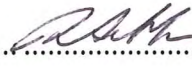
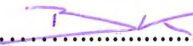


COMPONENT SPECIFICATION**Datamate****M80 SERIES RECTANGULAR CONNECTORS**

SEPT 2008

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	07	3527	06.09.96
	08	5415	22.08.00
	09	7998	25.05.04
	10	8578	02.08.05
	11	8693	18.08.05
	12	9549	09.11.06
	13	10156	17.09.08

COMPONENT SPECIFICATION



1. DESCRIPTION OF CONNECTOR AND INTENDED APPLICATION.

A range of 2mm pitch male and female rectangular, fully shrouded unsealed connectors with replaceable contacts for interconnecting board to board, cable to board and cable to cable. The range covers 2 to 50 ways, in various application methods. Female connectors are available for crimp, vertical through-board and surface mount termination. Male connectors are available for crimp, vertical or horizontal (90°) through-board and vertical surface-mount termination. Overmoulding of cable assemblies is also available for crimp versions.

The connectors are provided with a range of contact terminations (as shown in Appendix 1) that are gold or gold/tin plated. The contact zone of a gold plated contact is hard acid gold of 98% purity.

The connector is intended for use as a low voltage connector in high packing density electronic equipment. The connector is polarised to prevent mis-matching and can be produced with a latching feature (L-Tek) or in a jackscrew (J-Tek) format, with or without board mounting.

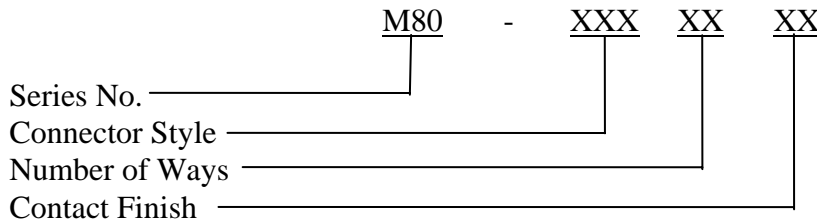
L-Tek and J-Tek connectors are available with low-frequency (LF) contacts, while customised Mixed Technology (Mix-Tek) connectors are also available in the jackscrew style, with a choice of power or coax contacts.

NOTE: Some connector styles are available manufactured and tested to BS9525 F0033. All other connectors in the range are designed to the same specification.

2. MARKING OF THE CONNECTOR AND/OR PACKAGE [ORDER CODE].

The marking (order code) shall appear on the package and shall be of the following style:

2.1. LOW FREQUENCY (LF):



For details of styles see the latest catalogue, or individual drawings.

2.1.1. Number of ways:

SINGLE ROW (standard)	No. of ways	2	3	4	5	6	7	17	22
	Order Code	02	03	04	05	06	07	17	22

DOUBLE ROW (standard)	No. of ways	2+2	3+3	4+4	5+5	6+6	7+7	8+8	9+9	10+10	13+13	17+17	22+22
	Order Code	04	06	08	10	12	14	16	18	20	26	34	44

DOUBLE ROW (jackscrew)	No. of ways	3+3	5+5	7+7	10+10	13+13	17+17	21+21	25+25
	Order Code	06	10	14	20	26	34	42	50

COMPONENT SPECIFICATION

Datamate

2. MARKING OF THE CONNECTOR AND/OR PACKAGE [ORDER CODE] (continued).

2.1. LOW FREQUENCY (LF):

2.1.2. Contact Finish:

Finish Code	01	05	22	42
Male PC Tail	--	Gold all over	Gold on Contact area Tin /Lead on tail	Gold on Contact area 100% Tin on tail
Male Crimp	--	Gold all over	--	--
Female PC Tail	Gold on Contact area Tin /Lead on tail	Gold all over	--	Gold on Contact area 100% Tin on tail
Female Crimp	--	Gold clip, Gold shell	--	Gold clip, Gold shell

2.2. MIXED TECHNOLOGY: Datamate Mix-Tek

See Appendix 1 for numbering system, and also consult latest catalogue and individual drawings.

3. RATINGS.

All materials are listed on individual drawings.

3.1. LOW-FREQUENCY CONNECTORS.

3.1.1. Electrical characteristics.

Current – per individual contact at an ambient temperature of 25°C	3.3A max
(When only one contact per connector is electrically loaded)	
Current – per individual contact at an ambient temperature of 85°C	2.6A max
(When only one contact per connector is electrically loaded)	
Current – per contact through all contacts at an ambient temperature of 25°C	3.0A max
Current – per contact through all contacts at an ambient temperature of 85°C	2.2A max
Working Voltage (at 1013mbar, sea level).....	120V DC or AC peak (at 3.3A max)
Working Voltage (at 1013mbar, sea level).....	240V DC or AC peak (at 2.0A max)
Voltage Proof (at 1013mbar, sea level).....	360V DC or AC peak
Contact resistance (initial)	20mΩ max
Contact resistance (after conditioning)	25mΩ max
Insulation resistance (initial).....	1,000MΩ min
Insulation resistance (hot after conditioning)	100MΩ min
Creepage path contact-to-contact.....	0.35mm min
Air gap contact-to-contact.....	0.35mm min

3.1.2. Environmental characteristics.

Environmental classification.....	55/125/56 at 95% RH
Low air pressure severity	300 mbar
Vibration severity.....	10Hz to 2000Hz over 0.75mm at 98m/s ² (10g), duration 6 hours
Bump severity	390m/s ² (40g), 4000 ±10 bumps
Shock severity	981m/s ² (100g) for 6ms
Acceleration severity.....	490m/s ² (50g)

