




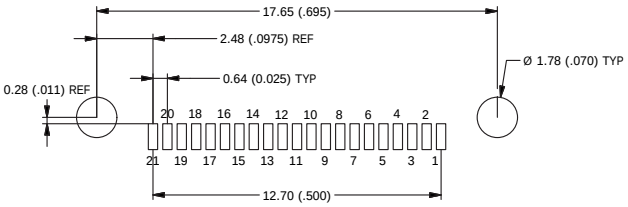
9 CONTACTS - VIEW A



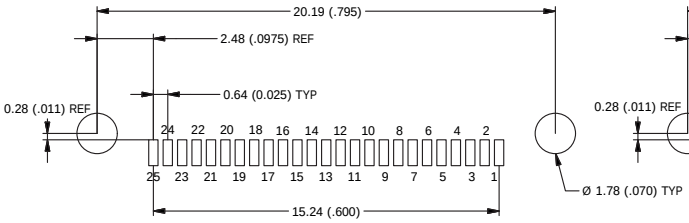
15 CONTACTS - VIEW A



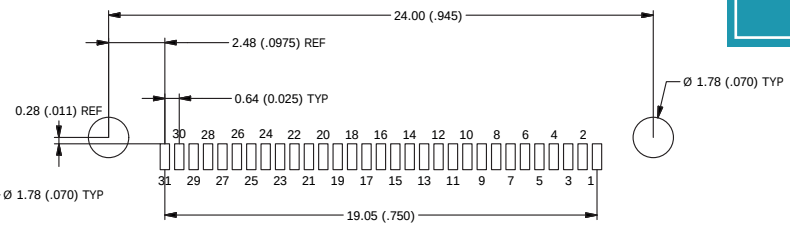
21 CONTACTS - VIEW A



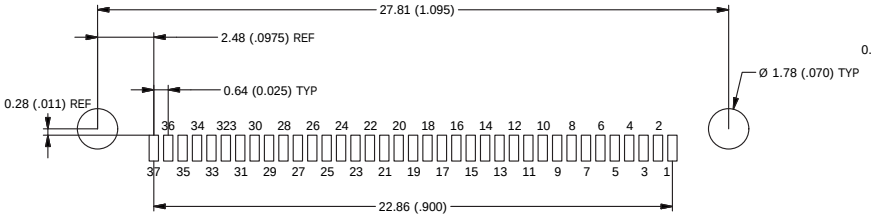
25 CONTACTS - VIEW A



31 CONTACTS - VIEW A

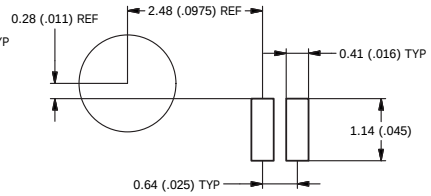


37 CONTACTS - VIEW A

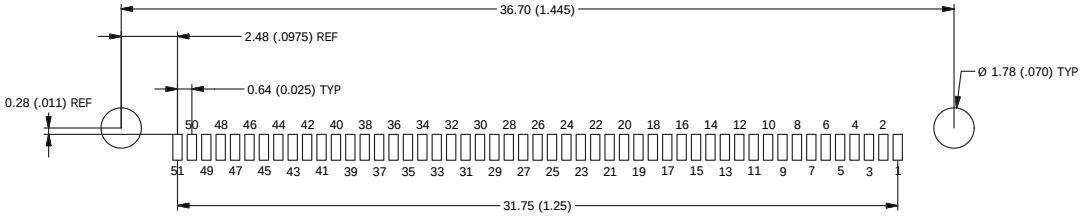


LAYOUT

Suggested PAD configuration



51 CONTACTS - VIEW A



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HIGH DENSITY CONNECTORS

- High density connectors 282
- General characteristics 283
- Pigtail connectors 284
- PCB connectors 286

Board straight type (BS) 0.050" pitch dimensions 287
PCB layout for BS type 288
Condensed board right (CBR) 0.050" pitch dimensions 289
PCB layout for CBR type 290

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HIGH DENSITY CONNECTORS

NANO-D PITCH

As the need for increased miniaturisation is becoming even greater, AXON' has developed an ultra-high density solution within the existing micro connector size. By putting nano contacts and nano pitch spacing into an existing micro shell, extremely compact connectors with very high pin counts can be produced in circular, rectangular, plastic and metal forms.

Optimal cabling density is achieved in a rectangular ultra high density connector made with Nano-D contacts and spacing inside a standard Micro-D shell size. Such a connector can accommodate a very large amount of pins while retaining excellent Micro-D reliability.

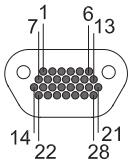
Most electrical and environmental performances are comparable to those of standard Nano-D connectors (250 VAC, 200°C), combined with the robustness and shielding efficiency of the Micro-D metal shell which is compatible with all the hardware types available for Micro-D pigtails.

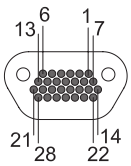
This same process can be applied to most of the standard and special Micro-D range, making it possible to have ultra high density versions of PCB connectors, wide flange versions, circular, rectangular and combo style versions with a mix of Micro-D and Nano-D contacts.

▲ RECTANGULAR HIGH DENSITY MICRO-D CONNECTORS

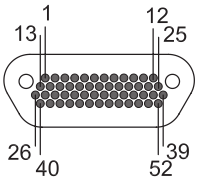
▶ Contact arrangements

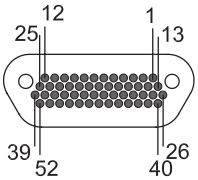
MATING FACE OF MALE CONNECTOR	MATING FACE OF FEMALE CONNECTOR



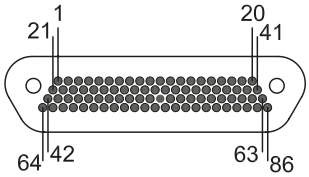


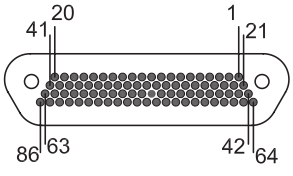
28 NANO WAYS IN A 9 WAY MICRO INSERT





52 NANO WAYS IN A 15 WAY MICRO INSERT





86 NANO WAYS IN A 25 WAY MICRO INSERT

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GENERAL CHARACTERISTICS

Electrical & mechanical characteristics

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	1 A max.	EIA-364-70
SIGNAL CONTACT RESISTANCE	71 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 100 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 m - ALTITUDE 21 km (70,000 ft)	 250 VAC 100 VAC	EIA-364-20
CONTACT ENGAGING AND SEPARATION FORCE	141 g max. (5 oz) 11 g min. (0.4 oz)	EIA-364-37
CONNECTOR MATING AND DE-MATING FORCE	198 g (7 oz) x number of contacts max.	EIA-364-13
CONTACT RETENTION	0.9 kg (2 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	200 mating cycles min.	EIA-364-09
TEMPERATURE RANGES - STANDARD - HIGH TEMP	 -55°C / +150°C -55°C / +200°C	
VIBRATION	20 g's - No discontinuity >1µs	EIA-364-28 - TEST CONDITION IV
SHOCK	100 g's - No discontinuity >1µs	EIA-364-27 - TEST CONDITION G
SALT SPRAY	48 hours	EIA-364-26 - TEST CONDITION B
HUMIDITY	Insulation resistance > 1MΩ	EIA-364-31 - TEST CONDITION B (EXCLUDING STEPS 7A & 7B)*

Material & Finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
FEMALE CONTACT	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
	COMMERCIAL BRONZE IN ACCORDANCE WITH ASTM-B-135, B-140/140M, B-372 OR B-587	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µm MIN. (0.00005")), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27µm (0.00005") TO 3.81µm (0.00015"))
	BRASS IN ACCORDANCE WITH ASTM-B-453 OR 453M OR 16 OR 16M	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS-2404, CLASS 4. BLACK ZINC NICKEL OVER NICKEL UNDERPLATE
	STAINLESS STEEL 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
INSERT/ PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C) OR PEEK	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	EPOXY RESIN	
INSULATED WIRE	PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH NEMA-HP3	
UNINSULATED WIRE	GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A-59551 OR GOLD PLATED SOLID COPPER BASED ALLOY IN ACCORDANCE WITH ASTM-B-194	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µm MIN. (0.00005")), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27µm (0.00005") TO 3.81µm (0.00015"))

** ACCORDING TO MIL-DTL-32139

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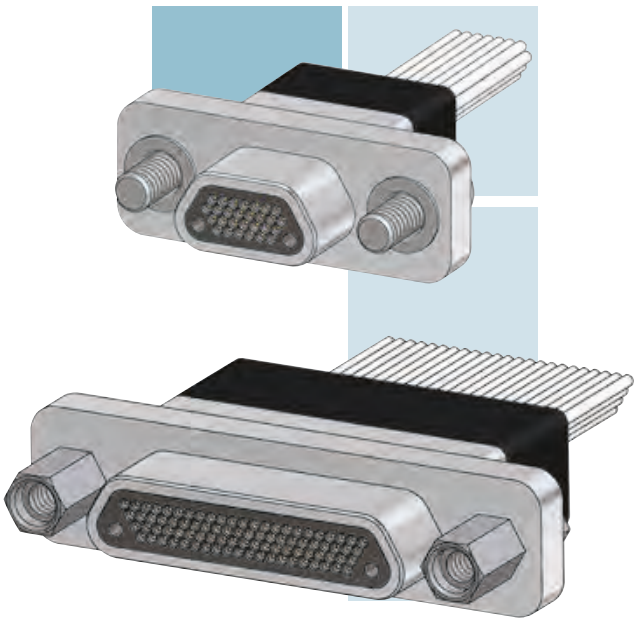

PIGTAIL CONNECTOR

METAL SHELL

- High performance metal connector and PTFE wires
- Operating temperature: 150°C or 200°C
- 28 to 86 contacts

IDENTIFICATION CODE

MDHDA 2 52 P 1 L 050 L

SERIES

MDHDA: Micro-D High Density AXON'.

CONNECTOR TYPE

1: Cadmium al. shell / **Z**: Black zinc nickel aluminium shell + potting 150°C.
2: Nickel aluminum shell + potting 150°C.
3: Nickel aluminum shell + potting 200°C.
S: Passivated stainless steel shell + potting 200°C.

NUMBER OF CONTACTS

28, **52**, **86**.
See page 282 for contact arrangements.

CONNECTOR GENDER

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

WIRE TYPE

1: UT3007, AWG 30, 7 strands, 160V.
2: ET3207, AWG 32, 7 strands, 250V.
3: ET3407, AWG 34, 7 strands, 250V.
4: ET3607, AWG 36, 7 strands, 250V.

COLOUR CODE

L: All white.
F: All yellow.
W: 10 colour repeat.
See page 215 for colour code.

WIRE LENGTH (in cm)

Attention! Wire length in centimetres - (1cm = 10mm = 0.394").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L >100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE

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

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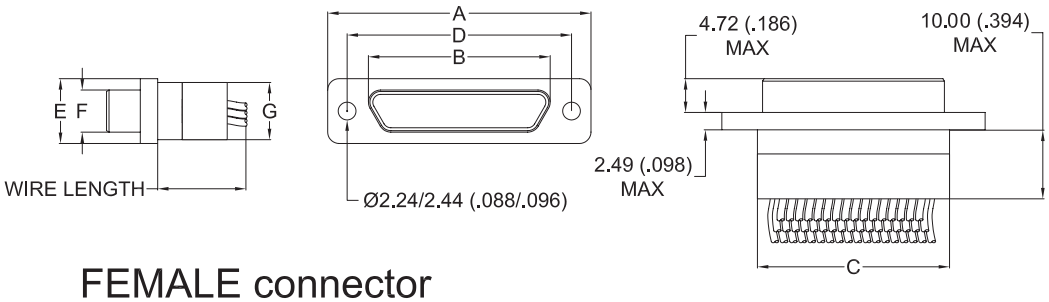
DIMENSIONS

Dimensions are in millimetres (inches).

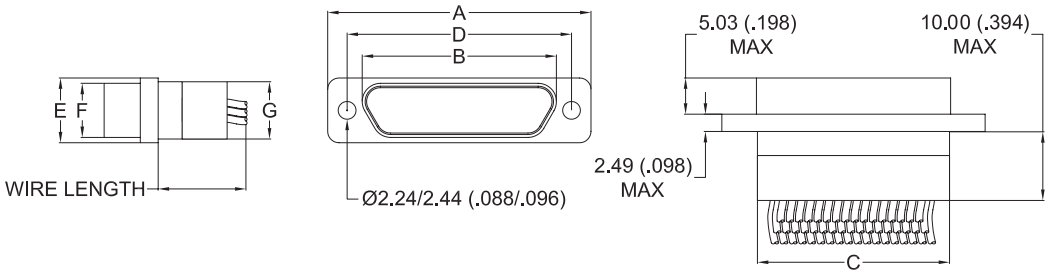
▲ PIGTAIL 28 WAY PLUG

▲ PIGTAIL 52 WAY RECEPTACLE

MALE connector



FEMALE connector



	A ±0.25 (±.010)	B max.		C - 0.46/+0.25 (-.018/+.010)	D ±0.13 (±.005)	E ±0.25 (±.010)	F max.		G max.
		Male	Female				Male	Female	
28 P / 28 S	19.69 .775	8.48 .334	10.16 .400	9.91 .390	14.35 .565	7.57 .298	4.69 .185	6.35 .250	6.86 .270
52 P / 52 S	23.50 .925	12.29 .484	14.00 .551	13.72 .540	18.16 .715	7.57 .298	4.69 .185	6.35 .250	6.86 .270
86 P / 86 S	29.85 1.175	18.64 .734	20.35 .801	20.07 .790	24.51 .965	7.57 .298	4.69 .185	6.35 .250	6.86 .270

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PCB CONNECTOR

0.050" PITCH

METAL SHELL

-Board Straight connector and Board Right angle connector for flexible and rigid printed circuit board
- Operating temperature: 150°C or 200°C
- Several tail lengths available

IDENTIFICATION CODE

MDHDA 2 52 S BS W G 1

SERIES
MDHDA: Micro-D High Density AXON'.

CONNECTOR TYPE
1: Cadmium aluminum shell / **Z**: Black zinc nickel shell + potting 150°C.
2: Nickel aluminum shell + potting 150°C.
3: Nickel aluminum shell + potting 200°C.

NUMBER OF CONTACTS
28, **52**, **86**.
See page 282 for contact arrangements.

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

PCB VERSION
BS: Board Straight connector 0.050" pitch.
CBR: Condensed Board Right Angle connector 0.050" pitch.

HARDWARE
B: No hardware.
P: Jackposts (non removable).
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
G: Gold plated solid conductor AWG30.

TAIL LENGTH
1: 2.80mm (0.110").
2: 3.80mm (0.150").
3: 4.80mm (0.190").
Tolerance: ± 0.25 mm (0.010").

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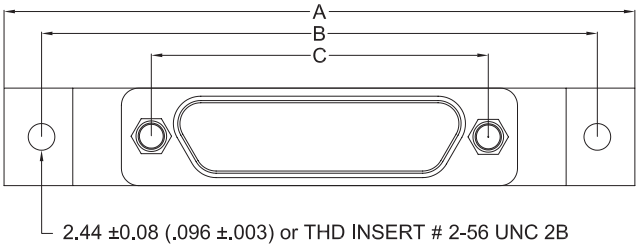
BOARD STRAIGHT TYPE (BS) 0.050" PITCH

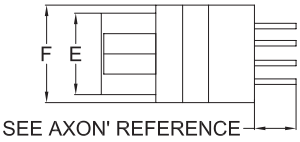
▲ BS 0.050" 28 WAY RECEPTACLE

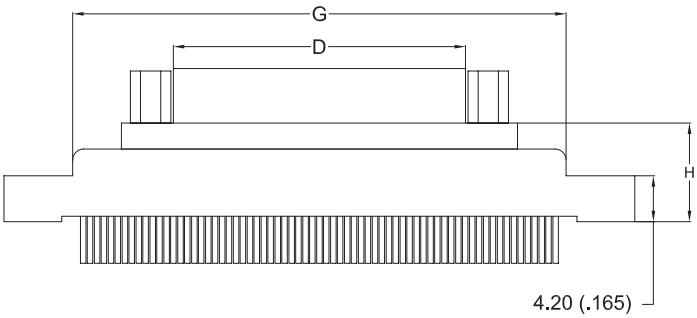
▲ BS 0.050" 86 WAY RECEPTACLE

DIMENSIONS

Dimensions are in millimetres (inches).







	A max.	B ±0.18 (±.007)	C ±0.13 (±.005)	D max.		E max.		F max.	G max.	H max.
				Male	Female	Male	Female			
28 P / 28 S	35.31 1.390	29.21 1.150	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	19.94 .785	9.02 .355
52 P / 52 S	35.31 1.390	29.21 1.150	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	24.00 .945	9.02 .355
86 P / 86 S	44.20 1.740	38.10 1.500	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	32.39 1.275	9.02 .355

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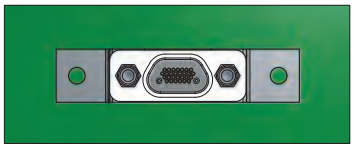
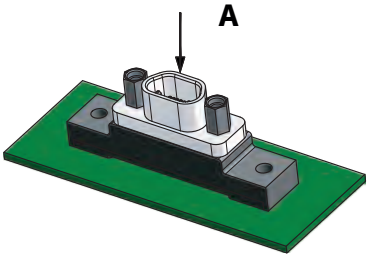
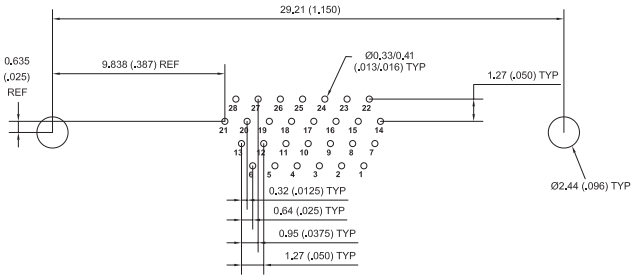
PCB LAYOUT FOR HIGH DENSITY BS TYPE 0.050" PITCH CONNECTORS



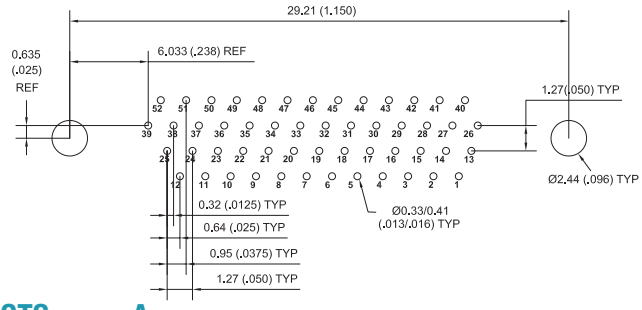


MALE CONNECTORS

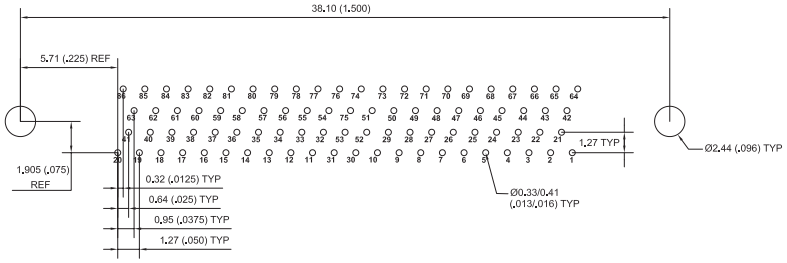
28 CONTACTS - VIEW A



52 CONTACTS - VIEW A

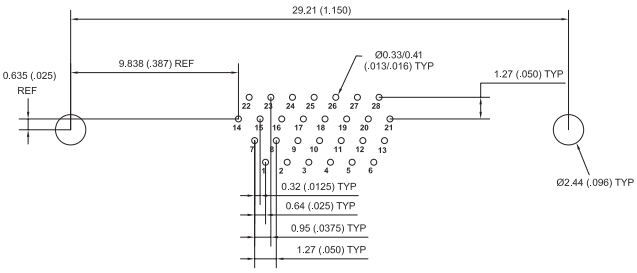


86 CONTACTS - VIEW A

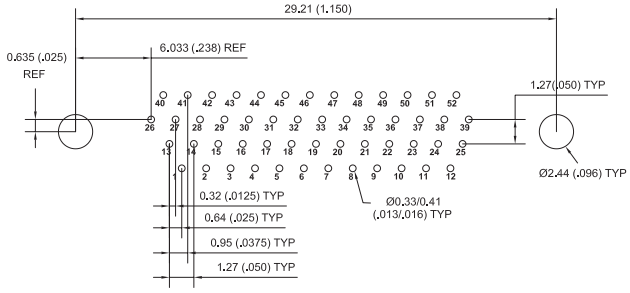


FEMALE CONNECTORS

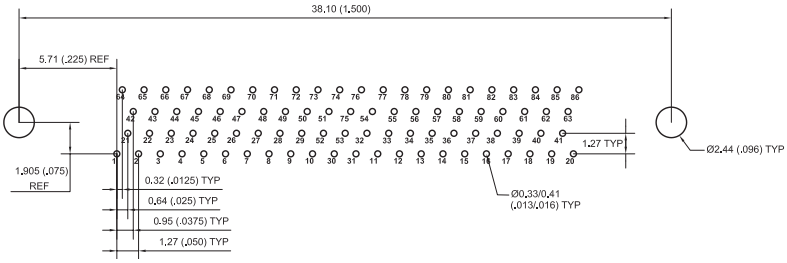
28 CONTACTS - VIEW A



52 CONTACTS - VIEW A



86 CONTACTS - VIEW A



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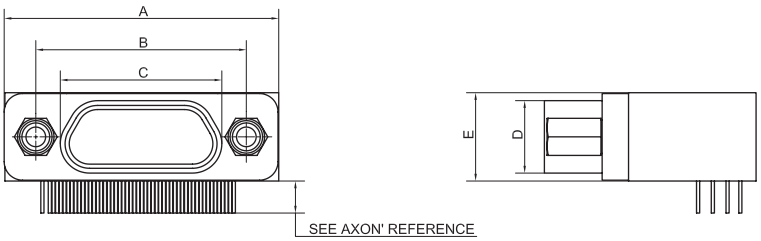
CONDENSED BOARD RIGHT (CBR) 0.050" PITCH

▲ CBR 0.050" 52 WAY RECEPTACLE

▲ CBR 0.050" 86 WAY RECEPTACLE

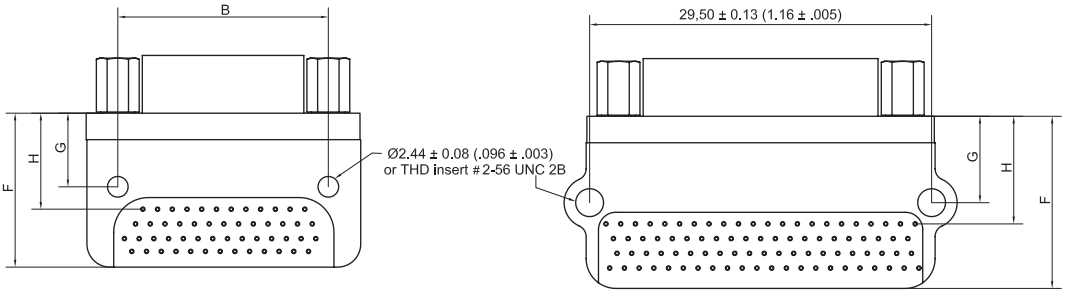
DIMENSIONS

Dimensions are in millimetres (inches).



28 - 52 way connectors

86 way connector



	A max.	B ±0.13 (±.005)	C max.		D max.		E max.	F max.	G ±0.25 (±.010)	H ±0.25 (±.010)
			Male	Female	Male	Female				
28 P / 28 S	19.94 .785	14.35 .565	8.48 .334	10.16 .400	4.69 .185	6.35 .250	7.82 .308	13.50 .532	6.35 .250	7.81 .308
52 P / 52 S	23.75 .935	18.16 .715	12.29 .484	14.00 .551	4.69 .185	6.35 .250	7.82 .308	13.50 .532	6.35 .250	8.28 .326
86 P / 86 S	30.10 1.185	24.51 .965	18.64 .734	20.35 .801	4.69 .185	6.35 .250	7.82 .308	15.00 .590	7.45 .293	9.28 .365

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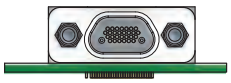
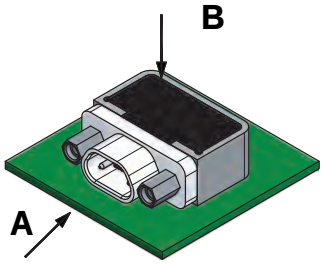
PCB LAYOUT FOR HIGH DENSITY CBR TYPE 0.050" PITCH CONNECTORS

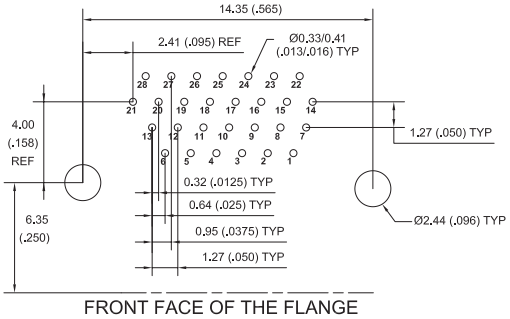
VIEW A



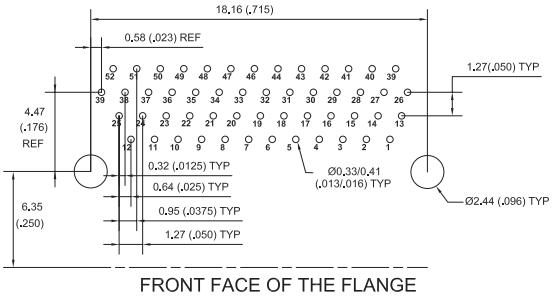


MALE CONNECTORS

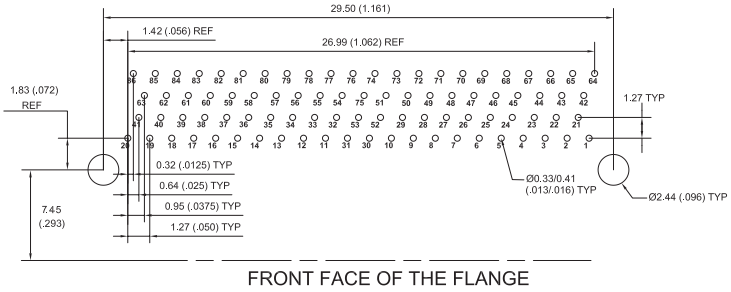
28 CONTACTS - VIEW B



52 CONTACTS - VIEW B

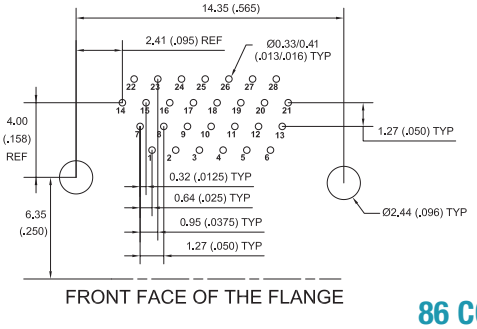


86 CONTACTS - VIEW B

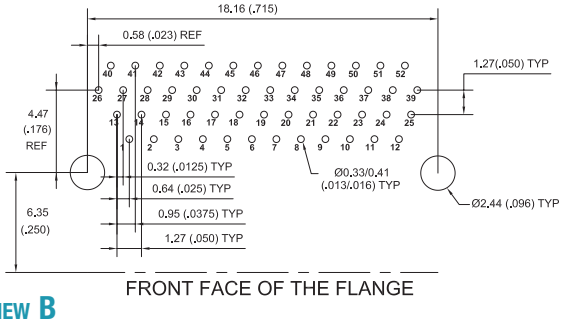


FEMALE CONNECTORS

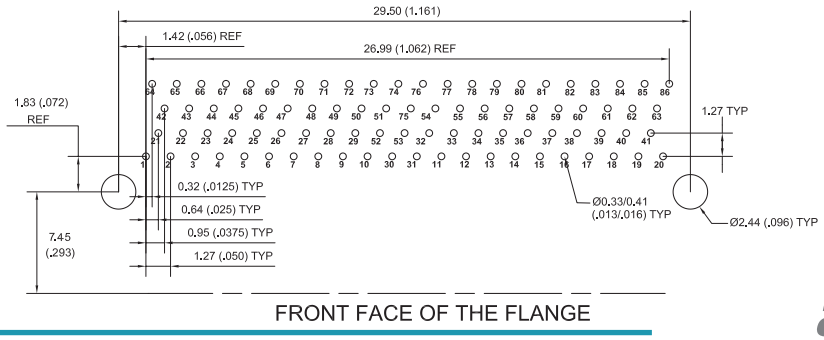
28 CONTACTS - VIEW B



52 CONTACTS - VIEW B



86 CONTACTS - VIEW B



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SPACE MICRO-D CONNECTORS

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PCB layout for BS type 322
PCB layout for CBR type 323
PCB layout for SMV type 324

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EXPERTISE IN SPACE

Lightweight, miniature, reliable and highly resistant to cosmic radiation and high temperatures: these are the qualities of wires, cables, cable assemblies, wire harnesses and connectors offered by AXON' for space applications. The scope of products and services offered by the company is extensive:

- ESA wires for spacecraft cabling
- Cable assemblies & harnesses terminated with various connector styles
- MIL-STD-1553 bus harnesses for data transmission
- High data rate assemblies including SpaceWire and very high speed links up to 10 Gb/s
- Microwave coaxial assemblies up to 50 GHz
- Bur bars for power distribution in spacecraft
- Numerous accessories including halorings, EMC banding adaptors and backshells
- Bespoke interconnect solutions
- Cable and interconnect engineering services

In addition to this large range of products, AXON' CABLE has developed miniature Micro-D connectors and Nano-D connectors designed to meet the most severe challenges of space:

- Miniature Micro-D connectors
  - 1.27 mm (0.050") contact spacing,
  - Weight and space saving solution,
  - ESCC 3401/029 EPPL 2,
  - Custom design.

- Miniature Nano-D connectors
  - 0.635 mm (0.025") contact spacing,
  - Extreme miniaturization,
  - ESCC 3401/086 EPPL2.

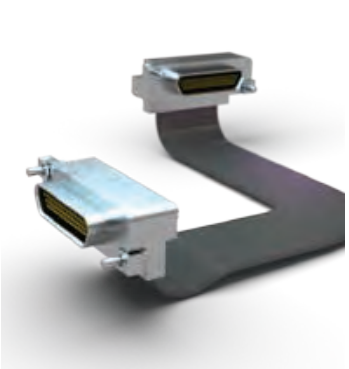
Flight heritage

Involved in numerous space projects in orbit and beyond for over 20 years, AXON' CABLE has a wealth of experience in designing and manufacturing interconnect solutions able to withstand the stresses of launch and the harsh space environment. Rocket launchers, ISS, Mars rovers, LEO and GEO satellites, manned and unmanned flights, thrusters, space research and experimental equipment are just a few examples.

Space programmes with AXON' on-board include Ariane, Alphabus, Curiosity, Bepi Colombo, Corot, Eurostar, Exomars, Gaia, Galileo, Globalstar, Insight, Irridium, Mangalayyan, Maven, O3B, Sentinel, Spacebus, Vega.

▲ SPACEWIRE LINK TERMINATED WITH MICRO-D CONNECTORS

▲ MANUFACTURE IN ISO 7 AND ISO 8 CLEAN ROOMS



▲ ASSEMBLY FOR CURIOSITY ROVER

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MICRO-D FOR SPACE APPLICATIONS

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- Wire descriptions 298

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MDSA RANGE

Micro-D connectors and assemblies for space applications

AXON' has drawn upon long experience in the highly challenging environment of space electronics to develop Micro-D connectors and assemblies suitable for this demanding area. Marrying the Micro-D design with the need to be able to reliably transmit signals, power and high speed data, AXON' has developed custom solutions for a wide variety of applications in space.

AXON' space products are assembled to the highest standards, meeting the ECSS-Q-ST-70-08C and ECSS-Q-ST-70-26C requirements, and all such products are built in one of our humidity controlled, class 100,000 (ISO 8) clean rooms.

AXON' has been approved to ESCC 3401/029 EPPL2 since 2006.

▲ GOLD PLATED MICRO-D CONNECTOR

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GENERAL CHARACTERISTICS

Electrical & mechanical characteristics

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	2.5 A max for AWG26 & uninsulated wires* 1.5 A max for AWG28 wires*	
CONTACT RESISTANCE	5 mΩ @ current rating 6 mΩ @ low level current	Para 9.1.1.3 OF ESCC 3401
INSULATION RESISTANCE	5000 MΩ min @ 500 V_{DC}	Para 9.1.1.1 OF ESCC 3401
DIELECTRIC WITHSTANDING VOLTAGE	600 V_{RMS} / 2 mA (leakage current)	Para 9.1.1.2 OF ESCC 3401
WORKING VOLTAGE - Sea level 0m - Altitude 33km	 150 V_{RMS} 100 V_{RMS}	Para 9.13.5 OF ESCC 3401
CONTACT ENGAGING & SEPARATION FORCE	1.667 N maximum 0.137 N minimum	Para 4.3.9 OF ESCC 3401/029
CONNECTOR MATING & DE-MATING FORCES	Mating: 20 N (9 ways) to 113 N (51 ways) max De-mating: 20 N max / 1.3 N min (9 ways) to 113 N max / 7.1 N min (51 ways)	Para 9.20 OF ESCC 3401
CONTACT RETENTION	22.25 N for female contacts	Para 9.17 OF ESCC 3401
DURABILITY	500 Mating cycles minimum	Para 9.18 OF ESCC 3401
TEMPERATURE RANGE	-55°C / +125°C	
VIBRATION	20g's - no discontinuity > 1µs	Para 9.11 OF ESCC 3401
SHOCK	50g's - no discontinuity > 1µs	Para 9.12 OF ESCC 3401
SALT SPRAY	48 hours	Para 9.22 OF ESCC 3401

*: For a single contact. Please refer to derating rule of ESCC 3401/029.

Materials & Finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27 µM (0.050") MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27 µM (0.050") TO 3.81 µM (0.150"))
FEMALE CONTACT	COPPER ALLOY	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061	HIGH-PHOSPHOROUS ELECTROLESS NICKEL PLATING – 25.4 µm MIN. 2.54 µm GOLD PLATING OVER NICKEL UNDERPLATING
PLASTIC INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
INTERFACIAL SEAL	FLUOROSILICONE RUBBER	HEAT-CURED TO MEET ECSS-Q-70-71 A OUTGASSING REQUIREMENTS
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS-2700
ENCAPSULANT	SPACE GRADE EPOXY RESIN	
INSULATED WIRE	- POLYIMIDE INSULATED WIRES IN ACCORDANCE WITH ESCC 3901/002 - PTFE INSULATED WIRES IN ACCORDANCE WITH ESCC 3901/013 - ETFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33	
UNINSULATED WIRE	SOLID COPPER WIRES IN ACCORDANCE WITH QQ-W-343 TYPE 'S' GOLD PLATED ACCORDING TO MIL-G-45204, CLASS 2 GRADE C OR D	

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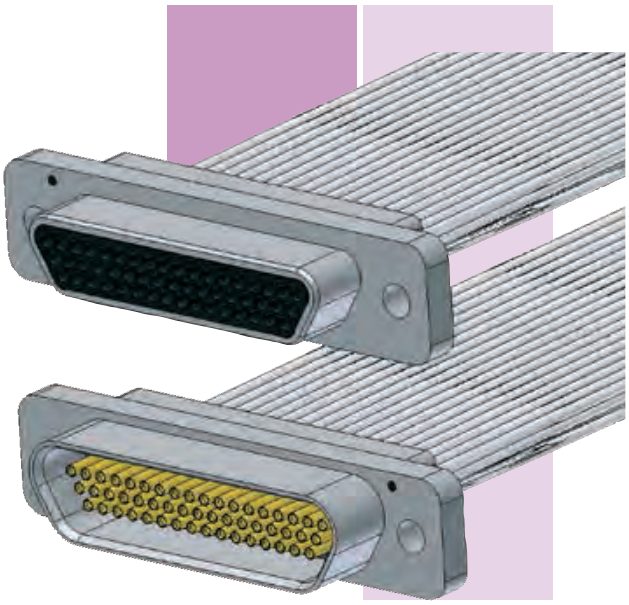

PIGTAIL CONNECTORS

METAL SHELL

- Nickel or gold plated shells for space applications.
- Supplied pre-wired and fully potted.

IDENTIFICATION CODE

MDSA	2	15	P	V01301	F	46	M

SERIES
MDSA: Micro-D Space AXON' connectors.

PLATING
2: Nickel plated.
5: Gold plated.

NUMBER OF CONTACTS
9, **15**, **21**, **25**, **31**, **37**, **51.**
See pages 26 & 27 for contact arrangements.

GENDER
P: Male crimped contacts.
S: Female crimped contacts.

WIRE TYPE
V01301: Single wire ESCC 3901/013 - Variant 01 (AWG28).
V01302: Single wire ESCC 3901/013 - Variant 02 (AWG26).
V00261: Single wire ESCC 3901/002 - Variant 61 (AWG28).
V00256: Single wire ESCC 3901/002 - Variant 56 (AWG26).
G: Uninsulated wires: gold plated AWG2501.
E: Single wire M22759/33-26 (recommended for space application by MIL-DTL-83513).
NB: Other wires upon request.

WIRE COLOUR
Wire code E
F: Yellow.
L: White.
W: 10 Colours code per MIL-STD-681, as required by MIL-DTL-83513.
Uninsulated wires or ESCC wires
BLANK (see wire descriptions and wire colours page 298).

WIRE LENGTH (in cm)
XXX = length in cm.

L in cm (inches)	L ≤ 10 L ≤ 3.940	10 < L ≤ 100 3.940 < L ≤ 39.40	L > 100 L > 39.40
TOLERANCE in cm (inches)	-0 / +0.5 -0 / +0.200	-0 / +3 -0 / +1.180	-0 / +5 -0 / +1.970

HARDWARE
B: Fixed mounting holes (no hardware).
C: U-clips with low profile hex socket head jackscrews (removable).
D: U-clips with low profile slot head jackscrews (removable).
M: Low profile Allen head jackscrews (removable).
N: High profile Allen head jackscrews (removable).
S: Low profile slot head jackscrews (removable).
T: High profile slot head jackscrews (removable).
P: Jackpost (removable).
K: High profile slot head jackscrews (non-removable).
L: Low profile Allen head jackscrews (non-removable).
F: Floating mount (non-removable).
See page 190 to 200 for hardware description.

LAT Level to be indicated when ordering - see page 299

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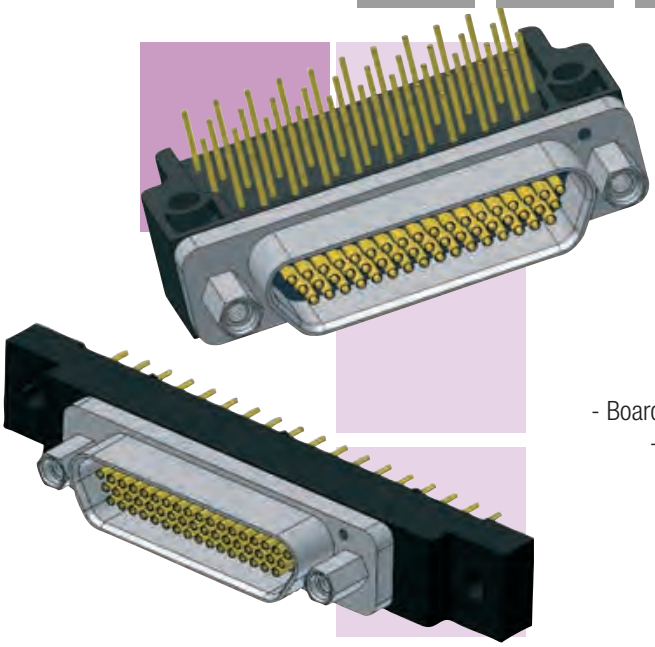

PCB CONNECTORS

METAL SHELL

- Nickel or gold plated shells for space applications.
- Board right angle or straight to accomodate all configurations.
- To be used with flexible and rigid printed circuit boards.
- Several tail lengths available.

IDENTIFICATION CODE

MDSA 2 25 P CBR P G 1

SERIES
MDSA: Micro-D Space AXON' connectors.

PLATING
2: Nickel plated.
5: Gold plated.

NUMBER OF CONTACTS
9, **15**, **21**, **25**, **31**, **37**, **51.**
See pages 26 & 27 for contact arrangements.

GENDER
P: Male crimped contacts.
S: Female crimped contacts.

TERMINATION TYPE
BS: Board Straight version.
BR: Board Right Angle version.
CBR: Condensed Board Right Angle version.

HARDWARE
B: No jackpost, no threaded PCB mounting hole.
P: Jackposts installed, no threaded PCB mounting hole.
T: Threaded PCB mounting holes only.
W: Jackposts installed and threaded PCB mounting hole.
See page 190 to 200 for hardware description.

CONDUCTOR TYPE
G: Uninsulated ESCC wire AWG2501 gold plated.

TAIL LENGTH
1: 2.80 mm - 0.109".
2: 3.80 mm - 0.150".
3: 4.80 mm - 0.190".
4: 6.35 mm - 0.250".

Tolerance: ± 0.38 mm (0.015").
NB: Other wires upon request.

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WIRE DESCRIPTIONS

Insulated wire AWG28, in accordance with ESCC 3901/013 Variant 01 (V01301)

Conductor	Max Ø: 0.42 mm
	Nominal cross-section: 0.089 mm²
Insulation	Max Ø: 0.82 mm
	Max weight: 1.8 g/m
	Colour: Natural

Insulated wire AWG26, in accordance with ESCC 3901/013 Variant 02 (V01302)

Conductor	Max Ø: 0.50 mm
	Nominal cross-section: 0.14 mm²
Insulation	Max Ø: 0.89 mm
	Max weight: 2.3 g/m
	Colour: Natural

Insulated wire AWG28, in accordance with ESCC 3901/002 Variant 61 (V00261)

Conductor	Max Ø: 0.43 mm
	Nominal cross-section: 0.10 mm²
Insulation	Max Ø: 0.68 mm
	Max weight: 1.23 g/m
	Colour: Brown

Insulated wire AWG26, in accordance with ESCC 3901/002 Variant 56 (V00256)

Conductor	Max Ø: 0.53 mm
	Nominal cross-section: 0.15 mm²
Insulation	Max Ø: 0.78 mm
	Max weight: 1.93 g/m
	Colour: Black

Uninsulated solid wire AWG2501, in accordance with QQ-W-343 type "S" (G)

Gold plated per MIL-G-45204, Class 2 grade C or D
Conductor Ø: 0.455 ± 0.005 mm
Min gold plating thickness: 0.5 µm
Max weight: 1.6 g/m

Insulated wire M22759/33-26 (E)

Conductor	Nom Ø: 0.483 mm
	Nominal cross-section: 0.154 mm²
Insulation	Nom Ø: 0.81 mm
	Max weight: 2.1 g/m

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LAT Levels

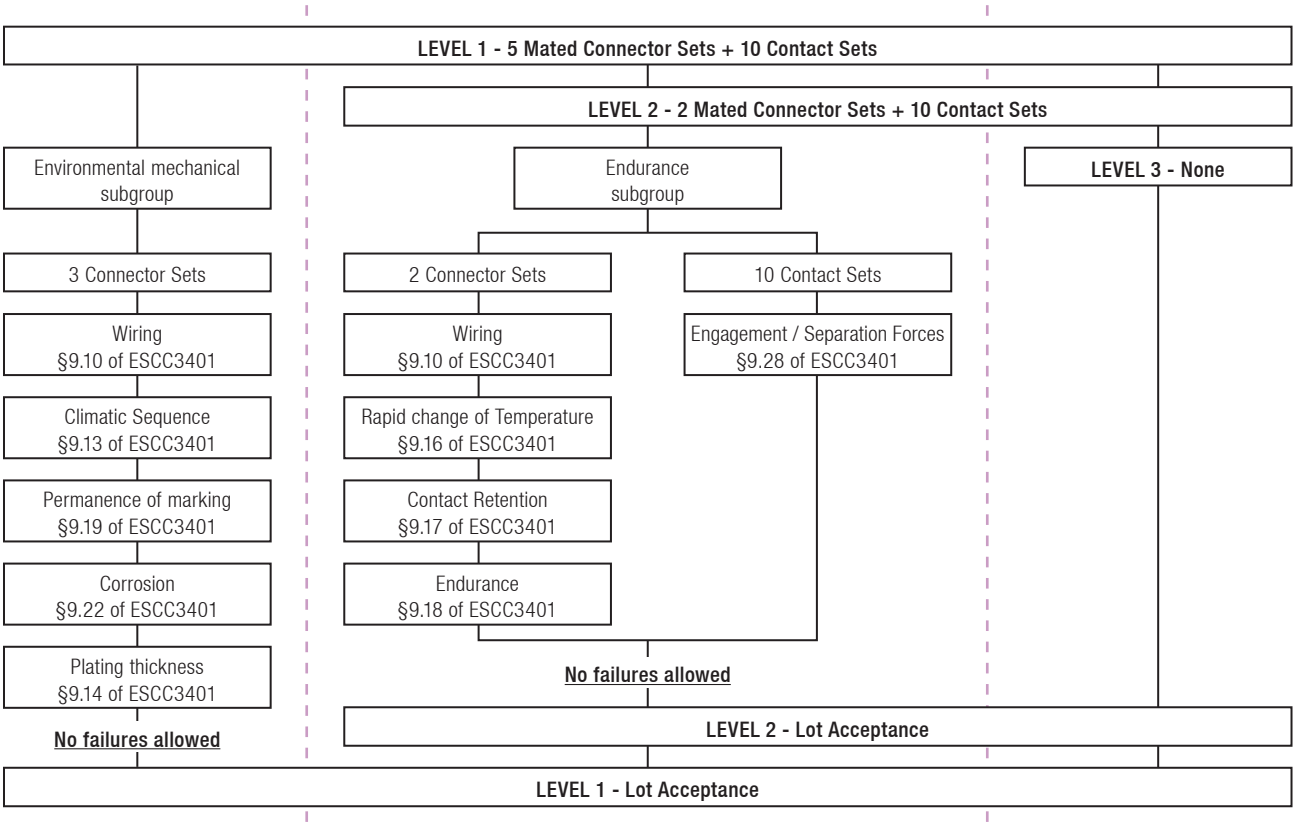
The required level of Lot Acceptance Testing is to be specified when ordering.
The sample size of the three Lot Acceptance Tests are shown in the diagram below.
All components assigned to a subgroup shall be subjected to all the tests of that subgroup in the table test sequence.
AXON' Space Micro-D connectors are tested according to ESCC 3401.

Lot Acceptance "level 3":
No additional tests or inspections are required for this level.

Lot Acceptance "level 2":
This level includes the electrical and endurance subgroup.

Lot Acceptance "level 1":
This level includes everything in level 2 plus environmental and mechanical subgroups.

SAMPLE SIZES ACCORDING TO REQUIRED LAT LEVEL



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120 WAY MICRO-D CONNECTORS

- 120 way Micro-D connectors. 302
- 120 way connectors for cable and harnesses. 305
- Surface mount PCB card edge connectors 306
- BS connectors. 307
- Connector saver 307
- PCB layouts 308

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120 WAY MICRO-D CONNECTORS

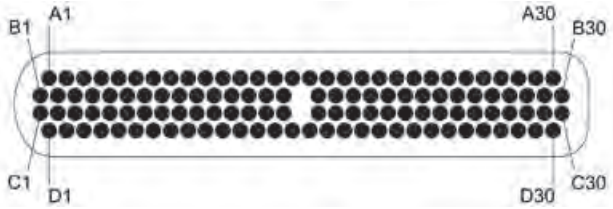
An enduring trend in the electronics industry is the continuing drive towards miniaturisation. This leads in turn to ever greater cabling densities with an ever larger number of signals required within limited space constraints. In answer to these challenges, AXON' CABLE has developed a range of 120 way Micro-D connectors. They are available as pigtails 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 have been developed and tested for the challenging requirements of space electronics, and can be used for any applications where severe environmental conditions and high density cabling are critical.
Keying hardware is an option.

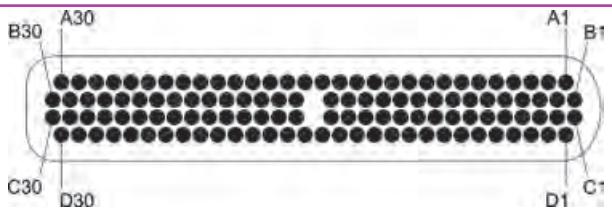
AXON' can offer specific numbers of contacts for custom designed applications. Specific designs are not contained within the MIL specification but AXON's solutions remain fully compatible with the MIL-DTL-83513 standard as far as performance and construction are concerned.

▲ 120 WAY MICRO-D CARD EDGE CONNECTOR

▶ Contact arrangements



MATING FACE OF THE 120 WAY MALE CONNECTOR



MATING FACE OF THE 120 WAY FEMALE CONNECTOR

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

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References

DESIGNATION	REFERENCE	COMMENTS	PAGE
120 WAY PLUG CONNECTOR FOR CABLE OR ASSEMBLY	P562630	Wire, length and colour type to be defined	305
120 WAY SOCKET CONNECTOR FOR CABLE OR ASSEMBLY	P562631	Wire, length and colour type to be defined	305
120 WAY SOCKET SURFACE MOUNT PCB CONNECTOR	P562632	Can only be mated with pigtail plug	306
120 WAY PLUG BOARD STRAIGHT PCB CONNECTOR	P562633		307
120 WAY CONNECTOR SAVER	P562634		307

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 ask for our *Cables & harnesses for space applications* catalog.

Keying Hardware

SPECIAL 120 WAY MALE HARDWARE KIT WITH KEYWAY: J	SPECIAL 120 WAY FEMALE HARDWARE KIT WITH KEYWAY: H

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Electrical & mechanical characteristics

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

Materials & finish

COMPONENTS	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.050") MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 CLASS 2 (1.27µM (0.050") TO 3.81µM (0.150"))
FEMALE CONTACT	COPPER ALLOY	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0005 INCH MIN.
INSERTS	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	SPACE GRADE EPOXY RESIN	
UNINSULATED WIRE	AWG 2801 SOLID COPPER WIRE	GOLD PLATED IN ACCORDANCE WITH A-A-59551

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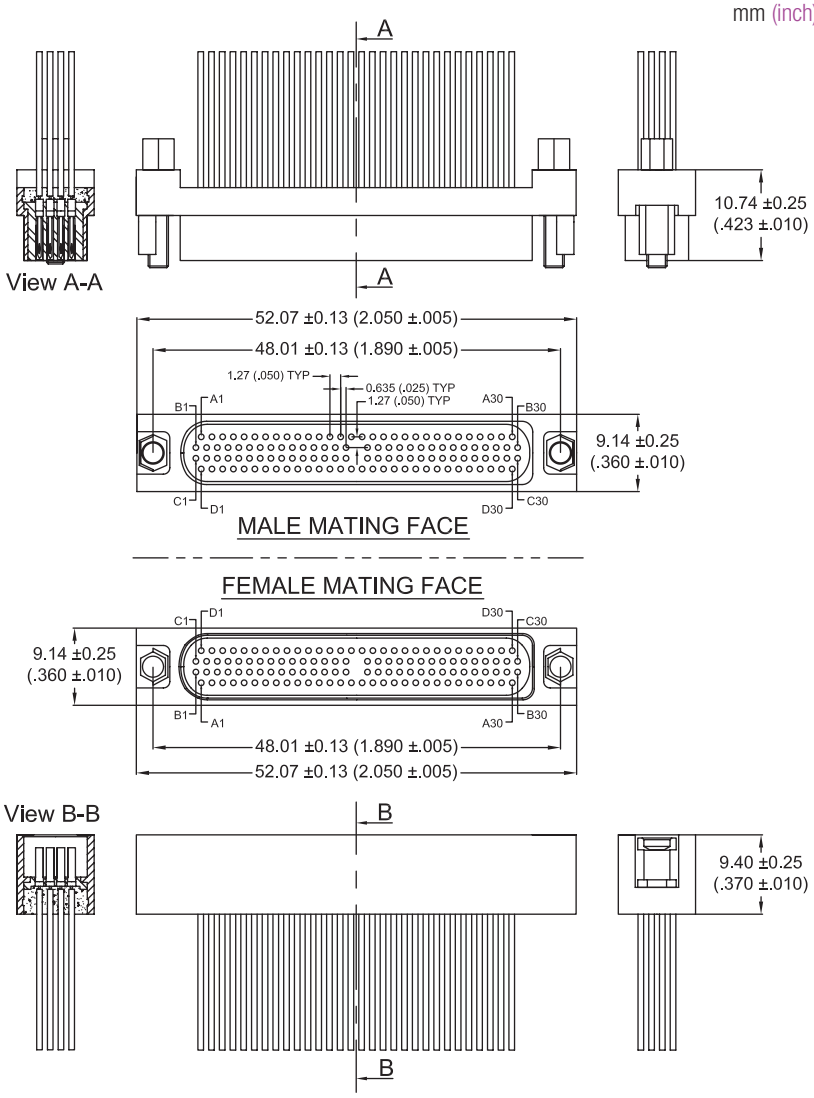
120 way male and female connectors for cable and harnesses

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.

P562630
P562631

mm (inch)



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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

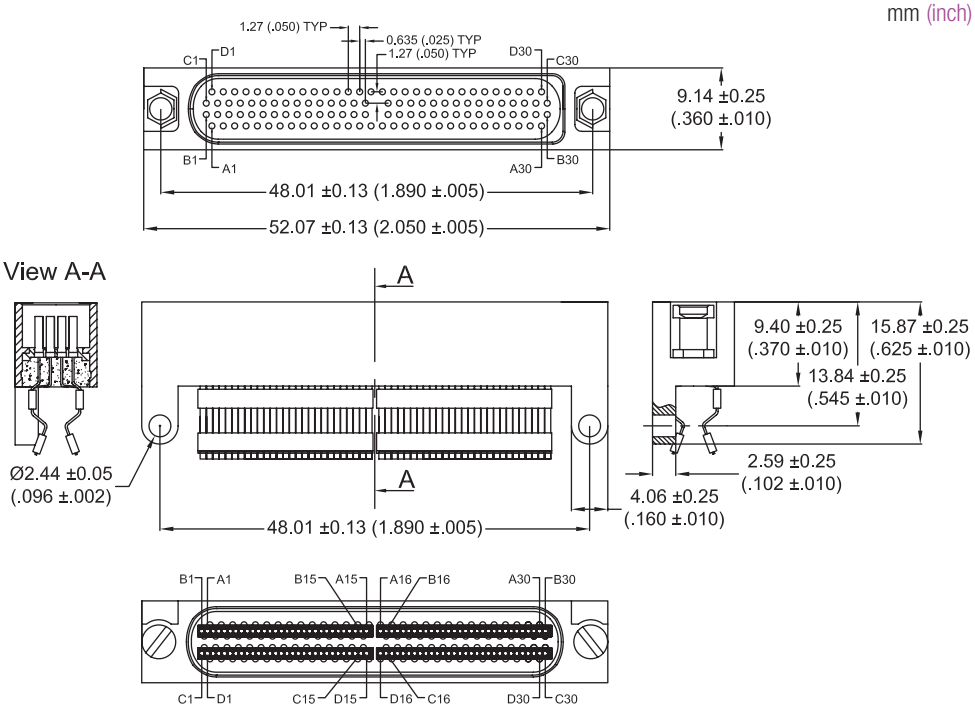
- Female style to mate with a male pigtail or assembly connector.
- Male and female styles to mate together (this option has a longer shell to retain the keying hardware system).
- Female style for panel mount.

FEMALE SMT

to mate to a male cable connector.

P562632

mm (inch)



SEE CONTACT LAYOUT ON PCB PAGE 308

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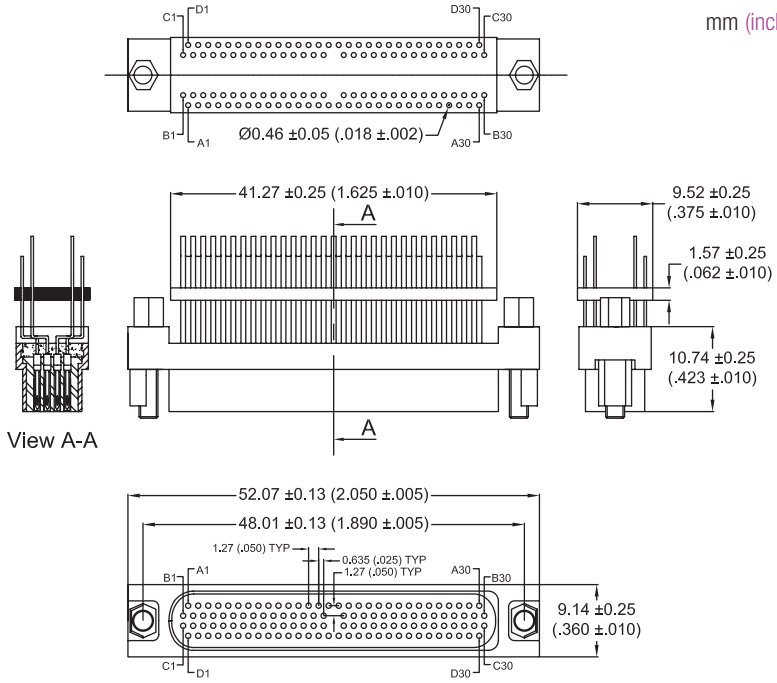
BS CONNECTOR

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

P562633

mm (inch)



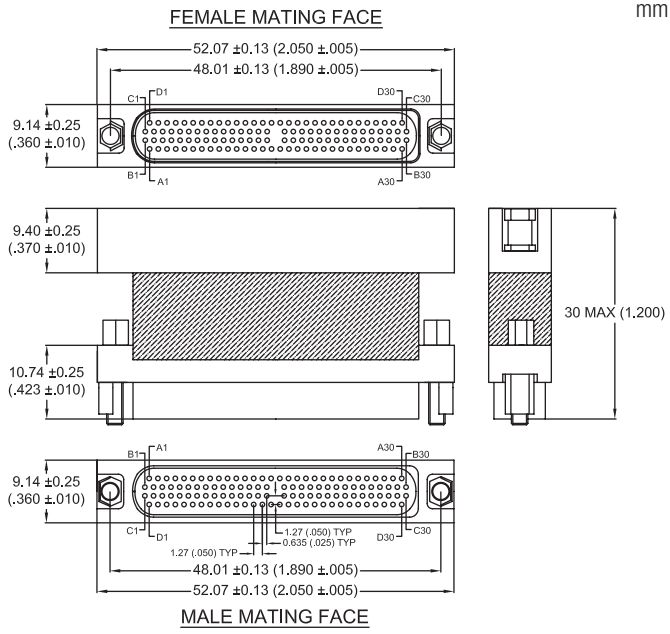
SEE CONTACT LAYOUT ON PCB PAGE 308

CONNECTOR SAVER

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

P562634

mm (inch)



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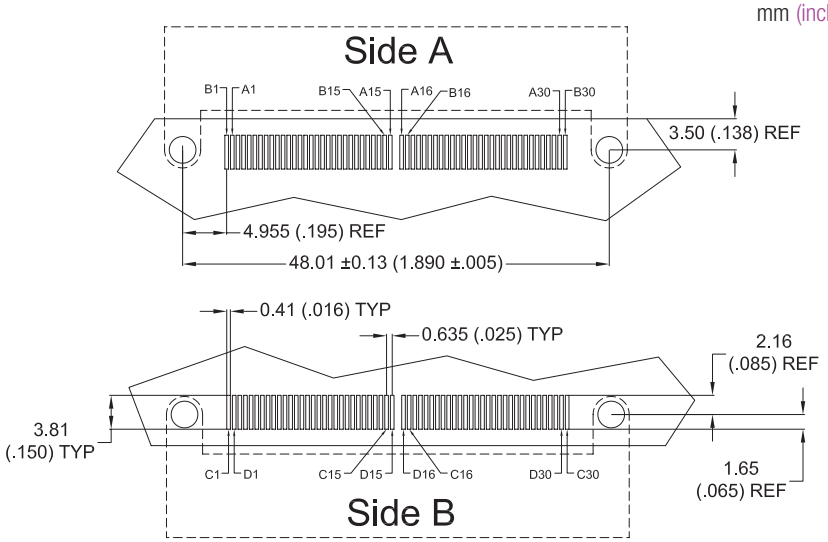
PCB layout

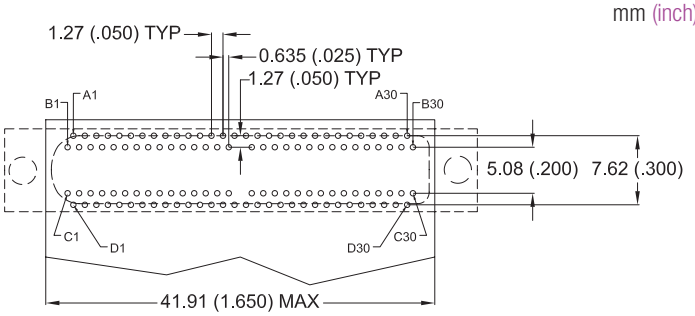
FEMALE SMT (SURFACE MOUNT STYLE) CONNECTOR

mm (inch)



BS VERSION (MALE ONLY)

mm (inch)



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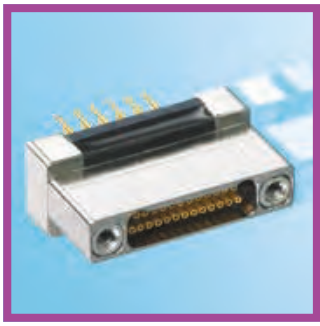
NANO-D FOR SPACE APPLICATIONS

- Nano-D connectors and assemblies for space applications 310
- General characteristics 311
- Dual row pigtail & jumper 312
- BS (Board Straight) type 316
- CBR (Condensed Board Right Angle) type 318
- SMV (Surface Mount Vertical) type 320

PCB layout for BS 0.050" type 322
PCB layout for CBR 0.050" type 323
PCB layout for SMV 0.025" type 324



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ND2SA RANGE

Nano-D connectors and assemblies for space applications

0.635 MM (.025") CONTACT SPACING

AXON' has drawn upon long experience in the highly challenging environment of space electronics to develop Nano-D connectors and assemblies suitable for this demanding area. Marrying the Nano-D design with the need to be able to reliably transmit signals, AXON' has developed custom solutions for a wide variety of application in space.
AXON' space products are assembled to the highest standards, meeting the ECSS-Q-ST-70-08C and the ECSS-Q-ST-70-26C requirements, and all such products are built in one of our humidity controlled, class 100.000 (ISO 8) clean rooms.
AXON' has been approved to ESCC 3401/086 EPPL2 since 2014.

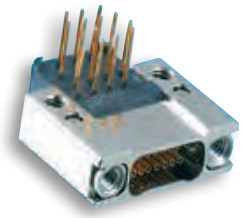
Different configurations

AXON's range of space Nano-D connectors is available in several different configurations:

- Nano-D rectangular connectors for cables.
- Nano-D rectangular connectors for PCBs.

Characteristics

- 0.635 mm (.025") contact spacing (double the density of a space Micro-D).
- Number of ways: 9, 15, 21, 25, 31, 37 and 51.
- High reliability twist pin contacts.
- Metal shell construction with captivated hardware.



▲ SPACE NANO-D CONNECTOR

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GENERAL CHARACTERISTICS

per ESCC 3401/086*

AXON's range of space Nano-D connectors which is covered by the ESCC 3401/086* standard, is ideally suited to equipment and applications where weight, miniaturisation and long term performance are required. It is available in 7 contact arrangements (9 to 51 contacts) for rectangular Nano-D connectors.

