

IEC SYSTEM FOR CONFORMITY TESTING
AND CERTIFICATION OF ELECTRICAL
EQUIPMENT (IECEE)
CB SCHEME

SYSTÈME CEI D'ESSAIS DE CONFORMITÉ
ET DE CERTIFICATION DES ÉQUIPEMENTS
ÉLECTRIQUE (IECEE)
METHODE OC

CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC

Product

Produit

Name and address of the applicant

Nom et adresse du demandeur

Name and address of the manufacturer

Nom et adresse du fabricant

Name and address of the factory

Nom et adresse de l'usine

Rating and principal characteristics

Valeurs nominales et caractéristiques principales

Trade mark (if any)

Marque de fabrique (si elle existe)

Model/type Ref.

Ref. de type

Additional information (if necessary)

Information complémentaire (si nécessaire)

A sample of the product was tested and found
to be in conformity with

*Un échantillon de ce produit a été essayé et a été
considéré conforme à la*

as shown in the Test Report Ref. No.

which form part of this certificate

*comme indiqué dans le Rapport d'essais numéro
de référence*

qui constitue une partie de ce certificat

This CB Test Certificate is issued by the National Certification Body

Ce Certificat d'essai OC est établi par l'Organisme National de Certification

Flat Panel Monitor

Advantech Co., Ltd.
4F., No. 108-3, Ming Chuan Rd.
HSIN TIEN CITY, TAIPEI HSIEN 231, TAIWAN, R.O.C.

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Input Rating : DC 12V, 4A
Protection Class : III

Not shown

FPM-3X120YY, FPM-3X120YY-T, FPM-X250YY
FPM-X250YY-T, VOP-1150YYY, VOP-1150YYY-T
X1 = 1 or 2, X2 = 11 or 32, Y = A-Z or blank

For differences between the models, refer to the test report

PUBLICATION

EDITION

inclusive CENELEC Common Modifications
IEC 60950:1999
National differences see test report

12002667 001





TÜV Rheinland Japan Ltd.
3-19-5 Shin-Yokohama
222-0033 Japan

Date 10.09.2002

Signature

[Signature]
Dipl.-Ing. W. Herlitschke

TEST REPORT	
IEC 60950	
Safety of information technology equipment	
Report reference No	<12002667 001>
Compiled by (+ signature)	M. Kera 
Approved by (+ signature)	E. Otsuka 
Date of issue	September 05, 2002
Contents	69 pages
Testing laboratory	TÜV Rheinland Japan Ltd., Yokohama Laboratories
Address	Festo Bldg. 5F, 1-26-10 Hayabuchi, Tsuzuki-Ku, Yokohama 224-0025, Japan
Testing location	TÜV Rheinland Japan Ltd., Yokohama Laboratories
Applicant	Advantech Co., Ltd.
Address	4F., No. 108-3, Ming Chuan Rd., Hsin Tien City, Taipei Hsien 231, Taiwan, R.O.C.
Standard	IEC 60950:1999, EN 60950:2000, SABS IEC 60950, UL 60950, CAN/CSA C22.2 No. 60950/UL60950, K60950
Test procedure	CB Scheme
Procedure deviation	Argentina, Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, The Netherlands, Norway, Poland, Portugal, Russian Federation, Sweden, Slovenia, Slovakia, Singapore, South Africa, Spain, Switzerland, Turkey, United Kingdom, U.S.A.
Non-standard test method	N.A.
Test Report Form No.	I950__E/99-08
TRF originator	FIMKO
Master TRF	dated 99-08
Copyright reserved to the bodies participating in the IECEE CB and/or the bodies participating in the CENELEC Certification Agreement (CCA). This report is based on a blank test report that was prepared by FIMKO using information obtained from the TRF originator.	
Type of test object	Flat Panel Monitor
Trademark	Not shown
Model and/or type reference	FPM-3X ₁ 20YY, FPM-3X ₁ 20YY-T, FPM-X ₂ 50YY, FPM-X ₂ 50YY-T, VOP-1150YYY, VOP-1150YYY-T (X ₁ = 1 or 2, X ₂ = 11 or 32, Y = A-Z or blank)
Manufacturer	Same as applicant
Factory:	Same as applicant
Rating(s)	DC 12V, 4A

Particulars: test item vs. test requirements

Equipment mobility	Equipment for building-in
Operating condition	Continuous
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)	3kg (for 12") 5kg (for 15")
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)

General remarks

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.

Brief description of the test sample:

These equipment models FPM-3X₁ 20YY, FPM-3X₁ 20YY-T, FPM-X₂ 50YY, FPM-X₂ 50YY-T, VOP-1150YYY and VOP-1150YYY-T, where X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank, are LCD monitors for general office use. Both models are identical except for type designation. The model FPM-3X₁ 20YY is similar to model FPM-3X₁ 20YY-T except without touchscreen function. The model FPM-X₂ 50YY is similar to model FPM-X₂ 50YY-T except without touchscreen function. The model VOP-1150YYY is similar to model VOP-1150YYY-T except without touchscreen function. The model FPM-3X₁ 20YY-T (12") is similar to model FPM-X₂ 50YY-T (15") except LCD panel size and type designation. The model VOP-1150YYY-T is identical to model FPM-X₂ 50YY-T except for type designation.

The external power adapters (SPS) are approved products, which were CB scheme tested according to IEC 60950: 1991 + A1 + A2 + A3 + A4, see appended table 1.5.1 for detail information.

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.

All tests were performed on model FPM-X₂ 50YY-T to represent the other model.

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

Copy of marking plate:

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: FPM-3120TV
Rating: 12 Vdc, 4A

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: FPM-3220TV-T
Rating: 12 Vdc, 4A

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: FPM-1150S
Rating: 12 Vdc, 4A

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: FPM-3250T-T
Rating: 12 Vdc, 4A

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: VOP-1150TVB
Rating: 12 Vdc, 4A

ADVANTECH Co., Ltd.
Flat Panel Monitor
Model No.: VOP-1150TVS-T
Rating: 12 Vdc, 4A

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

1	GENERAL		P
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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	Transformer used is suitable for their intended application and comply with the relevant requirements of the standard.	P
1.5.5	Interconnecting cables	No interconnecting cables.	N
1.5.6	Capacitors in primary circuits	Equipment is not directly connected to the AC mains supply.	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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.5.8	Components in equipment for IT power systems	Equipment is not directly connected to the AC mains supply.	N
1.6	Power interface		P
1.6.1	AC power distribution systems	Equipment is not directly connected to the AC mains supply.	N
1.6.2	Input current	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	This appliance is not a hand-held equipment.	N
1.6.4	Neutral conductor	Equipment is not directly connected to the AC mains supply.	N
1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V)	12 Vdc (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 (mA or A)	4A (no direct connection to the AC mains supply)	N
	Manufacturer's name/Trademark	ADVANTECH Co., Ltd.	P

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	Type/model	FPM-3X ₁ 20YY, FPM-3X ₁ 20YY-T, FPM-X ₂ 50YY, FPM-X ₂ 50YY-T, VOP-1150YYY, VOP-1150YYY-T (X ₁ = 1 or 2, X ₂ = 11 or 32, Y = A-Z 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	Not shown.	N
1.7.2	Safety instructions	The users 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
1.7.6	Fuse identification	Fuse reference provided.	P
1.7.7	Wiring terminals	See below.	N
1.7.7.1	Protective earthing and bonding terminals	No direct connection to AC mains supply.	N
1.7.7.2	Terminal for a.c. mains supply conductors	No direct connection to AC mains supply.	N
1.7.8	Controls and indicators	See below.	—
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		N
1.7.8.4	Markings using figures	No indicators for different positions.	N
1.7.9	Isolation of multiple power sources	No direct connection to AC mains supply.	N
1.7.10	IT power system	No direct connection to AC mains supply.	N
1.7.11	Thermostats and other regulating devices	No thermostat or other regulating device.	N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.12	Language	Installation instruction and marking label are in English. Versions of other languages will be provided when submitted for national approval.	P
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	No 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	No restricted access location.	N

2	PROTECTION FROM HAZARDS	P
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2.1	Protection from electric shock and energy hazards <i>The unit 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</i>		P
2.1.1	Protection in operator access areas		P
2.1.1.1	Access to energised parts		—
	Test by inspection		N
	Test with test finger		N
	Test with test pin		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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) through 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 below 240VA.	P
2.1.1.6	Manual controls	No manual controls	N
2.1.1.7	Discharge of capacitor s in the primary circuit		N
	Time-constant (s); measured voltage (V)		—
2.1.2	Protection in service access areas	No maintenance work in operation mode necessary.	N
2.1.3	Protection in restricted access locations	It is not intended to be used in restricted locations	N

2.2	SELV circuits		P
2.2.1	General requirements	The secondary circuits were tested as 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
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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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. No direct connection between SELV and any primary circuits.	P

2.3	TNV circuits <i>No TNV circuit.</i>		N
2.3.1	Limits		N
	Type of TNV circuits..... :		—
2.3.2	Separation from other circuits and from accessible parts		N
	Used insulation :		—
2.3.3	Separation from hazardous voltages		N
	Used insulation :		—
2.3.4	Connection of TNV circuits to other circuits		N
	Used insulation :		—
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 below	P
	Frequency (Hz)..... :	See below.	—
	Measured current (mA)..... :	The peak drop voltage was measured with an oscilloscope at a 2k Ω non-inductive resistor. Results see appended table 2.4.2.	—
	Measured voltage (V) :	450 < U < 15k	—
	Measured capacitance (μ F)..... :	< 45 μ C	—
2.4.3	Connection of limited current circuits to other circuits		P

