



Test Report issued under the responsibility of:

NCB TÜV SÜD PSB Pte Ltd
1 Science Park Drive,
Singapore 118221



PSB Singapore

TEST REPORT

IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006 Information technology equipment – Safety – Part 1: General requirements

Report Reference No.....: 081-100923-000

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CB/CCA Testing Laboratory.....: TÜV SÜD Asia Ltd. Taiwan Branch

Address.....: 7F., No.37, Sec. 2, Zhongyang S., Rd., Beitou District, Taipei City,
11270, Taiwan.

Applicant's name.....: NEC Display Solutions, Ltd.

Address.....: 4-13-23 Shibaura, Minato-ku, Tokyo, 108-0023, Japan

Manufacturer's name.....: NEC Display Solutions, Ltd.

Address.....: 4-13-23 Shibaura, Minato-ku, Tokyo, 108-0023, Japan

Factory's name.....: See page 5 for details

Address.....: See page 5 for details

Test specification:

Standard.....: ☒ IEC 60950-1:2005 (2nd Edition) and/or
☒ 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

Master TRF.....: Dated 2007-06

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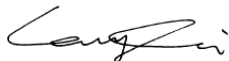
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Test item description : LCD Monitor	
Trade Mark : NEC	
Manufacturer : Same as applicant	
Model/Type reference : L309TY, PA301W-BK-L1(W)	
Ratings : 100-240 Vac, 50/60 Hz, 1.9-0.7 A	
Testing procedure and testing location:	
☒ CB/CCA Testing Laboratory:	TÜV SÜD Asia Ltd. Taiwan Branch
Testing location/ address	7F., No.37, Sec. 2, Zhongyang S., Rd., Beitou District, Taipei City, 11270, Taiwan.
☐ Associated CB Laboratory:	N/A
Testing location/ address	N/A
Tested by (name + signature)	Mr. Watson Yang 
Approved by (+ signature)	Mr. Larry Lai 
☐ Testing procedure: TMP	N/A
Tested by (name + signature)	
Approved by (+ signature)	
Testing location/ address	N/A
☐ Testing procedure: WMT	N/A
Tested by (name + signature)	
Witnessed by (+ signature)	
Approved by (+ signature)	
Testing location/ address	N/A
☐ Testing procedure: SMT	N/A
Tested by (name + signature)	
Approved by (+ signature)	
Supervised by (+ signature)	
Testing location/ address	N/A
☐ Testing procedure: RMT	N/A
Tested by (name + signature)	
Approved by (+ signature)	
Supervised by (+ signature)	
Testing location/ address	N/A



Tests performed (name of test and test clause):

Testing location:

All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 2.

National Differences for Austria (AT), Canada (CA), Germany (DE), Denmark (DK), Finland (FI), France (FR), United Kingdom (GB), Italy (IT), Japan (JP), Korea (KR), The Netherlands (NL), Norway (NO), Poland (PL), Sweden (SE), Slovenia (SI), United States of America (US). Group Differences as listed in the CB Bulletin No. 112A (December 2006) are recorded at the end of this Report.

**See attachment No. 2
(Total 2 pages)**



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Test item particulars	
Equipment mobility	☐ movable ☐ hand-held ☐ transportable ☒ stationary ☐ for building-in ☐ direct plug-in
Connection to the mains	☒ pluggable equipment ☒ type A ☐ type B ☐ permanent connection ☒ detachable power supply cord ☐ non-detachable power supply cord ☐ not directly connected to the mains
Operating condition	☒ continuous ☐ rated operating / resting time:
Access location	☒ operator accessible ☐ restricted access location
Over voltage category (OVC)	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ other:
Mains supply tolerance (%) or absolute mains supply values	+10%, -10%
Tested for IT power systems	☒ Yes ☐ No
IT testing, phase-phase voltage (V)	230 V (for Norway)
Class of equipment	☒ Class I ☐ Class II ☐ Class III ☐ Not classified
Considered current rating (A)	16 A or 20 A (for US)
Pollution degree (PD)	☐ PD 1 ☒ PD 2 ☐ PD 3
IP protection class	Ordinary
Altitude during operation (m)	Up to 3,048
Altitude of test laboratory (m)	below 2,000
Mass of equipment (kg)	Approx. 18.8 of LCD Monitor and Base Stand Approx. 1.4 of Hood (optional)
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	2010-08-25
Date(s) of performance of tests	2010-08-25 to 2010-09-13

**General remarks:**

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

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"(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.

Factories:

1) TOSHIN Technology (Shenzhen) Factory (ID No. : 45530)

Block 8, Townfull Industrial Park, Dalang Street, Baoan District, 518109 Shenzhen, Guangdong,
People's Republic of China

2) TPV Display Polska Sp. z o. o. (ID No. : 66259)

ul. Zlotego Smoka 9, 66-400 Gorzow Wlkp., Poland

Attachments:

Attachment No. 1	National Differences	19	pages
Attachment No. 2	Marking Plate	2	pages
Attachment No. 3	Photo	12	pages

General product information:

The equipment is LCD Monitor of information technology equipment.

Model L309TY is identical to model PA301W-BK-L1(W) except for model designation.

The backlight fulfils the requirements of limited current circuit (Clause 2.4).

The maximum ambient temperature specified by manufacturer is 40 °C.

The manufacturer specified that the equipment could be operated up to an altitude of 10,000 ft (3,048 m). The requirements according to IEC 60664-1:2007 for clearances are considered as the altitude correction factors (1.15) specified in Table A.2.

Unless otherwise specified, all tests were performed on model L309TY to represent the other similar models.

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

1	GENERAL		P
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1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	Components which were found to affect safety aspects comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards. (see appended table 1.5.1).	P
1.5.2	Evaluation and testing of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	No thermal control.	N/A
1.5.4	Transformers	Transformer used is suitable for their intended application and comply with the relevant requirements of the standard.	P
1.5.5	Interconnecting cables	Interconnection o/p cable to other device is carrying only SELV voltages on an energy level below 240 VA. →Except for the insulation material, there is no further requirement to the o/p interconnection cable.	P

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.6	Capacitors bridging insulation	X2 capacitor according to IEC 60384-14 with 2.5 kVpk pulse test. Y2 capacitor according to IEC 60384-14 with 5.0 kVpk pulse test. Y1 capacitor according to IEC 60384-14 with 8.0 kVpk pulse test. Y2 type capacitors (C114, C115, C214, C215) are provided and bridged between primary and secondary of SPS board.	P
1.5.7	Resistors bridging insulation	No bridging resistors provided.	N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems	Y-Cap. are all rated min. 230 V and complied with IEC 60384-14, and others component in such condition has suitable voltage rating. See table 1.5.1 for details.	P
1.5.9	Surge suppressors	See below.	P
1.5.9.1	General	Certified Varistor (VZ1) is used between L and N of SPS, see appended table 1.5.1 for details.	P
1.5.9.2	Protection of VDRs	The current fuse (F1 and F2) provided in series as the protection.	P
1.5.9.3	Bridging of functional insulation by a VDR	Refer to 1.5.9.1.	P
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A

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

1.6	Power interface		P
1.6.1	AC power distribution systems	TN / IT power system. Equipment was evaluated in TN power system. (see 1.5.8 and 1.7.2.4 for IT power system)	P
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the continuously. (see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	This equipment is not hand-held equipment.	N/A
1.6.4	Neutral conductor	Basic insulation for rated voltage between earthed parts and primary phases.	P

1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V)	100-240 Vac	P
	Symbol for nature of supply, for d.c. only	Mains from AC source.	N/A
	Rated frequency or rated frequency range (Hz) :	50/60 Hz	P
	Rated current (mA or A)	1.9-0.7 A	P
	Manufacturer's name or trademark or identification mark	NEC	P
	Model identification or type reference	L309TY, PA301W-BK-L1(W)	P
	Symbol for Class II equipment only	Class I equipment.	N/A
	Other markings and symbols	Additional symbols or markings that do not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	Safety instructions in English. Other languages will be provided when submitted for national approval.	P
1.7.2.1	General	Instructions are available.	P

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.2	Disconnect devices	Appliance Inlet is provided as disconnection device.	P
1.7.2.3	Overcurrent protective device		N/A
1.7.2.4	IT power distribution systems	Installation instruction will be stated when equipment is intended to be used for IT power system.	P
1.7.2.5	Operator access with a tool	No operator accessible area which needs to be accessed by use of a tool.	N/A
1.7.2.6	Ozone		N/A
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment	No supply voltage adjustment device.	N/A
	Methods and means of adjustment; reference to installation instructions		—
1.7.5	Power outlets on the equipment	No power outlet provided.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Marking adjacent to fuse reads as F1/F2: T6.3AH, 250 Vac of SPS board.	P
1.7.7	Wiring terminals	See below.	N/A
1.7.7.1	Protective earthing and bonding terminals	Main earth connection for supply wiring is marked on AC Inlet by symbol IEC 60417, No. 5019. This symbol is not used for other earth connection.	P
1.7.7.2	Terminal for a.c. mains supply conductors	The equipment with Appliance Inlet is intended to be use the detachable type power supply cord.	P
1.7.7.3	Terminals for d.c. mains supply conductors	Mains from AC source only.	N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.8	Controls and indicators	See below.	P
1.7.8.1	Identification, location and marking :	The marking and indication of the power switch is located on the switch so that indication of function is clear.	P
1.7.8.2	Colours :	The colour is clear that safety is not involved.	P
1.7.8.3	Symbols according to IEC 60417 :	The 60417-1-IEC-5009 (☺) is marked on secondary power switch.	P
1.7.8.4	Markings using figures :	No indicators for different positions.	N/A
1.7.9	Isolation of multiple power sources :	Only one supply from mains.	N/A
1.7.10	Thermostats and other regulating devices :	No thermostats used.	N/A
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth for 15 sec. and then again for 15 sec. with the cloth soaked with Petroleum Ether. After this test there was no damage to the label. The marking on the label did not fade. There was no curling nor lifting of the label edge.	P
1.7.12	Removable parts	Marking is not placed on removable parts.	N/A
1.7.13	Replaceable batteries	No batteries.	N/A
	Language :		—
1.7.14	Equipment for restricted access locations :	No restricted access location.	N/A