Electrical & mechanical characteristics

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	1 A max.	
CONTACT RESISTANCE	71 mΩ max.	Para 9.1.1.3 OF ESCC 3401
INSULATION RESISTANCE	1000 MΩ min. @ 100 V_{RMS}	Para 9.1.1.1 OF ESCC 3401
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 m - ALTITUDE 21 km (70,000 ft)	 250 V_{RMS} 100 V_{RMS}	Para 9.1.1.2 OF ESCC 3401
CONTACT ENGAGING AND SEPARATION FORCE	1.39 N max. 0.11 N min.	Para 4.3.9 OF ESCC 3401/086
CONNECTOR MATING AND DE-MATING FORCE	198 g (7 oz) x number of contacts max.	Para 9.20 OF ESCC 3401
CONTACT RETENTION	2.2 N min.	Para 9.17 OF ESCC 3401
DURABILITY	200 mating cycles min.	Para 9.18 OF ESCC 3401
TEMPERATURE RANGES	-55°C / +150°C	
VIBRATION	20 g's - No discontinuity >1µs	Para 9.11 OF ESCC 3401
SHOCK	50 g's - No discontinuity >1µs	Para 9.12 OF ESCC 3401
SALT SPRAY	48 hours	Para 9.22 OF ESCC 3401

Material & Finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
FEMALE CONTACT	PRECIOUS GOLD ALLOY IN ACCORDANCE WITH ASTM-B-477 OR 541 OR 562	NONE
	LEADED BRASS ALLOY CuZn9Pb2	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27 µm MIN. (.050")), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27 µm (.050") TO 3.81 µm (0.150"))
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061 IN ACCORDANCE WITH SAE-AMS-QQ-A-200/8 OR ASTM-B-209	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS-2404, CLASS 4.
INSERT/ PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	SPACE GRADE EPOXY RESIN	
INSULATED WIRE	CROSSLINKED ETFE INSULATED SILVER PLATED COPPER ALLOY IN ACCORDANCE WITH PARA 4.4 OF ESCC 3901/012	
INTEGRAL TAIL	GOLD PLATED SOLID COPPER BASE ALLOY IN ACCORDANCE WITH ASTM-B-194	

*: ISSUE **1** AT THE TIME OF GOING TO PRESS

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RECTANGULAR CONNECTORS FOR CABLES

DUAL ROW PIGTAIL & JUMPER

- Reliability for micro-miniature operating systems.
- High performance metal connector and ETFE crosslinked wire.
- Panel mount available for receptacle connector.
- Operating temperature: -55 / +150°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2SA	25	P	P	I	E	W1	9	50	L	L

SERIES
ND2SA: Nano-D Space application 2 row AXON'.
See below variants included in the ESCC3401/086 specification.

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31***, **37**, **51**.

1st CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector*.
M: Panel mount receptacle connector*.

2nd CONNECTOR TYPE
P: Plug connector.
S: Receptacle connector.
M: Panel mount receptacle connector*.
W: No second connector - free wires*.

CONNECTIONS (see jumper wiring on page 216)
D: Direct pin 1 to pin 1.
I: Indirect (usual for plug-plug jumper).
X: Pigtail*.

EMI FAMILY
E: Shielded pigtails or harnesses, shield soldered to the backshell (see page 314).
X: No shield.

WIRE CODE
W1: Single wire ESCC 3901/012 - Variant 01 (AWG30).
W2: 2 shielded jacketed twisted pairs ESCC 3901/012 - Variant 51 with the remaining wiring being single wire per ESCC 3901/012 - Variant 01.

COLOUR CODE
0: Black. **1**: Brown. **2**: Red. **3**: Orange*. **4**: Yellow*. **5**: Green*.
6: Blue*. **7**: Violet*. **8**: Grey*. **9**: White. **W**: 10 colour repeat*.
For colour code "W" see page 30

WIRE LENGTH (in cm)
Attention! Wire length in centimetres - (1cm = 10 mm = .394").

L in cm (inches)	5 ≤ L ≤10 (1.97 ≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE 1st CONNECTOR
P: Threaded hole #0-80 UNF (non removable jackposts, receptacle only).
R: Retractable short hex socket head jackscrews #0-80 UNF (semi-captivated, plug only).
L: Short hex socket head jackscrews #0-80 UNF (captivated, plug only).
V: Retractable short hex socket head jackscrews #0-80 UNF (semi captivated, plug with backshell only).
B: No hardware*.

HARDWARE 2nd CONNECTOR
P: Threaded hole #0-80 UNF (non removable jackposts, receptacle only).
R: Retractable short hex socket head jackscrews #0-80 UNF (semi-captivated, plug only).
L: Short hex socket head jackscrews #0-80 UNF (captivated, plug only).
V: Retractable short hex socket head jackscrews #0-80 UNF (semi captivated, plug with backshell only).
X: Pigtail*.
B: No hardware*.

***: not included in ESCC specification**

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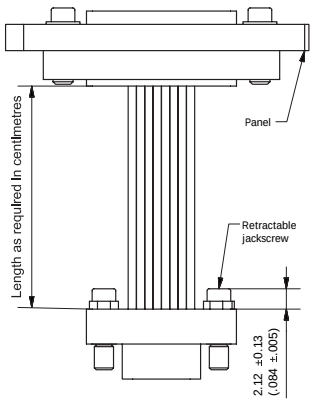
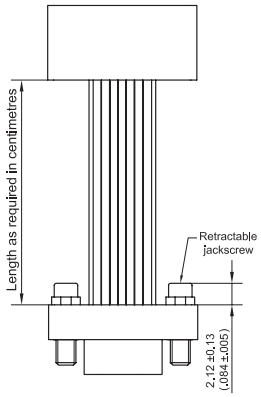
DIMENSIONS

Dimensions are in millimetres (inches).

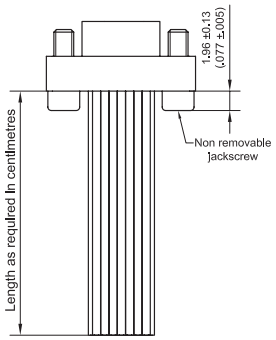
ND2SA 15 P M D X W1 9 20 R P



ND2SA 15 P S D X W1 9 20 R P



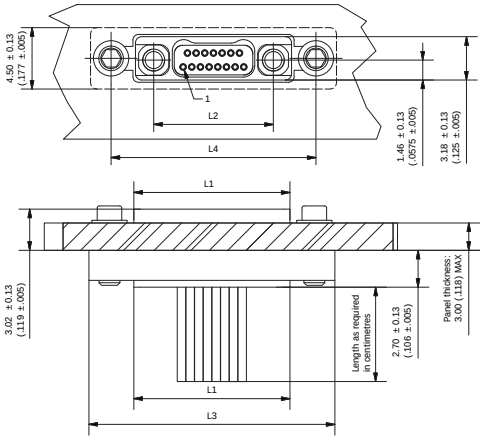
ND2SA 15 P W D X W1 0 20 P X



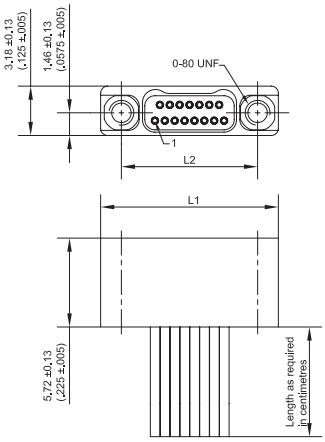
1 centimetre = 10 millimetres = 0.393 inch

1 inch = 25.4 millimetres = 2.54 centimetres

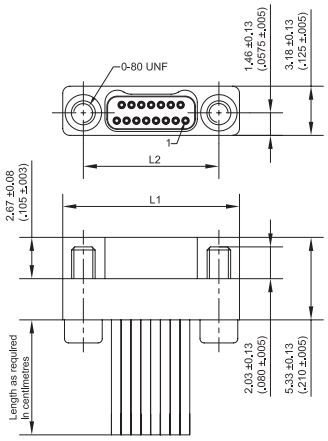
PANEL MOUNT RECEPTACLE



RECEPTACLE



PLUG



SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 P / 9 S	9.53 .375	6.86 .270	16.10 .634	13.10 .516
15 P / 15 S	11.43 .450	8.76 .345	18.00 .709	15.00 .591
21 P / 21 S	13.34 .525	10.67 .420	19.91 .784	16.91 .666
25 P / 25 S	14.61 .575	11.94 .470	21.18 .834	18.18 .716
31 P / 31 S*	16.51 .650	13.84 .545	23.09 .909	20.08 .791
37 P / 37 S	18.42 .725	15.75 .620	24.99 .984	21.99 .866
51 P / 51 S	22.86 .900	20.19 .795	29.43 1.159	26.43 1.041

*: not included in ESCC specification

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	1000 MΩ min. @ 250 VRMS
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VRMS
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	1.39 N max.
CONTACT SEPARATING FORCE	0.11 N min.
CONTACT RETENTION	2.2 N min.
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Precious gold alloy
SOCKET CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 311 FOR MORE INFORMATION

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EMI RANGE

SHIELDED DUAL ROW PIGTAIL & JUMPER

- Reliability for micro-miniature operating systems.
- High performance metal connector and ETFE crosslinked wire.
- Panel mount available for receptacle connector.
- 360° screen termination.
- Operating temperature: -55°C / +200°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2SA	25	P	P	I	E	W1	9	50	L	L

SERIES

ND2SA: Nano-D Space application 2 row AXON'.
See below variants included in the ESCC3401/086 specification.

NUMBER OF CONTACTS

09, **15**, **21**, **25**, **31***, **37**, **51**.

1st CONNECTOR TYPE

P: Plug connector.
S: Receptacle connector*.
M: Panel mount receptacle connector*.

2nd CONNECTOR TYPE

P: Plug connector.
S: Receptacle connector.
M: Panel mount receptacle connector*.
W: No second connector - free wires*.

CONNECTIONS (see jumper wiring on page 216)

D: Direct pin 1 to pin 1.
I: Indirect (usual for plug-plug jumper).
X: Pigtail*.

EMI FAMILY

E: Shielded pigtails or harnesses, shield soldered to the backshell.
X: No shield (see page 312).

WIRE CODE

W1: Single wire ESCC 3901/012 - Variant 01 (AWG30).
W2: 2 shielded jacketed twisted pairs ESCC 3901/012 - Variant 51 with the remaining wiring being single wire per ESCC 3901/012 - Variant 01.

COLOUR CODE

0: Black. **1**: Brown. **2**: Red. **3**: Orange*. **4**: Yellow*. **5**: Green*.
6: Blue*. **7**: Violet*. **8**: Grey*. **9**: White. **W**: 10 colour repeat*.

For colour code "W" see page 30

WIRE LENGTH (in cm)

Attention! Wire length in centimetres - (1cm = 10 mm = .394").

L in cm (inches)	5 ≤ L ≤10 (1.97 ≤ L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE 1st CONNECTOR

P: Threaded hole #0-80 UNF (non removable jackposts, receptacle only).
R: Retractable short hex socket head jackscrews #0-80 UNF (semi-captivated, plug only).
L: Short hex socket head jackscrews #0-80 UNF (captivated, plug only).
V: Retractable short hex socket head jackscrews #0-80 UNF (semi captivated, plug with backshell only).
B: No hardware*.

HARDWARE 2nd CONNECTOR

P: Threaded hole #0-80 UNF (non removable jackposts, receptacle only).
R: Retractable short hex socket head jackscrews #0-80 UNF (semi-captivated, plug only).
L: Short hex socket head jackscrews #0-80 UNF (captivated, plug only).
V: Retractable short hex socket head jackscrews #0-80 UNF (semi captivated, plug with backshell only).
X: Pigtail*.
B: No hardware*.

***: not included in ESCC specification**

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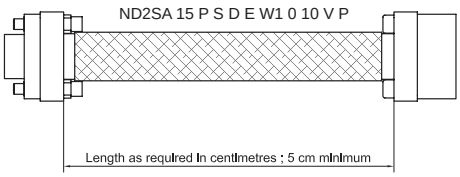
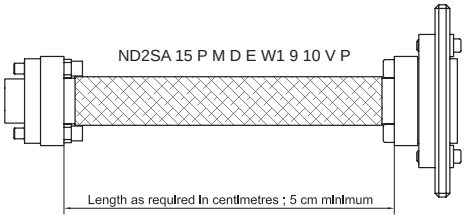
DIMENSIONS

Dimensions are in millimetres (inches).

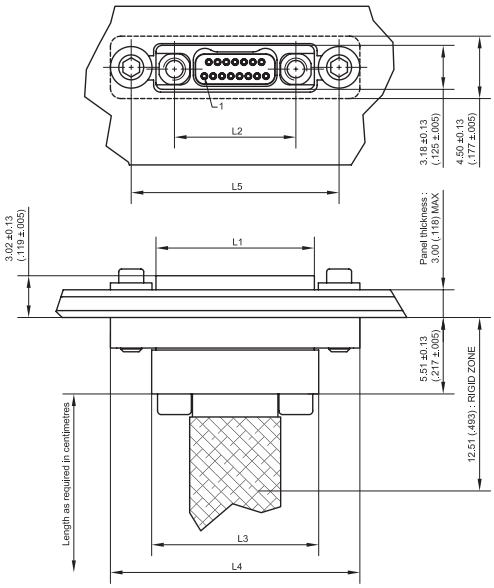




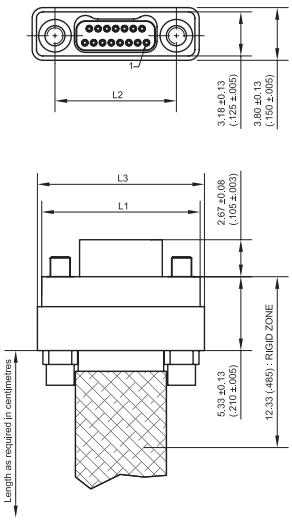
1 centimetre = 10 millimetres = 0,393 inch

1 inch = 25,4 millimetres = 2,54 centimetres

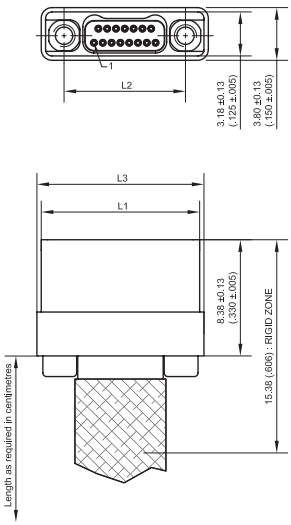
PANEL MOUNT RECEPTACLE



PLUG



RECEPTACLE



SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)	L5 ±0.13 (±.005)
9 P / 9 S	9.53 .375	6.86 .270	10.16 .400	16.10 .634	13.10 .516
15 P / 15 S	11.43 .450	8.76 .345	12.06 .475	18.00 .709	15.00 .591
21 P / 21 S	13.34 .525	10.67 .420	13.97 .550	19.91 .784	16.91 .666
25 P / 25 S	14.61 .575	11.94 .470	15.24 .600	21.18 .834	18.18 .716
31 P / 31 S*	16.51 .650	13.84 .545	17.14 .675	23.09 .909	20.08 .791
37 P / 37 S	18.42 .725	15.75 .620	19.05 .750	24.99 .984	21.99 .866
51 P / 51 S	22.86 .900	20.19 .795	23.49 .925	29.43 1.159	26.43 1.041

*: not included in ESCC specification

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	1000 MΩ min. @ 250 VRMS
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VRMS
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	1.39 N max.
CONTACT SEPARATING FORCE	0.11 N min.
CONTACT RETENTION	2.2 N min.
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium Alloy 6061 with nickel plating
BACKSHELL	Aluminium alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
PIN CONTACT	Precious gold alloy
SOCKET CONTACT	Precious gold alloy
ENCAPSULANT	Epoxy resin
HARDWARE	300 series stainless steel, passivated

SEE PAGE 311 FOR MORE INFORMATION

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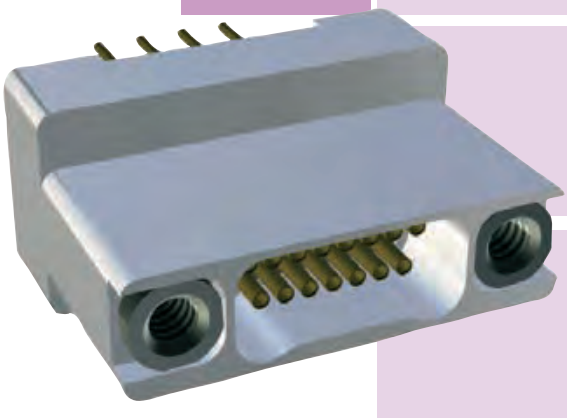

PCB RECTANGULAR CONNECTORS

BS TYPE

2 ROW VERTICAL PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: -55 / +150°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2SA 25 S BS P T 1

SERIES
ND2SA: Nano-D Space application 2 row AXON'.

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31**, **37**, **51**.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
BS: AXON' Vertical PCB connector.
Not included in the ESCC 3401/086 specification.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).

TAIL PLATING
T: Tin lead plated 1µm minimum (63-37 alloy).
G: Gold (not included in the ESCC specification).

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance ± 0.38 mm (0.015").

Connectors are supplied with
#0-80 UNF screws 1/4" ±0.004" long (for PCB mounting).

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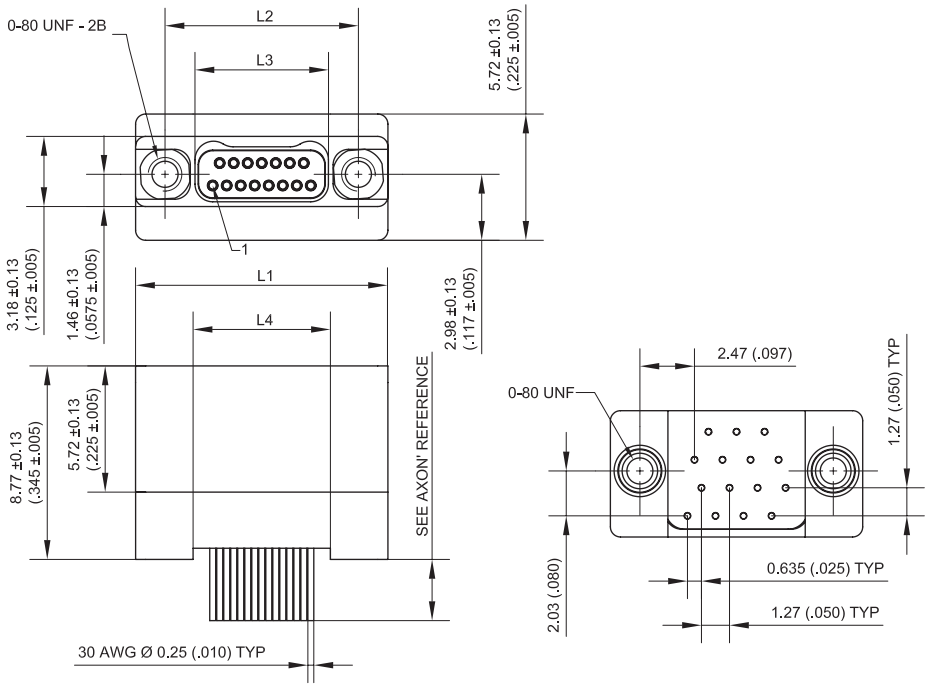
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 322

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	1000 MΩ min. @ 250 VRMS
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VRMS
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	1.39 N max.
CONTACT SEPARATING FORCE	0.11 N min.
CONTACT RETENTION	2.2 N min.
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 311 FOR MORE INFORMATION

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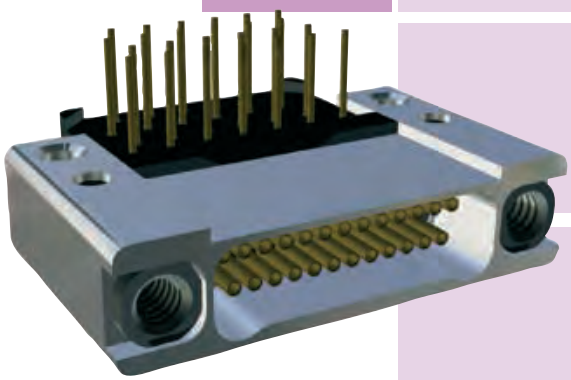

PCB RECTANGULAR CONNECTORS

CBR TYPE

2 ROW RIGHT ANGLE PCB RECEPTACLE

0.050" PITCH

- Reliability for micro-miniature operating systems.
- Several tail lengths available.
- Operating temperature: -55 / +150°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2SA 25 S CBR P T 1

SERIES
ND2SA: Nano-D Space application 2 row AXON'.
ESCC 3401/086 EPPL2.

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31***, **37**, **51**.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
CBR: AXON' Right Angle PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).
B: None.
Other versions available on request.

TAIL PLATING
T: Tin lead plated 1µm minimum (63-37 alloy).
G*: Gold (not included in the ESCC specification).

TAIL LENGTH
1: 2.77 mm (0.109").
2: 3.56 mm (0.140").
3: 4.37 mm (0.172").
4: 2.29 mm (0.090").
Tolerance ± 0.38 mm (0.015").

***: not included in ESCC specification**
Connectors are supplied with
#0-80 UNF screws 1/4" ±0.004" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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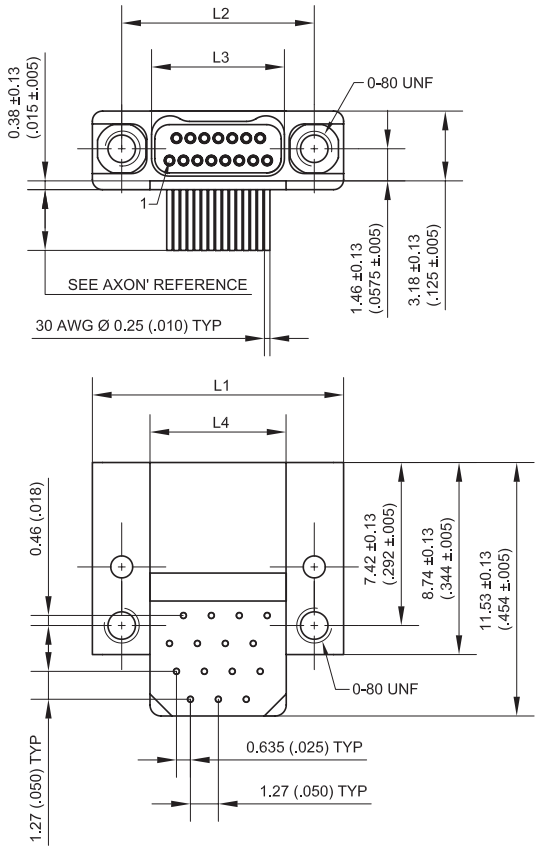
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 323

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S*	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

*: not included in ESCC specification

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	1000 MΩ min. @ 250 VRMS
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VRMS
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	1.39 N max.
CONTACT SEPARATING FORCE	0.11 N min.
CONTACT RETENTION	2.2 N min.
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 311 FOR MORE INFORMATION

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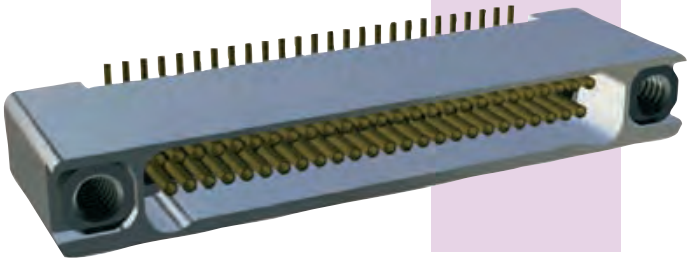
SMV TYPE

2 ROW VERTICAL SURFACE MOUNT PCB RECEPTACLE

0.025" PITCH



- Reliability for micro-miniature operating systems.
- Surface Mount.
- Several tail lengths available.
- Operating temperature: -55°C or +150°C.
- 7 contact arrangements (9 to 51 contacts).

IDENTIFICATION CODE

ND2SA 25 S SMV P T 1

SERIES
ND2SA: Nano-D Space application 2 row AXON'.
ESCC 3401/086 EPPL2.

NUMBER OF CONTACTS
09, **15**, **21**, **25**, **31***, **37**, **51**.

CONNECTOR TYPE
S: Receptacle connector.

FAMILY
SMV: AXON' Vertical surface mount PCB connector.

HARDWARE
P: Threaded hole #0-80 UNF (non removable jackposts).

TAIL PLATING
T: Tin lead plated 1µm minimum (63-37 alloy).
G*: Gold (not included in the ESCC specification).

TAIL LENGTH
1: 0.51 mm (0.020").
2: 1.02 mm (0.040").
Tolerance ± 0.25 mm (0.010").

*** not included in ESCC specification**
Connectors are supplied with
#0-80 UNF screws 1/4" ±0.004" long (for PCB mounting).

IN BOLD: FACTORY STANDARD

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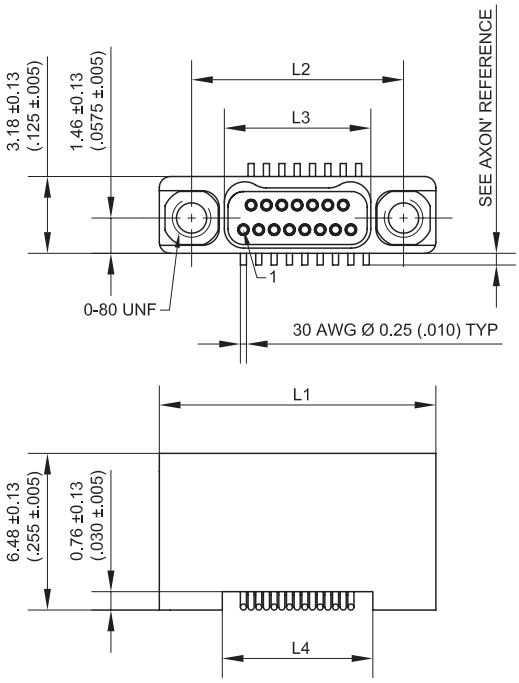
DIMENSIONS

Dimensions are in millimetres (inches).



SEE CONTACT LAYOUT ON PCB PAGE 324 & 325

SHELL SIZE	L1 ±0.13 (±.005)	L2 ±0.13 (±.005)	L3 ±0.13 (±.005)	L4 ±0.13 (±.005)
9 S	9.53 .375	6.86 .270	4.14 .163	4.32 .170
15 S	11.43 .450	8.76 .345	6.05 .238	6.22 .245
21 S	13.34 .525	10.67 .420	7.95 .313	8.13 .320
25 S	14.61 .575	11.94 .470	9.22 .363	9.40 .370
31 S*	16.51 .650	13.84 .545	11.12 .438	11.30 .445
37 S	18.42 .725	15.75 .620	13.03 .513	13.21 .520
51 S	22.86 .900	20.19 .795	17.48 .688	17.65 .695

*: not included in ESCC specification

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	1 A max.
CONTACT RESISTANCE	71 mΩ max.
INSULATION RESISTANCE	1000 MΩ min. @ 250 VRMS
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 250 VRMS
	Altitude 21 km (70,000 ft): 100 VAC
CONTACT ENGAGING FORCE	1.39 N max.
CONTACT SEPARATING FORCE	0.11 N min.
CONTACT RETENTION	2.2 N min.
DURABILITY	200 mating cycles min.
VIBRATION	20g's – No discontinuity > 1 µs
SHOCK	50g's – No discontinuity > 1 µs

MATERIAL & FINISH	
SHELL	Aluminium alloy 6061 with nickel plating
MOULDED INSULATOR	Liquid Crystal Polymer (LCP)
CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy Resin
PCB TERMINALS	Gold plated solid copper alloy wire
HARDWARE	300 series stainless steel, passivated

SEE PAGE 311 FOR MORE INFORMATION

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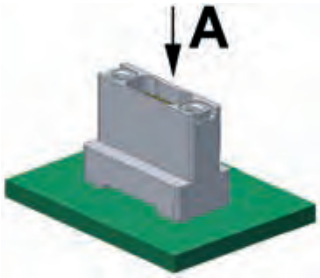
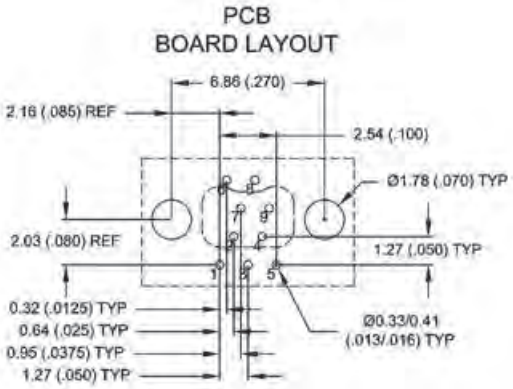
PCB LAYOUT FOR BS TYPE 0.050" PITCH - FEMALE CONNECTORS

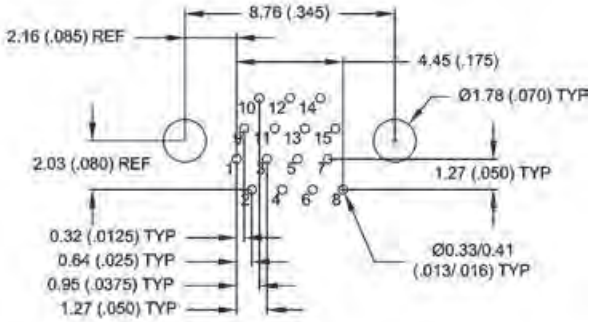
VIEW A



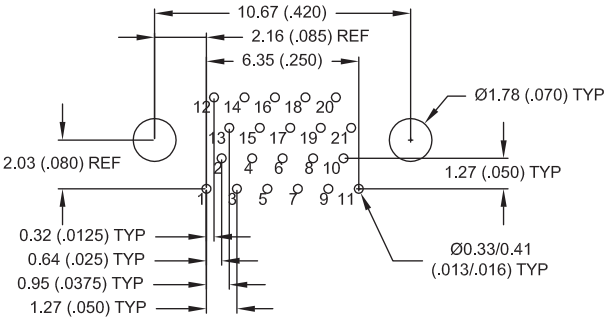
9 CONTACTS - VIEW A



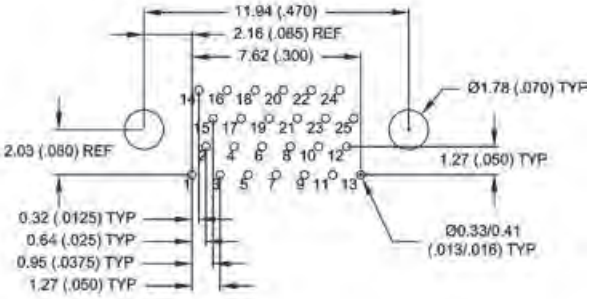
15 CONTACTS - VIEW A



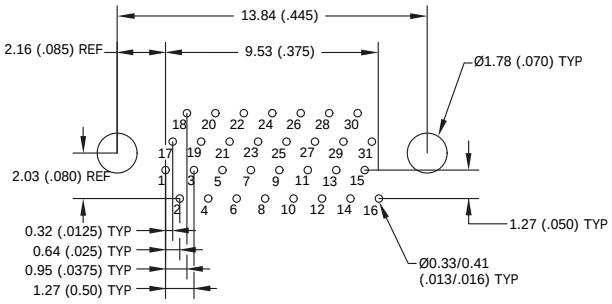
21 CONTACTS - VIEW A



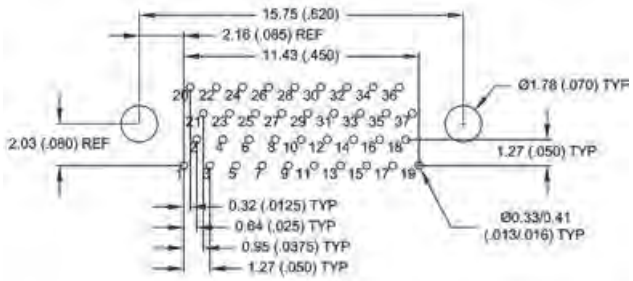
25 CONTACTS - VIEW A



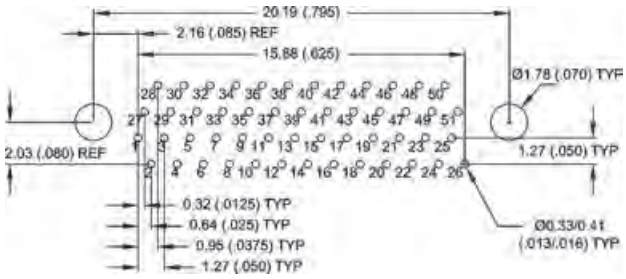
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A



51 CONTACTS - VIEW A



1.27 mm (0.05") contact spacing - 1.27 mm (0.05") spacing between rows - contact diameter: AWG 30

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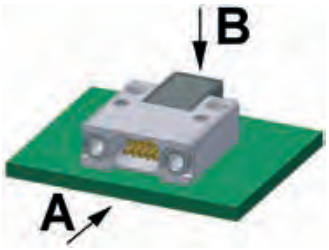
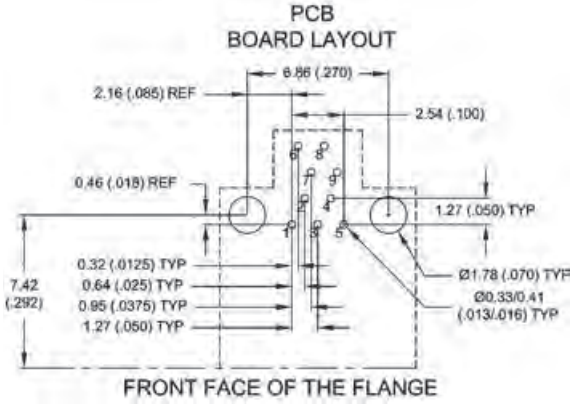
PCB LAYOUT FOR CBR TYPE 0.050" PITCH - FEMALE CONNECTORS

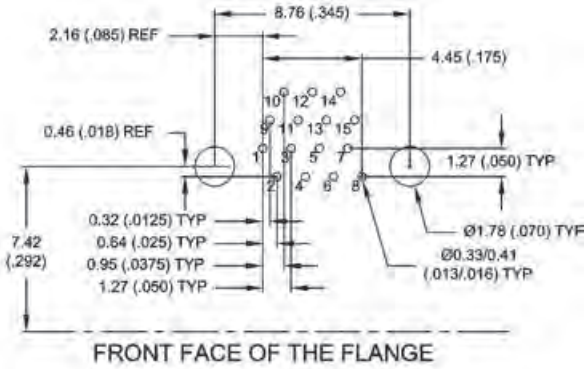
VIEW A



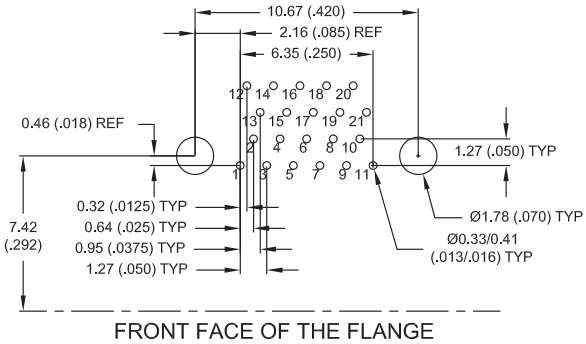
9 CONTACTS - VIEW B



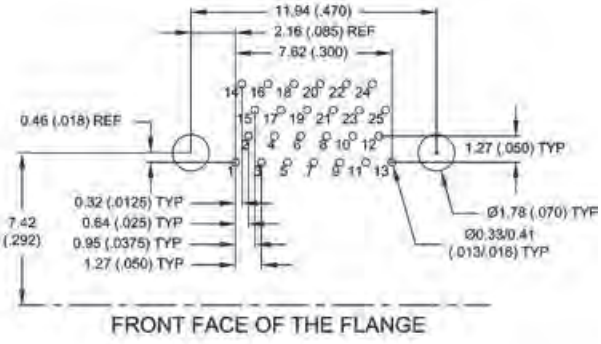
15 CONTACTS - VIEW B



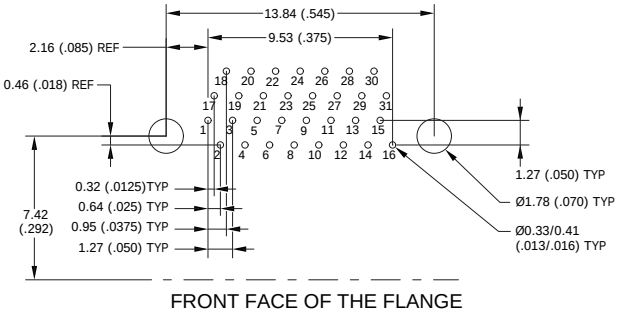
21 CONTACTS - VIEW B



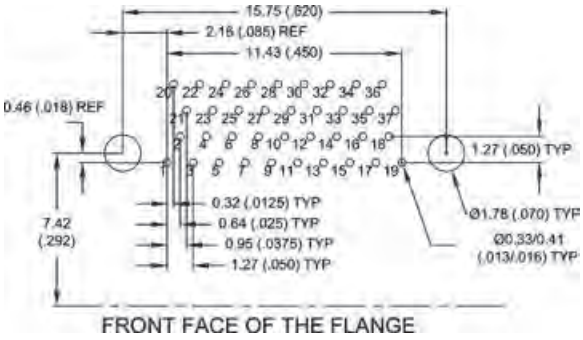
25 CONTACTS - VIEW B



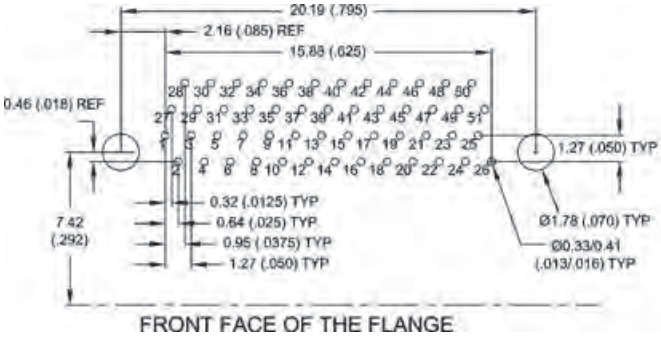
31 CONTACTS - VIEW B



37 CONTACTS - VIEW B



51 CONTACTS - VIEW B



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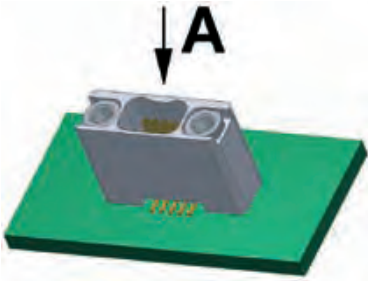
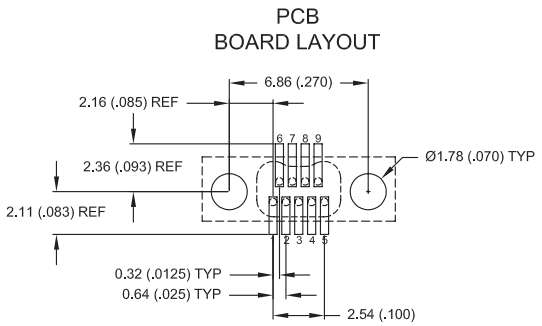
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - FEMALE CONNECTORS

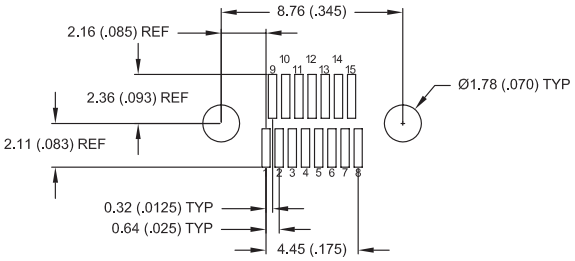
VIEW A



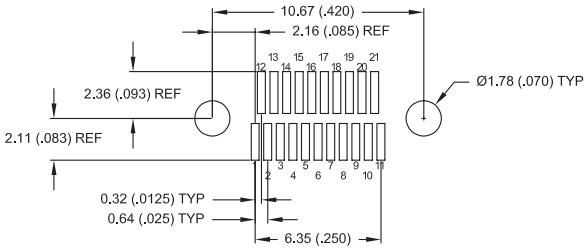
9 CONTACTS - VIEW A



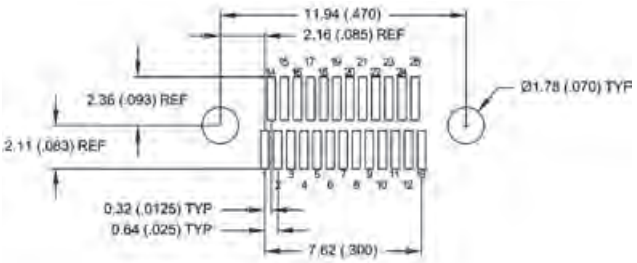
15 CONTACTS - VIEW A



21 CONTACTS - VIEW A



25 CONTACTS - VIEW A



0.635 mm (0.25") pad spacing - contact diameter: AWG 30

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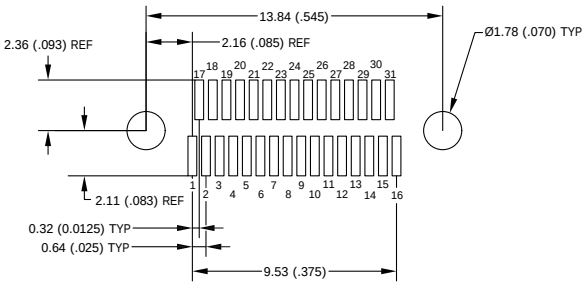
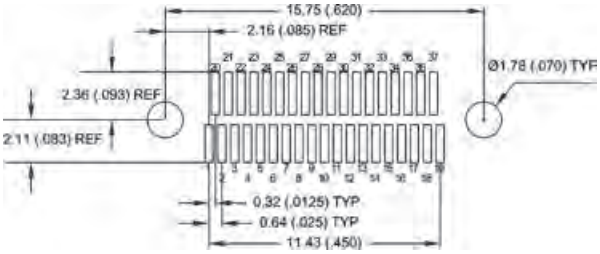
PCB LAYOUT FOR SMV TYPE 0.025" PITCH - FEMALE CONNECTORS

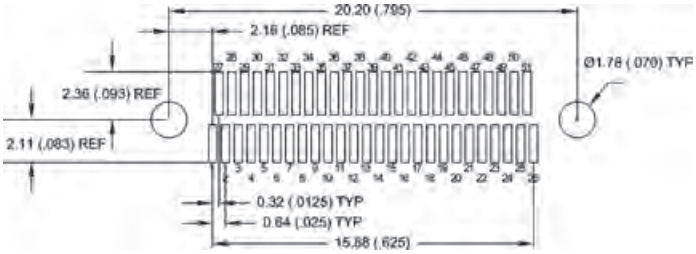
31 CONTACTS - VIEW A



37 CONTACTS - VIEW A

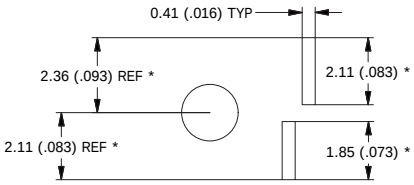


51 CONTACTS - VIEW A



LAYOUT

Suggested PAD configuration



*: For .040" tail length, add .020" to noted dimensions

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CIRCULAR MICRO-D CONNECTORS

GENERAL INFORMATION

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- D-Line® Twist Pin contact technology 332
- Product selection guide 334
- Connector dimensions 336
- Glossary of Terms 338
- General characteristics 339
- Rear panel mounting guide 340
- Front panel mounting guide 341
- Contact arrangements 342
- REACH & RoHS compliance 344
- Wire codes 345
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PANEL CUT-OUTS & ACCESSORIES

- Panel cut-outs for square flange connectors 350
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- AXOCLAMP®, EMI band termination 355

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- Metric Thread range 358
- Identification code 359
- In-line plugs 360
- Panel mount, female receptacles 362
- Master key positions / Weights / Torque 364

THREE LUG BAYONET CONNECTORS - MCA3B

- Three Lug Bayonet range 366
- Identification code 367
- In-line plugs 368
- Panel mount, female receptacles 370
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TRIPLE START CONNECTORS (ANTI-DECOUPLING) - MCAC
- Triple Start range 374
- Identification code. 375
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BREAKAWAY CIRCULAR CONNECTORS - MCABK
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PCB CONNECTORS

PCB circular connector range 392

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  (Metric Thread, Three Lug Bayonet & Triple Start) 393
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PLASTIC CONNECTORS

SOLDER CUP & PIGTAIL CONNECTOR - MCA
- Solder cup connector 412
- Pigtail connector. 414

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- AXOCLAMP®, EMI band termination 355

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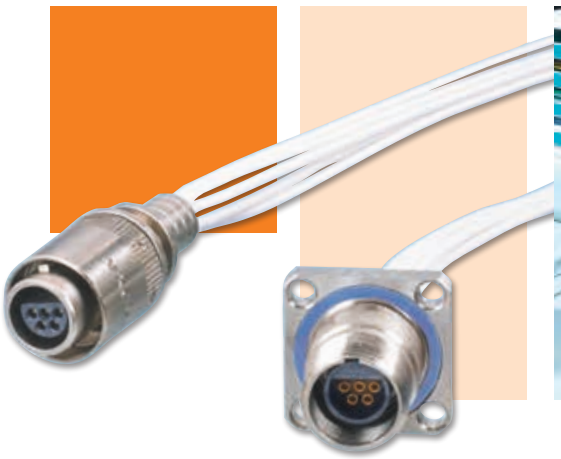
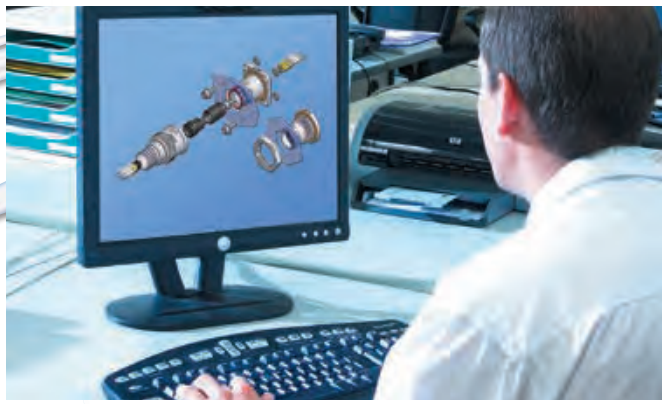




▲ ENGINEERING DEPARTMENT

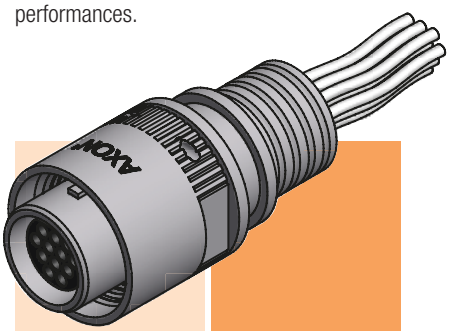
Micro-D Line®, twist

MINIATURE CIRCULAR CONNECTORS SYSTEMS IN HIGH

WEIGHT & SPACE SAVING

AXON' miniature circular connectors offer reliable connections for systems requiring reduced weight and miniaturization. Medical sensors, military equipment, research centres, nuclear power control systems, aircraft electronics and avionics equipment are just a few examples.

The circular connector range benefits from the expertise in the AXON' D-Line® MIL-DTL-83513 D-Shape connectors and features easy-to-use connect and disconnect functionality. The MIL-DTL-83513 is the standard which dictates the design and performance for Micro-D connectors. These well-known robust connectors rise to the challenge of demanding applications and harsh environments. Despite their high pin density, small size and lightweight bodies, the AXON' miniature circular connectors offer similar performances to their rectangular Micro-D cousins with the added benefit of good EMI performances.



RELIABLE TWIST PIN CONTACT

The heart of both the rectangular and circular connectors is the twist pin contact, which by its design and performance is highly reliable and enables the system to meet the most severe requirements - often significantly more so than stipulated in the MIL-DTL-83513 standard.

A COMPLETE RANGE FOR EVERY REQUIREMENT

Designed with 360° shield termination, durable twist-pin contacts and IP 67/68* waterproofness (IEC60529), the connectors are suitable for use in many harsh environments.

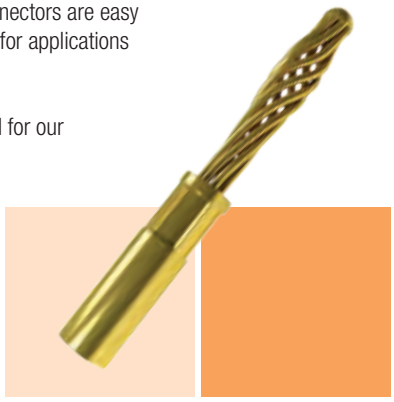
The standard range of Micro-D circular connectors consists of 5 basic types:

- **Metric thread connectors - MCAT** - This variant is ideal for applications which require space and weight saving and good EMI performances.
- **Three lug bayonet connectors - MCA3B** - Used when quick coupling is needed.
- **Triple start connectors (with anti-decoupling) - MCAC** - This version is specially designed to withstand vibration.
- **Breakaway connectors - MCABK** - This is a connector with an in-built spring to secure the connection. Quick to connect and disconnect, lightweight and small.
- **Plastic shells - MCA** - These circular plastic connectors are easy to use, very small and lightweight. They are ideal for applications which require easy connection and space saving.

In addition to the standard range of circular Micro-D connectors, AXON' offers **PCB connectors** designed for our 4 types of metal shell connectors.

Please refer to our *Product selection guide* page 334 to choose the most appropriate solution.

*: IP 67: The standard defines an immersion up to 1 m for 30 minutes.
IP 68: Immersion beyond 1 m and conditions specified by the manufacturer.



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▲ METROLOGY LABORATORY

▲ CLEAN ROOM

pin circular solutions

FOR CRITICAL INTERCONNECT TECHNOLOGY APPLICATIONS

CUSTOM DESIGNED SOLUTIONS

In addition to standard types, our engineering team can assist in designing any special version or custom design to meet specific requirements. Our sales and design team will help you in the choice and design of your specific requirements for a complete interconnect solution based on AXON' miniature circular connectors.
Maximize your supply chain efficiency by ordering D-Line® circular connectors from AXON' as complete cable assemblies with overmouldings.

▲ HIGH DENSITY CIRCULAR CONNECTOR

Main characteristics of AXON' miniature circular connectors

FEATURES	VALUE
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
DURABILITY	500 mating cycles min.
TEMPERATURE RANGE - Standard Version - High Temp. Version	 -55°C / +150°C -55°C / +200°C
VIBRATION	20 g's
SHOCK	50 g's
WATER RESISTANCE	IP67 / IP68*

*: IP 67: The standard defines an immersion up to 1 m for 30 minutes.
IP 68: Immersion beyond 1 m and conditions specified by the manufacturer.

QUALITY ASSURANCE

ISO 9001	EN 9100	ISO 14001	TS 16949	ISO 13485	OHSAS 18001

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TWIST PIN CONTACT TECHNOLOGY

The Micro-D male contact is made up of 10 strands of beryllium-copper and copper alloy twisted together, welded then bumped. These sprung strands are in fact compressed during insertion into the turned female contact and therefore a high number of electrical contact points is permanently assured, while retaining flexibility and ease of insertion / extraction.

The plating of these contacts is a minimum of 1.27 microns of gold in accordance with MIL-G-45204 type 2, class 1, and this gives additional operational security. Furthermore, the Twist Pin contact is auto-guided into its female contact, even if it is not centred in its recess.

▲ TWIST PIN CONTACTS

As with all contacts conforming to MIL-DTL-83513, the AXON' Micro-D contacts accept as standard 24, 26, 28 and 30 AWG wires. In order to meet specific customer requests, AXON' can also offer solutions for large section wires up to 22 AWG and for miniature wires as small as 36 AWG.

Twist pin performance versus MIL-DTL-83513 specification

CHARACTERISTIC	AXON' TWIST PIN	MIL REQUIREMENT
NUMBER OF CONTACT POINTS WITH FEMALE CONTACT	7	No requirement
CONTACT RESISTANCE (FOLLOWING TEST §3.5.6)	Max 3 mΩ (under 3 A)	8 mΩ (under 2.5 A)
VIBRATION (NO DISCONTINUITY > 1 µs)	200 g*	20 g*
SHOCK (NO DISCONTINUITY > 1 µs)	500 g*	50 g*
CRIMPING	22 to 36 AWG	24 to 26 AWG

*: Vibration & shock values depending on test profiles.

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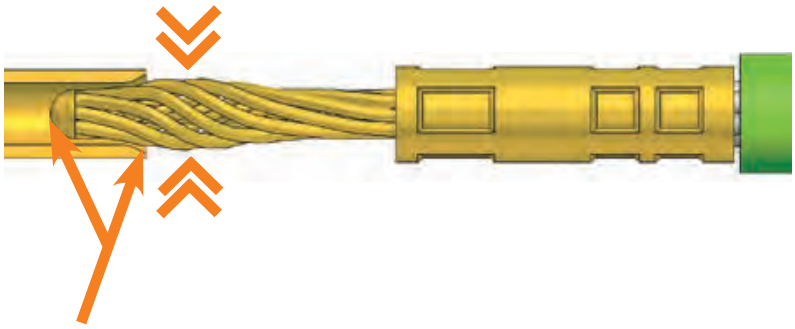
Before insertion

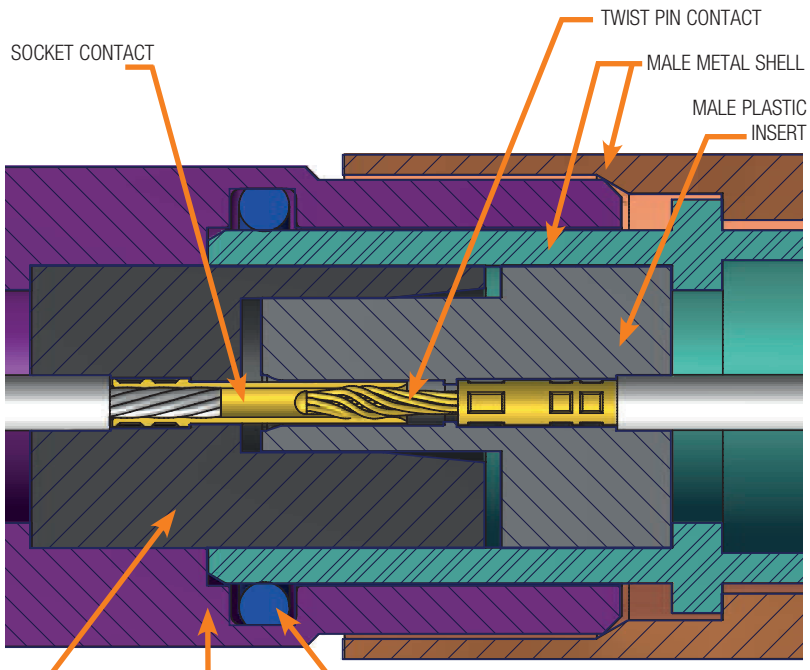
BUMP AREA WILL BE COMPRESSED INSIDE THE SOCKET DURING INSERTION

↳ INSERTION AND RETENTION PERFORMANCE OF THE TWIST-PIN AND SOCKET MATED PAIR



BOTH SOCKET CONTACT CHAMFER AND TWIST PIN HEMISPHERICAL RADIUS CONTRIBUTE TO ENSURING ADEQUATE INSERTION EVEN IN CASE OF MISALIGNMENT

After insertion



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PRODUCT SELECTION GUIDE

	METRIC THREAD MCAT	THREE LUG BAYONET MCA3B	TRIPLE START THREAD (ANTI-DECOUPLING) MCAC
COUPLING TYPE	SIMPLE METRIC THREAD	QUICK COUPLING 3 LUG BAYONET	TRIPLE START TRAPEZOIDAL THREAD
SHELL TYPE	CABLE PLUGS AND JACKS PANEL RECEPTACLE: JAM NUT OR SQUARE FLANGE, REAR OR FRONT MOUNT		
PCB VERSIONS	AVAILABLE		
COUPLING METHOD	ISO METRIC THREAD, TORQUE TIGHTENING REQUIRED	HAND COUPLING	1.5 TURN TO MATE, SECURED WITH RATCHET SYSTEM, HAND COUPLING
MATERIAL & PLATING	BRASS + NICKEL PLATING	BRASS + NICKEL PLATING	BRASS + NICKEL PLATING
N° OF CONTACTS	5, 7, 12, 15, 19 & 37	5, 7, 12, 15, 19 & 37	5, 7, 12, 15, 19 & 37
ADVANTAGES	VERY SMALL SIZE	QUICK CONNECT / DISCONNECT	QUICK THREAD MATING, GOOD FOR VIBRATION
EASE OF CONNECTION	★★	★★★★	★★★
SPACE SAVING	★★★★	★★★	★★
WEIGHT SAVING	★★★★	★★★	★★
EMI PERFORMANCE	★★★★	★★	★★★
TEMPERATURE	-55°C / +150°C OR -55°C / +200°C, DEPENDING ON RESIN OPTION		
WATER RESISTANCE	IP67 / IP68*		
VIBRATION	20 g		
SHOCK	50 g		
MATING CYCLES	MINIMUM 500 CYCLES, PLEASE SPECIFY IF MORE ARE REQUIRED		
APPLICATIONS	AERONAUTICS, MILITARY, ON-BOARD ELECTRONICS, MISSILES, RADARS, ETC.		

*: IP 67: The standard defines an immersion up to 1 m for 30 minutes.
IP 68: Immersion beyond 1 m and conditions specified by the manufacturer.

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PRODUCT SELECTION GUIDE

BREAKAWAY MCABK	PLASTIC SHELLS MCA	
BREAKAWAY TYPE CONNECTOR, WITH SPRING TO SECURE CONNECTION	READY TO MATE PLASTIC INSERT	**COUPLING TYPE**
CABLE PLUGS AND JACKS PANEL RECEPTACLE: JAM NUT OR SQUARE FLANGE, REAR OR FRONT MOUNT	CABLE PLUGS & JACKS, SOLDER CUPS	**SHELL TYPE**
AVAILABLE	ON REQUEST	**PCB VERSIONS**
HAND COUPLING	HAND COUPLING	**COUPLING METHOD**
ALUMINIUM + NICKEL PLATING	LCP PLASTIC	**MATERIAL & PLATING**
5, 7, 12, 15, 19 & 37	5, 7, 12, 15, 19 & 37	**N° OF CONTACTS**
QUICK CONNECT / DISCONNECT CALIBRATED RELEASE FORCE	«EASY TO USE», VERY SMALL AND LIGHTWEIGHT	**ADVANTAGES**
★★★★★	★★★★★	**EASE OF CONNECTION**
★★★	★★★★★	**SPACE SAVING**
★★★★★	★★★★★	**WEIGHT SAVING**
★★★	N/A	**EMI PERFORMANCE**
-55°C / +150°C OR -55°C / +200°C, DEPENDING ON RESIN OPTION		**TEMPERATURE**
IP67 / IP68*	N/A	**WATER RESISTANCE**
20 g	N/A	**VIBRATION**
50 g	N/A	**SHOCK**
MINIMUM 500 CYCLES, PLEASE SPECIFY IF MORE ARE REQUIRED		**MATING CYCLES**
MODERN SOLDIER SYSTEMS, GENERAL INDUSTRY.	MEDICAL, MILITARY, PROTOTYPING.	**APPLICATIONS**

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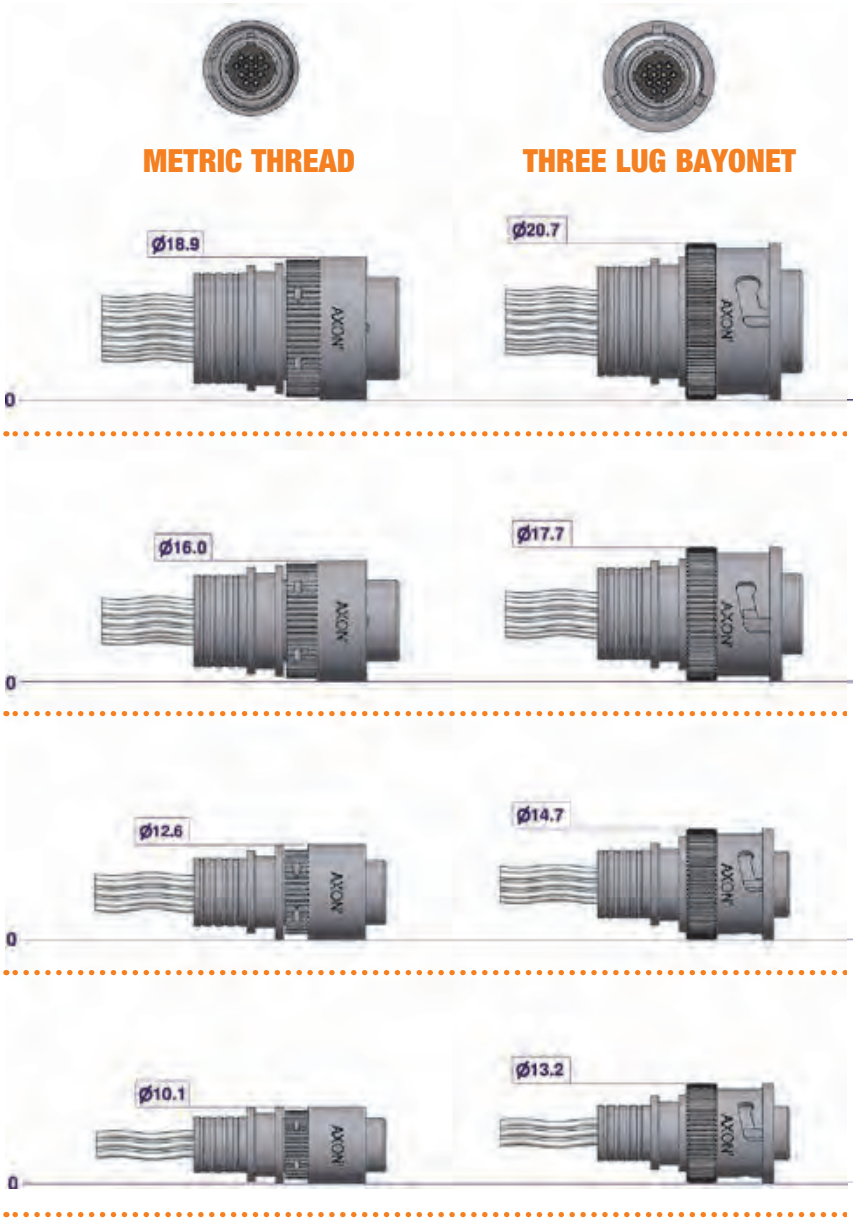
CONNECTOR DIMENSIONS

All drawings on these two pages are drawn at scale 1:1. Dimensions are in millimeters.
The front views are 12 way connectors.

1:1



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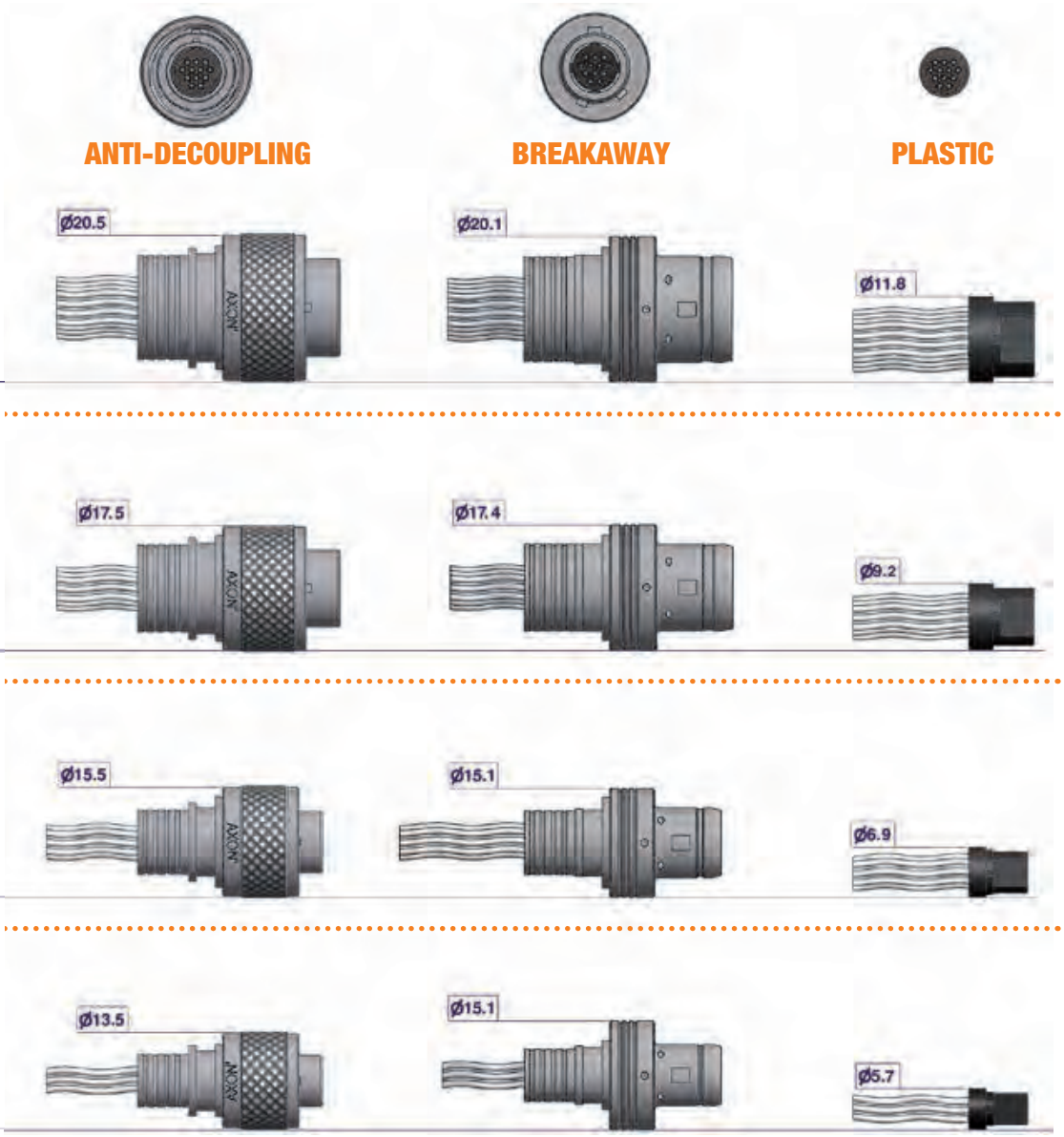
CONNECTOR DIMENSIONS

	METRIC THREAD	THREE LUG BAYONET	ANTI-DECOUPLING	BREAKAWAY	PLASTIC
37 WAYS	18.9 (.744)	20.7 (.815)	20.5 (.807)	20.1 (.791)	11.8 (.465)
19 WAYS	16 (.63)	17.7 (.697)	17.5 (.689)	17.4 (.685)	9.2 (.362)
12/15 WAYS	12.6 (.496)	14.7 (.579)	15.5 (.61)	15.1 (.594)	6.9 (.272)
5/7 WAYS	10.1 (.398)	13.2 (.52)	13.5 (.531)	15.1 (.594)	5.7 (.224)

Dimensions are in millimeters (inches).



