



TEST REPORT
IEC 61010-1
Safety requirements for electrical equipment for measurement,
control, and laboratory use
Part 1: General requirements

Report Number.: 48.420.23.1520.02

Date of issue: 2025-09-04

Total number of pages.....: 91

Name of Testing Laboratory: TÜV SÜD Certification and Testing (China) Co., Ltd.
preparing the Report.....: Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan
Economic and Technological Development Zone, Wuxi, Jiangsu
214100, P.R China

Applicant's name.....: Beijing HollySys Intelligent Technologie Co., Ltd

Address: No.2 Disheng Middle Road Beijing Economic-Technological
Development Area 100176 Beijing PEOPLE'S REPUBLIC OF
CHINA

Test specification:

Standard: IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016

Test procedure: N/A

Non-standard test method: N/A

TRF template used: IECEE OD-2020-F1:2020, Ed.1.3

Test Report Form No......: IEC61010_1P

Test Report Form(s) Originator: VDE Prüf- und Zertifizierungsinstitut GmbH

Master TRF: 2021-04-12

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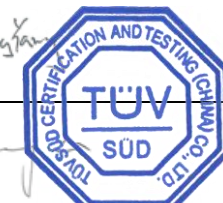
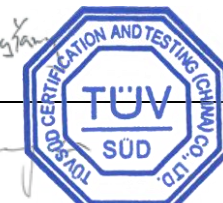
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General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description..... :	LX Control System	
Trade Mark..... :		
Manufacturer	Beijing HollySys Intelligent Technologie Co., Ltd No.2 Disheng Middle Road Beijing Economic-Technological Development Area 100176 Beijing PEOPLE'S REPUBLIC OF CHINA	
Model/Type reference	LX	
Ratings	100-240V~, 50/60Hz, 0.5A	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☐ Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd.	
Testing location/ address	Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu 214100, P.R China	
Tested by (name, function, signature)..... :	Yang YANG (Project Handler)	 
Approved by (name, function, signature) .. :	Laining LI (Project Reviewer)	 
Testing procedure: CTF Stage 1:		
Testing location/ address		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature) .. :		
Testing procedure: CTF Stage 2:		
Testing location/ address		
Tested by (name + signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
Testing procedure: CTF Stage 3:		
Testing procedure: CTF Stage 4:		
Testing location/ address		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment)		
Document No.	Documents included / attached to this report (description)	Page No.
1	Report of EN IEC 61010-2-201: 2018	29

Documents referenced by this report (available on request):		
Document Name or No.	Documents description	Page No.
N/A		

Summary of testing:

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

Clause	Comment
Complete tests.	The test results comply with the requirements.

Test Report History: This report may consist of more than one report and is only valid with additional or previous issued reports:	
Report Ref. No.	Item
N/A	
Tests performed (name of test and test clause): Complete tests. The test results comply with the requirements.	Testing location: TÜV SÜD Certification and Testing (China) Co., Ltd. Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu 214100, P.R China
Summary of compliance with National Differences (List of countries addressed): EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES The deviations between EN 61010-1:2010+A1:2019 and IEC 61010-1:2010+AMD1:2016 were taken into consideration additionally and included at the end of this report.	
☒ The product fulfils the requirements of EN 61010-1:2010+A1:2019.	
Statement concerning the uncertainty of the measurement systems used for the tests (may be required by the product standard or client)	
☐ Internal procedure used for type testing through which traceability of the measuring uncertainty has been established: Procedure number, issue date and title: Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.	
☒ Statement not required by the standard used for type testing (Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)	

Copy of marking plate:

	LX Control System	
	Type:LX	CE
Rated Input	100-240VAC ;50/60Hz;0.5A	
Manufacturer Name	Beijing HollySys Intelligent Technologies Co.,Ltd	
Manufacturer Address	No.2 Disheng Middle Road Beijing Economic-Technological Development Area 100176 Beijing P.R China	

Test item particulars:	
Type of item	Laboratory
Description of equipment function.....	PLC
Connection to MAINS supply	Permanent connection
Overvoltage category	II
POLLUTION DEGREE.....	2
Means of protection	Class I
Environmental conditions	Normal
For use in wet locations	No
Equipment mobility.....	Stationary
Operating conditions	Continuous
Overall size of equipment (W x D x H).....	approximately 520mm*400mm*240mm
Mass of equipment (kg).....	19.47kg
Marked degree of protection to IEC 60529	IPX0(After install)
Possible test case verdicts:	
- Test case does not apply to the test object	N/A (Not Applicable)
- Test object does meet the requirement.....	P (Pass)
- Test object does not meet the requirement	F (Fail)
Testing:	
Date of receipt of test item.....	2023-06-25; 2024-04-03; 2025-08-20
Date (s) of performance of tests	2023-06-25 to 2023-07-06; 2024-04-03-2024-04-19; 2025-09-04
General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory. "(see ENCLOSURE #)" refers to additional information appended to the report. "(see Form A.xx)" refers to a Table appended to the report. Bottom lines for measurement Tables Forms A.xx are optional if used as record.	
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Remark 1:	
Report No. 48.420.23.1520.01 replaced the previous version 48.420.23.1520.00 issued on 2023-07-20 due to modifications listed below: -Add alternate secondary cards.	
Remark 1:	
Report No. 48.420.23.1520.02 replaced the previous version 48.420.23.1520.00 issued on 2024-10-21 due to modifications listed below: -Add alternate secondary cards.	

Manufacturer's Declaration per sub-clause 4.2.5 of IEC60060-02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :

☐ **Yes**
☒ **Not applicable**

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

Name and address of factory (ies) : Beijing HollySys Intelligent Technologie Co., Ltd
No.2 Disheng Middle Road Beijing Economic-
Technological Development Area 100176 Beijing
PEOPLE'S REPUBLIC OF CHINA

General product information and other remarks:

Description of unit:

The EUT (Equipment under test) is Class I PLC intended used by professional personnel.

The power supply terminals and/or connectors are: Suitable for factory wiring only.

Proper bonding to the end-product main protective earthing termination is: Required.

Test with below module:

No.	Module Type	Model
1	CPU Module	LX-CU500
2	16-Channel NPN 24VDC Digital Input Module	LX-DI001
3	16-Channel PNP 24VDC Digital Input Module	LX-DI002
4	8-Channel 5VDC Digital Input Module	LX-DI005
5	16-Channel 24VDC Digital Output Module	LX-DO003
6	4-Channel Relay Digital Output Module	LX-DO004
7	8-Channel 5VDC Digital Output Module	LX-DO005
8	4-Channel Voltage Analog Input Module	LX-AI001
9	8-Channel Voltage Analog Input Module	LX-AI002
10	4-Channel Current Analog Input Module	LX-AI003
11	8-Channel Voltage Analog Output Module	LX-AO002
12	4-Channel Voltage Current Analog Output Module	LX-AO003
13	4-Channel Resistance thermometer Analog Input Module	LX-RTD001
14	2-Channel RS232 Serial Port Communications Module	LX-CM001
15	2-Channel RS232 Serial Port DB9 Communications Module	LX-CM002
16	2-Channel RS485 Serial Port Communications Module	LX-CM003
17	2-Channel RS485 Serial Port DB9 Communications Module	LX-CM004
18	DeviceNet Slave Communications Module	LX-CM005
19	DeviceNet Master Communications Module	LX-CM006
20	EtherCAT Coupler Module	LX-IM001
21	EtherCAT End Coupler Module	LX-IM002
22	Power Supply Module	LX-PM003
23	16 Channel GND Potential Distribution Module	LX-AUX001
24	16 Channel 24V Positive Potential Distribution Module	LX-AUX002
25	Rail mounting Power Module	LK910
26	Terminal Cover Plate	LX-AUX004
27	CPU Module	LX-CU501
28	CPU Coprocessor Module	LX-CM010
29	6 Port EtherCAT Hub	LX-HUB106
30	2-Channel Incremental Encoder Interface 24 VDC Module	LX-ECI002
31	4-Channel Thermocouple Type Analog Input Module	LX-TC001
32	4-Channel High-precision Thermocouple Type Analog Input Module	LX-TC601
33	EtherCAT Slave Communications Module	LX-CM020
34	2-Channel High-speed Pulse Output Module	LX-PO001
35	2-Channel Incremental Encoder Input Module	LX-ECI001
36	2-Channel Absolute Encoder Interface Module	LX-SSI001

No.	Module Type	Model
37	8-Channel High-Accuracy Voltage Analog Output Module	LX-AO102
38	8-Channel High-Feature Single-ended Voltage Analog Input Module	LX-AI103
39	8-Channel High-Feature Voltage Analog Input Module	LX-AI102
40	CANopen Master Module	LX-CM007
41	PROFIBUS DP Master Module	LX-CM009
42	PROFINET RT Master Module	LX-CM022
43	Enhanced DeviceNet master	LX-CM106
44	2 x EtherNet,RS485,24VDC	LX-CU430
45	2 x EtherNet,RS485,24VDC	LX-CU433
46	2 x EtherNet,RS485,24VDC	LX-CU510
47	2 x EtherNet,24VDC	LX-CU511
48	32 Digital Input Module,24VDC,NPN or PNP	LX-DI011
49	4 x digital output,24VDC/2A,PNP	LX-DO006
50	32 Digital Output Module,24VDC,0.1A,NPN	LX-DO011
51	32 Digital Output Module,24VDC,0.1A,PNP	LX-DO012
52	Enhanced 16 x digital output,24VDC/0.5A,PN or PNP (soft config)	LX-DO103
53	6 port EtherCAT HUB	LX-HUB107
54	2 x EtherCAT	LX-IM003

Description of model differences:

N/A

Description of special features:

(HV circuits, high pressure systems etc.)

