



APPLICATION FOR IP CODE
On Behalf of
Nordtronic A/S

Metal kappe Downlight spot

**Model No.: 1281, 1282, 1283, 1284, 1525, 1526, 1557, 1521,
1522, 1523, 1524, 1251, 1252, 1253, 1254, 2121, 2122, 2123,
2124, 1541, 1542, 1543, 1544, 1551, 1552, 1553, 1554, 1581,
1582, 1583, 1584**

Prepared For: Nordtronic A/S
Address: Boelsmindevej 5, 9300 Saeby, Denmark

Prepared By: Shenzhen Certification Technology Service Co., Ltd.
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Report Number: CSTH-S140606058
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TEST STANDARD
IEC 60529
Degrees of protection provided by enclosures(IP code)

Report reference No..... : CSTH-S140606058

Tested by (+signature)..... : Terry Lu

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Contents..... : 12 pages

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Testing location..... : As above

Applicant..... : Nordtronic A/S

Address..... : Boelsmindevej 5, 9300 Saeby, Denmark

Standard..... : IEC 60529:1989+A1:1999+A2:2013

Procedure deviation..... : N.A.

Non-standard test method.... : N.A.

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Object under test..... : Metal kappe Downlight spot

Model/Type reference..... : 1281, 1282, 1283, 1284, 1525, 1526, 1557, 1521, 1522, 1523, 1524,
1251, 1252, 1253, 1254, 2121, 2122, 2123, 2124, 1541, 1542, 1543,
1544, 1551, 1552, 1553, 1554, 1581, 1582, 1583, 1584

Model difference..... : All models are the same in waterproof construction, only different in colors and appearance.
All the tests of this application are carried out in the model for the 1521 sample.

Trade mark..... : Nordtronic

Manufacturer..... : Nordtronic A/S

Address : Boelsmindevej 5, 9300 Saeby, Denmark

IP degrees..... : IP44

Note..... : N.A.

Possible test case verdicts:

- test case does not apply to the test object: N(A)
- test object does meet the requirement: P(Pass)
- test object does not meet the requirement: F(Fail)

General remarks:

Throughout this report a point is used as the decimal separator.

The result appearing herein relates only to the sample(s) tested.

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Comments:

(For test condition):

- Waterproof and Dustproof test of the lamp products are according to IEC/EN 60598-1.
- The first characteristic numeral 4 indicated protection against solid foreign objects indicated. The protection is satisfactory if the full diameter of the probe specified in table 7 does not pass through any opening. Test means: rigid steel rod $1_0^{+0.5}$ mm diameter with edges free from burrs, Test force: $1N \pm 10\%$.
- Before the tests for the second characteristic numeral, with the exception of IPX8, the luminaire complete with lamp(s) shall be switched on and brought to a stable operating temperature at rated voltage.
- The second characteristic numeral 4 indicated protected against water. Protected against splashing water: Water splashed against the enclosure from any direction shall have no harmful effects. 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 12s.

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
5	Degrees of protection against access to hazardous parts and against solid foreign objects indicated by the first characteristic numeral	IP4X	P
5.1	Protection against access to hazardous parts		P
5.2	Protection Against Solid Foreign Objects		P
6	Degrees of protection against ingress of water indicated by the second characteristic numeral	IPX4	P
7	Degrees of protection against access to hazardous parts indicated by the additional letter		N
8	Supplementary letters		N
9	Examples of designations with the IP Code		—
9.1	IP Code not using optional letters:		—
9.2	IP Code using optional letters:		—
10	Marking		P
	The requirements for marking shall be specified in the relevant product standard.		P
	Where appropriate, such a standard should also specify the method of marking which is to be used when:		N
	one part of an enclosure has a different degree of protection to that of another part of the same enclosure		N
	the mounting position has an influence on the degree of protection		N
	the maximum immersion depth and time are indicated		N
11	General requirements for tests		P
11.1	Atmospheric conditions for water or dust tests	24.8-25.6, 52.5-64.3%R.H.	P
11.2	Test samples		P
11.3	Application of test requirements and interpretation of test results		P
11.4	Combination of test conditions for the first characteristic numeral	IP4X	P
	Designation with a first characteristic numeral implies that all test conditions are met for this numeral		P
11.5	Empty enclosures		N

