

## DESIGN OBJECTIVES

The product described in this document has not been fully tested to insure conformance to the requirements outlined below. Therefore AMP Incorporated makes no representation or warranty, expressed or implied, that the product will comply with these requirements.

Further, AMP Incorporated may change these requirements based on the results of additional testing and evaluation.

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### 15 AND 35 POS. SPLASH PROOF FEMALE CONNECTORS WITH SEC. LOCKING DEVICE (FOR JUNIOR POWER TIMER CONTACT)

#### 1. SCOPE

This specification covers features and performances of Splash Proof female connectors with the following AMP P/N:

C-282199 : 15 pos. Connector ( kit composition )

C-282195 : 35 pos. Connector ( kit composition: standard exit cable version )

C-282197 : 35 pos. Connector ( kit composition: opposite exit cable version )

with the relevant receptacle contacts - single wire seals - cavity plug with AMP P/N :

C-929939-3 : contact "AMP Junior Power Timer" wire range 0,5-1 mm<sup>2</sup>

C-929937-3 : contact "AMP Junior Power Timer" with wire range 1,5-2,5 mm<sup>2</sup>

C-929937-1 : contact "AMP Junior Power Timer" wire range 1,5-2,5 mm<sup>2</sup>

C-828904-1 : wire seal for single wire (and contact C-929939-3)

C-828905-1 : wire seal for single wire (and contact C-929937-3, -1)

C-282536-1 : wire seal for single wire 2.5 mm<sup>2</sup> only (and contact C-929937-3, -1)

C-828906-2 : cavity plug to close connector cavity (or, in alternative, P/N C-282081-1)

C-91-51054 : breather pipe ( retaining clip P/N 282279-1 plus wire seal plus plastic tube 1 m long )

These connectors are suitable for header counterparts, not manufactured by AMP, as shown on above mentioned customer drawing C-282199, C-282195, C-282197.

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				DR R. MARTINI <i>R.M.</i> 26 Sep 94		<b>AMP</b> AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)	
				CHK C. TARTARI 14 Oct 94			
				APP.	LOC. I	NUMBER 108 - 20094	REV. A
A	REVISED PER EC: ET00-0406-97	<i>R.M.</i>	C.T.	02-10 1997	SHEET  1 OF 7  NAME 15 AND 35 POS. SPLASH PROOF FEMALE CONNECTOR FOR JUNIOR POWER TIMER, PRODUCT SPECIFICATION		
1	REVISED PER EC: ET00-0150-97	R.M.	C.T.	20-03 1997			
0	FIRST ISSUE (ENGLISH VERSION)	-	-	-			
REV LTR	REVISION RECORD	DR	CHK	DATE			

## 2. CONNECTOR FEATURES :

2.1 Materials : - rec. contacts : Phosphor Bronze, Cu-Fe2 alloy for contact 929937-1, tin plated  
(with external reinforcement spring in stainless steel).

- housings : PA 6.6 glassfiber filled.
- frontal sealings : silicone rubber.
- single wire seals and cavity plugs: silicone rubber.

2.2 Wire Range : - stranded cable acc. to FIAT normation table n° 91107/03

0.5 mm <sup>2</sup> reduced insul. cable " phase 3 " dia.	1.5 - 1.7 mm
1.0 " " " " "	1.9 - 2.1 mm
1.5 " " " " "	2.2 - 2.4 mm
2.5 " " " " "	2.7 - 3.0 mm

2.3 Current Rating : 20 A (with 2.5 mm<sup>2</sup> wire and receptacle contact P/N 929937-1)

2.4 Working Temperature : -30 to +125°C (with included the temperature increasing due to working current flow).

2.5 Degree of Protection : IP x 4 according to IEC 529 ( when mated with the relevant interconnection box, E.C.U. made by Magneti Marelli )

2.6 Maximum operating voltage: 24 V dc. For application at higher voltage please contact AMP.

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SHEET  
2 OF 7

LOC.  
I

NUMBER

108 - 20094

REV.

