PRODUCT SPECIFICATION

CRIMP AND POKE RAST 5 CONNECTORS

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1.0 DESCRIPTION

This connector system is used to connect the harness of the apparatus to the electrical devices having a male tab mating interface according to the Rast 5 standard.
This family of connectors has been designed on a single row with a number of circuits in the range between 2 and 8 and in a 5 mm pitch configuration.
The "free hanging" female connectors consist of insulating housings and female terminals to be crimped to the harness wires.
The female terminals are obtained by stamping copper alloy stock of such thickness to grant the maximum robustness both of the body and of the contact itself. The resilient parts of the terminal are integral with the body and provide 4 high pressure contact points and low mating force (unplated tabs).
The springs, with the shape of a semi -symmetrical tuning fork- have a high current carrying capacity.
The contacts are provided with locking lances that engage into the cavities of the housing.
The housings are provided with polarizing keys, external latches and hinged secondary lock device.
The cavity of the housings is the same used for the MAXI-T type terminals.

2.0 IDENTIFICATION

This connector family is identified by the series number 94550.
Terminal to be used is the high normal force (HNF) female terminal 94518 series available in the following part numbers:

94518-01XX : for 0.5 - 1.0 mm^2 cables (20 - 18 AWG)

94518-02XX : for 1.0 - 2.5 mm^2 cables (18 - 14 AWG)

94518-04XX : for 2 cable crimping (wire section 1.5 - 3.0 mm^2 12 AWG in total)

Also terminals belonging to the 94549 series fit into the housing of the 94550 series.
The 94549 terminals are necessary when the counter part is equipped with male tabs of 4.8 x 0.8 mm (3/16") size.

3.0 MATERIALS, PLATINGS AND MARKINGS

-CRIMP TERMINALS: copper alloy terminals unplated, tin post-plated or preplatet (see drawings),

-HOUSINGS: see the relevant drawings. Hsg p/n visible on the

Both terminals and housings have the "MX-IT" logo.

4.0 ELECTRICAL PERFORMANCES(*)

4.1	Voltage rating:		250	Veff
		94518 series	94549 series	
4.2	Current rating: wire size 1 mm²	11 A max	10 A max	
	wire size 1.5 mm²	16 A max	----------	
	wire size 2.5 mm²	20 A max	----------	
4.3	Voltage drop (crimp section):		15	mV max
4.4	Voltage drop (through the connection):		25	mV max
4.5	Insulation resistance:		5000	Mohm min.
4.6	Dielectric withstanding voltage:		1500	Veff min.

(*) Based on brass (CuZn30), tin post-plated terminals and on brass unplated tabs.

5.0 MECHANICAL PERFORMANCES (*)

		94518 series	94549 series
5.1	Insertion force, single terminal:	6 N max	6 N max
5.2	Withdrawal force, single terminal:	2 N min	1 N min
5.3	Insertion force of the terminal into the housing:	20 N max	20 N max
5.4	Terminal withdrawal force from the housing (@23 + 5 °C. R.H.= 75 %)		
	-with sec. Lock operating.	100 N min	80 N min
	-without sec. lock operating	60 N min	50 N min

Note:
- these values shall be reduced of 25% in the first and in the last housing cavity due to the thinner external wall.
- terminal retention values are reduced by a further 30% when “no flame” material is used.
- with “no flame” material the retention values of the secondary lock feature become inconsistent.

5.5	Connector mating force to the counterpart (8 way fully equipped)	60 N max	60 N max
5.6	Connector unmating force from the Counter part with latches operating	40 N min	40 N min

- the unmating values are reduced by a further 30% when “no flame” material is used.

(*) Based on brass (CuZn30), tin post-plated or pre-plated terminals and on brass unplated tabs.

6.0 CRIMPING CHARACTERISTICS

See relevant terminal sales drawing.
Contact factory in case of further information.

