TEST REPORT

EN IEC 62752

In-cable control and protection device for mode 2 charging of electric road vehicles (IC-CPD)

Report Number.....:	**CTB26042904102A01**
Date of issue.....:	2026-07-09
Total number of pages.....:	80
Name of Testing Laboratory preparing the Report.....:	**Shenzhen CTB Testing Technology Co., Ltd.** 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	**Guangdong Cenwell Technology Co., Ltd**
Address.....:	Building A and office, No. 1 Xinmin First Street, Ma'an Town, Huicheng District, Huizhou City, Guangdong Province, China
Test specification:	
Standard.....:	EN IEC 62752:2024
Test procedure.....:	Type test report
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62752B
Test Report Form(s) Originator.....:	VDE Prüf- und Zertifizierungsinstitut GmbH
Master TRF.....:	Dated 2018-11-09

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Test item description.....:	Electric vehicle AC charging box
Trade Mark.....:	CenWell®
Manufacturer.....:	**Guangdong Cenwell Technology Co., Ltd** Building A and office, No. 1 Xinmin First Street, Ma'an Town, Huicheng District, Huizhou City, Guangdong Province, China
Model/Type reference.....:	CW-3-BEE-32A, CW-1-DZQ-AAA, Model reference difference table refer to page 8.
Ratings.....:	Input: 230-400Vac 50/60Hz 32A Max. Output: 230-400Vac 50/60Hz 32A Max. 22KW Max.

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

☒	**Testing Laboratory:**	**Shenzhen CTB Testing Technology Co., Ltd.**	
	Testing location/ address.....:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China	
	Tested by (name, function, signature).....:	Jedi Lin	
	Reviewed by (name, function, signature)... :	Bart Wang	
	Approved by (name, function, signature)... :	Rita Xiao	

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

Attachment No.1: Photo documentation (22 pages)

Summary of testing:

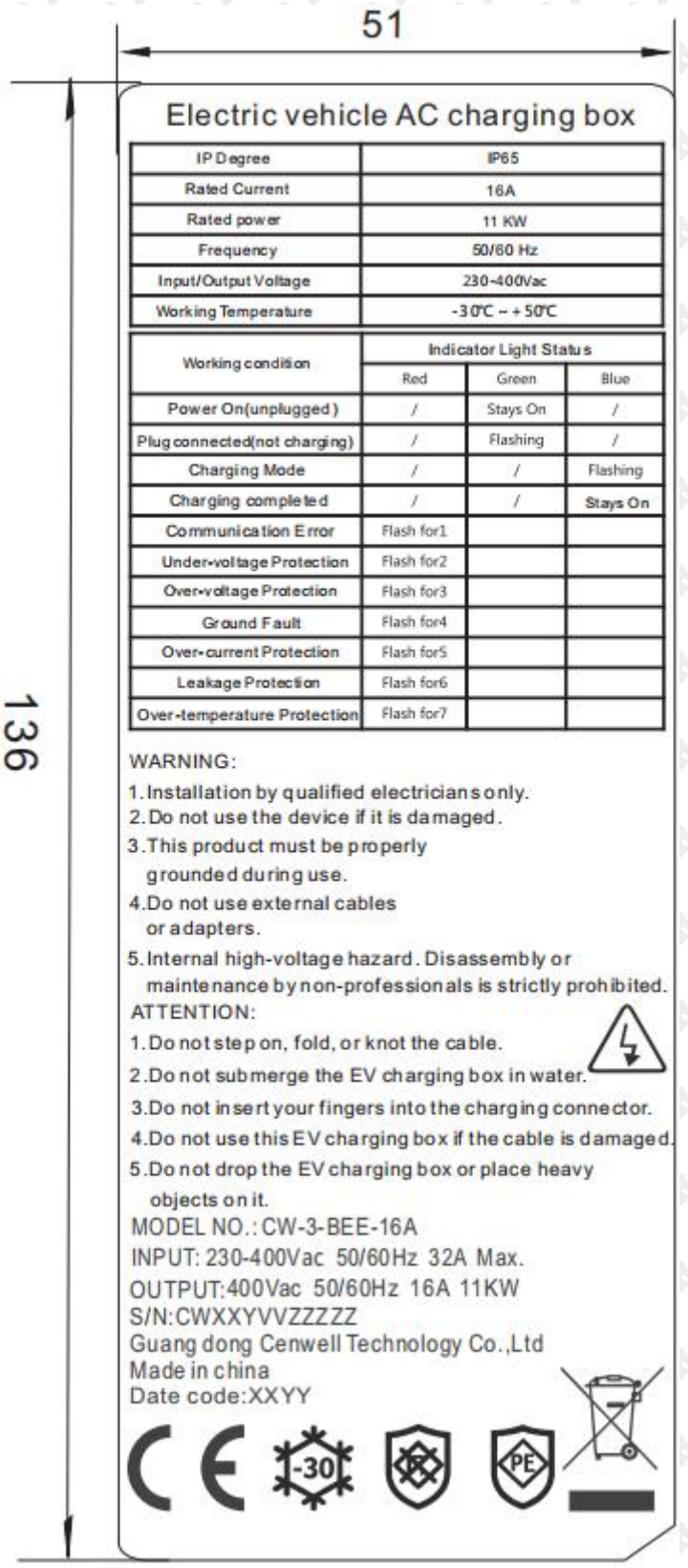
Tests performed (name of test and test clause):	**Testing location:**
The submitted samples were found to comply with the requirements of: ➢ IEC 62752:2024 ➢ EN IEC 62752:2024 ➢ BS EN IEC 62752:20024	**Shenzhen CTB Testing Technology Co., Ltd.** 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China

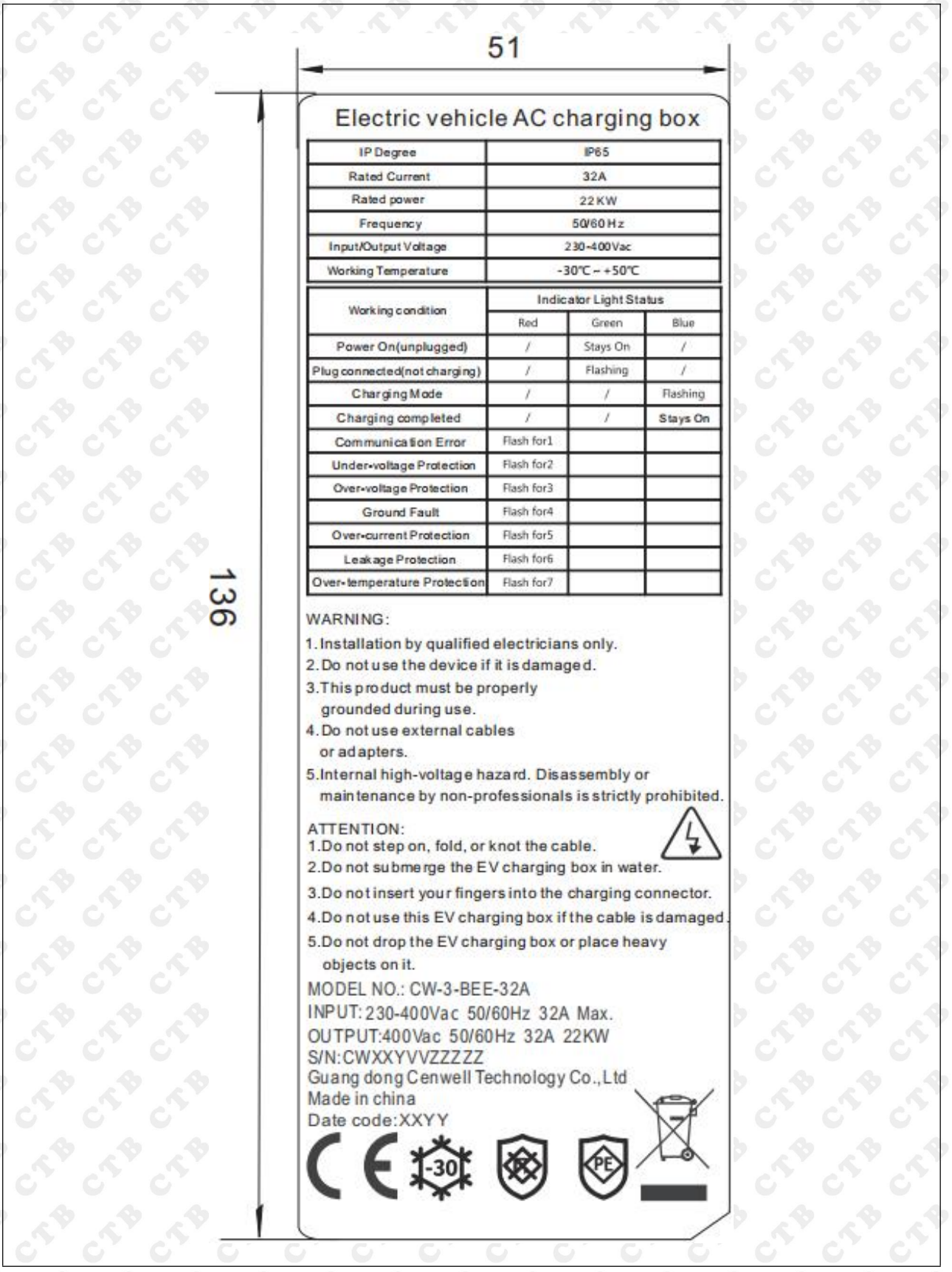
Summary of compliance with National Differences (List of countries addressed):

☒ **The product fulfils the requirements of** ___EN IEC 62752:2024_____

Copy of marking plate:

The artwork below may be only a draft.


51
136
Electric vehicle AC charging box
IP Degree IP65
Rated Current 16A
Rated power 11 KW
Frequency 50/60 Hz
Input/Output Voltage 230-400Vac
Working Temperature -30℃ ~ +50℃
Working condition
Indicator Light Status
Red Green Blue
Power On(unplugged) / Stays On /
Plug connected(not charging) / Flashing /
Charging Mode / / Flashing
Charging completed / / Stays On
Communication Error Flash for1
Under-voltage Protection Flash for2
Over-voltage Protection Flash for3
Ground Fault Flash for4
Over-current Protection Flash for5
Leakage Protection Flash for6
Over-temperature Protection Flash for7
WARNING:
1. Installation by qualified electricians only.
2. Do not use the device if it is damaged.
3. This product must be properly grounded during use.
4. Do not use external cables or adapters.
5. Internal high-voltage hazard. Disassembly or maintenance by non-professionals is strictly prohibited.
ATTENTION:
1. Do not step on, fold, or knot the cable.
2. Do not submerge the EV charging box in water.
3. Do not insert your fingers into the charging connector.
4. Do not use this EV charging box if the cable is damaged.
5. Do not drop the EV charging box or place heavy objects on it.
MODEL NO.: CW-3-BEE-16A
INPUT: 230-400Vac 50/60Hz 32A Max.
OUTPUT:400Vac 50/60Hz 16A 11KW
S/N:CWXXYVVZZZZZ
Guang dong Cenwell Technology Co.,Ltd
Made in china
Date code:XXYY
-30
PE


51
136
Electric vehicle AC charging box
IP Degree IP65
Rated Current 32A
Rated power 22KW
Frequency 50/60Hz
Input/Output Voltage 230-400Vac
Working Temperature -30℃~+50℃
Working condition
Indicator Light Status
Red Green Blue
Power On(unplugged) / Stays On /
Plug connected(not charging) / Flashing /
Charging Mode / / Flashing
Charging completed / / Stays On
Communication Error Flash for1
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Ground Fault Flash for4
Over-current Protection Flash for5
Leakage Protection Flash for6
Over-temperature Protection Flash for7
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INPUT: 230-400Vac 50/60Hz 32A Max.
OUTPUT:400Vac 50/60Hz 32A 22KW
S/N:CWXXYVZZZZZ
Guang dong Cenwell Technology Co.,Ltd
Made in china
Date code:XXYY
-30
PE

Test item particulars..... :	
Classification according to the supply..... :	[] 4.1.2 LNSE /LLSE or [] LNE /LLE [X] 4.1.3 LLLNSE or [] LLLNE
Classification according to the construction..... :	[X] 4.2.2 IC-CPD including the function box separated from the plug and vehicle connector 4.2.3 Modular IC-CPD [] 4.2.3 a) Residual current function and switching device integrated into the plug and control pilot function controller integrated into a separate function box between the plug and the vehicle connector [] 4.2.3 b) Residual current function and switching device integrated into the plug and control pilot function controller integrated into the vehicle connector
Classification according to the method of connecting the cable(s)..... :	[X] 4.3.2 non-rewirable IC-CPDs [] 4.3.3 IC-CPDs wired by the manufacturer [] 4.3.4 pluggable
Classification according to the protective conductor path..... :	[] 4.4.2 IC-CPDs with switched protective conductor [X] 4.4.3 IC-CPDs with non-switched protective conductor:
Classification according to behaviour in case of open protective conductor..... :	[] 4.5.2 upstream PE detection [X] 4.5.3 without upstream PE detection
Classification according to the usage..... :	[X] 4.6.1 IC-CPD for portable use [] 4.6.2 IC-CPD for wall mounting [] 4.6.3 IC-CPD for portable use and for wall mounting
switching contacts for line(s) and neutral..... :	[X] Yes [] No
switching contacts for the protective conductor... :	[] Yes [X] No
implemented software version..... :	/
rated operational voltage (U_e)..... :	230-400Vac
rated insulation voltage (U_i)..... :	400Vac
rated current (I_n)..... :	32A Max.
rated residual operating current ($I_{\Delta n}$)..... :	0.03A
rated residual non-operating current ($I_{\Delta no}$)..... :	0.020A
rated frequency..... :	50/60Hz
rated making and braking capacity (I_m)..... :	100A
rated residual making and breaking capacity ($I_{\Delta m}$) :	100A
residual currents comprising a d.c. component.... :	35mA d.c.
Coordination with short-circuit protection devices (SCPDs)	
rated conditional short-circuit current (I_{nc})..... :	1500A

Coordination with short-circuit protection devices (SCPDs)	
rated conditional short-circuit current ($I_{\Delta c}$).....:	1500A
minimum temperature for operation.....:	-30°C
maximum temperature for operation.....:	50°C
altitude.....:	5000m MSL
external magnetic field.....:	[X] Earth magnetic field [] other: μT
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.....:	2026-05-07
Date (s) of performance of tests.....:	2026-05-07 to 2026-06-29

General remarks:

The test results presented in this report relate only to the object tested.
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Laboratory CTB. The authenticity of this Test Report and its contents can be verified by contacting CTB, responsible for this Test Report.

" (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 IECEE 02:

The application for obtaining a 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.....:	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....:	**Guangdong Cenwell Technology Co., Ltd** Building A and office, No. 1 Xinmin First Street, Ma'an Town, Huicheng District, Huizhou City, Guangdong Province, China

General product information and other remarks:

The test items are mode 2 AC charging equipment for Electrical Vehicles which is portable equipment. They must be maintained and installed only by trained and authorized electricians. See the detailed installation method in the user manual.

All models with the same main board and hardware. The difference between all models is plug type, and duty cycle setting for different rating current. The model CW-3-BEE-32A is selected to do all the tests.