-

### 3. FEATURES AND TEST CONDITIONS


FEATURES	TEST CONDITIONS	LIMITS	
3.1 Connector Mating Force ( with contacts inserted )	In working condition with header counterpart.  Mating - Unmating speed 25 - 50 mm/minute  Direction as shown in Fig. 3 ( tab contact as shown in Fig. 1)	Ist insertion: ≤ 260 N ( 35 pos ) ≤ 200 N ( 15 pos )	
3.2 Connector Unmating Force ( with contacts inserted )	like point 3.1 ( but pressing on the retaining spring)	Ist extraction ≤ 260 N (35 p ) ≤ 200 N (15 p )	Xth extraction ≥ 80 N ( 35 p ) ≥ 65 N ( 15 p )
3.2.1 Connector Unmating Force ( with contacts inserted )	like point 3.1 ( but without pressing on the retaining spring )	≥ 200 N	
3.3 Single Contact Insertion Force	Single contact (tab as shown in Fig. 1)	≤ 18 N Ist insertion	
3.4 Single Contact Extraction Force	Single contact (tab as shown in Fig. 1)	Ist extr. ≤ 18 N	Xth extr. ≥ 4 N
3.5 Retention Force of the single contact from the housing	At temperature + 23 ± 5°C and at tensile speed of 25 - 50 mm/minute ( FIAT norm. 7.Z0690, as ref. )	Only with primary locking device ≥ 70 N Only with sec. locking device ≥ 30 N	
3.6 Crimping Tensile Strength	Tensile speed 25 - 50 mm/minute ( FIAT norm. 7.Z0700, as ref. )	0.5 mm <sup>2</sup> ≥ 70 N 1.0 mm <sup>2</sup> ≥ 115 N 1.5 mm <sup>2</sup> ≥ 155 N 2.5 mm <sup>2</sup> ≥ 235 N	
3.7 Voltage Drop	Between a point on the wire at 1 cm from the conn. edge and a point on the tab very closed to the conn. edge (FIAT n°7.Z0350 as ref.) see Fig. 2 as ref.	≤ 3 mV/A on new contacts and after 10 insertions/extractions	

<b>AMP</b>	AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)	SHEET	LOC.	NUMBER	REV.
		3 OF 7	I	108 - 20094	-

FEATURES	TEST CONDITIONS	LIMITS
3.8 Insulation Resistance	Between two adjacent contacts apply 500 Vdc for 1 minute. ( FIAT norm. 7.Z0250, as ref. )	$\geq 10 \text{ M}\Omega$
3.9 Dielectric Breakdown Resistance	Between two adjacent contacts apply voltage for 1 minute ( FIAT norm. 7.Z0200, as ref. )	$\geq 1000 \text{ Vac}$
3.10 High Temperature Resistance with current load. ( note 1: 6 adjacent circuits with 20 A current, remaining circuits with 3 A current )	On all ways contemporarily ( see note 1 ): -Not airy ambient-with a test temp. of $80 \pm 2^\circ\text{C}$ : -Test current on each way : ( see note 1 ) -Wire section: 2,5 mm <sup>2</sup> -20 A and 0,5 mm <sup>2</sup> -3 A -Duration: 5 hours	Temperature increasing detected: $\leq 50^\circ\text{C}$ (thermocouple placed on transition between contact body and wire barrel)  Voltage drop within limits indicated for new contacts.  No damaging.
3.11 Current Overload	On one way only w/o housing : - Test current : 21 A ( with a 1.5 mm <sup>2</sup> wire ) or 30 A (with a 2.5 mm <sup>2</sup> wire ). - Duration: 500 cycles composed of : 45' current "ON" 15' current "OFF".	Temperature increasing $\leq 60^\circ\text{C}$ on transition between contact body and wire barrel  Voltage drop $\leq 4.5 \text{ mV/A}$  No damaging
3.12 Thermal Cycling Resistance	5 cycles composed of : 2 hrs. at $+125^\circ\text{C} \pm 2^\circ\text{C}$ 2 hrs. at $+ 40^\circ\text{C} \pm 2^\circ\text{C}$ and 90-95% R.H. 2 hrs. at $-30^\circ\text{C} \pm 2^\circ\text{C}$  ( connector mated with header counterpart).	No deformation or cracking of housing  Voltage drop $\leq 4.5 \text{ mV/A}$  Insulation resistance, dielectric breakdown resistance, and mechanical features, at points 3.2 and 3.5, within limits indicated for new contacts.

