

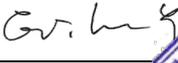


TEST REPORT IEC 62955 Residual direct current detecting device (RDC-DD) to be used for mode 3 charging of electric vehicles	
Report Number.....	64.105.23.31016.01
Date of issue	2023-09-22
Total number of pages.....	36
Name of Testing Laboratory preparing the Report	TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch 5F, Communication Building, 163 Pingyun Rd, Huangpu West Ave., 510656 Guangzhou, People's Republic of China
Applicant's name	NEXBLUE SRL
Address	RUE DE LONDERS 17, 1050 IXELLES, BRUXELLES, BELGIUM
Test specification:	
Standard.....	IEC 62955:2018
Test procedure.....	Test report
Non-standard test method.....	N/A
TRF template used.....	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No.	IEC62955A
Test Report Form(s) Originator.....	VDE Testing and Certification Institute
Master TRF.....	Dated 2022-04-28
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Test item description :	Residual direct current detecting device
Trade Mark(s) :	NEXBLUE
Manufacturer :	Same as applicant
Model/Type reference :	RDC-PD of NB1620A
Ratings :	RDC-PD of NB1620A: 32A, 230/400±10% V~ 50Hz, 3P+N+PE, IΔdc: 6mA, IΔn: 30mA, Detail information of product see “general product information”

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

<input checked="" type="checkbox"/>	Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch	
Testing location/ address :		5F, Communication Building, 163 Pingyun Rd, Huangpu West Ave., 510656 Guangzhou, People's Republic of China	
Tested by (name, function, signature) :		Guihua Yuan (Project handler)	
Approved by (name, function, signature) .. :		Martin Ma (Designated reviewer)	 

<input type="checkbox"/>	Testing procedure: CTF Stage 1:	-	
Testing location/ address :		-	
Tested by (name, function, signature) :		-	-
Approved by (name, function, signature) .. :		-	-

<input type="checkbox"/>	Testing procedure: CTF Stage 2:	-	
Testing location/ address :		-	
Tested by (name + signature) :		-	-
Witnessed by (name, function, signature) .. :		-	-
Approved by (name, function, signature) .. :		-	-

<input type="checkbox"/>	Testing procedure: CTF Stage 3:	-	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	-	
Testing location/ address :		-	
Tested by (name, function, signature) :		-	-
Witnessed by (name, function, signature) .. :		-	-
Approved by (name, function, signature) .. :		-	-
Supervised by (name, function, signature) .. :		-	-

List of Attachments (including a total number of pages in each attachment):

Attachment no.1: Photo documentation (6 pages).

Summary of testing:

Tests performed (name of test and test clause):

RDC-PD of NB1620A was subjected to the relevant tests of IEC 62955:2018.

Test item details, as following:

Test sequence	Clause or subclause	Test (or inspection)	
A	6	Marking	
	8.1.1	General	
	8.1.2	Mechanism	
	9.3	Indelebility of marking	
	9.15	Trip-free mechanism	
	9.4	Reliability of screws, current-carrying parts and connections	
	9.5	Reliability of terminals for external conductors	
	9.6	Protection against electric shock	
	9.13	Resistance to heat	
	8.1.3	Clearances and creepage distances	
A ₂	9.14	Resistance to abnormal heat and to fire	
B	9.7.7.3	Resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions	
	9.7.7.4	Verification of the behaviour of components bridging the basic insulation	
	9.7.1- 9.7.2	Resistance to humidity	
	9.7.3	Insulation resistance of the main circuit	
	9.7.4	Dielectric strength of the main circuit	
		Insulation resistance and dielectric strength of auxiliary circuits	
	9.7.7.2	Verification of clearances with the impulse withstand voltage	
	9.7.5	Secondary circuit of detection transformers	
	9.7.6	Capability of control circuits connected to the main circuits etc.	
	9.8	Temperature rise	
9.19.3	Reliability at 40°C		
9.20	Ageing of electronic components		
C	9.10	Mechanical and electrical endurance	
D	D0	9.9	Residual operating characteristics
	D1	9.17	Verification of the correct operation in case of three- and four- pole RDC-DDs powered on two poles only

Testing location:

For clause 9.10, 9.11, 9.19, 9.20:

Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality

4F, Building1, No.125 Miaohouwang Road, Binjiang District, Hangzhou, Zhejiang, China

For others:

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch

TÜV SÜD Testing Center, D1 building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China

	9.18	Verification of behaviour of RDC-DDs in case of current surges caused by impulse voltages
	9.16	Test device
E	9.11.2.3 a)	Coordination at Performance at Inc
	9.11.2.3 c)	Performance at Im
F	9.11.2.3 b)	Coordination at Im
	9.11.2.2	Coordination at I _{ΔC}
G	9.19.2	Reliability (climatic test)

All the test results in this report are positive.

Note:

I_{Δn}=30mA part see IEC 61008-1 Attachment no.1 for details.

EMC part wasn't considered in this report.

I_{nc}=1000A, I_{Δc}=1000A were specified by client.

Note for 8.1.3:

According to the requirement of 8.1.3, The clearances of items 1 may be reduced provided that the measured clearances are not less than 1.2mm allowed in IEC 60664-1 for homogenous field conditions.

Compliance for item 1 of table 6 of clause 8.1.3 is checked by the test according to 9.7.7.3.2. see appended table 9.7.7.3.2 for details.

