IEC | IECEE CB SCHEME

Ref. Certif. No.

JPTUV-006709

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product Produit	Server
Name and address of the applicant Nom et adresse du demandeur	Advantech Co., Ltd. 4F, No. 108-3, Ming Chuan Rd. Hsin Tien City, Taipei Hsien 231 Taiwan
Name and address of the manufacturer Nom et adresse du fabricant	Advantech Co., Ltd. 4F, No. 108-3, Ming Chuan Rd. Hsin Tien City, Taipei Hsien 231 Taiwan
Name and address of the factory Nom et adresse de l'usine	(See appendix for factories information)
Rating and principal characteristics Valeurs nominales et caractéristiques principales	Input Rating : AC 100-127/200-240V, 60/50Hz, 5/2.5A Protection Class: I
Trade mark (if any) Marque de fabrique (si elle existe)	ADVANTECH
Model/type Ref. Ref. de type	SG-4104XXXXXX (X can be any alphanumeric character or blank)
Additional information (if necessary) Information complémentaire (si nécessaire)	For differences between the models, refer to the test report
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	**PUBLICATION** **EDITION** IEC 60950:1999 inclusive CENELEC Common Modifications National differences see test report
As shown in the Test Report Ref. No.which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce Certificat	12005830 001

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

TÜV

TÜV Rheinland Berlin Brandenburg

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Date: 14.08.2003

Signature:

Dipl.-Ing. R. Keller

10/061-1 4.03

TÜV

Appendix to CB Certificate JPTUV-006709
Report Number: 12005830 001

Name and address of the manufacturer
Advantech Co., Ltd.
4F, No. 108-3, Ming Chuan Rd.
Hsin Tien City, Taipei Hsien 231
Taiwan

Name and address of the factory(ies)
Advantech Co., Ltd.

Fl.5, No.1, Lane 169, Kang-Ning St.
Xi-Zhi, Taipei Hsien 221
Taiwan

ADVANTECH CO., LTD.

3rd FL, NO. 10
LANE 130, MING CHUAN RD
HSIN-TIEN, TAIPEI HSIEN, 231
Taiwan

SUPERIOR CO., LTD.

TIENSONG AREA, QINGXING TOWN
DONGGUAN GUANGDONG
P.R. China

ADVANTECH CO., LTD.

NO. 600, HAN-PU ROAD, YU-SHAN
KUN-SHAN JIANGSU
P.R. China

Beijing Yan Hua Xing Ye Electronic Science & Technology Co., Ltd

No.7, 6th Street, Shang Di Zone
Haidian District, Beijing
P.R. China

Date: 14.08.2003

Dipl.-Ing. R. Keller

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TEST REPORT

IEC 60950 and/or EN 60950

Safety of information technology equipment

Report reference No	<12005830 001>
Tested by (printed name and signature)	P. Petschnig
Approved by (printed name and signature)	M. Teng
Date of issue	11 Aug., 2003
Testing Laboratory Name	TÜV Rheinland Japan Ltd., Yokohama Laboratory
Address	Festo Bldg. 5F, 1-26-10 Hayabuchi, Tsuzuki-ku, Yokohama 224-0025, Japan
Testing location	CBTL ☒ CCATL ☐ SMT ☐ TMP ☐
Address	Same as above.
Applicant's Name	Advantech Co., Ltd.
Address	4F., No. 108-3, Ming Chuan Rd, Hsin Tien City, Taipei Hsien 231, Taiwan
Test specification	
Standard	IEC 60950:1999 + Corr. Jan. 2000 EN 60950:2000 + Corr. Feb. 2002 CAN/CSA C22.2 No. 60950/UL 60950 third edition, J60950 (H14), K60950, UL 60950
Test procedure	CB scheme
Procedure deviation	Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Korea, Malaysia, The Netherlands, Norway, Poland, Portugal, Russian Federation, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States
Non-standard test method	N.A.
Test Report Form No.	IECEN60950A
TRF originator	SGS Fimko Ltd
Master TRF	dated 2003-03

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Test item description	Server
Manufacturer.....	Same as applicant
Trademark	ADVANTECH
Model and/or type reference	SG-4104XXXXXX (Where the X can be any alphanumeric character or blank)
Serial number.....	Pre-production without serial number
Rating(s)	100-127/200-240 Vac, 60/50 Hz, 5/2.5 A

Particulars: test item vs. test requirements	
Equipment mobility	Movable equipment
Operating condition	Continuous operation
Mains supply tolerance (%)	±10%
Tested for IT power systems	Yes
IT testing, phase-phase voltage (V)	IT, 230V for Norway
Class of equipment	Class I
Mass of equipment (kg)	5 kg
Protection against ingress of water	IPX0
Test case verdicts	
Test case does not apply to the test object	**N**(.A.)
Test item does meet the requirement.....	**P**(ass)
Test item does not meet the requirement.....	**F**(ail)
Testing	
Date of receipt of test item	July, 2003
Date(s) of performance of test	July, 2003

General remarks

"This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02".

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

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

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

"(see Annex #)" refers to an annex appended to the report.

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

Comments

Factory(ies):

1) ADVANTECH CO., LTD.
   5th FL, NO. 1, LANE 169, KANG-NING ST, XI-ZHI CITY, TAIPEI HSIEN 221, TAIWAN
2) ADVANTECH CO., LTD.
   3RD FL, NO. 10, LANE 130, MING CHUAN RD, HSIN-TIEN, TAIPEI HSIEN, 231, TAIWAN
3) SUPERIOR CO., LTD.
   TIENSONG AREA, QINGXING TOWN, DONGGUAN GUANGDONG, CHINA
4) ADVANTECH CO., LTD.
   NO. 600, HAN-PU ROAD, YU-SHAN, KUN-SHAN JIANGSU, CHINA
5) BEIJING YAN HUA XING YE ELECTRONIC SCIENCE & TECHNOLOGY CO., LTD.
   NO.7, 6TH STREET, SHANG DI ZONE, HAIDIAN DISTRICT, BEIJING, P.R.CHINA

Brief description of the test sample:

The equipment, model SG-4104XXXXXX (Where the X can be any alphanumeric character or blank), is a desktop type server for general office use.

The internal building-in switching power supply is CB Scheme tested and evaluated according to Standard IEC 60950:A1+A2+A3+A4. For details of the power supply, refer to appended table 1.5.1.

The test samples were pre-production sample without serial numbers.

Specified maximum ambient temperature is 50℃.

All tests are performed with CPU: Intel, Pentium III, 866MHz.

Copy of marking plate(s):

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1	GENERAL		**P**
1.5	Components		**P**
1.5.1	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 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 or had been evaluated during this approval.	**P**
	Dimensions (mm) of mains plug for direct plug-in :	Equipment is not direct plug-in type.	**N**
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N)..... :		**N**
1.5.3	Thermal controls	No thermal controls provided.	**N**
1.5.4	Transformers	No transformer except in approved SPS.	**N**
1.5.5	Interconnecting cables	No interconnecting cables.	**N**
1.5.6	Capacitors in primary circuits .....:	In approved SPS.	**N**
1.5.7	Double or reinforced insulation bridged by components		**N**
1.5.7.1	Bridging capacitors		**N**
1.5.7.2	Bridging resistors		**N**
1.5.7.3	Accessible parts		**N**
1.5.8	Components in equipment for IT power systems		**N**

1.6	Power interface		**P**
1.6.1	AC power distribution systems	TN power system. IT power system for Norway only.	**P**
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is communicated with PC and network server in highest transmitting speed.	**P**
1.6.3	Voltage limit of hand-held equipment	This appliance is not hand-held equipment.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.6.4	Neutral conductor	In approved SPS.	**P**
1.7	Marking and instructions		**P**
1.7.1	Power rating	See below.	**P**
	Rated voltage(s) or voltage range(s) (V) .....:	100-127/200-240V	**P**
	Symbol for nature of supply for d.c. .....:	Mains from AC source	**N**
	Rated frequency or frequency range (Hz) .....:	50/60Hz	**P**
	Rated current (A) .....:	5/2.5A	**P**
	Manufacturer's name/Trademark .....:	ADVANTECH	**P**
	Type/model .....:	SG-4104XXXXXX (Where the X can be any alphanumeric character or blank)	**P**
	Symbol of Class II .....:	Class I equipment.	**N**
	Other symbols .....:	Additional symbols or marking does not give rise to misunderstanding.	**P**
	Certification marks .....:	Not shown.	**N**
1.7.2	Safety instructions	Safety instruction, operations and maintenance guide, which contain information for operation, installation, servicing, transport, storage, troubleshooting and technical data were provided.	**P**
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	**N**
1.7.4	Supply voltage adjustment .....:	No voltage select switch.	**N**
1.7.5	Power outlets on the equipment .....:	No outlets.	**N**
1.7.6	Fuse identification .....:	In approved SPS.	**P**
1.7.7	Wiring terminals	See below.	**N**
1.7.7.1	Protective earthing and bonding terminals	Appliance inlet used.	**N**
1.7.7.2	Terminal for a.c. mains supply conductors	The equipment with appliance inlet, which is intended for use with detachable type power supply cord.	**N**
1.7.8	Controls and indicators	See below.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.8.1	Identification, location and marking .....:	The marking and indication of the front panel switch is located that indication of function is clearly.	**P**
1.7.8.2	Colours .....:	No safety relevant control or indicator.	**N**
1.7.8.3	Symbols according to IEC 60417 .....:	Marking for power switch according to IEC 60417 No. 5007 (line as ON) and 5008 (circle as OFF).	**P**
1.7.8.4	Markings using figures .....:	No indicators for different positions.	**N**
1.7.9	Isolation of multiple power sources .....:	Single mains supply.	**P**
1.7.10	IT power system	To be evaluated when submitted for national approval.	**N**
1.7.11	Thermostats and other regulating devices	None.	**N**
1.7.12	Language .....:	Installation instruction and marking in English. Versions of other languages will be provided, if necessary, during the national approval processes.	—
1.7.13	Durability	The marking plate was subjected to the permanence of marking test. The marking plate 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 marking. The marking on the label did not fade. There was no curling of the marking.	**P**
1.7.14	Removable parts	No marking provided on removable patrs.	**N**
1.7.15	Replaceable batteries	RTC Lithium battery for real time clock is exchangeable. Warning sentence printed in manual.	**P**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	Language.....:	English. Versions of other languages will be provided, if necessary, during the national approval processes.	—
1.7.16	Operator access with a tool.....:	The inside of the server is regarded to be service access area. This area is accessible when enclosure of server is being disassembled with screwdriver. When the enclosure is disassembled, the earthed metal enclosure of SPS is accessible. However, the SPS enclosure can be opened with the same screwdriver as the screw head is in same construction. Therefore, the SPS provided with electric shock hazard symbol (ISO 3864, No. 5036) on its rating label to discourage the user to access.	**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		**P**
2.1.1.1	Access to energized parts	See below	**P**
	Test by inspection .....:	The inside of server is regarded to be service access area. With the disassembled server enclosure, the accessible SPS is covered with an earthed metal enclosure. The construction of this metal enclosure prevents the accessibility to any parts with only basic insulation to ELV or hazardous voltage with test pin or test finger.	**P**
	Test with test finger .....:	dto	**P**
	Test with test pin .....:	dto	**P**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	Test with test probe .....:	No TNV.	**N**
2.1.1.2	Battery compartments .....:	Equipment contains no battery compartment.	**N**
2.1.1.3	Access to ELV wiring	No ELV wiring in operator access area.	**N**
	Working voltage (V); distance (mm) trough insulation		—
2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage wiring in operator access area.	**N**
2.1.1.5	Energy hazards .....:	The energy hazard in service personnel access area was prevented touching by guarding.	**P**
2.1.1.6	Manual controls	No conductive shafts of operating knobs and handles.	**N**
2.1.1.7	Discharge of capacitors in the primary circuit	In approved SPS.	**P**
	Time-constant (s); measured voltage (V).....:		—
2.1.2	Protection in service access areas	The inside compartment of the server is considered as service access area, any hazardous parts accessible are prevented touching by guarding.	**P**
2.1.3	Protection in restricted access locations	The unit is not intended to use in restricted locations.	**N**

