

TEST RECORD NO. 4

SAMPLES:

Representative production samples of Metallic Push button switches, Series 2PS and Pilot Lights, Series 2PL were tested for Type 4X and Type 12 ratings. These devices were fixed in an Type 4X enclosure and Type 12 enclosure, submitted by the manufacturer and subjected to the following tests.

Except where otherwise specified, tests were conducted on Type 4X and Type 12 enclosures housing these Pbs and PLs. Models 2PSF402, 2PSM310, 2PSSE210-3PSRL, 2PSSLR422-3PSR, 2PSSE410, 2PSM310 and 2PSMJ410 representing various combinations of Push button switches and Models 2PLBR4, 2PLBR3L and 3PLBR4L representing various combinations of Pilot Lights, are considered representative of Series 2PS and Series 2PL, for Type 4x and Type 12 rating.

The test program was in accordance with the Standard for Enclosures for Electrical Equipment, UL50, Eleventh Edition, October 1995 with revisions through and including November 1999. All the samples were subjected to a test program as outlined below at COSMIC Laboratory, Bangalore located in Bangalore, India and witnessed by Underwriters Laboratories India Pvt. Ltd, Conformity Assessment Services Engineering Staff (under the UL Witnessed Test Data Program).

Test Program

1. Hosedown Test
2. Corrosion Resistance Test
3. Gasket Tests
4. Rust Resistance Test

The results of the above tests are in compliance with UL 50, the Standard for Enclosures for Electrical Equipment, 11th Edition.

GENERAL:

The test results relate only to the items tested.

HOSEDOWN TEST:
(Standard UL 50, § 35)

METHOD

Two samples of the test enclosure mounted with Push button switches, Series 2PS models and Pilot Lights Series 2PL model was sprayed by water from a hose having a 1 in. (25.4 mm) inside diameter nozzle delivering at least 65 gal (246 l) of water per minute. The water stream was directed at the joints of the enclosure from a distance of 10 to 12 ft (3.0 to 3.7 m) and was moved along the joints or surface at a minimum rate of 4 s per linear inch (1.6 s per centimeter). As the enclosures had a test length - height plus width plus depth - of 75 in. (1.91 m) or less, the duration of the water stream contact with the enclosure was 5 min.

RESULTS

Both the Type 4X enclosure had no water inside after the test.

CORROSION RESISTANCE TEST:
(Standard UL 50, § 39)

METHOD

Two samples of the test enclosure mounted with Metallic Push button switches and metallic Pilot Lights was subjected to a salt spray (fog) using the test method in Salt Spray (Fog) Testing, ASTM B117-1985, and employing a 5 percent by weight salt solution for 200 hours. At the end of the test, the enclosures were removed from the chamber, washed in clean, running water not warmer than 100°F (37.8°C) to remove salt deposits from the surface, and dried immediately.

RESULTS

Both the Type 4X enclosure did not show pitting, cracking or other deterioration more severe than that resulting from a similar test on passivated American Iron and Steel Institute Type 304 stainless steel.

GASKET TEST-AGEING TEST:
(Standard UL 50, § 43)

METHOD

Samples of the gasket materials (used in the Manufacturer's Push button and Pilot Lights), as tabulated below were subjected to this test. First, the tensile strength and elongation of the unaged samples were measured. The samples were then subjected to a temperature of 69-70°C (156-158°F) in circulating air for 168 hours. After this, the tensile strength and elongation were remeasured.

RESULTS

<u>Manufacturer</u>	<u>Designation</u>	<u>Tensile Strength</u>		<u>Elongation</u>	
		<u>Initial</u>	<u>Aged</u>	<u>Initial</u>	<u>Aged</u>
		Kg/sq.mm		@2Kg load	
Moulik	Red Nitrile-NBR	0.066	0.061	2.16 cm	2.10 cm
Twoishet	Black Nitrile-NBR	0.068	0.063	2.18 cm	2.10 cm

There was no visible deterioration; deformation, melting or cracking of the material and the material was not hardened as determined by normal hand flexing.

Also, the aged material did have a tensile strength greater than or equal to 75 percent of the unaged material and did have an elongation greater than or equal to 60 percent of the unaged samples.

RUST RESISTANCE TEST:
(Standard UL 50, § 38)

METHOD

Two samples of the Type 12 Test enclosures were mounted with Metallic Push button switches and metallic Pilot Lights and were subjected to a salt spray (fog) using the test method in Salt Spray (Fog) Testing, ASTM B117-1985, and employing a 5 percent by weight salt solution for 24 hours. At the end of the test, the enclosures were removed from the chamber, washed in clean, running water not warmer than 100°F (37.8°C) to remove salt deposits from the surface, and dried immediately.

RESULTS

Both the Type 12 test enclosures had no visible rust.

CONCLUSION

Samples of the product covered by this Report have been found to comply with the requirements covering the category and the products are judged to be eligible for Recognition and Follow-Up Service. The manufacturer is authorized to use the UL Mark on such products, which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the UL Mark are considered as Recognized by Underwriters Laboratories Inc.

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Pursuant to the Corporate Services Agreement between UL India Pvt. Ltd. and Underwriters Laboratories Inc. ("UL"), UL hereby accepts and issues this Report.