TEST REPORT
IEC 62196-3
Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles
Part 3: Dimensional compatibility interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers

Report Number. ..... :	70.407.21.285.01-00
Date of issue ..... :	2021-07-02
Total number of pages ..... :	26
Name of Testing Laboratory preparing the Report ..... :	TUV SUD Certification and Testing(China)Co.,Ltd.Shanghai Branch
Applicant's name ..... :	Zhengzhou Saichuan Electronic Technology Co.,Ltd.
Address ..... :	RM1102,11/F,Building No,No11,Changchun Road,National High-tech Industrial Development area,Zhengzhou,China.
Test specification:	
Standard ..... :	IEC 62196-3:2014 for use in conjunction with IEC 62196-1: 2014 EN 62196-3:2014 for use in conjunction with EN 62196-1:2014
Test procedure ..... :	CE,TÜV Mark
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62196_3A
Test Report Form(s) Originator .... :	VDE Testing and Certification Institute
Master TRF ..... :	Dated 2016-01

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Test item description .....:	Vehicle inlets for conductive charging of electric vehicle
Trade Mark .....:	
Manufacturer.....:	Zhengzhou Saichuan Electronic Technology Co.,Ltd.
Model/Type reference.....:	SCZ-200A-1000V-EU
Ratings.....:	200A 1000VDC

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☐	**Testing Laboratory:**		
Testing location/ address ..... :			
☒	**Name of TÜV SÜD Branch preparing the Report:**	**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch 3-13, No.151 Heng Tong Road, Jingan District Shanghai,200070 P.R. China**	
Testing location/ address ..... :		China Automotive Technology and Research Center 68, East Xianfeng Road, Dongli District, Tianjin, P. R. China.	
Tested by (name, function, signature) ..... :		Jinyu Li Project handler	2021-08-11
Approved by (name, function, signature) .. :		Pengdong Yang Reviewer	2021-08-11
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
Supervised by (name, function, signature) :			

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

CDF: 2 pages

Photo Document:4Pages

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Vehilce inlets,CCS type2 without AC Part,complete test were performed according to IEC 62196-3: 2014/IEC 62196-1:2014,All test results meet the requirement of relevant standards.	China Automotive Technology and Research Center 68, East Xianfeng Road, Dongli District, Tianjin, P. R. China.

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

N/A,No EU Group Differences

☒ **The product fulfils the requirements of _ IEC 62169-1:2014, EN 62169-1:2014, IEC 62169-3:2014, EN 62169-3:2014 _**

The text of the International Standard IEC 62196-1:2014 and IEC 62169-3:2014 were approved by CENELEC as European Standards without any modification

Copy of marking plate:

型号/MODEL: SCZ-200A-1000V-EU

额定电流/RATED CURRENT:200A

额定电压/RATED VOLTAGE:1000VDC

防护等级/Degree of protection: IP55(When not mated)
IP44(After mated)

生产厂家：郑州赛川电子科技有限公司

ZHENGZHOU SAICHUAN ELECTRONIC TECHNOLOGY CO.,LTD.

Test item particulars.....:	Vehicle inlets for conductive charging of electric vehicle
Type of accessory	
▪ **Vehicle inlets .....:**	yes
▪ **Vehicle connectors .....:**	no
- Number of poles .....:	5(PP,PE,CP,DC+,DC-)
- Rated current .....:	200A
- Rated operating voltage .....:	1000V DC
- Degree of protection .....:	IP55(When not mated) IP44(When mated)
- Interlocking facilities (with/without interlock) .....:	with interlock
- Type of interlock (electrical/mechanical) .....:	mechanical
- Standard sheet .....:	3-IVa
- Configuration .....:	FF
- Type of terminal.....:	Crimp connection
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)
Date of order.....:	2021.06.18
Date of receipt of test item .....:	2021.06.18
Date (s) of performance of tests .....:	2021.06.18-2021.07.02

General remarks:

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

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Name and address of factory (ies) ..... : Zhengzhou Saichuan Electronic Technology Co.,Ltd. No.8,Changchun Road,National High-tech Industrial Development area,Zhengzhou,China.
General product information: CCS Isolated DC 1000V 200A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict

8	**MARKING**		P
8.1	All accessories marked with the following:		P
	Rated current (A) ..... :	200A	P
	Rated operating voltage (V) ..... :	1000V	P
	Name or trademark of responsible vendor ..... :		P
	Degree of protection ..... :	IP55(When not mated) IP44(When mated)	P
	Type reference ..... :	SCZ-200A-1000V-EU	P
8.2	Symbols comply with the examples		P
8.3	For plugs and connectors, responsible vendor name or trademark and the type reference are visible to the user		N/A
8.4	For all accessories, rated voltage and rated current markings visible prior to installation		P
	For inlets and socket outlets, responsible vendor name or trademark and type reference visible before installation.		P
	Contacts of rewireable accessories marked properly		N/A
	Wiring instructions provided for rewireable accessories		N/A
	Non-rewireable accessories not required to be marked in accordance with 8.5 and 8.6		P
8.8	Marking is indelible and easily legible after the humidity treatment of 20.3, the marking is rubbed vigorously by hand for 15 s with a piece of cloth soaked in water and again for 15 s with a piece of cloth soaked with petroleum spirit.		P
8.9	Cable assemblies with one accessory have all wires identified and are provided with wiring instructions		N/A

9	**DIMENSIONS**		**P**
	EV accessories dimensions comply with standard sheets		P
	Applicable standard sheet ..... :	3-IVa	P
	It is not possible to connect connectors to inlets with different ratings or different pin configurations unless safe operation is ensured		P
	Connectors and inlets that are intended to be mated are designed to ensure that improper connection is not possible		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	It is not possible to make single pole connections between the connectors and inlet		P
10	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
10.1	Live parts are not accessible to the user when the accessories are in partial or complete engagement		P
	Contact between a live parts not possible while any live part accessible		P
10.2	Accessories with shutters do not allow access	Without shutter	N/A
	Live parts automatically screened		N/A
	Operation only by complementary accessories		N/A
	Parts liable fixed against loosing		N/A
	Compliance after tests of cl. 23		N/A
10.3	Design of accessories		P
	a) When inserting the plug or vehicle connector		P
	1) The earth connection is made before the phase connections		P
	2) The control pilot connection is made after phase and neutral connection		P
	3) The proximity contact or connection switch contact is made after the earth contact, and before or simultaneously with the control pilot contact.		P
	b) When withdrawing the plug or vehicle connector		P
	1) The phase and neutral connections are broken before the earth connection is broken		P
	2) The control pilot connection is broken before the phase connection are broken		P
	3) The proximity contact or connection switch contact is broken before the earth contact, and after or simultaneously with the control pilot contact.		P
10.4	It is not possible to inadvertently assemble the contacts of one device into the enclosure of the mating device.		P
10.301	For configuration AA, vehicle couplers shall be used only with the isolated d.c. electric vehicle charging station specified in IEC 61851-23		N/A
10.302	For configuration BB, vehicle couplers shall be used only with either isolated or non-isolated d.c. electric vehicle charging station specified in IEC 61851-23		N/A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
10.303	For configuration EE and FF, vehicle couplers shall be used only with either isolated or non-isolated d.c. electric vehicle charging station specified in IEC 61851-23	Isolated DC	P
11	**SIZE AND COLOUR OF THE EARTHING CONDUCTORS**		**P**
	Size of earthing conductors or neutral conductors are at least the same size as the phase conductors, or as specified in Table 6.	25mm^2	P
	The earth conductor is green/yellow		P
12	**PROVISION FOR EARTHING**		**P**
12.1	Accessory is provided with a protective earthing contact and earthing terminal in case that the vehicle is connected galvanically to the mains through this accessory		P
	The protective earthing contact is directly and reliably connected to the earthing terminals		P
12.2	All accessible dead metal parts are reliably connected to the earthing terminal by construction		P
	Impedance of earthing path does not exceed 0,05 Ω ..... :	10,0027mΩ	P
12.3	Earthing contact comply with the test of 12.3 (a) or 12.3 (b) to 12.3 (d)..... :		P
	Earthing contacts do not overheat when conducting a current equal to that specified for the phase contacts in accordance with 12.3 (a)		P
	The earthing contact conducted the short time test currents without cracking, breaking or melting in accordance with 12.3 (b) to (d).		P
12.4	Earthing contacts are shrouded or guarded against mechanical damage		P
12.5	Data or signal earth contacts can carry 2 A without overheating		P
13	**TERMINALS**		**P**
13.1	**Common requirements**		P
13.1.1	Rewireable accessories are provided with terminals that accept flexible conductors		N/A
13.1.2	Non-rewireable accessories are provided with soldered, welded, crimped or other effective terminations		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Crimping of soldered conductors is not used unless soldering is outside of crimp area		P
13.1.3	Terminals do not require special preparation		P