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

2.5	Limited power sources		N
	Inherently limited output		N
	Impedance limited output		N
	Overcurrent protective device limited output		N
	Regulating network limited output under normal operating and single fault condition		N
	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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.4.1	Protective earthing and bonding terminals		N
	Rated current (A), type and nominal thread diameter (mm).....:		—
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 <i>With SELV supply from approved AC adapter, no primary circuits inside the LCD monitor → N/A</i>		N
2.7.1	Basic requirements		N
2.7.2	Faults not covered in 5.3		N
2.7.3	Short-circuit backup protection		N
2.7.4	Number and location of protective devices		N
2.7.5	Protection by several devices		N
2.7.6	Warning to service personnel.....:		N
2.8	Safety interlocks.		N
2.8.1	General principles		N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

2.8.5	Interlocks with moving parts		N
2.8.6	Overriding an interlock		N
2.8.7	Switches and relays in interlock systems		N
2.8.7.1	Contact gaps (mm) :		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test (V)		N
2.8.8	Mechanical actuators		N

2.9	Electrical insulation <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 circuit		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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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
2.10.5.4	Wound components		N
2.10.6	Coated printed boards		N
2.10.6.1	General		N
2.10.6.2	Sample preparation and preliminary inspection:		N
2.10.6.3	Thermal cycling		N
2.10.6.4	Thermal ageing		N
2.10.6.5	Electric strength test		N
2.10.6.6	Abrasion resistance test		N
	Electric strength test		N
2.10.7	Enclosed and sealed parts		N
2.10.8	Spacings filled by insulating compound		N
	Electric strength test		N
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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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. No internal wire for primary power distribution.	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
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 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 reliable secured.	P
3.1.10	Sleeving on wiring	No sleeving used as supplementary insulation.	N
3.2	Connection to a.c. mains supplies <i>Class III equipment.</i>		N
3.2.1	Means of connection		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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)		—
	Radius of curvature of cord (mm)		—
3.2.9	Supply wiring space		N

3.3	Wiring terminals for connection of external conductors <i>Class III equipment.</i>		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	Standard wire		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

3.4	Disconnection from the a.c. mains supply <i>Class III equipment.</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. No ELV interconnection circuits.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection	N

4	PHYSICAL REQUIREMENTS		P
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4.1	Stability		N
	Angle of 10°	Building-in type equipment, compliance should be investigated in the final system assembly.	N
	Test: force (N)		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
4.2	Mechanical strength <i>Building-in type equipment, compliance should be investigated in the final system assembly.</i>		N
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	Unit does not employ a cathode ray tube.	—
	Picture tube separately certified..... :		N
	Picture tubes > 16 cm intrinsically protected		N
	Non-intrinsically protected tubes > 16 cm used with protective screen		N
	Intrinsically protected tubes: tests on 12 samples		N
	Samples subject to ageing: 6		N
	Samples subject to implosion test: 6		N
	Samples subject to mechanical strength test (steel ball): 6		N
	Non-intrinsically protected tubes tested		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	Building-in type equipment, compliance should be investigated in the final system assembly.	N
4.3.2	Handles and manual controls; force (N)..... :		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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 with standard usual mechanical stress. For the protection solder pins are used.	P
4.3.5	Connection of plugs and sockets	In operator and service area, mismatch of connectors were prevented by incompatible form or location.	P
4.3.6	Direct plug-in equipment		N
	Torque (Nm)		—
4.3.7	Heating elements in earthed equipment		N
4.3.8	Batteries	No 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 power is far below LED Class 1 limit.	P
	Equipment using lasers, see separate test report of IEC 60825-1.	dto.	N
4.4	Protection against hazardous moving parts <i>Building-in type equipment, compliance should be investigated in the final system assembly.</i>		N
4.4.1	General		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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		N
4.5	Thermal requirements		P
4.5.1	Temperature rises	See appended table 4.5.1.	P
4.5.2	Resistance to abnormal heat		N
4.6	Openings in enclosures <i>Building-in type equipment, compliance should be investigated in the final system assembly.</i>		N
4.6.1	Top and side openings		N
	Dimensions (mm) :		—
4.6.2	Bottoms of fire enclosures		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
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Use of materials with the required flammability classes.	P
4.7.2	Conditions for a fire enclosure	See below	N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
4.7.2.1	Parts requiring a fire enclosure	With having the following parts: <ul style="list-style-type: none"> components in secondary (not supplied by LPS) insulated wiring the fire enclosure is required. However, with this unit as a building-in component, the meeting of the requirements has to be observed with the final system assembly.	N
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials	See below.	P
4.7.3.1	General	See appended table 1.5.1 for PCB.	P
4.7.3.2	Materials for fire enclosures		N
4.7.3.3	Materials for components and other parts outside fire enclosures		N
4.7.3.4	Materials for components and other parts inside fire enclosures		N
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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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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

	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
5.3.3	Transformers	No safety isolation transformer except in approved switching power supply adapter.	N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.4	Functional insulation	Method c) considered. Due to <ul style="list-style-type: none"> all components are mounted on PCB of flammability V-1 wiring is insulated by PVC no risk of electrical shock no test had been performed.	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	See below.	P
5.3.8.1	During the tests	No fire propagated beyond the equipment. No molten metal was emitted.	P
5.3.8.2	After the tests	Considered.	N

6	CONNECTION TO TELECOMMUNICATION NETWORKS <i>No TNV.</i>		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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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
	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		N
	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		N
	Wall thickness (mm)		—
A.2.2	Conditioning of samples; temperature (°C).....		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
A.2.3	Mounting of samples.....:		N
A.2.4	Test flame		N
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2.7	Alternative test acc. to IEC 60695-2-2, cl. 4, 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		N
	Wall thickness (mm)		—
A.3.2	Test circuit		N
A.3.3	Test electrodes		N
A.3.4	Test procedure		N
A.3.5	Compliance criteria		N
	Sample 1 number of arcs to ignition (pcs)		—
	Sample 2 number of arcs to ignition (pcs)		—
	Sample 3 number of arcs to ignition (pcs)		—
	Sample 4 number of arcs to ignition (pcs)		—
	Sample 5 number of arcs to ignition (pcs)		—
A.4	Hot wire ignition test (see 4.7.3.2)		N
A.4.1	Samples		N
	Wall thickness (mm)		—
A.4.2	Test circuit		N
A.4.3	Mounting of samples.....:		N
A.4.4	Test procedure		N
A.4.5	Compliance criteria		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
	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.5.1	Mounting of samples.....		N
A.5.2	Test procedure		N
A.5.3	Compliance criterion		N
A.6	Flammability tests for classifying materials V-0, V-1 or V-2		N
A.6.1	Samples		N
	Wall thickness (mm)		—
A.6.2	Conditioning of samples temperature (°C).....		N
A.6.3	Mounting of samples.....		N
A.6.4	Test procedure		N
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		N
	Wall thickness (mm)		—
A.7.2	Conditioning of samples; temperature (°C).....		N
A.7.3	Test procedure		N
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		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

	Sample thickness (mm)		—
A.8.2	Conditioning of samples; temperature (°C)		N
A.8.3	Mounting of samples		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		N
	Sample thickness (mm)		—
A.9.2	Conditioning of samples temperature (°C)		N
A.9.3	Test flame		N
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)		—

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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
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		N
	Position :		—
	Manufacturer :		—
	Type :		—
	Rated values :		—
C.1	Overload test		N
C.2	Insulation		N
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		N
D.1	Measuring instrument		N
D.2	Alternative measuring instrument		N
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13 and 4.5.1)		N
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES		N
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
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) <i>No ionizing radiation.</i>		N
	Ionizing radiation		N
	Measured radiation (mR/h)		—
	Measured high-voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings		—
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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.1)		P
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N
L.7	Other business equipment	See 1.6.2.	P

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringing signal		N
M.3.1.1	Frequency (f)		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

V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1) <i>Class III equipment.</i>		N
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IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict
V.1	Introduction		N
V.2	TN power systems		N
V.3	TT power systems		N
V.4	IT power systems		N

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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 Supply Adapter (SPS)	Lien Electronics Inc.	LE-9702B	i/p: 100-240Vac, 50/60Hz, 1.5A, Class I o/p: 12Vdc, 4A	IEC 60950 (complied with limited power source)	TÜV, UL, CB (issued by Nemko)	
LCD Panel	CPT Confidential	CLAA150XA03	15", TFT type	--	--	
	Torisan	MXS121022010	12", TFT type	--	--	
DC/AC Inverter (for 15" LCD panel)	TDK	TAD712	i/p: 10.8-13.2Vdc, 1.1A max.; o/p: 1500Vrms, 7mA max.	--	--	
- Transformer in Inverter (T1, T2)	TDK	NIA15/20EM- T09H004	Class 105°C	--	--	
DC/AC Inverter (for 15" LCD panel)	Lecerf Tec.	1501A-1	i/p: 11.3-13.2Vdc, 1000-1450mA; o/p: 1000- 1400Vrms, 7.5mA max.	--	--	
- Transformer in Inverter (T1, T2)	TOP NATION	X06A	Class 105°C	--	--	
DC/AC Inverter (for 12" LCD panel)	TDK	TAD143-1	i/p: 12-17Vdc, 380mA max.; o/p: 1200Vrms, 8mA max.	--	--	
- Transformer in Inverter (T1)	TDK	SRW15EM- T06H004	Class 105°C	--	--	
DC/AC Inverter (for 12' LCD panel)	Bright Deer Tec.	IV-12A	i/p: 11-13Vdc, 500-700mA; o/p: 700-900Vrms, 7mA max.	--	--	

