



LVD TEST REPORT

For

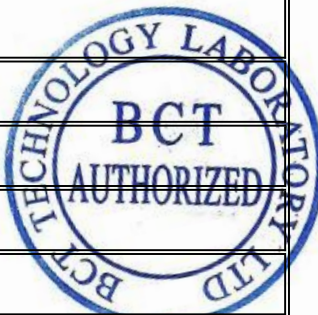
Shenzhen Consnant Technology Co., Ltd.

Building B6, Junfeng Industrial Park, Yonghe Road, Fuhai Sub-District, Bao'an District,
Shenzhen City, 518103 P.R.China.

Test Model: APF-150A

Additional Model No.: APF-30A, APF-50A, APF-75A, APF-100A, APF-200A

Equipment Under Test	: Active Power Filter
Date of receipt of test sample	: June 08, 2020
Test Date	: June 08, 2020 - June 17, 2020
Issue Date	: June 20, 2023
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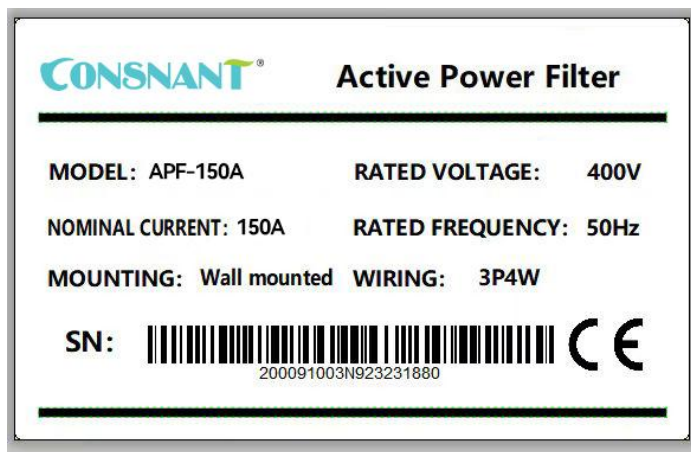


Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen BCT Technology Co., Ltd.

TEST REPORT EN 61439-1:2011 Low-voltage switchgear and controlgear assemblies - Part 1: General rules EN 61439-2:2011 Low-voltage switchgear and controlgear assemblies - Part 2: Power switchgear and controlgear assemblies	
Report No.:	BCT200608R-005SC
Date of issue.....:	June 20, 2023
Total number of pages	39
Applicant's name.....:	Shenzhen Consnant Technology Co., Ltd.
Address.....:	Building B6, Junfeng Industrial Park, Yonghe Road, Fuhai Sub-District, Bao'an District, Shenzhen City, 518103 P.R.China.
Manufacturer's name.....:	Shenzhen Consnant Technology Co., Ltd.
Address.....:	Building B6, Junfeng Industrial Park, Yonghe Road, Fuhai Sub-District, Bao'an District, Shenzhen City, 518103 P.R.China.
Name of Testing Laboratory preparing the Report	Shenzhen BCT Technology Co., Ltd.
Testing Laboratory.....:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.
Testing location / address.....:	Electronic Testing Building, No.43 ShaHe Road, XiLi Street, Nanshan District, Shenzhen, Guangdong, China
Test specification.....:	
Standard.....:	EN 61439-1:2011, EN 61439-2:2011
Test procedure.....:	Type test
Non-standard test method.....:	N/A
Test Report Form No.....:	EN/IEC 61439A
Test Report Form(s) Originator.....:	Nemko AS
Master TRF.....:	Dated 2011-03
Test item description.....:	Active Power Filter
Trade Mark.....:	CONSNANT
Model/Type reference.....:	APF-150A
Serial number	APF-30A, APF-50A, APF-75A, APF-100A, APF-200A
Ratings.....:	Input: AC400V, 50Hz, 150A, 100kvar

Copy of marking plate:

The artwork below may be only a draft.



Remark: The height dimension of CE mark should not less than 5mm, the height dimension of WEEE symbol should not less than 7mm.

Summary of testing:

The test object has been assessed for safety with respect to the above test specifications and found to comply with the requirements of EN 61439-1:2011; EN61439-2:2011.

General remarks:

This report shall not be reproduced except in full without prior approval of the company.

The test results presented in this report relate only to the item(s) tested.

“(see remark #)” refers to a remark appended to the report.

“(see Annex #)” refers to an annex appended the report.

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

General product information:

a)The model **APF-150A** is widely used in kinds of industry fields.

b)Indoor use only.

Test item particulars.....:

Classification of installation and use.....: Fixing device

Supply Connection.....: Directly connected to the mains

Possible test case verdicts:

- test case does not apply to the test object.....: N (N/A)

- test object does meet the requirement.....: P (Pass)

- test object does not meet the requirement..... : F (Fail)

*Note: This Report is based on report **BCT200608R-005SA**, In addition to the applicant's name and address, no further test need.*

EN 61439-2:2011			
Clause	Requirement- Test	Result	Verdict
5	Interface characteristics		P
5.1	General		P
	The characteristics of the ASSEMBLY shall ensure compatibility with the ratings of the circuits to which it is connected and the installation conditions and shall be specified by the ASSEMBLY manufacturer using the criteria identified in 5.2 to 5.6.		P
5.2	Voltage ratings		P
5.2.1	Rated voltage	400V	P
5.2.2	Rated operational voltage	380V(85%~115%)	P
5.2.3	Rated insulation voltage	2820V	P
5.2.4	Rated impulse withstand voltage	5000Vac (50Hz)	P
5.3	Current ratings		P
5.3.1	Rated current of the ASSEMBLY		P
5.3.2	Rated current of a circuit	150A	P
5.3.3	Rated peak withstand current		P
5.3.4	Rated short-time withstand current		P
5.3.5	Rated conditional short-circuit current of an ASSEMBLY		P
5.4	Rated diversity factor		P
	The rated diversity factor is the per unit value of the rated current, assigned by the ASSEMBLY manufacturer, to which outgoing circuits of an ASSEMBLY can be continuously and simultaneously loaded taking into account the mutual thermal influences.	Detail see user's Manual	P
	Rated diversity factor can be stated: <ul style="list-style-type: none"> • for groups of circuits; • for the whole ASSEMBLY. 		P
	The rated diversity factor multiplied by the rated current of the circuits shall be equal to or higher than the assumed loading of the outgoing circuits. The assumed loading of outgoing circuits shall be addressed by the relevant ASSEMBLY standard.		P
	The rated diversity factor is applicable with the ASSEMBLY operating at rated current (I nA).	150A	P
	See Annex E for further details.		N
	In the absence of an agreement between		N

