



PRODUCT SPECIFICATION

XRC™ (EXTRA RUGGED CIRCULAR) SEALED PLUGS AND RECEPTACLES

1.0 SCOPE

THIS PRODUCT SPECIFICATION COVERS THE XRC™ CIRCULAR SEALED CONNECTOR SERIES.

2.0 PRODUCT DESCRIPTION

2.1 SEALED CIRCULAR CONNECTOR ASSEMBLIES

- A. 18 SHELL – 14 PIN LAYOUT
- B. 24 SHELL – 31 PIN LAYOUT
- C. STAMPED AND FORMED PIN AND SOCKET TERMINALS
SIZE 16: 18-14 AWG

2.2 MATERIALS

- A. GLASS FILLED POLYESTER HOUSINGS
- B. NICKEL PLATED OR GOLD PLATED COPPER ALLOY TERMINALS
- C. SILICONE RUBBER SEALS

2.3 WIRE SEAL INSULATION OUTSIDE DIAMETER RANGE

- A. 18 AWG – 1.35-3.05MM (.053-.120 INCH)
- B. 16 AWG – 2.24-3.40MM (.088-.134 INCH)
- C. 14 AWG – 2.54-3.40MM (.100-.134 INCH)

2.4 SAFETY AGENCY APPROVALS

- A. UL FILE# E152602
- B. ALL PARTS ARE ROHS COMPLIANT
- C. ALL MOLDED COMPONENTS FLAMMABILITY RATED 94 V-0

3.0 SALES DRAWINGS ARE AVAILABLE FOR ASSEMBLIES AND TERMINALS

- A. SD-84501-001 18 SHELL PLUG CONNECTOR FOR PIN TERMINALS
- B. SD-84502-002 18 SHELL RECEPTACLE CONNECTOR FOR PIN TERMINALS
- C. SD-84507-002 18 SHELL PLUG CONNECTOR FOR SOCKET TERMINALS
- D. SD-84508-001 18 SHELL RECEPTACLE CONNECTOR FOR SOCKET TERMINALS
- E. SD-84502-008 18 SHELL RECEPTACLE HEX NUT
- F. SD-84502-027 18 SHELL PANEL GASKET
- G. SD-84505-001 24 SHELL PLUG CONNECTOR FOR PIN TERMINALS
- H. SD-84511-002 24 SHELL RECEPTACLE CONNECTOR FOR PIN TERMINALS
- I. SD-84510-002 24 SHELL PLUG CONNECTOR FOR SOCKET TERMINALS
- J. SD-84506-001 24 SHELL RECEPTACLE CONNECTOR FOR SOCKET TERMINALS
- K. SD-84506-012 24 SHELL RECEPTACLE HEX NUT
- L. SD-84506-062 24 SHELL PANEL GASKET
- M. SD-84537-003 24 SHELL STRAIGHT LONG BACKSHELL
- N. SD-84509-001 16 SIZE SEALING PLUG
- O. SD-84524-003 16 SIZE 14-18 AWG PIN TERMINALS, .095-.150 INSULATION DIA

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- P. SD-84525-007 16 SIZE 14-18 AWG SOCKET TERMINALS, .095-.150 INSULATION DIA
- Q. SD-84524-002 16 SIZE 14-18 AWG PIN TERMINALS, .075-.130 INSULATION DIA
- R. SD-84525-005 16 SIZE 14-18 AWG SOCKET TERMINALS, .075-.130 INSULATION DIA
- S. SD-84524-001 16 SIZE 16-18 AWG PIN TERMINALS, .055-.085 INSULATION DIA
- T. SD-84525-001 16 SIZE 16-18 AWG SOCKET TERMINALS, .055-.085 INSULATION DIA

4.0 RATINGS

4.1 CURRENT AND APPLICABLE WIRES

AWG	Amps
18	10
16	12
14	13

4.2 TEMPERATURE

Operating: - 40°C to + 125°C

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA.	30 milliohms MAXIMUM [initial]	X	X
2	Contact Resistance @ Rated Current	Mate connectors: apply a maximum voltage of 20 mV at rated current.	30 milliohms MAXIMUM [initial]	X	X
3	Insulation Resistance	Unmate connectors and apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Mega Ohms MINIMUM	X	X
4	Dielectric Withstanding Voltage	Unmate connectors and apply a voltage of 1600 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown; current leakage < 5 mA	X	X

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ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
5	Current Rating at Maximum Temperature Rise	Mate connectors 10 times and then incrementally increase the input current thru all positions of a fully loaded Connector until the Temperature Rise Stabilizes below the Maximum Material Ratings.	+125°C Maximum at Rated Current	X	X
6	Current Cycling	Mate connectors 10 times then submit to 200 hours of Rated Current Cycling (45 minutes on / 15 minutes off)	Millivolt Drop across terminals shall not exceed 10 millivolts / amp	X	X