COMPONENT SPECIFICATION

Datamate

3. RATINGS (continued).**3.1. LOW-FREQUENCY CONNECTORS (continued).**3.1.3. Mechanical characteristics.

Durability *	500 operations*
High temperature, long term (current as in 3.1.)	1000 hours at 85°C
High temperature, short term (no electrical load)	250 hours at 125°C
Contact retention in moulding	10N min
Male Crimp Jackscrew contacts – 2 operations at 10N	
Contact holding force	0.2N min
Insertion force (per contact, using mating pin, no latch fitted)	2.8N max, 0.5N min
Withdrawal force (per contact, using mating pin, no latch fitted)	1.8N max, 0.2N min

* *Datamate has been tested to 5,000 operations, and still performed within Electrical specifications. Please contact – datamate@harwin.com – for more information.*

3.1.4. Wire Termination Range.

Wire type (recommended)	BS 3G 210 Type A
Maximum insulation diameter	Ø1.1mm

Crimp Type	Small Bore	Small Bore	Small Bore	Large Bore
No. & Nominal dia. (mm) of wires	7 / 0.12	7 / 0.15	7 / 0.2	19 / 0.15
A.W.G.	28	26	24	22
Minimum pull-off force	12.5N	25N	44N	50N
M22520/2-01 Crimp tool setting	6	6	6	6

3.2. COAX CONTACTS.3.2.1. Electrical characteristics.

Impedance	50Ω
Frequency Range	6GHz
Also dependent on cable type or board layout	
V.S.W.R. (Voltage Standing Wave Ratio)	1.05 + (0.04 x Frequency) GHz max
Operating Voltage (at 1013mbar, sea level)	180V AC at 500mA
Maximum Voltage (at 1013mbar, sea level)	1,000V AC rms
Contact Resistance	6mΩ max
Insulation Resistance (at 250V rms)	10 ⁶ MΩ

3.2.2. Mechanical characteristics.

Insertion force	5.0N max, 0.6N min
Withdrawal force	2.0N max, 0.5N min
Contact wipe	1.30mm min
Contact replacement in moulding	5 times max

COMPONENT SPECIFICATION

Datamate

3. RATINGS (CONTINUED).3.2.3. Wire Termination Range.

Cable Type	Max. Insulation Diameter	Compatible contacts
RG 178	Ø2.0mm	M80-305, M80-308, M80-315, M80-318
PTFE cellular	Ø2.4mm	M80-306, M80-316
RG 174	Ø2.7mm	M80-307, M80-309, M80-317, M80-319
RG 179	Ø2.7mm	M80-307, M80-309, M80-317, M80-319
RG 316	Ø2.7mm	M80-307, M80-309, M80-317, M80-319

3.3. POWER CONTACTS.3.3.1. Electrical characteristics.

Current rating (contact only).....20A max
 Contact Resistance6mΩ max

3.3.2. Wire Termination Range.

A.W.G.	Current Rating of cable	Compatible contacts
12	20A max	M80-325, M80-335
14	15A max	M80-326, M80-336
16	10A max	M80-327, M80-337

