



TEST REPORT IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Report Reference No.	T1312124-357
Tested by (printed name and signature)	Kane Ma <i>Kane Ma</i>
Approved by (printed name and signature)	Star Gu <i>Star Gu</i>
Date of issue.....	January 16, 2014
Testing Laboratory Name	Cerpass Technology (Suzhou) Co., Ltd.
Address	No.66, Tangzhuang Road, Suzhou Industrial Park, Jiangsu, China.
Applicant's name	Zhejiang Dahua Vision Technology Co., Ltd.
Address	The 1st Floor, Building F, No.1199 Bin'an Road, Changhe Street, Binjiang District, Hangzhou, P.R. China.
Test specification:	
Standard.....	IEC 60950-1:2005 (2nd Edition); Am 1:2009 and/or EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011
Test procedure	Service of CE Marking in LVD
Non-standard test method.....	N/A
Test item description	
Trade Mark.....	None
Manufacturer	Zhejiang Dahua Vision Technology Co., Ltd. The 1st Floor, Building F, No.1199 Bin'an Road, Changhe Street, Binjiang District, Hangzhou, P.R. China.
Model/Type reference	NVR7464-16P, NVR7432-16P, NVR7416-16P, NVR7408-8P NVR7464, NVR7432, NVR7416, NVR7408 DHI-NVR7464-16P, DHI-NVR7432-16P, DHI-NVR7416-16P, DHI-NVR7408-8P, DHI-NVR7464, DHI-NVR7432, DHI-NVR7416 DHI-NVR7408.
Ratings	I/P: 100-240V~, 50-60Hz, 4.5-1.9A


Particulars: test item vs. test requirements

Equipment mobility	Movable
Connection to the mains	Pluggable A
Operating condition	Continuous
Access location	Operator accessible
Over voltage category (OVC)	OVCII
Mains supply tolerance (%) or absolute mains supply values	+10%, -10%
Tested for IT power systems	Yes
IT testing, phase-phase voltage (V)	230V (for Norway)
Class of equipment	Class I
Considered current rating (A)	16A
Pollution degree (PD)	PD 2
IP protection class	IPX0
Altitude during operation (m)	< 3000 m
Altitude of test laboratory (m)	< 2000 m
Mass of equipment (kg)	Approx. 4.8Kg

Possible test case verdicts:

- test case does not apply to the test object.....	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)

Testing

Date of receipt of test item	December 24, 2013
Date(s) of performance of tests	December 24, 2013 – January 16, 2014

General remarks:

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

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"(see Enclosure #)" refers to additional information appended to the report.

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

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

Factor(ies):

Zhejiang Dahua Vision Technology Co., Ltd.

Address: The 1st Floor, Building F, No.1199 Bin'an Road, Changhe Street, Binjiang District, Hangzhou, P.R. China.

**General product information:**

1. The unit is a network video recorder for use in general office equipment. All electrical components are mounted on V-1 PCB and housed in metal and plastic enclosure fixed by screws.
2. The differences among models NVR7464-16P, NVR7432-16P, NVR7416-16P, NVR7408-8P, NVR7464, NVR7432, NVR7416, NVR7408, DHI-NVR7464-16P, DHI-NVR7432-16P, DHI-NVR7416-16P, DHI-NVR7408-8P, DHI-NVR7464, DHI-NVR7432, DHI-NVR7416, DHI-NVR7408 as below:
 - 1) Models NVR7464-16P, NVR7432-16P, NVR7416-16P, DHI-NVR7464-16P, DHI-NVR7432-16P and DHI-NVR7416-16P are similar except for the type designation.
 - 2) Models NVR7464, NVR7432, NVR7416, NVR7408, DHI-NVR7464, DHI-NVR7432, DHI-NVR7416 and DHI-NVR7408 are similar except for the type designation.
 - 3) Models NVR7464-16P, NVR7408-8P and NVR7464 are similar except for the type designation and the number of POE ports, NVR7464 has no POE port, NVR7408-8P has 8 POE ports, while NVR7464-16P has 16 POE ports.
3. All ports except for POE ports complied with limited power source, see appended table 2.5.
4. POE ports don't evaluate limited power source (Sub-clause 2.5). The equipment which connected to these ports need fire material minimum V-1.
5. According to the applicants' requirement, the equipment is only evaluated to horizontal position.
6. Unless otherwise indicated, all tests were conducted on Model NVR7464-16P to represent the other similar models.

Other comments:

The product was submitted and tested for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 55 degree C.

Copy of marking plate:

The following label is only format show.

Representative

NETWORK VIDEO RECORDER

MODEL: NVR7464-16P

P/N: 
1.0.01.23.0084

S/N: 
YZA3LZ058D00001

INPUT: 100-240V~, 50-60Hz, 4.5-1.9A

ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD.

MADE IN CHINA





1	GENERAL		P
1.5	Components		P
1.5.1	General	See below.	P
	Comply with IEC 60950-1 or relevant component standard	Components which were found to affect safety aspects comply with the requirements of this standard or with 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 that are certified to IEC and /or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	No thermal control.	N/A
1.5.4	Transformers	Used transformer in approved switching power supply, which is suitable for their intended application and comply with the relevant requirements of the standard.	N/A
1.5.5	Interconnecting cables	Interconnection o/p cable to other device is carrying only SELV on an energy level below 240VA. Except for the insulation material, there are no further requirements for the o/p interconnection cable.	P
1.5.6	Capacitors bridging insulation	In approved built-in power supply.	N/A
1.5.7	Resistors bridging insulation		N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems		N/A
1.5.9	Surge suppressors		N/A
1.5.9.1	General		N/A



1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A

1.6	Power interface		P
1.6.1	AC power distribution systems	TN power system and IT power system (for Norway).	P
1.6.2	Input current	The steady state input current of the equipment did not exceed the RATED CURRENT by more than 10% under NORMAL LOAD. See appended table 1.6.2	P
1.6.3	Voltage limit of hand-held equipment	This appliance is not a hand-held equipment.	N/A
1.6.4	Neutral conductor	The neutral is not identified in the equipment. Base insulation for rated voltage between earthed parts and primary phases. Reinforced insulation for rated voltage between secondary parts and primary phases.	P

1.7	Marking and instructions		P
1.7.1	Power rating and identification markings	The required marking is located on the outside surface of the equipment.	P
1.7.1.1	Power rating marking	See below.	P
	Multiple mains supply connections.....:		N/A
	Rated voltage(s) or voltage range(s) (V)	100-240V	P
	Symbol for nature of supply, for d.c. only	Mains from AC Source.	N/A
	Rated frequency or rated frequency range (Hz)	50-60Hz	P
	Rated current (mA or A)	4.5-1.9A	P
1.7.1.2	Identification markings	See below.	P
	Manufacturer's name or trade-mark or identification mark	Manufacturer : Zhejiang Dahua Vision Technology Co., Ltd.	P
	Model identification or type reference	See page 1.	P
	Symbol for Class II equipment only	Class I equipment.	N/A



	Other markings and symbols	Additional symbols or markings do not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	See below.	P
1.7.2.1	General	The user's manual contains information for operation, installation, servicing, transport, storage and technical data. The operation guide is provided to the user.	P
1.7.2.2	Disconnect devices	Appliance inlet is provided as disconnection device.	P
1.7.2.3	Overcurrent protective device	Neither Pluggable equipment type B nor Permanently Connected Equipment.	N/A
1.7.2.4	IT power distribution systems	For Norway compliance has to be evaluated during the national approval.	N/A
1.7.2.5	Operator access with a tool	No tool is required to gain access to operator access area.	N/A
1.7.2.6	Ozone	No ozone produces within this equipment.	N/A
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment	No adjustment of supply voltage necessary.	N/A
	Methods and means of adjustment; reference to installation instructions		N/A
1.7.5	Power outlets on the equipment	No outlet provided.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Fuse marking on the approved built-in power supply.	N/A
1.7.7	Wiring terminals	See below.	P
1.7.7.1	Protective earthing and bonding terminals	Evaluated in approved built-in power supply.	N/A
1.7.7.2	Terminals for a.c. mains supply conductors	The equipment with appliance inlet is intended to be used the detachable type power supply cord.	N/A
1.7.7.3	Terminals for d.c. mains supply conductors	No connection to DC mains.	N/A
1.7.8	Controls and indicators	See below.	P
1.7.8.1	Identification, location and marking	The marking and indication for switches are located adjacent to the switches.	P
1.7.8.2	Colours	No safety relevant controls for	N/A



		indicators.	
1.7.8.3	Symbols according to IEC 60417	The symbols of switch comply with IEC 60417-5009.	P
1.7.8.4	Markings using figures	No used.	N/A
1.7.9	Isolation of multiple power sources	Only one supply connection.	N/A
1.7.10	Thermostats and other regulating devices	No such device provided.	N/A
1.7.11	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 neither curling nor lifting of the label edge.	P
1.7.12	Removable parts	No removable part provided.	N/A
1.7.13	Replaceable batteries	Warning text provided in the servicing instructions.	P
	Language(s)	English	—
1.7.14	Equipment for restricted access locations.....	Equipment not intended for installation in a RESTRICTED ACCESS LOCATION.	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	See below.	P
2.1.1.1	Access to energized parts	No acces with test finger and test pin to any parts with only basic insulation to hazardous voltage. Any hazardous parts accessible are unlikely.	P
	Test by inspection	Same as above.	P
	Test with test finger (Figure 2A)	Same as above.	P
	Test with test pin (Figure 2B)	Same as above.	P
	Test with test probe (Figure 2C)	No TNV circuits provided.	N/A
2.1.1.2	Battery compartments	No battery compartment.	N/A
2.1.1.3	Access to ELV wiring	No ELV wiring in operator accessible area.	N/A
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)		—



