

TEST REPORT

Reference No : WTF14F1120627S
 Applicant..... : Super Dense International Limited
 Address. : 2/F, 31 Lok Yip Road, On Lok Tsuen, Fanling, N. T. , Hong Kong
 Manufacturer. : Foshan Nanhai Maoxin Electrical Co.,Ltd.
 Address. : No. 2 South Area, LiYu Industrial Zone, Danzao Town, Nanhai District, Foshan City, Guangdong Province, China
 Product Name..... : INDUSTRIAL STEEL SURFACE DIN DB
 Model No..... : SM6-120, SM6-16, SM6-24, SM6-36, SM6-48, SM6-72, SM6-96
 Ratings..... : Enclosure of electric system: 100-380V~, 50/60Hz, IP54
 Standards..... : IEC60529:1989+A1:1999+A2:2013
 Test Category : Entrusted Test
 Test Item : IP54 Test
 Date of Receipt sample : 2014-11-26
 Date of Test : 2014-11-27 to 2014-12-11
 Date of Issue..... : 2015-01-29
 Test Report Form No. : WST-60529-41B
 Test Result..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Compiled by:

Owen Yan/Project Engineer


Approved by:



Oren Yang/Manager



List of test items:

No.	Test Items	Requirement + Test	Result
1	IP54 Test	IEC60529:1989+A1:1999+A2:2013	Pass
<p>Subcontract Whether parts of tests for the product have been subcontracted to other labs: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, list the related test items and lab information: Test items: IP6X Lab information: Vkan Certification & Testing Co. Ltd. No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, 510663, P. R. China Tel: +86-20-32293693 Fax: +86-20-32293700</p>			
<p>Remarks: 1. All models have same construction except the size in appearance.</p> <div style="text-align: center;">  </div> <p>2. Trade Mark : 3. Full tests were carried out on model SM6-120.</p>			

**Test Item :**

Tests for protection against dust-proof: IP5X

Test Method:

The tests should be carried out under the standard atmospheric condition.

The atmospheric conditions during tests are as follows:

Temperature range: 15 °C to 35 °C. Relative humidity: 25% to 75%.

The test wire of 1.0 mmφ insert into any openings of the enclosure with a force of $1N \pm 10\%$. The test is made using a dust chamber incorporating the basic principles shown in figure 2 where by the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50μm and the nominal width of gap between wires 75 μm. The amount of talcum powder to be used is 2 kg per cubic meter of the test chamber volume. It shall not have been used for more than 20 tests.

Enclosures are of necessity in one of two categories:

Category 1: Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, for example, due to thermal cycling effects.

The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. In no event shall the depression exceed 2kpa (20mbar) on the manometer shown in figure 2. If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2h. The extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8h has elapsed.

Category 2: Enclosures where no pressure difference relative to the surrounding air is present.

The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump. Any drain-hole normally open shall be left open for the duration of the test. The test shall be continued for a period of 8h.

The enclosure shall be deemed category 1 unless the relevant product standard for the equipment specifies that the enclosure is category 2.

The test wire of 1.0 mmφ insert into any openings of the enclosure with a force of $1N \pm 10\%$.

Acceptance Conditions:

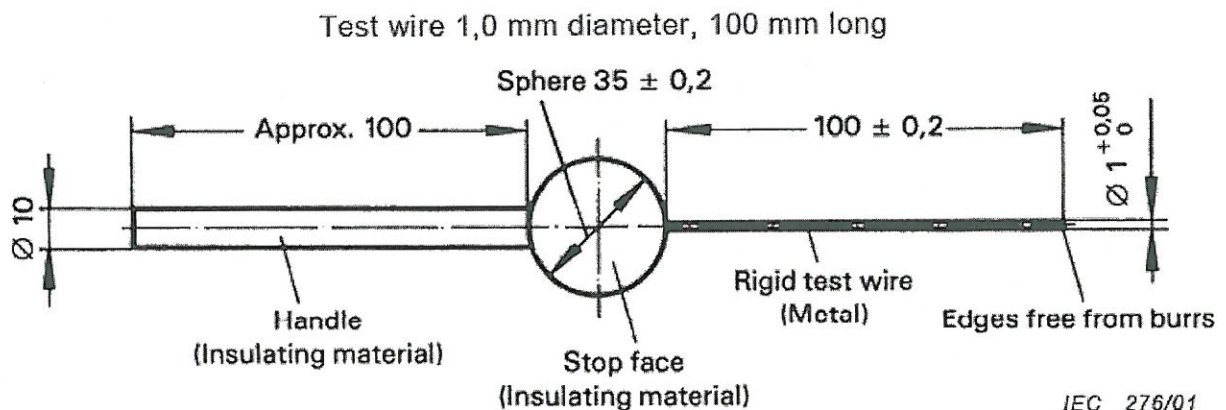
The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety. Except for special cases to be clearly specified in the relevant product standard, no dust shall deposit where it could lead to tracking along the creepage distances.

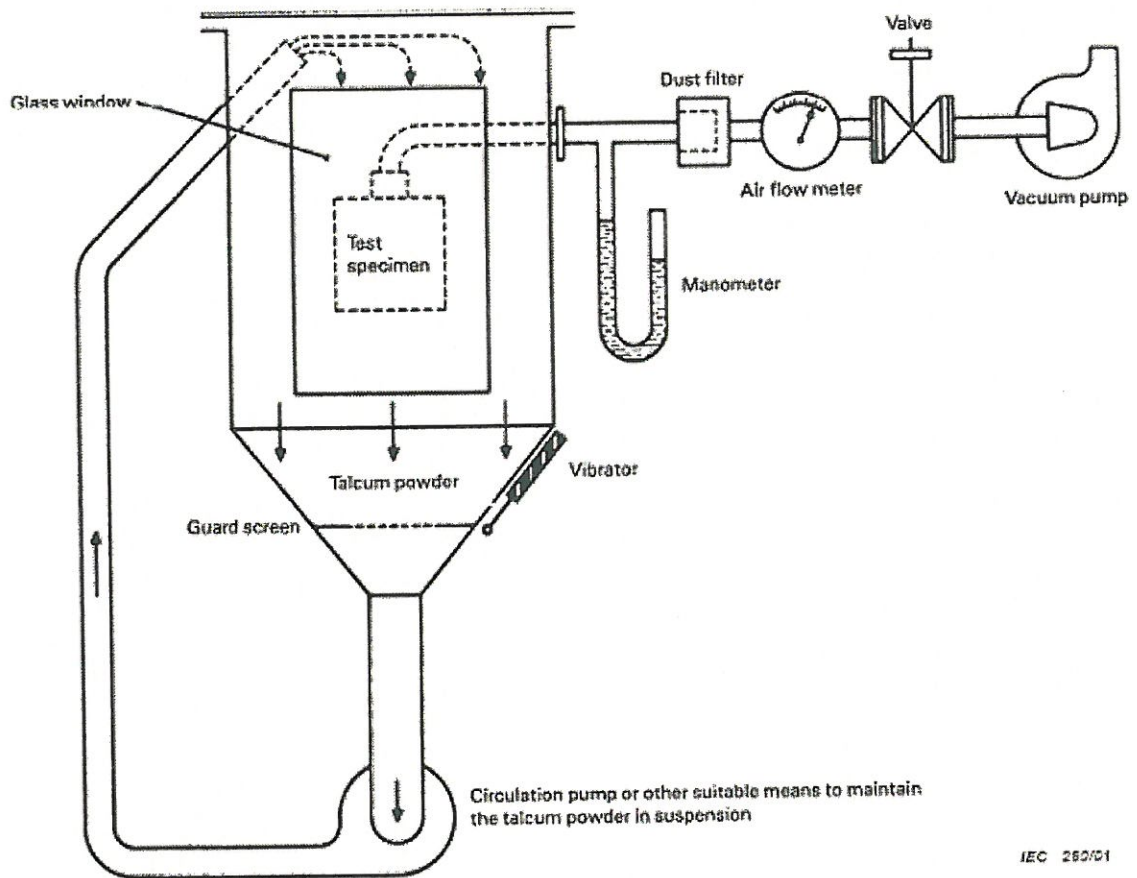
The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.