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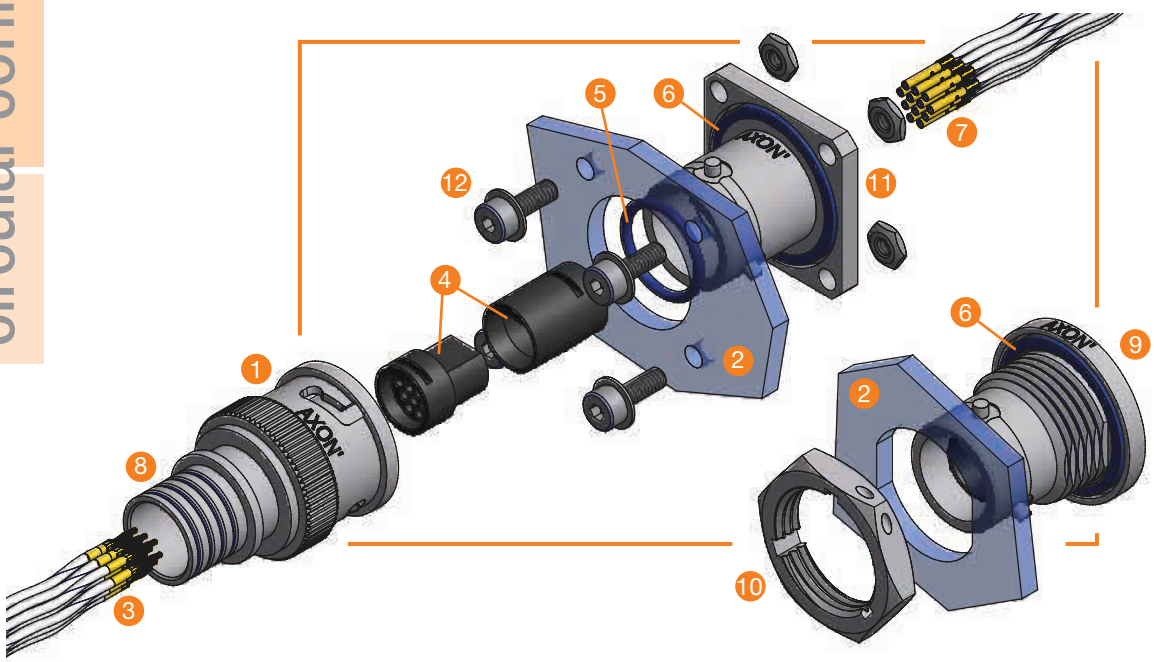
GLOSSARY OF TERMS



IN-LINE PLUG SHELL	1	Cable connector metal body
PANEL CUT-OUT	2	Shape used to lock socket receptacle in position
TWIST PIN	3	Male contact, fitted to male connector
INSERT	4	Moulded insulation housing, separating each connection
INTERNAL O-RING	5	For waterproofness between plug and socket connector
PANEL SEAL	6	For waterproofness between the panel and the socket connector
SOCKET	7	Female contact, fitted to femal connector
REAR FUNNEL	8	For in-line plugs only - Short version for heatshrink boot only or long for screen termination and heatshrink boot
JAM NUT RECEPTACLE	9	Female connector metal body locked by special nut
SPECIAL NUT	10	Locks the jam nut socket receptacle to the panel
SQUARE FLANGE RECEPTACLE	11	Female connector metal body locked by 4 screws
HEX. SOCKET HEAD SCREW	12	Locks the square flange socket receptacle to the panel

Standard connector	Manufactured to the standard dimensions and specifications.
Special connector	A standard connector modified to meet specific customer requirements.
Custom made connector	Designed to meet specific customer requirements.
Pigtail connector	Connector with insulated or uninsulated wires.
Solder cup connector	Connector with solder cup type of contacts, usually used for prototyping.
Harness	Cable assembly with two or more connectorised ends.
LCP	Liquid Crystal Polymer.
Potting	Epoxy compound used as an encapsulant.
In-line plug	Male or female cable connector.
Panel mount connector	Female connector designed to be mounted onto a panel, either with a nut or 4 screws.

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GENERAL CHARACTERISTICS

Based on the standard technology of our Micro-D rectangular range with twist pin contacts, the performances and characteristics of the Micro-D circular range are ideally suited to equipment and applications where weight, miniaturisation and long term performance are required. It is available in 6 contact arrangements, from 05 to 37 contacts.

TECHNICAL DATA SHEET

CHARACTERISTIC	SPECIFICATION	TEST METHOD
CURRENT RATING	3 A max.	EIA-364-70
CONTACT RESISTANCE	8 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - SEA LEVEL 0 M - ALTITUDE 21 KM (70.000 FT)	 600 VAC 150 VAC	EIA-364-20
CONTACT ENGAGING & SEPARATION FORCE (FOR TWIST-PIN CONTACT PAIR)	170 g max. (6 oz) 14 g min. (0.5 oz)	EIA-364-37
BREAKAWAY CONNECTOR DE-MATING FORCES (AVERAGE, FOR WHOLE CONNECTORS)	5 ways: 25 N - 7 ways: 27 N 12 ways: 30 N - 15 ways: 35 N 19 ways: 50 N - 37 ways: 65 N	EIA-364-09
CONTACT RETENTION	2.26 kg (5 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	500 mating cycles min.	EIA-364-09
TEMPERATURE RANGE: - STANDARD - HIGH TEMPERATURE	-55°C / +150°C -55°C / +200°C	
VIBRATION	20 g - no discontinuity > 1 µs	EIA-364-28 TEST CONDITION IV
SHOCK	50 g - no discontinuity > 1 µs	EIA-364-27 TEST CONDITION E
SALT SPRAY	48 Hours	EIA-364-26 TEST CONDITION B
WATER RESISTANCE	IP67	IEC 60529
HUMIDITY	Insulation resistance > 1 MΩ	EIA-364-31 TEST METHOD IV
SHELL TO SHELL CONDUCTIVITY	10 mΩ max	EIA-364-83
SHIELDING EFFECTIVNESS	40 to 55 dB up to 10 GHz (depending on versions)	IEC 61276

MATERIALS AND FINISHES

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µm (0.00005 in) MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27 µm (0.00005 in) TO 3.81µm (0.00015 in))
FEMALE CONTACT	COPPER ALLOY	
METAL SHELLS / FUNNELS / NUTS	ALUMINIUM ALLOY, TYPE 7075	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 4, .0005 INCH MIN.
	BRASS	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, .0005 INCH MIN.
	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
PLASTIC INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	-
O-RING / PANEL SEALS	FLUOROSILICONE RUBBER	-
ENCAPSULANT	EPOXY RESIN	-
INSULATED WIRE	PTFE INSULATED SILVER PLATED COPPER WITH NEMA-HP3	-
	PTFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/11	-
	CROSSLINKED ETFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33	-
UNINSULATED WIRE	GOLD PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A59551	-
	TIN PLATED SOLID COPPER WIRE IN ACCORDANCE WITH A-A59551	-
SPRINGS FOR BREAKAWAY	STAINLESS STEEL	-

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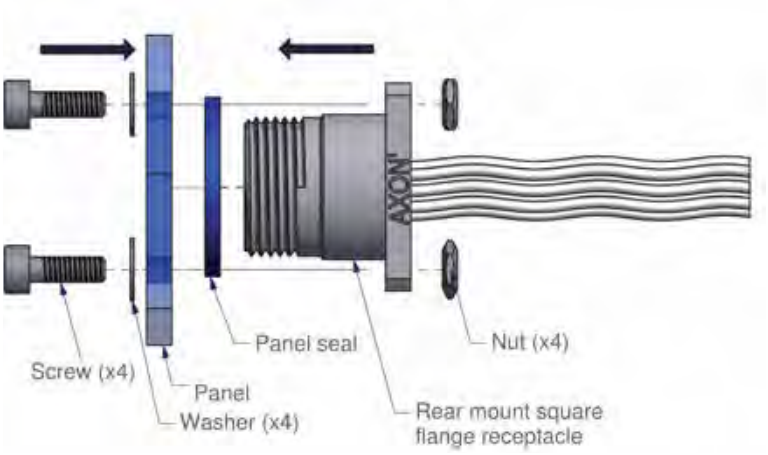
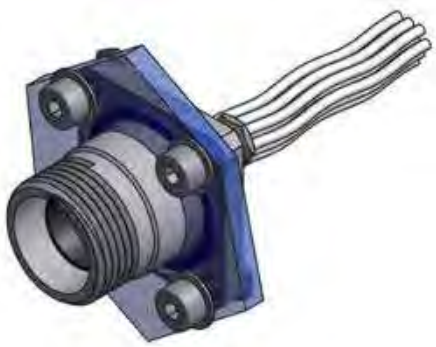
REAR PANEL MOUNTING GUIDE

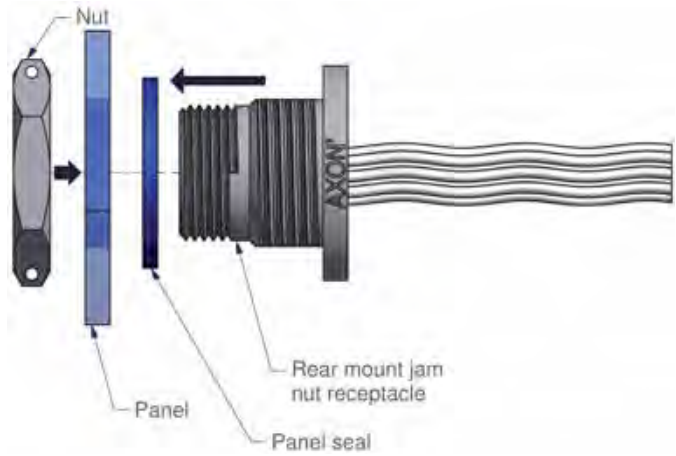
In addition to our in-line male and female plugs, designed to be used with flying leads or composite cables, we have designed 4 versions of panel mount connectors, equipped with panel seal, to support a wide range of mounting configurations. Available for selection are either a jam nut round flange or square flange with 4 screws, both for front or rear mount configuration. Installation recommendations are presented in the following diagrams. All the details of panel cut-outs are available pages 350 to 353.

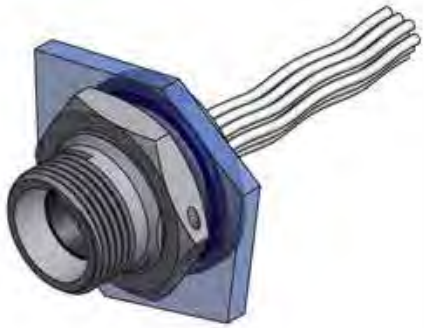
SQUARE FLANGE RECEPTACLES





JAM NUT RECEPTACLES





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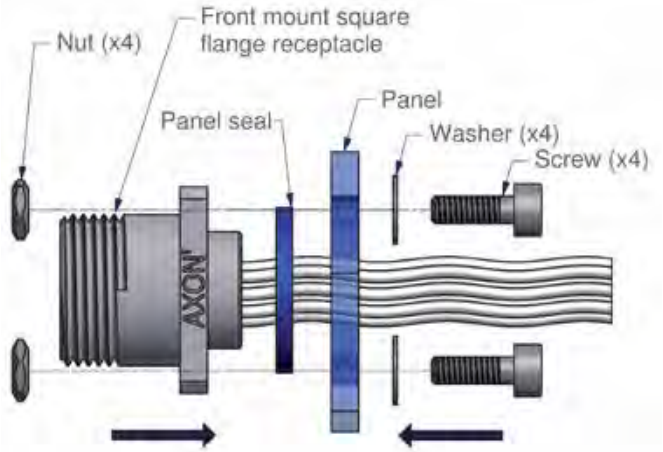
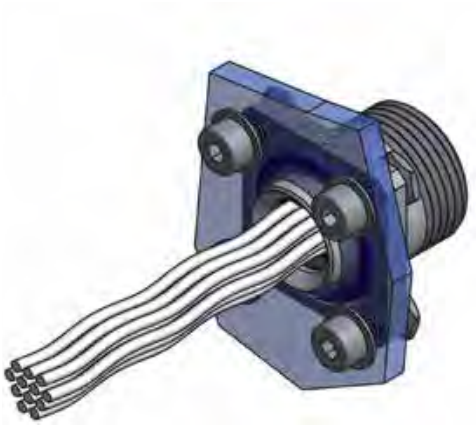
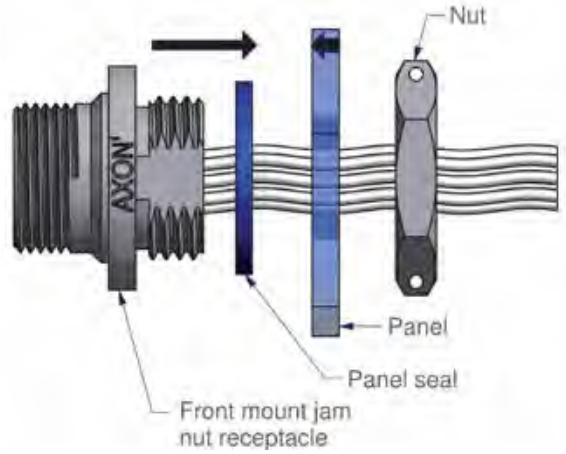
FRONT PANEL MOUNTING GUIDE

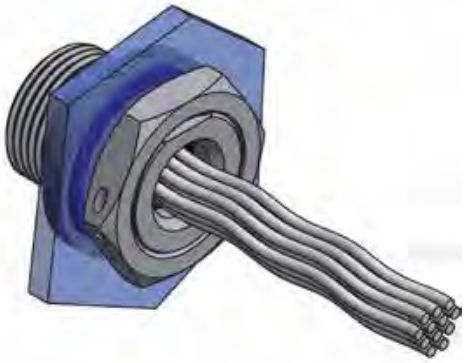
SQUARE FLANGE RECEPTACLES





JAM NUT RECEPTACLES





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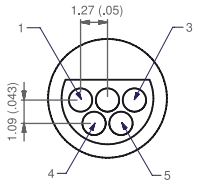
CONTACT ARRANGEMENTS

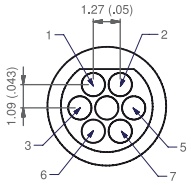
Mating face of male circular connector

- 1.27 mm (.050") contact spacing.

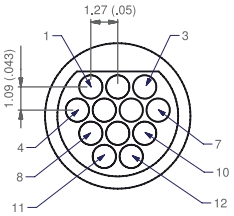
Dimensions are in millimeters (inches).



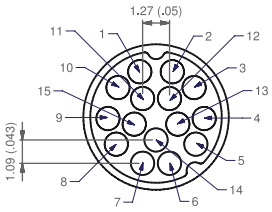
5 CONTACTS



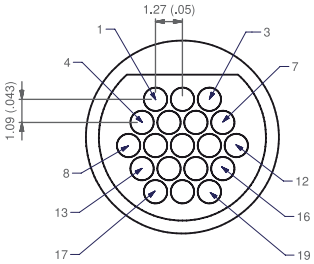
7 CONTACTS



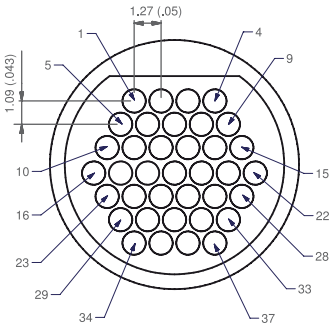
12 CONTACTS



15 CONTACTS



19 CONTACTS



37 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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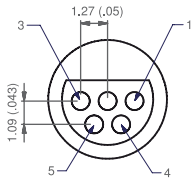
CONTACT ARRANGEMENTS

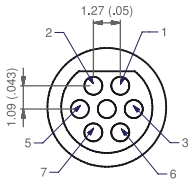
Mating face of female circular connector

- 1.27 mm (.050") contact spacing.

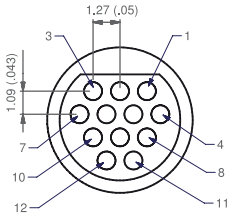
Dimensions are in millimeters (inches).



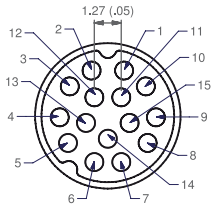
5 CONTACTS



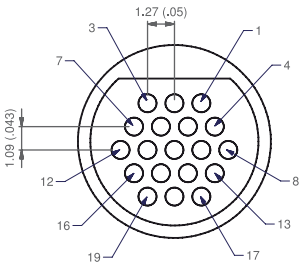
7 CONTACTS



12 CONTACTS



15 CONTACTS



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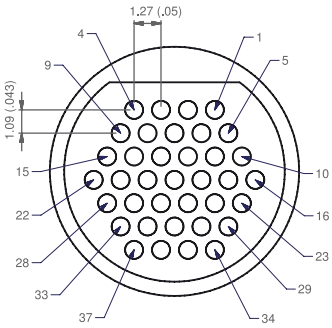

37 CONTACTS

OTHER CONTACT ARRANGEMENTS AVAILABLE ON REQUEST

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REACH & RoHS COMPLIANCE

RoHS compliance

AXON' CABLE has been pro-actively implementing measures for many years to ensure compliance with the European Directive 2011/65/EU which came into force on 21st July 2011. The Directive prohibits the use of Hazardous Substances such as lead, mercury, hexavalent chromium, cadmium, bromine compounds (PBB and PBDE) and various phtalates. It relates to all components of products which are used in the manufacture of electrical and electronic equipment.

As a cable and connector manufacturer, AXON' has taken actions to ensure compliance with directive 2000/53/EC applicable since 21st October 2000.

COMPONENT SPECIFIC RoHS COMPLIANCE

COMPONENT	MATERIAL	FINISH	RoHS STATUS
PIN CONTACT (TWIST PIN)	COPPER + BERYLLIUM COPPER	GOLD	RoHS Compliant
SOCKET CONTACT	COPPER ALLOY	GOLD	RoHS Compliant
PLASTIC SHELL & INSERT	LIQUID CRYSTAL POLYMER	N/A	RoHS Compliant
PCB TRAY	PEEK SERIE 1000	N/A	RoHS Compliant
METAL SHELL	ALUMINIUM ALLOY SERIES 7000	ELECTROLESS NICKEL	RoHS Compliant
	BRASS	ELECTROLESS NICKEL	RoHS Compliant
O-RING SEAL	FLUOROSILICONE RUBBER	N/A	RoHS Compliant
SPRING WASHERS & LATCHING SPRINGS	STAINLESS STEEL 300 SERIES	PASSIVATION	RoHS Compliant
ENCAPSULANT	EPOXY RESIN 150°C VERSION	N/A	RoHS Compliant
	EPOXY RESIN 200°C VERSION	N/A	RoHS Compliant
«STANDARD» SERIES PCB TERMINATION	SOLID COPPER WIRE	GOLD	RoHS Compliant
	SOLID COPPER WIRE	NOT LEADED TIN 97% MAX TIN	RoHS Compliant

Application of REACH

The new EU regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) came into force in June 2007. The regulation concerns the authorised use of chemicals. It requires manufacturers and importers to register substances and their use with the European Chemical Agency (ECHA).

AXON' CABLE is known as a "downstream user" with respect to the REACH regulation, and a manufacturer of "Articles". AXON' CABLE products are not intended to release any undesired substance under normal and reasonable operations of use.

To this day AXON' CABLE have not identified any component containing any SVHC in their product range.

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WIRE CODES

Nominal dimensions are used throughout this chapter.

Solid uninsulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT g/m	CONDUCTOR					
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/1000 ft)
G	GPC2501	1.45	GOLD PLATED COPPER	25	1x0.455 1x.018	0.455 .018	0.163 .000252	11 33.5
T	TPCL2401	1.81	TIN PLATED COPPER	24	1x0.510 1x.0201	0.510 .0201	0.205 .000317	9 27.4
T (FOR PCB)	GPC2501 RoHS SOLDER DIPPED TIN	1.81	GOLD PLATED COPPER AND TIN LEAD-FREE (97% TIN MAX.)	24	1x0.510 1x.0201	0.510 .0201	0.205 .000317	11 33.5

Insulated wires

WIRE CODE	WIRE DESIGNATION	WEIGHT g/m	CONDUCTOR						INSULATION		TEMPERATURE RATING	VOLTAGE RATING
			MATERIAL	AWG	CONSTRUCTION mm (inch)	Ø mm (inch)	AREA mm² (sq in)	RESISTANCE Ω/100m (Ω/1000 ft)	MATERIAL	Ø mm (inch)		
1	E 2607	2.70	SPC **	26	7x0.160 7x.0063	0.480 .0189	0.141 .000218	12.8 39.0	EXTRUDED PTFE	1.00 .039	-90°C / +200°C	600 VAC
3	M22759/11-26*	2.82	SPC **	26	19x0.102 19x.0040	0.504 .020	0.154 .000239	12.6 38.4	EXTRUDED PTFE	0.96 .038	-90°C / +200°C	600 VAC
4	E 2619	3.00	SPC **	26	19x0.102 19x.0040	0.504 .020	0.154 .000239	12 36.6	EXTRUDED PTFE	1.00 .039	-90°C / +200°C	600 VAC
6	E 2807	2.00	SPC **	28	7x0.127 7x.0050	0.381 .015	0.088 .000137	20.1 61.3	EXTRUDED PTFE	0.90 .035	-90°C / +200°C	600 VAC
8	E 3007	1.50	SPC **	30	7x0.102 7x.0040	0.304 .012	0.057 .000882	31 94.5	EXTRUDED PTFE	0.80 .031	-90°C / +200°C	600 VAC
E	M22759/33-26	2.08	HIGH STRENGTH SPCA ***	26	19x0.102 19x.0040	0.483 .019	0.154 .000238	14.7 44.8	CROSSLINKED EXTRUDED MODIFIED ETFE	0.81 .032	-90°C / +200°C	600 VAC
F	E 2607*	2.70	SPC **	26	7x0.160 7x.0063	0.480 .0189	0.141 .000218	12.8 39.0	EXTRUDED PTFE	1.00 .039	-90°C / +200°C	600 VAC

*: ONLY FOR COLOUR CODE V
**: SILVER PLATED COPPER
***: SILVER PLATED COPPER ALLOY

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WIRE COLOUR CODES

Colour codes F and L

All the wires have the same colour.
Available with all wire types.

COLOUR CODE	COLOUR
F	YELLOW
L	WHITE

OTHER COLOURS AVAILABLE ON REQUEST.

Colour code W

Also called 10 colour repeat (10 colours repeated in sequence) as per MIL-DTL-83513.
Available with all wire types.

PIN NUMBER	MIL-STD-681 NUMBER	COLOUR
1	0	BLACK
2	1	BROWN
3	2	RED
4	3	ORANGE
5	4	YELLOW
6	5	GREEN
7	6	BLUE
8	7	VIOLET
9	8	GREY
10	9	WHITE
11	0	BLACK
12	1	BROWN
13	2	RED
14	3	ORANGE
15	4	YELLOW
16	5	GREEN
17	6	BLUE
18	7	VIOLET
19	8	GREY
20	9	WHITE
21	0	BLACK

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Colour code V

Only available with 2607 AWG wires (Micro-D wire code F) and 2619 AWG wires (Micro-D wire code 3).
Colours and coloured stripes as per MIL-STD-681 system (except the appropriate colour code is the contact number minus 1).

Only available for Micro-D connectors with 51 contacts or less.

CONTACT NUMBER	MIL-STD-681 NUMBER	BASE COLOUR	FIRST STRIPE	SECOND STRIPE
1	0	BLACK	-	-
2	1	BROWN	-	-
3	2	RED	-	-
4	3	ORANGE	-	-
5	4	YELLOW	-	-
6	5	GREEN	-	-
7	6	BLUE	-	-
8	7	VIOLET	-	-
9	8	GREY	-	-
10	9	WHITE	-	-
11	90	WHITE	BLACK	-
12	91	WHITE	BROWN	-
13	92	WHITE	RED	-
14	93	WHITE	ORANGE	-
15	94	WHITE	YELLOW	-
16	95	WHITE	GREEN	-
17	96	WHITE	BLUE	-
18	97	WHITE	VIOLET	-
19	98	WHITE	GREY	-
20	901	WHITE	BLACK	BROWN
21	902	WHITE	BLACK	RED
22	903	WHITE	BLACK	ORANGE
23	904	WHITE	BLACK	YELLOW
24	905	WHITE	BLACK	GREEN
25	906	WHITE	BLACK	BLUE
26	907	WHITE	BLACK	VIOLET
27	908	WHITE	BLACK	GREY
28	912	WHITE	BROWN	RED
29	913	WHITE	BROWN	ORANGE
30	914	WHITE	BROWN	YELLOW
31	915	WHITE	BROWN	GREEN
32	916	WHITE	BROWN	BLUE
33	917	WHITE	BROWN	VIOLET
34	918	WHITE	BROWN	GREY
35	923	WHITE	RED	ORANGE
36	924	WHITE	RED	YELLOW
37	925	WHITE	RED	GREEN

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TEST & INSPECTION

Micro-D components

METAL SHELLS

- Dimensions measured with non-contact optical equipment.
- Plating thickness measured with X-ray spectrometer.

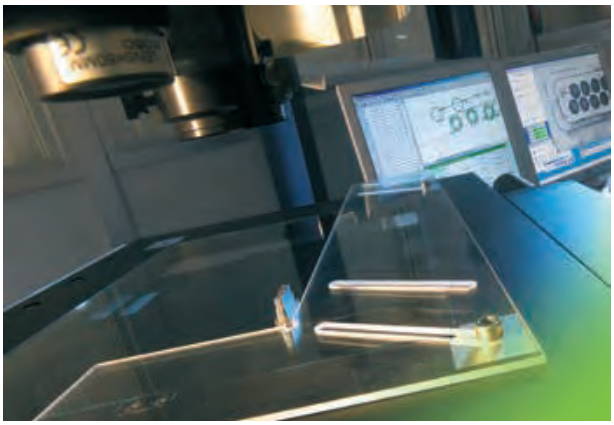
PLASTIC COMPONENTS

(shells, inserts, trays for PCB connectors,…).

- Dimensions measured with non-contact optical equipment.

CONTACTS

- Dimensions measured with non-contact optical equipment.
- Plating thickness measured with X-ray spectrometer.
- Insertion and retention forces.
- Electrical resistance of mated contacts.



NON CONTACT OPTICAL MEASUREMENT

EXAMPLE OF CONTACT INSPECTION

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Micro-D assemblies

AXON' carries out electrical tests on all the manufactured Micro-D harnesses and connectors.

TYPICAL TESTS

FOR MICRO-D HARNESSES	FOR MICRO-D PCB CONNECTORS
- continuity. - insulation resistance.	- contact resistance. - insulation resistance. - dielectric strength.

If requested by the customer for special products, AXON' can carry out other tests such as:

- Transfer impedance (Z_T) for shielded harnesses.
- Insertion and return loss for Micro-D with coaxial contacts.
- Attenuation plots for filtered products.
- Waterproofness tests.
- X-ray inspection.
- Mating and de-mating tests.
- And other specific tests as required.

AXON' carries out sample inspection for visual and dimensional criteria. The goods are delivered with:

- a certificate of compliance.
- a test report (on request).

AXON' maintains batch traceability records for 10 years (or more if required).
In order to guarantee a high quality level for each product, AXON' uses a wide variety of production tools, systems, machines and jigs. These include optimized line design, poka yoke, standardized operations and TPM (Total Productive Maintenance).

▲ STIRRED MODE CHAMBER

▲ AUTOMATIC CONTINUITY & INSULATION RESISTANCE TEST

▲ X-RAY INSPECTION

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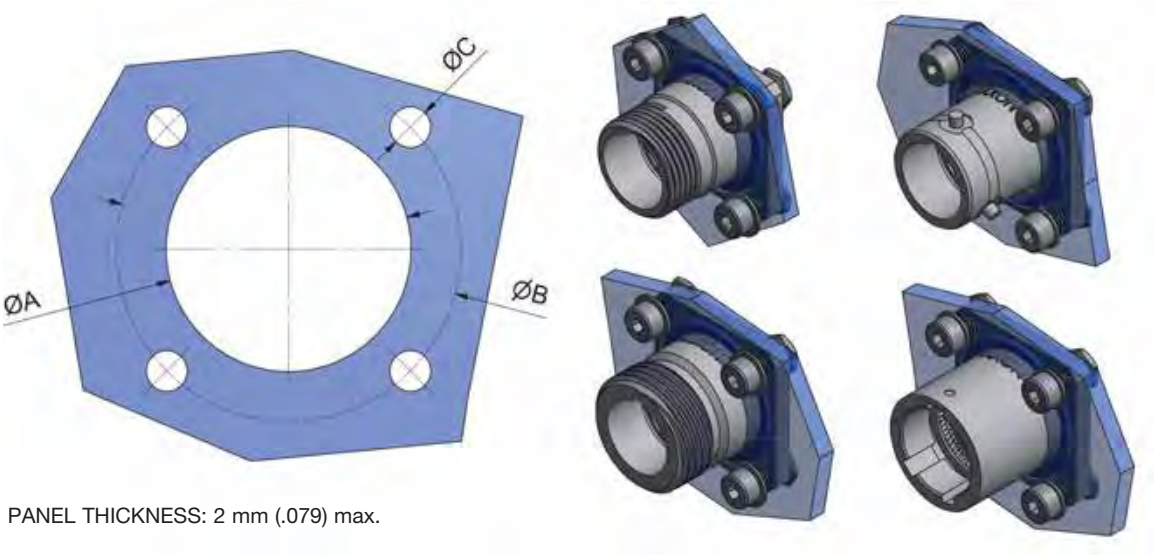
PANEL CUT-OUTS FOR REAR MOUNT SQUARE FLANGE RECEPTACLES



PANEL THICKNESS: 2 mm (.079) max.

TABLE OF DIMENSIONS - millimetres (inches)

NUMBERS OF WAYS	CONNECTOR TYPE	A +0.3/-0 (+0.012/-0)	B (BSC)	C ±0.05 (±0.002)
5 OR 7	METRIC THREAD	9.7 (.382)	16 (.631)	2.2 (.087)
	THREE LUG BAYONET	11.7 (.461)	18.5 (.728)	2.2 (.087)
	TRIPLE START	11.7 (.461)	18.5 (.728)	2.2 (.087)
	BREAKAWAY	13.2 (.52)	19.5 (.768)	2.2 (.087)
12 OR 15	METRIC THREAD	11.7 (.461)	18.5 (.728)	2.2 (.087)
	THREE LUG BAYONET	13.2 (.52)	19.5 (.768)	2.2 (.087)
	TRIPLE START	13.2 (.52)	19.5 (.768)	2.2 (.087)
	BREAKAWAY	13.2 (.52)	19.5 (.768)	2.2 (.087)
19	METRIC THREAD	15.2 (.598)	22.5 (.886)	3.2 (.126)
	THREE LUG BAYONET	16.2 (.638)	24.5 (.965)	3.2 (.126)
	TRIPLE START	15.2 (.598)	22.5 (.886)	3.2 (.126)
	BREAKAWAY	15.9 (.626)	24.5 (.965)	3.2 (.126)
37	METRIC THREAD	17.2 (.677)	24.5 (.965)	3.2 (.126)
	THREE LUG BAYONET	19.2 (.756)	27 (1.063)	3.2 (.126)
	TRIPLE START	18.5 (.728)	27 (1.063)	3.2 (.126)
	BREAKAWAY	18.6 (.732)	27.5 (1.083)	3.2 (.126)

Recommended screws for panel mounting

HOLE DIMENSIONS	ISO METRIC THREAD SCREWS	UNIFIED THREAD STANDARD SCREWS
2.2 (.087)	DIN EN ISO 4762 - CHC M2 x 6	CHC 2-56 UNC - 1/4
3.2 (.126)	DIN EN ISO 4762 - CHC M3 x 8	CHC 4-40 UNC - 5/16

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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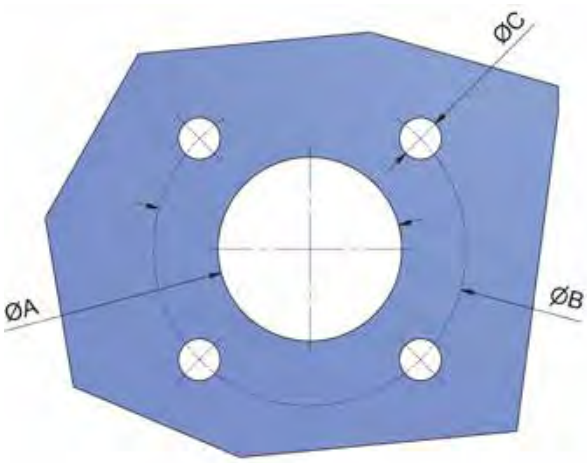
PANEL CUT-OUTS FOR FRONT MOUNT SQUARE FLANGE RECEPTACLES



PANEL THICKNESS: 2 mm (.079) max.

TABLE OF DIMENSIONS - millimetres (inches)

NUMBERS OF WAYS	CONNECTOR TYPE	A +0.3/-0 (+0.012/-0)	B (BSC)	C ±0.05 (±0.002)
5 OR 7	METRIC THREAD	8.7 (.342)	16 (.631)	2.2 (.087)
	THREE LUG BAYONET	9.7 (.382)	16 (.631)	2.2 (.087)
	TRIPLE START	9.2 (.362)	16 (.631)	2.2 (.087)
	BREAKAWAY	9.7 (.382)	19 (.748)	2.2 (.087)
12 OR 15	METRIC THREAD	8.7 (.342)	16.5 (.65)	2.2 (.087)
	THREE LUG BAYONET	9.7 (.382)	17 (.669)	2.2 (.087)
	TRIPLE START	9.2 (.362)	17 (.669)	2.2 (.087)
	BREAKAWAY	9.7 (.382)	19 (.748)	2.2 (.087)
19	METRIC THREAD	12.2 (.48)	19 (.748)	2.2 (.087)
	THREE LUG BAYONET	12.2 (.48)	19 (.748)	2.2 (.087)
	TRIPLE START	12.2 (.48)	19 (.748)	2.2 (.087)
	BREAKAWAY	13.2 (.52)	23 (.906)	3.2 (.126)
37	METRIC THREAD	15.2 (.598)	24 (.945)	3.2 (.126)
	THREE LUG BAYONET	15.2 (.598)	24 (.945)	3.2 (.126)
	TRIPLE START	15.2 (.598)	24 (.945)	3.2 (.126)
	BREAKAWAY	15.2 (.598)	26 (1.024)	3.2 (.126)

Recommended screws for panel mounting

HOLE DIMENSIONS	ISO METRIC THREAD SCREWS	UNIFIED THREAD STANDARD SCREWS
2.2 (.087)	DIN EN ISO 4762 - CHC M2 x 6	CHC 2-56 UNC - 1/4
3.2 (.126)	DIN EN ISO 4762 - CHC M3 x 8	CHC 4-40 UNC - 5/16

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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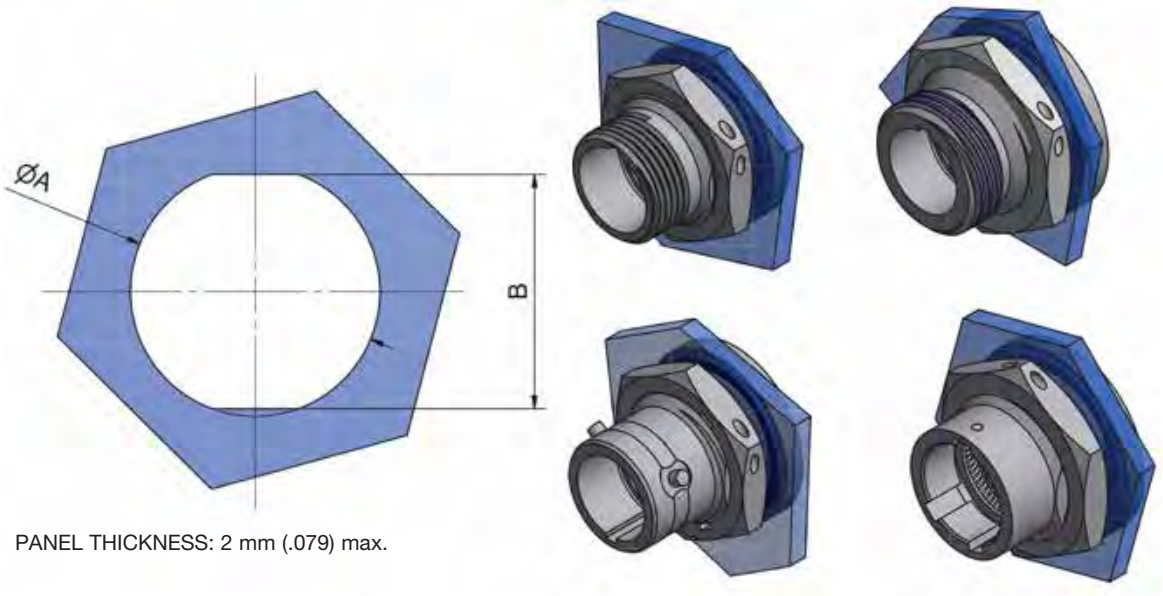
PANEL CUT-OUTS FOR REAR MOUNT JAM NUT RECEPTACLES



PANEL THICKNESS: 2 mm (.079) max.

TABLE OF DIMENSIONS - millimetres (inches)

NUMBERS OF WAYS	CONNECTOR TYPE	A +0.3/-0 (+0.012/-0)	B +0.3/-0 (+0.012/-0)	NUT THREAD	RECOMMENDED TORQUE
5 OR 7	METRIC THREAD	12.2 (.48)	11.2 (.441)	M12x1	1.5 Nm
	THREE LUG BAYONET	12.2 (.48)	11.2 (.441)	M12x1 + NOTCH*	1.5 Nm
	TRIPLE START	13.2 (.62)	12.2 (.48)	M13x1	1.5 Nm
	BREAKAWAY	15.2 (.598)	13.2 (.62)	M14x0.75	1.5 Nm
12 OR 15	METRIC THREAD	13.2 (.62)	12.2 (.48)	M13x1	1.5 Nm
	THREE LUG BAYONET	13.2 (.52)	12.2 (.48)	M13x1 + NOTCH*	1.5 Nm
	TRIPLE START	15.2 (.598)	14.2 (.559)	M15x1	1.5 Nm
	BREAKAWAY	15.2 (.598)	13.2 (.62)	M14x0.75	1.5 Nm
19	METRIC THREAD	16.2 (.638)	15.2 (.598)	M16x1	2 Nm
	THREE LUG BAYONET	16.2 (.638)	15.2 (.598)	M16x1 + NOTCH*	2 Nm
	TRIPLE START	17.2 (.677)	16.2 (.638)	M17x1	2 Nm
	BREAKAWAY	18.2 (.717)	16.2 (.638)	M18x1	2 Nm
37	METRIC THREAD	19.2 (.756)	18.2 (.717)	M19x1	2 Nm
	THREE LUG BAYONET	19.2 (.756)	18.2 (.717)	M19x1 + NOTCH*	2 Nm
	TRIPLE START	20.2 (.795)	19.2 (.756)	M20x1	2 Nm
	BREAKAWAY	20.2 (.795)	19.2 (.756)	M20x1	2 Nm

*: We recommend front mount for Three Lug Bayonet, please contact us for specific rear mount cut-outs.

SUPPLIED WITH JAM NUTS

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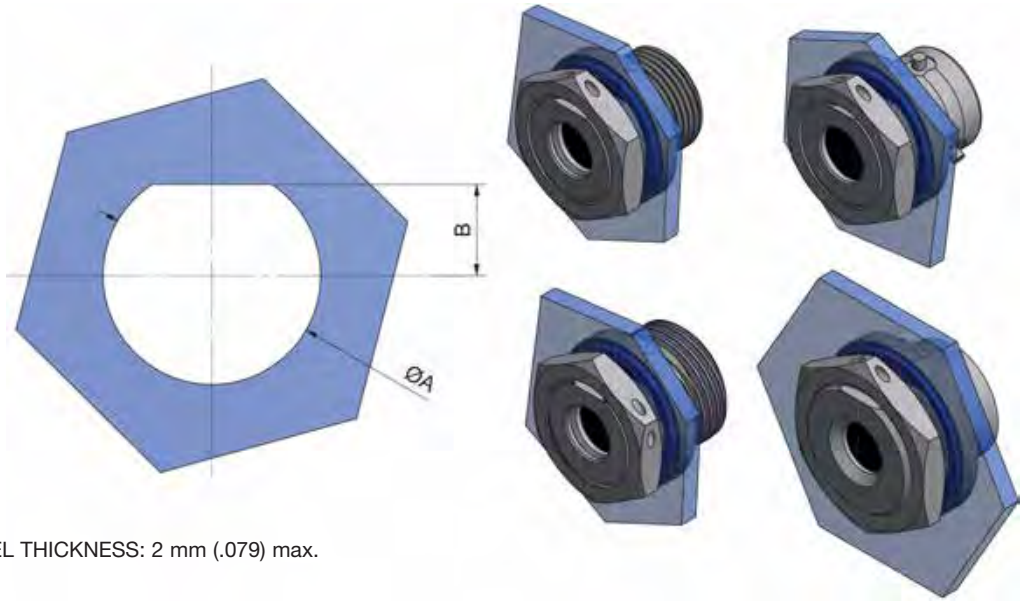
PANEL CUT-OUTS FOR FRONT MOUNT JAM NUT RECEPTACLES



PANEL THICKNESS: 2 mm (.079) max.

TABLE OF DIMENSIONS - millimetres (inches)

NUMBERS OF WAYS	CONNECTOR TYPE	A +0.3/-0 (+0.012/-0)	B +0.3/-0 (+0.012/-s0)	NUT THREAD	RECOMMENDED TORQUE
5 OR 7	METRIC THREAD	9.2 (.362)	3.6 (.142)	M9x0.75	1 Nm
	THREE LUG BAYONET	9.2 (.362)	3.6 (.142)	M9x0.75	1 Nm
	TRIPLE START	9.2 (.362)	3.6 (.142)	M9x0.75	1 Nm
	BREAKAWAY	13.2 (.52)	5.6 (.22)	M13x1	1.5 Nm
12 OR 15	METRIC THREAD	12.2 (.48)	5.1 (.201)	M9x0.75	1 Nm
	THREE LUG BAYONET	12.2 (.48)	5.1 (.201)	M9x0.75	1 Nm
	TRIPLE START	12.2 (.48)	5.1 (.201)	M9x0.75	1 Nm
	BREAKAWAY	15.2 (.598)	6.6 (.26)	M15x1	1.5 Nm
19	METRIC THREAD	13.2 (.52)	5.85 (.201)	M12x1	1.5 Nm
	THREE LUG BAYONET	13.2 (.52)	5.85 (.201)	M12x1	1.5 Nm
	TRIPLE START	13.2 (.52)	5.85 (.201)	M12x1	1.5 Nm
	BREAKAWAY	17.2 (.677)	7.1 (.28)	M17x1	2 Nm
37	METRIC THREAD	16.2 (.64)	7.35 (.289)	M15x1	1.5 Nm
	THREE LUG BAYONET	16.2 (.64)	7.35 (.289)	M15x1	1.5 Nm
	TRIPLE START	16.2 (.64)	7.35 (.289)	M15x1	1.5 Nm
	BREAKAWAY	19.2 (.756)	8.6 (.339)	M19x1	2 Nm

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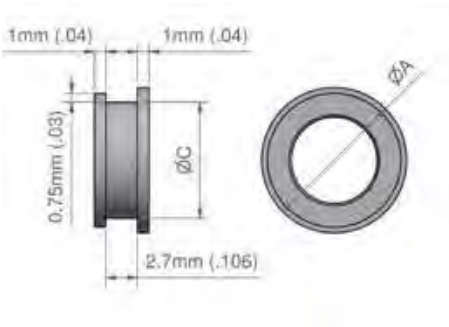
REAR FUNNEL DIMENSIONS

Our in-line male and female plugs are available with two types of funnel, both designed to provide effective cable termination with heat-shrink tubing and boots. A groove on the funnels is designed to ensure excellent grip with the lip of the heat-shrink boot.

Short version for heat shrinkable boots



Long version for AXOCLAMP® & heat shrinkable boots

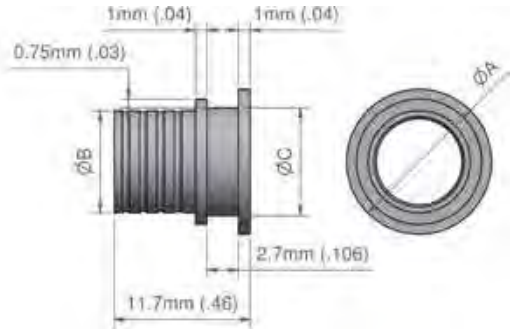


TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B (MAX)	Ø C (MAX)
5 OR 7	9.6 (.378)	7.2 (.283)	8 (.315)
12 OR 15	12 (.472)	8.8 (.346)	9 (.354)
19	14.6 (.575)	12 (.472)	12 (.472)
37	17.1 (.673)	14.4 (.567)	15 (.591)

▲ HEAT SHRINKABLE BOOTS

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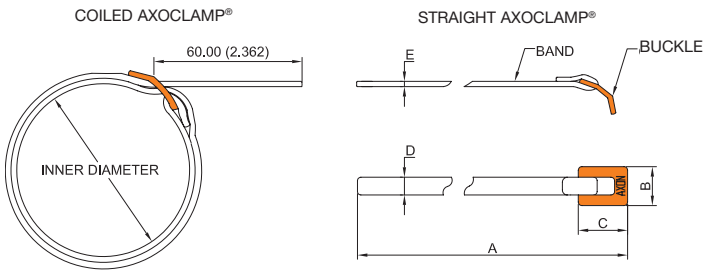
AXOCLAMP® EMI BAND TERMINATION

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

AXCL	01
AXOCLAMP®	BAND TYPES 01: standard 03: microband double wrapped

The standard version is coiled but straight AXOCLAMP® can be delivered on request (reference example AXCL03D). Minimum quantity: 100 pieces per reference.

DIMENSIONS

Dimensions are in millimetres (inches).

SPECIFICATIONS	AXOCLAMP® STANDARD	AXOCLAMP® MICROBAND
REFERENCE	**AX CL 01**	**AX CL 03**
DIMENSION A	375 (14.764)	200 (7.874)
DIMENSION B	9 (.364)	5.2 (.205)
DIMENSION C	10 (.394)	5.5 (.217)
DIMENSION D	5.9 (.232)	3 (.118)
DIMENSION E	0.5 (.020)	0.35 (.014)
MINIMUM DIAMETER*	10 (.394)	5 (.197)
MAXIMUM DIAMETER*	40 (1.575)	15 (.591)

*: Minimum and maximum diameter of the rear funnel on which the AXOCLAMP® can be mounted.
For other dimensions, please consult us.

BANDING TOOLS

	MANUAL HAND TOOL	CLAMPING VALUES	PNEUMATIC CLAMPING TOOL	RECOMMANDED BANDING VALUES*	CALIBRATION DEVICE
AXOCLAMP® AX CL 01	A 40199	100-180 LBS	A 35199	160	A 50099
AXOCLAMP® AX CL 03	A 30199	60-100 LBS	A 35599	90	A 50099

*: Banding values are given for information only.

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METAL PIGTAIL MICRO-D CIRCULAR CONNECTORS

METRIC THREAD CONNECTORS - MCAT

- Metric Thread range 358
- Identification code. 359
- In-line plugs 360
- Panel mount, female receptacles. 362
- Master key positions / Weights / Torque 364

THREE LUG BAYONET CONNECTORS - MCA3B

- Three Lug Bayonet range 366
- Identification code. 367
- In-line plugs 368
- Panel mount, female receptacles. 370
- Master key positions / Weights 372

TRIPLE START CONNECTORS (ANTI-DECOUPLING) - MCAC

- Triple Start range 374
- Identification code. 375
- In-line plugs 376
- Panel mount, female receptacles. 378
- Master key positions / Weights 380

BREAKAWAY CIRCULAR CONNECTORS - MCABK

- Breakaway range 382
- Identification code. 383
- In-line plugs 384
- Panel mount, female receptacles. 386
- Master key positions / Weights 388

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METRIC THREAD CONNECTOR RANGE - MCAT

The Metric Thread connector range is suited to systems where miniaturization, weight and EMI performances are paramount.

IN-LINE MALE PLUGS

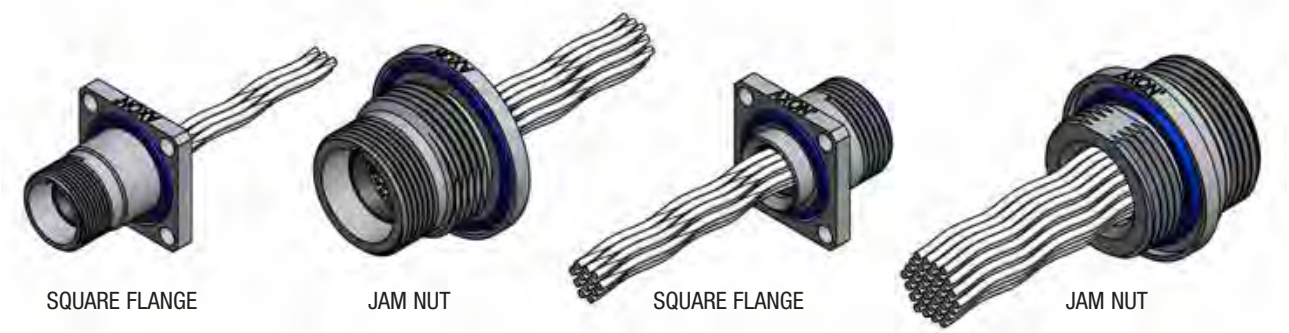
5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

IN-LINE FEMALE PLUGS

5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

PANEL MOUNT JAM NUT & SQUARE FLANGE RECEPTACLES

Rear mount — AVAILABLE IN ALL SIZES — **Front mount**



SQUARE FLANGE | JAM NUT | SQUARE FLANGE | JAM NUT

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IDENTIFICATION CODE

MCA	T	V	07	-	06	P	4	L	050	A	02

SERIES

MCA: Micro-D Circular AXON'.

COUPLING SYSTEM

T: Metric thread.

MATERIAL & FINISH TYPE

V: Nickel plated brass + epoxy resin 150°C.
W: Nickel plated brass + epoxy resin 200°C.

NUMBER OF CONTACTS

05, **07**, **12**, **15**, **19**, **37**.

See pages 342 & 343 for contact arrangements.

CONNECTOR TYPE

00: Rear panel mount square flange receptacle (female only).
01: Front panel mount square flange receptacle (female only).
06: In-line plug (male or female).
07: Rear panel mount jam nut receptacle (female only).
08: Front panel mount jam nut receptacle (female only).

CONNECTOR GENDER

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

WIRE TYPE

1: E2607, AWG 26, 7 strands, 600 V.
4: E2619, AWG 26, 19 strands, 600 V.
6: E2807, AWG 28, 7 strands, 600 V.
8: E3007, AWG 30, 7 strands, 600 V.
E: M22759/33, AWG 26, 19 strands, 600 V.

Specific wires on request.

For colour code V
3: M22759/11, AWG 26, 19 strands, 600 V.
F: E2607, AWG 26, 7 strands, 600 V.

Uninsulated wires (for panel mount only)
G: AWG 25 Gold plated.
T: AWG 24 Tin plated.

See page 345 for wire types.

COLOUR CODE

L: All white.
F: All yellow.
BLANK: If wire type is **G** or **T**.
W: 10 colour repeated code.
V: MIL-STD-681 striped (only for wire types 3 and F).

See pages 346 & 347 for colour code.

WIRE LENGTH (in cm)

Caution! Wire length in centimetres - (1 cm = 10 mm = 0.394").

L	5 ≤ L ≤ 10	10 < L ≤ 100	L >100
in cm (inches)	1.97 ≤ L ≤ 3.940	3.940 < L ≤ 39.40	L > 39.40
TOLERANCE	-0 / +0.5	-0 / +3	-0 / +5
in cm (inches)	-0 / +0.200	-0 / +1.180	-0 / +1.970

MASTER KEY POSITION

A: 0°. **B**: 90°.
C: 180°. **D**: 270°.

See page 364 for master key positions.

REAR FUNNEL (for In-line plugs only)

01: for heat-shrinkable boots only.
02: for 360° screen termination and heat-shrinkable boots.

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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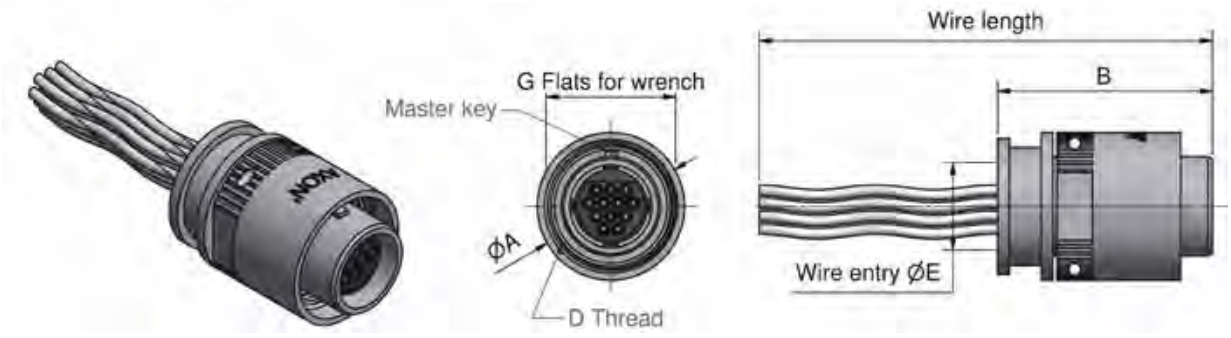
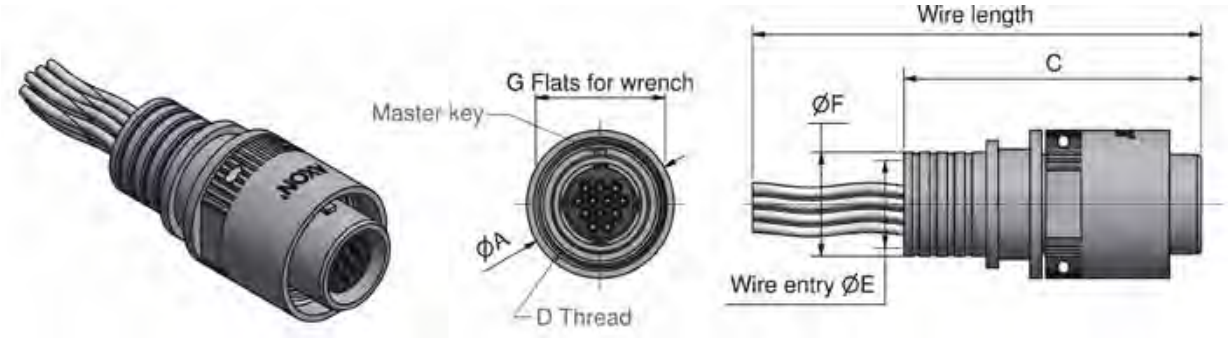


In-line male plug, short funnel (for heat-shrinkable boots only)

MCATxxx-06Pxxxxxx01



In-line male plug, screen termination funnel

MCATxxx-06Pxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	D THREAD	WIRE ENTRY Ø E	SCREEN TERM. FUNNEL Ø F	G FLATS FOR LOW PROFILE WRENCH
5 OR 7	10.1 (.398)	18.45 (.726)	25.45 (1.002)	M9x0.5	5.8 (.228)	7.2 (.283)	9 (.354)
12 OR 15	12.6 (.496)	18.45 (.726)	25.45 (1.002)	M11x0.75	7.4 (.291)	8.8 (.346)	11 (.433)
19	16 (.630)	20.2 (.795)	27.2 (1.071)	M14x0.75	9.6 (.378)	12 (.472)	15 (.591)
37	18.9 (.744)	20.2 (.795)	27.2 (1.071)	M17x1	12 (.472)	14.4 (.567)	18 (.709)

FOR RECOMMENDED TORQUE SEE PAGE 365
FOR MASTER KEY POSITIONS SEE PAGE 364
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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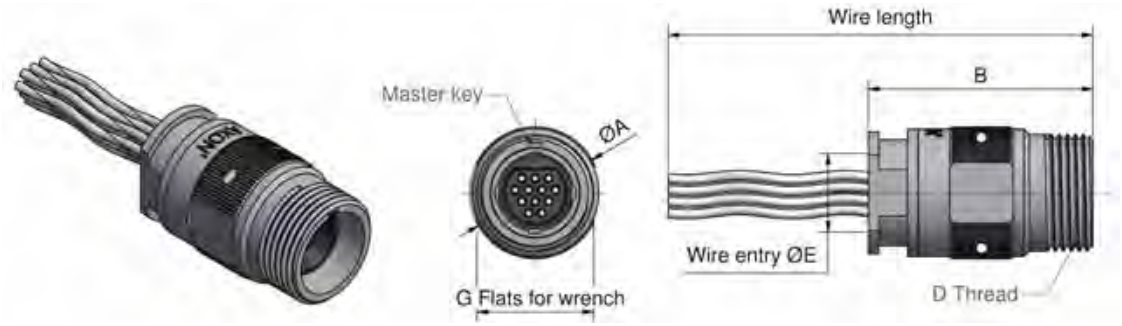
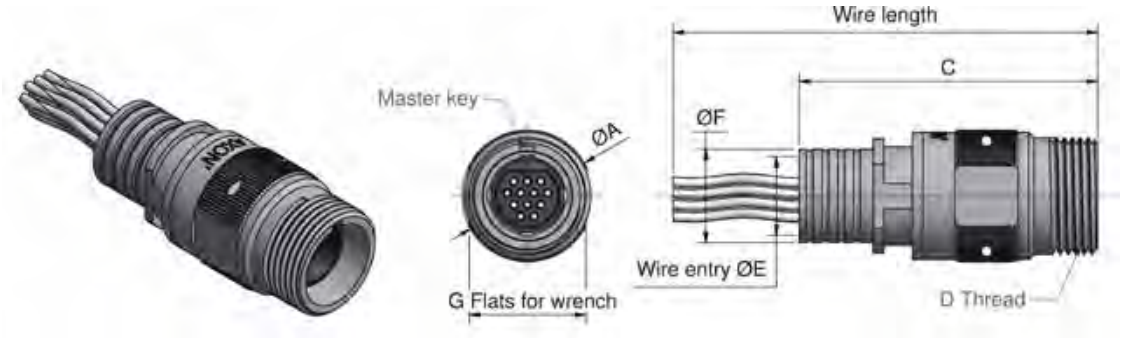


In-line female plug, short funnel (for heat-shrinkable boots only)

MCATxxx-06Sxxxxxx01



In-line female plug, screen termination funnel

MCATxxx-06Sxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	D THREAD	WIRE ENTRY Ø E	SCREEN TERM, FUNNEL Ø F	G FLATS FOR LOW PROFILE WRENCH
5 OR 7	10 (.394)	21.4 (.843)	28.4 (1.118)	M9x0.5	5.8 (.228)	7.2 (.283)	9 (.354)
12 OR 15	12.5 (.492)	21.4 (.843)	28.4 (1.118)	M11x0.75	7.4 (.291)	8.8 (.346)	11 (.433)
19	15 (.591)	22.9 (.902)	29.9 (1.177)	M14x0.75	9.6 (.378)	12 (.472)	14 (.551)
37	17.5 (.689)	22.9 (.902)	29.9 (1.177)	M17x1	12 (.472)	14.4 (.567)	16 (0.63)

FOR MASTER KEY POSITIONS SEE PAGE 364
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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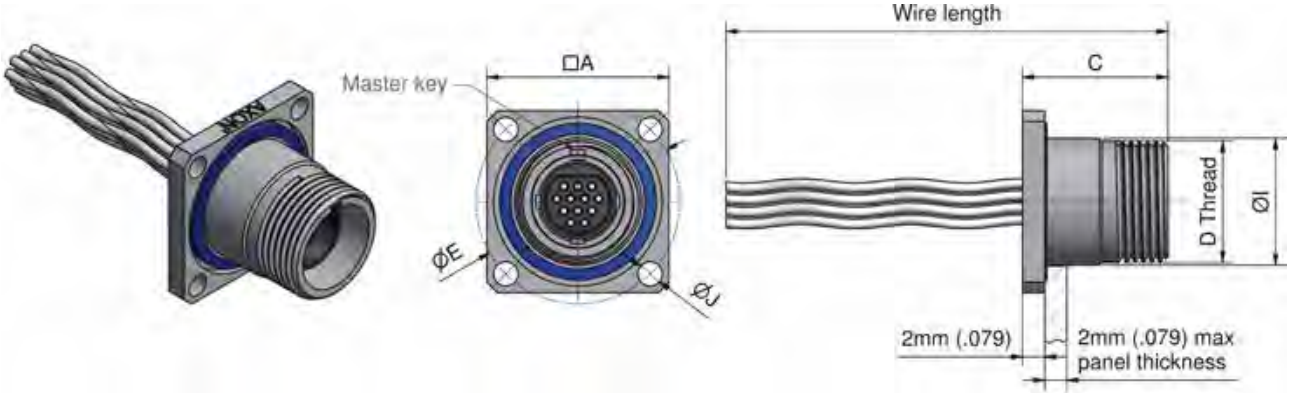
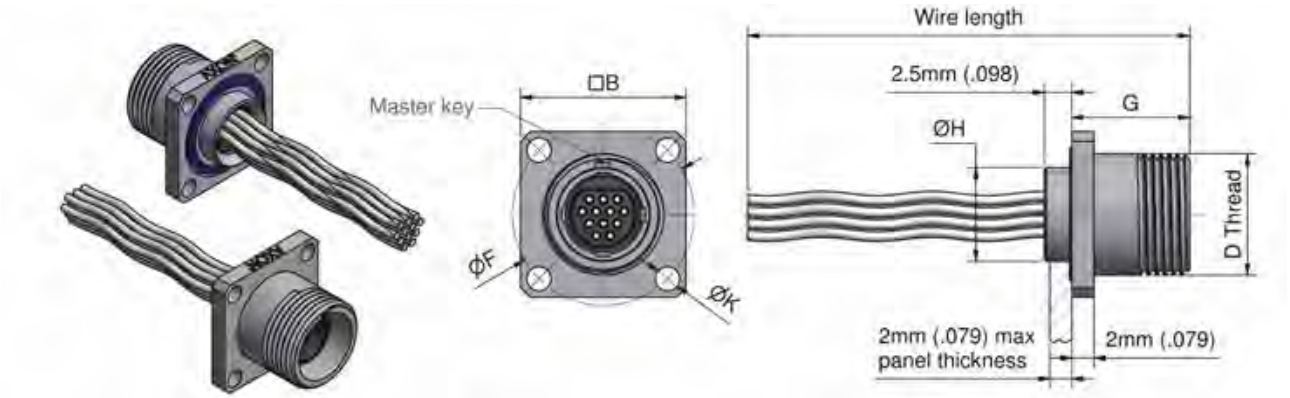
METRIC THREAD
PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLES



Rear mount square flange female
MCATxxx-00Sxxxxxx



Front mount square flange female
MCATxxx-01Sxxxxxx

PIGTAIL CONNECTORS

Circular Micro–D connectors

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	□B (MAX)	C (MAX)	D THREAD	Ø E BSC	Ø F BSC	G (MAX)	Ø H (MAX)	I (MAX)	Ø J +0.2 / -.0 (+.008 / -.0)	Ø K +0.2 / -.0 (+.008 / -.0)
5 OR 7	14.6 (.575)	14.6 (.575)	13.3 (.524)	M9X0.5	16 (.631)	16 (.631)	10.8 (.425)	8.6 (.339)	9.6 (.378)	2.2 (.087)	2.2 (.087)
12 OR 15	16.6 (.654)	15.1 (.594)	13.3 (.524)	M11X0.75	18.5 (.728)	16.5 (.65)	10.8 (.425)	8.6 (.339)	11.6 (.457)	2.2 (.087)	2.2 (.087)
19	20.1 (.791)	16.6 (.654)	14.8 (.583)	M14X0.75	22.5 (.886)	19 (.748)	12.3 (.484)	12.1 (.476)	15.1 (.594)	3.2 (.126)	2.2 (.087)
37	21.6 (.85)	21.1 (.831)	14.8 (.583)	M17X1	24.5 (.965)	24 (.945)	12.3 (.484)	15.1 (.595)	17.1 (.673)	3.2 (.126)	3.2 (.126)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 364
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 351

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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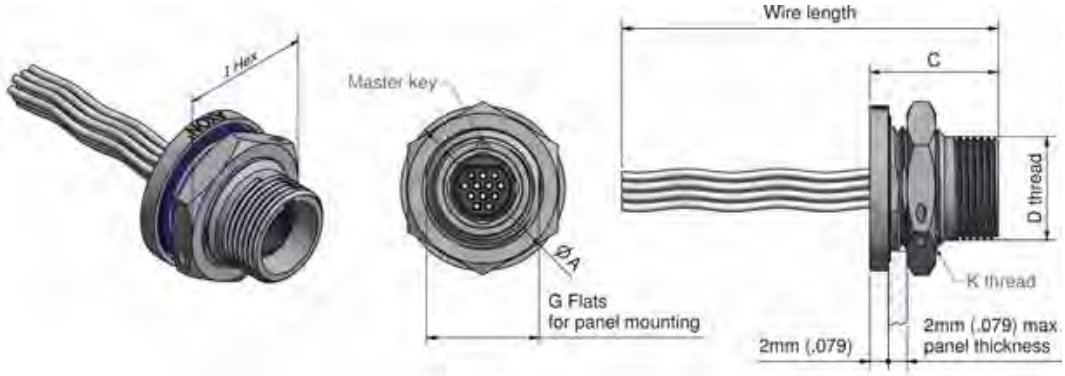
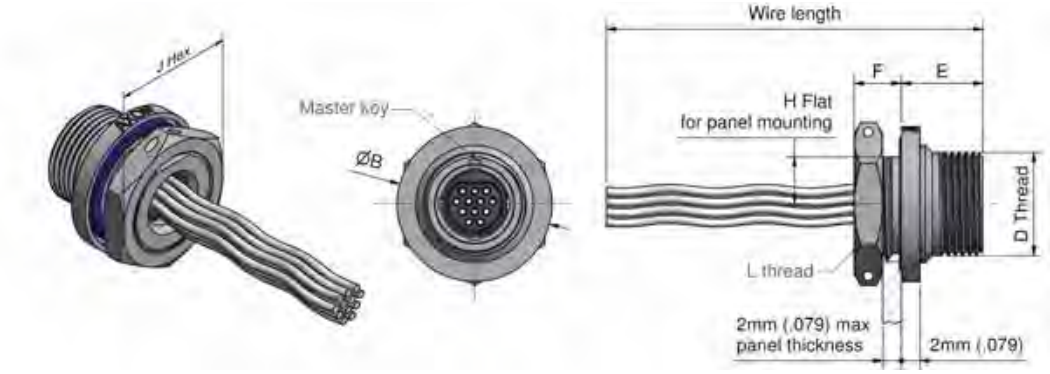
METRIC THREAD
PANEL MOUNT JAM NUT FEMALE RECEPTACLES



Rear mount jam nut female
MCATxxx-07Sxxxxxx



Front mount jam nut female
MCATxxx-08Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B (MAX)	C (MAX)	D THREAD	E (MAX)	F (MAX)	G BSC	H BSC	I HEX	J HEX	K THREAD	L THREAD
5 OR 7	16.6 (.654)	14.1 (.555)	13.8 (.543)	M9x0.5	8.8 (.346)	5.1 (.201)	11 (.433)	3.5 (.138)	15 (.591)	12 (.472)	M12x1	M9x0.75
12 OR 15	17.6 (.693)	16.6 (.654)	13.8 (.543)	M11x0.75	9.1 (.358)	5.1 (.201)	12 (.472)	5 (.197)	16 (.63)	15 (.591)	M13x1	M12x1
19	21.3 (.839)	17.6 (.693)	14.8 (.583)	M14x0.75	10.6 (.417)	5.6 (.22)	15 (.591)	5.75 (.226)	19 (.748)	16 (.63)	M16x1	M13x1
37	24.1 (.949)	21.3 (.839)	14.8 (.583)	M17x1	10.6 (.417)	5.6 (.22)	18 (.709)	7.25 (.285)	22 (.866)	19 (.75)	M19x1	M16x1

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 364
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 352 & 353

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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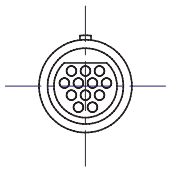
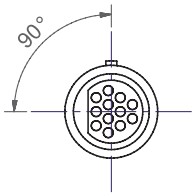
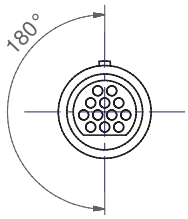
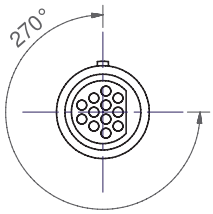
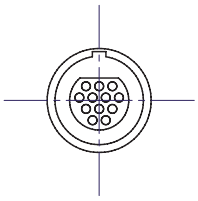
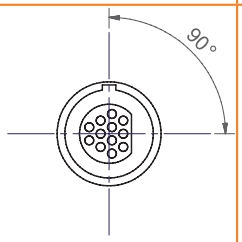
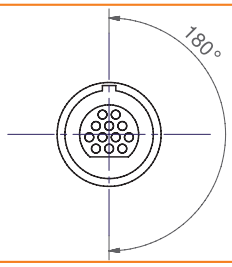
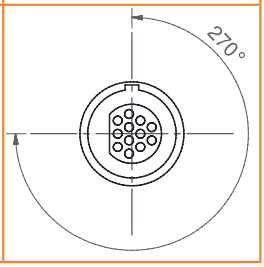
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

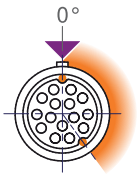
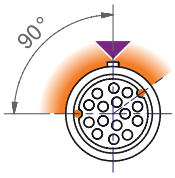
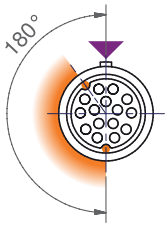
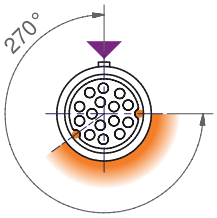
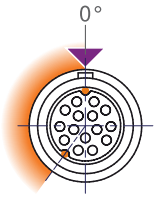
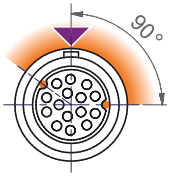
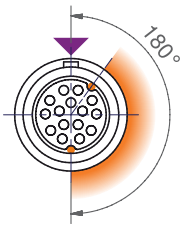
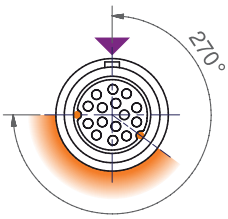
KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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TABLE OF WEIGHTS (estimated) - grams (ounces)

METRIC THREAD (with insert)	IN-LINE MALE PLUG		IN-LINE FEMALE PLUG		PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLE		PANEL MOUNT JAM NUT FEMALE RECEPTACLE	
	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	REAR MOUNT	FRONT MOUNT	REAR MOUNT	FRONT MOUNT
5 OR 7	6.3 (.23)	6.8 (.24)	6.8 (.24)	7.7 (.27)	6.3 (.22)	6.3 (.22)	10.6 (.37)	6.5 (.23)
12 OR 15	9.3 (.33)	10 (.35)	10.7 (.38)	11.5 (.4)	8.7 (.31)	6.6 (.23)	12 (.42)	6.9 (.24)
19	13.2 (0.47)	15.5 (.55)	16.3 (.57)	18.9 (.67)	15 (.53)	10.7 (.38)	18.1 (.64)	12.6 (.45)
37	19 (.67)	21.6 (.76)	19.2 (.68)	22.8 (.8)	16.3 (.58)	14.6 (.52)	22.7 (.8)	16.9 (.6)

MAXIMUM WEIGHT OF THE CONNECTOR WITHOUT WIRES
FOR WIRE WEIGHTS SEE PAGE 345

TORQUE

NUMBER OF CONTACTS	RECOMMENDED TORQUE
5	1.5 Nm
7	1.5 Nm
12	2 Nm
15	2 Nm
19	2 Nm
37	2 Nm

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THREE LUG BAYONET CONNECTOR RANGE - MCA3B

The Three Lug Bayonet connectors are intended for use in applications which require quick coupling (connect / disconnect).