13.1.4	Terminal materials adequate		P
13.1.5	Earthing terminal bodies that are not part of the accessory housing or frame have a body made of materials in accordance with 13.1.4		P
	Earthing terminal bodies that are part of the accessory housing or frame have clamping means that are made of materials in accordance with 13.1.4		P
	If the housing or frame are fabricated of aluminium or it is alloys, combinations of copper and aluminium are avoided or protection is provided……..:		P
13.1.6	Terminals are properly fixed and clamping means do not fix any other component		P
13.1.7	Terminals are located within proximity of other terminals		P
13.1.8	Terminals are located or shielded to avoid contact with screws or conductors		P
13.1.9	No risk of accidental contact between live parts between live parts and enclosure parts when conductors fitted as intended		P
	No risk of a stranded wire contacting live parts or enclosure parts		P
13.2	**Screw type terminals**		N/A
13.2.1	Screw type terminals allow proper connection of a copper or copper alloy conductor with the proper cross sectional area		N/A
	Depth of pillar terminal hole sufficient		N/A
13.2.2	Screw type terminals have appropriate mechanical strength		N/A
	Screws and nuts for clamping have an ISO thread or a thread comparable in pitch and mechanical strength		N/A
13.2.3	Screw type terminals clamp conductors between metal surfaces and do not damage the conductor		N/A
13.2.4	Lug terminals used with accessories rated at least 60 A and are fitted with spring washers or other means to lock the terminal		N/A
13.2.5	Clamping screws or nuts of earthing terminals are locked against accidental loosening and cannot be loosened without a tool		N/A
13.3	**Mechanical tests on terminals**		N/A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals comply with the test of 13.3.1		N/A
	Flexing under mechanical load test:		N/A
	Smallest cross-sectional area (mm²); height H (mm); mass (kg).....:		N/A
	Largest cross-sectional area (mm²); height H (mm); mass (kg).....:		N/A
	during the test: the conductor does not slip out, no break near clamping unit and no damage		N/A
	Terminals comply with the test of 13.3.2		N/A
	Pull test:		N/A
	- min. cross-sectional area (mm²); pull (N).....:		N/A
	- max. cross-sectional area (mm²); pull (N).....:		N/A
	during the test the conductor does not come out		N/A
14	**INTERLOCKS**		**P**
14.1	**Accessories with interlock**		P
14.1.1	Accessories classified in “not suitable for making and breaking an electrical circuit under load” shall be provided with an interlock.		P
14.1.2	Plugs and socket-outlets with interlocks shall be so constructed that:		N/A
	- A plug cannot be completely withdrawn from the socket-outlet while the contacts of that socket-outlet are live		N/A
	- the contacts of the socket-outlet cannot be made live until a plug is in proper engagement		N/A
	Vehicle couplers with interlocks shall be so constructed that:		P
	- a vehicle connector cannot be completely withdrawn from the vehicle inlet while the contacts of that vehicle connector are live		P
	- the contacts of the vehicle connector cannot be made live until the vehicle connector is in proper engagement		P
	The power contacts shall not make or break under load		P
14.1.3	Accessories with interlock but without latching function (electrical interlock) shall be so constructed that:		N/A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	a) the time interval between the opening of the contacts of the control switching device and the opening of the line contacts and neutral contact of the accessory shall be sufficient to ensure that the mechanical switching device interrupts the current before the contacts of the plug are disconnected from the contacts of the socket-outlet		N/A
	b) during the closing operation, the contacts of the control switching device shall close after or simultaneously with the contacts of the main poles.		N/A
14.1.4	Switched socket-outlets with interlock and latching device holding the plug into the socket-outlet (mechanical interlock) shall be so constructed that:		N/A
	- the interlock is linked with the operation of a switch so that the plug can neither be inserted nor withdrawn from the socket-outlet while the contacts of the socket-outlet are live		N/A
	- the contacts of the socket-outlet cannot be made live until a plug is almost completely in engagement		N/A
	Switched vehicle connectors with interlock and latching device holding the vehicle connector onto the vehicle inlet (mechanical interlock) shall be so constructed that:		P
	- the interlock is linked with the operation of a switch so that the vehicle connector can neither be inserted nor withdrawn from the vehicle inlet while the contacts of the vehicle connector are live		P
	- the contacts of the vehicle connector cannot be made live until it is almost completely in engagement with a vehicle inlet		P
	Accessories with interlock and latching device which hold the plug into the socket-outlet or connector are subjected to the test of 14.1.5 and 14.1.6.		P
14.1.5	The switched socket-outlet or connector with interlock is fixed to the support so that the axis of separation is vertical and the movement of the plug is downwards.		P
	After this test, the total weight shall be maintained for 60 s.	750N	P
14.1.6	The switched socket-outlet or connector with interlock is fixed to support so that the axis of separation is horizontal		P
