



Test Report issued under the responsibility of



www.nemko.com

TEST REPORT	
IEC 60950-1: 2005 (2nd Edition) and EN 60950-1:2006 + A11:2009	
Information technology equipment – Safety –	
Part 1: General requirements	
Report Reference No.	130708
Date of issue	11 December 2009
Total number of pages	56
CB/CCA Testing Laboratory Name :	Nemko A/S Phone: (+47) 22 96 03 30
Address	P.O. Box 73 Blindern, N-0314 Oslo, Norway
Applicant's name	Thrane & Thrane A/S
Address	Lundtoftegaardsvej 93D, 2800 Kgs. Lyngby, Denmark
Manufacturer's name	Same as above
Address	Same as above
Factory's name	Same as above
Address	Same as above
Test specification:	
Standard	<input checked="" type="checkbox"/> IEC 60950-1:2005 (2nd Edition) and <input checked="" type="checkbox"/> EN 60950-1:2006 + A11:2009
Test procedure	CB / CCA
Non-standard test method	N/A
Test Report Form No.	IECEN60950_1C
Test Report Form(s) Originator	SGS Fimko Ltd (Nemko)
Master TRF	Dated 2007-06 (2008 02)
Copyright © 2007 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.	
This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.	
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.	
If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.	
This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA	

This Test Report , when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.



Report No. 130708

Test item description	Power supply
Trade Mark	Thrane & Thrane
Manufacturer	Thrane & Thrane A/S
Model/Type reference.....	TT-6080A
Ratings	A.c. supply: 100 – 240 VAC, 47 – 63 Hz, 3.6A @ 100 VAC, 1.4 @ 240 VAC D.c. supply: 24V, 30A



Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB/CCA Testing Laboratory:	Nemko A/S
Testing location/ address	P.O. Box 73 Blindern, N-0314 Oslo, Norway
<input type="checkbox"/> Associated CB Laboratory:	
Testing location/ address	
Tested by (name + signature)	Mikko Luusalo
Approved by (+ signature)	Ole Morten Aaslund

Summary of testing:	
Tests performed (name of test and test clause): Tested according to national requirements for the countries listed below.	Testing location: All tests performed at Nemko A/S, P.O. Box 73 Blindern, N-0314 Oslo, Norway
Summary of compliance with National Differences: All CENELEC members as listed in EN 60950-1:2006.	



Report No. 130708

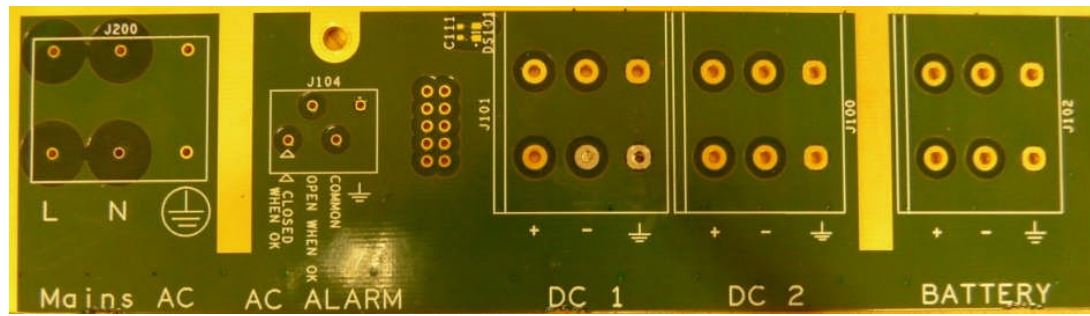
Copy of marking plate:

TT-6080A AC/DC Power Supply P/N 406080A Rev.: X	S/N: XXXXXXXX Prod.: Year/Week
Input Voltage: 100-240 VAC Input Frequency: 47-63 Hz Input Current: 3.6A @ 100VAC, 1.4A @ 240 VAC Battery Voltage / Current: 24V / 30A	
Mains Fuse: 6.3 AT Battery Fuse: 2 x 30A	
	Thrane & Thrane A/S Denmark

Warning marking for hot surfaces:



Markings at terminals:



List of attachments:

Photos (4 pages), Schematics and layouts (24 pages), Transformer specifications (2 pages)



Report No. 130708

Test item particulars	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	-10% / +6%
Tested for IT power systems	<input checked="" type="checkbox"/> Yes (for Norway) <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	230 V
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating (A)	16 A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IP 20, minimum
Altitude during operation (m)	< 2000m
Altitude of test laboratory (m)	100 m
Mass of equipment (kg)	3.7 kg
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	July 2009
Date(s) of performance of tests	July 2009 – November 2009



Report No. 130708

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 appended table)" refers to a table appended to the report.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

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

General product information:

The equipment under test is a power supply.

The equipment has single SELV d.c. output: 30V / 10A. Three units can be stacked and outputs chained to form 30A output. Higher output currents can be achieved by connecting several supplies in parallel output configuration.

The equipment is mounted with bolts through holes in enclosure. In stack of several units same bolts go through all units.

The output represents energy hazard. Terminals for a.c. and d.c. connections are located behind a protective cover.

The equipment is supplied from a.c. mains supply and has connection for back-up battery.

Maximum recommended ambient (T_{mra}): 55 °C

Connection to the supply:
Permanent connection with clamp terminals for wires.

1.1.2 - Additional requirements:

Exposure to extreme temperatures, excessive dust, moisture or vibration; to flammable gases; to corrosive or explosive atmospheres:

This equipment is exposed to adverse environmental conditions and vibration. Separately tested for applicable environmental conditions.

Electromedical equipment connected to the patient:

This equipment has not been considered as an electromedical equipment intended to be physically connected to a patient.



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General	Refer below:	P
	Comply with IEC 60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950.	P
1.5.3	Thermal controls	No such thermal controls.	P
1.5.4	Transformers	Transformers used are suitable for their intended applications and comply with relevant parts of this standard and particularly Annex C, see Annex C – Transformers.	P
1.5.5	Interconnecting cables	No interconnecting cables provided with the equipment.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.6	Capacitors bridging insulation	X2 (C200, C201, C202, C203) bridging functional insulation between primary phases. Two Y2 in series (C612, C613) bridging reinforced insulation between primary and secondary. Y2 (C204, C205, C206) bridging basic insulation between primary and protective earth. Capacitors are certified according to IEC 60384-14:1993/EN132400:1994.	P
1.5.7	Resistors bridging insulation	Refer below:	P
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	No specific requirements. 2.10.3 and 2.10.4 apply.	P
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	No such resistors.	N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	No such resistors.	N/A
1.5.8	Components in equipment for IT power systems	All bridging components rated for line to line voltage.	P
1.5.9	Surge suppressors	Refer below:	P
1.5.9.1	General	Varistor (RV201) in compliance with Annex Q. (see appended table 1.5.1)	P
1.5.9.2	Protection of VDRs	Protected by fuse.	P
1.5.9.3	Bridging of functional insulation by a VDR	Varistor (RV201) in compliance with Annex Q. (see appended table 1.5.1)	P
1.5.9.4	Bridging of basic insulation by a VDR	Not used.	N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR	Not used.	N/A
1.6	Power interface		P
1.6.1	AC power distribution systems	TN system (IT for Norway)	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	Not a hand-held equipment.	N/A
1.6.4	Neutral conductor	Neutral insulated as if it was line.	P