Model reference difference table as below:

Model number	Input		Output
CW-1-DZQ-AAA	230-400Vac 50/60Hz 32A Max.		230-400Vac 50/60Hz 32A Max. 22KW Max.
CW-1-DZQ-AAA	1	1	1 represents single-phase power
		3	3 represents three-phase power.
	D	A	A indicates an oval casing
		B	B indicates a diamond-shaped casing
		C	C indicates a cordless casing;
		D	D indicates an iron casing;
		E	E indicates a square casing
	Z	A	A indicates Australian standard plug;
		C	C indicates Chinese national standard plug;
		D	D indicates Thai plug;
		E	E indicates European or Korean plug;
		F	F indicates Swiss plug;
		H	H indicates no plug on the input side;
		I	I indicates Indian plug;
		J	J indicates Japanese plug;

		M	M indicates Argentine plug;
		Q	Q indicates Italian plug;
		R	R indicates Russian plug;
		S	S indicates American plug;
		T	T indicates Taiwanese plug;
		U	U indicates British/Singapore/Saudi/Malaysian plug;
		V	V indicates South African plug;
		X	X indicates Brazilian plug;
		Y	Y indicates Israeli plug;
		Z	Z indicates Indonesian plug.
	Q	C	C = China standard charging cable;
		E	E = European standard charging cable;
		S	S = American standard charging cable;
		T	T = Tesla standard charging cable.
	AAA	AAA Variable:	06–32 A (names vary by output current) For example: 06 = 06 A; 16 A = 16 A; 32 A = 32 A

Summary of enclosure printing style:



EN IEC 62752			
Clause	Requirement + Test	Result - Remark	Verdict

4	**Classification**		P
4.1	According to the supply	LLLNE	P
4.1.1	General		P
4.1.2	IC-CPD supplied from one phase and neutral and fromtwo phasesl (LNSE /LLSEor LNE/LLE)	☐ One phase ☐ LNSE ☐ LNE ☐ Two phases ☐ LLSE ☐ LLE	N/A
4.1.3	IC-CPD supplied from three phases and neutral (LLLNSE or LLLNE)	☐ Three phases+N ☐ LLLNSE ☒ LLLNE	P
4.2	According to the construction		P
4.2.1	General	See below	P
4.2.2	IC-CPD including the function box separated from the plug and vehicle connector	☒ Figure F.1	P
4.2.3	Modular IC-CPD	☐ Figure F.2 ☐ Figure F.3	N/A
4.3	According to the method of connecting the cable(s)		P
4.3.1	General	See below	P
4.3.2	Non-rewirable IC-CPDs	☒ Yes ☐ No	P
4.3.3	IC-CPDs wired by the manufacturer	☐ Yes ☒ No	N/A
4.3.4	Pluggable IC-CPD	☐ Yes ☒ No	N/A
4.4	Classification according to the protective conductor path		P
4.4.1	General	See below	P
4.4.2	IC-CPDs with switched protective conductor	☐ Yes ☒ No	N/A
4.4.3	IC-CPDs with non-switched protective conductor	☒ Yes ☐ No	P
4.5	Classification according to the verification of availability of the upstream protective conductor		P
4.5.1	General	See below	P
4.5.2	IC-CPD with verification of the availability of the upstream protective conductor	☐ Yes ☒ No	N/A
4.5.3	IC-CPD without verification of the availability of the upstream protective conductor	☒ Yes ☐ No	P
4.6	Classification according to the usage		P
4.6.1	IC-CPD for portable use		P
4.6.2	IC-CPD for wall mounting		N/A

4.6.3	IC-CPD for portable use and for wall mounting		N/A

5	**Characteristics of IC-CPDs**		P
5.1	Summary of characteristics	IC-CPDs for mode 2 charging of EV	P
5.2	Rated quantities and other characteristics		P
5.2.1	Rated voltages		P
5.2.1.1	Rated operational voltage (Ue)	See copy of marking plate	P
5.2.1.2	Rated insulation voltage (Ui)		P
5.2.2	Rated current (In)	See copy of marking plate	P
5.2.3	Rated residual operating current (IΔn)		P
5.2.4	Rated residual non-operating current (IΔno)		P
5.2.5	Rated frequency	See copy of marking plate	P
5.2.6	Rated making and breaking capacity (Im)		P
5.2.7	Rated residual making and breaking capacity (IΔm)		P
5.2.8	Operating characteristics in case of residual currents comprising a DC component		P
5.2.9	Insulation coordination including creepage distances andclearances	see clause 8.4.3	P
5.2.10	Coordination with short-circuit protection devics (SCPDs)		P
5.2.10.1	General	See 9.9.2.1, 9.9.2.4	P
5.2.10.2	Rated conditional short-circuit current (Inc)	See 9.9.2.4a)	P
5.2.10.3	Rated conditional residual short-circuit current (IΔc)	See 9.9.2.4c)	P
5.3	Standard and preferred values		P
5.3.1	Preferred values of rated operational voltage (Ue)	☐ 120V ☐ 220V ☐ 230V ☐ 240V ☐ 100/200V ☐ 120/240V ☐ 120/208V ☐ 220/380V ☒ 230/400V ☐ 240/415V ☐ 277/480V ☐ Others:400V	P
5.3.2	Preferred values of rated current (In)	☐ 6A ☐ 8A ☐ 10A ☐ 12A ☐ 13A ☐ 15A ☒ 16A ☐ 20A ☐ 24A ☐ 25A ☐ 30A ☒ 32A	P
5.3.3	Standard values of rated residual operating current (IΔn)	☐ 0.006A ☐ 0.01A ☐ 0.015A ☐ 0.02A ☒ 0.03A	P
5.3.4	Standard value of the rated residual non-operating current (IΔno)	☒ 0.5 IΔn ☐ 0.25 IΔn	P
5.3.5	Standard minimum value of the non-operating overcurrent through the IC-CPD	☒ 4In ☐ ____	P

5.3.6	Preferred values of rated frequency	☐ 50Hz ☐ 60Hz ☒ 50/60Hz ☐ ____	P
5.3.7	Minimum value of the rated making and breaking capacity (Im)	☒ 100A ☐ _____	P
5.3.8	Minimum value of the rated residual making and breaking capacity (IΔm)	☒ 100A ☐ _____	P
5.3.9	Standard value of the rated conditional short-circuit current (Inc)	☒ 1500A ☐ _____	P
5.3.10	Standard value of the rated conditional residual short-circuit current (IΔc)	☒ 1500A ☐ _____	P
5.3.11	Limit values of break time	☒ Table 2 for a.c. ☒ Table 3 for smooth d.c. ☒ Table 4 for pulsating	P

6	Marking and other product information		P
6.1	Data to be marked on the IC-CPD	See copy of marking plate	P
6.2	Information to be provided to the end-user	See operating manual	P

7	Standard conditions for operation in service and for installation		P
7.1	Standard conditions	☐ Standard: -25°C~+45°C ☒ Other: -30°C~+50°C with agreement between manufacturer and user	P
7.2	Conditions for installations	See operating manual	P

8	Requirements for construction and operation		P
8.1	Mechanical design	☒ 4.3.2 (non re-wirable), ☐ 4.3.3 (wired by manufacturer), ☐ 4.3.4 (Pluggable) ☒ IP65 except the plug and vehicle connector. ☒ Cord length: 0.63m <1.7m ☒ No provision to alter the residual operating characteristics. Approved ☒ plug ☒ power cord and cable ☒ vehicle connector provided.	P
8.2	Pluggable electrical connections of pluggalbe IC-CPDs according to 4.3.4	☐ Yes ☒ No	N/A

8.2.1	General	☐ accessories fulfill 8.2 ☐ connection in accordance with IEC60309-1	N/A
8.2.2	Degree of protection of pluggable electrical connection against solid foreign objects and water for pluggable IC-CPD	☐ IP55 in mated position ☐ IP24 in unmated position	N/A
8.2.3	Breaking capacity of pluggable electrical connection for pluggable IC-CPD	☐ break capacity test ☐ on-load test ☐ off-load test	N/A
8.3	Construction	☒ 4.3.2 (non re-wirable), ☐ 4.3.3 (wired by manufacturer), ☒ 4.3.4 (Pluggable)	P
8.3.1	General	It was impossible to disassemble the IC-CPD ☒ PWM under single fault conditions, compliance was checked by fault analysis provided by the manufacturer (FMEA)	P
8.3.2	Terminations of IC-CPDs	The terminations were located and protected, they could not create a dangerous situation. Comliance was checked by the test of 9.4	P
8.3.3	Enclosure of IC-CPDs according to 4.3.3	☐ Yes ☒ No ☐ Completely enclose the terminals and the ends of flexible cables and cords.	N/A
8.3.4	Terminal screws or nuts of IC-CPDs according to 4.3.3	☐ Yes ☒ No ☐ can not become loose and fall out of position	N/A
8.3.5	Strain on the conductors of IC-CPDs according to 4.3.3	☐ Yes ☒ No ☐ Comliance was checked by the test of 9.21	N/A
8.3.6	Additional requirements for IC-CPDs according to 4.3.3	☐ Yes ☒ No ☐ cord anchorage relief from strain and prevention of twisting	N/A
8.3.7	Insulating parts which keep the live parts in position	Reliably fixed.	P
8.3.8	Screws for IC-CPD according to 4.3.3	☐ Yes ☒ No ☐ be captive of use of tight-fitting washers or cardboard or the like	N/A
8.3.9	Means for suspension from a wall or other mounting surfaces	☐ Yes ☒ No ☐ Fulfill requirements for protection against electric shock according to 8.5	N/A

8.3.10	Plug as an integral part of plug-in equipment	☐ Yes ☒ No ☐ not cause overheating of pins (test of 9.6) ☐ not impose undue strain on fixed socket-outlets (test of 9.22)	N/A
8.3.11	Flexible cables and cords and their connection	☐ IEC60227 series ☐ IEC60245 series ☒ Others accepted: EN 50620	P
8.3.11.1	Cord anchorage	Prevent the conductors from strain and twisting. Compliance was checked by inspection and by the test of 9.23	P
8.3.11.2	Minimum cross section	For Load and protective earth conductor: ☐ 1.5mm^2 ☒ 2.5 mm^2 ☐ 4 mm^2 ☐ 6 mm^2; control pilot wire: ☒ 0.5 mm^2/20AWG ☐ 0.75 mm^2/18AWG	P
8.3.11.3	Bending	Guard of insulating material provided. Compliance was checked by inspection and by the test of 9.24.	P
8.4	Electrical performance		P
8.4.1	Protective conductor path	☒ No switched contact within the protective conductor path. ☒ No pass through the sensing toroid ☒ No semiconductor device connected in series with protective conductor. Compliance was checked by tests of ☒ 9.6.2, ☒ 9.9.2.3 and ☒ 9.9.2.4c)	P
8.4.2	Contact mechanism	The ☒ Line and ☒ Neutral contacts are mechanically and electrically coupled such that they make and break substantially together. Compliance was checked by inspection and by the tests of 9.7.	P
8.4.3	Clearances and creepage distance	☐ PD1 ☐ PD2 ☒ PD3 ☐ OVC I ☒ OVCII ☐ OVCIII ☐ Group I ☐ Group II ☒ Group III was considered. (see appended table)	P

8.5	Protection against electric shock		P
8.5.1	General	Accessible parts of operating means were made of insulating material. Compliance was checked by inspection and by the tests of 9.4	P
8.5.2	Requirements relating to plugs, whether incorporated or not in integral items	☐ plugs according to IEC60884-1 ☒ plugs according to IEC 60309 series ☐ national standards:	P
8.5.3	Degree of protection of the function box	☐ IP55 ☒ IP65	P
8.5.4	Requirements relating to vehicle connectors	According to IEC 62196-2.	P
8.6	Dielectric propterties	Compliance was checked by the tests of 9.5	P
8.7	Temperature rise	Compliance was checked by the tests of 9.6	P
8.8	Operating characteristics		P
8.8.1	General	Compliance was checked by the tests of 9.7	P
8.8.2	Safe connection operating characteristics	Compliance was checked by the test of 9.7.8	P
8.8.3	Operating characteristics with AC residual currents and residual currents having a DC component	Compliace was checked by the tests of 9.7.2, 9.7.3 and 9.7.5	P
8.8.4	Operating characteristics with smooth DC residual current	Compliace was checked by the tests of 9.7.5	P
8.8.5	Behaviour of the IC-CPD after a residual current operation	Compliance was checked by the test of 9.13	P
8.8.6	Residual pulsating direct currents which may result from rectifying circuits supplied from two phases	☐ Two phases ☐ LLSE ☒ LLNE Compliace was checked by the tests of: ☒ 9.7.10a) or ☒ 9.7.10b)	P
8.8.7	Residual pulsating direct currents which may result from rectifying circuits supplied from three phases	☐ Three phases+N ☐ LLLNSN ☒ LLLNE Compliace was checked by the tests of ☒ 9.7.11a) or ☒ 9.7.11b)	P
8.9	Mechanical and electrical enduarance	Compliace was checked by the tests of 9.8.1 and 9.8.2	P
8.10	Performance at short-circuit currents	Compliace was checked by the tests of 9.9	P
8.11	Resistance to mechanical shock and impact	Compliace was checked by the tests of 9.10	P

8.12	Resistance to heat	Compliace was checked by the tests of 9.11	P
8.13	Resistance to abnormal heat and to fire	Compliace was checked by the tests of 9.12	P
8.14	Performance of the test function	The verification was made by inspection and by the tests with a special prepared sample as described in 9.13	P
8.15	Behaviour in case of loss of the supply voltage	Compliace was checked by the tests of 9.7 and 9.14	P
8.16	Resistance of IC-CPDs against unwanted tripping due to surge currents to earth resulting from impulse voltages	Compliace was checked by the tests of 9.16	P
8.17	Control pilot function controller	Tested according to Annex A of IEC 61851	P
8.18	Reliability	Compliace was checked by the tests of 9.17, 9.18 and 9.27	P
8.19	Resistance to tracking	UL certified plastic with tracking resistance charateristic	P
8.21	Behaviour of the IC-CPD at low ambient air temperature	Compliace was checked by the tests of 9.7.2.7 and 9.7.2.8	P
8.22	Operation with supply failure and hazardous live protective conductor conditions	☐ 4.4.2 (switched protective conductor) Compliace was checked by the tests of 9.7.5	P
8.23	Verification of a standing current in the protective conductor in normal service	Compliace was checked by the tests of 9.7.8	P
8.24	Behaviour at specific environmental conditons	Compliace was checked by the tests of 9.27 to 9.32	P
8.25	Resistance to virbration and shock	Compliace was checked by the tests of 9.32	P

9	**Tests**		P
9.1	General		P
9.1.1	Opening and closing of contacts	The opening and closing sequence were triggered by the control pilot.	P
9.1.2	Type tests	☒ Yes ☐ No Tests as listed in table 9	P
9.1.3	Test sequences	As Stated in annex A	P
9.1.4	Routine tests	☐ Yes ☒ No Be carried out by the manufacturer in annex B	N/A

9.2	Test conditions	☒ New samples representative of production ☒ Normal use and installed according to the manufacturer's instructions ☒ Ambient temperature between 20°C-25°C or ☐ Otherwise specified:	P
9.3	Test of indelibility of marking	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. with the cloth soaked with an aliphatic solvent hexane. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge.	P
9.4	Verification of protection against electric shock	Test wire was applied in every possible position on every part	P
9.5	Test of dielectric properties		P
9.5.1	Resistance to humidity	(see appended table 9.5.1)	P
9.5.1.1	Preparation of the IC-CPD for test		P
9.5.1.2	Test conditions	Humidity: 93%RH, Temp:30°C	P
9.5.1.3	Test procedure	48hours	P
9.5.1.4	Condition of the IC-CPD after the test	No damage and withstand the test of 9.5.2 and 9.5.3	P
9.5.2	Insulation resistance of the main circuit	500V/5s, >5MΩ	P
9.5.3	Dielectric strength of the main circuit	Applied 2000/2500V voltage of 50Hz for 1min, no flashover or breakdown during the test	P
9.5.4	Secondary circuit of detection transformers	Insulation test: ☐ Yes ☒ No	N/A
9.5.5	Verification of impulse withstand voltages (across clearance and across solid insulation) and of leakage current across open contacts	(See appended table 9.5.5)	P
9.5.5.1	General testing procedure for the impulse withstand voltage tests	1,2us/50us, five positive and five negative impulses were applied for each test	P
9.5.5.2	Verification of clearances with the impulse withstand voltage	(see appended table 9.5.5.2)	P
9.5.5.3	Verification of the resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions	(see appended table 9.5.5.3)	P
9.5.5.3.1	General		P

