PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the AMP* universal panel mount programming system.

1.2. Operation

Universal panel mount programming systems function as manually operated switching devices, with the variety of switching combinations determined by the selection and placement of patchcords. They are general purpose systems, are nonshielded and have removable patchboards. They are designed for panel mounting.

1.3. Position

The programming systems are available in many sizes and configurations. Standard sizes include the 240, 480, 816, 1224, 1632, 3264 and 4896 with the number of contacts and model number corresponding respectively. Contact spring spacing is nominally .250.

1.4. Termination

Rear board wiring of universal programming systems can be accomplished in various manners. Basically, the system shall be ordered with a specific termination concept in mind. The standard available methods are LANCELOK*, AMP taper pin, TERMI-POINT* or wrap type, or the AMPMODU* interconnection system. It is often desirable and optionally possible to combine rear panels of different termination methods creating a hybrid for specialized applications. Each termination method is precision engineered and will result in excellent electrical performance.

1.5. 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.

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LTR	REVISION RECORD	APP	DATE

DR Fred Rinehart 1/11/82
CHK A E Plotts 1-11-82; J.R. Cooper 1-11-82
APP J.J. Conrad 1/11/82

AMP | AMP INCORPORATED Harrisburg, Pa.

LOC B | A | NO 108-7501 | REV 0

NAME PROGRAMMING SYSTEM, UNIVERSAL PANEL MOUNT

DIST 07

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)

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

A. Frames: Passivated stainless steel or anodized aluminum
B. Engaging mechanisms: Passivated stainless steel
C. Safety rails: Steel alloy, zinc plated
D. Program boards: Phenolic, general purpose, mineral filled or diallyl phthalate, asbestos filled
E. Contact springs: Copper alloy with electro-tin or gold over nickel plating
F. Hardware: Corrosion resistant steel

3.3. Ratings

A. Current/Voltage

(1) Nonswitching: 5.0 amperes maximum at 200.0 vdc (resistive load)
(2) Switching: It is not recommended that this programming system be switched while electrically energized.

B. Temperature

(1) Operating: -40° to 80°C (-40° to 176°F)
(2) Thermal shock: -45° to 85°C (-49° to 185°F)
(3) Storage (nonoperating): -48° to 88°C (-55° to 190°F)

3.4. Performance and Test Description

Programming systems are designed to meet the electrical, mechanical and environmental requirements specified in Figure 1. These requirements are stated independently and may be degraded when systems are subjected to combinations of these dependent variables.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing.	Visual, dimensional and functional per applicable inspection plan.
ELECTRICAL		
Contact Resistance, Specified Current	25 milliohms maximum for nickel plated systems.	Measure potential drop of mated contacts assembled in system, see Figure 3; AMP Spec 109-25, 5 amperes maximum, calculate resistance.
Contact Resistance, Dry Circuit (Low Level)	10 milliohms maximum for gold plated system.	Subject mated contacts assembled in system to 50 mv maximum open circuit at 25 ma maximum, see Figure 3; AMP Spec 109-6-7.
Dielectric Withstanding Voltage	1.0 Kvac (rms) or 1.0 Kvdc dielectric withstanding voltage, one minute hold. .1 milliampere maximum leakage current; no flashover or corona.	Test between adjacent contact springs and contact springs and frame; AMP Spec 109-29-1.
Insulation Resistance	1.0×10^6 megohms minimum for diallyl phthalate; 1.0×10^4 megohms minimum phenolic.	Test between adjacent contact springs and contact springs and frame; AMP Spec 109-28-4.
Temperature Rise vs Current (Electrical Stability)	Temperature rise shall not exceed 30°C; thermocouple shall be attached to spring beam; contact resistance.	T-rise at specified current; AMP Spec 109-45-1. 5.0 amperes through any set of contacts or series of contacts until temperature stabilizes.

Figure 1 (cont)

Test Description	Requirement	Procedure
Capacitance	3.0 picofarads maximum.	Test between adjacent contact springs and contact springs and frame; AMP Spec 109-47, cond D.
Self-Inductance	.05 microhenries maximum.	Use a suitable inductance bridge at 100 kHz and measure for the conductor length shown in Figure 3.
MECHANICAL		
Durability	No physical damage; 10 milliohms maximum final for gold plated system; 25 milliohms maximum final for nickel plated systems; dielectric withstanding voltage, final; insulation resistance, final.	Subject system to 50,000 cycles of mechanical operation; AMP Spec 109-27.
ENVIRONMENTAL		
Thermal Shock	No physical damage; contact resistance.	Subject system in the 1/2 programmed condition to 5 nonoperating cycles between -45° and 85°C; AMP Spec 109-22.
Temperature-Humidity Cycling	Final insulation resistance after drying period; dielectric withstanding voltage; termination resistance.	Subject mated system to 10 temperature-humidity cycles between 25° and 80°C at 70% RH; AMP Spec 109-23, method III, cond B, except high temperature as noted, cold shock at -40°C for all cycles.