1.7	Marking and instructions		P
1.7.1	Power rating	The required marking is located on the outside surface of the equipment.	P
	Rated voltage(s) or voltage range(s) (V)	100 – 240 VAC D.c. supply: 24V	P
	Symbol for nature of supply, for d.c. only.....	The equipment is for a.c. supply. Battery used as a back up only.	N/A
	Rated frequency or rated frequency range (Hz) ...	47 – 63 Hz	P
	Rated current (mA or A)	3.6A @ 100 VAC, 1.4 @ 240 VAC D.c. supply: 30A	P
	Manufacturer's name or trade-mark or identification mark	Thrane & Thrane A/S	P
	Model identification or type reference	TT-6080A	P
	Symbol for Class II equipment only	The equipment is Class I.	N/A
	Other markings and symbols	The additional marking does not give rise to misunderstandings.	P
1.7.2	Safety instructions and marking	Refer below:	P
1.7.2.1	General	Provided with symbol IEC 60417-5041 for hot surfaces.	P
1.7.2.2	Disconnect devices	Disconnect device is incorporated in the equipment.	N/A
1.7.2.3	Overcurrent protective device	The equipment is provided with overcurrent protective device.	P
1.7.2.4	IT power distribution systems	TN (IT for Norway)	N/A
1.7.2.5	Operator access with a tool	No such operator access area.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2.7.6	Ozone	The equipment does not produce ozone.	N/A
1.7.3	Short duty cycles	The equipment is intended for continuous operation.	N/A
1.7.4	Supply voltage adjustment	No voltage selector.	N/A
	Methods and means of adjustment; reference to installation instructions	-	N/A
1.7.5	Power outlets on the equipment	No standard power outlets.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Marked in the marking label: Mains Fuse: 6.3 AT Battery Fuse: 2 x 30A	P
1.7.7	Wiring terminals	Refer below:	P
1.7.7.1	Protective earthing and bonding terminals	Protective earthing terminal is marked with symbol IEC 60417-2 No. 5019 on PCB. Protective bonding terminals are marked with symbol IEC 60417-2 No. 5017 on PCB.	P
1.7.7.2	Terminals for a.c. mains supply conductors	Terminal for neutral is marked with N.	P
1.7.7.3	Terminals for d.c. mains supply conductors	Battery terminals marked to indicate polarity.	P
1.7.8	Controls and indicators	Refer below:	P
1.7.8.1	Identification, location and marking	The function of controls and indicators affecting safety is obvious without knowledge of language etc.	P
1.7.8.2	Colours	Colours used for functional indication only.	P
1.7.8.3	Symbols according to IEC 60417.....	Line for "ON" and circle for "OFF" on power switch.	P
1.7.8.4	Markings using figures	No such markings	N/A
1.7.9	Isolation of multiple power sources	Both supply connections are adequately marked.	P
1.7.10	Thermostats and other regulating devices	No thermostats or other regulating devices.	N/A
1.7.11	Durability	The marking withstands required tests.	P
1.7.12	Removable parts	No removable parts.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.13	Replaceable batteries	No batteries in the equipment.	N/A
	Language(s)	-	—
1.7.14	Equipment for restricted access locations	Not intended to RAL.	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	Refer below:	P
2.1.1.1	Access to energized parts	There is adequate protection against operator contact with bare parts at hazardous voltages. Checked by test finger and test pin.	P
	Test by inspection	-	P
	Test with test finger (Figure 2A)	-	P
	Test with test pin (Figure 2B)	-	P
	Test with test probe (Figure 2C)	-	N/A
2.1.1.2	Battery compartments	No batteries in the equipment.	N/A
2.1.1.3	Access to ELV wiring	No ELV circuits.	N/A
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)	-	—
2.1.1.4	Access to hazardous voltage circuit wiring	No internal wiring.	N/A
2.1.1.5	Energy hazards	Bridging of hazardous energy parts is not likely. Tested with test finger. Outputs of the power supply represents an energy hazard. Outputs are adequately protected from contact. (see appended table 2.1.1.5)	P
2.1.1.6	Manual controls	Certified mains switch is used.	P
2.1.1.7	Discharge of capacitors in equipment	Permanent connection.	N/A
	Measured voltage (V); time-constant (s).....	-	—
2.1.1.8	Energy hazards – d.c. mains supply	Permanent connection. No accessible disconnection point.	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	a) Capacitor connected to the d.c. mains supply .. :	$E = 0.5 * 2.2 \mu F * (24 V)^2 = 0.63 \text{ mJ}$	P
	b) Internal battery connected to the d.c. mains supply .. :	No batteries.	N/A
2.1.1.9	Audio amplifiers .. :	No audio amplifiers	N/A
2.1.2	Protection in service access areas	Unintentional contact with hazardous parts is not likely.	N/A
2.1.3	Protection in restricted access locations	Not intended to RAL.	N/A
2.2	SELV circuits		P
2.2.1	General requirements	SELV limits are not exceeded under normal condition and after a single fault.	P
2.2.2	Voltages under normal conditions (V) .. :	Within SELV limits.	P
2.2.3	Voltages under fault conditions (V) .. :	Within SELV limits.	P
2.2.4	Connection of SELV circuits to other circuits .. :	SELV circuits are only connected to other SELV circuits, Limited current circuits and protective earth.	P
2.3	TNV circuits 2.3.1 – 2.3.5; No TNV circuits in the equipment.		N/A
2.4	Limited current circuits		P
2.4.1	General requirements	Considered	P
2.4.2	Limit values	70 mA for frequency above 100 kHz.	P
	Frequency (Hz) .. :	179 kHz	—
	Measured current (mA) .. :	1) By C612 + C613: 33 mA peak 2) By C612 (C613 shorted): 34.5 mA peak	—
	Measured voltage (V) .. :	1) By C612 + C613: 66 mV peak 2) By C612 (C613 shorted): 69 mV peak	—