7.0 ENVIRONMENTAL CONDITIONS

7.1 Working temperature (this includes the temperature rising of the terminal due to the working current):
- Brass type terminals -40°C +85°C

7.2 Non operating temperature (temperature of the environment surrounding the parts): -40°C +55°C

7.3 Aggressive ambient (industrial atmosphere and/or salt fog)
-Tin post-plated terminals SUITABLE
-Unplated terminals or with bare edges NOT SUITABLE

8.0 PACKING CONDITIONS

a) Terminals: wounded in cardboard reels, 60 cm diameter, with interleaf protecting Paper:

P/N 94518-01XX	P/N 94549-010X	P/N 94549-030X	3000	pcs/reel
P/N 94518-02XX			2000	pcs/reel
P/N 94518-04XX			2000	pcs/reel

b) Housings: loose in plastic bags put in cartons. Plastic bags are sealed and contain water for part moisturization. Please follow factory instruction when parts are used in dry ambients.

9.0 TEST CONDITIONS

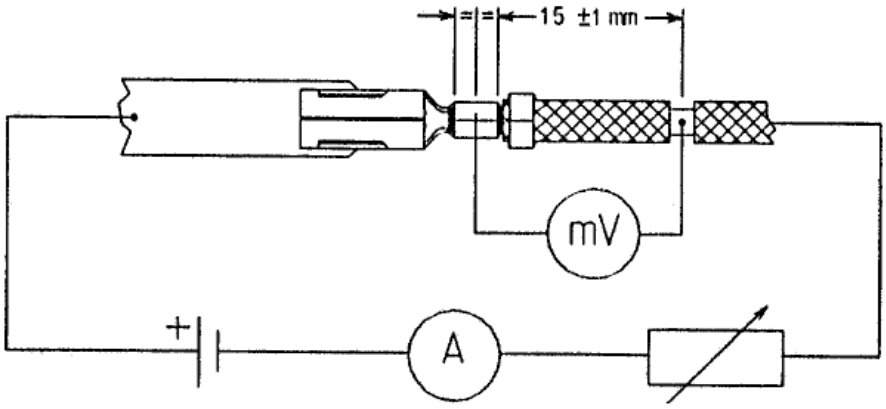
The electrical tests listed here below are performed, unless otherwise specified, with the terminals correctly crimped to wires of the requested size and in the following environmental conditions:

Temperature: 23 +/- 5 °C
pressure: 860 - 1060 mbar
R.H.: 45 - 70 %

Tests shall be performed after conditioning the parts (housings) in order to achieve the maximum moisture absorption at the “equilibrium” condition (2.5 - 2.7 % increment in weight of the moisturized parts).

9.1 CRIMP VOLTAGE DROP

Shall be measured according to the scheme sketched in fig. 1.
Reading shall be performed after reaching equilibrium with the ambient.
Test current: according to TAB. A.
Voltage drop: as per point (4.3).