9.5.5.3.2	IC-CPD in opened position	No disruptive discharges	P
9.5.5.3.3	IC-CPD in closed position	No disruptive discharges	P
9.5.5.3.4	Verification of the behaviour of components bridging the basic insulation	(see appended table 9.5.5.3.4)	P
9.6	Temperature-rise test	(see appended table 9.6)	P
9.6.1	Test conditions	In normal use	P
9.6.2	Test procedure		P
9.6.3	Measurement of the temperature rise of different parts	By thermocouples	P
9.6.4	Temperature rise of a part		P
9.7	Verification of the operating characteristic		P
9.7.1	Test circuit	The IC-CPD was connected as for normal use, unless otherwise specified.	P
9.7.2	Residual sinusoidal alternating currents tests	(see appended table 9.7.2)	P
9.7.2.1	General		P
9.7.2.2	Verification of the correct operation in the event of a steady increase of the residual current	(see appended table 9.7.2.2)	P
9.7.2.3	Verification of the correct operation at closing on residual current	(see appended table 9.7.2.3)	P
9.7.2.4	Verification of the correct operation in case of the sudden appearance of residual current	(see appended table 9.7.2.4)	P
9.7.2.5	Verification of the correct operation in case of the sudden appearance of residual current between 5A and 100A	(see appended table 9.7.2.5)	P
9.7.2.6	Verification of the correct operation with load at the reference temperature	(see appended table 9.7.2.6)	P
9.7.2.7	Tests at the temperature limits	(see appended table 9.7.2.7)	P
9.7.2.8	Verification of the correct operation at low ambient air temperature of -25℃	(see appended table 9.7.2.8)	P
9.7.3	Verification of the correct operation with residual currents having a DC component	(see appended table)	P
9.7.3.1	General		P
9.7.3.2	Verification of the correct operation in the event of a continuous rise of a residual pulsating direct current	(see appended table 9.7.3.2)	P
9.7.3.3	Verification of the correct operation in the event of siuddenly appearing residual pulsating direct currents with or without beirng superimposed by a smooth direct current	(see appended table 9.7.3.3)	P
9.7.3.4	Verification at the reference temperature of the correct operation with load	(see appended table 9.7.3.4)	P
9.7.4	Verification of behaviour in the event of composite residual current	(see appended table 9.7.4)	P

9.7.4.1	General		P
9.7.4.2	Verification of the correct operation in the event of a steady increase of composite residual current	(see appended table 9.7.4.2)	P
9.7.4.3	Verification of the correct operation in the event of the sudden appearance of composite residual current	(see appended table 9.7.4.3)	P
9.7.5	Verification of the correct operation in the event of smooth DC residual current	(see appended table 9.7.5)	P
9.7.6	Miswiring and supply failure tests	(see appended table)	P
9.7.6.1	General	Classified according to 4.4.2 ☒ Yes ☐ No	P
9.7.6.2	Verification of correct performance in the case of hazardous live protective conductor	Classified according to 4.4.2 ☒ Yes ☐ No	P
9.7.6.3	Verification of correct performance in the event of open neutral (LNSE/LNE and LLLNSE/LLLNE) and open line (LLSE/LLE)	(see appended table 9.7.6.3)	P
9.7.6.4	Verification of correct performance in the case of an open protective conductor	Classified according to 4.5.2: ☐ Yes ☒ No (see appended table 9.7.6.4)	N/A
9.7.7	Verification of protective conductor contact behaviour		N/A
9.7.7.1	Verification of protective conductor contact coupling when closing	By tests of changing the pilot status from state B to state C.	N/A
9.7.7.2	Verification of protective conductor contact coupling when opening	By tests of changing the pilot status from state C to state B.	N/A
9.7.8	Verification that the protective conductor is connected to the electric vehicle	(see appended table 9.7.8)	P
9.7.9	Verification of standing current in the protective conductor connection in normal service	(see appended table 9.7.9)	P
9.7.10	Verification of the correct operation in the event of residual direct currents which may result from rectifying circuits supplied from two phases	Classified according to 4.1.3: ☐ Yes ☒ No (see appended table 9.7.10)	N/A
9.7.11	Verification of correct operation in case of residual direct currents which may result from rectifying circuits supplied from three phases	Classified according to 4.1.4: ☐ Yes ☒ No (see appended table 9.7.11)	N/A
9.8	Verification of mechanical and electrical endurance		P
9.8.1	Endurance of plug and vehicle connector part	☒ IEC60309 approved plug, and ☒ IEC 62196 approved vehicle connector.	P
9.8.2	Endurance of the residual current function of the IC-CPD		P
9.8.2.1	General	(see appended table 9.8.2)	P
9.8.2.2	Test procedure for on-load test		P
9.8.2.3	Test procedure for making without breaking test		P
9.8.2.4	Condition of the IC-CPD after the tests		P

9.9	Verification of the behaviour of the IC-CPD under overcurrent conditions		P
9.9.1	List of the overcurrent tests		P
9.9.2	Short-circuit tests		P
9.9.2.1	General conditions for test		P
9.9.2.2	Verification of the rated making and breaking capacity (Im)		P
9.9.2.3	Verification of the rated residual short-circuit making and breaking capacity (IΔm)		P
9.9.2.4	Verification of the coordination between the IC-CPD and the SPCD		P
9.9.3	Verification of the making and breaking capacity of the plug of the IC-CPD	Plug in for approval (see appended table)	P
9.10	Verification of resistance to mechanical shock and impact		P
9.10.1	General		P
9.10.2	Drop test	Height: 1m. No visible damage of enclosure.	P
9.10.3	Test for screwed glands of IC-CPDs		N
9.10.4	Mechanical strength test on IC-CPDs provided with cords	Non-rewirable, fall onto a concrete floor eight times in various orientations. No damage, no parts become detached or loosened.	P
9.10.5	Mechanical impact test and shock test		P
9.11	Test of resistance to heat		P
9.11.1	General		P
9.11.2	Temperature test in heating cabinet	Temp of 100°C for 1hour. After the test, not undergo any change impairing their further use.	P
9.11.3	Ball pressure test for insulating material necessary to retain in position current-carrying parts	Temp of 125°C for 1hour, no diameter of impression exceed 2mm	P
9.11.4	Ball pressure test for insulating material not necessary to retain in position current-carrying parts	Temp of 70°C for 1hour, no diameter of impression exceed 2mm	P
9.12	Resistance of insulating material to abnormal heat and to fire	For current-carrying parts: 750°C; For other parts made of insulating material: 650°C	P
9.13	Verification of the self-test	The protective conductor on the supply side does not become live and the contacts to the load side was not closed.	P

9.14	Verification of the behaviour of IC-CPDs in the event of loss of the supply voltage		P
9.14.1	Verification of correct operation at the minimum operating voltage (Ux)	<0.85x230V	P
9.14.2	Verification of the automatic opening in the event of loss of the supply voltage	Less than 1s	P
9.14.3	Verification of the reclosing function	Starting from zero within 30s	P
9.15	Verification of the limiting values of the non-operating current under overcurrent conditions	The IC-CPD not open	P
9.16	Verification of resistance against unwanted tripping due to surge currents to earth resulting from impulse voltages	The IC-CPD did not trip during the tests	P
9.17	Verification of reliability		P
9.17.1	Climatic test	(see appended table 9.17.1)	P
9.17.1.1	Test chamber		P
9.17.1.2	Severity	Temp: 25°C,relative humidity: 93%RH	P
9.17.1.3	Testing procedure	28 cycles	P
9.17.1.4	Recovery		P
9.17.1.5	Final verification	Not trip with a current of IΔno and tripped with a test current of 1.25IΔn	P
9.17.2	Test at a temperature of 45℃	21h with current passing and there after 3h without current to 28 cycles. Not trip during the test and tripped with a test current of 1.25IΔn	P
9.18	Resistance to ageing	a) Temp of 70°C for 168h, force of 5N on enclosure. b) Temp of 45°C with 1.1xUe and rated current for 168h	P
9.19	Resistance to tracking	Compliance was checked by examing the data information	P
9.20	Test on pins provided with insulating sleeves	Integrated plug: ☐ Yes ☒ No; ☒ TUV SUD_approved plug	P
9.21	Verification of the effects of strain on the conductors	Re-wirable:☐ Yes ☒ No;	P
9.22	Checking of the torque exerted by IC-CPDs on fixed socket-outlets		P
9.23	Tests of the cord anchorage	Pull force of 100N, 100 times, no displacement more than 2mm.	P
9.24	Flexing test of non-rewirable IC-CPDs	(see appended table 9.24)	P
9.26	Tests replacing verifications of creepage distances and clearances	Do not evaluate instead of testing	N/A
9.26.1	General		N/A

9.26.2	Abnormal conditions		N/A
9.26.3	Temperature rise resulting from fault conditions		N/A
9.27	Verifications for single electronic components used in IC-CPDs	(see appened table CDF)	P
9.27.1	General	See below for capacitors, resistors and inductors.	P
9.27.2	Capacitors	X/Y capacitor complied with IEC 60384-14	P
9.27.3	Resistors and inductors	Compliance was checked by tests in accordance with this standard	P
9.28	Chemical loads		P
9.29	Heat test under solar radiation		P
9.30	Resistance to ultra-violet (UV) radiation		P
9.31	Damp and salt mist test for marine and coastal environments		P
9.31.1	Test for external metallic parts only		P
9.31.2	Test criteria		P
9.32	Vehicle drive-over		-
9.32.1	General		-
9.32.2	Test at crushing force 5000N		-
9.32.3	Test at crushing force 11000N		-
9.32.4	Performance after the tests		-
9.33	Low storage temperature test		P
9.34	Vibration and shock test		P
9.35	Verification of insulating parts which keep live parts in position		P
9.36	Verification of the thermal control device		P

Annex A	**Test sequences and number of samples to be submitted for verification of conformity to this standard**		P
A.1	Verification of conformity		P
A.2	Test sequences		P
A.3	Number of samples to be submitted for full test procedure		P
A.4	Number of samples to be submitted for simplified test procedures in case of submitting simultaneously a range of IC-CPDs of the same fundamental design		P

Annex B	**Routine tests**		N/A
	The choice of the proper tests is left to the manufacturer		N/A

Annex C	**Determination of clearances and creepage distances**		P
C.1	Overview		P
C.2	Orientation and location of a creepage distance		P
C.3	Creepage distances where more than one material is used		N/A
C.4	Creepage distances split by a floating conductive part		P
C.5	Measurement of creepage distances and clearances		P

Annex D	**Swithed-protective conductor application**		N/A
D.1	Explanation of switched-protective conductor (SPE) function and application		N/A
D.2	Examples of incorrect supply wiring		N/A

Annex E	**Example of IC-CPD for mode 2 charging**		P
	Figure E.1-Example for IC-CPD showing the different parts and functions		P

Annex F	**Types of IC-CPD according to construction and assembly**		P
	Figure F.1-Example of IC-CPD including function box, cables, plug and connector according to 4.2.2		P
	Figure F.2-Example of plug integrated function box according to 4.2.3		N/A
	Figure F.3-Example of modular IC-CPD according to 4.2.4a)		N/A
	Figure F.4-Example of modular IC-CPD according to 4.2.4b)		N/A

Annex G	**Methods for determination of short-circuit power factor**		P
G.1	Overview		P
G.2	Method I – Determination from d.c. components		N/A
G.3	Method II- Determination with pilot generator		P

Annex ZA	**Normative references to international publications with their corresponding European publications**	P

Annex ZB	**Special national conditions**		P
	Denmark: for IC-CPDs supplied with a plug for household and similar use, repeated continuous loads of long duration,shall be limited to 6A		N/A

	Finland: the following additional requirement applies: for IC-CPDs supplied with a plug for household and similar use the maximum charging current is 8A for long lasting charging		P
	Norway: pluggable types where connector is part of the ICCB shall not be used.		P
	Switzerland: simplified control pilot circuits is not allowed, the use of EN 60309-2 accessories is recommended for mode 2 connections for more than 8A (2KVA)		P
	France: the use of solid brass pins is required, for a rated current above 8A, rewirable connections of the household plug are not allowed. Connection between the household plugs and cable shall use terminations (see definition 3.2.3)		P
	Belgium: an IC-CPD shall be able to function properly in both LNE and LLE configurations, provided the correct voltage is available	LNE	N/A

Annex ZC	**A-deviations**		N/A
	Denmark: the requirements in this standard can not replace or change any part of the danish national requirements for plugs for household and similar use according to DS 60884-2-D1	N/A	N

Annex ZZA	**Relationship between this European standard and the essential requirements of directive 2014/30/EU [2014 OJ L96] aimed to be covered**	N/A

Annex ZZB	**Relationship between this European standard and the safety objectives of 2014/35/EU [2014 OJ L96] aimed to be covered**	N/A

8.4.3 and annex C	TABLE: Clearance and creepage distance measurements					P
Description	U r.m.s. (V)	Uimp (V)	Required cl (mm)	Cl (mm)	Required dcr (mm)	dcr (mm)
☒ 1.Between live parts which are separated when the main contacts are in the open position						
Contact gap of K1, K2, K3, K4	☒	☒	1.5	>3.0	2.5	>3.0
L/N Trace under K1, K2, K3, K4	☒	☒	1.5	>3.0	2.5	>3.0
☒ 2.Between live parts of different polarity						
L to N on terminal (Input)	☒	☒	1.5	4.0	2.5	4.0
L to N on terminal (Output)	☒	☒	1.5	4.0	2.5	4.0
☒ 3. Downstream interrupting contacts of the IC-CPD between live parts and accessible surface of operating means						
Live parts to enclosure outside	☒	☒	3.0	>10.0	5.0	>10.0
☐ 3. Downstream interrupting contacts of the IC-CPD between live parts and screws or other means for fixing covers which may be removed when connecting the connector						
/	/	/	/	/	/	/
☐ 3. Downstream interrupting contacts of the IC-CPD between live parts and accessible metal parts						
/	/	/	/	/	/	/
☒ 3. Downstream interrupting contacts of the IC-CPD between live parts and PE						
Trace of L to GND (output)	☒	☒	1.5	5.5	2.5	5.5
Trace of N to GND (output)	☒	☒	1.5	5.5	2.5	5.5
☐ 4. Upstream interrupting contacts of the IC-CPD between live parts and accessible surface of operating means						
/	/	/	/	/	/	/
☐ 4. Upstream interrupting contacts of the IC-CPD between live parts and screws or other means for fixing covers which may be removed when connecting the connector						
/	/	/	/	/	/	/
☐ 4. Upstream interrupting contacts of the IC-CPD between live parts and accessible metal parts						
L/N to to enclosure covered with metal foil	/	/	/	/	/	/
Supplementary information: refer to IEC 60664-1 Uimp=☐ 1.5kV ☒ 2.5kV, Ue=☐ 120V ☒ 250V ☐ 230/400 ☐ 480V was considered. CTI group: ☐ I ☐ II ☒ IIIa ☐ IIIb; pollution degree: ☐ 1 ☐ 2 ☒ 3						

9.3	TABLE: Indelibility of markings					P
Marking method				Agent		
1) silk screen				A Water		
2) impressing/moulding/engraving				B Aliphatic solvent hexane		
3)				C (specify agent)		
Test method: The marking was rubbed by hand with a piece of cotton cloth soaked with water for 15s. And then again for 15s with a piece of cotton cloth soaked with an aliphatic solvent hexane.						
Marking Method	Test agent	Remains legible	Label loose	Curled edges	Tests needed	
		Verdict	Verdict	Verdict		
☒ 1)	☒ A ☒ B ☐ C	☒ Yes ☐ No	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No	

☐ 2)	☐ A ☐ B ☐ C	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ 3)	☐ A ☐ B ☐ C	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

9.4	**TABLE: Verification of protection against electric shock**		**P**
	Exceptions	☒ NOTE 1	—
	Determination of accessible parts	See below	—

Item	Description	Thermoplastic Material	Determination method (NOTE 4)
☐ Figure F.1	Function box	☐ Yes ☐ No	☐ V; ☐ R; ☐ E; ☐ T; ☐ P
☒ Figure F.2	Plug integrated function box	☒ Yes ☐ No	☒ V; ☒ R; ☒ E; ☒ T; ☒ P
☐ Figure F.3	Plug of Modular	☐ Yes ☐ No	☐ V; ☐ R; ☐ E; ☐ T; ☐ P
	CP in function box	☐ Yes ☐ No	☐ V; ☐ R; ☐ E; ☐ T; ☐ P
☐ Figure F.4	Plug of Modular	☐ Yes ☐ No	☐ V; ☐ R; ☐ E; ☐ T; ☐ P
	Connector+ CP	☐ Yes ☐ No	☐ V; ☐ R; ☐ E; ☐ T; ☐ P

NOTE 1 – Test wire was applied without force unless a force in every possible position on every part except plug and vehicle connector
NOTE 2 – Special consideration should be given to elastomeric or thermoplastic material

NOTE 3 – Plug portion is an integral part of the function box
NOTE 4 – The determination methods are:
V = visual; R = rigid test wire; E = electrical indicator; T = test force for 1min at ta=35±2°C
P = press between two flat surface with a force of 300N for 1min.