2.2	SELV circuits		**P**
2.2.1	General requirements	See below.	**P**
2.2.2	Voltages under normal conditions (V) .....:	Between any SELV circuits 42.4V peak or 60VDC are not exceeded	**P**
2.2.3	Voltages under fault conditions (V) .....:	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71V peak and 120V DC were not exceed and SELV limits not for longer than 0.2 seconds.	**P**
2.2.3.1	Separation by double or reinforced insulation (method 1)	In approved SPS.	**P**
2.2.3.2	Separation by earthed screen (method 2)		**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		**N**
2.2.4	Connection of SELV circuits to other circuits ..... :	See 2.2.2 and 2.2.3. No direct connection between SELV and any primary circuits.	**N**
2.3	TNV circuits		**N**
2.3.1	Limits		**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		**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		**N**
	Inherently limited output		**N**
	Impedance limited output		**N**
	Overcurrent protective device limited output		**N**
	Regulating network limited output under normal operating and single fault condition		**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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) ..... :		—
	Current rating of overcurrent protective device (A)		—
2.6	Provisions for earthing and bonding		**P**
2.6.1	Protective earthing	In approved SPS.	**P**
2.6.2	Functional earthing	Secondary functional earthing is connected to protectively earthed conductive part that separated from primary by basic insulation.	**P**
2.6.3	Protective earthing and protective bonding conductors	In approved SPS.	**P**
2.6.3.1	Size of protective earthing conductors		**N**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
2.6.3.2	Size of protective bonding conductors	See 2.6.3.3.	**P**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
2.6.3.3	Rated current (A), type and nominal thread diameter (mm) ..... :		**N**
	Resistance (Ω) of earthing conductors and their terminations, test current (A) ..... :	See appended table 2.6.3.3.	**P**
2.6.3.4	Colour of insulation ..... :	No green/yellow wire used except in approved SPS.	**P**
2.6.4	Terminals	See below.	**P**
2.6.4.1	Protective earthing and bonding terminals	Appliance inlet used.	**N**
	Rated current (A), type and nominal thread diameter (mm) ..... :	Not permanently connected equipment.	—
2.6.4.2	Separation of the protective earthing conductor from protective bonding conductors	In approved SPS.	**P**
2.6.5	Integrity of protective earthing	See below.	**P**
2.6.5.1	Interconnection of equipment	This unit has its own earthing connection. Any other units connected via the output shall be provided SELV only. The equipment does not comprise class I and class II.	**P**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device in protective earthing or bonding conductor.	**P**
2.6.5.3	Disconnection of protective earth	Appliance inlet provided.	**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 part itself.	**P**
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	**P**
2.6.5.7	Screws for protective bonding	No screw for protective bonding.	**N**
2.6.5.8	Reliance on telecommunication network	No TNV.	**N**

2.7	Overcurrent and earth fault protection in primary circuits		**P**
2.7.1	Basic requirements	Equipment relies on 16A rated fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short circuit. Over current protection is provided in approved SPS.	**P**
	Instructions when protection relies on building installation	In approved SPS.	**P**
2.7.2	Faults not covered in 5.3 (EN 60950: Void)	Pluggable equipment type A, the building installation is considered as providing short circuit protection.	**P**
2.7.3	Short-circuit backup protection	In approved SPS.	**P**
2.7.4	Number and location of protective devices ..... :	In approved SPS.	**P**
2.7.5	Protection by several devices	In approved SPS.	**N**
2.7.6	Warning to service personnel..... :		**N**

2.8	Safety interlocks		**N**
2.8.1	General principles		**N**
2.8.2	Protection requirements		**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.8.3	Inadvertent reactivation		**N**
2.8.4	Fail-safe operation		**N**
2.8.5	Interlocks with moving parts		**N**
2.8.6	Overriding an interlock		**N**
2.8.7	Switches and relays in interlock systems		**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 (V)		**N**
2.8.8	Mechanical actuators		**N**
2.9	Electrical insulation		**P**
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used.	**P**
2.9.2	Humidity conditioning	40 °C, 95% R.H. for 120 h (tested for tropical condition).	**P**
2.9.3	Requirements for insulation	Insulation complies with sub-clauses 2.10, 4.5.1 and 5.2.	**P**
2.9.4	Insulation parameters	Both parameters were considered.	**P**
2.9.5	Categories of insulation	The adequate levels of safety insulation are provided and maintained to comply with the requirements of this standard.	**P**
2.10	Clearances, creepage distances and distances through insulation		
2.10.1	General	See 2.10.3, 2.10.4, 2.10.5.	**P**
2.10.2	Determination of working voltage	The rms and the peak voltage of the appliance is mains voltage 240V max. The unit was connected to a 240V TN power system.	**P**
2.10.3	Clearances	See below and advantage of annex G is not considered.	**P**
2.10.3.1	General	Considered.	**P**
2.10.3.2	Clearances in primary circuits	All in approved SPS.	**P**
2.10.3.3	Clearances in secondary circuits	See 5.3.4.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.10.3.4	Measurement of transient levels	No transient voltage across the clearance lower than due or normal.	**N**
2.10.4	Creepage distances	See 5.3.4.	**N**
	CTI tests ..... :		—
2.10.5	Solid insulation		**N**
2.10.5.1	Minimum distance through insulation		**N**
2.10.5.2	Thin sheet material		**N**
	Number of layers (pcs) ..... :		—
	Electric strength test		—
2.10.5.3	Printed boards ..... :		**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 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 (℃) ..... :		**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 ..... :	No hermetically sealed component.	**N**
	Temperature T_1=T_2 = T_{mra} – T_{amb} +10K (°C) ..... :		**N**
2.10.8	Spacings filled by insulating compound..... :		**N**
	Electric strength test		—
2.10.9	Component external terminations		**N**
2.10.10	Insulation with varying dimensions	Insulation kept homogenous.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
3	WIRING, CONNECTIONS AND SUPPLY		**P**
3.1	General		**P**
3.1.1	Current rating and overcurrent protection	Secondary cable is UL recognized wiring which is PVC insulated, VW-1, minimum 80℃. Internal wiring gauge is suitable for current intended to be carried.	**P**
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	**P**
3.1.3	Securing of internal wiring	The internal wiring is secured by solder pins, cable tie or tubing so that loosening of the terminal connections 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	Screws engage at least two complete threads into the metal enclosure. No screws of insulating material are used for electrical connections, or where supplementary or reinforced insulation could be impaired by a metal screws replacement.	**P**
3.1.7	Non-metallic materials in electrical connections	Spring washer, washer and screw are used.	**P**
3.1.8	Self-tapping and spaced thread screws	No self-tapping screws are used.	**P**
3.1.9	Termination of conductors	All conductors are reliable secured.	**P**
	10 N pull test		**N**
3.1.10	Sleeving on wiring	Sleeving on wiring is either heat-shrinkable or fixed by cable tie.	**P**
3.2	Connection to a.c. mains supplies		**P**

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Clause	Requirement – Test	Result – Remark	Verdict
3.2.1	Means of connection	Appliance inlet.	**P**
3.2.2	Multiple supply connections	Single supply connection.	**N**
3.2.3	Permanently connected equipment	Pluggable equipment.	**N**
	Number of conductors, diameter (mm) of cable and conduits ..... :		—
3.2.4	Appliance inlets	The appliance inlet complies with IEC/EN 60320. The power cord can be inserted without difficulties and is not intended to support the equipment.	**P**
3.2.5	Power supply cords	Not provided.	**N**
	Type..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG..... :		—
3.2.6	Cord anchorages and strain relief		**N**
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage	There are no parts of this equipment, which may damage the power supply cord to be provided.	**P**
3.2.8	Cord guards		**N**
	D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space	Appliance inlet is used.	**N**

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	Rated current (A), cord/cable type, cross-sectional area (mm^2) ..... :		**N**
3.3.5	Rated current (A), type and nominal thread diameter (mm)..... :		**N**
3.3.6	Wiring terminals design		**N**
3.3.7	Grouping of wiring terminals		**N**
3.3.8	Stranded wire		**N**

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Clause	Requirement – Test	Result – Remark	Verdict

3.4	Disconnection from the a.c. mains supply		**P**
3.4.1	General requirement	See below.	**P**
3.4.2	Disconnect devices	Appliance coupler (inlet) is provided as disconnection device.	**P**
3.4.3	Permanently connected equipment	Not permanently connected equipment.	**N**
3.4.4	Parts which remain energized	When the coupler is disconnected there are not remaining parts at hazardous voltage in the equipment.	**P**
3.4.5	Switches in flexible cords	Not provided.	**N**
3.4.6	Single-phase equipment	The appliance coupler disconnects both poles simultaneously.	**P**
3.4.7	Three-phase equipment	Single phase.	**N**
3.4.8	Switches as disconnect devices		**N**
3.4.9	Plugs as disconnect devices		**N**
3.4.10	Interconnected equipment	Interconnection to other devices by secondary output cable only.	**N**
3.4.11	Multiple power sources		**P**

3.5	Interconnection of equipment		**P**
3.5.1	General requirements	See below.	**P**
3.5.2	Types of interconnection circuits ..... :	Interconnection circuits of SELV through secondary output cables.	**P**
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) ..... :	Equipment is not a floorstanding unit.	**N**