2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage wiring in operator accessible area.	N/A
2.1.1.5	Energy hazards	No energy hazards circuit in user accessible parts.	P
2.1.1.6	Manual controls	No conductive shaft of operating knob and handle.	N/A
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock. Done in the approval of the switching power supply.	N/A
	Measured voltage (V); time-constant (s)	Same as above.	—
2.1.1.8	Energy hazards – d.c. mains supply	AC mains supply only.	N/A
	a) Capacitor connected to the d.c. mains supply ...:		N/A
	b) Internal battery connected to the d.c. mains supply		N/A
2.1.1.9	Audio amplifiers	No audio amplifier provided.	N/A
2.1.2	Protection in service access areas	No service work necessary.	N/A
2.1.3	Protection in restricted access locations	The equipment is not limited to be used in restricted access locations.	N/A

2.2	SELV circuits <i>(Evaluated in approved built-in power supply, the secondary circuits were tested as SELV)</i>		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V)		P
2.2.3	Voltages under fault conditions (V)		P
2.2.4	Connection of SELV circuits to other circuits	SELV circuits are only connected to other SELV circuits.	P

2.3	TNV circuits <i>(No TNV circuits within the equipment)</i>		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
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions		N/A



2.3.3	Separation from hazardous voltages		N/A
	Insulation employed.....:		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed.....:		—
2.3.5	Test for operating voltages generated externally		N/A

2.4	Limited current circuits		N/A
2.4.1	General requirements		N/A
2.4.2	Limit values		N/A
	Frequency (Hz).....:		—
	Measured current (mA).....:		—
	Measured voltage (V)		—
	Measured circuit capacitance (nF or μ F).....:		—
2.4.3	Connection of limited current circuits to other circuits		N/A

2.5	Limited power sources		P
	a) Inherently limited output	See appended table 2.5.	P
	b) Impedance limited output	See appended table 2.5.	P
	c) Regulating network limited output under normal operating and single fault condition	See appended table 2.5.	P
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)	See appended table 2.5.	—
	Current rating of overcurrent protective device (A) ..		—
	Use of integrated circuit (IC) current limiters		—

2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	Approved sources of internal power supply are used.	P
2.6.2	Functional earthing	Functional earthing (secondary trace) connected to protective bonding and separated from Hazardous voltage by reinforced insulation.	P
2.6.3	Protective earthing and protective bonding conductors	See below.	P



2.6.3.1	General	No power supply cord provided. See subclause 2.6.3.4.	P
2.6.3.2	Size of protective earthing conductors	No power cord provided.	N/A
	Rated current (A), cross-sectional area (mm ²), AWG		—
2.6.3.3	Size of protective bonding conductors	Complied with sub-clause 2.6.3.4.	P
	Rated current (A), cross-sectional area (mm ²), AWG		—
	Protective current rating (A), cross-sectional area (mm ²), AWG		
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)	From metal enclosure to PE of AC Inlet: Resistance: 0.015Ω, Voltage Drop 0.48V, Test Current 32A, Duration 2min.	P
2.6.3.5	Colour of insulation	No green/yellow wire used except in approved built-in power supply.	N/A
2.6.4	Terminals	See below.	P
2.6.4.1	General	Refer to 2.6.4.2 and 2.6.4.3.	P
2.6.4.2	Protective earthing and bonding terminals	Appliance inlet considered as protective earthing terminal.	P
	Rated current (A), type, nominal thread diameter (mm)		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Appliance inlet used.	P
2.6.5	Integrity of protective earthing	See below.	P
2.6.5.1	Interconnection of equipment	The unit has its own earthing connection. Any other units connected via the output shall be provided SELV only.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches or fuses in earthing conductors.	P
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect protective earth without disconnecting mains; an appliance inlet is used as disconnect device.	P
2.6.5.4	Parts that can be removed by an operator	Plug or inlet, earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P



2.6.5.5	Parts removed during servicing	It is not necessary to disconnect earthing except for the removing of the earthed parts itself.	P
2.6.5.6	Corrosion resistance	All protective earth connections in compliance with Annex J. Specifically no direct Al – Cu contacts.	P
2.6.5.7	Screws for protective bonding	No selftapping screws are used.	N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system	No TNV circuits.	N/A

2.7	Overcurrent and earth fault protection in primary circuits <i>(Evaluated in approved Built-in power supply.)</i>		N/A
2.7.1	Basic requirements		N/A
	Instructions when protection relies on building installation		N/A
2.7.2	Faults not simulated in 5.3.7		N/A
2.7.3	Short-circuit backup protection		N/A
2.7.4	Number and location of protective devices :		N/A
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel..... :		N/A

2.8	Safety interlocks <i>(No such device within this equipment.)</i>		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
	Protection against extreme hazard		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches, relays and their related circuits		N/A
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) :		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test		N/A
2.8.8	Mechanical actuators		N/A



2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, materials containing asbestos and hygroscopic materials are not used as insulation. Electric strength test was conducted after the humidity treatment. See below.	P
2.9.2	Humidity conditioning	See below.	P
	Relative humidity (%), temperature (°C) :	95%, 30°C, 48hours.	—
2.9.3	Grade of insulation	Functional, basic, supplementary, double and reinforced insulation.	P
2.9.4	Separation from hazardous voltages	See below.	P
	Method(s) used :	Method 1 used.	—

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See below.	P
2.10.1.1	Frequency :	The Frequency does not exceeding 30kHz.	P
2.10.1.2	Pollution degrees :	2	P
2.10.1.3	Reduced values for functional insulation	See subclause 5.3.4.	P
2.10.1.4	Intervening unconnected conductive parts	No such conductive parts.	N/A
2.10.1.5	Insulation with varying dimensions	No reduction of distances considered.	N/A
2.10.1.6	Special separation requirements	No TNV circuit.	N/A
2.10.1.7	Insulation in circuits generating starting pulses	No such circuit.	N/A
2.10.2	Determination of working voltage	Measured in the approved built-in power supply.	N/A
2.10.2.1	General	Same as above.	N/A
2.10.2.2	RMS working voltage	Same as above.	N/A
2.10.2.3	Peak working voltage	Same as above.	N/A
2.10.3	Clearances	See below.	N/A
2.10.3.1	General		N/A
2.10.3.2	Mains transient voltages		N/A
	a) AC mains supply:		N/A
	b) Earthed d.c. mains supplies:		N/A
	c) Unearthed d.c. mains supplies:		N/A
	d) Battery operation:		N/A



2.10.3.3	Clearances in primary circuits	In approved built-in power supply	N/A
2.10.3.4	Clearances in secondary circuits		N/A
2.10.3.5	Clearances in circuits having starting pulses	No such circuit.	N/A
2.10.3.6	Transients from a.c. mains supply		N/A
2.10.3.7	Transients from d.c. mains supply		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems		N/A
2.10.3.9	Measurement of transient voltage levels		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network :		N/A
2.10.4	Creepage distances	In approved built-in power supply	N/A
2.10.4.1	General	See below.	N/A
2.10.4.2	Material group and comparative tracking index	See below.	N/A
	CTI tests	Material group IIIb assumed; $100 \leq CTI < 175$.	—
2.10.4.3	Minimum creepage distances	In approved built-in power supply	N/A
2.10.5	Solid insulation	In approved built-in power supply	N/A
2.10.5.1	General	Same as above.	N/A
2.10.5.2	Distances through insulation	Same as above.	N/A
2.10.5.3	Insulating compound as solid insulation		N/A
2.10.5.4	Semiconductor devices		N/A
2.10.5.5	Cemented joints		N/A
2.10.5.6	Thin sheet material – General	In approved built-in power supply.	N/A
2.10.5.7	Separable thin sheet material		N/A
	Number of layers (pcs)		—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure		N/A
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		N/A
	Electric strength test		—
2.10.5.11	Insulation in wound components		N/A
2.10.5.12	Wire in wound components		N/A



	Working voltage		N/A
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation		N/A
	c) Compliance with Annex U		N/A
	Two wires in contact inside wound component; angle between 45° and 90°		N/A
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage		N/A
	- Basic insulation not under stress		N/A
	- Supplementary, reinforced insulation		N/A
2.10.6	Construction of printed boards	In approved built-in power supply.	N/A
2.10.6.1	Uncoated printed boards		N/A
2.10.6.2	Coated printed boards	No coated printed board.	N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs).....		N/A
2.10.7	Component external terminations		N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

3	WIRING, CONNECTIONS AND SUPPLY	P
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3.1	General		P
3.1.1	Current rating and overcurrent protection	Internal cable is UL recognized wiring, which is PVC insulated, rated VW-1, min. 80°C. Internal wiring gauge is suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks, which could damage the insulation and cause hazards.	P
3.1.3	Securing of internal wiring	The wires are secured by soldering and use of quick-connect termination, 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	No such insulators used.	N/A
3.1.6	Screws for electrical contact pressure	No screw used for electrical connection.	N/A
3.1.7	Insulating materials in electrical connections	All current carrying connections are metal to metal.	N/A
3.1.8	Self-tapping and spaced thread screws	No self-tapping or spaced thread screws used.	N/A
3.1.9	Termination of conductors	All conductors are reliably secured.	P
	10 N pull test	After test, no break away or pivot on its terminal.	P
3.1.10	Sleeving on wiring	No sleeving used as supplementary insulation.	N/A