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
12	Test for protection against access to hazardous parts indicated by the first characteristic numeral		P
12.1	Access probes		P
12.2	Test conditions		P
12.3	Acceptance conditions		P
12.3.1	For low-voltage equipment. (Rated voltage not exceeding 1000V a.c. and 1500V d.c.)		P
	The access probe shall not touch hazardous live parts.		P
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		P
12.3.2	For high-voltage equipment (Rated voltage exceeding 1000V a.c. and 1500V d.c.)		N
	When the access probe is placed in the most unfavourable position(s), the equipment shall be capable of withstanding the dielectric tests as specified in the relevant product standard applicable to the equipment.		N
	Verification may be made either by dielectric test or by inspection of the specified clearance dimension in air which would ensure that the tests would be satisfactory under the most unfavourable electric field configuration (see IEC 71-2).		N
	In the case where an enclosure includes sections at different voltage levels the appropriate acceptance conditions for adequate clearance shall be applied for each section.		N
12.3.3	For equipment with hazardous mechanical parts	No such parts	N
	The access probe shall not touch hazardous mechanical parts.		N
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		N
13	Test for protection against solid foreign objects indicated by the first characteristic numeral		P
13.1	Test means	IP4X	P
	Test means and the main test conditions are given in table 7		P
13.2	Test conditions for first characteristic numerals 1, 2, 3, 4	Diameter 1.0mm With a test force of $1N \pm 10\%$	P

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
13.3	Acceptance conditions for first characteristic numerals 1, 2, 3, 4	The full diameter of the probe can pass through, but no touch the dangerous parts.	P
13.4	Dust test for first characteristic numerals 5 and 6		N
	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.		N
	Category 2: Enclosures where no pressure difference relative to the surrounding air is present.		N
13.5	Special conditions for first characteristic numeral 5		N
13.5.1	Test conditions for first characteristic numeral 5		N
13.5.2	Acceptance conditions for first characteristic numeral 5		N
13.6	Special conditions for first characteristic numeral 6		N
13.6.1	Test conditions for first characteristic numeral 6		N
13.6.2	Acceptance conditions for first characteristic numeral 6		N

14	Test for protection against water indicated by the second characteristic numeral		P
14.1	The test means and the main test conditions are given in table 8	IPX4	P
14.2	Test conditions		P
	Test means and main test conditions are given in table 8		P
	During the tests for IPX1 to IPX6 the water temperature should not differ by more than 5K from the temperature of the specimen under test	No more than 5K	P
	For IPX7 and IPX9 details of the water temperature are given in 14.2.7 and 14.2.9 respectively.		N
	Test for second characteristic numeral 8, the test conditions are subject to agreement between manufacturer and user, but they shall be more severe than those prescribed in 14.2.7 and they shall take account of the condition that the enclosure will be continuously immersed in actual use		N
14.2.1	Test for second characteristic numeral 1 with the drip box		N
14.2.2	Test for second characteristic numeral 2 with the drip box		N

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
14.2.3	Test for second characteristic numeral 3 with oscillating tube or spray nozzle		N
14.2.4	Test for second characteristic numeral 4 with oscillating tube or spray nozzle	Test time: 5min	P
14.2.5	Test for second characteristic numeral 5 with the 6.3mm nozzle		N
14.2.6	Test for second characteristic numeral 6 with the 12.5mm nozzle		N
14.2.7	Test for second characteristic numeral 7: temporary immersion between 0.15m and 1m		N
	The test is made by completely immersing the enclosure in water in its service position as specified by the manufacturer so that the following conditions are satisfied		N
	a) the lowest point of enclosures with a height less than 850mm is located 1000mm below the surface of the water		N
	b) the highest point of enclosures with a height equal to or greater than 850mm is located 150mm below the surface of the water		N
	c) the duration of the test is 30min		N
	d) the water temperature does not differ from that of the equipment by more 5K		N
14.2.8	Test for second characteristic numeral 8: continuous immersion subject to agreement		N
14.2.9	Test for second characteristic numeral 9 with a spray nozzle		N
	The test is made by spraying the enclosure with a stream of water from a standard test nozzle as shown in Figures 7, 8 and 9.		N
	The set-up for measuring the impact force of the water jet is given in Figure 10.		N
	The distribution force shall be verified at upper and lower limits of distance tolerance range (see Figure 11).		N
	a) For small enclosures (largest dimension less than 250 mm), the enclosure shall be mounted on the test device shown in Figure 12.		N
	- turntable speed: 5 r/min \pm 1 r/min		N
	- spray positions: 0°, 30°, 60°, 90°		N
	The test duration is 30 s per position.		N

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
	b) For large enclosures (largest dimension greater than or equal to 250 mm), the enclosure shall be mounted as per intended use. The entire exposed surface area of the enclosure shall be subjected to the spray at some point during the test procedure.		N
	- spray positions: the enclosure shall be sprayed from all practical directions covering the entire surface area and the spray shall be, as far as possible, perpendicular to the sprayed surface.		N
	- distance between nozzle and sample under test shall be 175 ± 25 mm.		N
	The test duration is 1 min/m ² of the calculated surface area of the enclosure (excluding any mounting surface), with a minimum duration of 3 min.		N
14.3	After testing in accordance with the appropriate requirements of 14.2.1 to 14.2.8 the enclosure shall be inspected for ingress of water	A small amount of water, do not damage the safety.	P
	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	Between live parts and enclosure 3750V/AC, No flashover or breakdown occurred.	P
	In general, if any water has entered, it shall not:		P
	-be sufficient to interfere with the correct operation of the equipment or impair safety	No affect the safety	P
	-deposit on insulation parts where it could lead to tracking along the creepage distances	No affect the safety	P
	-reach live parts or windings not designed to operated when wet	No water touch the dangerous parts	P
	-accumulate near the cable end or enter the cable if any	No affect the safety	P
	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		P
	For enclosure without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts		N
15	Test for protection against access to hazardous parts indicated by the additional letter		N
15.1	Access probes	No additional letter	N
	The access probe are given in table 6		N