Supplementary information:

9.5.1	**TABLE: Resistance to humidity**		**P**
Items		Value	Required
Temperature (℃)		30°C	20°C-30°C
Relative humidity (%)		93%	91%-95%
Test period (h)		48hours	48hours
Observation:	Withstand test of 9.5.2		Withstand test of 9.5.3
☐ Damage ☒ No damaged	☒ Pass ☐ Fail		☒ Pass ☐ Fail

Supplementary information: parts of the IC-CPDs which can be removed without the aid of a tool are removed. Spring lids are kept open. Inlet openings are left open.

9.5.2	TABLE: Insulation resistance of the main circuit measurements		P
No.:	**Insulation resistance R:**	**R (MΩ)**	**Required R (MΩ)**
☒ a)	In turn between each pair of the terminals or pins *(IC-CPD in the open position)*	>100	>2
☒ b)	From each pole in turn to the other two connected together *(IC-CPD in the closed position)*	>100	>2
☒ c)	From all poles connected together to the frame *(IC-CPD in the closed position)*	>100	>5
☐ d)	Between internal metal parts of the mechanism and the frame	---	>5
☒ e)	Between the frame and the inner surface of the lining of insulating material	>100	>5
Supplementary information: The IC-CPD having been treated as specified in 9.5.1 is then removed from the cabinet. After an interval between 30min and 60min following this treatment, measured 5s after appication of a d.c. voltage of approximately 500V.			

9.5.3	TABLE: Dielectric strength of the main circuit tests			P
No.:	Test voltage applied:	Voltage shape (AC, DC)	Test voltage (V)	Observation (Breakdown)
☒ a)	In turn between each pari of the terminals or pins *(IC-CPD in the open position)*	AC	2000	☐ Yes ☒ No
☒ b)	From each pole in turn to the other two connected together *(IC-CPD in the closed position)*	AC	2000	☐ Yes ☒ No
☒ c)	From all poles connected together to the frame *(IC-CPD in the closed position)*	AC	2000	☐ Yes ☒ No
☐ d)	Between internal metal parts of the mechanism and the frame	AC	2000	☐ Yes ☐ No
☒ e)	Between the frame and the inner surface of the lining of insulating material	AC	2500	☐ Yes ☒ No
Supplementary information: Immediately after the IC-CPD has passed the tests of 9.5.2, the test voltage specified above was applied for 1min between the parts indicated in 9.5.2				

9.5.5	TABLE: Impulse withstand voltages tests										P
9.5.5.2	Verification of clearances										P
No.:	Test voltage applied:					Test Sequence		Test voltage (V)			Observation (disruptive discharge)
☒	The phase poles and the neutral pole connected together and the metal support connected to the terminals intended for the protective conductors					1st		2500			☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☒	The phase poles connected together and the neutral pole of the IC-CPD					2nd		2500			☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☒ b)	From each pole in turn to the other two connected together *(IC-CPD in the closed position)*					3rd		2500			☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☒ c)	From all poles connected together to the frame *(IC-CPD in the closed position)*					3rd		2500			☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☐ d)	Between internal metal parts of the mechanism and the frame					3rd		2500			☐ Yes ☐ No
Positive	1	☐ Yes ☐ No	2	☐ Yes ☐ No	3	☐ Yes ☐ No	4	☐ Yes ☐ No	5		☐ Yes ☐ No
Negative	1	☐ Yes ☐ No	2	☐ Yes ☐ No	3	☐ Yes ☐ No	4	☐ Yes ☐ No	5		☐ Yes ☐ No
☐ e)	Between the frame and the inner surface of the lining of insulating material					3rd		2500			☐ Yes ☐ No
Positive	1	☐ Yes ☐ No	2	☐ Yes ☐ No	3	☐ Yes ☐ No	4	☐ Yes ☐ No	5		☐ Yes ☐ No
Negative	1	☐ Yes ☐ No	2	☐ Yes ☐ No	3	☐ Yes ☐ No	4	☐ Yes ☐ No	5		☐ Yes ☐ No
☒	Accessible parts and circuits of the pilot signal					4th		2500x1.6			☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No

9.5.5.3	Verification of open contacts and basic insulation										P
☒	Between the line terminals connected together and the load terminals connected together with the contacts in the open position					/			2500		☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☒	The phase poles and the neutral pole connected together and the metal support connected to the terminals intended for the protective conductors *(IC-CPD in open position)*					1st			2500		☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
☒	The phase poles connected together and the neutral pole of the IC-CPD *(IC-CPD in closed position)*					2nd			2500		☐ Yes ☒ No
Positive	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Negative	1	☐ Yes ☒ No	2	☐ Yes ☒ No	3	☐ Yes ☒ No	4	☐ Yes ☒ No	5		☐ Yes ☒ No
Supplementary information: The impulses are given by a generator producing positive and negative impulses having front time of 1,2μs and a time to half-value of 50μs. For each test, five positive impulses and five negative impulses are applied.											

9.5.5.3.4	TABLE: Verificaition of the behaviour of components bridging the basic insulation			P
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Observation (Breakdown)
The phase poles and the neutral pole connected together and the metal support connected to the terminals intended for the protective conductors		AC	1450	☐ Yes ☒ No
Supplementary information: the voltage was applied for 5s.				
9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No
Supplementary information: Then the IC-CPD was connected to the mains in accordance with the manufacturer's instruction.				

9.6	TABLE: Temperature-rise test		P
	Test voltage(V) ..... :	1.05Ue	---
	Frequency(Hz)..... :	50	---
	Nominal cross-sectional area (mm^2)..... :	--	---
	Type of conductors..... :	--	
	Nominal diameter of thread (mm)..... :	--	

Maximum measured temperature T of part/at:		Test current (A)	t_m °C	dT (K)	Allowed dT(K)	Remark
1	AC Input terminal	32	--	27.7	50	Condition A
2	AC input cable	32	--	13.6	50	Condition A
3	AC Output terminal	32	--	24.1	50	Condition A
4	AC Output cable	32	--	13.5	50	Condition A
5	AC input plug	32	--	4.0	50	Condition A
6	Connector	32	--	12.0	50	Condition A
7	Plastic enclosure 1	32	--	13.4	Ref.	Condition A
8	Plastic enclosure 2	32	--	15.2	50	Condition A
9	LCD display	32	--	13.5	50	Condition A
10	C17 body	32	--	17.3	50	Condition B
11	L1 coil	32	--	21.8	75	Condition B
12	V3 body	32	--	21.5	50	Condition B
13	V4 body	32	--	20.3	50	Condition B
14	PCB near NT1	32	--	30.2	75	Condition B
15	C4 body	32	--	36.0	45	Condition B
16	PCB near U6	32	--	26.9	75	Condition B
17	C18 body	32	--	28.2	50	Condition B
18	L2 coil	32	--	14.1	75	Condition B
19	RCM body	32	--	18.1	Ref.	Condition B
20	CT3 coil	32	--	28.1	75	Condition B
21	K1 coil	32	--	19.6	55	Condition B
22	K3 coil	32	--	25.0	55	Condition B
23	T1 coil	32	--	2.3	75	Condition B

Supplementary information:

1)Test duration: for a period of time sufficient for the temperature rise to reach the steady-state value (variation does not exceed 1K/h)

2) tm = measured temperature, T(K) = tm-ta

3) Allowed T(K) was stated in table 8 and/or data/information provided by the manufacturer.

4) Condition: A) a current equal to In is passed simultaneously through the poles

B) current flowing in the protective conductor path alone and with voltage applied between line and neutral

5) A specially prepared sample with the trip circuit disable if the protective conductor passes through the toroid.

6) Condition A: Palpable surface,Condition B: Component limit

9.7.2	TABLE: Residual sinusoidal alternating currents tests				P
	☐ One phase	☐ LNSE	☐ LNE	☐ Figure 2a)	–
	☐ Two phases	☐ LLSE	☐ LLE	☐ Figure 2b)	
	☒ Three phases+N	☐ LLLNSE	☒ LLLNE	☒ Figure 2c)	

9.7.2.2	TABLE: Verification of the correct operation in case of a steady increase of the residual current		P
	Test voltage(V) ..... :	1.1Ue &0.85Ue	—
	Frequency(Hz)..... :	50	—
	IΔno..... :	15mA	—
	IΔn..... :	30mA	—
	Measured values shall be between IΔno and IΔn ?	☒ Yes ☐ No	—

Position						☒ 1.1Ue tripping current measured IΔ(mA)					☒ 0.85Ue tripping current measured IΔ(mA)				
S1	S2	S3	S4	S5	S6	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
C	C	1	/	/	/	24.6	24.3	24.2	24.1	24.0	24.8	24.5	24.1	24.2	24.3
C	C	2	/	/	/	24.2	24.1	24.2	24.3	24.2	24.5	24.8	24.4	24.7	24.2

Supplementary information: the residual current was steadily increased to attain the value within 30s. C=Close position; O=Open position; 1=Position 1; 2=Position 2;

9.7.3.4	TABLE: Verification at the reference temperature of the correct operation with load	P

Position						☒ 1.1Ue tripping current measured IΔ(mA)					☒ 0.85Ue tripping current measured IΔ(mA)				
S1	S2	S3	S4	S5	S6	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
C	C	1	/	/	/	24.5	24.5	24.5	24.4	24.1	24.5	24.6	24.5	24.2	24.3
C	C	2	/	/	/	24.6	24.6	24.8	24.6	24.3	24.5	24.7	24.5	24.6	24.7

Supplementary information: the residual current was steadily increased to attain the value of In within 30s. C=Close position; O=Open position; 1=Position 1; 2=Position 2;

9.7.2.3	TABLE: Verification of the correct operation at closing on residual current	P

Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	C	1	/	/	/	IΔn	28.9	28.9	29.0	28.6	29.0	<0.3
C	C	1	/	/	/	2IΔn	19.0	19.0	18.9	18.9	19.0	<0.15
C	C	1	/	/	/	5Δn	18.8	18.9	18.9	18.8	18.8	<0.04
Supplementary information: The IC-CPD in close on the circuit and with no-load. C=Close position; O=Open position; 1=Position 1; 2=Position 2;												

9.7.2.6	**TABLE: Verification of the correct operation with load at the reference temperature**	**P**
	Repeated 9.7.2.3 Verification of the correct operation at closing on residual current	–

Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	C	1	/	/	/	IΔn	29.1	29.0	29.0	29.1	28.9	<0.3
C	C	1	/	/	/	2IΔn	19.2	19.1	19.0	19.0	19.2	<0.15
C	C	1	/	/	/	5Δn	18.7	18.8	18.7	18.6	18.7	<0.04
Supplementary information: The IC-CPD in close on the circuit and with load. C=Close position; O=Open position; 1=Position 1; 2=Position 2;												

9.7.2.4	**TABLE: Verification of the correct operation in case of the sudden appearance of residual current**	**P**

Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	O-C	1	/	/	/	IΔn	29.1	29.0	29.1	28.8	29.0	<0.3
C	O-C	1	/	/	/	2IΔn	19.0	18.9	19.0	19.0	19.0	<0.15
C	O-C	1	/	/	/	5Δn	18.9	18.7	18.6	18.7	18.7	<0.04
Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; 1=Position 1. The IC-CPD with no-load												

9.7.2.6	**TABLE: Verification of the correct operation with load at the reference temperature**	**P**
	Repeated 9.7.2.4 Verification of the correct operation in case of the sudden appearance of residual current	–

Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	O-C	1	/	/	/	IΔn	29.2	29.2	29.0	29.1	29.0	<0.3
C	O-C	1	/	/	/	2IΔn	19.2	19.2	19.3	19.2	19.0	<0.15
C	O-C	1	/	/	/	5Δn	18.7	18.8	18.7	18.6	18.9	<0.04
Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; 1=Position 1. The IC-CPD with load												

9.7.2.5	TABLE: Verification of the correct operation in case of the sudden appearance of residual current between 5A and 100A											P
Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	O-C	1	/	/	/	5A	29.3	23.9	24.2	25.3	28.2	<0.04
C	O-C	1	/	/	/	10A	27.3	25.2	29.0	27.2	23.3	<0.04
C	O-C	1	/	/	/	20A	25.9	26.0	27.3	25.2	24.3	<0.04
C	O-C	1	/	/	/	50A	22.3	21.4	23.2	23.5	22.9	<0.04
C	O-C	1	/	/	/	100A	19.6	20.1	21.3	19.7	23.1	<0.04
Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; 1=Position 1												

9.7.2.7	TABLE: Tests at the temperature limits											P
	Repeated 9.7.2.4 Verification of the correct operation in case of the sudden appearance of residual current											P
Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	O-C	1	/	/	/	IΔn	29.2	29.2	29.7	29.3	29.5	<0.3
C	O-C	1	/	/	/	2IΔn	20.1	21.2	21.3	19.9	19.8	<0.15
C	O-C	1	/	/	/	5Δn	18.9	18.7	18.7	18.5	18.7	<0.04
Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; 1=Position 1. The IC-CPD with off-load and at ambient temperature: -5°C												
	Repeated 9.7.2.4 Verification of the correct operation in case of the sudden appearance of residual current											P
Position						IΔ	Break time measured (ms)					Limiting value (s)
S1	S2	S3	S4	S5	S6		1st	2nd	3rd	4th	5th	
C	O-C	1	/	/	/	IΔn	29.2	29.3	29.1	29.4	29.0	<0.3
C	O-C	1	/	/	/	2IΔn	20.0	20.1	19.8	19.8	19.7	<0.15
C	O-C	1	/	/	/	5Δn	18.5	18.7	18.9	18.5	18.7	<0.04
Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; 1=Position 1. The IC-CPD with load and at ambient temperature: +50°C												

9.7.2.8	TABLE: Verification of the correct operation at low ambient air temperature of -25℃		P
	Frequency(Hz)…….. :	50	_
	Alternating residual current IΔn……:	30mA	_
	Pulsating residual curren IΔn…….. :	☒=6mA ☐>6mA	_

Test	Test	Test	Temperature	Test	Trip time (s)

					AC ☒ 1.25 IΔn		Pulsating ☒ 1.25x1.4 IΔn ☐ 2 IΔn	
400	0	A	-25 ~+25	5cycle x 24hours	Mea. value	Limit	Mea. value	Limit
400	0	A	-25	5th cycle, 6hours	0.030	<0.3	0.025	<0.3
Supplementary information: Test procedure A: within 6h the ambient air temperature was reduced to -25°C±2°C without any supply of humidity and was keptt at this value for 6h. Within the next 6h the temperature was increased to +23℃±2℃ and relative humidity was increased to 93%±3%, these values are again kept for 6h.								