IN-LINE MALE PLUGS

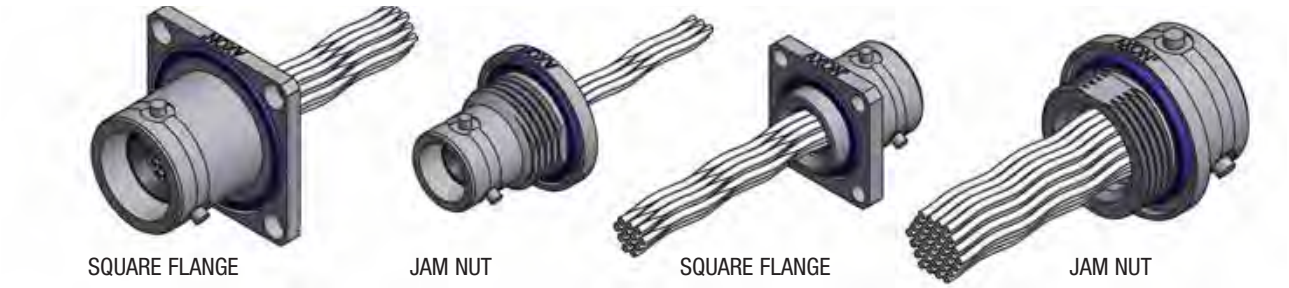
5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

IN-LINE FEMALE PLUGS

5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

PANEL MOUNT JAM NUT & SQUARE FLANGE RECEPTACLES

Rear mount AVAILABLE IN ALL SIZES **Front mount**



SQUARE FLANGE | JAM NUT | SQUARE FLANGE | JAM NUT

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IDENTIFICATION CODE

MCA	3B	V	07	-	06	P	4	L	050	A	02

SERIES

MCA: Micro-D Circular AXON'.

COUPLING SYSTEM

3B: Three lug bayonet.

SHELL TYPE

V: Nickel plated brass + epoxy resin 150°C.
W: Nickel plated brass + epoxy resin 200°C.

NUMBER OF CONTACTS

05, **07**, **12**, **15**, **19**, **37**.

See pages 342 & 343 for contact arrangements.

CONNECTOR TYPE

00: Rear panel mount square flange receptacle (female only).
01: Front panel mount square flange receptacle (female only).
06: In-line plug (male or female).
07: Rear panel mount jam nut receptacle (female only).
08: Front panel mount jam nut receptacle (female only).

CONNECTOR GENDER

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

WIRE TYPE

1: E2607, AWG 26, 7 strands, 600 V.
4: E2619, AWG 26, 19 strands, 600 V.
6: E2807, AWG 28, 7 strands, 600 V.
8: E3007, AWG 30, 7 strands, 600 V.
E: M22759/33, AWG 26, 19 strands, 600 V.

Specific wires on request.

For colour code V
3: M22759/11, AWG 26, 19 strands, 600 V.
F: E2607, AWG 26, 7 strands, 600 V.

Uninsulated wires (for panel mount only)
G: AWG 25 Gold plated.
T: AWG 24 Tin plated.

See page 345 for wire types.

COLOUR CODE

L: All white.
F: All yellow.

BLANK: If wire type is **G** or **T**.
W: 10 colour repeated code.
V: MIL-STD-681 striped (only for wire types 3 and F).

See pages 346 & 347 for colour code.

WIRE LENGTH (in cm)

Caution! Wire length in centimetres - (1 cm = 10 mm = 0.394").

L	$5 \leq L \leq 10$	$10 < L \leq 100$	$L > 100$
in cm (inches)	$1.97 \leq L \leq 3.940$	$3.940 < L \leq 39.40$	$L > 39.40$
TOLERANCE	-0 / +0.5	-0 / +3	-0 / +5
in cm (inches)	-0 / +0.200	-0 / +1.180	-0 / +1.970

MASTER KEY POSITION

A: 0°. **B**: 90°.
C: 180°. **D**: 270°.

See page 372 for master key positions.

REAR FUNNEL (for In-line plugs only)

01: for heat-shrinkable boots only.
02: for 360° screen termination and heat-shrinkable boots.

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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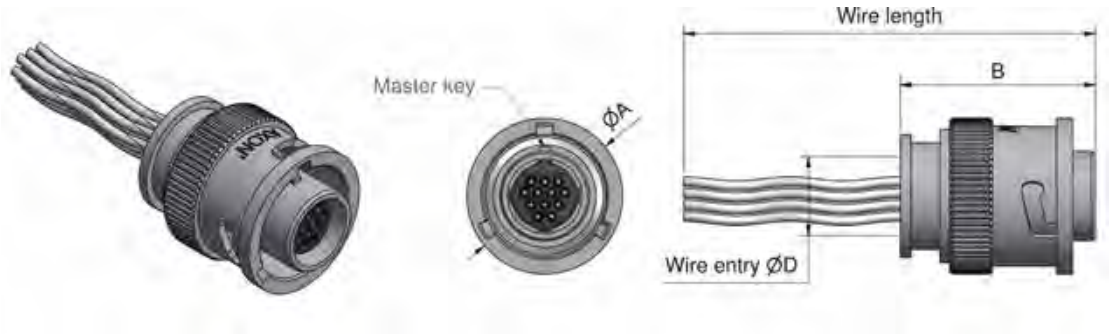
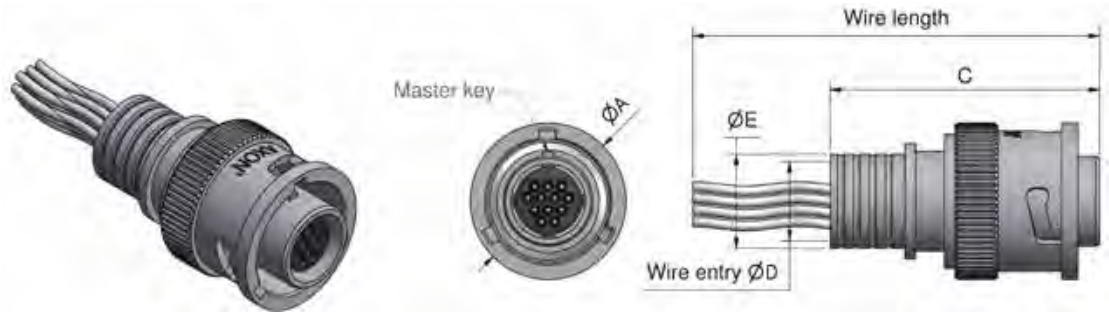


In-line male plug, short funnel (for heat-shrinkable boots only)

MCA3Bxxx-06Pxxxxxx01



In-line male plug, screen termination funnel

MCA3Bxxx-06Pxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	WIRE ENTRY Ø D	SCREEN TERM. FUNNEL Ø E
5 OR 7	13.2 (.52)	18.5 (.728)	25.5 (1.003)	5.8 (.228)	7.2 (.283)
12 OR 15	14.7 (.579)	18.5 (.728)	25.5 (1.003)	7.4 (.291)	8.8 (.346)
19	17.7 (.695)	20.2 (.795)	27.2 (1.071)	9.6 (.378)	12 (.472)
37	20.7 (.815)	20.2 (.795)	27.2 (1.071)	12 (.472)	14.4 (.567)

FOR MASTER KEY POSITIONS SEE PAGE 372
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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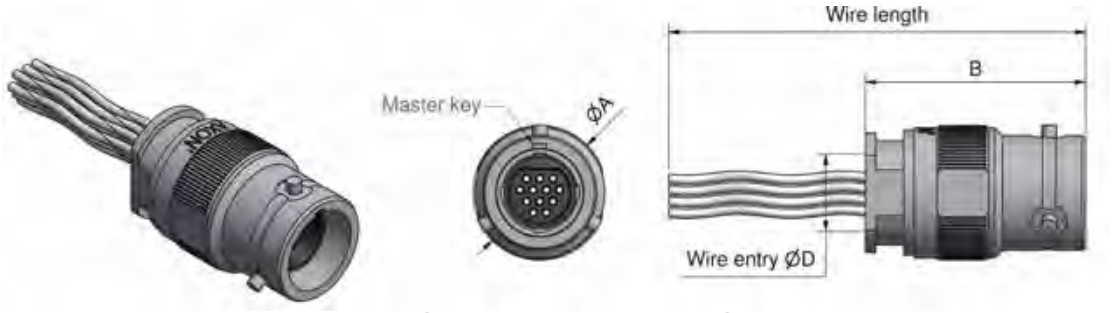
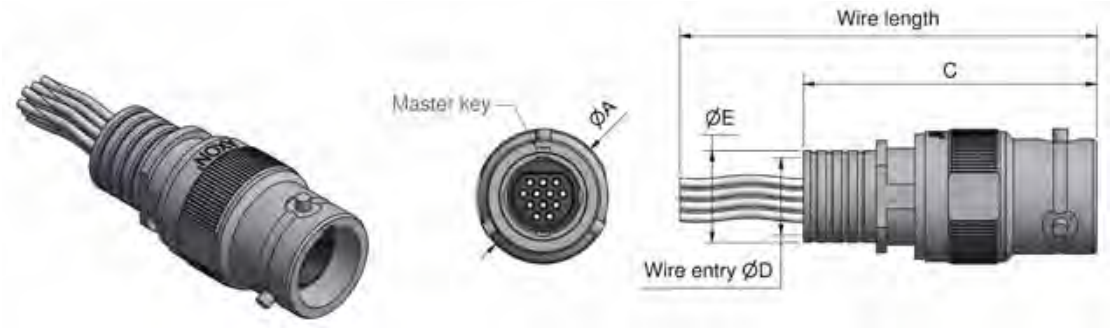
THREE LUG BAYONET IN-LINE FEMALE PLUGS



In-line female plug, short funnel (for heat-shrinkable boots only)

MCA3Bxxx-06Sxxxxxx01



In-line female plug, screen termination funnel

MCA3Bxxx-06Sxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	WIRE ENTRY Ø D	SCREEN TERM. FUNNEL Ø E
5 OR 7	10 (.394)	21.4 (.843)	28.4 (1.118)	5.8 (.229)	7.2 (.283)
12 OR 15	13 (.512)	21.4 (.843)	28.4 (1.118)	7.4 (.292)	8.8 (.346)
19	15 (.591)	22.9 (.902)	29.9 (1.177)	9.6 (.378)	12 (.472)
37	18 (.709)	22.9 (.902)	29.9 (1.177)	12 (.472)	14.4 (.567)

FOR MASTER KEY POSITIONS SEE PAGE 372
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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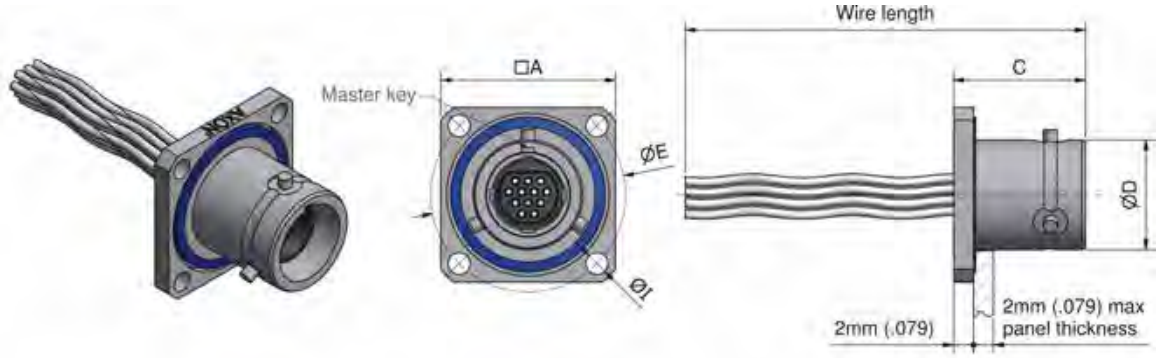
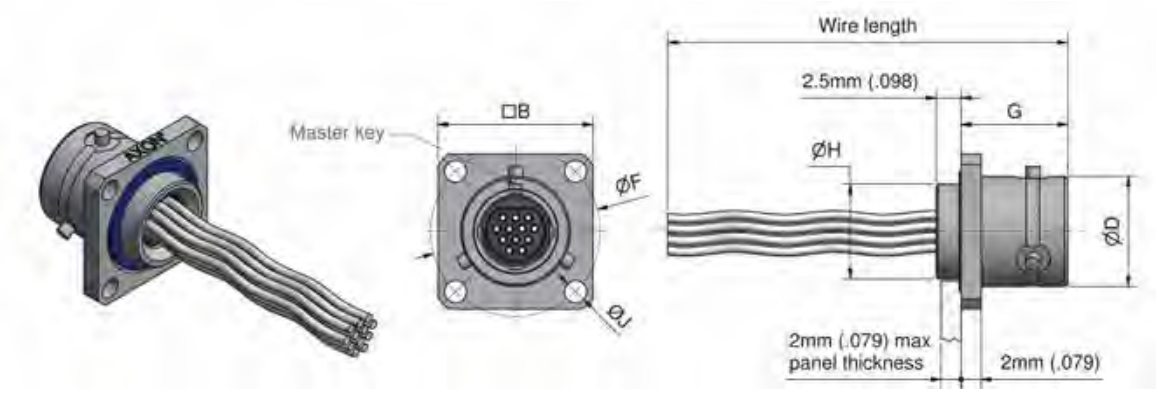
PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLES



Rear mount square flange female

MCA3Bxxx-00Sxxxxxx



Front mount square flange female

MCA3Bxxx-01Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	□B (MAX)	C (MAX)	Ø D (MAX)	Ø E BSC	Ø F BSC	G (MAX)	Ø H (MAX)	Ø I +0.2 / -.0 (+.008 / -.0)	Ø J +0.2 / -.0 (+.008 / -.0)
5 OR 7	16.6 (.654)	14.6 (.575)	13.3 (.524)	9.6 (.378)	18.5 (.728)	16 (.631)	10.8 (.425)	9.6 (.378)	2.2 (.087)	2.2 (.087)
12 OR 15	17.6 (.693)	15.6 (.614)	13.3 (.524)	11.1 (.437)	19.5 (.768)	17 (.669)	10.8 (.425)	9.6 (.378)	2.2 (.087)	2.2 (.087)
19	21.6 (.85)	16.6 (.654)	14.8 (.583)	14.1 (.555)	24.5 (.965)	19 (.748)	12.3 (.484)	12.1 (.476)	3.2 (.127)	2.2 (.087)
37	24.1 (.949)	21.1 (.831)	14.8 (.583)	17.1 (.673)	27 (1.063)	24 (.945)	12.3 (.484)	15.1 (.594)	3.2 (.126)	3.2 (.126)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 372
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 351

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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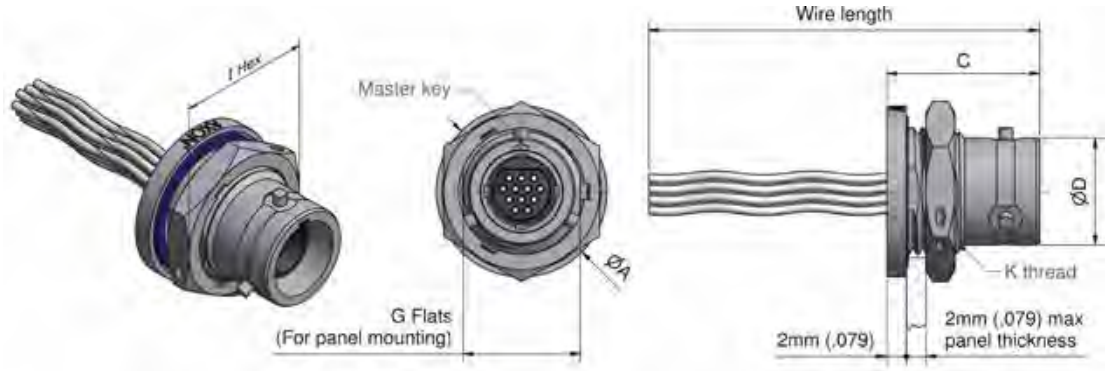
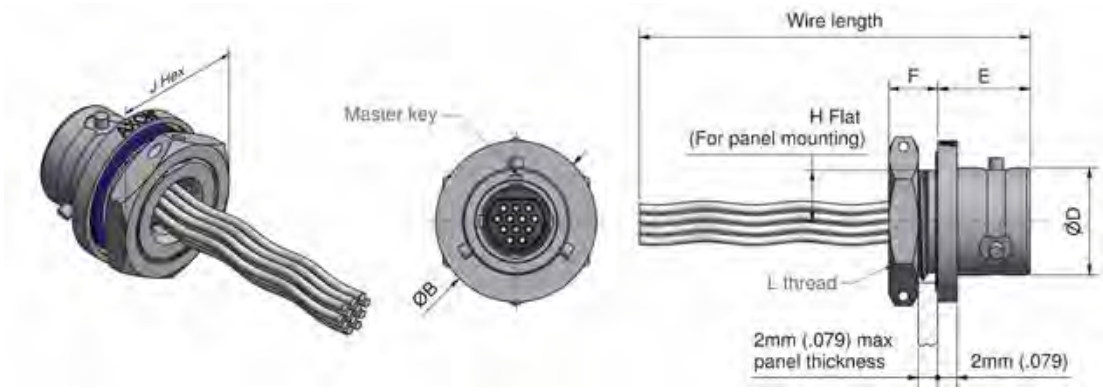
THREE LUG BAYONET
PANEL MOUNT JAM NUT FEMALE RECEPTACLES



Rear mount jam nut female
MCA3Bxxx-07Sxxxxxx



Front mount jam nut female
MCA3Bxxx-08Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B (MAX)	C (MAX)	Ø D (MAX)	E (MAX)	F (MAX)	G BSC	H BSC	I HEX	J HEX	K THREAD	L THREAD
5 OR 7	16.6 (.654)	14.1 (.555)	15.8 (.622)	9.6 (.378)	9.6 (.378)	5.1 (.201)	11 (.433)	3.5 (.138)	15 (.591)	12 (.473)	M12x1	M9x0.75
12 OR 15	17.6 (.693)	16.6 (.654)	15.8 (.622)	11.1 (.437)	9.6 (.378)	5.1 (.201)	12 (.473)	5 (.197)	16 (.63)	15 (.591)	M13x1	M12x1
19	21.3 (.839)	17.6 (.693)	16.8 (.661)	14.1 (.555)	10.6 (.417)	5.6 (.22)	15 (.591)	5.75 (.226)	19 (.748)	16 (.63)	M16x1	M13x1
37	24.1 (.949)	21.3 (.839)	16.1 (.634)	17.1 (.673)	10.6 (.417)	5.6 (.22)	18 (.709)	7.25 (.285)	22 (.866)	19 (.75)	M19x1	M16x1

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 372
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 352 & 353

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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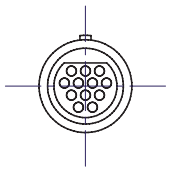
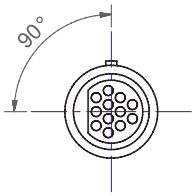
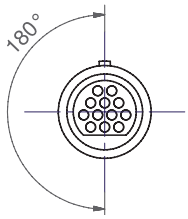
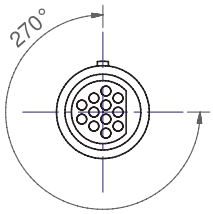
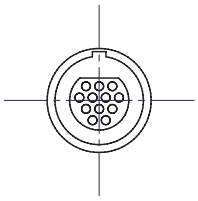
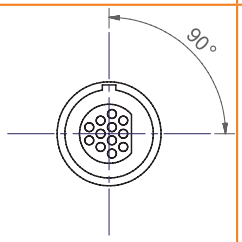
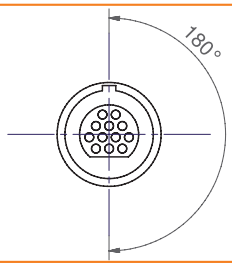
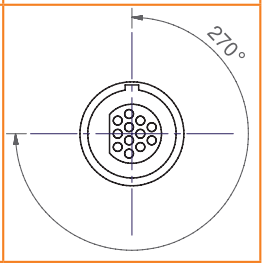
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

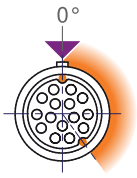
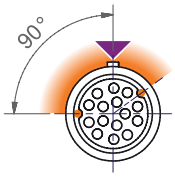
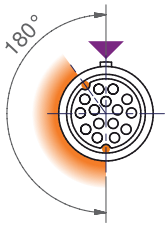
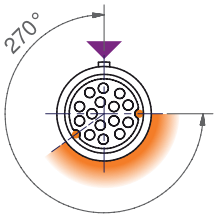
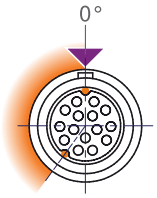
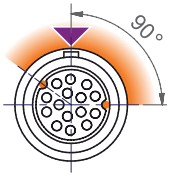
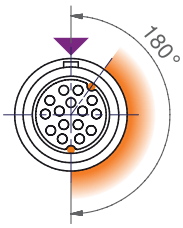
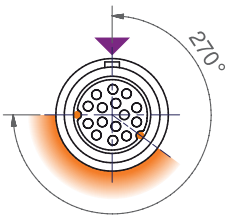
KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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TABLE OF WEIGHTS (estimated) - grams (ounces)

THREE LUG BAYONET	IN-LINE MALE PLUG		IN-LINE FEMALE PLUG		PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLE		PANEL MOUNT JAM NUT FEMALE RECEPTACLE	
	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	REAR MOUNT	FRONT MOUNT	REAR MOUNT	FRONT MOUNT
5 OR 7	8.1 (.29)	8.6 (.30)	6.8 (.24)	7.6 (.27)	7.2 (.25)	6.2 (.22)	9.6 (.34)	6.8 (.24)
12 OR 15	9.9 (.35)	10.5 (.37)	10.5 (.37)	11.2 (.40)	8.4 (.30)	6.9 (.24)	12.3 (.43)	6.6 (.23)
19	14.0 (.49)	16.2 (.57)	15.1 (.53)	17.5 (.62)	13.8 (.47)	10.1 (.36)	18.5 (.65)	11.1 (.39)
37	18.0 (.64)	20.5 (.72)	19.0 (.67)	22.3 (.79)	17.4 (.61)	14.2 (.50)	22.5 (.79)	14.6 (.51)

MAXIMUM WEIGHT OF THE CONNECTOR WITHOUT WIRES
FOR WIRE WEIGHTS SEE PAGE 345

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TRIPLE START (ANTI-DECOUPLING) CONNECTOR RANGE - MCAC

With its anti-decoupling system, the Triple Start Thread connector range is specially designed to withstand vibration.

IN-LINE MALE PLUGS

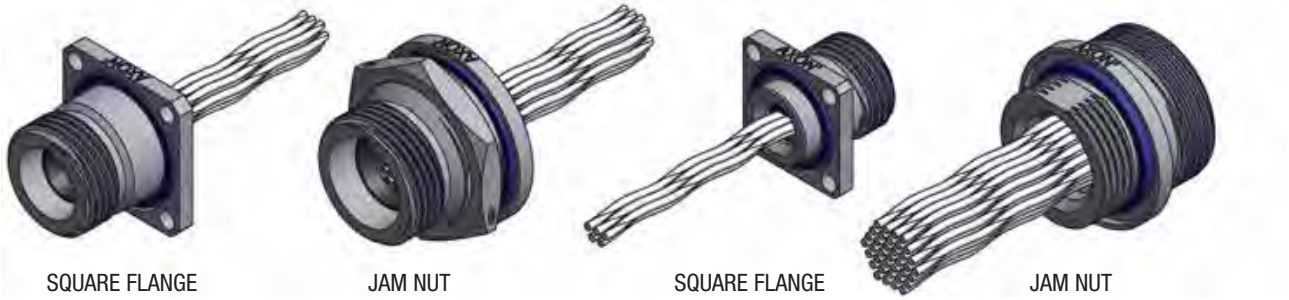
5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

IN-LINE FEMALE PLUGS

5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

PANEL MOUNT JAM NUT & SQUARE FLANGE RECEPTACLES

Rear mount — AVAILABLE IN ALL SIZES — **Front mount**



SQUARE FLANGE | JAM NUT | SQUARE FLANGE | JAM NUT

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IDENTIFICATION CODE

MCA	C	V	07	-	06	P	4	L	050	A	02

SERIES

MCA: Micro-D Circular AXON'.

COUPLING SYSTEM

C: Triple start thread & anti-decoupling system.

MATERIAL & FINISH TYPE

V: Nickel plated brass + epoxy resin 150°C.
W: Nickel plated brass + epoxy resin 200°C.

NUMBER OF CONTACTS

05, **07**, **12**, **15**, **19**, **37**.

See pages 342 & 343 for contact arrangements.

CONNECTOR TYPE

00: Rear panel mount square flange receptacle (female only).
01: Front panel mount square flange receptacle (female only).
06: In-line plug (male or female).
07: Rear panel mount jam nut receptacle (female only).
08: Front panel mount jam nut receptacle (female only).

CONNECTOR GENDER

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

WIRE TYPE

1: E2607, AWG 26, 7 strands, 600 V.
4: E2619, AWG 26, 19 strands, 600 V.
6: E2807, AWG 28, 7 strands, 600 V.
8: E3007, AWG 30, 7 strands, 600 V.
E: M22759/33, AWG 26, 19 strands, 600 V.

Specific wires on request.

For colour code V
3: M22759/11, AWG 26, 19 strands, 600 V.
F: E2607, AWG 26, 7 strands, 600 V.

Uninsulated wires (for panel mount only)
G: AWG 25 Gold plated.
T: AWG 24 Tin plated.

See page 345 for wire types.

COLOUR CODE

L: All white.
F: All yellow.

BLANK: If wire type is **G** or **T**.
W: 10 colour repeated code.
V: MIL-STD-681 striped (only for wire types 3 and F).

See pages 346 & 347 for colour code.

WIRE LENGTH (in cm)

Caution! Wire length in centimetres - (1 cm = 10 mm = 0.394").

L	5 ≤ L ≤ 10	10 < L ≤ 100	L >100
in cm (inches)	1.97 ≤ L ≤ 3.940	3.940 < L ≤ 39.40	L > 39.40
TOLERANCE	-0 / +0.5	-0 / +3	-0 / +5
in cm (inches)	-0 / +0.200	-0 / +1.180	-0 / +1.970

MASTER KEY POSITION

A: 0°. **B**: 90°.
C: 180°. **D**: 270°.

See page 380 for master key positions.

REAR FUNNEL (for In-line plugs only)

01: for heat-shrinkable boots only.
02: for 360° screen termination and heat-shrinkable boots.

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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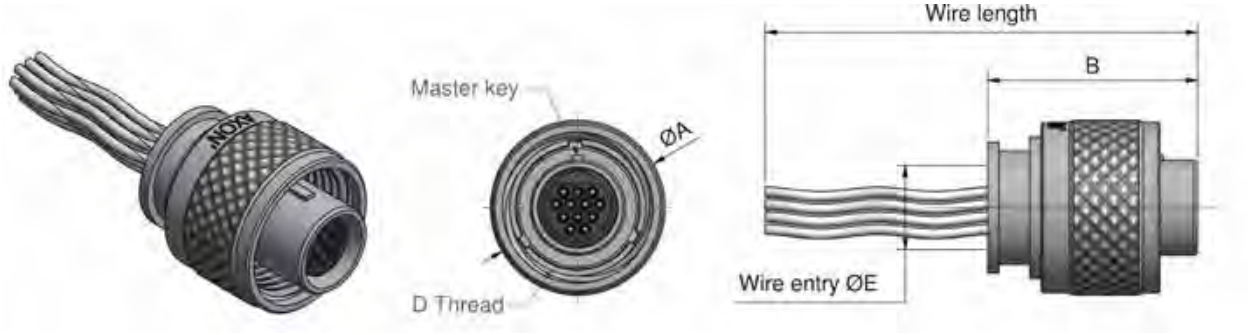
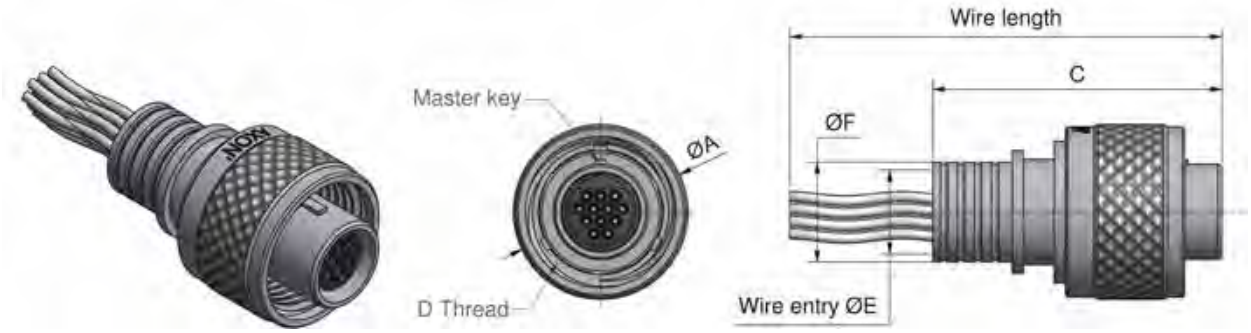
TRIPLE START (ANTI-DECOUPLING) IN-LINE MALE PLUGS



In-line male plug, short funnel (for heat-shrinkable boots only)

MCACxxx-06Pxxxxxx01



In-line male plug, screen termination funnel

MCACxxx-06Pxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	D THREAD	WIRE ENTRY Ø E	SCREEN TERM. FUNNEL Ø F
5 OR 7	13.5 (.531)	18.7 (.736)	25.7 (1.012)	Tr11x3P1	5.8 (.228)	7.2 (.283)
12 OR 15	15.5 (.611)	18.7 (.736)	25.7 (1.012)	Tr13x3P1	7.4 (.291)	8.8 (.346)
19	17.5 (.689)	20.8 (.819)	27.8 (1.094)	Tr15x3P1	9.6 (.378)	12 (.472)
37	20.5 (.807)	20.8 (.819)	27.8 (1.094)	Tr18x3P1	12 (.472)	14.4 (.567)

FOR MASTER KEY POSITIONS SEE PAGE 380
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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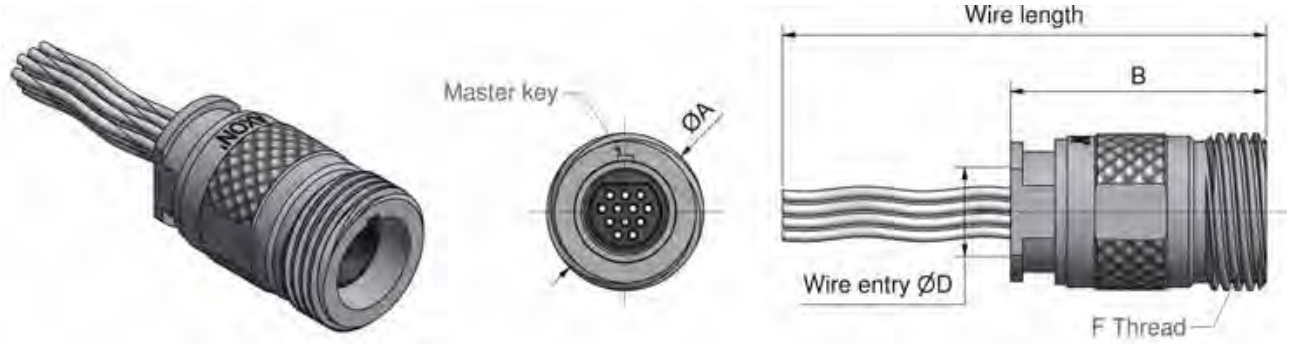
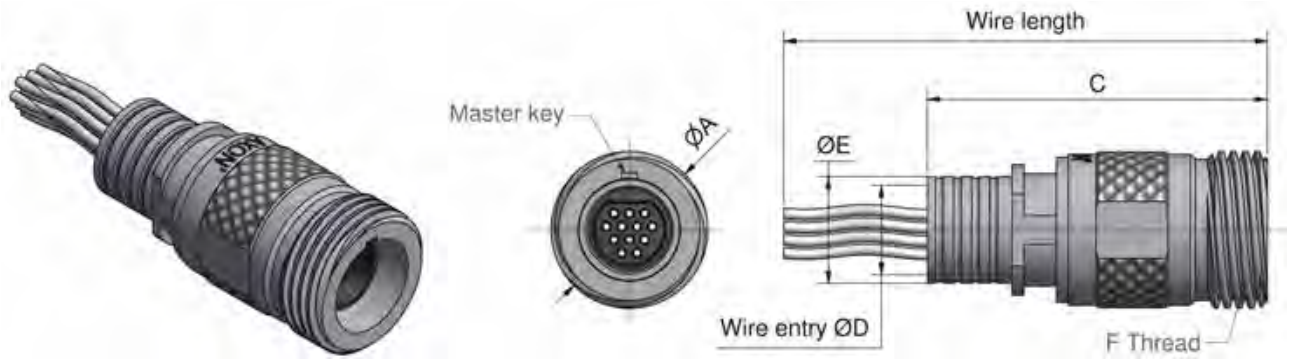
TRIPLE START (ANTI-DECOUPLING) IN-LINE FEMALE PLUGS



In-line female plug, short funnel (for heat-shrinkable boots only)

MCACxxx-06Sxxxxxx01



In-line female plug, screen termination funnel

MCACxxx-06Sxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	WIRE ENTRY Ø D	SCREEN TERM. FUNNEL Ø E	F THREAD
5 OR 7	11 (.433)	21.4 (.843)	28.4 (1.118)	5.8 (.228)	7.2 (.283)	Tr11x3P1
12 OR 15	13 (.512)	21.4 (.843)	28.4 (1.118)	7.4 (.291)	8.8 (.346)	Tr13x3P1
19	15 (.591)	22.9 (.902)	29.9 (1.177)	9.6 (.378)	12 (.472)	Tr15x3P1
37	18 (.709)	22.9 (.902)	29.9 (1.177)	12 (.472)	14.4 (.567)	Tr18x3P1

FOR MASTER KEY POSITIONS SEE PAGE 380
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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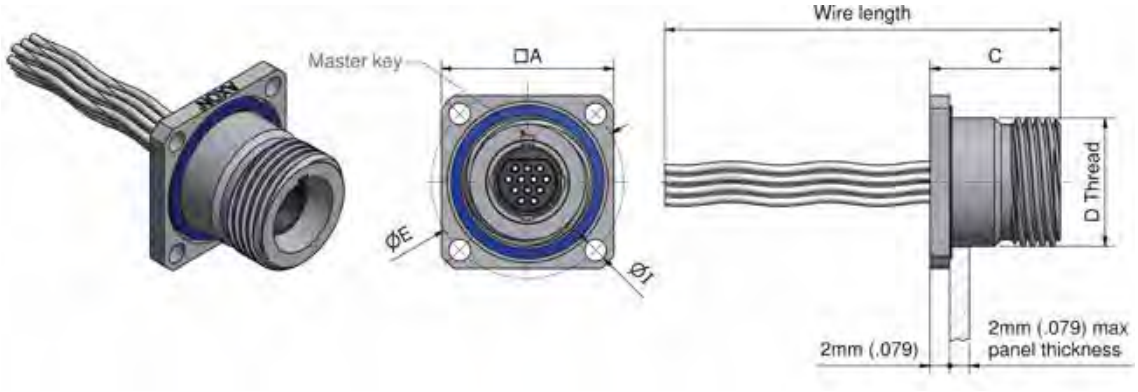
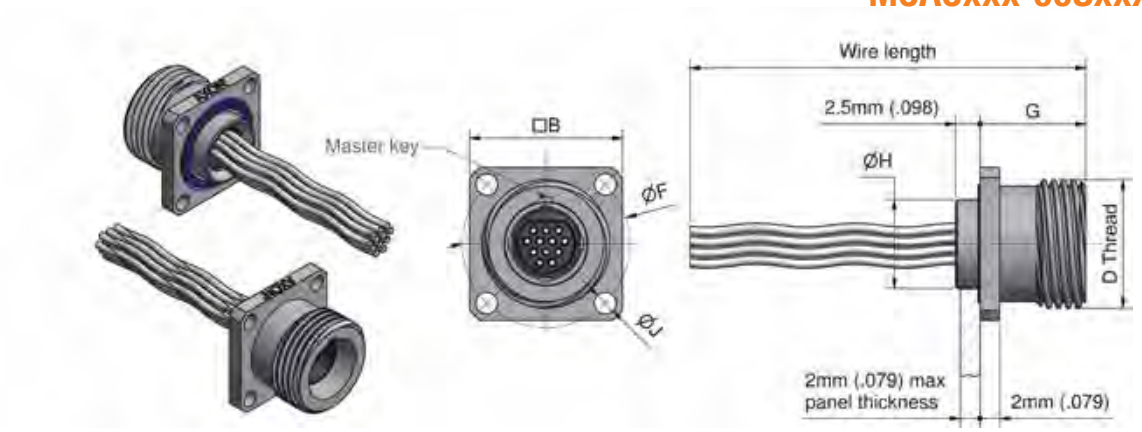
TRIPLE START (ANTI-DECOUPLING)
PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLES



Rear mount square flange female
MCACxxx-00Sxxxxxx



Front mount square flange female
MCACxxx-01Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	□B (MAX)	C (MAX)	D THREAD	Ø E BSC	Ø F BSC	G (MAX)	Ø H (MAX)	Ø I +0.2 / -.0 (+.008 / -.0)	Ø J +0.2 / -.0 (+.008 / -.0)
5 OR 7	16.6 (.654)	14.6 (.575)	13.3 (.524)	Tr11x3P1	18.5 (.728)	16 (.631)	10.8 (.425)	9.1 (.358)	2.2 (.087)	2.2 (.087)
12 OR 15	17.6 (.693)	15.6 (.614)	13.3 (.524)	Tr13x3P1	19.5 (.768)	17 (.669)	10.8 (.425)	9.1 (.358)	2.2 (.087)	2.2 (.087)
19	20.1 (.791)	16.6 (.654)	14.8 (.583)	Tr15x3P1	22.5 (.886)	19 (.748)	12.3 (.484)	12.1 (.476)	3.2 (.126)	2.2 (.087)
37	24.1 (.949)	21.1 (.831)	14.8 (.583)	Tr18x3P1	27 (1.063)	24 (.945)	12.3 (.484)	15.1 (.594)	3.2 (.126)	3.2 (.126)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 380
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 351

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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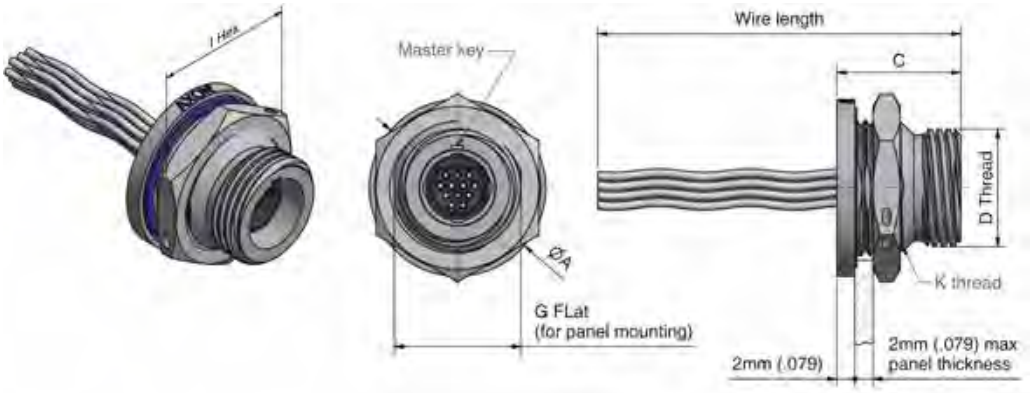
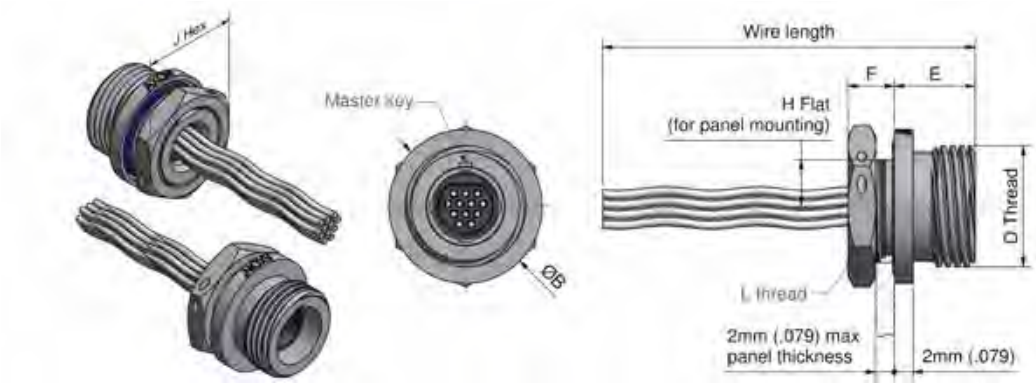
TRIPLE START (ANTI-DECOUPLING) PANEL MOUNT JAM NUT FEMALE RECEPTACLES



Rear mount jam nut female
MCACxxx-07Sxxxxxx



Front mount jam nut female
MCACxxx-08Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B (MAX)	C (MAX)	D THREAD	E (MAX)	F (MAX)	G BSC	H BSC	I HEX	J HEX	K THREAD	L THREAD
5 OR 7	17.6 (.693)	14.1 (.555)	13.8 (.543)	Tr11x3P1	8.8 (.346)	5.1 (.201)	12 (.473)	3.5 (.138)	16 (.631)	12 (.473)	M13x1	M9x0.75
12 OR 15	19.6 (.772)	16.6 (.654)	13.8 (.543)	Tr13x3P1	9.1 (.358)	5.1 (.201)	14 (.551)	5 (.197)	18 (.709)	15 (.591)	M15x1	M12x1
19	21.6 (.85)	17.6 (.693)	14.8 (.583)	Tr15x3P1	10.6 (.417)	5.6 (.22)	16 (.631)	5.75 (.226)	20 (.787)	16 (.63)	M17x1	M13x1
37	24.6 (.969)	21.3 (.839)	14.8 (.583)	Tr18x3P1	10.6 (.417)	5.6 (.22)	19 (.748)	7.25 (.285)	23 (.906)	19 (.75)	M20x1	M16x1

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 380
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 352 & 353

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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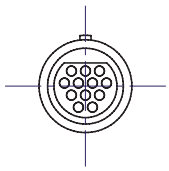
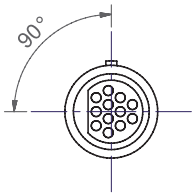
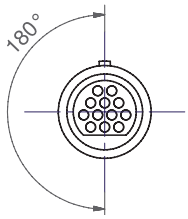
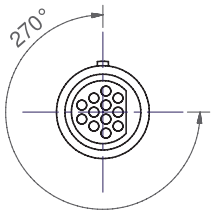
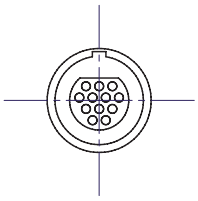
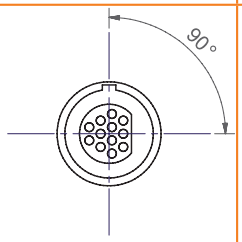
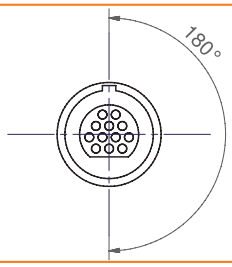
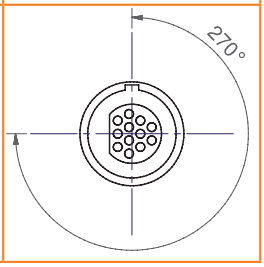
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

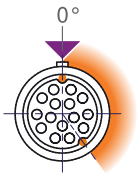
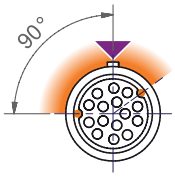
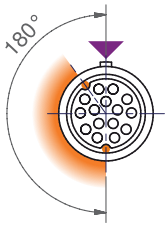
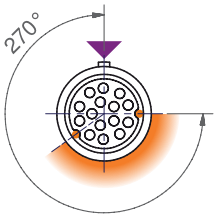
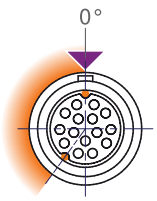
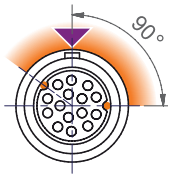
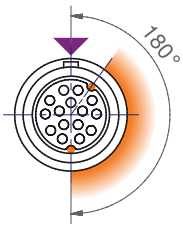
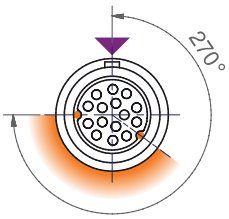
KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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TABLE OF WEIGHTS (estimated) - grams (ounces)

TRIPLE START	IN-LINE MALE PLUG		IN-LINE FEMALE PLUG		PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLE		PANEL MOUNT JAM NUT FEMALE RECEPTACLE	
	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	REAR MOUNT	FRONT MOUNT	REAR MOUNT	FRONT MOUNT
5 OR 7	9.0 (.32)	9.5 (.34)	8.1 (.29)	8.9 (.32)	8.7 (.30)	6.7 (.24)	12.3 (.43)	6.9 (.24)
12 OR 15	11.2 (.39)	11.8 (.42)	12.2 (.43)	12.9 (.45)	11.0 (.39)	8.1 (.29)	15.7 (.55)	7.6 (.27)
19	15.3 (.54)	17.48 (.62)	15.7 (.56)	18.0 (.64)	14.2 (.5)	10.1 (.36)	18.4 (.65)	11.1 (.39)
37	19.8 (.70)	22.23 (.70)	19.5 (.69)	22.8 (.80)	19.0 (.67)	14.3 (.51)	23.4 (.82)	14.8 (.52)

MAXIMUM WEIGHT OF THE CONNECTOR WITHOUT WIRES
FOR WIRE WEIGHTS SEE PAGE 345

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BREAKAWAY CONNECTOR RANGE - MCABK

Breakaway connectors are connectors with a spring to secure the connection. Easy to handle, they are lightweight and small.

IN-LINE MALE PLUGS

5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

IN-LINE FEMALE PLUGS

5 & 7 WAYS | 12 & 15 WAYS | 19 WAYS | 37 WAYS

PANEL MOUNT JAM NUT & SQUARE FLANGE RECEPTACLES

Rear mount — AVAILABLE IN ALL SIZES — **Front mount**

SQUARE FLANGE | JAM NUT | SQUARE FLANGE | JAM NUT

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IDENTIFICATION CODE

MCA	BK	L	07	-	06	P	4	L	050	A	02

SERIES

MCA: Micro-D Circular AXON'.

COUPLING SYSTEM

BK: Breakaway.

MATERIAL & FINISH TYPE

L: Nickel plated aluminium + epoxy resin 150°C.
M: Nickel plated aluminium + epoxy resin 200°C.

NUMBER OF CONTACTS

05, **07**, **12**, **15**, **19**, **37**.

See pages 342 & 343 for contact arrangements.

CONNECTOR TYPE

00: Rear panel mount square flange receptacle (female only).
01: Front panel mount square flange receptacle (female only).
06: In-line plug (male or female).
07: Rear panel mount jam nut receptacle (female only).
08: Front panel mount jam nut receptacle (female only).

CONNECTOR GENDER

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

WIRE TYPE

1: E2607, AWG 26, 7 strands, 600 V.
4: E2619, AWG 26, 19 strands, 600 V.
6: E2807, AWG 28, 7 strands, 600 V.
8: E3007, AWG 30, 7 strands, 600 V.
E: M22759/33, AWG 26, 19 strands, 600 V.

Specific wires on request.

For colour code V
3: M22759/11, AWG 26, 19 strands, 600 V.
F: E2607, AWG 26, 7 strands, 600 V.

Uninsulated wires (for panel mount only)
G: AWG 25 Gold plated.
T: AWG 24 Tin plated.

See page 345 for wire types.

COLOUR CODE

L: All white.
F: All yellow.

BLANK: If wire type is **G** or **T**.
W: 10 colour repeated code.
V: MIL-STD-681 striped (only for wire types 3 and F).

See pages 346 & 347 for colour code.

WIRE LENGTH (in cm)

Caution! Wire length in centimetres - (1 cm = 10 mm = 0.394").

L	5 ≤ L ≤ 10	10 < L ≤ 100	L >100
in cm (inches)	1.97 ≤ L ≤ 3.940	3.940 < L ≤ 39.40	L > 39.40
TOLERANCE	-0 / +0.5	-0 / +3	-0 / +5
in cm (inches)	-0 / +0.200	-0 / +1.180	-0 / +1.970

MASTER KEY POSITION

A: 0°. **B**: 90°.
C: 180°. **D**: 270°.

See page 388 for master key positions.

REAR FUNNEL (for In-line plugs only)

01: for heat-shrinkable boots only.
02: for 360° screen termination and heat-shrinkable boots.