	After this test, the total weight shall be maintained for 60 s.	750N	P
	The test is repeated three times, rotating the socket-outlet of 90° on the vertical plane each time		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test, the switched socket-outlet or vehicle connector with interlock shall show no damage or deformation which may impair the function of the product		P
14.2	Accessories with integral switching device		N/A
	Integral switching devices shall comply with IEC 60947-3 as far as it is applicable:		N/A
	- for a.c. application, shall have a rated current, at a utilization category of at least AC-22A		N/A
	- for d.c. application, shall have a rated current, at a utilization category of at least DC-21A		N/A
14.3	Control circuit devices and switching elements		N/A
	Control circuit devices and switching elements, if any, used in the control circuit of an electrically interlocked socket-outlet or connector shall comply with:		N/A
	- IEC 60947-5-1 or		N/A
	- IEC 61058-1		N/A
	Ratings suitable for the load to be controlled		N/A
	Control switching devices according to IEC 61058-1 shall be classified with at least 10 000 cycles		N/A
14.4	Pilot contacts and auxiliary circuits		P
	Pilot contacts and auxiliary circuits used for interlocks shall make after the neutral and phase(s) are made		P
	Pilot contacts and auxiliary circuits used for interlocks shall break before the phase(s) and neutral are broken		P
14.301	Latching function		P
	Accessories shall be provided with a latching device to prevent the connection to be separated unintentionally or by unauthorized persons		P
	Interlock function shall be performed by the proper functioning of latching device		P
	Means shall be provide to indicate that interlock is properly engaged		P
15	**RESISTANCE TO AGEING OF RUBBER AND THERMOPLASTIC MATERIAL**		**P**
	Rubber or thermoplastic enclosures, or elastomeric sealing rings and gaskets are resistant to aging		P
	Material complies with the accelerated ageing test		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Test temperature (°C)……:	70°C for rubber(protection lid, rubber ring), 80°C for thermoplastic material(enclosure, material supporting contact tube)	P
	Test duration (hours)……..:	240h for rubber (protection lid, rubber ring), 168h for thermoplastic material(enclosure, material supporting contact tube)	P
	No cracks in the material are visible		P
	Material is not sticky or greasy		P
16	**GENERAL CONSTRUCTION**		**P**
16.1	Accessible surfaces are free from sharp edges		P
16.2	Screws or other fastening means for fixing the part carrying the contacts to the mounting surfaces are accessible		N/A
	This fastening means does not perform any other function		N/A
16.3	Earthing contact unable to be altered by the user		P
16.4	Socket outlet and vehicle connectors when mounted as in normal use and without a plug and vehicle inlet respectively in position, shall ensure the degree of protection specified on its marked		N/A
	When a plug or vehicle inlet is fully engaged with the socket-outlet or vehicle connector, the lower degree of protection of the two accessories shall be ensured		P
16.5	Maximum temperatures on accessible parts are not exceeded		P
16.6	Adequate contact pressure is maintained when vehicle connectors and inlets are mated		P
16.7	Retaining device that prevents the plug or connector from working out of this mated part is provided		P
16.8	Latching device complies with pull test		P
	Type of device……..:	Vehicle inlet	P
	Cable length...……..:	1,5m	P
	Weight of device (kg)……..:	1,26kg	P
	Weight of cable (kg) ……..:	4,24kg	P
	Pull force (kg) ……..:	5,5kg	P
16.9	Locking feature is provided (optional)		N/A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
16.10	Conductors can be easily inserted into terminals and secured in rewireable devices		N/A
	Conductors can be positioned so as not to allow contact with uninsulated live parts or reducing spacing in rewireable devices		N/A
	Cover or enclosures of rewireable devices are easily removable and easily fixed after connection of conductors		N/A
16.11	Field serviceable accessories are designed to discourage user servicing		N/A
16.12	Enclosures have adequate mechanical strength and do not work loose during normal use		P
	Enclosures parts cannot be removed without a tool		P
16.13	Cable entries allow introduction of the cable to afford mechanical protection		P
16.14	Insulating barriers and the like have adequate mechanical strength, and are secured to the body of the device		P
	Insulating barriers and the like are designed such that they cannot be incorrectly replaced		P
16.15	The force to insert or withdraw a connector from an inlet is not greater than 100 N		P
	Force measured (N)……..…:	Insert:82,3N Withdraw:88,6N	P
16.16	Gripping surface is provided		P
17	**CONSTRUCTION OF SOCKET-OUTLETS**		**N/A**
	Not applicable		N/A
18	**CONSTRUCTION OF PLUG AND VEHICLE CONNECTORS**		N/A
18.1	Enclosures of plugs and connectors completely cover the terminals and cable ends		N/A
	Rewireable device connections can be made without removing the core		N/A
	Plugs and connectors can only be assembled or reassembled so as to ensure proper configurations		N/A
18.2	Parts of a plug or connector do not work loose during normal use		N/A
	Plugs and connectors cannot be dismantled without a tool		N/A
18.3	Plugs meet the marked degree of protection when in complete engagement with the socket outlet		N/A