IEC 60529			
Clause	Requirement – Test	Result - Remark	Verdict
15.2	Test conditions		N
	The access probe is pushed against any openings of the enclosure with the force specified in table 6		N
	If it partly or fully penetrates, it is placed in every possible position, but in no case shall the stop face fully penetrate through the opening.		N
	Internal barriers are considered part of the enclosure as defined in 3.1.		N
	For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected between the probe and the hazardous parts inside the enclosure.		N
	Hazardous live parts covered only with varnish or paint, or protected by oxidation or by a similar process, are covered by a metal foil electrically connected to those parts which are normally live in operation.		N
	The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment.		N
	Internal moving parts may be operated slowly, where this is possible.		N
15.3	Acceptance conditions		N
	The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.		N
	Test for the additional letter B		N
	Starting from the straight position, both joints of the test finger shall be successively bent through an angle of up to 90° with respect to the axis of the adjoining section of the finger and shall be placed in every possible position.		N
	Test for the additional letter C and D		N
	See Annex A for further clarification.		N
	Conditions for verification of adequate clearance are identical with those given in 12.3.1, 12.3.2 and 12.3.3.		N

Appendix
Photo documentation

Photo 1

View:
sample
characteristics

Sample model:
1521

front

rear

right side

left side

top

bottom

internal

**Photo 2**

View: sample
characteristics

Sample model:
1521

front

rear

right side

left side

top

bottom

internal



Photo documentation**Photo 3**

View: equipment of
dust proof testing
(IP4X)

Sample model:
1521

front

rear

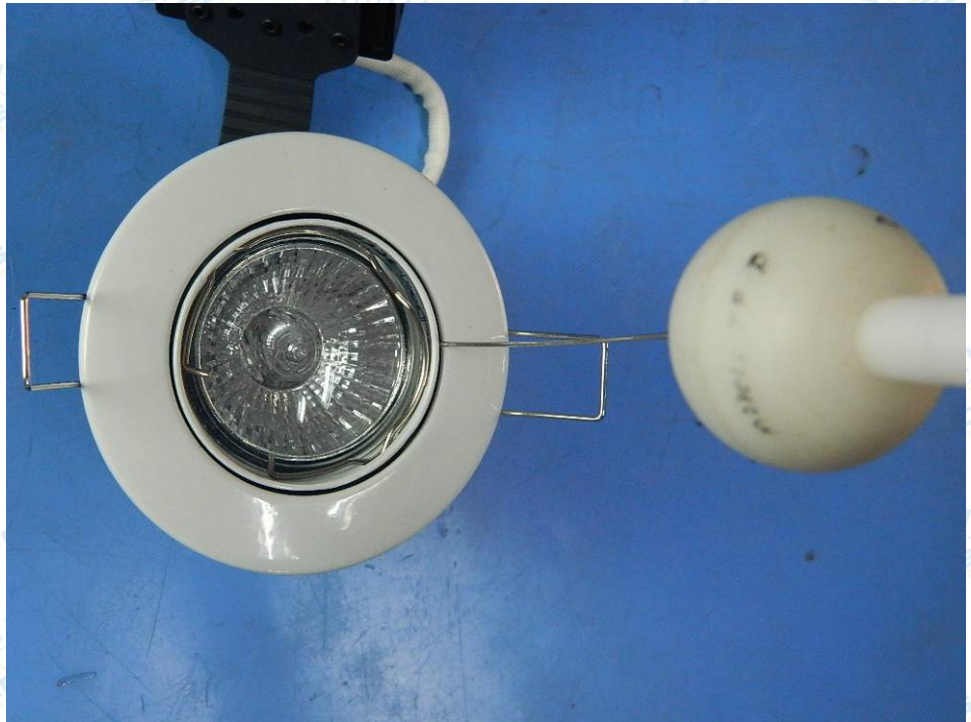
right side

left side

top

bottom

internal

**Photo 4**

View: equipment of
water proof testing
(IPX4)

Sample model:
1521

front

rear

right side

left side

top

bottom

internal



Photo documentation**Photo 5**

View: After testing

Sample model:
1521 front rear right side left side top bottom internal**Photo 6**

View: After testing

Sample model:
1521 front rear right side left side top bottom internal

Photo documentation

Photo 7

View: After testing

Sample model:
1521

front

rear

right side

left side

top

bottom

internal



Photo 8

View: After testing

Sample model:
1521

front

rear

right side

left side

top

bottom

internal