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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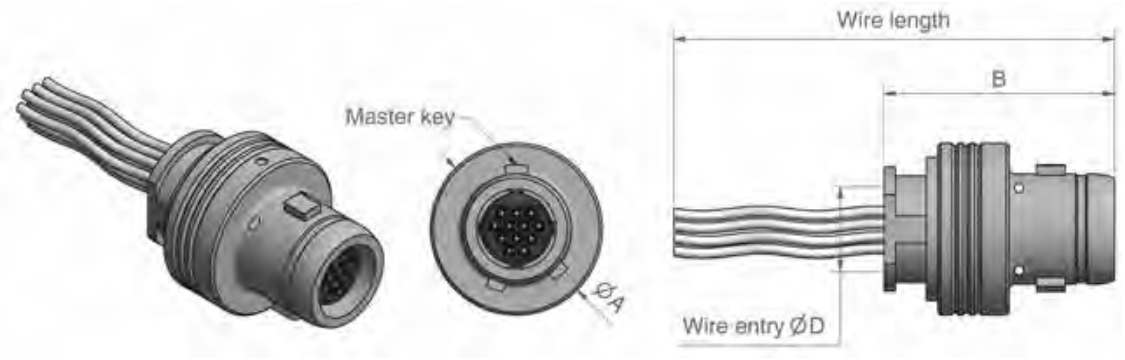
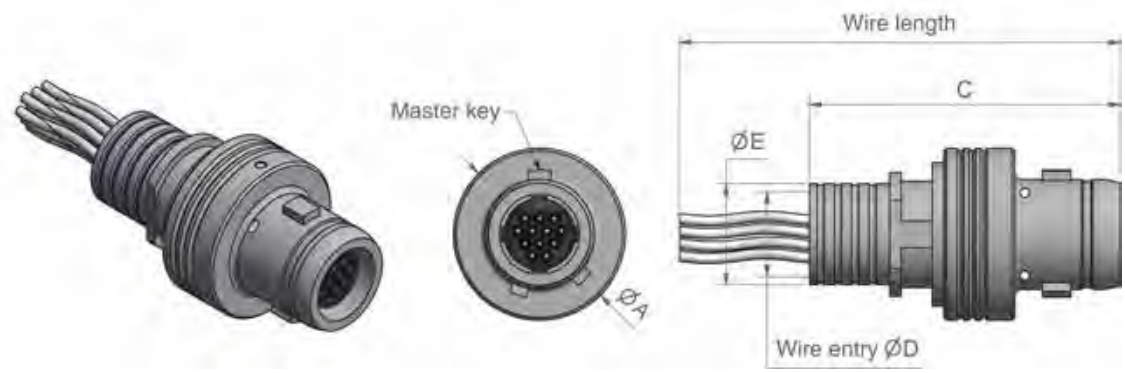


In-line male plug, short funnel (for heat-shrinkable boots only)

MCABKxxx-06Pxxxxxx01



In-line male plug, screen termination funnel

MCABKxxx-06Pxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	WIRE ENTRY Ø D	SCREEN TERM. FUNNEL Ø E
5 OR 7	15.1 (.594)	20.3 (.799)	27.3 (1.074)	5.8 (.228)	7.2 (.283)
12 OR 15	15.1 (.594)	20.3 (.799)	27.3 (1.074)	7.4 (.291)	8.8 (.346)
19	17.4 (.685)	22 (.866)	29 (1.142)	9.6 (.378)	12 (.472)
37	20.1 (.791)	22 (.866)	29 (1.142)	12 (.472)	14.4 (.567)

FOR MASTER KEY POSITIONS SEE PAGE 388
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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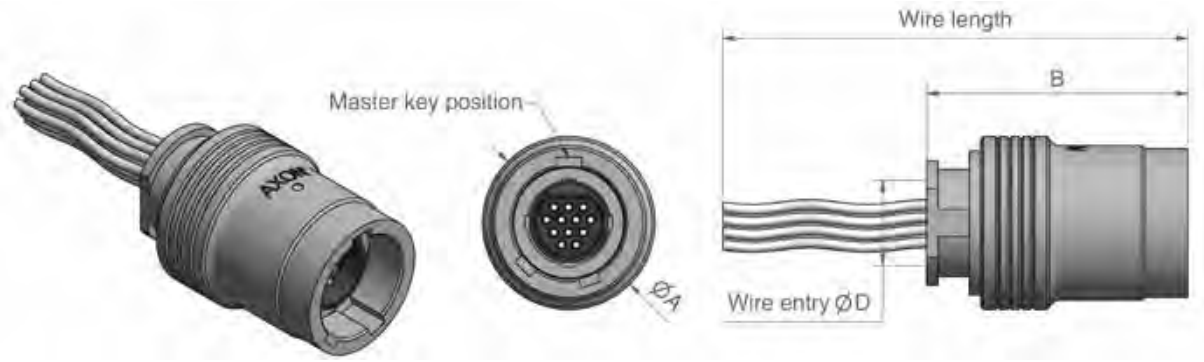
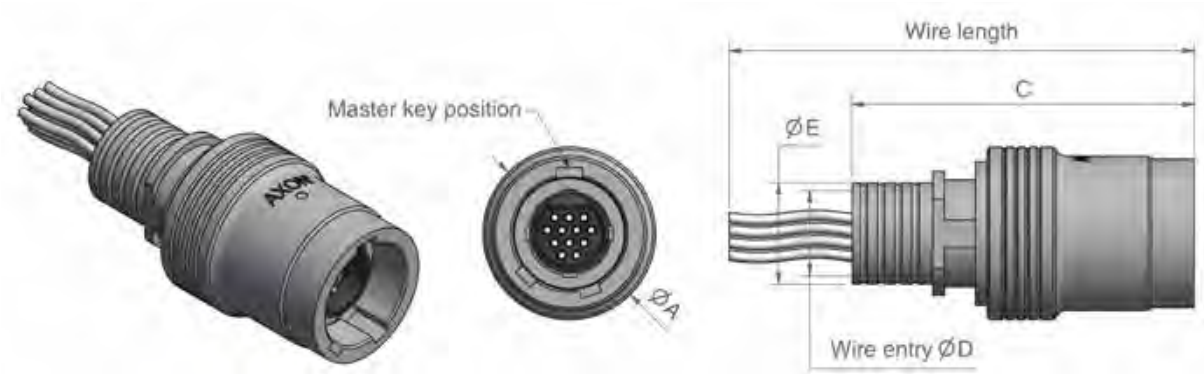


In-line female plug, short funnel (for heat-shrinkable boots only)

MCABKxxx-06Sxxxxxx01



In-line female plug, screen termination funnel

MCABKxxx-06Sxxxxxx02

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B (MAX)	C (MAX)	WIRE ENTRY Ø D	SCREEN TERM. FUNNEL Ø E
5 OR 7	15.1 (.594)	22.9 (.902)	29.9 (1.177)	5.8 (.228)	7.2 (.283)
12 OR 15	15.1 (.594)	22.9 (.902)	29.9 (1.177)	7.4 (.291)	8.8 (.346)
19	17.4 (.685)	24.4 (.961)	31.4 (1.236)	9.6 (.378)	12 (.472)
37	20.1 (.791)	24.4 (.961)	31.4 (1.236)	12 (.472)	14.4 (.567)

FOR MASTER KEY POSITIONS SEE PAGE 388
FOR REAR FUNNEL DIMENSIONS SEE PAGE 354

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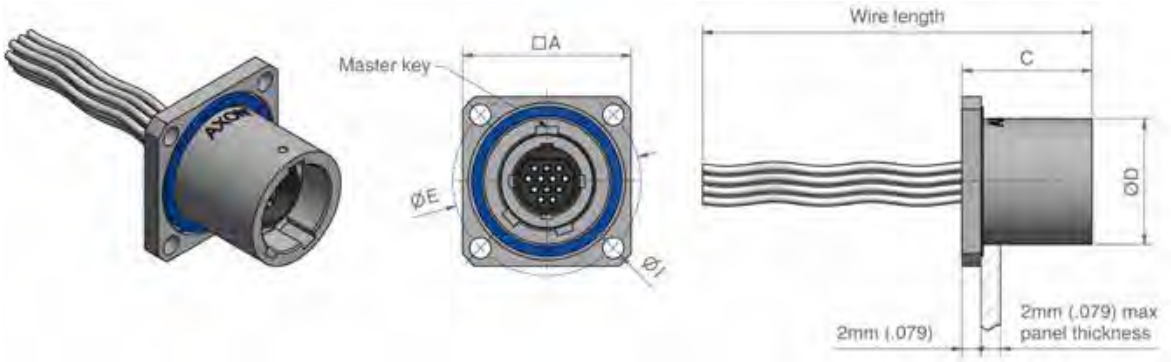
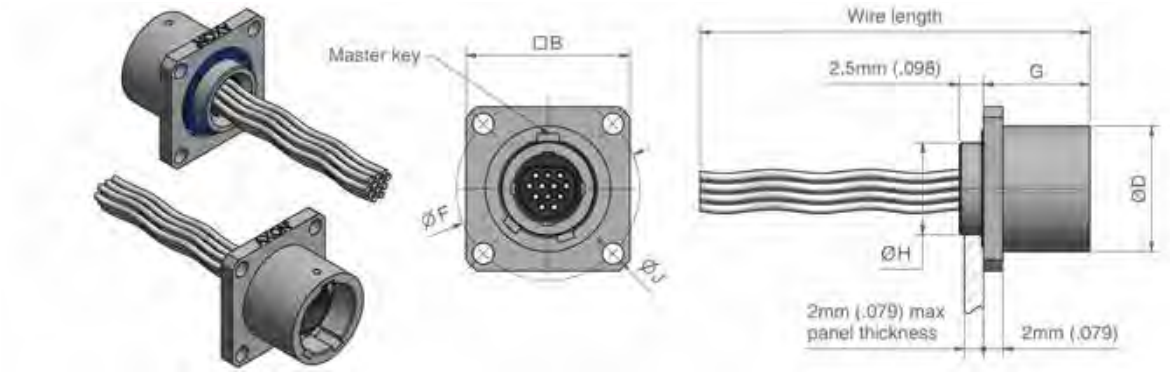
PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLES



Rear mount square flange female
MCABKxxx-00Sxxxxxx



Front mount square flange female
MCABKxxx-01Sxxxxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	□B (MAX)	C (MAX)	Ø D (MAX)	Ø E BSC	Ø F BSC	G (MAX)	Ø H (MAX)	Ø I +0.2 / -.0 (+.008 / -.0)	Ø J +0.2 / -.0 (+.008 / -.0)
5 OR 7	17.6 (.693)	17.1 (.673)	13.7 (.539)	13.1 (.515)	19.5 (.768)	19 (.748)	11.2 (.441)	9.6 (.378)	2.2 (.087)	2.2 (.087)
12 OR 15	17.6 (.693)	17.1 (.673)	13.7 (.539)	13.1 (.515)	19.5 (.768)	19 (.748)	11.2 (.441)	9.6 (.378)	2.2 (.087)	2.2 (.087)
19	22.1 (.87)	21.1 (.831)	15.2 (.598)	15.8 (.622)	24.5 (.965)	23 (.906)	12.7 (.5)	13.1 (.516)	3.2 (.126)	3.2 (.126)
37	24.1 (.949)	23.1 (.909)	15.2 (.598)	18.5 (.728)	27.5 (1.083)	26 (1.024)	12.7 (.5)	15.1 (.594)	3.2 (.126)	3.2 (.126)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 351

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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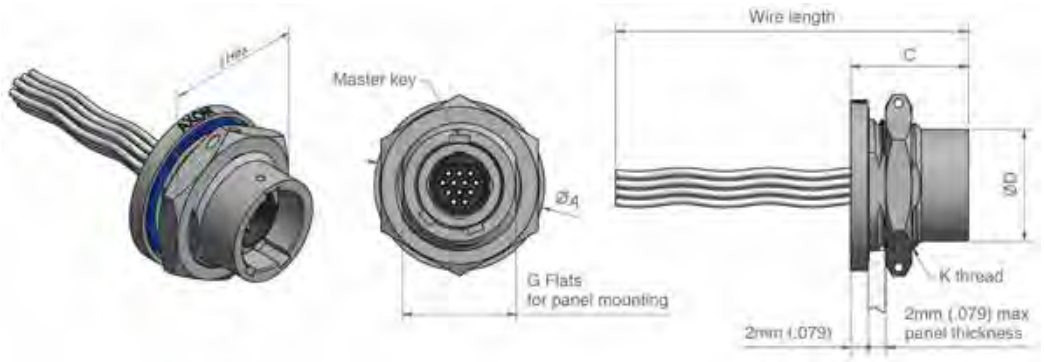
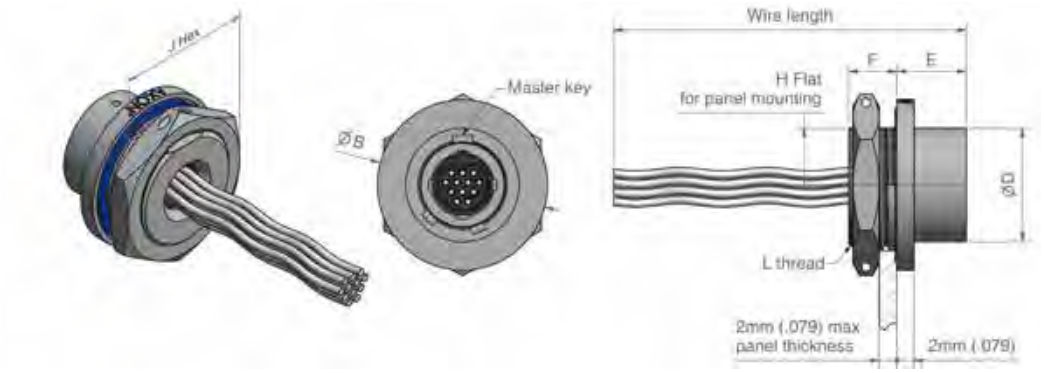
BREAKAWAY
PANEL MOUNT JAM NUT FEMALE RECEPTACLES



Rear mount jam nut female
MCABKxxx-07Sxxxxxx



Front mount jam nut female
MCABKxxx-08Sxxxxxx

PIGTAIL CONNECTORS

Circular Micro–D connectors

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B (MAX)	C (MAX)	Ø D (MAX)	E (MAX)	F (MAX)	G BSC	H BSC	I HEX	J HEX	K THREAD	L THREAD
5 OR 7	19.6 (.772)	17.6 (.693)	13.7 (.539)	13.1 (.516)	8.1 (.319)	5.6 (.22)	13 (.512)	5.5 (.217)	18 (.709)	16 (.63)	M14x0.75	M13x1
12 OR 15	19.6 (.772)	19.6 (.772)	13.7 (.539)	13.1 (.516)	8.1 (.319)	5.6 (.22)	13 (.512)	6.5 (.256)	18 (.709)	18 (.709)	M14x0.75	M15x1
19	22.3 (.878)	21.6 (.85)	15.2 (.598)	15.8 (.622)	9.6 (.378)	5.6 (.22)	16 (.63)	7 (.276)	22 (.866)	20 (.787)	M18x1	M17x1
37	24.6 (.969)	24.1 (.949)	15.2 (.598)	18.5 (.728)	9.6 (.378)	5.6 (.22)	19 (.748)	8.5 (.335)	23 (.906)	22 (.866)	M20x1	M19x1

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 352 & 353

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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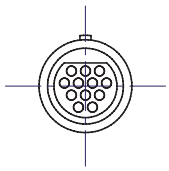
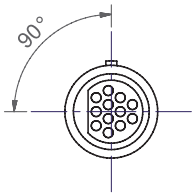
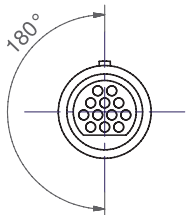
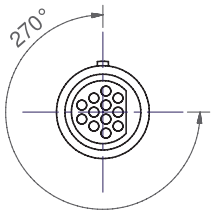
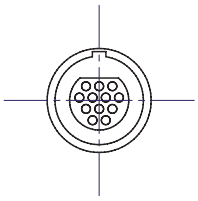
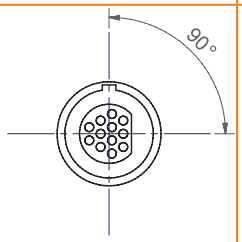
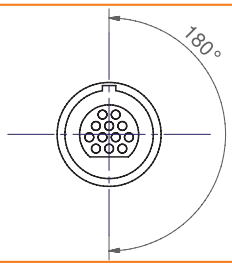
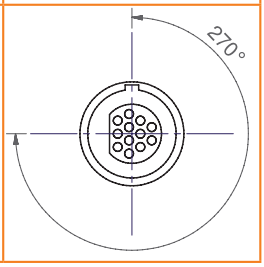
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

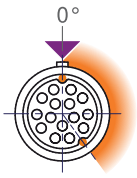
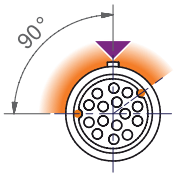
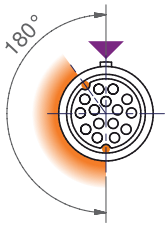
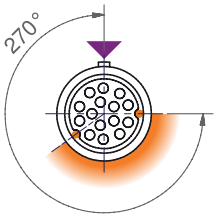
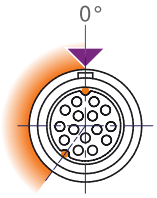
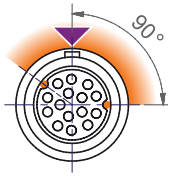
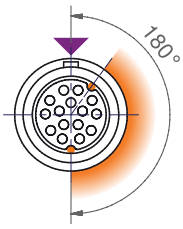
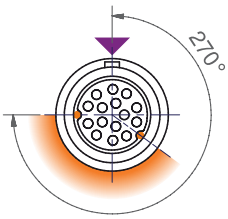
KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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TABLE OF WEIGHTS (estimated) - grams (ounces)

BREAKAWAY	IN-LINE MALE PLUG		IN-LINE FEMALE PLUG		PANEL MOUNT SQUARE FLANGE FEMALE RECEPTACLE		PANEL MOUNT JAM NUT FEMALE RECEPTACLE	
	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	SHORT FUNNEL	SCREEN TERMINATION FUNNEL	REAR MOUNT	FRONT MOUNT	REAR MOUNT	FRONT MOUNT
5 OR 7	4.8 (.17)	5.2 (.19)	6.9 (.25)	7.3 (.26)	4.8 (.17)	4.3 (.16)	6.4 (.23)	5.2 (.19)
12 OR 15	5.0 (.18)	5.3 (.19)	6.2 (.22)	6.5 (.23)	4.2 (.15)	3.7 (.13)	5.6 (.20)	5.6 (.20)
19	6.8 (.24)	7.7 (.27)	8.4 (.30)	9.2 (.32)	6.5 (.23)	5.7 (.21)	8.3 (.30)	7.2 (.25)
37	8.8 (.31)	9.8 (.35)	10.5 (.37)	11.6 (.41)	7.9 (.28)	6.9 (.25)	9.2 (.32)	8.5 (.30)

MAXIMUM WEIGHT OF THE CONNECTOR WITHOUT WIRES
FOR WIRE WEIGHTS SEE PAGE 345

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METAL PCB MICRO-D CIRCULAR CONNECTORS

PCB circular connector range 392

- Identification code
  (Metric Thread, Three Lug Bayonet & Triple Start) 393
  Metric Thread PCB connectors dimensions 394
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PCB CONNECTOR RANGE

In addition to the standard range of circular Micro-D connectors, AXON' offers PCB connectors designed for our 4 types of connector: Metric Thread, Three Lug Bayonet, Triple Start (anti-decoupling) and Breakaway. They are available in 2 layouts: 0.050" & 0.075" pitch.

AXON' Micro-D Printed Circuit Board connectors are designed for interconnection of printed circuit boards inside-the-box to external cables through panels. The gender of a PCB connector is female. On request, EMI optimized versions and ground-pins can be offered.
Printed Circuit Board connectors are available in rear mount version only.

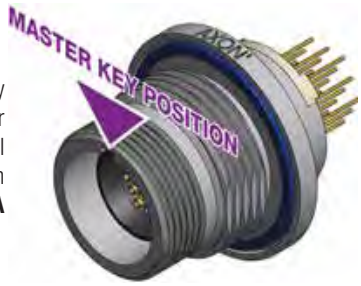
LAYOUT PITCH OPTIONS

PCB layout, 0.050" (1.27 mm) pitch.

PCB layout, 0.075" (1.905 mm) pitch.

EXAMPLES

19 way
metric thread connector
rear mount jam nut panel
0.075" pitch
MCATV19-12S75SG3A



12 way
bayonet connector
rear mount square flange panel
0.075" pitch
MCA3BV12-10S75SG3A

15 way
breakaway connector
rear mount jam nut panel
0.075" pitch
MCABKL15-12S75SG3A

19 way
triple start connector
rear mount jam nut panel
0.075" pitch
MCACV19-12S75SG3A

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IDENTIFICATION CODE

METRIC THREAD (MCAT), THREE LUG BAYONET (MCA3B) & TRIPLE START THREAD (MCAC)

MCA T V 07 - 10 S 75S G 3 A

SERIES
MCA: Micro-D Circular AXON'.

COUPLING SYSTEM
T: Metric thread.
3B: Three lug bayonet.
C: Triple start thread & anti-decoupling system.

MATERIAL & FINISH TYPE
V: Nickel plated brass + epoxy resin 150°C.
W: Nickel plated brass + epoxy resin 200°C.

NUMBER OF CONTACTS
05, **07**, **12**, **15**, **19**, **37**.
See page 343 for contact arrangements.

CONNECTOR TYPE
10: Rear panel mount square flange receptacle, PCB version.
12: Rear panel mount jam nut receptacle, PCB version.

CONNECTOR GENDER
S: Female connector (socket contacts).

PCB VERSION
50S: 0.050" pitch board, straight.
75S: 0.075" pitch board, straight.

CONDUCTOR TYPE
G: Gold plated solid conductor AWG25.
T: Tin plated solid conductor AWG24.
See page 345 for conductor type.

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

MASTER KEY POSITION
A: 0°. **B**: 90°.
C: 180°. **D**: 270°.
See page 400 for master key positions.

ADDITIONAL GROUND PINS AVAILABLE ON REQUEST

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 352

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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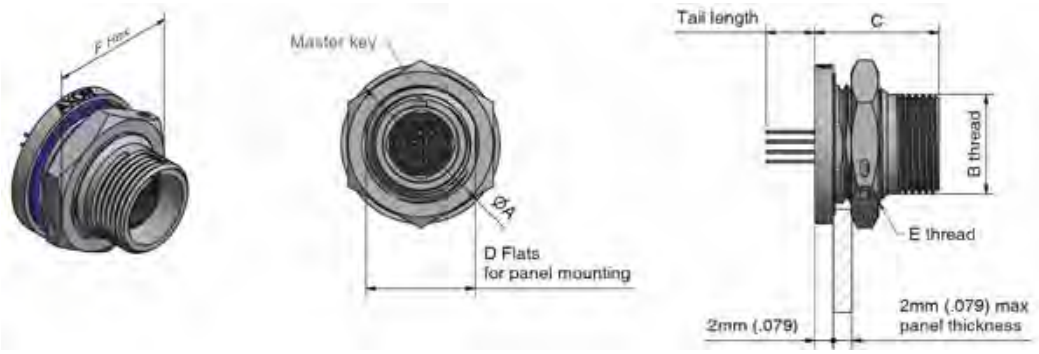
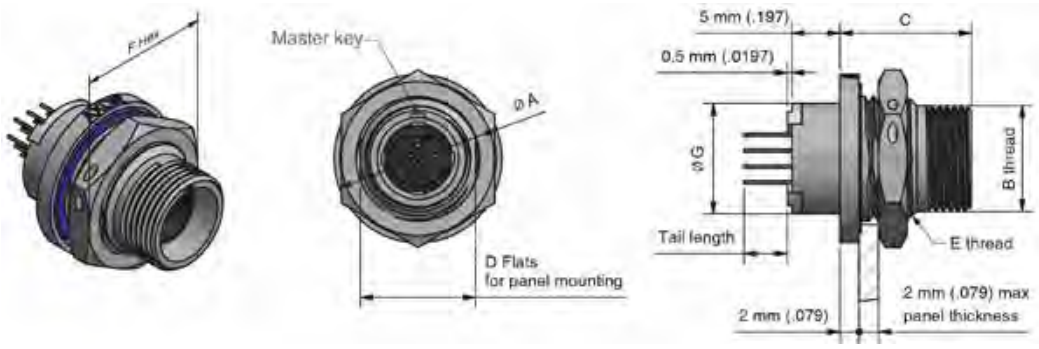


Rear mount jam nut female PCB 0.050" pitch
MCATxxx-12S50Sxxx



Rear mount jam nut female PCB 0.075" pitch
MCATxxx-12S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B THREAD	C (MAX)	D BSC	E THREAD	F HEX	Ø G (MAX)
5 OR 7	16.6 (.654)	M9x0.5	13.8 (.543)	11 (.433)	M12x1	15 (.591)	9.1 (.358)
12 OR 15	17.6 (.693)	M11x0.75	13.8 (.543)	12 (.472)	M13x1	16 (.63)	11.6 (.457)
19	21.3 (.839)	M14x0.75	14.8 (.583)	15 (.591)	M16x1	19 (.748)	13.6 (.535)
37	24.1 (.949)	M17x1	14.8 (.583)	18 (.709)	M19x1	22 (.866)	16.6 (.654)

SUPPLIED WITH JAM NUTS

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGE 352

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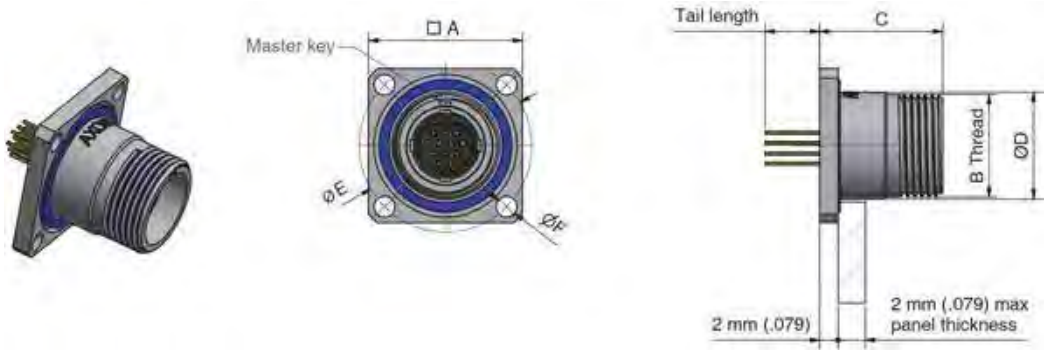
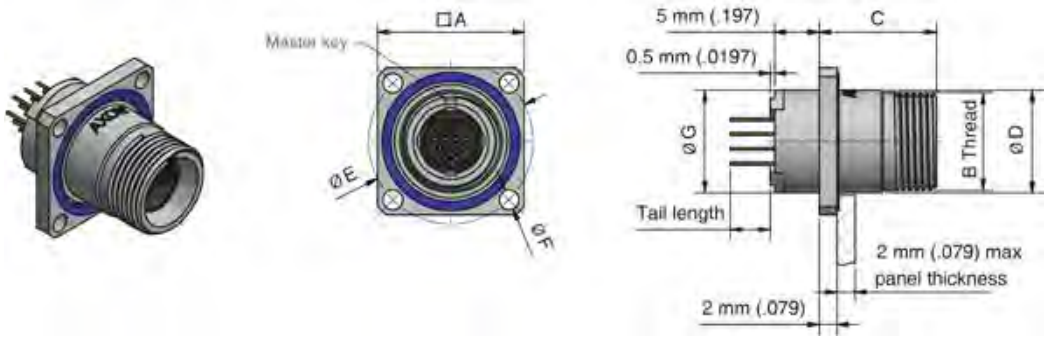


Rear mount square flange female PCB 0.050" pitch
MCATxxx-10S50Sxxx



Rear mount square flange female PCB 0.075" pitch
MCATxxx-10S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□ A (MAX)	B THREAD	C (MAX)	Ø D BSC	Ø E BSC	Ø F +0.2 / -.0 (+.008 / -.0)	Ø G (MAX)
5 OR 7	14.6 (.575)	M9x0.5	13.3 (.524)	9.6 (.378)	16 (.631)	2.2 (.087)	9.1 (.358)
12 OR 15	16.6 (.654)	M11x0.75	13.3 (.524)	11.6 (.457)	18.5 (.728)	2.2 (.087)	11.6 (.457)
19	20.1 (.791)	M14x0.75	14.8 (.583)	15.1 (.594)	22.5 (.886)	3.2 (.126)	13.6 (.535)
37	21.6 (.85)	M17x1	14.8 (.583)	17.1 (.673)	24.5 (.965)	3.2 (.126)	16.6 (.654)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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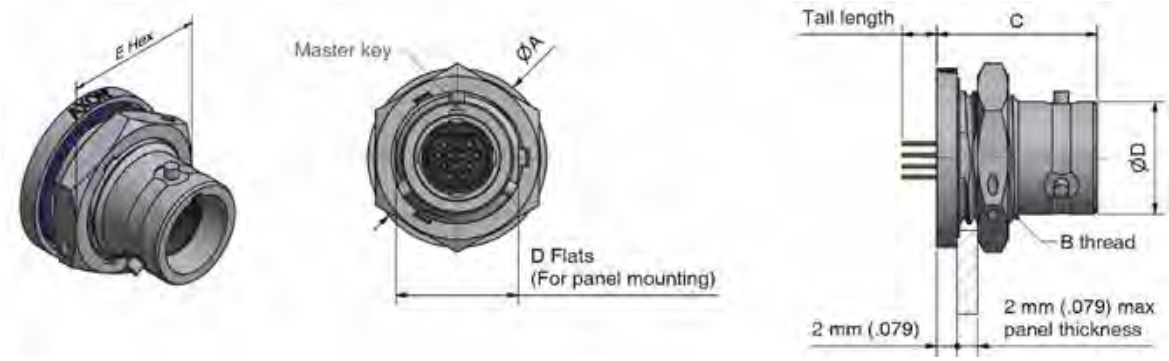
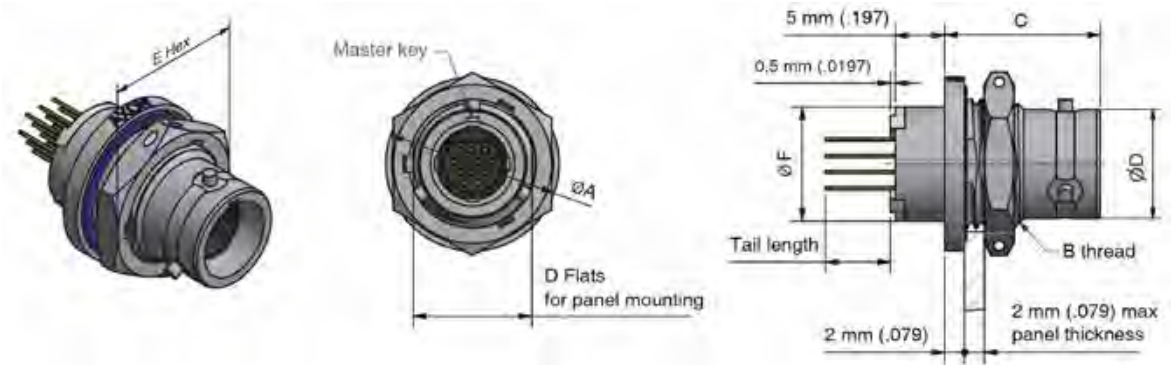


Rear mount jam nut female PCB 0.050" pitch
MCA3Bxxx-12S50Sxxx



Rear mount jam nut female PCB 0.075" pitch
MCA3Bxxx-12S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B THREAD	C (MAX)	D FLAT	E HEX	Ø F (MAX)
5 OR 7	16.6 (.654)	M12x1	15.8 (.622)	11 (.433)	15 (.591)	9.1 (.358)
12 OR 15	17.6 (.693)	M13x1	15.8 (.622)	12 (.473)	16 (.63)	11.6 (.457)
19	21.3 (.839)	M16x1	16.8 (.661)	15 (.591)	19 (.748)	13.6 (.535)
37	24.1 (.949)	M19x1	16.8 (.661)	18 (.709)	22 (.866)	16.6 (.654)

SUPPLIED WITH JAM NUTS

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGE 352

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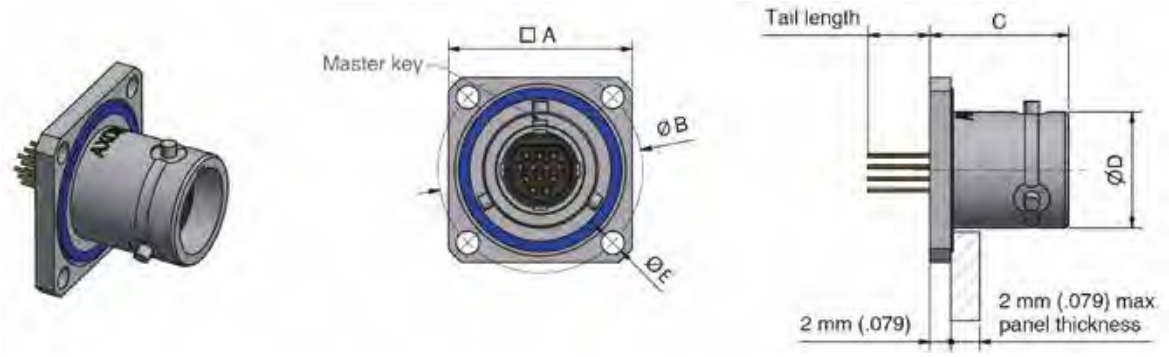
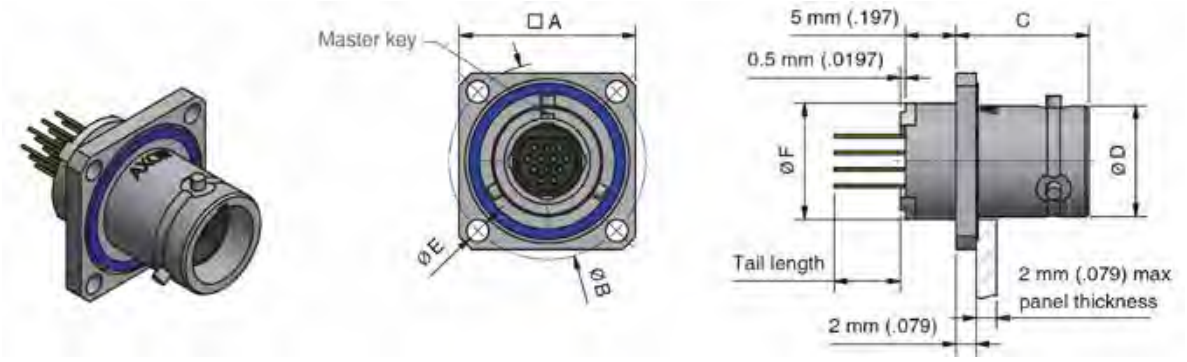


Rear mount square flange female PCB 0.050" pitch
MCA3Bxxx-10S50Sxxx



Rear mount square flange female PCB 0.075" pitch
MCA3Bxxx-10S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	Ø B BSC	C (MAX)	Ø D (MAX)	Ø E +0.2 / -.0 (+.008 / -.0)	Ø F (MAX)
5 OR 7	16.6 (.654)	18.5 (.728)	13.3 (.524)	9.6 (.378)	2.2 (.087)	9.1 (.358)
12 OR 15	17.6 (.693)	19.5 (.768)	13.3 (.524)	11.1 (.437)	2.2 (.087)	11.6 (.457)
19	21.6 (.85)	24.5 (.965)	14.8 (.583)	14.1 (.555)	3.2 (.126)	13.6 (.535)
37	24.1 (.949)	27 (1.063)	14.8 (.583)	17.1 (.673)	3.2 (.126)	16.6 (.654)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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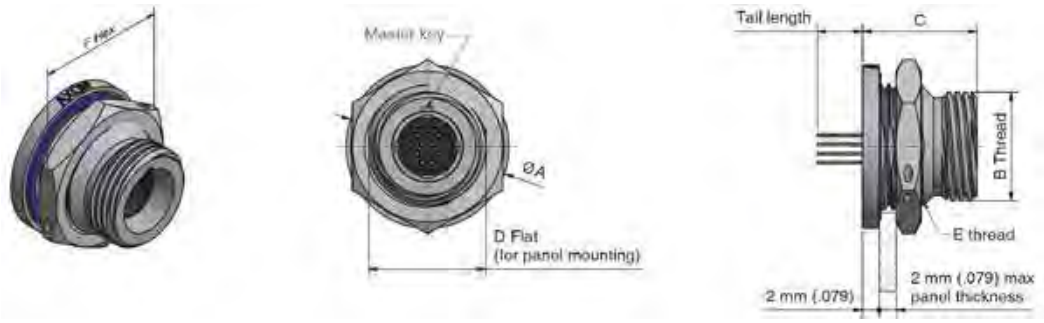
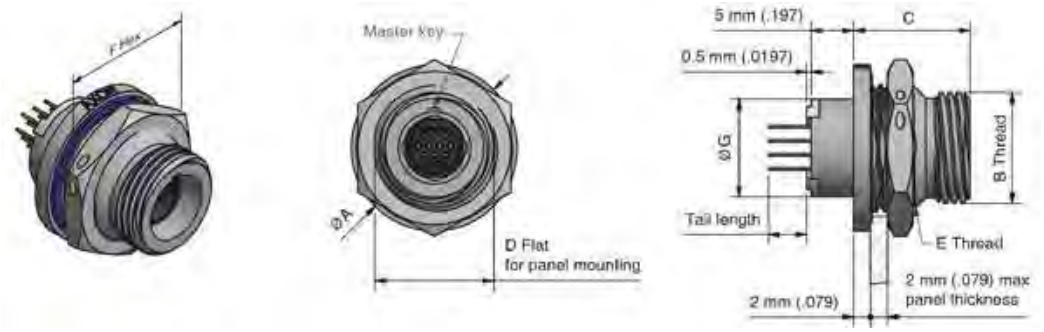


Rear mount jam nut female PCB 0.050" pitch
MCACxxx-12S50Sxxx



Rear mount jam nut female PCB 0.075" pitch
MCACxxx-12S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	B THREAD	C (MAX)	D BSC	E THREAD	F HEX	Ø G (MAX)
5 OR 7	17.6 (.693)	Tr11x3P1	13.8 (.543)	12 (.473)	M13x1	16 (.631)	9.1 (.358)
12 OR 15	19.6 (.772)	Tr13x3P1	13.8 (.543)	14 (.551)	M15x1	18 (.709)	11.6 (.457)
19	21.6 (.85)	Tr15x3P1	14.8 (.583)	16 (.631)	M17x1	20 (.787)	13.6 (.535)
37	24.6 (.969)	Tr18x3P1	14.8 (.583)	19 (.748)	M20x1	23 (.906)	16.6 (.654)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGE 352

SUPPLIED WITH JAM NUTS

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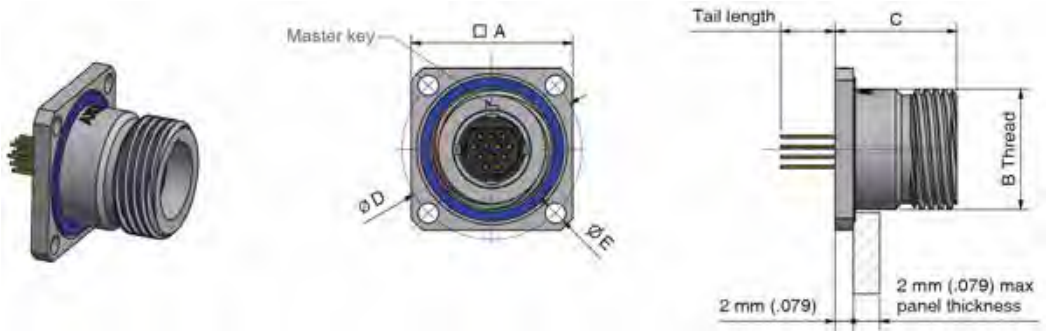
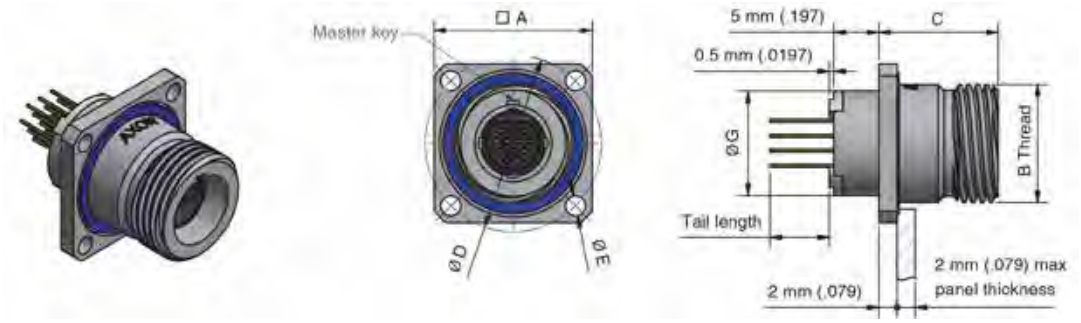
TRIPLE START (ANTI-DECOUPLING) PCB CONNECTORS



Rear mount square flange female PCB 0.050" pitch

MCACxxx-10S50Sxxx



Rear mount square flange female PCB 0.075" pitch

MCACxxx-10S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	B THREAD	C (MAX)	Ø D BSC	Ø E +0.2 / -.0 (+.008 / -.0)	Ø G (MAX)
5 OR 7	16.6 (.654)	Tr11x3P1	13.3 (.524)	18.5 (.728)	2.2 (0.87)	9.1 (.358)
12 OR 15	17.6 (.693)	Tr13x3P1	13.3 (.524)	19.5 (.768)	2.2 (0.87)	11.6 (.457)
19	20.1 (.791)	Tr15x3P1	14.8 (.583)	22.5 (.886)	3.2 (.126)	13.6 (.535)
37	24.1 (.949)	Tr18x3P1	14.8 (.583)	27 (1.063)	3.2 (.126)	16.6 (.654)

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 388
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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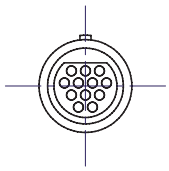
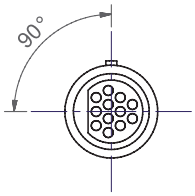
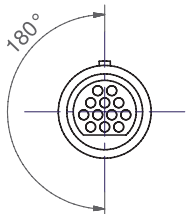
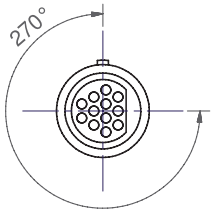
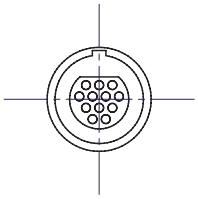
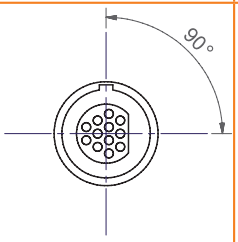
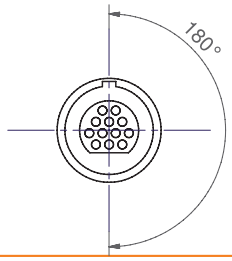
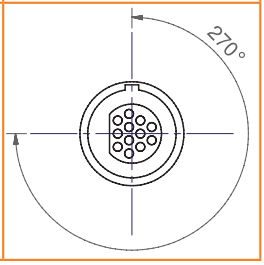
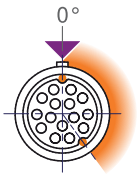
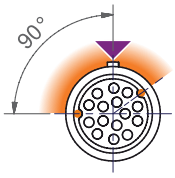
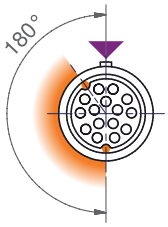
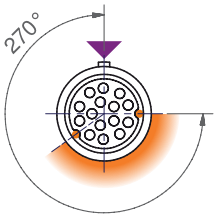
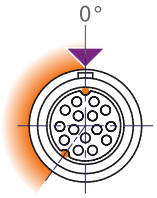
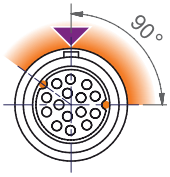
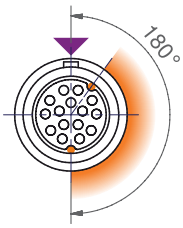
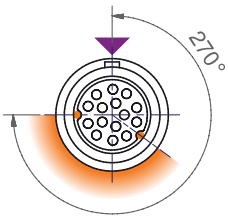
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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IDENTIFICATION CODE BREAKAWAY (MCABK)

MCA	BK	L	12	-	12	S	75S	G	3	A

SERIES

MCA: Micro-D Circular AXON'.

COUPLING SYSTEM

BK: Breakaway.

MATERIAL & FINISH TYPE

L: Nickel plated aluminium + epoxy resin 150°C.
M: Nickel plated aluminium + epoxy resin 200°C.

NUMBER OF CONTACTS

05, **07**, **12**, **15**, **19**, **37**.

See page 343 for contact arrangements.

CONNECTOR TYPE

10: Rear panel mount square flange receptacle, PCB version.
12: Rear panel mount jam nut receptacle, PCB version.

CONNECTOR GENDER

S: Female connector (socket contacts).

PCB VERSION

50S: 0.050" pitch board, straight.
75S: 0.075" pitch board, straight.

CONDUCTOR TYPE

G: Gold plated solid conductor AWG25.
T: Tin plated solid conductor AWG24.

See page 345 for conductor type.

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

MASTER KEY POSITION

A: 0°. **B**: 90°.
C: 180°. **D**: 270°.

See page 404 for master key positions.

ADDITIONAL GROUND PINS AVAILABLE ON REQUEST

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350 & 352

PANEL MOUNT SQUARE FLANGE CONNECTORS ARE SUPPLIED WITHOUT PANEL MOUNTING SCREWS

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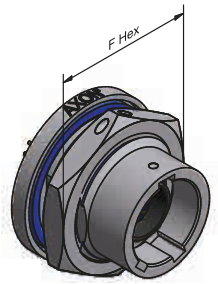
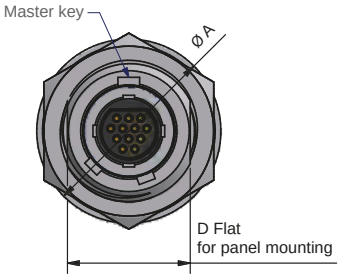
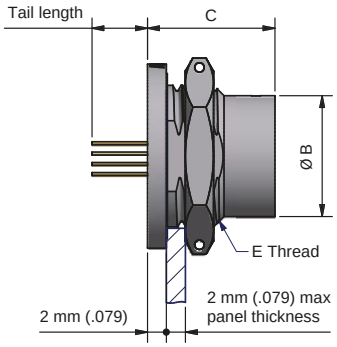
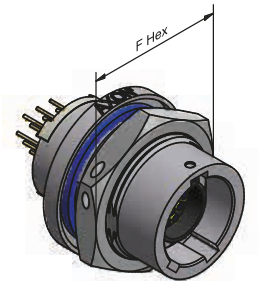


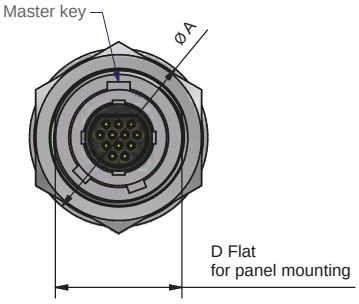


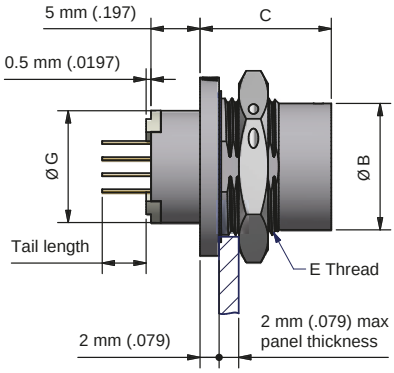


Rear mount jam nut female PCB 0.050" pitch

MCABKxxx-12S50Sxxx







Rear mount jam nut female PCB 0.075" pitch

MCABKxxx-12S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	Ø A (MAX)	Ø B	C (MAX)	D BSC	E THREAD	F (MAX)	G
5 OR 7	19.6 (.772)	13.1 (.516)	13.7 (.539)	13 (.512)	M14x0.75	16 (.630)	9.1 (.358)
12 OR 15	19.6 (.772)	13.1 (.516)	13.7 (.539)	13 (.512)	M14x0.75	18 (.709)	11.6 (.457)
19	22.3 (.878)	15.8 (.622)	15.2 (.598)	16 (.63)	M18x1	22 (.866)	13.6 (.535)
37	24.6 (.969)	18.5 (.728)	15.2 (.598)	19 (.748)	M20x1	23 (.906)	16.6 (.654)

SUPPLIED WITH JAM NUTS

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 404
FOR PANEL CUT-OUT DIMENSIONS SEE PAGE 352

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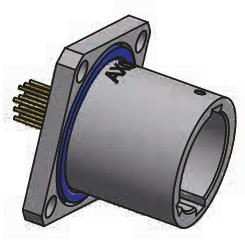
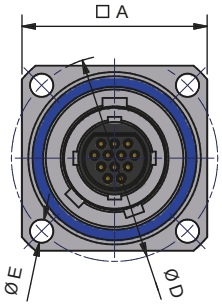
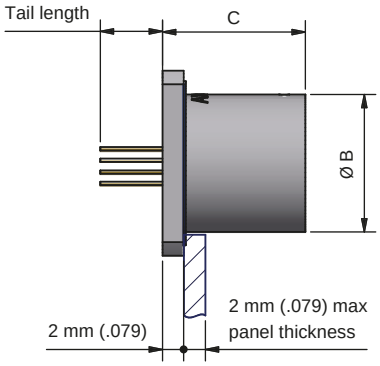
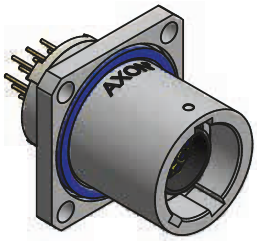


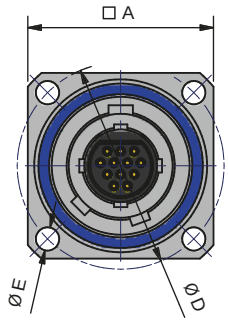


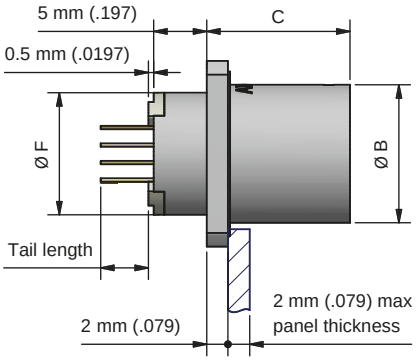


Rear mount square flange female PCB 0.050" pitch

MCABKxxx-10S50Sxxx







Rear mount square flange female PCB 0.075" pitch

MCABKxxx-10S75Sxxx

TABLE OF DIMENSIONS - millimetres (inches)

NUMBER OF WAYS	□A (MAX)	Ø B (MAX)	C (MAX)	Ø D BSC	Ø E +0.2 / -.0 (+.008 / -.0)	Ø F (MAX)
5 OR 7	17.6 (.693)	13.1 (.515)	13.7 (.539)	19.5 (.768)	2.2 (.087)	9.1 (.358)
12 OR 15	17.6 (.693)	13.1 (.515)	13.7 (.539)	19.5 (.768)	2.2 (.087)	11.6 (.457)
19	22.1 (.87)	15.8 (.622)	15.2 (.598)	24.5 (.965)	3.2 (.126)	13.6 (.535)
37	24.1 (.949)	18.5 (.728)	15.2 (.598)	27.5 (1.083)	3.2 (.126)	16.6 (.654)

SUPPLIED WITHOUT PANEL MOUNTING SCREWS

FOR PANEL MOUNTING GUIDE SEE PAGES 340 & 341
FOR MASTER KEY POSITIONS SEE PAGE 404
FOR PANEL CUT-OUT DIMENSIONS SEE PAGES 350

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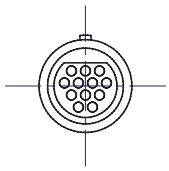
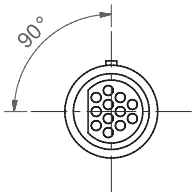
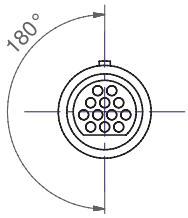
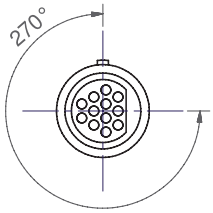
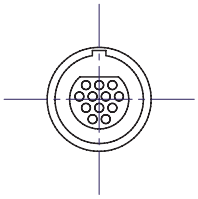
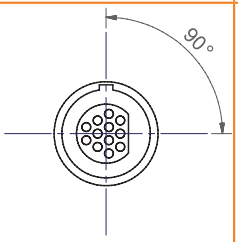
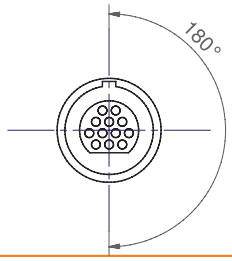
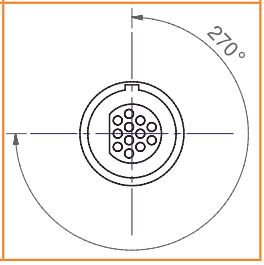
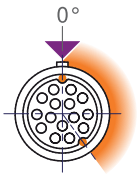
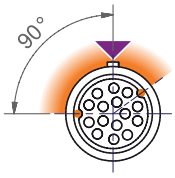
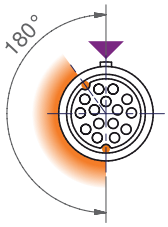
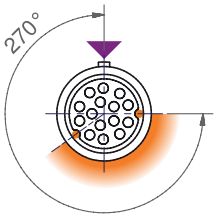
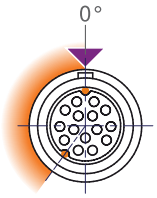
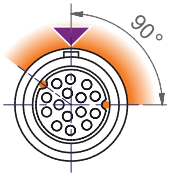
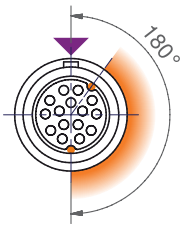
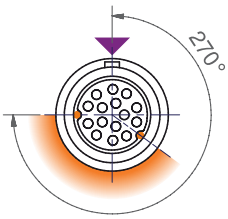
MASTER KEY POSITIONS (5, 7, 12, 19 & 37 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

MASTER KEY POSITIONS (15 way connectors)

KEY CODE	A	B	C	D
ORIENTATION	0°	90°	180°	270°
MALE KEYING (for in-line male plugs)				
FEMALE KEYING (for in-line female plugs & panel mount receptacles)				

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TABLES OF WEIGHTS (estimated) - grams (ounces)

PCB 0.050" PITCH	METRIC THREAD		THREE LUG BAYONET		ANTI-DECOUPLING		BREAKAWAY	
	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT
5 OR 7	5.7 (.21)	9.6 (.34)	7.2 (.26)	9.6 (.34)	8.8 (.31)	12.3 (.44)	4.8 (.17)	6.4 (.23)
12 OR 15	7.9 (.28)	11 (.39)	8.4 (.31)	12.3 (.44)	11.1 (.39)	15.7 (.56)	4.2 (.15)	5.6 (.20)
19	13.7 (.48)	16.5 (.58)	13.8 (.49)	18.5 (.66)	14.2 (.50)	18.5 (.65)	6.5 (.23)	8.3 (.30)
37	14.8 (.55)	20.7 (.73)	17.4 (.62)	22.5 (.80)	19 (.67)	23.4 (.83)	7.9 (.28)	9.2 (.33)

PCB 0.075" PITCH	METRIC THREAD		THREE LUG BAYONET		ANTI-DECOUPLING		BREAKAWAY	
	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT	SQUARE FLANGE	JAM NUT
5 OR 7	7.3 (.26)	11.2 (.40)	8.8 (.31)	11.2 (.40)	10.4 (.37)	13.9 (.49)	5.6 (.20)	7.2 (.26)
12 OR 15	10.3 (.37)	13.4 (.48)	10.8 (.38)	14.7 (.52)	13.5 (.48)	18.1 (.64)	5.5 (.20)	6.9 (.25)
19	16.6 (.59)	19.4 (.69)	16.7 (.59)	21.4 (.76)	17.1 (.60)	21.4 (.76)	8.2 (.29)	9.9 (.35)
37	18.7 (.66)	24.6 (.87)	21.3 (.75)	26.4 (.94)	22.9 (.81)	27.3 (.97)	10.3 (.37)	11.6 (.41)

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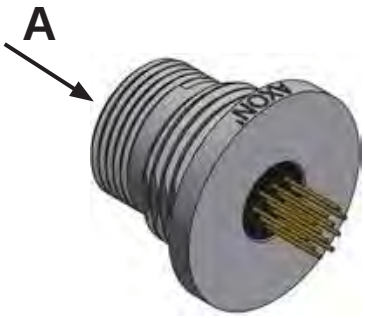
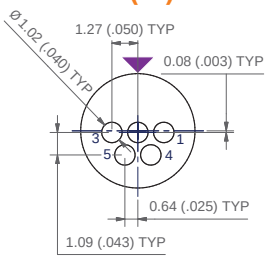
PCB LAYOUT 0.050" PITCH

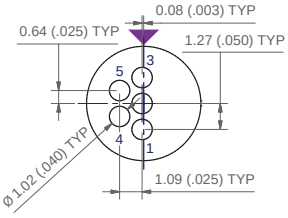


5 CONTACTS - VIEW A

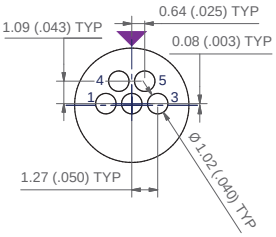
A (0°)



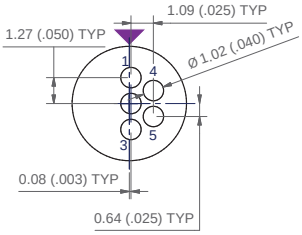
B (90°)



C (180°)

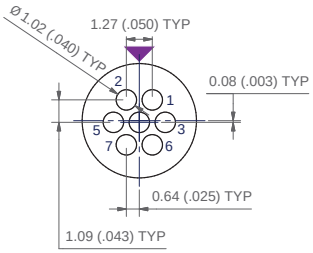


D (270°)

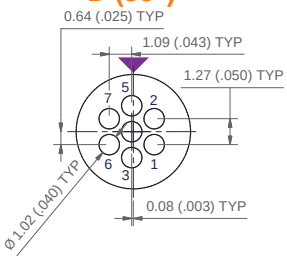


7 CONTACTS - VIEW A

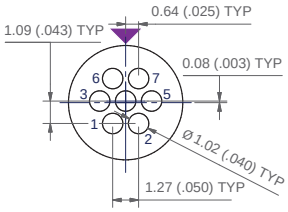
A (0°)



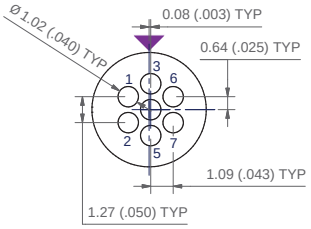
B (90°)



C (180°)

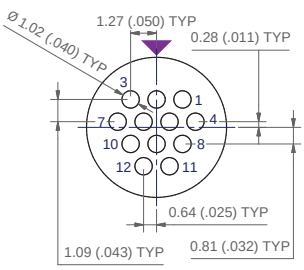


D (270°)

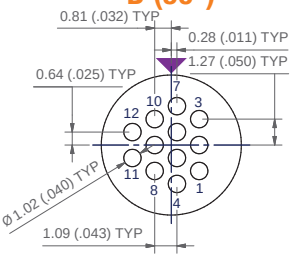


12 CONTACTS - VIEW A

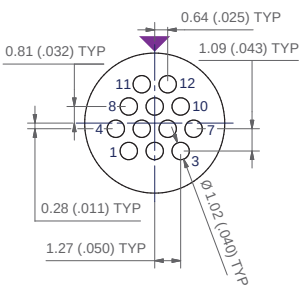
A (0°)



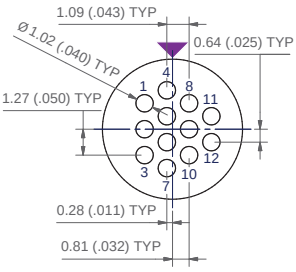
B (90°)



C (180°)



D (270°)



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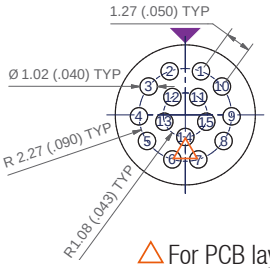
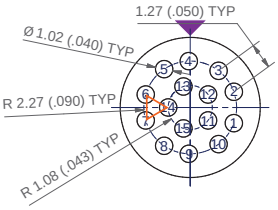
PCB LAYOUT 0.050" PITCH

15 CONTACTS - VIEW A

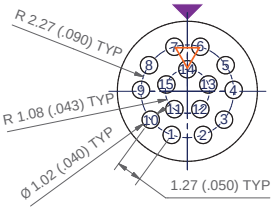
A (0°)



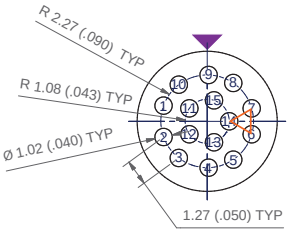
B (90°)



C (180°)



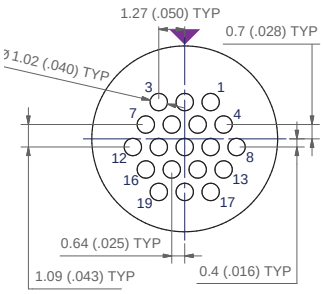
D (270°)



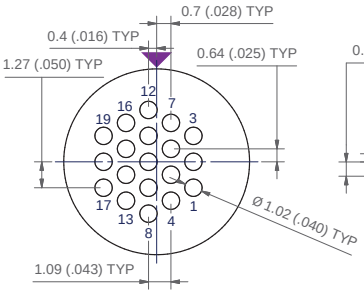
△ For PCB layout options for 15 way connectors, please see page 410 for detailed explanation

19 CONTACTS - VIEW A

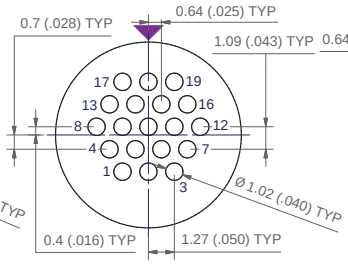
A (0°)



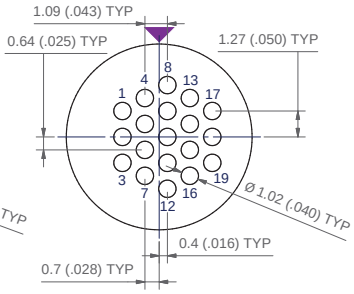
B (90°)



C (180°)

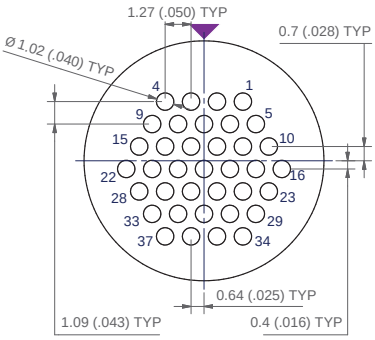


D (270°)

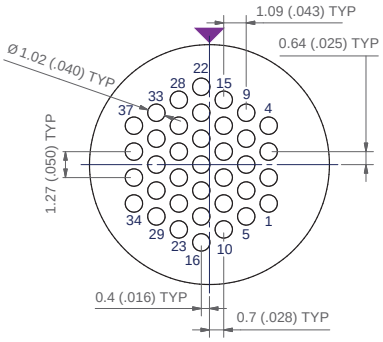


37 CONTACTS - VIEW A

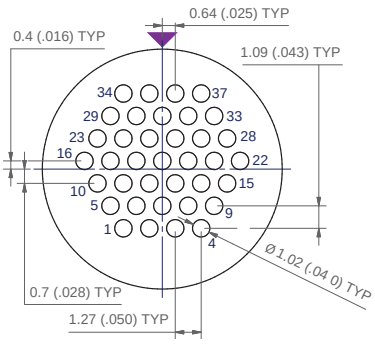
A (0°)



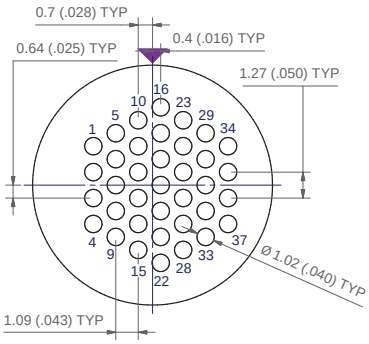
B (90°)



C (180°)



D (270°)



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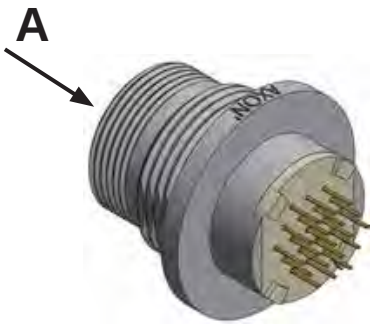
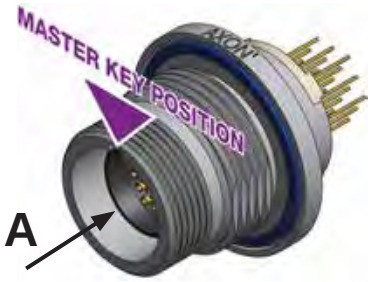
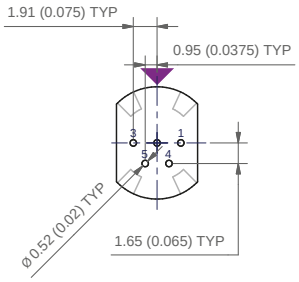
PCB LAYOUT 0.075" PITCH



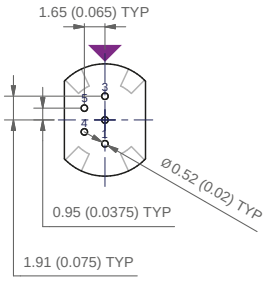


5 CONTACTS - VIEW A

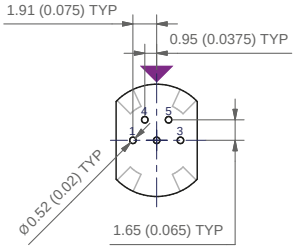
A (0°)



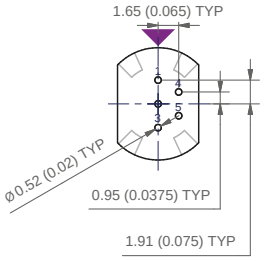
B (90°)



C (180°)

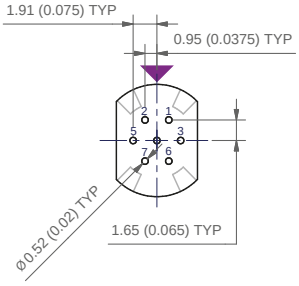


D (270°)

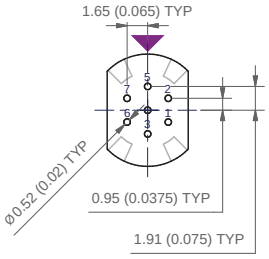


7 CONTACTS - VIEW A

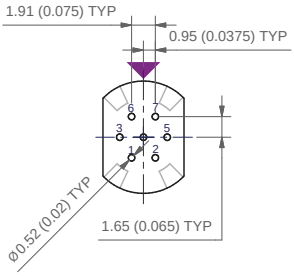
A (0°)



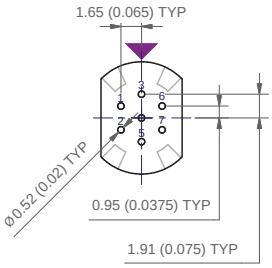
B (90°)



C (180°)

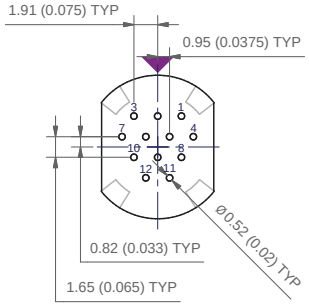


D (270°)

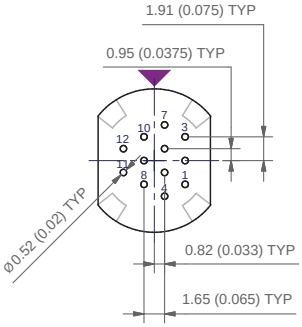


12 CONTACTS - VIEW A

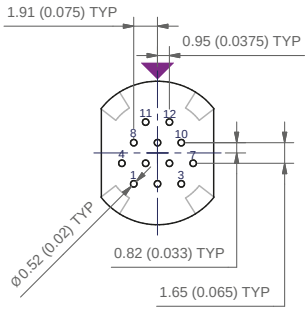
A (0°)



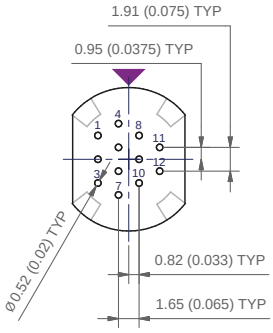
B (90°)



C (180°)



D (270°)



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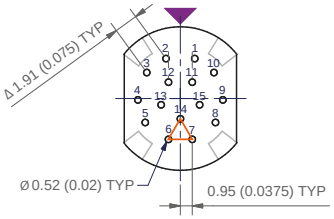
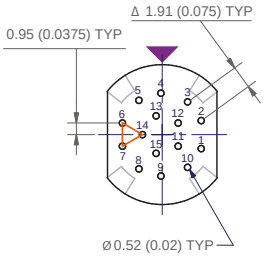
PCB LAYOUT 0.075" PITCH

15 CONTACTS - VIEW A

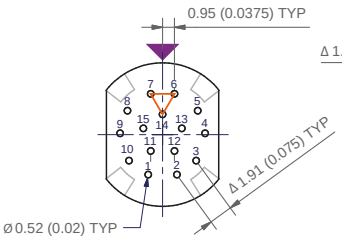
A (0°)



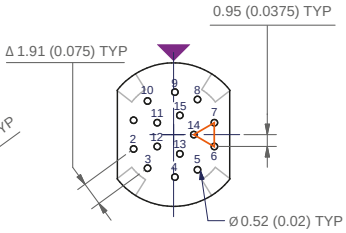
B (90°)



C (180°)



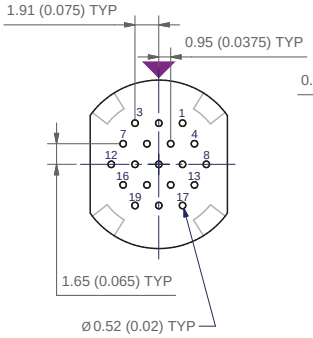
D (270°)



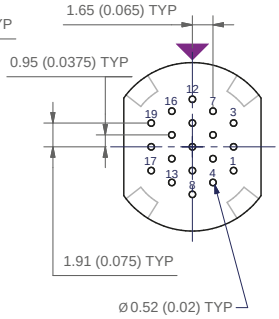
△ For PCB layout options for 15 way connectors, please see page 410 for detailed explanation

19 CONTACTS - VIEW A

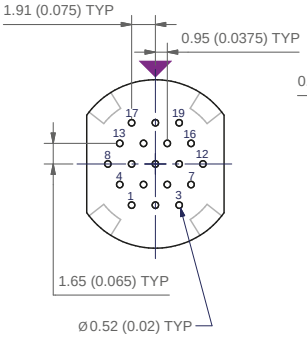
A (0°)



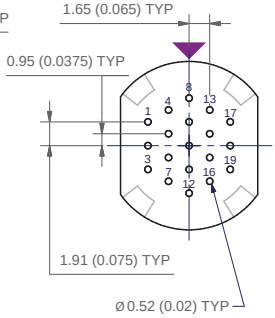
B (90°)



C (180°)

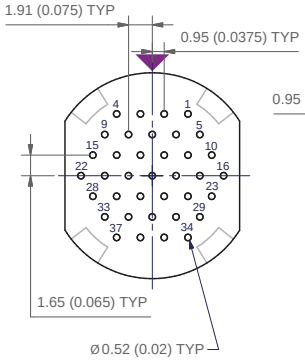


D (270°)

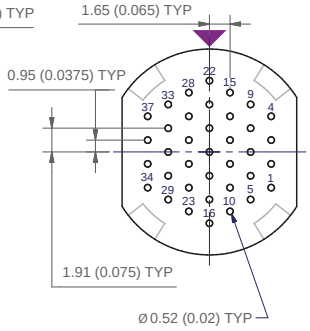


37 CONTACTS - VIEW A

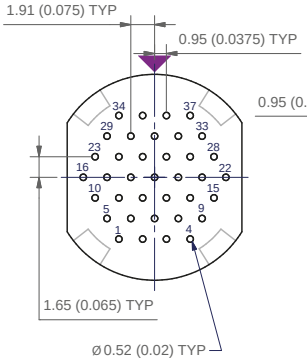
A (0°)



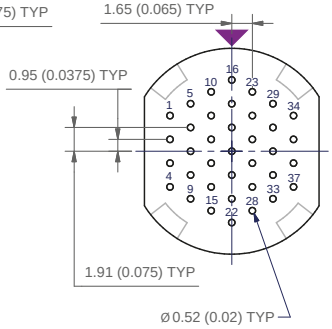
B (90°)



C (180°)



D (270°)



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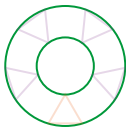
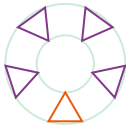
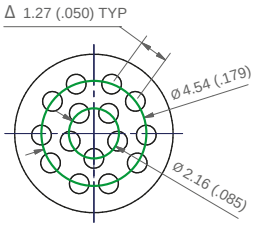
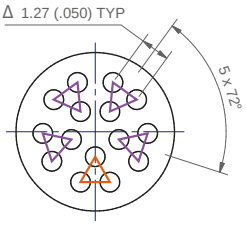
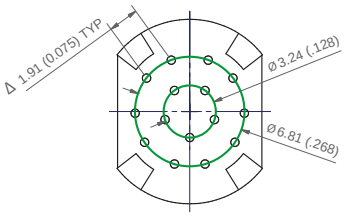
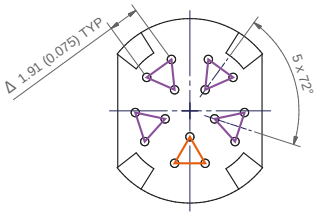
15 WAY CONNECTORS PCB LAYOUTS

This page describes in more detail the construction of the PCB layouts for the 15-way connectors shown on pages X (0.050" pitch) and Y (0.075" pitch).