N/A

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		N/A
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		—
	– stopped while fully energized		N/A
	– prevented from starting		N/A
	– one phase interrupted (multi-phase)		N/A
4.4.2.6	Capacitors	No such capacitors.	N/A
4.4.2.7	MAINS transformers	Transformer certified separately.	P
4.4.2.7.2	Short circuit	(see Form A.39)	N/A
4.4.2.7.3	Overload	(see Form A.26B and A.40)	N/A
4.4.2.8	Outputs	No such outputs.	N/A
4.4.2.9	Equipment for more than one supply	Only one supply.	N/A
4.4.2.10	Cooling	(see Form A.26A)	—
	– air holes closed		N/A
	– fans stopped		N/A
	– coolant stopped		N/A
	– loss of cooling liquid		N/A
4.4.2.11	Heating devices		—
	– timer overridden		N/A
	– temperature controller overridden		N/A
4.4.2.12	Insulation between circuits and parts		P
4.4.2.13	Interlocks	No interlocks.	N/A
4.4.2.14	Voltage selectors		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
5.1	Marking		P
5.1.1	General		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Required equipment markings		—
	– Visible from the exterior; or		P
	– Visible after removing cover or opening door	No removable cover or opening door.	N/A
	– Visible after removal from a rack or panel	No rack or panel removable.	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:		—
	a) Manufacturer's or supplier's name or trademark	See label	P
	b) Model number, name or other means	See label	P
	Manufacturing location identified	See label	P
5.1.3	MAINS supply		P
	Equipment is marked as follows:		—
	a) Nature of supply:		—
	1) a.c. RATED MAINS frequency or range of frequencies	See label	—
	2) d.c. with symbol 1		—
	b) RATED supply voltage(s) or range	See label	—
	c) Max. RATED power (W or VA) or input current	See label	—
	The marked value not less than 90 % of the maximum value	(see Form A.2)	P
	If more than one 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:		—
	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:	No socket-outlet	—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Symbol 14 with full details in the documentation		N/A
5.1.4	Fuses		P
	OPERATOR replaceable fuse marking (see also 5.4.5).....: Approved power supply used.		—
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:		—
	– 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	No functional earth terminals.	N/A
	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)		N/A
	d) HAZARDOUS LIVE TERMINALS supplied from the interior		N/A
	Standard MAINS socket outlet used; or		N/A
	RATINGS marked; or		N/A
	Symbol 14 used		N/A
5.1.6	Switches and circuit-breakers		P
	If disconnecting device, off position clearly marked		P
	If push-button used as power supply switch:	Approved circuit breaker	—
	– Symbol 9 and 15 used for on-position		P
	– Symbol 10 and 16 used for off-position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– Pair of symbols 9, 15 and 10, 16 close together		N/A
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	No field-wiring terminal box	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	h) Instructions for lifting and carrying		N/A
	Warning statements and a clear explanation of warning symbols:		—
	– provided in the documentation; or		P
	– information is marked on the equipment		N/A
5.4.2	Equipment RATINGS		P
	Documentation includes:		—
	a) Supply voltage or voltage range..... : 100-240V~		—
	Frequency or frequency range : 50/60Hz		—
	Power or current rating..... : 0.5A		—
	b) Description of all input and output connections in accordance to 6.6.1 a)		N/A
	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,	<2000m	P
	3) temperature,	60°C	P
	4) relative humidity,		P
	5) MAINS supply voltage fluctuations,		N/A
	6) OVERVOLTAGE CATEGORY,	II	P
	7) WET LOCATION, if applicable,		N/A
	8) POLLUTION DEGREE of the intended environment	2	P
	e) Degree of ingress protection (IEC 60529)	IPX0	N/A
	f) If impact rating less than 5 J:	IK08 considered.	—
	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:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	e) Ventilation requirements		P
	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		N/A
	c) Instructions for interconnection to accessories or other equipment		N/A
	d) Specification of intermittent operation limits	Continuous operation	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
	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		N/A
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		N/A
	Specific battery type of user replaceable batteries		N/A
	Any manufacturer specified parts		P
	RATING and characteristics of fuses		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
5.4.6	Integration into systems or effects resulting from special conditions		N/A
	Aspects described in documentation		N/A

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
	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		N/A
	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		N/A
	Those parts not HAZARDOUS LIVE 10 s after interruption of supply	(see Form A.5)	N/A
	Capacitance test if charge is received from internal capacitor	(see Forms A.4 and A.5)	N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
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	No opening	N/A
6.2.4	Openings for pre-set controls	No pre-set control	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		N/A
	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
	c) Levels of capacitive charge or energy less:		—
	1) 45 μ C for voltages up to 15 kV peak or d.c. or line A of Figure 3		N/A
	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		N/A
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:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	a) ENCLOSURES or PROTECTIVE BARRIERS (see 6.4.2)	Protective earthing enclosure	P
	b) BASIC INSULATION (see 6.4.3)		P
	c) Impedance (see 6.4.4)		N/A
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		P
	– meet requirements of 6.7 for CREEPAGE and CLEARANCES between ACCESSIBLE parts and HAZARDOUS live parts, if protection is provided by limited access		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)	N/A
	Impedance used as primary means of protection meets all the following requirements:		—
	a) limits current or voltage to level of 6.3.2	(see Form A.6)	N/A
	b) RATED for maximum WORKING VOLTAGE and the amount of power it will dissipate		N/A
	c) CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of BASIC INSULATION of 6.7	(see Form A.15)	N/A
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)		N/A
	d) current- or voltage-limiting device (see 6.5.6)		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)		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	Separated by conductive screen or barrier bonded to PROTECTIVE CONDUCTOR TERMINAL		N/A
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
	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)		N/A
	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.;		N/A
	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)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	2) PROTECTIVE BONDING: not interrupted by any switch or interrupting device		N/A
	i) FUNCTIONAL EARTH TERMINALS allow independent connection		N/A
	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		P
	k) Contact pressure not capable being reduced by deformation of materials		N/A
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		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	APPROVED BUILT-IN PSU USED	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7		P
6.5.4	PROTECTIVE IMPEDANCE	(see Form A.12)	N/A
	Limits current or voltage to level of 6.3.1 in NORMAL and to level of 6.3.2 in SINGLE FAULT CONDITION		N/A
	CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of DOUBLE or REINFORCED INSULATION of 6.7	(see Form A.15)	N/A
	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:		—
	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		N/A
	Single electronic device not used as PROTECTIVE IMPEDANCE		N/A
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		N/A
6.6.1	General		N/A
	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		—
	– the external circuits		N/A
	– the equipment		N/A
	Protection achieved by separation of circuits; or		N/A
	short circuit of separation does not cause a HAZARD		N/A
	Instructions or markings for each terminal include:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	a) RATED conditions for TERMINAL		N/A
	b) Required RATING of external circuit insulation		N/A
6.6.2	TERMINALS for external circuits		N/A
	TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE after 10 s of interrupting supply connection	(see Form A.5)	N/A
6.6.3	Circuits with terminals which are HAZARDOUS LIVE		N/A
	These circuits are:		—
	Not connected to ACCESSIBLE conductive parts; or		N/A
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N/A
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		N/A
6.6.4	Terminals for stranded conductors		N/A
	No RISK of accidental contact because:		—
	– Located or shielded		N/A
	– Self-evident or marked whether or not connected to ACCESSIBLE conductive parts		N/A
	Complies as applicable:		—
	a) Manufacturer's specified maximum length of removed insulation, or		N/A
	b) 8 mm length of insulation removed		N/A
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	2000m	P
6.7.1.3	CREEPAGE DISTANCES		P
	Required CREEPAGE DISTANCES reflecting factors of 6.7.1.1 a) to d)	(see Form A.14 and A.15)	P
	CTI material group reflected by requirements	IIIa or IIIb	P
	CTI test performed		N/A
6.7.1.4	Solid insulation		P
	Required solid insulation reflecting factors of 6.7.1.1 a) to d)		P

