



HARWIN

Test Report Summary

HT04003

General Testing of
Datamate 40A Power Contacts

1. Introduction

1.1. Description and Purpose

The Harwin Datamate (M80 Series) connector is manufactured to the requirements of BS9525-F0033. The following tests were carried out to test the performance of the Datamate Mix-Tek series 40A power contacts, an addition to the range known collectively as Special contacts.

1.2. Conclusion

The following data has been collated from Harwin test report 947 & QA000058. The 40A power contacts met the test requirements set out in section 2.3 of this test report summary – all electrical, mechanical and environmental requirements were fulfilled. These results are representative of all Datamate Mix-Tek 40A power contacts. Further information is available on request – please contact technical@harwin.com.

2. Test Method, Requirements and Results

2.1. Specification Parameters

Tests were carried out in accordance with EIA 364 standards for the following specifications:

Testing Standard	Description of Test	Section	Page No.
EIA-364-17B: 1999	Temperature Life, Method A, Cond. 150°C for 850 Hours	2.3.1.	3
EIA-364-06C: 2006	Contact Resistance	2.3.2.	3
EIA-364-70A: 1998	Temperature Rise versus Current, Method 2	2.3.3.	3-4
EIA-364-09C: 1999	Durability (Mechanical Operations)	2.3.4.	5
EIA-364-13C: 2006	Mating and Un-mating Forces, Method B	2.3.5.	5

2.2. List of Test Samples

All testing was carried out using standard parts. When mating pairs, female connectors had any jackscrews removed when the test required mating forces to be measured.

- M80-4000000F1-02-PF5-00-000 - Female 2 Position Cable Solder
- M80-400000000-03-PF5-00-000 - Female 3 Position Cable Solder
- M80-4000000F1-04-PF5-00-000 - Female 4 Position Cable Solder
- M80-4000000F1-06-PF5-00-000 - Female 6 Position Cable Solder
- M80-400000000-10-PF5-00-000 - Female 10 Position Cable Solder
- M80-5000000M1-02-PM1-00-000 - Male 2 Position Vertical PCB Throughboard
- M80-5000000M5-02-PM3-00-000 - Male 2 Position Horizontal PCB Throughboard
- M80-500000000-02-PM5-00-000 - Male 2 Position Cable Solder
- M80-500000000-03-PM5-00-000 - Male 3 Position Cable Solder
- M80-500000000-04-PM5-00-000 - Male 4 Position Cable Solder
- M80-5000000M1-06-PM1-00-000 - Male 6 Position Vertical PCB Throughboard
- M80-5000000M5-06-PM3-00-000 - Male 6 Position Horizontal PCB Throughboard
- M80-5000000M1-10-PM1-00-000 - Male 10 Position Vertical PCB Throughboard
- M80-5000000M5-10-PM3-00-000 - Male 10 Position Horizontal PCB Throughboard
- M80-500000000-10-PM5-00-000 - Male 10 Position Cable Solder
- M80-PM1 - Male 40A Vertical PCB Throughboard Contact
- M80-PF1 - Female 40A Vertical PCB Throughboard Contact

2.3. Test Method and Results

2.3.1. Temperature Life

Methodology: EIA-364-17B Method A, Condition 150°C for 850 hours, and Contact Resistance to EIA-364-06C.

3 samples of 3 position cable connectors (M80-400000000-03-PF5-00-000 and M80-500000000-03-PM5-00-000) were visually inspected for cracking or crazing. 50cm minimum of 10AWG wire was soldered to all solder cups. The connector was mated 3 times to condition the parts, then placed in a test chamber stabilised at 150±5°C. In the test chamber, mated pairs were suspended vertically by one set of wires, with no stress other than gravity placed on the other wires. The samples remained in the test chamber for more than 850 hours, stabilised at 150±5°C. Once removed, the connectors were measured for contact resistance and visually inspected for cracking, crazing, fusing, seizure or delamination of components or finishes.

Specification: Contact Resistance to be 6mΩ max after the test.