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Clause	Requirement – Test	Result – Remark	Verdict
4.2	Mechanical strength		**P**
4.2.1	General	See below. After tests, unit complies with 2.1.1, 2.6.1, and 2.10.	**P**
4.2.2	Steady force test, 10 N	10N applied to components other than parts serving as an enclosure.	**P**
4.2.3	Steady force test, 30 N	30N applied to all internal enclosures. No energy or other hazards.	**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	The steel sphere fall test and swung test are tested and found in compliance.	**P**
4.2.6	Drop test		**N**
4.2.7	Stress relief	Metal enclosure.	**N**
4.2.8	Cathode ray tubes	No CRT.	**N**
	Picture tube separately certified ..... :		
4.2.9	High pressure lamps	No high-pressure lamp.	**N**
4.2.10	Wall or ceiling mounted equipment; force (N) ....:		**N**
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 hazards.	**P**
4.3.3	Adjustable controls	None that would cause hazard.	**P**
4.3.4	Securing of parts	Electrical and mechanical connections and parts expected to withstand usual mechanical stress.	**P**
4.3.5	Connection of plugs and sockets	No mismating connector, plug or socket possible.	**P**
4.3.6	Direct plug-in equipment	Not direct plug in type.	**N**
	Torque (Nm)..... :		—
4.3.7	Heating elements in earthed equipment	No heating elements provided.	**N**

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Clause	Requirement – Test	Result – Remark	Verdict
4.3.8	Batteries	For RTC battery: a) Prevent from force charging by internal circuit. b) Reverse polarity installation is prevented by compartment design.	**P**
4.3.9	Oil and grease	Equipment in intended use not considered to be exposed to oil or grease.	**N**
4.3.10	Dust, powders, liquids and gases	Dto.	**N**
4.3.11	Containers for liquids or gases	No container for liquids or gases provided.	**N**
4.3.12	Flammable liquids ..... :		**N**
	Quantity of liquid (l) ..... :		**N**
	Flash point (°C) ..... :		**N**
4.3.13	Radiation; type of radiation ..... :	See below.	**P**
	Equipment using lasers	The LED energy is far below the limit of LED class 1 if LED used in equipment.	**P**
4.4	Protection against hazardous moving parts		**P**
4.4.1	General	See below.	**P**
4.4.2	Protection in operator access areas	No hazardous moving parts are used in operator access area.	**N**
4.4.3	Protection in restricted access locations		**N**
4.4.4	Protection in service access areas	The DC fans are protected and prevented touching by fan guard.	**P**
4.5	Thermal requirements		**P**
4.5.1	Temperature rises	Refer to appended table 4.5.1.	**P**
	Normal load condition per Annex L..... :	Maximum normal load as defined by the manufacturer.	**P**
4.5.2	Resistance to abnormal heat	In approved SPS.	**N**
4.6	Openings in enclosures		**P**

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Clause	Requirement – Test	Result – Remark	Verdict
4.6.1	Top and side openings	No hazardous parts within 5° projection area.	**P**
	Dimensions (mm) ..... :		—
4.6.2	Bottoms of fire enclosures	No openings.	**P**
	Construction of the bottom ..... :		—
4.6.3	Doors or covers in fire enclosures		**N**
4.6.4	Openings in transportable equipment		**N**
4.6.5	Adhesives for constructional purposes		**N**
	Conditioning temperature/time		—
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**
4.7.2	Conditions for a fire enclosure	See below.	**N**
4.7.2.1	Parts requiring a fire enclosure	With having the following parts: · Components in primary · Components in secondary (not supplied by LPS) · Components having unenclosed arcing parts at hazardous voltage or energy level · 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	The sources of PCB refer to appended table 1.5.1.	**P**
4.7.3.2	Materials for fire enclosures	Metal chassis.	**N**
4.7.3.3	Materials for components and other parts outside fire enclosures		**N**
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 assemblies provided.	**N**
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	**N**

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Clause	Requirement – Test	Result – Remark	Verdict

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

5.2	Electric strength		**P**
5.2.1	General	See appended table 5.2.	**P**
5.2.2	Test procedure	See appended table 5.2.	**P**

5.3	Abnormal operating and fault conditions		**P**
5.3.1	Protection against overload and abnormal operation	See below.	**P**
5.3.2	Motors	Approved components used.	**N**
5.3.3	Transformers	In approved SPS.	**N**

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Clause	Requirement – Test	Result – Remark	Verdict
5.3.4	Functional insulation..... :	By short-circuited, test results see appended table 5.3.	**P**
5.3.5	Electromechanical components	No electromechanical component other than motor provided.	**N**
5.3.6	Simulation of faults	Faults in primary and secondary components and operational insulation were already considered during the approval of the SPS. Ventilation blocked and DC fan locked test: Results see appended table. No hazard by operating buttons and controls not in accordance with the instructions.	**P**
5.3.7	Unattended equipment	Neither thermostat or temperature limiter nor thermal cut-out provided.	**N**
5.3.8	Compliance criteria for abnormal operating and fault conditions	Neither fire occured nor molten metal was emitted. Electric strength test primary to secondary and primary to earth were passed.	**P**

6	CONNECTION TO TELECOMMUNICATION NETWORKS		**N**
6.1	Protection of telecommunication network service personnel, 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**
6.2.1	Separation requirements		**N**
6.2.2	Electric strength test procedure		**N**
6.2.2.1	Impulse test		**N**

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Clause	Requirement – Test	Result – Remark	Verdict
6.2.2.2	Steady-state test		**N**
6.2.2.3	Compliance criteria		**N**
6.3	Protection of telecommunication wiring system from overheating		**N**
	Max. output current (A) ..... :		—
	Current limiting method..... :		—
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		**N**
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		**N**
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**
A.2.1	Samples		—
	Wall thickness (mm) ..... :		—
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, 8		**N**
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.3	High current arcing ignition test (see 4.7.3.2)		**N**

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Clause	Requirement – Test	Result – Remark	Verdict
A.3.1	Samples		—
	Wall thickness (mm) ..... :		—
A.3.5	Compliance criteria		**N**
	Sample 1 number of arcs to ignition (pcs) ..... :		—
	Sample 2 number of arcs to ignition (pcs) ..... :		—
	Sample 3 number of arcs to ignition (pcs) ..... :		—
	Sample 4 number of arcs to ignition (pcs) ..... :		—
	Sample 5 number of arcs to ignition (pcs) ..... :		—
A.4	Hot wire ignition test (see 4.7.3.2)		**N**
A.4.1	Samples		—
	Wall thickness (mm) ..... :		—
A.4.5	Compliance criteria		**N**
	Sample 1 ignition time (s) ..... :		—
	Sample 2 ignition time (s) ..... :		—
	Sample 3 ignition time (s) ..... :		—
	Sample 4 ignition time (s) ..... :		—
	Sample 5 ignition time (s) ..... :		—
A.5	Hot flaming oil test (see 4.6.2)		**N**
A.6	Flammability tests for classifying materials V-0, V-1 or V-2		**N**
A.6.1	Samples		—
	Wall thickness (mm) ..... :		—
A.6.5	Compliance criteria		**N**
A.6.6	Permitted retest		**N**
A.7	Flammability test for classifying foamed materials HF-1, HF-2 or HFB		**N**
A.7.1	Sample		—
	Wall thickness (mm) ..... :		—
A.7.4	Compliance criteria		**N**
A.7.5	Compliance criteria, HF-2		**N**
A.7.6	Compliance criteria, HF-1		**N**
A.7.7	Compliance criteria, HBF		**N**
A.7.8	Permitted retest, HF-1 or HF-2		**N**
A.7.9	Permitted retest, HBF		**N**
A.8	Flammability test for classifying materials HB		**N**

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Clause	Requirement – Test	Result – Remark	Verdict
A.8.1	Samples		—
	Sample thickness (mm) ..... :		—
A.8.2	Conditioning of samples; temperature (°C) ..... :		**N**
A.8.4	Test procedure		**N**
A.8.5	Compliance criteria		**N**
A.8.6	Permitted retest		**N**
A.9	Flammability test for classifying materials 5V		**N**
A.9.1	Samples		—
	Sample thickness (mm) ..... :		—
A.9.4	Test procedure, test bars		**N**
A.9.5	Test procedure, test plaques		**N**
A.9.6	Compliance criteria ..... :		**N**
A.9.7	Permitted retest		**N**
A.10	Stress relief conditioning (see 4.2.7)		**N**
	Temperature (°C)..... :		—
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS		**N**
B.1	General requirements		**N**
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
B.2	Test conditions		**N**
B.3	Maximum temperatures		**N**
B.4	Running overload test		**N**
B.5	Locked-rotor overload test		**N**
	Test duration (days) .....:		—
	Electric strength test: test voltage (V) .....:		—
B.6	Running overload test for DC motors in secondary circuits		**N**
B.7	Locked-rotor overload test for DC motors in secondary circuits		**N**
B.7.1	Test procedure		**N**
B.7.2	Alternative test procedure; test time (h).....:		**N**

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Clause	Requirement – Test	Result – Remark	Verdict
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 of displacement of windings :		**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.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**
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		**N**
	Ionizing radiation		**N**
	Measured radiation (mR/h) .....:		—
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—

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Clause	Requirement – Test	Result – Remark	Verdict
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		**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**
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		**N**
M.2	Method A		**N**
M.3	Method B		**N**
M.3.1	Ringing signal		**N**
M.3.1.1	Frequency (Hz)..... :		**N**
M.3.1.2	Voltage (V) ..... :		**N**
M.3.1.3	Cadence; time (s), voltage (V) ..... :		**N**
M.3.1.4	Single fault current (mA) ..... :		**N**
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**
M.3.2.3	Monitoring voltage (V) ..... :		**N**
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4).		**N**
	Separate test report		**N**

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Clause	Requirement – Test	Result – Remark	Verdict
	SPECIAL NATIONAL CONDITIONS AND NATIONAL DEVIATIONS S = Special National Condition, A = National Deviation (A-deviation), C = CENELEC Common Modification, F = other information		**P**
	C: delete all the "country" notes that appear on the following pages of the reference document (IEC 60950:1999): 85, 91, 99, 103, 117, 119, 123, 125, 149, 171, 213, 215, 219, 251, 283, 325, 327, 331, 333 and 407	Deleted.	**P**
1.2.4.1	S (DK): certain types of Class I appliances (see subclause 3.2.1) may be provided with a plug not establishing earthing continuity when inserted into Danish socket-outlets	No power supply cord provided.	**N**
1.5.1	A (CH, SE): add the following: NOTE: Switches containing mercury such as thermostats, relays and level controllers are not allowed	No such swithes used.	**N**
1.5.8	S (NO): due to the IT power system used (see annex V, figure V.7), capacitors are required to be rated for the applicable phase-to phase voltage (230 V)	Complied.	**P**
1.7.2	S (NO): class I pluggable equipment type A intended for connection to other equipment or a communication network shall, if safety relies on connection to protective earth, require a marking stating that the equipment must be connected to an earthed mains socket outlet	Provided.	**P**
	S (SE): if the separation between the mains and SELV terminal relies upon connection to the safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet. The marking text shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk."	Shall be provided in national approval.	**N**
	A (DK): supply cords of Class I equipment, which are 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 (IEC 417, No. 5019 eller IEC 417, No. 5017)." 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	No power supply cord provided.	**N**