3.2	Connection to a mains supply		P
3.2.1	Means of connection	Approved appliance inlet is provided.	P
3.2.1.1	Connection to an a.c. mains supply	An appliance inlet for connection of detachable power supply cord.	P
3.2.1.2	Connection to a d.c. mains supply	AC mains supply.	N/A
3.2.2	Multiple supply connections	Only one supply connection.	N/A
3.2.3	Permanently connected equipment	Not permanently connected.	N/A



	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets	Evaluated in approved built-in power supply.	P
3.2.5	Power supply cords	No power supply cords provided.	N/A
3.2.5.1	AC power supply cords	Same as above.	N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords	AC power supply cords used.	N/A
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. Enclosure without sharp edges.	N/A
3.2.8	Cord guards	No cord guard.	N/A
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm).....		—
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	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²).....		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm)		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A

3.4	Disconnection from the mains supply		P
3.4.1	General requirement	See below.	N/A



3.4.2	Disconnect devices	Appliance inlet is provided as disconnect devices.	P
3.4.3	Permanently connected equipment	Not permanently connected equipment.	N/A
3.4.4	Parts which remain energized	When power cord is removed from inlet no remaining parts with hazardous voltage in the equipment.	P
3.4.5	Switches in flexible cords	No such components.	N/A
3.4.6	Number of poles - single-phase and d.c. equipment	The appliance inlet disconnects both poles simultaneously.	P
3.4.7	Number of poles - three-phase equipment	Single phase.	N/A
3.4.8	Switches as disconnect devices	Refer to 3.4.2.	N/A
3.4.9	Plugs as disconnect devices	Same as above.	N/A
3.4.10	Interconnected equipment	Interconnection of the power supply to the other equipment by secondary output connectors only.	N/A
3.4.11	Multiple power sources		N/A

3.5	Interconnection of equipment		P
3.5.1	General requirements	See below.	P
3.5.2	Types of interconnection circuits	Interconnection circuits to SELV through the connectors.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N/A
3.5.4	Data ports for additional equipment	All data ports are comply with the requirements of L.P.S. See appended table 2.5.	P

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		P
	Angle of 10°	Unit does not overbalance at 10°.	P
	Test force (N)		N/A

4.2	Mechanical strength		P
4.2.1	General	See below. After tests, unit complies with the requirements of sub-clauses 2.1.1, 2.6.1, 2.10 and 4.4.1.	P
	Rack-mounted equipment.		N/A



4.2.2	Steady force test, 10 N	Evaluated in approved built-in power supply.	N/A
4.2.3	Steady force test, 30 N	30N applied to internal power supply's enclosure.	P
4.2.4	Steady force test, 250 N	250N applied to outer enclosure. No energy or other hazards.	P
4.2.5	Impact test	No hazard as result from steel ball impact test.	P
	Fall test	Same as above.	P
	Swing test	Same as above.	P
4.2.6	Drop test; height (mm)	Not hand-held or direct plug-in equipment.	N/A
4.2.7	Stress relief test	After 7h at 70°C and cooling down to room temperature, no shrinkage, distortion or loosening of outer plastic enclosure parts.	P
4.2.8	Cathode ray tubes	No CRTs provided.	N/A
	Picture tube separately certified		N/A
4.2.9	High pressure lamps	No such lamps.	N/A
4.2.10	Wall or ceiling mounted equipment; force (N)	No such equipment.	N/A
4.2.11	Rotating solid media		N/A
	Test to cover on the door.....		N/A

4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2	Handles and manual controls; force (N)..... :	No handles or controls provided.	N/A
4.3.3	Adjustable controls	No controls provided.	NA
4.3.4	Securing of parts	Mechanical fixings in such a way designed that they will withstand mechanical stress occurring in normal use.	P
4.3.5	Connection by plugs and sockets	No mismatch of connectors, plugs or sockets possible.	P
4.3.6	Direct plug-in equipment	Not direct plug-in type.	N/A
	Torque		—
	Compliance with the relevant mains plug standard		N/A



4.3.7	Heating elements in earthed equipment	No heating elements provided.	N/A
4.3.8	Batteries	Approved non-rechargeable source. See appended table 1.5.1.	P
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery	See appended table 4.3.8.	P
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease	Insulation in intended use not considered to be exposed to oil or grease.	N/A
4.3.10	Dust, powders, liquids and gases	The equipment in intended use not considered to be exposed to dust, powders, liquids and gases.	N/A
4.3.11	Containers for liquids or gases	No container for liquid or gas provided.	N/A
4.3.12	Flammable liquids	No flammable liquids provided.	N/A
	Quantity of liquid (l)		N/A
	Flash point (°C)		N/A
4.3.13	Radiation	See below.	P
4.3.13.1	General	See below.	P
4.3.13.2	Ionizing radiation		N/A
	Measured radiation (pA/kg)		N/A
	Measured high-voltage (kV)		N/A
	Measured focus voltage (kV)		N/A
	CRT markings		N/A
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N/A
	Part, property, retention after test, flammability classification		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N/A
4.3.13.5	Lasers (including laser diodes) and LEDs	LEDs considered as Class I.	P
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class		N/A
4.3.13.5.2	Light emitting diodes (LEDs)	The LED used as indicating lights.	P



4.3.13.6	Other types	No such consideration.	N/A
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4.4	Protection against hazardous moving parts		P
4.4.1	General	See below.	P
4.4.2	Protection in operator access areas	See below.	P
	Household and home/office document/media shredders	No moving parts except for DC fans located within equipment which was no operator accessible area inside.	P
4.4.3	Protection in restricted access locations	Not for restricted access locations used.	N/A
4.4.4	Protection in service access areas	Unintentional contact with inside DC fan is possible. However, indication for power off equipment first in service manual provided.	P
4.4.5	Protection against moving fan blades	No moving parts except for DC fans located within equipment which was no operator accessible area inside.	N/A
4.4.5.1	General	Same as above.	N/A
	Not considered to cause pain or injury. a).....	Same as above.	N/A
	Is considered to cause pain, not injury. b)	Same as above.	N/A
	Considered to cause injury. c)	Same as above.	N/A
4.4.5.2	Protection for users	Same as above.	N/A
	Use of symbol or warning	Same as above.	N/A
4.4.5.3	Protection for service persons	Same as above.	N/A
	Use of symbol or warning	Same as above.	N/A

4.5	Thermal requirements		P
4.5.1	General	See below	P
4.5.2	Temperature tests	See appended table 4.5.1	P
	Normal load condition per Annex L	See Annex L.	P
4.5.3	Temperature limits for materials	See appended table 4.5.1	P
4.5.4	Touch temperature limits	See appended table 4.5.1	P
4.5.5	Resistance to abnormal heat	In approved built-in power supply.	N/A



4.6	Openings in enclosures		P
4.6.1	Top and side openings	See below.	P
	Dimensions (mm)	See the appended table 4.6.1, 4.6.2	P
4.6.2	Bottoms of fire enclosures	See below.	P
	Construction of the bottom, dimensions (mm) ..	See the appended table 4.6.1, 4.6.2	P
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment	The equipment is not transportable equipment.	N/A
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm)		N/A
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks).....		N/A

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 1 used.	P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2	Conditions for a fire enclosure	See below.	P
4.7.2.1	Parts requiring a fire enclosure	With having the following components: - Components in primary - Component in secondary (not supplied by LPS) - Components having unenclosed arcing parts at hazardous voltage or energy level - Insulated wirings The fire enclosure is required.	P
4.7.2.2	Parts not requiring a fire enclosure	See sub-clauses 4.7.2.1	N/A
4.7.3	Materials		P



4.7.3.1	General	Integrated circuits and small electrical parts mounted on a printed wiring board min. rated V-1.	P
4.7.3.2	Materials for fire enclosures	Metal enclosure and plastic enclosure.	P
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 or better.	P
4.7.3.5	Materials for air filter assemblies	No air filter assembly within this equipment.	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6.	P
5.1.2	Configuration of equipment under test (EUT)	See below.	P
5.1.2.1	Single connection to an a.c. mains supply		P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		P
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit	Single phase equipment intended only for connection to TN system.	P
5.1.4	Application of measuring instrument	Tests are conducted using one of the measuring instruments in Annex D, or any other circuit giving the same results.	P
5.1.5	Test procedure		P
5.1.6	Test measurements	See below.	P
	Supply voltage (V)	See appended table 5.1.6.	—
	Measured touch current (mA)	See appended table 5.1.6.	—
	Max. allowed touch current (mA)	See appended table 5.1.6.	—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA)...		—
5.1.7	Equipment with touch current exceeding 3,5 mA	Touch current does not exceed 3.5mA.	N/A



5.1.7.1	General		N/A
5.1.7.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N/A
	Supply voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N/A
	a) EUT with earthed telecommunication ports		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A

5.2	Electric strength		P
5.2.1	General	See appended table 5.2	P
5.2.2	Test procedure	Tabel 5B used.	P

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	See appended table 5.3	P
5.3.2	Motors	Certified DC Fan was used.	N/A
5.3.3	Transformers	In approved Built-in power supply.	N/A
5.3.4	Functional insulation	Functional insulation complies with the requirements.	P
5.3.5	Electromechanical components	No electromechanical component provided.	N/A
5.3.6	Audio amplifiers in ITE		N/A
5.3.7	Simulation of faults	See appended table 5.3	P
5.3.8	Unattended equipment	None of the listed components was provided.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions	See appended table 5.3.	P
5.3.9.1	During the tests	No fire, emission of molten metal or deformation was noted during the tests.	P