Two geometrical patterns combine to create this layout:

PATTERNS	Two concentric circles. 	A circular array of five eqilateral triangles, 72° apart. 
0.050" PITCH		
0.075" PITCH		

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PLASTIC MICRO-D CIRCULAR CONNECTORS

SOLDER CUP & PIGTAIL CONNECTOR - MCA

- Solder cup connector 412
- Pigtail connector. 414

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SOLDER CUP CONNECTOR

PLASTIC SHELL

- Compact low weight connector.
- Small overall dimensions.
- Easy to integrate in custom solutions.
- Ideal for prototyping or where pigtail type connectors cannot be used.
- 5 to 15 contacts.

IDENTIFICATION CODE

MCA P 12 S FS

SERIES
MCA: Micro-D Circular AXON' plastic shell.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP shell + potting 200°C.

NUMBER OF CONTACTS
05, **07**, **12**, **15**.
See pages 342 & 343 for contact arrangements.

CONNECTOR GENDER
P: male (pin contacts).
S: female (socket contacts).

SOLDER CUP

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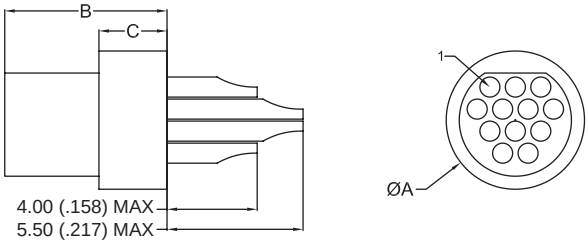
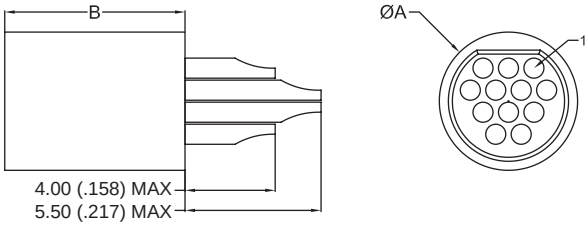
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



NUMBER OF WAYS	Ø A ± 0.10 (.004)	B ± 0.10 (.004)		C max.
		Male (P)	Female (S)	
5 OR 7	5.60 .220	8.10 .319	9.00 .354	3.50 .138
12	6.86 .270	8.10 .319	9.00 .354	3.50 .138
15	6.86 .270	8.10 .319	9.00 .354	3.50 .138

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
SOLDER CUP	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

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PIGTAIL CONNECTOR

PLASTIC SHELL

- Low cost plastic connector.
- 5 to 37 contacts.

IDENTIFICATION CODE

MCA P 12 S 4 L 050

SERIES
MCA: Micro-D Circular AXON' plastic shell.

CONNECTOR TYPE
P: LCP shell + potting 150°C.
L: LCP shell + potting 200°C.

NUMBER OF CONTACTS
05, **07**, **12**, **15**, **19**, **37**.
See pages 342 & 343 for contact arrangements.

CONNECTOR GENDER
P: male (pin contacts).
S: female (socket contacts).

WIRE TYPE
For colour codes F, L, W
1: E 2607, AWG 26, 7 strands, 600 V.
4: E 2619, AWG 26, 19 strands, 600 V.
6: E 2807, AWG 28, 7 strands, 600 V.
8: E 3007, AWG 30, 7 strands, 600 V.
E: M22759/33, AWG 26,19 strands, 600 V.

For colour code V only
3: M22759/11, AWG26, 19 strands, 600 V.
F: E 2607, AWG26, 7 strands, 600 V.

Solid uninsulated wires
G: AWG 25 gold plated.
T: AWG 24 tin plated.
See page 345 for wire types

COLOUR CODE
F: All yellow.
L: All white.
V: MIL-STD-681 striped (only for wire types 3 and F).
W: 10 colour repeated code.
BLANK: if wire type is **G** or **T**.
See pages 346 & 347 for colour code.

WIRE LENGTH (in cm)
Caution! wire length in centimetres - (1 cm = 10 mm = 0.394").

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

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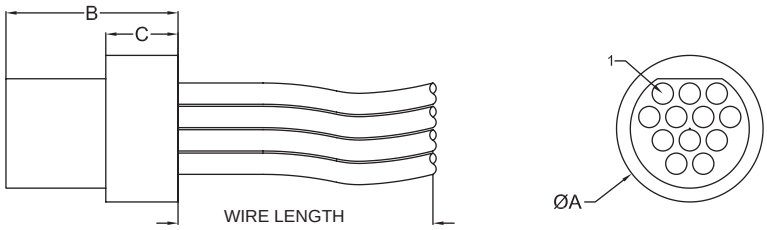
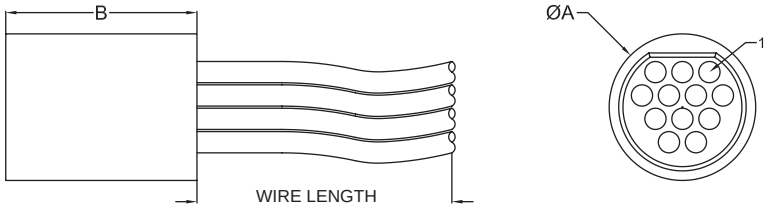
DIMENSIONS

Dimensions are in millimetres (inches).

MALE connector



FEMALE connector



NUMBER OF WAYS	Ø A ± 0.10 (.004)	B ± 0.10 (.004)		C max.
		Male (P)	Female (S)	
5 OR 7	5.60 .220	8.10 .319	9.00 .354	3.50 .138
12 OR 15	6.86 .270	8.10 .319	9.00 .354	3.50 .138
19	9.10 .358	9.00 .354	10.00 .393	4.50 .177
37	11.75 .463	9.00 .354	10.00 .393	4.50 .177

SUMMARY OF CHARACTERISTICS

ELECTRICAL & MECHANICAL PERFORMANCE	
CURRENT RATING	3 A max.
CONTACT RESISTANCE	8 mΩ max.
INSULATION RESISTANCE	5 000 MΩ min. @ 500 VDC
DIELECTRIC WITHSTANDING VOLTAGE	Sea level: 600 VAC
	Altitude 21 km (70,000 ft): 150 VAC
CONTACT ENGAGING FORCE	170 g max. (6 oz)
CONTACT SEPARATING FORCE	14 g min. (0.5 oz)
CONTACT RETENTION	2.26 kg (5 lbs)
DURABILITY	500 mating cycles min.

MATERIAL & FINISH	
MOULDED SHELL	Liquid Crystal Polymer (LCP)
PIN CONTACT	Copper and beryllium copper, gold over nickel plating
SOCKET CONTACT	Copper alloy, gold over nickel plating
ENCAPSULANT	Epoxy resin

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MILITARY CROSS REFERENCE CHART

M83513/01

MIL STANDARD	AXON' EQUIVALENT
M83513/01-AC	MDA109PFSB
M83513/01-AN	MDA209PFSB
M83513/01-AP	MDAS09PFSB
M83513/01-BC	MDA115PFSB
M83513/01-BN	MDA215PFSB
M83513/01-BP	MDAS15PFSB
M83513/01-CC	MDA121PFSB
M83513/01-CN	MDA221PFSB
M83513/01-CP	MDAS21PFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/01-DC	MDA125PFSB
M83513/01-DN	MDA225PFSB
M83513/01-DP	MDAS25PFSB
M83513/01-EC	MDA131PFSB
M83513/01-EN	MDA231PFSB
M83513/01-EP	MDAS31PFSB
M83513/01-FC	MDA137PFSB
M83513/01-FN	MDA237PFSB
M83513/01-FP	MDAS37PFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/01-GC	MDA151PFSB
M83513/01-GN	MDA251PFSB
M83513/01-GP	MDAS51PFSB
M83513/01-HC	MDA1100PFSB
M83513/01-HN	MDA2100PFSB
M83513/01-HP	MDAS100PFSB

M83513/02

MIL STANDARD	AXON' EQUIVALENT
M83513/02-AC	MDA109SFSB
M83513/02-AN	MDA209SFSB
M83513/02-AP	MDAS09SFSB
M83513/02-BC	MDA115SFSB
M83513/02-BN	MDA215SFSB
M83513/02-BP	MDAS15SFSB
M83513/02-CC	MDA121SFSB
M83513/02-CN	MDA221SFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/02-CP	MDAS21SFSB
M83513/02-DC	MDA125SFSB
M83513/02-DN	MDA225SFSB
M83513/02-DP	MDAS25SFSB
M83513/02-EC	MDA131SFSB
M83513/02-EN	MDA231SFSB
M83513/02-EP	MDAS31SFSB
M83513/02-FC	MDA137SFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/02-FN	MDA237SFSB
M83513/02-FP	MDAS37SFSB
M83513/02-GC	MDA151SFSB
M83513/02-GN	MDA251SFSB
M83513/02-GP	MDAS51SFSB
M83513/02-HC	MDA1100SFSB
M83513/02-HN	MDA2100SFSB
M83513/02-HP	MDAS100SFSB

M83513/03

MIL STANDARD	AXON' EQUIVALENT
M83513/03-A01C	MDA109P4L046B
M83513/03-A01N	MDA209P4L046B
M83513/03-A01P	MDAS09P4L046B
M83513/03-A02C	MDA109P4L092B
M83513/03-A02N	MDA209P4L092B
M83513/03-A02P	MDAS09P4L092B
M83513/03-A03C	MDA109P4W046B
M83513/03-A03N	MDA209P4W046B
M83513/03-A03P	MDAS09P4W046B
M83513/03-A04C	MDA109P4W092B
M83513/03-A04N	MDA209P4W092B
M83513/03-A04P	MDAS09P4W092B
M83513/03-A05C	MDA109PG002B
M83513/03-A05N	MDA209PG002B
M83513/03-A05P	MDAS09PG002B
M83513/03-A06C	MDA109PG003B
M83513/03-A06N	MDA209PG003B
M83513/03-A06P	MDAS09PG003B
M83513/03-A07C	MDA109PT002B
M83513/03-A07N	MDA209PT002B
M83513/03-A07P	MDAS09PT002B
M83513/03-A08C	MDA109PT003B
M83513/03-A08N	MDA209PT003B
M83513/03-A08P	MDAS09PT003B
M83513/03-A09C	MDA109PEL046B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-A09N	MDA209PEL046B
M83513/03-A09P	MDAS09PEL046B
M83513/03-A10C	MDA109PEL092B
M83513/03-A10N	MDA209PEL092B
M83513/03-A10P	MDAS09PEL092B
M83513/03-A11C	MDA109PEW046B
M83513/03-A11N	MDA209PEW046B
M83513/03-A11P	MDAS09PEW046B
M83513/03-A12C	MDA109PEW092B
M83513/03-A12N	MDA209PEW092B
M83513/03-A12P	MDAS09PEW092B
M83513/03-A13C	MDA109P4L183B
M83513/03-A13N	MDA209P4L183B
M83513/03-A13P	MDAS09P4L183B
M83513/03-A14C	MDA109P4W183B
M83513/03-A14N	MDA209P4W183B
M83513/03-A14P	MDAS09P4W183B
M83513/03-A15C	MDA109PEL183B
M83513/03-A15N	MDA209PEL183B
M83513/03-A15P	MDAS09PEL183B
M83513/03-A16C	MDA109PEW183B
M83513/03-A16N	MDA209PEW183B
M83513/03-A16P	MDAS09PEW183B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-B01C	MDA115P4L046B
M83513/03-B01N	MDA215P4L046B
M83513/03-B01P	MDAS15P4L046B
M83513/03-B02C	MDA115P4L092B
M83513/03-B02N	MDA215P4L092B
M83513/03-B02P	MDAS15P4L092B
M83513/03-B03C	MDA115P4W046B
M83513/03-B03N	MDA215P4W046B
M83513/03-B03P	MDAS15P4W046B
M83513/03-B04C	MDA115P4W092B
M83513/03-B04N	MDA215P4W092B
M83513/03-B04P	MDAS15P4W092B
M83513/03-B05C	MDA115PG002B
M83513/03-B05N	MDA215PG002B
M83513/03-B05P	MDAS15PG002B
M83513/03-B06C	MDA115PG003B
M83513/03-B06N	MDA215PG003B
M83513/03-B06P	MDAS15PG003B
M83513/03-B07C	MDA115PT002B
M83513/03-B07N	MDA215PT002B
M83513/03-B07P	MDAS15PT002B
M83513/03-B08C	MDA115PT003B
M83513/03-B08N	MDA215PT003B
M83513/03-B08P	MDAS15PT003B
M83513/03-B09C	MDA115PEL046B

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M83513/03 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/03-B09N	MDA215PEL046B
M83513/03-B09P	MDAS15PEL046B
M83513/03-B10C	MDA115PEL092B
M83513/03-B10N	MDA215PEL092B
M83513/03-B10P	MDAS15PEL092B
M83513/03-B11C	MDA115PEW046B
M83513/03-B11N	MDA215PEW046B
M83513/03-B11P	MDAS15PEW046B
M83513/03-B12C	MDA115PEW092B
M83513/03-B12N	MDA215PEW092B
M83513/03-B12P	MDAS15PEW092B
M83513/03-B13C	MDA115P4L183B
M83513/03-B13N	MDA215P4L183B
M83513/03-B13P	MDAS15P4L183B
M83513/03-B14C	MDA115P4W183B
M83513/03-B14N	MDA215P4W183B
M83513/03-B14P	MDAS15P4W183B
M83513/03-B15C	MDA115PEL183B
M83513/03-B15N	MDA215PEL183B
M83513/03-B15P	MDAS15PEL183B
M83513/03-B16C	MDA115PEW183B
M83513/03-B16N	MDA215PEW183B
M83513/03-B16P	MDAS15PEW183B
M83513/03-C01C	MDA121P4L046B
M83513/03-C01N	MDA221P4L046B
M83513/03-C01P	MDAS21P4L046B
M83513/03-C02C	MDA121P4L092B
M83513/03-C02N	MDA221P4L092B
M83513/03-C02P	MDAS21P4L092B
M83513/03-C03C	MDA121P4W046B
M83513/03-C03N	MDA221P4W046B
M83513/03-C03P	MDAS21P4W046B
M83513/03-C04C	MDA121P4W092B
M83513/03-C04N	MDA221P4W092B
M83513/03-C04P	MDAS21P4W092B
M83513/03-C05C	MDA121PG002B
M83513/03-C05N	MDA221PG002B
M83513/03-C05P	MDAS21PG002B
M83513/03-C06C	MDA121PG003B
M83513/03-C06N	MDA221PG003B
M83513/03-C06P	MDAS21PG003B
M83513/03-C07C	MDA121PT002B
M83513/03-C07N	MDA221PT002B
M83513/03-C07P	MDAS21PT002B
M83513/03-C08C	MDA121PT003B
M83513/03-C08N	MDA221PT003B
M83513/03-C08P	MDAS21PT003B
M83513/03-C09C	MDA121PEL046B
M83513/03-C09N	MDA221PEL046B
M83513/03-C09P	MDAS21PEL046B
M83513/03-C10C	MDA121PEL092B
M83513/03-C10N	MDA221PEL092B
M83513/03-C10P	MDAS21PEL092B
M83513/03-C11C	MDA121PEW046B
M83513/03-C11N	MDA221PEW046B
M83513/03-C11P	MDAS21PEW046B
M83513/03-C12C	MDA121PEW092B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-C12N	MDA221PEW092B
M83513/03-C12P	MDAS21PEW092B
M83513/03-C13C	MDA121P4L183B
M83513/03-C13N	MDA221P4L183B
M83513/03-C13P	MDAS21P4L183B
M83513/03-C14C	MDA121P4W183B
M83513/03-C14N	MDA221P4W183B
M83513/03-C14P	MDAS21P4W183B
M83513/03-C15C	MDA121PEL183B
M83513/03-C15N	MDA221PEL183B
M83513/03-C15P	MDAS21PEL183B
M83513/03-C16C	MDA121PEW183B
M83513/03-C16N	MDA221PEW183B
M83513/03-C16P	MDAS21PEW183B
M83513/03-D01C	MDA125P4L046B
M83513/03-D01N	MDA225P4L046B
M83513/03-D01P	MDAS25P4L046B
M83513/03-D02C	MDA125P4L092B
M83513/03-D02N	MDA225P4L092B
M83513/03-D02P	MDAS25P4L092B
M83513/03-D03C	MDA125P4W046B
M83513/03-D03N	MDA225P4W046B
M83513/03-D03P	MDAS25P4W046B
M83513/03-D04C	MDA125P4W092B
M83513/03-D04N	MDA225P4W092B
M83513/03-D04P	MDAS25P4W092B
M83513/03-D05C	MDA125PG002B
M83513/03-D05N	MDA225PG002B
M83513/03-D05P	MDAS25PG002B
M83513/03-D06C	MDA125PG003B
M83513/03-D06N	MDA225PG003B
M83513/03-D06P	MDAS25PG003B
M83513/03-D07C	MDA125PT002B
M83513/03-D07N	MDA225PT002B
M83513/03-D07P	MDAS25PT002B
M83513/03-D08C	MDA125PT003B
M83513/03-D08N	MDA225PT003B
M83513/03-D08P	MDAS25PT003B
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M83513/03-D09P	MDAS25PEL046B
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M83513/03-D10N	MDA225PEL092B
M83513/03-D10P	MDAS25PEL092B
M83513/03-D11C	MDA125PEW046B
M83513/03-D11N	MDA225PEW046B
M83513/03-D11P	MDAS25PEW046B
M83513/03-D12C	MDA125PEW092B
M83513/03-D12N	MDA225PEW092B
M83513/03-D12P	MDAS25PEW092B
M83513/03-D13C	MDA125P4L183B
M83513/03-D13N	MDA225P4L183B
M83513/03-D13P	MDAS25P4L183B
M83513/03-D14C	MDA125P4W183B
M83513/03-D14N	MDA225P4W183B
M83513/03-D14P	MDAS25P4W183B
M83513/03-D15C	MDA125PEL183B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-D15N	MDA225PEL183B
M83513/03-D15P	MDAS25PEL183B
M83513/03-D16C	MDA125PEW183B
M83513/03-D16N	MDA225PEW183B
M83513/03-D16P	MDAS25PEW183B
M83513/03-E01C	MDA131P4L046B
M83513/03-E01N	MDA231P4L046B
M83513/03-E01P	MDAS31P4L046B
M83513/03-E02C	MDA131P4L092B
M83513/03-E02N	MDA231P4L092B
M83513/03-E02P	MDAS31P4L092B
M83513/03-E03C	MDA131P4W046B
M83513/03-E03N	MDA231P4W046B
M83513/03-E03P	MDAS31P4W046B
M83513/03-E04C	MDA131P4W092B
M83513/03-E04N	MDA231P4W092B
M83513/03-E04P	MDAS31P4W092B
M83513/03-E05C	MDA131PG002B
M83513/03-E05N	MDA231PG002B
M83513/03-E05P	MDAS31PG002B
M83513/03-E06C	MDA131PG003B
M83513/03-E06N	MDA231PG003B
M83513/03-E06P	MDAS31PG003B
M83513/03-E07C	MDA131PT002B
M83513/03-E07N	MDA231PT002B
M83513/03-E07P	MDAS31PT002B
M83513/03-E08C	MDA131PT003B
M83513/03-E08N	MDA231PT003B
M83513/03-E08P	MDAS31PT003B
M83513/03-E09C	MDA131PEL046B
M83513/03-E09N	MDA231PEL046B
M83513/03-E09P	MDAS31PEL046B
M83513/03-E10C	MDA131PEL092B
M83513/03-E10N	MDA231PEL092B
M83513/03-E10P	MDAS31PEL092B
M83513/03-E11C	MDA131PEW046B
M83513/03-E11N	MDA231PEW046B
M83513/03-E11P	MDAS31PEW046B
M83513/03-E12C	MDA131PEW092B
M83513/03-E12N	MDA231PEW092B
M83513/03-E12P	MDAS31PEW092B
M83513/03-E13C	MDA131P4L183B
M83513/03-E13N	MDA231P4L183B
M83513/03-E13P	MDAS31P4L183B
M83513/03-E14C	MDA131P4W183B
M83513/03-E14N	MDA231P4W183B
M83513/03-E14P	MDAS31P4W183B
M83513/03-E15C	MDA131PEL183B
M83513/03-E15N	MDA231PEL183B
M83513/03-E15P	MDAS31PEL183B
M83513/03-E16C	MDA131PEW183B
M83513/03-E16N	MDA231PEW183B
M83513/03-E16P	MDAS31PEW183B
M83513/03-F01C	MDA137P4L046B
M83513/03-F01N	MDA237P4L046B
M83513/03-F01P	MDAS37P4L046B
M83513/03-F02C	MDA137P4L092B

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M83513/03 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/03-F02N	MDA237P4L092B
M83513/03-F02P	MDAS37P4L092B
M83513/03-F03C	MDA137P4W046B
M83513/03-F03N	MDA237P4W046B
M83513/03-F03P	MDAS37P4W046B
M83513/03-F04C	MDA137P4W092B
M83513/03-F04N	MDA237P4W092B
M83513/03-F04P	MDAS37P4W092B
M83513/03-F05C	MDA137PG002B
M83513/03-F05N	MDA237PG002B
M83513/03-F05P	MDAS37PG002B
M83513/03-F06C	MDA137PG003B
M83513/03-F06N	MDA237PG003B
M83513/03-F06P	MDAS37PG003B
M83513/03-F07C	MDA137PT002B
M83513/03-F07N	MDA237PT002B
M83513/03-F07P	MDAS37PT002B
M83513/03-F08C	MDA137PT003B
M83513/03-F08N	MDA237PT003B
M83513/03-F08P	MDAS37PT003B
M83513/03-F09C	MDA137PEL046B
M83513/03-F09N	MDA237PEL046B
M83513/03-F09P	MDAS37PEL046B
M83513/03-F10C	MDA137PEL092B
M83513/03-F10N	MDA237PEL092B
M83513/03-F10P	MDAS37PEL092B
M83513/03-F11C	MDA137PEW046B
M83513/03-F11N	MDA237PEW046B
M83513/03-F11P	MDAS37PEW046B
M83513/03-F12C	MDA137PEW092B
M83513/03-F12N	MDA237PEW092B
M83513/03-F12P	MDAS37PEW092B
M83513/03-F13C	MDA137P4L183B
M83513/03-F13N	MDA237P4L183B
M83513/03-F13P	MDAS37P4L183B
M83513/03-F14C	MDA137P4W183B
M83513/03-F14N	MDA237P4W183B
M83513/03-F14P	MDAS37P4W183B
M83513/03-F15C	MDA137PEL183B
M83513/03-F15N	MDA237PEL183B
M83513/03-F15P	MDAS37PEL183B
M83513/03-F16C	MDA137PEW183B
M83513/03-F16N	MDA237PEW183B
M83513/03-F16P	MDAS37PEW183B
M83513/03-G01C	MDA151P4L046B
M83513/03-G01N	MDA251P4L046B
M83513/03-G01P	MDAS51P4L046B
M83513/03-G02C	MDA151P4L092B
M83513/03-G02N	MDA251P4L092B
M83513/03-G02P	MDAS51P4L092B
M83513/03-G03C	MDA151P4W046B
M83513/03-G03N	MDA251P4W046B
M83513/03-G03P	MDAS51P4W046B
M83513/03-G04C	MDA151P4W092B
M83513/03-G04N	MDA251P4W092B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-G04P	MDAS51P4W092B
M83513/03-G05C	MDA151PG002B
M83513/03-G05N	MDA251PG002B
M83513/03-G05P	MDAS51PG002B
M83513/03-G06C	MDA151PG003B
M83513/03-G06N	MDA251PG003B
M83513/03-G06P	MDAS51PG003B
M83513/03-G07C	MDA151PT002B
M83513/03-G07N	MDA251PT002B
M83513/03-G07P	MDAS51PT002B
M83513/03-G08C	MDA151PT003B
M83513/03-G08N	MDA251PT003B
M83513/03-G08P	MDAS51PT003B
M83513/03-G09C	MDA151PEL046B
M83513/03-G09N	MDA251PEL046B
M83513/03-G09P	MDAS51PEL046B
M83513/03-G10C	MDA151PEL092B
M83513/03-G10N	MDA251PEL092B
M83513/03-G10P	MDAS51PEL092B
M83513/03-G11C	MDA151PEW046B
M83513/03-G11N	MDA251PEW046B
M83513/03-G11P	MDAS51PEW046B
M83513/03-G12C	MDA151PEW092B
M83513/03-G12N	MDA251PEW092B
M83513/03-G12P	MDAS51PEW092B
M83513/03-G13C	MDA151P4L183B
M83513/03-G13N	MDA251P4L183B
M83513/03-G13P	MDAS51P4L183B
M83513/03-G14C	MDA151P4W183B
M83513/03-G14N	MDA251P4W183B
M83513/03-G14P	MDAS51P4W183B
M83513/03-G15C	MDA151PEL183B
M83513/03-G15N	MDA251PEL183B
M83513/03-G15P	MDAS51PEL183B
M83513/03-G16C	MDA151PEW183B
M83513/03-G16N	MDA251PEW183B
M83513/03-G16P	MDAS51PEW183B
M83513/03-H01C	MDA1100P4L046B
M83513/03-H01N	MDA2100P4L046B
M83513/03-H01P	MDAS100P4L046B
M83513/03-H02C	MDA1100P4L092B
M83513/03-H02N	MDA2100P4L092B
M83513/03-H02P	MDAS100P4L092B
M83513/03-H03C	MDA1100P4W046B
M83513/03-H03N	MDA2100P4W046B
M83513/03-H03P	MDAS100P4W046B
M83513/03-H04C	MDA1100P4W092B
M83513/03-H04N	MDA2100P4W092B
M83513/03-H04P	MDAS100P4W092B
M83513/03-H05C	MDA1100PG002B
M83513/03-H05N	MDA2100PG002B
M83513/03-H05P	MDAS100PG002B
M83513/03-H06C	MDA1100PG003B
M83513/03-H06N	MDA2100PG003B
M83513/03-H06P	MDAS100PG003B

MIL STANDARD	AXON' EQUIVALENT
M83513/03-H07C	MDA1100PT002B
M83513/03-H07N	MDA2100PT002B
M83513/03-H07P	MDAS100PT002B
M83513/03-H08C	MDA1100PT003B
M83513/03-H08N	MDA2100PT003B
M83513/03-H08P	MDAS100PT003B
M83513/03-H09C	MDA1100PEL046B
M83513/03-H09N	MDA2100PEL046B
M83513/03-H09P	MDAS100PEL046B
M83513/03-H10C	MDA1100PEL092B
M83513/03-H10N	MDA2100PEL092B
M83513/03-H10P	MDAS100PEL092B
M83513/03-H11C	MDA1100PEW046B
M83513/03-H11N	MDA2100PEW046B
M83513/03-H11P	MDAS100PEW046B
M83513/03-H12C	MDA1100PEW092B
M83513/03-H12N	MDA2100PEW092B
M83513/03-H12P	MDAS100PEW092B
M83513/03-H13C	MDA1100P4L183B
M83513/03-H13N	MDA2100P4L183B
M83513/03-H13P	MDAS100P4L183B
M83513/03-H14C	MDA1100P4W183B
M83513/03-H14N	MDA2100P4W183B
M83513/03-H14P	MDAS100P4W183B
M83513/03-H15C	MDA1100PEL183B
M83513/03-H15N	MDA2100PEL183B
M83513/03-H15P	MDAS100PEL183B
M83513/03-H16C	MDA1100PEW183B
M83513/03-H16N	MDA2100PEW183B
M83513/03-H16P	MDAS100PEW183B

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MIL STANDARD	AXON' EQUIVALENT
M83513/04-A01C	MDA109S4L046B
M83513/04-A01N	MDA209S4L046B
M83513/04-A01P	MDAS09S4L046B
M83513/04-A02C	MDA109S4L092B
M83513/04-A02N	MDA209S4L092B
M83513/04-A02P	MDAS09S4L092B
M83513/04-A03C	MDA109S4W046B
M83513/04-A03N	MDA209S4W046B
M83513/04-A03P	MDAS09S4W046B
M83513/04-A04C	MDA109S4W092B
M83513/04-A04N	MDA209S4W092B
M83513/04-A04P	MDAS09S4W092B
M83513/04-A05C	MDA109SG002B
M83513/04-A05N	MDA209SG002B
M83513/04-A05P	MDAS09SG002B
M83513/04-A06C	MDA109SG003B
M83513/04-A06N	MDA209SG003B
M83513/04-A06P	MDAS09SG003B
M83513/04-A07C	MDA109ST002B
M83513/04-A07N	MDA209ST002B
M83513/04-A07P	MDAS09ST002B
M83513/04-A08C	MDA109ST003B
M83513/04-A08N	MDA209ST003B
M83513/04-A08P	MDAS09ST003B
M83513/04-A09C	MDA109SEL046B
M83513/04-A09N	MDA209SEL046B
M83513/04-A09P	MDAS09SEL046B
M83513/04-A10C	MDA109SEL092B
M83513/04-A10N	MDA209SEL092B
M83513/04-A10P	MDAS09SEL092B
M83513/04-A11C	MDA109SEW046B
M83513/04-A11N	MDA209SEW046B
M83513/04-A11P	MDAS09SEW046B
M83513/04-A12C	MDA109SEW092B
M83513/04-A12N	MDA209SEW092B
M83513/04-A12P	MDAS09SEW092B
M83513/04-A13C	MDA109S4L183B
M83513/04-A13N	MDA209S4L183B
M83513/04-A13P	MDAS09S4L183B
M83513/04-A14C	MDA109S4W183B
M83513/04-A14N	MDA209S4W183B
M83513/04-A14P	MDAS09S4W183B
M83513/04-A15C	MDA109SEL183B
M83513/04-A15N	MDA209SEL183B
M83513/04-A15P	MDAS09SEL183B
M83513/04-A16C	MDA109SEW183B
M83513/04-A16N	MDA209SEW183B
M83513/04-A16P	MDAS09SEW183B
M83513/04-B01C	MDA115S4L046B
M83513/04-B01N	MDA215S4L046B
M83513/04-B01P	MDAS15S4L046B
M83513/04-B02C	MDA115S4L092B
M83513/04-B02N	MDA215S4L092B
M83513/04-B02P	MDAS15S4L092B
M83513/04-B03C	MDA115S4W046B
M83513/04-B03N	MDA215S4W046B
M83513/04-B03P	MDAS15S4W046B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-B04C	MDA115S4W092B
M83513/04-B04N	MDA215S4W092B
M83513/04-B04P	MDAS15S4W092B
M83513/04-B05C	MDA115SG002B
M83513/04-B05N	MDA215SG002B
M83513/04-B05P	MDAS15SG002B
M83513/04-B06C	MDA115SG003B
M83513/04-B06N	MDA215SG003B
M83513/04-B06P	MDAS15SG003B
M83513/04-B07C	MDA115ST002B
M83513/04-B07N	MDA215ST002B
M83513/04-B07P	MDAS15ST002B
M83513/04-B08C	MDA115ST003B
M83513/04-B08N	MDA215ST003B
M83513/04-B08P	MDAS15ST003B
M83513/04-B09C	MDA115SEL046B
M83513/04-B09N	MDA215SEL046B
M83513/04-B09P	MDAS15SEL046B
M83513/04-B10C	MDA115SEL092B
M83513/04-B10N	MDA215SEL092B
M83513/04-B10P	MDAS15SEL092B
M83513/04-B11C	MDA115SEW046B
M83513/04-B11N	MDA215SEW046B
M83513/04-B11P	MDAS15SEW046B
M83513/04-B12C	MDA115SEW092B
M83513/04-B12N	MDA215SEW092B
M83513/04-B12P	MDAS15SEW092B
M83513/04-B13C	MDA115S4L183B
M83513/04-B13N	MDA215S4L183B
M83513/04-B13P	MDAS15S4L183B
M83513/04-B14C	MDA115S4W183B
M83513/04-B14N	MDA215S4W183B
M83513/04-B14P	MDAS15S4W183B
M83513/04-B15C	MDA115SEL183B
M83513/04-B15N	MDA215SEL183B
M83513/04-B15P	MDAS15SEL183B
M83513/04-B16C	MDA115SEW183B
M83513/04-B16N	MDA215SEW183B
M83513/04-B16P	MDAS15SEW183B
M83513/04-C01C	MDA121S4L046B
M83513/04-C01N	MDA221S4L046B
M83513/04-C01P	MDAS21S4L046B
M83513/04-C02C	MDA121S4L092B
M83513/04-C02N	MDA221S4L092B
M83513/04-C02P	MDAS21S4L092B
M83513/04-C03C	MDA121S4W046B
M83513/04-C03N	MDA221S4W046B
M83513/04-C03P	MDAS21S4W046B
M83513/04-C04C	MDA121S4W092B
M83513/04-C04N	MDA221S4W092B
M83513/04-C04P	MDAS21S4W092B
M83513/04-C05C	MDA121SG002B
M83513/04-C05N	MDA221SG002B
M83513/04-C05P	MDAS21SG002B
M83513/04-C06C	MDA121SG003B
M83513/04-C06N	MDA221SG003B
M83513/04-C06P	MDAS21SG003B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-C07C	MDA121ST002B
M83513/04-C07N	MDA221ST002B
M83513/04-C07P	MDAS21ST002B
M83513/04-C08C	MDA121ST003B
M83513/04-C08N	MDA221ST003B
M83513/04-C08P	MDAS21ST003B
M83513/04-C09C	MDA121SEL046B
M83513/04-C09N	MDA221SEL046B
M83513/04-C09P	MDAS21SEL046B
M83513/04-C10C	MDA121SEL092B
M83513/04-C10N	MDA221SEL092B
M83513/04-C10P	MDAS21SEL092B
M83513/04-C11C	MDA121SEW046B
M83513/04-C11N	MDA221SEW046B
M83513/04-C11P	MDAS21SEW046B
M83513/04-C12C	MDA121SEW092B
M83513/04-C12N	MDA221SEW092B
M83513/04-C12P	MDAS21SEW092B
M83513/04-C13C	MDA121S4L183B
M83513/04-C13N	MDA221S4L183B
M83513/04-C13P	MDAS21S4L183B
M83513/04-C14C	MDA121S4W183B
M83513/04-C14N	MDA221S4W183B
M83513/04-C14P	MDAS21S4W183B
M83513/04-C15C	MDA121SEL183B
M83513/04-C15N	MDA221SEL183B
M83513/04-C15P	MDAS21SEL183B
M83513/04-C16C	MDA121SEW183B
M83513/04-C16N	MDA221SEW183B
M83513/04-C16P	MDAS21SEW183B
M83513/04-D01C	MDA125S4L046B
M83513/04-D01N	MDA225S4L046B
M83513/04-D01P	MDAS25S4L046B
M83513/04-D02C	MDA125S4L092B
M83513/04-D02N	MDA225S4L092B
M83513/04-D02P	MDAS25S4L092B
M83513/04-D03C	MDA125S4W046B
M83513/04-D03N	MDA225S4W046B
M83513/04-D03P	MDAS25S4W046B
M83513/04-D04C	MDA125S4W092B
M83513/04-D04N	MDA225S4W092B
M83513/04-D04P	MDAS25S4W092B
M83513/04-D05C	MDA125SG002B
M83513/04-D05N	MDA225SG002B
M83513/04-D05P	MDAS25SG002B
M83513/04-D06C	MDA125SG003B
M83513/04-D06N	MDA225SG003B
M83513/04-D06P	MDAS25SG003B
M83513/04-D07C	MDA125ST002B
M83513/04-D07N	MDA225ST002B
M83513/04-D07P	MDAS25ST002B
M83513/04-D08C	MDA125ST003B
M83513/04-D08N	MDA225ST003B
M83513/04-D08P	MDAS25ST003B
M83513/04-D09C	MDA125SEL046B
M83513/04-D09N	MDA225SEL046B
M83513/04-D09P	MDAS25SEL046B

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M83513/04 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/04-D10C	MDA125SEL092B
M83513/04-D10N	MDA225SEL092B
M83513/04-D10P	MDAS25SEL092B
M83513/04-D11C	MDA125SEW046B
M83513/04-D11N	MDA225SEW046B
M83513/04-D11P	MDAS25SEW046B
M83513/04-D12C	MDA125SEW092B
M83513/04-D12N	MDA225SEW092B
M83513/04-D12P	MDAS25SEW092B
M83513/04-D13C	MDA125S4L183B
M83513/04-D13N	MDA225S4L183B
M83513/04-D13P	MDAS25S4L183B
M83513/04-D14C	MDA125S4W183B
M83513/04-D14N	MDA225S4W183B
M83513/04-D14P	MDAS25S4W183B
M83513/04-D15C	MDA125SEL183B
M83513/04-D15N	MDA225SEL183B
M83513/04-D15P	MDAS25SEL183B
M83513/04-D16C	MDA125SEW183B
M83513/04-D16N	MDA225SEW183B
M83513/04-D16P	MDAS25SEW183B
M83513/04-E01C	MDA131S4L046B
M83513/04-E01N	MDA231S4L046B
M83513/04-E01P	MDAS31S4L046B
M83513/04-E02C	MDA131S4L092B
M83513/04-E02N	MDA231S4L092B
M83513/04-E02P	MDAS31S4L092B
M83513/04-E03C	MDA131S4W046B
M83513/04-E03N	MDA231S4W046B
M83513/04-E03P	MDAS31S4W046B
M83513/04-E04C	MDA131S4W092B
M83513/04-E04N	MDA231S4W092B
M83513/04-E04P	MDAS31S4W092B
M83513/04-E05C	MDA131SG002B
M83513/04-E05N	MDA231SG002B
M83513/04-E05P	MDAS31SG002B
M83513/04-E06C	MDA131SG003B
M83513/04-E06N	MDA231SG003B
M83513/04-E06P	MDAS31SG003B
M83513/04-E07C	MDA131ST002B
M83513/04-E07N	MDA231ST002B
M83513/04-E07P	MDAS31ST002B
M83513/04-E08C	MDA131ST003B
M83513/04-E08N	MDA231ST003B
M83513/04-E08P	MDAS31ST003B
M83513/04-E09C	MDA131SEL046B
M83513/04-E09N	MDA231SEL046B
M83513/04-E09P	MDAS31SEL046B
M83513/04-E10C	MDA131SEL092B
M83513/04-E10N	MDA231SEL092B
M83513/04-E10P	MDAS31SEL092B
M83513/04-E11C	MDA131SEW046B
M83513/04-E11N	MDA231SEW046B
M83513/04-E11P	MDAS31SEW046B
M83513/04-E12C	MDA131SEW092B
M83513/04-E12N	MDA231SEW092B
M83513/04-E12P	MDAS31SEW092B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-E13C	MDA131S4L183B
M83513/04-E13N	MDA231S4L183B
M83513/04-E13P	MDAS31S4L183B
M83513/04-E14C	MDA131S4W183B
M83513/04-E14N	MDA231S4W183B
M83513/04-E14P	MDAS31S4W183B
M83513/04-E15C	MDA131SEL183B
M83513/04-E15N	MDA231SEL183B
M83513/04-E15P	MDAS31SEL183B
M83513/04-E16C	MDA131SEW183B
M83513/04-E16N	MDA231SEW183B
M83513/04-E16P	MDAS31SEW183B
M83513/04-F01C	MDA137S4L046B
M83513/04-F01N	MDA237S4L046B
M83513/04-F01P	MDAS37S4L046B
M83513/04-F02C	MDA137S4L092B
M83513/04-F02N	MDA237S4L092B
M83513/04-F02P	MDAS37S4L092B
M83513/04-F03C	MDA137S4W046B
M83513/04-F03N	MDA237S4W046B
M83513/04-F03P	MDAS37S4W046B
M83513/04-F04C	MDA137S4W092B
M83513/04-F04N	MDA237S4W092B
M83513/04-F04P	MDAS37S4W092B
M83513/04-F05C	MDA137SG002B
M83513/04-F05N	MDA237SG002B
M83513/04-F05P	MDAS37SG002B
M83513/04-F06C	MDA137SG003B
M83513/04-F06N	MDA237SG003B
M83513/04-F06P	MDAS37SG003B
M83513/04-F07C	MDA137ST002B
M83513/04-F07N	MDA237ST002B
M83513/04-F07P	MDAS37ST002B
M83513/04-F08C	MDA137ST003B
M83513/04-F08N	MDA237ST003B
M83513/04-F08P	MDAS37ST003B
M83513/04-F09C	MDA137SEL046B
M83513/04-F09N	MDA237SEL046B
M83513/04-F09P	MDAS37SEL046B
M83513/04-F10C	MDA137SEL092B
M83513/04-F10N	MDA237SEL092B
M83513/04-F10P	MDAS37SEL092B
M83513/04-F11C	MDA137SEW046B
M83513/04-F11N	MDA237SEW046B
M83513/04-F11P	MDAS37SEW046B
M83513/04-F12C	MDA137SEW092B
M83513/04-F12N	MDA237SEW092B
M83513/04-F12P	MDAS37SEW092B
M83513/04-F13C	MDA137S4L183B
M83513/04-F13N	MDA237S4L183B
M83513/04-F13P	MDAS37S4L183B
M83513/04-F14C	MDA137S4W183B
M83513/04-F14N	MDA237S4W183B
M83513/04-F14P	MDAS37S4W183B
M83513/04-F15C	MDA137SEL183B
M83513/04-F15N	MDA237SEL183B
M83513/04-F15P	MDAS37SEL183B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-F16C	MDA137SEW183B
M83513/04-F16N	MDA237SEW183B
M83513/04-F16P	MDAS37SEW183B
M83513/04-G01C	MDA151S4L046B
M83513/04-G01N	MDA251S4L046B
M83513/04-G01P	MDAS51S4L046B
M83513/04-G02C	MDA151S4L092B
M83513/04-G02N	MDA251S4L092B
M83513/04-G02P	MDAS51S4L092B
M83513/04-G03C	MDA151S4W046B
M83513/04-G03N	MDA251S4W046B
M83513/04-G03P	MDAS51S4W046B
M83513/04-G04C	MDA151S4W092B
M83513/04-G04N	MDA251S4W092B
M83513/04-G04P	MDAS51S4W092B
M83513/04-G05C	MDA151SG002B
M83513/04-G05N	MDA251SG002B
M83513/04-G05P	MDAS51SG002B
M83513/04-G06C	MDA151SG003B
M83513/04-G06N	MDA251SG003B
M83513/04-G06P	MDAS51SG003B
M83513/04-G07C	MDA151ST002B
M83513/04-G07N	MDA251ST002B
M83513/04-G07P	MDAS51ST002B
M83513/04-G08C	MDA151ST003B
M83513/04-G08N	MDA251ST003B
M83513/04-G08P	MDAS51ST003B
M83513/04-G09C	MDA151SEL046B
M83513/04-G09N	MDA251SEL046B
M83513/04-G09P	MDAS51SEL046B
M83513/04-G10C	MDA151SEL092B
M83513/04-G10N	MDA251SEL092B
M83513/04-G10P	MDAS51SEL092B
M83513/04-G11C	MDA151SEW046B
M83513/04-G11N	MDA251SEW046B
M83513/04-G11P	MDAS51SEW046B
M83513/04-G12C	MDA151SEW092B
M83513/04-G12N	MDA251SEW092B
M83513/04-G12P	MDAS51SEW092B
M83513/04-G13C	MDA151S4L183B
M83513/04-G13N	MDA251S4L183B
M83513/04-G13P	MDAS51S4L183B
M83513/04-G14C	MDA151S4W183B
M83513/04-G14N	MDA251S4W183B
M83513/04-G14P	MDAS51S4W183B
M83513/04-G15C	MDA151SEL183B
M83513/04-G15N	MDA251SEL183B
M83513/04-G15P	MDAS51SEL183B
M83513/04-G16C	MDA151SEW183B
M83513/04-G16N	MDA251SEW183B
M83513/04-G16P	MDAS51SEW183B
M83513/04-H01C	MDA1100S4L046B
M83513/04-H01N	MDA2100S4L046B
M83513/04-H01P	MDAS100S4L046B
M83513/04-H02C	MDA1100S4L092B
M83513/04-H02N	MDA2100S4L092B
M83513/04-H02P	MDAS100S4L092B

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M83513/04 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/04-H03C	MDA1100S4W046B
M83513/04-H03N	MDA2100S4W046B
M83513/04-H03P	MDAS100S4W046B
M83513/04-H04C	MDA1100S4W092B
M83513/04-H04N	MDA2100S4W092B
M83513/04-H04P	MDAS100S4W092B
M83513/04-H05C	MDA1100SG002B
M83513/04-H05N	MDA2100SG002B
M83513/04-H05P	MDAS100SG002B
M83513/04-H06C	MDA1100SG003B
M83513/04-H06N	MDA2100SG003B
M83513/04-H06P	MDAS100SG003B
M83513/04-H07C	MDA1100ST002B
M83513/04-H07N	MDA2100ST002B
M83513/04-H07P	MDAS100ST002B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-H08C	MDA1100ST003B
M83513/04-H08N	MDA2100ST003B
M83513/04-H08P	MDAS100ST003B
M83513/04-H09C	MDA1100SEL046B
M83513/04-H09N	MDA2100SEL046B
M83513/04-H09P	MDAS100SEL046B
M83513/04-H10C	MDA1100SEL092B
M83513/04-H10N	MDA2100SEL092B
M83513/04-H10P	MDAS100SEL092B
M83513/04-H11C	MDA1100SEW046B
M83513/04-H11N	MDA2100SEW046B
M83513/04-H11P	MDAS100SEW046B
M83513/04-H12C	MDA1100SEW092B
M83513/04-H12N	MDA2100SEW092B
M83513/04-H12P	MDAS100SEW092B

MIL STANDARD	AXON' EQUIVALENT
M83513/04-H13C	MDA1100S4L183B
M83513/04-H13N	MDA2100S4L183B
M83513/04-H13P	MDAS100S4L183B
M83513/04-H14C	MDA1100S4W183B
M83513/04-H14N	MDA2100S4W183B
M83513/04-H14P	MDAS100S4W183B
M83513/04-H15C	MDA1100SEL183B
M83513/04-H15N	MDA2100SEL183B
M83513/04-H15P	MDAS100SEL183B
M83513/04-H16C	MDA1100SEW183B
M83513/04-H16N	MDA2100SEW183B
M83513/04-H16P	MDAS100SEW183B

M83513/06

MIL STANDARD	AXON' EQUIVALENT
M83513/06-A	MDAP09PFSB
M83513/06-B	MDAP15PFSB
M83513/06-C	MDAP21PFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/06-D	MDAP25PFSB
M83513/06-E	MDAP31PFSB
M83513/06-F	MDAP37PFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/06-G	MDAP51PFSB

M83513/07

MIL STANDARD	AXON' EQUIVALENT
M83513/07-A	MDAP09SFSB
M83513/07-B	MDAP15SFSB
M83513/07-C	MDAP21SFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/07-D	MDAP25SFSB
M83513/07-E	MDAP31SFSB
M83513/07-F	MDAP37SFSB

MIL STANDARD	AXON' EQUIVALENT
M83513/07-G	MDAP51SFSB

M83513/08

MIL STANDARD	AXON' EQUIVALENT
M83513/08-A01	MDAP09P4L046B
M83513/08-A02	MDAP09P4L092B
M83513/08-A03	MDAP09P4W046B
M83513/08-A04	MDAP09P4W092B
M83513/08-A05	MDAP09PG002B
M83513/08-A06	MDAP09PG003B
M83513/08-A07	MDAP09PT002B
M83513/08-A08	MDAP09PT003B
M83513/08-A09	MDAP09PEL046B
M83513/08-A10	MDAP09PEL092B
M83513/08-A11	MDAP09PEW046B
M83513/08-A12	MDAP09PEW092B
M83513/08-A13	MDAP09P4L183B
M83513/08-A14	MDAP09P4W183B
M83513/08-A15	MDAP09PEL183B
M83513/08-A16	MDAP09PEW183B
M83513/08-B01	MDAP15P4L046B
M83513/08-B02	MDAP15P4L092B
M83513/08-B03	MDAP15P4W046B
M83513/08-B04	MDAP15P4W092B
M83513/08-B05	MDAP15PG002B
M83513/08-B06	MDAP15PG003B
M83513/08-B07	MDAP15PT002B

MIL STANDARD	AXON' EQUIVALENT
M83513/08-B08	MDAP15PT003B
M83513/08-B09	MDAP15PEL046B
M83513/08-B10	MDAP15PEL092B
M83513/08-B11	MDAP15PEW046B
M83513/08-B12	MDAP15PEW092B
M83513/08-B13	MDAP15P4L183B
M83513/08-B14	MDAP15P4W183B
M83513/08-B15	MDAP15PEL183B
M83513/08-B16	MDAP15PEW183B
M83513/08-C01	MDAP21P4L046B
M83513/08-C02	MDAP21P4L092B
M83513/08-C03	MDAP21P4W046B
M83513/08-C04	MDAP21P4W092B
M83513/08-C05	MDAP21PG002B
M83513/08-C06	MDAP21PG003B
M83513/08-C07	MDAP21PT002B
M83513/08-C08	MDAP21PT003B
M83513/08-C09	MDAP21PEL046B
M83513/08-C10	MDAP21PEL092B
M83513/08-C11	MDAP21PEW046B
M83513/08-C12	MDAP21PEW092B
M83513/08-C13	MDAP21P4L183B
M83513/08-C14	MDAP21P4W183B

MIL STANDARD	AXON' EQUIVALENT
M83513/08-C15	MDAP21PEL183B
M83513/08-C16	MDAP21PEW183B
M83513/08-D01	MDAP25P4L046B
M83513/08-D02	MDAP25P4L092B
M83513/08-D03	MDAP25P4W046B
M83513/08-D04	MDAP25P4W092B
M83513/08-D05	MDAP25PG002B
M83513/08-D06	MDAP25PG003B
M83513/08-D07	MDAP25PT002B
M83513/08-D08	MDAP25PT003B
M83513/08-D09	MDAP25PEL046B
M83513/08-D10	MDAP25PEL092B
M83513/08-D11	MDAP25PEW046B
M83513/08-D12	MDAP25PEW092B
M83513/08-D13	MDAP25P4L183B
M83513/08-D14	MDAP25P4W183B
M83513/08-D15	MDAP25PEL183B
M83513/08-D16	MDAP25PEW183B
M83513/08-E01	MDAP31P4L046B
M83513/08-E02	MDAP31P4L092B
M83513/08-E03	MDAP31P4W046B
M83513/08-E04	MDAP31P4W092B

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M83513/08 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/08-E05	MDAP31PG002B
M83513/08-E06	MDAP31PG003B
M83513/08-E07	MDAP31PT002B
M83513/08-E08	MDAP31PT003B
M83513/08-E09	MDAP31PEL046B
M83513/08-E10	MDAP31PEL092B
M83513/08-E11	MDAP31PEW046B
M83513/08-E12	MDAP31PEW092B
M83513/08-E13	MDAP31P4L183B
M83513/08-E14	MDAP31P4W183B
M83513/08-E15	MDAP31PEL183B
M83513/08-E16	MDAP31PEW183B
M83513/08-F01	MDAP37P4L046B
M83513/08-F02	MDAP37P4L092B
M83513/08-F03	MDAP37P4W046B
M83513/08-F04	MDAP37P4W092B
M83513/08-F05	MDAP37PG002B
M83513/08-F06	MDAP37PG003B
M83513/08-F07	MDAP37PT002B
M83513/08-F08	MDAP37PT003B
M83513/08-F09	MDAP37PEL046B
M83513/08-F10	MDAP37PEL092B
M83513/08-F11	MDAP37PEW046B
M83513/08-F12	MDAP37PEW092B
M83513/08-F13	MDAP37P4L183B
M83513/08-F14	MDAP37P4W183B
M83513/08-F15	MDAP37PEL183B
M83513/08-F16	MDAP37PEW183B
M83513/08-G01	MDAP51P4L046B
M83513/08-G02	MDAP51P4L092B
M83513/08-G03	MDAP51P4W046B
M83513/08-G04	MDAP51P4W092B
M83513/08-G05	MDAP51PG002B
M83513/08-G06	MDAP51PG003B
M83513/08-G07	MDAP51PT002B
M83513/08-G08	MDAP51PT003B
M83513/08-G09	MDAP51PEL046B
M83513/08-G10	MDAP51PEL092B
M83513/08-G11	MDAP51PEW046B
M83513/08-G12	MDAP51PEW092B
M83513/08-G13	MDAP51P4L183B
M83513/08-G14	MDAP51P4W183B
M83513/08-G15	MDAP51PEL183B
M83513/08-G16	MDAP51PEW183B

M83513/09

MIL STANDARD	AXON' EQUIVALENT
M83513/09-A01	MDAP09S4L046B
M83513/09-A02	MDAP09S4L092B
M83513/09-A03	MDAP09S4W046B
M83513/09-A04	MDAP09S4W092B
M83513/09-A05	MDAP09SG002B
M83513/09-A06	MDAP09SG003B
M83513/09-A07	MDAP09ST002B
M83513/09-A08	MDAP09ST003B
M83513/09-A09	MDAP09SEL046B
M83513/09-A10	MDAP09SEL092B
M83513/09-A11	MDAP09SEW046B
M83513/09-A12	MDAP09SEW092B
M83513/09-A13	MDAP09S4L183B
M83513/09-A14	MDAP09S4W183B
M83513/09-A15	MDAP09SEL183B
M83513/09-A16	MDAP09SEW183B
M83513/09-B01	MDAP15S4L046B
M83513/09-B02	MDAP15S4L092B
M83513/09-B03	MDAP15S4W046B
M83513/09-B04	MDAP15S4W092B
M83513/09-B05	MDAP15SG002B
M83513/09-B06	MDAP15SG003B
M83513/09-B07	MDAP15ST002B
M83513/09-B08	MDAP15ST003B
M83513/09-B09	MDAP15SEL046B
M83513/09-B10	MDAP15SEL092B
M83513/09-B11	MDAP15SEW046B
M83513/09-B12	MDAP15SEW092B
M83513/09-B13	MDAP15S4L183B
M83513/09-B14	MDAP15S4W183B
M83513/09-B15	MDAP15SEL183B
M83513/09-B16	MDAP15SEW183B
M83513/09-C01	MDAP21S4L046B
M83513/09-C02	MDAP21S4L092B
M83513/09-C03	MDAP21S4W046B
M83513/09-C04	MDAP21S4W092B
M83513/09-C05	MDAP21SG002B
M83513/09-C06	MDAP21SG003B
M83513/09-C07	MDAP21ST002B
M83513/09-C08	MDAP21ST003B
M83513/09-C09	MDAP21SEL046B
M83513/09-C10	MDAP21SEL092B
M83513/09-C11	MDAP21SEW046B
M83513/09-C12	MDAP21SEW092B
M83513/09-C13	MDAP21S4L183B
M83513/09-C14	MDAP21S4W183B
M83513/09-C15	MDAP21SEL183B
M83513/09-C16	MDAP21SEW183B
M83513/09-D01	MDAP25S4L046B
M83513/09-D02	MDAP25S4L092B
M83513/09-D03	MDAP25S4W046B
M83513/09-D04	MDAP25S4W092B
M83513/09-D05	MDAP25SG002B
M83513/09-D06	MDAP25SG003B
M83513/09-D07	MDAP25ST002B
M83513/09-D08	MDAP25ST003B
M83513/09-D09	MDAP25SEL046B
M83513/09-D10	MDAP25SEL092B
M83513/09-D11	MDAP25SEW046B
M83513/09-D12	MDAP25SEW092B
M83513/09-D13	MDAP25S4L183B
M83513/09-D14	MDAP25S4W183B
M83513/09-D15	MDAP25SEL183B
M83513/09-D16	MDAP25SEW183B
M83513/09-E01	MDAP31S4L046B
M83513/09-E02	MDAP31S4L092B
M83513/09-E03	MDAP31S4W046B
M83513/09-E04	MDAP31S4W092B
M83513/09-E05	MDAP31SG002B
M83513/09-E06	MDAP31SG003B
M83513/09-E07	MDAP31ST002B
M83513/09-E08	MDAP31ST003B
M83513/09-E09	MDAP31SEL046B
M83513/09-E10	MDAP31SEL092B
M83513/09-E11	MDAP31SEW046B
M83513/09-E12	MDAP31SEW092B
M83513/09-E13	MDAP31S4L183B
M83513/09-E14	MDAP31S4W183B
M83513/09-E15	MDAP31SEL183B
M83513/09-E16	MDAP31SEW183B
M83513/09-F01	MDAP37S4L046B
M83513/09-F02	MDAP37S4L092B
M83513/09-F03	MDAP37S4W046B
M83513/09-F04	MDAP37S4W092B
M83513/09-F05	MDAP37SG002B
M83513/09-F06	MDAP37SG003B
M83513/09-F07	MDAP37ST002B
M83513/09-F08	MDAP37ST003B
M83513/09-F09	MDAP37SEL046B
M83513/09-F10	MDAP37SEL092B
M83513/09-F11	MDAP37SEW046B
M83513/09-F12	MDAP37SEW092B
M83513/09-F13	MDAP37S4L183B
M83513/09-F14	MDAP37S4W183B
M83513/09-F15	MDAP37SEL183B
M83513/09-F16	MDAP37SEW183B
M83513/09-G01	MDAP51S4L046B
M83513/09-G02	MDAP51S4L092B
M83513/09-G03	MDAP51S4W046B
M83513/09-G04	MDAP51S4W092B
M83513/09-G05	MDAP51SG002B
M83513/09-G06	MDAP51SG003B
M83513/09-G07	MDAP51ST002B
M83513/09-G08	MDAP51ST003B
M83513/09-G09	MDAP51SEL046B
M83513/09-G10	MDAP51SEL092B
M83513/09-G11	MDAP51SEW046B
M83513/09-G12	MDAP51SEW092B
M83513/09-G13	MDAP51S4L183B
M83513/09-G14	MDAP51S4W183B
M83513/09-G15	MDAP51SEL183B
M83513/09-G16	MDAP51SEW183B

