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## Timer Connector Terminal

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### 1. SCOPE

#### 1.1. Content

This specification covers the performance, tests and quality requirements for the AMP\* timer connectors. These connectors are designed to mate directly with timing mechanisms on dish washers and other major appliances which require interconnection requiring timed operation cycles.

#### 1.2. Qualification

When tests are performed on the subject product line, the procedures specified in AMP 109 series specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

### 2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. 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. AMP Specifications

- A. 109-1: General Requirements for Test Specifications
- B. 109 Series: Test Specifications as indicated in Figure 1.  
(Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
- C. 114-2020: Terminal, Timer Connector, Application of

### 3. REQUIREMENTS

#### 3.1. Design and Construction

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

3.2. Materials

- A. Housing: Nylon 6/6, 94 V-2
- B. Terminals: Brass, pre-tin

3.3. Ratings

- A. Current/Voltage: 240 vac at 12 amperes maximum
- B. Operating Temperature: -55° to 105°C

3.4. Performance and Test Description

Connectors shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure																		
Examination of Product	Meets requirements of product drawing and AMP Spec 114-2020.	Visual, dimensional and functional per applicable inspection plan.																		
<b>ELECTRICAL</b>																				
Termination Resistance, Specified Current	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Wire Size, AWG</th> <th>Test Current, ampere</th> <th>Resistance, milliohms maximum initial</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>3.0</td> <td>3.0</td> </tr> <tr> <td>20</td> <td>4.5</td> <td>3.0</td> </tr> <tr> <td>18</td> <td>6.0</td> <td>3.0</td> </tr> <tr> <td>16</td> <td>8.0</td> <td>2.5</td> </tr> <tr> <td>14</td> <td>10.0</td> <td>2.5</td> </tr> </tbody> </table>	Wire Size, AWG	Test Current, ampere	Resistance, milliohms maximum initial	22	3.0	3.0	20	4.5	3.0	18	6.0	3.0	16	8.0	2.5	14	10.0	2.5	Measure potential drop of mated contacts assembled in housing, see Figure 4; AMP Spec 109-25, calculate resistance.
Wire Size, AWG	Test Current, ampere	Resistance, milliohms maximum initial																		
22	3.0	3.0																		
20	4.5	3.0																		
18	6.0	3.0																		
16	8.0	2.5																		
14	10.0	2.5																		
Termination Resistance, Dry Circuit (Low Level)	3.0 milliohms maximum initial.	Subject mated contacts assembled in housing to 50 mv open circuit at 100 ma maximum, see Figure 4; AMP Spec 109-6, cond A																		
Dielectric Withstanding Voltage	1500 vac dielectric withstanding voltage, one minute hold.	Test between adjacent contacts of mated connector assemblies; AMP Spec 109-29-1.																		
Insulation Resistance	1000 megohms minimum initial.	Test between adjacent contacts of mated connector assembly, AMP Spec 109-28-4.																		

Figure 1 (cont)

Test Description	Requirement	Procedure
Temperature Rise vs. Current (a)	Temperature rise, see Figure 2 and 4; termination resistance, specified current.	T-rise at rated current; AMP Spec 109-45.
<b>MECHANICAL</b>		
Vibration (b)	No discontinuities greater than 1 microsecond; 5.0 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at .06 inches total excursion; 2 hours in each of 3 mutually perpendicular planes; AMP Spec 109-21-1, cond A.
Mating Force	3.0 pounds maximum initial.	Measure force necessary to mate connector assembly with locking latches, a distance of from point of initial contact incorporating free floating fixtures at a rate of 0.5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.
Unmating Force	.5 pounds minimum final.	Measure force necessary to unmate connector assembly with locking latches removed, at a rate of 0.5 inch/minute; AMP Spec 109-42, cond A, calculate force per contact.
Contact Retention	8 pounds minimum.	Apply axial load to crimped contacts; AMP Spec 109-30 except grip wire.
Crimp Tensile	Wire Size, Crimp Tensile, <u>AWG</u> <u>pounds minimum</u> 22            14 20            14 18            30 16            45 14            50	Determine crimp tensile at a rate of 1 inch/minute; AMP Spec 109-16.