<b>AMP</b>	AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)	SHEET	LOC.	NUMBER	REV.
		4 OF 7	I	108 - 20094	-

<p>3.13 Mechanical Duration ( 10 cycles )</p>	<p>In working condition with header counterpart. Mating - Unmating speed 25 - 50 mm/minute. ( pressing on the retaining spring )</p>	<p>No damaging. Mechanical feature at point 3.5 within limits indicate for new contacts Voltage drop within limits indicated for new contacts.</p>
<p>3.14 Accelerated Ageing Test</p>	<p>200 hours at +90°C ± 2°C (Connector mated with header counterpart).</p>	<p>No deformation or cracking of hsg. and plastic mat'l discoloration are admitted. Voltage drop ≤ 4.5 mV/A Dielectric breakdown resistance and mechanical feature, as indicated at point 3.5</p>
<p>3.15 Salt Spray Corrosion Test</p>	<p>150 hrs of salt mist at 35°C ± 2°C, 5% of NaCl, pH 6.5-7.2 class 2 Mated connector (FIAT norm.7.Z8460 as ref. )</p>	<p>Voltage drop ≤ 4.5 mV/A Insulation resistance within indicated limits</p>
<p>3.16 Vibration Test</p>	<p>2 hours for each axis : Freq: 10-500-10 Hz in 5 minutes Displacement : 1.5 mmpp Acceleration : 25 g (FIAT norm.7.Z8510, as ref.)</p>	<p>Voltage drop ≤ 3 mV/A No circuit break greater than 1µs</p>
<p>3.17 Water Resistance (to be carried out after tests 3.12 + 3.14)</p>	<p>Acc. to IEC norm. 529 para. 7.4 and para. 8.4 Test equipment according to Fig.4 Duration 2 hours Connector axially mated with header counterpart; wire bundle length 25-30cm, with wire ends protected by silicone paste and breather pipe end out of test equipment room</p>	<p>Insulation resistance within indicated limits. Dielectric breakdown resistance within indicated limits. Voltage drop ≤ 4.5 mV/A No water infiltration inside the connector.</p>
<p>General Note: - Each test must be carried out, if not otherwise specified, at an ambient temperature of 23°C ± 5°C, relative humidity of 45-75% and atmospheric pressure of 860-1060 mbar. - See also page 7 for test groups and sequencies</p>		

	<p>AMP ITALIA S.p.A. Corso F.lli Cervi, 15 Collegno (TORINO)</p>	<p>SHEET 5 OF 7</p>	<p>LOC. I</p>	<p>NUMBER 108 - 20094</p>	<p>REV. -</p>
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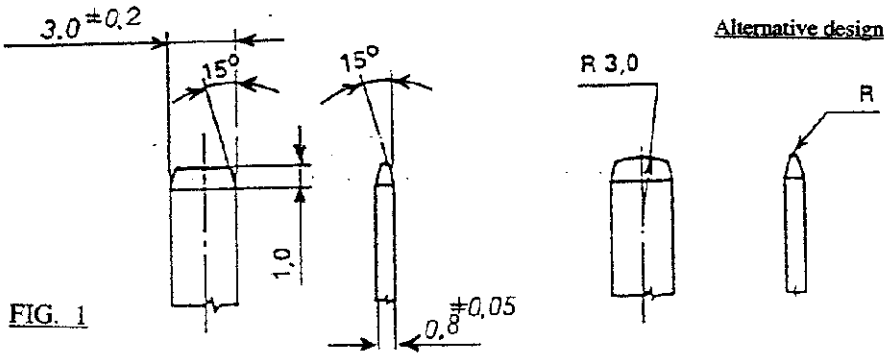


FIG. 1

Stitched Tab ( Brass, Bright Tin-plated )