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Clause	Requirement – Test	Result – Remark	Verdict

- Transformer in Inverter (T1)	Tatung	X03	Class 105°C	--	--
Enclosure Material	--	--	metal	UL 94	UL
PCB material	--	--	V-1, min. 105°C	UL 94	UL

¹⁾ an asterisk indicates a mark which 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
For model FPM-3220TV-T						
--	4	12Vdc	9.3	0.775	--	(measured at LCD monitor)
For model FPM-3250T-T						
--	4	12Vdc	17.64	0.147	--	(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

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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

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

2.4.2	TABLE: limited current circuit measurement					P
Location	Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments	
For TDK's DC/AC inverter, type TAD712						
normal condition						
CP2, Pin 1 to GND	31.6	15.8	47.3	33.11		
CP2, Pin 3 to GND	2.1	1.05	52.3	36.61		
CP2, Pin 1 to Pin 3	5.7	2.85	47.6	33.32		
single fault condition (C15 short)						
CP2, Pin 1 to GND	76	38	120.7	70		
CP2, Pin 3 to GND	2.1	1.05	49.5	34.65		
CP2, Pin 1 to Pin 3	7.2	3.6	125	70		
single fault condition (L1 short)						
CP2, Pin 1 to GND	37.2	18.6	49.2	34.44		
CP2, Pin 3 to GND	2.4	1.2	47.5	33.25		
CP2, Pin 1 to Pin 3	11.2	5.6	48.5	33.95		
single fault condition (Q4 short)						
CP2, Pin 1 to GND	0	0	--	--	Unit shutdown	
CP2, Pin 3 to GND	0	0	--	--	Unit shutdown	

IEC 60950					
Clause	Requirement – Test			Result – Remark	Verdict
CP2, Pin 1 to Pin 3	0	0	--	--	Unit shutdown
single fault condition (R17 short)					
CP2, Pin 1 to GND	29.6	14.8	47	32.9	
CP2, Pin 3 to GND	0.7	0.35	97.8	68.46	
CP2, Pin 1 to Pin 3	29.6	14.8	46.9	32.83	
single fault condition (Q6 short)					
CP2, Pin 1 to GND	36	18	46.9	32.83	
CP2, Pin 3 to GND	6.8	3.4	48.3	33.81	
CP2, Pin 1 to Pin 3	35.6	17.8	47.2	33.04	
For Lecerf Tec.'s DC/AC inverter					
normal condition					
CN2, Pin 1 to GND	19.6	9.8	41.1	28.77	
CN2, Pin 1 to Pin 3	20	10	41.0	28.7	
single fault condition (C6 short)					
CN2, Pin 1 to GND	19.6	9.8	41.1	28.77	
CN2, Pin 1 to Pin 3	20	10	41.0	28.7	
single fault condition (L1 short)					
CN2, Pin 1 to GND	38.4	19.2	41.7	29.19	
CN2, Pin 1 to Pin 3	28.4	14.2	41.8	29.26	
single fault condition (Q3 short)					
CN2, Pin 1 to GND	78.4	39.4	51.6	36.12	
CN2, Pin 1 to Pin 3	72	36	50	35	
single fault condition (Q4 short)					
CN2, Pin 1 to GND	0	0	--	--	Unit shutdown
CN2, Pin 1 to Pin 3	0	0	--	--	Unit shutdown
For TDK's DC/AC inverter, type TAD143-1					
normal condition					
CP2, Pin 1 to GND	35	17.5	30	21	
CP2, Pin 3 to GND	6.16	3.08	30.1	21.07	
CP2, Pin 1 to Pin 3	21.4	10.7	28.4	19.88	

IEC 60950					
Clause	Requirement – Test			Result – Remark	Verdict
single fault condition (C51 short)					
CP2, Pin 1 to GND	80.4	40.2	114.6	70	
CP2, Pin 3 to GND	8.4	4.2	30.1	21.07	
CP2, Pin 1 to Pin 3	23.2	11.6	115.7	70	
single fault condition (L1 short)					
CP2, Pin 1 to GND	36	18	31.2	21.84	
CP2, Pin 3 to GND	6.32	3.16	31.1	21.77	
CP2, Pin 1 to Pin 3	19.2	9.6	29.2	20.44	
single fault condition (Q1 short)					
CP2, Pin 1 to GND	37.6	18.8	31.2	21.84	
CP2, Pin 3 to GND	6.24	3.12	31.2	21.84	
CP2, Pin 1 to Pin 3	37.6	18.8	31.2	21.84	
For Bright Deer’s DC/AC inverter					
normal condition					
CN3, Pin 1 to GND	21.6	10.8	51.1	35.77	
CN3, Pin 2 to GND	0.2	0.1	344	70	
CN3, Pin 1 to Pin 2	19.6	9.8	51.1	35.77	
single fault condition (C8 short)					
CN3, Pin 1 to GND	27.6	13.8	157.8	70	
CN3, Pin 2 to GND	0.2	0.1	344	70	
CN3, Pin 1 to Pin 2	26.4	13.2	157.8	70	
single fault condition (L1 short)					
CN3, Pin 1 to GND	25.2	12.6	51.3	35.91	
CN3, Pin 2 to GND	0.7	0.35	155.8	70	
CN3, Pin 1 to Pin 2	24.8	12.4	51.1	35.77	
single fault condition (Q8 short)					
CN3, Pin 1 to GND	48	24	52.1	36.47	
CN3, Pin 2 to GND	0.1	0.05	150	70	
CN3, Pin 1 to Pin 2	51.2	25.6	53.8	37.66	

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

Output measured with a 2kΩ non-inductive resistor as load.

2.6.3.3	TABLE: ground continue test		N
Location	Resistant 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	TABLE: temperature rise measurements			P
	test voltage (V)	+ 12Vdc		—
	t1 (°C)			—
	t2 (°C)			—
Rise dT of part/at:		dT (K)	Allowed dT (K)	
Ambient		26°C	--	

IEC 60950					
Clause	Requirement – Test		Result – Remark		Verdict
For model FPM-3220TV-T					
U6			12		--
PCB near U800			26		55
L800			19		55
U401			29		--
LCD module			21		--
Enclosure outside			8		20
T2 coil of Bright Deer’s DC/AC inverter			31		55
T2 core of Bright Deer’s DC/AC inverter			27		55
L2 coil of Bright Deer’s DC/AC inverter			37		55
T2 coil of TDK’s DC/AC inverter, type TAD143-1			34		55
T2 core of TDK’s DC/AC inverter, type TAD143-1			34		55
L2 coil of TDK’s DC/AC inverter, type TAD143-1			28		55
For model FPM-3250T-T					
U1			15		--
PCB near U800			33		55
L800			27		55
U401			45		--
LCD module			15		--
Enclosure outside			12		20
T2 coil of Lecerf’s DC/AC inverter			46		55
T2 core of Lecerf’s DC/AC inverter			42		55
L2 coil of Lecerf’s DC/AC inverter			40		55
T1 coil of TDK’s DC/AC inverter, type TAD712			33		55
T1 core of TDK’s DC/AC inverter, type TAD712			32		55
L1 coil of TDK’s DC/AC inverter, type TAD712			32		55
Temperature rise dT of winding:					
		R ₁ (Ω)	R ₂ (Ω)	dT (K)	allowed dT (K)
					insulation class

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

Comments:

The temperatures were measured under worst case normal mode defined in 1.2.2.1 and as described in 1.6.1 at voltages as described in 1.6.5.

With maximum of 50°C ambient temperature specified the max. temperature rise is calculated as follows:

Electrolyte capacitor or components with:

- max. absolute temp. of 105°C → dT_{max} = (105-50) K = 55K

Surface of equipment which may be touched:

- metal → dT_{max} = 45 - (50-25) K = 20K

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	
For model FPM-3220TV-T			
Top	None		
Rear	5.5mm x 2.3mm ϕ 5.3mm	Numerous openings	
Bottom	None		
For model FPM-3250T-T			
Top	None		
Rear/Side	5.5mm x 2.3mm	Numerous openings	
Rear	5.5mm x 2.3mm ϕ 5.3mm	Numerous openings	
Bottom	None		

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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
Supplementary information			
Test voltage a.c. / d.c.			

5.3	TABLE: fault condition tests						P
	ambient temperature (°C): 26°C						—
	model/type of power supply: See appended table 1.5.1						—
	manufacturer of power supply: Lien						—
	rated markings of power supply: See appended table 1.5.1						—
No.	Component no.	Fault	Test voltage (V)	Test time	Fuse no.	Fuse current (A)	Result
01	all ventilation openings for model FPM-3320TV-T	blocked	12	2 hrs	--	--	Temperature of all parts stabled at T2 coil (D/A inverter) = 61°C, enclosure outside of LCD monitor = 39°C, no hazard.
02	all ventilation openings for model FPM-3250T-T	blocked	12	2 hrs	--	--	Temperature of all parts stabled at T2 coil (D/A inverter) = 78°C, enclosure inside of LCD monitor = 43°C, no hazard.