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

2	PROTECTION FROM HAZARDS		P
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2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	See below.	P
2.1.1.1	Access to energized parts	See below.	P
	Test by inspection	Operator can not contact with any parts with only basic insulation to ELV or hazardous voltage.	P
	Test with test finger (Figure 2A)	No access with test finger to any parts with only basic insulation to ELV or hazardous voltage.	P
	Test with test pin (Figure 2B)	The test pin can not touch hazardous voltage through any openings or seams of the whole enclosure.	P
	Test with test probe (Figure 2C)		N/A
2.1.1.2	Battery compartments		N/A
2.1.1.3	Access to ELV wiring	No ELV wiring in operator accessible area.	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 hazardous voltage wiring in operator accessible area.	N/A
2.1.1.5	Energy hazards	No energy hazard in operator access area.	P
2.1.1.6	Manual controls	None at ELV or hazardous voltage.	N/A
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock, see appended table.	P
	Measured voltage (V); time-constant (s)	<1s; (see appended table 2.1.1.7).	—

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Clause	Requirement + Test	Result - Remark	Verdict

2.1.1.8	Energy hazards – d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply :		N/A
	b) Internal battery connected to the d.c. mains supply		N/A
2.1.1.9	Audio amplifiers		N/A
2.1.2	Protection in service access areas	No maintenance work in operation mode necessary.	N/A
2.1.3	Protection in restricted access locations	The equipment is not intended to be used in restricted locations.	N/A

2.2	SELV circuits		P
2.2.1	General requirements	42.4 V peak or 60 Vdc are not exceeded in SELV circuit under normal operation or single fault condition.	P
2.2.2	Voltages under normal conditions (V)	Between any SELV circuits 42.4 V peak or 60 Vdc are not exceeded.	P
2.2.3	Voltages under fault conditions (V).....	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71 V peak and 120 Vdc were not exceed and SELV limits not for longer than 0.2 seconds. (see appended table 2.2.2 and 5.3)	P
2.2.4	Connection of SELV circuits to other circuits :	See 2.2.2 and 2.2.3. No direct connection between SELV and any primary circuits.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

2.3	TNV circuits		N/A
2.3.1	Limits	No TNV circuits.	N/A
	Type of TNV circuits		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed		—
2.3.5	Test for operating voltages generated externally		N/A

2.4	Limited current circuits		P
2.4.1	General requirements	The limits specified in 2.4.2 are not exceeded under normal operating conditions and in the event of a single failure within the equipment of the inverter output connector.	P
2.4.2	Limit values	The peak drop voltage was measured with an oscilloscope at a 2 kΩ non-inductive resistor. Results see appended table 2.4.2.	P
	Frequency (Hz)	See appended table.	—
	Measured current (mA)	See appended table.	—
	Measured voltage (V).....	See appended table.	—
	Measured circuit capacitance (nF or μF)	≤ 0.1 μF	—
2.4.3	Connection of limited current circuits to other circuits	Complies.	P



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Clause	Requirement + Test	Result - Remark	Verdict

2.5	Limited power sources		P
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output under normal operating and single fault condition	The output connectors are in compliance with table 2B in normal operating and single fault condition. (results see appended table).	P
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)	See appended table.	—
	Current rating of overcurrent protective device (A) ..		—

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Clause	Requirement + Test	Result - Remark	Verdict

2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	Metal enclosure – basic insulated conductive parts touchable in operator area earthed reliably.	P
2.6.2	Functional earthing	Secondary functional earthing is connected to protectively earthed conductive part that separated from primary by basic insulation.	P
2.6.3	Protective earthing and protective bonding conductors	See below.	P
2.6.3.1	General		N/A
2.6.3.2	Size of protective earthing conductors	Appliance Inlet is used. Power supply cord is not provided.	P
	Rated current (A), cross-sectional area (mm ²), AWG :		—
2.6.3.3	Size of protective bonding conductors	Protective bonding conductor complied with the minimum conductor size of table 2D and complied with the requirement of 2.6.3.4	P
	Rated current (A), cross-sectional area (mm ²), AWG		—
	Protective current rating (A), cross-sectional area (mm ²), AWG	The rating of overcurrent protective device is < 16 A, min. conductor size of 20 AWG used.	—

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)	< 0.1 Ω	P
2.6.3.5	Colour of insulation.....	Green/ Yellow wire from AC Inlet to PE trace and metal chassis provided.	P
2.6.4	Terminals	The equipment with detachable power supply core, connected on Appliance Inlet.	P
2.6.4.1	General	See below.	P
2.6.4.2	Protective earthing and bonding terminals	The equipment with detachable power supply cord, connected on Appliance Inlet.	N/A
	Rated current (A), type, nominal thread diameter (mm)		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Protective earthing conductor is in Appliance Inlet; the earth pin of Inlet is connected to PCB earthing trace directly with solderd then connected to metal chassis with connection by screwed grounding pad on PCB.	P
2.6.5	Integrity of protective earthing	See below.	P
2.6.5.1	Interconnection of equipment	This equipment has its own earthing connection. Any other units connected via the interconnecting cable to other unit shall provide SELV only.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches or fuses in earthing conductor.	P
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect protective earth without disconnecting mains; an Appliance Inlet is used as disconnect device.	P
2.6.5.4	Parts that can be removed by an operator	Plug or inlet, earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P

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Clause	Requirement + Test	Result - Remark	Verdict

2.6.5.5	Parts removed during servicing	It is not necessary to disconnect earthing except for the removing of the earthed parts itself.	P
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	P
2.6.5.7	Screws for protective bonding	No self tapping screws are used.	P
2.6.5.8	Reliance on telecommunication network or cable distribution system	Not intend to connect with telecommunication network or a cable distribution system for the integrity of protective earthing.	P

2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Equipment relies on 16 A or 20 A rated fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short circuit. Overcurrent protection is provided by the built-in device fuse.	P
	Instructions when protection relies on building installation	English.	—
2.7.2	Faults not simulated in 5.3.7	The protection devices are well dimensioned and mounted.	P
2.7.3	Short-circuit backup protection	Pluggable equipment type A, the building installation is considered as providing short circuit protection.	P
2.7.4	Number and location of protective devices :	Overcurrent protection by several built-in fuse, earth fault protection by fuse or circuit breaker in the phase of the building installation.	P
2.7.5	Protection by several devices	Only one fuse.	N/A
2.7.6	Warning to service personnel :	No service work necessary.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

2.8	Safety interlocks		N/A
2.8.1	General principles	No safety interlock provided.	N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches and relays		N/A
2.8.7.1	Contact gaps (mm) :		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test		N/A
2.8.8	Mechanical actuators		N/A

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used.	P
2.9.2	Humidity conditioning	Humidity treatment performed for 48 h.	P
	Relative humidity (%), temperature (°C) :	95 % R.H., 25 °C	—
2.9.3	Grade of insulation	Please refer to 5.2, 2.10 and 4.5.	P
2.9.4	Separation from hazardous voltages	See below.	P
	Method(s) used :	Method 1.	—

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Clause	Requirement + Test	Result - Remark	Verdict

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See 2.10.3, 2.10.4 and 2.10.5.	P
2.10.1.1	Frequency :	The frequency does not exceeding 30 kHz.	P
2.10.1.2	Pollution degrees :	Pollution degrees 2.	P
2.10.1.3	Reduced values for functional insulation	See 5.3.4.	P
2.10.1.4	Intervening unconnected conductive parts	Complied with.	P
2.10.1.5	Insulation with varying dimensions		N/A
2.10.1.6	Special separation requirements		N/A
2.10.1.7	Insulation in circuits generating starting pulses		N/A
2.10.2	Determination of working voltage	The rms and the peak voltage were measured on the switching power supply. The unit was connected to a 240 V TN power system and secondary ground was maintained during measurement. Results see appended table 2.10.2.	P
2.10.2.1	General	Complied	P
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	See below.	P
2.10.3.1	General		P
2.10.3.2	Mains transient voltages	See appended table 2.10.3 and 2.10.4.	P
	a) AC mains supply :	2500 Vpk considered.	P
	b) Earthed d.c. mains supplies :		N/A
	c) Unearthed d.c. mains supplies :		N/A
	d) Battery operation :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	See appended table 2.10.3 and 2.10.4 and refer to 5.3.4.	P
2.10.3.5	Clearances in circuits having starting pulses		N/A
2.10.3.6	Transients from a.c. mains supply	2500 Vpk assumed.	P
2.10.3.7	Transients from d.c. mains supply		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems	No TNV circuit.	N/A
2.10.3.9	Measurement of transient voltage levels		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	See below.	P
2.10.4.1	General	See appended table 2.10.3 and 2.10.4.	P
2.10.4.2	Material group and comparative tracking index	Material group IIIa/IIIb assumed.	P
	CTI tests	CTI rating for all materials of min. 100.	—
2.10.4.3	Minimum creepage distances	See appended table 2.10.3 and 2.10.4.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5	Solid insulation	Complied with 2.10.5.2 to 2.10.5.14 and 5.2.	P
2.10.5.1	General	See below.	P
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	—
2.10.5.3	Insulating compound as solid insulation	Complied with 2.10.5.2 and 2.10.10.	P
2.10.5.4	Semiconductor devices	See 2.10.5.3.	P
2.10.5.5.	Cemented joints	See appended table 2.10.3 and 2.10.4.	P
2.10.5.6	Thin sheet material – General	Considered.	P
2.10.5.7	Separable thin sheet material	The thin sheet materials of polyester tape used in transformer.	P
	Number of layers (pcs) :	See appended table 5.2.	—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure		P
	Electric strength test	See appended table 2.10.5.	—
2.10.5.10	Thin sheet material – alternative test procedure	Electric strength test applied to each one layer.	P
	Electric strength test	See appended table 5.2.	—
2.10.5.11	Insulation in wound components	In equipment, winding in wound components (choke, transformer...) are complied with functional insulation only. No wire in wound component provides basic, supplementary and reinforce insulation.	P



