Applicant	
- Company Name	SiChuan Kulun Electric Co., Ltd
- Company Address	No.586, Qinling South Road, Deyang City, Sichuan Province, China
Manufacturer	
- Company Name	Same as applicant
- Company Address	Same as applicant
Machinery	
- Product Name	Three-Phase Thyristor Power Controller
- Representative Model	APR3-0500
- Serial No.	See nameplate
- Rating	See nameplate
- Serial Model(s)	See the page 2
Verifying specification	
- standard(s):	EN 61010-1:2010+ A1:2019
- verification method	Visual Inspection and testing and Measurement and Calculation and Engineer assessment
Possible verdicts	
- does not apply to the EUT	N/A (Not Applicable)
- does meet the requirement	P (Pass)
- does not meet the requirement	F (Fail)
- does not requiring a verdict	"—"
Date and Place of Verifying	
- Verification body	SGS- CSTC Industry Service- Product Certification
- Result of Verification	Compliance with the requirements of above standards.
- Verifying date	July 08, 2024 –December 03, 2024
Reporting	
- Report No.	IN-SC-5805-TF24047-S1
- Verified by (+signature)	Tom Wang
- Approved by (+signature)	Clare Liu
- Date of issue	December 03, 2024

General remarks: The results only respond to the sample, and are invalided as separately used.

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Copy of marking plate:

Note: below marking plate is draft version for reference only. It will be updated according to the end product information.



General information:

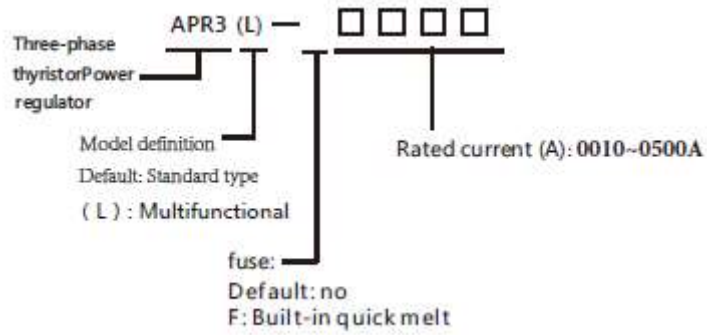
1). Three-Phase Thyristor Power Controller is applied in various fields such as industrial electric furnaces, glass industry, automotive industry, machinery, petrochemicals, etc. It has multiple control mode functions such as open-loop, constant voltage (constant output voltage), constant current (constant output current), constant power (constant output power), power regulation (zero crossing) control, phase shifting and zero crossing control, etc.

2). Series Model(s)

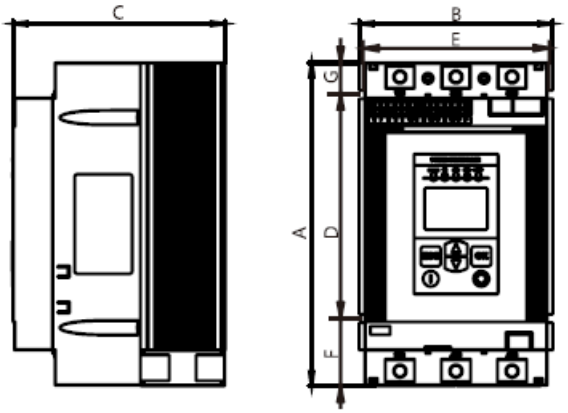
APR3-0010	APR3-0025	APR3-0040	APR3-0050	APR3-0075
APR3-0090	APR3-0100	APR3-0125	APR3-0150	APR3-0185
APR3-0200	APR3-0225	APR3-0250	APR3-0285	APR3-0300
APR3-0325	APR3-0350	APR3-0400	APR3-0450	APR3-0500
APR3-F0025	APR3-F0040	APR3-F0050	APR3-F0075	APR3-F0090
APR3-F0100	APR3-F0125	APR3-F0150	APR3-F0185	APR3-F0200
APR3-F0225	APR3-F0250	APR3-F0285	APR3-F0300	APR3-F0325
APR3-F0350	APR3-F0385	APR3-F0400	APR3-F0450	APR3-F0500
APR3L-0010	APR3L-0025	APR3L-0040	APR3L-0050	APR3L-0075
APR3L-0090	APR3L-0100	APR3L-0125	APR3L-0150	APR3L-0185
APR3L-0200	APR3L-0225	APR3L-0250	APR3L-0285	APR3L-0300
APR3L-0325	APR3L-0350	APR3L-0400	APR3L-0450	APR3L-0500
APR3L-F0010	APR3L-F0025	APR3L-F0040	APR3L-F0050	APR3L-F0075
APR3L-F0090	APR3L-F0100	APR3L-F0125	APR3L-F0150	APR3L-F0185
APR3L-F0200	APR3L-F0225	APR3L-F0250	APR3L-F0285	APR3L-F0300
APR3L-F0325	APR3L-F0350	APR3L-F0385	APR3L-F0450	APR3L-F0500

3）All testing evaluations in this report were based on model APR3-0500 product.

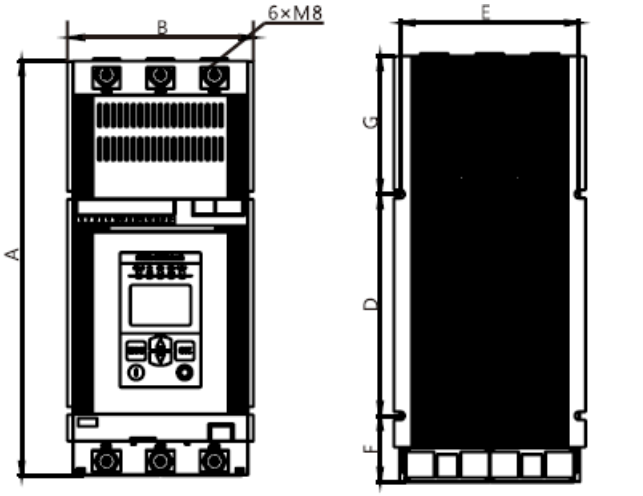
4）All models have the same structure, only fuse, rated current, and different sizes. The differences between specific models are as follows:



二、Appearance and mounting dimensions



APR3-010-150 Appearance and mounting dimensions



APR3-010-150 With quick melting shape and mounting dimensions

specifications	Rated current (A)	Overall dimensions							Installation
		A	B	C	D	E	F	G	
APR3-010~150	10~150	230	138	152	160	132	48	22.5	wall
APR3-F025~150	10~150	308	138	152	160	132	48	99.5	
APR3-185~350	185~350	350	205	210	328	150	10	10	
APR3-F185-350	185~350	445	205	210	423	150	10	10	
APR3-500	500	600	415	235	575	300	10	10	

Test Lab

Laboratory: SGS-CSTC Standards Technical Services (Qingdao) Co., Ltd.

Address: SGS Center, No.143, Zhuzhou Road, Laoshan District, Qingdao, P.R. China

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
4	**TESTS**		P
4.4	Testing in single fault conditions		P
4.4.1	Fault tests	(see Form A.1)	P
4.4.2	Application of SINGLE FAULT CONDITIONS		P
4.4.2.1	SINGLE FAULT CONDITIONS not covered by 4.4.2.2 to 4.4.2.14	(see Form A.1)	P
4.4.2.2	PROTECTIVE IMPEDANCE		P
4.4.2.3	PROTECTIVE CONDUCTOR	(see Form A.6)	P
4.4.2.4	Equipment or parts for short-term or intermittent operation	Continuous operation	N/A
4.4.2.5	Motors		P
	– stopped while fully energized		N/A
	– prevented from starting		P
	– one phase interrupted (multi-phase)		N/A
4.4.2.6	Capacitors	Without such devices	N/A
4.4.2.7	MAINS transformers	Without such devices	N/A
4.4.2.7.2	Short circuit	(see Form A.39)	N/A
4.4.2.7.3	Overload	(see Forms A.26B and A.40)	N/A
4.4.2.8	Outputs		P
4.4.2.9	Equipment for more than one supply	Single supply	N/A
4.4.2.10	Cooling	(see Form A.26A)	P
	– air holes closed		N/A
	– fans stopped		P
	– coolant stopped		N/A
	– loss of cooling liquid		N/A
4.4.2.11	Heating devices	No such devices	N/A
	– timer overridden		N/A
	– temperature controller overridden		N/A
4.4.2.12	Insulation between circuits and parts		P
4.4.2.13	Interlocks		N/A
4.4.2.14	Voltage selectors	Without such devices	N/A
4.4.3	Duration of tests	(see Form A.1)	—
4.4.4	Conformity after application of fault conditions	(see Forms A.1, A.6 and A.18)	P
5	**MARKING AND DOCUMENTATION**		P

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5.1	**Marking**		P
5.1.1	General		P
	Required equipment markings		—
	– Visible from the exterior; or		P
	– Visible after removing cover or opening door		P
	– Visible after removal from a rack or panel		N/A
	Not put on parts which can be removed by an operator		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols of Table 1 used		P
5.1.2	Identification		P
	Equipment is identified by:	See Marking plate	—
	a) Manufacturer's or supplier's name or trademark		P
	b) Model number, name or other means		P
	Manufacturing location identified		P
5.1.3	MAINS supply		P
	Equipment is marked as follows:	See Marking plate	—
	a) Nature of supply:		—
	1) a.c. RATED MAINS frequency or range of frequencies ..... :	50/60 Hz	—
	2) d.c. with symbol 1..... :		—
	b) RATED supply voltage(s) or range ..... :	Mains power, AC 260~440V Control power, 100~240V	—
	c) Max. RATED power (W or VA) or input current ..... :	Mains power, 500 A. Control power, 1 A.	—
	The marked value not less than 90 % of the maximum value	(see Form A.2)	P
	If more than one voltage range:	Single voltage range	—
	Separate values marked; or		N/A
	Values differ by less than 20 %	(see Form A.2)	N/A
	d) OPERATOR-set for different RATED supply voltages:	Not such appliance	—
	Indicates the equipment set voltage		N/A
	PORTABLE EQUIPMENT indication is visible from the exterior		N/A
	Changing the setting changes the indication		N/A
	e) Accessory MAINS socket-outlets accepting standard MAINS plugs are marked:	without socket-outs	—

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	With the voltage if it is different from the MAINS supply voltage .....:		—
	For use only with specific equipment		N/A
	If not marked for specific equipment it is marked with:		—
	The maximum RATED current or power; or		N/A
	Symbol 14 with full details in the documentation		N/A
5.1.4	Fuses	Without such device	N/A
	OPERATOR replaceable fuse marking (see also 5.4.5) .....:		—
5.1.5	TERMINALS, connections and operating devices		P
5.1.5.1	General		P
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		P
	If insufficient space, symbol 14 used		P
	Push-buttons and actuators of emergency stop devices and indicators:	Without such devices	—
	– used only to indicate a warning of danger; or		N/A
	– the need for urgent action		N/A
	– coloured red		N/A
	– coded as specified in IEC 60073		N/A
	Supplementary means of coding provided, if meaning of colour relates (see IEC 60073):		—
	– to safety of persons; or		N/A
	– safety of the environment		N/A
5.1.5.2	TERMINALS		—
	MAINS supply TERMINAL identified		P
	Other TERMINAL marking:		—
	a) FUNCTIONAL EARTH TERMINALS marked with symbol 5		P
	b) PROTECTIVE CONDUCTOR TERMINALS:		—
	Symbol 6 is placed close to or on the TERMINAL; or		P
	Part of appliance inlet		N/A
	c) TERMINALS of circuits (symbol 7 used)		P
	d) HAZARDOUS LIVE TERMINALS supplied from the interior	Without such device	N/A
	Standard MAINS socket outlet used; or		N/A
	RATINGS marked; or		N/A

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Symbol 14 used		P
5.1.6	Switches and circuit-breakers		P
	If disconnecting device, off position clearly marked		P
	If push-button used as power supply switch:		—
	– Symbol 9 and 15 used for on-position		P
	– Symbol 10 and 16 used for off-position		P
	– Pair of symbols 9, 15 and 10, 16 close together		P
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION	Class I equipment	N/A
	Protected throughout (symbol 11 used)		N/A
	Only partially protected (symbol 11 not used)		N/A
5.1.8	Field-wiring TERMINAL boxes	Without such device	N/A
	If TERMINAL or ENCLOSURE exceeds 60 °C:	(see Form A.26A)	—
	Cable temperature RATING marked ..... :		—
	Marking visible before and during connection or beside TERMINAL		N/A
5.2	**Warning markings**		P
	Visible when ready for NORMAL USE		P
	Are near or on applicable parts		P
	Symbols and text correct dimensions and colour:		—
	a) Symbols min 2,75 mm and text 1,5 mm high and contrasting in colour with background		P
	b) Symbols and text moulded, stamped or engraved in material min. 2,0 mm high and		N/A
	0,5 mm depth or raised if not contrasting in colour		N/A
	If necessary marked with symbol 14, or		P
	Additional symbols such as symbol 12, 13 or 17 used to indicate the nature of HAZARD		P
	Statement to place equipment in a safe state before access by using a tool to HAZARDOUS parts is permitted		P
5.3	**Durability of markings**		P
	The required markings remain clear and legible in NORMAL USE	(see Form A.3)	P
5.4	**Documentation**		P
5.4.1	General		P
	Equipment is accompanied by documentation for safety purposes for OPERATOR or RESPONSIBLE BODY		P

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Safety documentation for service personnel authorized by the manufacturer		P
	Documentation necessary for safe operation is provided in printed media or		P
	in electronic media if available at any time		N/A
	Documentation includes:		—
	a) Intended use		P
	b) Technical specification		P
	c) Name and address of manufacturer or supplier		P
	d) Information specified in 5.4.2 to 5.4.6		P
	e) Information to mitigate residual RISK (see also subclause 17)		N/A
	f) Accessories for safe operation of the equipment specified		N/A
	g) Guidance provided to check correct function of the equipment, if incorrect reading may cause a HAZARD from harmful or corrosive substances of HAZARDOUS live parts		P
	h) Instructions for lifting and carrying		N/A
	Warning statements and a clear explanation of warning symbols:		—
	– provided in the documentation; or		N/A
	– information is marked on the equipment		N/A
5.4.2	Equipment RATINGS		P
	Documentation includes:		—
	a) Supply voltage or voltage range..... :	Mains power, AC 260~440V, 50/60 Hz, 500A. Control power, AC 100~240V, 50/60 Hz, 1A.	—
	Frequency or frequency range ..... :		—
	Power or current rating..... :		—
	b) Description of all input and output connections in accordance to 6.6.1 a)		P
	c) RATING of insulation of external circuits in accordance to 6.6.1 b)		N/A
	d) Statement of the range of environmental conditions (refer to 1.4):		—
	1) indoor or outdoor use,	Indoor	P
	2) altitude,	Up to 2000 m	P
	3) temperature,	5℃～40℃	P
	4) relative humidity,	30% ~ 85% (non-condensing)	P

