

IEC**IECEE**
CB
SCHEME

Ref. Certif. No.

JPTUV-007875

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST
CERTIFICATES FOR ELECTRICAL EQUIPMENT
(IECEE) CB SCHEMESYSTEME CEI D'ACCEPTATION MUTUELLE DE
CERTIFICATS D'ESSAIS DES EQUIPEMENTS
ELECTRIQUES (IECEE) METHODE OC**CB TEST CERTIFICATE**
CERTIFICAT D'ESSAI OCProduct
Produit

Flat Panel Monitor

Name and address of the applicant
Nom et adresse du demandeurAdvantech Co., Ltd.
4F, No. 108-3, Ming Chuan Rd.
Hsin Tien City, Taipei Hsien 231 TaiwanName and address of the manufacturer
Nom et adresse du fabricantAdvantech Co., Ltd.
4F, No. 108-3, Ming Chuan Rd.
Hsin Tien City, Taipei Hsien 231 TaiwanName 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

DC 12V; 4A or 3.33A; Class III

Trade mark (if any)
Marque de fabrique (si elle existe)

ADVANTECH

Model/type Ref.
Ref. de typeFPM-3190TXX-XXX
FPM-3175XXX-XXX
(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 laIEC 60950:1999
inclusive CENELEC Common Modifications
National differences see test reportAs 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

12007706 001

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de CertificationTÜV Rheinland
Berlin BrandenburgTÜV Rheinland Japan Ltd.
Shin Yokohama Daini Center Bldg.
3-19-5, Shin Yokohama, Kohoku-ku
Yokohama 222-0033 Japan
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Signature:

Dipl.-Ing. W. Herlitschke

Date: 04.03.2004

Appendix to CB Certificate JPTUV-007875
Report Number: 12007706 001

PAGE 1 OF 1

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

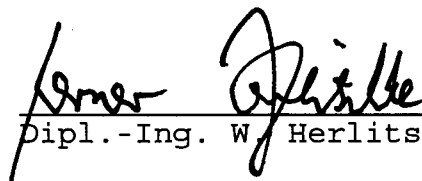
ADVANTECH CO., LTD.

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: 04.03.2004


Dipl.-Ing. W. Herlitschke

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Yokohama Head Office


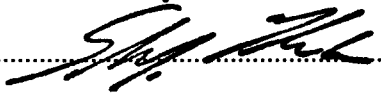
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Yokohama 224-0025, Japan

Tel. : (045) 592-1371
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TEST REPORT IEC 60950 and/or EN 60950 Safety of information technology equipment	
Report reference No	<12007706 001>
Tested by (printed name and signature)	M. Teng 
Approved by (printed name and signature)	Stefan Kischka 
Date of issue	March 02, 2004
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 <input checked="" type="checkbox"/> CCATL <input type="checkbox"/> SMT <input type="checkbox"/> TMP <input type="checkbox"/>
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 IEC Guide 112:2000 Test procedure CB-scheme Procedure deviation Argentina, Australia (see note on page 2), 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	Flat Panel monitor
Manufacturer	Same as applicant
Trademark	ADVANTECH
Model and/or type reference	FPM-3190TXX-XXX, FPM-3175XXX-XXX (X can be any alphanumeric character or blank)
Serial number	Pre-production samples without serial number
Rating(s)	DC 12V, 4A or 3.33A

Particulars: test item vs. test requirements

Equipment mobility : Equipment for building-in

Operating condition : Continuous

Mains supply tolerance (%) : No direct mains connection

Tested for IT power systems : No direct mains connection

IT testing, phase-phase voltage (V) : N.A.

Class of equipment : Class III

Mass of equipment (kg)..... : 8 (for model FPM-3175XXX-XXX)
9.5 (for model FPM-3190TXX-XXX)

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 : February, 2004

Date(s) of performance of test : February, 2004

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 IEC 60335-1-2".

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.

Note

Attached Australian national differences are not published in the CB Bulletin 105A (May 2003). These differences were outlined in Annexes YY and ZZ of AS/NZS 60950:2000 + A1:2003.

Comments

Factories:

1. Advantech Co., Ltd.
5th Fl, No. 1, Lane 169 Kang-Ning Street, Xi-Zhi, Taipei Hsien, Taiwan
2. Advantech Co., Ltd.
3rd Fl 10, Lane 130, Ming-Chuan Rd., Hsin-Tien City, Taipei Hsien, Taiwan
3. Superior Co., Ltd.
Tiensong Area, Qingxing Town, Dongguan, Guangdong, China
4. Advantech Co., Ltd.
No. 600 Han-Pu Rd., Yu-Shan, Kun-Shan, Jiang Su, 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:

These equipment models FPM-3190TXX-XXX and FPM-3175XXX-XXX, where X can be any alphanumeric character or blank for marketing purpose, are building-in LCD monitor for the use in information technology equipment. Both models are similar except for LCD panel size, DC/AC inverter, enclosure and type designation.

This report contains all national deviation as the class III equipment itself is subject of this CB report, but CB countries using for external power adapter should investigate while the equipment under test is submitted for national approval.

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. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
	Dimensions (mm) of mains plug for direct plug-in :	Not direct plug-in type.	N
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N) :	dto.	N
1.5.3	Thermal controls	No thermal control.	N
1.5.4	Transformers	Transformers used are suitable for their intended application and comply with the relevant requirements of the standard.	P
1.5.5	Interconnecting cables	No interconnecting cable.	N
1.5.6	Capacitors in primary circuits :	Class III equipment.	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	Equipment is not directly connected to the AC mains supply.	N

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.6.2	Input current	No direct connection to the mains supply. However the definition for normal load according to 1.2.2.1 for this equipment is the unit operated under full brightness and contrast of the LCD backlight circuit.	P
1.6.3	Voltage limit of hand-held equipment	Not hand-held equipment.	N
1.6.4	Neutral conductor	Class III equipment.	N

1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V)	See copy of marking plate. (no direct connection to the AC mains supply)	N
	Symbol for nature of supply for d.c.	No direct connection to the AC mains supply.	N
	Rated frequency or frequency range (Hz)	No direct connection to the AC mains supply.	N
	Rated current (A)	See copy of marking plate. (no direct connection to the AC mains supply)	N
	Manufacturer's name/Trademark	See copy of marking plate.	P
	Type/model	FPM-3190TXX-XXX, FPM-3175XXX-XXX (X can be any alphanumeric character or blank)	P
	Symbol of Class II	Class III equipment.	N
	Other symbols	Additional symbols or markings do not give rise to misunderstanding.	P
	Certification marks	See copy of the marking plate.	N
1.7.2	Safety instructions	The user manual provided	P
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N
1.7.4	Supply voltage adjustment	No voltage/frequency setting.	N
1.7.5	Power outlets on the equipment	No outlet.	N

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.6	Fuse identification	Fuse cross reference provided.	P
1.7.7	Wiring terminals	Class III equipment.	N
1.7.7.1	Protective earthing and bonding terminals		N
1.7.7.2	Terminal for a.c. mains supply conductors		N
1.7.8	Controls and indicators	See below.	N
1.7.8.1	Identification, location and marking	No safety relevant switch or control.	N
1.7.8.2	Colours	No safety relevant control or indicator.	N
1.7.8.3	Symbols according to IEC 60417.....	No safety relevant switch.	N
1.7.8.4	Markings using figures		N
1.7.9	Isolation of multiple power sources	Class III equipment.	N
1.7.10	IT power system		N
1.7.11	Thermostats and other regulating devices	No thermostat or other regulating device.	N
1.7.12	Language	User manual and marking label are in English. Versions of other languages will be provided when submitted for national approval.	—
1.7.13	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15s and then again for 15s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was neither curling nor lifting of the label edge.	P
1.7.14	Removable parts	No required markings placed on removable parts.	N
1.7.15	Replaceable batteries		N
	Language		—
1.7.16	Operator access with a tool	Only SELV and LCC inside.	N
1.7.17	Equipment for restricted access locations	Not limited use in restricted access locations.	N

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards <i>This equipment is supplied from an approved power supply adapter that provides SELV. Only SELV and limited current circuits inside the unit → no electrical shock or energy hazards, see below. However, this equipment is intended for building-in and compliance shall be evaluated in final system.</i>		P
2.1.1	Protection in operator access areas		P
2.1.1.1	Access to energized parts		N
	Test by inspection		N
	Test with test finger		N
	Test with test pin		N
	Test with test probe		N
2.1.1.2	Battery compartments.....		N
2.1.1.3	Access to ELV wiring		N
	Working voltage (V); distance (mm) trough insulation		—
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards	No energy hazard in operator access area. The connectors on the backside of the equipment are below 240VA.	P
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in the primary circuit		N
	Time-constant (s); measured voltage (V)		—
2.1.2	Protection in service access areas		N
2.1.3	Protection in restricted access locations		N

