TEST REPORT

IEC 61010-1/ EN 61010-1

Safety requirements for electrical equipment for measurement, control, and laboratory use

Part 1: General requirements

Report Reference No.....:	**B2003022**
Tested by (name and signature) .....:	Kim Boll Jensen
Approved by (name and signature)..:	Kim Boll Jensen Manager Bolls Rådgivning
Date of issue.....:	2003-09-17
Contents .....:	59 Pages

Manufacturer.....:	PTV / DK-AUDIO A/S
Address .....:	Marielundvej 37D DK-2730 Herlev Denmark

Test location .....:	Bolls Rådgivning
Address .....:	Ved Gadekæret 11F DK-3660 Stenløse Denmark

Test specification:

Standard.....:	IEC 61010 – 1 : 2001 (2nd Edition); EN 61010 – 1 : 2001 (2nd Edition)

Test item description .....:	Compact VariTime Sync Generator
Trademark .....:	
Model/Type reference .....:	PT 5202
Rating(s).....:	100 – 240 Vac, 25W

Test item particulars ..... :	
Type of item tested ..... :	Laboratory
Description of equipment function ..... :	Compact VariTime Sync Generator for 19” rack mounting, 1U high and ½ wide.
Installation/overvoltage category ..... :	II
Pollution degree ..... :	1
Environmental rating ..... :	standard
Equipment mobility ..... :	fixed (rack mounted)
Connection to mains supply ..... :	detachable cord set
Operating conditions ..... :	continuous
Overall size of the equipment (L x W x H) ..... :	354 x 216 x 42 mm
Mass of the equipment (kg) ..... :	1,25 Kg
Marked degree of protection to IEC 60529 ..... :	No special protection, N/A
Accessories and detachable parts included in the evaluation ..... :	N/A
Options ..... :	N/A
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 ..... :	2003-06-10
Date (s) of performance of tests ..... :	2003-09-15 to 2003-09-17

General remarks:

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

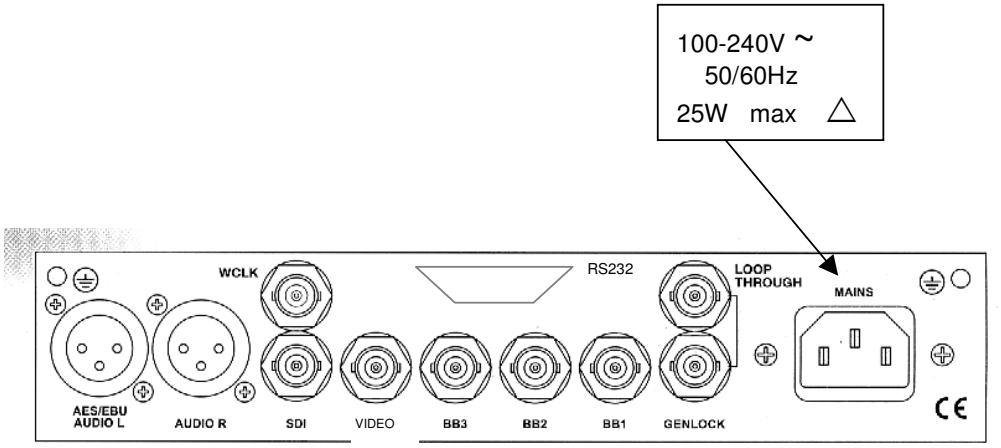
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

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

"(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report.
"(see Form A.#)" refers to a table appended to the report.

Bolls Rådgivning takes no responsibility for and will not assume liability for damages or economic losses resulting from the use of the product described in this report.

Copy of marking plate:



Summary of test results (information/comments):

Most of the safety requirements are fulfilled by the UL/TÜV approved PSU with integral mains inlet, therefore many of the tests are not applicable to this product, and reference is made to the PSU approval.

Safety of the product is based on both earth connection and the reinforced insulation in the PSU, the secondary circuits are also connected to earth. The product is designed and tested for both according to insulation requirements described I Annex D figure d.1 h).

	TABLE: 2 – Picture of product	

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

TABLE: 3 - List of components and circuits relied on for safety

Unique component reference or location (including drawing reference if required)	Application/Function	Manufacturer (NOTE 1)	Part number	RATING (NOTE 2)	Evidence of acceptance (NOTE 3)
Power supply	Integrated PSU and mains inlet	Powerbox/Kentex	PU25-105	90-264Vac input, +5Vdc 25W output	UL E128856, UR, C-UR according to UL1950 TÜV EN 60950
Internal wires	Earth connection and 5 Vdc	-	-	VW-1	UL/CSA approved
PCB		-	-	94V-1 or 94V-0	UR
Connector	5 Vdc	-	-	94V-2 as minimum	UR

NOTE 1 - List all manufacturers concerned.
NOTE 2 - Electrical, mechanical, flammability, etc.
NOTE 3 - Licence number, file number or other documentary evidence of acceptance

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	MARKING AND DOCUMENTATION		—
5.1.1	General		—
	Required equipment markings are:		P
	visible:		P
	From the exterior; or	Marking on back of cabinet	P
	After removing a cover; or	Fuse marking on PCB close to fuse	P
	Opening a door		N/A
	After removal from a rack or panel		N/A
	Not put on parts which can be removed by an OPERATOR	No operator removable parts.	P
	Letter symbols (IEC 60027) used		N/A
	Graphic symbols (IEC 61010-1: Table 1) used	Number 2 and 14 used	P
5.1.2	Identification		—
	Equipment is identified by:		—
5.1.2a)	Manufacturer's or supplier's name or trademark		P
5.1.2b)	Model number, name or other means		P
	Manufacturing location identified		N/A
5.1.3	Mains supply		—
	Equipment is marked as follows:		—
5.1.3a)	Nature of supply:		—
	1) a.c. RATED mains frequency or range of frequencies.....:	50/60 Hz	P
	2) d.c. with symbol 1		N/A
5.1.3b)	RATED supply voltage(s) or range.....:	100 - 240	P
5.1.3c)	Max. RATED power (W or VA)or input current.....:	25 W max.	P
	The measured value not more than 110 %	(see Form A.3) -44%	P
	If more than one voltage range:		—
	Separate values marked; or		N/A
	Values differ by less than 20 %	(see Form A.3) Differs by 7%	P
5.1.3d)	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