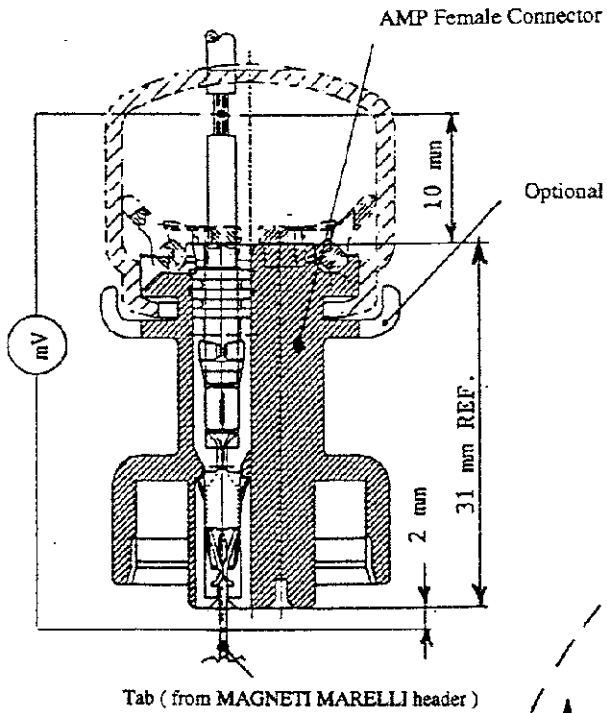


FIG. 2

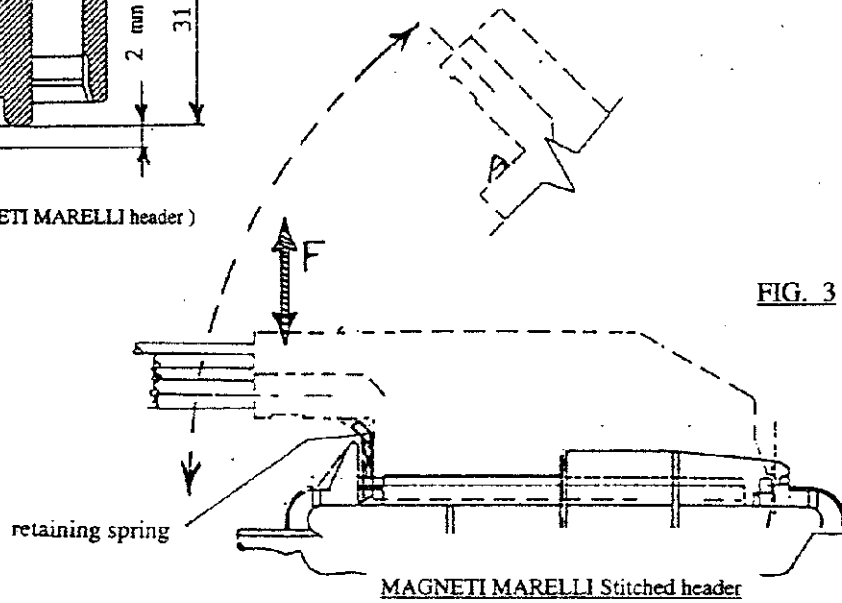


FIG. 3

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SHEET  
6 OF 7

LOC  
I

NUMBER

108 - 20094

REV.

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TEST TO BE CARRIED OUT	TEST GROUP AND SEQUENY									
	A	B	C	D	E	F	G	H	I	L
Visual examination	1,7	1,8	1,3	1,4	1,4	1,9	1,8	1,6	1,5	1,9
Single contact mating force	2									
Single contact unmating force	4									
Connector mating force with contacts inserted		2								
Connector unmating force with contacts inserted		4				5	5			
Mechanical duration ( 10 cycles )	5	5								
Voltage drop	3,6	3,6		3	3	2,4	2,4	2,4	2,4	2,6
Retention force of the single contact in the housing		7				8	7			
Crimping tensile strength			2							
Insulation resistance						6		5		7
Dielectric breakdown resistance						7	6			8
High temperat. resistance with current load				2						
Current overload					2					
Thermal cycling						3				3
Accelerated ageing test							3			4
Salt spray test								3		
Vibration test									3	
Water resistance										5