The protection is satisfactory if the access probe 1.0 mm diameter shall not pass through the any opening.

Test Result:

Pass Fail





NOTE See IEC 60068-2-68, figure 2 valid for La2 only.

Figure 2 – Test device to verify protection against dust (dust chamber)

**Test Item :**

Tests for protection against ingress moisture: IPX4

Test Method:

The tests should be carried out under the standard atmospheric condition. The atmospheric conditions during tests are as follows:

Temperature range: 15 °C to 35 °C; Relative humidity: 25% to 75%.

The tests are conducted with fresh water. The water temperature should not differ by more than 5 k from the temperature of the specimen under test. If the water temperature is more than 5 k below the temperature of the specimen a pressure balance shall be provided for the enclosure.

The test is made using one of the two test devices described in figure 4 and in figure 5 in accordance with the relevant product standard.

a) Conditions when using the test device as in figure 4 (oscillating tube):

The oscillating tube has spray holes over the whole 180° of the semicircle. The total flow rate is adjusted as specified table 9 and is measured with a flow meter.

The tube is caused to oscillate through an angle of almost 360°, 180° on either side of the vertical, the time for one complete oscillation ($2 \times 360^\circ$) being about 2s.

The duration of the test is 10 min.

If not specified otherwise in the relevant product standard, the support for the enclosure under test is perforated so as to avoid acting as a baffle and the enclosure is sprayed from every direction by oscillating the tube to the limit of its travel in each direction.

b) Conditions when using the test device as in figure 5 (spray nozzle):

The counterbalanced shield is removed from the spray nozzle and the enclosure is sprayed from all practicable directions.

The duration of the test is 5 min.

Acceptance Conditions:

After testing in accordance with the appropriate requirements, the enclosure shall be inspected for ingress of water.

It is the responsibility of the relevant Technical Committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.

In general, if any water has entered, it shall not:

- be sufficient to interfere with the correct operation of the equipment or impair safety;
- deposit on insulation parts where it could lead to tracking along the creepage distances;
- reach live parts or windings not designed to operate when wet;
- accumulate near the cable end or enter the cable if any.

If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.

For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.

Test Result:

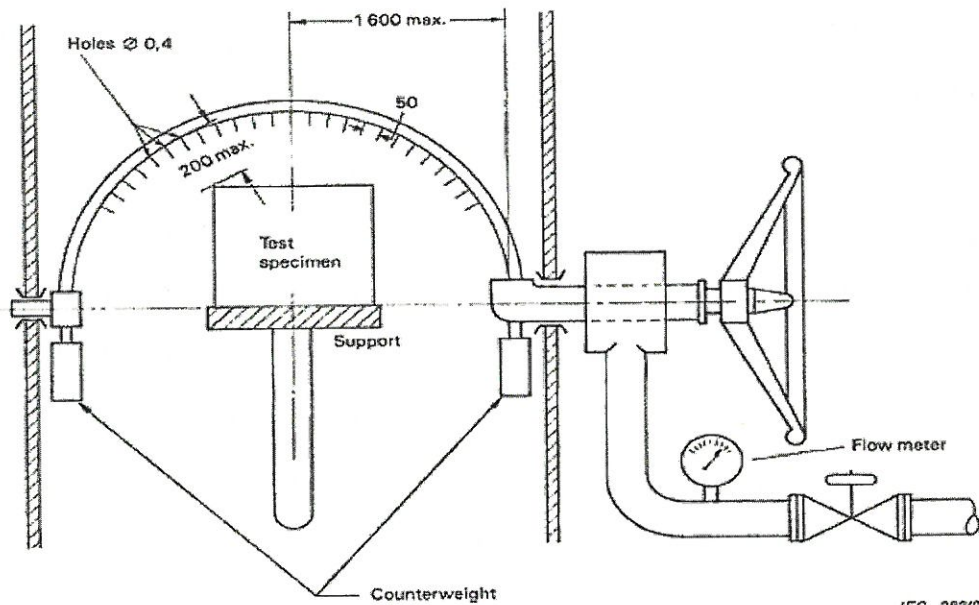
Pass Fail



Table 9-Total water flow rate q_v under IPX3 and IPX4 test conditions-
mean flow rate per hole $q_{v1}=0.07\text{l/min}$

Tube radius R mm	Degree IPx3		Degree IPx4	
	Number of open holes N1)	Total water flow q_v l/min	Number of open holes N1)	Total water flow q_v l/min
200	8	0.56	12	0.84
400	16	1.1	25	1.8
600	25	1.8	37	2.6
800	33	2.3	50	3.5
1000	41	2.9	62	4.3
1200	50	3.5	75	5.3
1400	58	4.1	87	6.1
1600	67	4.7	100	7.0

1) Depending on the actual arrangement of the hole centres at the specified distance, the number of open holes N may be increased by 1

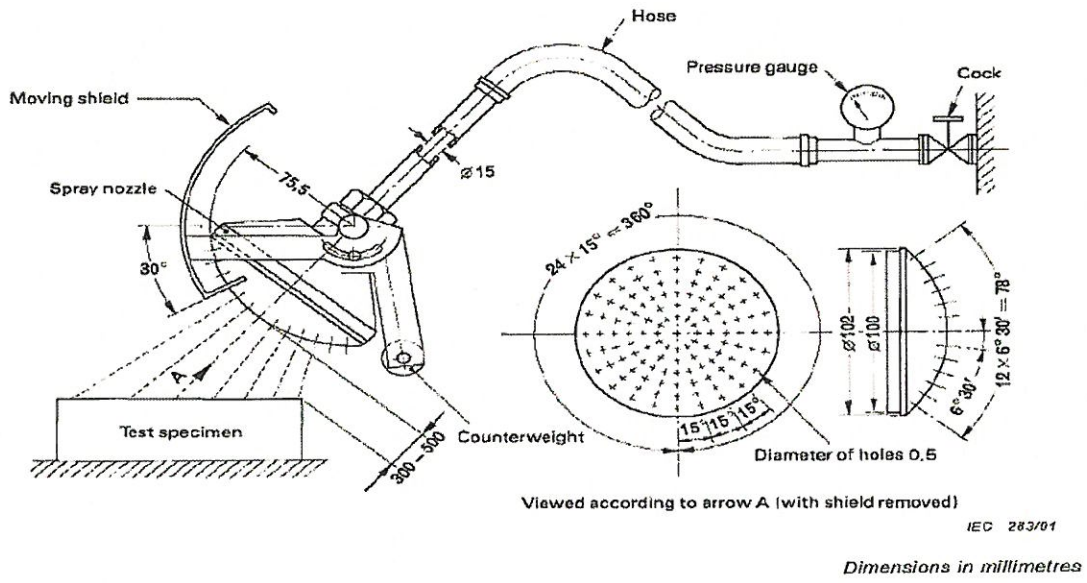


IEC 262/01

Dimensions in millimetres

NOTE The range of holes is shown as for second characteristic numeral 3 (see 14.2.3 a)).