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.3e)	Accessory mains socket-outlets accepting standard mains plugs are marked:		—
	With the voltage if it is different from the mains supply voltage .....:		N/A
	For use only with specific equipment		N/A
	If not marked for specific equipment it is marked with:		—
	The maximum RATED current or power; or		N/A
	Symbol 14 with full details in the documentation		N/A
5.1.4	Fuses		—
	OPERATOR replaceable fuse marking (see also 5.4.5).....:	Fuse is inside cabinet and not operator replaceable	N/A
5.1.5	TERMINALS, connections and operating devices		—
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		N/A
	If insufficient space, symbol 14 used		P
5.1.5.1	TERMINALS		N/A
	Mains supply TERMINALS identified	Appliance inlet	N/A
	Other TERMINAL marking ..... :		N/A
5.1.5.1a)	FUNCTIONAL EARTH TERMINALS (symbol 5 used)		N/A
5.1.5.1b)	PROTECTIVE CONDUCTOR TERMINALS:		—
	Symbol 6 is placed close to or on the TERMINAL; OR	Appliance inlet	N/A
	Part of appliance inlet		P
5.1.5.1c)	TERMINALS of measuring and control circuits (symbol 7 used)		N/A
5.1.5.1d)	HAZARDOUS LIVE TERMINALS supplied from the interior	No hazardous live at output connectors	—
	Standard MAINS socket outlet; or		N/A
	RATINGS marked; or		N/A
	Symbol 14 used		N/A
5.1.5.1e)	ACCESSIBLE FUNCTIONAL EARTH TERMINALS:		—
	Self-evident; or		N/A
	Indication (symbol 8 acceptable)		N/A
5.1.5.2	Measuring circuit TERMINALS	Not a measuring instrument	—
	For TERMINALS other than those permanently connected and not ACCESSIBLE:		—
	RATED voltage or current marked		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Unless clear indication that below limits:		—
	Maximum RATED voltage to earth is marked; or		N/A
	For specific connection to other equipment TERMINALS only, and means for identifying provided		N/A
	Appropriate measurement category marked (CAT II, CAT III or CAT IV); or		N/A
	No measurement category marked (CAT I)		N/A
	Required markings are adjacent to TERMINALS; OR		N/A
	If insufficient space:		—
	On the RATING plate or scale plate; or		N/A
	TERMINAL is marked with symbol 14		N/A
5.1.6	Switches and circuit breakers		—
	If disconnecting device, on or off position marked	No switch	N/A
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION	Protective conductor terminal in appliance inlet	—
	Protected throughout (symbol 11 used)		N/A
	Only partially protected (symbol 11 not used)		N/A
5.1.8	Field-wiring TERMINAL boxes	Appliance coupler used	—
	If TERMINAL or ENCLOSURE exceeds 60 °C:		—
	Cable temperature RATING marked		N/A
	Marking visible or beside TERMINAL		N/A
5.2	Warning markings	No warning marking	—
	Visible when ready for NORMAL USE		N/A
	Are near or on applicable parts		N/A
	Symbols and text correct dimensions and colour		N/A
	If necessary marked with symbol 14		N/A
	Statement to isolate or disconnect		N/A
5.3	Durability of markings		—
	The required markings remain clear and legible in NORMAL USE	(see Form A.4)	P
5.4	Documentation		—
5.4.1	General		—
	Equipment is accompanied by documentation which includes:		—
5.4.1a)	Intended use		P
5.4.1b)	Technical specification		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.1c)	Instructions for use		P
5.4.1d)	Name and address of manufacturer or supplier		P
5.4.1e)	Information specified in 5.4.2 to 5.4.5		—
5.4.1f)	If marking of TERMINALS required, definition of measurement category		N/A
5.4.1g)	If CAT 1:		—
	Warning		N/A
	RATINGS		N/A
	Warning statements and a clear explanation of warning symbols:		—
	Provided in the documentation; or		N/A
	Information is marked on the equipment		N/A
5.4.2	Equipment RATINGS		—
	Documentation includes:		—
5.4.2a)	Supply voltage or voltage range	100 – 240 Vac	P
	Frequency or frequency range	50/60 Hz	P
	Power or current RATING	25 W max.	P
5.4.2b)	Description of all input and output connections	All connectors marked	P
5.4.2c)	RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N/A
5.4.2d)	Statement of the range of environmental conditions		P
5.4.2e)	Degree of protection (IEC 60529)	No special protection	N/A
5.4.3	Equipment installation		—
	Documentation includes instructions for:		—
5.4.3a)	Assembly, location and mounting		P
5.4.3b)	Protective earthing		P
5.4.3c)	Connections to supply		P
5.4.3d)	PERMANENTLY CONNECTED EQUIPMENT:	Detachable power supply cord	—
	1) Supply wiring requirements		N/A
	2) If external switch or circuit-breaker, requirements and location recommendation		N/A
5.4.3e)	Ventilation requirements		P
5.4.3f)	Special services (e. g. air, cooling liquid)		N/A
5.4.3g)	Maximum sound power level		N/A
5.4.3h)	Instructions about sound pressure		N/A
5.4.3i)	Permanently connected measuring TERMINALS:	Detachable power supply cord	—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Measurement category		N/A
	RATED maximum WORKING VOLTAGE or current		N/A
5.4.4	Equipment operation		—
	Instructions for use include:		—
5.4.4a)	Identification of operating controls		P
5.4.4b)	Positioning for disconnection		P
5.4.4c)	Interconnection		P
5.4.4d)	Specification of intermittent operation limits		N/A
5.4.4e)	Explanation of symbols used	Table 1 number 14 used	P
5.4.4f)	Replacement of consumable materials		N/A
5.4.4g)	Cleaning and decontamination (see 11.2)		N/A
5.4.4h)	Listing of any poisonous or injurious gases and quantities		N/A
5.4.4i)	Risk-reduction procedures relating to flammable 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		—
	Instructions include:		—
	Sufficient preventive maintenance and inspection information	No maintenance required	N/A
	Replacement of hoses, etc.		N/A
	Specific battery type		N/A
	Any manufacturer specified parts		N/A
	RATING and characteristics of fuses	Fuse is not user replaceable	N/A
6	PROTECTION AGAINST ELECTRIC SHOCK	(see Form A.5)	—
6.1	General		—
6.1.1	Requirements		—
	ACCESSIBLE parts not HAZADOUS LIVE in NORMAL CONDITION and SINGLE FAULT CONDITION		P
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11		—
6.1.2	Exceptions		—
	Capacitance test	(see Forms A.6 and A.7)	P
	Parts not HAZARDOUS LIVE 10 s after interruption of supply	(see Form A.7)	P
6.2	Determination of ACCESSIBLE parts		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.1	General examination	(see Form A.6)	P
6.2.2	Openings above parts that are HAZARDOUS LIVE	Openings not wider than 3.6 mm.	P
6.2.3	Openings for pre-set controls	No preset control	N/A
6.3	Permissible limits for ACCESSIBLE parts		—
6.3.1	Values in NORMAL CONDITION	(see Form A.7)	P
6.3.2	Values in SINGLE FAULT CONDITION	(see Form A.8)	P
6.4	Protection in NORMAL CONDITION (see 6.2, 6.3.1, 6.7, 6.8 and 8.1)		P
6.5	Protection in SINGLE FAULT CONDITION		—
	Additional protection is provided by:		—
	One or more of 6.5.1 to 6.5.3;	Protective earth connection and/or reinforced insulation used	P
	Automatic disconnection of the supply (6.5.4)		N/A
6.5.1	Protective BONDING		—
	ACCESSIBLE conductive parts:		—
	Separated by DOUBLE INSULATION or REINFORCED INSULATION; or	All signal connectors is separated from mains by reinforced insulation	P
	Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or	Cabinet is bonded to protective earth	P
	Separated by screen or BARRIER bonded to PROTECTIVE CONDUCTOR TERMINAL from parts which are HAZARDOUS LIVE		N/A
6.5.1.1	Integrity of PROTECTIVE BONDING		—
6.5.1.1a)	PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		P
6.5.1.1b)	Soldered connections:		—
	Independently secured	Secured by heat shrinkable insulation	P
	Not used for other purposes		P
	Screw connections are secured	Washer used	P
6.5.1.1c)	PROTECTIVE BONDING not interrupted	Operator is not allowed to remove any part of equipment	N/A
6.5.1.1d)	Any moveable connection specifically designed, and meets 6.5.1.3		N/A
6.5.1.1e)	No external metal braid of cables used		N/A
6.5.1.1f)	If MAINS supply passes through:		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Means provided for passing protective conductor;	No output connector for mains	N/A
	Impedance meets 6.5.1.3.		N/A
6.5.1.1g)	Protective conductors bare or insulated, if insulated, green/yellow	Green/yellow used and only for protective conductor	P
	Exceptions:		—
	1) earthing braids;		N/A
	2) internal protective conductors etc.;		N/A
	Green/yellow not used for other purposes		P
6.5.1.1h)	TERMINAL suitable, and meets 6.5.1.2	Appliance inlet used. Protective conductor terminal can be implemented on some cabinets	P
6.5.1.2	PROTECTIVE CONDUCTOR TERMINAL	If implemented	—
6.5.1.2a)	Contact surfaces are metal		P
6.5.1.2b)	Appliance inlet used	Always	P
6.5.1.2c)	For rewireable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS		N/A
6.5.1.2d)	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