5.3.9.2	After the tests	Electric Strength tests performed after abnormal and fault tests.	P
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6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements		N/A
	Supply voltage (V)		—
	Current in the test circuit (mA)		—
6.1.2.2	Exclusions		N/A

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

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

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



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



A.3.3	Compliance criterion		N/A
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B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N/A
B.1	General requirements		N/A
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
B.2	Test conditions		N/A
B.3	Maximum temperatures		N/A
B.4	Running overload test		N/A
B.5	Locked-rotor overload test		N/A
	Test duration (days)		—
	Electric strength test: test voltage (V)		—
B.6	Running overload test for d.c. motors in secondary circuits		N/A
B.6.1	General		N/A
B.6.2	Test procedure		N/A
B.6.3	Alternative test procedure		N/A
B.6.4	Electric strength test; test voltage (V)		N/A
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
B.7.1	General		N/A
B.7.2	Test procedure		N/A
B.7.3	Alternative test procedure		N/A
B.7.4	Electric strength test; test voltage (V)		N/A
B.8	Test for motors with capacitors		N/A
B.9	Test for three-phase motors		N/A
B.10	Test for series motors		N/A
	Operating voltage (V)		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N/A
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—



	Method of protection.....:		—
C.1	Overload test		N/A
C.2	Insulation		N/A
	Protection from displacement of windings.....:		N/A

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

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



G.6	Determination of minimum clearances		N/A
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H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
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J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P
	Metal(s) used	Considerated.	—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability; operating voltage (V)		N/A
K.3	Thermostat endurance test; operating voltage (V)		N/A
K.4	Temperature limiter endurance; operating voltage (V)		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment	See appended table 1.6.2.	P

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringing signal		N/A
M.3.1.1	Frequency (Hz)		—
M.3.1.2	Voltage (V)		—
M.3.1.3	Cadence; time (s), voltage (V)		—
M.3.1.4	Single fault current (mA)		—
M.3.2	Tripping device and monitoring voltage		N/A



M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V):		N/A

N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A

P	ANNEX P, NORMATIVE REFERENCES		—
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Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N/A
	a) Preferred climatic categories:		N/A
	b) Maximum continuous voltage:		N/A
	c) Pulse current:		N/A

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

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

T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A

U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.12)		N/A
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V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P



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

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

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

Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N/A
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AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A
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BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
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CC	ANNEX CC, Evaluation of integrated circuit (IC) current limiters		N/A
CC.1	General		N/A
CC.2	Test program 1.....		N/A
CC.3	Test program 2.....		N/A

DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		N/A
DD.1	General		N/A
DD.2	Mechanical strength test, variable N.....		N/A



DD.3	Mechanical strength test, 250N, including end stops.....:		N/A
DD.4	Compliance.....:		N/A

EE	ANNEX EE, Household and home/office document/media shredders		N/A
EE.1	General		N/A
EE.2	Markings and instructions		N/A
	Use of markings or symbols.....:		N/A
	Information of user instructions, maintenance and/or servicing instructions.....:		N/A
EE.3	Inadvertent reactivation test.....:		N/A
EE.4	Disconnection of power to hazardous moving parts:		N/A
	Use of markings or symbols.....:		N/A
EE.5	Protection against hazardous moving parts		N/A
	Test with test finger (Figure 2A):		N/A
	Test with wedge probe (Figure EE1 and EE2):		N/A



EN 60950-1:2006/A11:2009/A1:2010/A12:2011 – CENELEC COMMON MODIFICATIONS			
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions		P
General	Delete all the “country” notes in the reference document (IEC 60950-1:2005) according to the following list: 1.4.8 Note 2 1.5.1 Note 2 & 3 1.5.7.1 Note 1.5.8 Note 2 1.5.9.4 Note 1.7.2.1 Note 4, 5 & 6 2.2.3 Note 2.2.4 Note 2.3.2 Note 2.3.2.1 Note 2 2.3.4 Note 2 2.6.3.3 Note 2 & 3 2.7.1 Note 2.10.3.2 Note 2 2.10.5.13 Note 3 3.2.1.1 Note 3.2.4 Note 3. 2.5.1 Note 2 4.3.6 Note 1 & 2 4.7 Note 4 4.7.2.2 Note 4.7.3.1 Note 2 5.1.7.1 Note 3 & 4 5.3.7 Note 1 6 Note 2 & 5 6.1.2.1 Note 2 6.1.2.2 Note 6.2.2 Note 6.2.2.1 Note 2 6.2.2.2 Note 7.1 Note 3 7.2 Note 7.3 Note 1 & 2 G.2.1 Note 2 Annex H Note 2		P
General (A1:2010)	Delete all the “country” notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1 Note 6.1.2.1 Note 2 6.2.2.1 Note 2 EE.3 Note		P
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.	See below.	N/A



(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010	Deleted.	N/A
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC	Added.	P
1.7.2.1 (A1:2010)	In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.	The equipment is not a PORTABLE SOUND SYSTEM.	N/A
1.7.2.1 (A12:2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.	Same as above.	N/A
	Zx Protection against excessive sound pressure from personal music players		N/A
	Zx.1 General This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players. A personal music player is a portable equipment for personal use, that: is designed to allow the user to listen to recorded or broadcast sound or video; and primarily uses headphones or earphones that can be worn in or on or around the ears; and allows the user to walk around while in use. NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment. A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause. The requirements in this sub-clause are valid for music or video mode only. The requirements do not apply: while the personal music player is connected to an external amplifier; or while the headphones or earphones are not used. NOTE 2 An external amplifier is an amplifier which is not part		N/A



	<p>of the personal music player or the listening device, but which is intended to play the music as a standalone music player.</p> <p>The requirements do not apply to: hearing aid equipment and professional equipment;</p> <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p>		
	<p>analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015.</p> <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.</p>		N/A
	<p>Zx.2 Equipment requirements</p> <p>No safety provision is required for equipment that complies with the following: equipment provided as a package (personal music player with its listening device), where the acoustic output $L_{Aeq,T}$ is ≤ 85 dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is ≤ 27 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” as described in EN 50332-1.</p> <p>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level $L_{Aeq,T}$ is meant. See also Zx.5 and Annex Zx.</p> <p>All other equipment shall:</p> <ol style="list-style-type: none"> protect the user from unintentional acoustic outputs exceeding those mentioned above; and have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when the power is switched off; and 		N/A



	<p>c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always required.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off.</p> <p>d) have a warning as specified in Zx.3; and</p> <p>e) not exceed the following:</p> <ol style="list-style-type: none"> 1) equipment provided as a package (player with its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed "programme simulation noise" described in EN 50332-1; and 2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" described in EN 50332-1. <p>For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song.</p> <p>NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA.</p> <p>For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA.</p>		N/A
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	<p>Zx.3 Warning The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following: the symbol of Figure 1 with a minimum height of 5 mm; and the following wording, or similar: “To prevent possible hearing damage, do not listen at high volume levels for long periods.”</p> <div data-bbox="497 680 764 940" data-label="Image"> </div> <p>Figure 1 – Warning label (IEC 60417-6044)</p> <p>Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.</p>		N/A
	<p>Zx.4 Requirements for listening devices (headphones and earphones)</p>		N/A
	<p>Zx.4.1 Wired listening devices with analogue input With 94 dBA sound pressure output $L_{Aeq,T}$, the input voltage of the fixed “programme simulation noise” described in EN 50332-2 shall be ≥ 75 mV. This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control). NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.</p>		N/A
	<p>Zx.4.2 Wired listening devices with digital input With any playing device playing the fixed “programme simulation noise” described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic level), the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.).</p>		N/A



	NOTE An example of a wired listening device with digital input is a USB headphone.		
	<p>Zx.4.3 Wireless listening devices</p> <p>In wireless mode: with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA.</p> <p>NOTE An example of a wireless listening device is a Bluetooth headphone.</p>		N/A
	<p>Zx.5 Measurement methods</p> <p>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s.</p> <p>NOTE Test method for wireless equipment provided without listening device should be defined.</p>		N/A
2.7.1	<p>Replace the subclause as follows:</p> <p>Basic requirements</p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p>		P
	c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building	Neither PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT.	N/A



	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.		
2.7.2	This subclause has been declared 'void'.		P
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.	Deleted.	N/A
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: Up to and including 6 0,75 ^{a)} Over 6 up to and including 10 (0,75) ^{b)} 1,0 Over 10 up to and including 16 (1,0) ^{c)} 1,5 In the conditions applicable to Table 3B delete the words "in some countries" in condition ^{a)} . In NOTE 1, applicable to Table 3B, delete the second sentence.		N/A
3.3.4	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		N/A
4.3.13.6 (A1:2010)	Replace the existing NOTE by the following: NOTE Z1 Attention is drawn to: 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and 2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation).		N/A
	Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N/A



Annex H	<p>Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 μSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p>	No ionizing radiation.	N/A
Bibliography	Additional EN standards.		—

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS	—
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ZB ANNEX (normative) SPECIAL NATIONAL CONDITIONS (EN)			
Clause	Requirement + Test	Result - Remark	Verdict
1.2.4.1	In Denmark , certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.	No power cord provided.	N/A
1.2.13.14	In Norway and Sweden , for requirements see 1.7.2.1 and 7.3 of this annex.		N/A
1.5.7.1	In Finland , Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.	No such components.	N/A
1.5.8	In Norway , due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	See the test report.	N/A
1.5.9.4	In Finland , Norway and Sweden , the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N/A
1.7.2.1	In Finland , Norway and Sweden , CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall		N/A