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	5) MAINS supply voltage fluctuations,		N/A
	6) OVERVOLTAGE CATEGORY	Category II for control power. Category III for Mians power.	P
	7) WET LOCATION, if applicable,	NOT WET LOCATION	P
	8) POLLUTION DEGREE of the intended environment	Pollution 2	P
	e) Degree of ingress protection (IEC 60529)	Without marking the IP	N/A
	f) If impact rating less than 5 J:		—
	IK code in accordance to IEC 62262 marked; or		N/A
	symbol 14 of Table 1 marked, with		N/A
	RATED energy level and test method stated		N/A
5.4.3	Equipment installation		P
	Documentation includes instructions for:		—
	a) Assembly, location and mounting requirements		P
	b) Instructions for protective earthing		P
	c) Connections to supply		P
	d) PERMANENTLY CONNECTED EQUIPMENT:		—
	1) Supply wiring requirements		P
	2) If external switch or circuit-breaker, requirements and location recommendation		P
	e) Ventilation requirements		N/A
	f) Safety characteristics for special external services (e. g. maximum and minimum temperature, pressure, flow of air, cooling liquid)		N/A
	g) Instructions relating to sound level		N//A
5.4.4	Equipment operation		P
	Instructions for use include:		—
	a) Identification and description of operating controls		P
	b) Positioning for disconnection		P
	c) Instructions for interconnection to accessories or other equipment		P
	d) Specification of intermittent operation limits		N/A
	e) Explanation of symbols used		P
	f) Replacement of consumable materials		N/A
	g) Cleaning and decontamination		P
	h) Listing of any poisonous or injurious gases and quantities		N/A

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	i) RISK reduction procedures relating to flammable liquids (see 9.5 c)		N/A
	j) RISK reduction procedures relating burn from surfaces permitted to exceed limits of 10.1		N/A
	Additional precautions for IEC 60950 conforming equipment in regard to moistures and liquids		N/A
	A statement about protection impairment if used in a manner not specified by the manufacturer		P
5.4.5	Equipment maintenance and service		P
	Instructions for RESPONSIBLE BODY include:		—
	Instructions sufficient in detail permitting safe maintenance and inspection and continued safety:		—
	Instruction against the use of detachable MAINS supply cord with inadequate RATING		P
	Specific battery type of user replaceable batteries		N/A
	Any manufacturer specified parts		P
	RATING and characteristics of fuses		N/A
	Instructions include following subjects permitting safe servicing and continued safety:		—
	a) Product specific RISKS may affect service personnel		N/A
	b) Protective measures for these RISKS		N/A
	c) Verification of the safe state after repair		P
5.4.6	Integration into systems or effects resulting from special conditions		P
	Aspects described in documentation		P
6	**PROTECTION AGAINST ELECTRIC SHOCK**		P
6.1	**General**	(see Forms A.14 and A.15)	P
6.1.1	Requirements		P
	Protection against electric shock maintained in NORMAL CONDITION and SINGLE FAULT CONDITION		P
	ACCESSIBLE parts not HAZARDOUS LIVE		P
	Voltage, current, charge or energy below the limits in NORMAL CONDITION and in SINGLE FAULT CONDITION between:		—
	ACCESSIBLE parts and earth		P
	two ACCESSIBLE parts on same piece of the equipment within a distance of 1,8 m		P

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11		P
6.1.2	Exceptions		P
	Following HAZARDOUS LIVE parts may be ACCESSIBLE to an OPERATOR:		—
	a) parts of lamps and lamp sockets after lamp removal		N/A
	b) parts to be replaced by OPERATOR only by the use of tool and warning marking		P
	Those parts not HAZARDOUS LIVE 10 s after interruption of supply	(see Form A.5)	P
	Capacitance test if charge is received from internal capacitor	(see Forms A.4 and A.5)	P
6.2	**Determination of accessible parts**	(see Form A.4)	P
6.2.1	General		P
	Unless obviously determination of ACCESSIBLE parts as specified in 6.2.2 to 6.2.4		P
6.2.2	Examination		P
	– with jointed test finger (as specified B.2)		P
	– with rigid test finger (as specified B.1) and a force of 10 N		P
6.2.3	Openings above parts that are HAZARDOUS LIVE		N/A
	– test pin with length of 100 mm and 4 mm in diameter applied		N/A
6.2.4	Openings for pre-set controls		N/A
	– test pin with length of 100 mm and 3 mm in diameter applied		N/A
6.3	**Limit values for ACCESSIBLE parts**		P
6.3.1	Levels in NORMAL CONDITION	(see Form A.5)	P
	a) Voltage limits less than 30 V r.m.s. and 42,4 V peak or 60 V d.c.		P
	for WET LOCATIONS voltage limits less than 16 V r.m.s. and 22,6 V peak or 35 V d.c.		N/A
	Voltages are not HAZARDOUS LIVE the levels of:		—
	b) Current less than 0,5 mA r.m.s. for sinusoidal, 0,7 mA peak non-sinusoidal or mixed frequencies or 2 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz		P
	for WET LOCATIONS measuring circuit A.4 used		N/A
	70 mA r.m.s. when measured with circuit A.3 for higher frequencies		N/A

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	c) Levels of capacitive charge or energy less:		—
	1) 45 µC for voltages up to 15 kV peak or d.c. or line A of Figure 3		P
	2) 350 mJ stored energy for voltages above 15 kV peak or d.c.		N/A
6.3.2	Levels in SINGLE FAULT CONDITION	(see Form A.6)	P
	a) Voltage limits less than 50 V r.m.s. and 70 V peak or 120 V d.c.		P
	for WET LOCATIONS voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c.		N/A
	Voltages are not HAZARDOUS LIVE the levels of:		—
	b) Current less than 3,5 mA r.m.s. for sinusoidal, 5 mA peak non-sinusoidal or mixed frequencies or 15 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz		P
	for WET LOCATIONS measuring circuit A.4 used		N/A
	500 mA r.m.s. when measured with circuit A.3 for higher frequencies		N/A
	c) Levels of capacitive charge or energy less line B of Figure 3		P
6.4	**Primary means of protection**		P
6.4.1	General		P
	ACCESSIBLE parts prevented from being HAZARDOUS LIVE by one or more of following means:		—
	a) ENCLOSURES or PROTECTIVE BARRIERS (see 6.4.2)		P
	b) BASIC INSULATION (see 6.4.3)		P
	c) Impedance (see 6.4.4)		P
6.4.2	ENCLOSURES or PROTECTIVE BARRIERS	(see Forms A.15 and A.16)	P
	– meet rigidity requirements of 8.1		P
	– meet requirements for BASIC INSULATION, if protection is provided by insulation	Control panel, plastic enclosure	P
	– meet requirements of 6.7 for creepage and clearances between accessible parts and hazardous live parts, if protection is provided by limited access	Complete machine, metal enclosure	P
6.4.3	BASIC INSULATION	(see Forms A.15 and A.16)	P
	– meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7		P
6.4.4	Impedance	(see Forms A.12 and A.15)	P
	Impedance used as primary means of protection meets all the following requirements:		—

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	a) limits current or voltage to level of 6.3.2	(see Form A.6)	P
	b) RATED for maximum WORKING VOLTAGE and the amount of power it will dissipate		P
	c) CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of BASIC INSULATION of 6.7	(see Form A.15)	P
6.5	**Additional means of protection in case of SINGLE FAULT CONDITION**		P
6.5.1	General		P
	ACCESSIBLE parts are prevented from becoming HAZARDOUS live by the primary means of protection and supplemented by one of:		—
	a) PROTECTIVE BONDING (see 6.5.2)		P
	b) SUPPLEMENTARY INSULATION (see 6.5.3)		P
	c) automatic disconnection of the supply (see 6.5.5)	Without such devices	N/A
	d) current- or voltage-limiting device (see 6.5.6)	Without such devices	N/A
	Alternatively one of the single means of protection is used:		—
	e) REINFORCED INSULATION (see 6.5.3)		P
	f) PROTECTIVE IMPEDANCE (see 6.5.4)		P
6.5.2	PROTECTIVE BONDING	(see Forms A.7, A.8, A.9, A.10 or A.11)	P
6.5.2.1	General		P
	ACCESSIBLE conductive parts, may become HAZARDOUS LIVE in SINGLE FAULT CONDITION:		—
	Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or		P
	Separated by conductive screen or barrier bonded to PROTECTIVE CONDUCTOR TERMINAL		P
6.5.2.2	Integrity of PROTECTIVE BONDING		—
	a) PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		P
	b) Soldered connections:		—
	Independently secured against loosening		N/A
	Not used for other purposes		N/A
	c) Screw connections are secured		P
	d) PROTECTIVE BONDING not interrupted; or		P
	except as removable part that carries MAINS SUPPLY input connection to the whole equipment		N/A