	the ASSEMBLY manufacturer and user concerning the actual load currents, the assumed loading of the outgoing circuits of the ASSEMBLY or group of outgoing circuits may be based on the values in Table 101.		
5.5	Rated frequency (f n)		P
	The rated frequency of a circuit is the value of frequency to which the operating conditions are referred. Where the circuits of an ASSEMBLY are designed for different values of frequency, the rated frequency of each circuit shall be given.	AC input:50Hz	P
5.6	Other characteristics		P
	The following characteristics shall be declared:		P
	a) additional requirements depending on the specific service conditions of a functional unit (e.g. type of coordination, overload characteristics);		P
	b) pollution degree; (see 3.6.9);	PD2	P
	c) types of system earthing for which the ASSEMBLY is designed;	PE	P
	d) indoor and/or outdoor installation (see 3.5.1 and 3.5.2);	Indoor used	P
	e) stationary or movable (see 3.5.3 and 3.5.4);	Stationary, Wall-Mount	P
	f) degree of protection;	IP20	P
	g) intended for use by skilled or ordinary persons (see 3.7.12 and 3.7.14);	use by skilled	P
	h) electromagnetic compatibility (EMC) classification (see Annex J);	See EMC Report BCT200608R-005EC	P
	i) special service conditions, if applicable (see 7.2);	Detail see user's Manual	P
	j) external design (see 3.3);	see user's Manual	P
	k) mechanical impact protection, if applicable (see 8.2.1);	see user's Manual	P
	l) the type of construction – fixed, removable or withdrawable parts (see 8.5.1 and 8.5.2 of Part 1);	Fixed, Wall-Mount	P
	m) the nature of short-circuit protective device(s) (see 9.3.2);the form of internal separation (see 8.101);	see user's Manual	P
	n) measures for protection against electric	see user's Manual	P

	shock;the types of electrical connections of functional units (see 8.5.101).		
	o) overall dimensions (including projections e.g handles, covers, doors), if required;	see user's Manual	P
	p) the weight, if required.	46Kg	P
6	Information		P
6.1	PSC - ASSEMBLY designation marking		P
	The ASSEMBLY manufacturer shall provide each ASSEMBLY with one or more labels, marked in a durable manner and located in a place such that they are visible and legible when the ASSEMBLY is installed and in operation. Compliance is checked according to the test of 10.2.7and by inspection.	It is provided and compliance with the requirements. Check OK	P
	The following information regarding the ASSEMBLY shall be provided on the designation label(s):	See marking	P
	a) ASSEMBLY manufacturer's name or trade mark (see 3.10.2);	Shenzhen Consnant Technology Co., Ltd.	P
	b) type designation or identification number or any other means of identification, making it possible to obtain relevant information from the ASSEMBLY manufacturer;	APF-150A	P
	c) means of identifying date of manufacture;	See Serial No.	P
	d) IEC 61439-2		P
6.2	Documentation		P
6.2.1	Information relating to the ASSEMBLY		P
	All interface characteristics according to Clause 5, where applicable, shall be provided in the ASSEMBLY manufacturer's technical documentation supplied with the ASSEMBLY.	It is provided and compliance with the requirements.	P
6.2.2	Instructions for handling, installation, operation and maintenance	Detail see user's Manual	P
	The ASSEMBLY manufacturer shall provide in documents or catalogues the conditions, if any, for the handling, installation, operation and maintenance of the ASSEMBLY and the equipment contained therein.	It is provided and compliance with the requirements.	P
	If necessary, the instructions shall indicate the measures that are of particular importance for the proper and correct		P

	transport, handling, installation and operation of the ASSEMBLY . The provision of weight details is of particular importance in connection with the transport and handling of ASSEMBLIES.		
	The correct location and installation of lifting means and the thread size of lifting attachments, if applicable, shall be given in the ASSEMBLY manufacturer's documentation or the instructions on how the ASSEMBLY has to be handled.		P
	The measures to be taken, if any, with regard to EMC associated with the installation, operation and maintenance of the ASSEMBLY shall be specified (see Annex J).		P
	Where necessary, the above-mentioned documents shall indicate the recommended extent and frequency of maintenance.		P
	If the circuitry is not obvious from the physical arrangement of the apparatus installed, suitable information shall be supplied, for example wiring diagrams or tables.		P
6.3	Device and/or component identification		P
	Inside the ASSEMBLY, it shall be possible to identify individual circuits and their protective devices. Any designations used shall be in compliance with IEC 61346-1 and IEC 61346-2 and identical with those used in the wiring diagrams, which shall be in accordance with IEC 61082-1.	It is provided and compliance with the requirements.	P
7	Service conditions		P
7.1	Normal service conditions		P
	ASSEMBLIES conforming to this standard are intended for use under the normal service conditions detailed below.	Compliance with the requirements.	P
7.1.1	Ambient air temperature		P
7.1.1.1	Ambient air temperature for indoor installations		P
	The ambient air temperature shall not exceed +40 °C and its average over a period of 24 h does not exceed +35 °C.	Not exceed 40°C. Over 40°C equipment may be automatically reduced in operation	P

	The lower limit of the ambient air temperature shall be -5 °C.	-10°C~40°C	P
7.1.1.2	Ambient air temperature for outdoor installations	indoor used	N
	The ambient air temperature shall not exceed +40 °C and its average over a period of 24 h does not exceed +35 °C.		N
	The lower limit of the ambient air temperature shall be -25 °C.		N
7.1.2	Humidity conditions		P
7.1.2.1	Humidity conditions for indoor installations		P
	The relative humidity of the air does not exceed 50 % at a maximum temperature of +40 °C. Higher relative humidity may be permitted at lower temperatures, for example 90 % at +20 °C. Moderate condensation should be borne in mind which may occasionally occur due to variations in temperature.	Maximum 95%, no condensation	P
	Moderate condensation should be borne in mind which may occasionally occur due to variations in temperature.		P
7.1.2.2	Humidity conditions for outdoor installations		N
	The relative humidity may temporarily be as high as 100 % at a maximum temperature of +25 °C.	indoor used	N
7.1.3	Pollution degree		P
	The pollution degree (see 3.6.9) refers to the environmental conditions for which the ASSEMBLY is intended.	Pollution degree 2	P
7.1.4	Altitude		P
	The altitude of the site of installation does not exceed 2 000 m.	Altitude not exceed 1000m. When applied to the altitude of 1000-4000 m, the amount should be reduced by 1% for every 100 m increase.	P
7.2	Special service conditions		P
	Where any special service conditions exist, the applicable particular requirements shall be complied with or special agreements shall be made between the ASSEMBLY manufacturer and the user. The user shall inform the ASSEMBLY manufacturer if such exceptional service conditions exist.	Detail see user's Manual	P

7.3	Conditions during transport, storage and installation		P
	A special agreement shall be made between the ASSEMBLY manufacturer and the user if the conditions during transport, storage and installation, for example temperature and humidity conditions, differ from those defined in 7.1.	Detail see user's Manual	P
8	Constructional requirements		P
8.1	Strength of materials and parts		P
8.1.1	General		P
	ASSEMBLIES shall be constructed of materials capable of withstanding the mechanical, electrical, thermal and environmental stresses that are likely to be encountered in specified service conditions.	Check ok	P
	The external shape of the ASSEMBLY enclosure can vary to suit the application and use, some examples have been defined in 3.3. These enclosures may also be constructed from various materials e.g. insulating, metallic or a combination of these.	Metal Shell with Insulation Layer	P
8.1.2	Protection against corrosion		P
	Protection against corrosion shall be ensured by the use of suitable materials or by protective coatings to the exposed surface,taking account of the normal service conditions (see 7.1). Compliance to this requirement is checked by the test of 10.2.2.	Protective Layer Application	P
8.1.3	Properties of insulating materials		P
8.1.3.1	Thermal stability		P
	For enclosures or parts of enclosures made of insulating materials, thermal stability shall be verified according to 10.2.3.1.	According to the relevant standards.	P
8.1.3.2	Resistance of insulating materials to heat and fire	Insulating materials are certified	P
8.1.3.2.1	General		P
	Parts of insulating materials which might be exposed to thermal stresses due to internal electrical effects, and the deterioration of which might impair the safety of the ASSEMBLY , shall not be adversely affected by normal (operational) heat,		P

