

Test Report No.:		LD910826L07
Client		
Name :		ADVANTECH CO., LTD
Address :		No. 1 Alley 20, Lane 26, Rueiguang Road, Neihu District Taipei 114, Taiwan, R.O.C.
Test Item :		INDUSTRIAL COMPUTER
Identification :		NAS 5 XXXX-XXXXXXXX, NAS 3 XXXX-XXXXXXXX, REU-4 XXXX-XXXX (Where X may be any alphanumeric character or blank)
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 60950, 3rd Edition:2000
Test Result :		The test item passed.
Tested By :		
 Signature <u>Stephanie Hung</u> Specialist		<u>October 22, 2002</u> Date
Approved By:		
 Signature <u>Angus Hsu</u> Manager		<u>October 22, 2002</u> Date
Other Aspects:		
The completed test report includes the following documents: ■ EN 60950 report (39 pages)		 0528 ILAC MRA
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TEST REPORT EN 60950 Safety of information technology equipment including electrical business equipment	
Report	
Reference No.....	LD910826L07
Compiled by (+ signature)	See cover sheet
Approved by (+ signature)	See cover sheet
Date of issue	October 22, 2002
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.
Testing location.....	Advance Data Technology Corporation
Address	No. 46, Lane 504, Chung Hsiao Road, Lin Kou Hsiang, Taipei, Taiwan.
Client	
Name.....	ADVANTECH CO., LTD
Address	No. 1 Alley 20, Lane 26, Rueiguang Road, Neihu District Taipei 114, Taiwan, R.O.C.
Test specification	
Standard.....	EN 60950:2000
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.....	NAS 5 XXXX-XXXXXXXX, NAS 3 XXXX-XXXXXXXX, REU-4 XXXX-XXXX (Where X may be any alphanumeric character or blank).
Manufacturer	ADVANTECH CO., LTD.
Rating(s).....	AC 100-240 V AC, 50 / 60Hz, 8 A.

Copy of marking plate

INDUSTRIAL COMPUTER

MODEL: NAS 5 XXXX-XXXXXXXXXX

RATING: 100-240 V AC, 50 / 60 Hz, 8 A



**THIS DEVICE COMPLES WITH PART 15 FCC RULES OPERATION
ISSUBJECT TO THE FOLLOWING TWO CONDITIONS:**

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND**
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED
INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATOR.**

ADVANTECH CO., LT.

INDUSTRIAL COMPUTER

MODEL: NAS 3 XXXX-XXXXXXXXXX

RATING: 100-240 V AC, 50 / 60 Hz, 8 A



**THIS DEVICE COMPLES WITH PART 15 FCC RULES OPERATION
ISSUBJECT TO THE FOLLOWING TWO CONDITIONS:**

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND**
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED
INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATOR.**

ADVANTECH CO., LT.

INDUSTRIAL COMPUTER

MODEL: REU-4 XXXX-XXXX

RATING: 100-240 V AC, 50 / 60 Hz, 8 A



**THIS DEVICE COMPLES WITH PART 15 FCC RULES OPERATION
ISSUBJECT TO THE FOLLOWING TWO CONDITIONS:**

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND**
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED
INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATOR.**

ADVANTECH CO., LT.

Particulars: test item vs. test requirements

Equipment mobility.....: Stationary or Rack mountable
 Operating condition.....: Continuous
 Mains supply tolerance (%): +6%, -10%
 Tested for IT power systems: No
 IT testing, phase-phase voltage (V): N/A
 Class of equipment: Class I
 Mass of equipment (kg): 29.2 kg
 Protection against ingress of water: IPX0

Test case verdicts

- test case does not apply to the test object.....: N/A
 - test object does meet the requirement.....: Pass
 - test object does not meet the requirement: Fail

Testing

Date of receipt of test item: October 06, 2002
 Date(s) of performance of test.....: October 14, 2002

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 a Class I INDUSTRIAL COMPUTER with building-in certified power supply
- 2) Dimension: 600 by 485 by 180 mm.
- 3) Maximum operating Temperature: 50°C .

Model Differences:

Model NAS 5 XXXX-XXXXXXXXX is identical to Model NAS 3 XXXX-XXXXXXXXX, except for model designation.
 Model REU-4 XXXX-XXXX is similar to Model NAS 3 XXXX-XXXXXXXXX, except for without main board and model designation.

Test condition:

Temperature : 25°C .
 Relative humidity: 60%
 Air pressure: 900 mbar.

The test sample was a pre-production sample without serial number.

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

1	GENERAL		
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1.5	Components		
1.5.1	Comply with IEC60950 or relevant component standard	(see appended table 1.5.1)	Pass
1.5.2	Evaluation and testing of components	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)	Pass
	Dimensions (mm) of mains plug for direct plug-in	The equipment is not direct plug-in type.	N/A
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N).....	The equipment is not direct plug-in type.	N/A
1.5.3	Thermal controls	No thermal control.	N/A
1.5.4	Transformers		N/A
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.	Pass
1.5.6	Capacitors in primary circuits	In approved SPS	Pass
1.5.7	Double or reinforced insulation bridged by components		N/A
1.5.7.1	Bridging capacitors		N/A
1.5.7.2	Bridging resistors		N/A
1.5.7.3	Accessible parts		Pass
1.5.8	Components in equipment for IT power systems	TN system	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

1.6	Power interface		Pass
1.6.1	AC power distribution systems	Highest load according to 1.2.2.1 for this equipment is: Unit continuously crossed reading and writig data between HDD continuously. Results see appended table.	Pass
1.6.2	Input current	(see appended table 1.6.2)	Pass
1.6.3	Voltage limit of hand-held equipment	This appliance is not a hand-held equipment.	N/A
1.6.4	Neutral conductor		N/A