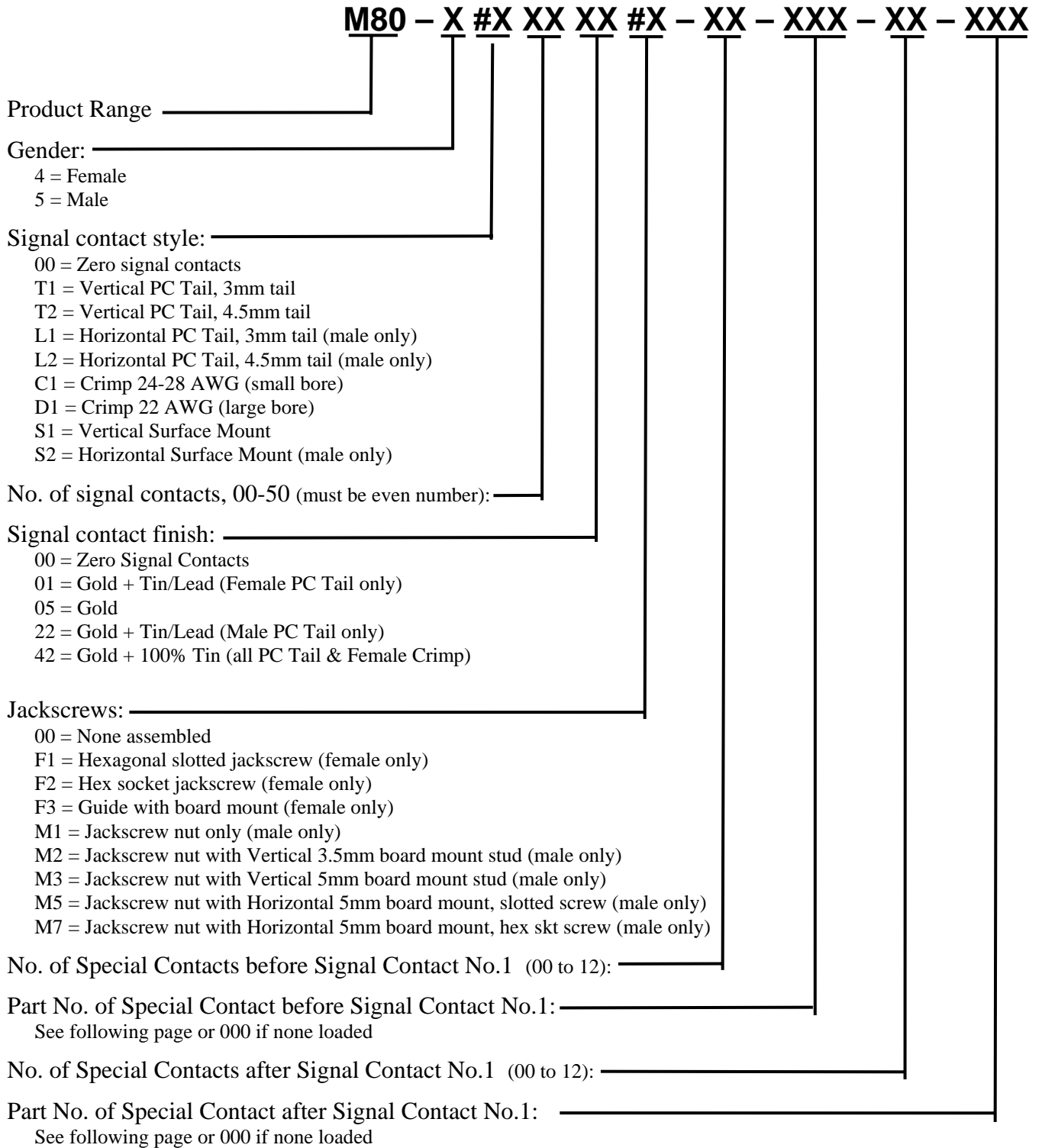
COMPONENT SPECIFICATION



APPENDIX 1 – ORDERING INFORMATION.

Datamate Mix -Tek

(see section 2.1. for Low Frequency):



COMPONENT SPECIFICATION

Datamate

APPENDIX 1 – ORDERING INFORMATION (continued).

Part number of special contact:

301 – Coax – Female Vertical PC Tail, 3.0mm tail	321 – Power – Female Vertical PC Tail, 3.5mm tail
302 – Coax – Female Vertical PC Tail, 4.5mm tail	322 – Power – Female Vertical PC Tail, 5.0mm tail
305 – Coax – Female Crimp Straight, Ø2.0mm cable	325 – Power – Female Solder Straight, 12 AWG cable
306 – Coax – Female Crimp Straight, Ø2.4mm cable	326 – Power – Female Solder Straight, 14 AWG cable
307 – Coax – Female Crimp Straight, Ø2.7mm cable	327 – Power – Female Solder Straight, 16 AWG cable
308 – Coax – Female Crimp/Solder 90°, Ø2.0mm cable	
309 – Coax – Female Crimp/Solder 90°, Ø2.7mm cable	
311 – Coax – Male Vertical PC Tail, 3.0mm tail	331 – Power – Male Vertical PC Tail, 3.5mm tail
312 – Coax – Male Vertical PC Tail, 4.5mm tail	332 – Power – Male Vertical PC Tail, 5.0mm tail
313 – Coax – Male Horizontal PC Tail, 3.0mm tail	333 – Power – Male Horizontal PC Tail, 3.5mm tail
314 – Coax – Male Horizontal PC Tail, 4.5mm tail	334 – Power – Male Horizontal PC Tail, 5.0mm tail
315 – Coax – Male Crimp Straight, Ø2.0mm cable	335 – Power – Male Solder Straight, 12 AWG cable
316 – Coax – Male Crimp Straight, Ø2.4mm cable	336 – Power – Male Solder Straight, 14 AWG cable
317 – Coax – Male Crimp Straight, Ø2.7mm cable	337 – Power – Male Solder Straight, 16 AWG cable
318 – Coax – Male Crimp/Solder 90°, Ø2.0mm cable	
319 – Coax – Male Crimp/Solder 90°, Ø2.7mm cable	

Part numbers for the special contacts (ordered separately) will be M80-XXX, where XXX is the 3-digit code above.

EXAMPLES:

M80-5T11422M1-02-311-04-331

DIL Male Vertical, PC Tail connector with Jackscrew, no board mount, – 2x Coax contacts before signal contact No.1 of 14 & 4x Power contacts after signal contact No.14. Signal contacts finished in Gold on contact area + Tin/Lead on tails.

M80-4D11042F2-04-305-02-308

DIL Female Crimp/Solder connector with Hex Socket Jackscrews, – 4x straight crimp Coax contact for Ø2.0 cable before Crimp signal contact No1 of 10, & 2x 90° Crimp/Solder Coax contact for Ø2.0 cable after Signal contact No.10. Crimp signal contacts finished in Gold on clip + 100% Tin on shell.