	abnormal heat or fire.		
8.1.3.2.2	Resistance of insulating materials to heat		P
	The original manufacturer shall select insulating materials either by reference to the insulation temperature index (determined for example by the methods of IEC 60216) or by compliance with IEC 60085.		P
8.1.3.2.3	Resistance of insulating materials to abnormal heat and fire due to internal electric effects	Insulating materials are certified	P
	Insulating materials used for parts necessary to retain current carrying parts in position and parts which might be exposed to thermal stresses due to internal electrical effects, and the deterioration of which might impair the safety of the ASSEMBLY, shall not be adversely affected by abnormal heat and fire and shall be verified by the glow-wire test in 10.2.3.2. For the purpose of this test, a protective conductor (PE) is not considered as a current-carrying part.		P
	For small parts (having surface dimensions not exceeding 14 mm x 14 mm), an alternative test may be used (e.g. needle flame test, according to IEC 60695-11-5). The same procedure may be applicable for other practical reasons where the metal material of a part is large compared to the insulating material.		P
8.1.4	Resistance to ultra-violet radiation		N
	For enclosures and external parts made of insulating materials which are intended to be used outdoor, resistance to ultra-violet radiation shall be verified according to 10.2.4.	Metal shell	N
8.1.5	Mechanical strength		P
	All enclosures or partitions including locking means and hinges for doors shall be of a mechanical strength sufficient to withstand the stresses to which they may be subjected in normal service, and during short-circuit conditions (see also 10.13).		P
	The mechanical operation of removable parts, including any insertion interlock, shall	No used	N

	be verified by test according to 10.13.		
8.1.6	Lifting provision		N
	Where required, ASSEMBLIES shall be provided with the appropriate provision for lifting. Compliance is checked according to the test of 10.2.5.	No this situation.	N
8.2	Degree of protection provided by a PSC-ASSEMBLY enclosure		P
8.2.1	Protection against mechanical impact		P
	Where a degree of protection provided by a PSC-ASSEMBLY enclosure against mechanical impact is declared by the original manufacturer this shall be verified in accordance with IEC 62262 (see 10.2.6).		P
8.2.101	PSC-ASSEMBLY with withdrawable parts		N
	The degree of protection indicated for PSC-ASSEMBLIES normally applies to the connected position (see 3.2.3) of withdrawable parts. The ASSEMBLY manufacturer shall indicate the degree of protection obtained in the other positions and during the transfer between positions.		N
	PSC-ASSEMBLIES with withdrawable parts may be so designed that the degree of protection applying to the connected position is also maintained in the test and isolated positions and during transfer from one position to another.		N
	If, after the removal of a withdrawable part, it is not possible to maintain the original degree of protection e.g. by closing a door, an agreement shall be reached between the ASSEMBLY manufacturer and user as to what measures shall be taken to ensure adequate protection. Information provided by the ASSEMBLY manufacturer may take the place of such an agreement.		N
8.2.2	Protection against contact with live parts, ingress of solid foreign bodies and water	IP20	P
	The degree of protection provided by any ASSEMBLY against contact with live parts, ingress of solid foreign bodies and liquid is	Indoor used only IP20	P

	indicated by the IP code according to IEC 60529 and verified according to 10.3.		
8.2.3	A SSEMBLY with removable parts		N
	The degree of protection indicated for ASSEMBLIES normally applies to the connected position (see 3.2.3) of removable parts.		N
	If, after the removal of a removable part, it is not possible to maintain the original degree of protection e.g. by closing a door, an agreement shall be reached between the ASSEMBLY manufacturer and the user as to what measures shall be taken to ensure adequate protection. Information provided by the ASSEMBLY manufacturer may take the place of such an agreement.		N
	When shutters are used to provide adequate protection to live parts they shall be secured to prevent unintentional removal.		N
8.3	Clearances and creepage distances		P
8.3.1	General		P
	The requirements for clearances and creepage distances are based on the principles of IEC 60664-1 and are intended to provide insulation co-ordination within the installation.	Based on the IEC 60664-1.	P
	The clearances and creepage distances of equipment that form part of the ASSEMBLY shall comply with the requirements of the relevant product standard.		P
	When incorporating equipment into the ASSEMBLY, the specified clearances and creepage distances shall be maintained during normal service conditions.		P
	For dimensioning clearances and creepage distances between separate circuits, the highest voltage ratings shall be used (rated impulse withstand voltage for clearances and rated insulation voltage for creepage distances).		P
	The clearances and creepage distances apply to phase to phase, phase to neutral, and except where a conductor is connected		P

	directly to earth, phase to earth and neutral to earth.		
8.3.2	Clearances		P
	The clearances shall be sufficient to enable the declared rated impulse withstand voltage (U_{imp}) of a circuit to be achieved. The clearances shall be as specified in Table 1 unless a design verification test and routine impulse withstand voltage test is carried out in accordance with 10.9.3 and 11.3, respectively.	Compliance with the requirements.	P
	The method of verifying clearances by measurement is given in Annex F.		P
	For withdrawable parts, the isolation provided in the isolated position shall at least comply with the requirements in the relevant specification for disconnectors (see IEC 60947-3). This applies with the equipment in new condition, taking account of the manufacturing tolerances and anticipated changes in dimensions due to wear.		P
	The isolating distance between the withdrawable unit main contacts and their associated fixed contacts in the isolated position shall be capable of withstanding the test voltage for the declared impulse withstand voltage as specified in Table 102.		P
8.3.3	Creepage distances		P
	The original manufacturer shall select a rated insulation voltage(s) (U_i) for the circuits of the ASSEMBLY from which the creepage distance(s) shall be determined. For any given circuit the rated insulation voltage shall not be less than the rated operational voltage (U_e).	Compliance with the requirements.	P
	The creepage distances shall not, in any case, be less than the associated minimum clearances.		P
	Creepage distances shall correspond to a pollution degree as specified in 7.1.3 and to the corresponding material group at the rated insulation voltage given in Table 2.	Compliance with the requirements.	P
	The method of verifying creepage distances by measurement is given in		P

