

**Positive Lock MK III, .250" (6,3 mm) series**

**Design Objectives**

*This product described in this document has not been fully tested to insure conformance to the requirements outlined below . Therefore , Tyco Electyronics Brazil makes no representation or warranty , express or implied , that the product will comply with these requirements . Further , Tyco Electronics Brazil may change these requirements based on the results of additional testing and evaluation . Contact Tyco Engineering for further details .*

**1. SCOPE**

This specification covers the requirements for product performance , test methods and quality assurance provisions of "Positive Lock MK III, .250 series Contacts and Housings" Tyco P/N's 1380087 ; 1380088 ; 1380089 ; 1380095 ; 521120 and 1380042 .

These terminals mate with tab size .250" (6,3 mm) series with hole and that is according to the commercial standard IEC 760 . These terminals and housings are suitable for Consumer Goods applications in which low insertion forces are needed .

**2. APPLICABLE DOCUMENTS**

The following documents form 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 the conflict between the requirements of this specification and the referenced documents , this specification shall take precedence .

**2.2 AMP Specifications**

- a) 109-1 Test Specification , General Requirements for Test Methods.
- b) 114 Application specification

**2.2 Commercial Standards and Specifications**

- a) EIA Publication 364
- b) IEC Publication 60512
- c) IEC Publication 760 , (edition 1989) flat, Quick-Connect Termination .
- d) UL 310 , (Sixth Edition – August 3, 1995) , Electrical Quick-Connect Terminals

**3. REQUIREMENTS**

**3.1 Design and Construction**

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

The Positive Lock Terminal has a sectioned part along their rolled body that is responsible for low insertion force . The own concept of the connection also helps in the reduction of the insertion force .

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Tyco Electronics Brasil Ltda.

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### 3.2 Materials

- a) Terminals : Brass , Temper H04 , tin plated and unplated .  
 b) Housings : PA 6.6 , UL94 V2 and UL94 V0 .

### 3.3 Wire Range

Wire Range (mm <sup>2</sup> )	Max. Ø – outside (mm)	Current Max.
0,20	2,30	2,0 A
0,35	2,30	3,0 A
0,50	2,30 / 2,70	5,0 A
0,75	2,70	6,5 A
1,00	2,70	8,0 A
1,50	3,70	10,0 A
2,00	3,70	14,0 A
2,50	3,70	16,5 A
4,00	4,50	23,5 A

## 4. RATINGS

- a) Temperature Rating : -55°C to 105°C including the temperature increases due to working current flow .  
 b) Maximum Operating Voltage : 240 V a.c. ; for application at higher voltage please contact Tyco Electronics .

## 5. QUALITY ASSURANCE PROVISION

### 5.1 Sample Preparation

Samples used for the tests shall be prepared by randomly selected components from the current production ; and the contact crimped in accordance with the application specification . No sample shall be reused , unless otherwise specified . Use a set minimum of 5 samples to each test of this specification .

### 5.2 Test Condition

All the tests shall be performed under the following environmental conditions , unless otherwise specified .

- Room temperature : 23° ± 5° C.
- Relative Humidity : 45% ~ 75%.
- Atmospheric Pressure : 860 ~1060 mbar.

## 5.3 Test Requirements And Procedures Summary

Test	Test Items	Requirements	Procedures																				
1	Confirmation of product and visual examination	Product shall be conforming to the requirements of applicable product drawing and application specification, without any visible damage, cracking or defect when the product is new and even after environmental, mechanical and electric tests.	-Visually, dimensional and functionally inspected per applicable quality inspection plan. -Visual inspection.																				
<b>Electrical</b>																							
2	Termination Resistance, Specified Current (According to item 4.3)	<table border="1"> <thead> <tr> <th>Wire Size (mm<sup>2</sup>)</th> <th>Resistance (mΩ max.)</th> </tr> </thead> <tbody> <tr><td>0,20</td><td>4,70</td></tr> <tr><td>0,35</td><td>3,30</td></tr> <tr><td>0,50</td><td>2,20</td></tr> <tr><td>0,75</td><td>1,90</td></tr> <tr><td>1,00</td><td>1,70</td></tr> <tr><td>1,50</td><td>1,60</td></tr> <tr><td>2,00</td><td>1,40</td></tr> <tr><td>2,50</td><td>1,25</td></tr> <tr><td>4,00</td><td>1,00</td></tr> </tbody> </table>	Wire Size (mm <sup>2</sup> )	Resistance (mΩ max.)	0,20	4,70	0,35	3,30	0,50	2,20	0,75	1,90	1,00	1,70	1,50	1,60	2,00	1,40	2,50	1,25	4,00	1,00	- Measure potential drop of mated contacts according to test 2b, section 2 of IEC 60512-2. - Results for resistance are referenced in UL 310 (Appendix B – Millivolt Drop test – 24 hours – Tin-to-Tin).
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0,35	3,30																						
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1,00	1,70																						
1,50	1,60																						
2,00	1,40																						
2,50	1,25																						
4,00	1,00																						
3	Temperature Rise X Current	Temperature rise of any individual termination shall not exceed 30° C. (T-rise = T. of Conn. – Room T.).	- Apply current per each cable, and measure the temperature according to EIA 364-70B.																				
4	Current Cycling	<p>After 24 cycles and at completion of 500 cycles, the following requirements shall be met:</p> <p>a) Termination Resistance shall not exceed the following limits:</p> <table border="1"> <thead> <tr> <th>Wire Size (mm<sup>2</sup>)</th> <th>Resistance (mΩ max.)</th> </tr> </thead> <tbody> <tr><td>0,20</td><td>6,70</td></tr> <tr><td>0,35</td><td>4,70</td></tr> <tr><td>0,50</td><td>3,00</td></tr> <tr><td>0,75</td><td>2,55</td></tr> <tr><td>1,00</td><td>2,20</td></tr> <tr><td>1,50</td><td>2,10</td></tr> <tr><td>2,00</td><td>1,80</td></tr> <tr><td>2,50</td><td>1,60</td></tr> <tr><td>4,00</td><td>1,20</td></tr> </tbody> </table> <p>b) Temperature Rise of each termination shall not exceed 85°C.</p>	Wire Size (mm <sup>2</sup> )	Resistance (mΩ max.)	0,20	6,70	0,35	4,70	0,50	3,00	0,75	2,55	1,00	2,20	1,50	2,10	2,00	1,80	2,50	1,60	4,00	1,20	- Subject mated contacts to 500 cycles at 200% rated current for: 45 minutes "ON"; 15 minutes "OFF". - Test shall be performed in accordance with Tyco 109-51, Condition D, Method 4. - Results for resistance are referenced in UL 310 (Appendix B – Millivolt Drop test – 500 hours – Tin-to-Tin).
Wire Size (mm <sup>2</sup> )	Resistance (mΩ max.)																						
0,20	6,70																						
0,35	4,70																						
0,50	3,00																						
0,75	2,55																						
1,00	2,20																						
1,50	2,10																						
2,00	1,80																						
2,50	1,60																						
4,00	1,20																						
5	Dielectric Withstanding Voltage	4 Kv a.c. per 1 minute.	- Test between adjacent terminals of mated connector assemblies. - According to EIA 364-20B. - Results for voltage are referenced in UL 310 (Flashover – Type A).																				
6	Insulation Resistance	1000 MΩ minimum initial.	- Test between adjacent terminals of mated connector assemblies. - According to EIA 364-21C.																				
<b>Mechanical</b>																							
7	Contact Insertion Force	See Product Drawing.	- Apply a force in axial direction. - Operation speed of 25 mm/min. - Use steel gage PN 92-339025-034-1. - According to test 13a, section 1 of IEC 60512-7.																				
8	Contact Extraction Force	See Product Drawing.	- Apply a force in axial direction. - Operation speed of 25 mm/min. - Use steel gage PN 92-339025-034-1. - According to test 13a, section 1 of IEC 60512-7.																				