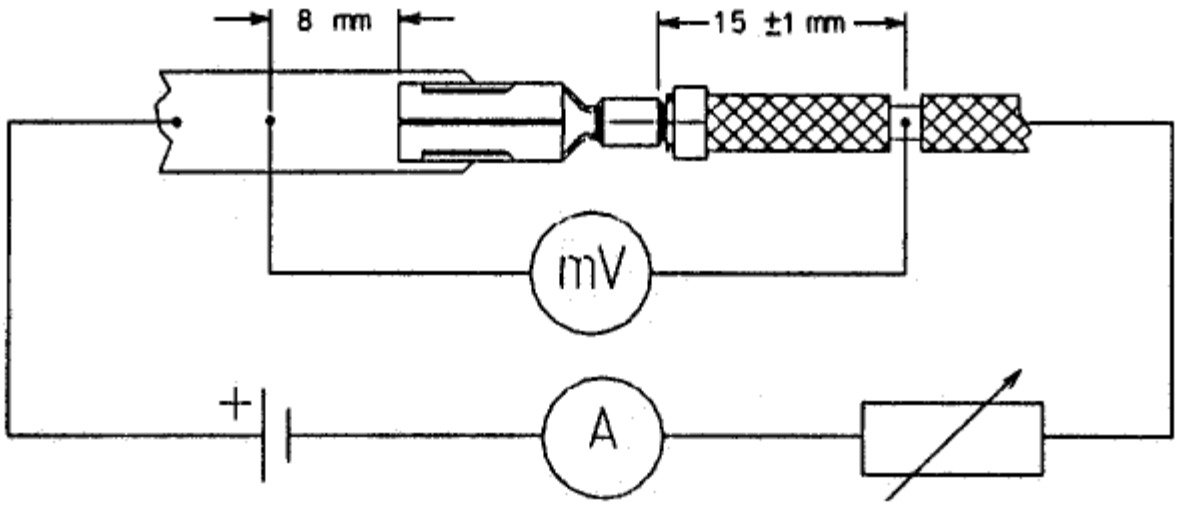


9.2 VOLTAGE DROP ON THE CONNECTION

Shall be measured according to the scheme sketched in fig. 2.
Reading shall be performed after reaching equilibrium with the ambient.
Test current: according to TAB. A.
Voltage drop: as per point (4.4).

TABLE A:

WIRE SIZE mm²	TEST CURRENT (A)
0.5	5
0.75	8
1.00	10
1.50	15
2.50	20



9.3 INSULATION RESISTANCE

Shall be measured after 60 sec. of application of the voltage among adjacent terminals and between the terminals and the external surfaces of the housing.
Test voltage: 500 Vdc.
Insulation resistance: as indicated in point (4.5).

9.4 DIELECTRIC WITHSTANDING VOLTAGE

Shall be measured after 60 sec. of application of the voltage among adjacent terminals and between the terminals and the external surfaces of the housing.
Test voltage 1500 Veff. No shorting or other damage are allowed.

9.5 SINGLE TERMINAL INSERTION/WITHDRAWAL FORCE

This test shall be performed with 6.3 x 0.8 brass unplated male tabs, using a push-pull machine, at speed rate between 25 and 100 mm/minute.
After fully loading a housing with female terminals, insert and withdraw the male tab for 10 times, recording both insertion and withdrawal forces.
Repeat the test for 5 terminals. The reference figures are indicated at points (5.1) and (5.2).

9.6 SINGLE TERMINAL INSERTION FORCE INTO THE HOUSING

Put a housing without terminals inside on the push-pull machine.
Push on the terminal, previously positioned on the opening of one cavity at a speed rate between 25 and 100 mm/minute, up to the "click" of its locking lance.
Record the reading and repeat for each cavity of the housing. The reference figure is indicated at point (5.3).

9.7 SINGLE TERMINAL WITHDRAWAL FORCE FROM THE HOUSING

This test shall be performed using a push-pull machine, at a speed rate between 25 and 100 mm/minute.
Put on the machine a fully equipped connector, with the terminals crimped to cables 100 mm long minimum, wire size 1.0 mm^2, in such way to be able to pull a cable one by one by acting along the axis of the cavity. The reference figure is indicated at point (5.4).

9.8 TENSILE STRENGTH OF CRIMP

This test shall be performed using a push-pull machine, at a speed rate between 25 and 100 mm/minute.
Terminals crimped to 20 cm long cables shall be used.
Pull the terminal by the end of the cable, along the axis of the crimp barrel, up to the requested force.
Maintain this force for 1 minute, then gradually increase it up to break the cable.
The readings, 10 for each wire size, shall conform to the figures given in the SD-94518-005 drawing and SD-94549-001