1.7	Marking and instructions		Pass
1.7.1	Power rating		Pass
	Rated voltage(s) or voltage range(s) (V)	AC 100-240 V AC	Pass
	Symbol for nature of supply for d.c.	Mains from AC source	N/A
	Rated frequency or frequency range (Hz)	50/60 Hz	Pass
	Rated current (A)	8 A	Pass
	Manufacturer's name/Trademark	ADVANTECH CO., LTD.	Pass
	Type/model	NAS 5 XXXX-XXXXXXXXX, NAS 3 XXXX-XXXXXXXXX, REU-4 XXXX-XXXX (X can be any alphanumeric character or blank)	Pass
	Symbol of Class II	Class I equipment.	N/A
	Other symbols	--	N/A
	Certification marks	CE	Pass
1.7.2	Safety instructions	The users manual provided.	Pass
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment		N/A
1.7.5	Power outlets on the equipment	No outlet	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.6	Fuse identification	Located in approved power supply.	Pass
1.7.7	Wiring terminals		N/A
1.7.7.1	Protective earthing and bonding terminals	In approved power supply	Pass
1.7.7.2	Terminal for a.c. mains supply conductors	Appliance inlet used	N/A
1.7.8	Controls and indicators	Indicator not effecting safety	N/A
1.7.8.1	Identification, location and marking		Pass
1.7.8.2	Colours	No safety involve indicator used	N/A
1.7.8.3	Symbols according to IEC 60417	Marking for the switch according 60417-1-IEC-5009.	Pass
1.7.8.4	Markings using figures		N/A
1.7.9	Isolation of multiple power sources	Only one supply from the mains.	N/A
1.7.10	IT power system		N/A
1.7.11	Thermostats and other regulating devices	No adjustable thermostats	N/A
1.7.12	Language	English	—
1.7.13	Durability	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.	Pass
1.7.14	Removable parts	Markings is not placed on removable parts	Pass
1.7.15	Replaceable batteries	Lithium battery for Real Time Clock (RTC). Warning sentence printed in manual or close to the battery.	Pass
	Language	English	—
1.7.16	Operator access with a tool.....	There is no hazard parts can be touched for operator access with a tool	Pass
1.7.17	Equipment for restricted access locations	No restricted access location	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

2	PROTECTION FROM HAZARDS		Pass
2.1	Protection from electric shock and energy hazards		Pass
2.1.1	Protection in OPERATOR access areas	As the installation guide specifies directions for the operator how to add additional memory cards or add-on cards inside the enclosure, the inside of this INDUSTRIAL COMPUTER is considered as operator accessible area. Even the INDUSTRIAL COMPUTER enclosure is disassembled, the accessible SPS is covered by earthed metal enclosure. The construction of this metal enclosure prevents the access, using test pin or test finger or test probe, to any parts having only basic insulation to ELV or hazardous voltage.	Pass
2.1.1.1	Access to energized parts	See below	Pass
	Test by inspection	Can not access to hazardous parts	Pass
	Test with test finger	Can not access to hazardous parts	Pass
	Test with test pin	Can not access to hazardous parts	Pass
	Test with test probe		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); distance (mm) through insulation		—
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	Energy does not exceed HAZARDOUS ENERGY LEVEL (240VA) between any two points in accessible parts (o/p connector of secondary circuit).	N/A
2.1.1.6	Manual controls	The equipment does not contain any knobs, handles, levers, or the like.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in the primary circuit	Approved power supply used.	N/A
	Time-constant (s); measured voltage (V) :		—
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	It is not intended to be used in restricted locations.	N/A
2.2	SELV circuits		Pass
2.2.1	General requirements	42.4V peak or 60VDC are not exceeded in SELV circuit under normal operation or single fault condition.	Pass
2.2.2	Voltages under normal conditions (V)..... :	Between any SELV circuits 42.4V peak or 60VDC are not exceeded.	Pass
2.2.3	Voltages under fault conditions (V) :	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71V peak and 120VDC were not exceed and SELV limits not for longer than 0.2 seconds.	Pass
2.2.3.1	Separation by double or reinforced insulation (method 1)		N/A
2.2.3.2	Separation by earthed screen (method 2)		N/A
2.2.3.3	Protection by earthing of the SELV circuit (method 3)	Approved Power Supply used.	Pass
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
2.3	TNV circuits		N/A
2.3.1	Limits		N/A
	Type of TNV circuits..... :		—
2.3.2	Separation from other circuits and from accessible parts		N/A
	Insulation employed :		—
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 :		—

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.3.5	Test for operating voltages generated externally		N/A
2.4	Limited current circuits		N/A
2.4.1	General requirements		N/A
2.4.2	Limit values		N/A
	Frequency (kHz)..... :		—
	Measured current (mA) :		—
	Measured voltage (V) :		—
	Measured capacitance (μF) :		—
2.4.3	Connection of limited current circuits to other circuits		N/A
2.5	Limited power sources		N/A
	Inherently limited output		N/A
	Impedance limited output		N/A
	Overcurrent protective device limited output		N/A
	Regulating network limited output under normal operating and single fault condition		N/A
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N/A
	Output voltage (V), output current (A), apparent power (VA) :		—
	Current rating of overcurrent protective device (A)		—
2.6	Provisions for earthing and bonding		Pass
2.6.1	Protective earthing	Parts connected to protective earthing reliably.	Pass
2.6.2	Functional earthing	Secondary functional earthing is connected to protectively earthed conductive part that separated from primary by basic insulation.	Pass
2.6.3	Protective earthing and protective bonding conductors	See below.	Pass
2.6.3.1	Size of protective earthing conductors	See appended table.	Pass
	Rated current (A), cross-sectional area (mm ²), AWG :	Dto	—
2.6.3.2	Size of protective bonding conductors	See 2.6.3.3	Pass
	Rated current (A), cross-sectional area (mm ²), AWG :		—

