Test Report issued under the responsibility of

electrosuisse

TEST REPORT

IEC 60 529 / EN 60 529

Degrees of protection provided by enclosures (Ip code)

Report reference No. ..... :	**08-IK-0250.02**
Tested by (name + signature) .... :	Markus Stalder
Approved by (name + signature) . :	Daniel Schneider
Date of issue ..... :	2012-04-16
CB/CCA Testing Laboratory Name :	Electrosuisse
Address ..... :	Luppmenstrasse 1, CH-8320 Fehraltorf
Testing location/procedure..... :	CBTL **X** RMT ☐ SMT ☐ WMT ☐ TMP ☐ STS 001
Address ..... :	CH-8320 Fehraltorf
Applicant's Name ..... :	Neutrik AG
Address ..... :	Im alten Riet 143, LI-9494 Schaan
Test specification	
Standard ..... :	IEC 60529:1989-11 + A1:1999 EN 60529 :1991-10 (incl. Corrigendum: 1993-05) + A1: 2000-02
Test procedure ..... :	Expertise
Procedure deviation ..... :	IP65, IP67
Non-standard test method ..... :	None
Test Report Form	IECEN60529A
TRF originator. ..... :	IMQ (SEV)
Master TRF (date) ..... :	Dated 2006-06 (2006-07)

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description ..... :	powerCON TRUE1
Trade Mark ..... :	Neutrik
Manufacturer ..... :	Neutrik AG, Im alten Riet 143, LI-9494 Schaan
Model /Type reference ..... :	powerCON / see page 4
Ratings ..... :	IP 65, IP 67

Copy of marking plate and summary of test results (information/comments):

Summary of test result see page 4

Summary of testing:

Appliance complies with this standard

See page 4

Test items particulars :

Classification of installation and use ..... : ---

Supply Connection ..... : ---

Possible test case verdicts :

Test case does not apply to the test object ..... : N/A

Test item does meet the requirement ..... : P(ass)

Test item does not meet the requirement..... : F(ail)

Test case not checked ..... : --

Testing

Date of receipt of test item..... : 2012-03-28

Date(s) of performance of test..... : 2012-04-12 - 2012-04-16

Product verification per IECEE 02, Clause 6.2.5 : ---

Steps taken by the NCB to ensure that the products from all the factories stated in the CB Test Certificate are equal..... :

General remarks

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal

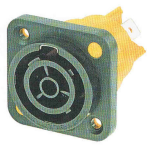
See also 08-IK-0250.02 Photo

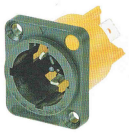
General product information:

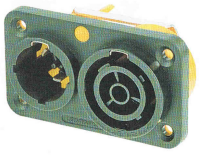
Type list: for IP 65 and IP 67

NKAC3F

NKAC3M

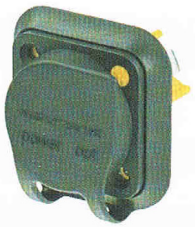






NAC3FPX NAC3MPX NAC3PX

SCNAC-PX



SCNAC-FPX

SCNAC-MPX

Dust – Test **IP6x**: All test samples were free of dust **IP6x-test was successful** **Water - Test** **IPx5**: All test samples were free of water **IPx5-test was successful** **IPx7**: All test samples were free of water **IPx7-test was successful** **IP65-test was successful** **IP67-test was successful**	**Test samples:** **- NAC3FPX with SCNAC-FPX** **- NAC3MPX with SCNAC-MPX** **- NAC3PX with SCNAC-PX** **- NKAC3F with NAC3MPX** **- NKAC3M with NAC3FPX** **- NKAC3F and NKAC3M with NAC3PX** **Fixed on a box (see Appendix Photo)**

IEC 60529 / EN 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			
5	The designation with a first characteristic numeral implies that conditions stated in both 5.1and 5.2 are met.			Pass
	The first characteristic numeral indicates that:			
	the enclosure provides protection of persons against access to hazardous parts by preventing or limiting the ingress of a part of the human body or an object held by a person;			Pass
	and simultaneously the enclosure provides protection of equipment against the ingress of solid foreign objects.			Pass
	An enclosure shall only be designated with a stated degree of protection indicated by the first characteristic numeral if it also complies with all lower degrees of protection.			Pass
	However, the tests establishing compliance with any one of the lower degrees of protection need not necessarily be carried out provided that these tests would obviously be met if applied			Pass
5.1	Protection against access to hazardous parts			
	Tab. I gives brief descriptions and definitions for the degrees of protection against access to hazardous parts.			Pass
	Degrees of protection listed in table I shall be specified only by the first characteristic numeral and not by reference to the brief descriptionor definition.			Pass
	To comply with the conditions of the first characteristic numeral, adequate clearance shall be kept between the access probe and hazardous parts			Pass
	The tests are specified in Clause 12.			Pass
	Tab. I-1 Degrees of protection against access to hazardous parts indicated by the first characteristic numeral			Pass
	First characteristic numeral	*Test conditions (Clause)*		—
	0	--		N/A
	1	12.2		Pass
	2	12.2		Pass