2.2	SELV circuits		P
2.2.1	General requirements	The secondary circuits were SELV. See 2.2.1 to 2.2.4.	P
2.2.2	Voltages under normal conditions (V)	42.4V peak or 60Vd.c. are not exceeded in SELV circuit under normal operation.	P

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.2.3	Voltages under fault conditions (V).....:	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71V peak and 120Vd.c. were not exceeded within 0.2s and limits 42.4V peak and 60Vd.c. were not exceeded for longer than 0.2 s.	P
2.2.3.1	Separation by double or reinforced insulation (method 1)	Class III equipment.	N
2.2.3.2	Separation by earthed screen (method 2)	dto	N
2.2.3.3	Protection by earthing of the SELV circuit (method 3)	dto	N
2.2.4	Connection of SELV circuits to other circuits.....:	See 2.2.2 and 2.2.3.	P

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		P
2.4.1	General requirements		P
2.4.2	Limit values	See appended table 2.4.	P
	Frequency (Hz)	dto	—
	Measured current (mA).....:	dto	—
	Measured voltage (V)	2k	—
	Measured capacitance (μF)	54pF	—
2.4.3	Connection of limited current circuits to other circuits		P

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict

2.5	Limited power sources <i>The output of SPS complied with limited power source.</i>		P
	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
	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 <i>Class III equipment.</i>		N
2.6.1	Protective earthing		N
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
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		N
	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)		N
2.6.3.4	Colour of insulation		N
2.6.4	Terminals		N
2.6.4.1	Protective earthing and bonding terminals		N
	Rated current (A), type and nominal thread diameter (mm)		—

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.4.2	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		N
2.6.5.1	Interconnection of equipment		N
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N
2.6.5.6	Corrosion resistance		N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network		N

2.7	Overcurrent and earth fault protection in primary circuits		N
2.7.1	Basic requirements		N
	Instructions when protection relies on building installation		N
2.7.2	Faults not covered in 5.3 (EN 60950: Void)		N
2.7.3	Short-circuit backup protection		N
2.7.4	Number and location of protective devices :		N
2.7.5	Protection by several devices		N
2.7.6	Warning to service personnel :		N

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

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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 <i>The unit is supplied from an approved power supply adapter that provides SELV. Only SELV and limited current circuits inside the unit. (See also sub clause 5.3.4)</i>		P
2.9.1	Properties of insulating materials		P
2.9.2	Humidity conditioning		N
2.9.3	Requirements for insulation		P
2.9.4	Insulation parameters		N
2.9.5	Categories of insulation		P
2.10	Clearances, creepage distances and distances through insulation <i>The unit is supplied from an approved power supply adapter that provides SELV. Only SELV and limited current circuits inside the unit. (See also sub clause 5.3.4)</i>		N
2.10.1	General		N
2.10.2	Determination of working voltage		N
2.10.3	Clearances		N
2.10.3.1	General		N
2.10.3.2	Clearances in primary circuits		N
2.10.3.3	Clearances in secondary circuits		N
2.10.3.4	Measurement of transient levels		N
2.10.4	Creepage distances		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

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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 (°C)		N
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		N
	Electric strength test		—
2.10.7	Enclosed and sealed parts		N
	Temperature $T_1=T_2 = T_{mra} - T_{amb} + 10K$ (°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		N

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	All internal wires are UL recognized wiring which is PVC insulated, rated VW-1, minimum 80°C. Internal wiring gauge is suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges, which could damage the insulation.	P
3.1.3	Securing of internal wiring	Internal wires are secured by solder pins so that a loosening of the terminal connection is unlikely.	P

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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	Electrical connections screwed two or more complete threads into metal.	P
3.1.7	Non-metallic materials in electrical connections	All current carrying connections are metal to metal.	P
3.1.8	Self-tapping and spaced thread screws	No self- tapping or spaced thread screws used.	P
3.1.9	Termination of conductors	All conductors are reliably secured.	P
	10 N pull test		N
3.1.10	Sleeving on wiring		N
3.2	Connection to a.c. mains supplies <i>No direct connect to a.c. mains.</i>		N
3.2.1	Means of connection		N
3.2.2	Multiple supply connections		N
3.2.3	Permanently connected equipment		N
	Number of conductors, diameter (mm) of cable and conduits		—
3.2.4	Appliance inlets		N
3.2.5	Power supply cords		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		N
3.2.8	Cord guards		N
	D (mm); test mass (g)		—

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	Radius of curvature of cord (mm).....:		—
3.2.9	Supply wiring space		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
3.4	Disconnection from the a.c. mains supply <i>No direct connection to a.c. mains supply.</i>		N
3.4.1	General requirement		N
3.4.2	Disconnect devices		N
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords		N
3.4.6	Single-phase equipment		N
3.4.7	Three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N
3.5	Interconnection of equipment		P
3.5.1	General requirements	See below.	P
3.5.2	Types of interconnection circuits	Interconnection circuits of SELV through the connectors.	P

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection	N

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N
	Angle of 10°	Equipment is for building-in.	N
	Test: force (N).....:	Equipment is not a floorstanding unit.	N

4.2	Mechanical strength <i>There are no hazardous voltages present in the unit or other hazards foreseeable.</i>		P
4.2.1	General		N
4.2.2	Steady force test, 10 N		N
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N		N
4.2.5	Impact test		N
4.2.6	Drop test		N
4.2.7	Stress relief		N
4.2.8	Cathode ray tubes		N
	Picture tube separately certified		N
4.2.9	High pressure lamps		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).....:		N
4.3.3	Adjustable controls	None that would cause hazard.	N
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to withstand usual mechanical stress. For the protection solder pins are used.	P

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Clause	Requirement – Test	Result – Remark	Verdict
4.3.5	Connection of plugs and sockets	Mismatch of connectors were prevented by incompatible form or location.	P
4.3.6	Direct plug-in equipment	Not direct plug-in type.	N
	Torque (Nm)		—
4.3.7	Heating elements in earthed equipment	Class III equipment.	N
4.3.8	Batteries		N
4.3.9	Oil and grease	No oil or grease.	N
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	P
4.3.11	Containers for liquids or gases	No container for liquid or gas.	N
4.3.12	Flammable liquids.....	No flammable liquid.	N
	Quantity of liquid (l)		N
	Flash point (°C).....		N
4.3.13	Radiation; type of radiation	No ionizing radiation or laser or flammable liquids presents. LED is used as indicator.	P
	Equipment using lasers		N
4.4	Protection against hazardous moving parts <i>No hazardous moving part.</i>		N
4.4.1	General		N
4.4.2	Protection in operator access areas		N
4.4.3	Protection in restricted access locations		N
4.4.4	Protection in service access areas		
4.5	Thermal requirements		P
4.5.1	Temperature rises	See appended table 4.5.1.	P
	Normal load condition per Annex L	See 1.6.2.	P
4.5.2	Resistance to abnormal heat		N
4.6	Openings in enclosures		N
4.6.1	Top and side openings	No electrical and fire enclosure required.	N

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Clause	Requirement – Test	Result – Remark	Verdict
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures	No electrical and fire enclosure required.	N
	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.	P
4.7.2.1	Parts requiring a fire enclosure		N
4.7.2.2	Parts not requiring a fire enclosure	The appliance with: Supply of components in the secondary circuit by a limited power source. Details refer subclause 2.5, and the components are mounted on PCB material of flammability rating V-1 min., the fire enclosure construction is not required. However, these equipments are for building-in.	P
4.7.3	Materials		P
4.7.3.1	General	See appended table 1.5.1 for PCB.	P
4.7.3.2	Materials for fire enclosures	No fire enclosure required.	N
4.7.3.3	Materials for components and other parts outside fire enclosures	Materials of parts outside enclosure are HB or better.	P
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.	N
4.7.3.6	Materials used in high-voltage components	No high voltage component.	N
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P

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Clause	Requirement – Test	Result – Remark	Verdict
5.1	Touch current and protective conductor current <i>Class III equipment without TNV circuit.</i>		N
5.1.1	General		N
5.1.2	Equipment under test (EUT)		N
5.1.3	Test circuit		N
5.1.4	Application of measuring instrument		N
5.1.5	Test procedure		N
5.1.6	Test measurements		N
	Test voltage (V)		—
	Measured current (mA)		—
	Max. allowed current (mA)		—
5.1.7	Equipment with touch current exceeding 3.5 mA		N
5.1.8	Touch currents to and from telecommunication networks		N
5.1.8.1	Limitation of the touch current to a telecommunication network		N
	Test voltage (V)		—
	Measured current (mA)		—
	Max. allowed current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N
5.2	Electric strength <i>Class III equipment.</i>		N
5.2.1	General		N
5.2.2	Test procedure		N
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	Ventilation openings blocked test: Results see appended table, no hazards Beside this, there is no other foreseeable misuse likely to happen.	P
5.3.2	Motors	No motor.	N