cont. .

9	Terminal Tensile Strength	Wire Size (mm <sup>2</sup> )	Force (N minimum)	<ul style="list-style-type: none"> <li>- Determine crimp tensile.</li> <li>- Operation speed of 25 mm/min.</li> <li>- According to EIA-364-08B .</li> </ul>
		0,20	25	
		0,35	35	
		0,50	60	
		0,75	80	
		1,00	110	
		1,50	160	
		2,00	195	
		2,50	240	
		4,00	270	
10	Vibration	Termination Resistance, First Extraction Force (lock working) within the initial requirements.		<ul style="list-style-type: none"> <li>- Subject rec. mated with tab. to 10-500-10 Hz at 98,1 m/s<sup>2</sup> acceleration in 15 minutes. The cycle shall be performed 12 times in each perpendicular direction for a period of 3 hours in each axle (x, y and z).</li> <li>- Amplitude of oscillation of 1,52 mm.</li> <li>- According to EIA 364-28D.</li> </ul>
<b>Environmental</b>				
11	Thermal Shock	Termination Resistance ≤ Requirement Initial (mΩ).		<ul style="list-style-type: none"> <li>- Subject mated terminals to 25 cycles between -55°C and 85°C.</li> <li>- Test the biggest wire range of each terminal.</li> <li>- According to EIA 364-32C, (Table 2, Test Condition I).</li> </ul>
12	Temperature – Humidity Cycling	Termination Resistance ≤ Requirement Initial (mΩ).		<ul style="list-style-type: none"> <li>- Subject mated terminals to 10 temperature-humidity cycles. between 25°C and 65°C at 95% R.H.</li> <li>- According to EIA 364-31B, method III, condition B, less steps 7a and 7b.</li> <li>- Measure resistance initial, 3, 5, 7 and 10 cycles.</li> </ul>
13	Temperature Life	Termination Resistance ≤ Requirement Initial (mΩ).		<ul style="list-style-type: none"> <li>- Subject mated terminals to 250 hours at 85°C.</li> <li>- According to EIA 364-17B (Test Condition 3 and Test Time Condition B).</li> </ul>
14	Salt Spray Corrosion	Termination Resistance ≤ Requirement Initial (mΩ).		<ul style="list-style-type: none"> <li>- Subject tin-plated mated terminals to 96 hours in salt spray solution.</li> <li>- According to EIA 364-26B (Test Condition A).</li> </ul>

## 5.4 Product Qualification Test Sequence

Test	Test Items	Test Group											
		A	B	C	D	E	F	G	H	I	J	K	L
		Test Sequence											
1	Confirmation of Product	1,4	1,3	1,3	1,3	1,3	1,4	1,3	1,5	1,4	1,4	1,4	1,4
2	Termination Resistance, Specified Current	2							3	3	3	3	3
3	Temperature Rise X Current	3	2										
4	Current Cycling			2									
5	Dielectric Withstanding Voltage				2								
6	Insulation Resistance					2							
7	Contact Insertion Force						2		4				
8	Contact Extraction Force						3						
9	Terminal Tensile Strength							2					
10	Vibration								2				
11	Thermal Shock									2			
12	Temperature – Humidity Cycling										2		
13	Temperature Life											2	
14	Salt Spray Corrosion												2

Revision Record		
Revision	Date	Description
O	24-Aug-2001	Released

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