



Test Report No.: LD88070204

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Client

Name : ADVANTECH CO., LTD.

Address : Fl. 4, No. 108-3, Ming-Chuan Rd., Shing Tien City, Taipei, Taiwan, R.O.C.

Test Item : INDUSTRIAL COMPUTER

Identification : IPC-602XXX-YYYY

Testing laboratory

Name : Advance Data Technology Corporation

Address : No. 46, Lane 504, Chung Hsiao Road, Lin Kou Hsiang, Taipei, R.O.C.

Test specification

Standard : EN 60 950:1992 + A1:1993 + A2:1993 + A3:1995 + A4:1996 + A11: 1997

Test Result : The test item passed.

Tested By :

Signature

Roy Chou

Name in block letters

Date

Reviewed By

Signature

Edward Chiueh

Name in block letters

Date

Other Aspets:

The completed test report includes the following documents:

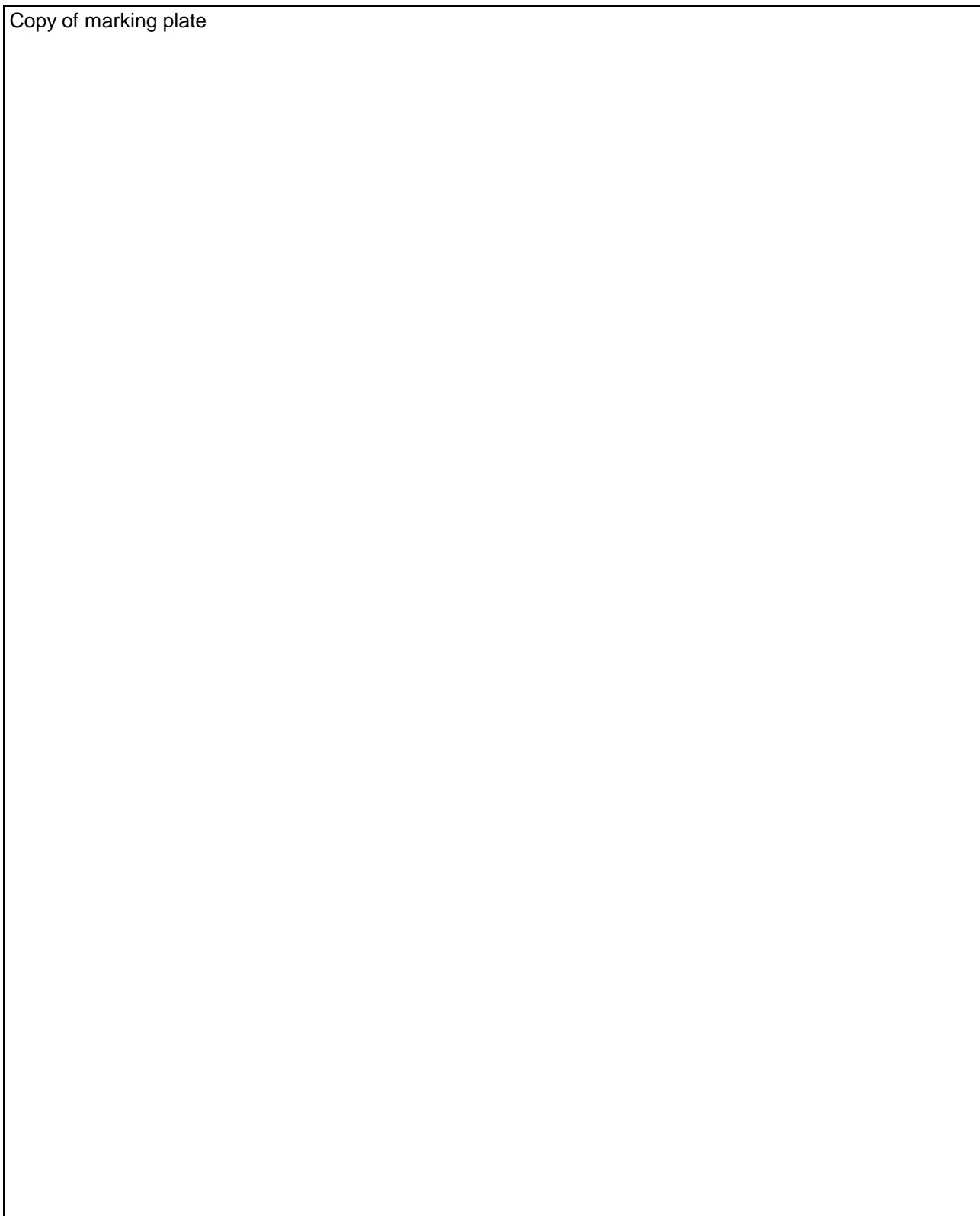
- EN 60 950 report (40 pages)

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TEST REPORT	
EN 60950	
Safety of information technology equipment including electrical business equipment	
Report	
Reference No.....	LD88070204
Compiled by (+ signature)	See cover sheet
Approved by (+ signature)	See cover sheet
Date of issue	See cover sheet
This report is based on a blank test report that was prepared by KEMA using information obtained from the TRF originator (see below).	
Testing laboratory	
Name.....	Advance Data Technology Corporation
Address.....	No. 46, Lane 504, Chung Hsiao Road, Lin Kou Hsiang, Taipei, Taiwan, R.O.C.
Testing location.....	Advance Data Technology Corporation
Address	No. 46, Lane 504, Chung Hsiao Road, Lin Kou Hsiang, Taipei, Taiwan, R.O.C.
Client	
Name.....	ADVANTECH CO., LTD.
Address.....	Fl. 4, No. 108-3, Ming-Chuan Rd., Shing Tien City, Taipei, Taiwan, R.O.C..
Test specification	
Standard.....	EN 60950:1992 + A1:1993 + A2:1993 + A3:1995 + A4:1996 +A11:1997
Test procedure	This Test Report is not valid as a CCA Test Report unless signed by a CCA Testing Laboratory and appended to a CCA Test Certificate.
Procedure deviation	N.A.
Non-standard test method.....	N.A.
Test Report Form/blank test report	
Test Report Form No.....	60950__D/97-08
TRF originator.....	FIMKO
Master TRF	Reference No. 60950 D, dated 97-02
Copyright reserved to the bodies participating in the Committee of Certification Bodies (CCB) and/or the bodies participating in the CENELEC Certification Agreement (CCA).	
Test item	
Description	INDUSTRIAL COMPUTER
Trademark	ADVANTECH
Model and/or type reference.....	IPC-602XXX-YYYY
Manufacturer.....	ADVANTECH CO., LTD.
Rating(s).....	AC Input: 115 / 230 Vac, 50 / 60 Hz, 9/5 A DC Input: 48 Vdc, 10A