9.7.3	**TABLE: Verification of the correct operation with residual currents having a DC component**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 10a) ☒ Figure 11a) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 10b) ☐ Figure 11b) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 10c) ☐ Figure 11c)		–
9.7.3.2	**Verification of the correct operation in the event of a continuous rise of a residual pulsating direct current**		**P**
	Test voltage(V) ..... :	Ue	—
	Frequency(Hz)..... :	50	—
	Pulsating residual curren IΔn..... :	☒ ≤6mA ☐ >6mA	—
	tripping current measured IΔ(mA)		—

Position					Delay angle a	☒ L1		☐ L2		☐ L3		Lower limit		Upper limit	
S1	S2	S3	S4	S5		1st	2nd	1st	2nd	1st	2nd	☒ ≤6	☐ >6	☒ ≤6	☐ >6
C	C	I	/	/	0	9.6	9.5	/	/	/	/	0.35 IΔn	/	2 IΔn	1.4 IΔn
C	C	I	/	/	90	8.7	8.8	/	/	/	/	0.25 IΔn	/	2 IΔn	1.4 IΔn
C	C	I	/	/	135	11.0	10.9	/	/	/	/	0.11 IΔn		2 IΔn	1.4 IΔn
C	C	II	/	/	0	9.7	9.5	/	/	/	/	0.35 IΔn	/	2 IΔn	1.4 IΔn
C	C	II	/	/	90	9.1	8.7	/	/	/	/	0.25 IΔn	/	2 IΔn	1.4 IΔn
C	C	II	/	/	135	10.9	10.7	/	/	/	/	0.11 IΔn		2 IΔn	1.4 IΔn
Supplementary information: the residual current was steadily increased to attain the value within 30s. C=Close position; O=Open position; 1=Position 1; 2=Position 2;															

9.7.3.3	**TABLE: Verification of the correct operation in the event of siuddenly appearing residual pulsating direct currents with or without beirng superimposed by a smooth direct current**	**P**

Position					Delay angle	IΔn		a) Break time		b) Break time			Limiting value (s)
S1	S2	S3	S4	S5		☐ >6	☒ ≤6	1st	2nd	1st	2nd	S* IΔn	
C	O-C	I	/	/	0	1.4 IΔn	2 IΔn	0.095	0.103	/	/	/	<0.3
C	O-C	I	/	/	0	2.8 IΔn	4 IΔn	0.052	0.050	/	/	/	<0.15
C	O-C	I	/	/	0	6 IΔn	10 IΔn	0.027	0.028	/	/	/	<0.04
C	O-C	II	/	/	0	1.4 IΔn	2 IΔn	0.120	0.105	/	/	/	<0.3
C	O-C	II	/	/	0	2.8 IΔn	4 IΔn	0.059	0.052	/	/	/	<0.15
C	O-C	II	/	/	0	6 IΔn	10 IΔn	0.030	0.025	/	/	/	<0.04

Supplementary information: C=Close position; O=Open position; O-C: Open to Close position; I=Position I; II=Position II; S*=smooth direct current; The IC-CPD with no-load.
a) Test without superimposed smooth direct current; b) Test with superimposed smooth direct current of 6mA;

9.7.4	**TABLE: Verification of behaviour in the event of composite residual current**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 30) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 30) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 30)		–
9.7.4.2	**Verification of the correct operation in the event of a steady increase of composite residual current**		**P**
	Test voltage(V) ..... :	Ue	—
	Frequency(Hz)..... :	50	—
	IΔn..... :	30mA	—
	tripping current measured IΔ(mA)		—

Position		☒ L1			☐ L2			☐ L3			☒ N			Low limit	Up limit
S1	S2	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd		
C	C	23.9	23.5	23.5	/	/	/	/	/	/	23.8	23.5	23.7	0.5 IΔn	1.4 IΔn

Supplementary information: the residual current was increased at a linear rate to attain the upper limit within 30s. C=Close position; O=Open position;

9.7.4.3	**TABLE: Verification of the correct operation in the event of the sudden appearance of composite residual current**												**P**
	Break time measurement with upper limit value: ☒ 1.4 IΔn												–
Position		☒ L1			☐ L2			☐ L3			☒ N			Limiting value (ms)
S1	S2	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	
C	O-C	28.9	29.1	29.2	/	/	/	/	/	/	23.8	23.5	23.7	<40

Supplementary information: the residual current was increased at a linear rate to attain the upper limit within 30s. C=Close position; O=Open position;

9.7.5	**TABLE: Verification of the correct operation in the event of smooth DC residual current**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 29) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 29) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 29)		–
	Test voltage(V) ..... :	Ue	—
	Frequency(Hz)..... :	50	—
	IΔn..... :	30	—
a)	**tripping current measured IΔ(mA)**		**P**

Position			/	/	/	☒ L1		☒ L2		☒ L3		☒ N		Limit value (mA)
S1	S2	S3	/	/	/	1st	2nd	1st	2nd	1st	2nd	1st	2nd	
C	C	1	/	/	/	5.2	5.2	/	/	/	/	5.1	5.1	3<IΔ<6
C	C	2	/	/	/	5.1	5.2	/	/	/	/	5.1	5.0	3<IΔ<6

Supplementary information: the residual current was increased steadily to attain the upper limit within 30s. C=Close position; O=Open position; 1=Position 1; 2=Position 2;

b)	**Break time (ms) measurement:**	**P**

Position			/	IΔ	/	☒ L1		☒ L2		☒ L3		☒ N		Limiting value (s)
S1	S2	S3	/		/	1st	2nd	1st	2nd	1st	2nd	1st	2nd	
C	O-C	1	/	6	/	0.148	0.108	/	/	/	/	0.168	0.288	<10
C	O-C	2	/	6	/	0.128	0.198	/	/	/	/	0.210	0.172	<10
C	O-C	1	/	60	/	0.081	0.087	/	/	/	/	0.090	0.093	<0.3
C	O-C	2	/	60	/	0.073	0.089	/	/	/	/	0.082	0.089	<0.3
C	O-C	1	/	300	/	0.018	0.019	/	/	/	/	0.021	0.020	<0.04
C	O-C	2	/	300	/	0.019	0.020	/	/	/	/	0.019	0.019	<0.04

Supplementary information: the residual current was increased at a linear rate to attain the upper limit within 30s. C=Close position; O=Open position; 1=Position 1; 2=Position 2;

9.7.6.3	**TABLE: Verification of the correct performance in the event of open neural and open line**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 6a) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 6b) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 6c)		—
	Test voltage(V) ..... :	Ue	—
	Frequency(Hz)..... :	50	—
a)	**Open voltage (V) and time (s)**		**P**

Position	Contacts	Open time	☒ L1-PE	☐ L2-PE	☐ L3-PE	Limit value

S1	S2	S3	S4	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	
C	C-O	/	/	O	O	0.18	0.18	0	0	/	/	/	/	<1s
C	C-O	/	/	/	/	/	/	/	/	/	/	/	/	<1s
Supplementary information: IC-CPD initiating the closing. C=Close position; O=Open position;														

9.7.6.4	**TABLE: Verification of correct performance in the case of an open protective conductor**		**N/A**
	☐ Classified according to 4.5.2 ☐ One phase ☐ LNSE ☐ Figure 12a) ☐ Two phases ☐ LLSE ☐ Figure 12b) ☐ Three phases+N ☐ LLLNSE ☐ Figure 12c)		–
	Test voltage(V) ..... :	/	—
	Frequency(Hz)..... :	/	—
	Open voltage (V)		**N/A**

Position		Contacts		/		☐ L1-PE		☐ L2-PE		☐ L3-PE		Commens
S1	S2	/	/	1st	2nd	/	/	1st	2nd	1st	2nd	1st	2nd	
C	O	/	/	/	/	/	/	/	/	/	/	/	/	/
C	O	/	/	/	/	/	/	/	/	/	/	/	/	/
Supplementary information: IC-CPD initiating the closing. C=Close position; O=Open position;														

9.7.8	**TABLE: Verification that the protective conductor is connected to the electric vehicle**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 28) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 28) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 28)		–
	Test voltage(V) ..... :	1.1Ue &0.85Ue	—
	Frequency(Hz)..... :	50	—
	Open voltage (V) and time (ms)		**P**

Position		Contacts open time (s)		☒ 1.1Ue						☒ 0.85Ue					
				☒ L1-N		☐ L2-N		☐ L3-N		☒ L1-N		☐ L2-N		☐ L3-N	
S1	S2	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
C	C-O	0.1	0.1	0.053	0.054	/	/	/	/	/	/	/	/	/	/
C	C-O	0.1	0.1	0.050	0.048	/	/	/	/	/	/	/	/	/	/
C	C-O	0.1	0.1	0.052	0.050	/	/	/	/	/	/	/	/	/	/
C	C-O	0.1	0.1	/	/	/	/	/	/	0.044	0.048	/	/	/	/
C	C-O	0.1	0.1	/	/	/	/	/	/	0.050	0.045	/	/	/	/
C	C-O	0.1	0.1	/	/	/	/	/	/	0.052	0.048	/	/	/	/

Supplementary information: IC-CPD initiating the closing. C=Close position; O=Open position; five times was measured.

9.7.9	**TABLE: Verification of a standing current in the protective conductor in normal service**		**P**
	☐ One phase ☐ LNSE ☐ LNE ☐ Figure 7) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 7) ☒ Three phases+N ☐ LLLNSE ☒ LLLNE ☒ Figure 7)		–
	Test voltage(V) ..... :	1.1Ue	—
	Frequency(Hz)..... :	50	—
	Voltage drop (mV)		**P**

Position		Measured					Limit value	Position							Limit value
S1	S2	1st	2nd	3rd	4th	5th		S1	S2	1st	2nd	3rd	4th	5th	
C	C	0.19	0.18	0.19	0.17	0.19	1.5	C	O	0.15	0.15	0.14	0.16	0.14	1.0

Supplementary information: IC-CPD initiating the closing. C=Close position; O=Open position;

9.7.10	**TABLE: Verification of the correct operation in the event of residual direct currents which may result from rectifying circuits supplied from two phases**		**N/A**
	☐ 4.1.3 two-phase supply ☐ Figure 15		–
	Test voltage(V) ..... :	Ue	—
	Frequency(Hz)..... :	50	—
a)	Tripping current measured:		**N/A**

Position			/	Limit value (mA)		☐ S3-I tripping current measured IΔ(mA)					☐ S3-II tripping current measured IΔ(mA)				
S1	S2	S3	/	low	uper	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
C	C	/	/	3.5	7	/	/	/	/	/	/	/	/	/	/

Supplementary information: the residual current was steadily increased to attain the value of limit within 30s. C=Close position; O=Open position; I=Position I; II=Position II;

b)	Break time measured	**N/A**

Position			IΔ	Limit value	☐ S3-I Break time measured (s)					☐ S3-II Break time measured (s)				
S1	S2	S3			1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
C	O-C	/	2IΔn	0.3	/	/	/	/	/	/	/	/	/	/
C	O-C	/	4IΔn	0.15	/	/	/	/	/	/	/	/	/	/
C	O-C	/	10IΔn	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	5A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	10A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	20A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	50A	0.04	/	/	/	/	/	/	/	/	/	/

Supplementary information: C=Close position; O=Open position; I=Position I; II=Position II;

9.7.11	TABLE: Verification of correct operation in case of residual direct currents which may result from rectifying circuits supplied from three phases		N/A
	☒ 4.1.4 three-phase supply ☒ Figure 16		–
	Test voltage(V) ..... :	Ue	—
	Frequency (Hz)..... :	50	—
a)	Tripping current measured:		N/A

Position			/	Limit value (mA)		☐ S3-I tripping current measured IΔ(mA)					☐ S3-II tripping current measured IΔ(mA)				
S1	S2	S3	/	low	uper	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
C	C	/	/	3.1	6.2	/	/	/	/	/	/	/	/	/	/
Supplementary information: the residual current was steadily increased to attain the value of In within 30s. C=Close position; O=Open position; I=Position I; II=Position II;															

b)	Break time measured		N/A

Position			IΔ	Limit value	☐ S3-I Break time measured (s)					☐ S3-II Break time measured (s)				
S1	S2	S3			1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
C	O-C	/	2IΔn	0.3	/	/	/	/	/	/	/	/	/	/
C	O-C	/	4IΔn	0.15	/	/	/	/	/	/	/	/	/	/
C	O-C	/	10IΔn	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	5A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	10A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	20A	0.04	/	/	/	/	/	/	/	/	/	/
C	O-C	/	50A	0.04	/	/	/	/	/	/	/	/	/	/
Supplementary information: C=Close position; O=Open position; I=Position I; II=Position II;														

9.8	TABLE: Endurance of the residual current function test of the IC-CPD				P
No.	Test procedure	Cycles	Operate rate	Apply IΔn?	Observation
A	On-load	1000	4cycles/ min	☐ Yes ☒ No	Undue wear? ☐ Yes ☒ No; Damage of enclosure? ☐ Yes ☒ No; Loosen of connection? ☐ Yes ☒ No; Seepage of sealing compound? ☐ Yes ☒ No;
B	On-load	1500	4cycles/ min	☒ Yes ☐ No	Undue wear? ☐ Yes ☒ No; Damage of enclosure? ☐ Yes ☒ No; Loosen of connection? ☐ Yes ☒ No; Seepage of sealing compound? ☐ Yes ☒ No;

C	Without breaking	7500	4cycles/ min	☐ Yes ☒ No	Undue wear? ☐ Yes ☒ No; Damage of enclosure? ☐ Yes ☒ No; Loosen of connection? ☐ Yes ☒ No; Seepage of sealing compound? ☐ Yes ☒ No;

9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Break time (s)	0.12	Limit (s)	0.3
9.5.3 test	☒ Yes ☐ No	Test voltage:	900V, 1min	Observation: (breakdown)	☐ Yes ☒ No		
Supplementary information: ☐ Figure 31; Operation cycle: closing S4, S3, closing S1, S2. Open S4 1s after closing of the main circuit, 2s after opening S2 or passing a residual operating current of IΔn through one pole.							

9.9.2.2	**TABLE: Verification of the rated making and breaking capacity (Im)**		**P**
	☒ Figure 7		–
	Test voltage(V) ..... :	1.1Ue	—
	Frequency (Hz)..... :	50	—
a)	Tripping current measured:		P

Position			/	Limit value (ms)	tripping current measured Im(A)									
S1	S2	S3	/		1st	2nd	3rd	/	/	/	/	/	/	/
C	C	C	/	40	100	100	100	/	/	/	/	/	/	/

b)	Break time measured		P

Position			Im	Limit value	Break time measured (ms)									
S1	S2	S3			1st	2nd	3rd	/	/	/	/	/	/	/
C	C	C	100	40	22.5	23.0	24.9	/	/	/	/	/	/	/

Supplementary information: C=Close position; O=Open position

9.9.2.3	**TABLE: Verification of the rated residual short-circuit making and breaking capacity (IΔm)**		**P**
	☒ Figure 7		–
	Test voltage(V) ..... :	1.1Ue	—
	Frequency (Hz)..... :	50	—
a)	Tripping current measured:		**P**

Position			/	Limit value (ms)	tripping current measured Im(A)									
S1	S2	S3	/		1st	2nd	3rd	/	/	/	/	/	/	/
C	C	C	/	40	100	100	100	/	/	/	/	/	/	/

b)	Break time measured		P

Position			Im	Limit value	Break time measured (ms)									
S1	S2	S3			1st	2nd	3rd	/	/	/	/	/	/	/
C	C	C	100	40	25.5	24.0	22.3	/	/	/	/	/	/	/

Supplementary information: C=Close position; O=Open position

9.10	**TABLE: Verification of resistance to mechanical shockand impact test**	**P**
	Devices classified: ☒ 4.3.2 ☐ 4.3.3 ☐ 4.3.4 ☐ for screwed glands Test subclause: ☐ 9.10.2 ☐ 9.10.3 ☐ 9.10.4	–
☒ 9.10.2 According to IEC 60068-2-31	Drop test:Assembly of the function box with less than 100mm length of cable on each side. Impact surface: ☒ concrete ground or ☐ steel plate; Orientation: first fall of each device at a different dimensional axis, second fall with the given device at the same dimensional axis but on the opposite side of the housing; Operattion mode: not operating.	P

Axis	Orientation		Drop height	Number of devices	Number of falls per devices	Sample No.	Observation (damage)
X	☒ Top	☒ Bottom	1m	3	2	☒ 1# ☐ 2# ☐ 3#	☐ Yes ☒ No
Y	☒ left	☒ right	1m	3	2	☐ 1# ☒ 2# ☐ 3#	☐ Yes ☒ No
Z	☒ front	☒ rear	1m	3	2	☐ 1# ☐ 2# ☒ 3#	☐ Yes ☒ No

Supplementary information: The IC-CPD was then ☒ could or☐ could not be powered up and ☒ could or☐ could not pass a self test.