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Clause	Requirement – Test	Result – Remark	Verdict
5.3.3	Transformers	No safety isolation transformer in this equipment.	N
5.3.4	Functional insulation	Method c) considered. Results see appended table.	P
5.3.5	Electromechanical components	No electromechanical component.	N
5.3.6	Simulation of faults	Faults in primary and secondary components and functional insulation were already considered during the approval of the SPS. No other abnormal tests necessary.	N
5.3.7	Unattended equipment	No thermostat, temperature limiter or thermal cut-out.	N
5.3.8	Compliance criteria for abnormal operating and fault conditions	Complied.	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
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
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Clause	Requirement – Test	Result – Remark	Verdict
	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
A.3.1	Samples		—
	Wall thickness (mm)		—
A.3.5	Compliance criteria		N

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Clause	Requirement – Test	Result – Remark	Verdict
	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
A.8.1	Samples		—
	Sample thickness (mm)		—

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Clause	Requirement – Test	Result – Remark	Verdict
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
B.7.3	Electric strength test		N



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Clause	Requirement – Test	Result – Remark	Verdict
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)		N
	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	Class III equipment.	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 switch.	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)	Class III equipment.	N
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	Class III equipment.	N
	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."	Class III equipment.	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 conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se	No supply cord provided.	N

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Clause	Requirement – Test	Result – Remark	Verdict
	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-outlet.	N
	A (DK): Class II equipment shall not be fitted with socket-outlets for providing power to other equipment	No socket-outlet.	N
1.7.12	A (DE): (Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment {Equipment safety law}], of 23 rd October 1992, Article 3, 3 rd paragraph, 2 nd 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 10 th January 1996, article 2, 4 th 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	German user's manual shall be provided during national approval.	N
1.7.15	A (CH): (Ordinance on environmentally hazardous substances SR 814.013) Annex 4.10 of SR 814.013 applies for batteries	No battery.	N
	F (ALL): warning texts for lithium batteries		N
	Languages :		N
2.2.4	S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply	No marking required.	N
2.3.2	S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply	No TNV.	N
2.3.3	S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply	No TNV.	N
2.3.4	S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply	No TNV.	N
2.7.1	C: replace the subclause as follows: Basic requirements To protect against excessive current, short circuits and earth faults in primary circuits, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b), and c):	Replaced.	N

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Clause	Requirement – Test	Result – Remark	Verdict
	<p>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.</p> <p>b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short circuit and earth fault protection may be provided by protective devices in the building installation.</p> <p>c) It is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instruction.</p> <p>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</p>		
2.7.2	C: This subclause has been declared 'void'	Declared.	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.	N
3.2.1	<p>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:</p> <ul style="list-style-type: none"> - 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 <p>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:</p> <ul style="list-style-type: none"> - SEV 5932-2:1998: plug type 25, 3L+N+PE 230/400 V, 16 A - SEV 5933-2:1998: plug type 21, L+N 250 V, 16 A - SEV 5934-2:1998: plug type 23, L+N+PE 250 V, 16 A 	No supply cord provided.	N
	S (DK): supply cords of single-phase equipment having a rated current not exceeding 10 A shall be	No supply cord provided.	N

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Clause	Requirement – Test	Result – Remark	Verdict
	<p>provided with a plug according to the Heavy Current Regulations Section 107-2-D1.</p> <p>Class I equipment provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with Standard Sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a rated current exceeding 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</p>		
	<p>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</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993</p> <p>Class I equipment provided with socket-outlets with earth contacts, or which are intended to be used locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2</p>	No supply cord provided.	N
	<p>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.</p> <p>NOTE: "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug</p>	No supply cord provided.	N
	<p>S (IE): apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug shall be fitted with a 13 A plug in accordance with Statutory Instrument 525: 1997 – National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use)</p>	No supply cord provided.	N

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Clause	Requirement – Test	Result – Remark	Verdict
	Regulations 1997		
3.2.3	C: delete note 1, and in table 3A delete the conduit sizes in parentheses	Deleted.	N
3.2.5	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 mm ² is allowed for equipment with rated current over 10 A and up to and including 13 A	No 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 mm ² to 1,5 mm ² nominal cross-sectional area	No supply cord provided.	N
4.3.6	S (GB): the torque test is performed using a socket outlet complying with BS 1363 and the plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C	Not direct plug-in equipment.	N
	S (IE): direct plug-in equipment is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 – National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997	Not direct plug-in equipment.	N
4.3.13	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	See report IEC 60950.	P

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Clause	Requirement – Test	Result – Remark	Verdict
	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		
6.1.2.1	<p>S (NO, SE): add the following text between the first and second paragraph:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>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:</p> <ul style="list-style-type: none"> - 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. <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2</p>	No TNV.	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.	N
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		N
Annex H	C: replace the last paragraph of this annex by: At any point 10 cm from the surface of the operator access area, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see note). Account is taken of the background level	Replaced.	N
	C: replace the NOTE as follows: NOTE – These values appear in Directive 96/29/Euratom	Replaced	N

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>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)</p> <p>a) A licence is required by those who operate an X-ray emission source.</p> <p>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</p> <p>1) the local dose rate at a distance of 0,1 m from the surface does not exceed 1 µSv/h and</p> <p>2) it is adequately indicated on the X-ray emission source that</p> <p>i) X-rays are generated and</p> <p>ii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.</p> <p>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</p> <p>1) the X-ray emission source has been granted a type approval and</p> <p>2) it is adequately indicated on the X-ray emission source that</p> <p>i) X-rays are generated</p> <p>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</p> <p>iii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.</p> <p>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</p> <p>1) the X-rays are generated only by intrinsically safe CRTs complying with Enclosure III, No. 6,</p> <p>2) the values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical measures and specified in the device and</p> <p>3) it is adequately indicated on the X-ray emission source that the X-rays generated are adequately screened by the intrinsically safe CRT</p>	No CRT.	N
Annex P	C: replace the text of this annex by: See Annex ZA	Replaced.	N

IEC 60950 / EN 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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. — IEC 60050-151:1978 — IEC 60050-195:1998 EN 60065 ¹⁾ :1993 + corr. Nov. 1993 IEC 60065 (mod):1985 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		P

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

1.5.1	TABLE: list of critical components					P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity ¹ .	
Power Adapter (SPS)	Asian Power Devices Inc.	DA-60F12	i/p: 100-240Vac, 50-60Hz, 1.1A max., Class I, 40°C o/p: 12Vdc, 4A	IEC 60950:1999 (complied with limited power source)	TÜV, UL, CB (issued by TÜV Rheinland)	
	Lien Electronics Inc.	LE-9702B	i/p: 100-240Vac, 50/60Hz, 1.5A, Class I, 25°C o/p: 12Vdc, 4A	IEC 60950:1991 +A1+ A2+A3+A4 (complied with limited power source)	TÜV, UL, CB (issued by Nemko)	
LCD Panel (for FPM-3190TXX- XXX)	Fujitsu Limited	FLC48SXC8V- 02	19", TFT type	--	--	
LCD Panel (for FPM-3175XXX- XXX)	Chi Mei	M170E4-L02	17", TFT type	--	--	
DC/AC Inverter (for 19" LCD panel)	Lecerf Technology	LV-200-A	i/p: 13Vdc max., 3A max.; o/p: 1830Vrms max., 18mA max.	--	--	
Transformer in DC/AC Inverter (T1, T2)	Lecerf Technology	3-X10A	105°C	--	--	
DC/AC Inverter (for 17" LCD panel)	Lecerf Technology	LV-1801-CA	i/p: 13Vdc max., 2.2A max.; o/p: 1940Vrms max., 15mA max.	--	--	
Transformer in DC/AC Inverter (T1, T2)	Lecerf Technology	3-X09A	105°C	--	--	
Front Enclosure Material	--	--	HB min.	UL 94	UL	
Enclosure Material	--	--	Metal	--	--	
PCB material	--	--	V-1, min. 105°C	UL 94	UL	
Note(s):						
1. An asterisk indicates a mark that assures the agreed level of surveillance.						