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.3	Rated current (A), type and nominal thread diameter (mm)..... :	Evaluation by test. Rated current below 16A.	Pass
	Resistance (Ω) of earthing conductors and their terminations, test current (A)..... :	See appended table for protective bonding conductor.	Pass
2.6.3.4	Colour of insulation	Green / yellow wire used.	Pass
2.6.4	Terminals	See below.	Pass
2.6.4.1	Protective earthing and bonding terminals	Appliance inlet used.	Pass
	Rated current (A), type and nominal thread diameter (mm)..... :		—
2.6.4.2	Separation of the protective earthing conductor from protective bonding conductors	Protective earthing conductor is in appliance inlet; green/yellow wire is provided for protective bonding conductor from appliance inlet to metal enclosure.	Pass
2.6.5	Integrity of protective earthing	See below.	Pass
2.6.5.1	Interconnection of equipment	No any other of interconnection of euipment.	Pass
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device in protective earthing or bonding connector.	Pass
2.6.5.3	Disconnection of protective earth	Appliance inlet provided.	Pass
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 remove parts.	Pass
2.6.5.5	Parts removed during servicing	It is not necessary to disconnect earthing except for the removing of the earthed part itself.	Pass
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	Pass
2.6.5.7	Screws for protective bonding	In approved power supply.	Pass
2.6.5.8	Reliance on telecommunication network	No TNV	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

2.7	Overcurrent and earth fault protection in primary circuits		Pass
2.7.1	Basic requirements	Approved Power Supply used	Pass
	Instructions when protection relies on building installation		N/A
2.7.2	Faults not covered in 5.3		N/A
2.7.3	Short-circuit backup protection		N/A
2.7.4	Number and location of protective devices :	One fuse in approved power supply	Pass
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel :		N/A

2.8	Safety interlocks		N/A
2.8.1	General principles		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	Interlocks with moving parts		N/A
2.8.6	Overriding an interlock		N/A
2.8.7	Switches and relays in interlock systems		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 (V)		N/A
2.8.8	Mechanical actuators		N/A

2.9	Electrical insulation		N/A
2.9.1	Properties of insulating materials		N/A
2.9.2	Humidity conditioning		N/A
2.9.3	Requirements for insulation		N/A
2.9.4	Insulation parameters		N/A
2.9.5	Categories of insulation		N/A

2.10	Clearances, creepage distances and distances through insulation		Pass
2.10.1	General		Pass
2.10.2	Determination of working voltage	AC 240 V	--
2.10.3	Clearances	See below	Pass
2.10.3.1	General		Pass

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.3.2	Clearances in primary circuit	In approved Power Supply	Pass
2.10.3.3	Clearances in secondary circuits		N/A
2.10.3.4	Measurement of transient levels		N/A
2.10.4	Creepage distances	In approved Power Supply.	Pass
	CTI tests.....:		—
2.10.5	Solid insulation		N/A
2.10.5.1	Minimum distance through insulation		N/A
2.10.5.2	Thin sheet material		N/A
	Number of layers (pcs).....:		—
	Electric strength test		—
2.10.5.3	Printed boards		N/A
	Distance through insulation		N/A
	Electric strength test for thin sheet insulating material		—
	Number of layers (pcs).....:		N/A
2.10.5.4	Wound components		N/A
	Number of layers (pcs).....:		N/A
	Two wires in contact inside component; angle between 45° and 90°		N/A
2.10.6	Coated printed boards	No coated printed board used.	N/A
2.10.6.1	General		N/A
2.10.6.2	Sample preparation and preliminary inspection		N/A
2.10.6.3	Thermal cycling		N/A
2.10.6.4	Thermal ageing (°C).....:		N/A
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		N/A
	Electric strength test		—
2.10.7	Enclosed and sealed parts.....:	No hermetically sealed components.	N/A
	Temperature $T_1=T_2 = T_{mra} - T_{amb} + 10K$ (°C)		N/A
2.10.8	Spacings filled by insulating compound		N/A
	Electric strength test		—
2.10.9	Component external terminations		N/A
2.10.10	Insulation with varying dimensions	Insulation kept homogenous.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

3	WIRING, CONNECTIONS AND SUPPLY		Pass
3.1	General		Pass
3.1.1	Current rating and overcurrent protection	Secondary output cable is UL recognized wiring which is PVC insulated, rated VW-1, min. 80°C, 300V. Internal wiring gauge is suitable for current intended to be carried. No internal wire for primary power distribution.	Pass
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	Pass
3.1.3	Securing of internal wiring	The wires are secured by soldering so that a loosening of the terminal connection is unlikely.	Pass
3.1.4	Insulation of conductors	The insulation of the individual conductors are suitable for the application and the working voltage. For the insulation material see 3.1.1.	Pass
3.1.5	Beads and ceramic insulators	Not used.	N/A
3.1.6	Screws for electrical contact pressure	No screws used for electrical connections. No screws of insulating material for connection, or where supplementary or reinforced insulation could be impaired by metal replacement.	N/A
3.1.7	Non-metallic materials in electrical connections		N/A
3.1.8	Self-tapping and spaced thread screws	No self tapping screws are used.	N/A
3.1.9	Termination of conductors	All conductors are reliable secured.	Pass
	10 N pull test		Pass
3.1.10	Sleeving on wiring		N/A