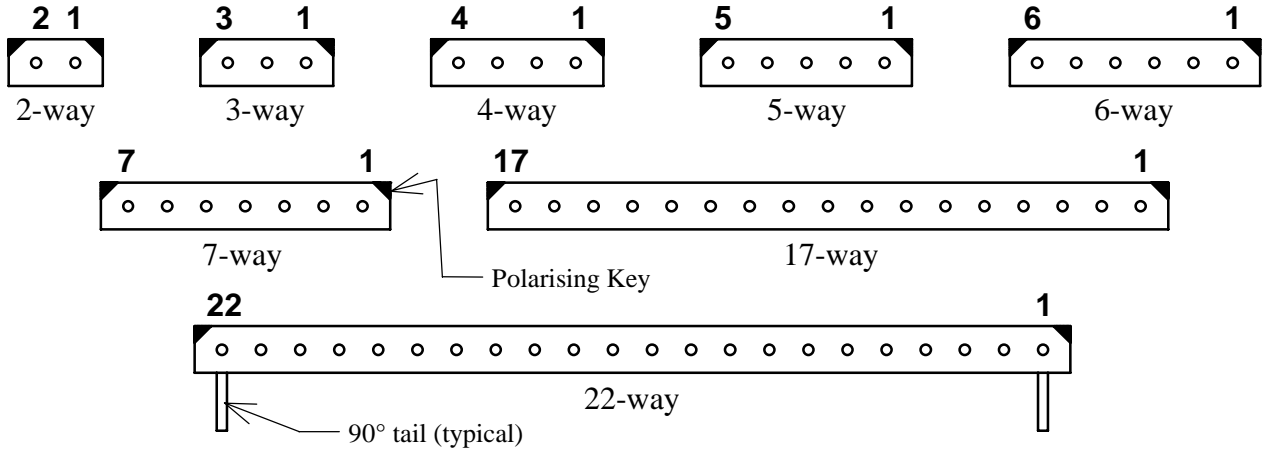
COMPONENT SPECIFICATION

Datamate

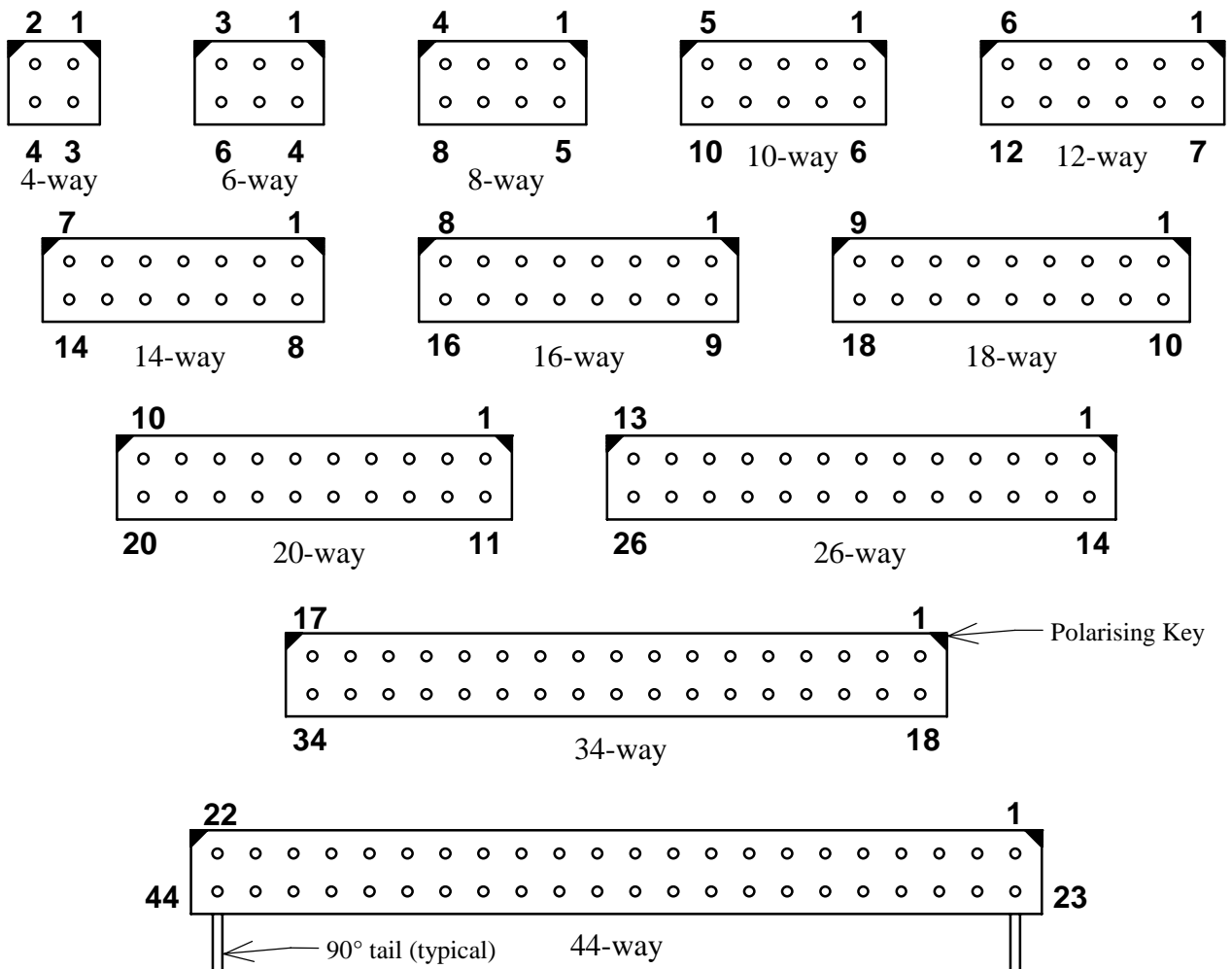
APPENDIX 2 – CONTACT ORIENTATIONS.

These diagrams show pin numbers with reference to the polarisation feature. They represent male connectors, shown looking onto the contact face.

A2.1. Datamate L-Tek SINGLE ROW.



A2.2. Datamate L-Tek DOUBLE ROW.