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured circuit capacitance (nF or μ F)	<< 0.1 μ F	—
2.4.3	Connection of limited current circuits to other circuits	Meets the limits of 2.4.2 under normal and single fault condition.	P
2.5	Limited power sources Limited power sources not considered.		N/A
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	Accessible conductive parts are earthed.	P
2.6.2	Functional earthing	No such earthing.	N/A
2.6.3	Protective earthing and protective bonding conductors	Refer below:	P
2.6.3.1	General	Refer below:	P
2.6.3.2	Size of protective earthing conductors	No such conductors. Only earthing traces on PCB and the enclosure.	N/A
	Rated current (A), cross-sectional area (mm^2), AWG	-	—
2.6.3.3	Size of protective bonding conductors	No such conductors.	N/A
	Rated current (A), cross-sectional area (mm^2), AWG	-	—
	Protective current rating (A), cross-sectional area (mm^2), AWG	-	—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min).....	Protective current rating: 16A (20A for US/CAN) Main protective earth terminal to enclosure: 1.3 $\text{m}\Omega$, 41 mV, 32A, 2 min 1.2 $\text{m}\Omega$, 48 mV, 40A, 2 min	P
2.6.3.5	Colour of insulation	No earthing wires.	N/A
2.6.4	Terminals	Refer below:	P
2.6.4.1	General	Refer below:	P
2.6.4.2	Protective earthing and bonding terminals	Main protective earthing terminal located in same terminal block with a.c. mains supply connectors.	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A), type, nominal thread diameter (mm)	12 A, cage clamp terminal	—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Separate terminals for protective bonding.	P
2.6.5	Integrity of protective earthing	Refer below:	P
2.6.5.1	Interconnection of equipment	Protective bonding provided for equipment powered by d.c. outputs.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches ore fuses in protective bonding conductors	P
2.6.5.3	Disconnection of protective earth	The main earthing terminal is adjacent to mains supply terminals. Disconnection of the earth without disconnecting mains supply is not likely.	P
2.6.5.4	Parts that can be removed by an operator	Permanent connection.	N/A
2.6.5.5	Parts removed during servicing	No need to remove earth connection during servicing.	P
2.6.5.6	Corrosion resistance	Corrosion not considered likely.	P
2.6.5.7	Screws for protective bonding	No self-tapping or spaced thread screws.	N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system	No connection to TNV or Cable distribution network.	N/A
2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Refer below:	P
	Instructions when protection relies on building installation	Adequate fuses provided in the equipment.	N/A
2.7.2	Faults not simulated in 5.3.7	Considered.	P
2.7.3	Short-circuit backup protection	Building installation provides backup protection.	P
2.7.4	Number and location of protective devices	1 mains fuse holder adjacent to a.c. mains switch. 2 fuses for both poles of back-up battery adjacent to battery terminal.	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.7.5	Protection by several devices	Fuses for battery are located together.	P
2.7.6	Warning to service personnel	Not required. No fuse in neutral.	P
2.8	Safety interlocks 2.8.1 – 2.8.8; No safety interlocks required. No hazard in operator access area.		N/A
2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Neither natural rubber, materials containing asbestos nor hygroscopic materials are used as insulation. No driving belts or couplings used.	P
2.9.2	Humidity conditioning	No hygroscopic insulation materials.	N/A
	Relative humidity (%), temperature (°C)	-	—
2.9.3	Grade of insulation	Basic between primary and earth. Reinforced between primary and secondary. Other insulation is functional.	P
2.9.4	Separation from hazardous voltages	Refer below:	P
	Method(s) used	Method 1 used for secondary circuits.	—
2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	Refer below:	P
2.10.1.1	Frequency	Switching frequency is 179 kHz. Normal values are used.	P
2.10.1.2	Pollution degrees	Pollution degree 2	P
2.10.1.3	Reduced values for functional insulation	Complies with 5.3.4 a) and c)	P
2.10.1.4	Intervening unconnected conductive parts	Considered	P
2.10.1.5	Insulation with varying dimensions	No such insulation	N/A
2.10.1.6	Special separation requirements	No such circuits.	N/A
2.10.1.7	Insulation in circuits generating starting pulses	No such circuits.	N/A
2.10.2	Determination of working voltage	Refer below:	P
2.10.2.1	General	Refer below:	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.2.2	RMS working voltage	(see appended table 2.10.2)	P
2.10.2.3	Peak working voltage	(see appended table 2.10.2)	P
2.10.3	Clearances	Refer below:	P
2.10.3.1	General	Refer below:	P
2.10.3.2	Mains transient voltages	Refer below:	P
	a) AC mains supply	2500 V	P
	b) Earthed d.c. mains supplies	-	N/A
	c) Unearthed d.c. mains supplies	-	N/A
	d) Battery operation	-	N/A
2.10.3.3	Clearances in primary circuits	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.4	Clearances in secondary circuits	Insulation in secondary circuits is only functional.	N/A
2.10.3.5	Clearances in circuits having starting pulses	No such circuits.	N/A
2.10.3.6	Transients from a.c. mains supply	Insulation in secondary circuits is only functional.	N/A
2.10.3.7	Transients from d.c. mains supply	No transients from back-up battery.	N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems	Not connected to telecommunication networks or cable distribution systems	N/A
2.10.3.9	Measurement of transient voltage levels	Not applied.	N/A
	a) Transients from a mains supply	-	N/A
	For an a.c. mains supply	-	N/A
	For a d.c. mains supply	-	N/A
	b) Transients from a telecommunication network :	-	N/A
2.10.4	Creepage distances	Refer below:	P
2.10.4.1	General	Refer below:	P
2.10.4.2	Material group and comparative tracking index	Material group IIIb is assumed to be used	P
	CTI tests.....	-	—
2.10.4.3	Minimum creepage distances	(see appended table 2.10.3 and 2.10.4)	P
2.10.5	Solid insulation	Refer below:	P
2.10.5.1	General	Refer below:	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	P
2.10.5.3	Insulating compound as solid insulation	Not used.	N/A
2.10.5.4	Semiconductor devices	(see appended table 1.5.1)	P
2.10.5.5.	Cemented joints	Pre-preg board rated for 130°C. Complies with c).	P
2.10.5.6	Thin sheet material – General	Insulator on RV200. (see appended table 1.5.1)	P
2.10.5.7	Separable thin sheet material	Single layer only.	P
	Number of layers (pcs).....: 1		—
2.10.5.8	Non-separable thin sheet material	-	N/A
2.10.5.9	Thin sheet material – standard test procedure	(see appended table 1.5.1)	P
	Electric strength test	-	—
2.10.5.10	Thin sheet material – alternative test procedure	Not used.	N/A
	Electric strength test	-	—
2.10.5.11	Insulation in wound components	Complies with Annex U.	P
2.10.5.12	Wire in wound components	Refer below:	P
	Working voltage: (see appended table 2.10.2)		P
	a) Basic insulation not under stress: No such insulation.		N/A
	b) Basic, supplementary, reinforced insulation: Complies with annex U.		P
	c) Compliance with Annex U: (see appended table 1.5.1)		P
	Two wires in contact inside wound component; angle between 45° and 90°: Tape is used as additional protection between TIW and wire crossing at 90°		P
2.10.5.13	Wire with solvent-based enamel in wound components	Not used as insulation.	N/A
	Electric strength test	-	—
	Routine test	-	N/A
2.10.5.14	Additional insulation in wound components	Not used.	N/A
	Working voltage: -		N/A
	- Basic insulation not under stress: -		N/A
	- Supplementary, reinforced insulation: -		N/A
2.10.6	Construction of printed boards	Refer below:	P
2.10.6.1	Uncoated printed boards	(see appended table 2.10.3 and 2.10.4)	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.6.2	Coated printed boards	No special coating in order to reduce distances.	N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board	Pre-preg board rated for 130°C. See 2.10.5.5.	P
2.10.6.4	Insulation between conductors on different layers of a printed board	Refer below:	P
	Distance through insulation	(see appended table 2.10.5)	P
	Number of insulation layers (pcs)..... : 3		P
2.10.7	Component external terminations	No coatings used to decrease insulation distances.	N/A
2.10.8	Tests on coated printed boards and coated components	No coatings used to decrease insulation distances.	N/A
2.10.8.1	Sample preparation and preliminary inspection	-	N/A
2.10.8.2	Thermal conditioning	-	N/A
2.10.8.3	Electric strength test	-	N/A
2.10.8.4	Abrasion resistance test	-	N/A
2.10.9	Thermal cycling	Not required.	N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound	Not used.	N/A
2.10.11	Tests for semiconductor devices and cemented joints	Pre-preg PCB. Test not required. Optocouplers are separately certified. (see appended table 1.5.1)	P
2.10.12	Enclosed and sealed parts	Not used.	N/A

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	3.1.1. – 3.1.5; No internal wiring	N/A
3.1.2	Protection against mechanical damage	-	N/A
3.1.3	Securing of internal wiring	-	N/A
3.1.4	Insulation of conductors	-	N/A
3.1.5	Beads and ceramic insulators	-	N/A
3.1.6	Screws for electrical contact pressure	No screws for electrical contact pressure.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.1.7	Insulating materials in electrical connections	No contact pressure through insulating material.	P
3.1.8	Self-tapping and spaced thread screws	No such screws.	N/A
3.1.9	Termination of conductors	No internal wiring.	N/A
	10 N pull test	-	N/A
3.1.10	Sleeving on wiring	Not used.	N/A

3.2	Connection to a mains supply		P
3.2.1	Means of connection	Refer below:	P
3.2.1.1	Connection to an a.c. mains supply	Permanent connection with wiring terminals.	P
3.2.1.2	Connection to a d.c. mains supply	Permanent connection with wiring terminals.	P
3.2.2	Multiple supply connections	Consideration has been taken.	P
3.2.3	Permanently connected equipment	Set of terminals provided.	P
	Number of conductors, diameter of cable and conduits (mm)	3 a.c. conductors and 2 d.c. conductors. Knock outs for cables up to 15 mm diameter.	—
3.2.4	Appliance inlets	Set of terminals provided.	N/A
3.2.5	Power supply cords	Set of terminals provided.	N/A
3.2.5.1	AC power supply cords	Set of terminals provided.	N/A
	Type	-	—
	Rated current (A), cross-sectional area (mm ²), AWG	-	—
3.2.5.2	DC power supply cords	Set of terminals provided.	N/A
3.2.6	Cord anchorages and strain relief	Permanent connection.	N/A
	Mass of equipment (kg), pull (N)	-	—
	Longitudinal displacement (mm)	-	—
3.2.7	Protection against mechanical damage	No sharp points or cutting edges.	P
3.2.8	Cord guards	Permanent connection.	N/A
	Diameter or minor dimension D (mm); test mass (g)	-	—
	Radius of curvature of cord (mm)	-	—