Test Description	Requirement	Procedure
Durability	Mating-unmating; 5.0 milliohms maximum termination resistance, dry circuit.	Mate and unmate connector assemblies for 10 cycles; AMP Spec 109-27.
ENVIRONMENTAL		
Temperature-Humidity Cycling	500 megohms final insulation resistance, 10.0 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 10 temperature-humidity cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B, with low frequency vibration and cold shock at -10°C.
Corrosion, Salt Spray	8.0 milliohms maximum termination resistance, dry circuit.	Subject mated connectors to 5% salt concentration for 48 hours; AMP Spec 109-24, cond B.

- (a) Maximum rated current that can be carried by this product is limited by maximum operating temperature of housings, which is 105°C, and temperature rise of contacts, which is 30°C. Variables which shall be considered for each application are: wire size, connector size, contact material, and ambient temperature.
- (b) Shall remain mated and show no evidence of damage, cracking or chipping.

Figure 1 (end)

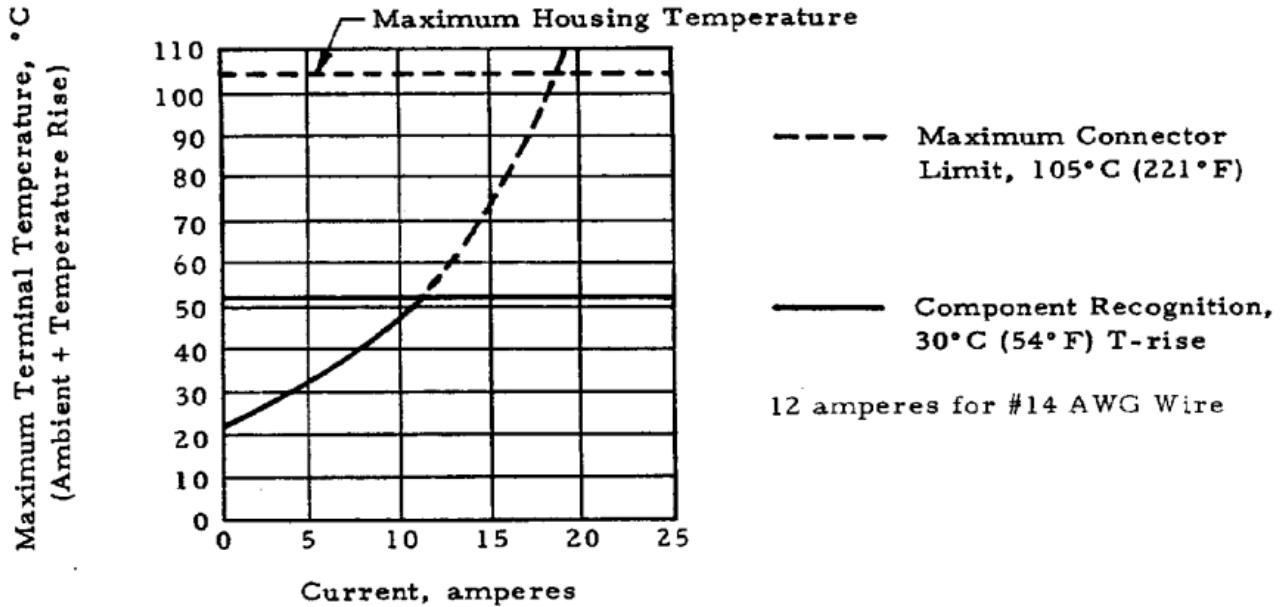


Figure 2

3.6. Connector Tests and Sequences

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Examination of Product	1						
Termination Resistance, Specified Current		2					
Termination Resistance, Dry Circuit			1, 3, 5	1, 5	2, 4		
Dielectric Withstanding Voltage				2, 6			
Insulation Resistance				3, 7			
Temperature Rise vs Current		1					
Vibration			2				
Mating Force					1		
Unmating Force					5		
Contact Retention							1
Crimp Tensile						1	
Durability					3		
Temperature-Humidity Cycling				4			
Corrosion, Salt Spray			4				

(a) See Para 4.1.A.