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Clause	Requirement + Test	Result - Remark	Verdict

2.10.5.12	Wire in wound components	Reinforced insulation.	P
	Working voltage	(see appended table 2.10.2).	P
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation		N/A
	c) Compliance with Annex U	Triple insulated wire is used in secondary winding of T101 for reinforced insulation, also see annex U and appended table 1.5.1.	P
	Two wires in contact inside wound component; angle between 45° and 90°	Insulation tape and/or tubing provided.	—
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.14	Additional insulation in wound components		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	See below.	P
2.10.6.1	Uncoated printed boards	See appended table 2.10.3 and 2.10.4.	P
2.10.6.2	Coated printed boards	No coated printed wiring boards.	N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs).....		N/A
2.10.7	Component external terminations	See appended table 2.10.3 and 2.10.4.	P
2.10.8	Tests on coated printed boards and coated components		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		—
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling	No insulation breakdown.	P
2.10.10	Test for Pollution Degree 1 environment and insulating compound	No cracks or voids in the insulating material.	P
2.10.11	Tests for semiconductor devices and cemented joints	No cracks, voids or gaps in the insulating material.	P
2.10.12	Enclosed and sealed parts	Passed 2.10.10.	P

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Clause	Requirement + Test	Result - Remark	Verdict

3	WIRING, CONNECTIONS AND SUPPLY		P
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3.1	General		P
3.1.1	Current rating and overcurrent protection	All internal wires are UL recognized wiring that is PVC insulated, rated VW-1, min. 80 °C, 300 V. Internal wiring gauge is suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring	Internal wires with only basic isolation are routed so that they are not close to any live bare components. The wires are secured by solder pins or quick connect terminals so that a loosening of the terminal connection is unlikely.	P
3.1.4	Insulation of conductors	Securely held on PCB. No hazard. The insulation of the individual conductors are suitable for the application and the working voltage. For the insulation material see 3.1.1.	P
3.1.5	Beads and ceramic insulators	Not used.	N/A
3.1.6	Screws for electrical contact pressure	Electrical connections screwed two or more complete threads into metal.	P
3.1.7	Insulating materials in electrical connections	All current carrying and safety earthing connections are metal to metal.	P
3.1.8	Self-tapping and spaced thread screws	No self-tapping or spaced thread screws used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

3.1.9	Termination of conductors	All conductors are reliable secured.	P
	10 N pull test		—
3.1.10	Sleeving on wiring	Sleeving on wiring reliable kept in position by cable ties or by the use of heatshrink sleeving.	P

3.2	Connection to a mains supply		P
3.2.1	Means of connection	See below.	P
3.2.1.1	Connection to an a.c. mains supply	Connection to AC mains by Appliance Inlet.	P
3.2.1.2	Connection to a d.c. mains supply	No connection to d.c. mains supply.	N/A
3.2.2	Multiple supply connections	Only one supply connection.	N/A
3.2.3	Permanently connected equipment	The unit is not permanent connected equipment.	N/A
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets	The Appliance Inlet complies with IEC/EN 60320-1.	P
3.2.5	Power supply cords		N/A
3.2.5.1	AC power supply cords		N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief	This equipment is not with non-detachable power supply cord.	N/A
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict

3.2.7	Protection against mechanical damage	No sharp edges and no part likely to damage the power cord.	P
3.2.8	Cord guards		P
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm)		—
3.2.9	Supply wiring space	The supply wiring space is satisfactory.	P

3.3	Wiring terminals for connection of external conductors		N/A
3.3.1	Wiring terminals	Equipment provided with an Appliance Inlet.	N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²)		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type and nominal thread diameter (mm)		—
3.3.6	Wiring terminals design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

3.4	Disconnection from the mains supply		P
3.4.1	General requirement	See below.	P
3.4.2	Disconnect devices	The Appliance Inlet is considered as disconnect device.	P
3.4.3	Permanently connected equipment	The unit is not permanently connected equipment.	N/A
3.4.4	Parts which remain energized	When the disconnect device is disconnected no remaining parts with hazardous voltage in the equipment.	P
3.4.5	Switches in flexible cords	No isolation switch provided.	N/A
3.4.6	Number of poles - single-phase and d.c. equipment	The disconnect device disconnects both poles simultaneously.	P
3.4.7	Number of poles - three-phase equipment	Equipment is single phase.	N/A
3.4.8	Switches as disconnect devices	No switch as disconnect device.	N/A
3.4.9	Plugs as disconnect devices	The Appliance Inlet is considered to be the disconnect device.	N/A
3.4.10	Interconnected equipment	Not interconnected equipment.	N/A
3.4.11	Multiple power sources	Only one supply connection provided.	N/A

3.5	Interconnection of equipment		P
3.5.1	General requirements	The power supply is not considered for connection to TNV.	P
3.5.2	Types of interconnection circuits.....:	Interconnection circuits of SELV through sec o/p cable. No ELV interconnection circuits.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection circuits.	N/A
3.5.4	Data ports for additional equipment	Considered. See appended table 2.5 for details	P

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Clause	Requirement + Test	Result - Remark	Verdict

4	PHYSICAL REQUIREMENTS		P
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4.1	Stability		P
	Angle of 10°	This unit is of a stable mechanical construction and does not overbalance when tilted to an angle of 10° from its normal upright position.	P
	Test: force (N)	Equipment is not a floor standing unit.	N/A

4.2	Mechanical strength		P
4.2.1	General	See below.	P
4.2.2	Steady force test, 10 N	10 N applied to components.	P
4.2.3	Steady force test, 30 N	30 N applied to internal chassis.	P
4.2.4	Steady force test, 250 N	250 N applied to outer enclosure. No energy or other hazards.	P
4.2.5	Impact test	500 g steel sphere ball fall, from 1.3 m height onto outer enclosure. No safety relevant damages.	P
	Fall test	Ditto.	P
	Swing test	Ditto.	P
4.2.6	Drop test; height (mm).....	The unit is not hand-held or direct plug-in equipment.	N/A
4.2.7	Stress relief test	After 7 h at 70 °C and cooling down to room temperature, no shrinkage, distortion or loosening of outer plastic enclosure parts was noticeable on the equipment. The internal metal chassis also treated as parts of enclosure.	P
4.2.8	Cathode ray tubes	No cathode ray tube.	N/A
	Picture tube separately certified		—

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Clause	Requirement + Test	Result - Remark	Verdict

4.2.9	High pressure lamps	No high pressure lamp.	N/A
4.2.10	Wall or ceiling mounted equipment; force (N) ...:	The equipment is mounted in accordance with the instruction in user's manual. The mounting means withstood the additional loading test of 409 N.	P

4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2	Handles and manual controls; force (N).....:	Each handle withstood the loading test of 137 N.	P
4.3.3	Adjustable controls	No control devices.	N/A
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to with standard usual mechanical stress. For the protection, solder pins, cable ties and heatshrink tubing are used.	P
4.3.5	Connection of plugs and sockets	No mismatching of connectors possible.	N/A
4.3.6	Direct plug-in equipment	The equipment is not a direct plug-in unit.	N/A
	Torque		—
	Compliance with the relevant mains plug standard		—
4.3.7	Heating elements in earthed equipment	No heating elements.	N/A
4.3.8	Batteries	No batteries provided.	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

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Clause	Requirement + Test	Result - Remark	Verdict

4.3.9	Oil and grease	Insulation not in contact with oil or grease.	N/A
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	N/A
4.3.11	Containers for liquids or gases	The equipment does not contain liquid.	N/A
4.3.12	Flammable liquids	No flammable liquids in this unit.	N/A
	Quantity of liquid (l)		—
	Flash point (°C)		—
4.3.13	Radiation; type of radiation	No ionizing radiation, laser or flammable gases present.	N/A
4.3.13.1	General		N/A
4.3.13.2	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		N/A
	Part, property, retention after test, flammability classification		—
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N/A
4.3.13.5	Laser (including LEDs)	No laser provided.	N/A
	Laser class		—
4.3.13.6	Other types		N/A

4.4	Protection against hazardous moving parts		N/A
4.4.1	General	No hazardous moving part.	N/A
4.4.2	Protection in operator access areas	No hazardous moving part.	N/A
4.4.3	Protection in restricted access locations	The equipment is not intended to be used in restricted locations.	N/A
4.4.4	Protection in service access areas	No hazardous moving part.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4.5	Thermal requirements		P
4.5.1	General	See below.	P
4.5.2	Temperature tests	See appended table 4.5.	P
	Normal load condition per Annex L	Maximum normal load which specified by manufacturer.	—
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	Phenolic bobbin used in Transformer T101 and T201. See appended table 4.5.5 for details.	P