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Attached devices used to assist in meeting the degree of protection are not removable without a tool		N/A
18.4	Vehicle connectors are enclosed when not in engagement with the vehicle inlet		N/A
	Vehicle connectors incorporate means to meet the marked degree of protection when engaged with the vehicle inlet		N/A
	Means provided to meet the marked degree of protection are securely fixed to the connector		N/A
	Lid springs are fabricated of corrosion resistant material		N/A
19	**CONSTRUCTION OF VEHICLE INLETS**		**P**
19.1	Vehicle inlet incorporate means to ensure the marked degree of protection when mated with a vehicle connector		P
	Attached caps provided on inlets meet marked degree or protection when fitted correctly		P
	It is not possible to dismantle the inlet or the attached cap without a tool		P
19.2	Vehicle Inlet is provided with an earthing contact		P
19.3	Vehicle Inlets designated IP44 are provided with a drain opening meeting the dimensional limits		P
20	**DEGREE OF PROTECTION**		**P**
20.1	Accessories have the required minimum ingress protection rating		P
	Plugs and vehicle connectors when mated are IP 44		N/A
	Vehicle inlets mated are IP 44		P
	Plugs, vehicle connectors, and socket outlets when not mated are IP 24		N/A
	Vehicle Inlets when not mated are IP 55		P
20.2	Enclosures comply with the relevant test of IEC 60529 for the IP rating marked on the device		P
20.3	No damage occurs to devices subjected to the humidity conditioning		P
	Humidity (%) ..... :	93%	P
	Temperature (°C)..... :	25°C	P
	Duration (hours)..... :	168H	P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
21	**INSULATION RESISTANCE AND DIELECTRIC STRENGTH**		**P**
21.1	Accessories comply with the insulation resistance and dielectric strength tests		P
21.2	The measured insulation resistance is not less 5 MΩ	See appended table 21.2	P
21.3	The accessory complies with the dielectric strength test	See appended table 21.1	P
21.4	The means for non-interchangeability were not impaired		P
22	**BREAKING CAPACITY**		**P**
22.1	Accessories intended to interrupt current have sufficient breaking capacity		N/A
22.2	Mating accessories comply with the breaking capacity test		N/A
	Test current: 1,25 rated current (A: power factor) .... :		N/A
	Test voltage: 1,1 rated operating voltage (V) ..... :		N/A
	Number of cycles..... :		N/A
	No sustained arcing occurs. No damage		N/A
22.3	D.C. accessories or the d.c portions of combined a.c./d.c. accessories are not required to be tested		P
23	**NORMAL OPERATION**		**P**
23.1	Accessories withstand the mechanical, electrical and thermal stresses of normal use		P
23.2	Test performed with both a.c. and d.c. voltages		P
	For d.c. vehicle inlets and vehicle connectors the maximum number of operation cycles is 10 000 without load		P
	In case d.c. vehicle inlets contain an a.c. part, these shall be tested separately with new accessories	Isolated DC	N/A
23.3	The accessories comply with the test		P
	Rated operating voltage (V) ..... :	1000V	P
	Rated current (A; power factor)..... :	200A	P
	Number of cycles: with load ..... :		N/A
	without load ..... :	10000	P
	No sustained arcing occur		P
	After test, no damage and electric test (§ 21.3) (V)		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
23.4	Lids or other moveable parts that are not operated automatically are also caused to move the required number of cycles		P
24	**TEMPERATURE RISE**		**P**
24.1	Temperature rise of terminals and surfaces do not exceed the required limits 50 K	See appended table 24.1	P
24.2	Accessories shall be so constructed that the surface temperatures in normal use are not excessive, as indicated in 16.5		P
25	**FLEXIBLE CABLES AND THEIR CONNECTION**		**P**
25.1	Conductors are relieved from stain at the terminals and are protected against abrasion		P
	Cable cannot contact unearthed metal parts		P
25.2	**Requirements for plugs and vehicle connectors**		N/A
25.2.1	Suitable flexible cable is provided with non-rewireable devices		N/A
25.2.2	Rewireable accessory provided with strain relief that prevents twisting of cable		N/A
	Instructions provided to identify parts not provided and explain assembly		N/A
	Cable anchorages do not have any sharp edges		N/A
	Insulating materials are smooth and free from burrs		N/A
25.3	Accessories comply with the cable pull test		N/A
	Rated current (A) ..... :		N/A
	Pulling force (N) ..... :		N/A
	Torque (Nm) ..... :		N/A
	Maximum displacement (mm) ..... :		N/A
	During the test, the cable shall not be damaged		N/A
	After the test, the cable shall not have been displaced by more than the values indicated in table 17.		N/A
25.301	Accessories not suitable for marking and breaking an electric circuit under load		N/A
	During the test, the cable shall not be damaged		N/A
26	**MECHANICAL STRENGTH**		**P**
26.1	Accessories have adequate mechanical strength		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
26.2	Accessories maintain their degree or protection after impact testing		P
	Ball impact test on enclosure for Socket-outlets and appliance inlets		P
	Impact test: 5 blows (fig. 5); energy:	4J	P
	- After test, no damage		P
	- Accessories higher than IP 44: withstand § 20		P
	- Enclosures of thermoplastic mat.: withstand § 21.4		P
26.3	Rewirable plugs and connectors, and non-rewirable plugs and connectors:		N/A
	For rewirable plugs and connectors: Type of cable (IEC 60245-4; mm²) ..... :		N/A
	8 drops – 1 m, total length of 2,25 m		N/A
	- After test, no damage		N/A
	- Accessories higher than IP 44: withstand § 20		N/A
	- Enclosures of thermoplastic mat.: withstand § 21.4		N/A
26.4	Non-rewireable accessories comply with the flexing test		N/A
	Current (A); Force (N) ..... :		N/A
	Number of flexing: 20.000		N/A
	After the test, no damage		N/A
26.5	Accessories with screwed cable glands comply with the deformation test	[ ] metal [ ] moulded mater	N/A
	Diameter of test rod (mm) ..... :		N/A
	Force (N)..... :		N/A
	After the test, no damage		N/A
26.6	Shutters, if provided, comply with the pin force test		N/A
26.7	Isolating caps fixed sufficiently		P
	Test of 26.8 and 26.9 comply with stated criteria		P
	After each of the following tests, the samples shall show no damage as follows:		P
	- no part shall become detached		P
	- no part shall have moved, loosened or deformed to the extent that the samples no longer function or operate as intended		P
	- no uninsulated live part shall become accessible with the probe (Figure 3)		P
	- no reduction shall occur of creepage and clearance between uninsulated live parts of		P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- no other evidence of damage shall result, that could increase the risk of fire or electric		P
26.8	Temperature test of IEC 60068-2-14, test procedure Nb		P
26.9	Force test on isolating caps at 20 N or 40 N for 1 minute	40N	P
27	**SCREWS, CURRENT CARRYING PARTS AND CONNECTIONS**		N/A
27.1	Connections withstand the mechanical stresses occurring in normal use		N/A
	Screws transmitting contact pressure having a diameter of 3,5 mm, screw into a metal nut or metal insert		N/A
	Screws comply with the engagement test	See appended table 27.1	N/A
	The screws or nuts are tightened and loosened:		N/A
	- ten times for screws in engagement with a thread of insulating material		N/A
	- five times for nuts and other screws		N/A
	Torque applied (Nm) ..... :		N/A
	After the test, the clamping unit shall not have undergone changes that adversely affect its further use		N/A
27.2	Screws engaging threads in insulating material have a suitable length and correct introduction is ensured		N/A
27.3	Contact pressure of electrical connections is not transmitted through insulating material unless insulating material is suitable for this use		N/A
27.4	Screws and rivets are locked against loosening		N/A
27.5	Current carrying parts are fabricated of suitable materials		N/A
27.6	Moving parts of contacts are suitably protected against corrosion		N/A
28	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCE**		**P**
28.1	Creepage distances and clearance comply with IEC 60664-1 and 60664-3, when evaluated in accordance with 28.4	See appended table 28.1	P
28.2	Sealing compounds do not extend outside the cavity in which they are contained		P
28.3	Pollution degree is 4 for outdoor use equipment unless protection is afforded by another means		P
	Pollution degree applied..... :	3 (inside enclosure)	P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
28.4	Overvoltage category II applies		P
	Pollution degree 2 on printed wiring boards applies due to the use of protective coatings		N/A
	Pollution degree 1 on printed wiring boards applies due to the use of silicone rubber or potting compounds		N/A
	Clearances were evaluated based on test and measurement in IEC 60664-1		P
	Evaluation of clearance and creepage distances are in accordance with IEC 60664-1, Section 3		P
	Protective coatings were evaluated to IEC 60664-3		P
	Primary circuit voltages are evaluated using the next highest value in the table. Interpolation is only allowed for secondary circuits		P
	Determination of the dimensions of clearance and creepage distances shall be conducted in accordance with IEC 60664-1:2007, Subclause 6.2		P
29	**RESISTANCE TO HEAT, TO FIRE AND TO TRACKING**		**P**
29.1	Accessories are resistant to heat		P
29.2	Devices are heated in cabinet for 1 hour at a temperature of 110 + 5°C and comply with all criteria at the end of the exposure		P
	Marking still be easily legible		P
29.3	Insulating materials comply with the ball pressure test	See appended table 29.3	P
	Temperature (°C)..... :	125°C for material supporting contact tube, 80°C for enclosure not supporting live parts	P
	Maximum deformation diameter (mm)..... :	0,7mm(material supporting contact tube; 0,6(enclosure not supporting live parts)	P
	For materials which deformation, this diameter not exceed 2 mm		P
29.4	External parts of insulating material and insulating material supporting live parts are resistant to abnormal heat and fire in accordance with IEC 60695-2-10	See appended table 29.4	P

