TEST REPORT

EN 60950-1:2001+A11

Product	**Network attached storage**
Name and address of the applicant	**QNAP System Inc.** **21F, No. 77, Sec. 1, Xintai 5th Rd., Xizhi City, Taipei County, Taiwan.**
Name and address of the manufacturer	**QNAP System Inc.** **21F, No. 77, Sec. 1, Xintai 5th Rd., Xizhi City, Taipei County, Taiwan.**
Name and address of the factory	**QNAP Systems, Inc.** **21F, No.77, Sec.1, Xintai 5th Rd, Xizhi City, Taipei Country, 221, Taiwan, R.O.C**
Rating and principal characteristics	**12Vdc, 8A**
Class of equipment	**Class III equipment**
Trade mark	**QNAP, VioStor**
Model/type	TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, Viostor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA,VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA.NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D
Serial no	**Test sample without serial numbers**
Tested according to	EN 60950-1:2001+A11
	Safety of information technology equipment
Name and address of the testing laboratory	International Standards Laboratory No.120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang, Tao Yuan County, Taiwan Telephone (+886) 3 407-1718 Fax (+886) 3 407-1738
Tested by	Emily Chang Signature Emily Chang / Engineer name in block letters Date 2007-11-13
Approved by	Jack Lin Signature Jack Lin / Director name in block letters Date 2007-12-26

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Particulars: test item vs. test requirements	
Equipment mobility ..... :	Movable equipment
Operating condition ..... :	continuous
Mains supply tolerance (%) ..... :	N.A.
Tested for IT power systems ..... :	Yes
IT testing, phase-phase voltage (V) ..... :	N.A.
Class of equipment ..... :	Class III
Mass of equipment (kg) ..... :	6.5 kg
Protection against ingress of water ..... :	IPX20
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 ..... :	2007-11-04
Date(s) of performance of test ..... :	2007-11-13
Total pages of report	55 (Report: 49; Photos: 4; Block & Circuit Diagram: 2)

General remarks

Comments:

Connection to the supply: external adaptor.

The equipment models TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, Viostor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA,VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D are Network attached storage for general office use.

Those model s are identical except for marketing differences.

All interior servicing is to be performed by qualified service personnel, which requires the use of a tool.

The external AC adapter (Class I) approved by Nemko Certificate No. NA-PROD 004,
Report No. P05205562.

Maximum recommended ambient (Tmra): 40°C

Dimensions: 250 x 164 x 225 mm (included front bezel).

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Copy of marking plate(s):

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1	GENERAL		**P**
1.5	Components		**P**
1.5.1	General		**P**
	Comply with IEC 60950 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/EN 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/EN standards are tested under the conditions present in the equipment.	**P**
1.5.3	Thermal controls	No thermal controls provided.	**N**
1.5.4	Transformers	In approved AC adaptor only.	**P**
1.5.5	Interconnecting cables	No interconnecting cables.	**N**
1.5.6	Capacitors in primary circuits .....:	In approved AC adaptor only.	**P**
1.5.7	Double insulation or reinforced insulation bridged by components	In approved AC adaptor only.	**P**
1.5.7.1	General		**N**
1.5.7.2	Bridging capacitors		**N**
1.5.7.3	Bridging resistors		**N**
1.5.7.4	Accessible parts		**N**
1.5.8	Components in equipment for IT power systems	In approved AC adaptor only.	**P**

1.6	Power interface		—
1.6.1	AC power distribution systems	Class III equipment	**N**
1.6.2	Input current	Highest load according to Max. Normal load for this equipment is the 4 set of Hard Disk Device permanently accessed and add dummy load USB 5V/0.5A * 3 ports.	—
1.6.3	Voltage limit of hand-held equipment	This appliance is not hand-held equipment.	—
1.6.4	Neutral conductor	Class III equipment supplied by SELV circuits.	**N**

1.7	Marking and instructions		**P**
1.7.1	Power rating	The required marking is located on the equipment.	**P**

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	Rated voltage(s) or voltage range(s) (V) .....:	12Vdc (no direct connection to the mains supply)	—
	Symbol for nature of supply, for d.c. only .....:	IEC 60417, Symbol No.5031 is used	**P**
	Rated frequency or rated frequency range (Hz) ..:	No direct connection to the AC mains supply.	**N**
	Rated current (mA or A) .....:	8A	—
	Manufacturer's name or trademark or identification mark .....:	QNAP, VioStor	**P**
	Type/model or type reference.....:	TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, Viostor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA,VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA.NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D.	**P**
	Symbol for Class II equipment only .....:	Class III equipment	**P**
	Other symbols .....:	Other symbols do not give rise to misunderstanding.	**P**
	Certification marks .....:	See copy of the marking plate for the safety marks.	**P**
1.7.2	Safety instructions		—
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	**P**
1.7.4	Supply voltage adjustment .....:	No voltage selector	**N**
	Methods and means of adjustment; reference to installation instructions .....:		—

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1.7.5	Power outlets on the equipment .....:	No power outlet	**N**
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	Class III equipment.	**N**
1.7.7	Wiring terminals	Class III equipment supplied by SELV circuits	**N**
1.7.7.1	Protective earthing and bonding terminals .....:	--	**N**
1.7.7.2	Terminal for a.c. mains supply conductors	--	**N**
1.7.7.3	Terminals for d.c. mains supply conductors		—
1.7.8	Controls and indicators	See below.	**P**
1.7.8.1	Identification, location and marking .....:	Marking is identification of the functional switch is located that the functions clear for the operator.	**N**
1.7.8.2	Colours .....:	No safety relevant controls or indicators , For functional indication a LED lights when the equipment is operating.	**N**
1.7.8.3	Symbols according to IEC 60417 ..... :	Marking for stand-by type functional switch according to IEC 60417, No. 5009 (line half inside circle).	**P**
1.7.8.4	Markings using figures ..... :	Not used.	**N**
1.7.9	Isolation of multiple power sources ..... :	Only one supply from the mains.	**N**
1.7.10	IT power distribution systems	For Norway compliance please see Norway deviation.	**N**
1.7.11	Thermostats and other regulating devices	No adjustable thermostats.	**N**
1.7.12	Language(s) .....:	User's manual and marking in English, in Local language will be provided with the shipment.	—
1.7.13	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. 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**
1.7.14	Removable parts	No required markings placed on removable parts.	**N**
1.7.15	Replaceable batteries	Lithium battery is exchangeable. Warning sentence is printed in the user's manual.	**P**
	Language(s)..... :	English	—

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1.7.16	Operator access with a tool .....:	The inside of the Server Charger is regarded to be operator access area. This area is accessible when the enclosure of the server is disassembled by screwdriver.	**P**
1.7.17	Equipment for restricted access locations.....:	No restricted access location.	**N**

2	PROTECTION FROM HAZARDS		**P**
2.1	Protection from electric shock and energy hazards		**P**
2.1.1	Protection in operator access areas	The construction of the outer metal enclosure prevents the accessibility to any parts with only basic insulation to ELV or hazardous voltage with the test pin or test finger.	**P**
2.1.1.1	Access to energized parts	Compliance checked.	**P**
	Test by inspection ..... :	Compliance checked.	**P**
	Test with test finger ..... :	Compliance checked.	**P**
	Test with test pin ..... :	Compliance checked.	**P**
	Test with test probe ..... :	Not applied.	**N**
2.1.1.2	Battery compartments ..... :	No battery compartment.	**N**
2.1.1.3	Access to ELV wiring	No ELV wiring provided	**N**
	Working voltage (Vpeak or Vrms); minimum distance (mm) through insulation		—
2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage wiring in operator accessible area.	**N**
2.1.1.5	Energy hazards ..... :	No energy hazard in user access area	**P**
2.1.1.6	Manual controls	No conductive shafts of operating knobs and handles.	**N**
2.1.1.7	Discharge of capacitors in equipment	Supplied by SELV only	**N**
	Time-constant (s); measured voltage (V) ..... :		—
2.1.2	Protection in service access areas	No maintenance works in operation mode necessary.	**N**
2.1.3	Protection in restricted access locations	The unit is not intended to be used in restricted locations.	**N**

2.2	SELV circuits		**P**
2.2.1	General requirements	SELV limits are not exceeded under normal condition and after a single fault.	**P**
2.2.2	Voltages under normal conditions (V) ..... :	All accessible voltages are less than 42.4 Vp or 60 V dc and are classified as SELV.	**P**

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2.2.3	Voltages under fault conditions (V)..... :	Under fault conditions voltages never exceed 71V peak and 120Vdc and do not exceed 42.4V peak or 60V dc for more than 0.2 sec.	**P**
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	Method 1 used.	**N**
2.2.3.2	Separation by earthed screen (method 2)	Not used.	**N**
2.2.3.3	Protection by earthing of the SELV circuit (method 3)	Not used.	**N**
2.2.4	Connection of SELV circuits to other circuits ..... :	SELV circuits are only connected to other SELV circuits.	**P**

2.3	TNV circuits		**N**
2.3.1	Limits	No TNV Circuit.	**N**
	Type of TNV circuits ..... :		—
2.3.2	Separation from other circuits and from accessible parts		**N**
	Insulation employed..... :		—
2.3.3	Separation from hazardous voltages		**N**
	Insulation employed..... :		—
2.3.4	Connection of TNV circuits to other circuits		**N**
	Insulation employed..... :		—
2.3.5	Test for operating voltages generated externally		**N**