(b) Numbers indicate sequence in which test are performed

Figure 3

#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Sample Section

Connector housings and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test group 1 shall consist of 1 contact and 1 housing of each type. Test groups 2 through 5 shall consist of two, 18 position connector assemblies. Test group 6 shall consist of 15 contacts crimped on each wire size. Test group 7 shall consist of 15 contacts crimped on number 14 AWG wire. All contacts shall be crimped to appropriate PN 103501 and 103502 tin plated test conductors in accordance with AMP Specification 114-2020. All contacts shall be mated with pre-tinned male spade, .020 x .125 where specified. Product covered under this specification include AMP PN's 61603, 61604, 480553, 480556, 641414 and 641415.

###### B. Test Sequence

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

###### C. Acceptance

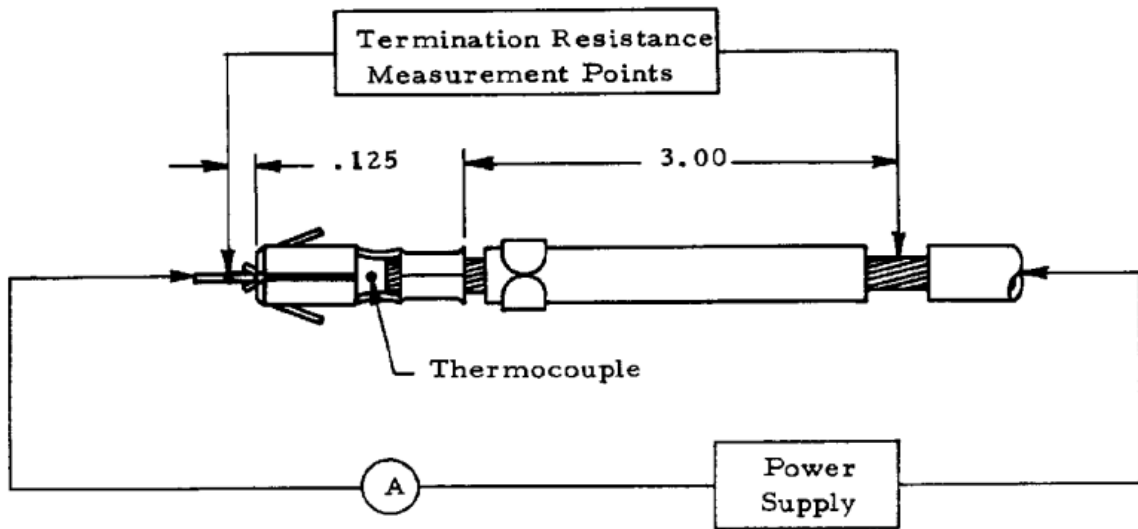
- (1) Requirements put on test samples, as indicated in the requirements portion of Figure 1, exist as either the upper or lower statistical tolerance limit (95% confidence, .99% reliability). All samples tested in accordance with this specification shall meet the stated tolerance limit.
- (2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

##### 4.2. Quality Conformance Inspection

The applicable AMP inspection plan will 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.

##### 4.3. Certification

This product has been Recognized under the Component Recognition Program of Underwriters Laboratories Inc. Electrical File Number E-28476, and Certified by Canadian Standards Association, File Number LR-16455.



- Notes: 1. A 1 foot minimum length of continuous lead for heat dissipation.  
 2. Termination resistance equals millivolts divided by test current less resistance of 3 inches of wire.

**Figure 4**  
**Resistance and Temperature Measurement Points**