IEC 62196-1 & IEC 62196-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature of glow wire tip (°C) ..... :	850°C for material supporting contact tube, 650°C for enclosure not supporting live parts	P
	No visible flame and no sustained glowing, or		P
	Flame or glowing of the specimen or of the surroundings extinguish within 30 s after the removal of the glow-wire		P
	Surrounding parts have not burned away completely		P
	No permanent ignition of the tissue paper		P
29.5	Insulating parts supporting live parts are resistant to tracking in accordance with IEC 60112 PTI test, solution a, 175 V, 50 drops	See appended table 29.5	P
	No flashover or breakdown between electrodes		P
30	**CORROSION AND RESISTANCE TO RUSTING**		**P**
	Ferrous parts are protected against rusting		P
31	**CONDITIONAL SHORT-CIRCUIT CURRENT WITHSTAND TEST**		**N/A**
	Not applicable		N/A
32	**ELECTROMAGNETC COMPATIBILITY**		**N/A**
32.1	Immunity		N/A
32.2	Emission		N/A
33	**VEHICLE DRIVEOVER**		**N/A**
33.1	A plug or vehicle connector shall have adequate resistance to damage from being driven over by a vehicle		N/A
33.2	Accessories wired with the min. size cable of a type recommended by the manufacturer shall be placed on a concrete floor in any normal position of rest	See appended table 33.2	N/A
33.4	This sub clause of part 1 is not applicable		N/A
33.5	This sub clause of part 1 is not applicable		N/A