1.6.2	TABLE: electrical data (in normal conditions)					P
Fuse #	I _{rated} (A)	U (V)	P (W)	I (A)	I _{fuse} (A)	Condition/status
--	3.3	12Vdc	36.32	3	--	measured at LCD monitor

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)

2.1.1.7	TABLE: discharge test				N
Condition	τ calculated (s)	τ measured (s)	t _u → 0V (s)	Comments	

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

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

2.4.2	TABLE: limited current circuit measurement					P
Location		Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments
For FPM-3175XXX-XXX DC/AC Inverter: Lecer, type LV-1801-CA						
normal condition						
CN3, Pin 1 to GND		44	22	55	38.5	

CN3, Pin 4 to GND	4.2	2.1	47	32.9	
CN3, Pin 1 to Pin 4	14.1	7.05	45	31.5	
T1, Pin 10 to GND	48.1	24.05	65	45.5	
T1, Pin 7 to GND	4.7	2.35	49	34.3	
T1, Pin 10 to 7	17.1	8.55	51	35.7	
single fault condition (L1 short)					
CN3, Pin 1 to GND	1.1	0.55	20	14	
CN3, Pin 4 to GND	2.4	1.2	45	31.5	
CN3, Pin 1 to Pin 4	17	8.5	42	29.4	
T1, Pin 10 to GND	1.12	0.56	21	14.7	
T1, Pin 7 to GND	2.7	1.35	41	28.7	
T1, Pin 10 to 7	18.4	9.2	50	35	
single fault condition (Q1 D-S short)					
CN3, Pin 1 to GND	0	0	--	--	Unit shutdown
CN3, Pin 4 to GND	0	0	--	--	Unit shutdown
CN3, Pin 1 to Pin 4	0	0	--	--	Unit shutdown
T1, Pin 10 to GND	0	0	--	--	Unit shutdown
T1, Pin 7 to GND	0	0	--	--	Unit shutdown
T1, Pin 10 to 7	0	0	--	--	Unit shutdown
single fault condition (C3 short)					
CN3, Pin 1 to GND	0	0	--	--	Unit shutdown
CN3, Pin 4 to GND	2	1	17	11.9	
CN3, Pin 1 to Pin 4	0	0	--	--	Unit shutdown
T1, Pin 10 to GND	0	0	--	--	Unit shutdown
T1, Pin 7 to GND	2	1	20	14	
T1, Pin 10 to 7	0	0	--	--	Unit shutdown
single fault condition (D5 short)					
CN3, Pin 1 to GND	0	0	--	--	Unit shutdown
CN3, Pin 4 to GND	0	0	--	--	Unit shutdown
CN3, Pin 1 to Pin 4	0	0	--	--	Unit shutdown
T1, Pin 10 to 7	0	0	--	--	Unit shutdown
single fault condition (D1 open)					
CN3, Pin 1 to GND	0	0	--	--	Unit shutdown
CN3, Pin 4 to GND	0	0	--	--	Unit shutdown
CN3, Pin 1 to Pin 4	0	0	--	--	Unit shutdown

T1, Pin 10 to 7	0	0	--	--	Unit shutdown
single fault condition (D3 open)					
CN3, Pin 1 to GND	0	0	--	--	Unit shutdown
CN3, Pin 4 to GND	0	0	--	--	Unit shutdown
CN3, Pin 1 to Pin 4	0	0	--	--	Unit shutdown
T1, Pin 10 to 7	0	0	--	--	Unit shutdown
For FPM-3190TXX-XXX DC/AC Inverter: Lecer, type LV-200-A					
normal condition					
CN4, Pin 1 to GND	72	36	95	66.5	
CN4, Pin 2 to GND	7	3.5	10	7	
CN4, Pin 1 to Pin 2	70	35	91	63.7	
T1, Pin 9 to GND	72	36	98	68.6	
T1, Pin 7 to GND	8	4	12	8.4	
T1, Pin 9 to 7	72	36	93	65.1	
single fault condition (L1 short)					
CN4, Pin 1 to GND	74	37	94	65.8	
CN4, Pin 2 to GND	10	5	11	7.7	
CN4, Pin 1 to Pin 2	64	32	74	51.8	
T1, Pin 9 to GND	78	39	94	65.8	
T1, Pin 7 to GND	7	3.5	14	9.8	
T1, Pin 9 to 7	74	37	95	66.5	
single fault condition (Q5 D-S short)					
CN4, Pin 1 to GND	0	0	--	--	Unit shutdown
CN4, Pin 2 to GND	0	0	--	--	Unit shutdown
CN4, Pin 1 to Pin 2	0	0	--	--	Unit shutdown
T1, Pin 9 to GND	0	0	--	--	Unit shutdown
T1, Pin 7 to GND	0	0	--	--	Unit shutdown
T1, Pin 9 to 7	0	0	--	--	Unit shutdown
single fault condition (C3 short)					
CN4, Pin 1 to GND	72	36	90	63	
CN4, Pin 2 to GND	6	3	11	7.7	
CN4, Pin 1 to Pin 2	70	35	88	61.6	
T1, Pin 9 to GND	72	36	93	65.1	
T1, Pin 7 to GND	8	4	14	9.8	

T1, Pin 9 to 7	72	36	91	63.7	
single fault condition (Q1 G-S short)					
CN4, Pin 1 to GND	0.44	0.22	45	31.5	
CN4, Pin 2 to GND	0.44	0.22	50	35	
CN4, Pin 1 to Pin 2	0.32	0.16	47	32.9	
T1, Pin 9 to 7	0	0	--	--	Unit shutdown
single fault condition (D5 short)					
CN4, Pin 1 to GND	0.38	0.19	105	70	
CN4, Pin 2 to GND	0	0	--	--	Unit shutdown
CN4, Pin 1 to Pin 2	0.72	0.36	105	70	
T1, Pin 9 to 7	0	0	--	--	Unit shutdown
single fault condition (D1 open)					
CN4, Pin 1 to GND	0.32	0.16	107	70	
CN4, Pin 2 to GND	0	0	--	--	Unit shutdown
CN4, Pin 1 to Pin 2	0.56	0.28	107	70	
T1, Pin 9 to 7	0	0	--	--	Unit shutdown
single fault condition (D3 open)					
CN4, Pin 1 to GND	46.7	23.2	46	32.2	
CN4, Pin 2 to GND	9.2	4.6	49	34.3	
CN4, Pin 1 to Pin 2	46.4	23.2	46	32.2	
T1, Pin 9 to 7	79.2	39.7	89	62.3	
Output measured with a 2kΩ non-inductive resistor as load.					

2.5	TABLE: limited power source measurement			N
	Limits	Measured	Verdict	
According to Table 2B/2C (normal condition)				
current (in A)				
apparent power (in VA)				
According to Table 2B/2C (single fault condition)				
current (in A)				
apparent power (in VA)				

2.6.3.3	TABLE: ground continue test	N
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Location	Resistance measured (mΩ)	Comments

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)

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)

4.5.1	TABLE: temperature rise measurements			P
	test voltage (V)	+12Vdc		—
	t1 (°C)			—
	t2 (°C)			—
Rise dT of part/at:		ΔT (K)	Allowed ΔT (K)	
For model FPM-3175XXX-XXX				
Ambient		27.3°C	--	
DC inlet body		15.1	45	
C801 body		17.6	--	
U906 body		21.1	--	
U900 body		32.3	--	
U501 body		30.3	--	
U802 body		33.3	--	

L803 coil	23.5	65			
U401 body	21.8	--			
L805 body	29.1	--			
PWB near U802 body	36.9	65			
D/A inverter: Leaerf, type LV-1801-CA					
T1 coil	35.8	65			
T1 core	18.9	65			
Enclosure inside U501 body	8.7	--			
Enclosure outside U501 body	12.3	30			
Panel body	14.3	--			
For model FPM-3190TXX-XXX					
Ambient	25.7°C	--			
DC inlet body	17.7	--			
L802 coil	25.9	65			
C801 body	17.9	45			
L804 coil	29.2	65			
PWB near U802	40.1	65			
U501 body	45.8	--			
L706 coil	19.8	65			
D/A inverter: Leaerf, type LV-200-A					
C35 body	37.8	45			
C10 body	40.3	45			
L2 coil	40.3	65			
T2 coil	40.7	65			
T2 core	31.9	65			
Enclosure inside near inverter	3.5	--			
Enclosure outside near inverter	5.3	30			
Panel body	23.4	--			
Temperature rise ΔT of winding:	R_1 (Ω)	R_2 (Ω)	ΔT (K)	allowed ΔT (K)	insulation class

Comments:

The temperatures were measured under worst case normal mode defined in 1.2.2.1 and as described in 1.6.2 at voltages as described above.