IEC 60529 / EN 60529				
Clause	Requirement – Test		Result – Remark	Verdict
	3	12.2		Pass
	4	12.2		Pass
	5	12.2		Pass
	6	12.2		Pass
	In the case of the first characteristic numerals 3, 4, 5 and 6,protection against access to hazardous parts is satisfied if adequate clearance is kept. The adequate clearance should be specified by the relevant product committee in accordance with 12.3.		(EN 60529/A1)	Pass
	Due to the simultaneous requirement specified in Table II, *the definition "shall not penetrate" is given in Table I.*		(EN 60529/A1)	Pass
5.2	Protection against solid foreign objects			
	Tab. II gives brief descriptions and the definitions for the degrees of protection against the penetration of solid foreign objects including dust.			Pass
	Degrees of protection listed in Tab II shall only be specified by the first characteristic numeral and not by reference to the brief description or definition.			Pass
	The protection against the ingress of solid foreign objects implies that the object probes up to numeral 2 in Tab. II shall not fully penetrate the enclosure. This means that the full diameter of the sphere shall not pass through an opening in the enclosure.			Pass
	Object probes for numerals 3 and 4 shall not penetrate the enclosure at all.			Pass
	Dust-protected enclosures to numeral 5 allow a limited quantity of dust to penetrate under certain conditions.			N/A
	Dust-tight enclosures to numeral 6 do not allow any dust to penetrate.			Pass
	Note Enclosures assigned a first characteristic numeral of 1 to 4 generally exclude both regularly and irregularly shaped solid foreign objects provided that three mutually perpendicular dimensions of the object exceed the appropriate figure in column 3 of Tab. II.			Pass

IEC 60529 / EN 60529				
Clause	Requirement – Test		Result – Remark	Verdict
	The tests are specified in Clause 13.			Pass
	Tab. II-2 Degrees of protection against solid foreign objects indicated by the first characteristic numeral			Pass
	First characteristic numeral	*Test conditions (Clause)*		—
	0	--		N/A
	1	13.2		Pass
	2	13.2		Pass
	3	13.2		Pass
	4	13.2		Pass
	5	13.4 13.5		Pass
	6	13.4 13.6	(EN 60529/A1)	Pass

6	DEGREES OF PROTECTION AGAINST INGRESS OF WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL		
	The second characteristic numeral indicates the degree of protection provided by enclosures with respect to harmful effects on the equipment due to the ingress of water.		Pass
	The tests for the second characteristic numeral are carried out with fresh water. The actual protection may not be satisfactory if cleaning operations with high pressure and/or solvents are used.		Pass
	Tab. III gives brief descriptions and definitions of the protection for the degrees represented by the second characteristic numeral.		Pass
	Degrees of protection listed in Tab. III shall be specified only by the second characteristic numeral and not by reference to the brief description or definition.		Pass
	The tests are specified in Clause 14.		Pass
	Up to and including second characteristic numeral 6, the designation implies compliance also with the requirements for all lower characteristic numerals.		Pass

IEC 60529 / EN 60529				
Clause	Requirement – Test		Result – Remark	Verdict
	However, the tests establishing compliance with any one of the lower degrees of protection need not necessarily be carried out provided that these tests obviously would be met if applied.			Pass
	An enclosure designated with second characteristic numeral 7 or 8 only is considered unsuitable for exposure to water jets (designated by second characteristic numeral 5 or 6) and need not comply with requirements for numeral 5 or 6 unless it is dual coded .			N/A
	Enclosures for “versatile” application shall meet requirements for exposure to both water jets and temporary or continuous immersion.		See page 4	Pass
	Enclosures for “restricted” application are considered suitable only for temporary or continuous immersion and unsuitable for exposure to water jets			N/A
	Tab. III-3 Degrees of protection against water indicated by the second characteristic numeral			Pass
	Second characteristic numeral	*Test conditions (Clause)*		—
	0	--		—
	1	14.2.1		Pass
	2	14.2.2		Pass
	3	14.2.3		Pass
	4	14.2.4		Pass
	5	14.2.5		Pass
	6	14.2.6		N/A
	7	14.2.7		Pass
	8	14.2.8		N/A