6.5.1.2e)	Equivalent current-carrying capacity to MAINS supply TERMINALS	(see Form A.9)	P
6.5.1.2f)	If plug-in, makes first and breaks last	IEC 60320-1 type appliance coupler	P
6.5.1.2g)	If also used for other bonding purposes, protective conductor:		—
	Applied first;		N/A
	Secured independently;		N/A
	Unlikely to be removed by servicing; or		N/A
	Warning marking requires replacement of protective conductor		N/A
6.5.1.2h)	Protective conductor of measuring circuit:		N/A
	1) Current RATING;		N/A
	2) PROTECTIVE BONDING:		—
	Not interrupted; or		N/A
	Indirect bonding used (see 6.5.1.5)		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.5.1.2i)	FUNCTIONAL EARTH TERMINALS allow independent connection		N/A
6.5.1.2j)	If a binding screw:	Internal and if implemented external	—
	Suitable size for bond wire		P
	Not smaller than M 4 (No. 6)	M 4 used	P
	At least 3 turns of screw engaged		P
	Contact pressure not capable of reduction by deformation of materials		P
	Passes tightening torque test	(see Form A.9)	P
6.5.1.3	Impedance of PROTECTIVE BONDING of plug-connected equipment	(see Form A.10)	P
6.5.1.4	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT		N/A
6.5.1.5	Indirect bonding for measuring and test equipment		N/A
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION (see 6.7, 6.8 and 6.9.2)		—
6.5.3	PROTECTIVE IMPEDANCE		N/A
6.5.3a)	HIGH-INTEGRITY single component used (s. 14.6); or	Only used in approved PSU	P
6.5.3b)	A combination of components used; or		N/A
6.5.3c)	A combination of BASIC INSULATION and current- or voltage-limiting device used		N/A
	Components, wires and connections are RATED as required		P
6.5.4	Automatic disconnection of the supply		N/A
	If used, it meets :		—
6.5.4a)	Supplied with the equipment; or		N/A
	Specified by installation instruction		N/A
6.5.4b)	RATED disconnecting time within limit specified		N/A
6.5.4c)	RATED for maximum RATED LOAD		N/A
6.6	Connections to external circuits		—
6.6.1	General		—
	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		—
6.6.1a)	The external circuits		P
6.6.1b)	The equipment		P
	Separation of circuits provided; or	Reinforced insulation used in PSU	P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Short circuit of separation does not cause a Hazard	Reinforced insulation is not short circuit	N/A
	Instructions or markings include:		—
	1) RATED conditions for TERMINAL		N/A
	2) Required RATING of external circuit insulation		N/A
6.6.2	TERMINALS for external circuits		—
	TERMINALS which receive a charge from an internal capacito are not HAZARDOUS LIVE	(see Form A.7)	P
	High voltage TERMINALS energized from the interior are:	No Hazardous voltage generated internally	—
	Not ACCESSIBLE if connected; or		N/A
	Unmated HAZARDOUS LIVE TERMINALS not ACCESSIBLE ; or		N/A
	marked with symbol 12		N/A
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE	Only appliance inlet	—
	These circuits are:		—
	Not connected to ACCESSIBLE conductive parts; or		P
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N/A
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		P
6.6.4	ACCESSIBLE TERMINALS for stranded conductors	Not used	—
6.6.4a)	No risk of accidental contact because:		—
	Located or shielded		N/A
	Self-evident or marked whether connected to ACCESSIBLE conductive parts		N/A
6.6.4b)	ACCESSIBLE TERMINALS will not work loose		N/A
6.7	CLEARANCES and CREEPAGE DISTANCES	(See Form A.5 and A.13)	P
6.8	Procedure for dielectric strength tests	(See Form A.5 and A.14)	P
6.9	Constructional requirements for protection against electric shock		—
6.9.1	General		—
	If a failure could cause a HAZARD:		—
6.9.1a)	Security of wiring connections		P
6.9.1b)	Screws securing removable covers		N/A
6.9.1c)	Accidental loosening		P
	Easily damaged materials not used		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Non-impregnated hydroscopic materials not used		P
6.9.2	ENCLOSURES of equipment with DOUBLE INSULATION or REINFORCED INSULATION	Equipment is protected by Protective earth	—
	ENCLOSURE surrounds all metal parts except for small metal parts which are separated		N/A
	ENCLOSURES or parts made of insulating material		N/A
	Protection for metal ENCLOSURES or parts by:		—
6.9.2a)	An insulating coating or BARRIER on the inside; or		N/A
6.9.2b)	CLEARANCES and CREEPAGE DISTANCES cannot be reduced by loosening of parts or wires		N/A
6.9.3	Over-range indication		—
	Unambiguous		N/A
6.10	Connection to MAINS supply source and connections between parts of equipment		—
6.10.1	MAINS supply cords		—
6.10.1a)	RATED for maximum equipment current (see 5.1.3c)	Nationally approved mains cords is supplied	P
	Cable complies with IEC 60227 or IEC 60245	For EU only	P
6.10.1b)	Heat-resistant if likely to contact hot parts		N/A
6.10.1c)	Temperature RATING (cord and inlet)	Cord 60℃ and inlet 70℃	P
6.10.1d)	Green/yellow used only for connection to PROTECTIVE CONDUCTOR TERMINALS		P
	Detachable cords with IEC 60320 MAINS connectors:		—
	Conform to IEC 60799; or		N/A
	Have the current RATING of the MAINS connector		P
6.10.2	Fitting of non-detachable MAINS supply cords	Detachable mains supply cord used	—
	Non-detachable cord protection:		—
6.10.2a)	Inlet or bushing smoothly rounded; or		N/A
6.10.2b)	Insulated cord guard protruding ≥5D		N/A
	The protective earth conductor is the last to take the strain		N/A
6.10.2	Cord anchorages:		—
6.10.2a)	Cord is not clamped by direct pressure from a screw		N/A
6.10.2b)	Knots are not used		N/A
6.10.2c)	Cannot push the cord into the equipment to cause a hazard		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.10.2d)	No failure of cord insulation in anchorage with metal parts		N/A
6.10.2e)	compression bushing:		—
	1) Clamps all types and sizes of MAINS cords; and		N/A
	2) Is suitable:		—
	For connection to TERMINALS provided; or		N/A
	It is designed for screened MAINS cord		N/A
6.10.2f)	Cord replacement does not cause a HAZARD and method of strain relief is clear		N/A
	Push-pull test		N/A
6.10.3	Plugs and connectors		—
6.10.3a)	MAINS supply plugs, connectors etc., conform with relevant specifications	IEC 60320-1 type used	P
6.10.3b)	If equipment supplied at voltages below 6.3.2.a) or from a sole source:	Only mains supply	—
	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
610.3c)	Plug pins which receive a charge from an internal capacitor		N/A
6.10.3d)	Accessory MAINS socket outlets:	No mains outlet	—
	1) Marking if accepts a standard MAINS plug (see 5.1.3e)		N/A
	2) Input has a protective earth conductor if outlet has earth TERMINAL contact		N/A
6.11	Disconnection from supply source		—
6.11.1	General		—
	Disconnects all current carrying conductors	Plug is used as disconnecting device	P
6.11.1.1	Exceptions		—
6.11.1.1a)	Equipment supplied by low energy source; or		N/A
6.11.1.1b)	Equipment connected to impedance protected supply; or		N/A
6.11.1.1c)	Equipment constitutes an impedance protected load		N/A
6.11.2	Requirements according to type of equipment		—
6.11.2.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Employs switch or circuit-breaker		N/A
	If switch or circuit-breaker is not part of the equipment, documentation specifies:		—
6.11.2.1a)	Switch or circuit-breaker to be included in building installation		N/A
6.11.2.1b)	Location		N/A
6.11.2.1c)	Marking		N/A
6.11.2.2	Single-phase cord-connected equipment		—
	Equipment is provided with:		—
6.11.2.2a)	Switch or circuit-breaker; or		N/A
6.11.2.2b)	Appliance coupler (disconnect able without TOOL); or		P
6.11.2.2c)	Separable plug (without locking device)		N/A
6.11.2.3	HAZARDS arising from function	No hazards due to functions	—
	Emergency switch		N/A
	Emergency switch ≤ 1 m from the moving part		N/A
6.11.3	Disconnecting devices	Appliance coupler is disconnection device	—
	Electrically close to the supply		N/A
6.11.3.1	Switches and circuit-breakers		—
	When used as disconnection device:		—
	Meets IEC 60947-1 and IEC 60947-3		N/A
	Marked to indicate function		N/A
	Not incorporated in MAINS cord		N/A
	Does not interrupt protective earth conductor		N/A
	If has other contacts meets separation requirements of 6.6 and 6.7		N/A
6.11.3.2	Appliance couplers and plugs		—
	Where an appliance coupler or seperable plug is used as the disconnecting device (see 6.11.2.2):		—
	Readily identifiable and easily reached by the OPERATOR		P
	Single-phase PORTABLE EQUIPMENT cord length ≤ 3 m		N/A
	Protective earth conductor connected first and disconnected last	IEC 60320-1 type used	P
7	PROTECTION AGAINST MECHANICAL HAZARDS	No moving parts	—
7.1	General		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conformity is checked by 7.2 to 7.6		N/A