	Annex F.		
8.4	Protection against electric shock		P
8.4.1	General		P
	The apparatus and circuits in the ASSEMBLY shall be so arranged as to facilitate their operation and maintenance, and at the same time to ensure the necessary degree of safety.	Base on IEC 60364.	P
	The following requirements are intended to ensure that the required protective measures are obtained when an ASSEMBLY is installed in a system conforming to the IEC 60364 series.		P
8.4.2	Basic protection		P
8.4.2.1	General		P
	Basic protection is intended to prevent direct contact with hazardous live parts.		P
	Basic protection can be achieved either by appropriate constructional measures on the ASSEMBLY itself or by additional measures to be taken during installation; this may require information to be given by the ASSEMBLY manufacturer.		P
8.4.2.2	Basic insulation provided by insulating material		P
	Hazardous live parts shall be completely covered with insulation that can only be removed by destruction.		P
	The insulation shall be made of suitable materials capable of durably withstanding the mechanical, electrical and thermal stresses to which the insulation may be subjected in service.		P
8.4.2.3	Barriers or enclosures		P
	Air insulated live parts shall be inside enclosures or behind barriers providing at least a degree of protection of IP XXB.	Metal shell	P
8.4.3	Fault protection		P
8.4.3.1	Installation conditions		P
	The ASSEMBLY shall include protective measures and be suitable for installations designed to be in accordance with IEC 60364-4-41. Protective measures suitable for particular installations (e.g. railways, ships) shall be subject to agreement	Base on IEC 60364.	P

	between the ASSEMBLY manufacturer and the user.		
8.4.3.2	Requirements for the protective conductor to facilitate automatic disconnection of the supply		N
8.4.3.3	Electrical separation		P
	Electrical separation of individual circuits is intended to prevent electrical shock through contact with exposed-conductive-parts, which may be energized by a fault in basic insulation of the circuit.		P
8.4.4	Protection by total insulation		N
	For basic and fault protection, by total insulation, the following requirements shall be met.		N
	a) The apparatus shall be completely enclosed in insulating material which is equivalent of double or reinforced insulation. The enclosure shall carry the symbol which shall be visible from the outside.		N
	b) The enclosure shall at no point be pierced by conducting parts in such a manner that there is the possibility of a fault voltage being brought out of the enclosure. This means that metal parts, such as actuator shafts which for constructional reasons have to be brought through the enclosure, shall be insulated on the inside or the outside of the enclosure from the live parts for the maximum rated insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY. If an actuator is made of metal (whether covered by insulating material or not), it shall be provided with insulation rated for the maximum rated insulation voltage and the maximum impulse withstand voltage of all circuits in the ASSEMBLY . If an actuator is principally made of insulating material, any of its metal parts which may become accessible in the event of insulation failure shall also be insulated from live parts for the maximum rated		N

	insulation voltage and the maximum rated impulse withstand voltage of all circuits in the ASSEMBLY.		
	<p>c) The enclosure, when the ASSEMBLY is ready for operation and connected to the supply, shall enclose all live parts, exposed conductive parts and parts belonging to a protective circuit in such a manner that they cannot be touched. The enclosure shall give at least the degree of protection IP 2XC (see IEC 60529).</p> <p>If a protective conductor, which is extended to electrical equipment connected to the load side of the ASSEMBLY, is to be passed through an ASSEMBLY whose exposed conductive parts are insulated, the necessary terminals for connecting the external protective conductors shall be provided and identified by suitable marking. Inside the enclosure, the protective conductor and its terminal shall be insulated from the live parts and the exposed conductive parts in the same way as the live parts are insulated.</p>		N
	d) Exposed conductive parts within the ASSEMBLY shall not be connected to the protective circuit, i.e. they shall not be included in a protective measure involving the use of a protective circuit. This applies also to built-in apparatus, even if they have a connecting terminal for a protective conductor.		N
	e) If doors or covers of the enclosure can be opened without the use of a key or tool, a barrier of insulating material shall be provided that will afford protection against unintentional contact not only with the accessible live parts, but also with the exposed conductive parts that are only accessible after the cover has been opened; this barrier, however, shall not be removable except with the use of a tool.		N
8.4.5	Limitation of steady-state touch current and charge		P

	If the ASSEMBLY contains items of equipment that may have steady-state touch current and charges after they have been switched off (capacitors, etc.) a warning plate is required.	Warning used	P
	Small capacitors such as those used for arc extinction, for delaying the response of relays, etc., shall not be considered dangerous.		P
8.4.6	Operating and servicing conditions		P
8.4.6.1	Devices to be operated or components to be replaced by ordinary persons	not applicable	N
	Protection against any contact with live parts shall be maintained when operating devices or when replacing components.		N
	The minimum level of protection shall be IP XXC. During the replacement of certain lamps or fuselinks openings larger than those defined by degree of protection IP XXC are allowed.		N
8.4.6.2	Requirements related to accessibility in service by authorized persons		P
8.4.6.2.1	General		P
	For accessibility in service by authorized persons, one or more of the following requirements in 8.4.6.2.2 to 8.4.6.2.4 shall be fulfilled subject to agreement between the ASSEMBLY manufacturer and the user. These requirements shall be complementary to the basic protection specified in 8.4.2.		P
	If doors or covers of the ASSEMBLY can be opened by authorized persons by overriding an interlock to obtain access to live parts, then the interlock shall automatically be restored on reclosing the door(s) or replacing the cover(s).	The product must be opened by professionals.	P
8.4.6.2.2	Requirements related to accessibility for inspection and similar operations		N
	The ASSEMBLY shall be constructed in such a way that certain operations, according to agreement between the ASSEMBLY manufacturer and the user, can be performed when the ASSEMBLY is in service and under voltage.		N

8.4.6.2.3	Requirements related to accessibility for maintenance		P
	To enable maintenance as agreed upon between the ASSEMBLY manufacturer and the user on an isolated functional unit or isolated group of functional units in the ASSEMBLY , with adjacent functional units or groups still under voltage, necessary measures shall be taken. The choice depends on such factors as service conditions, frequency of maintenance, competence of the authorized person, as well as local installation rules.		P
8.4.6.2.4	Requirements related to accessibility for extension under voltage		N
	When it is required to enable future extension of an ASSEMBLY with additional functional units or groups, with the rest of the ASSEMBLY still under voltage, the requirements specified in 8.4.6.2.3 shall apply, subject to agreement between the ASSEMBLY manufacturer and the user. These requirements also apply for the insertion and connection of additional outgoing cables when the existing cables are under voltage.		N
	The extension of busbars and connection of additional units to their incoming supply shall not be made under voltage, unless the ASSEMBLY is designed for this purpose.		N
8.4.6.2.5	Obstacles		P
	Obstacles shall prevent either: – unintentional bodily approach to live parts, or – unintentional contact with live parts during the operation of live equipment in normal service.		P
8.4.6.2.1 01	Operating and maintenance gangways within a PSC-ASSEMBLY		N
	Operating and maintenance gangways (see 3.102.1 and 3.102.2) within an ASSEMBLY shall comply with the requirements for basic protection as specified in IEC 61140. The design and construction of such gangways shall be		N

	agreed upon between ASSEMBLY manufacturer and user.		
	Recesses within a PSC-ASSEMBLY of limited depth, in the order of 1 m, are not considered to be gangways.		N
8.5	Incorporation of switching devices and components		P
8.5.1	Fixed parts		P
	For fixed parts (see 3.2.1), the connections of the main circuits (see 3.1.3) shall only be connected or disconnected when the ASSEMBLY is not under voltage. In general, removal and installation of fixed parts requires the use of a tool.		P
	The disconnection of a fixed part shall require the isolation of the complete ASSEMBLY or part of it.		P
	In order to prevent unauthorized operation, the switching device may be provided with means to secure it in one or more of its positions.		P
8.5.2	Removable and withdrawable parts		N
	The removable and withdrawable parts shall be so constructed that their electrical equipment can be safely removed and/or isolated from or connected to the main circuit whilst this circuit is live. The removable and withdrawable parts may be provided with an insertion interlock (see 3.2.5 of Part 1).		N
	Clearances and creepage distances (see 8.3 of Part 1 and 8.3.2 above) shall be complied with in the different positions as well as during transfer from one position to another.		N
8.5.2.10 1	Withdrawable parts		N
	Withdrawable parts shall have in addition an isolated position (see 3.2.103) and may have a test position (see 3.2.102), or a test situation (see 3.1.102). They shall be distinctly located in these positions. These positions shall be clearly discernible.		N
	In PSC-ASSEMBLIES with withdrawable parts all live parts shall be		