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

Electrolyte capacitor or components with:

- max. absolute temp. of 85°C → $\Delta T_{\max} = (85-40) \text{ K} = 45\text{K}$

Surface of equipment which may be touched:

- metal → $\Delta T_{\max} = 45 - (40-25) \text{ K} = 30\text{K}$

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		N
Location	Size (mm)	Comments	

5.1.6	TABLE: touch current measurement				N
Condition	L→ terminal A (mA)	N → terminal A (mA)	Limit (mA)	Comments	

5.2	TABLE: electric strength tests and impulse tests			N
Test voltage applied between:			Test voltage (V)	Breakdown

5.3	TABLE: fault condition tests			P
	ambient temperature (°C) :	25°C, if no else specified		—
	model/type of power supply :			—
	manufacturer of power supply :			—

rated markings of power supply :							—
No.	Component no.	Fault	Test voltage (V)	Test time	Fuse no.	Fuse current (A)	Result
01	All ventilation openings for model FPM-3175XXX-XXX	blocked	12Vdc	1.5 hrs	--	--	Temperature of all parts stabled at T1 coil (D/A inverter)= 59.9°C, enclosure outside of LCD monitor = 41.5°C, no hazard.
02	All ventilation openings for model FPM-3190TXX-XXX	blocked	12Vdc	3.5 hrs	--	--	Temperature of all parts stabled at T2 coil (D/A inverter)= 74°C, enclosure outside of LCD monitor = 55.6°C, no hazard.
03	D/A inverter: Leaerf, type LV-1801-CA T1 Pin 7 to Pin 10	s-c	12Vdc	1 sec	--	--	Unit shutdown immediately.
04	D/A inverter: Leaerf, type LV-200A T2 Pin 7 to Pin 9	s-c	12Vdc	1 sec	--	--	Unit shutdown immediately.

Note: In fault column, s-c=short-circuited, o-l=over-loaded.

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:					

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.	Unit was evaluated according to IEC 60950. The requirements have to be checked during national approval.	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 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 supply cord 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.”		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.		N

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.		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.	Equirement is for building-in..	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 supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.	Equirement is for building-in.	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 supply cord provided.	N
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	No permanently connected equipment.	N
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CAN/CSA C22.2 No. 0.	Neither wiring terminal nor associated spacings.	N
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).	No wire binding screws.	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).	No terminals for permanent wiring.	N
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 motor.	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.		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.		N
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No flammable liquid.	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.		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 information storage systems.	N
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m ² 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.		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.		N
Other Differences			
1.5.2	<p>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.</p> <p>The acceptance will be based on the following:</p> <p>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.</p> <p>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.</p>	Components are UL approved, see component list 1.5.1.	P

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>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.</p> <p>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.</p> <p>Some components may require annual re-testing, which may be carried out by the manufacturer, CSA International or another laboratory.</p>		
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.		N
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.	Supplied from adapter.	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%.	No direct connection to mains.	N
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	No direct connection to mains.	N
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.	No marking or instruction related to safety.	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
	<p>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.</p> <p>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.</p>		
1.2.12.101	<p>Addition:</p> <p>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.</p>	Added.	N
1.7.101	<p>Addition:</p> <p>Marking for CLASS 0I EQUIPMENT</p> <p>For CLASS 0I EQUIPMENT, the following instruction shall be indicated on the visible place of the mains plug or the main body:</p> <p>“Provide an earthing connection”</p> <p>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:</p> <p>“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.”</p>	Added.	N
2.1.1.1	<p>Replacement:</p> <p>Replace “IEC 60083” to “IEC 60083 or JIS C 8303” in 2.1.1.1 b).</p>	Replaced.	N
2.6.3.1	<p>Addition:</p> <p>Add the following after 1st paragraph.</p> <p>This also applies to the conductor of lead wire for protective earthing of CLASS 0I EQUIPMENT.</p>	Added.	N

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.4.1	<p>Replacement:</p> <p>Replace 2nd sentence in 1st paragraph.</p> <p>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.</p>	Replaced.	N
2.6.5.4	<p>Replacement:</p> <p>Replace 1st sentence.</p> <p>Protective earthing connections of CLASS I EQUIPMENT shall make earlier and break later than the supply connections in each of the following:</p>	Replaced.	N
2.6.101	<p>Addition:</p> <p>Earthing of CLASS 0I EQUIPMENT</p> <p>Plugs with a lead wire for earthing shall not be used for equipment having a rated voltage exceeding 150 V.</p> <p>For plugs with a lead wire for earthing, the lead wire shall not be earthed by a clip.</p> <p>CLASS 0I EQUIPMENT shall be provided with an earthing terminal or lead wire for earthing in the external where easily visible.</p>	Added.	N
3.2.5	Delete 1) in Table 3B.	Deleted.	N
4.2.8	<p>Addition:</p> <p>Add the following informative remark after the last sentence.</p> <p>Remark - IEC 61965 is also applicable instead of IEC 60065.</p>	Added.	N
4.5.1	<p>Addition:</p> <p>Add the following to suffix 5) as specified in “Conditions applicable to Table 4A, Parts 1 and 2”.</p> <p>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.</p> <p>Add a suffix 7) in “Conditions applicable to Table 4A, Parts 1 and 2”.</p> <p>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)”.</p>	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.			N
	Type of equipment	Terminal A of measuring instrument connected to:	Maximum TOUCH CURRENT mA r.m.s. ¹⁾	
	ALL equipment	Accessible parts and circuits not connected to protective earth	0,25	
	HAND-HELD	Equipment main protective earthing terminal (if any)	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		–	
	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.		Replaced	N

National Differences				
Clause	Requirement – Test		Result – Remark	Verdict
U.2.2	<p>Replacement:</p> <p>Flexibility and adherence</p> <p>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:</p> <p>for BASIC INSULATION or SUPPLEMENTARY INSULATION, 1500 V, or;</p> <p>for REINFORCED INSULATION, 3000 V.</p>		Replaced.	N
Table U.1	Replacement:			N
	Mandrel diameter			
	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 plug.	N
7	Addition: EMC The apparatus shall comply with the relevant CISPR standards.	The CISPR requirements have to be considered during national approval.	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.	Unit was evaluated according to IEC 60950. The requirements have to be checked during national approval.	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.		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."		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.		N
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.		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.		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.	N
3.2.3	Permanent connection of equipment to the mains by a power supply cord is not permitted.	Equipment is for building-in.	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.	N
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Equipment is for building-in.	N
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CSA C22.2 No. 0.	Neither wiring terminals nor associated spacings.	N
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).	No wire binding screws.	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).	Pluggable equipment type A.	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.	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.		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.		N
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.		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.		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 automated information storage systems.	N
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m ² 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.		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.		N
Other Differences			
1.5.1	<p>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:</p> <p>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</p> <p>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.</p>	Components are UL approved, see component list 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.		N
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.	Supplied from adapter.	N

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Australian National Differences according to AS/NZS 60950:2000 + A1:2003 (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.	P
1.2.12.10	After definition 1.2.12.10, add the following variation. 1.2.12.11 Potential ignition source Possible fault which can start a fire if the open circuit voltage measured across an interruption or faulty contact exceeds a value of 50 V (peak) a.c. or d.c. and the product of the peak value of this voltage and the measured r.m.s. current under normal operating conditions exceeds 15 VA. Such a faulty contact or interruption in an electrical connection includes those which may occur in conductive patterns on printed boards. NOTE 201: An electronic protection circuit may be used to prevent such a fault from becoming a potential ignition source. NOTE 202: This definition is identical to that used in AS/NZS 60065:2001.	Added.	P
1.5.1	Add the following variation to the first paragraph: "or the relevant Australian/New Zealand Standard."	Added.	P
1.5.2	Add the following variation after the words "IEC component standard" in the first dash item (occurs twice) and third dash item (occurs once): "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.	Added.	N
1.7.12	Add the following variation to the first paragraph: All safety instructions and safety markings shall be in English.	Added.	P
3.2.5	Replace Table 3B with the following variation:		

National Differences					
Clause	Requirement – Test			Result – Remark	Verdict
	Rated current of equipment A	Nominal cross-sectional area mm ²	AWG or kcmil (cross-sectional area in mm ²)	Replaced.	N
	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]		
	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]		
	<p>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).</p> <p>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.</p>				
4.3.6	Replace the third paragraph with the following variation: Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet complying with AS/NZS 3112, shall comply with the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets.			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 in compliance with IEC 60825.1.			Inserted.	N
4.7	Add After Clause 4.7 the following variation: For alternative tests refer to Annex YY.			Added.	N

