

**IEC****IECEE  
CB  
SCHEME**

Ref. Certif. No.

JPTUV-016541

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 OC**Product  
Produit

Switching Power Supply

Name and address of the applicant  
Nom et adresse du demandeurMean Well Enterprises Co., Ltd.  
No. 28, Wu-Chuan 3rd Road  
Wu Ku Ind. Park, Taipei Hsien 248 TaiwanName and address of the manufacturer  
Nom et adresse du fabricantMean Well Enterprises Co., Ltd.  
No. 28, Wu-Chuan 3rd Road  
Wu Ku Ind. Park, Taipei Hsien 248 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 principalesInput : AC 100-240V; 50/60Hz; 5A; Class I  
Output: refer to the test reportTrade mark (if any)  
Marque de fabrique (si elle existe)

MW

Model; type Ref.  
Ref. de typeSP-320-X  
(X =5, 7.5, 12, 13.5, 15, 24, 27, 48)Additional information (if necessary)  
Information complémentaire (si nécessaire)

For model differences, 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 60950-1:2001  
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

11008391 001

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

TÜV Rheinland Group

TÜV Rheinland Japan Ltd.  
Shin Yokohama Daini Center Bldg.  
3-19-5, Shin Yokohama, Kohoku-ku  
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Signature:

Dipl. - Ing. F. Stöelzel

Date: 21.09.2006

Appendix to CB Certificate JPTUV-016541  
Report Number: 11008391 001

PAGE 1 OF 1

Name and address of the manufacturer

Mean Well Enterprises Co., Ltd.  
No. 28, Wu-Chuan 3rd Road  
Wu Ku Ind. Park, Taipei Hsien 248  
Taiwan

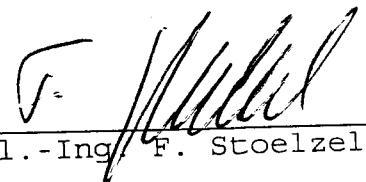
Name and address of the factory(ies)

Mean Well Enterprises Co., Ltd.  
  
No. 28, Wu-Chuan 3rd Road  
Wu Ku Ind. Park, Taipei Hsien 248  
Taiwan

GuangZhou Meanwell Electronics Co Ltd.

A Bldg.  
2nd Fl. Yuean Industrial Park  
Dongpu Town Tianhe, Guangzhou Guangdong, P.R. China

Date: 21.09.2006



Dipl.-Ing. F. Stoelzel

**TEST REPORT****IEC 60950-1 and/or EN 60950-1****Information technology equipment – Safety –****Part 1: General requirements**

Report reference No .....: 11008391 001

Tested by

(printed name and signature) .....

ROBERT KONG

Robert Kong

Approved by

(printed name and signature) .....

Simon Yu

Simon Yu

Date of issue .....: September 21, 2006

Testing Laboratory Name .....: TÜV Rheinland Taiwan Ltd., Taichung Laboratory

Address .....: 10F, No. 219, Min-Chuan Road, Taichung 403, Taiwan

Testing location .....: CBTL  CCATL  SMT  TMP 

Address .....: Same as above.

Applicant's Name .....: Mean Well Enterprises Co., Ltd.

Address .....: No. 28, Wu-Chuan 3<sup>rd</sup> Rd., Wu-Ku Ind. Park, Taipei Hsien, Taiwan**Test specification**Standard .....: IEC 60950-1:2001  
EN 60950-1:2001+A11:2004

Test procedure .....: CB-scheme

Non-standard test method .....: N/A

Test Report Form No .....: IECEN60950\_1B

TRF originator .....: SGS Fimko Ltd

Master TRF .....: dated 2003-03

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Test item description .....: Switching Power Supply

Trademark .....