	<p>be as follows:</p> <p>In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p> <p>In Norway and Sweden, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>"Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)."</p>		
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	<p>NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.”</p> <p>Translation to Swedish:</p> <p>”Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”</p>		N/A
1.7.5	<p>In Denmark, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.</p> <p>For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.</p>	No socket-outlet provided.	N/A
2.2.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.2	In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.6.3.3	In the United Kingdom , the current rating of the circuit shall be taken as 13 A, not 16 A.		N/A



2.7.1	In the United Kingdom , to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N/A
2.10.5.13	In Finland, Norway and Sweden , there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N/A
3.2.1.1	<p>In Switzerland, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:</p> <p>SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A</p> <p>SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A</p> <p>SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A</p> <p>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:</p> <p>SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A</p> <p>SEV 5933-2.1998: Plug Type 21, L+N, 250 V, 16A</p> <p>SEV 5934-2.1998: Plug Type 23, L+N+PE 250 V, 16A</p>		N/A



3.2.1.1	<p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p>		N/A
3.2.1.1	<p>In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N/A
3.2.1.1	<p>In the United Kingdom, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N/A



3.2.1.1	In Ireland , apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		N/A
3.2.4	In Switzerland , for requirements see 3.2.1.1 of this annex.		N/A
3.2.5.1	In the United Kingdom , a power supply cord with conductor of 1,25 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N/A
3.3.4	In the United Kingdom , the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm ² to 1,5 mm ² nominal cross-sectional area.		N/A
4.3.6	In the United Kingdom , the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.	Not a direct plug-in equipment.	N/A
4.3.6	In Ireland , DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.	Same as above.	N/A
5.1.7.1	In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and	Not such equipment.	N/A



	<p>has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and is provided with instructions for the installation of that conductor by a SERVICE PERSON;</p> <ul style="list-style-type: none"> • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT. 		
6.1.2.1 (A1:2010)	<p>In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. 		N/A
	<p>It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b).</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, 		N/A



	<p>is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1;</p> <ul style="list-style-type: none"> - the additional testing shall be performed on all the test specimens as described in EN 60384-14; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14. 		
6.1.2.2	<p>In Finland, Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.</p>		N/A
7.2	<p>In Finland, Norway and Sweden, for requirements see 6.1.2.1 and 6.1.2.2 of this annex.</p> <p>The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>		N/A
7.3	<p>In Norway and Sweden, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.</p>		N/A
7.3	<p>In Norway, for installation conditions see EN 60728-11:2005.</p>		N/A



1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
Metal Enclosure	--	--	Min. 1.0mm thickness	--	--	
Plastic Enclosure	SABIC Innovative Plastics Japan L L C	C6600	V-0 or better, min. 1.5mm thickness, 70°C	UL 94, UL 746	UL	
Built-in power supply	FSP Group Inc.	FSP300-20GSVXX (X=0-9, A-Z or blank)	I/P: 100-240V~, 4.5-1.9A, 50-60Hz, O/P: +12Vdc / 12.5A, -53Vdc / 2.8A, Total output continuous shall not exceed 300W. Ambient: 55degree C. Class I	IEC 60950-1: 2005(Seconded Edition)+Am1: 2009, EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011	CB by TUV Rh	
DC Fan for main board (One provided)	Adda Corporation	AD0605LX-D90	5Vdc, 0.16A, Min. 15.81CFM	EN 60950-1: 2006+A11+A1+A12	TUV	
DC Fan for System (One provided)	Adda Corporation	AD0405MS-G70	5Vdc, 0.11A, Min. 5.0CFM	EN 60950-1: 2006+A11+A1+A12	TUV	
RTC Battery	Various	CR2032	3Vdc, max. abnormal charging current 10mA, user replaceable against charging current by multiple components R390 and D15.	UL 1642	UL	
	Hitachi Maxell	CR2032	3Vdc, max. abnormal charging current 10mA.	UL 1642	UL	
HDD (Optional)	Various	Various	5/12Vdc, 0.75/0.55A max.	EN60950-1:2006+A11:2009+A1:2010+A12: 2011 or later version.	Approved by certification Body	



Polyswitch (RT3 for USB, RT4 for USB+ESATA, RT5 for Alarm port)	Littelfuse Inc.	1812L150/24	24Vdc, 1.5A	IEC/EN 60730-1, UL 1434	TUV, UL
Integrated Circuits (U49 for HDMI used)	DIODES INC	AP2331	2.7-5.2Vdc, 2.0A	IEC 60950-1	CB by Nemko
PCB	Various	Various	Min. V-1, min. 105°C	UL 796, UL 94	UL
Supplementary information:					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status
90Vac/50Hz	3.110	--	276.9	F1	3.110	Maximum normal load
90Vac/60Hz	3.110	--	277.1	F1	3.110	Maximum normal load
100Vac/50Hz	2.774	4.5	274.7	F1	2.774	Maximum normal load
100Vac/60Hz	2.774	4.5	274.7	F1	2.774	Maximum normal load
240Vac/50Hz	1.139	1.9	264.9	F1	1.139	Maximum normal load
240Vac/60Hz	1.139	1.9	264.9	F1	1.139	Maximum normal load
254.4Vac/50Hz	1.098	--	265.0	F1	1.098	Maximum normal load
254.4Vac/60Hz	1.098	--	265.0	F1	1.098	Maximum normal load
264Vac/50Hz	1.064	--	264.9	F1	1.064	Maximum normal load
264Vac/60Hz	1.064	--	264.9	F1	1.064	Maximum normal load
264Vac/50 Hz	1.21	--	309.0	F1	1.21	Maximum normal load
264Vac/60 Hz	1.22	--	309.3	F1	1.22	Maximum normal load
Supplementary information: Cross reading/writing data in HDD, each USB port loads 2.5 W, 16 POE ports support total 140W, one POE port supports max. 15W, alarm port loads 12V, 1A and Unit normal record video. (HDD rating 5/12Vdc, 0.75/0.55A).						



2.5	TABLE: limited power sources				P
Circuit output tested: See Below					
Measured Uoc (V) with all load circuits disconnected: See Below					
		I _{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
RS232 Port (J17) (Pin 3: GND)					
According to Table 2B (Normal condition) (Pin 1, 2 to GND), Uoc=0Vdc		0	8.0	0	100
VGA Port (J16) (Pin 2, 4, 6, 8, 10: GND)					
According to Table 2B (Normal condition) (Pin 1, 3 to GND), Uoc=0Vdc		0	8.0	0	100
According to Table 2B (Normal condition) (Pin 5, 7, 9 to GND), Uoc=1.2Vdc		0	8.0	0	100
MIC_OUT&IN Port (J23) (Pin 3, 4, 5, 6: GND)					
According to Table 2B (Normal condition) (Pin1 to GND), Uoc=5.0Vdc		0	8.0	0	100
According to Table 2B (Normal condition) (Pin2 to GND), Uoc=4.3Vdc		0	8.0	0	100
HDMI Port (J21) (Pin 2, 5, 8, 11, 14, 17: GND)					
According to Table 2B (Normal condition) (Pin Pin 18 to GND), Uoc=5.0Vdc *		0.4	8.0	1.8	100
According to Table 2B (Normal condition) (Pin 15, 16 to GND), Uoc=4.9Vdc		0	8.0	0	100
According to Table 2B (Normal condition) (Pin 1, 3, 4, 6, 7, 9, 10, 12, 13, 19 to GND), Uoc=0Vdc		0	8.0	0	100
USB&e-SATA Port (J25 on main board) (Pin A4, B4, S1, S4, S7: GND)					
According to Table 2B (Normal condition) (Pin Pin A1, B1 to GND), Uoc=5.0Vdc*		3.1	8.0	12.4	100
According to Table 2B (Normal condition) (Pin Pin A2-A3, B2-B3, S2-S3, S5-S6 to GND), Uoc=0Vdc		0	8.0	0	100
USB Port (J2 on main board) (Pin 4: GND)					
According to Table 2B (Normal condition) (Pin Pin 1 to GND), Uoc=5.0Vdc*		3.2	8.0	12.8	100
According to Table 2B (Normal condition) (Pin Pin 2, 3 to GND), Uoc=0Vdc		0	8.0	0	100
According to Table 2B (Normal condition) (Pin Pin 2, 3 to GND), Uoc=0Vdc		0	8.0	0	100
RJ45 Port (J20) (Pin 9, 11, BO1, BO2: GND)					