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
6.2.1	<p>Delete item c) and replace with the following:</p> <p style="padding-left: 40px;">c) An SELV circuit, a TNV-2 circuit or a limited current circuit provided for connection of other equipment. The requirement for separation applies whether or not this circuit is accessible.</p>	Deleted.	N
6.2.2	<p>Replace the first paragraph with the following variation:</p> <p>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.</p>	No TNV.	N
6.2.2.1	<p>Replace Clause 6.2.2.1 with the following variation:</p> <p>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, U_c, is:</p> <ul style="list-style-type: none"> - 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. <p>NOTE 1 - The 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines.</p> <p>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.</p>	Replaced.	N
6.2.2.2	<p>Replace the first and second paragraph of Clause 6.2.2.2 with the following variation:</p> <p>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.</p> <p>The a.c. test voltage is:</p> <ul style="list-style-type: none"> - for 6.2.1a): 3 kV; and - for 6.2.1b) and 6.2.1c): 1.5 kV. 	Replaced.	N

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>NOTE 1 – Where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used.</p> <p>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.</p>		
Annex YY Variations			
YY.1	<p>Parts of non-metallic material shall be resistant to ignition and spread of fire.</p> <p>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:</p> <p>(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.</p> <p>(b) The following parts which would contribute negligible fuel to a fire:</p> <ul style="list-style-type: none"> - 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 <p>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.</p> <p>Compliance is checked by the tests of YY.1.1 and YY.1.2.</p> <p>For the base materials of printed boards, compliance is checked by the test of YY.1.3.</p> <p>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</p>	UL approved thermoplastic materials used.	P

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	they would be in normal use. These tests are not carried out on internal wiring.		
YY.1.1	<p>Parts of non-metallic material are subjected to glow wire test of AS/NZS 4695.2.11, which is carried out at 550 °C.</p> <p>Part for which the glow-wire test cannot be carried out, such as those made of soft or foamy material, shall 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.</p>	dto	P
YY.1.2	<p>Testing of insulating materials</p> <p>Parts of insulating material supporting potential ignition sources shall be subject to the glow-wire test of AN/NZS 4695.2.11, which is carried out at 750 °C.</p> <p>The test shall be also carried out on other parts of insulating material which are within a distance of 3 mm of the connection.</p> <p>NOTE - Contacts in components such as switch contacts are considered to be connections.</p> <p>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 shall be subjected to the needle-flame test. However, parts shielded by a barrier which meets the needle-flame test shall not be tested.</p> <p>The needle-flame test shall be made in accordance with AS/NZS 4695.2.2 with the following modifications:</p> <p>5 Severities</p> <p>Replace with:</p> <p>The duration of application of the test flame shall be 30 s ± 1 s.</p> <p>8 Test procedure</p> <p>8.2 Modification:</p> <p>Replace the first sentence with:</p> <p>The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of figure 1.</p>	dto	P

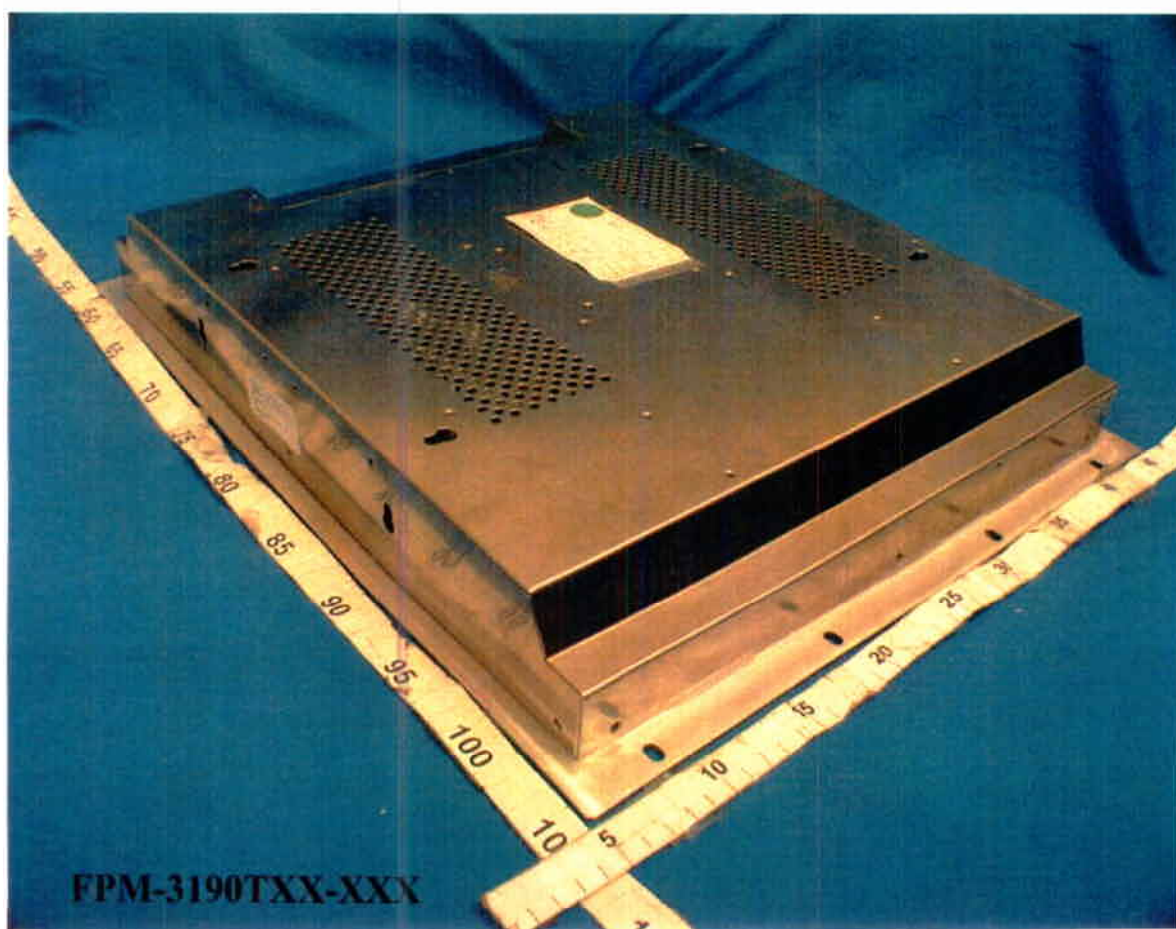
National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>8.4 Modification:</p> <p>The first paragraph does not apply.</p> <p>Addition:</p> <p>If possible, the flame shall be applied at least 10 mm from a corner.</p> <p>8.5 Replacement:</p> <p>The test shall be made on one specimen. 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.</p> <p>10 Evaluation of test results</p> <p>Replace with:</p> <p>The duration of burning (t_b) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s.</p> <p>The needle-flame test shall not be 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.</p>		
YY.1.3	<p>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.</p> <p>NOTE 1 - 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.</p> <p>NOTE 2 - 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.</p> <p>NOTE 3 - Parts likely to be impinged upon by the 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</p>	dto	P

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	flame, positioned above the point of the material supporting in contact with or in close proximity to connections.		
YY.2	<p>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 from a potential ignition source.</p> <p>The test is not carried out if the –</p> <ul style="list-style-type: none"> - 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 spark gaps which provide 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 which fill the openings completely. <p>Compliance is determined using the smallest thickness of the material.</p> <p>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.</p>	dto	P