2.4	Limited current circuits		**N**
2.4.1	General requirements	No LCC within the equipment	**N**
2.4.2	Limit values		**N**
	Frequency (Hz)..... :		—
	Measured current (mA)..... :		—
	Measured voltage (V) ..... :		—
	Measured capacitance (μF)..... :		—
2.4.3	Connection of limited current circuits to other circuits		**N**

2.5	Limited power sources **(The USB circuitry were tested as LPS)**		**P**
	Inherently limited output		**N**
	Impedance limited output	See appended table 2.5.	**P**
	Overcurrent protective device limited output		**N**

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	Regulating network limited output under normal operating and single fault condition		**N**
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		**N**
	Output voltage (V), output current (A), apparent power (VA) ..... :	See appended table 2.5.	—
	Current rating of overcurrent protective device (A)		—

2.6	Provisions for earthing and bonding		**N**
2.6.1	Protective earthing	Class III equipment. Supplied by SELV	**N**
2.6.2	Functional earthing		**N**
2.6.3	Protective earthing and protective bonding conductors		**N**
2.6.3.1	General		**N**
2.6.3.2	Size of protective earthing conductors		**N**
	Rated current (A), cross-sectional area (mm2), AWG ..... :		—
2.6.3.3	Size of protective bonding conductors		**N**
	Rated current (A), cross-sectional area (mm2), AWG ..... :		—
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current (A) ..... :		**N**
2.6.3.5	Colour of insulation ..... :		**N**
2.6.4	Terminals		**N**
2.6.4.1	General		**N**
2.6.4.2	Protective earthing and bonding terminals		**N**
	Rated current (A), type and nominal thread diameter (mm)..... :		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		**N**
2.6.5	Integrity of protective earthing		**N**
2.6.5.1	Interconnection of equipment		**N**
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		**N**
2.6.5.3	Disconnection of protective earth		**N**
2.6.5.4	Parts that can be removed by an operator		**N**
2.6.5.5	Parts removed during servicing		**N**
2.6.5.6	Corrosion resistance		**N**
2.6.5.7	Screws for protective bonding		**N**

2.6.5.8	Reliance on telecommunication network or cable distribution system		**N**

2.7	Overcurrent and earth fault protection in primary circuits		**N**
2.7.1	Basic requirements	Class III equipment. Supplied by SELV	**N**
	Instructions when protection relies on building installation		—
2.7.2	Faults not covered in 5.3		**N**
2.7.3	Short-circuit backup protection		**N**
2.7.4	Number and location of protective devices ..... :		**N**
2.7.5	Protection by several devices		**N**
2.7.6	Warning to service personnel ..... :		**N**

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

2.9	Electrical insulation		**N**
2.9.1	Properties of insulating materials		—
2.9.2	Humidity conditioning		—
	Humidity (%) ..... :		—
	Temperature (°C) ..... :		—
2.9.3	Grade of insulation		—

2.10	Clearances, creepage distances and distances through insulation		**N**
2.10.1	General		**N**

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2.10.2	Determination of working voltage	The measurements were done within the approval of the AC adaptor.	**N**
2.10.3	Clearances		**N**
2.10.3.1	General		**N**
2.10.3.2	Clearances in primary circuits	In approved AC adaptor only.	**N**
2.10.3.3	Clearances in secondary circuits		**N**
2.10.3.4	Measurement of transient voltage levels	No transient voltages across the clearance lower than due or normal.	**N**
2.10.4	Creepage distances	In approved AC adaptor only.	**N**
	CTI tests..... :		—
2.10.5	Solid insulation	In approved AC adaptor only.	**N**
2.10.5.1	Minimum distance through insulation		**N**
2.10.5.2	Thin sheet material	In approved AC adaptor only.	**N**
	Number of layers (pcs) ..... :		—
	Electric strength test		—
2.10.5.3	Printed boards	Not provided.	**N**
	Distance through insulation		**N**
	Electric strength test for thin sheet insulating material		—
	Number of layers (pcs) ..... :		**N**
2.10.5.4	Wound components		**N**
	Number of layers (pcs) ..... :		**N**
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		**N**
2.10.6	Coated printed boards		**N**
2.10.6.1	General		**N**
2.10.6.2	Sample preparation and preliminary inspection		**N**
2.10.6.3	Thermal cycling		**N**
2.10.6.4	Thermal ageing (°C) ..... :		**N**
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		**N**
	Electric strength test		—
2.10.7	Enclosed and sealed parts ..... :		**N**
	Temperature T1=T2 + Tma – Tamb +10K (°C)... :		**N**
2.10.8	Spacings filled by insulating compound..... :		**N**

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	Electric strength test		—
2.10.9	Component external terminations		**N**
2.10.10	Insulation with varying dimensions		**N**

3	WIRING, CONNECTIONS AND SUPPLY		**P**
3.1	General		**P**
3.1.1	Current rating and overcurrent protection	All internal wires are all 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 provided.	**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	The wires are secured by soldering and quick connector so that a loosening of the terminal connection is unlikely.	**P**
3.1.4	Insulation of conductors	The insulation of the individual conductors is 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**
3.1.6	Screws for electrical contact pressure	No such screws provided.	**N**
3.1.7	Insulating materials in electrical connections	All current carrying connections are metal to metal.	**P**
3.1.8	Self-tapping and spaced thread screws	No self - tapping or spaced thread screws used.	**N**
3.1.9	Termination of conductors	All conductors are reliable secured.	**P**
	10 N pull test		**P**
3.1.10	Sleeving on wiring		**N**

3.2	Connection to an a.c. mains supply or a d.c. mains supply		**N**
3.2.1	Means of connection ..... :	No direct connection to mains.	**N**
3.2.1.1	Connection to an a.c. mains supply		**N**
3.2.1.2	Connection to a d.c. mains supply		**N**
3.2.2	Multiple supply connections		—

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3.2.3	Permanently connected equipment		—
	Number of conductors, diameter (mm) of cable and conduits ..... :		—
3.2.4	Appliance inlets		**N**
3.2.5	Power supply cords		**N**
3.2.5.1	AC power supply cords		—
	Type ..... :		—
	Rated current (A), cross-sectional area (mm2), AWG ..... :		—
3.2.5.2	DC power supply cords		—
3.2.6	Cord anchorages and strain relief		—
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage		**N**
3.2.8	Cord guards	No cord guard provided.	**N**
	D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm) ..... :		—
3.2.9	Supply wiring space		—

3.3	Wiring terminals for connection of external conductors		**N**
3.3.1	Wiring terminals		**N**
3.3.2	Connection of non-detachable power supply cords		**N**
3.3.3	Screw terminals		**N**
3.3.4	Conductor sizes to be connected		**N**
	Rated current (A), cord/cable type, cross-sectional area (mm2) ..... :		—
3.3.5	Wiring terminal sizes		**N**
	Rated current (A), type and nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminals design		**N**
3.3.7	Grouping of wiring terminals		**N**
3.3.8	Stranded wire		**N**

3.4	Disconnection from the mains supply		**N**
3.4.1	General requirement	No direct connection to mains.	**N**
3.4.2	Disconnect devices		**N**
3.4.3	Permanently connected equipment		**N**
3.4.4	Parts which remain energized		**N**

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3.4.5	Switches in flexible cords		**N**
3.4.6	Single-phase equipment and d.c. equipment		**N**
3.4.7	Three-phase equipment		**N**
3.4.8	Switches as disconnect devices		**N**
3.4.9	Plugs as disconnect devices		**N**
3.4.10	Interconnected equipment		**N**
3.4.11	Multiple power sources		**N**

3.5	Interconnection of equipment		**N**
3.5.1	General requirements	See below.	**N**
3.5.2	Types of interconnection circuits ..... :	No Interconnections between the EUT.	**N**
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	**N**

4	PHYSICAL REQUIREMENTS		**P**
4.1	Stability		**P**
	Angle of 10°	This appliance 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)..... :	Mass of unit is less 25 kg.	**N**

4.2	Mechanical strength		**P**
4.2.1	General	See below. After tests, unit complies with 2.1.1, 2.10 and 4.4.1.	**P**
4.2.2	Steady force test, 10 N	Considered	**P**
4.2.3	Steady force test, 30 N	Considered for DC fan enclosure.	**P**
4.2.4	Steady force test, 250 N	Class III equipment	**N**
4.2.5	Impact test		—
	Fall test	Not applicable.	**N**
	Swing test		—
4.2.6	Drop test	Not applicable.	**N**
4.2.7	Stress relief test	Metal enclosure provided.	**N**
4.2.8	Cathode ray tubes	No CRT.	**N**
	Picture tube separately certified ..... :		**N**
4.2.9	High pressure lamps	No high pressure lamp.	**N**