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

Supplementary information							
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.	Afterflame time (s) t_1 or t_2	Afterflame + 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 afterflame 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.	Afterflame time (s) t_1 or t_2	Afterflame + afterglow (s) after 2nd flame application $t_2 + t_3$	
11			
12			
13			
14			
15			
Supplementary information:			

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

Total afterflame 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				

IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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
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IEC 60950			
Clause	Requirement – Test	Result – Remark	Verdict

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)	



IEC 60950				
Clause	Requirement – Test		Result – Remark	Verdict
11				
12				
13				
14				
15			—	—
Supplementary information:				

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Group Differences according to CB Bulletin No. 101A, December 2001 REPORT (IEC Publication 60950 : 1999)		P
2.7.1	<p>Replace the text of this sub-clause by:</p> <p>Basic requirements</p> <p>To protect against excess current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as a part of the building installation, subject to the following a), b) and c):</p> <p>(a) Except as detailed in (b) and (c), protective devices necessary to comply with the requirements of subclause 6.3 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 with 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 TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>	Replaced.	N
2.7.2	This subclause has been declared "Void".	Void.	N
3.2.3	Delete NOTE 1, and in table 3A delete the conduit sizes in parentheses.	Deleted.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
3.2.5	<p>Replace</p> <p>"60245 IEC 530" by "H05 RR-F",</p> <p>"60227 IEC 52" by "H03 VV-F or H03 VVH2-F" and</p> <p>"60227 IEC 53" by "H05 VV-F or H05 VVH2-F".</p> <p>In table 38, replace the first four lines by the following:</p> <p>Up to and including 6 0.75 ¹⁾</p> <p>Over 6 up to and including 10 (0.75)²⁾ 1.0</p> <p>Over 10 up to and including 16 (1.0)³⁾ 1.5</p> <p>In the conditions applicable to table 3B, delete the words "in some countries" in condition 1).</p> <p>In NOTE 1, delete the second sentence.</p>	Replaced.	N
3.3.4	<p>In table 30, replace the fourth line – conductor sizes for 10 to 13A, and replace with the following:</p> <p>Over 10 up to and including 16 1.5 to 2.5 1.5 to 4</p> <p>Delete the fifth line – conductor sizes for 13A to 16A.</p>	Replaced.	N
4.3.13	<p>Replace the second compliance paragraph by:</p> <p>For equipment using LEDs or lasers, compliance is checked according to EN 60825-1.</p> <p>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 LD of a higher class number, then a laser warning label or other laser warning statement is not required (see 1.1 of EN 60825-1).</p> <p>Renumber the NOTE below the third compliance paragraph 2S NOTE 2.</p>	See IEC 60950 test report.	P

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
Annex H	<p>Replace the last paragraph of this annex by:</p> <p>At any point 10cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceeded $1\mu\text{Sv/h}$(0.1mR/h) (see note). Account is taken of the background level.</p> <p>Replace the NOTE as follows:</p> <p>NOTE – These values appear in directive 96/29/Euratom.</p>	Replaced.	N
Annex P	<p>Replace the text of this annex by:</p> <p>Aee annex ZA.</p>	Replaced.	P
Annex Q	<p>Add the following notes for the standards indicated:</p> <p>IEC 60127 series NOTE: Harmonized as EN 60127 series (not modified)</p> <p>IEC 60529 NOTE: Harmonized as EN 60529:1991 (not modified)</p> <p>IEC 61032 NOTE: Harmonized as EN 61032:1998 (not modified)</p>	Added.	P

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Sweden, Norway and Finland National Differences according to CB Bulletin No. 101A, December 2001 REPORT (IEC Publication 60950 : 1999)		P
1.5.1	(SE) Add the following: NOTE: In Sweden, switches containing mercury such as thermostats, relays and level controllers are not allowed.	No such switch.	N
1.5.8	(NO) In Norway, 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 (230V).	Class III equipment.	N
1.7.2	(SE) In Sweden, if the separation between the mains and a 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 shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk".		N
1.7.2	(NO) In Norway, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a communication network shall, relies on connection to safety earth, require a marking stating that is must be connected to an earthed mains socket-outlet.		N
2.2.4	(NO) In Norway, requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply.		N
2.3.2	(NO) In Norway, requirements according to this annex, sub-clause 6.1.2.1 apply.		N
2.3.3	(NO) In Norway, requirements according to this annex, sub-clause 6.1.2.1 apply.		N
2.3.4	(NO) In Norway, requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply.		N
2.10.3.1	(NO) In Norway, 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 230V in case of a single earth fault.	Class III equipment.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
6.1.2.1	<p>(SE, NO) In Sweden and Norway, add the following text between the first and the second paragraph:</p> <p>If the 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 0.4mm, 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 1.5kV multiplied by 1.6 (the electric strength test of 2.10.7 shall be performed using 1.5kV); and - is subjected to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1.5kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p>	Added.	N
6.1.2.2	<p>(SE, NO, FI) In Sweden, Norway and Finland, the exclusions are applicable to PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B only.</p>		N
Annex G.2	<p>(NO) In Norway, 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 230V in case of a single earth fault.</p>	Class III equipment.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	<p>Canadian National Differences according to CB Bulletin No. 101A, December 2001</p> <p>(IEC Publication 60950 Third edition. The standard CAN/CSA C22.2 No. 60950/UL 60950, Third edition)</p>		P
<p>EXPLANATION FOR ABBREVIATIONS</p> <p>P=Pass, F=Fail, N=Not applicable. Placed in the column to the right.</p>			
Special National Conditions			
1.1.1	<p>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), ANS/NFPA 70, and, unless marked or otherwise identified, the Standard for the Protection fo Electronic Computer/ Data-Processing Equipment, ANS/NFPA 75.</p>	Complies.	P
1.5.5	<p>For iongths 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.</p> <p>For iongths 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 marking.</p>		N
1.7.1	<p>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.</p> <p>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 extended into the Table 2 "Normal Operating Conditions." Likewise, a voltage rating shall not be lower than specified "Normal Operating Condition," unless it is part of a range that extends into the "Normal Operating Conditions."</p>	Class III equipment.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
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
2.7.1	Suitable NEC/CEC branch circuit protection is required for all standard supply outlets 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 10KVA or more, required 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 NEC and CEC.		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.		N
3.2.3	Permanent connection of equipment to the mains by a power supply cord is not permitted, except for certain equipment, such as ATMs.		N
3.2.5	Power supply cords are required to be not 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.		N
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wiring bending space.		N
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CAN/CSA No. 0.		N
3.3.3	Wiring binding screws are not permitted to attach conductors larger than 10 AWG (5.3mm ²).		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).		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12A, or if the motor has a normal voltage rating greater than 120V or is rated more than 1/3 hp (locked rotor current over 43A).		N
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have “no” 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
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 and Canadian Radiation Emitting Devices Act, REDR C 1370, as applicable.		N
4.7.1	For computer room application, 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.		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/or Canadian Radiation Emitting Devices Act, REDR C1370, as applicable.		N
Other Differences			

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
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 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>E) A component Certified by a Canadian or U.S. 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 subjected to the applicable tests of the equipment standard.</p> <p>F) 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. Where necessary, it will also be subjected to the applicable tests of the equipment standard, and to the applicable tests of the Canadian and U.S. component standard, under the conditions occurring in the equipment.</p> <p>G) A component which has no approval as in A) or B) above or which is used not in accordance its specified ratings, will be subjected 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>H) Some components may require annual re-testing which may be carried out by the manufacturer, CSA Internal or another laboratory.</p>	Components are UL or CSA approved, see component list 1.5.1.	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 ma d.c. under normal operating conditions.		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
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 C.R.T 's having a diagonal dimension of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.		N
4.3.2	Equipment with handles is required to comply with special loading tests.		N
5.1.8.1.1	Equipment intended to receive telecommunication ringing signals is required to comply with special touch current measurement tests.		N
6.2.1	Enamel coating on winding wire not considered electrical separation unless subject to special investigation.		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.		N
6.5	Equipment connected to a telecommunications network and supplied with an earphone intended to be held against the ear is required to comply with special acoustic pressure tests.		N
M.2	Continuous ringing signals up to 16 ma only are permitted if the equipment is subject to special installation and performance restrictions.		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.		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Korean National Differences according to CB Bulletin, No. 101A, December 2001 REPORT (IEC Publication 60950 3rd edition, 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 and 8305).	Class III equipment.	N
7	Addition: EMC The apparatus shall comply with the relevant CISPR requirements.	It shall be evaluated when national approval.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	US National Differences according to CB Bulletin No. 101A, December 2001 (IEC Publication 60950 Third edition. The standard CAN/CSA C22.2 No. 60950/UL 60950, Third edition)		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), ANS/NFPA 70, and, unless marked or otherwise identified, the Standard for the Protection fo Electronic Computer/ Data-Processing Equipment, ANS/NFPA 75.	Complies.	P
1.5.5	For iongths 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 iongths 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 marking.		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."	Class III euqipment.	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

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
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
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.		N
3.2.3	Permanent connection of equipment to the mains by a power supply cord is not permitted.		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.		N
3.2.8	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.		N
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CAN/CSA No. 0.		N
3.3.3	Wiring binding screws are not permitted to attach conductors larger than 10 AWG (5.3mm ²).		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).		N
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12A, or if the motor has a normal voltage rating greater than 120V or is rated more than 1/3 hp (locked rotor current over 43A).		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.8	Vertically-mounted disconnect swithes and circuit breakers are required to have “no” 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 maixmum quantify of flammable liquid stored in equipment is required to comply with NFPA 30.		N
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 and Canadian Radiation Emitting Devices Act, REDR C 1370.		N
4.7.1	For computer room application, 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.		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/or Canadian Radiation Emitting Devices Act, REDR C1370.		N
Other Differences			