Copy of marking plate



Particulars: test item vs. test requirements

Equipment mobility.....: Movable
 Operating condition.....: Continuous
 Tested for IT power systems.....: No
 IT testing, phase-phase voltage (V): N/A
 Class of equipment.....: Class I
 Mass of equipment (kg).....: 12.5 kgs
 Protection against ingress of water: IPX0

Test case verdicts

Test case does not apply to the test object.....: N(.A.)
 Test item does meet the requirement.....: P(ass)
 Test item does not meet the requirement.....: F(ail)
:

Testing

Date of receipt of test item: July 13, 1999
 Date(s) of performance of test: July 21, 1999

General remarks

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

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

"(see remark #)" refers to a remark appended to the report.

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

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

Brief description of the test equipment:

1) The equipment is an INDUSTRIAL COMPUTER. Overall dimension: 430 by 455 by 90 mm.

2) Build-in Power Supply.

3) Normal load Condition:

PC operation normally with CD-ROM, FDD, HDD, Mother Board, Cooling Fan and two add-on dummy load card(5V: 5A, 12V: 0.5A).

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4) Model different:

IPC-602XXX-YYYY

X will be defined A~Z, 0~9 or blank.

XXX is for different Back Plane.

YYYY is for different SPS.

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

1	GENERAL		
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1.5	Components		
1.5.1	Comply with IEC 950 or relevant component standard	Components, which were found to affect safety aspects, are complied with the requirements of this standard or within the safety aspects of the relevant IEC component standards. (see appended table)	P
1.5.2	Evaluation and testing of components	Components which are certified to IEC and/or nation standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
	Dimensions (mm) of mains plug for direct plug-in ...:	---	N
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N)	---	N
1.5.3	Transformers	The power transformer used are suitable for their intended application and comply with the relevant requirements of the standard and particularly Annex C	P
1.5.4	High voltage components (component; manufacturer; flammability)	No high voltage components provided.	N
1.5.5	Interconnecting cables	Interconnecting cable for Interconnection is carrying only SELV voltages on an energy level below 240 VA. Except for the insulation material, there is no further requirements to the o/p interconnection cable.	P
1.5.6	Mains capacitors	X-capacitor is located on approval power supply and meets the applicable requirements and/or tests in IEC 60384-14	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

1.6	Power interface		
1.6.1	Steady state input current	Highest load according to 1.2.2.1 for this equipment is the operation with normal load (CPU, HDD, FDD and CD-ROM are in highest load). The operator can connect additional options like a parallel printer. The output power of max. 0.5W is considered to be negligible. (see appended table)	P
	Current deviation during normal operating cycle	< +10%	P
1.6.2	Voltage limit of hand-held equipment	The appliance equipment is not a hand-held equipment.	N
1.6.3	Neutral conductor insulated from earth and body	The neutral is not identified in the equipment. Basic insulation for rated voltage between primary phases and earthed parts.	P
1.6.4	Components in equipment intended for IT power system	The equipment was not applied for the IT power system.	N
1.6.5	Mains supply tolerance (V)	<p>-10% for specifies a rating of AC 115V at 60 Hz. Relevant tests were done with the range of 104V at 60Hz</p> <p>+10% for specifies a rating of AC 230V at 50 Hz. Relevant tests were done with the range of 253V at 50Hz.</p> <p>+6%, -10% for specifies a rating of DC 48V. Relevant tests were done with the range of 43.2-50.9Vdc</p>	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
1.7	Marking and instructions		
1.7.1	Rated voltage (V)	115 / 230 Vac, 48 Vdc	P
	Symbol of nature of supply for d.c.	DC symbol used only for DC to DC Power Supply	P
	Rated frequency (Hz)	50 / 60 Hz	P
	Rated current (A)	AC: 9/5 A, DC: 10 A	P
	Manufacturer	ADVANTECH CO., LTD.	P
	Trademark	ADVANTECH	P
	Type/model	IPC-602XXX-YYYY	P
	Symbol of Class II	Class I equipment	P
	Certification marks	CE	P
1.7.2	Safety instructions	Installation instructions are available to the user in a User's manual.	P
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N
1.7.4	Marking for voltage setting/frequency setting	Voltage selector is provided. The similar instruction appear near the power rating marking: SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING TO THE SUPPLY.	P
1.7.5	Marking at power outlets	115V/2A, 230V/1A	P
1.7.6	Marking at fuseholders	The marking is located in approval power supply.	P
1.7.7.1	Protective earthing terminals	The appliance inlet used.	N
1.7.7.2	Terminal for external primary power supply conductors	The equipment with appliance inlet is intended to be used with detachable type power cord.	N
1.7.8.1	Identification and location of switches and controls :	The marking and indications of the on/off power switch is located that indication of function is clearly.	P
1.7.8.2	Colours of controls and indicators	The colours are used for functional controls or indicators and safety is not involved.	P
1.7.8.3	Symbols according to IEC 417	The mains switch is marked with the symbols: "I" and "O" (IEC 60417, No. 5007, 5008)	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.8.4	Figures used for marking	No indicators for different position.	N
1.7.8.5	Location of markings and indications for switches and controls	The marking for the switch is located adjacent on the switch.	P
1.7.9	Isolation of multiple power sources	Only one supply from mains.	N
1.7.10	Instructions for installation to IT power system	Equipment is not applicable for IT power supply system.	N
1.7.11	Instructions when protection relies on building installation	The equipment is a Pluggable Equipment Type A.	N
1.7.12	Marking when leakage current exceeds 3,5 A	Leakage current does not exceed 3.5 mA. See 5.2.	N
1.7.13	Indication at thermostats and regulating devices	No adjustable thermostats are used.	N
1.7.14	Language of safety markings/instructions	Safety warning in English. Rating marking in English. User's Manual was provided in English language.	P
	Language	English.	—
1.7.15	Durability and legibility	The label was subjected to the test for permanence of marking. The label was rubbed with cloth for 15 sec. And then rubbed by the cloth soaked with Naphtha for 15 sec. After this test there was no damage to the label. The marking on the label did not fade. There was no curling nor lifting on the label edge.	P
1.7.16	Removable parts	No required markings placed on removable parts.	N
1.7.17	Warning text for replaceable lithium batteries	The warning is in the service manual.	P
	Language	English or languages which are acceptable in the country where the equipment is to be installed.	—
1.7.18	Operator access with a tool	No operator accessible area with tool. The electric shock hazard mark (ISO 3864, No. 5036) is labelled on the built-in power supply.	N
1.7.19	Equipment for restricted access locations	No restricted access location.	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