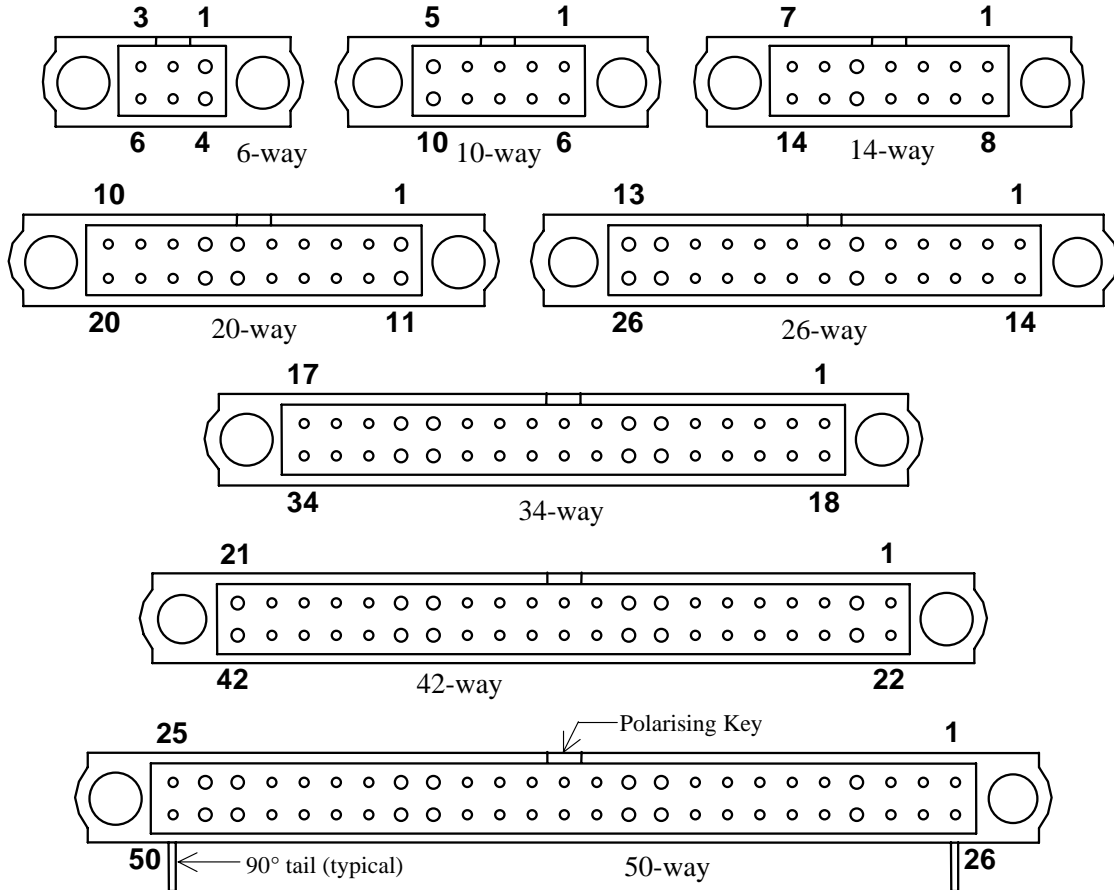
COMPONENT SPECIFICATION

Datamate

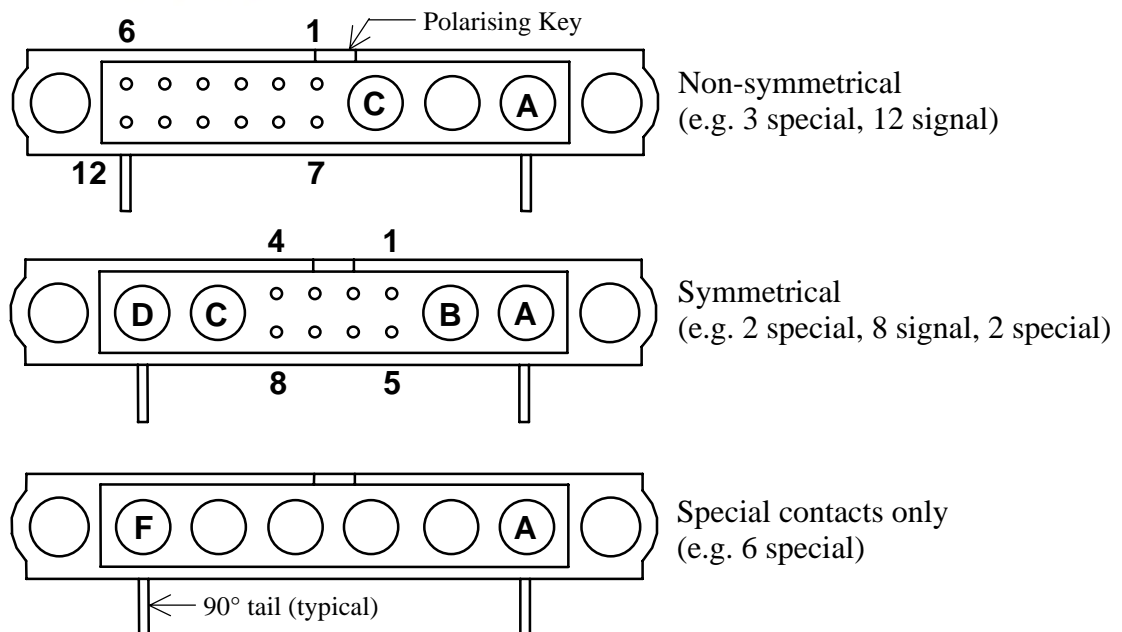
APPENDIX 2 – CONTACT ORIENTATIONS (continued).

These diagrams show pin numbers with reference to the polarisation feature. They represent male connectors, shown looking onto the contact face.