Table 12.3	TABLE: Short Time Test Currents				P
Earthing Contact Designation	**Device Rating (A)**	**Test Current (A)**	**Time (seconds)**	**Continuity exists (Yes/No)**	**Results**
25mm^2	200A	1530A	6S	YES	P
Supplementary information:					

Table 21.1	TABLE: Dielectric Strength		P
Test voltage applied between:	**Test potential applied (V)**	**Breakdown / flashover (Yes/No)**	
Between mains poles (primary fuse disconnected)	**3000**	**No**	
Between parts separated by basic or supplementary insulation	**3000**	**No**	
Between parts separated by double or reinforced insulation	**-**	**-**	
Supplementary information:			

Table 21.2	TABLE: Insulation Resistance		P
Test voltage applied between:	**Test potential applied (V)**	**Insulation Resistance (MΩ)**	
Between mains poles (primary fuse disconnected)	**1000**	**99.9GΩ**	
Between parts separated by basic or supplementary insulation	**1000**	**99.9GΩ**	
Between parts separated by double or reinforced insulation	**-**	**-**	
Supplementary information:			

Table 24	TABLE: Temperature rise		P
	Test current (A)..... :	DC+.DC-:200A, PP.CP:2A	—
	Ambient (℃) ..... :	**24,5℃**	—
Thermocouple Locations	**max. temperature rise measured (K)**	**max. temperature rise limit (K)**	
Table 24.1			
Contact of DC+	**40,2**	50	
Contact of DC-	**38,5**	50	
Contact of PE	**37,2**	50	
Contact of PP	**14,2**	50	

Contact of CP	**13,1**	50
Material supporting live parts	**11,4**	——
Sheath of internal wire	**13,2**	——
enclosure	**10,6**	——

Table 24.2

Thermocouple Locations	**max. surface temperature measured (℃)**	**max. surface temperature limit (℃)**
Accessible part on enclosure (handle)	**49,2**	60
Enclosure (maybe touched but not grasped)	**50,6**	85
Supplementary information:		