2	PROTECTION FROM HAZARDS		P
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2.1	Protection against electric shock and energy hazards		P
2.1.1	Access to energized parts	There are no hazardous voltages generated internally. There is no accessible to any parts with only basic insulation and ELV or hazardous voltage by a test finger. The test pin can not touch hazardous voltage through any openings of the whole enclosure.	P
2.1.2	Protection in operator access areas	Dto	P
	Test by inspection	Dto	P
	Test with test finger	Dto	P
	Test with test pin	Dto	P
2.1.3.1	Insulation of internal wiring in an ELV circuit accessible to operator	No ELV wiring in operator accessible area.	N
	Working voltage (V); distance (mm) through insulation	---	N
2.1.3.2	Operator accessible insulation of internal wiring at hazardous voltage	No hazardous voltage wiring in operator accessible area.	N
2.1.4.1	Protection in service access areas	No maintenance work in operation mode is necessary.	N
2.1.4.2	Protection in restricted access locations	The equipment is not intended to be used in restricted location.	N
2.1.5	Energy hazard in operator access area	No energy hazard in operator's access area.	N
2.1.6	Clearances behind conductive enclosures	The enclosure material is metal. See 4.2	P
2.1.7	Shafts of manual controls	No conductive handles or knobs.	N
2.1.8	Isolation of manual controls	No conductive handles or knobs.	N
2.1.9	Conductive casings of capacitors	Casings of capacitors are considered as insulation. It is directly connected to the respective circuitry. None at hazardous voltage accessible.	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.10	Risk of electric shock from stored charge on capacitors connected to mains circuit	The power supply is approved. (see appended table 2.1.10)	P
	Time-constant (s); measured voltage (V):	Dto	—
2.2	Insulation		P
2.2.1	Methods of insulation	The insulation materials are used solid or laminated, having adequate thickness and adequate creepage distance over their surface and clearance distance through air.	P
2.2.2	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used in the equipment.	P
2.2.3	Humidity treatment	Total time elapsed: 48 hours.	P
	Humidity (%):	94% R.H.	—
	Temperature (°C):	25°C	—
2.2.4	Requirements for insulation	The insulation of equipment meets the requirement. (see appended table 2.9, 5.1 and 5.3)	P
2.2.5	Insulation parameters	Both parameters were considered.	P
2.2.6	Categories of insulation	The adequate levels of safety insulation is provided and maintained to comply with the requirements of this standard.	P
2.2.7.1	General rules for working voltages	Considered in the approval power supply.	P
2.2.7.2	Clearances in primary circuits	Considered in the approval power supply.	P
2.2.7.3	Clearances in secondary circuits	Considered in the approval power supply.	P
2.2.7.4	Creepage distances	Considered in the approval power supply.	P
2.2.7.5	Electric strength tests	Considered in the approval power supply.	P
2.2.8.1	Bridging capacitors:	Considered in the approval power supply.	N
2.2.8.2	Bridging resistors	Dto	N
2.2.8.3	Accessible parts	Dto	N

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Clause	Requirement + Test	Result - Remark	Verdict

2.3	Safety extra-low voltage (SELV) circuits		P
2.3.1	Voltage (V) of SELV circuits under normal operating conditions and after a single fault	42.4V peak or 60 VDC are not exceeded in SELV circuit under normal operation or single fault condition.	—
2.3.2	Voltage (V) between any two conductors of SELV circuit(s) and for Class equipment between any conductor of SELV circuit and equipment protective earthing terminal under normal operating conditions	Only SELV circuit is accessible to the user. Between SELV circuits 42.4V peak or 60V DC are not exceeded.	P
2.3.3	Voltage (V) of SELV in the event of a single failure of basic or supplementary insulation or of a component	Single fault did not cause excessive voltage accessible SELV circuits. Limits of 71V peak and 120V DC were not exceed and SELV limits not for longer than 0.2 seconds, see abnormal result 5.4.6 and 6.2.1.3	—
	Method used for separation	Method 1	P
2.3.4	Additional constructional requirements	In multiway connectors and other cable ties prevent contact to hazardous parts in case of loosening of connection or conductor breakage IEC 60083 and IEC 60320 connectors are not used in SELV circuits.	P
2.3.5	Connection of SELV circuits to other circuits	See 2.3.2 and 2.3.3. No direct connection between SELV and any primary circuit.	P
2.3.8	Construction of SELV circuits	---	—
2.3.9	SELV circuits connected to other circuits	---	—

2.4	Limited current circuits		N
2.4.2	Frequency (Hz)	---	—
	Measured current (mA)	---	N
2.4.3	Measured voltage (V)	---	—
	Measured capacitance (uF)	---	N
2.4.4	Measured voltage (V)	---	—
	Measured charge (uC)	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.4.5	Measured voltage (V)	---	—
	Measured energy (mJ)	---	N
2.4.6	Limited current circuit supplied from or connected to other circuits	---	N

2.5	Provisions for earthing:		N
2.5.1	Class I equipment	Basic insulated conductive parts touchable in operator accessible area earthed reliably.	P
	Warning label for service personnel	---	N
2.5.2	Protective earthing in Class II equipment	This is Class I equipment.	N
2.5.3	Switches/fuses in earthing conductors	No switches or fuses in earthing conductor.	N
2.5.4	Assured earthing connection for Class equipment in systems comprising Class I and Class II equipment	The equipment does not comprise Class I and Class II.	N
2.5.5	Green/yellow insulation	The protection earth wire insulation is green/yellow.	P
2.5.6	Continuity of earth connections	It is impossible to disconnect earth without disconnecting mains. An appliance inlet is used as a disconnect device.	P
2.5.7	Making and breaking of protective earthing connections	Plug or inlet, earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P
2.5.8	Disconnection protective earthing connections	It is not necessary to disconnect earthing except for the removing of the appliance inlet itself.	P
2.5.9	Protective earthing terminals for fixed supply conductors or for non-detachable power supply cords	The equipment provided with a detachable power cord.	P
2.5.10	Corrosion resistance	All safety earthing connection in compliance with Annex J.	P
2.5.11	Resistance (Ω) of protective earthing conductors $\leq 0,1 \Omega$	$< 0.1 \text{ ohm}$, see below	P
	Test current (A)	Measured with 25 A / 1 minute from Appliance inlet ground pin to Chassis: 0.02 ohm.	—