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These components include: attachment plugs, cathode ray tubes, circuit breakers, communication circuit accessories, cord sets and power supply cords, direct plug-in equipment, enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, surge suppressors, switches (including interlock switches), thermal cutoffs, thermostats, transformer winding wire, tubing, wire connectors, and wire and cables.	Components are UL or CSA approved, see component list 1.5.1.	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 ma d.c. under normal operating conditions.		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 C.R.T.'s having a diagonal dimension of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.		N
4.3.2	Equipment with handles is required to comply with special loading tests.		N
5.1.8.1.1	Equipment intended to receive telecommunication ringing signals is required to comply with special touch current measurement tests.		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
6.2.1	Enamel coating on winding wire not considered electrical separation unless subject to special investigation.		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.		N
6.5	Equipment connected to a telecommunications network and supplied with an earphone intended to be held against the ear is required to comply with special acoustic pressure tests.		N
M.2	Continuous ringing signals up to 16 ma only are permitted if the equipment is subject to special installation and performance restrictions.		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.		N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Singapore National Differences REPORT (IEC Publication 60950 3rd edition, 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, insert the following: Under tropical conditions, the duration of the humidity conditioning is 5 days (120h) at a temperature (t) of 40°C ± 2°C with relative humidity of 90% to 95% Explanation: Conditions described in IEC Publications 60068-2-3 : 1969 – ‘Test Ca: Damp Heat, Steady State’ (temperature: 40°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	See IEC 60950 report.	N
2.10.6.5	Delete ‘(48h)’ Explanation: To be consistent with 2.9.2.	Deleted	N
3.2.8	Replace ‘23°C ± 2°C’ by ‘27°C ± 2°C’ Explanation: The recommended temperature for tropical countries is drawn from ISO 554 : 1976 – ‘Standard atmospheres for conditioning and/or testing – Specifications’	Replaced	N
An additional amendment is made as follows:			

National Deviation											
Clause	Requirement – Test	Result – Remark	Verdict								
1.2.8.6	<p>After NOTE 2, insert the following:</p> <p>NOTE3 – This definition for SELV CIRCUIT differs from the term 'SELV system' as given in SS CP 5.</p> <p>Attention is also drawn to the following :</p> <p>1. For a.c. power distribution systems, only TN-S and TT systems are allowed in the Republic of Singapore.</p> <p>2. Where the phrase 'this standard' appears, it should be read as 'Singapore Standard SS 337'.</p> <p>3. The comma has been used throughout as a decimal marker in IEC 60950, whereas in Singapore standard it is a practice to use a full-point on the baseline as the decimal marker.</p> <p>4. The IEC standard referred to shall be replaced by Singapore Standards as follows:</p> <table><tr><td>International Standards</td><td></td></tr><tr><td>Corresponding Singapore Standard</td><td></td></tr><tr><td>IEC 60065</td><td>SS 143: 2000 Audio, video and similar electronic apparatus – Safety requirements</td></tr><tr><td>IEC 60227</td><td>SS 358: Polyvinyl Chloride insulated cables of rated voltages up to and including 40/750V.</td></tr></table>	International Standards		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 40/750V.	Inserted	N
International Standards											
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 40/750V.										
NOTE	<p>1. 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.</p>		N								
	<p>2. Compliance with a Singapore Standard does not exempt users from legal obligations.</p>		N								

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Japanese National Differences REPORT (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: a) using BASIC INSULATION, and b) 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 c) 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.	Replaced.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>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.</p> <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 OI EQUIPMENT</p> <p>For CLASS OI 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 OI 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

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
2.1.1.1	Replacement: Replace "IEC 60083" to "IEC 60083 or JIS C 8303" in 2.1.1.1 b).	Replaced.	N
2.6.3.1	Addition: Add the following after 1st paragraph. This also applies to the conductor of lead wire for protective earthing of CLASS 0I EQUIPMENT.	Added.	N
2.6.4.1	Replacement: Replace 2nd sentence in 1st paragraph. For CLASS I EQUIPMENT with a DETACHABLE POWER SUPPLY CORD, the earthing terminal in the appliance inlet is regarded as the main protective earthing terminal.	Replaced.	N
2.6.5.4	Replacement: Replace 1st sentence. Protective earthing connections of CLASS I EQUIPMENT shall make earlier and break later than the supply connections in each of the following:	Replaced.	P
2.6.101	Addition: Earthing of CLASS 0I EQUIPMENT Plugs with a lead wire for earthing shall not be used for equipment having a rated voltage exceeding 150V. For plugs with a lead wire for earthing, the lead wire shall not be earthed by a clip. CLASS 0I EQUIPMENT shall be provided with an earthing terminal or lead wire for earthing in the external where easily visible.	Added.	N
3.2.5	Delete 1) in Table 3B.	Deleted.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
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> <p>Add 7) to Table 4A, Part 2 as follows.</p> <p>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).</p>	Added.	N
4.7.3.2	<p>Addition:</p> <p>Add the following in 7th paragraph.</p> <p>- for thin materials, e.g., flexible printed boards, etc., used inside equipment, be of FLAMMABILITY CLASS VTM-2 or better.</p>	Added.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
5.1.6	Replacement: Replace Table 5A.	Replaced.	N

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

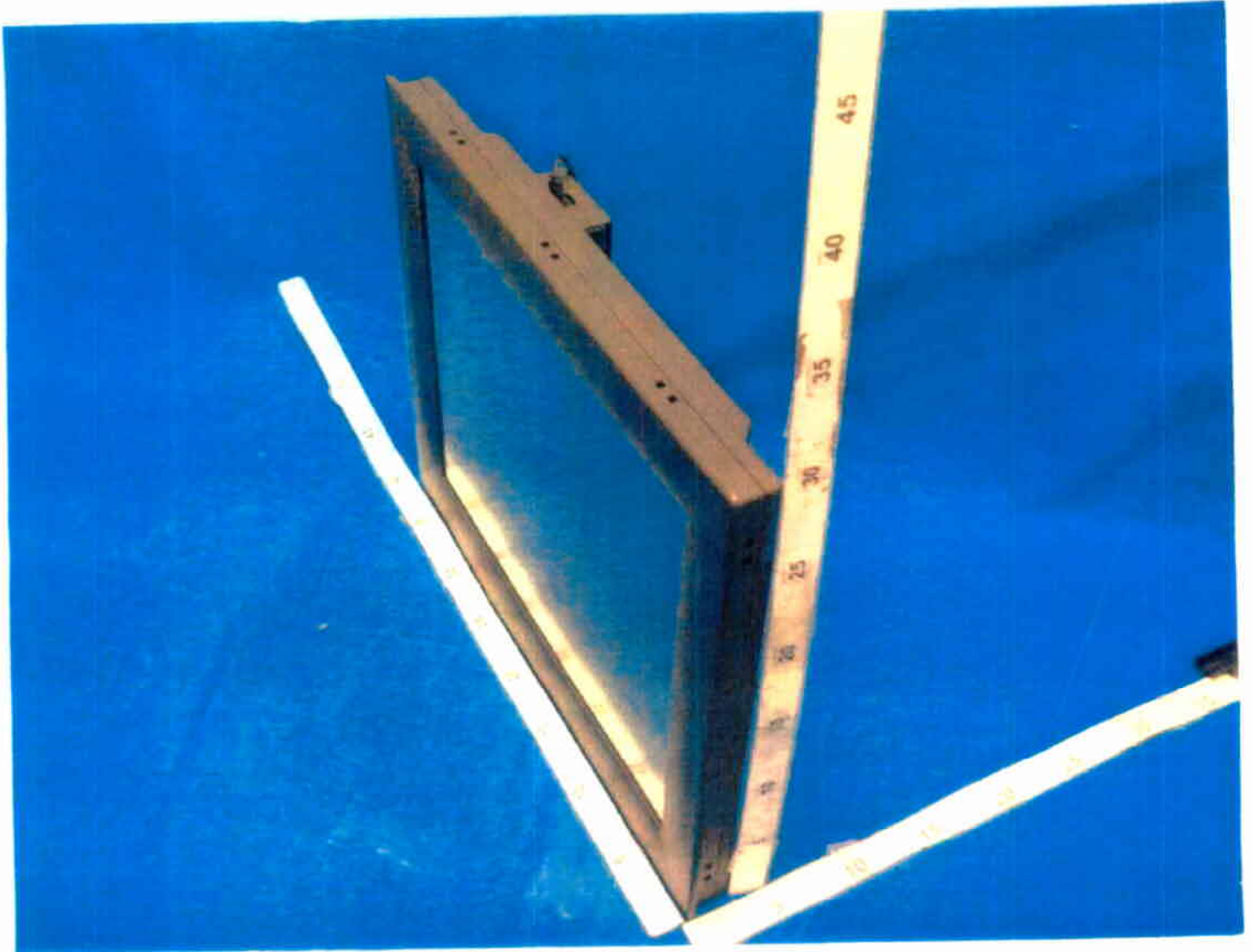
5.3.8.2	Replacement: Replace 3rd Item as follows. - BASIC INSULATION between the PRIMARY CIRCUIT and accessible conductive parts of CLASS I or 0I EQUIPMENT;	Replaced.	N
Annex A	Addition: Add the subclause A.101with the title "Flammability tests for classifying materials VTM" and the following: Thin sheet materials shall comply with ISO 9773.	Added.	N