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Clause	Requirement – Test	Result – Remark	Verdict
	conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning."		
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	No socket outlets.	**N**
	A (DK): Class II equipment shall not be fitted with socket-outlets for providing power to other equipment	Class I equipment.	**N**
1.7.12	A (DE): (Gesetz über techische 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 national approval.	**P**
1.7.15	A (CH): (Ordinance on environmentally hazardous substances SR 814.013) Annex 4.10 of SR 814.013 applies for batteries	To be evaluated when national approval.	**N**
	F (ALL): warning texts for lithium batteries		**N**
	Languages ..... :		—
2.2.4	S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply	No TNV circuits provided.	**N**
2.3.2	S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply	No TNV circuits provided.	**N**
2.3.3	S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply	No TNV circuits provided.	**N**
2.3.4	S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply	No TNV circuits provided.	**N**
2.7.1	C: replace the subclause as follows: Basic requirements To protect against excessive current, short circuits	Replaced.	**P**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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 integral parts of the equipment. b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short circuit and earth fault protection may be provided by protective devices in the building installation. c) It is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instruction. 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	C: This subclause has been declared 'void'	Void.	**N**
2.10.3.1	S (NO): due to the IT power distribution system used (see annex V, figure 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	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 884-1 and one of the following dimensions 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 60 309 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,	No power supply cord provided.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	16 A - SEV 5934-2:1998: plug type 23, L+N+PE 250 V, 16 A		
	S (DK): supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to the Heavy Current Regulations Section 107-2-D1. Class I equipment provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with Standard Sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a rated current exceeding 10 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations Section 107-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 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 Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE: "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug	No power supply cord provided.	**N**
	S (IE): apparatus which is fitted with a flexible	No power supply cord	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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	provided.	
3.2.3	C: delete note 1, and in table 3A delete the conduit sizes in parentheses	Deleted.	**N**
	C: replace "60245 IEC 53" by "H05 RR-F", "60227 IEC 52" by "H03 VV-F or H03 VVH2-F" and "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, delete the second sentence	Replaced	**N**
	S (GB): a power supply cord with conductor of 1,25 mm² is allowed for equipment with 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 Delete the fifth line – conductor sizes for 13 to 16 A.	Deleted.	**N**
	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 mm² to 1,5 mm² nominal cross-sectional area		**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 a direct plug-in equipment.	**N**
	S (IE): direct plug-in equipment is known as plug similar devices. Such devices shall comply with	Not a direct plug-in equipment.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	Statutory Instrument 526:1997 – National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997		
4.3.13	C: replace the second compliance paragraph by: For equipment using LEDs or lasers, compliance is checked according to EN 60825-1 NOTE 1 – If equipment falling within the scope of EN 60950 is inherently a class 1 laser product, i.e. it contains no embedded laser or LED of a higher class number, then a laser warning label or other laser warning statement is not required (see 1.1 of EN 60825-1) Renumber the NOTE below the third compliance paragraph as NOTE 2	Replaced.	**P**
6.1.2.1	S (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 subjected to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2	No TNV circuits.	**N**
6.1.2.2	S (FI, NO, SE): the exclusions are applicable for permanently connected equipment and pluggable equipment type B only	No TNV circuits.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
G.2	S (NO): due to the IT power distribution system used (see annex V, figure 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.	**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 exceecd 1 μSv/h (0,1 mR/h) (see note). Account is taken of the background level	Replaced.	**N**
	C: replace the NOTE as follows: NOTE – These values appear in Directive 96/29/Euratom		**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 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	No CRT.	**N**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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 adequately screened by the intrinsically safe CRT		
Annex P	C: replace the text of this annex by: See Annex ZA	Replaced.	**N**
Annex Q	C: Add the following notes for the standards indicated: IEC 60127 series NOTE: Harmonized as EN 60127 series (not modified) IEC 60269-2-1 NOTE: Harmonized as HD 630.2.1 S2:1997 (modified) IEC 60529 NOTE: Harmonized as EN 60529:1991 (not modified) IEC 61032 NOTE: Harmonized as EN 61032:1998 (not modified)	Added.	**N**
Annex ZA	C: This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate palces 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. NOTE: When an international publication has been modivied by common modifications, indicated by (mod), the relevant EN/HD applies. — — EN 60065[1)]:1993 + corr. Nov. 1993	IEC 60065 (mod):1985	**P**

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	EN 60073:1996	IEC 60073:1996	
	HD 566 S1:1990	IEC 60085:1984	
	HD 214 S2:1980	IEC 60112:1979	
	HD 21[2)] Series	IEC 60227 (mod) Series	
	HD 22[3)] Series	IEC 60245 (mod) Series	
	EN 60309 Series	IEC 60309 Series	
	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	
	—	IEC 60384-14:1993	
	EN 60417-1:1999	IEC 60417-1:1998	
	EN 60417-2:1999	IEC 60417-2:1998	
	HD 625.1 S1:1996 + corr. Nov. 1996	IEC 60664-1 (mod):1992	
	EN 60695-2-1/1:1996	IEC 60695-2-1/1:1994 + corr. May 1995	
	EN 60695-2-2:1994	IEC 60695-2-2:1991	
	—	IEC 60695-10-2:1995	
	EN 60730-1:1995	IEC 60730-1 (mod):1993	
	EN 60825-1:1994 + corr. Feb. 1995 + A11:1996 + corr. July 1997	IEC 60825-1:1993	
	EN 60851-3:1996	IEC 60851-3:1995	
	EN 60851-5:1996	IEC 60851-5:1996	
	EN 60851-6:1996	IEC 60851-6:1996	
	—	IEC 60885-1:1987	
	EN 60990:1999	IEC 60990:1999	
	—	IEC 61058-1:1996	
	—	ISO 261:1973	
	—	ISO 262:1973	
	—	ISO 3864:1984	
	—	ISO 4046:1978	
	—	ISO 7000:1989	
	ITU-T Recommendation K.17:1988, Tests on power-fed repeaters using solid-state devices in order to check the arrangements for protection from external interference		
	ITU-T Recommendation K.21:1996, Resistibility of subscribers' terminals to overvoltages and		

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	overcurrents _____ 1) EN 60065:1993 is superseded by EN 60065:1998 + corrigendum June 1999, which is based on IEC 60065:1998, mod. 2) The HD 21 series is related to, but not directly equivalent with the IEC 60227 series. 3) The HD 22 series is related to, but not directly equivalent with the IEC 60245 series.		

1.5.1	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])	
DC Fan (For system) (Two provided)	ACT-RX Technology Corporation	FD1240-A1(C)D	12 Vdc, 0.19 A	UL 507 EN 60950	TÜV, UL	
	Sunonwealth	GM1204PKVX-AF	12 Vdc, 0.12 A, 10.8 CFM	UL 507 EN 60950	TÜV, UL	
Power supply	Enhance Electronics Co., Ltd.	ENP-1815	I/p: 100-127/200-240Vac, 5/2.5A, 60/50Hz O/p: +3.3V/7A, +5V/12A, +12V/5A, -12V/1A, -5Vdc/0.2A, +5VSB/2.0A; total 150W Class I	EN 60950 UL 60950	TÜV, UL	
Lithium Battery	Toshiba	CR2032	3 V, 220 mAh Max. Abnormal Charging Current 10mA	UL 1642	UL	
	Rayovac	BR2032	3 V, 195 mAh. Max. Abnormal Charging Current 4 mA	UL 1642	UL	
DC Fan (For CPU)	Delta	EFB0512HA-F00	12 Vdc, 0.15 A, 10.26CFM	UL 507 EN 60950	TÜV, UL	
HDD Drive (Optional)	--	--	5 Vdc, 0.85 A maximum, 12 Vdc, 0.75 A maximum.	UL 60950	UL, CSA	
PCB	--	--	V-1 or better, 105°C min.	UL94	UL	
Enclosure	--	--	Metal, thickness 1.2 mm.	--	--	
Internal wire	--	--	Rated min. 60 V, 80°C.	UL 758	UL	

Note:

1) An asterisk indicates a mark, which assures the agreed level of surveillance.

1.6.2	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (A)	condition/status
--	5	100V/50Hz	57	0.89	--	Normal operation

--	5	100V/60Hz	57	0.88	--	dto.
--	5	127V/50Hz	60	0.77	--	dto.
--	5	127V/60Hz	60	0.77	--	dto.
--	2.5	200V/50Hz	56	0.51	--	dto.
--	2.5	200V/60Hz	56	0.51	--	dto.
--	2.5	240V/50Hz	59	0.47	--	dto.
--	2.5	240V/60Hz	59	0.47	--	dto.

2.1.1.5	TABLE: max. V, A, VA test				N
Voltage (Rated) (V)	Current (Rated) (A)	Voltage (Max) (V)	Current (Max.) (A)	VA (Max.) (VA)	
Note: The energy hazard in service personnel access area was prevented touching by guarding.					

2.1.1.7	TABLE: discharge test				N
Condition	τ calculated (s)	τ measured (s)	t u→ 0V (s)	comments	
Overall capacity: in approved SPS Discharge resistor: in approved SPS					

2.2.2	TABLE: Hazardous voltage measurement			N
Transformer	Location	max. Voltage		Voltage Limitation Component
		V peak	V d.c.	

2.2.2	TABLE: SEL voltage measurement		N
Location	Voltage measured (V)	Comments	

2.4.2	TABLE: limited current circuit measurement		N

Location	Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments
Output measured with a 2kΩ non-inductive resistor as load.					

2.5	TABLE: limited power source measurement		N
	Limits	Measured	Verdict
U_{oc} = 5.08V (measured under no load conditions)			
According to Table 2B (Normal Condition)			
I. For USB J54 Connector			
current (in A)	8		
apparent power (in VA)	5x U_{oc} (25.4)		

2.6.3.3	TABLE: ground continue test	P
Location	Resistant measured (mΩ)	Comments
Inlet ground pin to metal chassis	0.32	Test current=25A
Inlet ground pin to metal chassis	0.50	Test current=40A

2.10.2	Table: working voltage measurement		N
Location	RMS Voltage (V)	Peak Voltage (V)	Comments

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements					N
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Note: Functional insulation shorted, see sub-clause 5.3.4.						