☒ 9.10.3 Test for screwed glands	Material of glands	Torque	Test duration	Observation (damage)
	Metal	6.25	1min	☐ Yes ☐ No
	Moulded	3.75	1min	☐ Yes ☒ No

☒ 9.10.4 Mechanical strength test	Flexible cable length (m)	Fall times	Drop height	Observation (damage)	Observation (detached, loosened)
	2.25	8	750mm	☐ Yes ☒ No	☐ Yes ☒ No

9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No

Supplementary information: Then the IC-CPD was connected to the mains in accordance with the manufacturer's instruction.

9.11	**TABLE: Resistance to heat**			**P**
☒ 9.11.3	Ball pressure test for insulating material parts of current-carrying			P
No.:	Part	Test temperature °C	Impression diameter (mm)	Verdict
1	Terminal block of input	125	1.0	☐ ≥2mm ☒ <2mm
2	Terminal block of Output	125	1.0	☐ ≥2mm ☒ <2mm
☒ 9.11.4	Ball pressure test for insulating material parts of not current-carrying			P
No.:	Part	Test temperature °C	Impression diameter (mm)	Verdict
1	Enclosure of plug	☒ 70 or ☐ 45+___	1.1	☐ ≥2mm ☒ <2mm

2	/	/	/	/
Supplementary information: Test samples were kept for 1h in a heating cabinet, and after the test allowed to be immersed 10s in cold water to cool down to room temperature.				

☒ 9.11.2	Strain relief test	**P**

Part	Test temperature °C	Test period	Thickness of sample (mm)	Observation (undergo change)
☒ Whole enclosure	100	1h	4.2	☐ Yes ☒ No
☐ Removable covers	70	1h	/	☐ Yes ☐ No

9.7.2.3 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No
Supplementary information: Test samples were kept for 1h in a heating cabinet, and after the test allowed to cool down to room temperature.				

9.12	**TABLE: Resistance of insulating material to abnormal heatt and to fire**	**P**
	Test method used: Glow wire test according to IEC 60695-2-10 & IEC 60695-2-10	–
☒	Glow-wire test for insulating material parts of current-carrying	**P**

No.:	Part	Material	Test temperature °C	Observation
1	Terminal block of input	/	750	Visible flame? ☐ Yes ☒ No; Ti=__/__s; Te=__/__s; Ignition of tissue paper? ☐ Yes ☒ No;
2	/	/	/	Visible flame? ☐ Yes ☐ No; Ti=__/__s; Te=__/__s; Ignition of tissue paper? ☐ Yes ☐ No;
3	/	/	/	Visible flame? ☐ Yes ☐ No; Ti=__/__s; Te=__/__s; Ignition of tissue paper? ☐ Yes ☐ No;
4	/	/	/	Visible flame? ☐ Yes ☐ No; Ti=__/__s; Te=__/__s; Ignition of tissue paper? ☐ Yes ☐ No;
☒	Glow-wire test for other insulating material parts			**P**
1	Enclosure of plug	/	650	Visible flame? ☐ Yes ☒ No; Ti=__/__s; Te=__/__s; Ignition of tissue paper? ☐ Yes ☒ No;
2	/	/	650	Visible flame? ☐ Yes ☐ No; Ti=_____s; Te=_____s; Ignition of tissue paper? ☐ Yes ☐ No;

Supplementary information: Ti=Time of ignition; Te=Time of extinguish;

9.14.1	TABLE: Verification of correct operation at the minimum operating voltage Ux															P
	☐ One phase ☐ LNSE ☐ LNE ☐ Two phases ☐ LLSE ☐ LLE ☒ Three phases+N ☐ LLLNSE ☒ LLLNE															—
	Frequency(Hz)…….. :	50														—
	Opening voltage (V)															P
☒L1-N						☐L2-N					☐L3-N					Limit value
1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th		
70	70	70	70	70	/	/	/	/	/	/	/	/	/	/		<85
9.7.2.4 test	☒Yes ☐No			Test voltage	80	Test current	IΔn	Observation (trip): ☒Yes ☐No								
Supplementary information:																

9.14.2	TABLE: Verification of the automatic opening in the event of loss of the supply voltage															P
	☐ One phase ☐ LNSE ☐ LNE ☐ Two phases ☐ LLSE ☐ LLE ☒ Three phases+N ☐ LLLNSE ☒ LLLNE															—
	Frequency(Hz)…….. :	50														—
	Opening time of main contacts															P
☒L1/N						☐L2/N					☐L3/N					Limit value
1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th		
0.18	0.18	0.18	0.19	0.18	/	/	/	/	/	/	/	/	/	/		<1s
Supplementary information:																

9.14.3	TABLE: Verification of the reclosing function															P
	☐ One phase ☐ LNSE ☐ LNE ☐ Two phases ☐ LLSE ☐ LLE ☒ Three phases+N ☐ LLLNSE ☒ LLLNE															–
	Frequency(Hz)…….. :	50														—
	Reclosing voltage (V)															P
☒L1-N						☐L2-N					☐L3-N					Limit value
1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th		
75	75	75	75	75	/	/	/	/	/	/	/	/	/	/		<85
9.7.2.4 test	☒Yes ☐No			Test voltage	85	Test current	IΔn	Observation (trip): ☒Yes ☐No ☒not reclose automatically without manual reset								

Supplementary information:

9.17.1	TABLE: Climatic test				P
According to IEC 60068-3-4 &IEC 60068-2-30		Temperature (℃)	Test duration (h)	9.7.2.4 test	Observation (damage)
a) Initial verification		25, 95%RH	2h	☒ Yes ☐ No	☐ Yes ☒ No
b) Conditioning		25, 95%RH→ 55, 95%RH→ 55, 93%RH→ 25, 95%RH	28cycle x24h	☒ Yes ☐ No ☒ IΔno	☐ Yes ☒ No
c)Recovery		25, 65%RH	5h	☐ Yes ☒ No	☐ Yes ☒ No
d)Final		25, 65%RH	5h	☒ Yes ☐ No	☐ Yes ☒ No
a) 9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No	
			IΔno	Observation (trip): ☒ Yes ☐ No	
d) 9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No	
			IΔno	Observation (trip): ☒ Yes ☐ No	
Supplementary information:					

9.17.2	TABLE: Test at a temperature of 45℃				P			
	Limit of temperature rise of terminals			50K	—			
Test voltage (V)	Test current (A)	Test procedure	Temperature (℃)	Test duration (h)	Temperature of			
					Plug		Connector	
400	32	A	+45	27cycle x 24hours	(℃)	K	(℃)	K
400	32	A	+45	28th cycle, 21hours	76	31	72	27
9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No				
Supplementary information: Test procedure A: each cycle comprising 21h with current passing and thereafter 3h without current. K=Tmeasured-Tambient (45℃)								

9.18	TABLE: Resistance to ageing test			P
	Temperature (℃)	Test duration (h)	Press force (N)	Observation (damage)
☒ a) resistance to ageing	70	168	5	☐ Yes ☒ No
	Temperature (℃)	Test duration (h)	Test voltage /current	Observation (normal work)
☒ b)ageing of electronic components	45	168	1.1Ue/16A	☐ Yes ☒ No

9.7.2.4 test	☒ Yes ☐ No	Test current:	1.25IΔn	Observation (trip): ☒ Yes ☐ No
			IΔno	Observation (trip): ☐ Yes ☒ No
Supplementary information:				

9.23	**TABLE:Cord anchorage tests**	**P**
	☒ 4.3.2 Non-rewirable IC-CPDs ☐ 4.3.3 IC-CPDs wired by the manufacturer ☐ 60N: for 6A<In≤16A and Ue≤250V ☐ 80N: for 6A<In≤16A and Ue>250V ☒ 100N: for In>16A	–
	Measurements: 1 - location; 2 – current (A); 3 - pull (N); 4 - result; 5 - torque (Nm); 6 - result	_

1	2	3	4 (displacement)	5	6 (break)
☒ cable	32	100	☐ _____>2mm ☒ _1.6__<2mm	0.25	☐ Yes ☒ No
Supplementary information: 100 times pull for 1s without jerks					

9.24	**TABLE:flexing test of non-rewirable IC-CPDs**	**P**
	☒ circular section cable or cords ☐ flat cords ☒ 20N: for nominal cross-sectional area≤2.5mm² ☐ 25N: for 2.5mm²< nominal cross-sectional area≤6mm² ☒ 16A: for nominal cross-sectional area>1.5mm² ☐ 10A: for nominal cross-sectional area=1.5mm²	–
	Measurements: 1 - location; 2 – current (A); 3 – load mass (N); 4 –number of flexing operations; 5 – oscillating angle (°); 6 – result (interrupt of current, short-circuit between conductors)	_

1	2	3	4	5	6
☒ cable	16	20	10000	90°	☐ Yes ☒ No
Supplementary information: 100 times pull for 1s without jerks					

9.26.2	**TABLE: Abnormal condition test**	**P**
	☐ One phase ☐ LNSN ☐ LNE ☐ Figure 5a) ☐ Two phases ☐ LLSE ☐ LLE ☐ Figure 5b) ☒ Three phases+N ☐ LLLNSN ☒ LLLNE ☒ Figure 5c)	—
	Test voltage(V) ..... : 1.05Ue	—
	Frequency(Hz)..... : 50	—
	Nominal cross-sectional area (mm²)..... : 2.5	—
	Type of conductors..... : PVC	—
	Nominal diameter of thread (mm)..... : 3.2	—

No.	Component No.	Fault	Test time	SPCD	Observation

1	L/N output	S-C	10mins	/	☐ NOR; ☒ shutdown; ☒ NC; ☒ NCD; ☐ ___damaged; ☐ MT; ☒ Comply with 9.4
2	L/N output	O-L	2hours	/	☐ NOR; ☒ shutdown; ☒ NC; ☒ NCD; ☐ ___damaged; ☐ MT; ☒ Comply with 9.4
3	PE output	O-C	10mins	/	☐ NOR; ☐ shutdown; ☒ NC; ☒ NCD; ☐ ___damaged; ☐ MT; ☒ Comply with 9.4
4	CP	S-C	10mins	/	☐ NOR; ☒ shutdown; ☒ NC; ☒ NCD; ☐ ___damaged; ☐ MT; ☒ Comply with 9.4

Supplementary information: s-c=short-circuit, o-c=open circuit, o-l=overload
a)Short-circuit across clearances and creepage distances if small than specified
b)Short-circuit across insulation consisting of lacquer or enamel coatings
c)Short-circuit or interruption of semiconductors
d)Short-circuit of electrolytic capacitors
e)Short-circuit or disconnection of resistors, inductors or capacitors
NOR—normal working; NC---no charge; NCD---no component damage; MT---measured temperature;

9.26.3	**TABLE: Temperature-rise resulting from fault condition test**							**P**
Parts / Location	t_m °C						Max. T (°C)	Remark
	1	2	3	4	5	6		
Input wire (internal)	71.2	/	/	/	/	/	135	/
K1 coil	78.1	/	/	/	/	/	185	/
K2 coil	75.6	/	/	/	/	/	185	/
L1 coil	71.1	/	/	/	/	/	185	
L2 coil	72.3	/	/	/	/	/	185	/
Ambient	25.0	/	/	/	/	/	--	/

Supplementary information:

1)Test duration: for a period of time sufficient for the temperature rise to reach the steady-state value (variation does not exceed 1K/h) or after 4h (whichever is the shorter time)

2) tm = measured temperature

3) Max. T=Maximum perssible temperature (℃) was stated in table 21 and/or data/information provided by the manufacturer.

	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-325	32A, 380-415V, 5 (3P+N+E), industrial use without NTC resistance	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-325NTC	32A, 380-415V, 5 (3P+N+E), industrial use With NTC resistance, between live part and NTC resistance is basic insulation	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-323	32A, 200-250V, 3 (2P+E), industrial use without NTC resistance	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-323NTC	32A, 200-250V, 3 (2P+E), industrial use With NTC resistance, between live part and NTC resistance is basic insulation	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-165	16A, 380-415V, 5 (3P+N+E), industrial use without NTC resistance	EN IEC 60309-1:2022 EN IEC 60309-	TUV SUD Certificate No. B 122713 0007 Rev. 00

				2:2022	Report No.: 64105243 087401
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-165NTC	16A, 380-415V, 5 (3P+N+E), industrial use With NTC resistance, between live part and NTC resistance is basic insulation	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-163	16A, 200-250V, 3 (2P+E), industrial use without NTC resistance	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-163NTC	16A, 200-250V, 3 (2P+E), industrial use With NTC resistance, between live part and NTC resistance is basic insulation	EN IEC 60309-1:2022 EN IEC 60309-2:2022	TUV SUD Certificate No. B 122713 0007 Rev. 00 Report No.: 64105243 087401
Appliance Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-63	16A, 250V, 3 (2P+E), industrial use without NTC resistance	DIN VDE 0620-1:2021 DIN VDE 0620-2-1:2020/A1: 2023	TUV SUD Certificate No. B 122713 0001 Rev. 01 Report No.: 68100230 18802
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-63NTC	16A, 250V, 3 (2P+E), industrial use With NTC resistance, between live part and NTC resistance is	DIN VDE 0620-1:2021 DIN VDE 0620-2-1:2020/A1: 2023	TUV SUD Certificate No. B 122713 0001 Rev. 01 Report

			basic insulation		No.: 6810023018802
Appliance Plug	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-66	16A, 250V, 3 (2P+E), industrial use without NTC resistance	DIN VDE 0620-1:2021 DIN VDE 0620-2-1:2020/A1:2023	TUV SUD Certificate No. B 122713 0001 Rev. 01 Report No.: 6810023018802
(Alternative)	Dongguan Lanyue Electronic Technology Co., Ltd.	LY-66NTC	16A, 250V, 3 (2P+E), industrial use With NTC resistance, between live part and NTC resistance is basic insulation	DIN VDE 0620-1:2021 DIN VDE 0620-2-1:2020/A1:2023	TUV SUD Certificate No. B 122713 0001 Rev. 01 Report No.: 6810023018802
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	FR-4.0	Thk 1.4mm (Min) V-0,130°C	UL 94 UL796	UL E330731
(Alternative)	DONGGUAN WANNIENFU ELECTRONIC CO LTD	04V0	V-0, 130°C	UL 94 UL796	UL E88653
(Alternative)	Dongguan Shuanghe Electronics Co., Ltd	SH108, SH808, SH908	V-0, 130°C	UL 94 UL 796	UL E528144
(Alternative)	Interchangeable	Interchangeable	Min. V-1, 130°C	UL 94 UL796	UL approved
Current fuse (F1)	Dongguan Luoyi Electronic Technology Co Ltd	SAT	T3.15A 250V	UL 248-1 UL 248-14	UL E505058
(Alternative)	XC ELECTRONICS (SHENZHEN) CORP LTD	3T	T3.15A, 250Vac T5A, 250Vac T6.3A, 250Vac	IEC/EN 60127-1 IEC/EN 60127-3 UL 248-14 UL 248-1	VDE 40019614 UL E249609
(Alternative)	HONG HU BLUELIGHT ELECTRONIC CO LTD	L3T	T3.15A, 250Vac T5A, 250Vac T6.3A, 250Vac	IEC/EN 60127-1 IEC/EN 60127-3 UL 248-14 UL 248-1	VDE 40026874 UL E324232
(Alternative)	DONGGUAN	TBP	T3.15A, 250Vac	IEC/EN	VDE