7	DEGREES OF PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER	**N/A**

8	SUPPLEMENTARY LETTERS	**N/A**

9	EXAMPLES OF DESIGNATIONS WITH THE IP CODE	**N/A**

IEC 60529 / EN 60529			
Clause	Requirement – Test	Result – Remark	Verdict
10	MARKING		**N/A**

11	GENERAL REQUIREMENTS FOR TESTS		
11.1	Atmospheric conditions for water or dust tests		
	Unless otherwise specified in the relevant product standard, the tests should be carried out under the standard atmospheric conditions described in IEC 68-1.		Pass
	The recommended atmospheric conditions during the tests are as follows		Pass
	Temperature range: 15 to 35 °C Relative humidity: 25 to 75% Air pressure: 86 to 106 kPa (860 to 1060 mbar)		Pass
	The tests specified in this standard are type tests.		Pass
	Unless otherwise specified in a relevant product standard, the test samples for each test shall be in a clean and new condition, with all parts in place and mounted in the manner stated by the manufacturer.		Pass
	If it is impracticable to test the complete equipment, representative parts or smaller equipment having the same full-scale design details shall be tested		N/A
	The relevant product standard shall specify details such as:		Pass
	the number of samples to be tested;	6 different samples tested (see page 4)	Pass
	the conditions for mounting, assembling and positioning of the samples, for example by the use of an artificial surface (ceiling, floor or wall);		Pass
	the pre-conditioning, if any, which is to be used;		N/A
	whether to be tested energized or not;		N/A
	whether to be tested with its parts in motion or not.		N/A
	In the absence of such specification, the manufacturer's instructions shall apply.		Pass
11.3	Application of test requirements and interpretation of test results		
	The application of the general requirements for tests and the acceptance conditions for equipment containing drain-holes or ventilation openings is the responsibility of the relevant Technical Committee.		Pass
	In the absence of such specification the requirement of this standard shall apply.		Pass

IEC 60529 / EN 60529				
Clause	Requirement – Test		Result – Remark	Verdict
	The interpretation of test results is the responsibility of the relevant Technical Committee. In the absence of a specification the acceptance of a specification the acceptance conditions of this standard shall at least apply			Pass
11.4	Combination of test conditions for the first characteristic numeral			
	Designation with a first characteristic numeral implies that all test conditions are met for this numeral:			Pass
	Tab. V-5 Test conditions for degrees of protection indicated by the first characteristic numeral			Pass
	First characteristic numeral		Test for protection against	Pass
		access to hazardous parts	solid foreign objects	Pass
	0	*No test required*	*No test required*	N/A
	1		*The sphere of 50 mm Ø shall not fully penetrate and adequate clearance shall be kept*	Pass
	2	*The jointed test finger may penetrate up to its 80 mm length, but adequate clearance shall be kept*	*The sphere of 12,5 mm Ø shall not fully penetrate*	Pass
	3		*The test rod of 2,5 mm Ø shall not penetrate and adequate clearance shall be kept*	Pass
	4		*The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept*	Pass
	5	*The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept*	*Dust-protected as specified in Tab. II*	Pass
	6	*The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept*	*Dust-tight as specified in Tab. II*	Pass
11.5	Empty enclosures			
	If the enclosure is tested without equipment inside, detailed requirements shall be indicated by the enclosure manufacturer in his instructions for the arrangement and spacing of hazardous parts or parts which might be affected by the penetration of foreign objects or water.			N/A

IEC 60529 / EN 60529			
Clause	Requirement – Test	Result – Remark	Verdict
	The manufacturer of the final assembly shall ensure that after the electrical equipment is enclosed the enclosure meets the declared degree of protection of the final product.		N/A

12	TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL		
12.1	Access probes		
	Access probes to test the protection of persons against access to hazardous parts are given in Tab. VI.		Pass
12.2	Test conditions		
	The access probe is pushed against or (in case of the test for first characteristic numeral 2) inserted through any openings of the enclosure with the force specified in Tab. VI.		Pass
	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. 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/A
	The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment.		N/A
	Internal moving parts may be operated slowly, where this is possibile.		N/A
12.3	Acceptance conditions		
	The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.		Pass
	For the test of first characteristic numeral 1, the access probe 50 mm diameter shall not completely pass through the opening.		Pass
	For the test of first characteristic numeral 2, the jointed test finger may penetrate to its 80 mm length, but the stop face (Ø 50 ´ 20 mm) shall not pass through the opening. 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 adjoiningnsection of the finger and shall be placed in every possible position.		Pass
	See Annex A for further clarification. Adequate clearance means		Pass