2.10.5	TABLE: distance through insulation measurements			N
distance through insulation di at/of:	U r.m.s. (V)	test voltage (V)	required di (mm)	di (mm)

4.5	TABLE: temperature rise measurements			P
	test voltage (V) .....:	100V-10%/240V+10%		—
	t1 (°C) .....:	--		—
	t2 (°C) .....:	--		—
rise ΔT of part/at:		ΔT (K)		allowed ΔT (K)
L1 Coil		15	14	55
T1 Coil (class B)		12	18	60
T2 Coil (class A)		10	7	40
T3 Coil (class A)		10	8	40
The PCB near CPU		13	12	55
The PCB near U19		17	13	55
Metal Enclosure		3	5	20
HDD body		9	6	--
Room Ambient (°C)		23	27	--

temperature rise ΔT of winding:	R_1 (Ω)	R_2 (Ω)	ΔT (K)	allowed ΔT (K)	insulation class

Comments:

The temperatures were measured by thermal couple method under worst case normal load as described in 1.6.1 at voltages described in 1.6.5.

With a specified ambient temperature of 50℃, the max. temperature rise is calculated as follows:

Winding components or components:

- class A → ΔTmax = 75K – 10K – (50-25)K = 40K

- class B → ΔTmax = 95K – 10K – (50-25)K = 60K

Electrolyte capacitor or components with:

- max. absolute temp. of 105℃ → ΔTmax = (105-50) K = 55K

Touchable enclosure surface with:

- metal parts → ΔTmax = 45K-(50-25) K = 20K

Note:

Test was performed with two system fans (ACT-RX Technology Corporation, FD1240-A1(C)D).

4.5.2	TABLE: ball pressure test of thermoplastic parts		N
	allowed impression diameter (mm) .....:	≤ 2 mm	—
part		test temperature (°C)	impression diameter (mm)

4.6.1, 4.6.2	Table: enclosure openings	P
Location	Size (mm)	Comments
Top	--	No opening.
Right	2 by 12	No hazardous parts within 5 degree projection area.
Left	2 by 12	No hazardous parts within 5 degree projection area.
Bottom	--	No opening.
Rear	5 by 27. 3.5 by 30 max.	Numerous openings for system fans. Numerous openings of SPS fan's guard. No hazardous parts within 5 degree projection area.
Front	--	No opening.

5.1.6	TABLE: touch current measurement			P
Condition	L→ terminal A (mA)	N → terminal A (mA)	Limit (mA)	comments
Stand by Switch on	0.38	0.36	3.5	Metal chassis
Stand by Switch off	0.05	0.05	3.5	Metal chassis
Input voltage : 264V Input frequency : 60Hz Overall capacity: In approved SPS.				

5.2	TABLE: electric strength tests and impulse tests	P
test voltage applied between:	test voltage (V)	breakdown Yes / No
Primary and Secondary	DC 4242	No
Primary and Earthed	DC 2414	No

5.3	TABLE: fault condition tests		P
	ambient temperature (°C) .....:	25°C	—
	model/type of power supply .....:	ENP-1815	—
	manufacturer of power supply .....:	Enhance Electronics	—
	rated markings of power supply .....:	See table 1.5.1.	—

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
1	Ventilation Openings	blocked	240	3 hrs	--	--	Temperature of all parts stable at T1 coil= 45°C, T2 coil=48℃, T3 coil=53℃, no hazards
2	System Fan	locked	240	3 hrs	--	--	Temperature of all parts stable at T1 coil= 35°C, T2 coil=33℃, T3 coil=33℃, no hazards
3	RTC battery	reverse polarity charge	240	0.5 hr	--	--	Reverse charge current=0.01mA, no hazards.

4	RTC battery with DD6 (2-3) shorted	reverse polarity charge	240	0.5 hr	--	--	Reverse charge current=0.3mA, no hazards.
5	RTC battery with R491 shorted	reverse polarity charge	240	0.5 hr	--	--	Reverse charge current=0.045mA, no hazards.
supplementary information							
In fault column, where s-c=short-circuited, dis=disconnected, o-p=opened, o-l=overloaded							

A.6.5	TABLE: flammable test for classifying materials V-0, V-1 or V-2	**N**
Sample no./ref.	After flame time (s) t_1 or t_2	After flame + afterglow (s) after 2nd flame application $t_2 + t_3$
1/A		
2/A		
3/A		
4/A		
5/A		
6/B		
7/B		
8/B		
9/B		
10/B		
Supplementary information:		
Total after flame time (s) for any condition set $t_1 + t_2$ for five (5) specimens:		

A.6.6	TABLE: flammable test for classifying materials V-0, V-1 or V-2	**N**
Sample no.	After flame time (s) t_1 or t_2	After flame + after glow (s) after 2nd flame application $t_2 + t_3$
11		
12		
13		
14		
15		
Supplementary information:		
Total after flame time (s) for any condition set $t_1 + t_2$ for five (5) specimens:		

A.7.4, A.7.5, A.7.6 and A.7.7	TABLE: flammability test for classifying foam materials HF-1, HF-2 or HBF			N
Sample no./ref.	Flame time (s)	Glow time (s)	Flaming/glowing distance from the end (mm)	Comment (for A.7.7 burning rate mm/min)
1/A				
2/A				
3/A				
4/A				
5/A				
6/B				
7/B				
8/B				
9/B				
10/B				
Supplementary information:				

A.7.8	TABLE: flammability test for classifying foam materials HF-1 or HF-2			N
Sample no.	Flame time (s)	Glow time (s)	Flaming/glowing distance from the end (mm)	Comment
11				
12				
13				
14				
15				
supplementary information:				

A.7.9	TABLE: flammability test for classifying foam materials HBF			N
Sample no.	Flame time (s)	Glow time (s)	Flaming/glowing distance from the end (mm)	Comment (for A.7.7 burning rate mm/min)
11				
12				
13				

14				
15				
Supplementary information:				

A.8.5	TABLE: flammable test for classifying materials HB		N
Sample no.	Flaming/glowing rate (mm/min)	Flaming/glowing distance from reference mark (mm)	
1			
2			
3			
Supplementary information:			

A.8.6	TABLE: flammable test for classifying materials HB		N
Sample no.	Flaming/glowing rate (mm/min)	Flaming/glowing distance from reference mark (mm)	
4			
5			
6			
Supplementary information:			

A.9.6	TABLE: flammability test for classifying materials 5V			N
Sample no./ ref.	Test bars		Test plaques	
	Flaming + glowing time (s)	Burning distance (mm)	Flaming + glowing time (s)	Burning distance (mm)
1/A				
2/A				
3/A				
4/A				
5/A			—	—
6/B				
7/B				
8/B				
9/B				

10/B			—	—
Supplementary information:				

A.9.7	TABLE: flammability test for classifying materials 5V			**N**
Sample no.	Test bars		Test plaques	
	Flaming + glowing time (s)	Burning distance (mm)	Flaming + glowing time (s)	Burning distance (mm)
11				
12				
13				
14				
15			—	—
Supplementary information:				

C.2	Safety isolation transformer		**N**
	Construction details:		
Transformer part name:			
Manufacturer:	See appended table 1.5.1		
Type:	See appended table 1.5.1		
Recurring peak voltage			
Required clearance for reinforced			
insulation (from table 2H and 2J)			
Effective voltage rms			
Required creepage distance for reinforced			
insulation (from table 2L)			
Measured min. creepage distance			
Location		inside (mm)	outside (mm)

Measured min. clearances		
Location	inside (mm)	outside (mm)
Construction:		
Pin numbers		
Prim.		
Sec.		
Bobbin		
Material		
Thickness		
Electric strength test		
With AC 3000V after humidity treatment		
Result	Pass	

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Australian National Differences according to CB Bulletin No. 105A, May 2003 (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
Annex ZZ Variations			
1.2	Between the definitions for "frequency, rated" and "insulation, basic" insert the following variation: Ignition, source potential 1.2.12.11	Inserted.	**N**
1.2.12.10	After definition 1.2.12.10, add the following variation.	Added.	**P**
	1.2.12.11 POTENTIAL IGNITION SOURCE Possible fault such as a faulty contact or interruption in an electrical connection, including a conductive pattern on printed board, which can start a fire if, under normal operating condition, the open circuit voltage exceeds 50 V (peak) a.c. or d.c. and the product of this open circuit voltage and measured current through this possible fault exceeds 15 VA		**P**
1.5.1	Add the following variation to the first paragraph: "or the relevant Australian/New Zealand Standard."	Added.	**N**
1.5.2	Add the following variation after the words “IEC component standard” in the first and third dash items : "or the relevant Australian/New Zealand Standard."	Added.	**N**
1.6.1	Add the following variation: AC power distribution systems classified as TT or IT are not allowed.	Considered.	**N**
1.7.12	Add the following variation to the first paragraph: All safety instructions and safety markings shall be in English.	All safety instructions and safety markings are in English.	**P**
3.2.5	Replace Table 3B with the following variation:	Replaced.	**P**

Rated current of equipment A	Nominal cross-sectional area mm^2	AWG or kcmil (cross-sectional area in mm^2)
Over 0,2 up to and including 3	0,5[1)]	18 [0,8]
Over 3 up to and including 6	0,75	16 [1,3]