	REOMAX ELECTRONICS CO LTD		T5A, 250Vac T6.3A, 250Vac	60127-1 IEC/EN 60127-3 UL 248-14 UL 248-1	40032053 UL E340427
Y capacitor (CY3)(Optional)	Sichuan TRX Technology Co., Ltd	TLE 102M,	Max.4700pF, min. 250VAC, -40°C~125°C	UL 60384-14	UL E315719
(Alternative)	JYH CHUNG ELECTRONICS CO LTD	JD	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40041523 UL E187963
(Alternative)	SHAANXI HUAXING ELECTRONIC DEVELOPMENT CO LTD	CT7Y1	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40015542 UL E217400
(Alternative)	DONGGUAN EASY-GATHER ELECTRONIC CO LTD	DCF	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40015758 UL E252221
(Alternative)	JYA-NAY CO LTD	JN	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	UL E201384
(Alternative)	SHANTOU HIGH-NEW TECHNOLOGY DEVELOPMNT ZONE SONGTIAN ENTERPRISE CO LTD	CD-Series	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40025754 UL E208107
(Alternative)	ZHI WEI ELECTRONICS CO LTD	JD	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40032789, UL E330260
(Alternative)	Hsuan Tai Electronic Co. Ltd.	CY	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40008912 UL E199069
(Alternative)	JYH HSU (JEC) ELECTRONICS LTD	JD	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40038642 UL E356696
(Alternative)	Shenzhen Haotian Electronic Co., Ltd.	HT	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40029300 UL E326483
(Alternative)	Shen Zhen Shi Zhc Technology Co. Ltd.	CD	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40042268 UL E467226

(Alternative)	Dongguan City Dafu Electronics Co. Ltd.	CT7 Y1 Series	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40041523 UL E465278
(Alternative)	JYH CHUNG ELECTRONICS CO LTD	JD	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40041523 UL E187963
(Alternative)	SHAANXI HUAXING ELECTRONIC DEVELOPMENT CO LTD	CT7Y1	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40015542 UL E217400
(Alternative)	MACROFAR ELECTRONICS TECHNOLOGY (HK) LTD	MPX Series, HY	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40052686 UL E481054
(Alternative)	DONGGUAN JYHWEI ELECTRONICS CO., LTD	JN	Max.4700pF, min. 250VAC, -40°C~125°C	IEC/EN/UL 60384-14	VDE 40047520 UL E498213
(Alternative)	Shantou Heye Electronics Co. Ltd.	CD Series	Max.4700pF, min. 250VAC, -40°C~125°C	EN/IEC/UL 60384-14	VDE 40041506 UL E472346
Varistor (RV1) (Optional)	HONGZHI ENTERPRISES LTD	10D561K 10D681K 14D561K 14D681K	Min. 420V, -40°C~125°C	UL 1449	UL E324904
(Alternative)	Dongguan City Dafu Electronics Co. Ltd.	VDE: 10D681K, 10D751K, UL: NDF10D681K NDF10D751K NDF14D681K NDF14D751K	Min. 420V, coating material: min. V-1, 125°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	VDE 40050909 UL E502211
(Alternative)	Foshan Haohua Electronics Co., Ltd.	HVR 10K681 HVR 10K751 HVR 14K681 HVR 14K751	Min. 420V, coating material: min. V-1, 125°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	VDE 40031718 UL E332662
(Alternative)	SHENZHEN RICH ELECTRONIC CO.,LTD	RCX-10D681K RCX-10D751K RCX-14D681K RCX-14D751K	Min. 420V, coating material: min. V-1, 130°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	TUV SUD 11135300 02 UL E516033
(Alternative)	Shantou Heye Electronic Co Ltd	TUV : HYE10D681K HYE10D751K HYE14D681K HYE14D751K	Min. 420V, coating material: min. V-1, 130°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	TUV B105346 UL E510210

		UL: HYE-10D681KH HYE-10D751KH HYE-14D681KH HYE-14D751KH			
(Alternative)	HUIZHOU SONGLONGXIN DIAN ELECTRONIC CO.,LTD	VDE: 10D681KA 10D751K, 14D681KJ, 14D751KJ, UL: 10D681K, 10D751K, 14D681K, 14D751K,	Min. 420V, coating material: min. V-1, 85°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	VDE 40040037 UL E359158
(Alternative)	Shenzhen Haotian Electronics Co., Ltd.	HTE-10D681K HTE-10D751K HTE-14D681K HTE-14D751K	Min. 420V, coating material: min. V-1, 85°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	TUV B1054940001 UL E509500
	SHENZHENSHENHUAXINGELECTRONICSCO,LTD.	MYG20G10K681 MYG20G10K751 MYG20G14K681 MYG20G14K751	Min. 420V, coating material: min. V-1, 85°C	IEC/EN 61051-1 IEC/EN 61051-2 UL1449	VDE 40018747 UL E329651
X-Capacitor (X1) (Optional)	KNSCHA ELECTRONICS CO.,LIMITED	MKP	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	UL 60384-14	UL E477850
(Alternative)	Dongguan City Dafu Electronics Co., Ltd.	MPX	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40044620 UL E465278
(Alternative)	MACROFAR ELECTRONICS TECHNOLOGY(HK) LTD	MPX Series	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40052686 UL E481054
(Alternative)	Huizhou Zhongdian Huaxing Electronics Co Lid	MPX/MKP	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40051731 UL E505244
(Alternative)	Foshan City Xin Yuan Electronic Co., Ltd.	MKP Series	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40027433 UL E318581
(Alternative)	Tenta Electric Industrial Co.,Ltd.	MEX	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 119119, UL E222911
(Alternative)	Joey Electronics	MPX	Max. 0.33μF±10%,	EN/IEC/UL	VDE

	(Dong Guan) Co., Ltd.		Min.250Vac, 100°C, X2 type	60384-14	40032481 UL E216807
(Alternative)	Hsuan Tai Electronic Co. Ltd.	MCY	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 125205 ULE199069
(Alternative)	Hongzhi Enterprises Ltd.	MPX	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40023936 UL E192572
(Alternative)	Shantou High- New Technology Dev. Zone Songtian Enterprise Co.,Ltd.	MPX	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40034679 UL E208107
(Alternative)	MACROFAR ELECTRONICSTECHNOLOGY(HK) LTD	MPX Series	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40052686 UL E481054
(Alternative)	Huizhou Zhongdian Huaxing Electronics Co.,Ltd.	MPX/MKP	Max. 0.33μF±10%, Min.275Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40051731 UL E505244
(Alternative)	Shenzhen Yimanfeng Science And Technology Co.,Ltd.	X2-MPX/MKP	Max. 0.33μF±10%, Min.250Vac, 100°C, X2 type	EN/IEC/UL 60384-14	VDE 40028516 UL E315567
Optocoupler (OP1A,OP1)	EVERLIGHT ELECTRONICS CO LTD	EL 817 EL 1019 EL 1018	Dti>=0.4mm, Ext. dcr.≥7.6mm, Ext. dcl.≥7.6mm, min. 110°C	IEC/EN60747-5-5,UL1577	VDE 132249 ULE214129
(Alternative)	SHENZHEN ORIENT COMPONENTS CO LTD	OR-6N1XXX OR-10XX ORPC-817X ORPC-817MX ORPC-817SX OR-MOC30XXX OR-3XX	Dti>=0.4mm, Ext. cl≧8.1mm, Ext. cr≧8.1mm, min. 110°C	IEC/EN60747-5-5,UL1577	VDE 40029733 UL E323844
(Alternative)	BRIGHT LED ELECTRONICS CORP	BPC-817	Double protection, Isolation voltage 5000 Vac, Dti≥0.4mm, ext. dcr≥7.6mm,110° C	IEC/EN 60747-5-5, UL 1577	VDE 40007240 UL E236324
(Alternative)	FAIRCHILD SEMICONDUCTOR CORP	H11A817	Double protection, Isolation voltage 5000 Vac, Dti≥0.4mm, ext. dcr≥7.6mm,110° C	IEC/EN 60747-5-5, UL 1577	VDE 102497 UL E90700

(Alternative)	COSMO ELECTRONICS CORP	KP1010	Double protection, Isolation Voltage 5000 Vac, Dti≥0.4mm, ext. dcr≥7.6mm,110° C	IEC/EN 60747-5-5, UL 1577	VDE 101347 UL E169586
(Alternative)	CRM ICBG (Wuxi) Co., Ltd.	PC817X, HK817X, 817X, I817X	Dti>=0.4mm, Ext. dcr.≥7.6mm, Ext. dcl.≥7.6mm, min. 110°C	IEC/EN60747-5-5, UL1577	VDE 40042139 UL E465130
(Alternative)	COSMO ELECTRONICS CORP	KP1010	Double protection, Isolation Voltage 5000 Vac, Dti≥0.4mm, ext. dcr≥7.6mm,110° C	IEC/EN 60747-5-5, UL 1577	VDE 101347 UL E169586
(Alternative)	Interchangeable	Interchangeable	Double protection, Isolation voltage 5000 Vac, Dti≥0.4mm, ext. dcr≥7.6mm,110°C	IEC/EN 60747-5-5, UL 1577	VDE UL approved
Transformer	Guangdong Diweite Technology Co., Ltd	12V0.3A8.5V0.3A	Class B	Test with appliance	Test with appliance
-BOBBIN	CHANG CHUN PLASTICS CO LTD	T200HF	V-0 150°C	UL 746C	UL E59481
-TRIPLE WIRE	SHENZHEN KAIZHONG HEDONG NEW MATERIALS CO LTD	TIW-B	130°C	UL 2353	UL E357240
(Alternative)	SHANGHAI XIANGXIANG ELECTRON CO LTD	TKW-130	130°C	UL 2353	UL E308908
- INSULATION TAPE	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	CT*(b)(g)	130°C	UL 510A	UL E324093
(Alternative)	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	CT*(c)(g)	130°C	UL 510A	UL E324093
(Alternative)	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	PZ*(b)	130°C	UL 510A	UL E324093
(Alternative)	SHEN ZHEN XINHUAHUI ELECTRONIC	HMT803	130°C	UL 510A	UL E328315

	MATERIALS CO LTD				
(Alternative)	SHEN ZHEN XINHUAHUI ELECTRONIC MATERIALS CO LTD	HMT804	130°C	UL 510A	UL E328315
-VARNISH	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD	E962	130°C	UL 1446	UL E335405
(Alternative)	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a)	130°C	UL 1446	UL E228349
Vehicle connector for conductive charging of electric vehicle	Dongguan Lanyue electronic technology Co., LTD	LY25032 LY-48032	LY25032:250V,32A LY-48032:480V,32A IP 66	EN IEC 62196-1:2022 EN IEC 62196-2:2022 EN 17186:2019 EN 62196-1:2014 EN 62196-2:2017	No. B 122713 0002 Rev.00
(Alternative)	Dongguan Vanloon Wire and Cable Co., LTD	Connector for Conductive Charging of Electric Vehicles	AC250V(single-phase) AC 480V (three-phase) 16A, 20A, 32A	EN IEC 62196-2:2022 EN IEC 62196-1:2022 EN 17186:2019	R5056301 4 R5056300 9
(Alternative)	Dongguan Xinhailin New Energy Technology Co., Ltd.	Vehicle connector: EVE01, EVE02, EVE03, EVE04, EVE01A, EVE02A, EVE03A, EVE04A, CCC101, CCC201, CCC301 Plug: EVU01, EVU02, EVU03, EVU04, EVU01A, EVU02A,	480V 3N~ or 250V~ IP55 (when not mated, but with cap), IP54 (when mated)	EN 62196-1:2014 EN 62196-2:2017	No. N8A 121111 0002 Rev. 01

		EVU03A, EVU04A, CCS101, CCS201, CCS301 Cable assembly: EVT01, EVT02, EVT03, EVT04, EVT01A, EVT02A, EVT03A, EVT04A			
(Alternative)	Interchangeable	Interchangeable	LY25032:250V,32A LY-48032:480V,32A IP 66	EN IEC 62196-1:2022 EN IEC 62196-2:2022 EN 17186:2019 EN 62196-1:2014 EN 62196-2:2017	UL approved
Relay(RY1,RY2,RY3,RY4)	Xiamen Hongfa Electroacoustic Co.,ltd	HFE10-1 12HST-L2	277VAC Min.30A, 85°C	EN61810-1:2015 IEC61810-1:2015	UL E134517 VDE:40035869
(Alternative)	NINGBO BAO CHENG ELECTRONICS CO., LTD.	NB160-xS-S-AD NB160-xS-S-A	277VAC Min.30A, 85°C	EN61810-1:2015 IEC61810-1:2015	UL-US-2408693-0 TUV RH 506153040001
(Alternative)	DONGGUAN CHUROD ELECTRONICS CO LTD	CHS01-V-112LA2(50A) CHS01-S-112LA2(40A)	277VAC Min.30A, 85°C	EN61810-1:2015 IEC61810-1:2015	UL E341422 R 50271657
(Alternative)	Sanyou Corporation Limited	SLD-S-112DM	277VAC Min.30A, 85°C	IEC60335-1	UL E190598 TUV R50143450
(Alternative)	Sanyou Corporation Limited	SLG-S-112DM	277VAC Min.30A, 85°C	IEC60335-1	UL E190598 TUV R50143450
(Alternative)	Sanyou Corporation	SLD-S-112DM	277VAC Min.30A, 85°C	IEC60335-	UL E190598

	Limited			1	TUV R50143450
(Alternative)	Sanyou Corporation Limited	SLV-S-112DM	277VAC Min.30A, 85°C	IEC60335-1	UL E190598 TUV R50143450
(Alternative)	Interchangeable	Interchangeable	277VAC Min.30A, 85°C	EN61810-1:2015 IEC61810-1:2015	UL VDE
Housing material	CELANESE INTERNATIONAL CORP	FR50(+)(f1)	V-0	UL 746A UL94	UL E41938
(Alternative)	Interchangeable	Interchangeable	V-0	UL 746A UL94	UL approved
RCD	Beijing Ruisi Yuntu Technology Co., Ltd.	RSYT-R001	Supply voltage:4.95 -5.05 V -40°C~85°C	EN 62752:2016+A1 IEC 62752:2016+A1 IEC 62955:2018	R 507025370001 Report No.: CN24VXBQ 003
(Alternative)	Hubei RICHSENS Sci&Tech Co., Ltd	RCPD-08CS75 RCPD-14S75	Supply voltage:5V Power consumption: Max. 20mA -40°C~85°C	IEC 62955: 2018	B 1196060001 Rev.01
(Alternative)	Zhejiang Magtron Intelligent Technology Co.,Ltd	RCMU101SN-E-4SK-D1	Supply voltage:5V Power consumption: Max. 30mA -25°C~85°C	IEC 62955: 2018	B 1135980001 Rev.01
Input, Output, PE Wire	Dongguan Lanyue Electronic Technology Co., Ltd.	EVC H07BZ5	$3*6mm^2+1*0.75mm^2$ $3*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.75mm^2$ -35°C~90°C	EN 50620: 2017+A1	R 50577450
(Alternative)	Guangdong Baoming Industrial Technology Co., Ltd.	EVC H05BZ5-F EVC H07BZ5-F EVC H07BZ5-F	$3*6mm^2+1*0.75mm^2$ $3*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.75mm^2$ -35°C~90°C	EN 50620: 2017+A1	R 506169470001
(Alternative)	Interchangeable	Interchangeable	$3*6mm^2+1*0.75mm^2$ $3*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.5mm^2$ $5*6mm^2+1*0.75mm^2$	EN 50620: 2017+A1	Certified

			-35°C~90°C		
Supplementary information: 1) Provided evidence ensures the agreed level of compliance.					