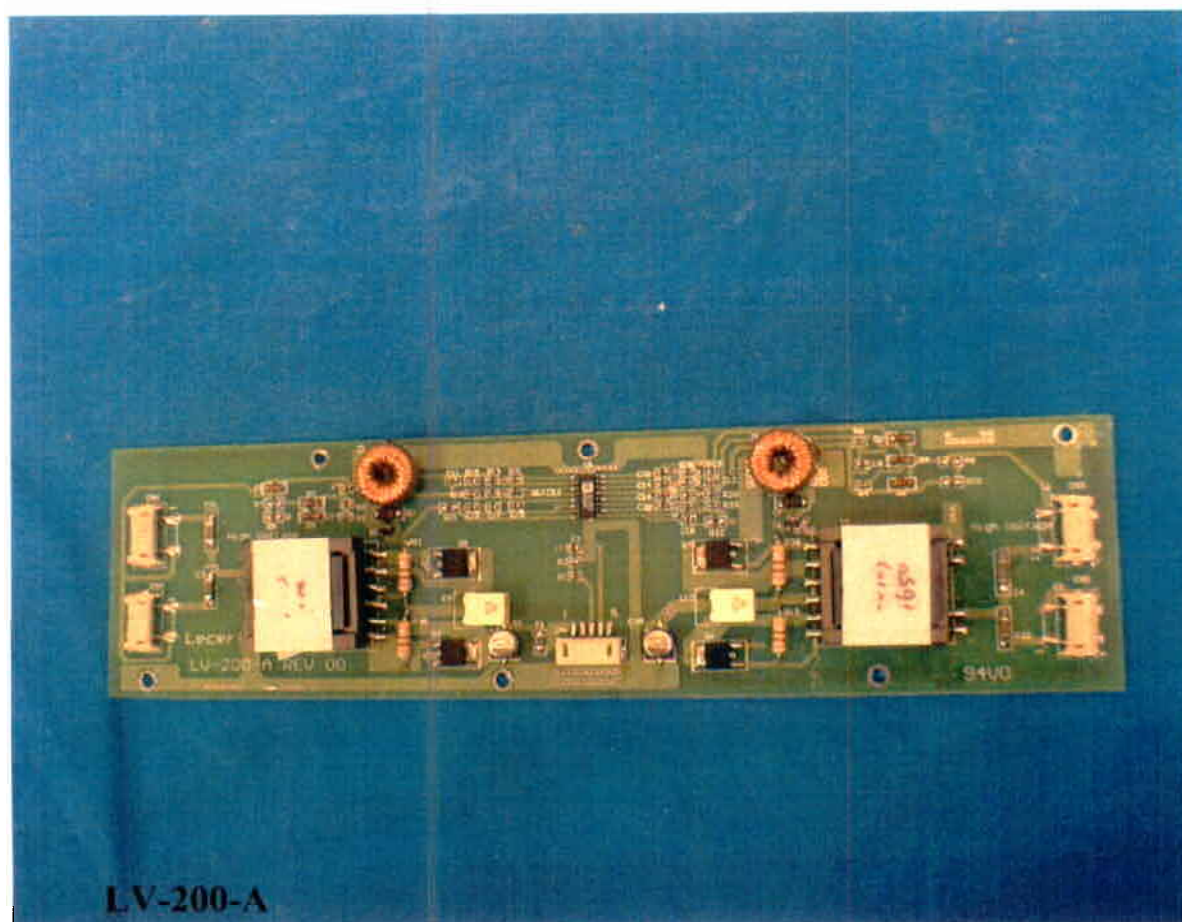
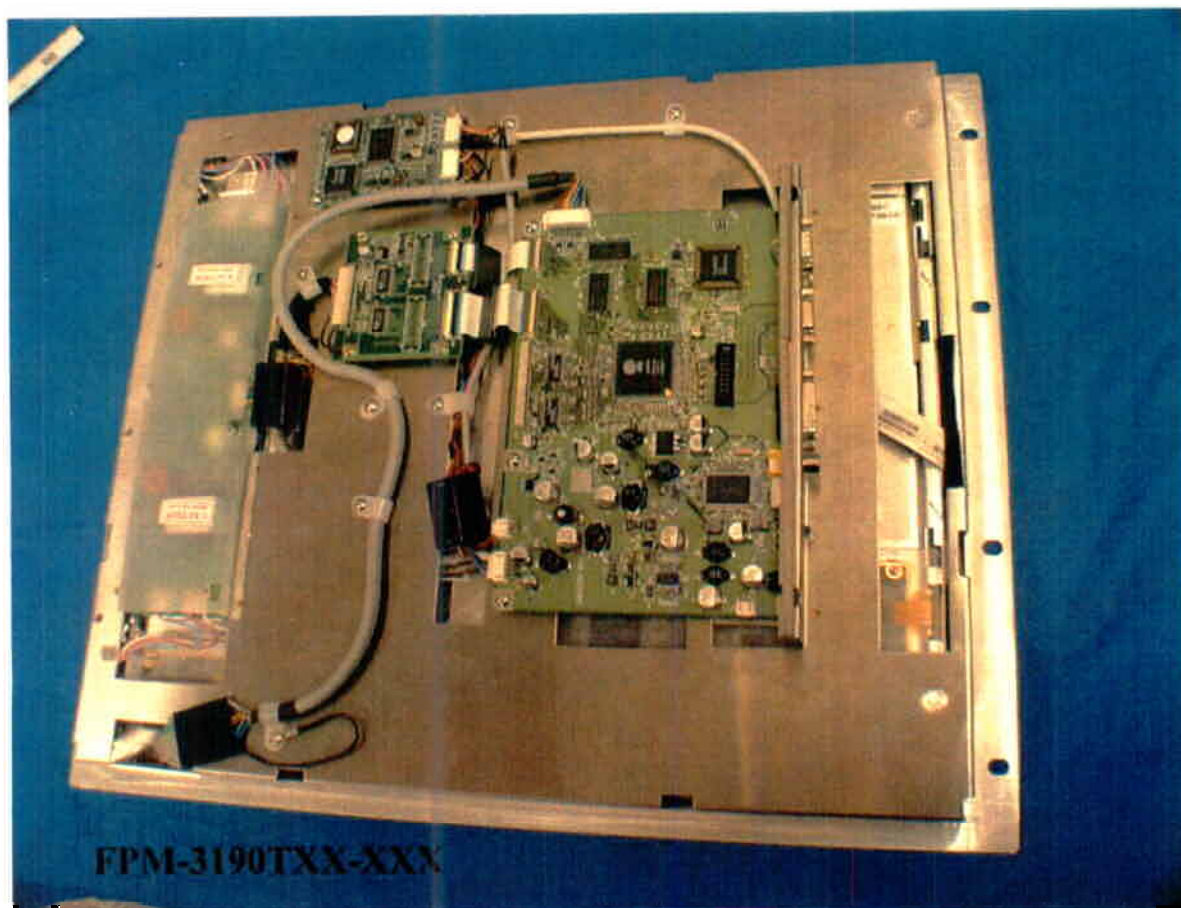
National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Singaporean National Differences (SS 337:2001) (IEC Publication 60950:1999)		P
EXPLANATION FOR ABBREVIATIONS			
P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.			
General	IT Power Systems are not allowed in the Republic of Singapore and all clauses related to IT Power Systems are not applicable.	Class III equipment.	N
2.9.2	After the first paragraph, <i>insert</i> the following: Under tropical conditions, the duration of the humidity conditioning is 5 days (120 h) at a temperature (t) of 40 °C ± 2 °C with relative humidity of 90% to 95% <i>Explanation:</i> Conditions described in IEC Publications 60068-2-3:1969 – ‘Test Ca: Damp Heat, Steady State’ (temperature: 40 °C ± 2 °C, 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		N
2.10.6.5	<i>Delete</i> ‘(48 h)’ <i>Explanation:</i> To be consistent with 2.9.2.	Deleted.	N
3.2.8	<i>Replace</i> ‘23 °C ± 2 °C’ by ‘27 °C ± 2 °C’ <i>Explanation:</i> 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, <i>insert</i> 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.	P

National Differences													
Clause	Requirement – Test	Result – Remark	Verdict										
	<p>Singapore Standards as follows:</p> <table><tr><td>International Standard</td><td>Corresponding Singapore Standard</td></tr><tr><td>IEC 60065</td><td>SS 143:2000</td></tr><tr><td></td><td>Audio, video and similar electronic apparatus – Safety requirements</td></tr><tr><td>IEC 60227</td><td>SS 358:-</td></tr><tr><td></td><td>Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V.</td></tr></table>	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.	—	
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.		—										

