



The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

AMR Bot and Charging Connectors

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for the TE Connectivity (TE) AMR Bot and Charging connector family. This product is available in configurations including 2 or 3 power contacts in conjunction with 8 signal contacts.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon completion of qualification testing.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-160271: AMR Bot and Charging Connector Application Specification
- 501-134149: Qualification Test Report

2.2. Industry Documents

- EIA-364

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials, and physical dimensions specified on the applicable product drawings.

3.2. Ratings:

	Voltage	Current	Wire Size	Temperature
Power	125VAC	40A	8 AWG	-20° to 60°C
		35A	10 AWG	
Signal		0.5A	22-28 AWG	

3.3. Performance and Test Description

Product is designed to meet the electrical, mechanical, and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.4. Test Requirements and Procedures Summary.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Initial examination of product	Meets requirements of product drawing and Application Specification 114-160271	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	<u>Power Contact:</u> 1.0 milliohms maximum – initial Δ 0.7 milliohms maximum – final <u>Signal Contact:</u> 16 milliohms maximum – initial Δ 55 milliohms maximum – final	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. Remove bulk wire resistance.
Insulation Resistance.	100 meg-ohms minimum	EIA-364-21. 500 volts DC, 2-minute hold. Test between adjacent contacts of mated specimens.
Withstanding Voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1250 volts AC at sea level. Test performed between adjacent power contact positions and between signal contact positions.
Temperature Rise vs Current.	45°C maximum temperature rise at specified current. Refer to section 3.2 for current value.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C. All power contacts and signal contacts are energized during testing.
Current Cycle	40°C maximum temperature rise on 8AWG and 45° on 10 AWG during the “ON” period of the cycle.	EIA-364-55, Condition C Apply 40 amperes to 8AWG and 35 amperes to 10AWG each power contact for 84 cycles each consisting of 5 hours “ON”, 1 hours “OFF”.
MECHANICAL		
Random Vibration.	No discontinuities of 1 microsecond or longer duration. Power contacts only See Note (a).	EIA-364-28, Condition VII, Level D. Subject mated specimens to 20-500 Hz at random levels at 3.1G's rms. 15 minutes in each of 3 mutually perpendicular planes.
Mechanical Shock.	No discontinuities of 1 microsecond or longer duration. Power Contacts only	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.

Connector Mating Force	40N maximum force (2P + 8S) 60N maximum force (3P + 8S)	EIA-364-13. Measure force necessary to mate fully populated connector (28.0mm mounting flange to mounting flange dimension) at a maximum rate of 12.7 mm per minute.
Connector Un-Mating Force	30N maximum force (2P + 8S) 45N maximum force (3P + 8S)	EIA-364-13. Measure force necessary to disconnect a fully populated connector (starting position is with a 28.0mm mounting flange to mounting flange dimension) at a maximum rate of 12.7 mm per minute.
Crimp Tensile Strength (power contact)	500N minimum force (8AWG) 400N minimum force (10AWG)	EIA-364-8. Measure force necessary to remove wire from crimped power contact at a maximum rate of 25.4 mm per minute.
Durability	See Note (a)	EIA-364-9: Mate and un-mate specimens for 12,000 cycles at a maximum rate of 360 cycles per hour.
Contact TPA Retention	600N minimum force.	EIA-364-8. Measure force necessary to pull contact TPA from housing assembly at a maximum rate of 12.7 mm per minute.

ENVIRONMENTAL

Thermal Shock.	See Note (a)	EIA-364-32. Subject mated specimens to 50 cycles between -30 and 75°C with 60-minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/Temperature Cycling.	See Note (a)	EIA-364-31, Method IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH
Temperature life	See Note (a)	EIA-364-17 Method A (without load), (95° ±2°C), Time Condition C (500 hrs.)



NOTE (a):

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

Figure 1 (end)

3.5. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	Test Group (a)						
	A	B (d)	C	D (d)	E	F	G
	Test Sequence (b)						
Initial examination of product	1	1	1	1	1	1	1
LLCR	2,5(c)	2,7(c)	2, 9(c)	2, 4	2, 4		
Insulation Resistance			3,7				
Withstanding Voltage			4, 8				
Temperature Rise vs Current		3,8					
Random Vibration	3	6					
Mechanical Shock	4						
Crimp Tensile Strength (Power)						2	
Current Cycling				3			
Connector Mating Force							2
Connector Un-Mating Force							3
Contact TPA Retention							4
Durability					3		
Thermal Shock			5				
Humidity/Temperature Cycling		4	6				
Temperature Life		5					
Final examination of product	6	9	10	5	5	3	5


NOTE

- (a) See paragraph 4.1.A
- (b) Numbers indicate sequence in which tests are performed.
- (c) Unmate and mate 1 time for reseating before final LLCR.
- (d) Signals are not measured in this Test Group

FIGURE 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Minimum specimen quantities are shown in Figure 3.

Specimen Description	Test Group							Total QTY
	A	B	C	D	E	F	G	
	Quantity (Minimum)							
2399991-1 (2P+8S)	1	4	2	2	3	-	4	16
2399992-1 (2P+8S)	1	4	2	2	3	-	4	16
2400405-1 (3P+8S)	3	2	3	3	2	-	2	15
2400406-1 (3P+8S)	3	2	3	3	2	-	2	15
2390328-1	11	14	13	13	12	10	14	87
2390329-1	11	14	13	13	12	10	14	87
794192-1	8	-	10	-	10	-	-	40
1-794217-0 or 1-794219-0	64	-	80	-	80	-	-	304
8AWG Stranded Cu Wire	22	28	26	-	12	10	14	112
10AWG Stranded Cu Wire	-	-	-	26	12	10	14	62
28AWG Stranded Cu Wire	64	-	80	-	80	-	-	224
26AWG Stranded Cu Wire	-	-	-	-	-	-	-	96

FIGURE 3

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 3.

4.2. Requalification testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality, and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken, and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.