4.6	Openings in enclosures		P
4.6.1	Top and side openings	See below.	P
	Dimensions (mm)	(see appended table).	—
4.6.2	Bottoms of fire enclosures	See below.	P
	Construction of the bottom	(see appended table).	—
4.6.3	Doors or covers in fire enclosures	No door or cover.	N/A
4.6.4	Openings in transportable equipment	Not 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 or screen secured with adhesive.	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	Use of materials with the required flammability classes and testing in Single Fault Conditions.	P
	Method 1, selection and application of components wiring and materials	Selection and application of components and materials which minimize the possibility of ignition and spread of flame.	P
	Method 2, application of all of simulated fault condition tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4.7.2	Conditions for a fire enclosure	See below.	P
4.7.2.1	Parts requiring a fire enclosure	With having the following components: ■ components with windings ■ wiring ■ semiconductor devices, transistors, diodes, integrated circuits ■ resistors, capacitors, inductors The metal chassis and plastic material used as fire enclosure.	P
4.7.2.2	Parts not requiring a fire enclosure	See 4.7.2.1.	N/A

4.7.3	Materials		P
4.7.3.1	General	Integrated circuits and small electrical parts mounted on a printed wiring board min. rated V-1 or better.	P
4.7.3.2	Materials for fire enclosures	The metal chassis and plastic material used as fire enclosure.	P
4.7.3.3	Materials for components and other parts outside fire enclosures	Materials or parts outside fire enclosure are metal or decorative plastic.	P
4.7.3.4	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2, HF-2 or better.	P
4.7.3.5	Materials for air filter assemblies	No air filters assemblies.	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage component used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
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5.1	Touch current and protective conductor current		P
5.1.1	General	See sub-clause 5.1.2 to 5.1.6.	P
5.1.2	Configuration of equipment under test (EUT)	EUT has only one mains connection.	P
5.1.2.1	Single connection to an a.c. mains supply	Each piece of equipment tested separately.	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	Equipment is tested using the test circuit in figure 5 A.	P
5.1.4	Application of measuring instrument	Tests are conducted using one of the measuring instruments in annex D, or any other circuit giving the same results.	P
5.1.5	Test procedure	The touch current was measured from supply to conductive parts and to 10 cm by 20 cm metal foil wrapped on accessible non- conductive parts (plastic enclosure).	P
5.1.6	Test measurements	See appended table 5.1.	P
	Supply voltage (V)	264 Vac	—
	Measured touch current (mA)	See appended table 5.1.	—
	Max. allowed touch current (mA)	3.5 mA (for PE) or 0.25 mA (for accessible non- conductive parts).	—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA)..		—

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Clause	Requirement + Test	Result - Remark	Verdict

5.1.7	Equipment with touch current exceeding 3,5 mA	Touch current does not exceed 3.5 mA.	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 telecommunication networks.	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system	No TNV.	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	No TNV.	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	All tests voltages were applied for 1 minute in the chamber after the humidity test of 2.9.2 and in warm conditions after the heating test of 4.5.2. No isolation breakdown was observed. (results see appended tables)	P
5.2.2	Test procedure	See appended table 5.2.	P

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Clause	Requirement + Test	Result - Remark	Verdict

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	Ventilation openings covered: results see appended table. No other foreseeable misuse considered to be possible.	P
5.3.2	Motors	No motor provided.	N/A
5.3.3	Transformers	No high temp. of the transformer are to be observed or to be expected. (see appended table 5.3 and Annex C)	P
5.3.4	Functional insulation.....:	Short Circuit tests. Result see appended table 5.3.	P
5.3.5	Electromechanical components	No electromechanical components.	N/A
5.3.6	Audio amplifiers in ITE		N/A
5.3.7	Simulation of faults	Faults in primary and secondary components and operational insulation were already considered for the building-in power supply board. No other abnormal tests necessary.	P
5.3.8	Unattended equipment	None of them are used.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted. Electric strength test was passed.	P
5.3.9.1	During the tests	Ditto.	P
5.3.9.2	After the tests	Ditto.	P

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Clause	Requirement + Test	Result - Remark	Verdict

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
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6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements	Not connected to telecommunication networks directly.	N/A
	Supply voltage (V)		—
	Current in the test circuit (mA)		—
6.1.2.2	Exclusions		N/A

6.2	Protection of equipment users from overvoltages on telecommunication networks		N/A
6.2.1	Separation requirements		N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test		N/A
6.2.2.2	Steady-state test		N/A
6.2.2.3	Compliance criteria		N/A

6.3	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A)		—
	Current limiting method		—



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Clause	Requirement + Test	Result - Remark	Verdict

7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A
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7.1	General	Not connected to cable distribution system directly.	N/A
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test		N/A
7.4.3	Impulse test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N/A
A.1.1	Samples		—
	Wall thickness (mm)		—
A.1.2	Conditioning of samples; temperature (°C)		N/A
A.1.3	Mounting of samples		N/A
A.1.4	Test flame (see IEC 60695-11-3)		N/A
	Flame A, B, C or D		—
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N/A
A.2.1	Samples, material		—
	Wall thickness (mm)		—
A.2.2	Conditioning of samples; temperature (°C)		N/A
A.2.3	Mounting of samples		N/A
A.2.4	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C		—
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.3	Hot flaming oil test (see 4.6.2)		N/A
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A



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Clause	Requirement + Test	Result - Remark	Verdict

B	Annex B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N/A
B.1	General requirements		N/A
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
B.2	Test conditions		N/A
B.3	Maximum temperatures		N/A
B.4	Running overload test		N/A
B.5	Locked-rotor overload test		N/A
	Test duration (days)		—
	Electric strength test: test voltage (V)		—
B.6	Running overload test for d.c. motors in secondary circuits		N/A
B.6.1	General		N/A
B.6.2	Test procedure		N/A
B.6.3	Alternative test procedure		N/A
B.6.4	Electric strength test; test voltage (V)		N/A
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
B.7.1	General		N/A
B.7.2	Test procedure		N/A
B.7.3	Alternative test procedure		N/A
B.7.4	Electric strength test; test voltage (V)		N/A
B.8	Test for motors with capacitors		N/A
B.9	Test for three-phase motors		N/A
B.10	Test for series motors		N/A
	Operating voltage (V)		—



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Clause	Requirement + Test	Result - Remark	Verdict

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position	(see appended table 1.5.1)	—
	Manufacturer	(see appended table 1.5.1)	—
	Type	(see appended table 1.5.1)	—
	Rated values	(see appended table 1.5.1)	—
	Method of protection		—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	(see appended table 5.2)	P
	Protection from displacement of windings		P

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Clause	Requirement + Test	Result - Remark	Verdict

C.2	Safety isolation transformer	P
Construction details:		
Transformer T201 of SPS board: TABUCHI ELECTRIC CO., LTD., type PA301W		
Mfr.: see appended table 1.5.1		
Type: see appended table 1.5.1		
Recurring peak voltage	408 Vac	
Required clearance insulation (from table 2K and 2L, pollution degree 2)		
for Reinforced	*4.6 mm	
for Basic	*2.3 mm	
Effective voltage rms	256 Vac	
Required creepage insulation (from table 2N, pollution degree 2, material group IIIa/IIIb)		
for Reinforced	5.2 mm	
for Basic	2.6 mm	
Measured min. clearances		
prim-sec (Reinforced)	9.0 mm (between inner windings)	
prim-core (Basic)	12.0 mm (between prim. pin to core)	
sec-core (Basic)	12.0 mm (between sec. pin to core)	
Measured min. creepages		
prim-sec (Reinforced)	9.0 mm (between inner windings)	
prim-core (Basic)	12.0 mm (between prim. pin to core)	
sec-core (Basic)	12.0 mm (between sec. pin to core)	
Supplementary information:		
*The multiplication factor for clearances as 1.15 according to Table A.2 of IEC 60664-1:2007 is considered for altitude up to 10,000 ft.		



PSB Singapore

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Clause	Requirement + Test	Result - Remark	Verdict

Construction:	
Concentric windings on phenolic type of bobbin, min. one layer of insulation tape between secondary to secondary windings. Primary windings (Polyurethane Enameled Copper Wire) and secondary windings (Polyurethane Enameled Copper Wire) were separated by the design of bobbin. Core is considered as floating. The outer windings wrapped with three layers of insulation tape.	
Pin numbers	
Prim.	3-4; 5-8
Sec.	9-12; 10-11; 13-15; 14-16
Bobbin	
Material	1. Sumitomo, type PM-9820 2. Hitachi Chemical, type CP-J-8600 or CP-J-8800
Thickness	Min. 0.64 mm
Electric strength test	
With AC 3000 V after humidity treatment	
Result	Pass



PSB Singapore

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

C.2	Safety isolation transformer	P
Construction details:		
Transformer T101 of SPS board: TABUCHI ELECTRIC CO., LTD., type PA301W		
Mfr.: see appended table 1.5.1		
Type: see appended table 1.5.1		
Recurring peak voltage	552 Vac	
Required clearance insulation (from table 2K and 2L, pollution degree 2)		
for Reinforced	*5.1 mm	
for Basic	*2.6 mm	
Effective voltage rms	308 Vac	
Required creepage insulation (from table 2N, pollution degree 2, material group IIIa/IIIb)		
for Reinforced	6.2 mm	
for Basic	3.1 mm	
Measured min. clearances		
prim-sec (Reinforced)	30 mm (pri. windings to sec. lead of windings)	
sec-core (Reinforced)	28 mm	
Measured min. creepages		
prim-sec (Reinforced)	30 mm (pri. windings to sec. lead of windings)	
sec-core (Reinforced)	28 mm	
Supplementary information:		
*The multiplication factor for clearances as 1.15 according to Table A.2 of IEC 60664-1:2007 is considered for altitude up to 10,000 ft.		