IEC 61010-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	e) Any movable PROTECTIVE BONDING connection specifically designed, and meets 6.5.2.4		N/A
	f) No external metal braid of cables used (not regarded as PROTECTIVE BONDING)		P
	g) IF MAINS SUPPLY passes through:		—
	Means provided for passing protective conductor;		N/A
	Impedance meets 6.5.2.4		N/A
	h) Protective conductors bare or insulated, if insulated, green/yellow		P
	Exceptions:		—
	1) earthing braids;		N/A
	2) internal protective conductors etc.;		P
	Green/yellow not used for other purposes		P
	TERMINAL suitable for connection of a PROTECTIVE CONDUCTOR, and meets 6.5.2.3		P
6.5.2.3	PROTECTIVE CONDUCTOR TERMINAL		—
	a) Contact surfaces are metal		P
	b) Appliance inlet used		N/A
	c) For rewirable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS		P
	d) If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL:		—
	Is near terminals of circuit for which protective earthing is necessary		N/A
	External if other terminals external		N/A
	e) Equivalent current-carrying capacity to MAINS supply TERMINALS	(see Form A.7) The earth power cable for external was provide by final user, without this equipment.	P
	f) If plug-in, makes first and breaks last		N/A
	g) If also used for other bonding purposes, PROTECTIVE CONDUCTOR:		—
	Applied first;		N/A
	Secured independently;		N/A
	Unlikely to be removed by servicing		N/A
	h) PROTECTIVE CONDUCTOR of measuring circuit:		—
	1) Current RATING equivalent to measuring circuit TERMINAL;		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	2) PROTECTIVE BONDING: not interrupted by any switch or interrupting device		N/A
	i) FUNCTIONAL EARTH TERMINALS allow independent connection		P
	j) If a binding screw used for PROTECTIVE CONDUCTOR TERMINAL:		—
	Suitable size for bond wire		P
	Not smaller than M 4		P
	At least 3 turns of screw engaged		P
	Passes tightening torque test	(see Form A.8)	P
	k) Contact pressure not capable being reduced by deformation of materials		P
6.5.2.4	Impedance of PROTECTIVE BONDING of plug-connected equipment	(see Form A.9)	N/A
	Impedance between PROTECTIVE CONDUCTOR TERMINAL and each ACCESSIBLE part where PROTECTIVE BONDING is specified, is:		—
	– less than 0,1 Ohm; or		N/A
	– less than 0,2 Ohm if equipment is provided with non-detachable cord		N/A
6.5.2.5	Impedance of PROTECTIVE BONDING of PERMANENTLY CONNECTED EQUIPMENT	(see Form A.10)	P
6.5.2.6	Transformer PROTECTIVE BONDING screen	(see Form A.11)	N/A
	Transformer provided with screen for PROTECTIVE BONDING:		—
	screen bonding consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses (see 6.5.2.2 a)		N/A
	screen bonding with soldered connection (see 6.5.2.2 b) is:		—
	– Independently secured against loosening		N/A
	– Not used for other purposes		N/A
6.5.3	SUPPLEMENTARY and REINFORCED INSULATION		P
	Meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7		P
6.5.4	PROTECTIVE IMPEDANCE	(see Form A.12)	P
	Limits current or voltage to level of 6.3.1 in NORMAL and to level of 6.3.2 in SINGLE FAULT CONDITION		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of DOUBLE or REINFORCED INSULATION of 6.7	(see Form A.15)	P
	The PROTECTIVE IMPEDANCE consists of one or more of the following:	(see TABLE 1.A and Form A.12)	—
	a) appropriate single component suitable for safety and reliability for protection, it is:		N/A
	1) RATED twice the maximum WORKING VOLTAGE		N/A
	2) resistor RATED for twice the power dissipation for maximum WORKING VOLTAGE		N/A
	b) combination of components		P
	Single electronic device not used as PROTECTIVE IMPEDANCE		P
6.5.5	Automatic disconnection of the supply		N/A
	a) RATED to disconnect the load within time specified in Figure 2		N/A
	b) RATED for the maximum load conditions of the equipment		N/A
6.5.6	Current- or voltage-limiting devices	(see Form A.13)	N/A
	Device complies with all of:		—
	a) RATED to limit the current or voltage to the level of 6.3.2	(see Form A.6)	N/A
	b) RATED for the maximum WORKING VOLTAGE; and		N/A
	RATED for the maximum operational current if applicable		N/A
	c) CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of SUPPLEMENTARY INSULATION of 6.7	(see Forms A.14 and A.15)	N/A
6.6	**Connections to external circuits**		P
6.6.1	General		P
	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		—
	– the external circuits		P
	– the equipment		P
	Protection achieved by separation of circuits; or		N/A
	short circuit of separation does not cause a HAZARD		P
	Instructions or markings for each terminal include:		—
	a) RATED conditions for TERMINAL		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	b) Required RATING of external circuit insulation		N/A
6.6.2	TERMINALS for external circuits		P
	TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE after 10 s of interrupting supply connection	(see Form A.5)	P
6.6.3	Circuits with terminals which are HAZARDOUS LIVE		P
	These circuits are:		—
	Not connected to ACCESSIBLE conductive parts; or		P
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		P
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		P
6.6.4	Terminals for stranded conductors	Control power module	P
	No RISK of accidental contact because:		—
	– Located or shielded		P
	– Self-evident or marked whether or not connected to ACCESSIBLE conductive parts		P
	Complies as applicable:		—
	a) Manufacturer's specified maximum length of removed insulation, or		P
	b) 8 mm length of insulation removed		P
6.7	**Insulation requirements**	(see Form A.14)	P
6.7.1	The nature of insulation		P
6.7.1.1	General		P
	Insulation between ACCESSIBLE parts or between separate circuits consist of CLEARANCES, CREEPAGE DISTANCES and solid insulation if provided as protection against a HAZARD		P
6.7.1.2	CLEARANCES		P
	Required CLEARANCES reflecting factors of 6.7.1.1	(see Forms A.14 and A.15)	P
	Equipment rated for operating altitude greater than 2000 m correction factor of Table 3 of 61010-1 applied		N/A
6.7.1.3	CREEPAGE DISTANCES		P
	Required CREEPAGE DISTANCES reflecting factors of 6.7.1.1 a) to d)	(see Forms A.14 and A.15)	P
	CTI material group reflected by requirements		P
	CTI test performed		N/A
6.7.1.4	Solid insulation		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Required solid insulation reflecting factors of 6.7.1.1 a) to d)	(see Forms A.14 and A.15)	P
6.7.1.5	Requirements for insulation according to type of circuit	(see Forms A.14 and A.15)	P
	a) 6.7.2 MAINS circuits of OVERVOLTAGE CATEGORY II up to nominal supply voltage of 300 V		P
	b) 6.7.3 secondary circuits separated from circuits defined in a) by transformer	The secondary circuits is SELV, not considered.	N/A
	c) K.1 MAINS circuits of OVERVOLTAGE CATEGORY III and IV or OVERVOLTAGE CATEGORY II over 300 V		P
	d) K.2 secondary circuits separated from circuits defined in c) by transformer		N/A
	e) K.3 circuits having one or more of:		—
	1) maximum TRANSIENT OVERVOLTAGE is limited to known level below the level of MAINS CIRCUIT		N/A
	2) maximum TRANSIENT OVERVOLTAGE above the level of MAINS CIRCUIT		N/A
	3) WORKING VOLTAGE is the sum of more than one circuit or a mixed voltage		N/A
	4) WORKING VOLTAGE includes recurring peak voltage, may include non-sinusoidal or non-periodic waveform		N/A
	5) WORKING VOLTAGE with a frequency above 30 kHz		N/A
6.7.2	Insulation for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II with a nominal supply voltage up to 300 V		P
6.7.2.1	CLEARANCES and CREEPAGE DISTANCES	(see Forms A.14 and A.15)	—
	Values for MAINS CIRCUITS of Table 4 are met		P
	Coatings to achieve reduction to POLLUTION DEGREE 1 comply with requirements of Annex H		N/A
6.7.2.2	Solid insulation		P
6.7.2.2.1	General		P
	Withstands electrical and mechanical stresses in normal use and all RATED environmental conditions of 1.4		P
	Equipment passed voltage tests of 6.8.3 with values of Table 5	(see Form A.18)	P
	Complies as applicable:		—
	a) ENCLOSURE or PROTECTIVE BARRIER of Clause 8		P
	b) moulded and potted parts requirements of 6.7.2.2.2		P
	c) inner layers of printed wiring boards requirements of 6.7.2.2.3		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	d) thin-film insulation requirements of 6.7.2.2.4		N/A
6.7.2.2.2	Moulded and potted parts		—
	Conductors between same two layers are separated by at least 0,4 mm after moulding is completed		P
6.7.2.2.3	Inner insulating layers of printed wiring boards		—
	Separated by at least 0,4 mm between same two layers		P
	REINFORCED INSULATION has adequate electric strength; one of following methods used:		—
	a) thickness of insulation is at least 0,4 mm		P
	b) insulation is assembled of minimum two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION		P
	c) insulation is assembled of minimum two separate layers, where the combination is rated for test voltage of Table 5 for REINFORCED INSULATION		P
6.7.2.2.4	Thin-film insulation		—
	Conductors between same two layers are separated by applicable CLEARANCES and CREEPAGE DISTANCE of 6.7.2.1		P
	REINFORCED INSULATION have adequate electric strength; one of the following methods used:		—
	a) thickness through the insulation at least 0,4 mm		P
	b) insulation is assembled of min. two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION	(see Form A.18)	P
	c) insulation is assembled of min. three separate layers, where the combination of two layers passed voltage tests of 6.8.3 with values of Table 5 for REINFORCED INSULATION	(see Form A.18)	P
6.7.3	Insulation for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V	The secondary circuits is SELV, not considered	N/A
6.7.3.1	General		N/A
	Secondary circuits where separation from MAINS CIRCUITS is achieved by a transformer providing:		—
	– REINFORCED INSULATION		N/A
	– DOUBLE INSULATION		N/A
	– screen connected to the PROTECTIVE CONDUCTOR TERMINAL		N/A
6.7.3.2	CLEARANCES	(see Forms A.14 and A.15)	N/A
	a) meet the values of Table 6 for BASIC INSULATION and SUPPLEMENTARY INSULATION; or		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	twice the values of Table 6 for REINFORCED INSULATION; or		N/A
	b) pass the voltage tests of 6.8 with values of Table 6;	(see Form A.18)	N/A
	with following adjustments:		—
	1) values for reinforced insulation are 1,6 times the values for basic insulation		N/A
	2) if operating altitude is greater than 2000 m values of CLEARANCES multiplied with factor of Table 3		N/A
	3) minimum CLEARANCE is 0,2 mm for POLLUTION DEGREE 2 and 0,8 mm for POLLUTION DEGREE 3		N/A
6.7.3.3	CREEPAGE DISTANCES	(see Forms A.14 and A.15)	N/A
	Based on WORKING VOLTAGE meets the values of Table 7 for BASIC and SUPPLEMENTARY INSULATION		N/A
	Values for REINFORCED INSULATION are twice the values of BASIC INSULATION		N/A
	Coatings to achieve reduction to POLLUTION DEGREE 1 comply with requirements of Annex H		N/A
6.7.3.4	Solid insulation		N/A
6.7.3.4.1	General		N/A
	Withstands electrical and mechanical stresses in normal use and all RATED environmental conditions of 1.4		—
	a) Equipment passed voltage test of 6.8.3.1 for 5 s with VALUES of Table 6 for BASIC and SUPPLEMENTARY INSULATION	(see Form A.18)	N/A
	values for REINFORCED INSULATION are 1,6 times the values of BASIC INSULATION		N/A
	b) if WORKING VOLTAGE exceeds 300 V, equipment passed voltage test of 6.8.3.1 for 1 min with a test voltage of 1,5 times working voltage for BASIC or SUPPLEMENTARY INSULATION	(see Form A.18)	N/A
	value for REINFORCED INSULATION are twice the WORKING VOLTAGE		N/A
	Complies as applicable:		—
	1) ENCLOSURE or PROTECTIVE BARRIER of Clause 8		N/A
	2) moulded and potted parts requirements of 6.7.3.4.2		N/A
	3) inner layers of printed wiring boards requirements of 6.7.3.4.3		N/A
	4) thin-film insulation requirements of 6.7.3.4.4		N/A
6.7.3.4.2	Moulded and potted parts		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Conductors between same two layers are separated by applicable distances of Table 8		N/A
6.7.3.4.3	Inner insulation layers of printed wiring boards		—
	Separated by at least the applicable distances of Table 8 between same two layers		N/A
	REINFORCED INSULATION have adequate electric strength; one of following methods used:		—
	a) thickness at least applicable distance of Table 8		N/A
	b) insulation is assembled of minimum two separate layers, each RATED for test voltage of Table 6 for BASIC INSULATION	(see Form A.18)	N/A
	c) insulation is assembled of min. two separate layers, where the combination is RATED for 1,6 times the test voltage of Table 6	(see Form A.18)	N/A
6.7.3.4.4	Thin-film insulation		—
	Conductors between same two layers are separated by applicable CLEARANCES and CREEPAGE DISTANCE of 6.7.3.2 and 6.7.3.3		N/A
	REINFORCED INSULATION have adequate electric strength; one of following methods used:		—
	a) thickness at least applicable distance of Table 8		N/A
	b) insulation is assembled of min. two separate layers, each RATED for test voltage of Table 6 for BASIC INSULATION	(see Form A.18)	N/A
	c) insulation is assembled of min. three separate layers, where the combination of two layers passed voltage tests with 1,6 time values of Table 6:	(see Form A.18)	—
	a.c. test of 6.8.3.1; or		N/A
	d.c. test of 6.8.3.2 for circuits stressed only by d.c. voltages		N/A
6.8	**Procedure for voltage tests**	(see Forms A.14 and A.18)	P
6.9	**Constructional requirements for protection against electric shock**		P
6.9.1	General		P
	If a failure could cause a HAZARD:		—
	a) security of wiring connections		P
	b) screws securing removable covers		P
	c) accidental loosening		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	d) CLEARANCES and CREEPAGE DISTANCES not reduced below the values of basic insulation by loosening of parts or wires		P
6.9.2	Insulating materials		P
	Material not to be used for safety relevant insulation:		—
	a) easily damaged materials not used		P
	b) non-impregnated hygroscopic materials not used		P
6.9.3	Colour coding		P
	Green-and-yellow insulation shall not be used except:		—
	a) protective earth conductors;		P
	b) PROTECTIVE BONDING conductors;		P
	c) potential equalization conductors;		P
	d) functional earth conductors		P
6.10	**Connection to MAINS supply source and connections between parts of equipment**		N/A
6.10.1	MAINS supply cords	Without MAINS supply cords	N/A
	RATED for maximum equipment current (see 5.1.3 c)		N/A
	Cable complies with IEC 60227 or IEC 60245		N/A
	Heat-resistant if likely to contact hot parts		N/A
	Temperature RATING (cord and inlet) .....:		—
	Green/yellow used only for connection to PROTECTIVE CONDUCTOR TERMINALS		N/A
	Detachable cords with IEC 60320 MAINS connectors:		—
	Conform to IEC 60799; or		N/A
	Have the current RATING of the MAINS connector		N/A
6.10.2	Fitting of non-detachable MAINS supply cords	Without MAINS supply cords	N/A
6.10.2.1	Cord entry		—
	a) inlet or bushing with a smoothly rounded opening; or		N/A
	b) insulated cord guard protruding >5 D (diameter)		N/A
6.10.2.2	Cord anchorage		—
	Protective earth conductor is the last to take the strain		N/A
	a) cord is not clamped by direct pressure from a screw		N/A
	b) knots are not used		N/A
	c) cannot push the cord into the equipment to cause a HAZARD		N/A
	d) no failure of cord insulation in anchorage with metal parts		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	e) not to be loosened without a tool		N/A
	f) cord replacement does not cause a HAZARD and method of strain relief is clear		N/A
	Push-pull and or torque test	(see Form A.19)	N/A
6.10.3	Plugs and connectors		N/A
	MAINS supply plugs, connectors etc., conform with relevant specifications		N/A
	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		—
	Plugs of supply cords do not fit MAINS sockets above rated SUPPLY voltage		N/A
	MAINS type plugs used only for connection to MAINS supply		N/A
	Plug pins which receive a charge from an internal capacitor	(see Form A.5)	N/A
	Accessory MAINS socket outlets:	Without such socket outlets	—
	a) marking if accepts a standard MAINS supply plug (see 5.1.3e)		N/A
	b) input has a protective earth conductor if outlet has EARTH TERMINAL CONTACT		N/A
6.11	**Disconnection from supply source**		P
6.11.1	Disconnects all current-carrying conductors		N/A
6.11.2	Exceptions		N/A
6.11.3	Requirements according to type of equipment		P
6.11.3.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		N/A
	Employs switch or circuit-breaker		N/A
	If switch or circuit-breaker is not part of the equipment, documentation requires:		—
	a) switch or circuit-breaker to be included in building installation		P
	b) suitable location easily reached		P
	c) marking as disconnecting for the equipment		P
6.11.3.2	Single-phase cord-connected equipment	3 phases	N/A
	Equipment is provided with one of the following:		—
	a) switch or circuit-breaker		N/A
	b) appliance coupler (disconnectable without tool)		N/A
	c) separable plug (without locking device)		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
6.11.4	Disconnecting devices	Disconnecting device is not part of the equipment	N/A
6.11.4.1	General		N/A
	Disconnecting device part of equipment		N/A
	Electrically close to the SUPPLY		N/A
	Power-consuming components not electrically located between the supply source and the disconnecting device		N/A
	Except electromagnetic interference suppression circuits permitted to be located on the supply side of the disconnecting device		N/A
6.11.4.2	Switches and circuit-breakers	the device is not part of the equipment	N/A
	When used as disconnection device:		—
	Circuit breaker meets the relevant requirements IEC 60947-2 and is suitable for the application		N/A
	Switch meets the relevant requirements IEC 60947-3 and is suitable for the application		N/A
	Marked to indicate function .....:		—
	Not incorporated in MAINS cord		N/A
	Does not interrupt PROTECTIVE EARTH CONDUCTOR		N/A
6.11.4.3	Appliance couplers and plugs	Without such devices	N/A
	Where an appliance coupler or separable plug is used as the disconnecting device (see 6.11.3.2):		—
	Readily identifiable and easily reached by the operator		N/A
	Single-phase portable equipment cord length not more than 3 m		N/A
	PROTECTIVE EARTH CONDUCTOR connected first and disconnected last		N/A
7	**PROTECTION AGAINST MECHANICAL HAZARDS**		P
7.1	**General**		P
	Equipment does not cause a mechanical HAZARD in NORMAL nor in SINGLE FAULT CONDITION		P
	Conformity is checked by 7.2 to 7.7		P
7.2	**Sharp edges**		P
	Easily-touched parts are smooth and rounded		P
	Do not cause injury during NORMAL USE and		P
	Do not cause injury during SINGLE FAULT CONDITION		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
7.3	**Moving parts**		N/A
7.3.1	General		N/A
	HAZARDS from moving parts limited to a tolerable level with the conditions specified in 7.3.2 and 7.3.5		N/A
	RISK assessment in accordance with 7.3.3 carried out		N/A
7.3.2	Exceptions		N/A
	Access to HAZARDOUS moving parts permitted under following circumstances:		—
	a) obviously intended to operate on parts or materials external of the equipment		N/A
	inadvertent touching of moving parts minimized by equipment design (e .g. guards or handles)		N/A
	b) If OPERATOR access is unavoidable outside NORMAL USE following precautions have been taken:		—
	1) access requires TOOL		N/A
	2) statement about training in the instructions		N/A
	3) warning markings on covers prohibiting access by untrained OPERATORS		N/A
	or symbol 14 with full details in documentation		N/A
7.3.3	RISK assessment for mechanical HAZARDS to body parts		N/A
	RISK is reduced to a tolerable level by protective measures as specified in Table 12		N/A
	Minimum protective measures:		—
	A. Low level measures		N/A
	B. Moderate measures		N/A
	C. Stringent measures		N/A
7.3.4	Limitation of force and pressure	(see Form A.20)	N/A
	Following levels are met in NORMAL and SINGLE FAULT CONDITION:		—
	Continuous contact pressure below 50 N / cm^2 with force below 150 N		N/A
	Temporary force below 250 N for an area at least of 3 cm^2 for a maximum duration of 0,75 s		N/A
7.3.5	Gap limitations between moving parts	(see Form A.20)	N/A
7.3.5.1	Access normally allowed		—
	If levels of 7.3.4 exceeded and a body part may be inserted minimum gap as specified in Table 13 assured in NORMAL and in SINGLE FAULT CONDITION		N/A
7.3.5.2	Access normally prevented		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Maximum gap as specified in Table 14 assured in NORMAL and in SINGLE FAULT CONDITION		N/A
7.4	**Stability**	Fixed equipment	N/A
	Equipment not secured to building structure is physical stable		N/A
	Stability maintained after opening of drawers etc. by automatic means, or		N/A
	warning marking requires the application of means		N/A
	Compliance checked by following tests as applicable:	(see Form A.20A)	—
	a) 10° tilt test for other than handheld equipment		N/A
	b) multi-directional force test for equipment exceeds height of 1 m and mass of 25 kg		N/A
	c) downward force test for floor-standing equipment		N/A
	d) overload test with 4 times maximum load for castor or support foot that supports greatest load, or		N/A
	e) castor or support foot that supports greatest load removed from equipment		N/A
7.5	**Provisions for lifting and carrying**		N/A
7.5.1	General		N/A
	Equipment more than 18 kg.....:		N/A
	Has means for lifting or carrying; or		N/A
	Directions are given in documentation		N/A
7.5.2	Handles and grips		N/A
	Handles or grips withstand four times weight		N/A
7.5.3	Lifting devices and supporting parts		N/A
	RATED for maximum load; or		N/A
	Tested with four times maximum static load		N/A
7.6	**Wall mounting**		N/A
	Mounting brackets withstand four times weight	(see Form A.20B)	N/A
	One fastener removed and test repeated with two times weight	(see Form A.20B)	N/A
7.7	**Expelled parts**		N/A
	Equipment contains or limits the energy		N/A
	Protection not removable without the aid of a tool		N/A
8	**RESISTANCE TO MECHANICAL STRESSES**		P
8.1	**General**		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Equipment does not cause a HAZARD when subjected to mechanical stresses in NORMAL USE		P
	Normal protection level is 5 J		P