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict

	Over 6 up to and including 10	(0,75) 1,00	16 [1,3]		
	Over 10 up to and including 16	(1,0) 1,5	14 [2]		
	[1)] This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliances, and the entry to the plug does not exceed 2 m (0,5 mm² three-core supply flexible cords are not permitted; see Note 2 to Table 2.17 of AS/NZS 3191). NOTE 1 – AWG and kcmil sizes are provided for information only. The associated cross-sectional areas, in square brackets, have been rounded to show significant figures only. AWG refers to the American Wire Gage and the term “cmil” refers to circular mils where one circular mil is equal to the area of a circle having a diameter of one mil (one thousandth of an inch). These items are commonly used to designate wire sizes in North America.				
4.3.6	Replace the third paragraph with the following variation: Equipment having pins for insertion into socket-outlets shall comply with 2.8.1, 2.8.4, 2.10, 2.12.6 and 2.14.6 of AS/NZS 3112, using the 10 A gauge in Appendix A of AS/NZS 3112. In addition, the equipment is inserted, as in normal use, into a socket outlet capable of accepting a 10 A plug complying with Figure 2.1(a) of AS/NZS 3112. The socket-outlet has a horizontal pivot at a distance of 8 mm behind the engagement face of the socket-outlet and in the plane of the lower intersection of the centre-lines of the contact apertures. The additional torque to be applied to maintain the engagement face in the vertical plane shall not exceed 0,25 Nm.			Replaced.	**N**
4.3.13	After the third paragraph insert the following variation: NOTE – For the purpose of this standard compliance with AS/NZS 2211.1 is deemed to be compliance with IEC 60825.1.			IEC60825 approved component shall be used.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
4.7	Add After Clause 4.7 the following variation: For alternative tests refer to Annex YY.	Added. The alternative tests were not used.	**N**
6.2.2	Replace the first paragraph with the following variation: In Australia (this variation does not apply in New Zealand), compliance with 6.2.2 is checked by the tests of both 6.2.2.1 and 6.2.2.2)	Replaced.	**N**
6.2.2.1	Replace Clause 6.2.2.1 with the following variation: In Australia (this variation does not apply in New Zealand), the electrical separation is subjected to 10 impulses of alternating polarity, using the impulse test generator of annex N for 10/700 µs impulses. The interval between successive impulses is 60 s and the initial voltage, Uc, is : - for 6.2.1 a) 7,0 kV for hand-held telephones and for headsets and 2,5 kV for other equipment; and - for 6.2.1b) and 6.2.1c): 1,5 kV. NOTE 1 - The 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines. NOTE 2 – The 2,5 kV impulse for 6.2.1a) was chosen to ensure adequacy of the insulation concerned and does not necessarily simulate likely overvoltages.	Replaced.	**N**
6.2.2.2	Replace the second paragraph of Clause 6.2.2.2 with the following variation: In Australia (this variation does not apply in New Zealand), the electrical separation is subjected to an electric strength test according to 5.2.2. The a.c. test voltage is : - for 6.2.1a) 3 kV; and - for 6.2.1b) and 6.2.1c) 1,5kV. NOTE 1 – Where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used. NOTE 2 – The 3 kV and 1,5 kV values have been determined considering the low frequency induced voltages from the power supply distribution system.	Replaced.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
Annex P	Replace the marginally barred normative references with the following: AS 1852.151 – 1988, International Electrotechnical Vocabulary – Part 151: Electrical and magnetic devices (identical to IEC 60050-151) AS/NZS 60065:2000, Safety requirements for Mains operated electronic and related apparatus for household and similar general use. AS 2768–1985, Electrical insulating materials – Evaluation and classification based on thermal endurance. AS/NZS 4695.112:1996, Fire hazard testing of electrotechnical products Part 112: Method for determining the comparative and the proof tracking indices of solid insulating material under moist conditions (identical to IEC 60112:1979) AS/NZS 3109.1:1996, Approval and test specification – Appliance couplers for household and similar general purposes Part 1: General requirements AS/NZS 4695.2.11:1996, Fire hazard testing of electrotechnical products – Part 2.11: Test methods – Glow-wire end-product test and guidance. AS/NZS 4695.2.2: 1996, Fire hazard testing of electrotechnical products – Part 2.2: Test methods – Needle-flame test AS/NZS 4695.10.2:1997, Fire hazard testing of electrotechnical products – Part 10.2: Guidance and test methods for the minimization of the effects of abnormal heat on electrotechnical products involved in fires – Method for testing products made from non-metallic materials for resistance to heat using the ball pressure test (identical to IEC 60950-10-2:1995) AS/NZS 2211.1:1997, Laser safety, Part 1: Equipment classification, requirements and users guide NOTE – For the purpose of this Standard compliance with AS/NZS 2211.1 is deemed to be compliance with IEC 60825.1. AS 1721–1985, General purpose metric screw threads AS 1721–1985, General purpose metric screw threads	Replaced.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
Annex Q	Replace the marginally barred informative references with the following: AS 2005.21.1–1990, Low voltage fuses – Fuses with enclosed fuse–links Part 21.1: Supplementary requirements for fuses for use by authorized persons (Fuses mainly for industrial application) – Standardized fuse systems – Fuses with fuse –links with blade contacts AS 3859–1991, Effects of current passing through the human body (identical to IEC 60479-1: 1984) AS 1939–1990, Degrees of protection provided by enclosures for electrical equipment (IP Code) (identical to IEC 60529:1989)	Replaced.	**N**
Annex YY Variations			
YY.1	Parts of non-metallic material shall be resistant to ignition and spread of fire. This requirement does not apply to decorative trims, knobs and other parts unlikely to be ignited or to propagate flames originating from inside the apparatus, or the following: (a) Components that are contained in an enclosure having a flammability category of FV-0 according to AS/NSZ 4695.707 and having openings only for the connecting wires filling the openings completely, and for the ventilation not exceeding 1 mm in width regardless of the length. (b) The following parts which would contribute negligible fuel to a fire: - small mechanical parts, the mass of which does not exceed 4 g, such as mounting parts, gears, cams, belts and bearings; - small electrical components, such as capacitors with a volume not exceeding 1750 mm3, integrated circuits, transistors and optocoupler packages, if these components are mounted on material flammability category FV-1 or better according to AS/NZS 4695.707 NOTE - In considering how to minimize propagation of fire and what “small parts” are, account should be taken of the cumulative effect of small parts adjacent to each other for the possible effect of propagating fire from one part to another. Compliance is checked by tested of YY.1.1 and	Not considered.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	YY.1.2. For the base materials of printed boards, compliance is checked by the test of YY.1.3. The tests are carried out on parts of non-metallic material, which have been removed from the apparatus. When the glow-wire test is carried out, they are placed in the same orientation, as they would be in normal use. These tests are not carried out on internal wiring.		
YY.1.1	Parts of non-metallic material are subjected to glow wire test of AS/NZS 4695.2.11, which is carried out at 550 °C. Part for which the glow-wire test cannot be carried out, such as those made of soft or foamy material, shell meet the requirements specified in ISO 9772 for category FH-3 material. The glow-wire test is not carried out on parts of materials classified at least FH-3 according to ISO 9772 provided that the sample was not thicker than the relevant part.		**N**
YY.1.2	Parts of insulating materials supporting POTENTIAL IGNITION SOURCES are subject to the glow-wire test of AN/NZS 4695.2.11, which is carried out at 750 °C. The test is also carried out on other parts of insulating material, which are within a distance of 3 mm of the connection. NOTE - Contacts in components such as switch contacts are considered to be connections. The test is not applicable to parts supporting welded connections; For parts, which withstand the glow-wire test but produce a flame, other parts above the connection within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm are subjected to the needle-flame test. However, parts shielded by a barrier, which meets the needle-flame test, are not tested. The needle-flame test is made in accordance with AS/NZS 4695.2.2 with the following modifications: **5 Severities** Replacement: The duration of application of the test is 30 s ± 1s.		**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	8 Test procedure 8.2 Modification: The specimen is arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1. 8.4 Modification: The first paragraph dose not apply. Addition: If possible, the flame is applied at least 10 mm from a corner. 8.5 Replacement: The test is made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall then withstand the test. **10 Evaluation of test results** The duration of burning (t_b) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s. The needle-flame test is not carried out on parts of material classified as V-0 or V-1 according to IEC 60695-11-10 provided that the sample tested was not thicker than the relevant part.		
YY.1.3	If parts, other than enclosures, do not withstand to glow-wire tests of YY-1.2, by failure to extinguish within 30 s after the removal of the glow-wire tip, the needle-flame test detailed in YY.1.2 is made on all parts of non-metallic material which are within a distance of 50 mm or which are likely to be impinged upon by flame during the tests of YY.1.2. Parts shielded by a separate barrier, which meets the needle-flame test, are not tested. NOTE - If the enclosure does not withstand the glow-wire test the equipment is considered to have failed to meet the requirement of Annex YY without the need for consequential testing. NOTE - If other parts do not withstand the glow-wire test due to ignition of the tissue paper and if this indicates that burring or glowing particles can fall onto an external surface underneath the equipment, the equipment is considered to have failed to meet the requirement of Annex YY without the need for consequential testing. NOTE - Parts likely to be impinged upon by the		**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	flame are considered to be those within the envelope of a vertical cylinder having a radius of 10 mm and a height equal to the height of the flame, positioned above the point of the material supporting in contact with or in close proximity to connections.		
YY.2	The base material of printed boards is subjected to needle-flame test to Clause YY.1.2. The flame is applied to the edge of the board where the heat sink effect is lowest when the board is positioned as in normal use. The flame shall not be applied to an edge, consisting of broken perforations, unless the edge is less than 3 mm for a POTENTIAL IGNITION SOURCE. The test is not carried out if the – - Printed board does not carry any POTENTIAL IGNITION SOURCE; - Base material of printed boards, on which the available apparent power at a connection exceeds 15 VA operating at a voltage exceeding 50 V and equal or less than 400 V (peak) a.c. or d.c. under normal operating conditions, is of flammability category FV-1 or better according to AS/NZS 4695.707, or the printed boards are protected by an enclosure meeting the flammability category FV-0 according to AS/NZS 4695.707 or made of metal, having openings only for connecting wires which fill the opening completely, or - Base material of printed boards, on which the available apparatus power at a connection exceeds 15 VA operating at a voltage exceeding 400 V (peak) a.c. or d.c. under normal operating conditions, and base material printed boards supporting speak gaps which provides protection against overvoltages, is of flammability category FV-0 according to AS/NSZ 4695.707 or the printed boards are contained in a metal enclosure, having openings only for connecting wires fill the openings completely. Compliance is determined using the smallest thickness of the material. NOTE - Available apparent power is the maximum apparent power, which can be drawn from the supplying circuit through a resistive load whose value is chosen to maximise the apparent power for more than 2 min when the circuit supplied is disconnected.		**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Canadian National Differences according to CB Bulletin No. 105A, May 2003 (CAN/CSA C22.2 No. 60950/UL60950, Third edition) (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
Special National Conditions			
1.1.1	All equipment design and installations are required to be in accordance with the Canadian Electrical Code (CEC), Part 1, CAN/CSA C22.1, and with National Electrical Code (NEC), ANSI/NFPA 70, and, unless marked or otherwise identified, the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	Considered.	**P**