3.2	Connection to a.c. mains supplies		Pass
3.2.1	Means of connection	Appliance inlet	Pass
3.2.2	Multiple supply connections		N/A
3.2.3	Permanently connected equipment	Not permanently connected equipment.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of conductors, diameter (mm) of cable and conduits	Dto.	—
3.2.4	Appliance inlets	The appliance inlet complies with IEC 60320. The power cord can be inserted without difficulties and does not support the unit.	Pass
3.2.5	Power supply cords	See appended table 1.5.1	Pass
	Type	Dto.	—
	Rated current (A), cross-sectional area (mm ²), AWG	Dto.	—
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—
3.2.7	Protection against mechanical damage	No parts under this unit likely to damage the power supply cord. No sharp edge.	Pass
3.2.8	Cord guards	No cord guard	N/A
	D (mm); test mass (g)	Dto.	—
	Radius of curvature of cord (mm)	Dto.	—
3.2.9	Supply wiring space		N/A
3.3	Wiring terminals for connection of external conductors		N/A
3.3.1	Wiring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Rated current (A), cord/cable type, cross-sectional area (mm ²).....		N/A
3.3.5	Rated current (A), type and nominal thread diameter (mm).....		N/A
3.3.6	Wiring terminals design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	Disconnection from the a.c. mains supply		Pass
3.4.1	General requirement	Disconnect device provided.	Pass
3.4.2	Disconnect devices	Appliance inlet	Pass
3.4.3	Permanently connected equipment	Not a permanently connected equipment.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.4	Parts which remain energized	When plug cord or inlet is disconnected no remaining parts with hazardous voltage in the equipment.	Pass
3.4.5	Switches in flexible cords		N/A
3.4.6	Single-phase equipment	The power cord plug or inlet disconnects both poles simultaneously.	Pass
3.4.7	Three-phase equipment	Single phase.	N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment	Interconnection to other devices by secondary output cable only.	N/A
3.4.11	Multiple power sources	Only one supply connection provided.	N/A

3.5	Interconnection of equipment		Pass
3.5.1	General requirements		Pass
3.5.2	Types of interconnection circuits..... :	The power supply is considered for connection to SELV only.	Pass
3.5.3	ELV circuits as interconnection circuits	NO ELV interconnection.	N/A

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

4.2	Mechanical strength		Pass
4.2.1	General	See below.	Pass
4.2.2	Steady force test, 10 N		N/A
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N	250 N applied to all outer enclosure. No energy or other hazards.	Pass
4.2.5	Impact test	No hazard as result from impact test.	Pass

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.6	Drop test	Not hand-held equipment	N/A
4.2.7	Stress relief	Metal enclosure.	N/A
4.2.8	Cathode ray tubes	Not provided.	N/A
	Picture tube separately certified		N/A
4.2.9	High pressure lamps	Not provided.	N/A
4.2.10	Wall or ceiling mounted equipment; force (N)		N/A

4.3	Design and construction		Pass
4.3.1	Edges and corners	Edges and corners of the enclosure are rounded.	Pass
4.3.2	Handles and manual controls; force (N)		N/A
4.3.3	Adjustable controls	No control device	N/A
4.3.4	Securing of parts	No connection likely to be exposed to mechanical stress are provided in unit.	Pass
4.3.5	Connection of plugs and sockets	No mismatching connector, plug or socket possible.	Pass
4.3.6	Direct plug-in equipment	Not direct plug-in equipment	N/A
	Torque (Nm).....	Dto.	—
4.3.7	Heating elements in earthed equipment	No heating element.	N/A
4.3.8	Batteries	A device which prevent reverse polarity installation provided.	Pass
4.3.9	Oil and grease	No oil or grease.	N/A
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	Pass
4.3.11	Containers for liquids or gases	No containers for liquid or gases.	N/A
4.3.12	Flammable liquids	No flammable liquids in the equipment.	N/A
	Quantity of liquid (l)	Dto.	N/A
	Flash point (°C)	Dto.	N/A
4.3.13	Radiation; type of radiation	Dto.	N/A
	Equipment using lasers	No laser used	N/A

4.4	Protection against hazardous moving parts		Pass
4.4.1	General		Pass
4.4.2	Protection in operator access areas	Fan guard used.	Pass
4.4.3	Protection in restricted access locations	No hazardous moving part in restricted access areas.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.4	Protection in service access areas		N/A
4.5	Thermal requirements		Pass
4.5.1	Temperature rises	(see appended table)	Pass
	Normal load condition per Annex L :	Dto.	Pass
4.5.2	Resistance to abnormal heat	Dto.	Pass
4.6	Openings in enclosures		Pass
4.6.1	Top and side openings	<p>No hazardous parts within 5° projection area.</p> <p>Construction A:</p> <ul style="list-style-type: none"> - Front side: (1) Provided numerous openings, covered three areas of 370 by 50 mm, 370 by 30 mm and one area of 370 by 10 mm. - Rear side: Provided numerous openings on upper part, covered an area of 440 by 80 mm. - Side: Provided eight openings on each side, covered an area of 29 by 59 mm. 	Pass
	Dimensions (mm) :	<p>Front side: Each opening 4.7 by 4.0 mm.</p> <p>Rear: Each opening 4.8 by 5.2 mm.</p> <p>Side: Each opening 29 by 3.2 mm.</p>	—
4.6.2	Bottoms of fire enclosures	No bottom opening provided.	N/A
	Construction of the bottom :		—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment	Not transportable equipment.	N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature/time :		—
4.7	Resistance to fire		Pass
4.7.1	Reducing the risk of ignition and spread of flame	Use of materials with the required flammability classes.	Pass
4.7.2	Conditions for a fire enclosure	See below	Pass