National Deviation			
Clause	Requirement – Test	Result – Remark	Verdict
Annex G	<p>Addition:</p> <p>Add the following to the Note for Table G.1.</p> <p>2. In Japan, MAINS TRANSIENT VOLTAGE for equipment with a Nominal AC MAINS SUPPLY VOLTAGE of 100V is to be decided based on the column where Nominal AC MAINS SUPPLY VOLTAGE in Table G.1 is 150V.</p>	Added.	N
Annex P	<p>Addition:</p> <p>Add "IEC 61965:2000, Mechanical Safety for Cathode Ray Tubes".</p>	Added.	N
Annex U	<p>Replacement:</p> <p>Replace 2nd paragraph.</p> <p>This annex covers to round winding wires having diameters between 0.05 mm and 5.00 mm.</p>	Replaced. No triple insulated wires provided.	N
U.2.1	<p>Replacement:</p> <p>Electric strength</p> <p>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:</p> <ul style="list-style-type: none"> - for BASIC INSULATION or SUPPLEMENTARY INSULATION, 3000 V, or; - for REINFORCED INSULATION, 6000 V. 		N

National Deviation			
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>		N
Table U.1	<p>Replacement:</p> <p>Mandrel diameter</p>		N

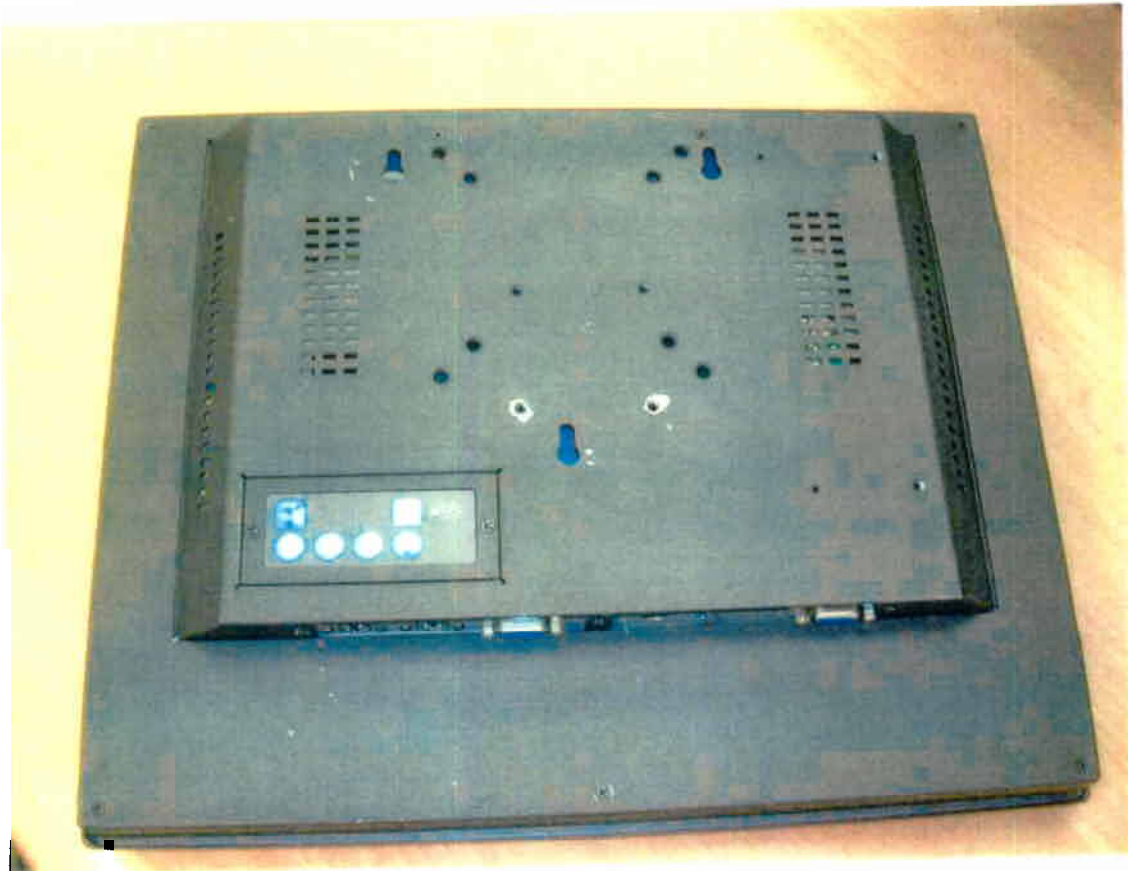
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FPM-X₂ 50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

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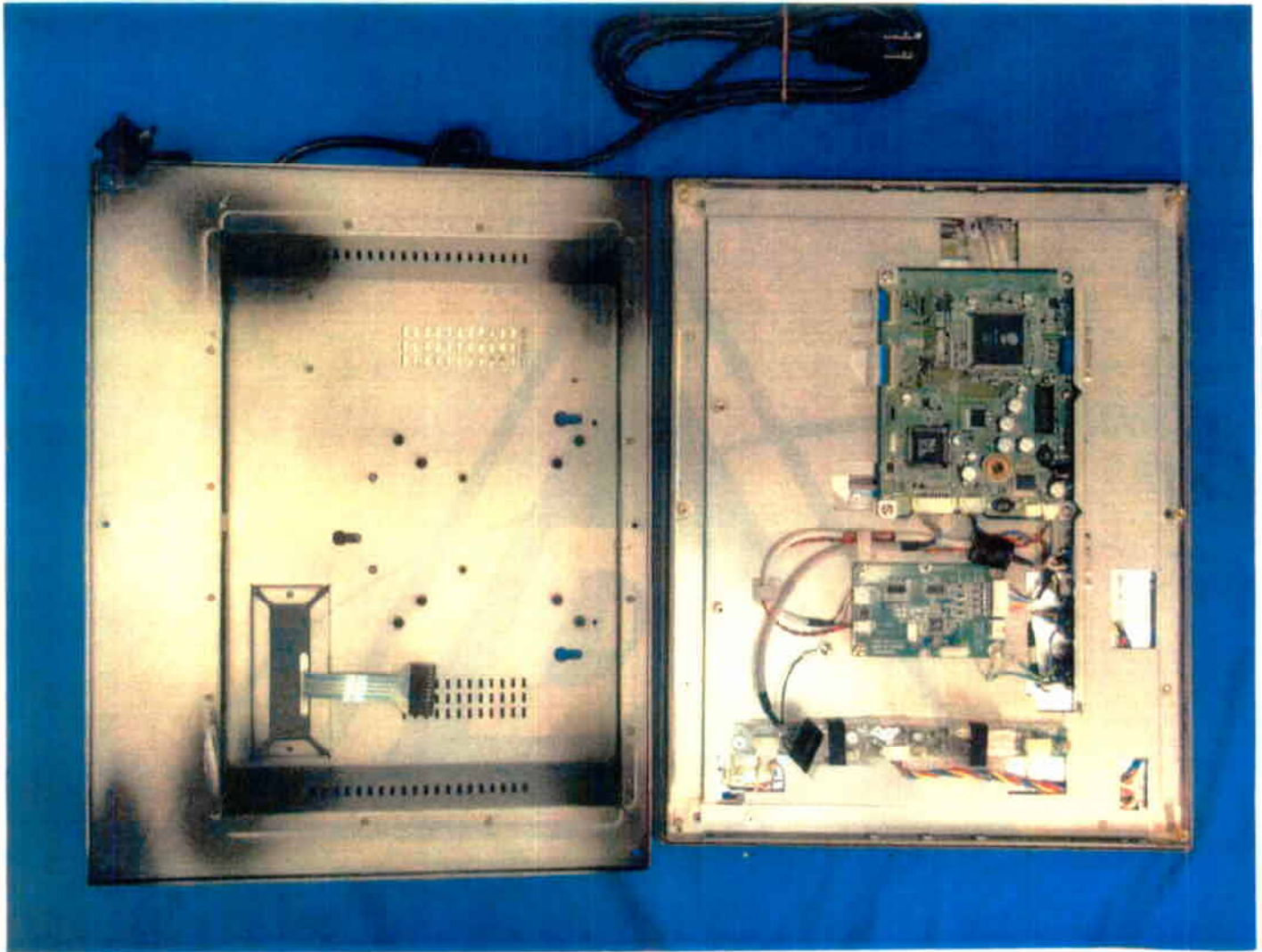


Type Designation: FPM-3X₁ 20YY, FPM-3X₁ 20YY-T, FPM-X₂ 50YY,
FPM-X₂ 50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

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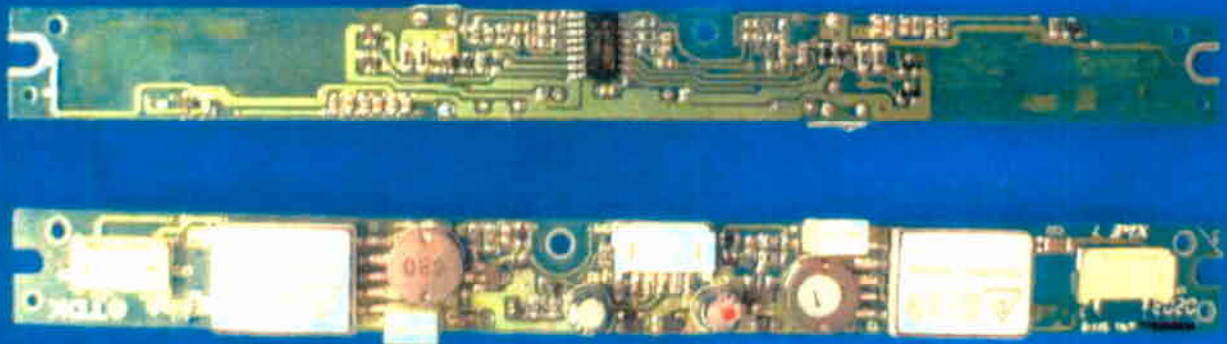