Results:

Sample	Contact Resistance (mΩ)			Visual Inspection
	Contact 1	Contact 2	Contact 3	
1	3	1	2	Passed
2	1	1	4	Passed
3	4	2	3	Passed

2.3.2. Contact Resistance to EIA-364-06C: 2006:

Methodology: Unconditioned Datamate power contacts M80-PM1 & M80-PF1 were mated for the first time and contact resistance was measured across the mated pair. 10 mated pairs were tested.

Specification: Contact Resistance to be 6mΩ max.

Results:

Maximum (mΩ)	Minimum (mΩ)	Average (mΩ)
0.325	0.308	0.318

2.3.3. Temperature Rise versus Current to EIA-364-70A: 1998, Method 2

Methodology: Samples of cable connectors in 2, 6 and 10 Position configurations were prepared with a minimum of 50cm of wire for single contact connections and 100cm of wire for series links between contacts. Current was passed through contacts and increased until a stable temperature rise of approximately 5 to 10°C was achieved. Temperature and test current were recorded and this method was repeated for every rise of approximately 25 to 30°C, until the maximum operating temperature of 150°C was reached.

Results - 2 position test: M80-4000000F1-02-PF5-00-000 mated to M80-500000000-02-PM5-00-000 (2 Position cable connectors) – 1 contact pair only energised. Average results of 3 samples

	Current (A)							Ambient Temperature (°C)	
	10	35	45	55	65	75	80	Start	Finish
Temp. Rise (°C)	4.2	28.5	44.9	66.2	89.4	116.3	128.1	21.2	24.5