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.2.1	Parts requiring a fire enclosure	With having the following components: <ul style="list-style-type: none"> - components in primary - Components in secondary (not supplied by LPS). - components having unenclosed arcing parts at hazardous voltage or energy level. - insulated wiring - semiconductor devices, transistors, diodes, integrated circuits. - resistors, capacitors, inductors. - the fire enclosure is required. 	Pass
4.7.2.2	Parts not requiring a fire enclosure		N/A
4.7.3	Materials		Pass
4.7.3.1	General		Pass
4.7.3.2	Materials for fire enclosures	metal used	Pass
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A
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.	Pass
4.7.3.5	Materials for air filter assemblies	No air filter	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage component.	N/A

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		Pass
5.1	Touch current and protective conductor current		Pass
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6	Pass
5.1.2	Equipment under test (EUT)	EUT has only one mains connection.	Pass
5.1.3	Test circuit	Using figure 5A.	Pass
5.1.4	Application of measuring instrument	Using measuring instrument in annex D.	Pass
5.1.5	Test procedure	The touch current was measured from primary to metal enclosure.	Pass
5.1.6	Test measurements	See below	Pass
	Test voltage (V)	See appended table 5.1.6	—
	Measured current (mA)	See appended table 5.1.6	—
	Max. allowed current (mA)	See appended table 5.1.6	—
5.1.7	Equipment with touch current exceeding 3.5 mA	Touch current does not exceed 3.5mA.	Pass
5.1.8	Touch currents to and from telecommunication networks	No TNV	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network	Dto.	N/A
	Test voltage (V)	Dto.	—
	Measured current (mA)	Dto.	—
	Max. allowed current (mA)	Dto.	—
5.1.8.2	Summation of touch currents from telecommunication networks.....	No TNV	N/A

5.2	Electric strength		Pass
5.2.1	General	See appended table 5.2	Pass
5.2.2	Test procedure	See appended table 5.2	Pass

5.3	Abnormal operating and fault conditions		Pass
5.3.1	Protection against overload and abnormal operation	See below.	Pass
5.3.2	Motors	Certified fans used, no hazard.	Pass
5.3.3	Transformers	Approved power supply used.	Pass
5.3.4	Functional insulation	Approved power supply used.	Pass

EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.5	Electromechanical components	No electromechanical component other than motor provided.	N/A
5.3.6	Simulation of faults	Result see appended table.	Pass
5.3.7	Unattended equipment	Not provided.	N/A
5.3.8	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted.	Pass

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service personnel, 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		N/A
	Test 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 telecommunication wiring system from overheating		N/A
	Max. output current (A)		—
	Current limiting method		—

EN 60950			
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, material		—
	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		N/A
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.2.6	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 60695-2-2, cl. 4, 8		N/A
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—

A.3	High current arcing ignition test (see 4.7.3.2)		N/A
A.3.1	Samples, material		—
	Wall thickness (mm)		—
A.3.5	Compliance criteria		N/A
	Sample 1 number of arcs to ignition (pcs)		—
	Sample 2 number of arcs to ignition (pcs)		—
	Sample 3 number of arcs to ignition (pcs)		—
	Sample 4 number of arcs to ignition (pcs)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Sample 5 number of arcs to ignition (pcs)		—
A.4	Hot wire ignition test (see 4.7.3.2)		N/A
A.4.1	Samples, material		—
	Wall thickness (mm)		—
A.4.5	Compliance criteria		N/A
	Sample 1 ignition time (s).....		—
	Sample 2 ignition time (s).....		—
	Sample 3 ignition time (s).....		—
	Sample 4 ignition time (s).....		—
	Sample 5 ignition time (s).....		—
A.5	Hot flaming oil test (see 4.6.2)		N/A
A.6	Flammability tests for classifying materials V-0, V-1 or V-2		N/A
A.6.1	Samples, material		—
	Wall thickness (mm)		—
A.6.5	Compliance criteria		N/A
A.6.6	Permitted re-test		N/A
A.7	Flammability test for classifying foamed materials HF-1, HF-2 or HFB		N/A
A.7.1	Sample, material		—
	Wall thickness (mm)		—
A.7.4	Compliance criteria		N/A
A.7.5	Compliance criteria, HF-2		N/A
A.7.6	Compliance criteria, HF-1		N/A
A.7.7	Compliance criteria, HBF		N/A
A.7.8	Permitted re-test, HF-1 or HF-2		N/A
A.7.9	Permitted re-test, HBF		N/A
A.8	Flammability test for classifying materials HB		N/A
A.8.1	Samples, material		—
	Sample thickness (mm)		—
A.8.2	Conditioning of samples; temperature (°C).....		N/A
A.8.4	Test procedure		N/A
A.8.5	Compliance criteria		N/A
A.8.6	Permitted re-test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
A.9	Flammability test for classifying materials 5V		N/A
A.9.1	Samples, material		—
	Sample thickness (mm)		—
A.9.4	Test procedure, test bars		N/A
A.9.5	Test procedure, test plaques		N/A
A.9.6	Compliance criteria		N/A
A.9.7	Permitted re-test		N/A
A.10	Stress relief conditioning (see 4.2.7)		N/A
	Temperature (°C)		—