7.2	Moving parts		—
	Moving parts not able to crush, etc. (see also 6.11.2.3)		N/A
	If OPERATOR access permitted:		—
7.2a)	Access requires TOOL		N/A
7.2b)	Statement about training		N/A
7.2c)	Warning markings or symbol 14		N/A
7.3	Stability		—
	Marking of non-automatic means		N/A
	Conformity tests:		—
7.3a)	10° tilt test		P
7.3b)	Multi-directional force test	The product is less than 1 m high	N/A
7.3c)	downward force test	Product is not floor-standing	N/A
7.4	Provisions for lifting and carrying	No handles or grips	—
	Handles or grips withstand four times weight		N/A
	Equipment >18 kg :	< 18 Kg.	—
	Has means for lifting or carrying; or		N/A
	Directions in documentation		N/A
7.5	Wall mounting	Product is not wall mounted	—
	Mounting brackets withstand four times weight		N/A
7.6	Expelled parts		—
	Equipment contains or limits the energy		N/A
	Protection not removable without the aid of a TOOL		N/A
8	MECHANICAL RESISTANCE TO SHOCK AND IMPACT		—
	After the tests of 8.1 to 8.2:		—
	Voltage tests	(see Form A.14)	P
	Inspections:		—
8a)	HAZARDOUS LIVE parts not accessible		P
8b)	ENCLOSURE shows no cracks (hazard)		P
8c)	CLEARANCES not less than their permitted values	(see Form A.13)	P
8d)	BARRIERS not damaged or loosened		P
8e)	No moving parts exposed, except permitted by 7.2		N/A
8f)	No damage which could cause spread of fire		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
9	PROTECTION AGAINST THE SPREAD OF FIRE		—
	Conformity for each source of HAZARD or area of the equipment is checked by one of the following:	(See Form A.16)	—
9a)	Fault test of 4.4; or	(See Forms A.1 and A.2)	P
9b)	Application of 9.1 (eliminating or reducing the sources of ignition); or	Max current is 9A @ 5 Vdc	N/A
9c)	Application of 9.2 (containment of fire within the equipment)		N/A
9.1	Eliminating or reducing the sources of ignition within the equipment		—
9.1a)	1) Limited-energy circuit (see 9.3); or		N/A
	2) Insulation meets the requirements for BASIC INSULATION; OR	(see Form A.5 and A.14)	P
	Bridging the insulation does not cause ignition	Reinforced insulation	N/A
9.1b)	Surface temperature of liquids and parts (see 9.4.a)	No liquids	N/A
9.1c)	No ignition in circuits designed to produce heat	No heating elements	N/A
9.2	Containment of the fire within the equipment, should it occur		—
9.2a)	Energizing of the equipment is controlled by an OPERATOR held switch		N/A
9.2b)	Enclosure is conform with constructional requirements of 9.2.1; and		P
	Requirements of 9.4b) or c) are met		N/A
9.2.1	Constructional requirements		—
9.2.1a)	Insulated wires have flammability classification FV1 or better	(see Table 3 or Form A.17)	P
	Connectors and insulating material have flammability classification FV2 or better	(see Table 3 or Form A.17)	P
9.2.1b)	The enclosure is constructed as follows :		—
	1) Bottom constructed with:		—
	No openings; or		P
	Extent as specified in figure 7; or	No openings in bottom	N/A
	Baffles as specified in figure 6; or		N/A
	Perforated as specified in Table 12; or		N/A
	Metal screen with a mesh		N/A
	2) Sides have no openings as specified in figure 7		P
	3) Material of ENCLOSURE and any baffle or flame barrier is made of:		—
	Metal (except magnesium); or		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Non metallic materials have flammability classification FV1 or better	(see Table 3 or Form A.17)	N/A
	4) ENCLOSURE and any baffle or flame barrier have adequate rigidity		P
9.3	Limited-energy circuit	Max current is 9A @ 5 Vdc	—
9.3a)	Potential not more than 30 r.m.s. and 42.4 V peak, or 60 V dc		N/A
9.3b)	Current limited by one of following means:		—
	1) Inherently or by impedance; or		N/A
	2) Overcurrent protective device; or		N/A
	3) A regulating network limits also in SINGLE FAULT CONDITION		N/A
9.3c)	Is separated by at least BASIC INSULATION		N/A
	If overcurrent protective device used:		—
	Fuse or a non adjustable electromechanical device		N/A
9.4	Requirements for equipment containing or using flammable liquids	No liquids contained or used by equipment	N/A
	Flammable liquids contained in or specified for use with equipment do not cause spread of fire		N/A
	Risk is reduced to a tolerable level :		—
9.4a)	The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point		N/A
9.4b)	The quantity of liquid is limited		N/A
9.4c)	Flames are contained within the equipment		N/A
	Detailed instructions for risk-reduction provided		N/A
9.5	Overcurrent protection		P
	Devices not in the protective conductor		P
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase)		N/A
9.5.1	PERMANENTLY CONNECTED EQUIPMENT	Detachable power supply cord	N/A
	Overcurrent device:		—
	Fitted within the equipment; or		N/A
	Specified in manufacturer's instructions		N/A
9.5.2	Other equipment	PSU have over current protection	P
	Protection within the equipment		P
10	EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.1	Surface temperature limits for protection against burns		—
	Easily touched surfaces within the limits	(see Form A.20A and 20A1)	P
	Heated surfaces necessary for functional reasons exceeding specified values:	No heated surfaces	—
	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	PSU is approved for application	P
	Limits not exceeded in:		—
	NORMAL CONDITION		P
	SINGLE FAULT CONDITION		P
10.3	Other temperature measurements	(see Form A.20A and 20A1)	P
	Following measurements conducted if applicable:		—
10.3a)	Value of 60 °C of field-wiring TERMINAL box not exceeded		N/A
10.3b)	Surface of flammable liquids and parts in contact with this liquids		N/A
10.3c)	Surface of non-metallic ENCLOSURES		N/A
10.3d)	Parts made of insulating material supporting parts connected to MAINS supply		N/A
10.3e)	TERMINALS carrying a current more than 0.5 A	Max temp. 60°C	P
10.4	Conduct of temperature test	(see Form A20)	P
10.5	Resistance to heat		P
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES	(See Form A.13)	P
10.5.2	Non-metallic ENCLOSURES		N/A
	After treatment:		N/A
	No HAZARDOUS LIVE parts ACCESSIBLE;		N/A
	Tests of 8.1 and 8.2		N/A
	In case of doubt, tests of 6.8 (without humidity preconditioning)		N/A
10.5.3	Insulating material	Only in PSU approval	P
10.5.3a)	Parts supporting parts connected to MAINS supply		P
10.5.3b)	TERMINALS carrying a current more than 0.5 A	5 Vdc connector on PCB	P
	Examination of material data; or		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	in case of doubt::		—
	1) Ball pressure test; or		N/A
	2) Vicat softening testof ISO 306		N/A
11	PROTECTION AGAINST HAZARDS FROM FLUIDS	No liquids used	—
11.1	General		N/A
11.2	Cleaning		N/A
11.3	Spillage		N/A
11.4	Overflow		N/A
11.5	Battery electrolyte		—
	Battery electrolyte leakage presents no hazard		N/A
11.6	Specially protected equipment		N/A
11.7	Fluid pressure and leakage		—
11.7.1	Maximum pressure	No parts under pressure	—
	Maximum pressure of any part does not exceed P_{RATED}		N/A
11.7.2	Leakage and rupture at high pressure		N/A
	Test to IEC 60335 (refrigeration only)		N/A
11.7.3	Leakage from low-pressure parts		N/A
11.7.4	Overpressure safety device		—
	Does not operate in NORMAL USE		N/A
	Meets ISO 4126-1; and		N/A
	It is conform with:		—
11.7.4a)	Connected as close as possible to parts intended to be protected		N/A
11.7.4b)	Easy access for inspection, maintenance and repair		N/A
11.7.4c)	Adjustment only with TOOL		N/A
11.7.4d)	No discharge towards person		N/A
11.7.4e)	No HAZARD from deposit of discharged material		N/A
11.7.4f)	Adequate discharge capacity		N/A
11.7.4g)	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		—
12.1	General	No radiation generated	—
	Equipment provides protection		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.2	Equipment producing ionizing radiation		N/A
12.2.1	Ionizing radiation		N/A
12.2.2	Accelerated electrons		N/A
12.3	Ultra-violet (UV) radiation		—
	No unintentional and HAZARDOUS escape of UV radiation		N/A
12.4	Micro-wave radiation		—
	Power density does not exceed 10 W/m^2 ..... :		N/A
12.5	Sonic and ultrasonic pressure		—
12.5.1	Sound level		N/A
12.5.2	Ultrasonic pressure		N/A
12.6	Laser sources (IEC 60825-1)		N/A
13	PROTECTION AGAINST LIBERATED GASES, EXPLOSION AND IMPLOSION	No gases used or generated	—
13.1	Poisonous and injurious gases		N/A
	Attached data/test reports demonstrate conformity		N/A
13.2	Explosion and implosion		—
13.2.1	Components		—
	Components liable to explode:		—
	Pressure release device provided; or		N/A
	Apparatus incorporates OPERATOR protection (see also 7.6)		N/A
	Pressure release device:		—
	Discharge without danger		N/A
	Cannot be obstructed		N/A
13.2.2	Batteries and battery charging		—
	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