PSB Singapore

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

Construction:	
Concentric windings on phenolic type of bobbin, one layer of insulation tape between primary (Polyurethane Enameled Copper Wire) and secondary windings (Triple Insulation Wire). Min. one layer of insulation tape between primary and primary winding and two layers of insulation tape wrapped around outer secondary winding. Core is considered as primary parts. Details of triple insulated wire used, see appended table 1.5.1.	
Pin numbers	
Prim.	7-8-9, 10-11-12
Sec.	A-B
Bobbin	
Material	1. Sumitomo, type PM-9820 2. Hitachi Chemical, type CP-J-8600 or CP-J-8800
Thickness	Min. 0.64 mm
Electric strength test	
With AC 3000 V after humidity treatment	
Result	Pass

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Clause	Requirement + Test	Result - Remark	Verdict

D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument	Figure D.1 used.	P
D.2	Alternative measuring instrument		N/A

E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
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F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
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G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1	Clearances		N/A
G.1.1	General		N/A
G.1.2	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V)		N/A
G.2.1	AC mains supply		N/A
G.2.2	Earthed d.c. mains supplies		N/A
G.2.3	Unearthed d.c. mains supplies		N/A
G.2.4	Battery operation		N/A
G.3	Determination of telecommunication network transient voltage (V)		N/A
G.4	Determination of required withstand voltage (V)		N/A
G.4.1	Mains transients and internal repetitive peaks		N/A
G.4.2	Transients from telecommunication networks		N/A
G.4.3	Combination of transients		N/A
G.4.4	Transients from cable distribution systems		N/A
G.5	Measurement of transient voltages (V)		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
G.6	Determination of minimum clearances		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
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J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P
	Metal(s) used		—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N/A
K.1	Making and breaking capacity		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)		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment		P

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Clause	Requirement + Test	Result - Remark	Verdict

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringling signal		N/A
M.3.1.1	Frequency (Hz)		—
M.3.1.2	Voltage (V)		—
M.3.1.3	Cadence; time (s), voltage (V)		—
M.3.1.4	Single fault current (mA)		—
M.3.2	Tripping device and monitoring voltage		N/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V)		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
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A

P	Annex P, NORMATIVE REFERENCES		P
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Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		P
	a) Preferred climatic categories	Varistor (VZ1) is certified component on SPS board, see appended table 1.5.1.	P
	b) Maximum continuous voltage	Ditto.	P
	c) Pulse current	Ditto.	P

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Clause	Requirement + Test	Result - Remark	Verdict

R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A

S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A

T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
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U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
		See separated Report for triple insulation wire used in T101.	—

V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction	Single-phase TN power system considered and used for testing.	P
V.2	TN power distribution systems		P
V.3	TT power systems		N/A
V.4	IT power systems	230 V for Norway.	P

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Clause	Requirement + Test	Result - Remark	Verdict

W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N/A
W.1	Touch current from electronic circuits		N/A
W.1.1	Floating circuits		N/A
W.1.2	Earthed circuits		N/A
W.2	Interconnection of several equipments		N/A
W.2.1	Isolation		N/A
W.2.2	Common return, isolated from earth		N/A
W.2.3	Common return, connected to protective earth		N/A

X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N/A
X.1	Determination of maximum input current		N/A
X.2	Overload test procedure		N/A

Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N/A
Y.1	Test apparatus		N/A
Y.2	Mounting of test samples		N/A
Y.3	Carbon-arc light-exposure apparatus		N/A
Y.4	Xenon-arc light exposure apparatus		N/A

Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N/A
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AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A
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BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
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Clause	Requirement + Test	Result - Remark	Verdict

EN 60950-1:2006 – 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					N/A
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

IEC/EN 60950-1															
Clause	Requirement + Test	Result - Remark	Verdict												
2.7.1	Replace the subclause as follows: Basic requirements 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): 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; 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; 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. 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												
2.7.2	This subclause has been declared 'void'.		N/A												
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	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: <table><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> In the conditions applicable to Table 3B delete the words "in some countries" in condition^{a)}. In NOTE 1, applicable to Table 3B, delete the second sentence.	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	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: <table><tr><td> Over 10 up to and including 16</td><td> 1,5 to 2,5</td><td> 1,5 to 4</td><td> </td></tr></table> Delete the fifth line: conductor sizes for 13 to 16 A.	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	Add the following NOTE: 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.		N/A												

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Clause	Requirement + Test	Result - Remark	Verdict

Annex H	Replace the last paragraph of this annex by: 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. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.		N/A
Bibliography	Additional EN standards.		—

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
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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
1.5.7.1	In Finland, Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.		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
1.7.2.1	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. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskaskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"		N/A
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.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict																								
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.		P																								
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: <table> <tr> <td>SEV 6532-2.1991</td><td>Plug Type 15</td><td>3P+N+PE</td><td>250/400 V, 10 A</td></tr> <tr> <td>SEV 6533-2.1991</td><td>Plug Type 11</td><td>L+N</td><td>250 V, 10 A</td></tr> <tr> <td>SEV 6534-2.1991</td><td>Plug Type 12</td><td>L+N+PE</td><td>250 V, 10 A</td></tr> </table> 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: <table> <tr> <td>SEV 5932-2.1998</td><td>Plug Type 25</td><td>3L+N+PE</td><td>230/400 V, 16 A</td></tr> <tr> <td>SEV 5933-2.1998</td><td>Plug Type 21</td><td>L+N</td><td>250 V, 16 A</td></tr> <tr> <td>SEV 5934-2.1998</td><td>Plug Type 23</td><td>L+N+PE</td><td>250 V, 16 A</td></tr> </table>	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	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
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																								
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																								
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																								

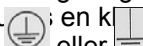
IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. 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. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		N/A
3.2.1.1	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. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
3.2.1.1	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.		N/A
3.2.4	In Switzerland , for requirements see 3.2.1.1 of this annex.		N/A
3.2.5.1	In the United Kingdom , a power supply cord with conductor of 1,25 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N/A
3.3.4	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: • 1,25 mm² to 1,5 mm² nominal cross-sectional area.		N/A
4.3.6	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.		N/A
4.3.6	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.		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.7.1	In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that ○ 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	In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - 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. 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 - 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. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - 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



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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 , there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.		N/A
7.3	In Norway , for installation conditions see EN 60728-11:2005.		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
ZC	A-DEVIATIONS (informative)		P
1.5.1	Sweden (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted.		N/A
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.		N/A
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: Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket eller  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
1.7.2.1	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). 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. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.		N/A
1.7.5	Denmark (Heavy Current Regulations) 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.		N/A
1.7.13	Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.		N/A
5.1.7.1	Denmark (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.		N/A

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⁾
Plastic Enclosure (without base)	Teijin Chemicals Ltd., Research & Development Div.	TN-7500(v). ((v) May be suffixed with any one or two letters except F and T)	5VB, 2.0 mm thickness min., 60 °C, overall 450 mm by 690 mm by 125 mm	UL 94	UL
	CHEIL INDUSTRIES INC., CHEMICALS DIV.	GC-1017(+) ((+) May be replaced by one, two or three numbers and/or letter(s)).	5VB, 2.0 mm thickness min., 85 °C, overall 450 mm by 690 mm by 125 mm	UL 94	UL
Metal Chassis	Various	Various	Min. 0.81 mm thickness	--	--
Base Stand (Optional)	Various	Various	Combination with min. HB plastic and metal, weight 6.3 kg, overall 380 mm by 301.6 mm and height 309 mm	UL 94	UL
Insulation Sheet (between Power Supply Board and Metal Chassis)	Various	Various	Min. V-2	UL 94	UL
LCD Panel	LG Display	LM300WQ5	30" TFT-LCD	--	--
DC/AC Inverter (one provided)	KOREA TAIYO YUDEN Co., Ltd.	KLS-LM300BCI- HF	I/P: DC 21.6-26.4 V (DC 24 V typ.), 5.40 A max. O/P: 1140 Vrms max., 6 mArms max.	--	--
- DC/AC Inverter Transformer (T101-T109)	SEJIN ELECCOM CO., LTD.	S-2235B-300BCI	105 °C	--	--
Printed Wiring Board	Various	Various	Minimum V-1, minimum 105 °C	UL 796	UL

Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾
Switching Power Supply Board	TABUCHI ELECTRIC CO., LTD.	PA301W	O/P: 24 V/4.8 A, 18 V/2.5 A, 5.2 V/4.5 A, Class I	--	--
-AC Inlet	Yamate Electric Co., Ltd.	AP-300 series	10 A, 250 Vac (for VDE), 15 A, 250 Vac (for UL)	IEC/EN 60320-1, UL 498	VDE, UL
-Fuse (F1, F2)	SKYGATE CO LTD	SG5013 -R- Serie(s)	T6.3AH, 250 V	UL 248 IEC 60127-1 IEC 60127-2	VDE, UL
-Varistor (VZ1) (optional)	JOYIN CO LTD	14S621K	385 Vac, 505 Vdc	IEC61051-1 IEC 61051-2: 1991, UL 1449 3 rd (SPD type 3)	VDE, UL
-Thermistor (TH1, TH2) (optional)	Various	Various	Type NTC, min. 5 A, 5 ohm at 25 °C	--	--
-X-Capacitor (C1, C8) (optional)	Okaya Electric Industries Co., Ltd.	LE SERIES,	250 Vac, 0.22 µF max., 85 °C min.	IEC/EN 60384- 14, UL 1414	VDE, UL
-Y-Capacitors (C2, C3, C4) (Y2 type) (optional)	Murata Mfg. Co., Ltd.	KY	100pF max., 250Vac, 85°C min.	IEC/EN 60384- 14, UL 1414	VDE, UL
- Bleeder Resistor (R1)	Various	Various	1/2 W, 1M ohm	--	--
-Y-Capacitors (C5, C6, C7) (Y2 type) (optional)	Murata Mfg. Co., Ltd.	KY	2200 pF max., 250 Vac, 85 °C min.	IEC/EN 60384- 14, UL 1414	VDE, UL
-Bridge Capacitor (C114, C115, C214, C215) (Y2 type) (optional)	Murata Mfg. Co., Ltd.	KY	470 pF max., 250 Vac, 85 °C min.	IEC/EN 60384- 14, UL 1414	VDE, UL
-Bridge Diode (DS1)	Various	Various	Min. 25 A, min. 600 V	--	--
-Storage Capacitor (C304)	Various	Various	150 µF, min. 450 V, 105 °C min.	--	--

Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾
-Transistor (Q101)	Various	Various	Min. 6 A, min. 600 V	--	--
-Transistor (Q201, Q202)	Various	Various	Min. 15 A, min. 600 V	--	--
-Photo coupler (PC201, PC101, PC102, PC103) (optional)	Sharp Corp Electronic Components And Devices Group	PC123	Di>0.4mm, Ext.> 8.0 mm, 100 °C, Thermal cycling, 5000 Vac	IEC 60950-1, DIN EN 60747- 5-2	VDE
-PFC Choke (L1) (optional)	Tabuchi Electric Co., Ltd.	ZL28T99	105 °C	--	--
-Choke (L2)	Ueno Co., Ltd.	ADR25H- 04150YD	105 °C	--	--
-PFC Choke (L301) (optional)	Tabuchi Electric Co., Ltd.	CHT186	105 °C	--	--
-Choke (L302) (optional)	Ueno Co., Ltd.	UHP10-04060D	105 °C	--	--
-Transformer (T101)	Tabuchi Electric Co., Ltd.	PTTX192	Class A	--	--
- Triple Insulation Wire (use in T101)	Furukawa Electric Co., Ltd.	TEX-E	130 °C.	IEC/EN 60950- 1, UL 60950-1	VDE, UL
	ONAMBA Co., Ltd.	O-TEM/B	130 °C.	IEC/EN 60950- 1, UL 60950-1	TUV, UL
-Transformer (T201)	Tabuchi Electric Co., Ltd.	PTTX191	Class A	--	--

¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (Vac/Hz)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status
For DVI-1 Mode						
90/50	1.762	--	155.1	F1, F2	1.762	Maximum normal load
90/60	1.764	--	155.2	F1, F2	1.764	Maximum normal load
100/50	1.560	1.9	153.0	F1, F2	1.560	Maximum normal load
100/60	1.560	1.9	153.1	F1, F2	1.560	Maximum normal load
240/50	0.658	0.7	151.4	F1, F2	0.658	Maximum normal load
240/60	0.661	0.7	151.4	F1, F2	0.661	Maximum normal load
254/50	0.621	--	151.9	F1, F2	0.621	Maximum normal load
254/60	0.624	--	152.1	F1, F2	0.624	Maximum normal load
264/50	0.605	--	150.9	F1, F2	0.605	Maximum normal load
264/60	0.606	--	151.0	F1, F2	0.606	Maximum normal load
For DVI-2 Mode						
90/50	1.758	--	155.0	F1, F2	1.758	Maximum normal load
90/60	1.759	--	155.1	F1, F2	1.759	Maximum normal load
100/50	1.550	1.9	152.8	F1, F2	1.550	Maximum normal load
100/60	1.552	1.9	152.9	F1, F2	1.552	Maximum normal load
240/50	0.650	0.7	151.1	F1, F2	0.650	Maximum normal load
240/60	0.650	0.7	151.2	F1, F2	0.651	Maximum normal load
254/50	0.614	--	151.6	F1, F2	0.614	Maximum normal load
254/60	0.615	--	151.6	F1, F2	0.615	Maximum normal load
264/50	0.600	--	150.7	F1, F2	0.600	Maximum normal load
264/60	0.602	--	150.7	F1, F2	0.602	Maximum normal load
Supplementary information:						

U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status
For Display-1 Mode						
90/50	1.725	--	152.0	F1, F2	1.725	Maximum normal load
90/60	1.726	--	152.0	F1, F2	1.726	Maximum normal load
100/50	1.550	1.9	151.6	F1, F2	1.550	Maximum normal load
100/60	1.551	1.9	151.6	F1, F2	1.551	Maximum normal load
240/50	0.634	0.7	147.6	F1, F2	0.634	Maximum normal load
240/60	0.637	0.7	147.7	F1, F2	0.637	Maximum normal load
254/50	0.600	--	146.8	F1, F2	0.600	Maximum normal load
254/60	0.603	--	146.8	F1, F2	0.603	Maximum normal load
264/50	0.583	--	146.0	F1, F2	0.583	Maximum normal load
264/60	0.584	--	146.1	F1, F2	0.584	Maximum normal load
For Display-2 Mode						
90/50	1.742	--	152.4	F1, F2	1.742	Maximum normal load
90/60	1.744	--	152.4	F1, F2	1.744	Maximum normal load
100/50	1.560	1.9	151.9	F1, F2	1.560	Maximum normal load
100/60	1.562	1.9	152.0	F1, F2	1.562	Maximum normal load
240/50	0.626	0.7	145.6	F1, F2	0.626	Maximum normal load
240/60	0.629	0.7	145.6	F1, F2	0.629	Maximum normal load
254/50	0.597	--	146.2	F1, F2	0.597	Maximum normal load
254/60	0.601	--	146.3	F1, F2	0.601	Maximum normal load
264/50	0.585	--	146.8	F1, F2	0.585	Maximum normal load
264/60	0.590	--	146.8	F1, F2	0.590	Maximum normal load
Supplementary information:						

2.1.1.7	TABLE: Discharge test				P
Condition	Switch Position	τ calculated (s)	τ measured (s)	comments	
Fuse In	--	0.44	0.43	Vpk=372 V, 37% of Vpk=137.64 V, after 1 sec voltage drop to 36 V	
Overall capacity: C1 and C8: 0.22 μ F					
Discharge resistor: R1: 1Mohm					

2.2.2	TABLE: Hazardous voltage (circuit) measurement Test				P
Transformer designation	Location	Maximum Voltage	Voltage Limiting Component	Comments	
T201	Pin 11, 12 – 9	21.6 Vac	--	--	
T201	Pin 11, 12 – 10	21.8 Vdc	--	--	
T201	Pin 13, 14 – 15	25.6 Vac	--	--	
T201	Pin 13, 14 – 16	26.2 Vdc	--	--	
T101	Pin 5 – 2	36.4 Vac	--	--	
Supplementary information:					
If the voltage exceeded 42.4 V pk or 60 V dc, the measurement was taken again after the next component in series with the secondary until the voltage measured was less than 42.4 V pk or 60 V dc.					
Each voltage measured and each component located in series directly before the measurement was noted.					

2.4.2	TABLE: Limited current circuit measurement					P
Location	Voltage (V)	Current (mA)	Freq. (KHz)	Limit (mA)	Comments	
For DC/AC Inverter Board: KOREA TAIYO YUDEN Co., Ltd., type KLS-LM300BCI-HF						
CN101 pin 1 to Earth						
Normal	--	--	--	--	EUT shut down after 1 sec	
C113 short	--	--	--	--	EUT shut down after 1 sec	
RA112A short	--	--	--	--	EUT shut down after 1 sec	
C011 short	--	--	--	--	EUT shut down immediately	
C010 short	--	--	--	--	EUT shut down immediately	
C005 short	--	--	--	--	EUT shut down immediately	
Q101 Pin D-S short	--	--	--	--	Q101 damaged, test repeated three times.	
CN101 pin 1 to pin 2						
Normal	--	--	--	--	EUT shut down after 1 sec	
C113 short	--	--	--	--	EUT shut down after 1 sec	
RA112A short	--	--	--	--	EUT shut down after 1 sec	
C011 short	--	--	--	--	EUT shut down immediately	
C010 short	--	--	--	--	EUT shut down immediately	
C005 short	--	--	--	--	EUT shut down immediately	
Q101 Pin D-S short	--	--	--	--	Q101 damaged, test repeated three times.	
For SPS Board: TABUCHI ELECTRIC CO., LTD., type PA301W						
C214, C215 and C114, C115 to Earth	0.36	0.18	0.06	0.7	C214, C215, C114 and C115 = 470 pF	
Supplementary information:						
1. Output measured with a 2 KΩ resistor as load.						
2. Tests were conducted on CN101 to represent the other output connectors (CN201-CN901) of DC/AC Inverter.						

2.5	TABLE: Limited power source measurement					P
1. According to Table 2B with normal condition for USB-1 Pin 1						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.155	≤8.0	1.2	≤100	4.76
2. According to Table 2B with normal condition for USB-1 Pin 2-4						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
3. According to Table 2B with fault condition for USB-1 Pin 1 (IC705 Pin 7-8 short)						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.214	≤8.0	3.4	≤100	13.56
4. According to Table 2B with normal condition for USB-2 Pin 1						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.152	≤8.0	1.2	≤100	4.75
5. According to Table 2B with normal condition for USB-2 Pin 2-4						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
6. According to Table 2B with fault condition for USB-2 Pin 1 (IC704 Pin7-8 short)						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.215	≤8.0	3.4	≤100	13.48
7. According to Table 2B with normal condition for USB-3 Pin 1						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.153	≤8.0	1.2	≤100	4.68
Supplementary information:						

8. According to Table 2B with normal condition for USB-3 Pin 2-4						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
9. According to Table 2B with fault condition for USB-3 Pin 1 (IC704 Pin7-8 short)						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	5.215	≤8.0	3.4	≤100	13.48
10. According to Table 2B with normal condition for Displayport-1 Pin 1, 3-12, 14-20						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
11. According to Table 2B with normal condition for Displayport-1 Pin 2, 13						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	3.278	≤8.0	0.01	≤100	0.01
12. According to Table 2B with normal condition for Displayport-2 Pin 1, 3-12, 14-20						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
13. According to Table 2B with normal condition for Displayport-2 Pin 2, 13						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	3.279	≤8.0	0.01	≤100	0.01
14. According to Table 2B with normal condition for DVI-1 Port Pin 3, 8, 11,15, 16, 19, 22						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
Supplementary information:						