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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 DC motors in secondary circuits		N/A
B.7	Locked-rotor overload test for DC motors in secondary circuits		N/A
B.7.1	Test procedure		N/A
B.7.2	Alternative test procedure; test time (h)		N/A
B.7.3	Electric strength test		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)		Pass
	Position	Located on approved power supply.	
	Manufacturer		
	Type		
	Rated values		
	Method of protection		
C.1	Overload test		Pass
C.2	Insulation		Pass
	Protection from displacement of windings		Pass

G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V).....		N/A
G.3	Determination of telecommunication network transient voltage (V)		N/A
G.4	Determination of required withstand voltage (V) .:		N/A
G.5	Measurement of transient levels (V)		N/A
G.6	Determination of minimum clearances		N/A

H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
	Ionizing radiation		N/A
	Measured radiation (mR/h)		—
	Measured high-voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings		—

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Clause	Requirement + Test	Result - Remark	Verdict

J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
	Metal used		—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		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

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		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 (f)		—
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

U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
	Separate test report		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components					Pass
object/part No.	manufacturer/ trademark	type/model	technical data	Standard	mark(s) of conformity ¹⁾	
1. Power Plug	Various	--	250Vac, 10A	VDE0620, IEC60320	VDE	
2. Power Cable	Various	--	3G, 0.75mm ²	VDE 0281	VDE	
3. Power Connector	Various	--	250Vac, 10A	VDE0620, IEC60320	VDE	
4. Power Supply	Power Research	PRM400	Input: 100-240Vac, 8A, 50/60Hz. Output: +12Vdc/14A, +5Vdc/42A, +3.3Vdc/20A, -12Vdc/1.0A, -5Vdc/1.0A, +5VSB/0.75A	EN 60950	TUV, NEMKO, UL	
5. Hard Disk	Various	Various	+5/+12 V dc, 1.5 / 1.8 A maximum.	EN 60950	TUV, UL	
6. RTC Battery	Rayvoas	BR2032	3.0Vdc, 300mAh	--	UL	
7. Front DC Fan (five provided)	Delta	AFB0812H	+12Vdc, 0.24A	EN 60950	VDE, UL	
8. CPU Fan	Delta	AFB0512HB	+12Vdc, 0.15A	EN 60950	VDE, UL, CSA	
9. System DC Fan	Delta	AFB0612HB	+12Vdc, 0.15A	EN 60950	VDE, UL, CSA	
10. PCB	Various	Various	V-1 min. 105°C	UL94	UL	
11. Enclosure Material	---	Metal	1.1 mm thick minimum.	--	--	

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Clause	Requirement + Test	Result - Remark	Verdict

1.6.2	TABLE: electrical data (in normal conditions)					Pass
fuse #	I rated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
--	--	90V/50Hz	292	3.25	3.25	Maximum normal load.
--	--	90V/60Hz	292	3.26	3.26	Dto.
--	8	100V/50Hz	290	2.91	2.91	Dto.
--	8	100V/60Hz	290	2.91	2.91	Dto.
--	8	240V/50Hz	278	1.21	1.21	Dto.
--	8	230V/60Hz	278	1.23	1.23	Dto.
--	--	254V/50Hz	277	1.15	1.15	Dto.
--	--	254V/60Hz	277	1.17	1.17	Dto.
--	--	264V/50Hz	276	1.14	1.14	Dto.
--	--	264V/60Hz	276	1.16	1.16	Dto.
supplementary information:						

2.6.3.3 and 2.6.1	TABLE: earthing test		Pass
Location		resistant measures (Ω)	comments
Intel earthed pin to metal enclosure		0.030	25 A / 1 min.

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Clause	Requirement + Test	Result - Remark	Verdict
4.5	TABLE: temperature rise measurements		Pass
	test voltage (V)	Maximum normal load (90 V) Maximum normal load (254 V) / Blocked openings / All Fans locked / Only one power supply	—
	t1 (°C)	--	—
	t2 (°C)	--	—
temperature rise dT of part/at:		dT (K)	Required dT (K)
Ambient		28/29/29/29/27°C	--
LAN Card			
U8 body		10/10/34/43/11	--
RAID			
U1 body		30/29/53/51/29	--
Main Board			
U10 body		30/29/48/65/31	--
U38 body		05/04/28/33/04	--
U33 body		13/12/36/41/07	--
U24 body		07/07/33/40/07	--
RTC body		11/10/33/49/10	--
PWB near Q8		27/26/48/65/26	55
PWB near CPU		05/04/27/43/05	55
C291 body		02/01/24/33/02	35
L2 coil		05/04/27/47/05	55
HDD body		07/06/25/25/09	--
T1 Coil		11/11/47/79/13	40
T1 Core		15/19/55/91/17	40
T2 Coil		14/12/49/79/16	40
T2 Core		17/16/52/74/19	40
L4 Coil		17/15/53/79/18	55
L1 Coil		21/11/51/81/19	55
T1 Coil		11/09/49/74/08	40
T1 Core		14/14/53/79/08	40
T2 Coil		14/12/52/73/15	40
T2 Coil		15/13/53/73/15	40
L4 Coil		09/08/57/79/05	55

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Clause	Requirement + Test	Result - Remark	Verdict
L1 Coil		20/10/52/79/10	55
Enclosure outside near power		02/01/26/25/03	20
<p>comments:</p> <p>The temperatures were measured under worst case normal mode defined in 1.2.2.1 and described in 1.6.2 at voltages as described in 1.4.5</p> <p>Without specified ambient temperature in users manual, therefore the ambient temperature assumed as 50 °C, the max. temperature rise is calculated as follows:</p> <p>Winding components:</p> <p>- class A → $dT_{max} = 75K - 10K - (50-25)K = 40 K$</p> <p>Electrolyte capacitor or components with:</p> <p>- max. absolute temp. of 105 °C → $dT_{max} = (105-50-)K = 55 K$</p> <p>- max. absolute temp. of 85 °C → $dT_{max} = (85-50-)K = 35 K$</p> <p>Enclosure temp. 45K → $dT_{max} = 45 - (50-25)K = 20 K$</p>			