4.2.10	Wall or ceiling mounted equipment; force (N) .... :	Not wall or ceiling mounted equipment.	**N**

4.3	Design and construction		**P**
4.3.1	Edges and corners	Edges and corners of the enclosure are well rounded.	**P**
4.3.2	Handles and manual controls; force (N) ..... :		**N**
4.3.3	Adjustable controls	None that would cause hazard.	**N**
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to withstand the usual mechanical stress. For the protection solder pins are used.	**P**
4.3.5	Connection of plugs and sockets	Mismatch of connectors was prevented by incompatible form or location.	**P**
4.3.6	Direct plug-in equipment	Not direct plug-in type.	**N**
	Dimensions (mm) of mains plug for direct plug-in :		—
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N) ..... :		—
4.3.7	Heating elements in earthed equipment	No heating elements.	**N**
4.3.8	Batteries		—
4.3.9	Oil and grease	No insulation is exposed to grease or oil.	**N**
4.3.10	Dust, powders, liquids and gases	The equipment in intended use is not considered to be exposed to dust, powders, liquids and gases.	**N**
4.3.11	Containers for liquids or gases	No container for liquid or gas.	**N**
4.3.12	Flammable liquids ..... :	No flammable liquids.	**N**
	Quantity of liquid (l) ..... :		—
	Flash point (°C) ..... :		—
4.3.13	Radiation; type of radiation ..... :		—
4.3.13.1	General		—
4.3.13.2	Ionizing radiation		—
	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		—

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	Part, property, retention after test, flammability classification ..... :		—
4.3.13.4	Human exposure to ultraviolet (UV) radiation .... :		—
4.3.13.5	Laser (including LEDs)		—
	Laser class ..... :		—
4.3.13.6	Other types ..... :		—

4.4	Protection against hazardous moving parts		**N**
4.4.1	General		**N**
4.4.2	Protection in operator access areas		—
4.4.3	Protection in restricted access locations		—
4.4.4	Protection in service access areas		—

4.5	Thermal requirements		**P**
4.5.1	Maximum temperatures	See appended table 4.5.1.	**P**
	Normal load condition per Annex L ..... :	See 1.6.2.	**P**
4.5.2	Resistance to abnormal heat	No direct mains connection.	**N**

4.6	Openings in enclosures		**P**
4.6.1	Top and side openings	See table 4.6.1	**P**
	Dimensions (mm) ..... :	See table 4.6.1	—
4.6.2	Bottoms of fire enclosures	No bottom openings	**P**
	Construction of the bottom..... :		—
4.6.3	Doors or covers in fire enclosures	Considered	**P**
4.6.4	Openings in transportable equipment	Not transportable equipment.	**N**
4.6.5	Adhesives for constructional purposes	Not used.	**N**
	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.	**P**
	Method 1, selection and application of components wiring and materials		—
	Method 2, application of all of simulated fault condition tests		—
4.7.2	Conditions for a fire enclosure	See below	**P**

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4.7.2.1	Parts requiring a fire enclosure	With having the following parts: · components in secondary · insulated wiring the fire enclosure is required.	**P**
4.7.2.2	Parts not requiring a fire enclosure		**N**
4.7.3	Materials		**P**
4.7.3.1	General	PCB is rated V-0.	**P**
4.7.3.2	Materials for fire enclosures	Metal enclosure provided.	**P**
4.7.3.3	Materials for components and other parts outside fire enclosures	No decorative part.	**P**
4.7.3.4	Materials for components and other parts inside fire enclosures	Internal components except small parts are rated V-2 or better.	**P**
4.7.3.5	Materials for air filter assemblies	No air filter assemblies.	**N**
4.7.3.6	Materials used in high-voltage components	No high voltage component.	**N**

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		**N**
5.1	Touch current and protective conductor current		**N**
5.1.1	General	See below.	**P**
5.1.2	Equipment under test (EUT)		**N**
5.1.3	Test circuit		**—**
5.1.4	Application of measuring instrument		**N**
5.1.5	Test procedure		**N**
5.1.6	Test measurements	Class III equipment	**N**
	Test voltage (V) ..... :		**—**
	Measured touch current (mA) ..... :		**—**
	Max. allowed touch current (mA) ..... :		**—**
	Measured protective conductor current (mA) ..... :		—
	Max. allowed protective conductor current (mA) :		—
5.1.7	Equipment with touch current exceeding 3.5 mA :		**N**
5.1.8	Touch currents to and from telecommunication networks and cable distribution systems and from telecommunication networks	No TNV connection.	**N**
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distribution system		**N**
	Test voltage (V) ..... :		—
	Measured touch current (mA) ..... :		—
	Max. allowed touch current (mA) ..... :		—

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5.1.8.2	Summation of touch currents from telecommunication networks ..... :		**N**

5.2	Electric strength		**N**
5.2.1	General	Class III Product	**N**
5.2.2	Test procedure		**—**

5.3	Abnormal operating and fault conditions		**P**
5.3.1	Protection against overload and abnormal operation	Ventilation openings blocked and the DC fan rotor locked tests was considered as foreseeable misuse.	**P**
5.3.2	Motors	Approved DC fans used.	**P**
5.3.3	Transformers	Safety isolation transformer only provided in approved AC adaptor.	**N**
5.3.4	Functional insulation ..... :	Method c) considered.	**P**
5.3.5	Electromechanical components	No electromechanical components provided.	**N**
5.3.6	Simulation of faults	Faults in primary and secondary, components and functional insulation were already considered during the approval of the AC adaptor. Ventilation blocked and DC fan locked tests: Results see appended table 5.3.	**P**
5.3.7	Unattended equipment	Not unattended equipment.	**N**
5.3.8	Compliance criteria for abnormal operating and fault conditions	Complied.	**P**

6	CONNECTION TO TELECOMMUNICATION NETWORKS (No TNV connections provided)		**N**
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		**N**
6.1.1	Protection from hazardous voltages		**N**
6.1.2	Separation of the telecommunication network from earth		**N**
6.1.2.1	Requirements		**N**
	Test voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2	Exclusions..... :		**N**

6.2	Protection of equipment users from overvoltages on telecommunication networks	**N**

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6.2.1	Separation requirements		**N**
6.2.2	Electric strength test procedure		**N**
6.2.2.1	Impulse test		**N**
6.2.2.2	Steady-state test		**N**
6.2.2.3	Compliance criteria		**N**
6.3	Protection of the telecommunication wiring system from overheating		**N**
	Max. output current (A) ..... :		—
	Current limiting method..... :		—

7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		**N**
7.1	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		**N**
7.2	Protection of equipment users from overvoltages on the cable distribution system		**N**
7.3	Insulation between primary circuits and cable distribution systems		**N**
7.3.1	General		**N**
7.3.2	Voltage surge test		**N**
7.3.3	Impulse test		**N**

A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		**P**
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.1.1	Samples ..... :		—
	Wall thickness (mm) ..... :		—
A.1.2	Conditioning of samples; temperature (°C) ..... :		**N**
A.1.3	Mounting of samples..... :		**N**
A.1.4	Test flame (see IEC 60695-11-3)		**N**
	Flame A, B, C or D ..... :		—
A.1.5	Test procedure		**N**
A.1.6	Compliance criteria		**N**
	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**

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A.2.1	Samples, material ..... :		—
	Wall thickness (mm) ..... :		—
A.2.2	Conditioning of samples		**N**
A.2.3	Mounting of samples ..... :		**N**
A.2.4	Test flame (see IEC 60695-11-4)		**N**
	Flame A, B or C ..... :		—
A.2.5	Test procedure		**N**
A.2.6	Compliance criteria		**N**
	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 and 8		**N**
	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.3.1	Mounting of samples		**N**
A.3.2	Test procedure		**N**
A.3.3	Compliance criterion		**N**

B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		**P**
B.1	General requirements		**P**
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
B.2	Test conditions		—
B.3	Maximum temperatures		—
B.4	Running overload test		—
B.5	Locked-rotor overload test		—
	Test duration (days) ..... :		—
	Electric strength test: test voltage (V) ..... :		—
B.6	Running overload test for d.c. motors in secondary circuits		—
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		**P**
B.7.1	Test procedure	See table 5.3	**P**

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B.7.2	Alternative test procedure; test time (h)..... :		**N**
B.7.3	Electric strength test		**N**
B.8	Test for motors with capacitors		**N**
B.9	Test for three-phase motors		**N**
B.10	Test for series motors		**N**
	Operating voltage (V) ..... :		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		**N**
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
	Method of protection ..... :		—
C.1	Overload test		**N**
C.2	Insulation		**N**
	Protection from displacement of windings..... :		**N**

D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		**N**
D.1	Measuring instrument	In approved AC adaptor	**N**
D.2	Alternative measuring instrument		**N**

E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)	**N**

F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)	**N**

G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		**N**
G.1	Summary of the procedure for determining minimum clearances		**N**
G.2	Determination of mains transient voltage (V) ..... :		**N**
G.2.1	AC mains supply		**N**
G.2.2	DC mains supply		**N**
G.3	Determination of telecommunication network transient voltage (V)..... :		**N**
G.4	Determination of required withstand voltage (V) . :		**N**
G.5	Measurement of transient levels (V)..... :		**N**
G.6	Determination of minimum clearances ..... :		**N**

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H	ANNEX H, IONIZING RADIATION (see 4.3.13)	**N**