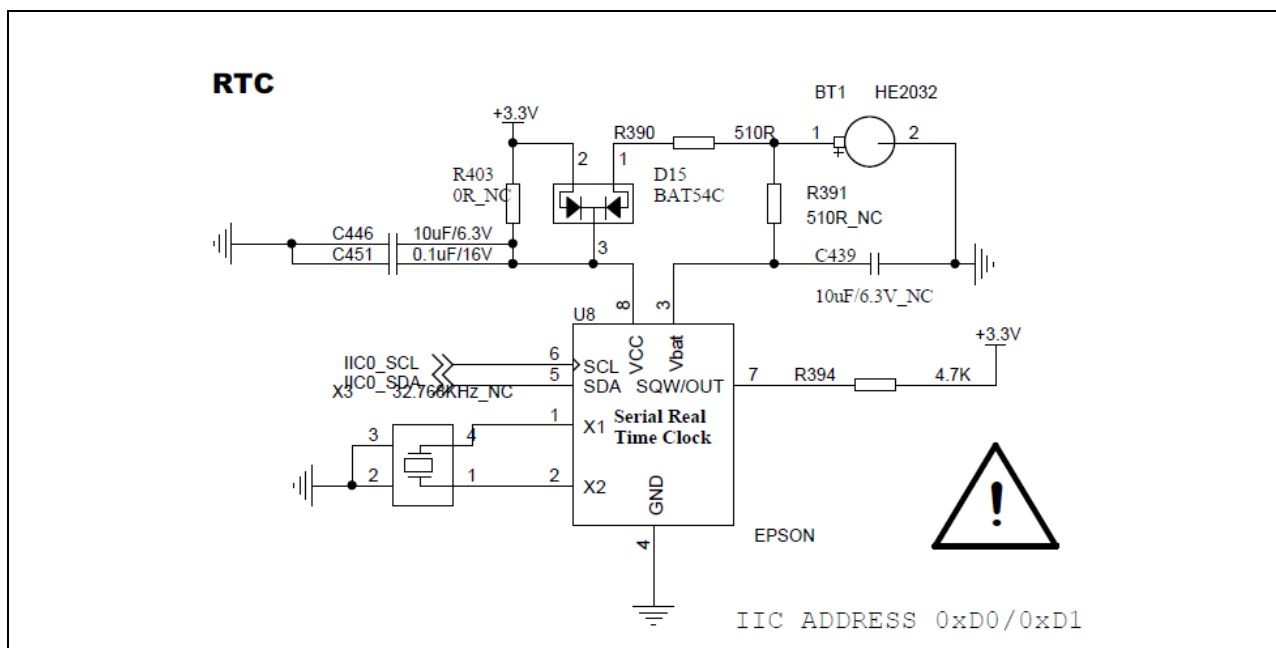
According to Table 2B (Normal condition) (Pin Pin 1-8, 10, 12 to GND), Uoc=0Vdc	0	8.0	0	100
ALARM Port (J18) (Pin 9, 10, 19, 20: GND)				
According to Table 2B (Normal condition) (Pin Pin 1-8, Pin11-18 to GND), Uoc=4.2Vdc	0	8.0	0	100
ALARM Port (J19) (Pin 14, 16, 17, 19: GND)				
According to Table 2B (Normal condition) (Pin Pin 8, 10, 12 to GND), Uoc=12.0Vdc*	3.0	8.0	33.0	100
According to Table 2B (Normal condition) (Pin Pin 18 to GND), Uoc=5.0Vdc	0	8.0	0	100
According to Table 2B (Normal condition) (Pin Pin 1- 7, 9, 11, 13, 15, 20 to GND), Uoc=0Vdc	0	8.0	0	100
Video Port (J22) (Pin 3, 4, 5, 6: GND)				
According to Table 2B (Normal condition) (Pin Pin 2 to GND), Uoc=0Vdc	0	8.0	0	100
supplementary information:				
1.*Indicate J25(USB&E-SATA Port) are Protected By PTC(RT4), J2(USB Port) is Protected By PTC(RT3), J19(Alarm Port) is Protected By PTC(RT5), J21(HDMI Port) is Protected By IC (U49).				
2.The detail information of RT3, RT4, RT5 and U49 refer to appended table 1.5.1.				

4.3.8	TABLE: Batteries								P
The tests of 4.3.8 are applicable only when appropriate battery data is not available						See below.			P
Is it possible to install the battery in a reverse polarity position?						Not possible.			--
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition	--	--	0	--	--	--	--	--	--
Max. current during fault condition (D15 Pin1 to Pin2 Shorted)	--	--	6.5	--	--	--	--	--	--



4.3.8	TABLE: Batteries								P
The tests of 4.3.8 are applicable only when appropriate battery data is not available					See below.				P
Is it possible to install the battery in a reverse polarity position?					Not possible.				--
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during fault condition (R390 Shorted)	--	--	0	--	--	--	--	--	--
Test results:									Verdict
- Chemical leaks					No chemical leak.				P
- Explosion of the battery					No explosion of the battery.				P
- Emission of flame or expulsion of molten metal					No emission of flame or expulsion of molten metal.				P
- Electric strength tests of equipment after completion of tests									N/A
Supplementary information:									

4.3.8	TABLE: Batteries	P
Battery category : Lithium		
Manufacturer : See appended table 1.5.1		
Type / model : See appended table 1.5.1		
Voltage : See appended table 1.5.1		
Capacity : --		
Tested and Certified by (incl. Ref. No.)..... : See appended table 1.5.1 & 4.3.8		
Circuit protection diagram: See below		



MARKINGS AND INSTRUCTIONS (1.7.2.1, 1.7.13)

Location of replaceable battery	In service access areas
Language(s)	English
Close to the battery	N/A
In the servicing instructions	Provided.
In the operating instructions	N/A

4.5	TABLE: Thermal requirements						P
	Supply voltage (V)	90Vac/60Hz		264Vac/50Hz		--	—
	Ambient T _{min} (°C)	See below	See below	See below	See below	--	—
	Ambient T _{max} (°C)	See below	See below	See below	See below	--	—
Maximum measured temperature T of part/at::		T (°C)					Allowed T _{max} (°C)
AC inlet (in power adapter)		33.5	65.1	33.0	60.3	--	70
CX1 body (in power adapter)		34.9	66.5	34.5	61.8	--	85
L10 coil (in power adapter)		40.1	71.7	39.3	66.6	--	105
C10 body (in power adapter)		32.4	64.0	32.4	59.7	--	105
T1 coil (in power adapter)		45.1	76.7	44.3	71.6	--	110



T1 core (in power adapter)	49.7	81.3	49.0	76.3	--	110	
CY8 body (in power adapter)	42.3	73.9	40.8	68.1	--	85	
L20 coil (in power adapter)	42.1	73.7	42.2	69.5	--	105	
PCB near HS1 (in power adapter)	52.9	84.5	45.8	73.1	--	105	
PCB near HS2 (in power adapter)	46.5	78.1	45.9	73.2	--	105	
PCB near U23 (on POE board)	39.9	71.5	40.7	68.0	--	105	
PCB near U5 (on POE board)	42.7	74.3	43.4	70.7	--	105	
PCB near T1 (on POE board)	43.0	74.6	44.1	71.4	--	105	
PCB near T2 (on POE board)	39.2	70.8	40.1	67.4	--	105	
PCB near T3 (on POE board)	46.8	78.4	47.7	75.0	--	105	
PCB near T4 (on POE board)	39.3	70.9	40.3	67.6	--	105	
PCB near U20 (on main board)	34.1	65.7	33.4	60.7	--	105	
RTC body (on main board)	32.9	64.5	33.2	60.5	--	--	
PCB near T1 (on main board)	33.4	65.0	34.3	61.6	--	105	
PCB near L1 (on main board)	39.1	70.7	40.4	67.7	--	105	
PCB near U21 (on main board)	36.1	67.7	37.3	64.6	--	105	
HDD body	31.8	63.4	32.9	60.2	--	--	
Internal Plastic enclosure	27.8	59.4	28.8	56.1	--	--	
External Plastic enclosure	26.8	58.4	27.8	55.1	--	95	
Metal enclosure near Adapter	28.7	60.3	29.4	56.7	--	70	
Ambient	23.4	Shift to 55.0	27.7	Shift to 55.0	--	--	
Supplementary information:							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							
1. The temperature were measured under the worse case normal mode defined in 1.2.2.1 and as described in sub-clause 1.6.2 at voltage as described above.							
2. The maximum ambient temperature (Tma) permitted by the manufacturer's specification is 55°C.							

4.6.1, 4.6.2 Table: enclosure openings			P
Location	Size (mm)	Comments	
Top side	None	--	
Bottom side	None	--	
Front side	None	--	



Rear side	Max. Diagonal 3.0mm	Total area is rough 3890 mm ² , Openings that do not exceed 5 mm in any dimension.
Left side	Max. Diagonal 4.5mm	One regular hexagon area is rough 3800 mm ² , numerous regular hexagon openings. Openings that do not exceed 5mm in any dimension.
	Max. Diagonal 4.5mm	One rectangle area is rough 800 mm ² , numerous regular hexagon openings. Openings that do not exceed 5mm in any dimension.
Right side	Max. Diagonal 4.5mm	One rectangle area is rough 2100 mm ² , numerous regular hexagon openings. Openings that do not exceed 5mm in any dimension.
	Max. Diagonal 4.5mm	One regular hexagon area is rough 3800 mm ² , numerous regular hexagon openings. Openings that do not exceed 5mm in any dimension.
Note(s):		

4.7	TABLE: Resistance to fire					P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
PCB	--	--	-	1)	1)	
Metal Enclosure	--	Metallic	1)	1)	1)	
Plastic Enclosure	1)	1)	1)	1)	1)	
Supplementary information:						
1) For details refer to table 1.5.1.						