IEC 60529 / EN 60529					
Clause	Requirement – Test		Result – Remark		Verdict
12.3.1	For low-voltage equipment (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.)				
	The access probe shall not touch hazardous live parts.				Pass
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.				Pass
12.3.2	For high-voltage equipment (rated voltages exceeding 1000 V a.c. and 1500 V d.c.)				
	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/A
	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/A
	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/A
12.3.3	For equipment with hazardous mechanical parts				
	The access probe shall not touch hazardous mechanical parts.				N/A
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.				N/A

13	TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL				
13.1	Test means				
	Test means and the main test conditions are given in Tab. VII.				Pass
	Tab. VII-7 Test means for the tests for protection against solid foreign objects				Pass
	First characteristic numeral				—
	0				N/A
	1	Test means	Test force	Test conditions	Pass
	2	*No test required*	—	—	Pass

IEC 60529 / EN 60529					
Clause	Requirement – Test		Result – Remark		Verdict
	1	*Rigid sphere without handle or guard 50 mm diameter*	50 N ±10%	13.2	Pass
	2	*Rigid sphere without handle or guard 12,5 mm diameter*	30 N ±10%	13.2	Pass
	3	*Rigid steel rod2,5 mm diameter with edges free from burrs*	3 N ±10%	13.2	Pass
	4	*Rigid steel wire 1 mm diameter with edges free from burrs*	1 N ±10%	13.2	Pass
	5	*Dust chamber Fig. 2, with or without underpressure*	—	13.4 and 13.5	N/A
	6	*Dust chamber Fig. 2, with underpressure*	—	13.4 and 13.6	Pass
13.2	Test conditions for first characteristic numerals 1, 2, 3, 4				
	The object probe is pushed against any openings of the enclosure with the force specified in Tab. VII.				Pass
13.3	Acceptance conditions for first characteristic numerals 1, 2, 3, 4				
	The protection is satisfactory if the full diameter of the probe specified in Table VII does not pass through any opening.		(EN 60529/A1)		Pass
13.4	Dust test for first characteristic numerals 5 and 6				
	The test is made using a dust chamber incorporating the basic principles shown in Fig. 2 whereby 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 50 mm and the nominal width of a gap between wires 75 mm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.		(EN 60529/A1)		Pass
	Enclosures are of necessity in one of two categories:				Pass
	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, e.g., due to thermal cycling effects.				Pass
	Category 2: Enclosures where no pressure difference relative to the surrounding air is present				N/A

IEC 60529 / EN 60529			
Clause	Requirement – Test	Result – Remark	Verdict
	Category 1 enclosures:		
	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.		Pass
	The suction connection shall be made to a hole specially provided for this test.		Pass
	If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts.		Pass
	If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole.		N/A
	If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site.		N/A
	The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. .		Pass
	In no event shall the depression exceed 2 kPa (20 mbar) on the manometer shown in Fig. 2.		Pass
	If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.		N/A
	If, with a maximum depression of 2 kPa (20 mbar), 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 8 h has elapsed.		Pass
	or a period of 8 h has elapsed.		Pass
	Category 2 enclosures:		
	The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump.		N/A
	Any drain-hole normally open shall be left open for the duration of the test.		N/A
	The test shall be continued for a period of 8 h		N/A
	Category 1 and category 2 enclosures:		N/A
	If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied:		N/A
	testing of individually enclosed sections of the enclosure;.		N/A

IEC 60529 / EN 60529			
Clause	Requirement – Test	Result – Remark	Verdict
	testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during test;		N/A
	testing of a smaller enclosure having the same full-scale design details.		N/A
	In the last two cases, the volume of air to be drawn through the enclosure under test shall be the same as for the whole enclosure in full scale		N/A
13.5	Special conditions for first characteristic numeral 5		
13.5.1	Test conditions for first characteristic numeral 5		
	The enclosure shall be deemed category 1 unless the relevant product standard for the equipment specifies that the enclosure is category 2.		N/A
13.5.2	Acceptance conditions for first characteristic numeral 5		
	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.		N/A
	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.		N/A
13.6	Special conditions for first characteristic numeral 6		
13.6.1	Test conditions for first characteristic numeral 6		
	The enclosure shall be deemed category 1, whether reductions in pressure below the atmospheric pressure are present or not.		Pass
13.6.2	Acceptance conditions for first characteristic numeral 6		
	The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.		Pass