Table 27.1	**TABLE: Threaded Part Torque Test**		**-**
Threaded part identification	**Diameter of thread (mm)**	**Column number (I, II, or III)**	**Applied torque (Nm)**
-	-	-	-
Supplementary information:			

Table 28.1	**TABLE: Clearance And Creepage Distance Measurements**					**P**
	Rated voltage (V) ..... :	**1000**				**—**
	Pollution degree ..... :	**3**				**—**
	Overvoltage category ..... :	**II**				**—**
	Insulation group ..... :	**II**				**—**
clearance cl and creepage distance dcr at/of:	**Up (V)**	**U r.m.s. (V)**	**Required cl (mm)**	**cl (mm)**	**Required dcr (mm)**	**dcr (mm)**
Between terminal of DC+ and DC-	-	1000	5,5	27,08	14,0	72,36
Between terminal of DC+ and PE	-	1000	5,5	52,07	14,0	323,03
Between terminal of DC+ and accessible enclosure	-	1000	5,5	51,07	14,0	233,82
Between terminal of DC- and PP	-	1000	5,5	60,92	14,0	331,66
Between terminal of DC+ and CP	-	1000	5,5	60,91	14,0	330,27
Supplementary information:						

Table 29.3	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) .....:			—
Part	**Test temperature (°C)**	**Impression diameter (mm)**	
Material supporting contact tube	125	0,7	
Enclosure not supporting live parts	80	0,6	
Supplementary information:			

Table 29.4	TABLE: Glow-wire Test				P
part under test	**material designation**	**test temperature (°C)**	**visible flame and sustained glowing (Y/N)**	**flames and glowing extinction time**	**ignition of the tissue paper (Y/N)**
Material supporting contact tube	PA6	850	N	0s	N
Enclosure not supporting live parts	PA6	650	N	0s	N
Supplementary information:					

Table 29.5	TABLE: Tracking Test		P
part under test	**material designation**	**test voltage (V)**	**flashover / breakdown (Yes/No)**
Material of enclosure supporting contact tube	PA6	175	No
Supplementary information:			

Table 33.2	TABLE: Vehicle Drive Over Test		-
	Tire Size..... :	-	—
	Force Applied (N) ..... :	-	—
	Tire Pressure (kPa) ..... :	-	
	Velocity (km/h)..... :	-	
Sample Number	**Orientation**	**Results / Observations**	
-	-	-	
Supplementary information:			

Measurement devices list:

No.	Equipment ID	Type	Model	Calibration Last date	Calibration Due date
1	NJ.18.91.1305	Electrical safety analyzer	19032-P	2021.04.23	2022.04.22
2	NJ.18.91.542	Water proof tester	TMJ-9710	2021.03.27	2022.03.26

3	NJ.18.91.539	Dust Test Chamber	ESDT-5200-F	2021.03.27	2022.03.26
4	NJ.18.8.2819	Jaeger-type constant temperature and humidity box	KTM-THBE415	2021.05.22	2022.05.21
5	NJ.18.8.522	GM10 data recording system	GM10	2021.02.14	2022.02.13
6	NJ.18.8.531	Conductivity meter	DDS-11A	2021.02.10	2022.02.09
7	NJ.18.91.548	Short-circuit current tester	——	2021.06.01	2022.05.31
8	NJ.18.91.508	Cable anchorage testing apparatus	——	2021.03.17	2022.03.16
9	NJ.18.91.527	Ball Pressure set	——	2021.03.17	2022.03.16
10	NJ.18.8.532	Creepage distanaugece and clearance g	SH1308	2021.01.24	2022.01.23
11	NJ.18.8.2884	Insertion force testing machine	YH-8816CDS	2021.02.08	2022.02.07
12	NJ.18.91.1209	Terminal vertical connection reliability tester	SH9429B	2021.03.17	2022.03.16
13	NJ.18.91.551	Cable flexing test station	XNYL-01	2021.03.17	2022.03.16
14	NJ.18.8.2894	Glow Wire set	T03.35	2021.03.21	2022.03.20
15	NJ.18.8.2893	Proof Tracking Tester	M31.10	2021.02.15	2022.02.14
16	NJ.18.8.2892	Drive	Sun-LTNY	2021.03.17	2022.03.16
17	NJ.18.8.145	Vernier Caliper	——	2020.11.27	2021.11.26
18	NJ.18.8.503	Probe	DMS-A	2021.04.27	2022.04.26
19	NJ.18.91.550	AC constant current source	AFA	2021.03.16	2022.03.15
20	NJ.18.91.1264	Three coordinate measuring machine	Explorer-07.10.07	2020.12.13	2021.12.12

End of Report