A2.3. Datamate J-Tek DOUBLE ROW



A2.4. Datamate Mix-Tek DOUBLE ROW

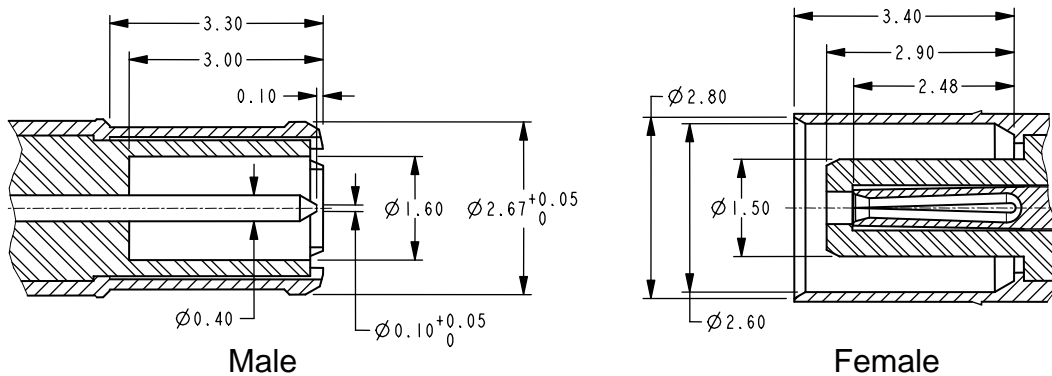


COMPONENT SPECIFICATION



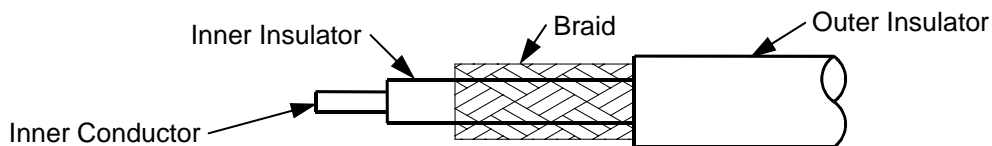
APPENDIX 3 – COAX CONTACT DETAILS.

A3.1. COAX INTERFACE DIMENSIONS.

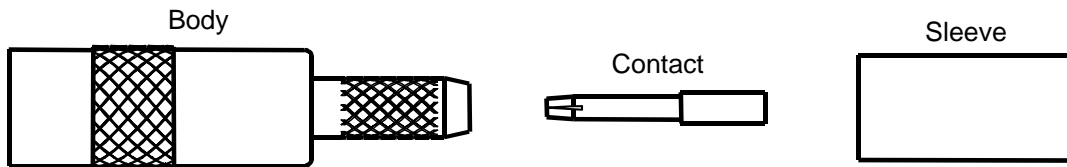


A3.2. COAX ASSEMBLY INSTRUCTIONS – M80-305/306/307, M80-315/316/317.

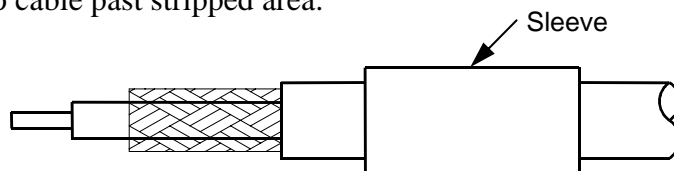
1) Strip cable to dimensions shown against relevant part (see appropriate engineering drawings).



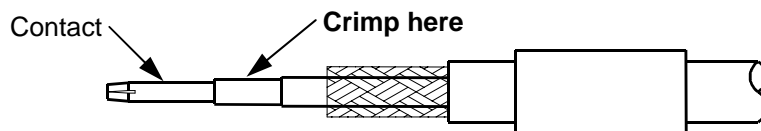
2) Identify pieces of coax connector to be assembled.



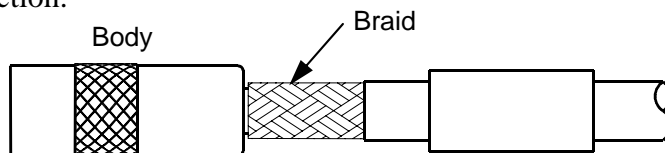
3) Slide sleeve onto cable past stripped area.



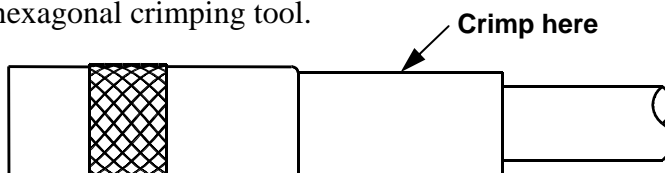
4) Crimp contact to end of cable inner conductor.



5) Insert cable and contact into coax body from back end – make sure that the braid goes outside and over the end section.



6) Slide sleeve back over the end of the coax body and the braid. Crimp into place on the cable insulation, using a hexagonal crimping tool.



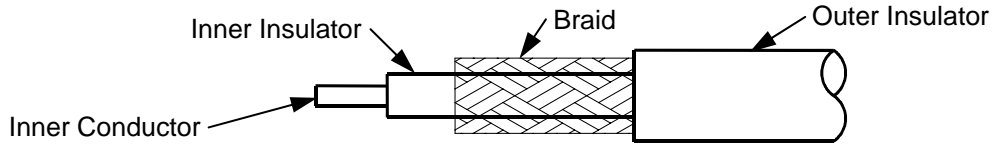
COMPONENT SPECIFICATION



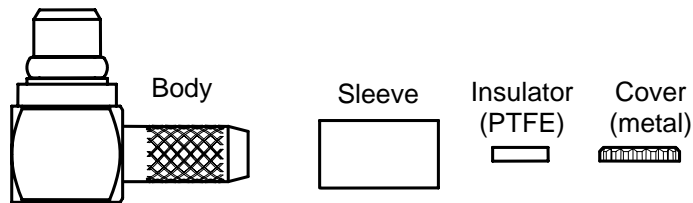
APPENDIX 3 – COAX CONTACT DETAILS (continued).

A3.3. COAX ASSEMBLY INSTRUCTIONS – M80-308/309, M80-318/319.

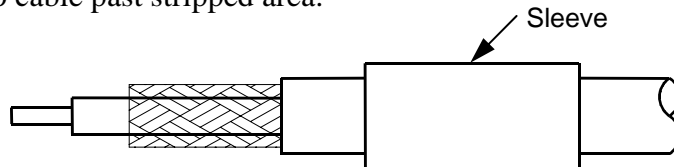
1) Strip cable to dimensions shown against relevant part (see appropriate engineering drawings).