14	TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL					
14.1	Test means					
	The test means and the main test conditions are given in Tab. VIII.					Pass
	Tab. VIII-8 Test means and main test conditions for the tests for protection against water					Pass
	Second charact. numeral	Test means	Water flow rate	Duration of test	Test conditions	—

IEC 60529 / EN 60529						
Clause	Requirement – Test			Result – Remark		Verdict
	0	*No test required*	—	—	—	—
	1	*Drip box Fig.3* *Enclosure on turntable*	1 mm/min	10 min	14.2.1	N/A
	2	*Drip box Fig.3* *Enclosure in 4 fixed positions of 15° tilt*	3 mm/min	2,5 min for each position of tilt	14.2.2	N/A
	3	*Oscillating tube Fig. 4* *Spray ± 60° from vertical,* *distance max. 200 mm* *or* *Spray nozzle Fig. 5* *Spray ± 60° from vertical*	0,07 l /min ± 5% *per hole, multiplied by number of holes* 10 l /min ± 5%	10 min 1 min/m² *at least 5 min*	14.2.3 a) 14.2.3 b)	N/A
	4	*As for numeral 3* *Spray ± 180° from vertical*	*As for numeral 3*		14.2.4	N/A
	5	*Water jet hose nozzle Fig. 6* *Nozzle 6,3 mm diameter, distance 2,5m to 3 m*	12,5 l /min ± 5%	1 min/m² *at least 3 min*	14.2.5	Pass
	6	*Water jet hose nozzle Fig. 6* *Nozzle 12,5 mm diameter, distance 2,5 m to 3 m*	100 l /min ± 5%	1 min/m² *at least 3 min*	14.2.6	N/A

IEC 60529 / EN 60529						
Clause	Requirement – Test			Result – Remark		Verdict
	7	*Immersion tank* *Water-level on enclosure:* *0,15 m above top* *1 m above bottom*	—	30 min	14.2.7	Pass
	8	*Immersion tank* *Water-level: by agreement*	—	*by agreement*	14.2.8	N/A
14.2	Test conditions					
	Test means and main test conditions are given in Tab. VIII.					Pass
	Details concerning compliance of degrees of protection – in particular for second characteristic numerals 5/6 (water jets) and numerals 7/8 (immersion) – are given in Clause 6.					Pass
	The tests are conducted with fresh water.					Pass
	During the tests for IPX1 to IPX6 the water temperature should not differ by more than 5 K from the temperature of the specimen under test.					Pass
	If the water temperature is more than 5 K below the temperature of the specimen a pressure balance shall be provided for the enclosure.					N/A
	For IPX7 details of the water temperature are given in 14.2.7.					Pass
	During the test, the moisture contained inside the enclosure may partly condense. The dew which may thus deposit shall not be mistaken for an ingress of water.					Pass
	For the purpose of the tests, the surface area of the enclosure is calculated with a tolerance of 10%.					Pass
	Adequate safety precautions should be taken when testing the equipment in the energized condition					N/A
14.2.1	Test for second characteristic numeral 1 with the drip box					
	The test is made with a device which produces a uniform flow of water drops over the whole area of the enclosure.					N/A

IEC 60529 / EN 60529			
Clause	Requirement – Test	Result – Remark	Verdict
	The turntable on which the enclosure is placed has a rotation speed of 1 r/min and the eccentricity(distance between turntable axis and specimen axis) is approximately 100 mm.		N/A
	The enclosure under test is placed in its normal operating position under the drip box, the base of which is larger than that of the enclosure.		N/A
	Except for enclosures designed for wall or ceiling mounting, the support for the enclosure under test should be smaller than the base of the enclosure.		N/A
	An enclosure normally fixed to a wall or ceiling is fixed in its normal position of use to a wooden board having dimensions which are equal to those of that surface of the enclosure which is in contact with the wall or ceiling when the enclosure is mounted as in normal use.		N/A
	The duration of test is 10 min.		N/A
14.2.2	Test for second characteristic numeral 2 with the drip box		
	The dripping device is the same as specified in 14.2.1 adjusted to provide the water flow rate specified in Tab. VIII.		N/A
	The table on which the enclosure is placed does not turn as in the case of the test for the second characteristic numeral 1.		N/A
	The enclosure is tested for 2,5 min in each of four fixed positions of tilt. These positions are 15° on either side of the vertical in two mutually perpendicular planes (see Fig. 3b)).		N/A
	The total duration of the test is 10 min.		N/A
14.2.3	Test for second characteristic numeral 3 with oscillating tube or spray nozzle		
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.		N/A
	a) Conditions when using the test device as in Fig. 4 (oscillating tube)		N/A
	b) Conditions when using the test device as in Fig. 5 (spray nozzle)		N/A
14.2.4	Test for second characteristic numeral 4 with oscillating tube or spray nozzle		N/A
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.		N/A
	a) Conditions when using the test device as in Fig. 4 (oscillating tube):		N/A
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):		N/A