	Levels below 5 J but not less than 1 J are acceptable if all of the following criteria are met:		—
	a) Lower level justified by RISK assessment of manufacturer		P
	b) Equipment installed in its intended application is not easily touched		N/A
	c) Only occasional access during NORMAL USE		N/A
	d) IK code in accordance to IEC 62262 marked or symbol 14 used with full information in the documentation		N/A
	for non-metallic ENCLOSURES rated below 2 °C ambient temperature value chosen for minimum RATED temperature		N/A
	impact energies between IK values, the IK code marked for nearest lower value		N/A
	Conformity is checked by performing following tests:	(see Form A.16)	—
	1) Static test of 8.2.1		P
	2) Impact test of 8.2.2 with 5 J except for HAND-HELD EQUIPMENT		P
	if specified impact energy is not 5 J alternate method of IEC 62262 used		N/A
	3) Drop test of 8.3.1 or 8.3.2 except for FIXED EQUIPMENT and equipment with mass over 100 kg		N/A
	Equipment RATED with an impact rating of IK 08 that obviously meets the criteria		N/A
	After the tests inspection with following results:		—
	– HAZARDOUS LIVE parts above the limits of 6.3.2 not ACCESSIBLE		P
	– insulation pass the voltage tests of 6.8	(see Form A.30)	P
	i) No leaks of corrosive and harmful substances		P
	ii) ENCLOSURE shows no cracks resulting in a HAZARD		P
	iii) CLEARANCES not less than their permitted values		P
	iv) Insulation of internal wiring remains undamaged		P
	v) PROTECTIVE BARRIERS not damaged or loosened		P
	vi) No moving parts exposed, except permitted by 7.3		P
	vii) No damage which could cause spread of fire		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
8.2	**ENCLOSURE rigidity test**		P
8.2.1	Static test	(see Form A.21A)	P
	– 30 N with 12 mm rod applied to each part of ENCLOSURE		P
	– in case of doubt test conducted at maximum RATED ambient temperature		N/A
8.2.2	Impact test	(see Form A.21A)	P
	Impact applied to any part of ENCLOSURE causing a HAZARD if damaged		P
	Impact energy level and corresponding IK code .....:	IK 08	—
	Non-metallic ENCLOSURES cooled to minimum RATED ambient temperature if below 2 °C		N/A
8.3	**Drop test**	(see Form A.21B)	N/A
8.3.1	Other than HAND-HELD and DIRECT-PLUG-IN EQUIPMENT		N/A
	Tests conducted with a drop height or angle of .....:		—
8.3.2	HAND-HELD and DIRECT-PLUG-IN EQUIPMENT		N/A
	Non-metallic ENCLOSURES cooled to minimum RATED ambient temperature if below 2 °C		N/A
	Drop test conducted with an height of 1 m		N/A
9	**PROTECTION AGAINST THE SPREAD OF FIRE**		P
9.1	**General**		P
	No spread of fire in NORMAL and SINGLE FAULT CONDITION		P
	MAINS supplied equipment meets requirements of 9.6 additionally		P
	Conformity is checked by minimum one or a combination of the following (see Figure 11):	(see Form A.22)	—
	a) SINGLE FAULT test of 4.4; or	(see Form A.1)	P
	b) Application of 9.2 (eliminating or reducing the sources of ignition); or		N/A
	c) Application of 9.3 (containment of fire within the equipment)		P
9.2	**Eliminating or reducing the sources of ignition within the equipment**		N/A
	a) 1) Limited-energy circuit (see 9.4); or		N/A
	2) BASIC INSULATION provided for parts of different potential; or	(see Forms A.14 and A.18)	N/A
	Bridging the insulation does not cause ignition	(see Form A.1)	N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	b) Surface temperature of liquids and parts (see 9.5)		N/A
	c) No ignition in circuits designed to produce heat	(see Form A.1)	N/A
9.3	**Containment of the fire within the equipment, should it occur**		P
9.3.1	General		P
	Spread of fire outside equipment reduced to a tolerable level if:		—
	a) Energizing of the equipment is controlled by an OPERATOR held switch		N/A
	b) ENCLOSURE is conform with constructional requirements of 9.3.2; and		P
	Requirements of 9.5 are met	Without flammable liquids	N/A
9.3.2	Constructional requirements		P
	a) Connectors and insulating material have flammability classification V-2 or better	(see TABLE 1.A or Form A.23)	P
	b) Insulated wires and cables are flame retardant (VW-1 or equivalent)	(see TABLE 1.A or Form A.23)	P
	c) ENCLOSURE meets following requirements:	(see Form A.22)	—
	1) Bottom and sides in arc of 5 ° (see Figure 13) to non-limited circuits (9.4) meets:		—
	i) no openings; or		P
	ii) perforated as specified in Table 16; or		N/A
	iii) metal screen with a mesh; or		N/A
	iv) baffles as specified in Figure 12		N/A
	2) Material of ENCLOSURE and any baffle or flame barrier is made of:		—
	Metal (except magnesium); or		P
	Non-metallic materials have flammability classification V-1 or better	(see TABLE 1.A or Form A.22)	P
	3) ENCLOSURE and any baffle or flame barrier have adequate rigidity		P
9.4	**Limited-energy circuit**	(see Form A.24)	N/A
	a) Potential not more than 30 r.m.s. and 42,4 V peak, or 60 V d.c.		N/A
	b) Current limited by one of following means:		—
	1) Inherently or by impedance (see Table 17); or		N/A
	2) Overcurrent protective device (see Table 18); or		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	3) A regulating network limits also in SINGLE FAULT CONDITION (see Table 17)		N/A
	c) Is separated by at least BASIC INSULATION		N/A
	Fuse or a nonadjustable electromechanical device is used		N/A
9.5	**Requirements for equipment containing or using flammable liquids**		N/A
	Flammable liquids contained in or specified for use with equipment do not cause spread of fire	(see Form A.25)	N/A
	RISK is reduced to a tolerable level:		—
	a) The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point		N/A
	b) The quantity of liquid is limited		N/A
	c) Flames are contained within the equipment		N/A
	Detailed instructions for RISK-reduction provided		N/A
9.6	**Overcurrent protection**		P
9.6.1	General		P
	MAINS supplied equipment protected		P
	BASIC INSULATION between MAINS parts of opposite polarity provided	(see Forms A.14 and A.15)	P
	Overcurrent protection devices not fitted in the protective conductor		P
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase equipment)		P
9.6.2	PERMANENTLY CONNECTED EQUIPMENT		P
	Overcurrent protection device:		—
	Fitted within the equipment; or		N/A
	Specified in manufacturer's instructions		P
9.6.3	Other equipment		N/A
	Protection within the equipment		N/A
10	**EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT**		P
10.1	**Surface temperature limits for protection against burns**		P
	Easily touched surfaces within the limits in NORMAL and in SINGLE FAULT CONDITION:	(see Form A.26A)	—
	– at an specified ambient temperature of 40 °C		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	– for equipment rated above 40 °C ambient temperature limits not exceeded raised by the difference to 40 °C		N/A
	Heated surfaces necessary for functional reasons exceeding specified values:		—
	– Are recognizable as such by appearance or function; or		N/A
	– Are marked with symbol 13		N/A
	– Guards are not removable without tool		N/A
10.2	**Temperatures of windings**		N/A
	Limits not exceeded in:	(see Form A.26B)	—
	NORMAL CONDITION		N/A
	SINGLE FAULT CONDITION		N/A
10.3	**Other temperature measurements**		P
	Following measurements conducted if applicable:	(see Form A.26A)	—
	a) Value of 60 °C of field-wiring terminal box not exceeded		N/A
	b) Surface of flammable liquids and parts in contact with this liquids		N/A
	c) Surface of non-metallic ENCLOSURES		P
	d) Parts made of insulating material supporting parts connected to MAINS supply		P
	e) Terminals carrying a current more than 0,5 A		P
10.4	**Conduct of temperature tests**		P
10.4.1	General		P
	Tests conducted under reference test conditions and manufacturer's instructions	(see Form A.26A)	P
	Tests alternatively conducted at the least favourable ambient temperature within the RATED ambient temperature .....:	(see Form A.26A)	—
10.4.2	Temperature measurement of heating equipment		N/A
	Tests conducted in test corner	(see Form A.26A)	N/A
10.4.3	Equipment intended for installation in a cabinet or wall		N/A
	Equipment built in as specified in installation instructions	(see Form A.26A)	N/A
10.5	**Resistance to heat**		P
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES	(see Form A.16)	P
10.5.2	Non-metallic ENCLOSURES	(see Form A.27)	P
	Within 10 min after treatment:		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Equipment subjected to suitable stresses of 8.2 and 8.3 complying with criteria of 8.1		P
10.5.3	Insulating material		P
	a) Parts supporting parts connected to MAINS supply		P
	b) TERMINALS carrying a current more than 0,5 A		P
	Examination of material data; or		N/A
	in case of doubt:		P
	1) Ball pressure test; or	(see Form A.28)	P
	2) Vicat softening test of ISO 306	(see Form A.29)	N/A
11	**PROTECTION AGAINST HAZARDS FROM FLUIDS AND SOLID FOREIGN OBJECTS**		P
11.1	**General**		P
	Protection to OPERATORS and surrounding area provided by EQUIPMENT		P
	All fluids specified by manufacturer considered		P
11.2	**Cleaning**	(see Form A.30)	P
11.3	**Spillage**	(see Form A.30)	N/A
11.4	**Overflow**	(see Form A.30)	N/A
11.5	**Battery electrolyte**	Without battery	N/A
	Battery electrolyte leakage presents no HAZARD		N/A
11.6	**Equipment RATED with a degree of ingress protection (IP code)**	(see Form A.30)	N/A
11.6.1	General		N/A
	Equipment marked with IP code ..... :		—
	Conditions specified in the documentation		N/A
11.6.2	Conditions for testing		N/A
	Equipment in clean and new condition, all parts in place and mounted as specified by manufacturer		N/A
	Complete equipment tested, or		N/A
	representative parts tested		N/A
	HAND-HELD EQUIPMENT and PORTABLE EQUIPMENT placed in least favourable position of NORMAL use		N/A
	Other equipment positioned or installed as specified		N/A
	TERMINALS provided with protective cap or cover, are installed as specified by manufacturer		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	The equipment is operating (energized) during the treatment except:		—
	a) If manufacturer specifies degrees of protection for non-operating (de-energized) equipment, or		N/A
	b) Equipment is operating or non-operating during the treatment with does not affect the test results		N/A
11.6.3	Protection against solid foreign objects (including dust)		N/A
	Applicable test of IEC 60529 for protection against solid foreign objects conducted		N/A
	Additionally inspection of equipment resulted:		—
	a) No deposit on insulation parts that could lead to a HAZARD		N/A
	b) No created accumulations that have the potential to cause spread of fire		N/A
11.6.4	Protection against water		N/A
	Applicable test of IEC 60529 for protection against water conducted		N/A
	If any water has entered, safety is not impaired, inspection of equipment resulted:		—
	a) No deposit on insulation parts that could lead to a HAZARD		N/A
	b) Water has not reached hazardous live parts or windings which are not designed to operate when wet		N/A
	c) No accumulations near the end of cable nor enter the cable where it could cause a HAZARD		N/A
	d) No accumulations where it could lead to a HAZARD taking in consideration movement of the equipment		N/A
11.7	**Fluid pressure and leakage**	Without such hazards	N/A
11.7.1	Maximum pressure ..... :	(see Form A.31)	—
	Maximum pressure of any part does not exceed P_{RATED}		N/A
11.7.2	Leakage and rupture at high pressure		N/A
	Fluid-containing parts checked by inspection or if a HAZARD could arise subjected to hydraulic test, if:	(see Form A.31)	—
	a) product of pressure and volume > 200 kPa·l; and		N/A
	b) pressure > 50 kPa		N/A
	Safety evidence established by calculation in acc. to national authorities (e.g. Pressure Equipment Directive 2014/68/EU)		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Parts of refrigerating systems meets pressure-related requirements of EN 378-2 or IEC 60335-2-89 as applicable		N/A
11.7.3	Leakage from low-pressure parts	(see Form A.32)	N/A
11.7.4	Overpressure safety device		N/A
	Does not operate in NORMAL USE		N/A
	a) Connected as close as possible to parts intended to be protected		N/A
	b) Easy access for inspection, maintenance and repair		N/A
	c) Adjustment only with TOOL		N/A
	d) No discharge towards person		N/A
	e) No HAZARD from deposit of discharged material		N/A
	f) Adequate discharge capacity		N/A
	No shut-off valve between overpressure safety device and protected parts		N/A
12	**PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE**		P
12.1	**General**		P
	Equipment provides protection		P
12.2	**Equipment producing ionizing radiation**		N/A
12.2.1	Ionizing radiation	(see Form A.33)	N/A
12.2.1.1	General		N/A
	Equipment meets the following requirements:		—
	a) if intended to emit radiation meets requirements of 12.2.1.2; or		N/A
	tested, classified and marked in accordance to IEC 62598		N/A
	b) if only emits stray radiation meets requirements of 12.2.1.3		N/A
12.2.1.2	Equipment intended to emit radiation		—
	Effective dose rate of radiation measured .....:		—
	If dose rate exceeds 5 µSv/h marked with the following:		—
	a) symbol 17 (ISO 361)		N/A
	b) abbreviations of the radionuclides..... :		—
	c) with maximum dose at 1 m; or ..... :		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	with dose rate value between 1 µSv/h and 5 µSv/h in m .....:		—
12.2.1.3	Equipment not intended to emit radiation	(see Form A.34)	—
	Limit for unintended stray radiation of 1 µSv/h at any easily reached point kept .....:		N/A
12.2.2	Accelerated electrons		N/A
	Compartments opened only by the use of a TOOL		N/A
12.3	**Optical radiation**		P
	No unintentional HAZARDOUS escape of optical radiation as ultraviolet, visible or infrared radiation, including light emitting diodes:		—
	– Checked by inspection; and		N/A
	– Radiation sources assessed in acc. to the requirements of IEC 62471, except for sources considered to be safe (Table 22) or conditionally safe (Table 23).	LCD screens	P
	–Lamp and lamp systems assessed to Risk Groups 1, 2, or 3 of IEC 62471 are labelled in acc. to IEC 62471-2		N/A
	– If labelling impractical, lamp or lamp systems marked with symbol 14		N/A
	– Protective measures, restrictions on use, and operating instructions that may be necessary are provided, including the applicable conditions of use of Table 23.		N/A
12.4	**Microwave radiation**		N/A
	Power density does not exceed 10 W/m^2 ..... :		N/A
12.5	**Sonic and ultrasonic pressure**		N/A
12.5.1	Sound level	(see Form A.35)	N/A
	No HAZARDOUS sound emission		N/A
	Maximum sound pressure level measured and calculated for maximum sound power level as specified in ISO 3746 or ISO 9614-1		N/A
	Instruction describes measures for protection		N/A
12.5.2	Ultrasonic pressure	(see Form A.36)	N/A
	Equipment not intended to emit ultrasound does not exceed limit of 110 dB between 20 kHz and 100 kHz		N/A
	Equipment intended to emit ultrasound:		N/A
	Outside useful beam does not exceed limit of 110 dB between 20 kHz and 100 kHz		N/A
	If inside useful beam above values exceeded:		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Marked with Symbol 14 of Table 1		N/A
	and following information in the documentation:		—
	a) dimensions of useful beam		N/A
	b) area where ultrasonic pressure exceed 110 dB		N/A
	c) maximum sound pressure inside beam area		N/A
12.6	**Laser sources**		N/A
	Equipment meets requirements of IEC 60825-1		N/A
13	**PROTECTION AGAINST LIBERATED GASES AND SUBSTANCES, EXPLOSION AND IMPLOSION**		N/A
13.1	**Poisonous and injurious gases and substances**		N/A
	No hazardous substances liberated in NORMAL CONDITION and in SINGLE FAULT CONDITION		N/A
	If potentially-hazardous substances are liberated:		—
	Operator is not directly exposed to a quantity of the substance that could cause harm		N/A
	Requirements to discharge of hazardous substances during NORMAL operation in accordance to manufacturer's instructions not considered as liberation		N/A
	Attached data/test reports demonstrate conformity	See Technical of User Manual	N/A
13.2	**Explosion and implosion**		N/A
13.2.1	Components		N/A
	Components liable to explode:		—
	Pressure release device provided; or		N/A
	Apparatus incorporates operator protection (see also 7.7)		N/A
	Pressure release device:		—
	Discharge without danger		N/A
	Cannot be obstructed		N/A
13.2.2	Batteries and battery charging	(see Form A.37)	N/A
	If explosion or fire HAZARD could occur:		—
	Protection incorporated in the equipment; or		N/A
	Instructions specify batteries with built-in protection		N/A
	In case of wrong type of battery used:		—
	No HAZARD; or		N/A
	Warning by marking and within instructions		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Equipment with means to charge rechargeable batteries:		—
	Warning against the charging of non-rechargeable batteries; and		N/A
	Type of rechargeable battery indicated; or		N/A
	Symbol 14 used		N/A
	Battery compartment design		N/A
	Single component failure		N/A
	Polarity reversal test		N/A
13.2.3	Implosion of cathode ray tubes		N/A
	If maximum face dimensions > 160 mm.....:		—
	Intrinsically protected and correctly mounted; or		N/A
	ENCLOSURE provides protection:		N/A
	If non-intrinsically protected:		—
	Screen not removable without TOOL		N/A
	If glass screen, not in contact with surface of tube		N/A
14	**COMPONENTS AND SUBASSEMBLIES**		P
14.1	**General**		P
	Where safety is involved, components and subassemblies meet relevant requirements	(see TABLE 1.A)	P
14.2	**Motors**	DC motor	P
14.2.1	Motor temperatures		P
	Does not present a HAZARD when stopped or prevented from starting; or	(see Forms A.1 and A.26B)	P
	Protected by over-temperature or thermal protection device conform with 14.3		N/A
14.2.2	Series excitation motors		N/A
	Connected direct to device, if overspeeding causes a HAZARD		N/A
14.3	**Overtemperature protection devices**		N/A
	Devices operating in a SINGLE FAULT CONDITION	(see Form A.38)	N/A
	a) Reliable function is ensured		N/A
	b) RATED to interrupt maximum current and voltage		N/A
	c) Does not operate in NORMAL USE		N/A
	If self-resetting device used to prevent a HAZARD, protected part requires intervention before restarting		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
14.4	**Fuse holders**		N/A
	No access to HAZARDOUS LIVE parts		N/A
14.5	**MAINS voltage selecting devices**		N/A
	Accidental change not possible		N/A
14.6	**MAINS transformers tested outside equipment**	(see Forms A.39 and A.40)	N/A
14.7	**Printed wiring boards**		P
	Data shows conformity with V-1 of IEC 60695-11-10 or better; or		P
	Test shows conformity with V-1 of IEC 60695-11-10 or better	(see Form A.23)	N/A
	Not applicable for printed wiring boards with limited-energy circuits (9.4)		P
14.8	**Circuits used to limit TRANSIENT OVERVOLTAGES**		N/A
	Test conducted between each pair of MAINS SUPPLY TERMINALS	(see Form A.41)	N/A
	No ignition or overheating of other materials :		—
	– no ignition		N/A
	– no heat to other parts above the self-ignition points		N/A
	Safely suppressing and properly functional after applied tests		N/A
15	**PROTECTION BY INTERLOCKS**		N/A
15.1	**General**		N/A
	Interlocks are designed to remove a HAZARD before OPERATOR exposed		N/A
15.2	**Prevention of reactivation**		N/A
15.3	**Reliability**		N/A
	Single fault unlikely to occur; or		N/A
	Cannot cause a HAZARD		N/A
16	**HAZARDS RESULTING FROM APPLICATION**		N/A
16.1	**REASONABLY FORESEEABLE MISUSE**		N/A
	No HAZARDS arising from settings not intended and not described in the instructions		N/A
	Other cases of REASONABLY FORESEEABLE MISUSE addressed by RISK assessment		N/A
16.2	**Ergonomic aspects**		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Factors giving rise to a HAZARD the RISK assessment is reflecting those aspects:		—
	a) limitation of body dimensions		N/A
	b) displays and indicators		N/A
	c) accessibility and conventions of controls		N/A
	d) arrangement of TERMINALS		N/A
17	**RISK ASSESSMENT**		N/A
	RISK assessment conducted, if HAZARD might arise and not covered by Clauses 6 to 16		N/A
	TOLERABLE RISK achieved by iterative documented process covering the following:		—
	a) RISK analysis		N/A
	Identifies HAZARDS and estimates RISK		N/A
	b) RISK evaluation		N/A
	Plan to judge acceptability of resulting RISK level based on the estimated severity and likelihood of a RISK		N/A
	c) RISK reduction		N/A
	Initial RISK reduced by counter measures;		N/A
	Repeated RISK evaluation without new RISKS introduced		N/A
	RISKS remaining after RISK assessment addressed in instructions to RESPONSIBLE BODY:		—
	Information contained how to mitigate these RISKS		N/A
	Following principles in methods of RISK reduction applied by manufacturer in given order:		—
	1) RISKS eliminated or reduced as far as possible		N/A
	2) Protective measures taken for RISKS that cannot be eliminated		N/A
	3) User information about residual RISK due to any defect of the protective measures		N/A
	Indication of particular training is required		N/A
	Specification of the need for personal protective equipment		N/A
	Conformity checked by evaluation of the RISK assessment documentation		N/A
ANNEX F	**ROUTINE TESTS**		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Manufacturer ´s declaration		P
ANNEX H	**QUALIFICATION OF CONFORMAL COATINGS FOR PROTECTION AGAINST POLLUTION**		N/A
H.1	**General**		N/A
	Conformal coatings meet the requirements of Clause H.2 and H.3.		N/A
H.2	**Technical properties**		N/A
	Technical properties of conformal coatings are suitable for the intended application. In particular:		—
	a) Manufacturer indicate that it is a coating for PWBs;		N/A
	b) RATED operating temperature include the temperature range of the indicated application;		N/A
	c) CTI, insulation resistance and dielectric strength are suitable for the intended application;		N/A
	d) Coating have adequate UV resistance, if it is exposed to sunlight;		N/A
	e) Flammability RATING of the coating is at least the required flammability RATING of the applied PWB.		N/A
H.3	**Qualification of coatings**	(see Form A.42)	N/A
	Coating complies with the conformity requirements.		N/A
ANNEX K	**INSULATION REQUIREMENTS NOT COVERED BY CLAUSE 6.7**	(see Forms A.15 and A.18)	P