J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		**P**
	Metal used ..... :		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		**N**
K.1	Making and breaking capacity		**N**
K.2	Thermostat reliability; operating voltage (V)..... :		**N**
K.3	Thermostat endurance test; operating voltage (V) ..... :		**N**
K.4	Temperature limiter endurance; operating voltage (V) ..... :		**N**
K.5	Thermal cut-out reliability		**N**
K.6	Stability of operation		**N**

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.1)		**N**
L.1	Typewriters		**N**
L.2	Adding machines and cash registers		**N**
L.3	Erasers		**N**
L.4	Pencil sharpeners		**N**
L.5	Duplicators and copy machines		**N**
L.6	Motor-operated files		**N**
L.7	Other business equipment		**N**

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		**N**
M.1	Introduction		**N**
M.2	Method A		**N**
M.3	Method B		**N**
M.3.1	Ringing signal		**N**
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**
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		**N**
M.3.2.2	Tripping device		**N**

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M.3.2.3	Monitoring voltage (V)..... :		**N**

N	ANNEX N, IMPULSE TEST GENERATORS (see 2.10.3.4, 6.2.2.1, 7.3.2 and clause G.5)		**N**
N.1	ITU-T impulse test generators		**N**
N.2	IEC 60065 impulse test generator		**N**
P	ANNEX P, NORMATIVE REFERENCES		**P**

Q	ANNEX Q, BIBLIOGRAPHY		**P**

R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		**N**
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6)		**N**
R.2	Reduced clearances (see 2.10.3)		**N**

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

T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		**N**
			—

U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		**N**
			—

V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		**P**
V.1	Introduction		**N**
V.2	TN power distribution systems		**N**
V.3	TT power systems		**N**
V.4	IT power systems		**N**

W	ANNEX W, SUMMATION OF TOUCH CURRENTS		**N**
W.1	Touch current from electronic circuits		**N**
W.1.2	Earthed circuits		**N**
W.2	Interconnection of several equipments		**N**

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W.2.1	Isolation		**N**
W.2.2	Common return, isolated from earth		**N**
W.2.3	Common return, connected to protective earth		**N**

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

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

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CENELEC COMMON MODIFICATIONS [C], SPECIAL NATIONAL CONDITIONS [S] AND A-DEVIATIONS (NATIONAL DEVIATIONS) [A] (EN 60950-1:2001, Annex ZB and Annex ZC)			**P**
General	C: Delete all the "country" notes in the reference document according to the following list: 1.1.5 Note 2 1.5.8 Note 2 1.6.1 Note 1.7.2 Note 4 1.7.12 Note 2 2.6 Note 2.2.3 Note 2.2.4 Note 2.3.2 Note 2, 7, 8 2.3.3 Note 1, 2 2.3.4 Note 2,3 2.7.1 Note 2.10.3.1 Note 4 3.2.1.1 Note 3.2.3 Note 1, 2 3.2.5.1 Note 2 4.3.6 Note 1,2 4.7.2.2 Note 4.7.3.1 Note 2 6.1.2.1 Note 6.1.2.2 Note 6.2.2 Note 6.2.2.1 Note 2 6.2.2.2 Note 7 Note 4 7.1 Note G2.1 Note 1, 2 Annex H Note 2	Deleted.	**P**
1.2.4.1	S (DK): 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.	No such switch.	**N**
1.5.1	A (SE, Ordinance 1990:944 and CH, Ordinance on environmentally hazardous substances SR 814.013, Annex 3.2, Mercury): Add NOTE – Switches containing mercury such as thermostats, relays and level controllers are not allowed.	No such switch.	**N**
1.5.8	S (NO): Due to the IT power system used (see annex V, Fig. V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	In approved SPS used only.	**P**
1.7.2	S (FI, NO, SE): 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:	No power cord provided.	**N**
	FI: "Laite on liitettävä suojamaadoitus-koskettimilla varustettuun pistorasiaan"	Must be evaluated during national approval.	**N**
	NO: "Apparatet må tilkoples jordet stikkontakt"	Must be evaluated during national approval.	**N**
	SE: "Apparaten skall anslutas till jordat uttag"	Must be evaluated during national approval.	**N**
	A (DK, 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 	Must be evaluated during national approval.	**N**

	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 instalationsvejledning."		
1.7.5	S (DK): 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.	No outlets.	**N**
1.7.5	A (DK, Heavy Current Regulations): CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.	No outlets.	**N**
1.7.12	A (DE, Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment {Equipment safety law}], of 23rd October 1992, Article 3, 3rd paragraph, 2nd sentence, together with the "Allgemeine Verwaltungsvorschrift zur Durchführung des Zweiten Abschnitts des Gerätesicherheitsgesetzes" [General administrative regulation on the execution of the Second Section of the Equipment safety law], of 10th January 1996, article 2, 4th paragraph item 2): Directions for use with rules to prevent certain hazards for (among others) maintenance of the technical labour equipment, also for imported technical labour equipment shall be written in the German language. NOTE: Of this requirement, rules for use even only by service personnel are not exempted.	To be evaluated when submitted for national approval.	**N**
1.7.15	A (CH, Ordinance on environmentally hazardous substances SR 814.013): Annex 4.10 of SR 814.013 applies for batteries.	There is no battery containing Cd or Hg in the equipment.	**N**
	A (DE, Regulation on protection against hazards by X-ray, of 8th January 1987, Article 5 [Operation of X-ray emission source], clauses 1 to 4): a) A licence is required by those who operate an X-ray emission source. b) A licence in accordance with Cl. 1 is not required by those who operate an X-ray emission source on which the electron acceleration voltage does not exceed 20 kV if 1) the local dose rate at a distance of 0,1 m from the surface does not exceed 1 µSv/h and 2) it is adequately indicated on the X-ray emission source that i) X-rays are generated and ii) the electron acceleration voltage must not	The unit does not emit X-ray radiation.	**N**

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	exceed the maximum value stipulated by the manufacturer or importer. c) A licence in accordance with Cl. 1 is also not required by persons who operate an X-ray emission source on which the electron acceleration voltage exceeds 20 kV if 1) the X-ray emission source has been granted a type approval and 2) it is adequately indicated on the X-ray emission source that i) X-rays are generated ii) the device stipulated by the manufacturer or importer guarantees that the maximum permissible local dose rate in accordance with the type approval is not exceeded and iii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer. d) Furthermore, a licence in accordance with Cl. 1 is also not required by persons who operate X-ray emission sources on which the electron acceleration voltage does not exceed 30 kV if 1) the X-rays are generated only by intrinsically safe CRTs complying with Enclosure III, No. 6, 2) the values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical measures and specified in the device and 3) it is adequately indicated on the X-ray emission source that the X-rays generated are ade-quately screened by the intrinsically safe CRT.		
2.2.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.	No TNV	**P**
2.3.2	S (NO): Requirements according to this annex, 6.1.2.1 apply.	No TNV	**P**
2.3.3 and 2.3.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.	No TNV	**P**
2.6.3.3	S (GB): The current rating of the circuit shall be taken as 13 A, not 16 A.	No TNV	**P**
2.7.1	C: 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	Replaced	**P**

	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.		
	S (GB): To protect against excessive currents and short-circuits in the PRIMARY CIRCUIT OF DIRECT PLUG-IN EQUIPMENT, protective device shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT.	Not direct plug-in equipment.	**N**
2.7.2	C: Void.	Void.	**N**
2.10.2	C: Replace in the first line "(see also 1.4.7)" by "(see also 1.4.8)".	Considered.	**P**
2.10.3.1	S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage and will remain at 230 V in case of a single earth fault	Considered.	**P**
3.2.1.1	S (CH): Supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991, Plug type 15, 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991, Plug type 11, L+N 250 V, 10 A SEV 6534-2.1991, Plug type 12, L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998, Plug type 25, 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998, Plug type 21, L+N 250 V, 16 A SEV 5934-2.1998, Plug type 23, L+N+PE 250 V, 16 A	No power supply cord provided.	**N**

	S (DK): 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 ply-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.	No power supply cord provided.	**N**
	S (ES): 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.	No power supply cord provided.	**N**
	S (GB): 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 Socket 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.	No power supply cord provided.	**N**

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	S (IE): 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.	No power supply cord provided.	**N**
3.2.3	C: Delete Note 1 and in Table 3A, delete the conduit sizes in parentheses.	Deleted.	**N**
3.2.5.1	C: 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: Up to and including 6 0,75[1)] Over 6 up to and including 10 (0,75)[2)] 1,0 Over 10 up to and including 16 (1,0)[3)] 1,5 In the Conditions applicable to Table 3B delete the words "in some countries" in condition [1)]. In Note 1, applicable to Table 3B, delete the second sentence.	No power supply cord provided.	**N**
3.2.5.1	S (GB): 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.	No power supply cord provided.	**N**
3.3.4	C: In table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: "Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4" Delete the fifth line: conductor sizes for 13 to 16 A.	No power supply cord provided.	**N**
3.3.4	S (GB): 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 mm^2 to 1,5 mm^2 nominal cross-sectional area.	No power supply cord provided.	**N**
4.3.6	S (GB): The torque test is performed using a socket outlet complying with BS 1363 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, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C.	Not direct plug-in equipment.	**N**

