POSITIVE LOCK PRODUCT SPECIFICATION (MK I)

1. GENERAL REQUIREMENTS

This specification covers the requirement for a single or multiway connection to the tabs on component parts.

The Positive Lock terminal is a receptacle which can be used with or without an insulating housing.

This receptacle can be used in an in-line connector system.

The receptacle was designed for use with tabs which conform to the following specifications:

BS 5057 : 1992 (IEC 760:1989) originally BS 5057 : 1973
BS AU 151 : 1972
BS 3456 : 1969 (Part 1)
DIN 46248
DIN 46244

Please Note: The above tabs are to be made of half hard brass (hardness 62 ± 7 Rockwell 30T) or material with equivalent harness. These tabs may or may not be tin plated, and must have a hole for locking, with a chamfer, around both sides of the hole of 0.1mm maximum.

For in-line connectors it is usual for the tabs to be made by folding the material. These folded tabs should be made so that they conform to specification DIN 46248 with respect to the position of the hole and its size and the flatness of the tab. The seam should have a maximum gap of 0.127mm.

2. PRODUCT DESCRIPTION

2.1 The general term "Positive Lock MK.1" is used to describe this connector.

DIST

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2.2 The receptacle is made in three wire ranges, 0.5mm² to 1.5mm², 0.7mm² to 2.0mm² and 2.5mm² to 4.0mm².

The specified cavity size of the insulating housing is such that it is suitable for all three receptacles.

2.3 The receptacle is designed to give a low insertion force (receptacle to tab) and positively lock onto the tab.

With the locking feature released, the receptacle has a low withdrawal force.

To release the locking feature, the spring member of the receptacle can be depressed manually, when an insulating housing is not used. When a housing is used, the locking feature is released by pulling back on the housing.

It is also possible to have a housing with a depressor button, which effectively releases the locking feature. (This type of design is suitable for both single and multiway housings).

2.4 The receptacle is made in brass and phosphor bronze and can be pre or post plate finished.

The physical dimensions of the receptacle are specified on drawings C160759, C154718 and C154717 (small, medium and large wire ranges respectively).

The single way housing is made of approved material as specified, including dimensions, on drawing C154719. (This housing is often called a "boot").

3. MECHANICAL REQUIREMENTS

3.1 The initial engagement force between receptacle and tab shall be 27N maximum, inclusive of the 6.7N exerted by the spring (Locking Dimple), steadily applied load, for tabs mentioned in paragraph 1. For tabs made of softer material (e.g. copper) the initial engagement force shall be 35N maximum.

The initial withdrawal force between receptacle and tab shall be 6.7N minimum steadily applied load (when locking feature is released).

After six engagements, the disengagement force should be 4.448N minimum steadily applied load.

When the locking feature is engaged, the receptacle should not pull off the tab unless an axial pull of approximately 111N is exerted upon it. (In normal use this means pulling on the wire, not the insulation boot). This force is a destructive force.

A gauge, part number 525112-1, has been designed and produced to enable non-destructive on-line quality checks to be carried out on the receptacle.

The gauge ensures that a maximum force applied to a receptacle, when locked onto the gauge's tab, is 40N. This is an adequate force to check the retention of the locking dimple without any damage occurring to the spring of the receptacle.

3.2 The receptacle is retained in the insulation boot (when required) by a small pip in the base of the boot, which locates in a slot in the terminal. Should it be required the terminal can be removed from the boot by deflecting the base of the boot so that the pip disengages from the slot in the terminal. With the boot held, the pip must not fracture when a steadily applied tensile load of 40N minimum is applied to the receptacle.

3.3 The crimp provides uniform attachment, adequate tensile strength, electrical conductivity and resists corrosion and vibration.

3.4 Typical cables terminated - the crimp will contain no excessive air gaps and will meet the following tensile requirements:

16/0.2	67N
8/0.3	67N
9/0.3	67N
14/0.25	111N
2 x 14/0.25	111N (one wire only is pulled)
28/0.3	200N
35/0.3	222N
44/0.3	249N
56/0.3	280N

4. ELECTRICAL REQUIREMENTS

4.1 The terminals are manufactured with suitable wire and insulation barrels, such that the following groups of wire can be accommodated:

(a) 16/0.2 - 8/0.3 - 9/0,3 - 14/0.25 - 14/0.3 - 21/0.3
(b) 14/0.25 - 2 x 14/0.25 or 28/0.3
(c) 35/0.3 - 28/0.3 + 14/0.25 - 44/0.3 or 56/0.3

4.2 At an ambient temperature of 20°C to 25°C, with an unused receptacle, crimped to 56/0.3 plain copper stranded wire, locked onto a tab, soldered to the same size wire and a full load current of 25 amperes flowing, the stabilised temperature rise measured as near to the crimp as possible should not exceed 20°C.

Please note the tab is soldered to the wire, in an effort to simulate normal usage, ie. tabs that are usually part of a component or switch.

The millivolt drop, with the same set up, shall not exceed 37.5 m.v. when measured across the complete joint - one probe being positioned 3mm along the wire behind the receptacle's insulation barrel and the other on the tab.

4.3 Repeat the test under 4.2 after six connections and disconnections.

4.4 Repeat 4.2 immediately after the test sample has been subjected to a current of 37.5 amps (1.5 times the rated current) for 15 minutes.

4.5 Repeat 4.2 immediately after the test sample has been subjected to a current of 250 amps (10 times the rated current) for 7 seconds.

4.6 Test a sample as in 4.2, but after samples have been subjected to a temperature of -40°C for thirty minutes and allowed to return to room ambient.

4.7 Repeat all the above electrical tests, but with 28/0.3 wire crimped to the appropriate receptacle and soldered to a tab, and using a current of 17.5 amperes.

5. ENVIRONMENTAL TEST REQUIREMENTS

5.1 Single way assemblies are to be subjected to a salt spray test complying with A.S.T.M. B.117-64, but extended in duration to ninety-eight hours. During the first forty-eight hours of the test the rated D.C. current, as determined in the electrical test, shall be passed through the connectors. On completion of this test, the samples shall be thoroughly rinsed in pure water and dried before the introduction of the following humidity test.

5.2 At the completion of the salt spray test, the above samples shall be subjected to humidity testing and maintained in the following conditions:

(a) 3 hours at 40°C ± 2°C relative humidity greater than 96%.

(b) Followed by 3 hours cooling at 20°C ± 5°C. Relative humidity greater than 96%.

(c) Followed finally by 3 hours at 40°C ± 2°C. Relative humidity greater than 96%.

During the first half of humidity condition (a) and (c) the rated D.C. current as determined in the electrical test, shall be passed through the connectors.

At the conclusion of this test, the connectors shall be washed in clean water, dried and allowed to return to room ambient temperature. The millivolt drop test described previously, shall be repeated before and after additional engagements.

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