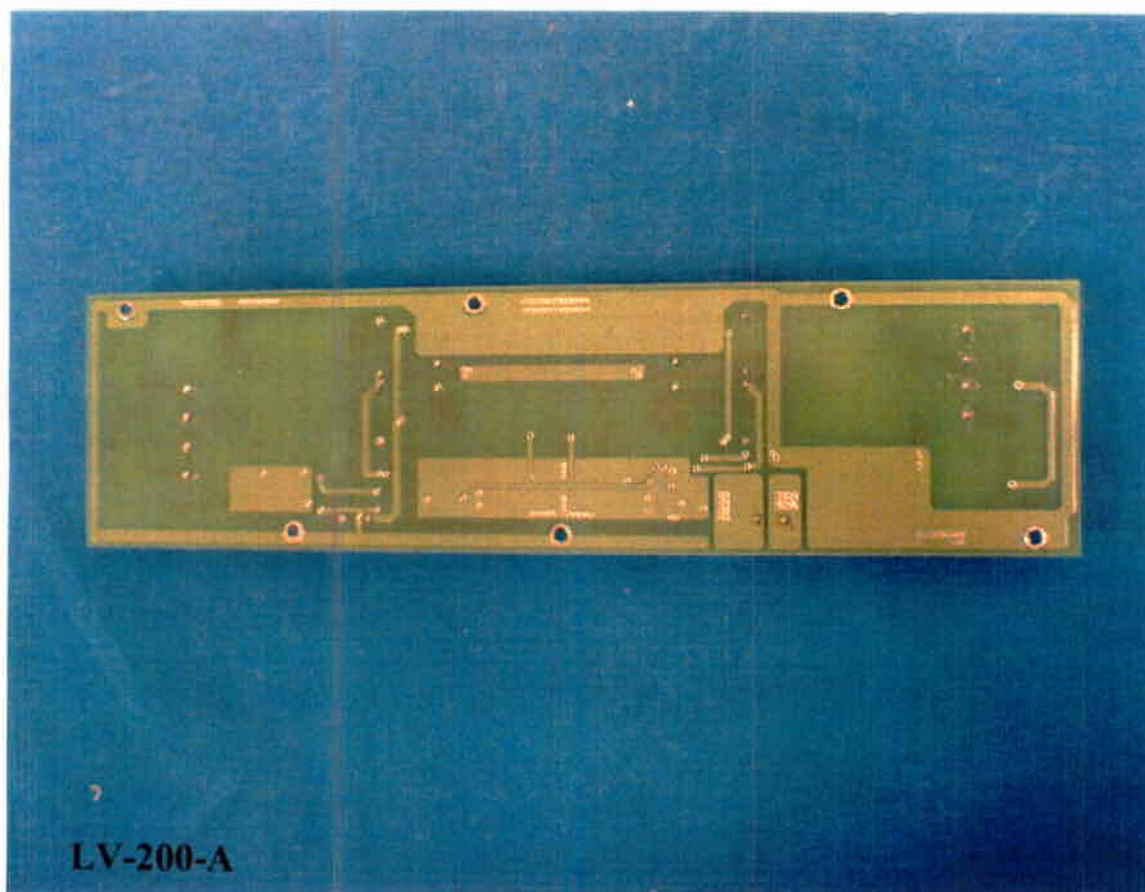
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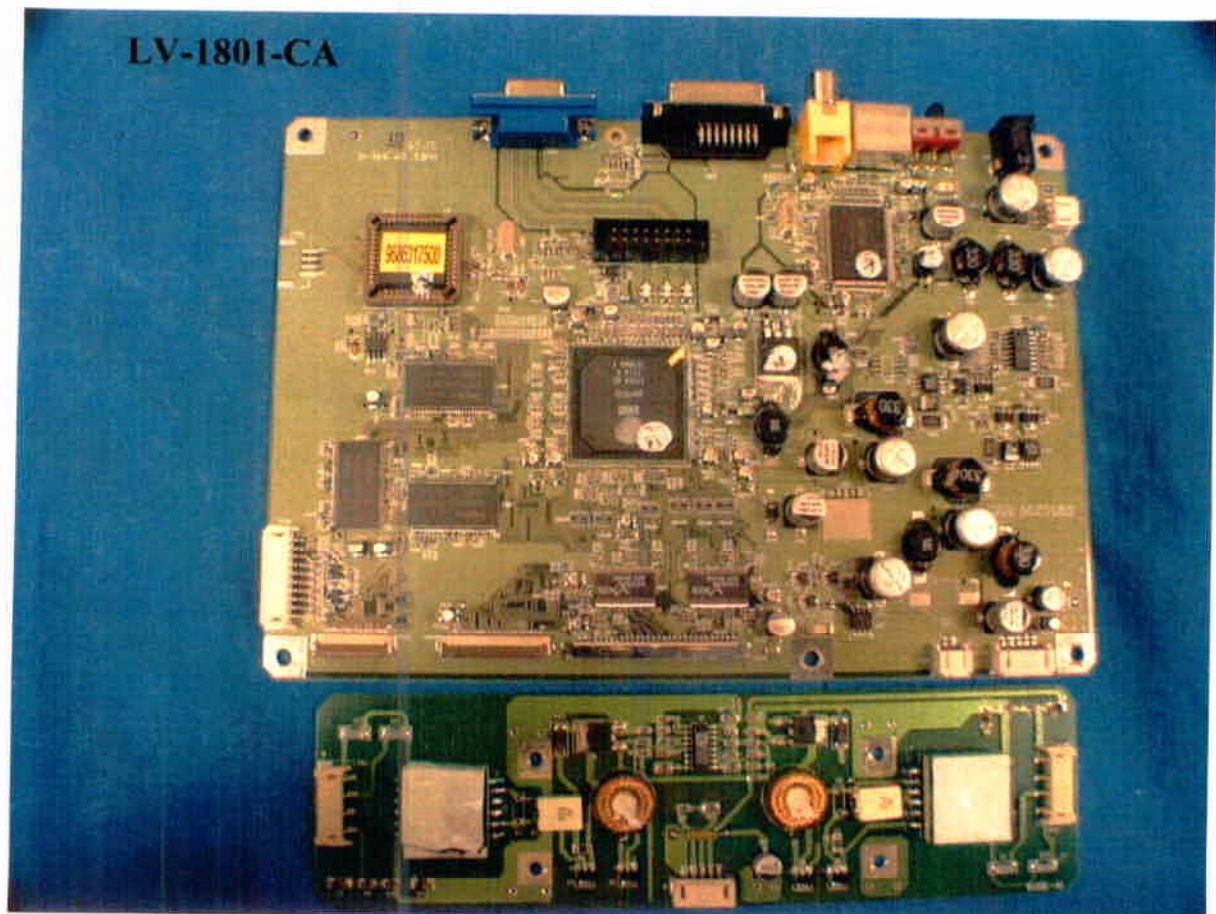
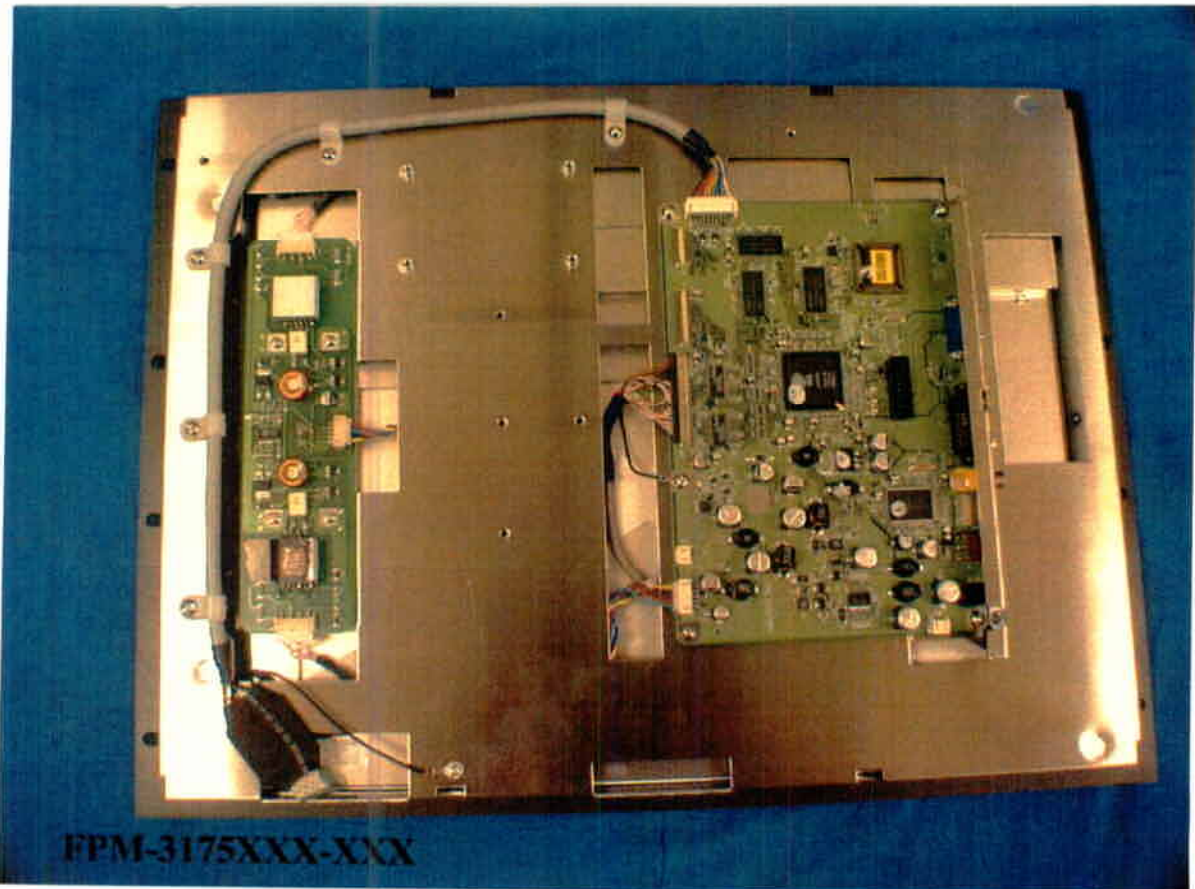
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