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.9	Supply wiring space	Adequate supply wiring space.	P

3.3	Wiring terminals for connection of external conductors		P
3.3.1	Wiring terminals	Cage clamp terminals.	P
3.3.2	Connection of non-detachable power supply cords	No such cord.	N/A
3.3.3	Screw terminals	Cage clamp terminals.	N/A
3.3.4	Conductor sizes to be connected	Refer below:	P
	Rated current (A), cord/cable type, cross-sectional area (mm ²)..... :	A.c. supply: 3.6 A, flexible or solid, 0.08 – 2.5 mm ² D.c supply: 30 A, flexible, 0.2 – 6 mm ²	—
3.3.5	Wiring terminal sizes	Cage clamp terminals.	N/A
	Rated current (A), type, nominal thread diameter (mm) :	-	—
3.3.6	Wiring terminal design	Adequate clamping pressure between metal surfaces.	P
3.3.7	Grouping of wiring terminals	A.c. terminals located in same terminal block with the main protective earthing terminal. D.c terminals located in proximity to each other.	P
3.3.8	Stranded wire	Loose strand does not contact conductive parts.	P

3.4	Disconnection from the mains supply		P
3.4.1	General requirement	Mains switch is used as a disconnection device.	P
3.4.2	Disconnect devices	Certified mains switch with over 3 mm contact separation.	P
3.4.3	Permanently connected equipment	Mains switch is used as a disconnection device.	P
3.4.4	Parts which remain energized	Accidental contact not likely.	P
3.4.5	Switches in flexible cords	No cord provided.	N/A
3.4.6	Number of poles - single-phase and d.c. equipment	Switch disconnects both poles.	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.7	Number of poles - three-phase equipment	Single phase equipment.	N/A
3.4.8	Switches as disconnect devices	Marked according to 1.7.8.	P
3.4.9	Plugs as disconnect devices	Not used.	N/A
3.4.10	Interconnected equipment	No interconnections using hazardous voltages.	P
3.4.11	Multiple power sources	Adequately marked.	P
3.5	Interconnection of equipment		P
3.5.1	General requirements	See below:	N/A
3.5.2	Types of interconnection circuits	SELV circuits	N/A
3.5.3	ELV circuits as interconnection circuits	No ELV.	N/A
3.5.4	Data ports for additional equipment	No data ports.	N/A
4	PHYSICAL REQUIREMENTS		P
4.1	Stability		P
	Angle of 10°	Unit does not overbalance at 10°.	P
	Test force (N)	The unit is not floor-standing.	N/A
4.2	Mechanical strength		P
4.2.1	General	Complies with the requirement also after tests described below are applied.	P
4.2.2	Steady force test, 10 N	No hazard, ref. comment in appended table 2.10.3, 2.10.4.	P
4.2.3	Steady force test, 30 N	No internal enclosure.	N/A
4.2.4	Steady force test, 250 N	No hazard. The test is performed at all sides of the enclosure.	P
4.2.5	Impact test	Refer below:	P
	Fall test	No hazard as result from the steel sphere fall test.	P
	Swing test	No hazard as result from the steel sphere swing test.	P
4.2.6	Drop test; height (mm)	Drop test not applicable.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.7	Stress relief test	Metal enclosure.	N/A
4.2.8	Cathode ray tubes	CRT(s) not used in the equipment.	N/A
	Picture tube separately certified	-	N/A
4.2.9	High pressure lamps	No high pressure lamps in the equipment.	N/A
4.2.10	Wall or ceiling mounted equipment; force (N)	The mounting means are adequate.	P

4.3	Design and construction		P
4.3.1	Edges and corners	All edges and corners are rounded and/or smoothed.	P
4.3.2	Handles and manual controls; force (N)..... :	No knobs, grips, handles, lever etc.	N/A
4.3.3	Adjustable controls	No adjustable controls.	N/A
4.3.4	Securing of parts	No loosening of parts impairing creepage distances or clearances is likely to occur.	P
4.3.5	Connection by plugs and sockets	No such connection.	N/A
4.3.6	Direct plug-in equipment	Not intended to plug directly into a wall socket-outlet.	N/A
	Torque	-	—
	Compliance with the relevant mains plug standard	-	N/A
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N/A
4.3.8	Batteries	No batteries in the equipment.	N/A
	- Overcharging of a rechargeable battery	-	N/A
	- Unintentional charging of a non-rechargeable battery	-	N/A
	- Reverse charging of a rechargeable battery	-	N/A
	- Excessive discharging rate for any battery	-	N/A
4.3.9	Oil and grease	Insulation is not exposed to oil, grease etc.	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.10	Dust, powders, liquids and gases	The equipment does not produce dust or use powders, liquids or gasses.	N/A
4.3.11	Containers for liquids or gases	No containers for liquids or gases in the equipment.	N/A
4.3.12	Flammable liquids	The equipment does not contain flammable liquid.	N/A
	Quantity of liquid (l)	-	N/A
	Flash point (°C)	-	N/A
4.3.13	Radiation	Refer below:	N/A
4.3.13.1	General	Refer below:	N/A
4.3.13.2	Ionizing radiation	The equipment does not generate ionizing radiation.	N/A
	Measured radiation (pA/kg)	-	—
	Measured high-voltage (kV)	-	—
	Measured focus voltage (kV)	-	—
	CRT markings	-	—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials	The equipment does not produce UV radiation.	N/A
	Part, property, retention after test, flammability classification	-	N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation	The equipment does not produce UV radiation.	N/A
4.3.13.5	Laser (including LEDs)	No lasers or LEDs	N/A
	Laser class	-	—
4.3.13.6	Other types	The equipment does not generate other types of radiation.	N/A
4.4	Protection against hazardous moving parts		N/A
4.4.1	General	No moving parts.	N/A
4.4.2	Protection in operator access areas	No moving parts.	N/A
4.4.3	Protection in restricted access locations	No moving parts.	N/A
4.4.4	Protection in service access areas	No moving parts.	N/A
4.5	Thermal requirements		P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.5.1	General	Refer below:	P
4.5.2	Temperature tests	(see appended table 4.5)	P
	Normal load condition per Annex L	Maximum rated load.	—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P
4.5.5	Resistance to abnormal heat	Certified thermoplastic parts are used.	P
4.6	Openings in enclosures		P
4.6.1	Top and side openings	Small openings around the d.c. fuse connectors don't allow entry of objects.	P
	Dimensions (mm)	-	—
4.6.2	Bottoms of fire enclosures	Fire enclosure construction is considered to comply with the requirements. No bottom openings.	P
	Construction of the bottom, dimensions (mm) ...:	-	—
4.6.3	Doors or covers in fire enclosures	No doors or covers in fire enclosure.	N/A
4.6.4	Openings in transportable equipment	The unit is not regarded as transportable equipment.	N/A
4.6.4.1	Constructional design measures	-	N/A
	Dimensions (mm)	-	—
4.6.4.2	Evaluation measures for larger openings	-	N/A
4.6.4.3	Use of metallized parts	-	N/A
4.6.5	Adhesives for constructional purposes	No barrier secured by adhesive inside enclosure.	N/A
	Conditioning temperature (°C), time (weeks)	-	—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 is used.	P
	Method 1, selection and application of components wiring and materials	(see appended table 1.5.1)	P
	Method 2, application of all of simulated fault condition tests	-	N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.2	Conditions for a fire enclosure	Refer below:	P
4.7.2.1	Parts requiring a fire enclosure	The fire enclosure is required to cover all parts except as listed below.	P
4.7.2.2	Parts not requiring a fire enclosure	Terminal blocks.	P
4.7.3	Materials		P
4.7.3.1	General	Refer below:	P
4.7.3.2	Materials for fire enclosures	Metal enclosure.	P
4.7.3.3	Materials for components and other parts outside fire enclosures	Terminals comply with relevant IEC standards. Terminal cover is of V-2 material. (see appended table 1.5.1)	P
4.7.3.4	Materials for components and other parts inside fire enclosures	Minimum V-2 or small parts mounted on PCB of minimum V-0 material.	P
4.7.3.5	Materials for air filter assemblies	No air filters.	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage components.	N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	Test conducted in accordance with 5.1.2 to 5.1.7.	P
5.1.2	Configuration of equipment under test (EUT)	Refer below:	
5.1.2.1	Single connection to an a.c. mains supply	Single connection.	P
5.1.2.2	Redundant multiple connections to an a.c. mains supply	-	N/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply	-	N/A
5.1.3	Test circuit	Tested according to figure 5A for star TN or TT distributions system (and IT for Norway).	P
5.1.4	Application of measuring instrument	Measuring instrument D1 is used.	P
5.1.5	Test procedure	Refer below:	P
5.1.6	Test measurements	(see appended table 5.1)	P
	Supply voltage (V)	254V	—