	protected in such a manner that they cannot unintentionally be touched when the door, if any, is open and the withdrawable part is withdrawn from the connected position or removed. Where an obstacle or shutter is used they shall meet the requirements of 8.4.6.2.5 of Part 1.		N
	For the electrical conditions associated with the different positions of withdrawable parts, see Table 103.		N
8.5.2.10 2	Interlocking and padlocking of removable and withdrawable parts		N
	Unless otherwise specified the removable and withdrawable parts shall be fitted with a device, which ensures that the apparatus can only be removed/withdrawn and/or re-inserted after its main circuit has been interrupted.		N
	In order to prevent unauthorized operation the removable and withdrawable parts or their associated ASSEMBLY location may be provided with a lockable means to secure them in one or more of their positions.		N
8.5.3	Selection of switching devices and components		P
	Switching devices and components incorporated in ASSEMBLIES shall comply with the relevant IEC standards.		P
	The switching devices and components shall be suitable for the particular application with respect to the external design of the ASSEMBLY (e.g. open type or enclosed), their rated voltages, rated currents, rated frequency, service life, making and breaking capacities, shortcircuit withstand strength, etc.	Compliance with the requirements.	P
8.5.4	Installation of switching devices and components		P
	Switching devices and components shall be installed and wired in the ASSEMBLY in accordance with instructions provided by their manufacturer and in such a manner that their proper functioning is not impaired by interaction, such as heat, switching	Compliance with the requirements.	P

	emissions, vibrations, electromagnetic fields, which are present in normal operation. In the case of electronic assemblies, this may necessitate the separation or screening of all electronic signal processing circuits.		
	When fuses are installed the original manufacturer shall state the type and rating of the fuse- links to be used.		P
8.5.5	Accessibility		N
	Adjusting and resetting devices, which have to be operated inside the ASSEMBLY shall be easily accessible.		N
	Functional units mounted on the same support (mounting plate, mounting frame) and their terminals for external conductors shall be so arranged as to be accessible for mounting, wiring, maintenance and replacement.		N
8.5.6	Barriers		P
	Barriers for manual switching devices shall be so designed that the switching emissions do not present a danger to the operator.		P
8.5.7	Direction of operation and indication of switching positions		P
	The operational positions of components and devices shall be clearly identified. If the direction of operation is not in accordance with IEC 60447, then the direction of operation shall be clearly identified.	Compliance with the requirements.	P
8.5.8	Indicator lights and push-buttons		P
	Unless otherwise specified in the relevant product standard the colours of indicator lights and push-buttons shall be in accordance with IEC 60073.	Compliance with the requirements.	P
8.5.101	Description of the types of electrical connections of functional units		P
	The types of electrical connections of functional units within PSC-ASSEMBLIES or parts of PSC- ASSEMBLIES can be denoted by a three-letter code:		P
	– the first letter denotes the type of electrical connection of the main incoming circuit;		P

	<ul style="list-style-type: none"> – the second letter denotes the type of electrical connection of the main outgoing circuit; – the third letter denotes the type of electrical connection of the auxiliary circuits. 		
	The following letters shall be used:		P
	<ul style="list-style-type: none"> – F for fixed connections (see 3.2.6 of Part 1); – D for disconnectable connections (see 3.101.1); – W for withdrawable connections (see 3.101.2). 		P
8.6	Internal electrical circuits and connections		P
8.6.1	Main circuits		P
	The busbars (bare or insulated) shall be arranged in such a manner that an internal shortcircuit is not to be expected.	Compliance with the requirements.	P
	They shall be rated at least in accordance with the information concerning the short-circuit withstand strength (see 9.3) and designed to withstand at least the short-circuit stresses limited by the protective device(s) on the supply side of the busbars.	Compliance with the requirements.	P
8.6.2	Auxiliary circuits		P
	The design of the auxiliary circuits shall take into account the supply earthing system and ensure that an earth-fault or a fault between a live part and an exposed conductive part shall not cause unintentional dangerous operation.	Compliance with the requirements.	P
8.6.3	Bare and insulated conductors		P
	The connections of current-carrying parts shall not suffer undue alteration as a result of normal temperature rise, ageing of the insulating materials and vibrations occurring in normal operation.	Compliance with the requirements.	P
	In particular, the effects of thermal expansion and of the electrolytic action in the case of dissimilar metals, and the effects of the endurance of the materials to the temperatures attained, shall be taken	Compliance with the requirements.	P

	into consideration.		
8.6.4	Selection and installation of non-protected live conductors to reduce the possibility of short-circuits		P
	Live conductors in an ASSEMBLY that are not protected by short-circuit protective devices (see 8.6.1 and 8.6.2) shall be selected and installed throughout the entire ASSEMBLY in such a manner that an internal short-circuit between phases or between phase and earth is a remote possibility.	Compliance with the requirements.	P
8.6.5	Identification of the conductors of main and auxiliary circuits		P
	With the exception of the cases mentioned in 8.6.6, the method and the extent of identification of conductors, for example by arrangement, colours or symbols, on the terminals to which they are connected or on the end(s) of the conductors themselves, is the responsibility of the ASSEMBLY manufacturer and shall be in agreement with the indications on the wiring diagrams and drawings.	Compliance with the requirements.	P
8.6.6	Identification of the protective conductor (PE, PEN) and of the neutral conductor (N) of the main circuits		P
	The protective conductor shall be readily distinguishable by location and/or marking or colour. If identification by colour is used, it shall only be green and yellow (twin-coloured), which is strictly reserved for the protective conductor. When the protective conductor is an insulated single-core cable, this colour identification shall be used, preferably throughout the whole length.		P
	Any neutral conductor of the main circuit shall be readily distinguishable by location and/or marking or colour (see IEC 60445 where blue is required).		P
8.7	Cooling		P
	ASSEMBLIES can be provided with both natural and forced cooling. If special precautions are		