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	c) K.1 MAINS circuits of OVERVOLTAGE CATEGORY III and IV or OVERVOLTAGE CATEGORY II over 300 V		N/A
	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		P
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
	d) thin-film insulation requirements of 6.7.2.2.4		N/A
6.7.2.2.2	Moulded and potted parts		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductors between same two layers are separated by at least 0,4 mm after moulding is completed		N/A
6.7.2.2.3	Inner insulating layers of printed wiring boards		—
	Separated by at least 0,4 mm between same two layers		N/A
	REINFORCED INSULATION have adequate electric strength; one of following methods used:		—
	a) thickness of insulation is at least 0,4 mm		N/A
	b) insulation is assembled of minimum two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION		N/A
	c) insulation is assembled of minimum two separate layers, where the combination is rated for test voltage of Table 5 for REINFORCED INSULATION		N/A
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		N/A
	REINFORCED INSULATION have adequate electric strength; one of the following methods used:		—
	a) thickness through the insulation at least 0,4 mm		N/A
	b) insulation is assembled of min. two separate layers, each RATED for test voltage of Table 5 for BASIC INSULATION		N/A
	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) insulation tape	N/A
6.7.3	Insulation for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V		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
	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:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		—
	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:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	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;		N/A
	b) PROTECTIVE BONDING conductors;		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) potential equalization conductors;		N/A
	d) functional earth conductors		N/A
6.10	Connection to MAINS supply source and connections between parts of equipment		N/A
6.10.1	MAINS supply cords		P
	RATED for maximum equipment current (see 5.1.3 c)		P
	Cable complies with IEC 60227 or IEC 60245		P
	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		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
	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		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

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Clause	Requirement + Test	Result - Remark	Verdict
	Plug pins which receive a charge from an internal capacitor		N/A
	Accessory MAINS socket outlets:	No socket-outlet	—
	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		P
6.11.2	Exceptions		N/A
6.11.3	Requirements according to type of equipment		N/A
6.11.3.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		P
	Employs switch or circuit-breaker		P
	If switch or circuit-breaker is not part of the equipment, documentation requires:		—
	a) switch or circuit-breaker to be included in building installation		N/A
	b) suitable location easily reached		N/A
	c) marking as disconnecting for the equipment		N/A
6.11.3.2	Single-phase cord-connected equipment		P
	Equipment is provided with one of the following:		—
	a) switch or circuit-breaker		P
	b) appliance coupler (disconnectable without tool)		N/A
	c) separable plug (without locking device)		N/A
6.11.4	Disconnecting devices		P
6.11.4.1	General		P
	Disconnecting device part of equipment		P
	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		P
	When used as disconnection device:		—
	Circuit breaker meets the relevant requirements IEC 60947-2 and is suitable for the application		P
	Switch meets the relevant requirements IEC 60947-3 and is suitable for the application		—
	Marked to indicate function		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Not incorporated in MAINS cord		P
	Does not interrupt PROTECTIVE EARTH CONDUCTOR		P
6.11.4.3	Appliance couplers and plugs		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
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		—
	Maximum gap as specified in Table 14 assured in NORMAL and in SINGLE FAULT CONDITION		N/A
7.4	Stability	Fixed installation	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		P
7.5.1	General		P
	Equipment more than 18 kg.....:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Has means for lifting or carrying; or		N/A
	Directions are given in documentation		P
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
	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		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	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		N/A
	vi) No moving parts exposed, except permitted by 7.3		P
	vii) No damage which could cause spread of fire		P
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		P
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.....:	IK08	—
	Non-metallic ENCLOSURES cooled to minimum RATED ambient temperature if below 2 °C		N/A
8.3	Drop test		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

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Clause	Requirement + Test	Result - Remark	Verdict
	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)	N/A
	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		N/A
	Bridging the insulation does not cause ignition		N/A
	b) Surface temperature of liquids and parts (see 9.5)		N/A
	c) No ignition in circuits designed to produce heat		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		N/A
9.3.2	Constructional requirements		P
	a) Connectors and insulating material have flammability classification V-2 or better	(see TABLE 1 or Form A.23)	P
	b) Insulated wires and cables are flame retardant (VW-1 or equivalent)	(see TABLE 1 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

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Clause	Requirement + Test	Result - Remark	Verdict
	Non-metallic materials have flammability classification V-1 or better		N/A
	3) ENCLOSURE and any baffle or flame barrier have adequate rigidity		N/A
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
	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	(see Form A.14 and A.15)	P
	BASIC INSULATION between MAINS parts of opposite polarity provided		P
	Overcurrent protection devices not fitted in the protective conductor		N/A
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase equipment)		N/A
9.6.2	PERMANENTLY CONNECTED EQUIPMENT		P
	Overcurrent protection device:		—
	Fitted within the equipment; or		P
	Specified in manufacturer's instructions		P
9.6.3	Other equipment		N/A
	Protection within the equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
	– for equipment rated above 40 °C ambient temperature limits not exceeded raised by the difference to 40 °C		P
	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		P
	Limits not exceeded in:	(see Form A.26B)	—
	NORMAL CONDITION		P
	SINGLE FAULT CONDITION		P
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		N/A
	d) Parts made of insulating material supporting parts connected to MAINS supply		N/A
	e) Terminals carrying a current more than 0,5 A		P
10.4	Conduct of temperature tests		P
10.4.1	General	(see Form A.26A)	P
	Tests conducted under reference test conditions and manufacturer's instructions		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

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Clause	Requirement + Test	Result - Remark	Verdict
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:		—
	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		N/A
	b) TERMINALS carrying a current more than 0,5 A		P
	Examination of material data; or		P
	in case of doubt:		P
	1) Ball pressure test; or		P
	2) Vicat softening test of ISO 306	(see Form A.29)	N/A

11	PROTECTION AGAINST HAZARDS FROM FLUIDS AND SOLID FOREIGN OBJECTS		N/A
11.1	General		N/A
	Protection to OPERATORS and surrounding area provided by EQUIPMENT		N/A
	All fluids specified by manufacturer considered	(see Form A.30)	N/A
11.2	Cleaning	(see Form A.30)	N/A
11.3	Spillage		N/A
11.4	Overflow		N/A
11.5	Battery electrolyte		N/A
	Battery electrolyte leakage presents no HAZARD		N/A
11.6	Equipment RATED with a degree of ingress protection (IP code)		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

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Clause	Requirement + Test	Result - Remark	Verdict
	TERMINALS provided with protective cap or cover, are installed as specified by manufacturer		N/A
	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		N/A
11.7.1	Maximum pressure : (see Form A.31)		—
	Maximum pressure of any part does not exceed P_{RATED}	See cl.11.7.2	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 $> 200 \text{ kPa} \cdot \text{l}$; and		N/A
	b) pressure $> 50 \text{ kPa}$		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Safety evidence established by calculation in acc. to national authorities (e.g. Pressure Equipment Directive 2014/68/EU)		N/A
	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		N/A
12.1	General		N/A
	Equipment provides protection		N/A
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 $\mu\text{Sv/h}$ and 5 $\mu\text{Sv/h}$ in m.....:		—
12.2.1.3	Equipment not intended to emit radiation	(see Form A.34)	—
	Limit for unintended stray radiation of 1 $\mu\text{Sv/h}$ 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		N/A
	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).		N/A
	– 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:		—
	Marked with Symbol 14 of Table 1		N/A
	and following information in the documentation:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
14.2.1	Motor temperatures	Approved fan used.	N/A
	Does not present a HAZARD when stopped or prevented from starting; or	(see Form A.1; A.26B)	N/A
	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	Overttemperature protection devices		N/A
	Devices operating in a SINGLE FAULT CONDITION		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
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 Form A.39 and A.40)	P
14.7	Printed wiring boards		P
	Data shows conformity with V-1 of IEC 60695-11-10 or better; or		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test shows conformity with V-1 of IEC 60695-11-10 or better		N/A
	Not applicable for printed wiring boards with limited-energy circuits (9.4)		N/A
14.8	Circuits used to limit TRANSIENT OVERVOLTAGES		N/A
	Test conducted between each pair of MAINS SUPPLY TERMINALS		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	No interlocks.	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
	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:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A
	Manufacturer 's declaration		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
	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)	N/A

IEC 61010-1					
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
4.4.2.3	1	protective conductor disconnect	7h	No hazard happen, equipment can still be normal operate after the test.	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.					
Supplementary information: N/A					

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Clause	Requirement — Test	Result — Remark	Verdict

5.1.3c)	TABLE: MAINS supply		Form A.2	P
	Marked rating	100-240	VAC	—
	Phase	single		—
	Frequency	50/60	Hz	—
	Current	0.5	A	—
	Power	--	W	—
	Power	--	VA	—