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured touch current (mA)	(see appended table 5.1)	—
	Max. allowed touch current (mA)	3.5mA (to PE) 0.25mA (to accessible parts)	—
	Measured protective conductor current (mA)	(see appended table 5.1)	—
	Max. allowed protective conductor current (mA) ...	3.5mA (to PE)	—
5.1.7	Equipment with touch current exceeding 3,5 mA	The touch current does not exceed 3.5mA.	N/A
5.1.7.1	General	-	N/A
5.1.7.2	Simultaneous multiple connections to the supply	-	N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	Not connected to a telecommunication network nor a cable distribution system.	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system	-	N/A
	Supply voltage (V)	-	—
	Measured touch current (mA)	-	—
	Max. allowed touch current (mA)	-	—
5.1.8.2	Summation of touch currents from telecommunication networks	-	N/A
	a) EUT with earthed telecommunication ports	-	N/A
	b) EUT whose telecommunication ports have no reference to protective earth	-	N/A
5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure	(see appended table 5.2)	P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors	No motors.	N/A
5.3.3	Transformers	See Annex C and appended table C.2.	P
5.3.4	Functional insulation	Complies with a) and c).	P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.5	Electromechanical components	No electromechanical components.	N/A
5.3.6	Audio amplifiers in ITE	No audio amplifiers.	N/A
5.3.7	Simulation of faults	See the enclosed fault condition tests.	P
5.3.8	Unattended equipment	Fault condition of the thermal shut down was tested.	P
5.3.9	Compliance criteria for abnormal operating and fault conditions	Refer below:	P
5.3.9.1	During the tests	No fire or molten metal occurred and no deformation of enclosure during the tests.	P
5.3.9.2	After the tests	No reduction of clearance and creepage distances. No visible signs of damage to insulation. Electric strength test is made on basic, supplementary and reinforced insulation.	P
6	CONNECTION TO TELECOMMUNICATION NETWORKS 6.1 – 6.3; No connection to telecommunication networks.		N/A
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS 7.1 – 7.4.3; No connection to cable distribution systems.		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE All materials have suitable flame class, no testing required.		N/A
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2) No motors.		N/A
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position	Primary to SELV	—
	Manufacturer	Thrane & Thrane	—
	Type	T601: 127955B L600: 127956A	—
	Rated values	Class F	—
	Method of protection	Overcurrent protection. The overloaded output shuts down. Fuses in secondary coils of T601	—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	The insulation fulfil the requirements in 2.10 and relevant tests of 5.2.2.	P
	Protection from displacement of windings	Secured to the soldering pins with wrapping.	P
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument	Measuring instrument of clause D.1 was used.	P
D.2	Alternative measuring instrument	-	N/A
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		P
K.1	Making and breaking capacity	Thermal limiter shuts down driver circuitry.	N/A
K.2	Thermostat reliability; operating voltage (V) :	-	N/A
K.3	Thermostat endurance test; operating voltage (V) :	-	N/A
K.4	Temperature limiter endurance; operating voltage (V) :	Limiter circuit tested for 1000 cycles. No change.	P
K.5	Thermal cut-out reliability	-	N/A
K.6	Stability of operation	No noticeable change.	P
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N/A
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N/A
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1) (see appended table 1.5.1)		P
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
		(see appended table 1.5.1)	—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		P
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		P
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

EN 60950-1:2006 + A11:2009 – CENELEC COMMON MODIFICATIONS				
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations			P
General	Delete all the "country" notes in the reference document according to the following list: 1.4.8 Note 2 1.5.1 Note 2 & 3 1.5.7.1 Note 1.5.8 Note 2 1.5.9.4 Note 1.7.2.1 Note 4, 5 & 6 2.2.3 Note 2.2.4 Note 2.3.2 Note 2.3.2.1 Note 2 2.3.4 Note 2 2.6.3.3 Note 2 & 3 2.7.1 Note 2.10.3.2 Note 2 2.10.5.13 Note 3 3.2.1.1 Note 3.2.4 Note 3. 2.5.1 Note 2 4.3.6 Note 1 & 2 4.7 Note 4 4.7.2.2 Note 4.7.3.1 Note 2 5.1.7.1 Note 3 & 4 5.3.7 Note 1 6 Note 2 & 5 6.1.2.1 Note 2 6.1.2.2 Note 6.2.2 Note 6. 2.2.1 Note 2 6.2.2.2 Note 7.1 Note 3 7.2 Note 7.3 Note 1 & 2 G.2.1 Note 2 Annex H Note 2			P
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for "one package equipment", and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.			N/A
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC			P
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss			N/A



Report No. 130708

IEC/EN 60950-1															
Clause	Requirement + Test	Result - Remark	Verdict												
2.7.1	<p>Replace the subclause as follows:</p> <p>Basic requirements</p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		P												
2.7.2	This subclause has been declared 'void'.		P												
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N/A												
3.2.5.1	<p>Replace "60245 IEC 53" by "H05 RR-F";</p> <p>"60227 IEC 52" by "H03 VV-F or H03 VVH2-F";</p> <p>"60227 IEC 53" by "H05 VV-F or H05 VVH2-F2".</p> <p>In Table 3B, replace the first four lines by the following:</p> <table border="1"> <tr> <td>Up to and including 6</td> <td></td> <td>0,75^{a)}</td> <td></td> </tr> <tr> <td>Over 6 up to and including 10</td> <td>(0,75)^{b)}</td> <td>1,0</td> <td></td> </tr> <tr> <td>Over 10 up to and including 16</td> <td>(1,0)^{c)}</td> <td>1,5</td> <td></td> </tr> </table> <p>In the conditions applicable to Table 3B delete the words "in some countries" in condition^{a)}.</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p>	Up to and including 6		0,75 ^{a)}		Over 6 up to and including 10	(0,75) ^{b)}	1,0		Over 10 up to and including 16	(1,0) ^{c)}	1,5			N/A
Up to and including 6		0,75 ^{a)}													
Over 6 up to and including 10	(0,75) ^{b)}	1,0													
Over 10 up to and including 16	(1,0) ^{c)}	1,5													
3.3.4	<p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <table border="1"> <tr> <td>Over 10 up to and including 16</td> <td>1,5 to 2,5</td> <td>1,5 to 4</td> </tr> </table> <p>Delete the fifth line: conductor sizes for 13 to 16 A.</p>	Over 10 up to and including 16	1,5 to 2,5	1,5 to 4		N/A									
Over 10 up to and including 16	1,5 to 2,5	1,5 to 4													
4.3.13.6	<p>Add the following NOTE:</p> <p>NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.</p>		N/A												