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Symbol 14 used		N/A
	Battery compartment design		N/A
	Single component failure		N/A
	Polarity reversal test		N/A
13.2.3	Implosion of cathode ray tubes	No cathode ray tube	—
	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
13.2.4	Equipment RATED for high pressure (See 11.7)		N/A
14	COMPONENTS		P
14.1	General		P
	Where safety is involved, components meet relevant requirements	(see Table 3)	P
14.2	Motors	No motors in equipment	—
14.2.1	Motor temperatures		—
	Does not present a HAZARD when stopped or prevented form starting; or		N/A
	Protected by overtemperature or thermal protection device conform with 14.3		N/A
14.2.2	Series excitation motors		—
	Connected direct to device, if overspeeding causes a HAZARD		N/A
14.3	Overtemperature protection devices		N/A
	Devices operating in a SINGLE FAULT CONDITION		N/A
14.3a)	Reliable function is ensured		N/A
14.3b)	RATED to interrupt maximum current and voltage		N/A
14.3c)	Does not operate in NORMAL USE		N/A
14.4	Fuse holders	No operator replaceable fuses	N/A
	No access to HAZARDOUS LIVE parts		N/A
14.5	Mains voltage selecting devices	Auto ranging PSU	N/A
	Accidental change not possible		N/A
14.6	HIGH INTEGRITY components	Only in approved PSU	N/A
	Used in applicable positions (see Table 3)		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Conforms with IEC publications		N/A
	Single electronic device not used		N/A
14.7	Mains transformers tested outside equipment	Approved PSU used	N/A
14.8	Printed circuit boards		P
	Data shows conformity with FV-1 of IEC 60707 or better; or		P
	Test shows conformity with FV-1 of IEC 60707 or better; or	See Form A.17	N/A
	Thin film flexible PCB with limited-energy circuit used		N/A
14.9	Circuits or components used as transient overvoltage limiting devices		—
	After test, no sign of overload or degradation		N/A
15	PROTECTION BY INTERLOCKS	Protection by interlock not used	—
15.1	General		—
	Interlocks are designed to remove a hazard before OPERATOR exposed		N/A
15.2	Prevention of reactivation		N/A
15.3	Reliability		—
	Single fault unlikely to occur; or		N/A
	Cannot cause a HAZARD		N/A
16	TEST AND MEASUREMENT EQUIPMENT	Equipment is not a test or measurement equipment	N/A
16.1	Current measuring circuits		N/A
16.2	Multifunction meters and similar equipment		N/A
	No HAZARD from:		—
	RATED input voltage combinations		N/A
	Settings of functions		N/A
	Settings of range controls		N/A
ANNEX F	ROUTINE TESTS		P
	Manufacturer’s declaration	100% test	P