5.1	TABLE: touch current measurement			P
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
Metal Enclosure	0.5	3.5	Switch "e" opened, Polarity Switch P1 Normal, Primary Switch on	
Metal Enclosure	0.5	3.5	Switch "e" opened, Polarity Switch P1 Reverse, Primary Switch on	
Earthed SELV terminal	0.5	3.5	Switch "e" opened, Polarity Switch P1 Normal, Primary Switch on	
Earthed SELV terminal	0.5	3.5	Switch "e" opened, Polarity Switch P1 Reverse, Primary Switch on	
Plastic enclosure with metal foil	0.005	0.25	Switch "e" closed, Polarity Switch P1 Normal, Primary Switch on	



Plastic enclosure with metal foil	0.005	0.25	Switch "e" closed, Polarity Switch P1 Reverse, Primary Switch on
Metal Enclosure	0.8	3.5	Switch "e" opened, Polarity Switch P1 Normal, Primary Switch off
Metal Enclosure	0.1	3.5	Switch "e" opened, Polarity Switch P1 Reverse, Primary Switch off
Earthed SELV terminal	0.8	3.5	Switch "e" opened, Polarity Switch P1 Normal, Primary Switch off
Earthed SELV terminal	0.1	3.5	Switch "e" opened, Polarity Switch P1 Reverse, Primary Switch off
Plastic enclosure with metal foil	0.005	0.25	Switch "e" closed, Polarity Switch P1 Normal, Primary Switch off
Plastic enclosure with metal foil	0.005	0.25	Switch "e" closed, Polarity Switch P1 Reverse, Primary Switch off
supplementary information:			
Test Voltage 264Vac, 60Hz			

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			P
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Functional:				
Line to Neutral (without fuse)		AC	1500	No
Basic/supplementary:				
Line and Neutral to Metal enclosure		DC	2800	No
Reinforced:				
Line and Neutral to Plastic enclosure		AC	3000	No
Line and Neutral to SELV terminal		DC	4242	No
Supplementary information:				
<ul style="list-style-type: none"> - All electrical strength test durations last at least 60s. - All applied test voltages for electric strength (In table 5B) are based on the working voltage measured on T1 of switching power supply: 301Vr.m.s, 604Vpeak. 				

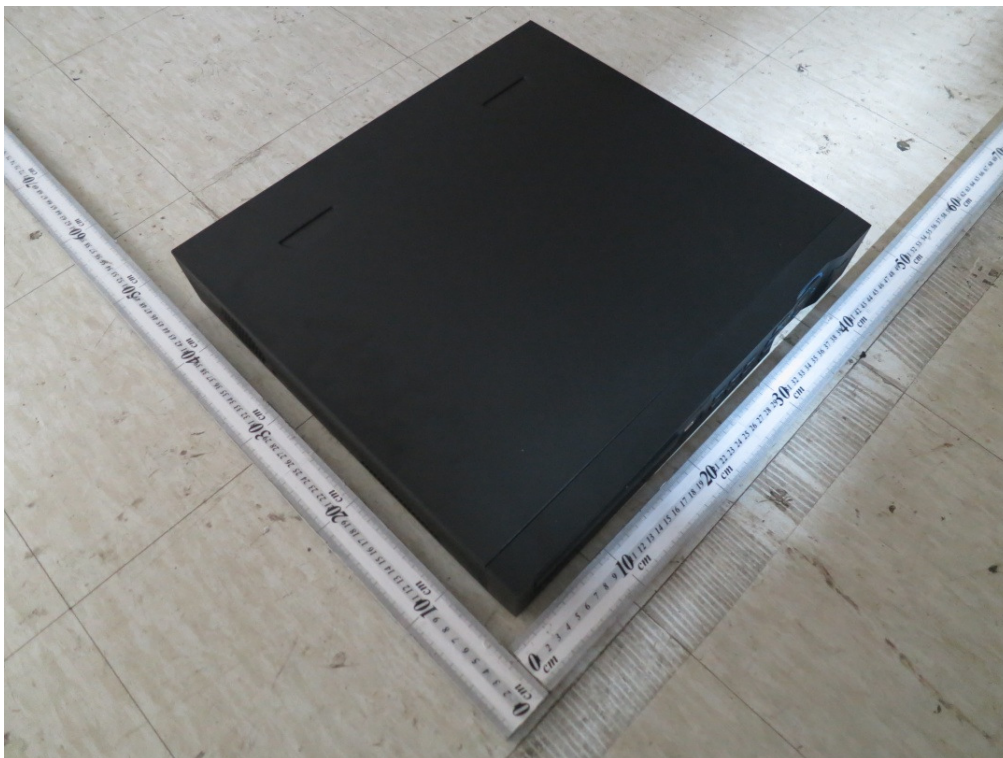
5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C)		See below			—
	Power source for EUT: Manufacturer, model/type, output rating		See table 1.5.1.			—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation



All Ventilation openings	Blocked	240Vac/ 50Hz	3hrs. 23mins.	F1	1.139→ 1.139	Unit operated normally, Max. Temp. of T1 coil (in power adapter)= 56.5°C, T1 core (in power adapter)= 63.7°C, PCB near T4 (on POE board)= 54.6°C, PCB near U21 (on main board)= 46.6°C. Ambient= 28.3°C, no damaged, no hazard.
DC Fan for main Board	Locked	240Vac/ 50Hz	2hrs. 29mins.	F1	1.139→ 1.137	Unit operated normally, Max. Temp. of T1 coil (in power adapter)= 44.3°C, T1 core (in power adapter)= 49.0°C, PCB near U21 (on main board)= 47.3°C. Ambient= 27.7°C, no damaged, no hazard.
DC Fan For System	Locked	240Vac/ 50Hz	1hr. 36mins.	F1	1.139→ 1.133	Unit operated normally, Max. Temp. of T1 coil (in power adapter)= 43.4°C, T1 core (in power adapter)= 48.5°C, PCB near U21 (on main board)= 40.6°C. Ambient= 22.2°C, no damaged, no hazard.
Power Fan	Locked	240Vac/ 50Hz	1hr. 51mins.	F1	0	Fuse opened after 10 mins, Max. Temp. of T1 coil (in power adapter)= 57.7°C, T1 core (in power adapter)= 61.2°C, PCB near U21 (on main board)= 39.0°C. Ambient= 27.6°C, no hazard.
Supplementary information:						



Photo(s)





Photo(s)