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g. DP, CL2) specified in the CEN/NEC. For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies which are not types specified in the CEN/NEC are required to have special construction features and identification markings.	No power cords provided.	**N**
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 “Normal Operating Conditions.” Likewise, a voltage rating shall not be lower than the specified “Normal Operating Conditions,” unless it is part of a range that extends into the “Normal Operating Conditions.”	Single-phase equipment.	**N**
2.5	Where a fuse is used to provide Class 2, Limited Power Source, or TNV current limiting, it shall not be operator-accessible unless it is not interchangeable.	Not operator-accessible.	**P**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.7.1	Suitable CEC/NEC branch circuit protection is required for all standard supply outlets, receptacles and medium-base or smaller lampholders if the supply branch circuit protection is not suitable. Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require transformer overcurrent protection.	No outlet.	**N**
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the CEC/NEC.	Appliance inlet used.	**N**
3.2.1	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	No power cords provided.	**N**
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, expect for certain equipment, such as ATMs.	Appliance inlet used.	**N**
3.2.5	Power supply cords are required to be no longer than 4.5 m in length. Flexible power supply cords are required to be compatible with Table 11 & 12 of the CEC, and Article 400 of the NEC.	No power cords provided.	**N**
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Appliance inlet used.	**N**
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CAN/CSA C22.2 No. 0.	Appliance inlet used.	**N**
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm²).	Dto	**N**
3.3.4	Terminals for permanent wiring, including protective earthing terminals are required to be suitable for Canadian/U.S. wire gauge sizes, rated 125 percent of the equipment rating, and specially marked when specified (1.7.7).	Dto	
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12 A, or if the motor has a normal voltage rating greater than 120 V or is rated more than 1/3 hp (locked rotor current over 43 A).	No such device.	**N**
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the ”on” position indicated by the handle in the up position.	No such device.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.10	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.	No such battery.	**N**
4.3.12	The maximum quantify of flammable liquid stored in equipment is required to comply with NFPA 30.	No fluids.	**N**
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 and/or Canadian Radiation Emitting Devices Act, REDR C1370, as applicable.	Approved components shall be used. Evaluation shall be done when national approval.	**N**
4.7.1	For computer room applications, automated information storage systems with combustible media greater than 27 cubic feet are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	Not applied for.	**N**
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m² or a single dimension greater than 1.8 m, are required to have a flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.	Not applied for.	**N**
Annex H	Equipment that produces ionizing radiation is required to comply with Code of Federal Regulations, 21 CFR 1020 and/or Canadian Radiation Emitting Devices Act, REDR C1370, as applicable.	No ionizing radiation.	**N**
Other Differences			
1.5.2	Components of equipment must be suitable for the application, and must comply with the requirements of the equipment standard and the applicable national (Canadian and/or U.S.) component or material standards, as far as they may apply. The acceptance will be based on the following: A component Certified by a Canadian or U.S. National Certification Body (NCB) to a Canadian or U.S. component standard will be checked for correct application and use in accordance with its specified rating. Where necessary, it will also be subject to the applicable tests of the equipment standard. A component which has a CB Test Certificate for compliance with a relevant IEC component standard will be checked for correct application and use in accordance with its specified ratings.	CSA or UL approved components used, see table 1.5.1	**P**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Where necessary, it will also be subject to the applicable tests of the equipment standard, and to the applicable tests of the Canadian and/or U.S. component or material standard, under the conditions occurring in the equipment. A component, which has no approval as in A) or B) above or which is used not in accordance with its specified ratings, will be subject to the applicable tests of the equipment standard, and to the applicable tests of the Canadian and/or U.S. component or material standard, under the conditions occurring in the equipment. Some components may require annual re-testing, which may be carried out by the manufacturer, CSA International or another laboratory.		
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vp or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mAd.c. under normal operating conditions.	No TNV.	**N**
2.6.3.3	When subject to impedance testing, protective earthing and bonding are required to be tested to the additional test conditions that originate in CAN/CSA C22.2 No. 0.4.	See test report.	**P**
4.2.8.1	Enclosures around CRTs having a diagonal dimension of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	**N**
4.3.2	Equipment with handles is required to comply with special loading tests.	No handle.	**N**
5.1.8.1.1	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV.	**N**
6.2.1	Enamel coating on winding wire not considered electrical separation unless subject to special investigation.	No TNV.	**N**
6.4	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC.	No TNV.	**N**
6.5	Equipment connected to a telecommunications network and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure tests.	No TNV.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subject to special installation and performance restrictions.	No TNV.	**N**
Annex NAB	Equipment connected to centralized d.c. power systems is required to comply with special earthing, wiring, marking and insulation requirements in accordance with Annex NAB and 3.6.1.	AC power system.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Chinese National Differences according to CB Bulletin No. 105A, May 2003 (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
1	Supply tolerance Item 1.4.5 of IEC 60950 stipulates the tolerance of rated voltage is +6% and -10%, while GB4943-2001 makes a specification of tolerance of +10% and -10%.	Tolerance of +/- 10% of a mains supply voltage of 220 V considered and passed.	**P**
2	Power rating marking Item 1.7.1 of IEC 60950 does not specify concrete figures for supply voltage and frequency, instead, descriptions are given by examples. But the examples do not include China's main voltage. GB4943-2001 stipulates that: - A single rated voltage shall be expressed as 220 V - When a rated voltage range is given, the range shall cover 220 V - When a variety of rated voltages or rated voltage ranges are given, one of them shall be 220 V, and shall be set as 220 V when dispatched from the factory - Rated frequency or rated frequency range shall be 50 Hz or include 50 Hz If a unit is not provided with a means for direct connection to the AC mains supply, it need not be marked with any electrical rating	220 V and 50 Hz included in the marked electrical ratings.	**P**
3	Plate and warning marking in Chinese Item 1.7.12 of GB4943-2001 stipulates: instructions and equipment markings related to safety shall be in standardized Chinese.	Compliance has to be evaluated during the national approval process.	**N**
4	Power supply plug According to China's particular standards for power supply plug, it is added in article 3.2.1 of GB4943-2001 that plug connecting equipment with AC mains supply shall be in accordance with requirements of GB1002.	No power supply cord provided.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Japanese National Differences according to CB Bulletin No. 105A, May 2003 (J60950(H14)) (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
1.2	Addition: Add the following terms. Equipment, Class 0I 1.2.4.101 Material, VTM 1.2.12.101	Added.	**N**
1.2.4.101	Addition: CLASS 0I EQUIPMENT: Equipment where protection against electric shock is achieved by: using BASIC INSULATION, and providing a means of connecting to the protective earthing conductor in the building wiring those conductive parts that are otherwise capable of assuming HAZARDOUS VOLTAGES if the BASIC INSULATION fails, and using a supply cord without earthing conductor and a plug without earthing wire although the equipment has externally an earth terminal or a lead wire for earthing. Equipment provided with a cord set having a two-pin type plug with a lead wire for earthing is also regarded as Class 0I. NOTE – Class 0I equipment may have a part constructed with Double Insulation or Reinforced Insulation as well as an operating part as SELV circuit.	Added.	**N**
1.2.12.1	Replacement: FLAMMABILITY CLASSIFICATION OF MATERIALS: The recognition of the burning behaviour of materials and their ability to extinguish if ignited. Materials are classified as in 1.2.12.2 to 1.2.12.9, and 1.2.12.101 when tested in accordance with annex A. NOTE 1 - When applying the requirements in this standard, HF-1 CLASS FOAMED MATERIALS are regarded as better than those of CLASS HF-2, and HF-2 better than HBF.	Replaced.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	NOTE 2 - Similarly, other MATERIALS, including rigid (engineering structural) foam of CLASSES 5V or V-0 are regarded as better than those of CLASS V-1, V-1 better than V-2, and V-2 better than HB. NOTE 3 - Similarly, for thin MATERIALS, VTM-0 Class materials are regarded as better than those of VTM-1 Class, and VTM-1 better than VTM-2.		
1.2.12.101	Addition: VTM CLASS MATERIAL: Thin MATERIALS fulfil the specified conditions during the test of clause A.101 applied for materials that the test and evaluation of clauses A.6 to A.10 is difficult to enforce. Materials are classified to three classifications as VTM-0, VTM-1 and VTM-2 according to the conditions after the removal of the test flame.	Added.	**N**
1.7.101	Addition: Marking for CLASS 0I EQUIPMENT For CLASS 0I EQUIPMENT, the following instruction shall be indicated on the visible place of the mains plug or the main body: “Provide an earthing connection” Moreover, for CLASS 0I EQUIPMENT, the following instruction shall be indicated on the visible place of the main body or written in the operating instructions: “Provide an earthing connection before the mains plug is connected to the mains. And, when disconnecting the earthing connection, be sure to disconnect after pulling out the mains plug from the mains.”	Added.	**N**
2.1.1.1	Replacement: Replace “IEC 60083” to “IEC 60083 or JIS C 8303” in 2.1.1.1 b).	Replaced.	**N**
2.6.3.1	Addition: Add the following after 1st paragraph. This also applies to the conductor of lead wire for protective earthing of CLASS 0I EQUIPMENT.	Added.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.4.1	Replacement: Replace 2nd sentence in 1st paragraph. For CLASS I EQUIPMENT with a DETACHABLE POWER SUPPLY CORD, the earthing terminal in the appliance inlet is regarded as the main protective earthing terminal.	Replaced.	**N**
2.6.5.4	Replacement: Replace 1st sentence. Protective earthing connections of CLASS I EQUIPMENT shall make earlier and break later than the supply connections in each of the following:	Replaced.	**N**
2.6.101	Addition: Earthing of CLASS 0I EQUIPMENT Plugs with a lead wire for earthing shall not be used for equipment having a rated voltage exceeding 150 V. For plugs with a lead wire for earthing, the lead wire shall not be earthed by a clip. CLASS 0I EQUIPMENT shall be provided with an earthing terminal or lead wire for earthing in the external where easily visible.	Added.	**N**
3.2.5	Delete 1) in Table 3B.	Deleted.	**N**
4.2.8	Addition: Add the following informative remark after the last sentence. Remark - IEC 61965 is also applicable instead of IEC 60065.	Added.	**N**
4.5.1	Addition: Add the following to suffix 5) as specified in “Conditions applicable to Table 4A, Parts 1 and 2”. With regard to Table 4A, insulating materials complying with Japanese requirements (refer to Japanese differences for the current IEC 60335-1 (3rd Edition) in CB Bulletin 101B) are also acceptable. Add a suffix 7) in “Conditions applicable to Table 4A, Parts 1 and 2”. In the right column of Table 4A, Part 1, add suffix 7) to “50” (K), corresponding to “- without T – marking” in the left column so as to become “50 [7]”.	Added.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Add 7) to Table 4A, Part 2 as follows. 7) This value shall apply only to wiring or cords complying with relevant IEC standards. Others shall comply with Japanese requirements (refer to Japanese differences for the current IEC 60335-1 (3rd Edition) in CB Bulletin 101B).		
4.7.3.2	Addition: Add the following in 7th paragraph. for thin materials, e.g., flexible printed boards, etc., used inside equipment, be of FLAMMABILITY CLASS VTM-2 or better.	Added.	**N**
5.1.6	Replacement: Replace Table 5A.		**P**