ATTACHMENT TO TEST REPORT

IEC 61010-1

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

(Electrical Equipment For Measurement, Control, and Laboratory Use; Part1: General Requirements)

Differences according to ..... :	EN 61010-1:2010/A1
Attachment Form No. ..... :	EU_GD_IEC61010_1P
Attachment Originator..... :	TÜV Rheinland LGA Products GmbH
Master Attachment ..... :	Date 2021-04-12

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	CENELEC COMMON MODIFICATIONS (EN)		
	Procedure for voltage tests		
6.8.3.1	The a.c. voltage test *Replace the first sentence by the following sentence:* The voltage tester shall be capable of maintaining the test voltage throughout the test within +/- 5 % of the specified value.		P
Annex ZA (normative)	The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.		P
Annex ZZ (informative)	Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered		P

Test data

Clause	Requirement + Test	Result - Remark	Verdict

4.4 **TABLE: Testing in SINGLE FAULT CONDITION – Results** **Form A.1** P

Test subclause	Fault No.	Fault description	Td 4.4.3 (NOTE)	How was test terminated Comments	Meets 4.4.4
4.4.2.2	1.	Y1 capacitor shorted	0:15:0	EUT can work, No hazard.	P
4.4.2.3	2.	The protective conductor shall be interrupted.	0:15:0	EUT can work, No hazard.	P
4.4.2.5 4.4.2.10	3.	The fan stopped	2:0:0	EUT work for a while, then EUT is protected. No hazard. The temperature results see Form A.26A	P
4.4.2.8	4.	Output port, U-V shorted	0:15:0	EUT protected. No hazard.	P
4.4.2.8	5.	Output port, U-W shorted	0:15:0	EUT protected. No hazard.	P
4.4.2.8	6.	Output port, W-V shorted	0:15:0	EUT protected. No hazard.	P
4.4.2.12	7.	Dc power module output was shorted	0:30:0	EUT protected. No hazard.	P
4.4.2.12	8.	L and N at power PCB	0:30:0	EUT can't work, the fuse was open. No hazard.	P

NOTE Td = Test duration in hh:mm:ss
Record dielectric strength test on Form A.18 and temperature tests on Forms A.26A and / or A.26B.
Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

Test data

Clause	Requirement + Test	Result - Remark	Verdict
5.1.3c)	**TABLE: MAINS supply**	**Form A.2**	P

Control power	Marked rating ..... :	AC 100-240 V	
	Phase ..... :	1 Phase	
	Frequency ..... :	50/60 Hz	
	Current ..... :	1 A.	

Test	Voltage	Frequency	Current	Power		Comments
No.	[V]	[Hz]	[A]	[W]	[VA]	
1	100	50	0.863	56.5	—	/
2	240	50	0.404	53.9	—	
3	100	60	0.841	56.0	—	
4	240	60	0.393	53.8	—	

NOTE – Measurements are only required for marked ratings. Initial inrush currents are not regarded.

Supplementary information:

1. Mains power supply circuit provide power for secondary load. In reality, this circuit consumes almost no electrical energy.

Test data			
Clause	Requirement + Test	Result - Remark	Verdict

5.3	TABLE: Durability of markings	Form A.3	P

Marking method (see NOTE)	Agent
1) Adhesive label	A Water
2) Ink printed	B Isopropyl alcohol 70%
3) Laser marked	C (specify agent)
4) Film-coated (plastic foil control panel)	D (specify agent)
5) Imprinted on plastic (moulded in)	E (specify agent)

NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

Marking location	Marking method (see above)
Identification (5.1.2)	1)
MAINS supply (5.1.3)	1)
Fuses (5.1.4)	N/A
Terminals and operating devices (5.1.5.2)	1)
Switches and circuit breakers (5.1.6)	2)
Double/reinforced equipment (5.1.7)	N/A
Field wiring Terminal boxes (5.1.8)	N/A
Warning marking (5.2)	1)
Battery charging (13.2.2)	N/A

Method	Test agent	Remains legible Verdict	Label loose Verdict	Curled edges Verdict	Comments
1)&2)	A, B	P	P	P	clearly legible and adhesive
—	—	—	—	—	—
—	—	—	—	—	—

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6.2	**TABLE: List of ACCESSIBLE parts**	**Form A.4**	P
6.1.2	Exceptions		—
6.2	Determination of ACCESSIBLE parts		—

Item	Description	Determination method (NOTE 5)	Exception under 6.1.2 (NOTE 4)
1.	Plastic enclosure	V (Accessible part)	N/A
2.	Metal enclosure	V (Accessible part)	N/A
3.	Control panel	V (Accessible part)	N/A
4.	Input and output terminals	RJ (only accessible 10 s after interruption of the supply.)	N/A
5.	Internal live parts	V (not accessible part)	N/A

NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified (see 6.2.2)

NOTE 2 – Special consideration should be given to inadequate insulation and high voltage parts (see 6.2)

NOTE 3 – Parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation (see 6.4).

NOTE 4 – Capacitance test may be required (see Form A.5).

NOTE 5 – The determination methods are:
V = visual; R = rigid test finger; J = jointed test finger; P3 = pin 3 mm diameter; P4 = pin 4 mm diameter.

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6	**TABLE: Values in NORMAL CONDITION**	**Form A.5**	P
6.1.2	Exceptions	11.2 Cleaning and decontamination	—
6.3.1	Values in NORMAL CONDITION (see NOTE 1)	11.3 Spillage	—
6.6.2	Terminals for external circuit	11.4 Overflow	—
6.10.3	Plugs and connections		—

Item (see Form A.4)	Voltage			Current				Capacitance		10 s / 5 s test (NOTE)			Comments
	V r.m.s.	V peak	V d.c.	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.	µC	mJ	V	µC	mJ	
1	0	—	—	—	—	—	—	—	—	—	—	—	Between the part and earth
2	0	—	—	—	—	—	—	—	—	—	—	—	Between the part and earth
3	0	—	—	—	—	—	—	—	—	—	—	—	Between the part and earth
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line R and S
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line R and T
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line T and S
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line U and V
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line U and W
4	440	—	—	—	—	—	—	—	—	0	—	—	Between the Line W and V

NOTE – A 10 s test is specified in 6.1.2 a) b). A. 5 s test is specified in 6.10.3. The capacitance level versus voltage below the limits given from figure 3 of IEC 61010-1.

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6.3.2	**TABLE: Values in SINGLE FAULT CONDITION**	**Form A.6**	P

Item (see Form A.4)	Subclause and fault No. (see Form A.1)	Voltage			Transient (see NOTE)		Current				Capacitance	Comments
		V r.m.s.	V peak	V d.c.	V	s	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.	µF (see NOTE)	
2	1	1.3	—	—	—	—	—	—	—	—	—	Between the part and earth
2	2	6.5	—	—	—	—	—	—	—	—	—	Between the part and earth
2	3,4,5,6,7,8	1.3	—	—	—	—	—	—	—	—	—	Between the part and earth

NOTE – Transient voltages must be below the limits given from Figure 2 and the capacitance below the limits from figure 3 of IEC 61010-1.

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6.5.2.2	**TABLE: Cross-sectional area of bonding conductors**	**Form A.7**	N/A

Conductor location	CROSS-SECTIONAL AREA [mm²]	Verdict
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

Supplementary information: None

6.5.2.3	**TABLE: Tightening torque test**	**Form A.8**	P

Conductor location	Size of screw	Tightening torque [Nm]	Verdict
Fixing screw of enclosure	3.93	1.2	P
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information: None

Test data			
Clause	Requirement + Test	Result - Remark	Verdict

6.5.2.4	TABLE: BONDING impedance of plug-connected equipment			Form A.9	N/A
ACCESSIBLE part under test	Test current [A]	Voltage attained after 1 min [V]	Calculated resistance (Maximum 0,1 or 0,2 Ω) [Ω] (NOTE 1)		Verdict
/	/	/	/		/

NOTE 1 – For none-detachable power cord the impedance between protective conductor plug pin of MAINS cord and each ACCESSIBLE part shall not exceed 0,2 Ohm.

Supplementary information:

6.5.2.5	TABLE: Bonding impedance of permanently connected equipment		Form A.10	N/A
ACCESSIBLE part under test	Test current [A]	Voltage attained after 1 min (maximum 10 V) [V]		Verdict
Between the bonding terminal and the further screw	25	0.75		P
—	—	—		—
—	—	—		—

Supplementary information:

1.The protected bonding circuit is for control power supply.

6.5.2.6	TABLE: Transformer PROTECIVE BONDING screen			Form A.11	N/A
ACCESSIBLE part under test	Test current (see NOTE) [A]	Voltage attained after 1 min (maximum 10 V) [V]	Calculated resistance (maximum 0,1 Ω) [Ω]		Verdict
—	—	—	—		—
—	—	—	—		—
—	—	—	—		—

NOTE – Test current must be twice the value of the overcurrent protection means of the winding. Test is specified in 6.5.2.6 a) or b).

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6.5.4	**TABLE: PROTECTIVE IMPEDANCE**	**Form A.12**	N/A

A single component

Component	Location	Measured		Calculated	Rated		Verdict	Comments
		Working voltage [V]	Current [A]	Power dissipation [W]	Working voltage [V]	Power dissipation [W]		
/	/	/	/	/	/	/	/	/

A combination of components

Component	Location	Comments
Y1,Y2	Between L and PE at the power PCB	—
—	—	—
—	—	—

NOTE – A PROTECTIVE IMPEDANCE shall not be a single electronic device that employs electron conduction in a vacuum, gas or semiconductor.

Supplementary information: None

Test data

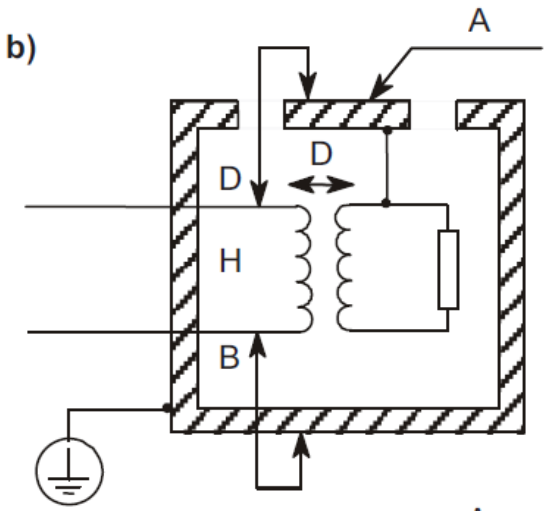
Clause	Requirement + Test	Result - Remark	Verdict
6.5.6	**TABLE: Current- or voltage-limiting device**	**Form A.13**	N/A

Component	Location	Measured		Rated		Verdict	Comments
		Working voltage [V]	Current [A]	Working voltage [V]	Current [A]		
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

Supplementary information:

Test data			
Clause	Requirement + Test	Result - Remark	Verdict

6.7	TABLE: Insulation requirements - Block diagram of system	Form A.14	P



Pollution degree .....: 2	Overvoltage category .....: III / II

Area	Location	Insulation type (NOTE 1)	WORKING VOLTAGE			CLEARANCE (NOTE 3) [mm]	CREEPAGE DISTANCE (NOTE 3)				Test voltage (NOTE 2) [V]	Comments (NOTE 3)
			RMS [V]	Peak [V]	Freq. [Hz]		PWB [mm]	CTI	Other [mm]	CTI		
At input terminal	R/S/T to metal enclosure	BI	240	339	50/60	3.0	—	—	3.0	—	—	overvoltage category III
At output terminal	U/V/W to metal enclosure	BI	240	339	50/60	3.0	—	—	3.0	—	—	overvoltage category III
At controller	Live parts to PE	BI	240	339	50/60	1.5	—	—	1.5	—	—	overvoltage category II
	Live parts to SELV	RI	240	339	50/60	3.0	—	—	3.0	—	—	overvoltage category II
	Live parts to accessible surface	RI	240	339	50/60	3.0	—	—	4.88	III b	—	overvoltage category II

NOTE 1 – Type of insulation:
BI = BASIC INSULATION
DI = DOUBLE INSULATION
PI = PROTECTIVE IMPEDANCE
RI = Reinforced INSULATION
SI = Supplementary INSULATION

NOTE 2 - Types of voltage
Peak impulse test voltage (pulse)
r.m.s.
d.c.
peak

NOTE 3 - OVERVOLTAGE CATEGORIES or POLLUTION DEGREES which differ should be shown under "Comments"

see also Form A.15 for further details

Supplementary Information:

1.Mains power circuit belongs to overvoltage category III.

2.Control power circuit belongs to overvoltage category II.

Test data

Clause	Requirement + Test	Result - Remark	Verdict

6.7	**TABLE: Insulation requirements - CLEARANCES and CREEPAGES**		**Form A.15**	P
6.2.2	Examination	6.5.4	Protective impedance	—
6.4.2	ENCLOSURES and protective barriers	6.5.6	Current- or voltage-limiting device	—
6.4.4	Impedance	9.6.1	BASIC INSULATION between opposite polarity	—

Area	Location (See Form A.14)	Insulation type (NOTE 1)	WORKING VOLTAGE (NOTE 2)			CLEARANCE		CREEPAGE DISTANCE		CTI	Verdict	Comments
			RMS [V]	Peak [V]	Frequency [Hz]	Required [mm]	Measured [mm]	Required [mm]	Measured [mm]			
At input terminal	R/S/T to metal enclosure	BI	240	339	50/60	3.0	28	3.0	>28	/	P	overvoltage category III
At output terminal	U/V/W to metal enclosure	BI	240	339	50/60	3.0	25	3.0	>25	/	P	overvoltage category III
At controller	Live parts to PE	BI	240	339	50/60	1.5	4.5	1.5	4.5	/	P	overvoltage category II
	Live parts to SELV	RI	240	339	50/60	3.0	10	3.0	10	/	P	overvoltage category II
	Live parts to accessible surface	RI	240	339	50/60	3.0	25	4.88	25	III b	P	overvoltage category II

NOTE 1 – refer to Form A.14 for type of insulation shown in the insulation diagram NOTE 2 - to be used for definition of required insulation (see Form A.14)

Supplementary information:

1.Mains power circuit belongs to overvoltage category III, AC 260~440V, 3L+PE, 50/60 Hz, 500A.

2.Control power circuit belongs to overvoltage category II, AC 100~240V, 50/60 Hz, 1A.

Test data

Clause	Requirement + Test	Result - Remark	Verdict
6.7	**TABLE: Insulation requirements - CLEARANCES and CREEPAGES**	**Form A.16**	P

6.4.2	ENCLOSURES or PROTECTIVE BARRIERS	9.6.1	Overcurrent protection basic insulation between MAINS parts	—
8	Mechanical resistance to shock and impact	10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES	—

Area	Location (See Form A.14)	Insulation type	Mechanical tests (NOTE)					Test at max.	Measured after test (if required)		Verdict	Comments
			Applied force	Rigidity (8.2)		Drop (8.3)		RATED ambient	CLEARANCE	CREEPAGE DISTANCE		
			[N]	Static (8.2.1)	Impact (8.2.2)	Normal (8.3.1)	Hand-held/ Plug-in	(10.5.1)	[mm]	[mm]		
At input terminal	R/S/T to metal enclosure	BI	30	/	1000 mm	100 mm	—	40℃	28	>28	P	No
At output terminal	U/V/W to metal enclosure	BI	30	/	1000 mm	100 mm	—	40℃	25	>25	P	No
At DC power module	Live parts to PE	BI	30	/	1000 mm	100 mm	—	40℃	4.5	4.5	P	No
	Live parts to SELV	RI	30	/	1000 mm	100 mm	—	40℃	10	10	P	No
	Live parts to accessible surface	RI	30	/	1000 mm	100 mm	—	40℃	25	25	P	No

NOTE – Refer to Form A.18 for dielectric strength tests following the above tests.

Supplementary information: None

Test Data			
Clause	Requirement + Test	Result - Remark	Verdict
6.7.2.2.2	**TABLE: Reliability of potted components**	**Form A.17 (optional)**	N/A
14.1 b)	**Components and subassemblies**		N/A

Temperature Cycling Test

Manufacturer.....:	—
Type.....:	—
Construction.....:	—
Potting compound.....:	—
CREEPAGE DISTANCES measured.....:	—
CLEARANCES measured.....:	—
Thickness through insulation.....:	—
Adhesive test Pass/Fail .....:	—
Test temperature T °C .....:	—

Cycles at U= AC 500 V				Leakage current (at AC 500 V) mA			
Number of cycles	Date			68 h / 125 °C	1 h / 25 °C	2 h / 0 °C	1 h / 25 °C
1. Cycle from	—	to	—	—	—	—	—
2. Cycle from	—	to	—	—	—	—	—
3. Cycle from	—	to	—	—	—	—	—
4. Cycle from	—	to	—	—	—	—	—
5. Cycle from	—	to	—	—	—	—	—
6. Cycle from	—	to	—	—	—	—	—
7. Cycle from	—	to	—	—	—	—	—
8. Cycle from	—	to	—	—	—	—	—
9. Cycle from	—	to	—	—	—	—	—
10. Cycle from	—	to	—	—	—	—	—

After Cycling Test :

Humidity conditioning	48 h	—
Requirements for dielectric strength (s. insulation diagram)	Test voltage V r.m.s.	Verdict
Basic insulation _____ V r.m.s.	—	—
Supplementary insulation _____ V r.m.s.	—	—
Reinforced insulation _____ V r.m.s.	—	—

NOTE - to be used for evaluation of components containing insulation through solid insulation, when the component standard require thermal cycling test. Ref Clause 14.1 and Figure 15, option b)

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
6.8	**TABLE: Dielectric strength tests**	**Form A.18**	P
4.4.4.1 b)	Conformity after application of SINGLE FAULT CONDITIONS[1]		P
6.4	Primary means of protection[2]		P
6.6	Connections to external circuits		P
6.7	Insulation requirements[2] (see Annex K)		P
6.10.2	Fitting of non-detachable MAINS supply cords[1]		N/A
9.2 a) 2)	Eliminating or reducing the sources of ignition within the equipment		N/A
9.4 c)	Limited-energy circuit		N/A
9.6.1	Overcurrent protection basic insulation between MAINS - parts		N/A

Location or references from Forms A.1 and A.14	Clause or sub-clause	Humidity	Working voltage	Test voltage	Comments (NOTE)	Verdict
		Yes/No	[r.m.s./d.c.]	[r.m.s./peak/d.c.]		
Input/output terminal to PE	6.7 & 6.7 & 6.4	Yes	240V rms	2100Vrms/5s	No flashover	P
Input/output terminal to PE	6.7 & 6.7 & 6.4	Yes	240V rms	1500Vrms/60s	No flashover	P
L/N to controller enclosure	6.7 & 6.7 & 6.4 & 4.4.4.1 b)	Yes	240V rms	3000Vrms/60s	No flashover	P
L/N to controller screen		Yes	240V rms	3000Vrms/60s	No flashover	P
L/N to PE		Yes	240V rms	1500Vrms/60s	No flashover	P

[1] Record the fault, test or treatment applied before the dielectric strength test. [2] Humidity preconditioning required.

NOTE: Test duration may be recorded.

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
6.10.2	**TABLE: Cord anchorage**	**Form A.19**	N/A

Location	Mass [kg]	Pull [N]	Verdict	Torque [Nm]	Verdict	Comment
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—

Dielectric strength test for 1 min. (6.8.3.1)..... :	—	V r.m.s.	—

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
7.	**TABLE: Protection against mechanical HAZARDS**	**Form A.20**	N/A
7.3.4	Limitation of force and pressure		—
7.3.5	Gap limitations between moving parts		—

Part / Location	Clause 7.3.4		Clause 7.3.5.1								Clause 7.3.5.2			Verdict	Comments
	Continuous	Temporary	Minimum gaps [mm]								Maximum gaps [mm]				
	Contact pressure max. 50 N /cm² @ max. 150 N	max. 250 N / 3 cm² @ max. 0,75 s	Torso 500	Head 300	Leg 180	Foot 120	Toes 50	Arm 120	Hand 100	Finger 25	Head 120	Foot 35	Finger 4		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Supplementary information:

Test data

Clause	Requirement + Test	Result - Remark	Verdict
7.4	**TABLE: Stability**	**Form A.20A**	N/A
	Equipment height / mass ..... :	/ mm / kg	/
	Equipment (Containers) loaded ..... :	[~~yes~~ / no]	N/A
	Castors at unfavourable position ..... :	[~~yes~~ / no]	N/A
	Doors, drawers and movable arms closed ..... :	[~~yes~~ / no]	N/A
	Doors and drawers at unfavourable position ..... :	[~~yes~~ / no]	N/A

Location	Tilt angle	Applied force				Comments	Verdict
	10°	250 N	20% [N]	800 N	4 times load [N]		
Front side	/	/	/	—	—	—	/
Left side	/	/	/	—	—	—	/
Rear side	/	/	/	—	—	—	/
Right side	/	/	/	—	—	—	/
Top side	/	/	/		—	—	/
Working surface	—	—	—	/	—	—	/
Ledge	—	—	—	/	—	—	/
Castor / support foot	—	—	—	—	/	—	/
Castor / support foot removed	—	—	—	—	/	—	N/A

Supplementary information: None

7.6	**TABLE: Wall mounting**	**Form A.20B**	N/A
	Equipment weight .....:	kg	—
	Equipment mounted as specified by manufacturer ..:	[yes / no]	—
	Equipment mounted at plasterboard (drywall).....:	[yes / no]	—
	More than one fastener used.....:	[yes / no]	—
	Test maintained (after 5 s to 10 s to full load) .....:	1 min	—

Location	Applied weight		Comments	Verdict
	4 times weight [kg]	2 times weight [kg]		
/	/	/	/	/

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
8.2	**TABLE: ENCLOSURE rigidity test**	**Form A.21A**	P
8.2.1	Static test		P
	Material of enclosure .....:	Metal and non-metallic	—
	Preparation for the test .....:	Secured against test bench support	—
	Operated at ambient temperature .....:	40 °C 2 h	—

Location	Comments	Verdict
Front side	30 N	P
Left side	30 N	P
Rear side	30 N	P
Right side	30 N	P
Top side	30 N	P

Supplementary information: None

8.2.2	TABLE: Impact test		P
	Material of enclosure .....:	Metal and non-metallic	—
	Corresponding IK-code.....:	IK 08	—
	Preparation for the test:	Secured against test bench support	—
	Cooled to (temperature) .....:	40 °C	—

Location	Comments	Verdict
1) Top	500 g ± 25 g, 1000 mm	P
2) Side left / right	500 g ± 25 g, 1000 mm	P
3) Bottom	500 g ± 25 g, 1000 mm	P

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
8.3	**TABLE: Drop test**	**Form A.21B**	N/A
8.3.1	Other equipment		/

Location	Raised up to [mm]	Raised up to 30 °	Comments	—
1) Top	/	/	/	/
2) Side left / right	/	/	/	/
3) Bottom	/	/	/	/

Supplementary information: None

8.3.2	HAND-HELD EQUIPMENT and DIRECT PLUG-IN EQUIPMENT		N/A
	Material of enclosure .....:	Metal / non-metallic	—
	Preparation for the test:		—
	Cooled to (temperature) .....:	°C	—

Location	Comments	Verdict
1) Side	/	/
2) Edge	/	/
3) Corner	/	/

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
9	**TABLE: Protection against the spread of fire**	**Form A.22**	P

Item	Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.)	Protection Method (9.1 a, b or c)	Protection details	Verdict
01	Circuit	9.1 c)	Metal enclosure	P
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
9.3.2	**TABLE: Constructional requirements**	**Form A.23**	N/A
14.7	Printed wiring boards		N/A

Material tested ..... :	—	—
Generic name ..... :	—	—
Material manufacturer ..... :	—	—
Type ..... :	—	—
Colour ..... :	—	—
Conditioning details ..... :	—	—

		Sample					
		1	2	3	4	5	6
Thickness of specimen	mm	—	—	—	—	—	—
Duration of flaming after first Application	s	—	—	—	—	—	—
Duration of flaming plus glowing After second application	s	—	—	—	—	—	—
Specimen burns to holding clamp	Yes/No	—	—	—	—	—	—
Cotton ignited	Yes/No	—	—	—	—	—	—
Sample result	Pass/Fail	—	—	—	—	—	—

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
9.4	**TABLE: Limited-energy circuit**	**Form A.24**	N/A

Item or Location (see Form A.22)	9.4 a)	9.4 b) Current limitation (NOTE)		9.4 c)	Decision Yes/No	Comments
	Maximum potential in circuit voltage r.m.s./d.c. [V]	Maximum available current [A]	Overload protection after 120 s [A]	Circuit separation		
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—

NOTE – Maximum values see Tables 17 and 18 of IEC 61010-1

Supplementary information: None

Test Data			
Clause	Requirement + Test	Result - Remark	Verdict

9.5	**TABLE: Requirements for equipment containing or using flammable liquids**	**Form A.25**	N/A

Type of liquid	9.5 Flammable liquids		Verdict
	b) Quantity	c) Containment	
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
10.	**TABLE: Temperature Measurements**	**Form A.26A**	P
10.1	Surface temperature limits – NORMAL CONDITION		P
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION		N/A
10.3	Other temperature measurements		P

Operating conditions: Tests conducted under reference test conditions and manufacturer's instructions

Mains power: AC 440V, 50 Hz	Test room ambient temperature (ta) ...: 23.8 °C
Control power: AC 90V, 50 Hz	Test duration .....: 2 h 00 min

Part / Location	t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
1）. DC power module	45.5	61.7	85	P	Normal working
2）. Internal wire	38.6	54.8	125	P	Normal working
3）. Terminal of controller	50.2	66.4	85	P	Normal working
4）. X capacitor of controller	45.3	61.5	105	P	Normal working
5）. Y capacitor of controller	46.2	62.4	85	P	Normal working
6）. AC-DC module of controller	47.3	63.5	85	P	Normal working
7）. PCB of controller	52.3	68.5	130	P	Normal working
8）. Fan enclosure	58.7	74.9	85	P	Normal working
9）. Metal enclosure	40.1	56.3	65	P	Normal working
10）. Display screen	32.3	48.5	85	P	Normal working

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ **40 °C** or max. RATED ambient)
t_{max} = maximum permitted temperature

NOTE 2 - see also 14.1 with reference to component operating conditions

NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

NOTE 4 - see Form A.26B for details of winding temperature measurements

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
10.	**TABLE: Temperature Measurements**	**Form A.26A**	P
10.1	Surface temperature limits – NORMAL CONDITION		P
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION		N/A
10.3	Other temperature measurements		P

Operating conditions: Tests conducted under reference test conditions and manufacturer's instructions

Mains power: AC 440V, 50 Hz	Test room ambient temperature (ta) ...: 23.8 °C
Control power: AC 264V, 50 Hz	Test duration .....: 2 h 00 min

Part / Location	t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
1）. DC power module	45.7	61.9	85	P	Normal working
2）. Internal wire	38.8	55.0	125	P	Normal working
3）. Terminal of controller	50.5	66.7	85	P	Normal working
4）. X capacitor of controller	45.5	61.7	105	P	Normal working
5）. Y capacitor of controller	46.5	62.7	85	P	Normal working
6）. AC-DC module of controller	47.5	63.7	85	P	Normal working
7）. PCB of controller	52.6	68.8	130	P	Normal working
8）. Fan enclosure	59.0	75.2	85	P	Normal working
9）. Metal enclosure	40.3	56.5	65	P	Normal working
10）. Display screen	32.5	48.7	85	P	Normal working

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ **40 °C** or max. RATED ambient)
t_{max} = maximum permitted temperature

NOTE 2 - see also 14.1 with reference to component operating conditions

NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

NOTE 4 - see Form A.26B for details of winding temperature measurements

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
10.	**TABLE: Temperature Measurements**	**Form A.26A**	P
10.1	Surface temperature limits –SINGLE FAULT CONDITION		P
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION		N/A
10.3	Other temperature measurements		P

Operating conditions: Tests conducted under reference test conditions and manufacturer's instructions. The fan motor is stopped.

Mains power: AC 440V, 50 Hz	Test room ambient temperature (ta) ...: 23.8 °C
Control power: AC 2640V, 50 Hz	Test duration .....: 2 h 00 min

Part / Location	t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
1）. Fan enclosure	65.2	81.4	105	P	EUT work for a while, then EUT is protected. No hazard.
2）. Metal enclosure	50.2	66.4	105	P	
3）. Display screen	35.2	51.4	105	P	

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ **40 °C** or max. RATED ambient)
t_{max} = maximum permitted temperature

NOTE 2 - see also 14.1 with reference to component operating conditions

NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

NOTE 4 - see Form A.26B for details of winding temperature measurements

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
10.2	**TABLE: Temperature of windings** **Form A.26B** **Resistance method Temperature Measurements**		N/A
4.4.2.7	MAINS transformers		N/A
14.2.1	Motor temperatures		N/A

Operating conditions..:

Frequency.....: Hz | Test room ambient temperature (ta1/ta2) : / °C (initial / final)

Voltage.....: V | Test duration.....: h min

Part / Designation	Rcold [Ω]	Rwarm [Ω]	Current [A]	t_r [K]	t_c [°C]	t_{max} [°C]	Verdict	Comments
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

NOTE 1- R_{cold} = initial resistance; R_{warm} = final resistance
t_r = temperature rise; t_c = t_r corrected (t_c= t_r + [40 °C or max RATED ambient])
t_{max} = maximum permitted temperature

NOTE 2 - Indicate insulation class (IEC 60085) under comments (optional)

NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

Supplementary information: None

Test Data			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.2	**TABLE: Resistance to heat of non-metallic ENCLOSURES** **Form A.27**		P
	Test method used:	10.5.2 a)	—
	Non-operative treatment .....:	[ ]	N/A
	Empty ENCLOSURE .....:	[ ]	N/A
	Operative treatment .....:	[An operative treatment]	P
	Temperature during tests .....:	23.5~24.5°C	—

Description	Material	Comments	Verdict
Enclosure of controller	Plastic	meet the pass criteria of 8.1.	P
Dielectric strength test (6.8) .....:		3000 V [r.m.s./peak/d.c.]	P

NOTE – Within 10 minutes of the end of treatment suitable tests in acc. to 8.2 and 8.3 must be conducted and pass criteria of 8.1.

Supplementary information: None

10.5.3	**TABLE: Insulating material** **Form A.28**		P
10.5.3 1)	Ball-pressure test		P
	Max. allowed impression diameter .....:	2 mm	—

Part	Test temperature [°C]	Impression diameter [mm]	Verdict
Terminal	125.0	0.85	P

Supplementary information: None

10.5.3 2)	**Vicat softening test (ISO 306)** **Form A.29**		N/A

Part	Vicat softening temperature [°C]	Thickness of sample [mm]	Verdict
—	—	—	—

Supplementary information: None

Test Data

Clause	Requirement + Test	Result - Remark	Verdict
8	**TABLE: Mechanical resistance to shock and impact**	**Form A.30**	P
11	**Protection against HAZARDS from fluids and solid foreign objects**		N/A

Voltage tests can be carried out once after performing the tests of clause **8** and clause **11**. However, if voltage tests are carried out separately after each set of tests, two forms can be used.

	Clause 8 tests				Clause 11 tests							
Location (see Form A.14)	Static (8.2.1) 30 N	Impact (8.2.2)	Normal (8.3.1)	Handheld Plug-in (8.3.2)	Cleaning (11.2)	Spillage (11.3)	Overflow (11.4)	IEC 60529 (11.6)	Working voltage [r.m.s./d.c.]	Test voltage [r.m.s./peak/d.c.]	Verdict	Comments
Input/output terminal to PE	√	√	N/A	N/A	√	N/A	N/A	N/A	240	2100Vrms/5s	P	/
Input/output terminal to PE	√	√	N/A	N/A	√	N/A	N/A	N/A	240	1500Vrms/60s	P	/
L/N to controller enclosure	√	√	N/A	N/A	√	N/A	N/A	N/A	240	3000Vrms/60s	P	/
L/N to controller screen	√	√	N/A	N/A	√	N/A	N/A	N/A	240	3000Vrms/60s	P	/
L/N to PE	√	√	N/A	N/A	√	N/A	N/A	N/A	240	1500Vrms/60s	P	/

NOTE – Use r.m.s., d.c. or peak to indicate the used test voltage.

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
11.7.2	**TABLE: Leakage and rupture at high pressure**	**Form A.31**	N/A

Part	Maximum permissible working pressure [MPa]	Test pressure [MPa]	Leakage Yes / No	Deformation Yes / No	Burst Yes / No	Comments
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—

NOTE – see also Annex G with requirements for USA and Canada.

Supplementary information: None

11.7.2	TABLE: Leakage and rupture at high pressure	Form A.31	N/A

Part	Test pressure [MPa]	Leakage Yes / No	Comments
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
12.2.1	**TABLE: Ionizing radiation**	**Form A.33**	N/A
12.2.1.2	Equipment intended to emit radiation		N/A

Locations tested	Measured values [µSv/h]	Verdict	Comments
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information: None

12.2.1.3	**Equipment not intended to emit radiation**	**Form A.34**	N/A
	Max. allowed effective dose rate at 100 mm……:	1 µSv/h	—

Locations tested	Measured values [µSv/h]	Verdict	Comments
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
12.5.1	**TABLE: Sound level**	**Form A.35**	N/A

Locations tested	Measured maximum sound pressure level dB(A)	Calculated maximum sound power level
At operator's normal position and at bystanders' positions	—	—
a)	—	—
b)	—	—
c)	—	—
d)	—	—
e)	—	—
f)	—	—

Supplementary information: None

12.5.2	**TABLE: Ultrasonic pressure**	**Form A.36**	N/A

Locations tested	Measured values		Comments
	[dB]	[kHz]	
At operator's normal position	—	—	—
At 1 m from the ENCLOSURE	—	—	—
a)	—	—	—
b)	—	—	—
c)	—	—	—
d)	—	—	—
e)	—	—	—

NOTE – No limit is specified at present, but a limit of 110 dB above the reference pressure value of 20 μPa is under consideration for applicable frequencies between 20 kHz and 100 kHz.

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
13.2.2	**TABLE: Batteries and battery charging**	**Form A.37**	N/A
	Battery load and charging circuit diagram:		—

	Battery type.....:		—
	Battery manufacturer/model/catalogue No. .....:		—
	Battery ratings.....:		—
	Reverse polarity instalment test		

Single component failures	Verdict	
Component	Open circuit	Short circuit
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

Supplementary information: None

Test data			
Clause	Requirement + Test	Result - Remark	Verdict
14.3	**TABLE: Overtemperature protection devices**	**Form A.38**	N/A

Reliability test

Component	Type (NOTE)	Verdict	Comments
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

NOTE:
NSR = non-self-resetting (10 times)
NR = non-resetting (1 time)
SR = self-resetting (200 times)

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
4.4.2.7	**TABLE: MAINS transformer**	**Form A.39**	N/A
4.4.2.7.2	Short circuit		N/A
14.6	MAINS transformers tested outside equipment		N/A
Type ..... :			—
Manufacturer ..... :			—
Test in equipment			N/A
Test on bench			N/A
Test repeated inside equipment (see 14.6)			N/A
Optional – Insulation class (IEC 60085) of the lowest rated winding ..... :			—

Winding identification	—	—	—	—
Type of Protector for winding (NOTE 1)	—	—	—	—
Elapsed time	—	—	—	—
Current, A primary	—	—	—	—
secondary	—	—	—	—
Winding temperature, °C primary	—	—	—	—
(see NOTE 2) secondary	—	—	—	—
Tissue paper / cheesecloth OK ? (Pass / Fail)	—	—	—	—
Voltage tests (see NOTE 3)	—	—	—	—
Primary to secondary _____ V ____				
Primary to core _____ V ____	—	—	—	—
Secondary to secondary _____ V ____	—	—	—	—
Secondary to core _____ V ____	—	—	—	—
Verdict	N/A	N/A	N/A	N/A

NOTE 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

NOTE 2: Indicate method of measurement
- TC = with thermocouple
- R = resistance method
If resistance method is used, record resistance in cold and warm condition in Form A.26B.

NOTE 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
4.4.2.7	**TABLE: MAINS transformer**	**Form A.40**	N/A
4.4.2.7.3	Overload tests (for MAINS transformers)		N/A
14.6	MAINS transformers tested outside equipment		N/A
Type			—
Manufacturer			—
Test in equipment			N/A
Test on bench			N/A
Test repeated inside equipment (see 14.6)			N/A
Optional – Insulation class (IEC 60085) of the lowest rated winding ..... :			—

Winding identification				—	—	—	—
Type of Protector for winding (NOTE 1)				—	—	—	—
Elapsed time				—	—	—	—
Current, A primary				—	—	—	—
secondary				—	—	—	—
Winding temperature, °C primary				—	—	—	—
(see NOTE 2) secondary				—	—	—	—
Tissue paper / cheesecloth OK ? (Pass / Fail)				—	—	—	—
Voltage tests (see NOTE 3)				—	—	—	—
Primary to secondary	_____	V	____				
Primary to core	_____	V	____	—	—	—	—
Secondary to secondary	_____	V	____	—	—	—	—
Secondary to core	_____	V	____	—	—	—	—
Verdict				N/A	N/A	N/A	N/A

NOTE 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

NOTE 2: Indicate method of measurement — TC = with thermocouple; R = resistance method
If resistance method is used, record resistance in cold and warm condition in Form A.26B.

NOTE 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information: None

Test data

Clause	Requirement + Test	Result - Remark	Verdict
14.8	**TABLE: Circuits used to limit TRANSIENT OVERVOLTAGES**	**Form A.41**	N/A

Circuit / Designation	Overvoltage Category	MAINS voltage [V r.m.s.]	Test voltage [V]	t_m [°C]	t_c [°C]	t_{max} [°C]	Ignited Yes / No	Safely suppressed Yes / No	Properly functional Yes / No	Verdict	Comments
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—

Test room ambient temperature: °C

NOTE - t_m = measured temperature

t_c = t_m corrected (t_m–t_a+ **40 °C** or max. RATED ambient)

t_{max} = maximum permitted temperature

Conformity is checked by applying 5 positive and 5 negative impulses with the applicable impulse withstand voltage, spaced up to 1 min apart, from a hybrid impulse generator (see IEC 61180-1).

Supplementary information: None

Test data			
Clause	Requirement + Test	Result - Remark	Verdict
Annex H	**TABLE: Qualification of conformal coating for protection against pollution** **Form A.42**		N/A

Technical properties		
Manufacturer ..... :		—
Type ..... :		—
Meet requirements of ANSI / UL 746E ..... :	[yes / no]	N/A
Manufacturer declaration of coating material :	[yes / no]	N/A
Operating temperature of coating ..... :	[ ] °C	N/A
Comparative tracking index (CTI) ..... :	[ ]	N/A
Insulation resistance ..... :	[ ] MΩ	N/A
Dielectric strength ..... :	[ ] V	N/A
UV resistance (if required) ..... :	[yes / no]	N/A
Flammability rating ..... :		N/A
Preparation of the test specimens conducted :	[yes / no]	N/A

Item	Test conditioning	Parameter	Td	Samples						Verdict	Comments
			h	1	2	3	4	5	6		
1	Cold		24	—	—	—	—	—	—	—	—
2	Dry heat		48	—	—	—	—	—	—	—	—
3	Rapid temp. change			—	—	—	—	—	—	—	—
4	Damp heat		24	—	—	—	—	—	—	—	—
5	Adhesion of coating	5 N		—	—	—	—	—	—	—	—
	Visual inspection			—	—	—	—	—	—	—	—
6	Humidity		48	—	—	—	—	—	—	—	—
7	Insulation resistance	≥ 100 MΩ		—	—	—	—	—	—	—	—
	Visual inspection			—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—

NOTE Td = Test duration time

Supplementary information:

Test data			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Additional or special tests conducted	Form A.43	N/A
Clause and name of test	Test type and condition	Observed results	—
—	—	—	—
—	—	—	—
—	—	—

Test data

Clause	Requirement + Test	Result - Remark	Verdict
	TABLE 1.A: List of components and circuits relied on for safety		P

Unique component reference or location	Application/function	Manufacturer / trademark (NOTE 1)	Type / model	Technical data (NOTE 2)	Standard	Mark(s) of conformity evidence of acceptance (NOTE 3 and 4)
/	Switch power unit	Haerbin Honghai Science and Technology Development Co., Ltd	MDD60-12	In: AC 176~264V Out: DC 12V, 5.6A	EN 62368-1:2014 +A11:2017	CE
/	AC-DC module	Guangzhou Gaoya Information Technology Co., Ltd	AP12N12-Zero	Input: 100~240Vac, 50/60 Hz Output: 5~28Vdc, 10~12 W	EN 62368-1:2014 +A11:2017	CE
/	Current transformer	Qinhuangdao Dechang Electric Co., Ltd	TA1020	800A, 0.2A	EN IEC 61326-1:2021 EN IEC 61326-2-1:2021	CE
/	Ordinary thyristor	Tech Semiconductors Co., Ltd	Y40KPE	$I_{T(AV)}$=800A V_{DRM}/V_{RPM}=1400V	/	/
/	EMC Filter	Chengdu Hongming Electronics Co., Ltd	JLC6301	250V, 35A	/	/
/	EMC Filter	Chengdu Hongming Electronics Co., Ltd	HMKD-100000W-380AC-3X	260～440VAC，50/60Hz， 500A	/	/

NOTE → 1 List all different manufacturers of the above components
→ 2 May include electrical, mechanical values
→ 3 List licence no or method of acceptance
→ 4 asterisk indicates mark assuring agreed level of surveillance

EUT Photographs

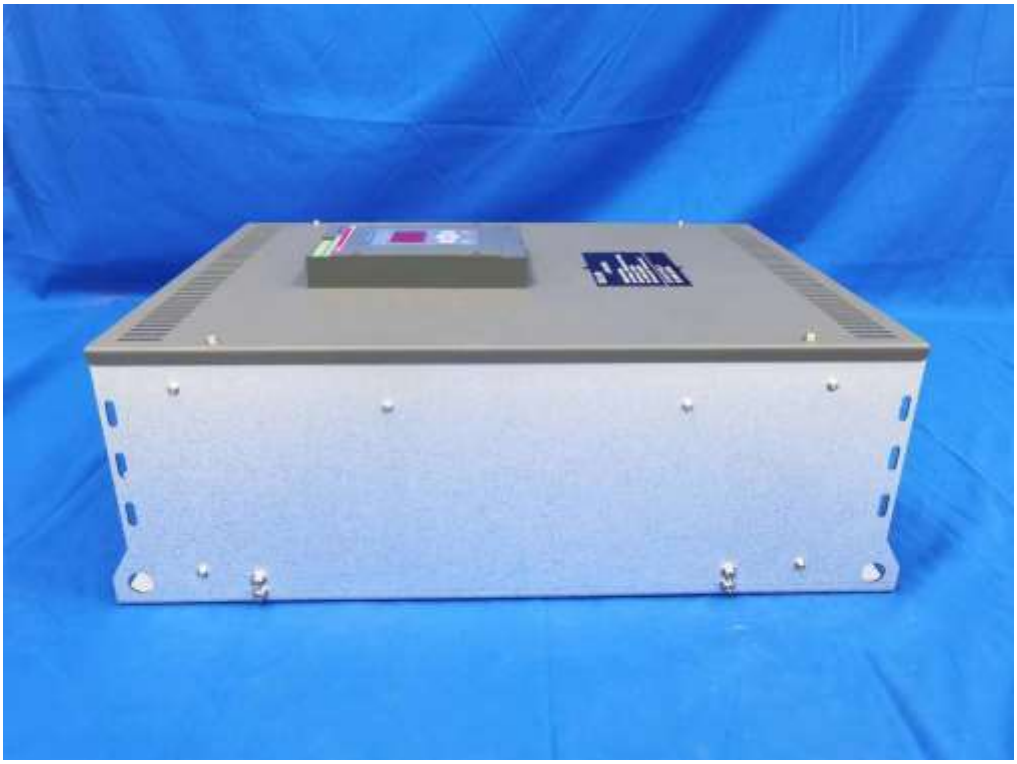
Photograph 1: the view 1 of EUT



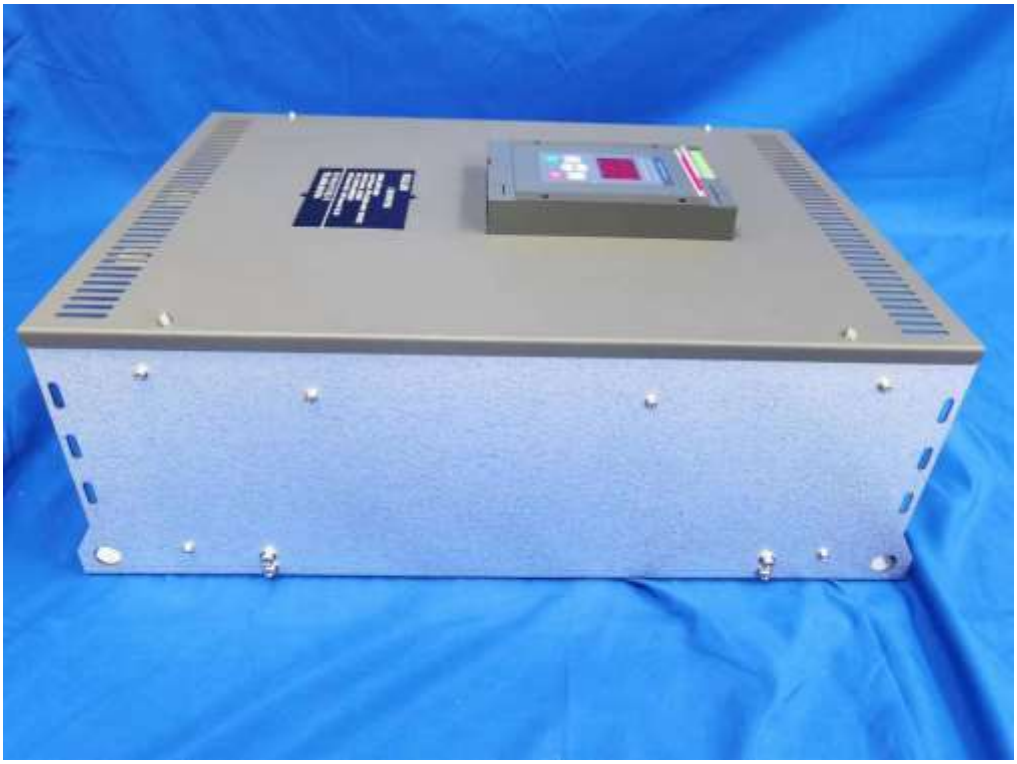
Photograph 2: the view 2 of EUT



Photograph 3: the view 3 of EUT



Photograph 4: the view 4 of EUT



Photograph 5: the view 5 of EUT



Photograph 6: the internal view 6 of EUT



*****END OF THE REPORT*****