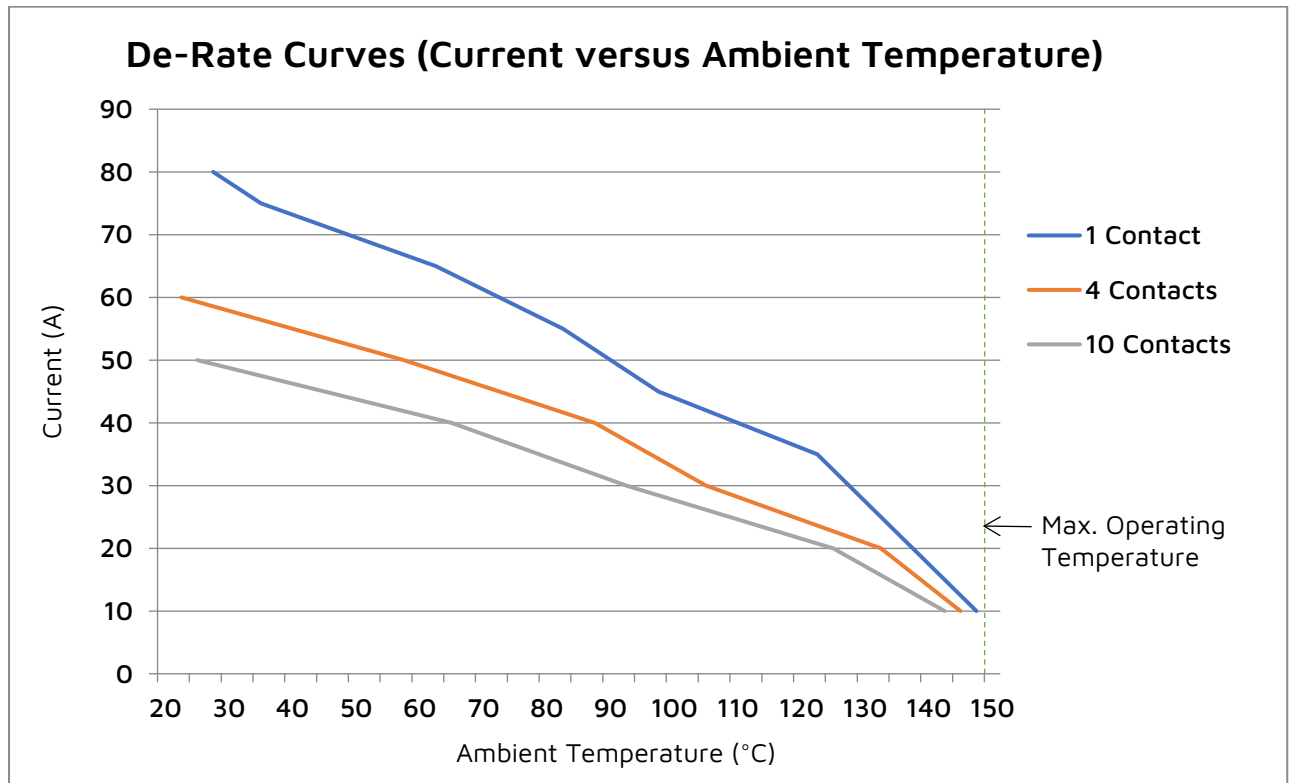
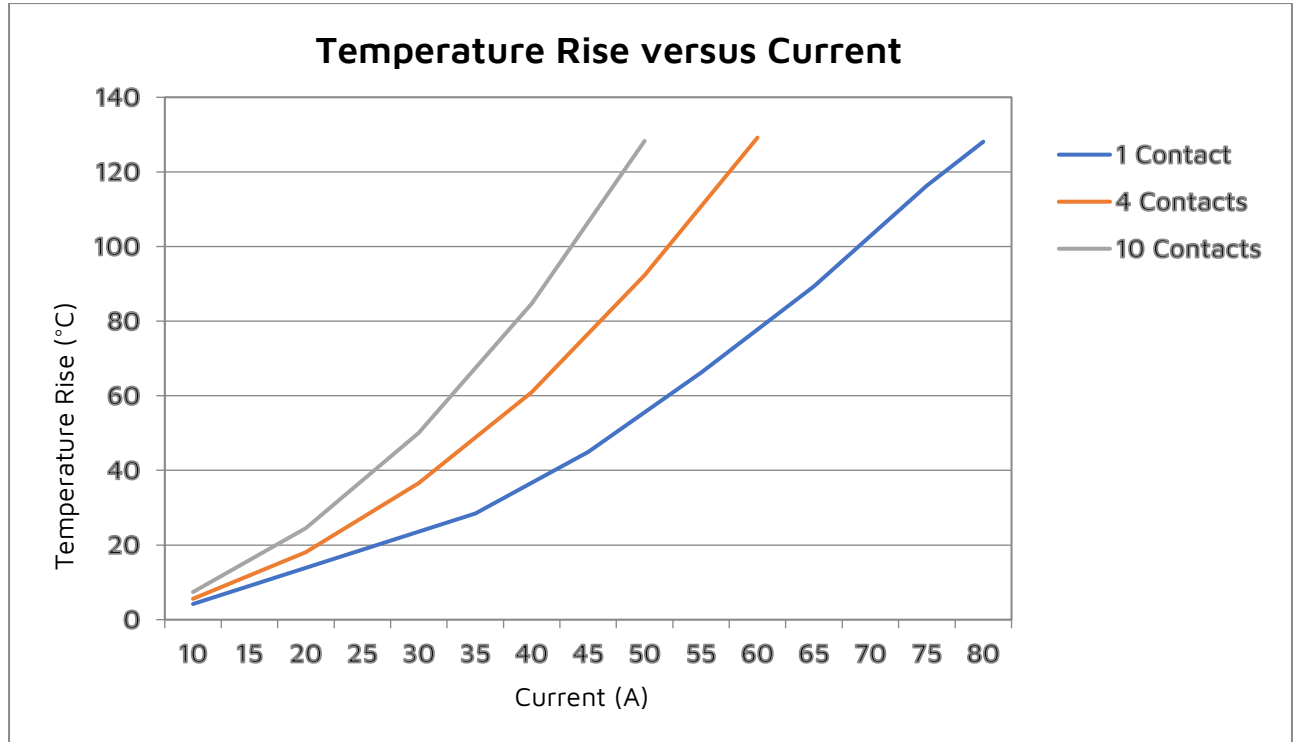
Results - 4 position test: M80-4000000F1-04-PF5-00-000 mated to M80-500000000-04-PM5-00-000 (4 Position cable connectors) – all contact pairs energised. Average results of 3 samples