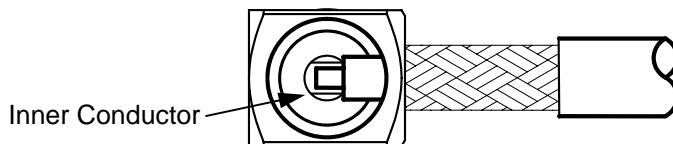
2) Identify pieces of coax connector to be assembled.



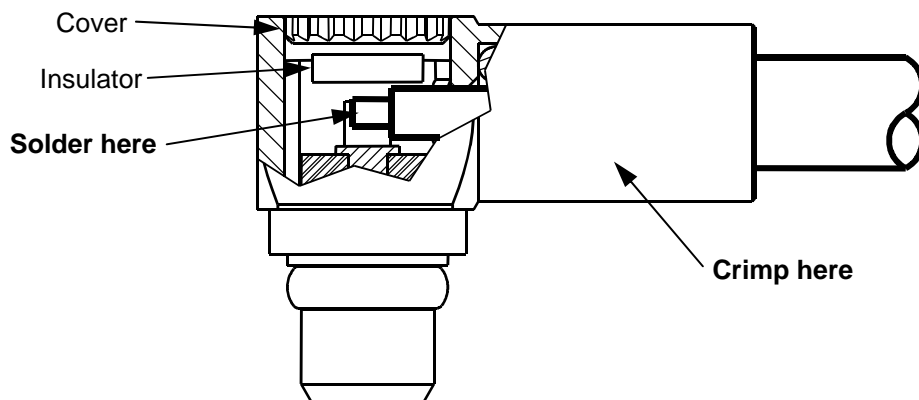
3) Slide sleeve onto cable past stripped area.



4) Push the cable and sleeve into the body, as far as it will go. The cable inner conductor will be visible through the hole in the top of the coax body, and should go into the slot in the inner contact of the body. Make sure that the braid goes outside and over the end section.



5) Solder the cable inner conductor to the body inner contact. When cool, place the insulator inside the top, and press the cover into place. Slide the sleeve up to meet the coax body, and hexagonal crimp in place.

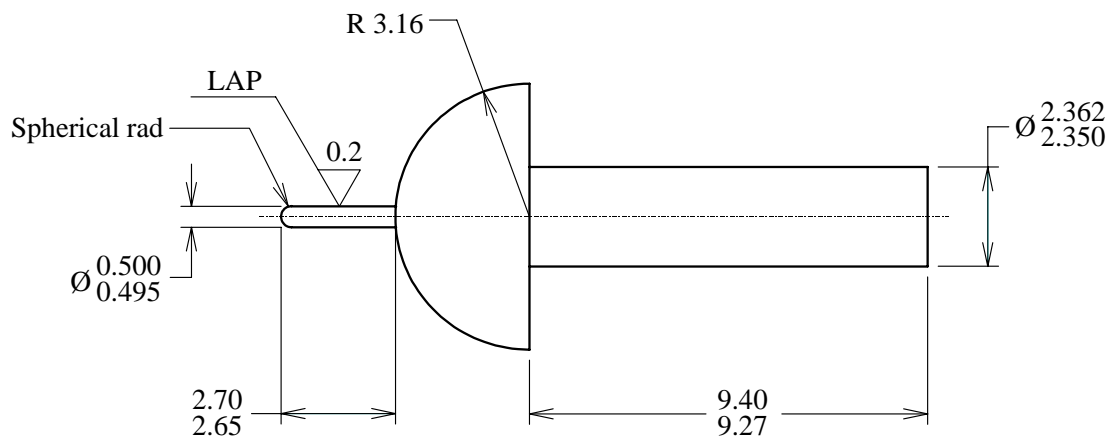
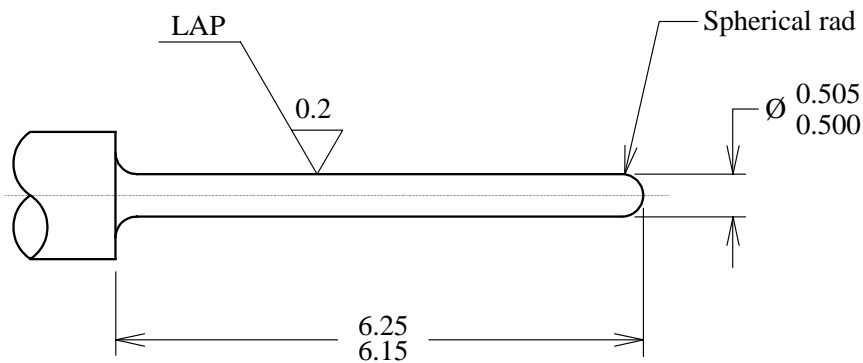
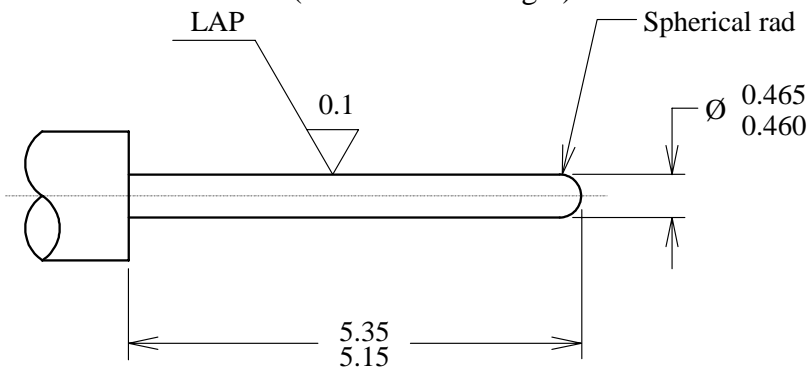