	required at the place of installation to ensure proper cooling, the ASSEMBLY manufacturer shall furnish the necessary information (for instance indication of the need for spacing with respect to parts that are liable to impede the dissipation of heat or produce heat themselves).	Compliance with the requirements.	P
8.8	Terminals for external conductors		N
	The ASSEMBLY manufacturer shall indicate whether the terminals are suitable for connection of copper or aluminium conductors, or both.		N
8.101	Internal separation of PSC-ASSEMBLIES		P
	Typical arrangements of internal separation by barriers or partitions are described in Table 104 and are classified as forms (for examples, see Annex AA).		P
	The form of separation and higher degrees of protection shall be the subject of an agreement between ASSEMBLY manufacturer and user.		P
9	Performance requirements		P
9.1	Dielectric properties		P
9.1.1	General		P
	Each circuit of the ASSEMBLY shall be capable of withstanding:		P
	– temporary overvoltages;		P
	– transient overvoltages.		P
	The ability to withstand temporary overvoltages, and the integrity of solid insulation, is verified by the power-frequency withstand voltage and the ability to withstand transient overvoltages is verified by the impulse withstand voltage.	Compliance with the requirements.	P
9.1.2	Power-frequency withstand voltage		P
	The circuits of the ASSEMBLY shall be capable of withstanding the appropriate power- frequency withstand voltages given in Tables 8 and 9 (see 10.9.2.1). The rated insulation voltage of any circuit of the ASSEMBLY shall be equal to or higher than its maximum operational voltage.		P
9.1.3	Impulse withstand voltage		P
9.1.3.1	Impulse withstand voltages of main circuits		P
	Clearances from live parts to exposed		P

	conductive parts and between live parts of different potential shall be capable of withstanding the test voltage given in Table 10 appropriate to the rated impulse withstand voltage.		
	The rated impulse withstand voltage for a given rated operational voltage shall not be less than that corresponding in Annex G to the nominal voltage of the supply system of the circuit at the point where the ASSEMBLY is to be used and the appropriate overvoltage category.		P
9.1.3.2	Impulse withstand voltages of auxiliary circuits		P
	a) Auxiliary circuits that are connected to the main circuit and operate at the rated operational voltage without any means for reduction of overvoltage shall comply with the requirements of 9.1.3.1.		P
	b) Auxiliary circuits that are not connected to the main circuit may have an overvoltage withstand capacity different from that of the main circuit. The clearances of such circuits – a.c. or d.c. – shall be capable of withstanding the appropriate impulse withstand voltage in accordance with Annex G.		P
9.1.4	Protection of surge protective devices		N
	When overvoltage conditions require surge protective devices (SPD's) to be connected to the main circuit, such SPD's shall be protected to prevent uncontrolled short-circuit conditions as specified by the SPD manufacturer.		N
9.2	Temperature rise limits		P
	The ASSEMBLY and its circuits shall be able to carry their rated currents under specified conditions (see 5.3.1, 5.3.2 and 5.3.3), taking into consideration the ratings of the components, their disposition and application, without exceeding the limits given in Table 6 when verified in accordance with 10.10. The temperature rise limits given in Table 6 apply for a mean ambient air temperature up to	Compliance with the requirements.	P

	35 °C		
	The temperature rise of an element or part is the difference between the temperature of this element or part measured in accordance with 10.10.2.3.3 and the ambient air temperature outside the ASSEMBLY . If the mean ambient air temperature is higher than 35 °C, then the temperature rise limits have to be adapted for this special service condition, so that the sum of the ambient temperature and the individual temperature rise limit remains the same. If the mean ambient air temperature is lower than 35 °C the same adaptation of the temperature rise limits is allowed subject to agreement between the user and ASSEMBLY manufacturer.		P
	The temperature rise shall not cause damage to current-carrying parts or adjacent parts of the ASSEMBLY . In particular, for insulating materials, the original manufacturer shall demonstrate compliance either by reference to the insulation temperature index (determined for example by the methods of IEC 60216) or by compliance with IEC 60085.		P
9.3	Short-circuit protection and short-circuit withstand strength		P
9.3.1	General		P
	ASSEMBLIES shall be capable of withstanding the thermal and dynamic stresses resulting from short-circuit currents not exceeding the rated values.	Compliance with the requirements.	P
9.3.2	Information concerning short-circuit withstand strength		P
	For ASSEMBLIES with a short-circuit protective device (SCPD) incorporated in the incoming unit, the ASSEMBLY manufacturer shall indicate the maximum allowable value of prospective short-circuit current at the input terminals of the ASSEMBLY.This value shall not exceed the appropriate rating(s) (see 5.3.3, 5.3.4 and 5.3.5). The corresponding power factor and peak values shall be those shown in	Compliance with the requirements.	P

	9.3.3.		
9.3.3	Relationship between peak current and short-time current		P
	For determining the electrodynamic stresses, the value of peak current shall be obtained by multiplying the r.m.s.value of the short-circuit current by the factor n . The values for the factor n and the corresponding power factor are given in Table 7.		P
9.3.4	Co-ordination of protective devices		P
	The co-ordination of protective devices within the ASSEMBLY with those to be used external to the ASSEMBLY shall be the subject of an agreement between the ASSEMBLY manufacturer and the user. Information given in the ASSEMBLY manufacturer's catalogue may take the place of such an agreement.		P
9.4	Electromagnetic compatibility (EMC)		P
	For EMC related performance requirements, see J.9.4 of Annex J.	See Report BCT200608R-005EC	P
10	Design verification		P
10.1	General		P
	Design verification is intended to verify compliance of the design of an ASSEMBLY or ASSEMBLY system with the requirements of this series of standards.		P
	The tests shall be performed on a representative sample of an ASSEMBLY in a clean and new condition.		P
10.2	Strength of materials and parts		P
10.2.1	General		P
	The mechanical, electrical and thermal capability of constructional materials and parts of the ASSEMBLY shall be deemed to be proven by verification of construction and performance characteristics.	Compliance with the requirements.	P
	Where an empty enclosure in accordance with IEC 62208 is used, and it has not been modified so as to degrade the performance of the enclosure, no repetition of the enclosure testing to 10.2 is required.		P
10.2.2	Resistance to corrosion		N
10.2.3	Properties of insulating materials		P

10.2.3.1	Verification of thermal stability of enclosures		--
	The thermal stability of enclosures manufactured from insulating material shall be verified by the dry heat test. The test shall be carried out according to IEC 60068-2-2 Test Bb, at a temperature of 70 ° C, with natural air circulation, for a duration of 168 h and with a recovery of 96 h.		P
10.2.3.2	Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects		N
10.2.4	Resistance to ultra-violet (UV) radiation	Indoor used	N
10.2.5	Lifting		N
10.2.6	Mechanical impact		P
	When a mechanical impact test is performed, it shall be carried out according to 9.6 of IEC 62208:2002.		P
10.2.7	Marking		P
	Marking made by moulding, pressing, engraving or similar, including labels with a laminated plastic covering, shall not be submitted to the following test.		P
	The test is made by rubbing the marking by hand for 15 s with a piece of cloth soaked in water and then for 15 s with a piece of cloth soaked with petroleum spirit.		P
	After the test the marking shall be legible to normal or corrected vision without additional magnification.		P
10.3	Degree of protection of ASSEMBLIES		P
	The degree of protection provided in accordance with 8.2.2, 8.2.3 and 8.4.2.3 shall be verified in accordance with IEC 60529; the test may be carried out on one representative equipped ASSEMBLY in a condition stated by the original manufacturer . Where an empty enclosure in accordance with IEC 62208 is used, a verification assessment shall be performed to ensure that any external modification that has been carried out does not result in a deterioration of the degree of protection. In this case no further testing is		P