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
7	Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 50 ± 6 mm (2 ± ¼ inch) per minute.	53.4 N (12 lbf) MINIMUM retention force	X	X
8	Terminal Insertion Force (in Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch).	22.2 N (5 lbf) MAXIMUM insertion force	X	X
9	Durability	Mate Nickel Plated and Gold Plated terminals up to 250 times at a maximum rate of 10 cycles per minute.	10 milliohms Maximum (change from initial)	X	X
10	Vibration (Random)	Mate connectors 10 times, and vibrate from 10Hz to 2000Hz to 10Hz for 8 hours in each of three mutually perpendicular axes (X, Y, Z) with a maximum acceleration of 20g.	10 milliohms Maximum (change from initial) & Discontinuity < 1 microsecond	X	X

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ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
11	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch) for 1 minute.	Minimum pullout force N (lbf) 18 awg 88.9(20) 16 awg 133.5(30) 14 awg 222.4(50)	X	X

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
12	Thermal Cycling	Mate connectors 10 times and then expose to 120 cycles of: <u>Temp°C</u> <u>Duration (Mins)</u> -40 180 +125 180 And Repeat (3-5°C/minute Transfer Rate)	10 milliohms Maximum (change from initial) & Visual: No Damage	X	X*
13	Immersion	Mated connectors are submerged in 10 ft of Sea (salt) Water for 20 minutes.	No Water penetration into connector is allowed.	X	
14	Thermal Aging	Mate connectors 10 times and then expose to 336 hours at 125 ± 2°C	10 milliohms Maximum (change from initial) & Visual: No Damage	X	X
15	Salt Spray	Mated connectors are submitted to 500 hours exposure to Salt Spray of a 5% solution at a temperature of 35 +1/-2°C	10 milliohms Maximum (change from initial) & Visual: No Damage	X	X
16	Temp/Humidity Cycling	Mated Connectors are submitted to 15 Cycles of 16 hrs @ 95% RH & 40°C 2 hrs @ -40°C 2 hrs @ +125°C 4 hrs @ Room Ambient (25°C)	10 milliohms Maximum (change from initial)	X	X*

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ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	TEST PERFORMED	
				18-14	24-31
17	Low Temp	Mate connectors 10 times and then expose to 96 hours at $-40 \pm 3^{\circ}\text{C}$	10 milliohms Maximum (change from initial) & Visual: No Damage	X**	X
18	Fluid Compatibility (Seals)	Submerge seals for 30 minutes minimum in each of the following automotive fluids: antifreeze, 2 cycle oil, ASTM IRM 903 oil, and gear oil	Visual: No Damage or Change in Fit, Form or Function.	X	X
19	IP67	IP6X - Expose mated connector to suspended dust under pressure IPX7 – Submerge mated connector under water 1 meter minimum for 30 minutes minimum duration.	No breakdown; current leakage < 5mA & Visual: No dust or water	X	X

* Performance qualification based on 18-14 validation test results. 24-31 and 18-14 connectors are of similar construction, utilize the same crimp terminals and are manufactured using identical materials.

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6.0 PACKAGING

ASSEMBLIES SHALL BE PACKAGED IN TRAYS TO PROTECT AGAINST DAMAGE DURING HANDLING, TRANSIT AND STORAGE.

7.0 APPLICATION TOOLING

A. MOLEX FINE ADJUST APPLICATORS

- I. 16-18 AWG WIRE WITH .055-.070" INSULATION DIAMETER
APPLICATOR NUMBER 63868-1000
- II. 16-18 AWG WIRE WITH .070-.085" INSULATION DIAMETER
APPLICATOR NUMBER 63868-1100
- III. 14-18 AWG WIRE WITH .075-.095" INSULATION DIAMETER
APPLICATOR NUMBER 63867-9000
- IV. 14-18 AWG WIRE WITH .095-.150" INSULATION DIAMETER
APPLICATOR NUMBER 63867-9200

B. MOLEX HAND CRIMP TOOLS

- I. 16-18 AWG WIRE WITH .055-.085" INSULATION DIAMETER
HAND CRIMP NUMBER 63811-5500
- II. 14-18 AWG WIRE WITH .075-.130" INSULATION DIAMETER
HAND CRIMP NUMBER 63811-5600
- III. 14-18 AWG WIRE WITH .095-.150" INSULATION DIAMETER
HAND CRIMP NUMBER 63811-5800

C. MOLEX TERMINAL EXTRACTION TOOL

63813-1900

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