	Current (A)						Ambient Temperature (°C)	
	10	20	30	40	50	60	Start	Finish
Temp. Rise (°C)	5.6	18.1	36.6	61.0	92.4	129.2	20.9	24.6



Results - 10 position test: M80-400000000-10-PF5-00-00 mated to M80-500000000-10-PM5-00-000 (2 Position cable connectors) – all contact pairs energised. Average results of 3 samples

	Current (A)					Ambient Temperature (°C)	
	10	20	30	40	50	Start	Finish
Temp. Rise (°C)	7.4	24.5	50.1	84.7	128.3	20.7	23.6



2.3.4. Durability to EIA-364-09C: 1999

Methodology: 3 samples of M80-4000000F1-02-PF5-00-00 (2 position Female cable) mated to M80-500000000-02-PM1-00-000 (2 position Male vertical PCB throughboard) connectors were measured and recorded for Contact Resistance, Insulation Resistance, Dielectric Withstanding Voltage, mating and un-mating forces prior to cycling and at specified intervals during cycling. To cycle, connectors were clamped in holding fixture with one half allowed to float, and cycled by fully mating and un-mating at 25.4mm/minute. Visual inspection also took place at specified intervals. After this test was completed, contact retention in housing was also checked.

Results: All contacts passed the requirement of 10N minimum contact retention in housing. P/F Is Pass/Fail. S1/S2/S3 Is Sample 1, Sample 2 and Sample 3.

No. of Cycles	Mating Force (N)			Un-mating Force (N)			Contact Resistance (6mΩ max)			Other Electrical Tests (P/F)			Visual Inspection (P/F)		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
0	-	-	-	-	-	-	1	0	0	P	P	P	P	P	P
10	14.1	15.7	15.0	12.1	8.6	13.7	1	0	0	P	P	P	P	P	P
30	13.4	18.1	15.4	12.7	13.5	13.8	1	1	0	P	P	P	P	P	P
50	15.8	18.2	19.4	14.6	16.1	20.1	1	0	0	P	P	P	P	P	P
100	18.6	19.5	20.4	16.2	17.9	18.1	0	0	0	P	P	P	P	P	P
200	22.1	20.3	19.1	18.2	19.0	18.1	0	0	0	P	P	P	P	P	P
300	19.8	23.6	22.2	18.2	19.2	18.0	1	1	0	P	P	P	P	P	P
400	23.5	20.9	21.9	21.9	18.9	19.0	1	0	0	P	P	P	P	P	P
500	24.9	23.25	24.0	24.5	18.1	21.8	2	0	0	P	P	P	P	P	P

2.3.5. Mating and Un-mating Forces, Method B to EIA-364-13C

Methodology: 3 samples of 2, 6 and 10 Position connectors in various configurations of Female Solder Cup to Male Solder Cup, Vertical PCB Throughboard and Horizontal PCB Throughboard were clamped in holding fixture with one half allowed to float; then fully mated and un-mating at 25.4mm/minute. Peak forces were measured and recorded.

Results - 2 position test: Female connector is M80-400000000-XX-PF5-00-00 (XX position female cable). ‡ Average of 3 samples.

Male Part No.	Male Connector Style	Mating Force (N)			Un-mating Force (N)		
		2 pos.	6 pos.	10 pos.	2 pos.	6 pos.	10 pos.
M80-500000000-XX-PM1-00-000	Vertical PCB Throughboard	12.63	26.70	-	11.85	26.10	-
M80-500000000-XX-PM3-00-000	Horizontal PCB Throughboard	8.06	32.56	-	12.70	16.00	-
M80-500000000-XX-PM5-00-000	Cable Solder	8.90	26.70	40.57 ‡	9.30	22.80	32.10 ‡