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

2.6	Disconnection from primary power:		P
2.6.1	General requirements	The appliance inlet is considered to be the disconnect device.	P
2.6.2	Type of disconnect device	Appliance inlet	P
2.6.3	Disconnect device in permanently connected equipment	Pluggable equipment type A.	N
2.6.4	Parts of disconnect device which remain energized	When detachable power cord or appliance inlet is disconnected, there are no remaining parts with hazardous voltage in the equipment.	P
2.6.5	Switches in flexible cords	No isolated switch in flexible cord.	N
2.6.6	Disconnection of both poles simultaneously in single-phase equipment	The detachable power cord or appliance inlet disconnects both poles simultaneously.	P
2.6.7	Disconnection of all phase conductors of supply in three-phase equipment	The equipment is for single phase.	N
2.6.8	Marking of switch acting as disconnect device	The switch provided does not serve as a disconnecting device. However, the marking is in compliance with 1.7.8.	P
2.6.9	Installation instructions if plug on power supply cord acts as disconnect device	See 1.7.2	N
	Language	---	—
2.6.11	Interconnected equipment	Interconnection to other devices by secondary output cable only.	N
2.6.12	Multiple power sources	Only one supply connection provided.	N

2.7	Overcurrent and earth fault protection in primary circuits:		
2.7.1	Basic requirements	Protective device are integrated in the primary circuit.	P
2.7.2	Protection against faults not covered in 5.4	---	N
2.7.3	Short-circuit backup protection	The equipment is considered to be pluggable equipment type A, the building installation is considered to provide short circuit protection.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.7.4	Number and location of protective devices	Fuse is located at approval power supply.	P
2.7.5	Protection by several devices	Only one fuse	P
2.7.6	Warning to service personnel	It is considered that the plug to power mains will be disconnected during service work. No markings are required.	P

2.8	Safety interlocks: No operator accessible areas which presents hazards in the meaning of this standard.		N
2.8.2	Design	---	N
2.8.3	Protection against inadvertent reactivation	---	N
2.8.4	Reliability	---	N
2.8.5	Overriding an interlock	---	N
2.8.6.1	Contact gap (mm)	---	N
2.8.6.2	Switch performing 50 cycles	---	N
2.8.6.3	Electric strength test: test voltage (V)	---	N
2.8.7	Protection against overstress	---	N

2.9	Clearances, creepage distances and distances through insulation:		P
	Nominal voltage (V)	The normal input voltage: 230V	—
	General	---	P
2.9.2	Clearances	The required clearance distance is considered in the approval power supply.	P
2.9.2.1	Clearances in primary circuits	(see appended table 2.9.2 and 2.9.3)	P
2.9.2.2	Clearances in secondary circuits	(see appended table 2.9.2 and 2.9.3)	P
2.9.3	Creepage distances	The required creepage distance is considered in the approval power supply. (see appended table 2.9.2 and 2.9.3)	P
	CTI tests	CTI rating for all materials of minimum 100.	—

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Clause	Requirement + Test	Result - Remark	Verdict
2.9.4.1	Minimum distances through insulation	The required insulation has been considered in the approval power supply.	P
2.9.4.2	Thin sheet material	The required insulation has been considered in the approval power supply.	P
	Number of layers (pcs)	One layer is provided.	P
	Electrical strength test: test voltage (V)	3000V AC applied.	P
2.9.4.3	Printed boards	Single layer printed board provided on approval power supply, minimum thickness > 0.4mm. the required insulation have been considered.	P
	Distance through insulation	(see appended table 2.9.4)	N
	Electric strength test at voltage for thin sheet insulating material	(see appended table 5.3)	N
	Number of layers (pcs)	---	N
2.9.4.4	Wound components without interleaved insulation	No wound components without interleaved insulation.	N
	Number of layers (pcs)	---	N
	Two wires in contact inside component; angle between 45° and 90°	---	N
	Routine testing for finished component	---	N
2.9.5	Distances on coated printed boards	No coated printed wiring boards.	N
	Routine testing for electric strength	---	N
2.9.6	Enclosed and sealed parts	No hermetically sealed components.	N
	Temperature T1 (°C)	---	N
	Humidity %	---	N
2.9.7	Spacings filled by insulating compound	The required spacing has been considered in the approval power supply.	P
	Temperature T1 (°C)	---	N
	Humidity %	---	N
2.9.8	Component external terminations	No external terminals for components.	N
2.9.9	Insulation with varying dimensions	The required spacing has been considered in the approval power supply.	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

2.10	Interconnection of equipment		P
2.10.1	General requirements	Only interconnection circuit of SELV through the connector. No ELV interconnection circuits.	P
2.10.2	Type of interconnection circuits	Dto	N
2.10.3	ELV circuits as interconnection circuits	Dto	N

2.11	Limited power source:		N
	Use of limited power source	---	N

3	WIRING, CONNECTIONS AND SUPPLY		P
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3.1	General		P
3.1.1	Cross-sectional area of internal wiring/interconnecting cables	All internal wires are UL recognized wiring with PVC insulation, rated VW-1, min. 80 °C, 300V. The cross sectional area of the internal wiring is suitable for its rated current. (see appended table 5.1)	P
	Protection of internal wiring and interconnecting cables	No internal wire for primary power distribution.	N
3.1.2	Wireways	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	P
3.1.3	Fixing 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 and quick connect terminals so that a loosening of the terminal connection is unlikely.	P
3.1.4	Fixing of uninsulated conductors	Securely held on PCB, no hazard.	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.1.5	Insulation of internal wiring	The insulation of the individual conductors are suitable for the application and the working voltage. See 3.1.1 for the insulation material.	P
3.1.6	Wires coloured green/yellow only for protective earth connection	The green/yellow wire is only for protective earth connection.	P
3.1.7	Fixing of beads and similar ceramic insulators	The bead or similar devices are fixed.	P
3.1.8	Required electrical contact pressure	Electrical and earthing connection screwed two or more complete threads into metal. No screws of insulating material for electrical and earthing connections, or where supplementary or reinforced insulation could be impaired by a metal replacement.	P
3.1.9	Reliable electrical connections	All current carrying and safety earthing connections are metal to metal.	P
3.1.10	End of stranded conductor	No risk of stranded conductors coming loose.	P
3.1.11	Use of spaced thread screws/thread-cutting screws	No self-tapping screw is used for electrical connections.	P