Type of equipment	Terminal A of measuring instrument connected to:	Maximum TOUCH CURRENT mA r.m.s. [1)]	Maximum PROTECTIVE CONDUCTOR CURRENT
ALL equipment	Accessible parts and circuits not connected to protective earth	0,25	–
HAND-HELD	Equipment main protective earthing terminal (if any) CLASS I EQUIPMENT	0,75	–
MOVABLE (other than HAND_HELD, but including TRANSPORTABLE EQUIPMENT		3,5	–
STATIONARY, PLUGGABLE TYPE A		3,5	–
ALL other STATIONARY EQUIPMENT not subject to the conditions of 5.1.7		3,5	–
subject to the conditions of 5.1.7		–	5 % of input current
HAND-HELD	Equipment main protective earthing terminal (if any) CLASS 0I EQUIPMENT	0,5	–

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Others	1,0 –	
	[1] If peak values of TOUCH-CURRENT are measured, the maximum values obtained by multiplying the r.m.s. values by 1,414.		
5.3.8.2	Replacement: Replace 3rd item as follows. BASIC INSULATION between the PRIMARY CIRCUIT and accessible conductive parts of CLASS I or 0I EQUIPMENT;	Replaced.	**N**
Annex A	Addition: Add the subclause A.101 with the title "Flammability tests for classifying materials VTM" and the following: Thin sheet materials shall comply with ISO 9773.	Added.	**N**
Annex G	Addition: Add the following to the Note for Table G.1. 2. In Japan, MAINS TRANSIENT VOLTAGE for equipment with a Nominal AC MAINS SUPPLY VOLTAGE of 100 V is to be decided based on the column where Nominal AC MAINS SUPPLY VOLTAGE in Table G.1 is 150 V.	Added.	**N**
Annex P	Addition: Add "IEC 61965:2000, Mechanical Safety for Cathode Ray Tubes".	Added.	**N**
Annex U	Replacement: Replace 2nd paragraph. This annex covers to round winding wires having diameters between 0.05 mm and 5.00 mm.	Replaced.	**N**
U.2.1	Replacement: Electric strength The test sample is prepared according to IEC 60851-5:1997, 4.4.1 (for a twisted pair). The sample is then subjected to the test of 5.2.2 of this standard, with a test voltage not less than twice the appropriate voltage in table 5B (see 5.2.2) of this standard. However, the minimum values shall be as follows: for BASIC INSULATION or SUPPLEMENTARY INSULATION, 3000 V, or; for REINFORCED INSULATION, 6000 V.	Dto.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
U.2.2	Replacement: Flexibility and adherence Test 8 of IEC 60851-3:1996, 5.1.1, using the mandrel diameters of table U.1. The test sample is then examined in accordance with IEC 60851-3:1996, 5.1.1.4, followed by the test of 5.2.2 of this standard except applying the test voltage between the wire and the mandrel. A test voltage shall not be less than twice the appropriate voltage in table 5B (see 5.2.2) of this standard. However, the minimum values shall be as follows: for BASIC INSULATION or SUPPLEMENTARY INSULATION, 1500 V, or; for REINFORCED INSULATION, 3000 V.	Dto.	**N**
Table U.1	Replacement: Mandrel diameter		**N**

Nominal Conductor diameter mm	Mandrel diameter mm ± 0,2 mm
0,05 – 0,34	4,0
0,35 – 0,49	6,0
0,50 – 0,74	8,0
0,75 – 2,49	10,0
2,50 – 5,00	4 times of the diameter of conductor [1)]

[1)] in compliance with IEC 60317-43.

The tension to be applied to the wire during winding on the mandrel is calculated from the wire diameter to be equivalent to 118 MPa ± 10 % (118 N/mm^2 ± 10 %).

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Korean National Differences according to CB Bulletin, No. 105A, May 2003 (K60950) (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
1.5.101	Addition: Plugs for the connection of the apparatus to the supply mains shall comply with the Korean requirements (KSC 8305).	No supply cord provided.	**N**
7	Addition: EMC The apparatus shall comply with the relevant CISPR standards.	Compliance has to be evaluated during the national approval process.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	US National Differences according to CB Bulletin No. 105A, May 2003 (UL 60950) (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
Special National Conditions			
1.1.1	All equipment is to be designed to allow installations in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, and, unless marked or otherwise identified, the Standard for the protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	Overall compliance needs to be evaluated during the corresponding national approval process.	**N**
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g. DP, CL2) specified in the NEC. For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies which are not types specified in the NEC are required to have special construction features and identification markings.	No supply cord provided.	**N**
1.7.1	Equipment for use on supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 “Normal Operating Conditions.” Likewise, a voltage rating shall not be lower than the specified “Normal Operating Conditions,” unless it is part of a range that extends into the “Normal Operating Conditions.”	Not applicable for this single-phase equipment.	**N**
2.5	Where a fuse is used to provide Class 2, LPS (or TNV) current limiting, it shall not be operator-accessible unless it is not interchangeable.	Not operator-accessible.	**P**
2.7.1	Suitable NEC branch circuit protection is required for all standard supply outlets, receptacles and medium-base or smaller lampholders if the supply branch circuit protection is not suitable. Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require transformer overcurrent protection.	No outlet.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC.	Approved appliance inlet provided.	**N**
3.2.1	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	No supply cord provided.	**N**
3.2.3	Permanent connection of equipment to the mains by a power supply cord is not permitted.	Equipment is pluggable type.	**N**
3.2.5	Power supply cords are required to be no longer than 4.5 m in length. Flexible power supply cords are required to be compatible with Article 400 of the NEC.	No supply cord provided.	**N**
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Equipment is pluggable type.	**N**
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CSA C22.2 No. 0.	Approved appliance inlet provided.	**N**
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm²).	Dto.	**N**
3.3.4	Terminals for permanent wiring, including protective earthing terminals are required to be suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and specially marked when specified (1.7.7).	Dto.	**N**
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the motor (a) has a nominal voltage rating greater than 120 V, (b) is rated more than 12 A, or (c) is rated more than 1/3 hp (locked rotor current over 43 A)	No motor incorporated.	**N**
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the ”on” position indicated by the handle in the up position.	Not applicable for this equipment.	**N**
3.4.10	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.	No battery system incorporated.	**N**
4.3.12	The maximum quantify of flammable liquid stored in equipment is required to comply with NFPA 30.	No liquids incorporated.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 and Canadian Radiation Emitting Devices Act, REDR C1370.	Approved components shall be used. Evaluation shall be done when national approval.	**N**
4.7.1	For computer room applications, automated information storage systems with combustible media greater than 27 cubic feet are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	Not applicable for this equipment.	**N**
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m² or a single dimension greater than 1.8 m, are required to have flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.	Dto.	**N**
Annex H	Equipment that produces ionizing radiation is required to comply with Code of Federal Regulations, 21 CFR 1020 and Canadian Radiation Emitting Devices Act, REDR C1370.	No ionizing radiation.	**N**
Other Differences			
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These components include: attachment plugs, cathode ray tubes, circuit breakers, communication circuit accessories, cord sets and power supply cords, direct plug-in equipment, enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, surge suppressors, switches (including interlock switches), thermal cutoffs, thermostats, transformer winding wire, tubing, wire connectors, and wire and cables.	UL approved components used, see table 1.5.1	**P**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vp or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mAd.c. under normal operating conditions.	No TNV.	**N**
2.6.3.3	When subject to impedance testing, protective earthing and bonding is required to be tested subject per the specified test conditions that originate in CSA C22.2 No. 0.4.	See test report.	**P**
4.2.8.1	Enclosures around CRTs with a face area (diagonal dimension) of 160mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	**N**
4.3.2	Equipment with handles is required to comply with special loading tests.	No handle.	**N**
5.1.8.1.1	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV.	**N**
6.2.1	Enamel coating on winding wire not considered electrical separation unless subjected to special investigation.	No TNV.	**N**
6.4	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC.	No TNV.	**N**
6.5	Equipment connected to a telecommunications network and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure tests.	No TNV.	**N**
M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.	No TNV.	**N**
Annex NAB	Equipment connected to centralized d.c. power systems is required to comply with special earthing, wiring, marking and insulation requirements in accordance with Annex NAB and 3.6.1.	AC power system.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Singaporean National Differences (SS 337:2001) (IEC Publication 60950:1999)		**P**
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
General	IT Power Systems are not allowed in the Republic of Singapore and all clauses related to IT Power Systems are not applicable.	Connection to IT power system only considered for Norway.	**P**
2.9.2	After the first paragraph, *insert* the following: Under tropical conditions, the duration of the humidity conditioning is 5 days (120 h) at a temperature (t) of 40℃ ± 2℃ with relative humidity of 90% to 95% *Explanation:* Conditions described in IEC Publications 60068-2-3:1969 – 'Test Ca: Damp Heat, Steady State' (temperature: 40℃ ± 2℃, relative humidity: 90% to 95%) apply to insulation to be used under tropical conditions. The additional requirement on humidity conditioning is drawn from Clause 10.2 of IEC 60065:1998	Inserted. Test performed accordingly, see IEC 60950 test report.	**P**
2.10.6.5	*Delete* '(48 h)' *Explanation:* To be consistent with 2.9.2.	Deleted.	**P**
3.2.8	*Replace* '23℃± 2℃' by '27℃ ± 2℃' *Explanation:* The recommended temperature for tropical countries is drawn from ISO 554: 1976 – 'Standard atmospheres for conditioning and/or testing – Specifications'.	Replaced.	**N**
Editorial amendment:			
1.2.8.6	After NOTE 2, *insert* the following: NOTE 3 – This definition for SELV CIRCUIT differs from the term 'SELV system' as given in SS CP 5. Attention is also drawn to the following : For a.c. power distribution systems, only TN-S and TT systems are allowed in the Republic of Singapore. Where the phrase 'this standard' appears, it should be read as 'Singapore Standard SS 337'. The comma has been used throughout as a decimal marker in IEC 60950, whereas in Singapore standards it is a practice to use a full-point on the baseline as the decimal marker. The IEC standard referred to shall be replaced by	Inserted.	**N**

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Singapore Standards as follows: International Standard — Corresponding Singapore Standard IEC 60065 — SS 143:2000 Audio, video and similar electronic apparatus – Safety requirements IEC 60227 — SS 358:- Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V.		
NOTE	Singapore Standards are subject to periodic review to keep abreast of technological changes and new technical developments. The revisions of Singapore Standards are announced through the issue of either amendment slips or revised editions.		—
	Compliance with a Singapore Standard does not exempt users from legal obligations.		—

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