COMPONENT SPECIFICATION

Datamate

APPENDIX 4 – GAUGES (LOW FREQUENCY).**NOTES:**

1. Material = Steel to BS1407 or equivalent.
2. Gauging surfaces to be hardened/ground to 650 H.V.5 minimum.
3. These gauges to be used for testing fully assembled components only.
4. Ultimate wear limit of 0.005mm is allowable on gauging diameters.
5. Loading force to give 2mNm (Test prod only).
6. All dimensions are in millimetres.
7. For explanation of dimensions, etc. see BS8888.
8. Unless otherwise stated, all dimensions are maxima.

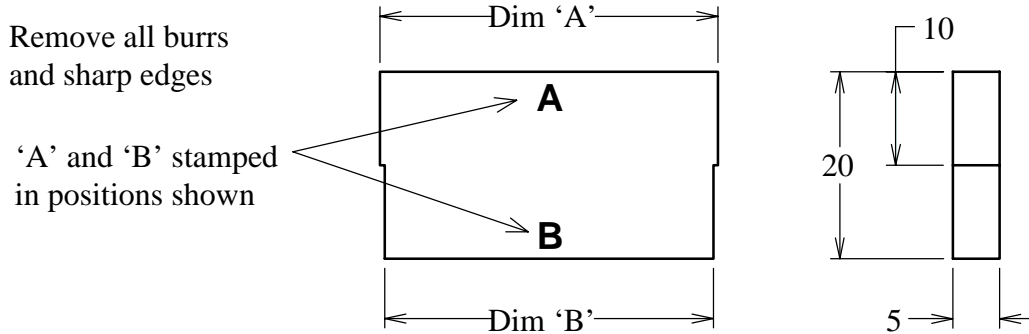
A4.1. TEST PROD.**A4.2. SIZING GAUGE.****A4.3. HOLDING GAUGE (Mass = 20 +0/-1 gm).**

COMPONENT SPECIFICATION



APPENDIX 5 – TEST FOR LATCH INTEGRITY Datamate L-Tek

A5.1. LATCH INTEGRITY GAUGE.



No. of contacts per row	2	3	4	5	6	7	8	9	10	13	17	22
Dim 'A' +0.00 / -0.02	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	28.00	36.00	46.00
Dim 'B' +0.02 / -0.00	5.00	7.00	9.00	11.00	13.00	15.00	17.00	19.00	21.00	27.00	35.00	45.00

A5.2. LATCH INTEGRITY TEST.

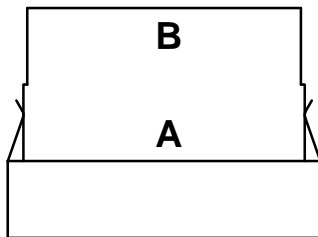


Figure 1

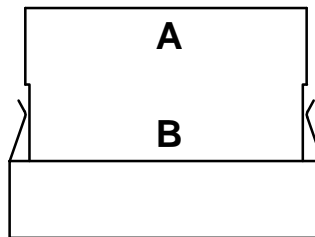


Figure 2

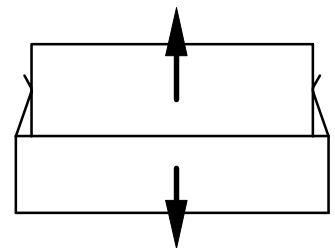


Figure 3

When Gauge A is placed between the two faces of the latch clips (as shown in Figure 1), the connector shall be held against its own weight.

When Gauge B is placed between the two faces of the latch clips (as shown in Figure 2), the connector shall not be held against its own weight.

When an unloaded female connector moulding is mated with a latched male connector, and a force of 20N is applied for 10 seconds in the directions shown in Figure 3, there shall be no failure of any part of the latch mechanism.

COMPONENT SPECIFICATION

Datamate

APPENDIX 6 – INSTRUCTIONS FOR THE USE OF CONNECTORS FITTED WITH JACKSCREWS (Datamate Mix-Tek , Datamate J-Tek)

Connectors are fitted with jackscrews where it is considered necessary to provide mechanical assistance in ensuring a satisfactory engagement and separation of the connector. This may apply in cases where engagement and separation forces are so high as to prevent satisfactory hand engagement, or where access to connector is restricted. Jackscrews also provide a locking feature, preventing the connector from disengaging under adverse conditions.

In order to obtain maximum effectiveness from the jackscrew system, the following rules for their use should be observed.

1. The connector with the fixed jackscrew should be fixed to the mounting board by means of the male thread on the jackscrew, and the supplied M2 nut. The nut should be tightened to a torque of $21 \pm 2 \text{cmN}$.
2. On engaging the two halves of the connector after ensuring correct polarity, lightly push home the floating half until the jackscrews touch. Then, maintaining the pressure, turn one of the floating jackscrews clockwise, until it engages with the fixed screw. Repeat with the other screw.

Then screw in each jackscrew, ensuring even loading by applying a maximum of one turn to each screw in sequence until the connector is bottomed. This will be evident by a sudden increase in the torque required on the screw. This torque should not exceed 23cmN .

NB: Care to be taken when aligning male and female threads to avoid cross-threading and possible failure of parts.

3. On disengaging the two halves of the connector turn each of the floating jackscrews anti-clockwise. Again ensure even loading by turning each screw in sequence for a maximum of one turn until the jackscrew disengage. The connector can then be easily pulled apart.