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

4.4.2	**TABLE: Summary of SINGLE FAULT CONDITIONS**			**Form A.1**	—
Subclause	Title	Does not apply	Carried out	Comments	
4.4.2.1	PROTECTIVE IMPEDANCE	X		No protective impedance	
4.4.2.2	Protective conductor		X		
4.4.2.3	Equipment or parts for short-term or intermittent operation	X		Equipment is for continuous operation	
4.4.2.4	Motors	X		No motors	
4.4.2.5	Capacitors	X		No motor capacitors	
4.4.2.6	Mains transformers Attach drawing of MAINS Txs showing all protective devices (see Forms A.29 and A.30)	X		PSU is approved	
4.4.2.7	Outputs		X		
4.4.2.8	Equipment for more than one supply	X		Only one supply	
4.4.2.9	Cooling – air holes closed – fans stopped – coolant stopped	 X X	X X 	 No fan No special cooling	
4.4.2.10	Heating devices – timer overridden – temperature controller overridden – loss of cooling liquid – overfilled or empty or both	X X X X X		No heating devices in equipment	
4.4.2.11	Insulation between circuits and parts	X		All insulations are in compliance with requirements	
4.4.2.12	Interlocks	X		No interlocks	
List below all SINGLE FAULT CONDITIONS not covered by 4.4.2.1 to 4.4.2.12:					
Supplementary information: (see Form A.2 for details of tests)					

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

4.4	**TABLE: Testing in single FAULT CONDITION – Results**			**Form A.2**	
Test subclause	Fault No.	Fault description	Td 4.4.3 (NOTE)	How was test terminated Comments	Meets 4.4.4
4.4.2.9	1	Blocking of ventilation holes	4	No critical temperature, product functioning normal	P
4.4.2.2	2	Interruption of protective earth connection	0.1	No hazardous voltages on accessible parts, product functioning normal	P
4.4.2.7	3	Short-circuit of outputs	-	Approved PSU have short-circuit protection, product complies with 9.2 therefore no other test necessary.	P

NOTE Td = Test duration in h:min:s
Record dielectric strength test on Form A.14 and temperature tests on Form A.20.
Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

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

5.1.3c)	**TABLE: Mains supply**		**Form A.3**	**P**
	Marked rating .....:	100 - 240	V	—
	Phase .....:	1		—
	Frequency .....:	50/60	Hz	—
	Current .....:	-	A	—
	Power .....:	25	W	—
	Power .....:	-	VA	—

Test No.	Voltage V	Frequency Hz	Current A	Power in W	Power in VA	Comments
1	100	50	0.22	13	22	
2	240	50	0.10	14	24	
3	90	50	0.25	13	22,5	
4	264	50	0.09	14	23,8	

Note: Measurements are only required for marked ratings.

Supplementary information:

Power max deviation = -44% from marking (requirement <= +10%)

Min – Max power deviation = 7% (requirement < 20%)

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

5.3	**TABLE: Durability of markings**	**Form A.4**	P

Marking method (see NOTE)	Agent
1) Plastic label directly on unpainted metal	A Water
2) Ink directly on unpainted metal	B Isopropyl alcohol
3) Plastic front panel	C (specify agent)
4)	D (specify agent)
5)	E (specify agent)

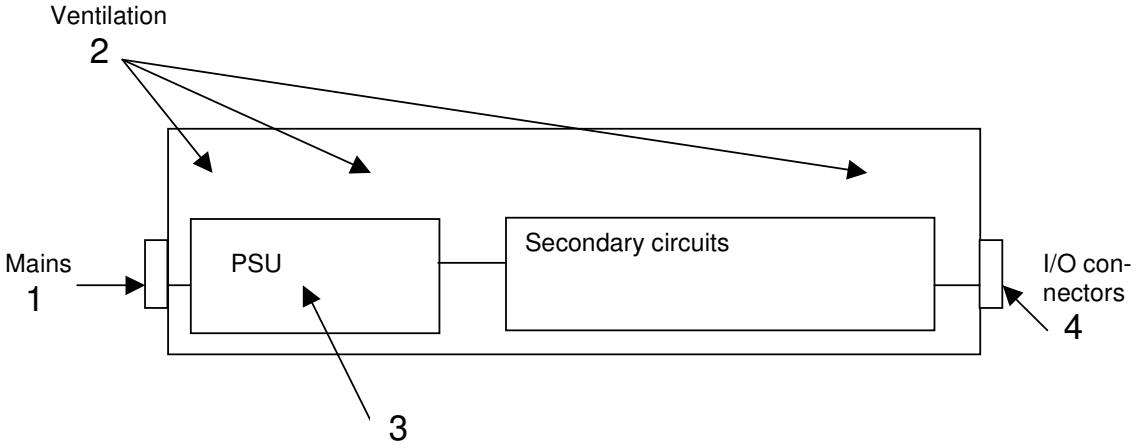
NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

Marking location	Marking method (see above)
Identification (5.1.2)	2) and 3)
Mains supply (5.1.3)	1)
Fuses (5.1.4)	N/A
TERMINALS and operating devices (5.1.5.1)	1)
Measuring circuit TERMINALS (5.1.5.2)	N/A
Switches and □ircuit 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 Verdict	Label loose Verdict	Curled edges Verdict	Comments
1)	B	P	P	P	No change at all
2)	B	P	N/A	N/A	do.
3)	B	P	P	P	do.

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

6	**TABLE: Protection against electric shock – Block diagram of system Form A.5**	P



Pollution degree.....: 1	Installation category (overvoltage category).....: II

Location or	Insulation type	Maximum working	CREEPAGE DISTANCE (NOTE 3)				CLEARANCE (NOTE 3)	Test voltage	Comments
description	(NOTE 1)	voltage (NOTE 2)	PWB mm	CTI	Other mm	CTI	mm	(NOTE 2) V	
1	RI	230 Vrms	*	*	*	*	*	*	Approved PSU
2	-	-	-	-	-	-	-	-	3.6 mm wide
3	RI	230 Vrms	*	*	*	*	*	*	Approved PSU
4	RI	5 Vdc							Relies on PSU approval

NOTE 1 – Type of insulation:	NOTE 2 – Types of voltage	NOTE 3 – INSTALLATION CATEGORIES (OVERVOLTAGE CATEGORIES)
BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION	Peak impulse test voltage (pulse) r.m.s. d.c. peak	or POLLUTION DEGREES which differ from these should be shown under "Comments".

Supplementary Information:

* UL 1950, EN 60950 approved PSU UL and TÜV

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

6.2	**TABLE: List of ACCESSIBLE parts**		**Form A.6**	**P**
6.1.2	Exceptions			—
6.2	Determination of accessible parts			—

Item	Description	Determination method (NOTE 5)	Exception under 6.1.2 (NOTE 4)
1	Appliance inlet	Measure voltage after disconnect	(6.10.3)
2	Ventilation openings	4 mm test pin	
3	PSU mains to secondary	Approved PSU no test	
4	I/O connectors	Measure voltage	Reinforce insulation relies on Approved PSU no test

NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified (see 6.2.1)
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 note to paragraph 1 of 6.4).
NOTE 4 – Capacitor test may be required (see Form A.7).
NOTE 5 – The determination methods are: visual; rigid test finger; jointed test finger; pin 3 mm diameter; pin 4 mm diameter.