Figure 4 – Test device to verify protection against spraying and splashing water;
second characteristic numerals 3 and 4 (oscillating tube)



- 121 holes of $\varnothing 0,5$;
- 1 hole at the centre
- 1 inner circles of 12 holes at 30° pitch
- 4 outer circles of 24 holes at 15° pitch
- Moving shield – Aluminium
- Spray nozzle – Brass

Figure 5 – Hand-held device to verify protection against spraying and splashing water; second characteristic numerals 3 and 4 (spray nozzle)



Photo Documentation :
Model: SM6-120



Photo 1: Overall view



Photo 2: Overall view

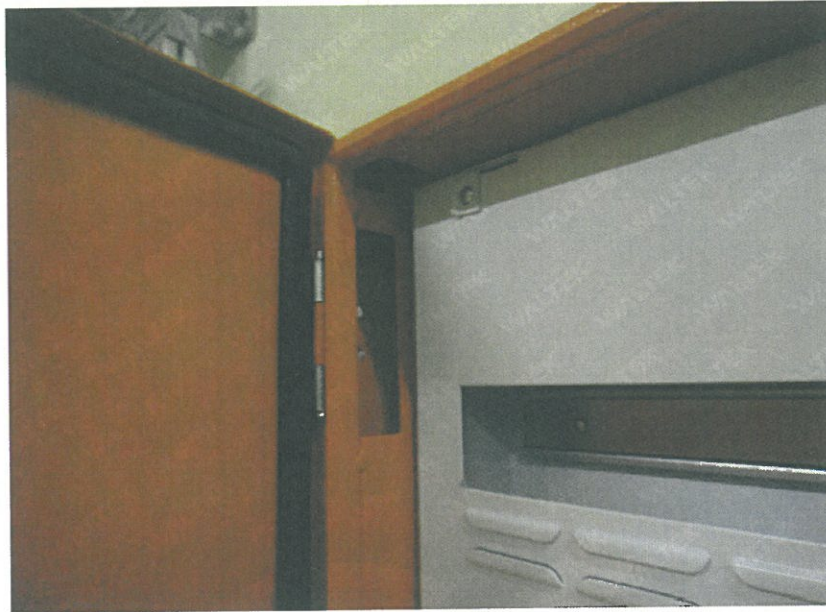


Photo 3: After the IP54 test

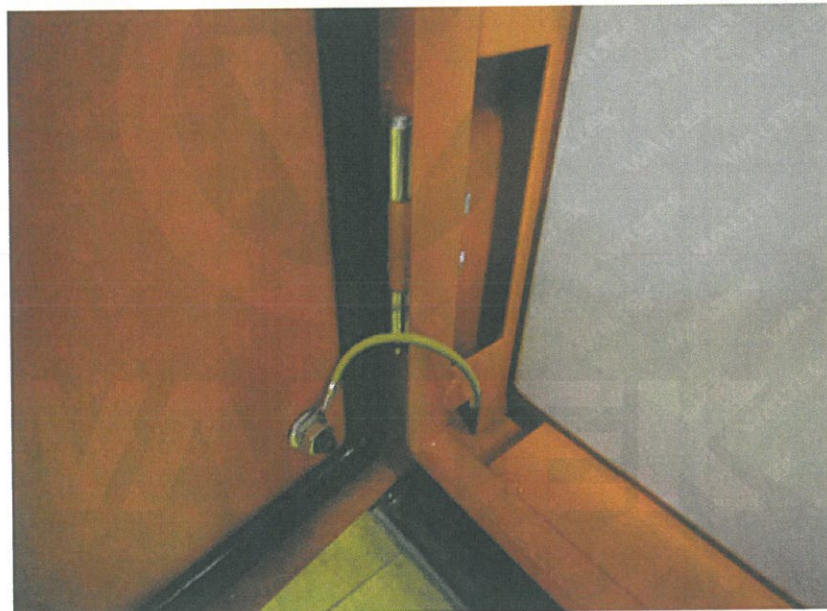


Photo 4: After the IP54 test