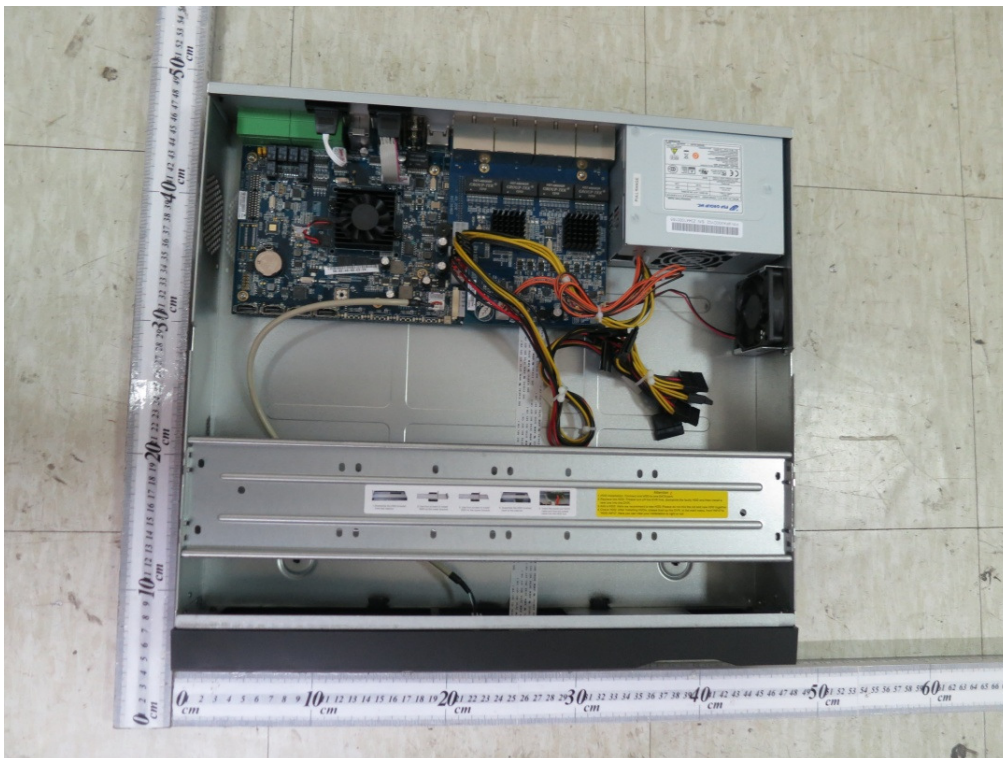


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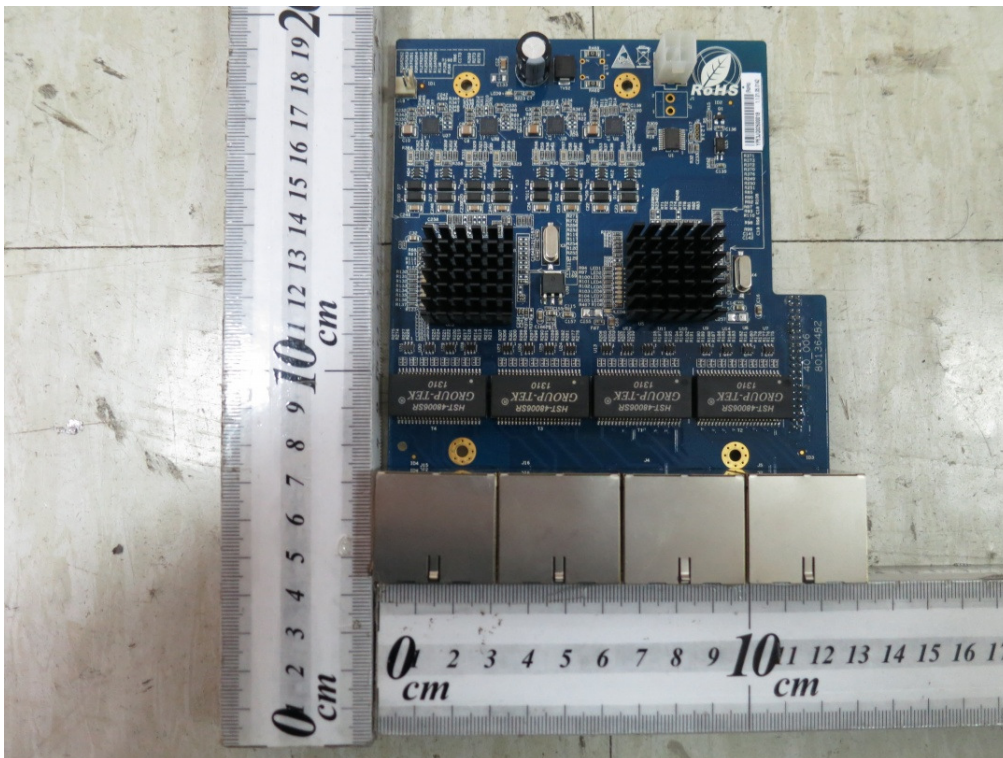
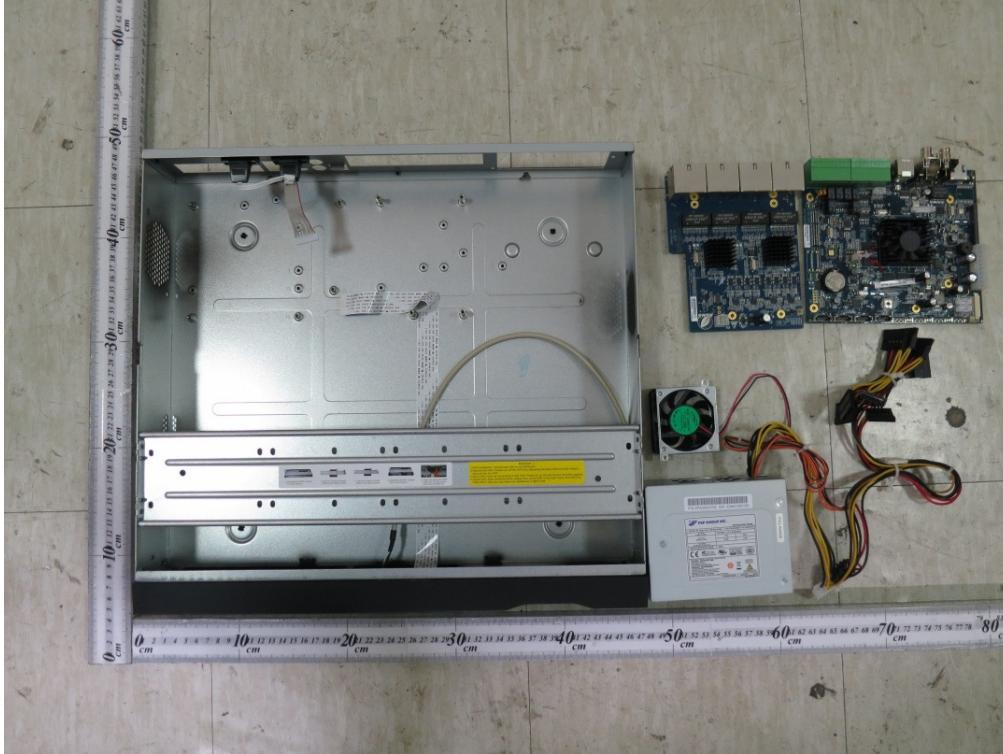


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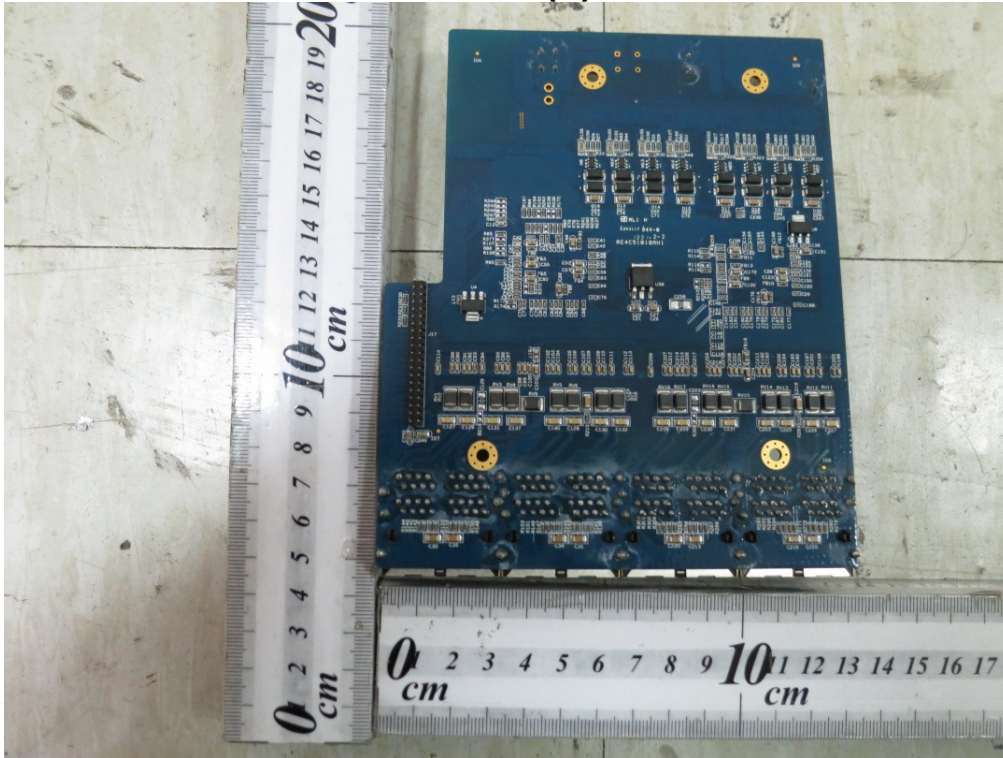


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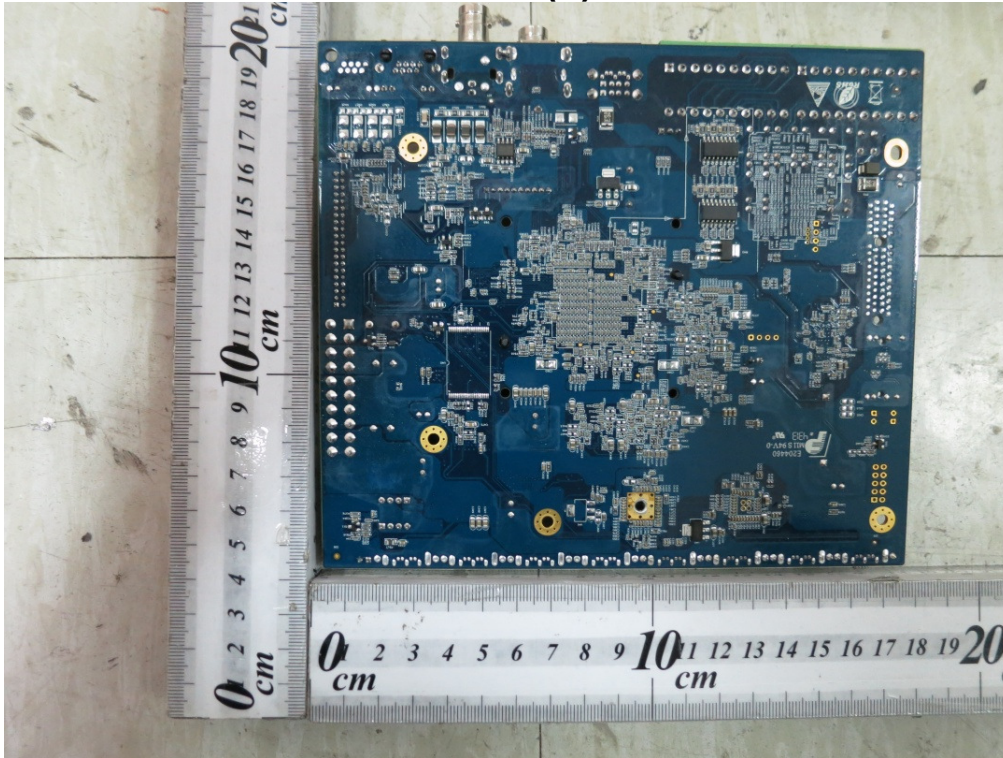


Photo(s)





Photo(s)



Built-in power supply (Manufacturer: FSP, Model: FSP300-20GSV)





Photo(s)





REMARKS:

1. The instructions specified by the standard have to be in official language of each country, however, only English is checked for this report. It is the applicant responsibility to provide instruction in each official language of the EU.
2. This report is submitted for the exclusive use of the client to whom it is addressed. Its significance is subject to the adequacy and representative character of the sample(s) and to the comprehensiveness of the tests, examinations or surveys made.
3. This report justified only the submitted samples exclusively and not necessarily implies that all other samples are also to be found in same result.
4. The CE marking may only be used if all relevant and effective EC directives are complied with.