Type Designation: FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)
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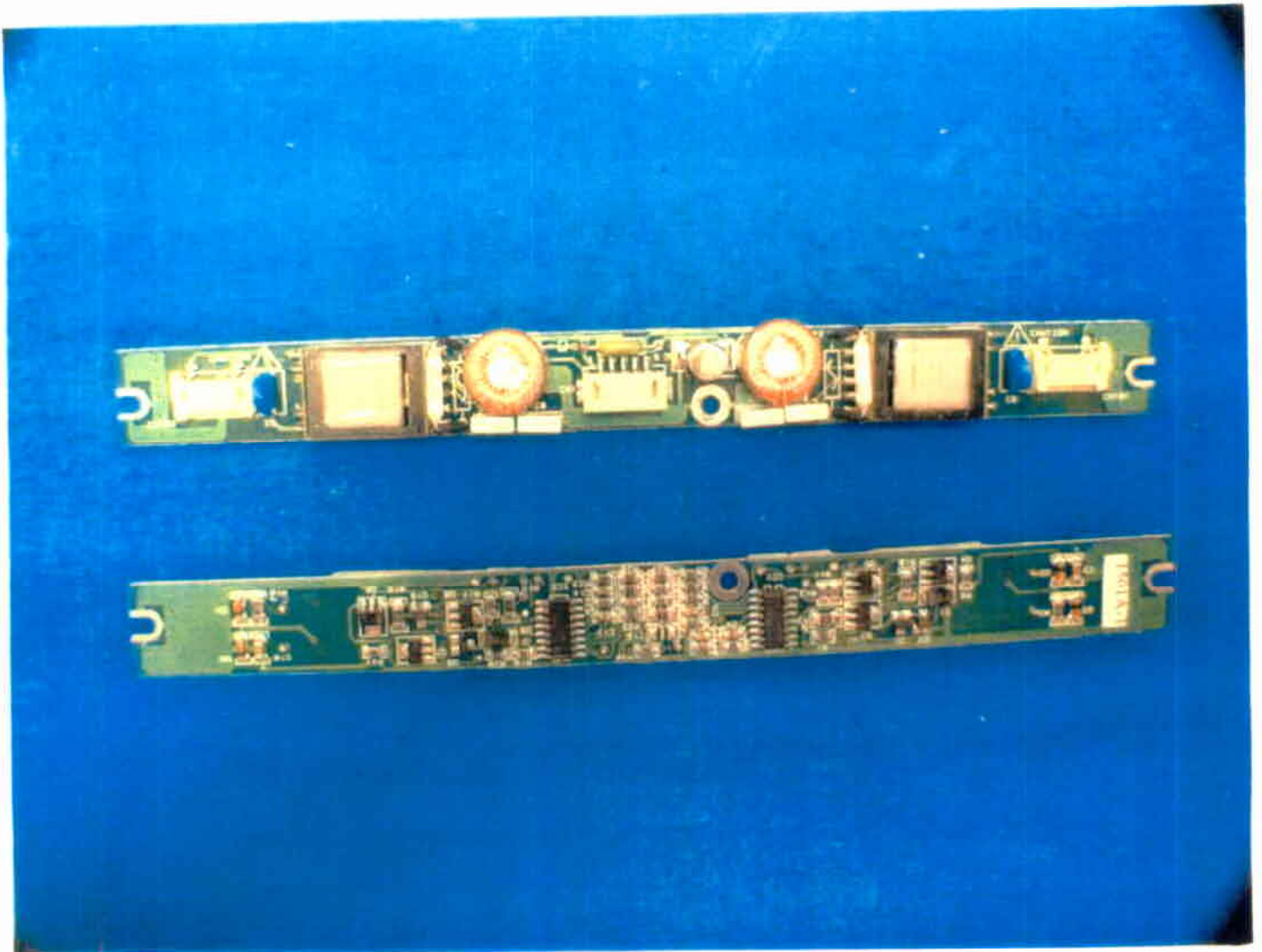
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FPM-X₂ 50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

Report Number: 12002667 001

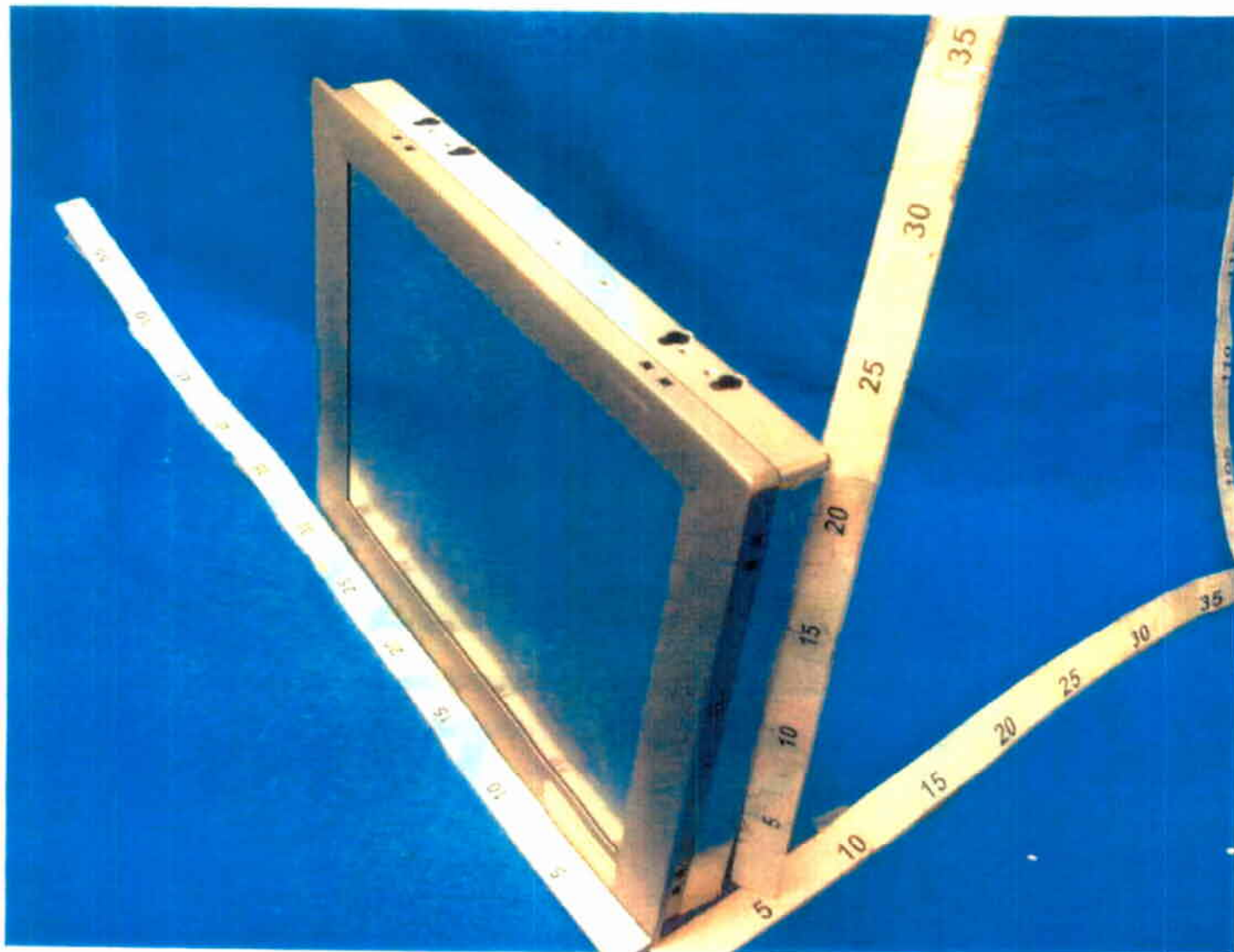


Type Designation: FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

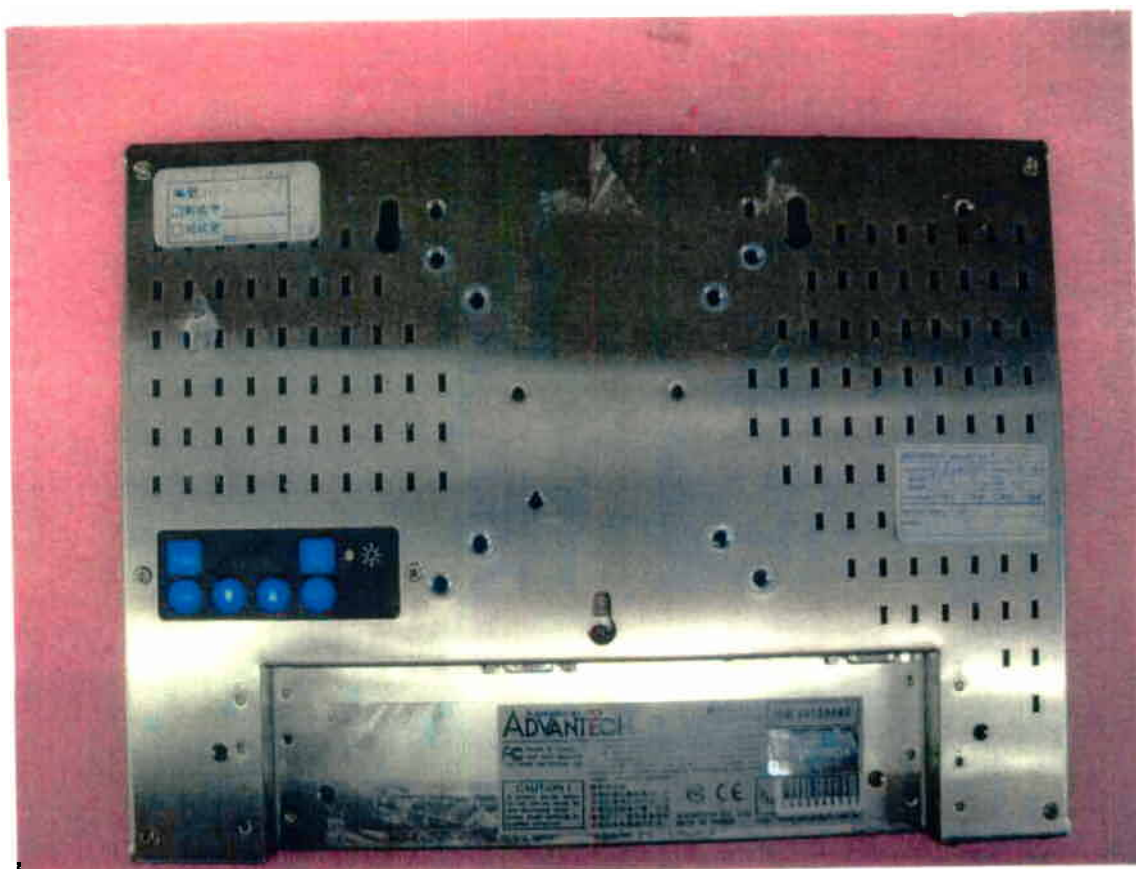
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Type Designation: FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)
Report Number: 12002667 001