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex H	<p>Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 μSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p>		N/A
Bibliography	Additional EN standards.		—
ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
ZB	SPECIAL NATIONAL CONDITIONS		P
1.2.4.1	In Denmark , certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N/A
1.2.13.14	In Norway and Sweden , for requirements see 1.7.2.1 and 7.3 of this annex.		N/A
1.5.7.1	In Finland, Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N/A
1.5.8	In Norway , due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		P
1.5.9.4	In Finland, Norway and Sweden , the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	<p>In Finland, Norway and Sweden, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Finland: "Laitte on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p> <p>In Norway and Sweden, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>"Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)."</p> <p>NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway): "Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet."</p> <p>Translation to Swedish: "Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet."</p>		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.5	In Denmark , socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a. For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.		N/A
2.2.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.2	In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.6.3.3	In the United Kingdom , the current rating of the circuit shall be taken as 13 A, not 16 A.		N/A
2.7.1	In the United Kingdom , to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N/A
2.10.5.13	In Finland, Norway and Sweden , there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N/A
3.2.1.1	In Switzerland , supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A		N/A
3.2.1.1	In Denmark , supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	<p>In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N/A
3.2.1.1	<p>In the United Kingdom, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N/A
3.2.1.1	<p>In Ireland, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.</p>		N/A
3.2.4	<p>In Switzerland, for requirements see 3.2.1.1 of this annex.</p>		N/A
3.2.5.1	<p>In the United Kingdom, a power supply cord with conductor of 1,25 mm² is allowed for equipment with a rated current over 10 A and up to and including 13 A.</p>		N/A
3.3.4	<p>In the United Kingdom, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is:</p> <ul style="list-style-type: none"> • 1,25 mm² to 1,5 mm² nominal cross-sectional area. 		N/A
4.3.6	<p>In the United Kingdom, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p>		N/A
4.3.6	<p>In Ireland, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.</p>		N/A





Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.7.1	<p>In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment:</p> <ul style="list-style-type: none"> • STATIONARY PLUGGABLE EQUIPMENT TYPE A that <ul style="list-style-type: none"> ○ is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and ○ has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and ○ is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT. 		N/A
6.1.2.1	<p>In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400. 		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.2	In Finland, Norway and Sweden , the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		N/A
7.2	In Finland, Norway and Sweden , for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N/A
7.3	In Norway and Sweden , for requirements see 1.2.13.14 and 1.7.2.1 of this annex.		N/A
7.3	In Norway , for installation conditions see EN 60728-11:2005.		N/A

ZC	A-DEVIATIONS (informative)		P
1.5.1	Sweden (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted.		P
1.5.1	Switzerland (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.		P
1.7.2.1	Denmark (Heavy Current Regulations) Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be provided with a visible tag with the following text: <div style="text-align: center;"> Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket  eller  </div> If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning."		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	<p>Germany (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2).</p> <p>If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market.</p> <p>Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.</p>		N/A
1.7.5	<p>Denmark (Heavy Current Regulations)</p> <p>With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.</p>		N/A
1.7.13	<p>Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries)</p> <p>Annex 2.15 of SR 814.81 applies for batteries.</p>		N/A
5.1.7.1	<p>Denmark (Heavy Current Regulations, Chapter 707, clause 707.4)</p> <p>TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.</p>		N/A



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
Enclosure	Various	Various	Metal	IEC 60950-1	Tested in the unit	
Terminal cover material	Sabic	Lexan FXD921A	V-2, min 1.5 mm	UL94	UL (E45329)	
PCB	Various	Various	FR4, V-0, 4 layer board, minimum 0.475 mm between layers, min. 130°C, Electric strength 3000V	UL94	UL	
AC terminal (J200)	Wago	736-703	500V, 12A (UL: 300V, 10A)	IEC 60947-1 UL 60947-1	KEMA UL (E45172)	
AC Fuse holder (H200)	Schurter	FAU	250 VAC, 10A, UL94 V-0, 85°C	IEC 60127-6 UL 512	VDE UL (E39328)	
AC Fuse (F200)	Various	Various	T6.3A, 6.3 x 32 mm	IEC 60127-2	-	
X-Capacitors (C200, C201, C202, C203, C301, C302)	Vishay	MKP 3382 X2	275 VAC, 1µF, X2, 105°C	IEC 60384-14 2 nd ed UL 1283	ENEC 02 UL (E109565)	
Y-Capacitors (C205, C206)	Vishay	MKP 3366 Y2	300 VAC, 22 nF, Y2, 105°C	IEC 60384-14 2 nd ed EN 132400 UL 1283	ENEC 16 UL (E109565)	
Y-Capacitors (C204, C612, C613)	Vishay	MKP 3366 Y2	300 VAC, 4.7 nF, Y2, 105°C	IEC 60384-14 2 nd ed EN 132400 UL 1283	ENEC 16 UL (E109565)	
Mains switch	Legion	SS21	250 VAC, 12 A (UL: 10A), UL94 V-0, with lamp	IEC 61058-1 UL 1541	N, VDE UL (E153399)	
Resistor (R200)	Various	Various	1 Mohm	IEC 60950-1	Tested in the unit	
Resistors (R201, R202)	Various	Various	10 Mohm, Cl. min. 2.0 mm, Cr. min. 2.5 mm	IEC 60950-1	Tested in the unit	



Report No. 130708

IEC/EN 60950-1					
Clause	Requirement + Test			Result - Remark	Verdict
Varistor (RV201)	Thinking	TRV20471	471 V, Type 3 SPD ²⁾	IEC 61051-2 UL 1449 3 rd ed	VDE UL (E314979)
Common mode chokes (T200, T201)	Epcos	B82723A	250 VAC, 2.7 mH, 125 °C, UL94 V-0	EN 60938-2	VDE
NTC resistor (RV200)	Epcos	B57237	3.7A, 10 ohm at 25°C	IEC 60950-1	Tested in the unit
Insulating tubing on RV200	Qualtek	Q-200	200°C, 7.9 kV/mm, min. 0.8 mm thick	UL 224	UL (E245010)
Rectifying diodes (CR301, CR303, CR305, CR306)	Various	Various	3A, 600V	IEC 60950-1	Tested in the unit
Coupled Choke (L300)	Flux	12340029A1	Class F	IEC 60950-1	Tested in the unit
Bobbin	DuPont	Rynite FR 530 L	V-0	UL94	UL (E41938)
Wire	Various	Various	155°C minimum	-	-
Bulk capacitors (C303, C304, C305)	Various	Various	450 V, 150 µF, 105°C	IEC 60950-1	Tested in the unit
PWM Controller (U500)	TI	UCC38C43	-	IEC 60950-1	Tested in the unit
Temperature control circuit (U401)	Microchip	TC6502	85°C operating point	IEC 60950-1	Tested in the unit
Temperature control circuit (U402)	Microchip	TC6502	75°C operating point	IEC 60950-1	Tested in the unit
Switching transistors (Q600, Q601)	Infineon	IPB60R385CP	650 V, 9 A	IEC 60950-1	Tested in the unit