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M83513/10

MIL STANDARD	AXON' EQUIVALENT
M83513/10-A01CN	MDA109PCBRBG1
M83513/10-A01CP	MDA109PCBRPG1
M83513/10-A01CT	MDA109PCBRTG1
M83513/10-A01CW	MDA109PCBRWG1
M83513/10-A01NN	MDA209PCBRBG1
M83513/10-A01NP	MDA209PCBRPG1
M83513/10-A01NT	MDA209PCBRTG1
M83513/10-A01NW	MDA209PCBRWG1
M83513/10-A01PN	MDAS09PCBRBG1
M83513/10-A01PP	MDAS09PCBRPG1
M83513/10-A01PT	MDAS09PCBRTG1
M83513/10-A01PW	MDAS09PCBRWG1
M83513/10-A02CN	MDA109PCBRBG2
M83513/10-A02CP	MDA109PCBRPG2
M83513/10-A02CT	MDA109PCBRTG2
M83513/10-A02CW	MDA109PCBRWG2
M83513/10-A02NN	MDA209PCBRBG2
M83513/10-A02NP	MDA209PCBRPG2
M83513/10-A02NT	MDA209PCBRTG2
M83513/10-A02NW	MDA209PCBRWG2
M83513/10-A02PN	MDAS09PCBRBG2
M83513/10-A02PP	MDAS09PCBRPG2
M83513/10-A02PT	MDAS09PCBRTG2
M83513/10-A02PW	MDAS09PCBRWG2
M83513/10-A03CN	MDA109PCBRBG3
M83513/10-A03CP	MDA109PCBRPG3
M83513/10-A03CT	MDA109PCBRTG3
M83513/10-A03CW	MDA109PCBRWG3
M83513/10-A03NN	MDA209PCBRBG3
M83513/10-A03NP	MDA209PCBRPG3
M83513/10-A03NT	MDA209PCBRTG3
M83513/10-A03NW	MDA209PCBRWG3
M83513/10-A03PN	MDAS09PCBRBG3
M83513/10-A03PP	MDAS09PCBRPG3
M83513/10-A03PT	MDAS09PCBRTG3
M83513/10-A03PW	MDAS09PCBRWG3
M83513/10-B01CN	MDA115PCBRBG1
M83513/10-B01CP	MDA115PCBRPG1
M83513/10-B01CT	MDA115PCBRTG1
M83513/10-B01CW	MDA115PCBRWG1
M83513/10-B01NN	MDA215PCBRBG1
M83513/10-B01NP	MDA215PCBRPG1
M83513/10-B01NT	MDA215PCBRTG1
M83513/10-B01NW	MDA215PCBRWG1
M83513/10-B01PN	MDAS15PCBRBG1
M83513/10-B01PP	MDAS15PCBRPG1
M83513/10-B01PT	MDAS15PCBRTG1
M83513/10-B01PW	MDAS15PCBRWG1
M83513/10-B02CN	MDA115PCBRBG2
M83513/10-B02CP	MDA115PCBRPG2
M83513/10-B02CT	MDA115PCBRTG2
M83513/10-B02CW	MDA115PCBRWG2
M83513/10-B02NN	MDA215PCBRBG2
M83513/10-B02NP	MDA215PCBRPG2
M83513/10-B02NT	MDA215PCBRTG2
M83513/10-B02NW	MDA215PCBRWG2
M83513/10-B02PN	MDAS15PCBRBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/10-B02PP	MDAS15PCBRPG2
M83513/10-B02PT	MDAS15PCBRTG2
M83513/10-B02PW	MDAS15PCBRWG2
M83513/10-B03CN	MDA115PCBRBG3
M83513/10-B03CP	MDA115PCBRPG3
M83513/10-B03CT	MDA115PCBRTG3
M83513/10-B03CW	MDA115PCBRWG3
M83513/10-B03NN	MDA215PCBRBG3
M83513/10-B03NP	MDA215PCBRPG3
M83513/10-B03NT	MDA215PCBRTG3
M83513/10-B03NW	MDA215PCBRWG3
M83513/10-B03PN	MDAS15PCBRBG3
M83513/10-B03PP	MDAS15PCBRPG3
M83513/10-B03PT	MDAS15PCBRTG3
M83513/10-B03PW	MDAS15PCBRWG3
M83513/10-C01CN	MDA121PCBRBG1
M83513/10-C01CP	MDA121PCBRPG1
M83513/10-C01CT	MDA121PCBRTG1
M83513/10-C01CW	MDA121PCBRWG1
M83513/10-C01NN	MDA221PCBRBG1
M83513/10-C01NP	MDA221PCBRPG1
M83513/10-C01NT	MDA221PCBRTG1
M83513/10-C01NW	MDA221PCBRWG1
M83513/10-C01PN	MDAS21PCBRBG1
M83513/10-C01PP	MDAS21PCBRPG1
M83513/10-C01PT	MDAS21PCBRTG1
M83513/10-C01PW	MDAS21PCBRWG1
M83513/10-C02CN	MDA121PCBRBG2
M83513/10-C02CP	MDA121PCBRPG2
M83513/10-C02CT	MDA121PCBRTG2
M83513/10-C02CW	MDA121PCBRWG2
M83513/10-C02NN	MDA221PCBRBG2
M83513/10-C02NP	MDA221PCBRPG2
M83513/10-C02NT	MDA221PCBRTG2
M83513/10-C02NW	MDA221PCBRWG2
M83513/10-C02PN	MDAS21PCBRBG2
M83513/10-C02PP	MDAS21PCBRPG2
M83513/10-C02PT	MDAS21PCBRTG2
M83513/10-C02PW	MDAS21PCBRWG2
M83513/10-C03CN	MDA121PCBRBG3
M83513/10-C03CP	MDA121PCBRPG3
M83513/10-C03CT	MDA121PCBRTG3
M83513/10-C03CW	MDA121PCBRWG3
M83513/10-C03NN	MDA221PCBRBG3
M83513/10-C03NP	MDA221PCBRPG3
M83513/10-C03NT	MDA221PCBRTG3
M83513/10-C03NW	MDA221PCBRWG3
M83513/10-C03PN	MDAS21PCBRBG3
M83513/10-C03PP	MDAS21PCBRPG3
M83513/10-C03PT	MDAS21PCBRTG3
M83513/10-C03PW	MDAS21PCBRWG3
M83513/10-D01CN	MDA125PCBRBG1
M83513/10-D01CP	MDA125PCBRPG1
M83513/10-D01CT	MDA125PCBRTG1
M83513/10-D01CW	MDA125PCBRWG1
M83513/10-D01NN	MDA225PCBRBG1
M83513/10-D01NP	MDA225PCBRPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/10-D01NT	MDA225PCBRTG1
M83513/10-D01NW	MDA225PCBRWG1
M83513/10-D01PN	MDAS25PCBRBG1
M83513/10-D01PP	MDAS25PCBRPG1
M83513/10-D01PT	MDAS25PCBRTG1
M83513/10-D01PW	MDAS25PCBRWG1
M83513/10-D02CN	MDA125PCBRBG2
M83513/10-D02CP	MDA125PCBRPG2
M83513/10-D02CT	MDA125PCBRTG2
M83513/10-D02CW	MDA125PCBRWG2
M83513/10-D02NN	MDA225PCBRBG2
M83513/10-D02NP	MDA225PCBRPG2
M83513/10-D02NT	MDA225PCBRTG2
M83513/10-D02NW	MDA225PCBRWG2
M83513/10-D02PN	MDAS25PCBRBG2
M83513/10-D02PP	MDAS25PCBRPG2
M83513/10-D02PT	MDAS25PCBRTG2
M83513/10-D02PW	MDAS25PCBRWG2
M83513/10-D03CN	MDA125PCBRBG3
M83513/10-D03CP	MDA125PCBRPG3
M83513/10-D03CT	MDA125PCBRTG3
M83513/10-D03CW	MDA125PCBRWG3
M83513/10-D03NN	MDA225PCBRBG3
M83513/10-D03NP	MDA225PCBRPG3
M83513/10-D03NT	MDA225PCBRTG3
M83513/10-D03NW	MDA225PCBRWG3
M83513/10-D03PN	MDAS25PCBRBG3
M83513/10-D03PP	MDAS25PCBRPG3
M83513/10-D03PT	MDAS25PCBRTG3
M83513/10-D03PW	MDAS25PCBRWG3
M83513/10-E01CN	MDA131PCBRBG1
M83513/10-E01CP	MDA131PCBRPG1
M83513/10-E01CT	MDA131PCBRTG1
M83513/10-E01CW	MDA131PCBRWG1
M83513/10-E01NN	MDA231PCBRBG1
M83513/10-E01NP	MDA231PCBRPG1
M83513/10-E01NT	MDA231PCBRTG1
M83513/10-E01NW	MDA231PCBRWG1
M83513/10-E01PN	MDAS31PCBRBG1
M83513/10-E01PP	MDAS31PCBRPG1
M83513/10-E01PT	MDAS31PCBRTG1
M83513/10-E01PW	MDAS31PCBRWG1
M83513/10-E02CN	MDA131PCBRBG2
M83513/10-E02CP	MDA131PCBRPG2
M83513/10-E02CT	MDA131PCBRTG2
M83513/10-E02CW	MDA131PCBRWG2
M83513/10-E02NN	MDA231PCBRBG2
M83513/10-E02NP	MDA231PCBRPG2
M83513/10-E02NT	MDA231PCBRTG2
M83513/10-E02NW	MDA231PCBRWG2
M83513/10-E02PN	MDAS31PCBRBG2
M83513/10-E02PP	MDAS31PCBRPG2
M83513/10-E02PT	MDAS31PCBRTG2
M83513/10-E02PW	MDAS31PCBRWG2
M83513/10-E03CN	MDA131PCBRBG3
M83513/10-E03CP	MDA131PCBRPG3
M83513/10-E03CT	MDA131PCBRTG3

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M83513/10 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/10-E03CW	MDA131PCBRWG3
M83513/10-E03NN	MDA231PCBRBG3
M83513/10-E03NP	MDA231PCBRPG3
M83513/10-E03NT	MDA231PCBRTG3
M83513/10-E03NW	MDA231PCBRWG3
M83513/10-E03PN	MDAS31PCBRBG3
M83513/10-E03PP	MDAS31PCBRPG3
M83513/10-E03PT	MDAS31PCBRTG3
M83513/10-E03PW	MDAS31PCBRWG3
M83513/10-F01CN	MDA137PCBRBG1
M83513/10-F01CP	MDA137PCBRPG1
M83513/10-F01CT	MDA137PCBRTG1
M83513/10-F01CW	MDA137PCBRWG1
M83513/10-F01NN	MDA237PCBRBG1
M83513/10-F01NP	MDA237PCBRPG1
M83513/10-F01NT	MDA237PCBRTG1

MIL STANDARD	AXON' EQUIVALENT
M83513/10-F01NW	MDA237PCBRWG1
M83513/10-F01PN	MDAS37PCBRBG1
M83513/10-F01PP	MDAS37PCBRPG1
M83513/10-F01PT	MDAS37PCBRTG1
M83513/10-F01PW	MDAS37PCBRWG1
M83513/10-F02CN	MDA137PCBRBG2
M83513/10-F02CP	MDA137PCBRPG2
M83513/10-F02CT	MDA137PCBRTG2
M83513/10-F02CW	MDA137PCBRWG2
M83513/10-F02NN	MDA237PCBRBG2
M83513/10-F02NP	MDA237PCBRPG2
M83513/10-F02NT	MDA237PCBRTG2
M83513/10-F02NW	MDA237PCBRWG2
M83513/10-F02PN	MDAS37PCBRBG2
M83513/10-F02PP	MDAS37PCBRPG2
M83513/10-F02PT	MDAS37PCBRTG2

MIL STANDARD	AXON' EQUIVALENT
M83513/10-F02PW	MDAS37PCBRWG2
M83513/10-F03CN	MDA137PCBRBG3
M83513/10-F03CP	MDA137PCBRPG3
M83513/10-F03CT	MDA137PCBRTG3
M83513/10-F03CW	MDA137PCBRWG3
M83513/10-F03NN	MDA237PCBRBG3
M83513/10-F03NP	MDA237PCBRPG3
M83513/10-F03NT	MDA237PCBRTG3
M83513/10-F03NW	MDA237PCBRWG3
M83513/10-F03PN	MDAS37PCBRBG3
M83513/10-F03PP	MDAS37PCBRPG3
M83513/10-F03PT	MDAS37PCBRTG3
M83513/10-F03PW	MDAS37PCBRWG3

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MIL STANDARD	AXON' EQUIVALENT
M83513/11-G01CN	MDA151PCBRBG1
M83513/11-G01CP	MDA151PCBRPG1
M83513/11-G01CT	MDA151PCBRTG1
M83513/11-G01CW	MDA151PCBRWG1
M83513/11-G01NN	MDA251PCBRBG1
M83513/11-G01NP	MDA251PCBRPG1
M83513/11-G01NT	MDA251PCBRTG1
M83513/11-G01NW	MDA251PCBRWG1
M83513/11-G01PN	MDAS51PCBRBG1
M83513/11-G01PP	MDAS51PCBRPG1
M83513/11-G01PT	MDAS51PCBRTG1
M83513/11-G01PW	MDAS51PCBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/11-G02CN	MDA151PCBRBG2
M83513/11-G02CP	MDA151PCBRPG2
M83513/11-G02CT	MDA151PCBRTG2
M83513/11-G02CW	MDA151PCBRWG2
M83513/11-G02NN	MDA251PCBRBG2
M83513/11-G02NP	MDA251PCBRPG2
M83513/11-G02NT	MDA251PCBRTG2
M83513/11-G02NW	MDA251PCBRWG2
M83513/11-G02PN	MDAS51PCBRBG2
M83513/11-G02PP	MDAS51PCBRPG2
M83513/11-G02PT	MDAS51PCBRTG2
M83513/11-G02PW	MDAS51PCBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/11-G03CN	MDA151PCBRBG3
M83513/11-G03CP	MDA151PCBRPG3
M83513/11-G03CT	MDA151PCBRTG3
M83513/11-G03CW	MDA151PCBRWG3
M83513/11-G03NN	MDA251PCBRBG3
M83513/11-G03NP	MDA251PCBRPG3
M83513/11-G03NT	MDA251PCBRTG3
M83513/11-G03NW	MDA251PCBRWG3
M83513/11-G03PN	MDAS51PCBRBG3
M83513/11-G03PP	MDAS51PCBRPG3
M83513/11-G03PT	MDAS51PCBRTG3
M83513/11-G03PW	MDAS51PCBRWG3

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MIL STANDARD	AXON' EQUIVALENT
M83513/12-H01CN	MDA1100PCBRBG1
M83513/12-H01CP	MDA1100PCBRPG1
M83513/12-H01CU	MDA1100PCBRTG1
M83513/12-H01CY	MDA1100PCBRWG1
M83513/12-H01NN	MDA2100PCBRBG1
M83513/12-H01NP	MDA2100PCBRPG1
M83513/12-H01NU	MDA2100PCBRTG1
M83513/12-H01NY	MDA2100PCBRWG1
M83513/12-H01PN	MDAS100PCBRBG1
M83513/12-H01PP	MDAS100PCBRPG1
M83513/12-H01PU	MDAS100PCBRTG1
M83513/12-H01PY	MDAS100PCBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/12-H02CN	MDA1100PCBRBG2
M83513/12-H02CP	MDA1100PCBRPG2
M83513/12-H02CU	MDA1100PCBRTG2
M83513/12-H02CY	MDA1100PCBRWG2
M83513/12-H02NN	MDA2100PCBRBG2
M83513/12-H02NP	MDA2100PCBRPG2
M83513/12-H02NU	MDA2100PCBRTG2
M83513/12-H02NY	MDA2100PCBRWG2
M83513/12-H02PN	MDAS100PCBRBG2
M83513/12-H02PP	MDAS100PCBRPG2
M83513/12-H02PU	MDAS100PCBRTG2
M83513/12-H02PY	MDAS100PCBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/12-H03CN	MDA1100PCBRBG3
M83513/12-H03CP	MDA1100PCBRPG3
M83513/12-H03CU	MDA1100PCBRTG3
M83513/12-H03CY	MDA1100PCBRWG3
M83513/12-H03NN	MDA2100PCBRBG3
M83513/12-H03NP	MDA2100PCBRPG3
M83513/12-H03NU	MDA2100PCBRTG3
M83513/12-H03NY	MDA2100PCBRWG3
M83513/12-H03PN	MDAS100PCBRBG3
M83513/12-H03PP	MDAS100PCBRPG3
M83513/12-H03PU	MDAS100PCBRTG3
M83513/12-H03PY	MDAS100PCBRWG3

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MIL STANDARD	AXON' EQUIVALENT
M83513/13-A01CN	MDA109SCBRBG1
M83513/13-A01CP	MDA109SCBRPG1
M83513/13-A01CT	MDA109SCBRTG1
M83513/13-A01CW	MDA109SCBRWG1
M83513/13-A01NN	MDA209SCBRBG1
M83513/13-A01NP	MDA209SCBRPG1
M83513/13-A01NT	MDA209SCBRTG1
M83513/13-A01NW	MDA209SCBRWG1
M83513/13-A01PN	MDAS09SCBRBG1
M83513/13-A01PP	MDAS09SCBRPG1
M83513/13-A01PT	MDAS09SCBRTG1
M83513/13-A01PW	MDAS09SCBRWG1
M83513/13-A02CN	MDA109SCBRBG2
M83513/13-A02CP	MDA109SCBRPG2
M83513/13-A02CT	MDA109SCBRTG2
M83513/13-A02CW	MDA109SCBRWG2
M83513/13-A02NN	MDA209SCBRBG2
M83513/13-A02NP	MDA209SCBRPG2
M83513/13-A02NT	MDA209SCBRTG2
M83513/13-A02NW	MDA209SCBRWG2
M83513/13-A02PN	MDAS09SCBRBG2
M83513/13-A02PP	MDAS09SCBRPG2
M83513/13-A02PT	MDAS09SCBRTG2
M83513/13-A02PW	MDAS09SCBRWG2
M83513/13-A03CN	MDA109SCBRBG3
M83513/13-A03CP	MDA109SCBRPG3
M83513/13-A03CT	MDA109SCBRTG3
M83513/13-A03CW	MDA109SCBRWG3
M83513/13-A03NN	MDA209SCBRBG3
M83513/13-A03NP	MDA209SCBRPG3
M83513/13-A03NT	MDA209SCBRTG3
M83513/13-A03NW	MDA209SCBRWG3
M83513/13-A03PN	MDAS09SCBRBG3
M83513/13-A03PP	MDAS09SCBRPG3
M83513/13-A03PT	MDAS09SCBRTG3
M83513/13-A03PW	MDAS09SCBRWG3
M83513/13-B01CN	MDA115SCBRBG1
M83513/13-B01CP	MDA115SCBRPG1
M83513/13-B01CT	MDA115SCBRTG1
M83513/13-B01CW	MDA115SCBRWG1
M83513/13-B01NN	MDA215SCBRBG1
M83513/13-B01NP	MDA215SCBRPG1
M83513/13-B01NT	MDA215SCBRTG1
M83513/13-B01NW	MDA215SCBRWG1
M83513/13-B01PN	MDAS15SCBRBG1
M83513/13-B01PP	MDAS15SCBRPG1
M83513/13-B01PT	MDAS15SCBRTG1
M83513/13-B01PW	MDAS15SCBRWG1
M83513/13-B02CN	MDA115SCBRBG2
M83513/13-B02CP	MDA115SCBRPG2
M83513/13-B02CT	MDA115SCBRTG2
M83513/13-B02CW	MDA115SCBRWG2
M83513/13-B02NN	MDA215SCBRBG2
M83513/13-B02NP	MDA215SCBRPG2
M83513/13-B02NT	MDA215SCBRTG2
M83513/13-B02NW	MDA215SCBRWG2
M83513/13-B02PN	MDAS15SCBRBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/13-B02PP	MDAS15SCBRPG2
M83513/13-B02PT	MDAS15SCBRTG2
M83513/13-B02PW	MDAS15SCBRWG2
M83513/13-B03CN	MDA115SCBRBG3
M83513/13-B03CP	MDA115SCBRPG3
M83513/13-B03CT	MDA115SCBRTG3
M83513/13-B03CW	MDA115SCBRWG3
M83513/13-B03NN	MDA215SCBRBG3
M83513/13-B03NP	MDA215SCBRPG3
M83513/13-B03NT	MDA215SCBRTG3
M83513/13-B03NW	MDA215SCBRWG3
M83513/13-B03PN	MDAS15SCBRBG3
M83513/13-B03PP	MDAS15SCBRPG3
M83513/13-B03PT	MDAS15SCBRTG3
M83513/13-B03PW	MDAS15SCBRWG3
M83513/13-C01CN	MDA121SCBRBG1
M83513/13-C01CP	MDA121SCBRPG1
M83513/13-C01CT	MDA121SCBRTG1
M83513/13-C01CW	MDA121SCBRWG1
M83513/13-C01NN	MDA221SCBRBG1
M83513/13-C01NP	MDA221SCBRPG1
M83513/13-C01NT	MDA221SCBRTG1
M83513/13-C01NW	MDA221SCBRWG1
M83513/13-C01PN	MDAS21SCBRBG1
M83513/13-C01PP	MDAS21SCBRPG1
M83513/13-C01PT	MDAS21SCBRTG1
M83513/13-C01PW	MDAS21SCBRWG1
M83513/13-C02CN	MDA121SCBRBG2
M83513/13-C02CP	MDA121SCBRPG2
M83513/13-C02CT	MDA121SCBRTG2
M83513/13-C02CW	MDA121SCBRWG2
M83513/13-C02NN	MDA221SCBRBG2
M83513/13-C02NP	MDA221SCBRPG2
M83513/13-C02NT	MDA221SCBRTG2
M83513/13-C02NW	MDA221SCBRWG2
M83513/13-C02PN	MDAS21SCBRBG2
M83513/13-C02PP	MDAS21SCBRPG2
M83513/13-C02PT	MDAS21SCBRTG2
M83513/13-C02PW	MDAS21SCBRWG2
M83513/13-C03CN	MDA121SCBRBG3
M83513/13-C03CP	MDA121SCBRPG3
M83513/13-C03CT	MDA121SCBRTG3
M83513/13-C03CW	MDA121SCBRWG3
M83513/13-C03NN	MDA221SCBRBG3
M83513/13-C03NP	MDA221SCBRPG3
M83513/13-C03NT	MDA221SCBRTG3
M83513/13-C03NW	MDA221SCBRWG3
M83513/13-C03PN	MDAS21SCBRBG3
M83513/13-C03PP	MDAS21SCBRPG3
M83513/13-C03PT	MDAS21SCBRTG3
M83513/13-C03PW	MDAS21SCBRWG3
M83513/13-D01CN	MDA125SCBRBG1
M83513/13-D01CP	MDA125SCBRPG1
M83513/13-D01CT	MDA125SCBRTG1
M83513/13-D01CW	MDA125SCBRWG1
M83513/13-D01NN	MDA225SCBRBG1
M83513/13-D01NP	MDA225SCBRPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/13-D01NT	MDA225SCBRTG1
M83513/13-D01NW	MDA225SCBRWG1
M83513/13-D01PN	MDAS25SCBRBG1
M83513/13-D01PP	MDAS25SCBRPG1
M83513/13-D01PT	MDAS25SCBRTG1
M83513/13-D01PW	MDAS25SCBRWG1
M83513/13-D02CN	MDA125SCBRBG2
M83513/13-D02CP	MDA125SCBRPG2
M83513/13-D02CT	MDA125SCBRTG2
M83513/13-D02CW	MDA125SCBRWG2
M83513/13-D02NN	MDA225SCBRBG2
M83513/13-D02NP	MDA225SCBRPG2
M83513/13-D02NT	MDA225SCBRTG2
M83513/13-D02NW	MDA225SCBRWG2
M83513/13-D02PN	MDAS25SCBRBG2
M83513/13-D02PP	MDAS25SCBRPG2
M83513/13-D02PT	MDAS25SCBRTG2
M83513/13-D02PW	MDAS25SCBRWG2
M83513/13-D03CN	MDA125SCBRBG3
M83513/13-D03CP	MDA125SCBRPG3
M83513/13-D03CT	MDA125SCBRTG3
M83513/13-D03CW	MDA125SCBRWG3
M83513/13-D03NN	MDA225SCBRBG3
M83513/13-D03NP	MDA225SCBRPG3
M83513/13-D03NT	MDA225SCBRTG3
M83513/13-D03NW	MDA225SCBRWG3
M83513/13-D03PN	MDAS25SCBRBG3
M83513/13-D03PP	MDAS25SCBRPG3
M83513/13-D03PT	MDAS25SCBRTG3
M83513/13-D03PW	MDAS25SCBRWG3
M83513/13-E01CN	MDA131SCBRBG1
M83513/13-E01CP	MDA131SCBRPG1
M83513/13-E01CT	MDA131SCBRTG1
M83513/13-E01CW	MDA131SCBRWG1
M83513/13-E01NN	MDA231SCBRBG1
M83513/13-E01NP	MDA231SCBRPG1
M83513/13-E01NT	MDA231SCBRTG1
M83513/13-E01NW	MDA231SCBRWG1
M83513/13-E01PN	MDAS31SCBRBG1
M83513/13-E01PP	MDAS31SCBRPG1
M83513/13-E01PT	MDAS31SCBRTG1
M83513/13-E01PW	MDAS31SCBRWG1
M83513/13-E02CN	MDA131SCBRBG2
M83513/13-E02CP	MDA131SCBRPG2
M83513/13-E02CT	MDA131SCBRTG2
M83513/13-E02CW	MDA131SCBRWG2
M83513/13-E02NN	MDA231SCBRBG2
M83513/13-E02NP	MDA231SCBRPG2
M83513/13-E02NT	MDA231SCBRTG2
M83513/13-E02NW	MDA231SCBRWG2
M83513/13-E02PN	MDAS31SCBRBG2
M83513/13-E02PP	MDAS31SCBRPG2
M83513/13-E02PT	MDAS31SCBRTG2
M83513/13-E02PW	MDAS31SCBRWG2
M83513/13-E03CN	MDA131SCBRBG3
M83513/13-E03CP	MDA131SCBRPG3
M83513/13-E03CT	MDA131SCBRTG3

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M83513/13 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/13-E03CW	MDA131SCBRWG3
M83513/13-E03NN	MDA231SCBRBG3
M83513/13-E03NP	MDA231SCBRPG3
M83513/13-E03NT	MDA231SCBRTG3
M83513/13-E03NW	MDA231SCBRWG3
M83513/13-E03PN	MDAS31SCBRBG3
M83513/13-E03PP	MDAS31SCBRPG3
M83513/13-E03PT	MDAS31SCBRTG3
M83513/13-E03PW	MDAS31SCBRWG3
M83513/13-F01CN	MDA137SCBRBG1
M83513/13-F01CP	MDA137SCBRPG1
M83513/13-F01CT	MDA137SCBRTG1
M83513/13-F01CW	MDA137SCBRWG1
M83513/13-F01NN	MDA237SCBRBG1
M83513/13-F01NP	MDA237SCBRPG1
M83513/13-F01NT	MDA237SCBRTG1

MIL STANDARD	AXON' EQUIVALENT
M83513/13-F01NW	MDA237SCBRWG1
M83513/13-F01PN	MDAS37SCBRBG1
M83513/13-F01PP	MDAS37SCBRPG1
M83513/13-F01PT	MDAS37SCBRTG1
M83513/13-F01PW	MDAS37SCBRWG1
M83513/13-F02CN	MDA137SCBRBG2
M83513/13-F02CP	MDA137SCBRPG2
M83513/13-F02CT	MDA137SCBRTG2
M83513/13-F02CW	MDA137SCBRWG2
M83513/13-F02NN	MDA237SCBRBG2
M83513/13-F02NP	MDA237SCBRPG2
M83513/13-F02NT	MDA237SCBRTG2
M83513/13-F02NW	MDA237SCBRWG2
M83513/13-F02PN	MDAS37SCBRBG2
M83513/13-F02PP	MDAS37SCBRPG2
M83513/13-F02PT	MDAS37SCBRTG2

MIL STANDARD	AXON' EQUIVALENT
M83513/13-F02PW	MDAS37SCBRWG2
M83513/13-F03CN	MDA137SCBRBG3
M83513/13-F03CP	MDA137SCBRPG3
M83513/13-F03CT	MDA137SCBRTG3
M83513/13-F03CW	MDA137SCBRWG3
M83513/13-F03NN	MDA237SCBRBG3
M83513/13-F03NP	MDA237SCBRPG3
M83513/13-F03NT	MDA237SCBRTG3
M83513/13-F03NW	MDA237SCBRWG3
M83513/13-F03PN	MDAS37SCBRBG3
M83513/13-F03PP	MDAS37SCBRPG3
M83513/13-F03PT	MDAS37SCBRTG3
M83513/13-F03PW	MDAS37SCBRWG3

M83513/14

MIL STANDARD	AXON' EQUIVALENT
M83513/14-G01CN	MDA151SCBRBG1
M83513/14-G01CP	MDA151SCBRPG1
M83513/14-G01CT	MDA151SCBRTG1
M83513/14-G01CW	MDA151SCBRWG1
M83513/14-G01NN	MDA251SCBRBG1
M83513/14-G01NP	MDA251SCBRPG1
M83513/14-G01NT	MDA251SCBRTG1
M83513/14-G01NW	MDA251SCBRWG1
M83513/14-G01PN	MDAS51SCBRBG1
M83513/14-G01PP	MDAS51SCBRPG1
M83513/14-G01PT	MDAS51SCBRTG1
M83513/14-G01PW	MDAS51SCBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/14-G02CN	MDA151SCBRBG2
M83513/14-G02CP	MDA151SCBRPG2
M83513/14-G02CT	MDA151SCBRTG2
M83513/14-G02CW	MDA151SCBRWG2
M83513/14-G02NN	MDA251SCBRBG2
M83513/14-G02NP	MDA251SCBRPG2
M83513/14-G02NT	MDA251SCBRTG2
M83513/14-G02NW	MDA251SCBRWG2
M83513/14-G02PN	MDAS51SCBRBG2
M83513/14-G02PP	MDAS51SCBRPG2
M83513/14-G02PT	MDAS51SCBRTG2
M83513/14-G02PW	MDAS51SCBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/14-G03CN	MDA151SCBRBG3
M83513/14-G03CP	MDA151SCBRPG3
M83513/14-G03CT	MDA151SCBRTG3
M83513/14-G03CW	MDA151SCBRWG3
M83513/14-G03NN	MDA251SCBRBG3
M83513/14-G03NP	MDA251SCBRPG3
M83513/14-G03NT	MDA251SCBRTG3
M83513/14-G03NW	MDA251SCBRWG3
M83513/14-G03PN	MDAS51SCBRBG3
M83513/14-G03PP	MDAS51SCBRPG3
M83513/14-G03PT	MDAS51SCBRTG3
M83513/14-G03PW	MDAS51SCBRWG3

M83513/15

MIL STANDARD	AXON' EQUIVALENT
M83513/15-H01CN	MDA1100SCBRBG1
M83513/15-H01CP	MDA1100SCBRPG1
M83513/15-H01CU	MDA1100SCBRTG1
M83513/15-H01CY	MDA1100SCBRWG1
M83513/15-H01NN	MDA2100SCBRBG1
M83513/15-H01NP	MDA2100SCBRPG1
M83513/15-H01NU	MDA2100SCBRTG1
M83513/15-H01NY	MDA2100SCBRWG1
M83513/15-H01PN	MDAS100SCBRBG1
M83513/15-H01PP	MDAS100SCBRPG1
M83513/15-H01PU	MDAS100SCBRTG1
M83513/15-H01PY	MDAS100SCBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/15-H02CN	MDA1100SCBRBG2
M83513/15-H02CP	MDA1100SCBRPG2
M83513/15-H02CU	MDA1100SCBRTG2
M83513/15-H02CY	MDA1100SCBRWG2
M83513/15-H02NN	MDA2100SCBRBG2
M83513/15-H02NP	MDA2100SCBRPG2
M83513/15-H02NU	MDA2100SCBRTG2
M83513/15-H02NY	MDA2100SCBRWG2
M83513/15-H02PN	MDAS100SCBRBG2
M83513/15-H02PP	MDAS100SCBRPG2
M83513/15-H02PU	MDAS100SCBRTG2
M83513/15-H02PY	MDAS100SCBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/15-H03CN	MDA1100SCBRBG3
M83513/15-H03CP	MDA1100SCBRPG3
M83513/15-H03CU	MDA1100SCBRTG3
M83513/15-H03CY	MDA1100SCBRWG3
M83513/15-H03NN	MDA2100SCBRBG3
M83513/15-H03NP	MDA2100SCBRPG3
M83513/15-H03NU	MDA2100SCBRTG3
M83513/15-H03NY	MDA2100SCBRWG3
M83513/15-H03PN	MDAS100SCBRBG3
M83513/15-H03PP	MDAS100SCBRPG3
M83513/15-H03PU	MDAS100SCBRTG3
M83513/15-H03PY	MDAS100SCBRWG3

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MIL STANDARD	AXON' EQUIVALENT
M83513/16-A01CN	MDA109PBRBG1
M83513/16-A01CP	MDA109PBRPG1
M83513/16-A01CT	MDA109PBRTG1
M83513/16-A01CW	MDA109PBRWG1
M83513/16-A01NN	MDA209PBRBG1
M83513/16-A01NP	MDA209PBRPG1
M83513/16-A01NT	MDA209PBRTG1
M83513/16-A01NW	MDA209PBRWG1
M83513/16-A01PN	MDAS09PBRBG1
M83513/16-A01PP	MDAS09PBRPG1
M83513/16-A01PT	MDAS09PBRTG1
M83513/16-A01PW	MDAS09PBRWG1
M83513/16-A02CN	MDA109PBRBG2
M83513/16-A02CP	MDA109PBRPG2
M83513/16-A02CT	MDA109PBRTG2
M83513/16-A02CW	MDA109PBRWG2
M83513/16-A02NN	MDA209PBRBG2
M83513/16-A02NP	MDA209PBRPG2
M83513/16-A02NT	MDA209PBRTG2
M83513/16-A02NW	MDA209PBRWG2
M83513/16-A02PN	MDAS09PBRBG2
M83513/16-A02PP	MDAS09PBRPG2
M83513/16-A02PT	MDAS09PBRTG2
M83513/16-A02PW	MDAS09PBRWG2
M83513/16-A03CN	MDA109PBRBG3
M83513/16-A03CP	MDA109PBRPG3
M83513/16-A03CT	MDA109PBRTG3
M83513/16-A03CW	MDA109PBRWG3
M83513/16-A03NN	MDA209PBRBG3
M83513/16-A03NP	MDA209PBRPG3
M83513/16-A03NT	MDA209PBRTG3
M83513/16-A03NW	MDA209PBRWG3
M83513/16-A03PN	MDAS09PBRBG3
M83513/16-A03PP	MDAS09PBRPG3
M83513/16-A03PT	MDAS09PBRTG3
M83513/16-A03PW	MDAS09PBRWG3
M83513/16-B01CN	MDA115PBRBG1
M83513/16-B01CP	MDA115PBRPG1
M83513/16-B01CT	MDA115PBRTG1
M83513/16-B01CW	MDA115PBRWG1
M83513/16-B01NN	MDA215PBRBG1
M83513/16-B01NP	MDA215PBRPG1
M83513/16-B01NT	MDA215PBRTG1
M83513/16-B01NW	MDA215PBRWG1
M83513/16-B01PN	MDAS15PBRBG1
M83513/16-B01PP	MDAS15PBRPG1
M83513/16-B01PT	MDAS15PBRTG1
M83513/16-B01PW	MDAS15PBRWG1
M83513/16-B02CN	MDA115PBRBG2
M83513/16-B02CP	MDA115PBRPG2
M83513/16-B02CT	MDA115PBRTG2
M83513/16-B02CW	MDA115PBRWG2
M83513/16-B02NN	MDA215PBRBG2
M83513/16-B02NP	MDA215PBRPG2
M83513/16-B02NT	MDA215PBRTG2
M83513/16-B02NW	MDA215PBRWG2
M83513/16-B02PN	MDAS15PBRBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/16-B02PP	MDAS15PBRPG2
M83513/16-B02PT	MDAS15PBRTG2
M83513/16-B02PW	MDAS15PBRWG2
M83513/16-B03CN	MDA115PBRBG3
M83513/16-B03CP	MDA115PBRPG3
M83513/16-B03CT	MDA115PBRTG3
M83513/16-B03CW	MDA115PBRWG3
M83513/16-B03NN	MDA215PBRBG3
M83513/16-B03NP	MDA215PBRPG3
M83513/16-B03NT	MDA215PBRTG3
M83513/16-B03NW	MDA215PBRWG3
M83513/16-B03PN	MDAS15PBRBG3
M83513/16-B03PP	MDAS15PBRPG3
M83513/16-B03PT	MDAS15PBRTG3
M83513/16-B03PW	MDAS15PBRWG3
M83513/16-C01CN	MDA121PBRBG1
M83513/16-C01CP	MDA121PBRPG1
M83513/16-C01CT	MDA121PBRTG1
M83513/16-C01CW	MDA121PBRWG1
M83513/16-C01NN	MDA221PBRBG1
M83513/16-C01NP	MDA221PBRPG1
M83513/16-C01NT	MDA221PBRTG1
M83513/16-C01NW	MDA221PBRWG1
M83513/16-C01PN	MDAS21PBRBG1
M83513/16-C01PP	MDAS21PBRPG1
M83513/16-C01PT	MDAS21PBRTG1
M83513/16-C01PW	MDAS21PBRWG1
M83513/16-C02CN	MDA121PBRBG2
M83513/16-C02CP	MDA121PBRPG2
M83513/16-C02CT	MDA121PBRTG2
M83513/16-C02CW	MDA121PBRWG2
M83513/16-C02NN	MDA221PBRBG2
M83513/16-C02NP	MDA221PBRPG2
M83513/16-C02NT	MDA221PBRTG2
M83513/16-C02NW	MDA221PBRWG2
M83513/16-C02PN	MDAS21PBRBG2
M83513/16-C02PP	MDAS21PBRPG2
M83513/16-C02PT	MDAS21PBRTG2
M83513/16-C02PW	MDAS21PBRWG2
M83513/16-C03CN	MDA121PBRBG3
M83513/16-C03CP	MDA121PBRPG3
M83513/16-C03CT	MDA121PBRTG3
M83513/16-C03CW	MDA121PBRWG3
M83513/16-C03NN	MDA221PBRBG3
M83513/16-C03NP	MDA221PBRPG3
M83513/16-C03NT	MDA221PBRTG3
M83513/16-C03NW	MDA221PBRWG3
M83513/16-C03PN	MDAS21PBRBG3
M83513/16-C03PP	MDAS21PBRPG3
M83513/16-C03PT	MDAS21PBRTG3
M83513/16-C03PW	MDAS21PBRWG3
M83513/16-D01CN	MDA125PBRBG1
M83513/16-D01CP	MDA125PBRPG1
M83513/16-D01CT	MDA125PBRTG1
M83513/16-D01CW	MDA125PBRWG1
M83513/16-D01NN	MDA225PBRBG1
M83513/16-D01NP	MDA225PBRPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/16-D01NT	MDA225PBRTG1
M83513/16-D01NW	MDA225PBRWG1
M83513/16-D01PN	MDAS25PBRBG1
M83513/16-D01PP	MDAS25PBRPG1
M83513/16-D01PT	MDAS25PBRTG1
M83513/16-D01PW	MDAS25PBRWG1
M83513/16-D02CN	MDA125PBRBG2
M83513/16-D02CP	MDA125PBRPG2
M83513/16-D02CT	MDA125PBRTG2
M83513/16-D02CW	MDA125PBRWG2
M83513/16-D02NN	MDA225PBRBG2
M83513/16-D02NP	MDA225PBRPG2
M83513/16-D02NT	MDA225PBRTG2
M83513/16-D02NW	MDA225PBRWG2
M83513/16-D02PN	MDAS25PBRBG2
M83513/16-D02PP	MDAS25PBRPG2
M83513/16-D02PT	MDAS25PBRTG2
M83513/16-D02PW	MDAS25PBRWG2
M83513/16-D03CN	MDA125PBRBG3
M83513/16-D03CP	MDA125PBRPG3
M83513/16-D03CT	MDA125PBRTG3
M83513/16-D03CW	MDA125PBRWG3
M83513/16-D03NN	MDA225PBRBG3
M83513/16-D03NP	MDA225PBRPG3
M83513/16-D03NT	MDA225PBRTG3
M83513/16-D03NW	MDA225PBRWG3
M83513/16-D03PN	MDAS25PBRBG3
M83513/16-D03PP	MDAS25PBRPG3
M83513/16-D03PT	MDAS25PBRTG3
M83513/16-D03PW	MDAS25PBRWG3
M83513/16-E01CN	MDA131PBRBG1
M83513/16-E01CP	MDA131PBRPG1
M83513/16-E01CT	MDA131PBRTG1
M83513/16-E01CW	MDA131PBRWG1
M83513/16-E01NN	MDA231PBRBG1
M83513/16-E01NP	MDA231PBRPG1
M83513/16-E01NT	MDA231PBRTG1
M83513/16-E01NW	MDA231PBRWG1
M83513/16-E01PN	MDAS31PBRBG1
M83513/16-E01PP	MDAS31PBRPG1
M83513/16-E01PT	MDAS31PBRTG1
M83513/16-E01PW	MDAS31PBRWG1
M83513/16-E02CN	MDA131PBRBG2
M83513/16-E02CP	MDA131PBRPG2
M83513/16-E02CT	MDA131PBRTG2
M83513/16-E02CW	MDA131PBRWG2
M83513/16-E02NN	MDA231PBRBG2
M83513/16-E02NP	MDA231PBRPG2
M83513/16-E02NT	MDA231PBRTG2
M83513/16-E02NW	MDA231PBRWG2
M83513/16-E02PN	MDAS31PBRBG2
M83513/16-E02PP	MDAS31PBRPG2
M83513/16-E02PT	MDAS31PBRTG2
M83513/16-E02PW	MDAS31PBRWG2
M83513/16-E03CN	MDA131PBRBG3
M83513/16-E03CP	MDA131PBRPG3
M83513/16-E03CT	MDA131PBRTG3

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M83513/16 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/16-E03CW	MDA131PBRWG3
M83513/16-E03NN	MDA231PBRBG3
M83513/16-E03NP	MDA231PBRPG3
M83513/16-E03NT	MDA231PBRTG3
M83513/16-E03NW	MDA231PBRWG3
M83513/16-E03PN	MDAS31PBRBG3
M83513/16-E03PP	MDAS31PBRPG3
M83513/16-E03PT	MDAS31PBRTG3
M83513/16-E03PW	MDAS31PBRWG3
M83513/16-F01CN	MDA137PBRBG1
M83513/16-F01CP	MDA137PBRPG1
M83513/16-F01CT	MDA137PBRTG1
M83513/16-F01CW	MDA137PBRWG1
M83513/16-F01NN	MDA237PBRBG1
M83513/16-F01NP	MDA237PBRPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/16-F01NT	MDA237PBRTG1
M83513/16-F01NW	MDA237PBRWG1
M83513/16-F01PN	MDAS37PBRBG1
M83513/16-F01PP	MDAS37PBRPG1
M83513/16-F01PT	MDAS37PBRTG1
M83513/16-F01PW	MDAS37PBRWG1
M83513/16-F02CN	MDA137PBRBG2
M83513/16-F02CP	MDA137PBRPG2
M83513/16-F02CT	MDA137PBRTG2
M83513/16-F02CW	MDA137PBRWG2
M83513/16-F02NN	MDA237PBRBG2
M83513/16-F02NP	MDA237PBRPG2
M83513/16-F02NT	MDA237PBRTG2
M83513/16-F02NW	MDA237PBRWG2
M83513/16-F02PN	MDAS37PBRBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/16-F02PP	MDAS37PBRPG2
M83513/16-F02PT	MDAS37PBRTG2
M83513/16-F02PW	MDAS37PBRWG2
M83513/16-F03CN	MDA137PBRBG3
M83513/16-F03CP	MDA137PBRPG3
M83513/16-F03CT	MDA137PBRTG3
M83513/16-F03CW	MDA137PBRWG3
M83513/16-F03NN	MDA237PBRBG3
M83513/16-F03NP	MDA237PBRPG3
M83513/16-F03NT	MDA237PBRTG3
M83513/16-F03NW	MDA237PBRWG3
M83513/16-F03PN	MDAS37PBRBG3
M83513/16-F03PP	MDAS37PBRPG3
M83513/16-F03PT	MDAS37PBRTG3
M83513/16-F03PW	MDAS37PBRWG3

M83513/17

MIL STANDARD	AXON' EQUIVALENT
M83513/17-G01CN	MDA151PBRBG1
M83513/17-G01CP	MDA151PBRPG1
M83513/17-G01CT	MDA151PBRTG1
M83513/17-G01CW	MDA151PBRWG1
M83513/17-G01NN	MDA251PBRBG1
M83513/17-G01NP	MDA251PBRPG1
M83513/17-G01NT	MDA251PBRTG1
M83513/17-G01NW	MDA251PBRWG1
M83513/17-G01PN	MDAS51PBRBG1
M83513/17-G01PP	MDAS51PBRPG1
M83513/17-G01PT	MDAS51PBRTG1
M83513/17-G01PW	MDAS51PBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/17-G02CN	MDA151PBRBG2
M83513/17-G02CP	MDA151PBRPG2
M83513/17-G02CT	MDA151PBRTG2
M83513/17-G02CW	MDA151PBRWG2
M83513/17-G02NN	MDA251PBRBG2
M83513/17-G02NP	MDA251PBRPG2
M83513/17-G02NT	MDA251PBRTG2
M83513/17-G02NW	MDA251PBRWG2
M83513/17-G02PN	MDAS51PBRBG2
M83513/17-G02PP	MDAS51PBRPG2
M83513/17-G02PT	MDAS51PBRTG2
M83513/17-G02PW	MDAS51PBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/17-G03CN	MDA151PBRBG3
M83513/17-G03CP	MDA151PBRPG3
M83513/17-G03CT	MDA151PBRTG3
M83513/17-G03CW	MDA151PBRWG3
M83513/17-G03NN	MDA251PBRBG3
M83513/17-G03NP	MDA251PBRPG3
M83513/17-G03NT	MDA251PBRTG3
M83513/17-G03NW	MDA251PBRWG3
M83513/17-G03PN	MDAS51PBRBG3
M83513/17-G03PP	MDAS51PBRPG3
M83513/17-G03PT	MDAS51PBRTG3
M83513/17-G03PW	MDAS51PBRWG3

M83513/18

MIL STANDARD	AXON' EQUIVALENT
M83513/18-H01CN	MDA1100PBRBG1
M83513/18-H01CP	MDA1100PBRPG1
M83513/18-H01CU	MDA1100PBRTG1
M83513/18-H01CY	MDA1100PBRWG1
M83513/18-H01NN	MDA2100PBRBG1
M83513/18-H01NP	MDA2100PBRPG1
M83513/18-H01NU	MDA2100PBRTG1
M83513/18-H01NY	MDA2100PBRWG1
M83513/18-H01PN	MDAS100PBRBG1
M83513/18-H01PP	MDAS100PBRPG1
M83513/18-H01PU	MDAS100PBRTG1
M83513/18-H01PY	MDAS100PBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/18-H02CN	MDA1100PBRBG2
M83513/18-H02CP	MDA1100PBRPG2
M83513/18-H02CU	MDA1100PBRTG2
M83513/18-H02CY	MDA1100PBRWG2
M83513/18-H02NN	MDA2100PBRBG2
M83513/18-H02NP	MDA2100PBRPG2
M83513/18-H02NU	MDA2100PBRTG2
M83513/18-H02NY	MDA2100PBRWG2
M83513/18-H02PN	MDAS100PBRBG2
M83513/18-H02PP	MDAS100PBRPG2
M83513/18-H02PU	MDAS100PBRTG2
M83513/18-H02PY	MDAS100PBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/18-H03CN	MDA1100PBRBG3
M83513/18-H03CP	MDA1100PBRPG3
M83513/18-H03CU	MDA1100PBRTG3
M83513/18-H03CY	MDA1100PBRWG3
M83513/18-H03NN	MDA2100PBRBG3
M83513/18-H03NP	MDA2100PBRPG3
M83513/18-H03NU	MDA2100PBRTG3
M83513/18-H03NY	MDA2100PBRWG3
M83513/18-H03PN	MDAS100PBRBG3
M83513/18-H03PP	MDAS100PBRPG3
M83513/18-H03PU	MDAS100PBRTG3
M83513/18-H03PY	MDAS100PBRWG3

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M83513/19

MIL STANDARD	AXON' EQUIVALENT
M83513/19-A01CN	MDA109SBRBG1
M83513/19-A01CP	MDA109SBRPG1
M83513/19-A01CT	MDA109SBRTG1
M83513/19-A01CW	MDA109SBRWG1
M83513/19-A01NN	MDA209SBRBG1
M83513/19-A01NP	MDA209SBRPG1
M83513/19-A01NT	MDA209SBRTG1
M83513/19-A01NW	MDA209SBRWG1
M83513/19-A01PN	MDAS09SBRBG1
M83513/19-A01PP	MDAS09SBRPG1
M83513/19-A01PT	MDAS09SBRTG1
M83513/19-A01PW	MDAS09SBRWG1
M83513/19-A02CN	MDA109SBRBG2
M83513/19-A02CP	MDA109SBRPG2
M83513/19-A02CT	MDA109SBRTG2
M83513/19-A02CW	MDA109SBRWG2
M83513/19-A02NN	MDA209SBRBG2
M83513/19-A02NP	MDA209SBRPG2
M83513/19-A02NT	MDA209SBRTG2
M83513/19-A02NW	MDA209SBRWG2
M83513/19-A02PN	MDAS09SBRBG2
M83513/19-A02PP	MDAS09SBRPG2
M83513/19-A02PT	MDAS09SBRTG2
M83513/19-A02PW	MDAS09SBRWG2
M83513/19-A03CN	MDA109SBRBG3
M83513/19-A03CP	MDA109SBRPG3
M83513/19-A03CT	MDA109SBRTG3
M83513/19-A03CW	MDA109SBRWG3
M83513/19-A03NN	MDA209SBRBG3
M83513/19-A03NP	MDA209SBRPG3
M83513/19-A03NT	MDA209SBRTG3
M83513/19-A03NW	MDA209SBRWG3
M83513/19-A03PN	MDAS09SBRBG3
M83513/19-A03PP	MDAS09SBRPG3
M83513/19-A03PT	MDAS09SBRTG3
M83513/19-A03PW	MDAS09SBRWG3
M83513/19-B01CN	MDA115SBRBG1
M83513/19-B01CP	MDA115SBRPG1
M83513/19-B01CT	MDA115SBRTG1
M83513/19-B01CW	MDA115SBRWG1
M83513/19-B01NN	MDA215SBRBG1
M83513/19-B01NP	MDA215SBRPG1
M83513/19-B01NT	MDA215SBRTG1
M83513/19-B01NW	MDA215SBRWG1
M83513/19-B01PN	MDAS15SBRBG1
M83513/19-B01PP	MDAS15SBRPG1
M83513/19-B01PT	MDAS15SBRTG1
M83513/19-B01PW	MDAS15SBRWG1
M83513/19-B02CN	MDA115SBRBG2
M83513/19-B02CP	MDA115SBRPG2
M83513/19-B02CT	MDA115SBRTG2
M83513/19-B02CW	MDA115SBRWG2
M83513/19-B02NN	MDA215SBRBG2
M83513/19-B02NP	MDA215SBRPG2
M83513/19-B02NT	MDA215SBRTG2
M83513/19-B02NW	MDA215SBRWG2
M83513/19-B02PN	MDAS15SBRBG2
M83513/19-B02PP	MDAS15SBRPG2
M83513/19-B02PT	MDAS15SBRTG2
M83513/19-B02PW	MDAS15SBRWG2
M83513/19-B03CN	MDA115SBRBG3
M83513/19-B03CP	MDA115SBRPG3
M83513/19-B03CT	MDA115SBRTG3
M83513/19-B03CW	MDA115SBRWG3
M83513/19-B03NN	MDA215SBRBG3
M83513/19-B03NP	MDA215SBRPG3
M83513/19-B03NT	MDA215SBRTG3
M83513/19-B03NW	MDA215SBRWG3
M83513/19-B03PN	MDAS15SBRBG3
M83513/19-B03PP	MDAS15SBRPG3
M83513/19-B03PT	MDAS15SBRTG3
M83513/19-B03PW	MDAS15SBRWG3
M83513/19-C01CN	MDA121SBRBG1
M83513/19-C01CP	MDA121SBRPG1
M83513/19-C01CT	MDA121SBRTG1
M83513/19-C01CW	MDA121SBRWG1
M83513/19-C01NN	MDA221SBRBG1
M83513/19-C01NP	MDA221SBRPG1
M83513/19-C01NT	MDA221SBRTG1
M83513/19-C01NW	MDA221SBRWG1
M83513/19-C01PN	MDAS21SBRBG1
M83513/19-C01PP	MDAS21SBRPG1
M83513/19-C01PT	MDAS21SBRTG1
M83513/19-C01PW	MDAS21SBRWG1
M83513/19-C02CN	MDA121SBRBG2
M83513/19-C02CP	MDA121SBRPG2
M83513/19-C02CT	MDA121SBRTG2
M83513/19-C02CW	MDA121SBRWG2
M83513/19-C02NN	MDA221SBRBG2
M83513/19-C02NP	MDA221SBRPG2
M83513/19-C02NT	MDA221SBRTG2
M83513/19-C02NW	MDA221SBRWG2
M83513/19-C02PN	MDAS21SBRBG2
M83513/19-C02PP	MDAS21SBRPG2
M83513/19-C02PT	MDAS21SBRTG2
M83513/19-C02PW	MDAS21SBRWG2
M83513/19-C03CN	MDA121SBRBG3
M83513/19-C03CP	MDA121SBRPG3
M83513/19-C03CT	MDA121SBRTG3
M83513/19-C03CW	MDA121SBRWG3
M83513/19-C03NN	MDA221SBRBG3
M83513/19-C03NP	MDA221SBRPG3
M83513/19-C03NT	MDA221SBRTG3
M83513/19-C03NW	MDA221SBRWG3
M83513/19-C03PN	MDAS21SBRBG3
M83513/19-C03PP	MDAS21SBRPG3
M83513/19-C03PT	MDAS21SBRTG3
M83513/19-C03PW	MDAS21SBRWG3
M83513/19-D01CN	MDA125SBRBG1
M83513/19-D01CP	MDA125SBRPG1
M83513/19-D01CT	MDA125SBRTG1
M83513/19-D01CW	MDA125SBRWG1
M83513/19-D01NN	MDA225SBRBG1
M83513/19-D01NP	MDA225SBRPG1
M83513/19-D01NT	MDA225SBRTG1
M83513/19-D01NW	MDA225SBRWG1
M83513/19-D01PN	MDAS25SBRBG1
M83513/19-D01PP	MDAS25SBRPG1
M83513/19-D01PT	MDAS25SBRTG1
M83513/19-D01PW	MDAS25SBRWG1
M83513/19-D02CN	MDA125SBRBG2
M83513/19-D02CP	MDA125SBRPG2
M83513/19-D02CT	MDA125SBRTG2
M83513/19-D02CW	MDA125SBRWG2
M83513/19-D02NN	MDA225SBRBG2
M83513/19-D02NP	MDA225SBRPG2
M83513/19-D02NT	MDA225SBRTG2
M83513/19-D02NW	MDA225SBRWG2
M83513/19-D02PN	MDAS25SBRBG2
M83513/19-D02PP	MDAS25SBRPG2
M83513/19-D02PT	MDAS25SBRTG2
M83513/19-D02PW	MDAS25SBRWG2
M83513/19-D03CN	MDA125SBRBG3
M83513/19-D03CP	MDA125SBRPG3
M83513/19-D03CT	MDA125SBRTG3
M83513/19-D03CW	MDA125SBRWG3
M83513/19-D03NN	MDA225SBRBG3
M83513/19-D03NP	MDA225SBRPG3
M83513/19-D03NT	MDA225SBRTG3
M83513/19-D03NW	MDA225SBRWG3
M83513/19-D03PN	MDAS25SBRBG3
M83513/19-D03PP	MDAS25SBRPG3
M83513/19-D03PT	MDAS25SBRTG3
M83513/19-D03PW	MDAS25SBRWG3
M83513/19-E01CN	MDA131SBRBG1
M83513/19-E01CP	MDA131SBRPG1
M83513/19-E01CT	MDA131SBRTG1
M83513/19-E01CW	MDA131SBRWG1
M83513/19-E01NN	MDA231SBRBG1
M83513/19-E01NP	MDA231SBRPG1
M83513/19-E01NT	MDA231SBRTG1
M83513/19-E01NW	MDA231SBRWG1
M83513/19-E01PN	MDAS31SBRBG1
M83513/19-E01PP	MDAS31SBRPG1
M83513/19-E01PT	MDAS31SBRTG1
M83513/19-E01PW	MDAS31SBRWG1
M83513/19-E02CN	MDA131SBRBG2
M83513/19-E02CP	MDA131SBRPG2
M83513/19-E02CT	MDA131SBRTG2
M83513/19-E02CW	MDA131SBRWG2
M83513/19-E02NN	MDA231SBRBG2
M83513/19-E02NP	MDA231SBRPG2
M83513/19-E02NT	MDA231SBRTG2
M83513/19-E02NW	MDA231SBRWG2
M83513/19-E02PN	MDAS31SBRBG2
M83513/19-E02PP	MDAS31SBRPG2
M83513/19-E02PT	MDAS31SBRTG2
M83513/19-E02PW	MDAS31SBRWG2
M83513/19-E03CN	MDA131SBRBG3
M83513/19-E03CP	MDA131SBRPG3
M83513/19-E03CT	MDA131SBRTG3

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M83513/19 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/19-E03CW	MDA131SBRWG3
M83513/19-E03NN	MDA231SBRBG3
M83513/19-E03NP	MDA231SBRPG3
M83513/19-E03NT	MDA231SBRTG3
M83513/19-E03NW	MDA231SBRWG3
M83513/19-E03PN	MDAS31SBRBG3
M83513/19-E03PP	MDAS31SBRPG3
M83513/19-E03PT	MDAS31SBRTG3
M83513/19-E03PW	MDAS31SBRWG3
M83513/19-F01CN	MDA137SBRBG1
M83513/19-F01CP	MDA137SBRPG1
M83513/19-F01CT	MDA137SBRTG1
M83513/19-F01CW	MDA137SBRWG1
M83513/19-F01NN	MDA237SBRBG1
M83513/19-F01NP	MDA237SBRPG1
M83513/19-F01NT	MDA237SBRTG1

MIL STANDARD	AXON' EQUIVALENT
M83513/19-F01NW	MDA237SBRWG1
M83513/19-F01PN	MDAS37SBRBG1
M83513/19-F01PP	MDAS37SBRPG1
M83513/19-F01PT	MDAS37SBRTG1
M83513/19-F01PW	MDAS37SBRWG1
M83513/19-F02CN	MDA137SBRBG2
M83513/19-F02CP	MDA137SBRPG2
M83513/19-F02CT	MDA137SBRTG2
M83513/19-F02CW	MDA137SBRWG2
M83513/19-F02NN	MDA237SBRBG2
M83513/19-F02NP	MDA237SBRPG2
M83513/19-F02NT	MDA237SBRTG2
M83513/19-F02NW	MDA237SBRWG2
M83513/19-F02PN	MDAS37SBRBG2
M83513/19-F02PP	MDAS37SBRPG2
M83513/19-F02PT	MDAS37SBRTG2

MIL STANDARD	AXON' EQUIVALENT
M83513/19-F02PW	MDAS37SBRWG2
M83513/19-F03CN	MDA137SBRBG3
M83513/19-F03CP	MDA137SBRPG3
M83513/19-F03CT	MDA137SBRTG3
M83513/19-F03CW	MDA137SBRWG3
M83513/19-F03NN	MDA237SBRBG3
M83513/19-F03NP	MDA237SBRPG3
M83513/19-F03NT	MDA237SBRTG3
M83513/19-F03NW	MDA237SBRWG3
M83513/19-F03PN	MDAS37SBRBG3
M83513/19-F03PP	MDAS37SBRPG3
M83513/19-F03PT	MDAS37SBRTG3
M83513/19-F03PW	MDAS37SBRWG3

M83513/20

MIL STANDARD	AXON' EQUIVALENT
M83513/20-G01CN	MDA151SBRBG1
M83513/20-G01CP	MDA151SBRPG1
M83513/20-G01CT	MDA151SBRTG1
M83513/20-G01CW	MDA151SBRWG1
M83513/20-G01NN	MDA251SBRBG1
M83513/20-G01NP	MDA251SBRPG1
M83513/20-G01NT	MDA251SBRTG1
M83513/20-G01NW	MDA251SBRWG1
M83513/20-G01PN	MDAS51SBRBG1
M83513/20-G01PP	MDAS51SBRPG1
M83513/20-G01PT	MDAS51SBRTG1
M83513/20-G01PW	MDAS51SBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/20-G02CN	MDA151SBRBG2
M83513/20-G02CP	MDA151SBRPG2
M83513/20-G02CT	MDA151SBRTG2
M83513/20-G02CW	MDA151SBRWG2
M83513/20-G02NN	MDA251SBRBG2
M83513/20-G02NP	MDA251SBRPG2
M83513/20-G02NT	MDA251SBRTG2
M83513/20-G02NW	MDA251SBRWG2
M83513/20-G02PN	MDAS51SBRBG2
M83513/20-G02PP	MDAS51SBRPG2
M83513/20-G02PT	MDAS51SBRTG2
M83513/20-G02PW	MDAS51SBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/20-G03CN	MDA151SBRBG3
M83513/20-G03CP	MDA151SBRPG3
M83513/20-G03CT	MDA151SBRTG3
M83513/20-G03CW	MDA151SBRWG3
M83513/20-G03NN	MDA251SBRBG3
M83513/20-G03NP	MDA251SBRPG3
M83513/20-G03NT	MDA251SBRTG3
M83513/20-G03NW	MDA251SBRWG3
M83513/20-G03PN	MDAS51SBRBG3
M83513/20-G03PP	MDAS51SBRPG3
M83513/20-G03PT	MDAS51SBRTG3
M83513/20-G03PW	MDAS51SBRWG3

M83513/21

MIL STANDARD	AXON' EQUIVALENT
M83513/21-H01CN	MDA1100SBRBG1
M83513/21-H01CP	MDA1100SBRPG1
M83513/21-H01CU	MDA1100SBRTG1
M83513/21-H01CY	MDA1100SBRWG1
M83513/21-H01NN	MDA2100SBRBG1
M83513/21-H01NP	MDA2100SBRPG1
M83513/21-H01NU	MDA2100SBRTG1
M83513/21-H01NY	MDA2100SBRWG1
M83513/21-H01PN	MDAS100SBRBG1
M83513/21-H01PP	MDAS100SBRPG1
M83513/21-H01PU	MDAS100SBRTG1
M83513/21-H01PY	MDAS100SBRWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/21-H02CN	MDA1100SBRBG2
M83513/21-H02CP	MDA1100SBRPG2
M83513/21-H02CU	MDA1100SBRTG2
M83513/21-H02CY	MDA1100SBRWG2
M83513/21-H02NN	MDA2100SBRBG2
M83513/21-H02NP	MDA2100SBRPG2
M83513/21-H02NU	MDA2100SBRTG2
M83513/21-H02NY	MDA2100SBRWG2
M83513/21-H02PN	MDAS100SBRBG2
M83513/21-H02PP	MDAS100SBRPG2
M83513/21-H02PU	MDAS100SBRTG2
M83513/21-H02PY	MDAS100SBRWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/21-H03CN	MDA1100SBRBG3
M83513/21-H03CP	MDA1100SBRPG3
M83513/21-H03CU	MDA1100SBRTG3
M83513/21-H03CY	MDA1100SBRWG3
M83513/21-H03NN	MDA2100SBRBG3
M83513/21-H03NP	MDA2100SBRPG3
M83513/21-H03NU	MDA2100SBRTG3
M83513/21-H03NY	MDA2100SBRWG3
M83513/21-H03PN	MDAS100SBRBG3
M83513/21-H03PP	MDAS100SBRPG3
M83513/21-H03PU	MDAS100SBRTG3
M83513/21-H03PY	MDAS100SBRWG3