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Clause	Requirement – Test			Result – Remark		Verdict
	Tab. IX-9 Total water rate qv under IPX3 and IPX4 test conditions Mean flow rate per hole qv1 = 0,07 l/min					N/A
	Tube radium R mm	Number of open holes N(1)	Total water flow Qv l /min	Number of open holes 1)	Total water flow qv l /min	N/A
	200	8	0,56	12	0.84	N/A
	400	16	1,1	25	1,8	N/A
	600	25	1,8	37	2,6	N/A
	800	33	2,3	50	3,5	N/A
	1000	41	2,9	62	4,3	N/A
	1200	50	3,5	75	5,3	N/A
	1400	58	4,1	87	6,1	N/A
	1600	67	4,7	100	7,0	N/A
						N/A
	(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.					
14.2.5	Test for second characteristic numeral 5 with the 6,3 mm nozzle					
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.					Pass
	The conditions to be observed are as follows:.					
	internal diameter of the nozzle: 6,3 mm;					Pass
	delivery rate: 12,5 l/min ± 5%;					Pass
	water pressure: to be adjusted to achieve the specified delivery rate;					Pass
	core of the substantial stream: circle of approximately 40 mm diameter at 2,5 m distance from nozzle;					Pass
	test duration per square metre of enclosure surface area likely to be sprayed: 1 min;					Pass
	minimum test duration: 3 min;					Pass
	distance from nozzle to enclosure surface:between 2,5 and 3 m					Pass
14.2.6	Test for second characteristic numeral 6 with the 12,5 mm nozzle					
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.					N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	The conditions to be observed are as follows:.		N/A
	internal diameter of the nozzle: 12,5 mm;		N/A
	delivery rate: 100 l/min ± 5%;.		N/A
	water pressure: to be adjusted to achieve the specified delivery rate;		N/A
	core of the substantial stream: circle of approximately 120 mm diameter at 2,5 m distance from nozzle;		N/A
	test duration per square metre of enclosure surface area likely to be sprayed: 1 min;		N/A
	minimum test duration: 3 min;		N/A
	distance from nozzle to enclosure surface: between 2,5 and 3 m.		N/A
14.2.7	Test for second characteristic numeral 7: temporary immersion between 0,15 and 1 m		
	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:		
	a) the lowest point of enclosures with a height less than 850 mm is located 1000 mm below the surface of the water		Pass
	b) the highest point of enclosures with a height equal to or greater than 850 mm is located 150 mm below the surface of the water;		Pass
	c) the duration of the test is 30 min;		Pass
	d) the water temperature does not differ from that of the equipment by more than 5 K.		Pass
	However, a modified requirement may be specified in the relevant product standard if the tests are to be made when the equipment is energized and/or its parts in motion		N/A
14.2.8	Test for second characteristic numeral 8: continuous immersion subject to agreement		
	Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user,		N/A
	but they shall be more severe than those prescribed in 14.2.7		N/A
	And they shall take account of the condition that the enclosure will be continuously immersed in actual use.		N/A
14.3	Acceptance conditions		
	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.		Pass

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Clause	Requirement – Test	Result – Remark	Verdict
	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 dieletric strength test, if any.		Pass
	In general, if any water has entered, it shall not:		
	be sufficient to interfere with the correct operation of the equipment or impair safety;		Pass
	deposit on insulation parts where it could lead to tracking along the creepage distances;		Pass
	reach live parts or windings not designed to operate when wet;		Pass
	accumulate near the cable end or enter the cable if any.		Pass
	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.		N/A
	For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts		Pass

15	TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER	**N/A**

ZA	ANNEX ZA (NORMATIVE) Other International Publications quoted in this standard with the references of the relevant European Publications		**N/A**
	When the International Publication as been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.	(EN 60529)	N/A