Report No. 130708

IEC/EN 60950-1					
Clause	Requirement + Test		Result - Remark		Verdict
Common mode choke (T602)	Thrane & Thrane	L/T70			
Bobbin	DSM	TE250F6 TE250F8 TS250F6 TS250F8	V-0 V-0 V-0 V-0	UL 94 UL 94 UL 94 UL 94	UL (E43392) UL (E43392) UL (E172082) UL (E172082)
	Sumitomo Hexion	PM-9630 UP 3420	V-0 V-0	UL 94 UL 94	UL (E41429) UL (E61040)
Wire	Various	Various	155°C minimum	-	-
Tape ⁴⁾	Various	Various	Polyester, 155°C minimum	-	-
Transformer (T601)	Thrane & Thrane	L/T65			
Bobbin	DuPont DSM Sumitomo	FR-530 AV2365SN PM-9630	V-0 V-0 V-0	UL 94 UL 94 UL 94	UL (E41938) UL (E47960) UL (E41429)
TIW	Great Leoflon Totoku Young Chang	TRW(F) TIW-3 STW-F	Class F Class F Class F	UL 2353 UL 2353 UL 2353	UL (E211989) UL (E166483) UL (E242198)
Wire	Various	Various	155°C minimum	-	-
Tape ⁴⁾	Various	Various	Polyester, 155°C minimum	-	-
Output fuses	Belfuse	SSQ 10	10 A, 86 VDC	UL 248-1	UL (E20624)
Coupled Choke (L600)	Thrane & Thrane	L/T66			
Bobbin	DuPont DSM Sumitomo	FR-530 AV2365SN PM-9630	V-0 V-0 V-0	UL 94 UL 94 UL 94	UL (E41938) UL (E47960) UL (E41429)
TIW	Great Leoflon Totoku Young Chang	TRW(F) TIW-3 STW-F	Class F Class F Class F	UL 2353 UL 2353 UL 2353	UL (E211989) UL (E166483) UL (E242198)
Wire	Various	Various	155°C minimum	-	-
Tape ⁴⁾	Various	Various	Polyester, 155°C minimum	-	-



Report No. 130708

IEC/EN 60950-1					
Clause	Requirement + Test			Result - Remark	Verdict
Optocouplers (Q702, Q802)	Avago	HCPL-817	See Table: Opto Electronic Devices	IEC 60747-5-2 UL 1577 CSA/UL 60950	VDE UL (E55361) CSA (1253038)
DC terminals (J100, J101, J102)	Wago	745-303	630V, 41A (UL: 300V, 30A)	IEC 60947-1 UL 60947-1	KEMA UL (E45172)
DC input fuseholders (H100, H101)	Jenn Feng	JEF-703H	30A	IEC 60950-1	Tested in the unit
Material	DuPont	Zytel 101L	V-2	UL 94	UL (E41938)
Thermal pads	Berquist	Gap Pad 1500S30	V-0, 200°C, min. 0.5 mm, 6000 VAC	IEC 60950-1	Tested in the unit
¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance					
Supplementary information:					
2) UL testing performed with 6 kV / 3 kA combination pulse and 15 pulses. Complies with Annex Q requirements. 3) The component can touch the enclosure when 10N force is applied. Additional insulator is required. 4) Constructional purpose. Not used as basic, supplementary or reinforced insulation.					



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: Opto Electronic Devices		P
Manufacturer : Avago Type..... : HCPL-817 Separately tested..... : CSA Bridging insulation : Reinforced External creepage distance : 9.0 Internal creepage distance : 5.4 Distance through insulation : 0.4 Tested under the following conditions : 5000 V rms Input..... : Output..... :			
Supplementary information:			



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)						P
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status	
90	4.04	-	364	F200	4.04	Normal load (10A)	
100	3.60	3.6	360	F200	3.60	Normal load (10A)	
240	1.48	1.4	355	F200	1.48	Normal load (10A)	
254	1.40	-	356	F200	1.40	Normal load (10A)	
Supplementary information:							

2.1.1.5 c1)	TABLE: max. V, A, VA test					P
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)		
30	10	30.9	23.8	423		
Supplementary information:						
The +30V output from the power supply represents an energy hazard: 423 VA. Outputs are adequately protected from contact.						

2.1.1.5 c2)	TABLE: stored energy			P
Capacitance C (μF)	Voltage U (V)	Energy E (J)		
880	30	0.40		
Supplementary information:				
$E=0,5 CU^2 \times 10^{-6}$				



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2.2	TABLE: evaluation of voltage limiting components in SELV circuits			P
Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components	
	V peak	V d.c.		
T601 output (pins 7 – 9)	123	-		
After CR601	85	31.5	CR601	
After L604	-	31.5	CR601, L604	
Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)			
L604 s-c	See table 5.3			
Supplementary information:				
S-c = Short circuit				

2.5	TABLE: limited power sources			N/A
Circuit output tested:				
Measured Uoc (V) with all load circuits disconnected:				
	I _{sc} (A)		VA	
	Meas.	Limit	Meas.	Limit
Normal condition				
Single fault:				
Supplementary information:				



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2.10.2	Table: working voltage measurement			P
Location	RMS voltage (V)	Peak voltage (V)	Comments	
Voltages measured at L600:				
Pin 1 – Pins 7 / 6	198	380		
Pin 1 – Pins 8 / 5	198	376		
Pin 1 – Pins 9 / 11	223	480		
Pin 1 – Pins 10 / 12	222	412		
Pin 2 – Pins 7 / 6	198	360		
Pin 2 – Pins 8 / 5	199	392		
Pin 2 – Pins 9 / 11	223	456		
Pin 2 – Pins 10 / 12	223	396		
Voltages measured at T601:				
Pin 2 – Pin 7	264	552		
Pin 2 – Pin 9	216	472		
Pin 2 – Pin 10	254	560		
Pin 2 – Pin 12	204	488		
Pin 5 – Pin 7	250	512		
Pin 5 – Pin 9	278	576		
Pin 5 – Pin 10	213	448		
Pin 5 – Pin 12	263	528		
Supplementary information:				
Tested with 100 – 240 V a.c. / Load 0 – 10 A				



Report No. 130708

IEC/EN 60950-1							
Clause	Requirement + Test	Result - Remark					Verdict
2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements						P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)	
Functional:							
Primary before fuse L – N	339	240	1.5	8.0	2.5	8.0	
Basic/supplementary:							
Primary soldering pins – Enclosure (below PCB)	576	278	2.3	3.0	2.8	-	
Primary – Earth (on PCB)	576	278	2.3	4.0	2.8	4.0	
Primary – Earth (on a.c. terminal)	339	240	1.5	> 8	2.5	> 8	
Reinforced:							
Primary – Secondary (Q702 / Q802)	576	278	4.6	7.2	5.6	8.0	
Supplementary information:							
Refer Annex C for distances in transformers.							

2.10.5	TABLE: Distance through insulation measurements					P
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Thermal Pads (primary parts – enclosure)	576	278	1860	-	-	
Supplementary information:						



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries		N/A
Battery category..... : Manufacturer : Type / model..... : Voltage : Capacity..... : Tested and Certified by (incl. Ref. No.) : Circuit protection diagram:			

MARKINGS AND INSTRUCTIONS (1.7.12, 1.7.15)	
Location of replaceable battery	
	Language(s):
Close to the battery	
In the servicing instructions	
In the operating instructions	



Report No. 130708

IEC/EN 60950-1									
Clause	Requirement + Test							Result - Remark	Verdict
4.3.8	TABLE: Batteries								N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available								N/A	
Is it possible to install the battery in a reverse polarity position?								N/A	
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition									
Max. current during fault condition									
Test results:									
- Chemical leaks								N/A	
- Explosion of the battery								N/A	
- Emission of flame or expulsion of molten metal								N/A	
- Electric strength tests of equipment after completion of tests								N/A	
Supplementary information:									