15. According to Table 2B with normal condition for DVI-1 Port Pin 1, 2, 4, 5, 9, 10, 12, 13, 17, 18, 20, 21, 23, 24						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	3.276	≤8.0	0.01	≤100	0.01
16. According to Table 2B with normal condition for DVI-1 Port Pin 6, 7						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	4.706	≤8.0	0.01	≤100	0.01
17. According to Table 2B with normal condition for DVI-2 Port Pin 3, 8, 11, 15, 16, 19, 22						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
18. According to Table 2B with normal condition for DVI-2 Port Pin 1, 2, 4, 5, 9, 10, 12, 13, 17, 18, 20, 21, 23, 24						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	3.281	≤8.0	0.01	≤100	0.01
19. According to Table 2B with normal condition for DVI-2 Port Pin 6, 7						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	4.711	≤8.0	0.01	≤100	0.01
20. According to Table 2B with normal condition for INUSB-1 Port All Pins						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
21. According to Table 2B with normal condition for INUSB-2 Port All Pins						
Output Voltage (Voc)			Output Current (Isc)		VA	
V ac	V dc	Measured	Max Allowed	Measured	Max Allowed	Measured
≤30	≤30	--	≤8.0	--	≤100	--
Supplementary information:						



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2.6.3.4	TABLE: Ground continue test		P
Location	Resistant measured (Ω)	Comments	
AC Inlet earth pin to metal chassis	0.008	Test current= 32 A, 2 min	
AC Inlet earth pin to metal chassis	0.009	Test current= 40 A, 2 min	
Supplementary information:			
Test current= 32 A, 40 A			

2.10.2	TABLE: Max. working voltage measurement			P
Location		Peak Voltage (V)	TRMS Voltage (V)	Comments
T201 Pin 3,4 to 9		328	187	--
T201 Pin 3,4 to 10		364	212	--
T201 Pin 3,4 to 11,12		348	199	--
T201 Pin 3,4 to 13,14		344	199	--
T201 Pin 3,4 to 15		344	200	--
T201 Pin 3,4 to 16		332	187	--
T201 Pin 5-8 to 9		408	252	--
T201 Pin 5-8 to 10		392	248	--
T201 Pin 5-8 to 11,12		384	238	--
T201 Pin 5-8 to 13,14		392	237	--
T201 Pin 5-8 to 15		392	248	--
T201 Pin 5-8 to 16		408	256	--
T101 Pin 12 to 2		440	308	--
T101 Pin 12 to 5		408	294	--
T101 Pin 11 to 2		464	263	--
T101 Pin 11 to 5		472	258	--
T101 Pin 10 to 2		552	280	--
T101 Pin 10 to 5		552	292	--
T101 Pin 9 to 2		416	173	--
T101 Pin 9 to 5		408	178	--
T101 Pin 8 to 2		400	187	--
T101 Pin 8 to 5		432	201	--
T101 Pin 7 to 2		408	193	--
T101 Pin 7 to 5		448	207	--
C214/C215 Pri. to Sec.		384	178	--
C114/C115 Pri. to Sec.		384	178	--
PC201 Pin 3 to 1		400	189	--
PC201 Pin 3 to 2		400	188	--
PC201 Pin 4 to 1		392	186	--
Supplementary information:				

Location	Peak Voltage (V)	TRMS Voltage (V)	Comments
PC201 Pin 4 to 2	392	186	--
PC103 Pin 3 to 1	384	178	--
PC103 Pin 3 to 2	384	178	--
PC103 Pin 4 to 1	368	168	--
PC103 Pin 4 to 2	368	169	--
PC101 Pin 3 to 1	392	183	--
PC101 Pin 3 to 2	384	181	--
PC101 Pin 4 to 1	384	181	--
PC101 Pin 4 to 2	384	181	--
PC102 Pin 3 to 1	368	168	--
PC102 Pin 3 to 2	368	167	--
PC102 Pin 4 to 1	360	168	--
PC102 Pin 4 to 2	360	167	--
Supplementary information:			

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	U peak (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Primary components (with 10N) → metal chassis (Basic insulation)	420	250	*2.3	See below	2.5	See below
Line to Neutral				3.3		3.3
Line to Earth trace of PCB				8.1		8.1
Primary/ Secondary components (with 10 N) → floating parts (Basic insulation)	420	250	*2.3	See below	2.5	See below
C115 Pri. pin to PC103 Sec. pin				4.0		4.0
T201 core to Sec. heatsink				9.8		9.8
Primary components (with 10 N) → Secondary components (with 10 N) (Basic + Supplement insulation)	420	250	*4.6	See below	5.0	See below
Under C114 + C115				4.6 + 4.2		4.6 + 4.2
Under C214 + C215				4.3 + 4.6		4.3 + 4.6
Pri. → Sec. traces (Double insulation)	420	250	*4.6	See below	5.0	See below
Under PC101, PC102, PC103				6.5		6.5
Under PC201				6.5		6.5
Under T101	552	308	*5.1	12.5	6.2	12.5
Under T201	408	256	*4.6	14.0	5.2	14.0
Between Fuse two ends (Basic insulation)	420	250	*2.3	7.9	2.5	7.9

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements	P
Supplementary information: 1. The CTI rating of PCB is material group IIIa/IIIb (Cl. 2.10.4). 2. Separation Method between SELV and hazard circuit by double or reinforced insulation (Method 1) and earthed screen (Method 2) 3. Functional insulation shorted, see Cl. 5.3.4. 4. There is an Insulation Sheets located between SPS board and metal chassis to keep the insulation. 5. The components C1, VZ1, L301 and L302 were fixed in position by silicon or glue. 6. The components TH1 and TH2 were covered with insulation tube to keep the insulation. 7. All primary and secondary wires are fixed in position reliably by soldering, cable tie or mechanical cramp. 8. * The multiplication factor for clearances as 1.15 according to Table A.2 of IEC 60664-1:2007 is considered for altitude up to 10,000 ft.		

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)
Opto-couplers (reinforced insulation for all sources)	420	250	3000 Vac	0.4	0.4
Cover of T201	420	250	3000 Vac	0.4	0.4
Supplementary information: See appended table 1.5.1 for further details.					

4.5	TABLE: Thermal requirements			P
	Supply voltage (V) :	90 Vac/ 264 Vac (Panel in horizontal position)		—
	Ambient T _{min} (°C) :	--		—
	Ambient T _{max} (°C) :	--		—
Maximum measured temperature T of part/at::		T (°C)		Allowed T _{max} (°C)
Test condition		90 Vac	264 Vac	--
Ambient		40.0	40.0	--
AC Inlet (For POWER board)		47.6	44.9	70
Wire line (For POWER board)		48.5	45.6	80
VZ1 body (For POWER board)		56.0	49.2	85
C1 body (For POWER board)		54.3	48.4	85
PWB under TH2 (For POWER board)		70.2	57.5	105
L1 coil (For POWER board)		57.6	49.6	105
C8 body (For POWER board)		58.4	51.1	85
L2 coil (For POWER board)		60.7	53.8	105
C304 body (For POWER board)		60.7	54.2	85
PWB under DS1 (For POWER board)		67.7	65.2	105
L302 coil (For POWER board)		60.5	55.8	105
L301 coil (For POWER board)		68.3	61.5	105
PWB under Q201 (For POWER board)		68.0	63.1	105
T201 coil (For POWER board)		63.6	63.2	90
T201 core (For POWER board)		63.2	63.2	90
T101 coil (For POWER board)		54.5	58.3	90
T101 core (For POWER board)		53.5	55.1	90
PC103 body (For POWER board)		49.5	51.2	100
PC102 body (For POWER board)		47.2	48.0	100
PC101 body (For POWER board)		48.8	49.8	100
C215 body (For POWER board)		56.6	58.0	85
C114 body (For POWER board)		49.3	50.2	85
C216 body (For POWER board)		59.7	61.1	85
L201 coil (For POWER board)		63.0	62.9	105
PC201 body (For POWER board)		56.5	58.4	100

Maximum measured temperature T of part/at::	T (°C)		Allowed T _{max} (°C)
PWB under IC401S (For Main board)	65.0	64.7	105
L22 coil (For Main board)	60.1	60.1	105
PWB under IC781 (For Bridge board)	53.4	57.8	105
C743 body (For Bridge board)	48.1	50.9	105
PWB under IC904 (For Sensor board)	60.1	59.9	105
T901 coil (For Inverter board)	84.4	84.7	105
T901 core (For Inverter board)	84.7	85.1	105
PWB under IC001 (For Inverter board)	76.1	76.1	105
C151 body (For Inverter board)	73.9	73.8	85
Metal Enclosure	45.6	45.5	70
Plastic Enclosure inside	41.1	41.3	60
Plastic Enclosure outside	40.6	41.1	95
Panel body	54.4	54.8	--
Supplementary information:			

4.5	TABLE: Thermal requirements			P
	Supply voltage (V) :	90 Vac/ 264 Vac (Panel in vertical position)		—
	Ambient T _{min} (°C) :	--		—
	Ambient T _{max} (°C) :	--		—
Maximum measured temperature T of part/at::		T (°C)		Allowed T _{max} (°C)
Test condition		90 Vac	264 Vac	--
Ambient		40.0	40.0	--
AC Inlet (For POWER board)		64.9	61.5	70
Wire line (For POWER board)		67.2	62.0	80
VZ1 body (For POWER board)		71.3	64.7	85
C1 body (For POWER board)		76.2	65.8	85
PWB under TH2 (For POWER board)		73.8	68.6	105
L1 coil (For POWER board)		81.1	64.5	105
C8 body (For POWER board)		72.5	66.1	85
L2 coil (For POWER board)		72.5	64.9	105
C304 body (For POWER board)		71.1	66.8	85
PWB under DS1 (For POWER board)		79.0	71.1	105
L302 coil (For POWER board)		66.8	63.2	105
L301 coil (For POWER board)		56.9	67.7	105
PWB under Q201 (For POWER board)		73.5	70.3	105
T201 coil (For POWER board)		67.6	63.7	90
T201 core (For POWER board)		66.6	62.6	90
T101 coil (For POWER board)		70.9	68.5	90
T101 core (For POWER board)		65.1	64.7	90
PC103 body (For POWER board)		65.3	63.3	100
PC102 body (For POWER board)		63.8	61.5	100
PC101 body (For POWER board)		64.2	62.4	100
C215 body (For POWER board)		69.4	64.2	85
C114 body (For POWER board)		64.5	63.4	85
C216 body (For POWER board)		54.1	54.9	85
L201 coil (For POWER board)		58.6	56.9	105
PC201 body (For POWER board)		66.2	67.4	100