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M83513/22

MIL STANDARD	AXON' EQUIVALENT
M83513/22-A01CN	MDA109PBSBG1
M83513/22-A01CP	MDA109PBSPG1
M83513/22-A01CT	MDA109PBSTG1
M83513/22-A01CW	MDA109PBSWG1
M83513/22-A01NN	MDA209PBSBG1
M83513/22-A01NP	MDA209PBSPG1
M83513/22-A01NT	MDA209PBSTG1
M83513/22-A01NW	MDA209PBSWG1
M83513/22-A01PN	MDAS09PBSBG1
M83513/22-A01PP	MDAS09PBSPG1
M83513/22-A01PT	MDAS09PBSTG1
M83513/22-A01PW	MDAS09PBSWG1
M83513/22-A02CN	MDA109PBSBG2
M83513/22-A02CP	MDA109PBSPG2
M83513/22-A02CT	MDA109PBSTG2
M83513/22-A02CW	MDA109PBSWG2
M83513/22-A02NN	MDA209PBSBG2
M83513/22-A02NP	MDA209PBSPG2
M83513/22-A02NT	MDA209PBSTG2
M83513/22-A02NW	MDA209PBSWG2
M83513/22-A02PN	MDAS09PBSBG2
M83513/22-A02PP	MDAS09PBSPG2
M83513/22-A02PT	MDAS09PBSTG2
M83513/22-A02PW	MDAS09PBSWG2
M83513/22-A03CN	MDA109PBSBG3
M83513/22-A03CP	MDA109PBSPG3
M83513/22-A03CT	MDA109PBSTG3
M83513/22-A03CW	MDA109PBSWG3
M83513/22-A03NN	MDA209PBSBG3
M83513/22-A03NP	MDA209PBSPG3
M83513/22-A03NT	MDA209PBSTG3
M83513/22-A03NW	MDA209PBSWG3
M83513/22-A03PN	MDAS09PBSBG3
M83513/22-A03PP	MDAS09PBSPG3
M83513/22-A03PT	MDAS09PBSTG3
M83513/22-A03PW	MDAS09PBSWG3
M83513/22-B01CN	MDA115PBSBG1
M83513/22-B01CP	MDA115PBSPG1
M83513/22-B01CT	MDA115PBSTG1
M83513/22-B01CW	MDA115PBSWG1
M83513/22-B01NN	MDA215PBSBG1
M83513/22-B01NP	MDA215PBSPG1
M83513/22-B01NT	MDA215PBSTG1
M83513/22-B01NW	MDA215PBSWG1
M83513/22-B01PN	MDAS15PBSBG1
M83513/22-B01PP	MDAS15PBSPG1
M83513/22-B01PT	MDAS15PBSTG1
M83513/22-B01PW	MDAS15PBSWG1
M83513/22-B02CN	MDA115PBSBG2
M83513/22-B02CP	MDA115PBSPG2
M83513/22-B02CT	MDA115PBSTG2
M83513/22-B02CW	MDA115PBSWG2
M83513/22-B02NN	MDA215PBSBG2
M83513/22-B02NP	MDA215PBSPG2
M83513/22-B02NT	MDA215PBSTG2
M83513/22-B02NW	MDA215PBSWG2
M83513/22-B02PN	MDAS15PBSBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/22-B02PP	MDAS15PBSPG2
M83513/22-B02PT	MDAS15PBSTG2
M83513/22-B02PW	MDAS15PBSWG2
M83513/22-B03CN	MDA115PBSBG3
M83513/22-B03CP	MDA115PBSPG3
M83513/22-B03CT	MDA115PBSTG3
M83513/22-B03CW	MDA115PBSWG3
M83513/22-B03NN	MDA215PBSBG3
M83513/22-B03NP	MDA215PBSPG3
M83513/22-B03NT	MDA215PBSTG3
M83513/22-B03NW	MDA215PBSWG3
M83513/22-B03PN	MDAS15PBSBG3
M83513/22-B03PP	MDAS15PBSPG3
M83513/22-B03PT	MDAS15PBSTG3
M83513/22-B03PW	MDAS15PBSWG3
M83513/22-C01CN	MDA121PBSBG1
M83513/22-C01CP	MDA121PBSPG1
M83513/22-C01CT	MDA121PBSTG1
M83513/22-C01CW	MDA121PBSWG1
M83513/22-C01NN	MDA221PBSBG1
M83513/22-C01NP	MDA221PBSPG1
M83513/22-C01NT	MDA221PBSTG1
M83513/22-C01NW	MDA221PBSWG1
M83513/22-C01PN	MDAS21PBSBG1
M83513/22-C01PP	MDAS21PBSPG1
M83513/22-C01PT	MDAS21PBSTG1
M83513/22-C01PW	MDAS21PBSWG1
M83513/22-C02CN	MDA121PBSBG2
M83513/22-C02CP	MDA121PBSPG2
M83513/22-C02CT	MDA121PBSTG2
M83513/22-C02CW	MDA121PBSWG2
M83513/22-C02NN	MDA221PBSBG2
M83513/22-C02NP	MDA221PBSPG2
M83513/22-C02NT	MDA221PBSTG2
M83513/22-C02NW	MDA221PBSWG2
M83513/22-C02PN	MDAS21PBSBG2
M83513/22-C02PP	MDAS21PBSPG2
M83513/22-C02PT	MDAS21PBSTG2
M83513/22-C02PW	MDAS21PBSWG2
M83513/22-C03CN	MDA121PBSBG3
M83513/22-C03CP	MDA121PBSPG3
M83513/22-C03CT	MDA121PBSTG3
M83513/22-C03CW	MDA121PBSWG3
M83513/22-C03NN	MDA221PBSBG3
M83513/22-C03NP	MDA221PBSPG3
M83513/22-C03NT	MDA221PBSTG3
M83513/22-C03NW	MDA221PBSWG3
M83513/22-C03PN	MDAS21PBSBG3
M83513/22-C03PP	MDAS21PBSPG3
M83513/22-C03PT	MDAS21PBSTG3
M83513/22-C03PW	MDAS21PBSWG3
M83513/22-D01CN	MDA125PBSBG1
M83513/22-D01CP	MDA125PBSPG1
M83513/22-D01CT	MDA125PBSTG1
M83513/22-D01CW	MDA125PBSWG1
M83513/22-D01NN	MDA225PBSBG1
M83513/22-D01NP	MDA225PBSPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/22-D01NT	MDA225PBSTG1
M83513/22-D01NW	MDA225PBSWG1
M83513/22-D01PN	MDAS25PBSBG1
M83513/22-D01PP	MDAS25PBSPG1
M83513/22-D01PT	MDAS25PBSTG1
M83513/22-D01PW	MDAS25PBSWG1
M83513/22-D02CN	MDA125PBSBG2
M83513/22-D02CP	MDA125PBSPG2
M83513/22-D02CT	MDA125PBSTG2
M83513/22-D02CW	MDA125PBSWG2
M83513/22-D02NN	MDA225PBSBG2
M83513/22-D02NP	MDA225PBSPG2
M83513/22-D02NT	MDA225PBSTG2
M83513/22-D02NW	MDA225PBSWG2
M83513/22-D02PN	MDAS25PBSBG2
M83513/22-D02PP	MDAS25PBSPG2
M83513/22-D02PT	MDAS25PBSTG2
M83513/22-D02PW	MDAS25PBSWG2
M83513/22-D03CN	MDA125PBSBG3
M83513/22-D03CP	MDA125PBSPG3
M83513/22-D03CT	MDA125PBSTG3
M83513/22-D03CW	MDA125PBSWG3
M83513/22-D03NN	MDA225PBSBG3
M83513/22-D03NP	MDA225PBSPG3
M83513/22-D03NT	MDA225PBSTG3
M83513/22-D03NW	MDA225PBSWG3
M83513/22-D03PN	MDAS25PBSBG3
M83513/22-D03PP	MDAS25PBSPG3
M83513/22-D03PT	MDAS25PBSTG3
M83513/22-D03PW	MDAS25PBSWG3
M83513/22-E01CN	MDA131PBSBG1
M83513/22-E01CP	MDA131PBSPG1
M83513/22-E01CT	MDA131PBSTG1
M83513/22-E01CW	MDA131PBSWG1
M83513/22-E01NN	MDA231PBSBG1
M83513/22-E01NP	MDA231PBSPG1
M83513/22-E01NT	MDA231PBSTG1
M83513/22-E01NW	MDA231PBSWG1
M83513/22-E01PN	MDAS31PBSBG1
M83513/22-E01PP	MDAS31PBSPG1
M83513/22-E01PT	MDAS31PBSTG1
M83513/22-E01PW	MDAS31PBSWG1
M83513/22-E02CN	MDA131PBSBG2
M83513/22-E02CP	MDA131PBSPG2
M83513/22-E02CT	MDA131PBSTG2
M83513/22-E02CW	MDA131PBSWG2
M83513/22-E02NN	MDA231PBSBG2
M83513/22-E02NP	MDA231PBSPG2
M83513/22-E02NT	MDA231PBSTG2
M83513/22-E02NW	MDA231PBSWG2
M83513/22-E02PN	MDAS31PBSBG2
M83513/22-E02PP	MDAS31PBSPG2
M83513/22-E02PT	MDAS31PBSTG2
M83513/22-E02PW	MDAS31PBSWG2
M83513/22-E03CN	MDA131PBSBG3
M83513/22-E03CP	MDA131PBSPG3
M83513/22-E03CT	MDA131PBSTG3

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M83513/22 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/22-E03CW	MDA131PBSWG3
M83513/22-E03NN	MDA231PBSBG3
M83513/22-E03NP	MDA231PBSPG3
M83513/22-E03NT	MDA231PBSTG3
M83513/22-E03NW	MDA231PBSWG3
M83513/22-E03PN	MDAS31PBSBG3
M83513/22-E03PP	MDAS31PBSPG3
M83513/22-E03PT	MDAS31PBSTG3
M83513/22-E03PW	MDAS31PBSWG3
M83513/22-F01CN	MDA137PBSBG1
M83513/22-F01CP	MDA137PBSPG1
M83513/22-F01CT	MDA137PBSTG1
M83513/22-F01CW	MDA137PBSWG1
M83513/22-F01NN	MDA237PBSBG1
M83513/22-F01NP	MDA237PBSPG1
M83513/22-F01NT	MDA237PBSTG1

MIL STANDARD	AXON' EQUIVALENT
M83513/22-F01NW	MDA237PBSWG1
M83513/22-F01PN	MDAS37PBSBG1
M83513/22-F01PP	MDAS37PBSPG1
M83513/22-F01PT	MDAS37PBSTG1
M83513/22-F01PW	MDAS37PBSWG1
M83513/22-F02CN	MDA137PBSBG2
M83513/22-F02CP	MDA137PBSPG2
M83513/22-F02CT	MDA137PBSTG2
M83513/22-F02CW	MDA137PBSWG2
M83513/22-F02NN	MDA237PBSBG2
M83513/22-F02NP	MDA237PBSPG2
M83513/22-F02NT	MDA237PBSTG2
M83513/22-F02NW	MDA237PBSWG2
M83513/22-F02PN	MDAS37PBSBG2
M83513/22-F02PP	MDAS37PBSPG2
M83513/22-F02PT	MDAS37PBSTG2

MIL STANDARD	AXON' EQUIVALENT
M83513/22-F02PW	MDAS37PBSWG2
M83513/22-F03CN	MDA137PBSBG3
M83513/22-F03CP	MDA137PBSPG3
M83513/22-F03CT	MDA137PBSTG3
M83513/22-F03CW	MDA137PBSWG3
M83513/22-F03NN	MDA237PBSBG3
M83513/22-F03NP	MDA237PBSPG3
M83513/22-F03NT	MDA237PBSTG3
M83513/22-F03NW	MDA237PBSWG3
M83513/22-F03PN	MDAS37PBSBG3
M83513/22-F03PP	MDAS37PBSPG3
M83513/22-F03PT	MDAS37PBSTG3
M83513/22-F03PW	MDAS37PBSWG3

M83513/23

MIL STANDARD	AXON' EQUIVALENT
M83513/23-G01CN	MDA151PBSBG1
M83513/23-G01CP	MDA151PBSPG1
M83513/23-G01CT	MDA151PBSTG1
M83513/23-G01CW	MDA151PBSWG1
M83513/23-G01NN	MDA251PBSBG1
M83513/23-G01NP	MDA251PBSPG1
M83513/23-G01NT	MDA251PBSTG1
M83513/23-G01NW	MDA251PBSWG1
M83513/23-G01PN	MDAS51PBSBG1
M83513/23-G01PP	MDAS51PBSPG1
M83513/23-G01PT	MDAS51PBSTG1
M83513/23-G01PW	MDAS51PBSWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/23-G02CN	MDA151PBSBG2
M83513/23-G02CP	MDA151PBSPG2
M83513/23-G02CT	MDA151PBSTG2
M83513/23-G02CW	MDA151PBSWG2
M83513/23-G02NN	MDA251PBSBG2
M83513/23-G02NP	MDA251PBSPG2
M83513/23-G02NT	MDA251PBSTG2
M83513/23-G02NW	MDA251PBSWG2
M83513/23-G02PN	MDAS51PBSBG2
M83513/23-G02PP	MDAS51PBSPG2
M83513/23-G02PT	MDAS51PBSTG2
M83513/23-G02PW	MDAS51PBSWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/23-G03CN	MDA151PBSBG3
M83513/23-G03CP	MDA151PBSPG3
M83513/23-G03CT	MDA151PBSTG3
M83513/23-G03CW	MDA151PBSWG3
M83513/23-G03NN	MDA251PBSBG3
M83513/23-G03NP	MDA251PBSPG3
M83513/23-G03NT	MDA251PBSTG3
M83513/23-G03NW	MDA251PBSWG3
M83513/23-G03PN	MDAS51PBSBG3
M83513/23-G03PP	MDAS51PBSPG3
M83513/23-G03PT	MDAS51PBSTG3
M83513/23-G03PW	MDAS51PBSWG3

M83513/24

MIL STANDARD	AXON' EQUIVALENT
M83513/24-H01CN	MDA1100PBSBG1
M83513/24-H01CP	MDA1100PBSPG1
M83513/24-H01CU	MDA1100PBSTG1
M83513/24-H01CY	MDA1100PBSWG1
M83513/24-H01NN	MDA2100PBSBG1
M83513/24-H01NP	MDA2100PBSPG1
M83513/24-H01NU	MDA2100PBSTG1
M83513/24-H01NY	MDA2100PBSWG1
M83513/24-H01PN	MDAS100PBSBG1
M83513/24-H01PP	MDAS100PBSPG1
M83513/24-H01PU	MDAS100PBSTG1
M83513/24-H01PY	MDAS100PBSWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/24-H02CN	MDA1100PBSBG2
M83513/24-H02CP	MDA1100PBSPG2
M83513/24-H02CU	MDA1100PBSTG2
M83513/24-H02CY	MDA1100PBSWG2
M83513/24-H02NN	MDA2100PBSBG2
M83513/24-H02NP	MDA2100PBSPG2
M83513/24-H02NU	MDA2100PBSTG2
M83513/24-H02NY	MDA2100PBSWG2
M83513/24-H02PN	MDAS100PBSBG2
M83513/24-H02PP	MDAS100PBSPG2
M83513/24-H02PU	MDAS100PBSTG2
M83513/24-H02PY	MDAS100PBSWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/24-H03CN	MDA1100PBSBG3
M83513/24-H03CP	MDA1100PBSPG3
M83513/24-H03CU	MDA1100PBSTG3
M83513/24-H03CY	MDA1100PBSWG3
M83513/24-H03NN	MDA2100PBSBG3
M83513/24-H03NP	MDA2100PBSPG3
M83513/24-H03NU	MDA2100PBSTG3
M83513/24-H03NY	MDA2100PBSWG3
M83513/24-H03PN	MDAS100PBSBG3
M83513/24-H03PP	MDAS100PBSPG3
M83513/24-H03PU	MDAS100PBSTG3
M83513/24-H03PY	MDAS100PBSWG3

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M83513/25

MIL STANDARD	AXON' EQUIVALENT
M83513/25-A01CN	MDA109SBSBG1
M83513/25-A01CP	MDA109SBSPG1
M83513/25-A01CT	MDA109SBSTG1
M83513/25-A01CW	MDA109SBSWG1
M83513/25-A01NN	MDA209SBSBG1
M83513/25-A01NP	MDA209SBSPG1
M83513/25-A01NT	MDA209SBSTG1
M83513/25-A01NW	MDA209SBSWG1
M83513/25-A01PN	MDAS09SBSBG1
M83513/25-A01PP	MDAS09SBSPG1
M83513/25-A01PT	MDAS09SBSTG1
M83513/25-A01PW	MDAS09SBSWG1
M83513/25-A02CN	MDA109SBSBG2
M83513/25-A02CP	MDA109SBSPG2
M83513/25-A02CT	MDA109SBSTG2
M83513/25-A02CW	MDA109SBSWG2
M83513/25-A02NN	MDA209SBSBG2
M83513/25-A02NP	MDA209SBSPG2
M83513/25-A02NT	MDA209SBSTG2
M83513/25-A02NW	MDA209SBSWG2
M83513/25-A02PN	MDAS09SBSBG2
M83513/25-A02PP	MDAS09SBSPG2
M83513/25-A02PT	MDAS09SBSTG2
M83513/25-A02PW	MDAS09SBSWG2
M83513/25-A03CN	MDA109SBSBG3
M83513/25-A03CP	MDA109SBSPG3
M83513/25-A03CT	MDA109SBSTG3
M83513/25-A03CW	MDA109SBSWG3
M83513/25-A03NN	MDA209SBSBG3
M83513/25-A03NP	MDA209SBSPG3
M83513/25-A03NT	MDA209SBSTG3
M83513/25-A03NW	MDA209SBSWG3
M83513/25-A03PN	MDAS09SBSBG3
M83513/25-A03PP	MDAS09SBSPG3
M83513/25-A03PT	MDAS09SBSTG3
M83513/25-A03PW	MDAS09SBSWG3
M83513/25-B01CN	MDA115SBSBG1
M83513/25-B01CP	MDA115SBSPG1
M83513/25-B01CT	MDA115SBSTG1
M83513/25-B01CW	MDA115SBSWG1
M83513/25-B01NN	MDA215SBSBG1
M83513/25-B01NP	MDA215SBSPG1
M83513/25-B01NT	MDA215SBSTG1
M83513/25-B01NW	MDA215SBSWG1
M83513/25-B01PN	MDAS15SBSBG1
M83513/25-B01PP	MDAS15SBSPG1
M83513/25-B01PT	MDAS15SBSTG1
M83513/25-B01PW	MDAS15SBSWG1
M83513/25-B02CN	MDA115SBSBG2
M83513/25-B02CP	MDA115SBSPG2
M83513/25-B02CT	MDA115SBSTG2
M83513/25-B02CW	MDA115SBSWG2
M83513/25-B02NN	MDA215SBSBG2
M83513/25-B02NP	MDA215SBSPG2
M83513/25-B02NT	MDA215SBSTG2
M83513/25-B02NW	MDA215SBSWG2
M83513/25-B02PN	MDAS15SBSBG2
M83513/25-B02PP	MDAS15SBSPG2
M83513/25-B02PT	MDAS15SBSTG2
M83513/25-B02PW	MDAS15SBSWG2
M83513/25-B03CN	MDA115SBSBG3
M83513/25-B03CP	MDA115SBSPG3
M83513/25-B03CT	MDA115SBSTG3
M83513/25-B03CW	MDA115SBSWG3
M83513/25-B03NN	MDA215SBSBG3
M83513/25-B03NP	MDA215SBSPG3
M83513/25-B03NT	MDA215SBSTG3
M83513/25-B03NW	MDA215SBSWG3
M83513/25-B03PN	MDAS15SBSBG3
M83513/25-B03PP	MDAS15SBSPG3
M83513/25-B03PT	MDAS15SBSTG3
M83513/25-B03PW	MDAS15SBSWG3
M83513/25-C01CN	MDA121SBSBG1
M83513/25-C01CP	MDA121SBSPG1
M83513/25-C01CT	MDA121SBSTG1
M83513/25-C01CW	MDA121SBSWG1
M83513/25-C01NN	MDA221SBSBG1
M83513/25-C01NP	MDA221SBSPG1
M83513/25-C01NT	MDA221SBSTG1
M83513/25-C01NW	MDA221SBSWG1
M83513/25-C01PN	MDAS21SBSBG1
M83513/25-C01PP	MDAS21SBSPG1
M83513/25-C01PT	MDAS21SBSTG1
M83513/25-C01PW	MDAS21SBSWG1
M83513/25-C02CN	MDA121SBSBG2
M83513/25-C02CP	MDA121SBSPG2
M83513/25-C02CT	MDA121SBSTG2
M83513/25-C02CW	MDA121SBSWG2
M83513/25-C02NN	MDA221SBSBG2
M83513/25-C02NP	MDA221SBSPG2
M83513/25-C02NT	MDA221SBSTG2
M83513/25-C02NW	MDA221SBSWG2
M83513/25-C02PN	MDAS21SBSBG2
M83513/25-C02PP	MDAS21SBSPG2
M83513/25-C02PT	MDAS21SBSTG2
M83513/25-C02PW	MDAS21SBSWG2
M83513/25-C03CN	MDA121SBSBG3
M83513/25-C03CP	MDA121SBSPG3
M83513/25-C03CT	MDA121SBSTG3
M83513/25-C03CW	MDA121SBSWG3
M83513/25-C03NN	MDA221SBSBG3
M83513/25-C03NP	MDA221SBSPG3
M83513/25-C03NT	MDA221SBSTG3
M83513/25-C03NW	MDA221SBSWG3
M83513/25-C03PN	MDAS21SBSBG3
M83513/25-C03PP	MDAS21SBSPG3
M83513/25-C03PT	MDAS21SBSTG3
M83513/25-C03PW	MDAS21SBSWG3
M83513/25-D01CN	MDA125SBSBG1
M83513/25-D01CP	MDA125SBSPG1
M83513/25-D01CT	MDA125SBSTG1
M83513/25-D01CW	MDA125SBSWG1
M83513/25-D01NN	MDA225SBSBG1
M83513/25-D01NP	MDA225SBSPG1
M83513/25-D01NT	MDA225SBSTG1
M83513/25-D01NW	MDA225SBSWG1
M83513/25-D01PN	MDAS25SBSBG1
M83513/25-D01PP	MDAS25SBSPG1
M83513/25-D01PT	MDAS25SBSTG1
M83513/25-D01PW	MDAS25SBSWG1
M83513/25-D02CN	MDA125SBSBG2
M83513/25-D02CP	MDA125SBSPG2
M83513/25-D02CT	MDA125SBSTG2
M83513/25-D02CW	MDA125SBSWG2
M83513/25-D02NN	MDA225SBSBG2
M83513/25-D02NP	MDA225SBSPG2
M83513/25-D02NT	MDA225SBSTG2
M83513/25-D02NW	MDA225SBSWG2
M83513/25-D02PN	MDAS25SBSBG2
M83513/25-D02PP	MDAS25SBSPG2
M83513/25-D02PT	MDAS25SBSTG2
M83513/25-D02PW	MDAS25SBSWG2
M83513/25-D03CN	MDA125SBSBG3
M83513/25-D03CP	MDA125SBSPG3
M83513/25-D03CT	MDA125SBSTG3
M83513/25-D03CW	MDA125SBSWG3
M83513/25-D03NN	MDA225SBSBG3
M83513/25-D03NP	MDA225SBSPG3
M83513/25-D03NT	MDA225SBSTG3
M83513/25-D03NW	MDA225SBSWG3
M83513/25-D03PN	MDAS25SBSBG3
M83513/25-D03PP	MDAS25SBSPG3
M83513/25-D03PT	MDAS25SBSTG3
M83513/25-D03PW	MDAS25SBSWG3
M83513/25-E01CN	MDA131SBSBG1
M83513/25-E01CP	MDA131SBSPG1
M83513/25-E01CT	MDA131SBSTG1
M83513/25-E01CW	MDA131SBSWG1
M83513/25-E01NN	MDA231SBSBG1
M83513/25-E01NP	MDA231SBSPG1
M83513/25-E01NT	MDA231SBSTG1
M83513/25-E01NW	MDA231SBSWG1
M83513/25-E01PN	MDAS31SBSBG1
M83513/25-E01PP	MDAS31SBSPG1
M83513/25-E01PT	MDAS31SBSTG1
M83513/25-E01PW	MDAS31SBSWG1
M83513/25-E02CN	MDA131SBSBG2
M83513/25-E02CP	MDA131SBSPG2
M83513/25-E02CT	MDA131SBSTG2
M83513/25-E02CW	MDA131SBSWG2
M83513/25-E02NN	MDA231SBSBG2
M83513/25-E02NP	MDA231SBSPG2
M83513/25-E02NT	MDA231SBSTG2
M83513/25-E02NW	MDA231SBSWG2
M83513/25-E02PN	MDAS31SBSBG2
M83513/25-E02PP	MDAS31SBSPG2
M83513/25-E02PT	MDAS31SBSTG2
M83513/25-E02PW	MDAS31SBSWG2
M83513/25-E03CN	MDA131SBSBG3
M83513/25-E03CP	MDA131SBSPG3
M83513/25-E03CT	MDA131SBSTG3

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M83513/25 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/25-E03CW	MDA131SBSWG3
M83513/25-E03NN	MDA231SBSBG3
M83513/25-E03NP	MDA231SBSPG3
M83513/25-E03NT	MDA231SBSTG3
M83513/25-E03NW	MDA231SBSWG3
M83513/25-E03PN	MDAS31SBSBG3
M83513/25-E03PP	MDAS31SBSPG3
M83513/25-E03PT	MDAS31SBSTG3
M83513/25-E03PW	MDAS31SBSWG3
M83513/25-F01CN	MDA137SBSBG1
M83513/25-F01CP	MDA137SBSPG1
M83513/25-F01CT	MDA137SBSTG1
M83513/25-F01CW	MDA137SBSWG1
M83513/25-F01NN	MDA237SBSBG1
M83513/25-F01NP	MDA237SBSPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/25-F01NT	MDA237SBSTG1
M83513/25-F01NW	MDA237SBSWG1
M83513/25-F01PN	MDAS37SBSBG1
M83513/25-F01PP	MDAS37SBSPG1
M83513/25-F01PT	MDAS37SBSTG1
M83513/25-F01PW	MDAS37SBSWG1
M83513/25-F02CN	MDA137SBSBG2
M83513/25-F02CP	MDA137SBSPG2
M83513/25-F02CT	MDA137SBSTG2
M83513/25-F02CW	MDA137SBSWG2
M83513/25-F02NN	MDA237SBSBG2
M83513/25-F02NP	MDA237SBSPG2
M83513/25-F02NT	MDA237SBSTG2
M83513/25-F02NW	MDA237SBSWG2
M83513/25-F02PN	MDAS37SBSBG2

MIL STANDARD	AXON' EQUIVALENT
M83513/25-F02PP	MDAS37SBSPG2
M83513/25-F02PT	MDAS37SBSTG2
M83513/25-F02PW	MDAS37SBSWG2
M83513/25-F03CN	MDA137SBSBG3
M83513/25-F03CP	MDA137SBSPG3
M83513/25-F03CT	MDA137SBSTG3
M83513/25-F03CW	MDA137SBSWG3
M83513/25-F03NN	MDA237SBSBG3
M83513/25-F03NP	MDA237SBSPG3
M83513/25-F03NT	MDA237SBSTG3
M83513/25-F03NW	MDA237SBSWG3
M83513/25-F03PN	MDAS37SBSBG3
M83513/25-F03PP	MDAS37SBSPG3
M83513/25-F03PT	MDAS37SBSTG3
M83513/25-F03PW	MDAS37SBSWG3

M83513/26

MIL STANDARD	AXON' EQUIVALENT
M83513/26-G01CN	MDA151SBSBG1
M83513/26-G01CP	MDA151SBSPG1
M83513/26-G01CT	MDA151SBSTG1
M83513/26-G01CW	MDA151SBSWG1
M83513/26-G01NN	MDA251SBSBG1
M83513/26-G01NP	MDA251SBSPG1
M83513/26-G01NT	MDA251SBSTG1
M83513/26-G01NW	MDA251SBSWG1
M83513/26-G01PN	MDAS51SBSBG1
M83513/26-G01PP	MDAS51SBSPG1
M83513/26-G01PT	MDAS51SBSTG1
M83513/26-G01PW	MDAS51SBSWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/26-G02CN	MDA151SBSBG2
M83513/26-G02CP	MDA151SBSPG2
M83513/26-G02CT	MDA151SBSTG2
M83513/26-G02CW	MDA151SBSWG2
M83513/26-G02NN	MDA251SBSBG2
M83513/26-G02NP	MDA251SBSPG2
M83513/26-G02NT	MDA251SBSTG2
M83513/26-G02NW	MDA251SBSWG2
M83513/26-G02PN	MDAS51SBSBG2
M83513/26-G02PP	MDAS51SBSPG2
M83513/26-G02PT	MDAS51SBSTG2
M83513/26-G02PW	MDAS51SBSWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/26-G03CN	MDA151SBSBG3
M83513/26-G03CP	MDA151SBSPG3
M83513/26-G03CT	MDA151SBSTG3
M83513/26-G03CW	MDA151SBSWG3
M83513/26-G03NN	MDA251SBSBG3
M83513/26-G03NP	MDA251SBSPG3
M83513/26-G03NT	MDA251SBSTG3
M83513/26-G03NW	MDA251SBSWG3
M83513/26-G03PN	MDAS51SBSBG3
M83513/26-G03PP	MDAS51SBSPG3
M83513/26-G03PT	MDAS51SBSTG3
M83513/26-G03PW	MDAS51SBSWG3

M83513/27

MIL STANDARD	AXON' EQUIVALENT
M83513/27-H01CN	MDA1100SBSBG1
M83513/27-H01CP	MDA1100SBSPG1
M83513/27-H01CU	MDA1100SBSTG1
M83513/27-H01CY	MDA1100SBSWG1
M83513/27-H01NN	MDA2100SBSBG1
M83513/27-H01NP	MDA2100SBSPG1
M83513/27-H01NU	MDA2100SBSTG1
M83513/27-H01NY	MDA2100SBSWG1
M83513/27-H01PN	MDAS100SBSBG1
M83513/27-H01PP	MDAS100SBSPG1
M83513/27-H01PU	MDAS100SBSTG1
M83513/27-H01PY	MDAS100SBSWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/27-H02CN	MDA1100SBSBG2
M83513/27-H02CP	MDA1100SBSPG2
M83513/27-H02CU	MDA1100SBSTG2
M83513/27-H02CY	MDA1100SBSWG2
M83513/27-H02NN	MDA2100SBSBG2
M83513/27-H02NP	MDA2100SBSPG2
M83513/27-H02NU	MDA2100SBSTG2
M83513/27-H02NY	MDA2100SBSWG2
M83513/27-H02PN	MDAS100SBSBG2
M83513/27-H02PP	MDAS100SBSPG2
M83513/27-H02PU	MDAS100SBSTG2
M83513/27-H02PY	MDAS100SBSWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/27-H03CN	MDA1100SBSBG3
M83513/27-H03CP	MDA1100SBSPG3
M83513/27-H03CU	MDA1100SBSTG3
M83513/27-H03CY	MDA1100SBSWG3
M83513/27-H03NN	MDA2100SBSBG3
M83513/27-H03NP	MDA2100SBSPG3
M83513/27-H03NU	MDA2100SBSTG3
M83513/27-H03NY	MDA2100SBSWG3
M83513/27-H03PN	MDAS100SBSBG3
M83513/27-H03PP	MDAS100SBSPG3
M83513/27-H03PU	MDAS100SBSTG3
M83513/27-H03PY	MDAS100SBSWG3

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M83513/28

MIL STANDARD	AXON' EQUIVALENT
M83513/28-A01CN	MDA109P75SABG1
M83513/28-A01CP	MDA109P75SAPG1
M83513/28-A01CT	MDA109P75SATG1
M83513/28-A01CW	MDA109P75SAWG1
M83513/28-A01NN	MDA209P75SABG1
M83513/28-A01NP	MDA209P75SAPG1
M83513/28-A01NT	MDA209P75SATG1
M83513/28-A01NW	MDA209P75SAWG1
M83513/28-A01PN	MDAS09P75SABG1
M83513/28-A01PP	MDAS09P75SAPG1
M83513/28-A01PT	MDAS09P75SATG1
M83513/28-A01PW	MDAS09P75SAWG1
M83513/28-A02CN	MDA109P75SABG2
M83513/28-A02CP	MDA109P75SAPG2
M83513/28-A02CT	MDA109P75SATG2
M83513/28-A02CW	MDA109P75SAWG2
M83513/28-A02NN	MDA209P75SABG2
M83513/28-A02NP	MDA209P75SAPG2
M83513/28-A02NT	MDA209P75SATG2
M83513/28-A02NW	MDA209P75SAWG2
M83513/28-A02PN	MDAS09P75SABG2
M83513/28-A02PP	MDAS09P75SAPG2
M83513/28-A02PT	MDAS09P75SATG2
M83513/28-A02PW	MDAS09P75SAWG2
M83513/28-A03CN	MDA109P75SABG3
M83513/28-A03CP	MDA109P75SAPG3
M83513/28-A03CT	MDA109P75SATG3
M83513/28-A03CW	MDA109P75SAWG3
M83513/28-A03NN	MDA209P75SABG3
M83513/28-A03NP	MDA209P75SAPG3
M83513/28-A03NT	MDA209P75SATG3
M83513/28-A03NW	MDA209P75SAWG3
M83513/28-A03PN	MDAS09P75SABG3
M83513/28-A03PP	MDAS09P75SAPG3
M83513/28-A03PT	MDAS09P75SATG3
M83513/28-A03PW	MDAS09P75SAWG3
M83513/28-B01CN	MDA115P75SABG1
M83513/28-B01CP	MDA115P75SAPG1
M83513/28-B01CT	MDA115P75SATG1
M83513/28-B01CW	MDA115P75SAWG1
M83513/28-B01NN	MDA215P75SABG1
M83513/28-B01NP	MDA215P75SAPG1
M83513/28-B01NT	MDA215P75SATG1
M83513/28-B01NW	MDA215P75SAWG1
M83513/28-B01PN	MDAS15P75SABG1
M83513/28-B01PP	MDAS15P75SAPG1
M83513/28-B01PT	MDAS15P75SATG1
M83513/28-B01PW	MDAS15P75SAWG1
M83513/28-B02CN	MDA115P75SABG2
M83513/28-B02CP	MDA115P75SAPG2
M83513/28-B02CT	MDA115P75SATG2
M83513/28-B02CW	MDA115P75SAWG2
M83513/28-B02NN	MDA215P75SABG2
M83513/28-B02NP	MDA215P75SAPG2
M83513/28-B02NT	MDA215P75SATG2
M83513/28-B02NW	MDA215P75SAWG2
M83513/28-B02PN	MDAS15P75SABG2

MIL STANDARD	AXON' EQUIVALENT
M83513/28-B02PP	MDAS15P75SAPG2
M83513/28-B02PT	MDAS15P75SATG2
M83513/28-B02PW	MDAS15P75SAWG2
M83513/28-B03CN	MDA115P75SABG3
M83513/28-B03CP	MDA115P75SAPG3
M83513/28-B03CT	MDA115P75SATG3
M83513/28-B03CW	MDA115P75SAWG3
M83513/28-B03NN	MDA215P75SABG3
M83513/28-B03NP	MDA215P75SAPG3
M83513/28-B03NT	MDA215P75SATG3
M83513/28-B03NW	MDA215P75SAWG3
M83513/28-B03PN	MDAS15P75SABG3
M83513/28-B03PP	MDAS15P75SAPG3
M83513/28-B03PT	MDAS15P75SATG3
M83513/28-B03PW	MDAS15P75SAWG3
M83513/28-C01CN	MDA121P75SABG1
M83513/28-C01CP	MDA121P75SAPG1
M83513/28-C01CT	MDA121P75SATG1
M83513/28-C01CW	MDA121P75SAWG1
M83513/28-C01NN	MDA221P75SABG1
M83513/28-C01NP	MDA221P75SAPG1
M83513/28-C01NT	MDA221P75SATG1
M83513/28-C01NW	MDA221P75SAWG1
M83513/28-C01PN	MDAS21P75SABG1
M83513/28-C01PP	MDAS21P75SAPG1
M83513/28-C01PT	MDAS21P75SATG1
M83513/28-C01PW	MDAS21P75SAWG1
M83513/28-C02CN	MDA121P75SABG2
M83513/28-C02CP	MDA121P75SAPG2
M83513/28-C02CT	MDA121P75SATG2
M83513/28-C02CW	MDA121P75SAWG2
M83513/28-C02NN	MDA221P75SABG2
M83513/28-C02NP	MDA221P75SAPG2
M83513/28-C02NT	MDA221P75SATG2
M83513/28-C02NW	MDA221P75SAWG2
M83513/28-C02PN	MDAS21P75SABG2
M83513/28-C02PP	MDAS21P75SAPG2
M83513/28-C02PT	MDAS21P75SATG2
M83513/28-C02PW	MDAS21P75SAWG2
M83513/28-C03CN	MDA121P75SABG3
M83513/28-C03CP	MDA121P75SAPG3
M83513/28-C03CT	MDA121P75SATG3
M83513/28-C03CW	MDA121P75SAWG3
M83513/28-C03NN	MDA221P75SABG3
M83513/28-C03NP	MDA221P75SAPG3
M83513/28-C03NT	MDA221P75SATG3
M83513/28-C03NW	MDA221P75SAWG3
M83513/28-C03PN	MDAS21P75SABG3
M83513/28-C03PP	MDAS21P75SAPG3
M83513/28-C03PT	MDAS21P75SATG3
M83513/28-C03PW	MDAS21P75SAWG3
M83513/28-D01CN	MDA125P75SABG1
M83513/28-D01CP	MDA125P75SAPG1
M83513/28-D01CT	MDA125P75SATG1
M83513/28-D01CW	MDA125P75SAWG1
M83513/28-D01NN	MDA225P75SABG1
M83513/28-D01NP	MDA225P75SAPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/28-D01NT	MDA225P75SATG1
M83513/28-D01NW	MDA225P75SAWG1
M83513/28-D01PN	MDAS25P75SABG1
M83513/28-D01PP	MDAS25P75SAPG1
M83513/28-D01PT	MDAS25P75SATG1
M83513/28-D01PW	MDAS25P75SAWG1
M83513/28-D02CN	MDA125P75SABG2
M83513/28-D02CP	MDA125P75SAPG2
M83513/28-D02CT	MDA125P75SATG2
M83513/28-D02CW	MDA125P75SAWG2
M83513/28-D02NN	MDA225P75SABG2
M83513/28-D02NP	MDA225P75SAPG2
M83513/28-D02NT	MDA225P75SATG2
M83513/28-D02NW	MDA225P75SAWG2
M83513/28-D02PN	MDAS25P75SABG2
M83513/28-D02PP	MDAS25P75SAPG2
M83513/28-D02PT	MDAS25P75SATG2
M83513/28-D02PW	MDAS25P75SAWG2
M83513/28-D03CN	MDA125P75SABG3
M83513/28-D03CP	MDA125P75SAPG3
M83513/28-D03CT	MDA125P75SATG3
M83513/28-D03CW	MDA125P75SAWG3
M83513/28-D03NN	MDA225P75SABG3
M83513/28-D03NP	MDA225P75SAPG3
M83513/28-D03NT	MDA225P75SATG3
M83513/28-D03NW	MDA225P75SAWG3
M83513/28-D03PN	MDAS25P75SABG3
M83513/28-D03PP	MDAS25P75SAPG3
M83513/28-D03PT	MDAS25P75SATG3
M83513/28-D03PW	MDAS25P75SAWG3
M83513/28-E01CN	MDA131P75SABG1
M83513/28-E01CP	MDA131P75SAPG1
M83513/28-E01CT	MDA131P75SATG1
M83513/28-E01CW	MDA131P75SAWG1
M83513/28-E01NN	MDA231P75SABG1
M83513/28-E01NP	MDA231P75SAPG1
M83513/28-E01NT	MDA231P75SATG1
M83513/28-E01NW	MDA231P75SAWG1
M83513/28-E01PN	MDAS31P75SABG1
M83513/28-E01PP	MDAS31P75SAPG1
M83513/28-E01PT	MDAS31P75SATG1
M83513/28-E01PW	MDAS31P75SAWG1
M83513/28-E02CN	MDA131P75SABG2
M83513/28-E02CP	MDA131P75SAPG2
M83513/28-E02CT	MDA131P75SATG2
M83513/28-E02CW	MDA131P75SAWG2
M83513/28-E02NN	MDA231P75SABG2
M83513/28-E02NP	MDA231P75SAPG2
M83513/28-E02NT	MDA231P75SATG2
M83513/28-E02NW	MDA231P75SAWG2
M83513/28-E02PN	MDAS31P75SABG2
M83513/28-E02PP	MDAS31P75SAPG2
M83513/28-E02PT	MDAS31P75SATG2
M83513/28-E02PW	MDAS31P75SAWG2
M83513/28-E03CN	MDA131P75SABG3
M83513/28-E03CP	MDA131P75SAPG3
M83513/28-E03CT	MDA131P75SATG3

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M83513/28 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/28-E03CW	MDA131P75SAWG3
M83513/28-E03NN	MDA231P75SABG3
M83513/28-E03NP	MDA231P75SAPG3
M83513/28-E03NT	MDA231P75SATG3
M83513/28-E03NW	MDA231P75SAWG3
M83513/28-E03PN	MDAS31P75SABG3
M83513/28-E03PP	MDAS31P75SAPG3
M83513/28-E03PT	MDAS31P75SATG3
M83513/28-E03PW	MDAS31P75SAWG3
M83513/28-F01CN	MDA137P75SABG1
M83513/28-F01CP	MDA137P75SAPG1
M83513/28-F01CT	MDA137P75SATG1
M83513/28-F01CW	MDA137P75SAWG1
M83513/28-F01NN	MDA237P75SABG1
M83513/28-F01NP	MDA237P75SAPG1
M83513/28-F01NT	MDA237P75SATG1

MIL STANDARD	AXON' EQUIVALENT
M83513/28-F01NW	MDA237P75SAWG1
M83513/28-F01PN	MDAS37P75SABG1
M83513/28-F01PP	MDAS37P75SAPG1
M83513/28-F01PT	MDAS37P75SATG1
M83513/28-F01PW	MDAS37P75SAWG1
M83513/28-F02CN	MDA137P75SABG2
M83513/28-F02CP	MDA137P75SAPG2
M83513/28-F02CT	MDA137P75SATG2
M83513/28-F02CW	MDA137P75SAWG2
M83513/28-F02NN	MDA237P75SABG2
M83513/28-F02NP	MDA237P75SAPG2
M83513/28-F02NT	MDA237P75SATG2
M83513/28-F02NW	MDA237P75SAWG2
M83513/28-F02PN	MDAS37P75SABG2
M83513/28-F02PP	MDAS37P75SAPG2
M83513/28-F02PT	MDAS37P75SATG2

MIL STANDARD	AXON' EQUIVALENT
M83513/28-F02PW	MDAS37P75SAWG2
M83513/28-F03CN	MDA137P75SABG3
M83513/28-F03CP	MDA137P75SAPG3
M83513/28-F03CT	MDA137P75SATG3
M83513/28-F03CW	MDA137P75SAWG3
M83513/28-F03NN	MDA237P75SABG3
M83513/28-F03NP	MDA237P75SAPG3
M83513/28-F03NT	MDA237P75SATG3
M83513/28-F03NW	MDA237P75SAWG3
M83513/28-F03PN	MDAS37P75SABG3
M83513/28-F03PP	MDAS37P75SAPG3
M83513/28-F03PT	MDAS37P75SATG3
M83513/28-F03PW	MDAS37P75SAWG3

M83513/29

MIL STANDARD	AXON' EQUIVALENT
M83513/29-G01CN	MDA151P75SABG1
M83513/29-G01CP	MDA151P75SAPG1
M83513/29-G01CT	MDA151P75SATG1
M83513/29-G01CW	MDA151P75SAWG1
M83513/29-G01NN	MDA251P75SABG1
M83513/29-G01NP	MDA251P75SAPG1
M83513/29-G01NT	MDA251P75SATG1
M83513/29-G01NW	MDA251P75SAWG1
M83513/29-G01PN	MDAS51P75SABG1
M83513/29-G01PP	MDAS51P75SAPG1
M83513/29-G01PT	MDAS51P75SATG1
M83513/29-G01PW	MDAS51P75SAWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/29-G02CN	MDA151P75SABG2
M83513/29-G02CP	MDA151P75SAPG2
M83513/29-G02CT	MDA151P75SATG2
M83513/29-G02CW	MDA151P75SAWG2
M83513/29-G02NN	MDA251P75SABG2
M83513/29-G02NP	MDA251P75SAPG2
M83513/29-G02NT	MDA251P75SATG2
M83513/29-G02NW	MDA251P75SAWG2
M83513/29-G02PN	MDAS51P75SABG2
M83513/29-G02PP	MDAS51P75SAPG2
M83513/29-G02PT	MDAS51P75SATG2
M83513/29-G02PW	MDAS51P75SAWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/29-G03CN	MDA151P75SABG3
M83513/29-G03CP	MDA151P75SAPG3
M83513/29-G03CT	MDA151P75SATG3
M83513/29-G03CW	MDA151P75SAWG3
M83513/29-G03NN	MDA251P75SABG3
M83513/29-G03NP	MDA251P75SAPG3
M83513/29-G03NT	MDA251P75SATG3
M83513/29-G03NW	MDA251P75SAWG3
M83513/29-G03PN	MDAS51P75SABG3
M83513/29-G03PP	MDAS51P75SAPG3
M83513/29-G03PT	MDAS51P75SATG3
M83513/29-G03PW	MDAS51P75SAWG3

M83513/30

MIL STANDARD	AXON' EQUIVALENT
M83513/30-H01CN	MDA1100P75SABG1
M83513/30-H01CP	MDA1100P75SAPG1
M83513/30-H01CU	MDA1100P75SATG1
M83513/30-H01CY	MDA1100P75SAWG1
M83513/30-H01NN	MDA2100P75SABG1
M83513/30-H01NP	MDA2100P75SAPG1
M83513/30-H01NU	MDA2100P75SATG1
M83513/30-H01NY	MDA2100P75SAWG1
M83513/30-H01PN	MDAS100P75SABG1
M83513/30-H01PP	MDAS100P75SAPG1
M83513/30-H01PU	MDAS100P75SATG1
M83513/30-H01PY	MDAS100P75SAWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/30-H02CN	MDA1100P75SABG2
M83513/30-H02CP	MDA1100P75SAPG2
M83513/30-H02CU	MDA1100P75SATG2
M83513/30-H02CY	MDA1100P75SAWG2
M83513/30-H02NN	MDA2100P75SABG2
M83513/30-H02NP	MDA2100P75SAPG2
M83513/30-H02NU	MDA2100P75SATG2
M83513/30-H02NY	MDA2100P75SAWG2
M83513/30-H02PN	MDAS100P75SABG2
M83513/30-H02PP	MDAS100P75SAPG2
M83513/30-H02PU	MDAS100P75SATG2
M83513/30-H02PY	MDAS100P75SAWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/30-H03CN	MDA1100P75SABG3
M83513/30-H03CP	MDA1100P75SAPG3
M83513/30-H03CU	MDA1100P75SATG3
M83513/30-H03CY	MDA1100P75SAWG3
M83513/30-H03NN	MDA2100P75SABG3
M83513/30-H03NP	MDA2100P75SAPG3
M83513/30-H03NU	MDA2100P75SATG3
M83513/30-H03NY	MDA2100P75SAWG3
M83513/30-H03PN	MDAS100P75SABG3
M83513/30-H03PP	MDAS100P75SAPG3
M83513/30-H03PU	MDAS100P75SATG3
M83513/30-H03PY	MDAS100P75SAWG3

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M83513/31

MIL STANDARD	AXON' EQUIVALENT
M83513/31-A01CN	MDA109S75SABG1
M83513/31-A01CP	MDA109S75SAPG1
M83513/31-A01CT	MDA109S75SATG1
M83513/31-A01CW	MDA109S75SAWG1
M83513/31-A01NN	MDA209S75SABG1
M83513/31-A01NP	MDA209S75SAPG1
M83513/31-A01NT	MDA209S75SATG1
M83513/31-A01NW	MDA209S75SAWG1
M83513/31-A01PN	MDAS09S75SABG1
M83513/31-A01PP	MDAS09S75SAPG1
M83513/31-A01PT	MDAS09S75SATG1
M83513/31-A01PW	MDAS09S75SAWG1
M83513/31-A02CN	MDA109S75SABG2
M83513/31-A02CP	MDA109S75SAPG2
M83513/31-A02CT	MDA109S75SATG2
M83513/31-A02CW	MDA109S75SAWG2
M83513/31-A02NN	MDA209S75SABG2
M83513/31-A02NP	MDA209S75SAPG2
M83513/31-A02NT	MDA209S75SATG2
M83513/31-A02NW	MDA209S75SAWG2
M83513/31-A02PN	MDAS09S75SABG2
M83513/31-A02PP	MDAS09S75SAPG2
M83513/31-A02PT	MDAS09S75SATG2
M83513/31-A02PW	MDAS09S75SAWG2
M83513/31-A03CN	MDA109S75SABG3
M83513/31-A03CP	MDA109S75SAPG3
M83513/31-A03CT	MDA109S75SATG3
M83513/31-A03CW	MDA109S75SAWG3
M83513/31-A03NN	MDA209S75SABG3
M83513/31-A03NP	MDA209S75SAPG3
M83513/31-A03NT	MDA209S75SATG3
M83513/31-A03NW	MDA209S75SAWG3
M83513/31-A03PN	MDAS09S75SABG3
M83513/31-A03PP	MDAS09S75SAPG3
M83513/31-A03PT	MDAS09S75SATG3
M83513/31-A03PW	MDAS09S75SAWG3
M83513/31-B01CN	MDA115S75SABG1
M83513/31-B01CP	MDA115S75SAPG1
M83513/31-B01CT	MDA115S75SATG1
M83513/31-B01CW	MDA115S75SAWG1
M83513/31-B01NN	MDA215S75SABG1
M83513/31-B01NP	MDA215S75SAPG1
M83513/31-B01NT	MDA215S75SATG1
M83513/31-B01NW	MDA215S75SAWG1
M83513/31-B01PN	MDAS15S75SABG1
M83513/31-B01PP	MDAS15S75SAPG1
M83513/31-B01PT	MDAS15S75SATG1
M83513/31-B01PW	MDAS15S75SAWG1
M83513/31-B02CN	MDA115S75SABG2
M83513/31-B02CP	MDA115S75SAPG2
M83513/31-B02CT	MDA115S75SATG2
M83513/31-B02CW	MDA115S75SAWG2
M83513/31-B02NN	MDA215S75SABG2
M83513/31-B02NP	MDA215S75SAPG2
M83513/31-B02NT	MDA215S75SATG2
M83513/31-B02NW	MDA215S75SAWG2
M83513/31-B02PN	MDAS15S75SABG2

MIL STANDARD	AXON' EQUIVALENT
M83513/31-B02PP	MDAS15S75SAPG2
M83513/31-B02PT	MDAS15S75SATG2
M83513/31-B02PW	MDAS15S75SAWG2
M83513/31-B03CN	MDA115S75SABG3
M83513/31-B03CP	MDA115S75SAPG3
M83513/31-B03CT	MDA115S75SATG3
M83513/31-B03CW	MDA115S75SAWG3
M83513/31-B03NN	MDA215S75SABG3
M83513/31-B03NP	MDA215S75SAPG3
M83513/31-B03NT	MDA215S75SATG3
M83513/31-B03NW	MDA215S75SAWG3
M83513/31-B03PN	MDAS15S75SABG3
M83513/31-B03PP	MDAS15S75SAPG3
M83513/31-B03PT	MDAS15S75SATG3
M83513/31-B03PW	MDAS15S75SAWG3
M83513/31-C01CN	MDA121S75SABG1
M83513/31-C01CP	MDA121S75SAPG1
M83513/31-C01CT	MDA121S75SATG1
M83513/31-C01CW	MDA121S75SAWG1
M83513/31-C01NN	MDA221S75SABG1
M83513/31-C01NP	MDA221S75SAPG1
M83513/31-C01NT	MDA221S75SATG1
M83513/31-C01NW	MDA221S75SAWG1
M83513/31-C01PN	MDAS21S75SABG1
M83513/31-C01PP	MDAS21S75SAPG1
M83513/31-C01PT	MDAS21S75SATG1
M83513/31-C01PW	MDAS21S75SAWG1
M83513/31-C02CN	MDA121S75SABG2
M83513/31-C02CP	MDA121S75SAPG2
M83513/31-C02CT	MDA121S75SATG2
M83513/31-C02CW	MDA121S75SAWG2
M83513/31-C02NN	MDA221S75SABG2
M83513/31-C02NP	MDA221S75SAPG2
M83513/31-C02NT	MDA221S75SATG2
M83513/31-C02NW	MDA221S75SAWG2
M83513/31-C02PN	MDAS21S75SABG2
M83513/31-C02PP	MDAS21S75SAPG2
M83513/31-C02PT	MDAS21S75SATG2
M83513/31-C02PW	MDAS21S75SAWG2
M83513/31-C03CN	MDA121S75SABG3
M83513/31-C03CP	MDA121S75SAPG3
M83513/31-C03CT	MDA121S75SATG3
M83513/31-C03CW	MDA121S75SAWG3
M83513/31-C03NN	MDA221S75SABG3
M83513/31-C03NP	MDA221S75SAPG3
M83513/31-C03NT	MDA221S75SATG3
M83513/31-C03NW	MDA221S75SAWG3
M83513/31-C03PN	MDAS21S75SABG3
M83513/31-C03PP	MDAS21S75SAPG3
M83513/31-C03PT	MDAS21S75SATG3
M83513/31-C03PW	MDAS21S75SAWG3
M83513/31-D01CN	MDA125S75SABG1
M83513/31-D01CP	MDA125S75SAPG1
M83513/31-D01CT	MDA125S75SATG1
M83513/31-D01CW	MDA125S75SAWG1
M83513/31-D01NN	MDA225S75SABG1
M83513/31-D01NP	MDA225S75SAPG1

MIL STANDARD	AXON' EQUIVALENT
M83513/31-D01NT	MDA225S75SATG1
M83513/31-D01NW	MDA225S75SAWG1
M83513/31-D01PN	MDAS25S75SABG1
M83513/31-D01PP	MDAS25S75SAPG1
M83513/31-D01PT	MDAS25S75SATG1
M83513/31-D01PW	MDAS25S75SAWG1
M83513/31-D02CN	MDA125S75SABG2
M83513/31-D02CP	MDA125S75SAPG2
M83513/31-D02CT	MDA125S75SATG2
M83513/31-D02CW	MDA125S75SAWG2
M83513/31-D02NN	MDA225S75SABG2
M83513/31-D02NP	MDA225S75SAPG2
M83513/31-D02NT	MDA225S75SATG2
M83513/31-D02NW	MDA225S75SAWG2
M83513/31-D02PN	MDAS25S75SABG2
M83513/31-D02PP	MDAS25S75SAPG2
M83513/31-D02PT	MDAS25S75SATG2
M83513/31-D02PW	MDAS25S75SAWG2
M83513/31-D03CN	MDA125S75SABG3
M83513/31-D03CP	MDA125S75SAPG3
M83513/31-D03CT	MDA125S75SATG3
M83513/31-D03CW	MDA125S75SAWG3
M83513/31-D03NN	MDA225S75SABG3
M83513/31-D03NP	MDA225S75SAPG3
M83513/31-D03NT	MDA225S75SATG3
M83513/31-D03NW	MDA225S75SAWG3
M83513/31-D03PN	MDAS25S75SABG3
M83513/31-D03PP	MDAS25S75SAPG3
M83513/31-D03PT	MDAS25S75SATG3
M83513/31-D03PW	MDAS25S75SAWG3
M83513/31-E01CN	MDA131S75SABG1
M83513/31-E01CP	MDA131S75SAPG1
M83513/31-E01CT	MDA131S75SATG1
M83513/31-E01CW	MDA131S75SAWG1
M83513/31-E01NN	MDA231S75SABG1
M83513/31-E01NP	MDA231S75SAPG1
M83513/31-E01NT	MDA231S75SATG1
M83513/31-E01NW	MDA231S75SAWG1
M83513/31-E01PN	MDAS31S75SABG1
M83513/31-E01PP	MDAS31S75SAPG1
M83513/31-E01PT	MDAS31S75SATG1
M83513/31-E01PW	MDAS31S75SAWG1
M83513/31-E02CN	MDA131S75SABG2
M83513/31-E02CP	MDA131S75SAPG2
M83513/31-E02CT	MDA131S75SATG2
M83513/31-E02CW	MDA131S75SAWG2
M83513/31-E02NN	MDA231S75SABG2
M83513/31-E02NP	MDA231S75SAPG2
M83513/31-E02NT	MDA231S75SATG2
M83513/31-E02NW	MDA231S75SAWG2
M83513/31-E02PN	MDAS31S75SABG2
M83513/31-E02PP	MDAS31S75SAPG2
M83513/31-E02PT	MDAS31S75SATG2
M83513/31-E02PW	MDAS31S75SAWG2
M83513/31-E03CN	MDA131S75SABG3
M83513/31-E03CP	MDA131S75SAPG3
M83513/31-E03CT	MDA131S75SATG3

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M83513/31 (continued)

MIL STANDARD	AXON' EQUIVALENT
M83513/31-E03CW	MDA131S75SAWG3
M83513/31-E03NN	MDA231S75SABG3
M83513/31-E03NP	MDA231S75SAPG3
M83513/31-E03NT	MDA231S75SATG3
M83513/31-E03NW	MDA231S75SAWG3
M83513/31-E03PN	MDAS31S75SABG3
M83513/31-E03PP	MDAS31S75SAPG3
M83513/31-E03PT	MDAS31S75SATG3
M83513/31-E03PW	MDAS31S75SAWG3
M83513/31-F01CN	MDA137S75SABG1
M83513/31-F01CP	MDA137S75SAPG1
M83513/31-F01CT	MDA137S75SATG1
M83513/31-F01CW	MDA137S75SAWG1
M83513/31-F01NN	MDA237S75SABG1
M83513/31-F01NP	MDA237S75SAPG1
M83513/31-F01NT	MDA237S75SATG1

MIL STANDARD	AXON' EQUIVALENT
M83513/31-F01NW	MDA237S75SAWG1
M83513/31-F01PN	MDAS37S75SABG1
M83513/31-F01PP	MDAS37S75SAPG1
M83513/31-F01PT	MDAS37S75SATG1
M83513/31-F01PW	MDAS37S75SAWG1
M83513/31-F02CN	MDA137S75SABG2
M83513/31-F02CP	MDA137S75SAPG2
M83513/31-F02CT	MDA137S75SATG2
M83513/31-F02CW	MDA137S75SAWG2
M83513/31-F02NN	MDA237S75SABG2
M83513/31-F02NP	MDA237S75SAPG2
M83513/31-F02NT	MDA237S75SATG2
M83513/31-F02NW	MDA237S75SAWG2
M83513/31-F02PN	MDAS37S75SABG2
M83513/31-F02PP	MDAS37S75SAPG2
M83513/31-F02PT	MDAS37S75SATG2

MIL STANDARD	AXON' EQUIVALENT
M83513/31-F02PW	MDAS37S75SAWG2
M83513/31-F03CN	MDA137S75SABG3
M83513/31-F03CP	MDA137S75SAPG3
M83513/31-F03CT	MDA137S75SATG3
M83513/31-F03CW	MDA137S75SAWG3
M83513/31-F03NN	MDA237S75SABG3
M83513/31-F03NP	MDA237S75SAPG3
M83513/31-F03NT	MDA237S75SATG3
M83513/31-F03NW	MDA237S75SAWG3
M83513/31-F03PN	MDAS37S75SABG3
M83513/31-F03PP	MDAS37S75SAPG3
M83513/31-F03PT	MDAS37S75SATG3
M83513/31-F03PW	MDAS37S75SAWG3

M83513/32

MIL STANDARD	AXON' EQUIVALENT
M83513/32-G01CN	MDA151S75SABG1
M83513/32-G01CP	MDA151S75SAPG1
M83513/32-G01CT	MDA151S75SATG1
M83513/32-G01CW	MDA151S75SAWG1
M83513/32-G01NN	MDA251S75SABG1
M83513/32-G01NP	MDA251S75SAPG1
M83513/32-G01NT	MDA251S75SATG1
M83513/32-G01NW	MDA251S75SAWG1
M83513/32-G01PN	MDAS51S75SABG1
M83513/32-G01PP	MDAS51S75SAPG1
M83513/32-G01PT	MDAS51S75SATG1
M83513/32-G01PW	MDAS51S75SAWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/32-G02CN	MDA151S75SABG2
M83513/32-G02CP	MDA151S75SAPG2
M83513/32-G02CT	MDA151S75SATG2
M83513/32-G02CW	MDA151S75SAWG2
M83513/32-G02NN	MDA251S75SABG2
M83513/32-G02NP	MDA251S75SAPG2
M83513/32-G02NT	MDA251S75SATG2
M83513/32-G02NW	MDA251S75SAWG2
M83513/32-G02PN	MDAS51S75SABG2
M83513/32-G02PP	MDAS51S75SAPG2
M83513/32-G02PT	MDAS51S75SATG2
M83513/32-G02PW	MDAS51S75SAWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/32-G03CN	MDA151S75SABG3
M83513/32-G03CP	MDA151S75SAPG3
M83513/32-G03CT	MDA151S75SATG3
M83513/32-G03CW	MDA151S75SAWG3
M83513/32-G03NN	MDA251S75SABG3
M83513/32-G03NP	MDA251S75SAPG3
M83513/32-G03NT	MDA251S75SATG3
M83513/32-G03NW	MDA251S75SAWG3
M83513/32-G03PN	MDAS51S75SABG3
M83513/32-G03PP	MDAS51S75SAPG3
M83513/32-G03PT	MDAS51S75SATG3
M83513/32-G03PW	MDAS51S75SAWG3

M83513/33

MIL STANDARD	AXON' EQUIVALENT
M83513/33-H01CN	MDA1100S75SABG1
M83513/33-H01CP	MDA1100S75SAPG1
M83513/33-H01CU	MDA1100S75SATG1
M83513/33-H01CY	MDA1100S75SAWG1
M83513/33-H01NN	MDA2100S75SABG1
M83513/33-H01NP	MDA2100S75SAPG1
M83513/33-H01NU	MDA2100S75SATG1
M83513/33-H01NY	MDA2100S75SAWG1
M83513/33-H01PN	MDAS100S75SABG1
M83513/33-H01PP	MDAS100S75SAPG1
M83513/33-H01PU	MDAS100S75SATG1
M83513/33-H01PY	MDAS100S75SAWG1

MIL STANDARD	AXON' EQUIVALENT
M83513/33-H02CN	MDA1100S75SABG2
M83513/33-H02CP	MDA1100S75SAPG2
M83513/33-H02CU	MDA1100S75SATG2
M83513/33-H02CY	MDA1100S75SAWG2
M83513/33-H02NN	MDA2100S75SABG2
M83513/33-H02NP	MDA2100S75SAPG2
M83513/33-H02NU	MDA2100S75SATG2
M83513/33-H02NY	MDA2100S75SAWG2
M83513/33-H02PN	MDAS100S75SABG2
M83513/33-H02PP	MDAS100S75SAPG2
M83513/33-H02PU	MDAS100S75SATG2
M83513/33-H02PY	MDAS100S75SAWG2

MIL STANDARD	AXON' EQUIVALENT
M83513/33-H03CN	MDA1100S75SABG3
M83513/33-H03CP	MDA1100S75SAPG3
M83513/33-H03CU	MDA1100S75SATG3
M83513/33-H03CY	MDA1100S75SAWG3
M83513/33-H03NN	MDA2100S75SABG3
M83513/33-H03NP	MDA2100S75SAPG3
M83513/33-H03NU	MDA2100S75SATG3
M83513/33-H03NY	MDA2100S75SAWG3
M83513/33-H03PN	MDAS100S75SABG3
M83513/33-H03PP	MDAS100S75SAPG3
M83513/33-H03PU	MDAS100S75SATG3
M83513/33-H03PY	MDAS100S75SAWG3

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>> BRAZIL
AXON' CABLE INDUSTRIA E COMÉRCIO LTDA
ED. CORPORATE LEAD AMERICAS
BARRA DA TIJUCA
AV. DAS AMÉRICAS, 2480 - BL. 2
VICTORY - SALAS 111/112
RIO DE JANEIRO, RJ, CEP.: 22640-101
TEL.: +55 21 3596-8002
e-mail: salesbrazil@axon-cable.com

>> CANADA
AXON' CABLE CANADIAN OFFICE
MONTREAL, QUEBEC
TEL.: +1 514 898 2044
e-mail: sales@axoncable.com

>> CHINA
AXON' INTERCONNECT LTD
HIGH TECH INDUSTRIAL PARK,
CHANG BAO XI ROAD
RONGGUI, 528306
SHUNDE, GUANGDONG
TEL.: +86 757 2838 7200
FAX: +86 757 2838 7212
e-mail: sales@axon-interconnect.com

>> GERMANY
AXON' KABEL GMBH
POSTFACH 1131 - 71201 LEONBERG
HERTICHSTR. 43 - 71229 LEONBERG
TEL.: +49 7152-97992-0
FAX: +49 7152-97992-7
e-mail: sales@axon-cable.de

>> HUNGARY
AXON' KÁBELGYÁRTÓ KFT.
KÜLSÖ-SZEGEDI ÚT 104.
H-6000 KECSKEMÉT,
TEL.: +36 76 508 195
FAX: +36 76 508 196
e-mail: axon@axon-cable.hu

>> INDIA
AXON' INTERCONNECTORS AND WIRES PVT LTD
PLOT NO. 102, KIADB HITECH DEFENSE AND AEROSPACE PARK
UNACHUR VILLAGE, B. MARENAHALLI,
JALA HOBLI, BUDIGERE POST
BANGALORE NORTH TALUK
BANGALORE URBAN - 562 129
KARNATAKA
TEL.: +91 80 68162966
FAX: +91 80 68162999
e-mail: sales@axon-cable.in

>> JAPAN
AXON' CABLE JAPAN OFFICE
TEL./FAX: +81 26 217 6728
e-mail: axon-japan@axon-cable.com

>> LATVIA
AXON' CABLE SIA
VIŠĶU IELA, 21 C
LV-5410 DAUGAVPILS
TEL.: +371 6540 78 91
FAX: +371 6540 78 93
e-mail: axon@axoncable.lv

>> MEXICO
AXON' INTERCONEX, S.A. DE C.V.
AV. PEÑUELAS 21-A1.
INDUSTRIAL SAN PEDRITO PEÑUELAS
QUERÉTARO PARK
76148 QUERÉTARO, QRO.
TEL: +52 442 215 2713
FAX: +52 442 220 6464
e-mail: axon-mexico@axoncable.com

>> SINGAPORE
AXON' CONNECT PTE LTD
50 GAMBAS CRESCENT
PROXIMA@GAMBAS
#08-08 SINGAPORE 757022
TEL.: +65 62 50 31 69
FAX: +65 62 50 31 67
e-mail: sales.singapore@axon-cable.com

>> SPAIN
AXON' CABLE SPANISH OFFICE
C/CAPITÁN HAYA, N°1, PLANTA 15
28020 MADRID
TEL.: +34 91 418 43 46
FAX: +34 91 556 28 80
e-mail: sales@axon-cable.com

>> UNITED KINGDOM
AXON' CABLE LTD
AXON' AGORA - ADMIRALTY PARK
ROSYTH, DUNFERMLINE
FIFE KY11 2YW
TEL.: +44 1383 421500
FAX: +44 8715 282789
e-mail: sales@axon-cable.co.uk

>> USA
AXON' CABLE INC.
1316 N PLUM GROVE ROAD
SCHAUMBURG, IL. 60173
TEL.: +1 847 230 7800
FAX: +1 847 230 7849
e-mail: sales@axoncable.com

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www.axon-cable.com

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>> AXON' CABLE S.A.S.
2 ROUTE DE CHALONS EN CHAMPAGNE - 51210 MONTMIRAIL
TEL.: +33 3 26 81 70 00 - FAX: +33 3 26 81 28 83
e-mail : sales@axon-cable.com - www.axon-cable.com

axon' cable & interconnect