5.1	TABLE: touch current test						Pass
Condition	switch "e"	switch on	switch off	Reverse on	Reverse off	comment	
Earthing conductor to accessible metal parts	open	3.1	0.98	3.1	0.98	No damage	
<p>Input voltage: 264V</p> <p>Input frequency: 60Hz</p> <p>Overall capacity: In approved power supply.</p>							

5.2.2	TABLE: electric strength tests (for all power supply)		Pass
test voltage applied between:		test voltage (V)	breakdown Yes / No
Primary to Secondary		4242 Vdc	No
Primary to Earth		3000 Vdc	No
supplementary information: N/A			

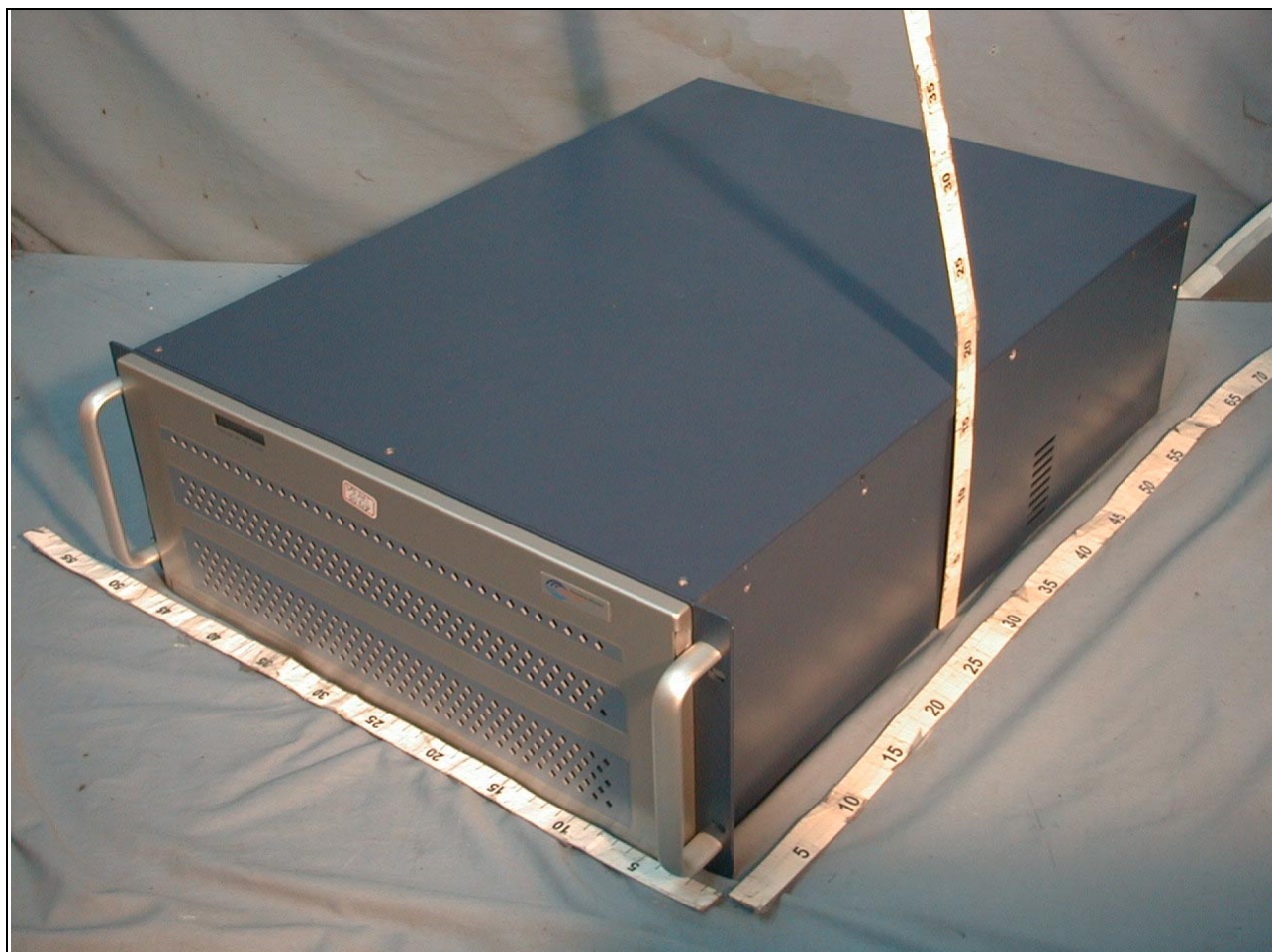
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Clause		Requirement + Test				Result - Remark		Verdict
5.3.1, 5.3.4, 5.3.6		TABLE: fault condition tests						Pass
		ambient temperature (°C)				28°C		—
		model/type of power supply				PRM400		—
		manufacturer of power supply				Power Research		—
		rated markings of power supply				Input: 100-240Vac, 8A, 50/60Hz. Output: +12Vdc/14A, +5Vdc/42A, +3.3Vdc/20A, -12Vdc/1.0A, -5Vdc/1.0A, +5VSB/0.75A		—
No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result	
1	Ventilation openings	Blocked	240	6 hrs	F1	1.23	No damage	
2	All fans	Locked	240	7.5 hrs	F1	1.22	No damage	
3	Power supply	Only one	240	2.5 hrs	F1	1.02	No damage	
4	RTC Battery	Short	240	< 1 sec	---	---	Abnormal reverse charging current 2.8 < 4 mA	
supplementary information								