3.2	Connection to primary power:		P
3.2.1	Type of connection	Appliance inlet	P
	Design of product with more than one supply connection	Only one power connected to the appliance inlet	P
3.2.2	Provision for permanent connection	See 3.2.1	P
	Size (mm) of cables and conduits	---	P
3.2.3	Appliance inlet	The appliance inlet complies with IEC 60320 and is located at the rear of the unit. The power cord can be inserted without difficulties and does not support the unit.	P
3.2.4	Type and cross-sectional area (mm ²) of power supply cord	0.75mm ² , H05VV-F.	P
3.2.5	Cord anchorage		N
	Test: 25 times; 1 ; pull (N)	---	—
	Longitudinal displacement ≤ 2 m	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.6	Protection of power supply cord	No parts under this equipment is likely to damage the power supply cord. No sharp edges.	P
3.2.7	Cord guard		N
	D (mm)	---	—
	Test: mass (g)	---	—
	Radius of curvature of the cord $\leq 1,5$	---	N
3.2.8	Supply wiring space	The equipment is not designed for permanent connection.	N

3.3	Wiring terminals for external power supply conductors		N
3.3.1	Terminals	No external power supply conductors.	N
3.3.2	Special non-detachable cord		N
	Type of connection	---	—
	Pull test at 5 N	---	N
3.3.3	Screws and nuts	---	N
3.3.4	Fixing of conductors	---	N
3.3.5	Connection of connectors	---	N
3.3.6	Size of terminals	---	N
	Nominal thread diameter (mm)	---	N
3.3.7	Protection against damage of conductors	---	N
3.3.8	Terminal location	---	N
3.3.9	Test with 8 mm stranded wire	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

4	PHYSICAL REQUIREMENTS		P
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4.1	Stability and mechanical hazards		P
4.1.1	Stability tests		P
	Angle of 10°	This equipment is intended to use on desktop and is of a stable mechanical construction and does not overbalance when tilted to an angle of 10 degrees from its normal upright position.	P
	Test: force (N)	Not floor standing.	N
4.1.2	Protection against personal injury	No access to the user	N
4.1.3	Warning and means provided for stopping the moving part	No moving parts.	N
4.1.4	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.1.5	Enclosure of a high pressure lamp	No lamp with cold pressure of 0.2Mpa or hot pressure of 0.4Mpa.	N

4.2	Mechanical strength and stress relief:		P
4.2.1	General	See below.	P
4.2.2	Internal enclosures 30 N \pm 3 N; 5 s	30 N was applied to the internal enclosure. No damage or other hazards.	P
4.2.3	External enclosures 250 N \pm 10 N; 5 s	250N was applied to outer enclosure. No damage or other hazards.	P
4.2.4	Steel ball tests		P
	Fall test	500g steel sphere ball fall, from 1.3m height onto outer enclosure. No safety relevant damages.	P
	Swing test	500g steel sphere ball as pendulum onto outer enclosure. No safety relevant damages.	P
4.2.5	Drop test	Nor hand-held.	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.6	Heat test for enclosures of moulded or formed thermoplastic materials: 7h; T (°C)	The enclosure material is metal. There was no softening of the enclosure, shrinkage, warping, cracking or other signs of deterioration that would result in exposure of internal parts.	N
4.2.7	Compliance criteria	Complied.	P
4.2.8	Mechanical strength of cathode ray tubes	No CRT provided.	N
4.3	Construction details		P
4.3.1	Changing of setting for different power supply voltages	A voltage selector switch is provided and the incorrect setting won't cause a hazards.	P
4.3.2	Adjustment of accessible control devices	Not applicable.	N
4.3.4	Prevention of dangerous concentration of dust, powder, liquid and gas	The equipment does not produce dust or powder, liquids or gases.	P
4.3.5	Fixing of knobs, grips, handles, levers		N
	Test: force (N)	---	N
4.3.6	Driving belts/couplings shall not ensure electrical insulation	Not used for insulation.	N
4.3.7	Retaining of sleeves	Sleeving on wiring are reliably kept in position by cable ties or by the use of heatshrink sleeving. The sleeves used as supplementary insulation on internal wiring are retained by positive means.	P
4.3.9	Protection of loosening parts	Electrical and mechanical connections can be expected to withstand usual mechanical stress. For the protection, cable ties and heatshrink tubing are used. Conductors use connectors or solder spears for loosening protection.	P
4.3.11	Resistance to oil and grease	Insulation is not in contact with oil or grease.	N
4.3.12	Protection against harmful concentration of ionizing radiation, ultraviolet light, laser or flammable gases (for laser see IEC 60825-1)	No ionizing radiation, ultraviolet light, laser or flammable gases presents.	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.13	Securing of screwed connections	Starwasher provided for the screwed earth connection.	P
4.3.15	Openings in the top of enclosure	No top opening provided.	N
	Dimensions (mm)	---	—
4.3.16	Openings in the sides of enclosure	Provided numerous openings. See below	P
	Dimensions (mm)	<p>Provided numerous openings on one sides, each 20 by 1.9 mm maximum, covering one area overall 130 by 20 mm. Besides numerous openings on another sides, each 20 by 2 covering one area overall 193 by 20 mm and each 12 by 2 mm, covering another area overall 193 by 12 mm</p> <p>Provided numerous openings on rear cover, max. 10 by 2 mm, covering two areas overall 58 by 10 and 90 by 10 mm.</p> <p>Provided numerous openings on front sides, max. 20 by 2.9 mm. Covering one area overall 158 by 44 mm for air ventilation of two fans</p> <p>No bare parts at hazardous voltage are located in 5 angle.</p>	—
4.3.17	Interchangeable plugs and sockets	---	N
4.3.18	Torque test for direct plug-in equipment:		N
	Additional torque (Nm)	---	N
4.3.19	Protection against excessive pressure	---	N
4.3.20	Protection of heating elements in Class I equipment	No heating elements.	N
4.3.21	Protection of lithium batteries		N
	Construction of protection circuit	A protection circuit is provided to prevent reverse polarity installation and prevent forced charge or forced discharge.	P
4.3.22	Ageing of barrier/screen secured with adhesive		N
	Day 1: temperature (°C); time (weeks)	---	N
	Day 8/22/57: a) temperature (°C) for 1 b) temperature (°C) for 4 c) temperature (°C) over 8	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
	Day 9/23/58: a) relative humidity (%) for 72 b) temperature (°C) for 1 c) temperature (°C) for 4 d) temperature (°C) over 8	---	N