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	S (IE): 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.	Not direct plug-in equipment.	**N**
4.3.13.6	C: Add the following note: NOTE 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 are currently under development.	Replaced	**N**
6.1.2.1	S (FI, NO, SE): Add the following text between the first and second paragraph: 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 2.10.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.7 shall be performed using 1,5 kV), and - is subject to ROUTINGE 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 60950:2000, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400;	Added	**N**

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	- 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.		
6.1.2.2	S (FI, NO, SE): The exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and 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.	Not permanently connected	**N**
7.1	S (FI, NO, SE): Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.	No TNV Circuit.	**P**
G.2.1	S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault.	Shall be evaluated when national approval.	**N**
Annex H	C: 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.	Replaced.	**N**
Annex P	C: Replace the text of this annex by: See annex ZA.	Replaced.	**N**
Annex Q	C: Replace the title of IEC 61032 by "Protection of persons and equipment by enclosures – Probes for verification". Add the following notes for the standards indicated: IEC 60127 NOTE Harmonized as EN 60127 (Series) (not modified) IEC 60269-2-1 NOTE Harmonized as HD 630.2.1 S4:2000 (modified) IEC 60529 NOTE Harmonized as EN 60529:1991 (not modified) IEC 61032 NOTE Harmonized as EN 61032:1998 (not modified) IEC 61140 NOTE Harmonized as EN 61140:2001 (not modified) ITU-T Recommendation K.31 NOTE in Europe, the suggested document is EN 50083-1.		**N**

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Annex ZA	C: NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR RELEVANT EUROPEAN PUBLICATIONS This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments). NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.	**P**

—	IEC 60050-151
—	IEC 60050-195
EN 60065:1998 + corr. June 1999	IEC 60065 (mod):1998
EN 60073:1996	IEC 60073:1996
HD 566 S1:1990	IEC 60085:1984
HD 214 S2:1980	IEC 60112:1979
HD 611.4.1.S1:1992	IEC 60216-4-1:1990
HD 21 [1)] Series	IEC 60227 (mod) Series
HD 22 [2)] Series	IEC 60245 (mod) Series
EN 60309 Series	IEC 60309 Series
EN 60317-43:1997	IEC 60317-43:1997
EN 60320 Series	IEC 60320 (mod) Series
HD 384.3 S2:1995	IEC 60364-3 (mod):1993
HD 384.4.41 S2:1996	IEC 60364-4-41 (mod):1992 [3)]
EN 132400:1994 [4)] + A2:1998 + A3:1998 + A4:2001	IEC 60384-14:1993
EN 60417-1	IEC 60417-1
HD 625.1 S1:1996 + corr. Nov. 1996	IEC 60664-1 (mod):1992
EN 60695-2-2:1994	IEC 60695-2-2:1991
EN 60695-2-11:2001	IEC 60695-2-11:2000
—	IEC 60695-2-20:1995
—	IEC 60695-10-2:1995
—	IEC 60695-11-3:2000
—	IEC 60695-11-4:2000
EN 60695-11-10:1999	IEC 60695-11-10:1999
EN 60695-11-20:1999	IEC 60695-11-20:1999
EN 60730-1:2000	IEC 60730-1:1999 (mod)
EN 60825-1:1994 + corr. Febr. 1995 + A11:1996 + corr. July 1997	IEC 60825-1:1993
EN 60825-2:2000	IEC 60825-2:2000
—	IEC 60825-9:1999
EN 60851-3:1996	IEC 60851-3:1996
EN 60851-5:1996	IEC 60825-5:1996
EN 60851-6:1996	IEC 60851-6:1996
—	IEC 60885-1:1987
EN 60990:1999	IEC 60990:1999
—	IEC 61058-1:2000
EN 61965:2001	IEC 61965:2000
EN ISO 178:1996	ISO 178:1993
EN ISO 179 Series	ISO 179 Series
EN ISO 180:2000	ISO 180:1993
—	ISO 261:1998
—	ISO 262:1998
EN ISO 527 Series	ISO 527 Series

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	—	ISO 386:1984	
	EN ISO 4892 Series	ISO 4892 Series	
	—	ISO 7000:1989	
	EN ISO 8256:1996	ISO 8256:1990	
	—	ISO 9772:1994	
	EN ISO 9773:1998	ISO 9773:1998	
	—	ITU-T:1988 Recommendation K.17	
	—	ITU-T:2000 Recommendation K.21	
	1) The HD 21 series is related to, but not directly equivalent with the IEC 60227 series 2) The HD 22 series is related to, but not directly equivalent with the IEC 60245 series 3) IEC 60364-4-41:1992 is superseded by IEC 60364-4-41:2001 4) EN 132400, Sectional Specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains (Assessment level D), and its amendments are related to, but not directly equivalent to IEC 60384-14		

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1.5.1	TABLE: list of critical components				P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity [1.]
Metal Enclosure	Various	Various	Metal, min. 0.4 mm thick	--	--
Front plastic Enclosure	Various	Various	94-HB or better, min. 60°C	UL94	UL
PWB	Various	Various	94V-0 or better, min. 105°C	UL 94	UL
AC Adapter	FSP Group Inc.	FSP096-AHB	i/p: 100-240Vac, 50-60Hz, 2A o/p:12Vdc, 8A Class I	IEC 60950-1(ed.1) EN 60950-1:2001, A1	CB, Nemko
System Fan	Yen Sun Technology Corp.	FD129225LB-N	12Vdc, 0.1A, 40.2 CFM	EN 60950-1, UL 507	TUV, UL
RTC Battery	Matsushita Electric Corp. of America	CR2032	3Vdc, 220mAh, Max. Abnormal Charging current 10 mA	UL1642	UL
Hard Disk Driver	Various	Various	5Vdc , 1.0A max. ,	IEC 60950-1 EN 60950-1	TUV
Polyswitch	Polytronics Technology Corp.	SMD1206P075F	8V dc,Ih :0.75A It : 1.5A,	EN 60730-1	TUV
Note (s) :					

1.6.2	TABLE: electrical data (in normal conditions)					P
Fuse #	Irated (A)	U (V)	P (W)	I (mA)	Ifuse (mA)	Condition/status
--	8	12Vdc	57.67	4806	--	Max. Normal Load
Note(s): Max. normal load: 4 set of Hard Disk Device continuously accessed and add dummy load USB 5V/0.5A * 3 ports.						

2.5	TABLE: limited power source measurement		P
	Limits	Measured	Verdict
Uoc = 4.99 V (measured under no load conditions, for front USB port)			
current (in A)	≤8	1.98	P
power (in VA)	≤5*Uoc(25VA)	8	P
Uoc = 4.99 V (measured under no load conditions, for rear USB port up)			
current (in A)	≤8	1.9	P
power (in VA)	≤5*Uoc(25VA)	7.71	P

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Uoc = 4.99 V (measured under no load conditions, for rear USB port down)			
current (in A)	≤8	1.9	**P**
power (in VA)	≤5*Uoc(25VA)	7.9	**P**
Note:			

4.5.1	TABLE: maximum temperatures			**P**
	test voltage (V) .....:	12Vdc		—
	t1 (°C) .....:	--		—
	t2 (°C) .....:	--		—
Maximum temperature T of part/at:		T (°C)		allowed T_{max} (°C)
Max Normal Load		--	--	--
1.Q16 near PCB0		47(62)	--	105
2.L17 Coil		47(62)	--	105
3.U11 near PCB		47(62)	--	105
4.U4 near PCB		43(58)	--	105
5.RTC body		36(51)	--	100
6.HDD 4 body		36(51)	--	--
7.HDD 3 body		34(49)	--	--
8.HDD 2 body		37(52)	--	--
9.HDD 1 body		33(48)	--	--
10. Top of metal enclosure		25(40)	--	70
9.Front of plastic enclosure (inside)		26(41)	--	60
10.Front of plastic enclosure (outside)		25(40)	--	95
11.Fan enclosure		28(43)	--	70
12.Adapter enclosure		40(55)	--	95
13.Ambient		25(40)	--	--

Temperature T of winding:	R_1 (Ω)	R_2 (Ω)	T (°C)	allowed T_{max} (°C)	insulation class

Note(s):

1. The temperatures were measured under worst case normal mode defined in Max. Normal Load and as described in 1.6.2 at voltages as above.

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2. With a specified ambient temperature of 40°C, the max. temperature rise is calculated as follows:

PCB or components with:

For Choke: Class A, Tmax = 105 °C

For PCB: Tmax = 105°C

Touchable surfaces:

- maximum temp. of 95 °C (plastic) / 70 °C (Metal)

4.6.1, 4.6.2	Table: enclosure openings		P
Location	Size (mm)	Comments	
Top	--	None	
Rear	Numerous tetragon openings, 29 by 6.5 max.	No hazardous parts are located behind in the 5º projection area.	
Front	1.65	No hazardous parts are located behind in the 5º projection area.	
Bottom	--	None	
Sides	--	None	
Note(s):			

4.7	Table: resistance to fire			P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class
Metal enclosure	--	--	0.75	--
Note(s): 爲金屬外殼				

5.3	TABLE: fault condition tests		P
	ambient temperature (°C) .....:	See below	—
	model/type of power supply .....:	See table 1.5.1	—
	manufacturer of power supply .....:	See table 1.5.1	—
	rated markings of power supply .....:		—

No.	Component no.	Fault	Test voltage (V)	Test time	Fuse no.	Fuse current (A)	Result
1	Ventilation openings	blocked	12 Vdc	7 hrs	--	--	Temperature of all parts stabled at: U11 near PCB = 50°C, U4 near PCB = 42°C, Q16 near PCB = 48°C, L17 Coil = 47°C, , Ambient = 25°C, NC, NT , No hazardous.