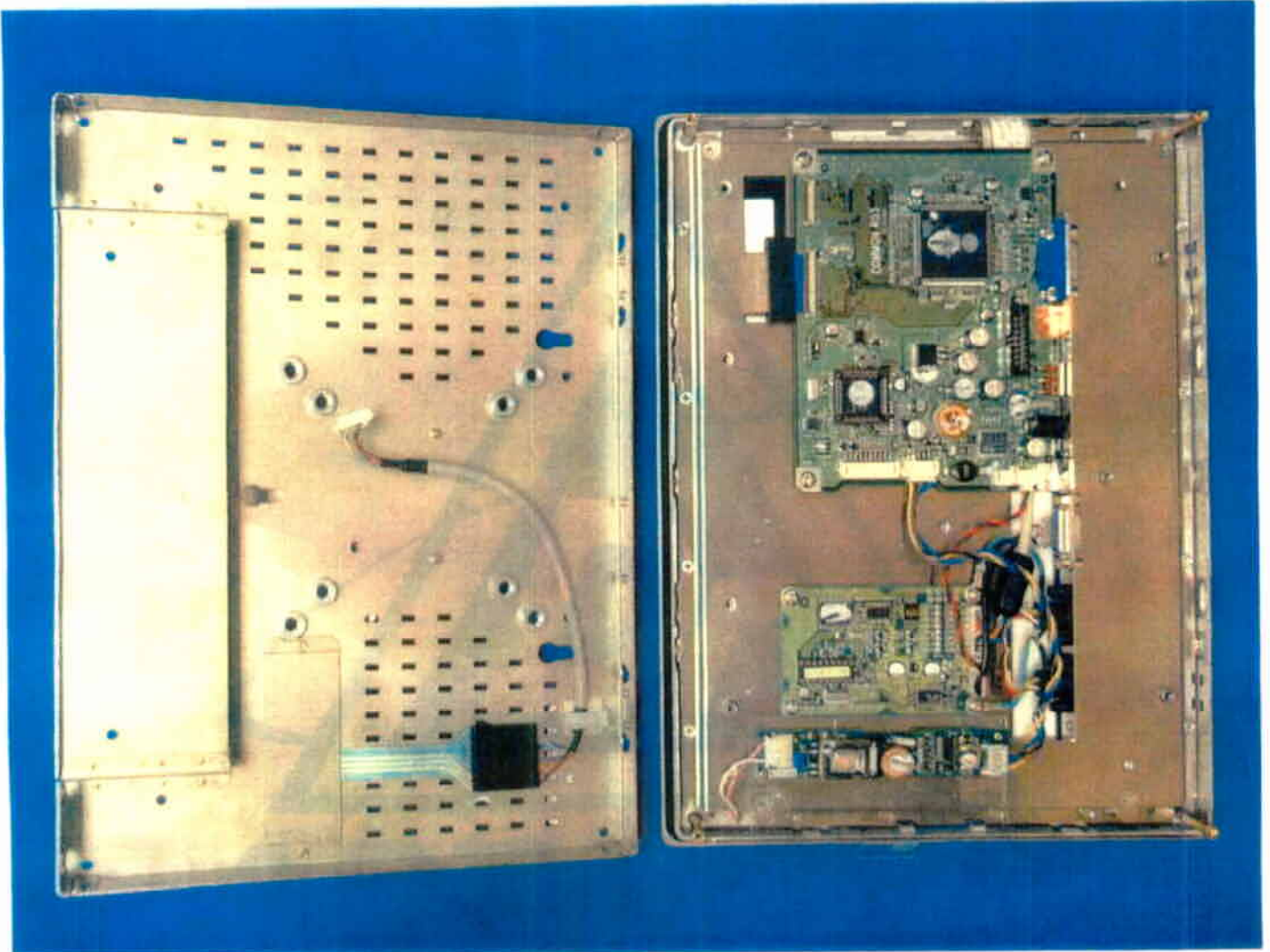


Type Designation: FPM-3X₁ 20YY, FPM-3X₁ 20YY-T, FPM-X₂ 50YY,
FPM-X₂ 50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)
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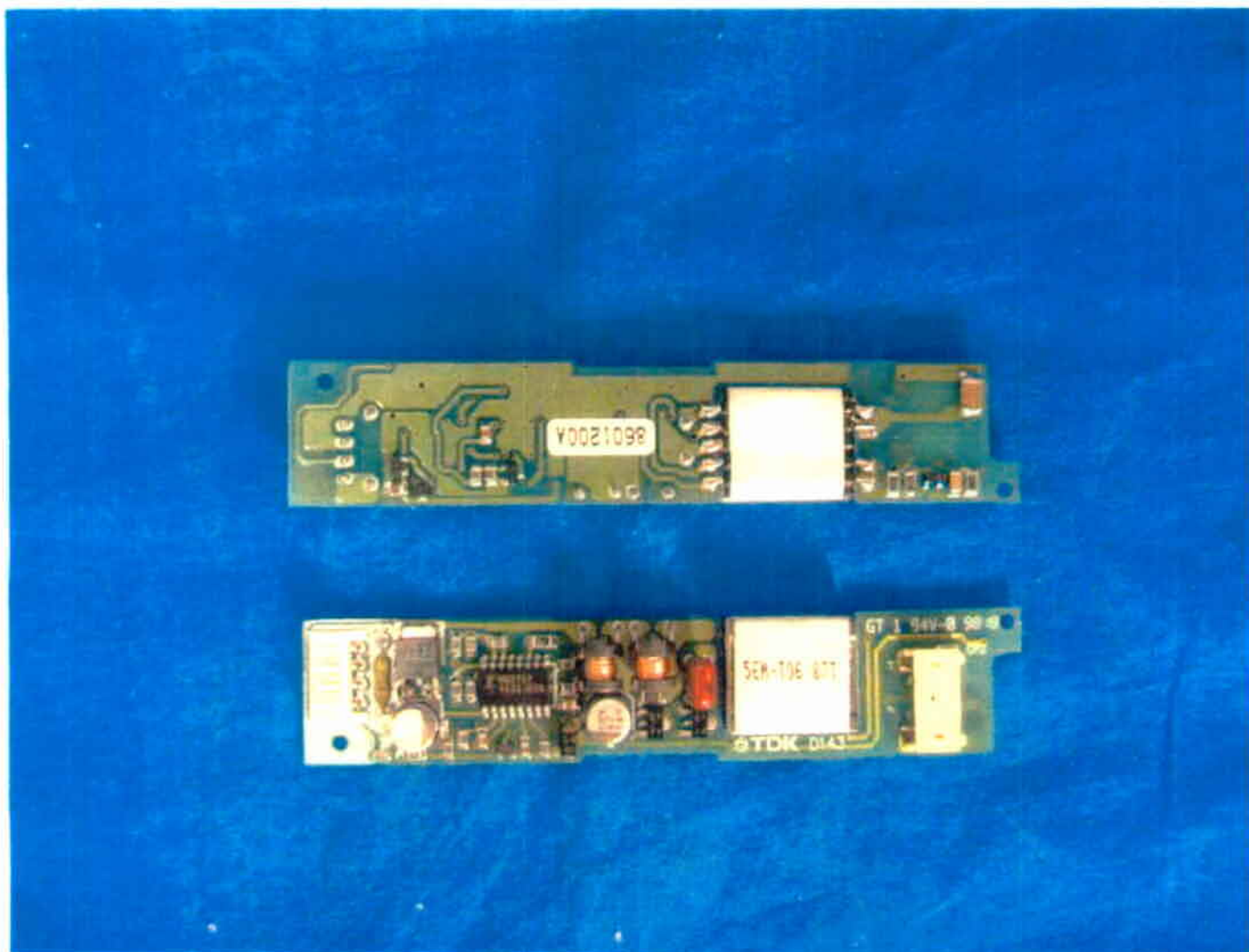


Type Designation: FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

Report Number: 12002667 001



Type Designation: FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)
Report Number: 12002667 001



Type Designation:

FPM-3X₁20YY, FPM-3X₁20YY-T, FPM-X₂50YY,
FPM-X₂50YY-T, VOP-1150YYY, YOP-1150YYY-T
(X₁=1 or 2, X₂=11 or 32, Y=A-Z or blank)

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12002667 001