Supplementary information

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

6	**TABLE: Values in NORMAL CONDITION**		**Form A.7**	**P**
6.1.1	Exceptions	11.2	Cleaning and decontamination	—
6.3.1	Values in NORMAL CONDITION (see NOTE 1)	11.3	Spillage	—
6.6.2	Terminals for external circuit	11.4	Overflow	—
6.10.3	Plugs and connections			—

Item	Voltage			Current				Capacitance		10 s test (NOTE 2)			Comments
(see Form A.6)	V r.m.s.	V peak	V d.c.	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.	μC	mJ	V	μC	mJ	
1	230 Vrms	-	-	-	-	-	-	-	-	< 1 V	-	-	
4	-	-	< 5	-	-	-	-	-	-	< 1 V	-	-	

NOTE 1 – The requirements of 6.3.1 include drying out (if specified). For permanently connected equipment, the current values are 1,5 times the specified values.
NOTE 2 – A 5 s test is specified in 6.10.3c).

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

6.3.2	**TABLE: Values in SINGLE FAULT CONDITION**											**Form A.8**	**P**
Item	Subclause and	Voltage			Transient (see NOTE)		Current				Capacitance	Comments	
(See Form A.6)	fault No. (see FormA.2)	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 (NOTE)		
1	*												
4	*												
Supplementary information * Relies on Approved PSU no test													
NOTE – Transient voltages must be below the limits given from Figure 1 and the capacitance below the limits from figure 2 of IEC 61010-1.													

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

6.5.1.1	**TABLE: Cross-sectional area of bonding conductors**	**Form A.9**	**P**
Conductor location	Cross-sectional area mm^2		Verdict
Internal from appliance inlet to cabinet	(18 AWG) 1.0 mm		P
6.5.1.2	**TABLE: Tighting torque test**		
Conductor location	Size of Screw	Tighting torque Nm	Verdict
External	M4	1.2	P
Internal	M4	1.2	P

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

6.5.1.3	TABLE: Bonding impedance of plug connected equipment Form A.10			P
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min V	Calculated resistance (maximum allowed 0,1 Ω) Ω	Verdict
Cabinet – appliance inlet	25	230 mV	0.01 ohm	P

Supplementary information:

6.5.1.4	TABLE: Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT		N/A
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min (maximum 10 V) V	Verdict

Supplementary information:

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

6.5.1.5	TABLE: Indirect bonding for measuring and test equipment	Form A.11	N/A

ACCESSIBLE part under test	Voltage attained s	Time for voltage to drop to allowable levels s	Verdict
a) Voltage limiting device	—	—	—

Supplementary Information:

ACCESSIBLE part under test	Voltage applied V	Time for device to trip s	Verdict
b) Voltage-sensitive tripping device			

Supplementary Information:

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

6.5.3	**TABLE: PROTECTIVE IMPEDANCE**	**Form A.12**	**N/A**

A high INTEGRITY single component		
Component	Location	Comments

A combination of components		
Component	Location	Comments

A combination of BASIC INSULATION and a current or voltage limiting device		
Component	Location	Comments

Supplementary information:

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

6.7	**TABLE: CLEARANCES and CREEPAGE DISTANCES** **(Only applicable to approved PSU EN 60590)** **Form A.13**	**P**
8	Mechanical resistance to shock and impact	P
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES **(Only applicable to approved PSU EN 60590)**	P

Location (see Form A.5)	Measured (initial – 6.7)		Verdict	Mechanical tests (note)					Test at max.	Measured after test (if required)		Verdict	Comments
	CREEPAGE DISTANCE mm	CLEARANCE mm		Applied force (6.7) N	Rigidity (8.1) Static	Rigidity (8.1) Dynamic	Drop (8.2) Normal	Drop (8.2) Hand-held Plug-in	RATED ambient (10.5.1)	CREEPAGE DISTANCE mm	CLEARANCE mm		
1	*	*	P	*	X	X	X	-	40°C**	*	*	P	No components or parts has become loos or changed position
2	-	-	-	-	X	X	X	-	40°C**	-	-	P	Ventilation openings still comply with requirements.
3	*	*	P	*	X	X	X	-	40°C**	*	*	P	No components or parts has become loos or changed position

Supplementary information:

* According to approval of PSU

** No components or parts are close to critical temperatures (see A20A) therefore temperature have no influence on the clearances and Creepage distance and the test was done at 21°C amb.

NOTE – Refer to Form A.12 for dielectric strength tests following the above tests.

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

6.8	**TABLE: Dielectric strength tests** **Form A.14**		**P**
4.4.4.1 b)	Conformity after application of fault conditions[1]		P*
6.4	Protection in NORMAL CONDITION		P*
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION		P*
6.6.1	Connections to external circuits		P
6.7.3.1 c)	CLEARANCE values – General: reduced CLEARANCES for homogeneous construction		N/A
6.10.2.5	Fitting of non-detachable MAINS SUPPLY cords[1]		N/A
8	Mechanical resistance to shock and impact		P
9.1 a) 2)	Eliminating or reducing the sources of ignition within the equipment		N/A
9.3 c)	Limited-energy circuit		N/A
11.2	Cleaning[1]		N/A
11.3	Spillage[1]		N/A
11.4	Overflow[1]		N/A
11.6	Specially protected equipment[1]		N/A
[1] Record the fault, test or treatment applied before the dielectric strength test			
N/A	Test site altitude ..... :	m	—
N/A	Test voltage correction factor (see Table 10) ... :		—

Location or references from Forms A.2 and A.3	Clause or sub-clause	Humidity Yes/No	Working voltage V	Test voltage r.m.s./peak/d.c V	Comments	Verdict
1 to 4	6.6.1	No	230	2224 Vrms	1.6 x 1390 V (for 1.5 mm clearance) **	P
1	8	No	230	1390	Basic insulation	P

Supplementary information:

* Based on test under PSU approval

** Tested between 230V mains inlet Phase / Neutral and +5Vdc (5Vdc was not connected to internal PCB since 0V dc is grounded)

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

6.10.2	**TABLE: Cord anchorage**				**Form A.15**	N/A
Location	Mass kg	Pull N	Verdict	Torque Nm	Verdict	Comment
Supplementary information:						

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

9	**TABLE: Protection against the spread of fire**		**Form A.16**	**P**
Item	Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.)	Protection Method (9a, 9b or 9c)	Protection details	Verdict
1 and 3	PSU and mains inlet	9a, 2)*	Basic insulation between mains and cabinet/earth	P

Supplementary information:

* No flammable liquids or circuits designed to produce heat.