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Clause	Requirement + Test	Result - Remark	Verdict

5.3.6	TABLE: Overload of Operator Accessible Connector test					Pass
Connector	Pin # s	Open Circuit Voltage (V)	Maximum Available Current (mA)	Length of Test	Comments	
RJ45 1-2	All pins	0	0	---	No hazard	
PS/2 Mouse, Keyboard	1, 3, 4, 5, 6	0	0	---	No hazard	
PS/2 Mouse, Keyboard	2	5.13	1350	1 hr	No hazard	
VGA	1~11, 13	0	0	---	No hazard	
VGA	12, 15	5.1	10	1 Sec	Shutdown, no hazard	
VGA	14	5.1	80	1 hr	No hazard	
COM 1	All pins	0	0	---	No hazard	
SCS1 port	1-16, 19-34	0	0	---	No hazard	
SCS1 port	35-50, 53-68	0	0	---	No hazard	
SCS1 port	17, 18, 51, 52	4.82	2150	1 hr	No hazard	

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Clause	Requirement + Test	Result - Remark	Verdict

Photos



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Clause	Requirement + Test	Result - Remark	Verdict



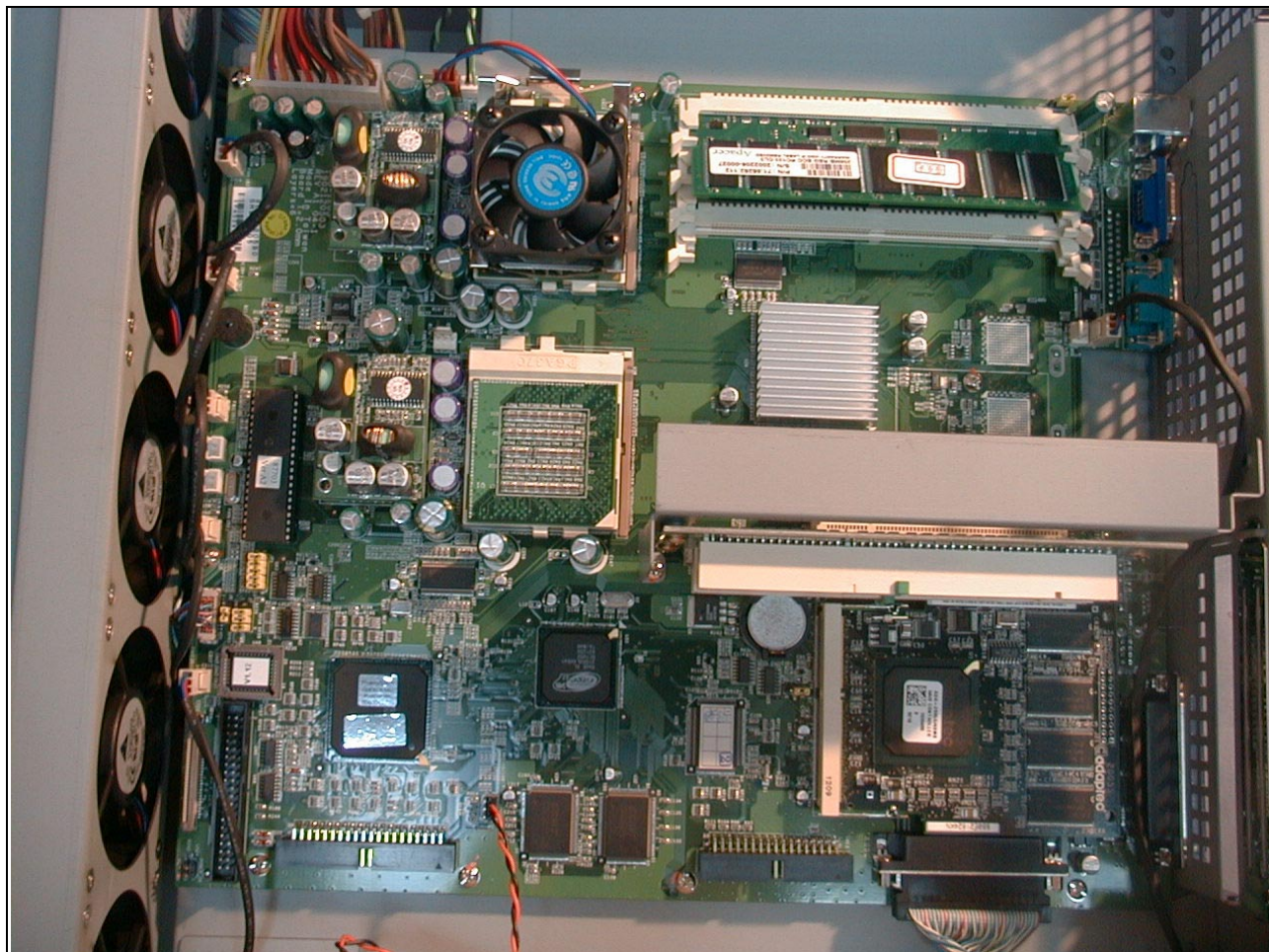
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Clause	Requirement + Test	Result - Remark	Verdict



EN 60950			
Clause	Requirement + Test	Result - Remark	Verdict