4.4	Resistance to fire		P
4.4.1	Methods of achieving resistance to fire	Use of materials with the required flammability classes.	P
4.4.2	Minimizing the risk of ignition	Electrical parts are not likely to ignite nearby materials. Parts not protected against overheating under fault conditions. Temperature see 5.1	P
	Printed board: manufacturer; type; flammability	See 1.5.1 appended table	P
4.4.3	Flammability of materials and components	Internal components except small parts are V-2, HF-2 or better.	P
4.4.3.2	Material and component: manufacturer; type; flammability	See 1.5.1 appended table	P
4.4.3.3	Exemptions	Considered.	P
4.4.3.4	Wiring harnesses: manufacturer; flammability	Insulation material consists of PVC.	P
4.4.3.5	Cord anchorage bushings: manufacturer; flammability	No cord anchorage bushings.	N
4.4.3.6	Air filter assemblies: manufacturer; flammability	No air filter assemblies.	N
4.4.4	Enclosures and decorative parts: manufacturer; type; flammability	The enclosure material is metal.	P
4.4.5	Conditions for fire enclosures	The fire enclosure is required to cover all parts.	P
4.4.5.1	Components requiring fire enclosure: manufacturer; flammability	See 4.4.5.	P
4.4.5.2	Components not requiring fire enclosure	See 4.4.5.	N
4.4.6	Fire enclosure construction	See 4.4.5.	P
4.4.7	Doors or covers in fire enclosures	The top cover intended only for occasional use by the operator, such as for the installation of accessories, the directions for correct removal the cover is provided in the users manual.	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.8	Flammable liquids	No flammable liquids in this unit.	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

5	THERMAL AND ELECTRICAL REQUIREMENTS		P
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5.1	Heating		P
	Heating tests	(see appended table)	P

5.2	Earth leakage current		P
5.2.1	General	The earth leakage current was measured from AC power source (Primary) to ground.	P
5.2.2	Leakage current	(See appended table)	P
	Test voltage (V)	(See appended table)	—
	Measured current (mA)	(See appended table)	—
	Max. allowed current (mA)	3.5 mA.	—
5.2.3	Single-phase equipment	See 5.2.2	P
	Test voltage (V)	---	—
	Measured current (mA)	---	—
	Max. allowed current (mA)	---	—
5.2.4	Three-phase equipment	Single phase equipment.	N
	Test voltage (V)	---	—
	Measured current (mA)	---	—
	Max. allowed current (mA)	---	—
5.2.5	Equipment with earth leakage current exceeding 3.5 mA	Leakage current does not exceed 3.5 mA.	N
	Test voltage (V)	---	—
	Measured current (mA)	---	—
	Max. allowed current (mA)	---	—
	Cross-sectional area (mm ²) of internal protective earthing conductor	---	—
	Warning label	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

5.3	Electric strength		P
5.3.1	General	All test voltage were applied for 1 minute in the chamber after the humidity test of 2.3.2 and in warm conditions after the heating test of 5.1. No isolation breakdown was observed (results see appended tables)	P
5.3.2	Test procedure	(see appended table)	P

5.4	Abnormal operating and fault conditions		P
5.4.2	Motors	No motor.	N
5.4.3	Transformers	The test had been done in the approval power supply.	P
5.4.4	Compliance of operational insulation: The test had been done in the approval power supply.		P
	Method used	---	N
5.4.5	Electromechanical components in secondary circuits	All electromechanical components (HDD,..) in secondary are approved.	P
5.4.6	Other components and circuits	The test had been done in the approval power supply.	P
5.4.7	Test in any expected condition and foreseeable misuse	Ventilation openings covered test: Results see appended table. No hazards.	P
5.4.8	Unattended use of equipment having thermostats, temperature limiters etc.	None of these components are used.	N
5.4.9	Compliance	No fire, molten metal or deformation during the test. Electric strength test are passed. (see appended table)	P
5.4.10	Ball-pressure test of thermoplastic parts; impression shall not exceed 2 mm	The test had been evaluated in the approval power supply.	P

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

6	CONNECTION TO TELECOMMUNICATION NETWORKS		
---	--	--	--

6.1	General		N
6.2	TNV circuits		N
6.2.1.1	Limits of the TNV circuits	---	N
6.2.1.1 a)	TNV-1 circuits	---	N
6.2.1.1 b)	TNV-2 and TNV-3 circuits	---	N
6.2.1.2	Separation from other circuits and from accessible parts	---	N
	Voltage (V) in SELV circuits, TNV-1 circuits and accessible conductive parts in event of single insulation fault or component failure	---	N
6.2.1.3	Operating voltages generated externally	---	N
	Voltage (V) in SELV circuit, TNV-1 circuit or accessible conductive part	---	N
6.2.1.4	Separation from hazardous voltages	---	N
	Insulation between TNV circuit and circuit at hazardous voltage	---	
	Method used	---	
6.2.1.5	Connection of TNV circuits to other circuits	---	N
	Insulation (mm) between TNV circuit supplied conductively from secondary circuit and hazardous voltage circuit	---	N
6.2.2.1	Protection against contact with bare conductive parts of TNV-2 and TNV-3 circuits	---	N
	Test with test finger	---	N
	Test with test probe	---	N
6.2.2.2	Battery compartments	---	N
	Marking next to door/on door	---	N

6.3	Protection of telecommunication network service personnel, and users of other equipment connected to the telecommunication network, from hazards in the equipment		N
6.3.1	Protection from hazardous voltages	---	N
6.3.2	Use of protective earthing		N
	Language of installation instructions	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
6.3.3.1	Insulation between TNV circuit and parts or circuitry that may be earthed	---	N
6.3.3.2	Exclusions	---	N
6.3.4.1	Limitation of leakage current (mA) to telecommunication network	---	N
6.3.4.2	Summation of leakage currents from telecommunication network	---	N

6.4	Protection of equipment users from voltages on the telecommunication networks		N
6.4.1	Separation requirements	---	N
6.4.2	Test procedure	---	N
6.4.2.1	Impulse test: separation between TNV-1 circuits/TNV-3 circuits and:		N
6.4.2.1 a)	Unearthed conductive parts/non-conductive parts of the equipment expected to be held or touched during normal use; test at 2,5 V	---	N
6.4.2.1 b)	parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe; test at 1,5 V	---	N
6.4.2.1 c)	circuitry which is provided for connection of other equipment; test at 1,5 V	---	N
6.4.2.2	Electric strength test: separation between TNV-1 circuits/TNV-3 circuits and:		N
6.4.2.2 a)	unearthed conductive parts/non-conductive parts of the equipment expected to be held or touched during normal use; test at 1,5 V	---	N
6.4.2.2 b)	parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe; test at 1,0 V	---	N
6.4.2.2 c)	circuitry which is provided for connection of other equipment; test at 1,0 V	---	N
6.4.2.3	Compliance criteria	---	N

6.5	Protection of telecommunication wiring system from overheating		N
	Maximum continuous output current (A)	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

A	ANNEX , TESTS FOR RESISTANCE TO HEAT AND FIRE		N
A.1	Flammability test for fire enclosures of moveable equipment having a total mass exceeding 18 kg, and of stationary equipment		N
A.2	Flammability test for fire enclosures of moveable equipment having a total mass not exceeding 18 kg, and for materials located within fire enclosures		N
A.3	High current arcing ignition test	---	N
A.3.6	Number of arcs	---	N
A.4	Hot wire ignition test	---	N
A.4.6	Ignition time (s)	---	N
A.5	Hot flaming oil test	---	N
A.6	Flammability test for classifying materials V-0, V-1 or V-2	---	N
A.7	Flammability test for classifying foamed materials HF-1, HF-2 or HBF	---	N
A.8	Flammability test for classifying materials HB	---	N
A.9	Flammability test for classifying materials 5V	---	N
A	Tested material		N
	Preconditioning: 7days (168 hr); temperature (°C) ..	---	—
	Mounting of samples during test	---	—
	Wall thickness	---	—
	Sample 1 burning time	---	
	Sample 2 burning time	---	
	Sample 3 burning time	---	
	Material: compliance with the requirements	---	
	Manufacturer of tested material	---	—
	Type of tested material	---	—
	Additional information	---	—

B	ANNEX , MOTOR TESTS UNDER ABNORMAL CONDITIONS		N
B.1	General requirements	---	N
	Position	---	—
	Manufacturer	---	—
	Type	---	—
	Rated voltage (V) or current (A)	---	—

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
B.2	Test conditions	---	N
B.3	Maximum temperatures	(see appended table 5.4)	N
B.4	Running overload test	---	N
B.5	Locked-rotor overload test	---	N
	Test duration (days)	---	—
	Electric strength test: test voltage (V)	---	—
B.6	Running overload test for DC motor in secondary circuits	---	N
B.7	Locked-rotor overload test for DC motor in secondary circuits		N
B.7.2	Test time (h)	---	N
B.7.3	Test time (h)	---	N
B.8	Test for motors with capacitors	---	N
B.9	Test for three-phase motors	---	N
B.10	Test for series motors	---	N
	Test voltage (V)	---	—

C	ANNEX , TRANSFORMERS		N
	This built-in power supply unit is approved for EN60950.		
	Position	---	—
	Manufacturer	---	—
	Type	---	—
	Rated values	---	—
	Temperatures	(see appended table 5.4)	
	Thermal cut-out	(see appended table 5.1)	
C.1	Overload test	(see 5.4.3)	
	Conventional transformer	---	
C.2	Insulation		
	Precautions	---	
	Retaining of end turns of all windings	---	
	Earthing test at 25	---	
C.3	Electric strength test	(see appended table 5.3)	

H	ANNEX , IONIZING RADIATION		N
	Ionizing radiation		N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured radiation	---	—
	Measured high-voltage (kV)	---	—
	Measured focus voltage (kV)	---	—
	CRT markings	---	—
	Certified by	---	—
	Standard used	---	—

U	ANNEX , INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION		N
	See separate test report	---	N

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components??					P
object/part No.	manufacturer/ trademark	Type/model	technical data	standard	Mark(s) of conformity ¹⁾	
Power Inlet	Various	---	250V, 10A	IEC 60320	Yes	
Power cord (Optional)	Various	---	0.75mm ² , 3G, H05VV-F	IEC 60227	Yes	
Power Plug (Optional)	Various	---	250V, 10A	IEC 60320	Yes	
Power Connector (Optional)	Various	---	250V, 10A	IEC 60320	Yes	
Power Switch	Various	---	250V 10A	VDE 0630	Yes	
Power Supply	Delta	DPS-200PB- 103A, 250W	Input: 115/230 Vac, 50/60 Hz, 9/5A Output: +5Vdc: 25A -5Vdc: 0.3A +12Vdc: 8A -12Vdc: 0.8A +5VSB: 1A +3.3V: 14A	EN60950	Yes	
	Skynet	ADT-925C, 260W	Input: 115/ 230 Vac, 50/60 Hz, 6/3 A Output: +5 Vdc: 25A -5 Vdc: 0.5A +12 Vdc: 9A -12 Vdc: 2A	EN60950	Yes	

EN 60950					
Clause	Requirement + Test		Result - Remark		Verdict
	Win-Tact	WT-310D, 310W	Input: 48 Vdc, 10 A Output: +5Vdc: 25A -5Vdc: 1A +12Vdc: 10A -12Vdc:5A	EN60950	Yes
Hard Disk Drive (Optional)	Various	---	+5Vdc, 2A max. +12Vdc, 2A max.	EN 60950	Yes
Floppy Disk Drive (Optional)	Various	---	+5Vdc, 1A max.	EN60950	Yes
DC Fan	AVC	E1238B12H	+12VDC, 0.5A 140.74CFM		
	Delta	DFB0912H-SG	+12Vdc, 0.30A 49.79CFM		
		WFB1212H-F00	+12Vdc, 0.36A 86.5CFM	EN60950	Yes
CPU Fan	ACR-RX	ACC6060-12VHz	+12Vdc, 0.12A 8.47CFM	EN60950	Yes
RTC Battery	Various	CR2032	+3Vdc, Max. abnormal charging current: 10 mA.	---	UL
PCB	Various	---	Class V-1, 105 °C min.	UL94	UL
Enclosure	---	---	Metal	---	---
¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance					