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2	System DC Fan	Locked	12 Vdc	7 hrs	--	--	Temperature of all parts stabled at: U11 near PCB = 57°C, U4 near PCB = 56°C, Q16 near PCB = 61°C, L17 Coil = 63°C, , Ambient = 25°C, NC, NT , No hazardous.
3	D1 pin2-pin3	Short	3.3V	1 min	--	--	Abnormal charging current flow to RTC is 3.3 mA
4	R200	Short	3.3V	1 min	--	--	Abnormal charging current flow to RTC is 0 mA
Note(s): S-c = Short-circuit, O-c = Open circuit, Dis = Disconnection, O-l = Overload, o/p = output NC = Cheesecloth remained intact, NT = Tissue paper remained intact							

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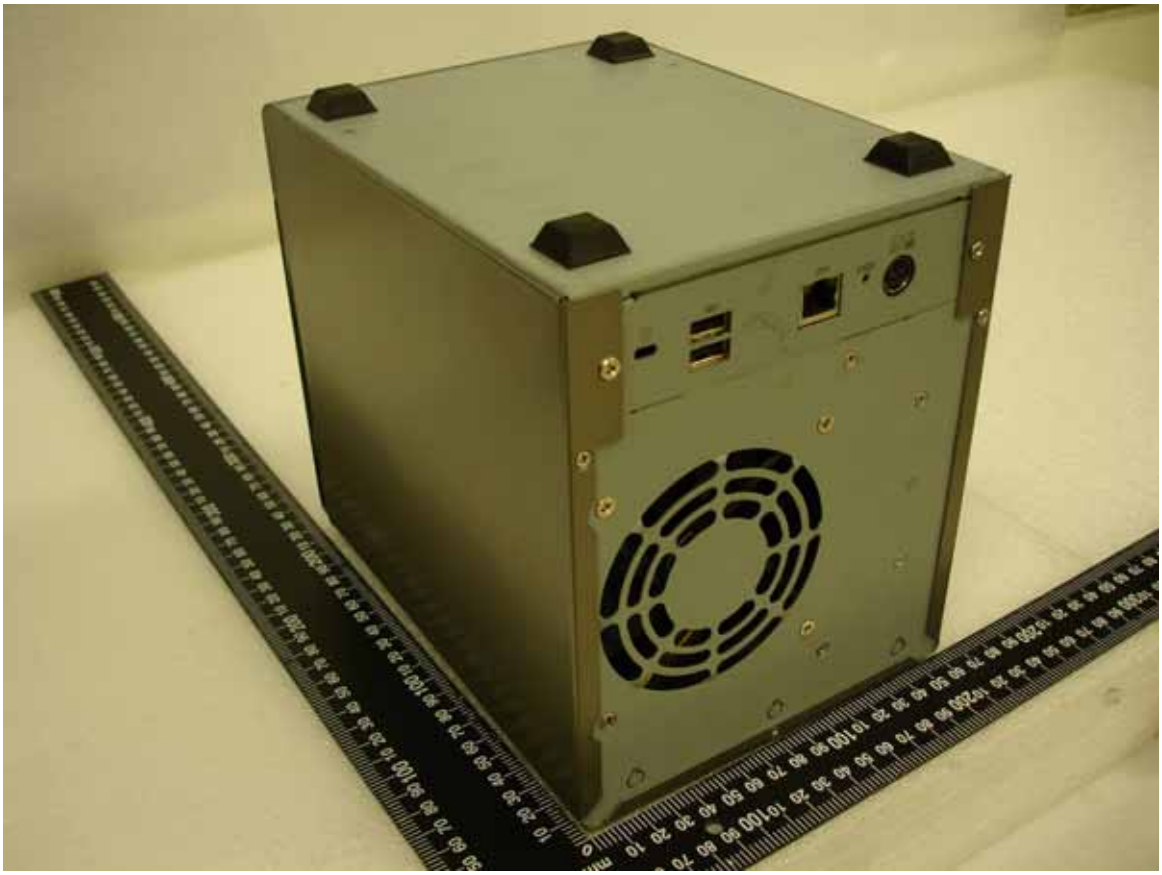

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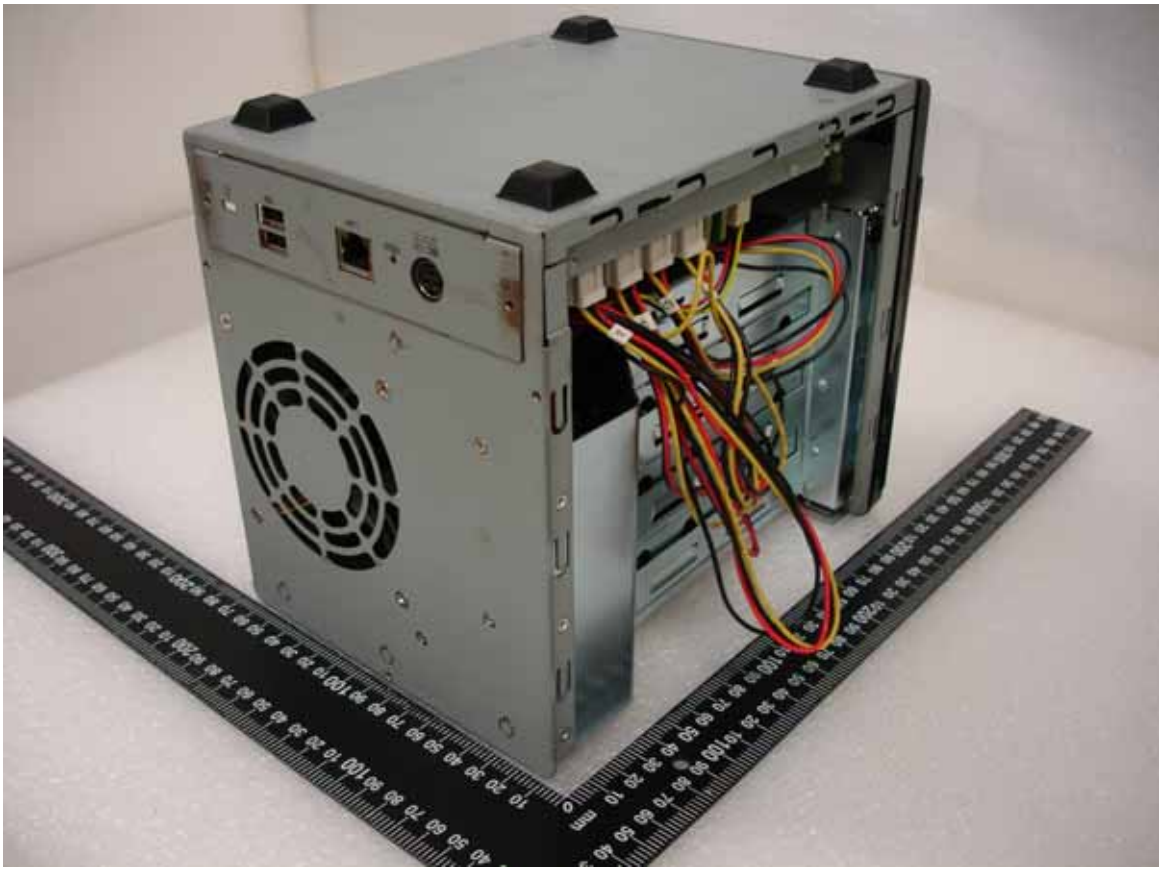