And in field, need to ensure that the power supply to this product is properly connected to a fuse box with an Miniature Circuit Breaker (The value depends on the cable diameter and length, charger rating and environmental parameters as decided by the electrician) suitable for the electrical connection and meeting the requirements of the applicable regulations, and the distance between live part which separated when the main contacts in the open position must exceed 4mm (for example ABB model: iC65N-C40A/4P).

Summary of compliance with National Differences (List of countries addressed): none

The product fulfils the requirements of IEC 62955:2018.

Use of uncertainty of measurement for decisions on conformity (decision rule):

No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

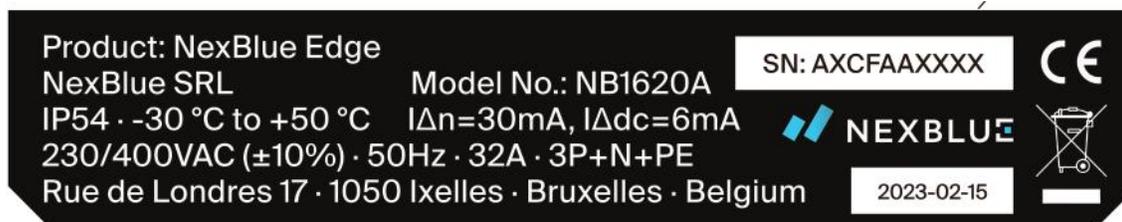
Other: (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Copy of marking plate:



Test item particulars	RDC-PD
Classification of installation and use	Integrated in EV Charger
Supply Connection	Screw-type terminals
Required SCPD	By a silver (Ø0.5mm)
Rated operational voltage(s) U_e (V)	230/400±10% V
Rated insulation voltage U_i (V)	440V
Rated impulse withstand voltage U_{imp} (V)	4kV
Rated current(s) I_n (A).....	32A
maximum rated current of the circuit-breaker or RCD with which it may be assembled (for RDC-MD according to 4.1.1.2)	N/A
maximum rated current of the monitored circuit (for RDC-MD according to 4.1.1.3).....	N/A
Rated d.c. residual operating current $I_{\Delta dc}$ (A).....	6mA
Rated d.c. residual non-operating current $I_{\Delta ndc}$ (A).....	3mA
Rated frequency(s) (Hz).....	50Hz
Rated making and breaking capacity I_m (A).....	500A
Rated residual making and breaking capacity $I_{\Delta m}$ (A) :	500A
Rated conditional short-circuit current I_{nc} (A)	1000A
Rated conditional residual short-circuit current $I_{\Delta c}$ (A) :	1000A
Degree of Protection (IP)	IP00 (RDC-PD is integrated in EV Charger)
Classification RDC-DD according to construction.....	<input type="checkbox"/> RDC-MD with <u>mechanical</u> switching in one unit (according to 4.1.1.1) <input type="checkbox"/> RDC-MD <u>mechanically coupled</u> to a separate switching device (4.1.1.2) See Annex M for modified tests <input type="checkbox"/> RCBO Type A according to IEC 61009 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.2a) <input type="checkbox"/> RCCB Type A according to IEC61008 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.2b) <input type="checkbox"/> Circuit Breaker according to IEC60898-1 (4.1.1.2c) <input type="checkbox"/> RDC-MD <u>electrically coupled</u> to a separate switching device (4.1.1.3) See Annex N for modified tests <input type="checkbox"/> RCBO Type A according to IEC 61009 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.3a)



- RCCB Type A according to IEC61008 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.3b)
- Circuit Breaker according to IEC60898-1. For AC and pulsating DC protection; this RDC-MD shall be used in series with a Type A RCD according to IEC61008 or IEC61009 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.3c)
- Remotely operated switch e.g. contactor or relay For AC and pulsating DC protection; this RDC-MD shall be used in series with a Type A RCD according to IEC61008 or IEC61009 or a Type F RCD according to IEC62423 with residual operating current rating \leq 30mA (4.1.1.3d)
- RDC-PD with integrated a.c., pulsating d.c. and 6mA d.c. detection, evaluation and mechanical switching in one unit (4.1.2)
See Annex O for modified tests

- Classification according to the number of poles : 2-pole RDC-DD
 3-pole RDC-DD
 4-pole RDC-DD

- Classification to the method of connection..... : RDC-DDs, the electrical connections of which are not associated with the mechanical mounting
 RDC-DDs, the electrical connections of which are associated with the mechanical mounting

- Classification according to the type of terminals..... : RDC-DDs with screw-type terminals for external copper conductors
 RDC-DDs with screwless type terminals for external copper conductors
 RDC-DDs with flat quick-connect terminals for external copper conductors
 RDC-DDs with screw-type terminals for external aluminium conductors

- Classification according to ambient temperature..... : -5°C up to 40°C
 -25°C up to 40°C
 Others: -30 °C up to +50 °C (Specified by client)

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)

Testing..... :

Date of receipt of test item : 2023-06-13



Date (s) of performance of tests : 2023-06-13 to 2023-09-22

General remarks:

"(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 separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60384-14:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
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When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)..... : SCUD ENERGY TECHNOLOGY CO., LTD
Room 44, 23rd Floor, Building 1, New Drug Innovation Center, Yaoxi Road 10, Nanyu Town, Minhou County, Fuzhou City, Fuzhou Province, China

General product information and other remarks:

RDC-PD of NB1620A is an integral part of the charging system.
The rating of RDC-PD as following,
230/400±10%V~, 50Hz, 3P+N+PE, 32A IΔn=30mA, IΔdc=6mA, Im=500A, IΔm=500A, Inc=1000A, IΔc=1000A