Maximum measured temperature T of part/at::	T (°C)		Allowed T _{max} (°C)
PWB under IC401S (For Main board)	64.3	63.9	105
L22 coil (For Main board)	55.1	55.2	105
PWB under IC781 (For Bridge board)	52.3	53.3	105
C743 body (For Bridge board)	47.4	47.2	105
PWB under IC904 (For Sensor board)	62.3	61.7	105
T901 coil (For Inverter board)	69.8	69.5	105
T901 core (For Inverter board)	71.2	70.7	105
PWB under IC001 (For Inverter board)	76.0	75.4	105
C151 body (For Inverter board)	78.4	78.0	85
Metal Enclosure	48.6	48.2	70
Panel body	56.5	56.6	--
Plastic Enclosure inside	46.1	42.8	60
Plastic Enclosure outside	45.7	42.5	95
Supplementary information:			

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:

The temperatures were measured by thermal couple (type K) method under worst case normal mode as described in 1.6.2 at voltage described in 1.4.5. The worst case normal mode is defined with max. load of the LCD Monitor.

With max. ambient temperature specified as 40 °C, therefore, the maximum temperature rise is calculated as follows:

Winding components:

- Class A → 100-10 = 90 °C (for Transformer T101 and T201 of SPS board)

Components with:

- max. temp. of 70 °C (AC Inlet)
- max. temp. of 105 °C (all PCB)
- max. temp. of 105 °C (Choke)
- max. temp. of 85 °C (Capacitor)
- max. temp. of 100 °C (Photo coupler)
- max. temp. of 60 °C (Plastic Enclosure)
- When no class of insulation is given, min. insulation 105 °C assumed.

User accessible area:

- material is plastic (95 °C)
- material is metal (70 °C)

4.5.5	TABLE: Ball pressure test of thermoplastic parts		P
	Allowed impression diameter (mm) :	≤ 2 mm	—
Part		Test temperature (°C)	Impression diameter (mm)
Insulation Cover (Case) of T201: E I DU PONT DE NEMOURS & CO., INC., type FR530		125	0.19
Supplementary information:			

4.6.1& 4.6.2	TABLE: enclosure openings		P
Location		Size (mm)	Comments
Metal Enclosure (inner)			
Top		Several circular openings, each measured max. 3.5 mm in diameter.	No hazardous parts within 5 degrees of projection area from openings.
Left Side		Several circular openings, each measured max. 3.5 mm in diameter.	No hazardous parts within 5 degrees of projection area from openings.
Right Side		Several circular openings, each measured max. 2.0 mm in diameter.	No hazardous parts within 5 degrees of projection area from openings.
Rear Side		Several circular openings, each measured max. 5.0 mm in diameter.	No hazardous parts within 5 degrees of projection area from openings.
Bottom		Several circular openings, each measured max. 1.9 mm in diameter.	Metal bottom of fire enclosure (with min. 0.81 mm thickness) conforming to the dimensional limits of Table 4D (max. diameter of hole is 1.9 mm, spacing of holes centre to centre is more than 3.1 mm)
Plastic Enclosure (outer)			
Top		Several slot openings, each measured max. 2.3 mm in width.	No hazardous parts within 5 degrees of projection area from openings.
Left/ Right/ Rear Side		Several slot openings, each measured max. 2.3 mm in width.	No hazardous parts within 5 degrees of projection area from openings.
Bottom		Several slot openings, each measured max. 3.3 mm in width.	The outer openings are under the inner metal enclosure as barrier.
Supplementary Information: See attached photo for the detail coverage areas of openings.			

5.1	TABLE: Touch current measurement			N
	Normal	The tests are repeated in reverse polarity		
Condition	Current (mA) L, N→ Plastic Enclosure (with foil)	Current (mA) L, N→ Plastic Enclosure (with foil)		Comments
System ON	0.01	0.01		With "e" closed
Condition	Current (mA) L, N→ Earth output (-)	Current (mA) L, N→ Earth output (-)		Comments
System ON	0.2	0.2		With "e" opened
Condition	Current (mA) L, N→ Earth Metal Enclosure	Current (mA) L, N→ Earth Metal Enclosure		Comments
System ON	0.2	0.2		With "e" opened
Input voltage: 264 Vac				
Input frequency: 60 Hz				
Overall capacity: on SPS board: C2, C3, C4 = 100 pF; C5, C6, C7 = 2200 pF				

5.2	TABLE: Electric strength measurements		N
test voltage applied between:		test voltage (V)	breakdown
For Unit			
Primary to Output connector		4212 Vdc	No
Primary to Earthed Metal enclosure		2594 Vdc	No
Primary to Plastic Enclosure with foil		4212 Vdc	No
For Transformer T101			
Primary winding to Secondary winding		3000 Vac	No
Secondary winding to Core		3000 Vac	No
For Transformer T201			
Primary winding to Secondary winding		3000 Vac	No
Primary winding to core		1605 Vac	No
Secondary winding to core		1605 Vac	No
One layer of insulation tape		3000 Vac	No
Mylar sheet		3000 Vac	No
Supplementary information:			

5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C)				25 °C or see below	—
	Power source for EUT: Manufacturer, model/type, output rating				See Table 1.5.1 for detail	—
Component No.	Fault	Supply voltage (Vac)	Test time	Fuse #	Fuse current (A)	Observation
DS1 ~ - +	S	240	1 sec	F1, F2	0	F1, F2, DS1 damaged, no hazards.
C304	S	240	1 sec	F1, F2	0	F1, F2, DS1 damaged, no hazards.
Q201 Pin 2-1	S	240	1 sec	F1, F2	0	F1, F2, DS1, Q201 damaged, no hazards
Q201 Pin 2-3	S	240	1 sec	F1, F2	0	F1, F2, DS1, Q201 damaged, no hazards.
Q201 Pin 1-3	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Q202 Pin 2-1	S	240	1 sec	F1, F2	0	F1, F2, DS1, Q201, Q202 damaged, no hazards.
Q202 Pin 2-3	S	240	1 sec	F1, F2	0	F1, F2, DS1, Q201, Q202 damaged, no hazards.
Q202 Pin 1-3	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
IC101 Pin 8-2	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC201 Pin 3-4	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC201 Pin 1	O	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC101 Pin 3-4	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC101 Pin 1	O	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC103 Pin 3-4	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC103 Pin 1	O	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
PC102 Pin 3-4	S	240	2.0 h	F1, F2	0.66	Operation normally, no hazards. Temp. were stabled at: Ambient: 28.3 °C, T201 coil: 58.4 °C, T101 coil: 51.0 °C



Component No.	Fault	Supply voltage (Vac)	Test time	Fuse #	Fuse current (A)	Observation
PC102 Pin 1	O	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Output connect +18V ~ GND	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Output connect +24V ~ GND	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Output connect +5V ~ GND	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Ventilation openings	Blocked	240	3.2 h	F1, F2	0.66	Operation normally, no hazards. Temp. were stabled at: Ambient: 22.8°C, T201 coil: 58.4°C, T101 coil: 51.6 °C
T201 Pin 11,12 - 9,10 (After D208)	o-l	240	8.9 h	F1, F2	0.04	No hazard, Unit shut down at overload to 3.1 A. Temp. were stabled as following: Ambient:27.8 °C, PC201 body:50.6 °C, PC101 body:39.7 °C, T201 coil:60.7 °C, T201 core:58.2 °C, T101 coil:50.6 °C, T101 core:48.2 °C, PC102 body:40.9 °C, PC103 body:39.8 °C
T201 Pin 11,12 - 9	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T201 Pin 11,12 - 10	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T201 Pin 2,3 – 4~7	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T201 Pin 13,14 - 15,16 (After D209, D212)	o-l	240	9.1 h	F1, F2	0.04	No hazard, Unit shut down at overload to 3.1 A. Temp. were stabled as following: Ambient:24.8 °C, PC201 body:50.0 °C, PC101 body:38.1 °C, T201 coil:72.5 °C, T201 core:67.7 °C, T101 coil:44.4 °C, T101 core:45.4 °C, PC102 body:40.0 °C, PC103 body:37.1 °C

Component No.	Fault	Supply voltage (Vac)	Test time	Fuse #	Fuse current (A)	Observation
T201 Pin 13,14 - 15	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T201 Pin 13,14 - 16	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T101 Pin 5-2 (After D106)	o-l	240	7.8 h	F1, F2	0.04	No hazard, Unit shut down at overload to 4.5 A Temp. were stabled as following: Ambient:26.7 °C, PC201 body:54.4 °C, PC101 body:41.5 °C, T201 coil:58.9 °C, T201 core:56.5 °C, T101 coil:55.6 °C, T101 core:55.4 °C, PC102 body:46.1 °C, PC103 body:39.3 °C
T101 Pin 5-2	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T101 Pin 10-12	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T101 Pin 8-9	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
T101 Pin 7-9	S	240	30 min	F1, F2	0.04	Unit shut down, No damaged, no hazards.
Supplementary information:						
Fault: S = short circuit, O = open circuit, o-l = overload						