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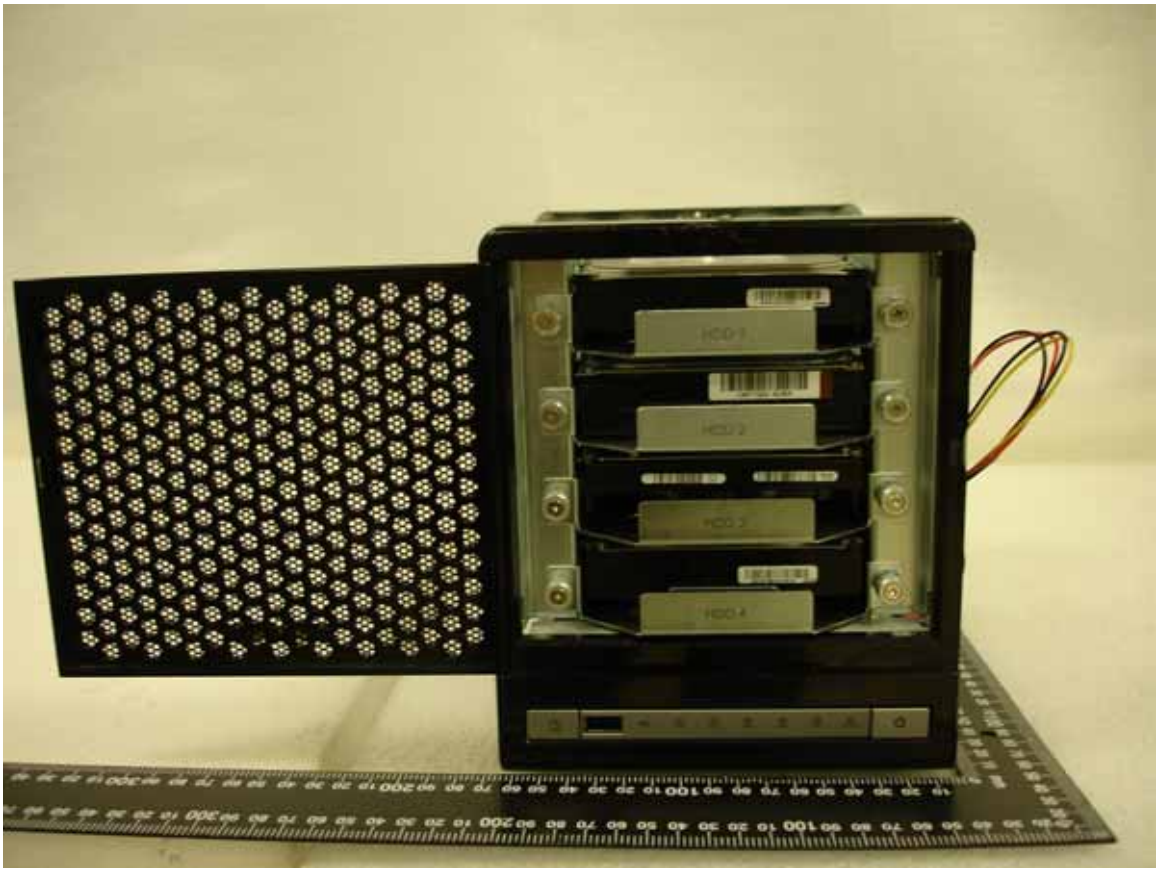

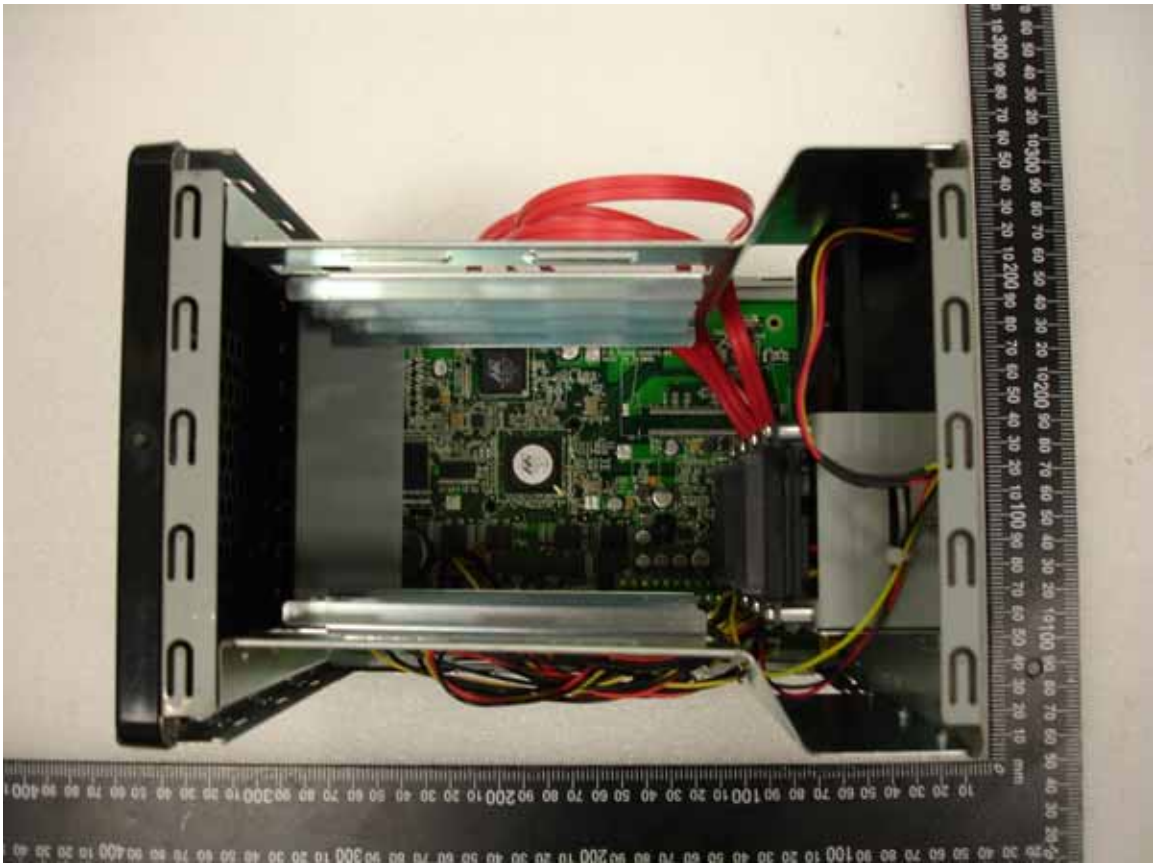

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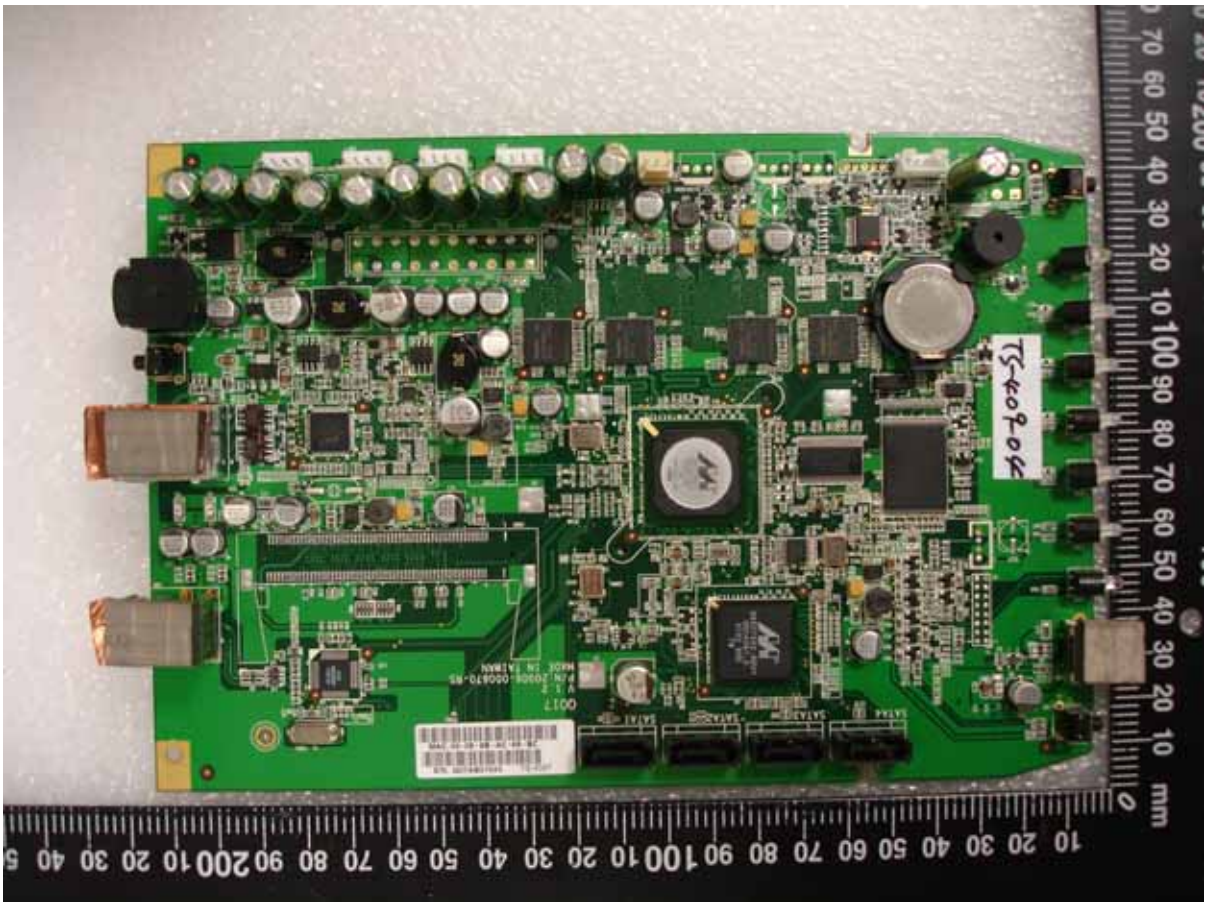

