



HARWIN

Component Specification

C05005

M225 Series
Industrial 2mm Pitch Cable-to-Board Connectors
November 2022

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1. DESCRIPTION OF CONNECTOR AND INTENDED APPLICATION

The M225 series of connectors is aimed at the industrial market, and is a 2.00mm pitch, high performance connector range from Harwin. The range is available in a cable-to-board configuration. The female cable connector is double row, mating to a throughboard PCB male connector.

The female cable contact is an open crimp with a choice of contacts accommodating 22 to 28AWG wires, designed to resist industrial levels of vibration and shock, supplied on reels suitable for automated assembly at high volume. Loose crimps are available for low volume/prototyping, with a hand crimp tool.

To meet the higher requirements of vibration, shock and acceleration for industrial products, the contact style has three contact surfaces touching the mating male contact. Added security is provided with a unique and simple connector locking mechanism fitted to the female housing, which is engaged by pressing home a pin on either end of the connector.

2. RATINGS

2.1. Materials

Female Contact.....	Beryllium Copper, Tin over Nickel finish
Male Contact	Phosphor Bronze, Tin over Nickel finish
Housing.....	Glass-filled Thermoplastic, UL94V-0
Rubber Locking Collar	Fluoroelastic Polymer
Locking Pin.....	Glass-filled PPS

2.2. Electrical Characteristics

Current per contact through all contacts, 25°C ambient:

10-contact connector	4.0A max
50-contact connector.....	3.0A max
Working Voltage (at 1,013mbar, sea level)	800V DC or AC peak
Voltage Proof (at 1,013mbar, sea level)	1,200V DC or AC peak
Contact Resistance:	
Initial	20mΩ max
After Conditioning	25mΩ max
Insulation resistance:	
Initial	1,000MΩ min
Hot After Conditioning.....	100MΩ min
Creepage Path contact-to-contact	0.35mm min
Clearance Distance contact-to-contact.....	0.35mm min

2.3. Environmental Characteristics

Environmental Classification.....	55/125/56 at 95% RH
Operating Temperature.....	-55°C to +125°C
Low Air Pressure Severity (only one contact is electrically loaded)	300 mbar (9,144m/30,000ft)
<i>The connector will function correctly using a simultaneous combination of high temperature and low air pressure down to 300mbar (altitude of 9,144m/30,000ft).</i>	
Vibration Severity (fully mated with push pin fixings engaged)	10Hz to 2,000Hz at 98m/s ² (10G), duration 12 hours over 0.75mm
Shock Severity (fully mated with push pin fixings engaged)	981m/s ² (100G) for 3ms

2.4. Mechanical Characteristics

Durability	50 operations
High Temperature, Long Term (no electrical load)	1,000 hours at +125°C
High Temperature, Short Term (no electrical load)	250 hours at +125°C
Contact Insertion into Cable Housing	5.0N max, 0.5N min
Contact Retention in Housing	6N min
Contact Holding Force	0.2N min
Insertion Force (per contact, using mating contact)	5.0N max, 0.5N min
Withdrawal Force (per contact, using mating contact)	4.0N max, 0.2N min

2.5. Wire Termination Range

Wire Type (recommended)	BS 3G 210 Type A
<i>Refer to Component Specification C049xx for suitable alternatives to BS 3G 210 Type A.</i>	
Maximum Insulation Diameter	Ø1.10mm
Insulation Strip Length	2.7-3.0mm

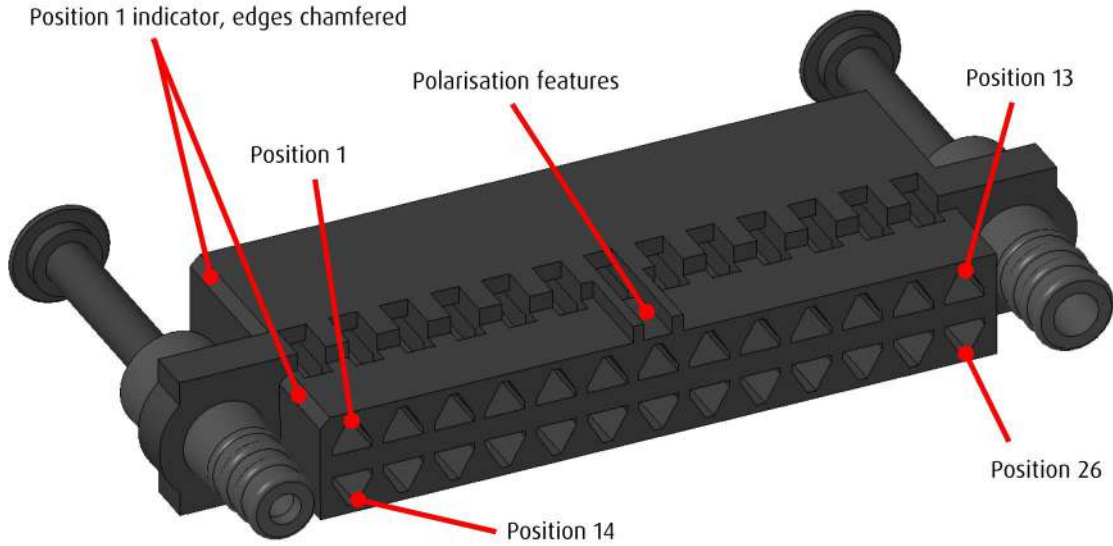
AWG Wire Size	Qty & Nominal diameter (mm) of strands	Conductor Diameter (mm)	Area (mm ²)	Circular MIL Area (CMA)	Max Insulation Diameter	Hand Crimp Tool Z80-255 Nest I/D	Crimp Height (mm)	Crimp Width (mm)	Minimum Pull-Off Force (N)
28	7/0.12	0.36	0.079	156	Ø0.71mm	26-28	0.50-0.56	1.02	9.5
26	7/0.15	0.45	0.124	244	Ø0.80mm				20
24	7/0.20	0.60	0.220	434	Ø0.95mm	22-24	0.76-0.82	1.21	30
22	19/0.15	0.75	0.336	663	Ø1.10mm				45

All dimensions are nominal unless otherwise stated.

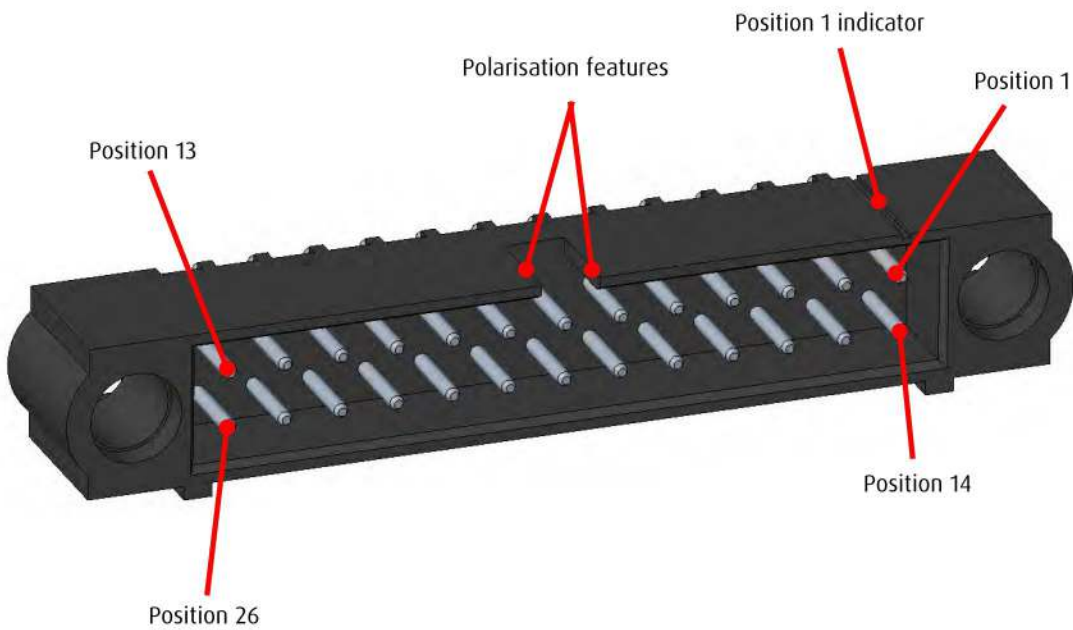
APPENDIX 1 – CONTACT NUMBERING

These diagrams show examples of contact numbering with reference to the polarisation feature.

A1.1. Female Connector



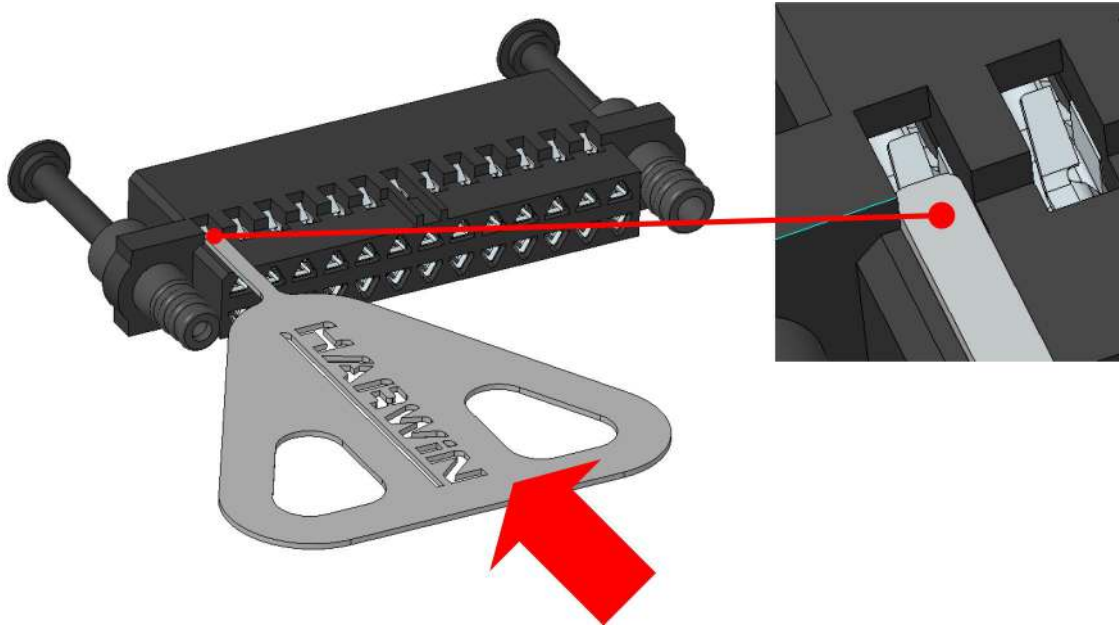
A1.2. Male Connector



APPENDIX 2 – CONTACT EXTRACTION FROM HOUSING

The Z80-258 tool assists with the removal of the M225 cable contacts from the respective housings. The tool should be held parallel to the body as shown below and inserted into the relevant slot, to depress the locking tab and release the contact as shown.

It is not recommended that a contact is re-used in the housing after removal. The Housing can be re-used. For more information on contact extraction see **Tooling Instruction Sheet IS-50**.



APPENDIX 3 – RETAINING PIN EXTRACTION FROM MATED ASSEMBLY

It is recommended that pliers or similar tool are used to remove the fixing pins from the mated assembly, as shown (PCB hidden for illustration purposes).