Attachment No.1: Photo documentation

Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

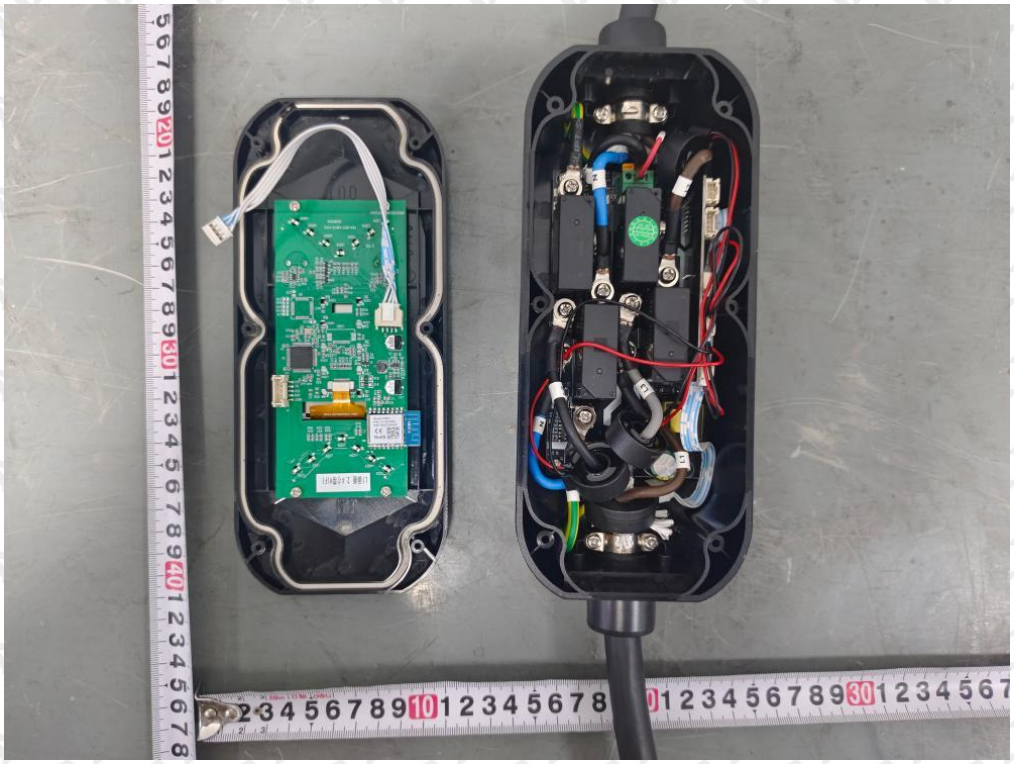


Photo 6

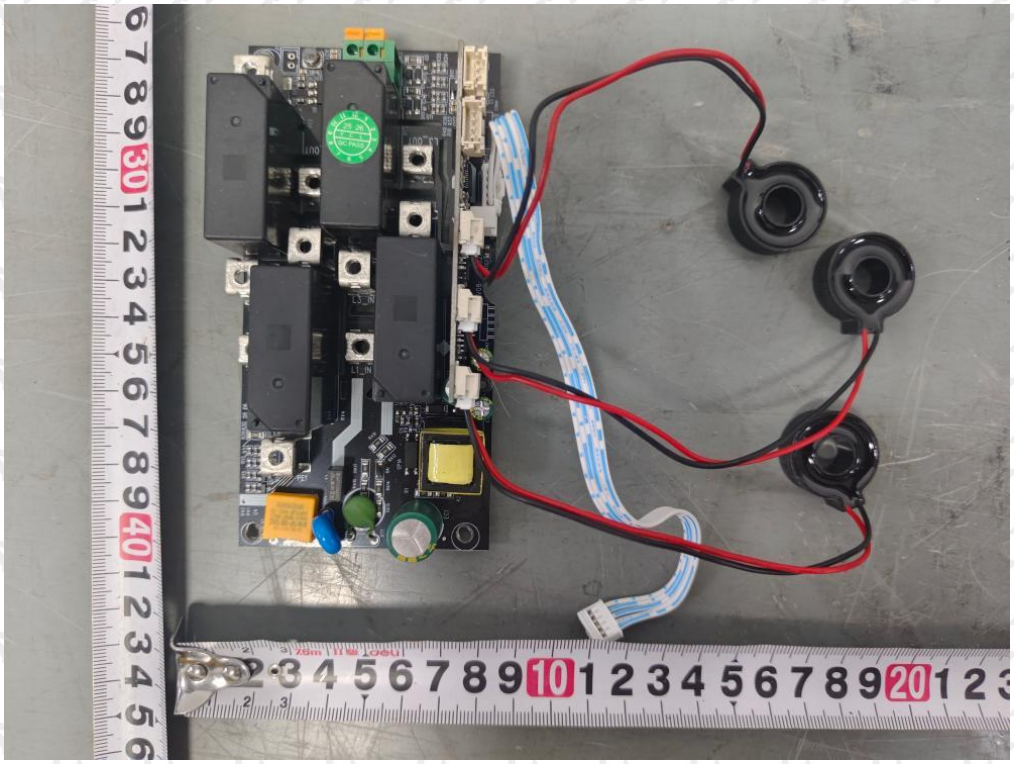


Photo 7

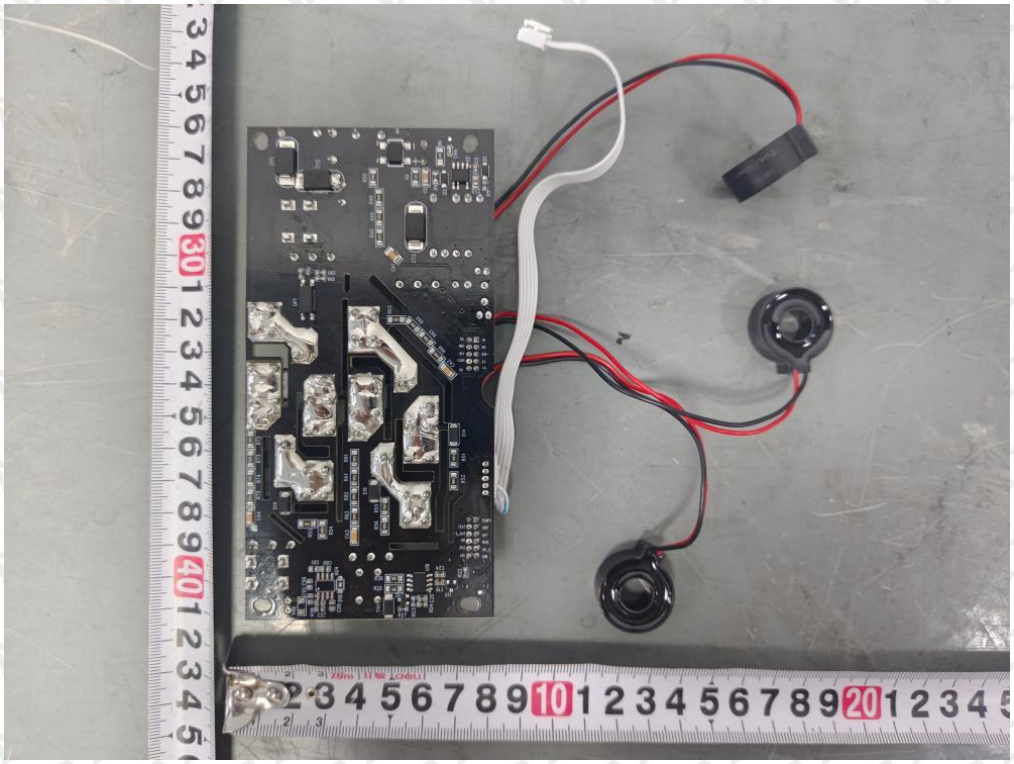


Photo 8

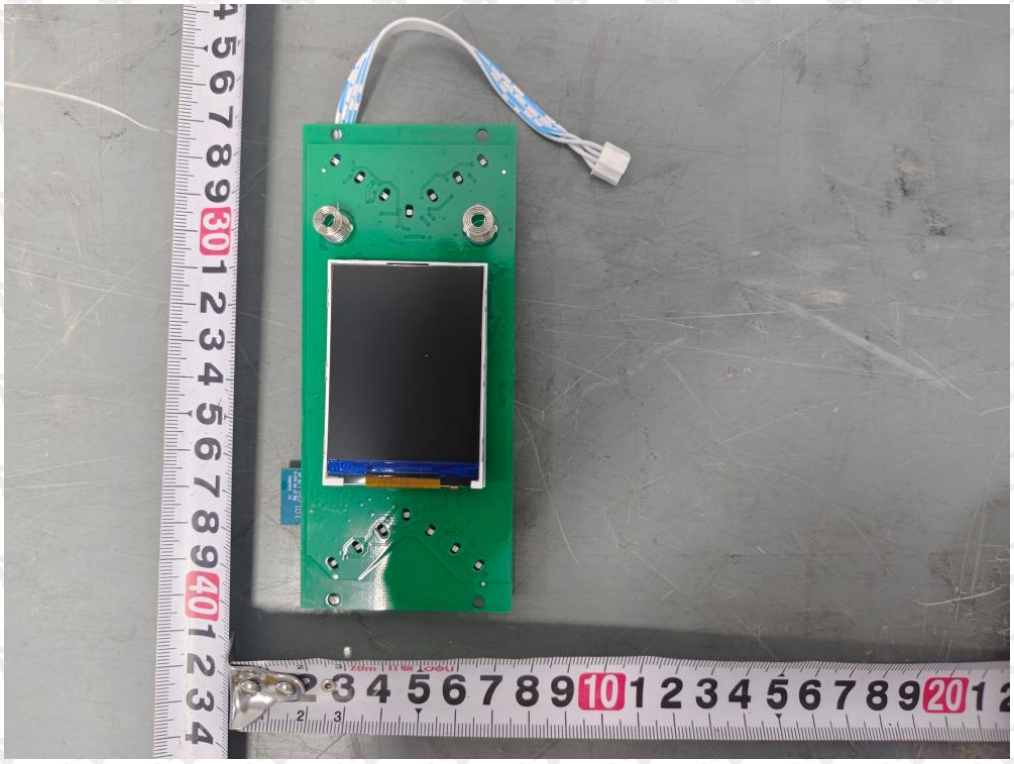


Photo 9

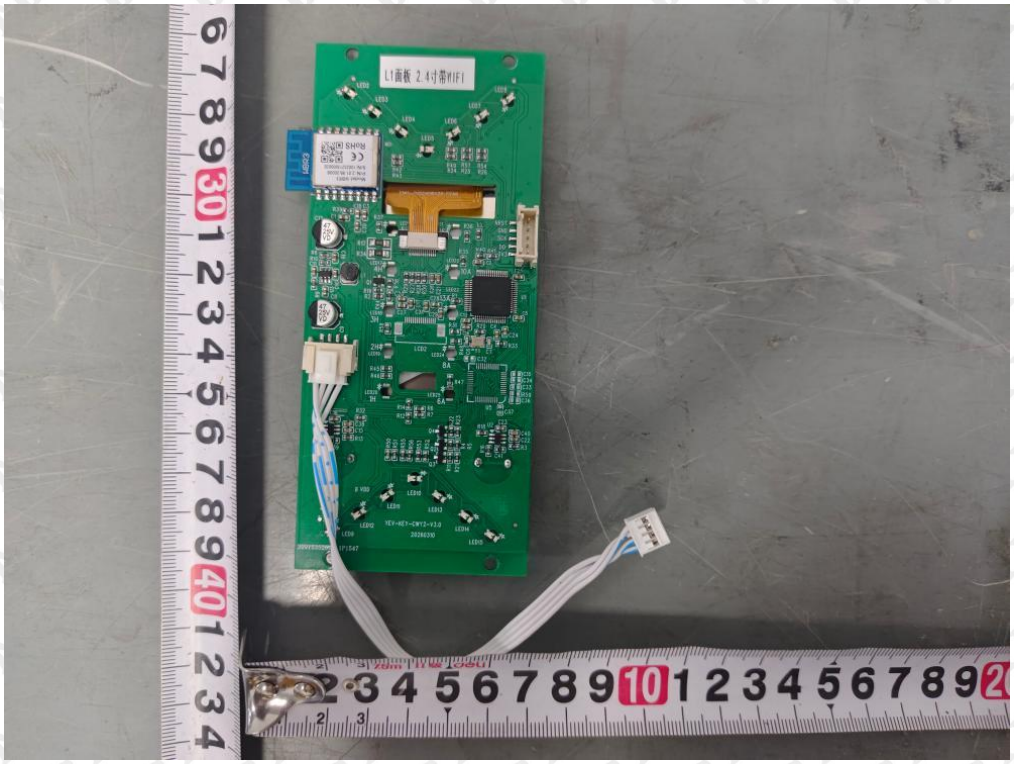
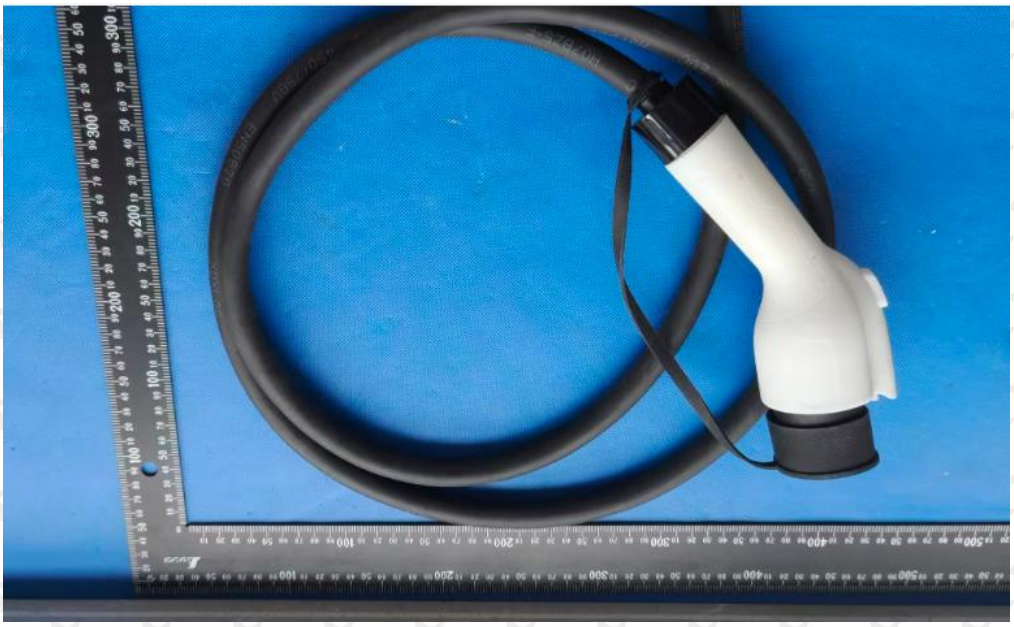


Photo 10





EUT photo 11



EUT photo 12



EUT photo 13



EUT photo 14



EUT photo 15



EUT photo 16



EUT photo 17



EUT photo 18



EUT photo 19



EUT photo 20



EUT photo 21



EUT photo 22



EUT photo 23



EUT photo 24



EUT photo 25



EUT photo 26



EUT photo 27



EUT photo 28



EUT photo 29



EUT photo 30



EUT photo 31



EUT photo 32



EUT photo 33



EUT photo 34



EUT photo 35



EUT photo 36



EUT photo 37



EUT photo 38



EUT photo 39



EUT photo 40



EUT photo 41



EUT photo 42



--- END OF TEST REPORT---

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