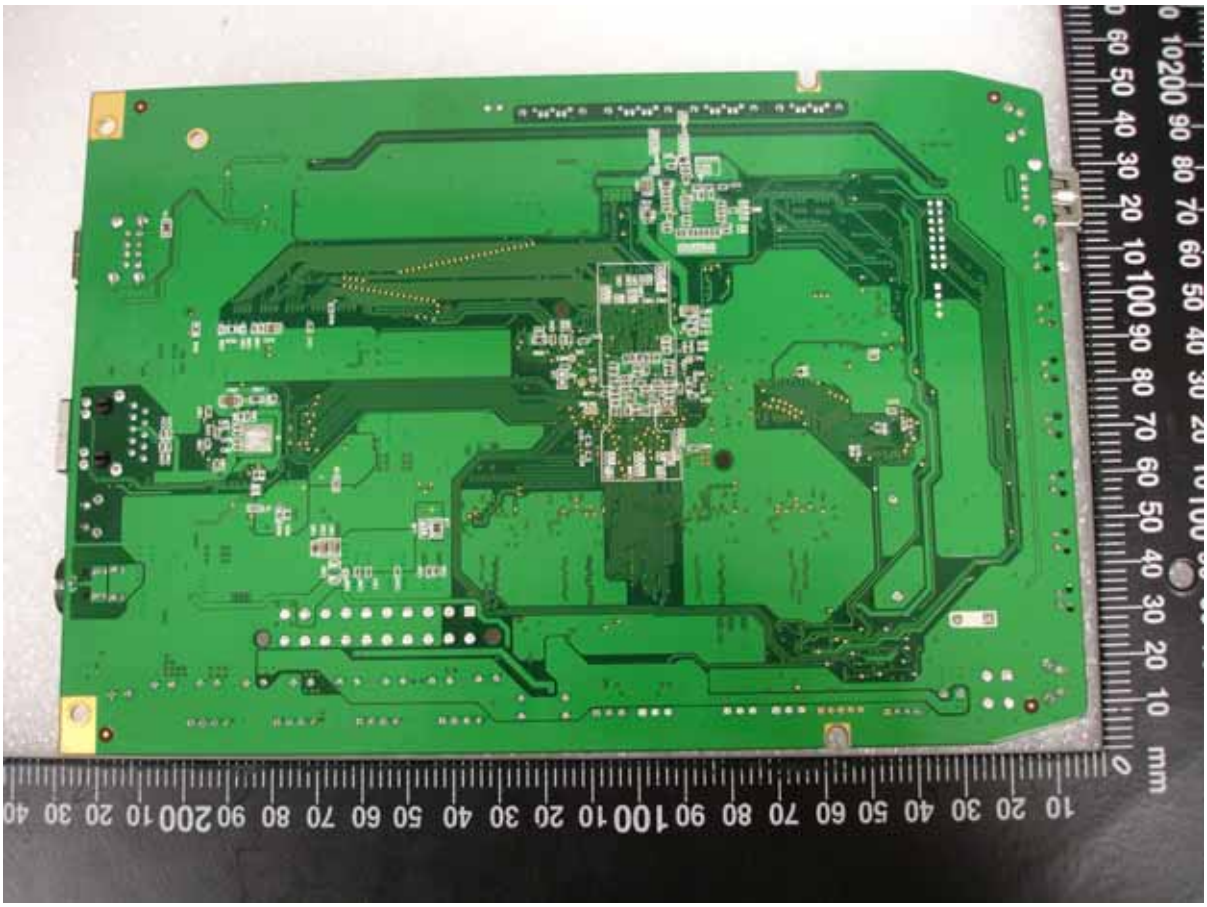

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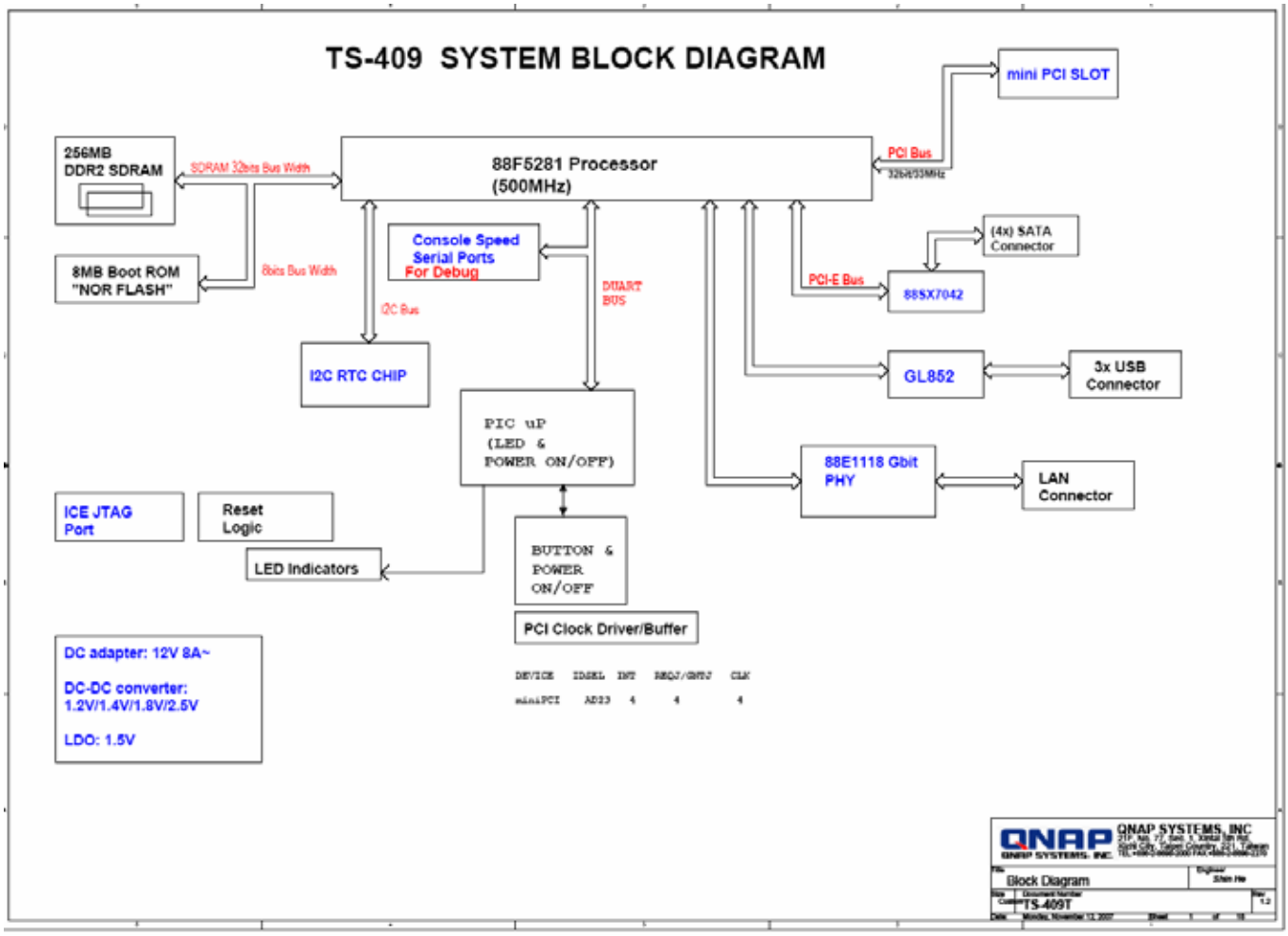
Block Diagram



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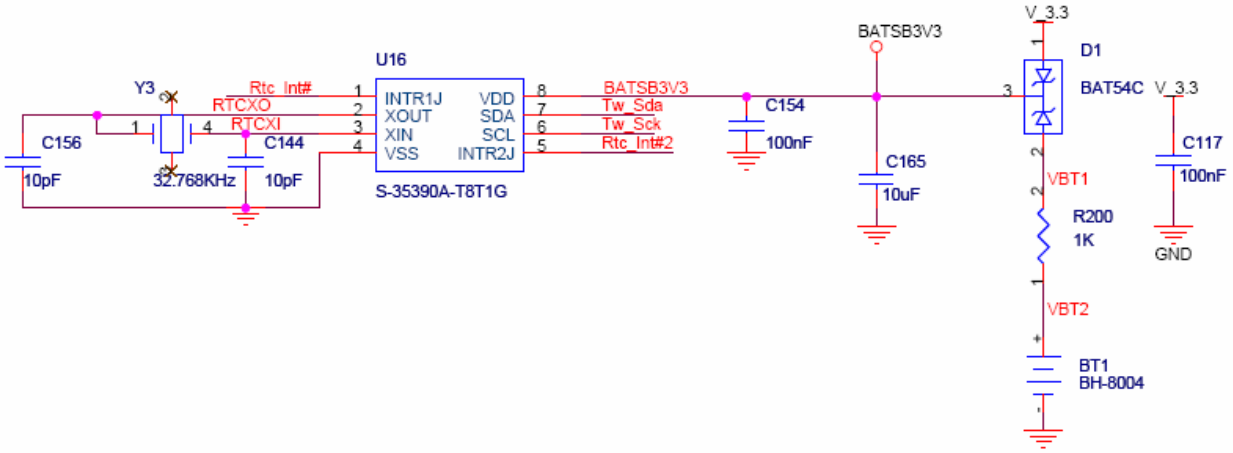
RTC



USB