	required.		
	The degree of protection associated with withdrawable parts as specified in accordance with 8.2.101 and associated with internal separation in accordance with 8.101 shall be verified in accordance with IEC 60529.		P
10.4	Clearances and creepage distances		P
	It shall be verified that the clearances and creepage distances comply with the requirements of 8.3.		P
	The clearances and creepage distances shall be measured in accordance with Annex F.		P
10.5	Protection against electric shock and integrity of protective circuits		P
10.5.1	Effectiveness of the protective circuit		P
	The effectiveness of protective circuit is verified for the following functions:		P
	a) protection against the consequences of a fault within the ASSEMBLY (internal faults) as outlined in 10.5.2, and		P
	b) protection against the consequences of faults in external circuits supplied through the ASSEMBLY (external faults) as outlined in 10.5.3.		P
10.5.2	Effective earth continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit		P
	It shall be verified that the different exposed conductive parts of the ASSEMBLY are effectively connected to the terminal for the incoming external protective conductor and that the resistance of the circuit does not exceed 0,1 Ω .		P
	Verification shall be made using a resistance measuring instrument which is capable of driving a current of at least 10 A (a.c. or d.c.). The current is passed between each exposed conductive part and the terminal for the external protective conductor. The resistance shall not exceed 0,1 Ω .		P
10.5.3	Short-circuit withstand strength of the protective circuit		P

10.5.3.1	General		P
	The rated short-circuit withstand strength shall be verified. Verification may be by comparison with a reference design or by test as detailed in 10.5.3.3 to 10.5.3.5.		P
	The original manufacturer shall determine the reference design(s) that will be used in 10.5.3.3 and 10.5.3.4.		P
10.5.3.2	Protective circuits that are exempted from short-circuit withstand verification		P
	Where a separate protective conductor is provided in accordance with 8.4.3.2.3, short-circuit testing is not required if one of the conditions of 10.11.2. is fulfilled.		P
10.5.3.3	Verification by comparison with a reference design – Utilising a check list		P
	Verification is achieved when comparison of the ASSEMBLY to be verified with an already tested design utilising items 1 to 6 and 8 to 10 of the check list in Table 13 shows no deviations.		P
	To ensure the same current carrying capacity for that portion of the fault current that flows through the exposed conductive parts, the design, number and arrangement of the parts that provide contact between the protective conductor and the exposed conductive parts, shall be the same as in the tested reference design.		P
10.5.3.4	Verification by comparison with a reference design – Utilising calculation		N
	Verification by comparison with a reference design based on calculation is to be in accordance with 10.11.4		N
	To ensure the same current carrying capacity for that portion of the fault current that flows through the exposed conductive parts, the design, number and arrangement of the parts that provide contact between the protective conductor and the exposed conductive parts, shall be the same as in the tested reference design.		N
10.5.3.5	Verification by test		P

	Subclause 10.11.5.6 applies.		P
10.6	Incorporation of switching devices and components		P
10.6.1	General		P
	Compliance with the design requirements of 8.5 for the incorporation of switching devices and components shall be confirmed by inspection and verified to the requirements of this standard.	Compliance with the requirements.	P
10.6.2	Electromagnetic compatibility		P
	The performance requirements of J.9.4 for electromagnetic compatibility shall be confirmed by inspection or where necessary by test (see J.10.12).		P
10.7	Internal electrical circuits and connections		P
	Compliance with the design requirements of 8.6 for internal electrical circuits and connections shall be confirmed by inspection and verified to this standard.		P
10.8	Terminals for external conductors		N
	Compliance with the design requirements of 8.8 for terminals for external conductors shall be confirmed by inspection.		N
10.9	Dielectric properties		N
10.9.1	General		N
	Such apparatus shall be disconnected at one of their terminals unless they are not designed to withstand the full test voltage, in which case all terminals may be disconnected.		N
10.9.2	Power-frequency withstand voltage		P
10.9.2.1	Main, auxiliary and control circuits		P
	Main circuits as well as auxiliary and control circuits that are connected to the main circuit shall be subjected to the test voltage according to Table 8.		P
	Auxiliary and control circuits, whether a.c. or d.c., that are not connected to the main circuit shall be subjected to the test voltage according to Table 9.		P
10.9.2.2	Test voltage		P
	The test voltage shall have a substantially sinusoidal waveform and a frequency between 45 Hz and 65 Hz.		P
	The high-voltage transformer used for the		P

	test shall be so designed that, when the output terminals are short-circuited after the output voltage has been adjusted to the appropriate test voltage, the output current shall be at least 200 mA.		
	The overcurrent relay shall not trip when the output current is less than 100 mA.		P
	The value of the test voltage shall be that specified in Table 8 or 9 as appropriate with a permitted tolerance of $\pm 3\%$.		P
10.9.2.3	Application of the test voltage		P
10.9.2.4	Acceptance criteria		P
	The overcurrent relay shall not operate and there shall be no disruptive discharge (see 3.6.17) during the tests.		P
10.9.3	Impulse withstand voltage		P
10.9.3.1	General		P
	Verification shall be made by test or by assessment.		P
	In place of the impulse withstand voltage test the original manufacturer may perform, at his discretion, an equivalent a.c. or d.c. voltage test, in accordance with 10.9.3.3 or 10.9.3.4.		P
10.9.3.2	Impulse withstand voltage test		P
	The impulse voltage generator shall be adjusted to the required impulse voltage with the ASSEMBLY connected. The value of the test voltage shall be that specified in 9.1.3. The accuracy of the applied peak voltage shall be $\pm 3\%$.		P
	The impulse withstand voltage capability of the isolating distance between the withdrawable units' main contacts and their associated fixed contacts shall be verified to confirm compliance with 8.3.2.		P
10.9.3.3	Alternative power-frequency voltage test		P
	The test voltage shall have a substantially sinusoidal waveform and a frequency between 45 Hz and 65 Hz.	50Hz	P
	The high-voltage transformer used for the test shall be so designed that, when the output terminals are short-circuited after the output voltage has been adjusted to the appropriate test voltage, the output current		P