9.9 HEATING

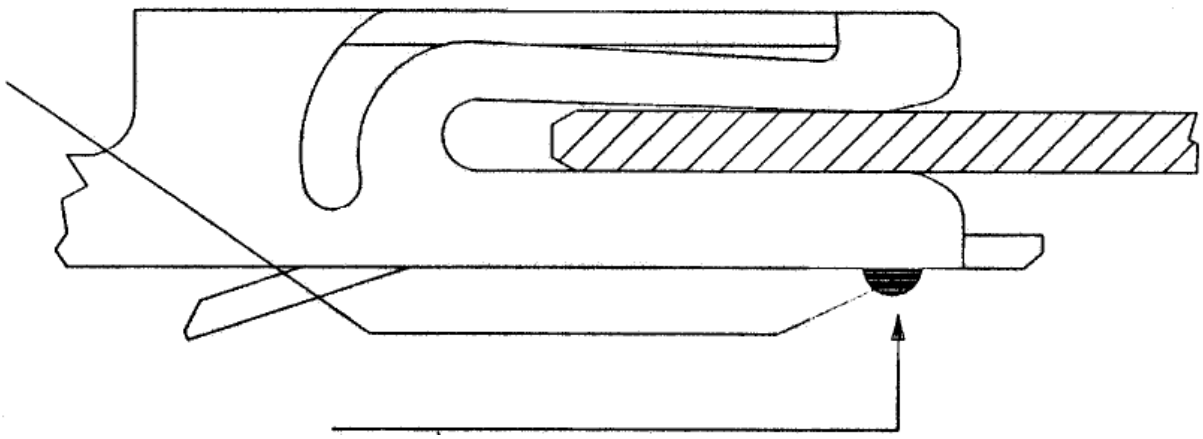
This test shall be performed on housed terminal horizontally placed in a non ventilate chamber. The over-temperatures indicated in TAB. B are valid for tin plated brass terminals.
The test consists of making a connection male-female, crimped to the relevant cables, be passed through by an alternating current as indicated in TAB. A.
The temperature in the different points of the connection is then measured (crimp area and contact area) according to the scheme indicated in fig. 3.
This shall be determined by a thin wire thermocouple or by thermal blisters (precision ±1 °C) in order not to influence the measurement.
For unplated terminals, a temperature rise 20 % greater than those indicated in TAB. 6 shall be acceptable.

TABLE B:

CURRENT	ΔT (C°) versus wire size section (mm^2)					
	0,5	0,75	1.0	1,5	2,5	4.0
5 A	18	12	10	--	--	--
10 A	--	35	30	22	16	--
15 A	--	60	55	40	32	--
20 A	--	--	85	60	50	30

(/\T = temperature rise above room temperature of the hottest point)

Note: the over temperature figures can vary for non-brass terminals.



temperature measurement point fig. 3

9.10 THERMAL CYCLING TEST

This test consists of 5 thermal cycles, each consisting of:
- 2 hours at +100 °C ± 2 °C
- 2 hours at +40 ° C ± 2 °C and 90-95 % R.H.
- 2 hours at -30 °C ± 2 °C

(the passage shall take 3 minutes max).
After the test check if:
- no deformation or breaking occurred
- the voltage drop is within 1.5 times the initial value
- the insulation resistance is inside the limits
- the dielectric withstanding voltage is inside the limits

9.11 SALT SPRAY TEST

Put the connectors, mated to tin plated male terminals, in a salt spray chamber.
The test conditions are as follows:
temperature: 35 °C
relative humidity: 95 %
Concentration (NaCl): 50 g/l
After 96 hours exposure, rinse the parts with deionized water and when these are dry check that:
- the voltage drop is within 1.5 times the initial value
- the insulation resistance is inside the limits
- there is no evidence of corrosion on the plated surfaces

9.12 OVER TEMPERATURE RESISTANCE TEST

The terminals of the connector shall be connected in series, so that the same current shall flow through all the contacts.
The connector shall be placed in a not ventilated oven at a temperature of 80 °C ±2 °C.

The test current (the values are indicated in TABLE A) shall be let to flow for 5 hours.
The temperature of the terminals shall be monitored using thermocouples placed in touch with the copper crimp barrel and with the contact area: the temperature rising (DT) shall not be greater than 50 °C.
After the test check that:

- no damage of the connector has occurred
- the voltage drop is within 1.5 times the initial value

9.13 OVERLOAD CURRENT CYCLING TEST

The test shall be performed at room temperature with connectors in the mated condition. Duration of test: 500 cycles composed by 45 minutes "ON" and 15 minutes "OFF".
Test current: 1.5 times the values shown in TABLE A.
The temperature of the terminals shall be monitored using thermcouples placed in touch with the copper crimp barrel: the temperature rise (DT) shall not be greater than 60 °C and the measured voltage drop shall be within 1.5 times the initial value.