Report No. 130708

IEC/EN 60950-1							
Clause	Requirement + Test				Result - Remark		Verdict
4.5	TABLE: Thermal requirements, Three units stacked in horizontal position						P
	Supply voltage (V)	254	254	100	90		—
	Ambient T _{max} (°C)	25	55	55	22		—
Maximum measured temperature T of part/at::		T (°C)				Allowed T _{max} (°C)	
		1)	2)	2)	2)		
C201		63	70	70	63	105	
C204		61	70	69	62	100	
T200		69	73	76	96	115	
C206		62	71	71	65	100	
C203		61	70	71	71	105	
C306		65	72	72	68	105	
L300		83	78	82	94	130	
L600		92	80	75	80	130	
T601		90	95	83	96	130	
T602		88	86	79	79	130	
PCB (near L600 and T601)		98	86	79	82	130	
J101		73	72	69	61	-	
J200		61	69	69	65	-	
S200 (switch body)		65	77	70	62	85	
H200		61	70	70	63	85	
Enclosure top		65	71	70	65	3)	
Enclosure bottom		66	74	73	67	3)	
C612 / C613		86	80	74	74	105	
Temperature T of winding:		t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C) / Insulation class
Supplementary information:							
1) Units daisy chained and loaded to single 30A load. 2) All 3 units are loaded to 10A. 3) Unintentional contact with the installed power supply is not likely. Symbol IEC 60417-5041 is used. All measurements are performed on the middle unit of the stack.							



Report No. 130708

IEC/EN 60950-1								
Clause	Requirement + Test				Result - Remark		Verdict	
4.5	TABLE: Thermal requirements, Three units stacked in vertical position						P	
	Supply voltage (V)	100	90	254			—	
	Ambient T _{max} (°C)	55	55	55			—	
Maximum measured temperature T of part/at::		T (°C)				Allowed T _{max} (°C)		
		1)	2)	1)				
	C201	69	69	69			105	
	C204	68	68	69			100	
	T200	75	75	72			115	
	C206	70	70	70			100	
	C203	70	70	70			105	
	C306	71	71	72			105	
	L300	82	82	78			130	
	L600	74	73	79			130	
	T601	82	79	94			130	
	T602	77	77	85			130	
	PCB (near L600 and T601)	76	76	85			130	
	J101	68	68	70			-	
	J200	67	67	68			-	
	S200	68	68	75			85	
	H200	68	68	69			85	
	Enclosure top	70	69	72			3)	
	Enclosure bottom	71	71	74			3)	
	C612 / C613	74	73	79			105	
Temperature T of winding:		t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Supplementary information:								
1) All 3 units are loaded to 10A. 2) All 3 units are loaded to 9A. 3) Unintentional contact with the installed power supply is not likely. Symbol IEC 60417-5041 is used.All measurements are performed on the middle unit of the stack.								



Report No. 130708

IEC/EN 60950-1								
Clause	Requirement + Test				Result - Remark		Verdict	
4.5	TABLE: Thermal requirements, Single unit in horizontal position						P	
	Supply voltage (V)	90	254	90	254		—	
	Ambient T _{max} (°C)	55	55	23	23		—	
Maximum measured temperature T of part/at::		T (°C)				Allowed T _{max} (°C)		
C201		68	71	54	46		105	
C204		68	71	53	45		100	
T200		80	75	102	53		115	
C206		70	71	57	45		100	
C203		72	71	67	45		105	
C306		71	73	60	49		105	
L300		86	83	98	66		130	
L600		76	87	79	70		130	
T601		86	107	99	90		130	
T602		79	88	74	64		130	
PCB (near L600 and T601)		81	92	84	76		130	
J101		69	75	57	52		-	
J200		67	70	52	45		-	
S200		69	76	54	52		85	
H200		69	70	55	46		85	
Enclosure top		68	71	50	43		¹⁾	
Enclosure bottom		69	73	61	52		¹⁾	
C612 / C613		74	85	71	63		105	
Temperature T of winding:		t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
Supplementary information:								
Loaded to 10A in all measurements.								
1) Unintentional contact with the installed power supply is not likely. Symbol IEC 60417-5041 is used.								



Report No. 130708

IEC/EN 60950-1						
Clause	Requirement + Test			Result - Remark	Verdict	
4.5.5	TABLE: Ball pressure test of thermoplastic parts				N/A	
	Allowed impression diameter (mm): ≤ 2 mm				—	
Part		Test temperature (°C)		Impression diameter (mm)		
Supplementary information:						
Certified thermoplastic parts.						
4.7	TABLE: Resistance to fire				P	
Part		Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Supplementary information:						
See table 1.5.1.						
5.1	TABLE: touch current measurement				P	
Measured between:		Measured (mA)	Limit (mA)	Comments/conditions		
Line – PE		1.8	3.5	254V, 50 Hz, Normal load		
Neutral – PE		2.1	3.5	254V, 50 Hz, Normal load		
Line – Output		0.08	0.25	254V, 50 Hz, Normal load		
Neutral – Output		0.08	0.25	254V, 50 Hz, Normal load		
Line – PE		1.8	3.5	254V, 50 Hz, No load		
Neutral – PE		2.1	3.5	254V, 50 Hz, No load		
Line – Output		0.03	0.25	254V, 50 Hz, No load		
Neutral – Output		0.04	0.25	254V, 50 Hz, No load		
Supplementary information:						



Report No. 130708

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests		P
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V) Breakdown Yes / No
Basic/supplementary:			
Primary – Protective Earth		AC	1860 No
Reinforced:			
Primary – Secondary		AC	3000 No
Supplementary information:			

5.3	TABLE: Fault condition tests					P
Ambient temperature (°C)		23			—	
Power source for EUT: Manufacturer, model/type, output rating		Mains supply, isolating transformer and variac.			—	
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
U401	O-c	100	90 min	F200	3.61	Fault in middle unit of three unit stack. All units loaded to 10A at 55°C ambient temperature. Thermal shut down doesn't operate. Thermally stable condition is reached. Temperatures: T601: 142°C L600: 117°C No hazard.
Q802, R803	S-c	240	1 min	F200	1.5	Normal operation. No increase in output voltage. No hazard.
Q702, R715	S-c	240	15 min	F200	1.8	Maximum 34.3V at output. No excessive temperature rise. No hazard.
L600 (pin 7 – pin 8)	S-c	240	1 min	F200	¹⁾	Fuse blows immediately. The equipment does not operate after replacement of the fuse. No hazard.



Report No. 130708

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict
Output	O-I	100	15 min	F200	5.05	Output loaded to 15.2 A. The unit stops operating after 10 minutes. Circuitry is damaged (R327 has burnt).
Output	S-c	240	5 min	F200	0.27	The unit shuts down. No hazard.
C302	S-c	240	1 min	F200	¹⁾	Fuse blows immediately. Normal operation after replacement of the fuse. No hazard.
C303, C304, C305	S-c	240	15 min	F200	0.27	Output 0V. The equipment is damaged. L300A open circuits and small SMD components near U300 are burnt. No excessive temperature rise. No hazard.
CR601	S-c	240	1 min	F200	0.28	TR601 output fuse blows immediately. Normal operation after replacement of the fuse. No hazard.
Supplementary information:						
1) 2.1 x fuse rating. Fuse blows every time when the fault in primary circuit is repeated 10 times.						



Report No. 130708

IEC/EN 60950-1							
Clause	Requirement + Test			Result - Remark			Verdict
C.2	TABLE: transformers						P
Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)
T601	Reinforced (primary – secondary and core)	576	278	3000 Va.c.	4.6	5.6	*
L600	Reinforced (primary – secondary and core)	480	223	3000 Va.c.	4.2	5.0	*
Loc.	Tested insulation			Test voltage / V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
T601	Reinforced (primary – secondary and core)			3000 Va.c.	6.5	6.5	TIW
L600	Reinforced (primary – secondary and core)			3000 Va.c.	6.5	6.5	TIW
Supplementary information:							
* 2 or 3 layers / 0.4mm / Annex U							