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

9.2.1	**TABLE: Constructional requirements**	**Form A.17**	**P**
14.8	Printed circuit boards	UL approved to 94V0 or 1	P

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

		Sample 1	Sample 2	Sample 3
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:

PCB's are UL approved, therefore no tests have been made

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

9.3	**TABLE: Limited-energy circuit**					**Form A.18**	**N/A**
Item	9.3 a)	9.3 b) Current and power limitation			9.3 c)	Decision	
or Location (see Form A.16)	Maximum potential in circuit voltage r.m.s./d.c. V	Maximum available current A	Maximum available power VA	Overload protection after 120 s A	Circuit separation	Yes/No	Comments
Supplementary information:							

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

9.4	**TABLE: Requirements for equipment containing or using flammable liquids** **Form A.19**		N/A
Type of liquid	9.4 Flammable liquids		Verdict
	b) quantity	c) Containment	
Supplementary information:			

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

10.	**TABLE : Temperature Measurements** **Form A.20A**	**P**
10.1	Surface temperature limits - NORMAL CONDITION and / or SIGNLE FAULT CONDITION	P
10.2	Temperature of windings- NORMAL CONDITION and / or SIGNLE FAULT CONDITION	P
10.3	Other temperature measurements	P

Operating conditions:	Normal operation		
Frequency ..... :	50 Hz	Test room ambient temperature (t_a) ..... :	21 °C
Voltage ..... :	264 V	Test duration ..... :	7 h 0 min

Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments
400V capacitor in PSU	51,6	70,6	105	P	
Mains transformer in PSU	61,2	81,2	105	P	
Mains inlet	36,0	55,0	70	P	
5 Vdc connector	41,0	60,0	105	P	
ALTERA IC in 5 Vdc circuit	43,0	62,0	105	P	
Cabinet	34,1	53,1	70	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.20B for details of winding temperature measurements

Supplementary information:

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

10.	**TABLE : Temperature Measurements** **Form A.20A1**	**P**
10.1	Surface temperature limits - NORMAL CONDITION and / or SIGNLE FAULT CONDITION	P
10.2	Temperature of windings- NORMAL CONDITION and / or SIGNLE FAULT CONDITION	P
10.3	Other temperature measurements	P

Operating conditions:	Normal operation + ventilation openings in left side blocked		
Frequency ..... :	50 Hz	Test room ambient temperature (t_a) ..... :	21 °C
Voltage ..... :	230 V	Test duration ..... :	7 h 0 min

Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments
400V capacitor in PSU	52.5	72,5	105	P	
Mains transformer in PSU	62.4	81,4	150	P	
Mains inlet	36.3	55,3	70	P	
5 Vdc connector	41.8	60,8	105	P	
ALTERA IC in 5 Vdc circuit	43.5	62,5	105	P	
Cabinet	34.9	53,9	105	P	

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ 40 °C or max. RATED ambient)
t_{max} = maximum permitted temperature
NOTE 2 - See also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - See Form A.20B for details of winding temperature measurements

Supplementary information:

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

10.2	**TABLE: Temperature of windings** **Form A.20B** **Resistance method Temperature Measurements**	N/A *
4.4.2.6	MAINS Transformers	
14.2.1	Motor temperatures	

Operating conditions:								
Frequency ..... :	Hz	Test room ambient temperature (t_{a1}/t_{a2}) ... :					/	℃ (initial / final)
Voltage ..... :	V	Test duration ..... :					h	min
Part / Designation	R_{cold} Ω	R_{warm} Ω	Current A	t_r K	t_c °C	t_{max} °C	Verdict	Comments

NOTE 1- R_{cold} = initial resistance R_{warm} = final resistance
t_r = temperature rise t_c = t_r corrected (t_c= t_r - { t_{a2} - t_{a1}} + [40 °C or max RATED ambient])
t_{max} = maximum permitted temperature
NOTE 2 - Indicate insulation class (IEC 85) 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:

* Tested at approval of PSU

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

10.5.2	**TABLE: Resistance to heat of non-metallic enclosures**			**Form A.21**	**N/A**
	Test method used:				—
	Non operative treatment..... :	[ ]			
	Empty ENCLOSURE ..... :	[ ]			
	Operative treatment..... :	[ ]			
	Temperature during tests ..... :				—
	ENCLOSURE samples tested were..... :				—

Description	Material	Comments	Verdict

	Dielectric strength test (6.8) ..... :		V	r.m.s./peak/d.c.	

Supplementary information:
Cabinet is made of metal

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

10.5.3	**TABLE: Insulating Materials**		**Form A.22**	**N/A**
10.5.3a)	Ballpressure test			
	Max. allowed impression diameter..... :	2 mm		—

Part	Test temperature ℃	Impression Diameter (mm)	Verdict

Supplementary information:

10.5.3b)	Vicat softening test (ISO 306)		

Part	Vicat softening temperature ℃	Thickness of sample (mm)	Verdict

Supplementary information:

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

8	**TABLE: Mechanical resistance to shock and impact**	**Form A.23**	**P**
11	**Protection against hazards from fluids**		**N/A**

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

	Clause 8 tests				Clause 11 tests							
Location	Static	Dynamic	Normal	Handheld Plug-in	Cleaning (11.2)	Spillage (11.3)	Overflow (11.4)	IEC 60529 (11.6)	Working voltage V	Test voltage V	Verdict	Comments
Cabinet	X	X	X	-	-	-	-	-	230	1390	P	

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

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

11.7.2	**TABLE: Leakage and rupture at high pressure**				**Form A.24**	N/A
Part	Maximum permissible working pressure MPa	Test pressure MPa	Leakage YES / NO	Burst YES / NO	Comments	
Supplementary information:						

11.7.3	Leakage from low-pressure parts			
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 25**	N/A
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.26**	N/A

Locations tested	Measured values dBA	Calculated maximum sound pressure level
At operator's normal position and at bystanders' positions		
a)		
b)		
c)		
d)		
e)		

Supplementary information:

12.5.2	Ultrasonic pressure	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**	**Form A.27**	**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

14.3	**TABLE: Overtemperature protection devices**	**Form A.28**	**N/A**

Reliability test

Component	Type (note)	Verdict	Comments

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

Supplementary information:

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

4.4.2.6	**TABLE: Mains transformer**	**Form A.29**	N/A
4.4.2.6.1	Short circuit		
14.7.1	MAINS transformers tested outside equipment		
Type .....:			—
Manufacturer .....:			—
Test in equipment			
Test on bench			
Test repeated inside equipment (see 14.7)			
Optional – Insulation class (IEC 60085) of the lowest RATED winding .....:			—

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

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 FormA.20B!

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:

Transformer is tested under approval of PSU

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

4.4.2.6	**TABLE: Mains transformer**	**Form A.30**	N/A
14.7.2	Overload tests (for mains transformers)		
Type .....:			—
Manufacturer .....:			—
Test in equipment			
Test on bench			
Test repeated inside equipment (see 14.7)			
Optional – Insulation class (IEC 60085) of the lowest RATED winding .....:			—

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

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 FormA.20B!

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

16.1	**TABLE: Current measuring circuits**	**Form A.31**	N/A

These tests are performed with all types and models of current transformers without internal protection, and which are specified by the manufacturer for use with the equipment

a) Current transformers

Type/Model	RATED current A	Test current A	Interrupt Yes / No	Verdict	Comments

Supplementary information:

b) Range changing switches

Type / Model	Maximum rated current of switch A	Cycling test Verdict	Comments

Supplementary information:

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

16.2	**TABLE: Multifunctional meters and similar equipment**	**Form A. 32**	N/A
	Operating conditions ..... :		—
	Maximum RATED voltage applied (V) ..... :		—
	Measurement category..... :		—
	Test source limit (KVA)..... :		—

Function	Range	Verdict

Supplementary information: