Low Profile Terminal Block Assembly

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Terminal Block Assembly for field wiring attachment to appliances.

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

Successful qualification testing on the subject product line was completed on 11Nov03. The Qualification Test Report number for this testing is 501-573. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. Tyco Electronics Documents

- 109 Series: Test Specifications as indicated in Figure 1
- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 501-573: Qualification Test Report

2.2. Industry Standard

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage: 300 volts AC
- Current:
  - 65 amperes for 4 AWG aluminum to 6 AWG copper wire
  - 55 amperes for 6 AWG aluminum to 8 AWG copper wire
  - 45 amperes for 8 AWG aluminum to 10 AWG copper wire
- Temperature: -30 to 120˚C

3.4. 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 per EIA-364.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	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.	0.5 milliohm maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 3.
Insulation resistance.	5000 megohms minimum.	EIA-364-21. Test between adjacent contacts.
Withstanding voltage.	1 minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1600 volts AC at sea level. Test between adjacent contacts.
Temperature rise vs current.	30˚C maximum temperature rise at specified current.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1˚C. See Figure 4
Current cycling.	See Note.	AMP Spec 109-51, Test Condition B, Test Method 4. Subject specimens to 500 cycles at 125% of rated current for 45 minutes ON and 15 minutes OFF.

Figure 1 (cont)

Test Description	Requirement	Procedure
	MECHANICAL	
Vibration, sinusoidal.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition I. Subject mated specimens to 10-55-10 Hz traversed in 1 minute with 1.5 mm maximum total excursion. 2 hours in each of 3 mutually perpendicular planes. See Figure 5.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. See Figure 5.
Screw torque.	Screw Size: Torque (N•m max) #10: 3.5 M-6: 5.5 No thread stripping or cracked housings.	AMP Spec 109-183. Apply torque to terminal block screws.
Wire retention.	Wire Size (AWG): Pullout Force (N) 4 aluminum: 160 6 copper: 94 6 aluminum: 124 8 copper: 90 8 aluminum: 44 10 copper: 80	AMP Spec 109-46-1, Test Condition Z. Subject specimens to the specified axial load at a maximum rate of 20 N per second and hold for 1 minute.
	ENVIRONMENTAL	
Thermal shock.	See Note.	EIA-364-32, Test Condition VIII. Subject specimens to 25 cycles between -40 and 105˚C.
Humidity-temperature cycling.	See Note.	EIA-364-31, Method III. Subject specimens to 10 cycles (10 days) between 25 and 65˚C at 80 to 100% RH.

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105˚C for 500 hours.

NOTE *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)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
Low level contact resistance	2,5	2,5,7,9		2,4	
Insulation resistance			2,6		
Withstanding voltage			3,7		
Temperature rise vs current		3,10			
Current cycling				3	
Vibration, sinusoidal	3	8(c)			
Mechanical shock	4				
Screw torque	6				
Wire retention					3
Thermal shock			4		2
Humidity-temperature cycling		4	5		
Temperature life		6			
Final examination of product	7	11	8	5	4

NOTE
(a) See paragraph 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Discontinuities shall not be measured. Energize at 18˚C level for 100% loadings per Specification 102-950.

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. Each test group shall consist of 5 specimens.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

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.

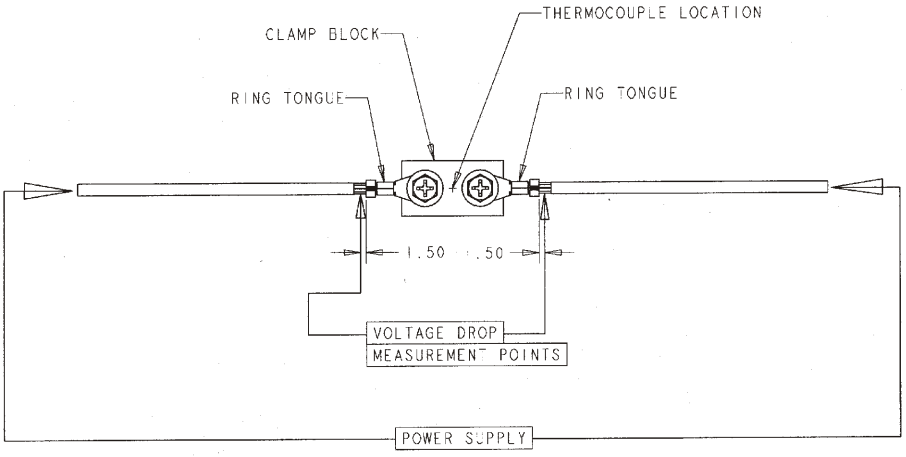


Figure 3A

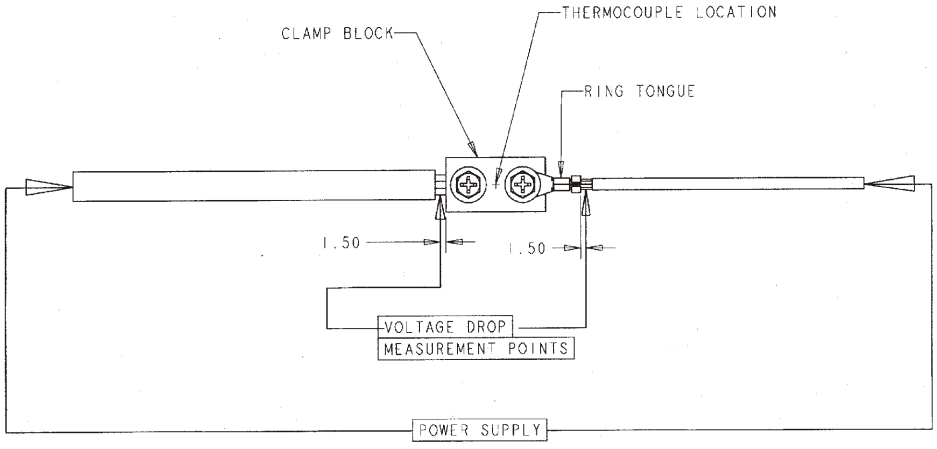
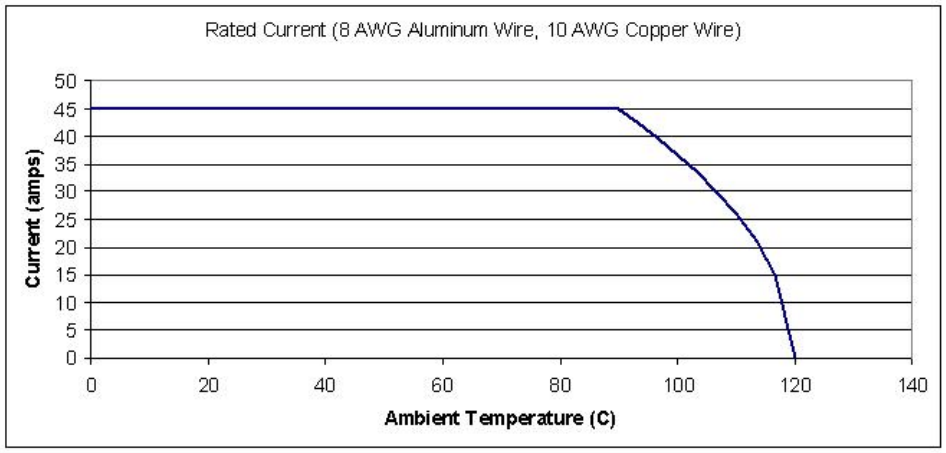
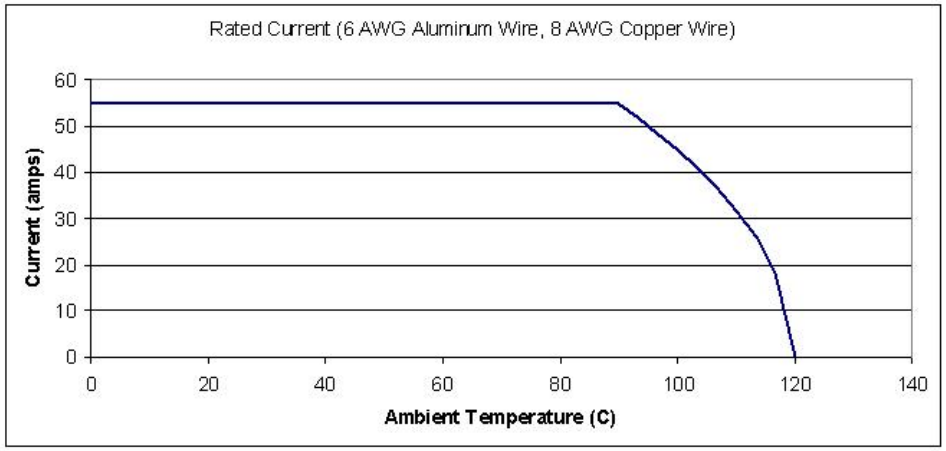


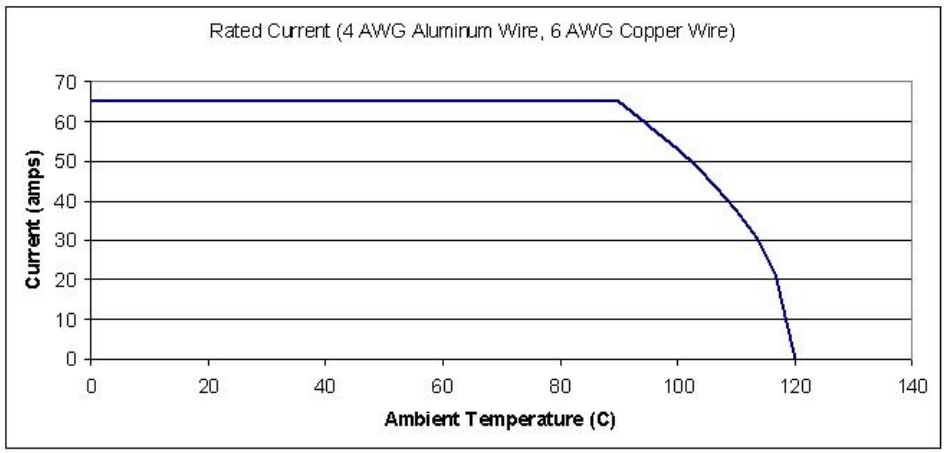
Figure 3B
Low Level Contact Resistance Measurement Points



| Current Rating at 105˚C = 31.8 amperes

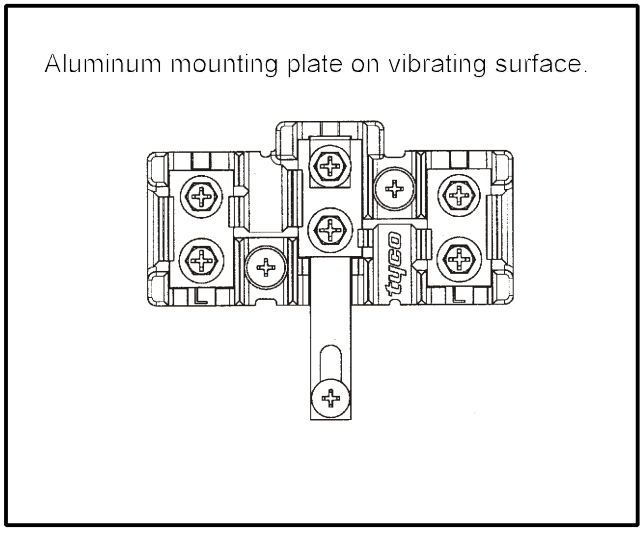


| Current Rating at 105˚C = 41.0 amperes



| Current Rating at 105˚C = 46.0 amperes

| Figure 4
| Current Carrying Capability



NOTE *Wires (not shown) shall be clamped at 450 ± 50 mm from housing edge to non-vibrating support.*

Figure 5
Vibration & Mechanical Shock Mounting Fixture