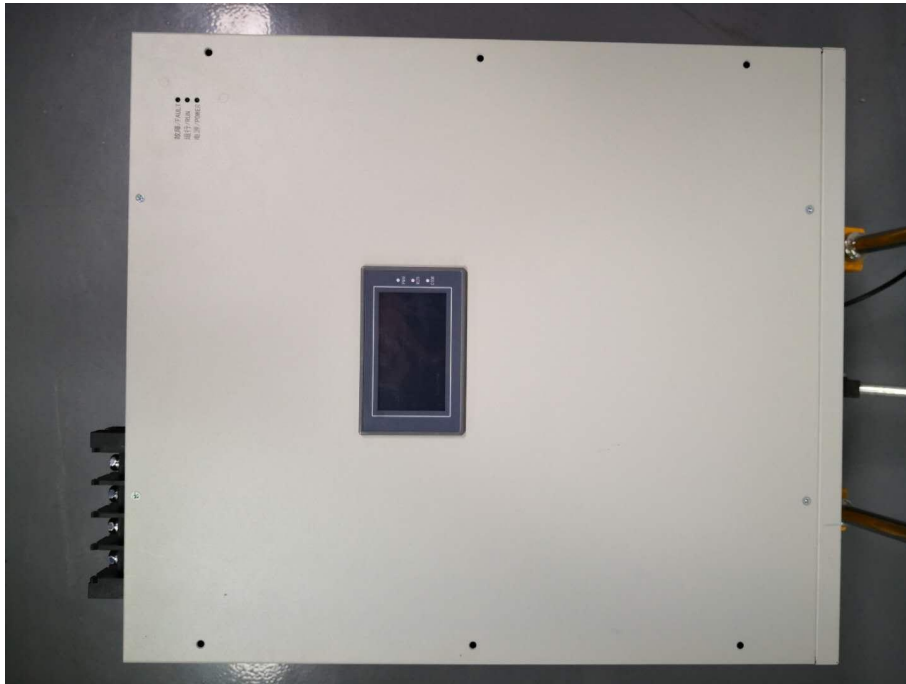
	shall be at least 200 mA.		
	The overcurrent relay shall not trip when the output current is less than 100 mA.		P
	The value of the test voltage shall be that specified in Table 8 or 9 as appropriate with a permitted tolerance of $\pm 3\%$.		P
	The power-frequency voltage shall be applied once, at full value, for a duration sufficient for the magnitude to be ascertained, but it shall not be less than 15 ms.		P
	It shall be applied to the ASSEMBLY in the manner described in 10.9.3.2. a) b) and c) above.		P
	For an acceptable result the overcurrent relay shall not operate and there shall be no disruptive discharge during the tests.		P
10.9.3.4	Alternative d.c. voltage test		N
10.9.3.5	Verification assessment		P
	Clearances shall be verified by measurement, or verification of measurements on design drawings, employing the measurement methods stated in Annex F. The clearances shall be at least 1,5 times the values specified in Table 1.		P
	It shall be verified by assessment of the device manufacturer's data that all incorporated devices are suitable for the specified rated impulse withstand voltage (U_{imp}).		P
10.9.4	Testing of enclosures made of insulating material		P
	For ASSEMBLIES with enclosures made of insulating material, an additional dielectric test shall be carried out by applying an a.c. test voltage between a metal foil laid on the outside of the enclosure over openings and joints, and the interconnected live and exposed conductive parts within the ASSEMBLY located next to the openings and joints. For this additional test, the test voltage shall be equal to 1,5 times the values indicated in Table 8.		P

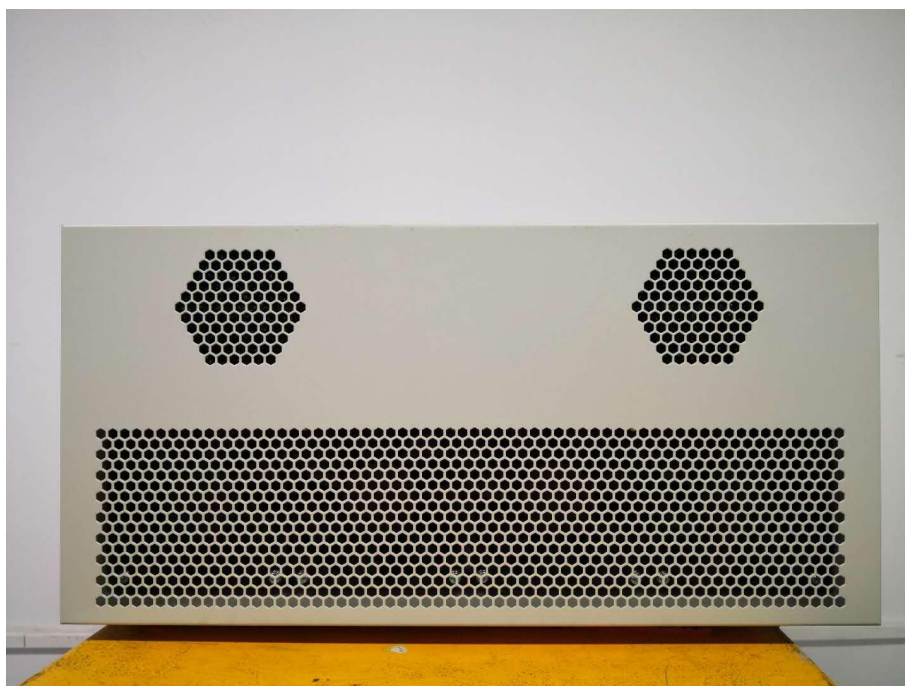
10.9.5	External operating handles of insulating material		N
	In the case of handles made of or covered by insulating material, a dielectric test shall be carried out by applying a test voltage equal to 1,5 times the test voltage indicated in Table 8 between the live parts and a metal foil wrapped round the whole surface of the handle. During this test, the exposed conductive parts shall not be earthed or connected to any other circuit.		N
10.10	Verification of temperature rise		P
10.10.1	General		P
	It shall be verified that the temperature-rise limits specified in 9.2 for the different parts of the ASSEMBLY or ASSEMBLY system will not be exceeded.	Compliance with the requirements.	P
10.11	Short-circuit withstand strength		P
10.11.1	General		P
	The short-circuit withstand strength declared by the original manufacturer shall be verified. Verification may be by the application of design rules, by calculation or by test as specified.	Compliance with the requirements.	P
10.12	Electromagnetic compatibility (EMC)		P
10.13	Mechanical operation		P
	This verification test shall not be made on such devices of the ASSEMBLY which have already been type tested according to their relevant product standard unless their mechanical operation is impaired by their mounting.		P
	In the case of withdrawable parts, the operating cycle includes any physical movements from the connected to the isolated position and back to the connected position.		N
11	Routine verification		P
11.1	General		P
	Verification is intended to detect faults in materials and workmanship and to ascertain proper functioning of the manufactured ASSEMBLY. It is made on each ASSEMBLY.		P
	The ASSEMBLY Manufacturer shall		

	determine if routine verification is carried out during and/or after manufacture. Where appropriate, routine verification shall confirm that design verification is available.		P
11.2	Degree of protection of enclosures		P
	A visual inspection is necessary to confirm that the prescribed measures to achieve the designated degree of protection are maintained.		P
11.3	Clearances and creepage distances		P
	The prescribed measures with regard to creepage distances (see 8.3.3) shall be subject to a visual inspection.		P
11.4	Protection against electric shock and integrity of protective circuits		P
	The prescribed protective measures with regard to basic protection and fault protection (see 8.4.2 and 8.4.3) shall be subject to a visual inspection.	Compliance with the requirements.	P
11.5	Incorporation of built-in components		P
	The installation and identification of built-in components shall be in accordance with the ASSEMBLY manufacturing instructions.		P
11.6	Internal electrical circuits and connections		P
	The connections, especially screwed and bolted connections, shall be checked for the correct tightness on a random basis.		P
11.7	Terminals for external conductors		P
	The number, type and identification of terminals shall be checked in accordance with the ASSEMBLY manufacturing instructions.	Compliance with the requirements.	P
11.8	Mechanical operation		P
	Verification shall include the checking of interlocking and locking arrangements associated with removable and withdrawable parts.		P
11.9	Dielectric properties		P
	A power-frequency withstand test shall be performed on all circuits in accordance with 10.9.2 but for a duration of 1 s.		P
11.10	Wiring, operational performance and function		P
	It shall be verified that the information and markings specified in Clause 6 are		P

	complete.		
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EUT EXTERIOR AND INTERIOR PHOTOGRAPHS







--End Of The Report --