Test No.	Voltage [V]	Frequency [Hz]	Current [A]	Power		Comments
				[W]	[VA]	
1	90	50	0.372	30.42	--	--
2	100	50	0.345	30.24	--	--
3	240	50	0.170	29.54	--	--
4	264	50	0.168	29.23	--	--
5	90	60	0.374	30.41	--	--
6	100	60	0.343	30.22	--	--
7	240	60	0.182	29.54	--	--
8	264	60	0.171	29.22	--	--
1	90	50	0.561	48.39	--	Update first
2	100	50	0.483	45.53	--	--
3	240	50	0.299	49.74	--	--
4	264	50	0.276	46.34	--	--
5	90	60	0.567	48.79	--	--
6	100	60	0.513	45.49	--	--
7	240	60	0.304	48.94	--	--
8	264	60	0.290	48.22	--	--
1	90	50	0.525	42.8	--	Update secondary
2	100	50	0.490	43.6	--	--
3	240	50	0.393	46.0	--	--
4	264	50	0.374	44.3	--	--
5	90	60	0.553	45.1	--	--
6	100	60	0.505	44.8	--	--
7	240	60	0.403	45.9	--	--
8	264	60	0.387	44.6	--	--

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

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Clause	Requirement — Test			Result — Remark		Verdict
5.1.3c)	TABLE: MAINS supply					Form A.2
	Marked rating	100-240	VAC			—
	Phase	single				—
	Frequency	50/60	Hz			—
	Current	0.5	A			—
	Power	--	W			—
	Power	--	VA			—
Test No.	Voltage [V]	Frequency [Hz]	Current [A]	Power [W] [VA]		Comments
Supplementary information: N/A						

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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)			2)		
Terminals and operating devices (5.1.5.2)			N/A		
Switches and circuit breakers (5.1.6)			N/A		
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	Label loose	Curled edges	Comments
		Verdict	Verdict	Verdict	
1)	A+B	P	P	P	No damage
Supplementary information: 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.

[illegible]

6.3.2	TABLE: Values in SINGLE FAULT CONDITION											Form A.6	P
Item (see Form A.4)	Subclause and	Voltage			Transient (see NOTE)		Current				Capacitance	Comments	
	fault No. (see Form A.1)	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)		
1	Fault No.1	--	--	--	--	--	A1	1.96mA	--	--	-	—	

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: N/A

IEC 61010-1				
Clause	Requirement — Test	Result — Remark	Verdict	
6.5.2.2	TABLE: Cross-sectional area of bonding conductors	Form A.7	P	
	Conductor location	CROSS-SECTIONAL AREA [mm ²]	Verdict	
	Protective earth conductor	Min 0.75AWG	P	
Supplementary information:				
6.5.2.3	TABLE: Tightening torque test	Form A.8	P	
	Conductor location	Size of screw	Tightening torque [Nm]	Verdict
	Earth	4mm	1.2	pass
Supplementary information:				

IEC 61010-1				
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
				P
ACCESSIBLE part under test	Test current [A]	Voltage attained after 1 min (maximum 10 V) [V]		Verdict
PE- furthest metal enclosure	32	1.73		P
Supplementary information:				
6.5.2.6	TABLE: Transformer PROTECTIVE 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:				

IEC 61010-1			
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				
NOTE – A PROTECTIVE IMPEDANCE shall not be a single electronic device that employs electron conduction in a vacuum, gas or semiconductor.									
Supplementary information:									

IEC 61010-1									
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:									

IEC 61010-1												
Clause		Requirement — Test					Result — Remark					Verdict
6.7		TABLE: Insulation requirements - Block diagram of system -								Form A.14		P
Line Neutral PE A B C Approved PSU SELV												
Pollution degree..... : 2							Overvoltage category: 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. [kHz]		PWB [mm]	CTI	Other [mm]	CTI		
A	Line to Neutral before circuit breaker	BI	240	340	60Hz	4.0	--	--	4.0	--	1740V rms	--
B	Primary to earthed accessible parts	BI	240	340	60Hz	>5	--	--	>5	--	1740V rms	--
C	Primary circuits to secondary circuits	RI	240	340	60Hz	-	--	--	--	--	3660V rms	Approved power supply
NOTE 1 – Type of insulation: BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION see also Form A.15 for further details			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"					
Supplementary Information:												

IEC 61010-1													
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 [kHz]	Required [mm]	Measured [mm]	Required [mm]	Measured [mm]				
A	Line to Neutral before circuit breaker	BI	240	340	60Hz	1.5	4.0	3.0	4.0	IIIb	P		
B	Primary to earthed accessible parts	BI	240	340	60Hz	1.5	>5	3.0	>5	IIIb	P		
C	Primary circuits to secondary circuits	RI	240	340	60Hz	--	--	--	--	IIIb	P	Approved components used	
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)													
Input supply voltage.....:		240VAC(max)		V	50/60	Hz							
Supplementary information:													

IEC 61010-1													
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 [N]	Rigidity (8.2)		Drop (8.3)		RATED ambient (10.5.1)	CLEARANCE [mm]	CREEPAGE DISTANCE [mm]			
				Static (8.2.1)	Impact (8.2.2)	Normal (8.3.1)	Hand-held/ Plug-in						
A	Line to Neutral before circuit breaker	BI	10	No	Yes	Yes	-	-	4.0	4.0	P		
B	Primary to earthed accessible parts	BI	10	Yes	Yes	Yes	-	-	>5	>5	P		
C	Primary circuits to secondary circuits	RI	10	Yes	Yes	Yes	-	-	-	-	P		
NOTE – Refer to Form A.18 for dielectric strength tests following the above tests.													
Supplementary information:													

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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						
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 /	1 h /	2 h /	1 h /
				125 °C	25 °C	0 °C	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:							

IEC 61010-1							
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						N/A
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						P
	Test site altitude				5m		—
	Test voltage correction factor (see table 10)				1.16 for BI, 1.22 for RI		—
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.]			
Primary to earthed accessible parts	4.4.4.1 b); 6.4;6.7	Yes	340	1740Vrms		P	
Primary circuits to secondary circuits	6.4;6.7	Yes	340	3660Vrms		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:

IEC 61010-1						
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:							

IEC 61010-1			
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:

IEC 61010-1								
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]		—	
	Castors at unfavourable position				[yes- / no]		—	
	Doors, drawers and movable arms closed				[yes- / no]		—	
	Doors and drawers at unfavourable position				[yes- / no]		—	
Location		Tilt angle	Applied force				Comments	Verdict
		10°	250 N	20% [N]	800 N	4 times load [N]		
Front side								N/A
Left side								N/A
Rear side								N/A
Right side								N/A
Top side								N/A
Working surface								N/A
Ledge								N/A
Castor / support foot								N/A
Castor / support foot removed								N/A
Supplementary information:								
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]					
Mounting brackets								
Supplementary information:								

IEC 61010-1			
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 enclosure	—
	Preparation for the test:	N/A	—
	Operated at ambient temperature	°C h	—
Location		Comments	Verdict
1)Top Enclosure		No damages. No hazards.	P
2)Side Enclosure		No damages. No hazards.	P
3)Front Enclosure		No damages. No hazards.	P
4)Rear Enclosure		No damages. No hazards.	P
Supplementary information:			
8.2.2	TABLE: Impact test		P
	Material of enclosure	metallic	—
	Corresponding IK-code.....	IK08	—
	Preparation for the test:	N/A	—
	Cooled to (temperature)	-- °C	—
Location		Comments	Verdict
1)Side enclosure		No damage	P
2)Rear enclosure		No damage	P
3)Top enclosure		No damage	P
Supplementary information: 1300mm.			

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Clause	Requirement – Test		Result - Remark	Verdict
8.3	TABLE: Drop test			Form A.21B
8.3.1	Other equipment			N/A
	Location	Raised up to		Comments
		[mm]	30 °	
				—
Supplementary information:				
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:				

IEC 61010-1				
Clause	Requirement — Test		Result — Remark	Verdict
9	TABLE: Protection against the spread of fire			Form A.22
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
1	SELV circuits	9c	- Fire enclosure-metal; - Without openings on sides and bottom of 5° angle project area from a source of fire hazard; - Components mounted on PCB of flame class V-0, and other materials of internal parts are rated min.V-2; - UL recognized internal wiring and tube rated VW-1 used	P
Supplementary information:				

IEC 61010-1							
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:							

IEC 61010-1			
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:
Not use flammable liquids.

IEC 61010-1					
Clause	Requirement — Test			Result — Remark	Verdict
10.	TABLE : Temperature Measurements				Form A.26A
10.1	Surface temperature limits – NORMAL CONDITION and / or SINGLE FAULT CONDITION				P
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION				P
10.3	Other temperature measurements				P
Operating conditions:		Normal operating			
Frequency..... :		50 Hz	Test room ambient temperature (ta).... :		24.4 °C
Voltage..... :		90 V	Test duration..... :		3 h - min
Part / Location		t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict
Breaker		29.2	64.8	85	P
Internal wire		28.7	64.3	105	P
Transformer coil(PSU)		42.2	77.8	90	P
Secondary terminal		32.4	48.0	85	P
PM003(PWB)		35.2	60.8	130	P
CM006(PWB)		44.3	79.9	130	P
CM006 terminal		39.2	74.8	85	P
LX-IM001(PWB)		34.8	70.4	130	P
LX-CU500(PWB)		49.1	84.7	130	P
CM002(PWB)		34.3	69.9	130	P
CM004(PWB)		30.7	66.3	130	P
IM002(PWB)		28.5	64.1	130	P
Metal enclosure		26.5	62.1	reference	--
Ambient		24.4	60.0	--	P
NOTE 1 - t_m = measured temperature $t_c = t_m$ corrected ($t_m - t_a + 40\text{ °C}$ 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: <u>N/A</u>					

IEC 61010-1						
Clause	Requirement — Test	Result — Remark			Verdict	
10.	TABLE : Temperature Measurements	Form A.26A			P	
10.1	Surface temperature limits – NORMAL CONDITION and / or SINGLE FAULT CONDITION				P	
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION				P	
10.3	Other temperature measurements				P	
Operating conditions:		Normal operating				
Frequency..... :		60 Hz	Test room ambient temperature (ta)...		24.3 °C	
Voltage..... :		264 V	Test duration..... :		3 h -- min	
Part / Location		t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
Breaker		28.7	64.4	85	P	
Internal wire		27.9	63.6	105	P	
Transformer coil(PSU)		43.2	78.9	90	P	
Secondary terminal		32.2	67.9	85	P	
PM003(PWB)		35.3	71.0	130	P	
CM006(PWB)		43.7	79.4	130	P	
CM006 terminal		38.6	74.3	85	P	
LX-IM001(PWB)		34.6	70.3	130	P	
LX-CU500(PWB)		48.6	84.3	130	P	
CM002(PWB)		33.8	69.5	130	P	
CM004(PWB)		30.3	66.0	130	P	
IM002(PWB)		27.9	63.6	130	P	
Metal enclosure		26.1	61.8	reference	--	
Ambient		24.3	60.0	--	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:						

IEC 61010-1					
Clause	Requirement — Test	Result — Remark	Verdict		
10.	TABLE : Temperature Measurements	Form A.26A	P		
10.1	Surface temperature limits – NORMAL CONDITION and / or SINGLE FAULT CONDITION		P		
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION		P		
10.3	Other temperature measurements		P		
Operating conditions:		Normal operating			
Frequency	50 Hz	Test room ambient temperature (ta)....	23.4 °C		
Voltage	90 V	Test duration	1 h 26 min		
Part / Location	t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
Internal wire	40.1	56.7	105	P	
Input terminal	43.2	59.8	85	P	
T1 coil	52.9	69.5	90	P	
T1 core	51.5	68.1	90	P	
L2 coil	61.5	78.1	90	P	
L4 coil	49.6	66.2	90	P	
C6 body	48.2	64.8	105	P	
LX-CU500(PWB)	43.7	60.3	130	P	
LX-IM001(PWB)	41.7	58.3	130	P	
Secondary terminal	56.4	73.0	85	P	
CM020(PWB)	55.2	71.8	130	P	
IM002(PWB)	49.2	65.8	130	P	
LX-HUB106(PWB)	39.4	56.0	130	P	
Metal enclosure	25.0	41.6	60	P	
Ambient	23.4	40.0	--	--	
NOTE 1 - t_m = measured temperature $t_c = t_m$ corrected ($t_m - t_a + 40\text{ °C}$ 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: <u>N/A</u>					

IEC 61010-1					
Clause	Requirement — Test	Result — Remark	Verdict		
10.	TABLE : Temperature Measurements	Form A.26A	P		
10.1	Surface temperature limits – NORMAL CONDITION and / or SINGLE FAULT CONDITION		P		
10.2	Temperature of windings – NORMAL CONDITION and / or SINGLE FAULT CONDITION		P		
10.3	Other temperature measurements		P		
Operating conditions:		Normal operating			
Frequency..... :	60 Hz	Test room ambient temperature (ta)...	24.0 °C		
Voltage..... :	264 V	Test duration..... :	2 h 12 min		
Part / Location	t_m [°C]	t_c [°C]	t_{max} [°C]	Verdict	Comments
Internal wire	38.5	54.5	105	P	
Input terminal	41.8	57.8	85	P	
T1 coil	52.0	68.0	90	P	
T1 core	50.5	66.5	90	P	
L2 coil	51.7	67.7	90	P	
L4 coil	47.7	63.7	90	P	
C6 body	47.7	63.7	105	P	
LX-CU500(PWB)	42.8	58.8	130	P	
LX-IM001(PWB)	40.7	56.7	130	P	
Secondary terminal	55.0	71.0	85	P	
CM020(PWB)	54.0	70.0	130	P	
IM002(PWB)	47.9	63.9	130	P	
LX-HUB106(PWB)	38.7	54.7	130	--	
Metal enclosure	25.3	41.3	60	P	
Ambient	24.0	40.0	--		
NOTE 1 - t_m = measured temperature $t_c = t_m$ corrected ($t_m - t_a + 40\text{ °C}$ 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:					

10.2	TABLE: Temperature of windings Resistance method Temperature Measurements	Form A.26B	N/A
4.4.2.7	MAINS transformers		N/A
14.2.1	Motor temperatures		N/A

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

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:

TRF No. IEC61010_1P

IEC 61010-1			
Clause	Requirement — Test	Result — Remark	Verdict
10.5.3	TABLE: Insulating material	Form A.28	N/A
10.5.3 1)	Ball-pressure test		N/A
	Max. allowed impression diameter :		—
Part	Test temperature [°C]	Impression diameter [mm]	Verdict
Supplementary information:			
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:			

8	TABLE: Mechanical resistance to shock and impact	Form A.30	P
11	Protection against HAZARDS from fluids and solid foreign objects		P

[illegible]

Supplementary information: N/A

IEC 61010-1			
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:												
11.7.3	TABLE: Leakage from low-pressure parts					Form A.32	N/A					
Part	Test pressure [MPa]	Leakage Yes / No	Comments									
Supplementary information:												

IEC 61010-1				
Clause	Requirement — Test		Result — Remark	Verdict
12.2.1	TABLE: Ionizing radiation			Form A.33
12.2.1.2	Equipment intended to emit radiation			N/A
	Locations tested	Measured values [μSv/h]	Verdict	Comments
Supplementary information:				
12.2.1.3	Equipment not intended to emit radiation			Form A.34
	Max. allowed effective dose rate at 100 mm.....:		1 μSv/h	—
	Locations tested	Measured values [μSv/h]	Verdict	Comments
Supplementary information:				

IEC 61010-1			
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:			
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:			

IEC 61010-1			
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:			

IEC 61010-1			
Clause	Requirement — Test	Result — Remark	Verdict

[illegible]

IEC 61010-1				
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				Yes
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 _r.m.s._			
□ Primary to core	V r.m.s._			
Secondary to secondary	V r.m.s._			
Secondary to core	V r.m.s._			
Verdict		Pass		
NOTE 1:	Primary fuse - PF / () A Secondary fuse - SF / () A Overtemperature protection - OP / (115) °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:				

IEC 61010-1				
Clause	Requirement — Test		Result — Remark	Verdict
4.4.2.7	TABLE: MAINS transformer			Form A.40
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)				
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 r.m.s.			
Primary to core	V AC			
Secondary to secondary	V AC			
Secondary to core	V AC			
Verdict				
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:				

IEC 61010-1			
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:												

IEC 61010-1			
Clause	Requirement – Test	Result — Remark	Verdict

Annex H	TABLE: Qualification of conformal coating for protection against pollution	Form A.42	N/A
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Technical properties											
Manufacturer										—	
Type										—	
Meet requirements of ANSI / UL 746E				[yes / no]							
Manufacturer declaration of coating material				[yes / no]							
Operating temperature of coating				[] °C							
Comparative tracking index (CTI)				[]							
Insulation resistance				[] MΩ							
Dielectric strength				[] V							
UV resistance (if required)				[yes / no]							
Flammability rating											
Preparation of the test specimens conducted				[yes / no]							
Item	Test conditioning	Parameter	Td h	Samples						Verdict	Comments
				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:

IEC 61010-1			
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	—	
Supplementary information:				

IEC 61010-1			
Clause	Requirement — Test	Result — Remark	Verdict

TABLE 1: - 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)	
Power supply(2)	Insulation	Hollysys Group Co., Ltd	LK910	Input: 100-240VAC, 50-60Hz, 1.5A, 55°C Output: 24VDC, 5A	EN 62368-1	TUV SUD	
Circuit breaker	Fire protection	ABB	S200L	2-pole, 2A, 400VAC, 6KA, 35MM wide	DIN EN 60898-1 (VDE 0641-11):2020-11; EN 60898-1:2019	VDE	
Power cord	Connection	HONGSHI ELECTRICAL LTD	H05VV-F	3 x 0.75 mm ²	DIN VDE 0620-2-1/A1 (VDE 0620-2-1/A1):2017-09 DIN VDE 0620-2-1 (VDE 0620-2-1):2016-01	VDE	
plug	Connection	Scolmore International Ltd	SW102	AC 250VAC, 16A	DIN VDE 0620-2-1/A1 (VDE 0620-2-1/A1):2017-09 DIN VDE 0620-2-1 (VDE 0620-2-1):2016-01	VDE 40004330	
Internal wire	Fire protection	Souft Cable(Jiangsu) Co., Ltd	H05V-K.05	0.5mm 300/500V	EN 50525-1 EN 50525-2-11	CE	
earthing conductor	Fire protection	Souft Cable(Jiangsu) Co., Ltd	H05V-K.07	0.75mm 300/500V	EN 50525-1 EN 50525-2-11	CE	
PWB	Fire protection	GUANGZHOU FAST-PRINT CIRCUIT TECHNOLOGY CO LTD	M1	Min130 °C, V-0	UL 796	U LE204460	

TABLE 1: - 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)	
Terminal	Connection	Switchlab Inc	ODU2.5	AC 600 V, 24A	UL 486	UL E167040	
Relay	Control	Xiamen Hongfa Electroacoustic Co Ltd	HFD4-I/4.5S1R	24Vd.c.	UL 508	UL	
NOTE → 1 List all different manufacturers of the above components → 4 asterisk indicates mark assuring agreed level of surveillance → 2 May include electrical, mechanical values → 3 List licence no or method of acceptance							

Deviations Between EN 61010-1:2010+A1:2019 and IEC 61010-1:2010+AMD1:2019		
	The text of the International Standard IEC 61010-1:2010/AMD1:2016 was approved by CENELEC as a European Standard without any modification.	—
6.8.3.1	The a.c. voltage test	N/A
	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.	N/A
Annex ZA	Normative references to international publications with their corresponding European publications	P
Annex ZZ	Relationship between this European standard and the safety objectives Directive 2014/35/EU [2014 OJ L96] aimed to be covered	P



TEST REPORT
IEC 61010-2-201
Safety requirements for electrical equipment for measurement,
control, and laboratory use
Part 2-201: Particular requirements for control equipment

Report Number. : 48.420.23.1520.02 Attachment No.1

Date of issue : 2025-09-04

Total number of pages : 29

Name of Testing Laboratory
preparing the Report.....: TÜV SÜD Certification and Testing (China) Co., Ltd.

Applicant's name.....: Beijing HollySys Intelligent Technologie Co., Ltd

Address: No.2 Disheng Middle Road Beijing Economic-Technological
 Development Area 100176 Beijing PEOPLE'S REPUBLIC OF CHINA

Test specification:

Standard: IEC 61010-2-201:2017 for use with IEC61010-1:2010, AMD1:2016

Test procedure.....: N/A

Non-standard test method.....: N/A

Test Report Form No......: IEC61010_2_201D

Test Report Form(s) Originator....: UL(US)

Master TRF: 2019-04-11

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General disclaimer:

The test results presented in this report relate only to the object tested.

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Test item description..... :	LX Control System	
Trade Mark..... :		
Manufacturer :	Beijing HollySys Intelligent Technologie Co., Ltd No.2 Disheng Middle Road Beijing Economic-Technological Development Area 100176 Beijing PEOPLE'S REPUBLIC OF CHINA	
Model/Type reference..... :	LX	
Ratings..... :	100-240V~, 50/60Hz, 0.5A	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd.	
Testing location/ address :	Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu 214100, P.R China	
Tested by (name, function, signature)..... :	Yang YANG (Project Handler)	 
Approved by (name, function, signature) .. :	Laining LI (Project Reviewer)	
Testing procedure: CTF Stage 1:		
Testing location/ address :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature) .. :		
Testing procedure: CTF Stage 2:		
Testing location/ address :		
Tested by (name + signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
Testing procedure: CTF Stage 3:		
Testing procedure: CTF Stage 4:		
Testing location/ address :		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

TRF No. IEC61010_2_201D

Copy of marking plate:

	LX Control System	
	Type:LX	CE
Rated Input	100-240VAC ;50/60Hz;0.5A	
Manufacturer Name	Beijing HollySys Intelligent Technologies Co.,Ltd	
Manufacturer Address	No.2 Disheng Middle Road Beijing Economic-Technological Development Area 100176 Beijing P.R China	

Test item particulars:	
Type of item	PLC
Modular equipment	Yes
Description of equipment function (intended use)	Control
Switching device, intended use	N/A
Enclosure type	enclosed equipment
Connection to MAINS supply	Permanent
Overvoltage category	II
POLLUTION DEGREE	2
Means of protection	Class I (PE connected)
Environmental conditions	Normal
For use in wet locations	No
Equipment mobility	Stationary
Operating conditions	Continuous
Overall size of equipment (W x D x H)	approximately 520mm*400mm*240mm
Mass of equipment (kg)	19.47kg
Marked degree of protection to IEC 60529	IPX0(After install)
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	
Date of receipt of test item	2023-06-25; 2024-04-03; 2025-08-20
Date (s) of performance of tests	2023-06-25 to 2023-07-06; 2024-04-03-2024-04-19; 2025-08-20-2025-09-04
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) HollySys Group Co.,Ltd No.2 Disheng Middle Road Beijing Economic- Technological Development Area 100176 Beijing PEOPLE'S REPUBLIC OF CHINA	
General product information and other remarks: The EUT (Equipment under test) is Class I PLC intended used by professional personnel. The power supply terminals and/or connectors are: Suitable for factory wiring only. Proper bonding to the end-product main protective earthing termination is: Required.	

IEC 61010-2-201			
Clause	Requirement + Test	Result - Remark	Verdict

4.4	Testing in SINGLE FAULT CONDITIONS		P
4.4.2	Application of fault conditions		P
4.4.2.101	Switching devices test		P
4.4.2.101.1	Overload test	See Table 4.4.2.101.1	P
4.4.2.101.2	Endurance test (when required by cl. 14.102)	See Table 4.4.2.101.2	P
	Exemption for solid state devices for general or resistive use		P

5	MARKING AND DOCUMENTATION		P
5.1.5.2	TERMINALS		N/A
	a) FUNCTIONAL EARTH TERMINALS		N/A
5.1.8	FIELD WIRING TERMINAL boxes		P
5.4.1	Documentation in electronic media provided with symbol 14		P
5.4.3	Equipment installation		P
	h) OPEN EQUIPMENT		N/A
	d) 1) Supply and FIELD WIRING requirements		P
5.4.4	Equipment operation		P
	j) methods of reducing risk of burns from surfaces		P

6	PROTECTION AGAINST ELECTRIC SHOCK		P
6.1.2	Exceptions: Parts for operating reasons HAZARDOUS LIVE and ACCESSIBLE to SERVICE PERSONNEL during NORMAL USE:		N/A
	a) parts of lamps and lamp sockets after lamp removal		N/A
	b) parts intended to be replaced by SERVICE PERSONNEL or other action if accessible only by a tool and having a warning marking		N/A
	Parts not HAZARDOUS LIVE 10 s after interruption of supply	See Table 6.3.2	N/A
	Charge received from an internal capacitor tested to clause 6.3, below levels of 6.3.1 c)	See Table 6.3.2	N/A
6.2	Determination of ACCESSIBLE PARTS		P
6.2.1	General (enclosed equipment)		P
6.2.2	Examination (enclosed equipment)		P
6.2.3	Openings above parts that are HAZARDOUS LIVE (enclosed equipment)		P
6.2.4	Openings for pre-set controls		N/A
	EUT is enclosed equipment		N/A

IEC 61010-2-201			
Clause	Requirement + Test	Result - Remark	Verdict
	- test pin with length of 100 mm and 3 mm in diameter applied		N/A
6.2.101	Accessibility of TERMINALS and ports		P
	Operator accessible interfaces, ports, terminals not hazardous live under normal and single-fault conditions		P
6.2.102	Control equipment		P
6.2.102.1	Accessible parts		P
	No hazardous live parts accessible at enclosed equipment or at open equipment installed to manufacturer's instructions (See 6.2.2)		P
	Protection from hazards for service personnel making adjustments at open equipment (See 6.2.2)		P
6.2.102.2	SELV/PELV circuits		P
	Intended use at dry locations		P
6.5.2.6	Transformer PROTECTIVE BONDING screen :	See Table 6.5.2.6	N/A
	No overcurrent protection means for the winding		N/A
	Test current twice the rating of equipment overcurrent protection means		N/A
	Overcurrent protection means		N/A
	- integrated into equipment		N/A
	- specified in manual		N/A
6.5.2.101	Classes of equipment or equipment classes		P
6.5.2.101.2	Class I equipment		P
	Flexible cord includes protective earth (PE)		P
	Accessible conductive parts connected to PE		P
	PE circuit not interrupted by removing parts of enclosure for normal maintenance		P
6.5.2.101.3	Class II equipment		N/A
	Double or reinforced insulation used or		N/A
	Protective impedance used		N/A
	Means for maintaining continuity of double insulated for protection		N/A
	Connection to earth terminals for functional purposes doesn't break continuity of double insulation		N/A
	Is one of the following types:		N/A
	a) Insulation encased		N/A
	- by durable and continuous enclosure of insulating material		N/A
	- envelops all conductive parts with exception of small parts		N/A

IEC 61010-2-201			
Clause	Requirement + Test	Result - Remark	Verdict
	- small parts insulated by reinforced insulation or equivalent		N/A
	b) Metal-encased		N/A
	- by continuous metal enclosure		N/A
	- double insulation used throughout, except:		N/A
	- parts have reinforced insulation		N/A
	c) combination of a) and b)		N/A
6.5.2.101.4	Class III equipment		N/A
	All circuits SELV/PELV		N/A
	Voltages do not exceed SELV/PELV limits		N/A
	Earth terminals for functional purposes		N/A
	Wiring for SELV/PELV circuits and other circuits:		N/A
	- segregated, or		N/A
	- insulation rated for the rated voltage, or		N/A
	- earthed screen, or		N/A
	- additional insulation based on 60364-4-41		N/A
6.5.2.102	Protective earth requirement for enclosed equipment		P
	Accessible parts of Class I equipment electrically interconnected and connected to the protective earth terminal		P
	Structural parts providing electrical continuity independent of usage on its own or incorporated in an assembly		P
	Cord or cable that supplies Class I portable equipment has a PE conductor		N/A
	Accessible isolated conductive parts are so located that exclude contact with live parts and dielectric voltage test passed for reinforced insulation	See Table 6.8	N/A
	Class II equipment with internal functional earth connection, without PE terminal or PE conductor in input cord		N/A
	Class I equipment with PE terminal		P
	PE terminal readily accessible, and		P
	Connection maintained when cover or any removable part removed		P
	Mains cord connected equipment with PE terminal integral to plug cap or socket		N/A
	PE terminal is screw, stud or pressure type and made of corrosion resistant material		P
	Clamping means PE terminals adequately locked against accidental loosening and		N/A
	- only to be loosed by aid of a tool		P

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Clause	Requirement + Test	Result - Remark	Verdict
	PE terminals and earth contacts not connected direct to neutral terminal within equipment		P
	Devices (as capacitors or surge suppression devices) appropriately rated, when used to connect PE terminal and neutral		N/A
	PE terminal and subsequent protective internal equipment complies with requirements in 6.5.2.5		P
	PE terminal has no other function		P
6.5.2.103	Protective earth requirements for open equipment		N/A
	Open equipment complies with the requirements of clause 6.5.2.4 or 6.5.2.5. Except that the provision for connection to an external protective conductor is replaced by a means for bonding to the enclosure accessible to the operator.		N/A
6.6.2	TERMINALS for external circuits		N/A
	All parts of terminals that maintain contact and carry current are of metal, and have adequate mechanical strength in		N/A
	Bending of each conductor not possible to radius curvature less than six times of its diameter after removal of covering elements		N/A
	Clearances between terminals and between terminals and earthed parts in conformity to 6.7.101		N/A
6.6.3	Circuits with terminals which are HAZARDOUS LIVE		N/A
	No accessible conductive parts of terminals and ports of enclosed equipment are hazardous life		N/A
	Ports of open equipment protected as defined in table 103		N/A
6.7	Insulation requirements..... :	See Table 6.7	P
6.7.1	The nature of insulation		P
6.7.1.1	Insulation between ACCESSIBLE parts or between separate circuits consist of CLEARANCES, CREEPAGE DISTANCES and solid insulation if provided as protection against a HAZARD		P
	Insulation specified in Figure 102 :	See Table 6.7	P
	Between ACCESSIBLE SELV circuits, ACCESSIBLE PELV circuits, or ungrounded conductive ACCESSIBLE parts and HAZARDOUS LIVE parts, two levels of protection		P
6.7.1.2	CLEARANCES		P
	Linear interpolation used between nearest two points in Table 3.		P
6.7.1.5	Requirements for insulation according to type of circuit..... :	See Table 6.7A and 6.7B	P
	a) requirements as specified in Figure 102, or		P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) requirements as specified in Part 1 Annex K.3 for circuits that have one or more of the following characteristics..... :		N/A
	1) maximum TRANSIENT OVERVOLTAGE is limited to known level below the level of MAINS CIRCUIT		N/A
	2) maximum TRANSIENT OVERVOLTAGE is 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 30kHz		N/A
	c) requirements as specified in Annex K.1 for Mains circuits of Overvoltage Category III or IV or II over 300 V.		N/A
	d) requirements as specified in Annex K.2 for secondary circuits separated from the circuits in c) only by means of a transformer		N/A
6.7.1.101	Non-metallic material supporting hazardous live parts		N/A
	CTI ≥ 175 for non-metallic material supporting hazardous live parts		N/A
6.7.2	Insulation for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II with a nominal supply voltage up to 300V		P
	For mains circuits above 300 V Annex K applies. For Tables K.2, K.3, and K.4, linear interpolation of creepage used		N/A
6.7.2.1	CLEARANCES and CREEPAGE DISTANCES..... :	See Table 6.7A and 6.7B	P
	Values for MAINS CIRCUITS of replacement Table 4 are met		P
6.7.2.2	Solid insulation		P
6.7.2.2.1	For mains > 300V values of Annex K applied		N/A
	Withstands electrical and mechanical stresses in normal use and all RATED environmental conditions of clause 1.4		N/A
	Voltage tests of 6.8.3 with values of Table 5..... :	See Table 6.8	N/A
	A.C. circuits with the A.C. test of 6.8.3.1		N/A
	D.C. circuits with the D.C. test of 6.8.3.2		N/A
	The 1 min & the 5 s test or a single test representing the worst case combination of both tests		N/A
6.7.3.1	For MAINS CIRCUITS above 300 V, Annex K used		N/A
6.7.3.2	CLEARANCES		N/A
	a) meet the values of replacement 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 replacement Table 6 for REINFORCED INSULATION, or		N/A
	b) pass the voltage tests of 6.8 with values of replacement Table 6 ; with following adjustments :	See Table 6.8	N/A
	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
6.7.3.3	CREEPAGE DISTANCES		P
	Based on WORKING VOLTAGE meets the values of Table 7 WITH THE REPLACEMENT OF THE FIRST COLUMN HEADING 'SECONDARY WORKING VOLTAGE A.C.R.M.S V ^C		N/A
6.7.101	Insulation for field wiring terminals of overvoltage category II with a nominal voltage up to 1000 V		N/A
	Minimum clearances at field wiring terminals comply with Table 104		N/A
	Minimum creepage distances at field wiring terminals comply with Table 104		N/A

7	PROTECTION AGAINST MECHANICAL HAZARDS		N/A
7.1.101	Open and panel mounted equipment		N/A
	Open equipment installed within an enclosure		N/A
	For panel mounted equipment, the portion that form as part of the ENCLOSURE complies with clause 7		N/A
7.3	Moving parts		N/A
7.3.3	RISK assessment for mechanical HAZARDS to body parts		N/A
	For control equipment having only cooling fans as moving parts only accessibility checked		N/A

8	RESISTANCE TO MECHANICAL STRESSES		P
8.1	Normal Energy protection level is 6.8 ±5 % J		P
8.1.101	Open equipment		N/A
	Additional enclosure providing safety required by the manual		N/A
8.1.102	Panel mounted equipment		N/A
	When portion inside the required additional enclosure is an open equipment, the portion outside the additional enclosure is in conformity with cl. 8		N/A
8.2	ENCLOSURE rigidity test		P
8.2.2	Impact test :	See Table 8.2.2	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Impact applied to any part of ENCLOSURE causing a HAZARD if damaged, dimension X and mass are determined by equation $J = X \times m \times g$		P
9	PROTECTION AGAINST THE SPREAD OF FIRE		P
9.3.2	Constructional requirements		N/A
	Open equipment conforms with a) and b)		N/A
	Non-metallic enclosure of open equipment and portion of PANEL MOUNTED EQUIPMENT, forming part of enclosed equipment		N/A
	- has flammability rating of V-1 or better, or		N/A
	- the glow-wire test is passed		N/A
	Magnesium alloy used for the enclosure verified as specified in Annex DD		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 (Table 19, Part 201). :	See Table 10	P
	- at an specified ambient temperature of 40 °C		N/A
	- for equipment exceeding the limits in Table 19, see 5.4.4 item j.		P
10.3	Other temperature measurements		P
	Following measurements conducted if applicable ... :	See Table 10.2	P
	a) Does not apply to control equipment FIELD WIRING which do not contain power consumable parts		P
	f) Temperature of field wiring terminals measured, and - temperature requirements checked		P
10.4	Conduct of temperature tests		P
10.4.1.100	General method		P
	Tests conducted under reference test conditions:	See Table 10	P
10.4.1.101	Special method, PANEL MOUNTED EQUIPMENT		N/A
	Test ambient temperatures of the outer portion of the equipment and inner portion of the equipment		N/A
	General method from 10.4.1.100 followed with regard to test conditions and least favourable EUT configuration		N/A
	Three special methods for testing PANEL MOUNTED EQUIPMENT a), b), or c)		N/A
10.4.1.102	Special method, large or heavy equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tested at room AMBIENT TEMPERATURE, with the recorded temperature corrected by the difference between the EUT's max. RATED AMBIENT TEMPERATURE and actual room AMBIENT TEMPERATURE	See Table 10	N/A
10.4.1.103	Other considerations, applying to all cases		N/A
	a) temperature of windings measured by resistance method or use of temperature sensors		N/A
	b) Fault tests done at room AMBIENT TEMPERATURE and corrected to RATED AMBIENT TEMPERATURE		N/A
10.5	Resistance to heat		N/A
10.5.2	Non-metallic enclosures		N/A
	This sub clause is applicable for enclosed equipment		N/A

11	PROTECTION AGAINST HAZARDS FROM FLUIDS		N/A
11.6	Specially protected equipment	See combined Tables 8 & 11	N/A
	Inspection of the equipment	IP rating: _	N/A
	Equipment testing to IEC 60529 or other method..... :	See appended Report	N/A
	Voltage test to 6.8 without humidity preconditioning. :	See Tables 6.7A and 6.8	N/A

14	COMPONENTS AND SUBASSEMBLIES		P
14.101	Components bridging insulation		P
14.101.1	Capacitors	Approved components used.	P
	Capacitor(s) connected between 2 line conductors in mains circuit or between line conductor and neutral complies with subclass X1 or X2 of IEC 60384-14,		P
	- used in accordance with its rating		P
	Capacitor(s) bridging any double or reinforced insulation comply with Y1 or Y2 of IEC 60384-14 in accordance with its ratings (requires 2 x Y2 in series)		P
	Capacitor(s) between the MAINS CIRCUIT and protective earth complies with subclass Y1, Y2, or Y4 of IEC 60384-14		P
14.101.2	Surge suppressors		N/A
	Surge suppressor in mains circuit is a VDR, and		N/A
	- complies with IEC 61051-2		N/A
14.102	Switching devices		N/A
	Switching devices controlling outputs operate within their ratings or		N/A
	- according to IEC 60947-5-1, or		N/A
	- overload and endurance tests to 4.4.2.15 passed		N/A

4.4	TABLE: Testing in SINGLE FAULT CONDITION – Results			P
Test sub-clause	Fault No.	Fault description	How was test terminated Comments	Meets 4.4.4

NOTE Td = Test duration in hh:mm:ss
Record dielectric strength test in Table 6.8 and temperature tests in Table10 or 10.2.
Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

Supplementary information:

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Clause	Requirement – Test	Verdict

4.4.2.101.1	TABLE: Switching devices tests - Overload test		P
Parameter	Test value	Note	—
Intended use	DC general use/DC pilot duty	--	—
Current	0.15A/0.1A	--	—
Voltage	24Vd.c./30Vd.c.	--	—
Power factor	--	--	—
Number of cycles	50	--	—
Endurance test follows	Yes	--	—
Electrical function	--	--	P
Mechanical function	--	--	P
No dielectric breakdown	--	--	N/A
Supplementary information:			

4.4.2.101.2	Endurance test		P
Parameter	Test value	Note	—
Intended use	DC general use/DC pilot duty	--	—
Current	0.1A	--	—
Voltage	24Vd.c.	--	—
Power factor	--	--	—
Number of cycles	0-1000	--	—
	1000-6000	--	P
Electrical function	--	--	P
Mechanical function	--	--	P
No dielectric breakdown	--	--	N/A
Supplementary information:			

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Clause	Requirement — Test	Verdict

[illegible]

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 – Capacitor test may be required (see Table 6).

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: Refer to report of 48.420.23.1520.02

[illegible]

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Clause	Requirement — Test	Verdict

6.5.2.6	TABLE: Transformer PROTECTIVE BONDING screen			N/A
ACCESSIBLE part under test	Test current (see NOTE) (A)	Voltage attained after 1 min (max. 10 V), (V)	Calculated resistance (maximum 0,1 Ω) (Ω)	Verdict
NOTE – Test current must be twice the value of the over current protection means of the winding. Test is specified in 6.5.2.6 a) or b).				
Supplementary information:				

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Clause	Requirement — Test						Verdict
6.7	TABLE: Insulation requirements- Block diagram of system						P
Pollution degree				Overvoltage category			
Area	Location	Insulation type	WORKING VOLTAGE			Test voltage	Comments (NOTE 3)
		(NOTE 1)	RMS (V)	Peak (V)	Frequency (kHz)	(NOTE 2) (V)	
A							
B							
C							
D							
E							
F							
NOTE 1 – Type of insulation: BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION see also Table 6.7B for further details		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"		
Supplementary Information: Refer to report of 48.420.23.1520.02							

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Clause	Requirement — Test	Verdict

6.7A	TABLE: Insulation requirements- Clearances and Creepage										P
6.7.101	Insulation for field wiring terminals										—
Area	Location	Insulation type	WORKING VOLTAGE (NOTE 2)			Clearance		Creepage		CTI	Comments
	(See Table 6.7A)	(NOTE 1)	RMS (V)	Peak (V)	Frequency (kHz)	Required (mm)	Measured (mm)	Required (mm)	Measured (mm)		
A											
B											
C											
D											
E											
F											
NOTE 1 – refer to Table 6.7A for type of insulation shown in the insulation diagram						NOTE 2 - to be used for definition of required insulation (see Table 6.7A)					
Input supply voltage.....:		V	Hz								
Supplementary information: Refer to report of 48.420.23.1520.02											

[illegible]

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Clause	Requirement — Test	Verdict

8.2.2	Table: Impact test		P
	Material of enclosure.....:	Metal / non-metallic	—
	Corresponding IK-code.....:		—
	Preparation for the test.....:		—
	Cooled to (temperature).....:	° C	—
Location		Comments	
1) Top		No damage	
2) Side left / right		No damage	
3) Bottom		No damage	
Impact test:6.8J			

8.3	Drop test		N/A
	Material of enclosure.....:	Metal / non-metallic	—
	Preparation for the test.....:		—
	Cooled to (temperature).....:	° C	—
	Mass of equipment.....:	kg	—
Free Fall	Lands in position		Comments
1 st trial			
2 nd trial			
Dropping onto a face		Raised up to	
Location		mm	30 °
1)			
2)			
Dropping onto an edge or corner		Raised up to	
Location		mm	30 °
1)			
2)			
Supplementary information:			

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Clause	Requirement — Test	Verdict

9	TABLE: Protection against the spread of fire			P
Item	Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.)	Protection Method (9a, 9b or 9c)	Protection details	
Supplementary information: Refer to report of 48.420.23.1520.02				

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Clause	Requirement — Test	Verdict

10.	TABLE : Temperature Measurements		
10.1	Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION		
10.3	Other temperature measurements		

Operating conditions:				
Frequency (Hz)		Test room ambient temperature (A)		°C
		Test room ambient temperature (B)		
Voltage (V)		Test duration (hours: min)		

[illegible]

NOTE 1 – Testing is to be conducted at rated ambient temperature except where allowed testing can be conducted a room ambient and adjusted as follows:

t_m = measured temperature

$$t_g = t_m \text{ corrected } (t_m - [A \text{ or } B] + 40\text{ }^{\circ}\text{C} \text{ or max. RATED ambient})$$
 $t_{\max}$ = maximum permitted temperature

See 10.4.1.101 for three methods for testing panel mounted equipment.

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 Table

NOTE 4 - see Table 10.2 for details of winding temperature measurements

Supplementary information: Maximum Rated Ambient _____ .

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Clause	Requirement — Test	Verdict

[illegible]

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Clause	Requirement — Test			Verdict
11	TABLE : Protection against HAZARDS from fluids			N/A
8	Mechanical resistance to shock and impact			
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.				
Location (see Table 6.7.A)	Clause 11 tests			Comments
	IEC 60529 (11.6)	Working voltage, (V)	Test voltage (V)	
NOTE 1 - t_m = measured temperature $t_c = t_m$ corrected ($t_m - t_a + 40\text{ °C}$ 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 Table NOTE 4 - see Table 10.2 for details of winding temperature measurements				
Supplementary information:				

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Clause	Requirement – Test	Result — Remark	Verdict

[illegible]

Supplementary information:

1) An asterisk indicates a mark which assures the agreed level of surveillance. See Licenses and Certificates of Conformity for verification.

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Clause	Requirement – Test	Result — Remark	Verdict

[illegible]