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Model: IPC-602P3-25X

1.6	TABLE: electrical data (in normal conditions)					P
Fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (mA)	condition/status
N/A	---	104V/50Hz	55.5	0.99	0.99	Normal load condition
N/A	---	104V/60Hz	57.3	1.01	1.01	Normal load condition
N/A	9	115V/50Hz	58.5	0.96	0.96	Normal load condition
N/A	9	115V/60Hz	58.0	0.95	0.95	Normal load condition
N/A	5	230V/50Hz	57.2	0.49	0.49	Normal load condition
N/A	5	230V/60hz	57.5	0.49	0.49	Normal load condition
N/A	---	253V/50hz	58.3	0.47	0.47	Normal load condition
N/A	---	253V/60Hz	58.2	0.46	0.46	Normal load condition

Power Supply: Skynet, DPS-200PB-103A

Model: IPC-602P3-26P

1.6	TABLE: electrical data (in normal conditions)					P
Fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (mA)	condition/status
N/A	---	104V/50Hz	76.2	1.27	1.27	Normal load condition
N/A	---	104V/60Hz	76.4	1.28	1.28	Normal load condition
N/A	9	115V/50Hz	76.6	1.19	1.19	Normal load condition
N/A	9	115V/60Hz	76.2	1.20	1.20	Normal load condition
N/A	5	230V/50Hz	77.1	0.69	0.69	Normal load condition
N/A	5	230V/60hz	77.0	0.69	0.69	Normal load condition
N/A	---	253V/50hz	79.8	0.66	0.66	Normal load condition
N/A	---	253V/60Hz	78.3	0.66	0.66	Normal load condition

Power Supply: Skynet, ADT-925C

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Model: IPC-602P3-30D

1.6	TABLE: electrical data (in normal conditions)					P
Fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (mA)	condition/status
N/A	10	43.2	63.5	1.47	1.47	Normal load condition
N/A	10	48	65.8	1.37	1.37	Normal load condition
N/A	10	50.9	66.2	1.30	1.30	Normal load condition
Power Supply: Win-Tact, WT-310D						

2.9.2 and 2.9.3	TABLE: clearance and creepage distance measurements					P
Clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	Required dcr (mm)	dcr (mm)
N/A						
Separation between primary and SELV circuits is provided in the Approved power supply.						

Model: IPC-602P3-25X

5.1	TABLE: temperature rise measurements		P
	test voltage (V)	104/ 253/ 230 opening blocked	—
	t1 (°C)	27	—
	t2 (°C)		—
temperature rise dT of part/at:		dT (K)	Required dT (K)
Power Supply T1 Coil		6/7/25	40
Power Supply T1 Coe		9/11/28	40
H.D.D. Body		3/4/17	---
F.D.D. body		2/5/16	---
CD-ROM		2/5/15	---
CPU Heatsink		6/7/21	---
U9 Body		9/9/26	---
RTC Battery body		1/2/19	---
VGA Card U8 Body		10/11/30	
Enclosure Inside		2/2/12	10
Max. Operating Temp.: 50°C			
The temperature were measures under worst case normal mode as described in 1.6.1 at voltages described in 1.6.5.			

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Model: IPC-602P3-26P

5.1	TABLE: temperature rise measurements		P
	test voltage (V)	104/ 253/ 230 opening blocked	—
	t1 (°C)	28	—
	t2 (°C)		—
temperature rise dT of part/at:		dT (K)	Required dT (K)
Power Supply T1 Coil		7/6/22	40
Power Supply T1 Coe		7/7/21	40
H.D.D. Body		4/3/19	---
F.D.D. body		3/3/15	---
CD-ROM		4/5/14	---
CPU Heatsink		6/6/18	---
U9 Body		9/8/22	---
RTC Battery body		2/1/11	---
VGA Card U8 Body		19/18/28	
Enclosure Inside		3/2/15	10
Max. Operating Temp.: 50°C			
The temperature were measures under worst case normal mode as described in 1.6.1 at voltages described in 1.6.5.			

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Model: IPC-602P3-30D

5.1	TABLE: temperature rise measurements		P
	test voltage (V)	48/ 48 opening blocked	—
	t1 (°C)	28	—
	t2 (°C)		—
temperature rise dT of part/at:		dT (K)	Required dT (K)
Power Supply T1 Coil		7/25	40
Power Supply T1 Coe		7/26	40
H.D.D. Body		3/16	---
F.D.D. body		3/13	---
CD-ROM		4/12	---
CPU Heatsink		6/17	---
U9 Body		8/20	---
RTC Battery body		1/11	---
VGA Card U8 Body		12/27	
Enclosure Inside		2/12	10
Max. Operating Temp.: 50°C			
The temperature were measures under worst case normal mode as described in 1.6.1 at voltages described in 1.6.5.			

5.2	TABLE: leakage current measurement			P
Condition	Current L-enclosure(mA)	Current N-enclosure(mA)	Comments	
Switch ON	0.94	0.95		
Switch OFF	0.025	0.025		

5.3	TABLE: electric strength measurements			P
test voltage applied between:		Test voltage (V)	Breakdown	
Primary and secondary		DC 4242V	No	
Primary and Ground		DC 2121V	No	

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix Photos

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Appendix Photos

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

Measuring Instruments Calibration List

Kind of Instrument Precision Class	Manufacturer	Model Serial No.	Calibrated until
Hybrid Record	Yokogawa Electric Corp.	HR-2500E, 41VA0567	Mar. 18, 2000
		HR-1300, 43VH0086	Mar. 17, 2000
Leakage Meter	Yokogawa Electric Corp.	3226	Oct. 16, 1999
		61NJ0375	
Digitizing Oscilloscope	Tektronix Corp.	TDS520	May. 30, 2000
		B011331	
Hi-pot Tester	Tamadensoku Electric Corp.	TP-515ADZ 13050	Mar. 16, 2000
Earth Tester	Tamadensoku Electric Corp.	Tec-1225A E-12911	Mar. 16, 2000
Digital Multimeter	Hewlett Packard	34401	Oct. 18, 1999
		3146A02016	
Oven Chamber	Terchy	FH-480	Nov. 04, 1999
		80100302	
Humidity Chamber	Terchy	MHD-800LR	Nov. 04, 1999
		80100301	
Power Meter	Yokogawa Electric Corp.	2534 10	Mar. 17, 2000
		53BT9495	
X-Ray Meter	Victoreen	440RF/D 542	Nov. 10, 1999
Electric Load	Prodigit	MPAL 7755,91340 MPAL 3344,91204	Oct. 15, 1999 Mar. 18, 2000
Power Meter	Chitai Topward	2402A, HT900876	Mar. 18, 2000
		1301, 981703	Oct. 15, 1999
		1310, 667214	Mar. 18, 2000
		1310, 667215	Mar. 18, 2000