Figure 1 (end)

3.6. Switch Tests and Sequences

Test or Examination	Test Group (a)	
	1	2
	Test Sequence (b)	
Examination of Product	1,9,11,15,23	1,9,11,15,23
Contact Resistance, Specified Current (c)		2,8,12,18,20
Contact Resistance, Dry Circuit (c)	2,8,12,18,20	
Dielectric Withstanding Voltage	4,17,21	4,17,21
Insulation Resistance	3,13,16,22	3,13,16,22
Temperature Rise vs Current	7	7
Capacitance	5	5
Self Inductance	6	6
Durability	19	19
Thermal Shock	10	10
Temperature-Humidity Cycling	14	14

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Use proper contact resistance methods for plated contacts being tested.

Figure 2

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Section

Programming system 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 any standard size system with a full compliment of gold plated contacts. Test group 2 shall consist of any standard size system with a full compliment of nickel plated contacts. A minimum of 25 contacts shall be used for all measurements.

B. Test Sequence

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

C. Acceptance

(1) Requirements put on test samples, as indicated in the requirements portion of Figure 1, exist ad 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.

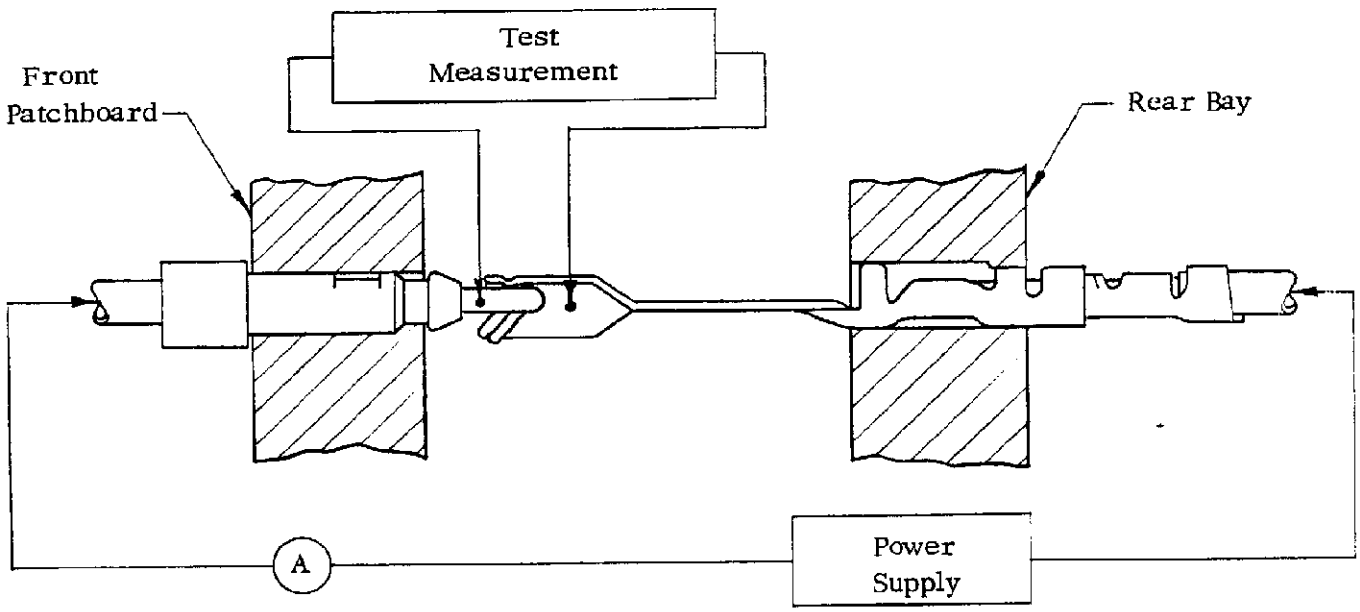

Figure 3

Contact Resistance and Inductance Measurement Points