Manufacturer .....: Same as applicant

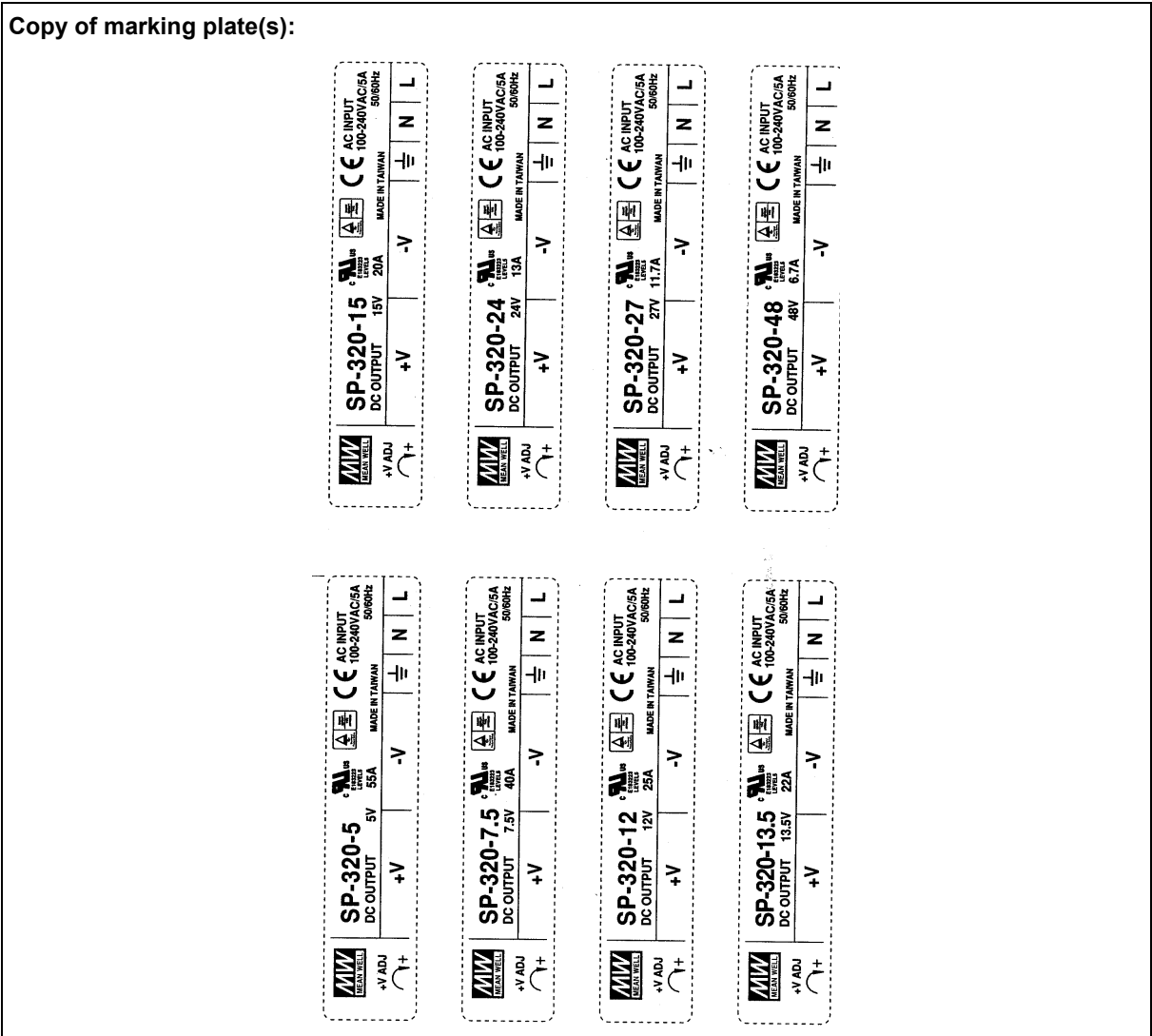
Model and/or type reference .....: SP-320-X (X= 5, 7.5, 12, 13.5, 15, 24, 27, 48)

Serial number .....: Test samples without serial numbers

Rating(s) .....: i/p: 100-240VAC, 50/60Hz, 5A

o/p: See on page 4

Copy of marking plate(s):



Summary of testing:

- The manufacturer specified maximum ambient temperature as +50°C.
- The heating tests have been performed on models have a internal DC Fan with air flow 21.3 CFM min.
- The heating tests have been performed on the bench with components side up.
- Unless otherwise specified, all tests were performed on models SP-320-5, SP-320-27 and SP-320-48 to represent the other similar models.

**Particulars: test item vs. test requirements**

Equipment mobility .....: For building-in  
 Operating condition .....: Continuous  
 Mains supply tolerance (%) .....:  $\pm 10$   
 Tested for IT power systems .....: Yes (for Norway)  
 IT testing, phase-phase voltage (V) .....: IT, 230V (for Norway)  
 Class of equipment .....: Class I  
 Mass of equipment (kg).....: 1.1  
 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 .....: August, 2006  
 Date(s) of performance of test .....: August - September, 2006

**General remarks**

**"This report is not valid as a CB Test Report unless appended by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IEC 60950-1".**

The test result presented in this report relate only to the object(s) tested.  
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

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

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

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

**Comments:**

Summary of compliance with National Differences (for explanation of codes see below):

EU Group Differences, EU Special National Conditions, EU A-Deviations, AR, AT, AU, BE, CA, CH, CN, CZ, DE, DK, FI, FR, GB, GR, HU, IL, IN, IT, KE, KR, MY, NL, NO, PL, SE, SG, SI, SK, US.

AR=Argentina, AT=Austria, AU=Australia, BE=Belgium, CA=Canada, CH=Switzerland, CN=China,  
 CZ=Czech Republic, DE=Germany, DK=Denmark, FI=Finland, FR=France, GB=United Kingdom,  
 GR=Greece, HU=Hungary, IL=Israel, IN=India, IT=Italy, KE=Kenya, KR=Korea, MY=Malaysia, NL=The  
 Netherlands, NO=Norway, PL=Poland, SE=Sweden, SG=Singapore, SI=Slovenia, SK=Slovakia, US=United  
 States of America.

For National Differences see end of this test report.

Factory(ies):

1. Mean Well Enterprises Co., Ltd.  
No. 28, Wu-Chuan 3<sup>rd</sup> Road, Wu-Ku Ind. Park, Taipei Hsien 248 Taiwan
2. GuangZhou Meanwell Electronics Co Ltd.  
A Bldg., 2nd Fl. Yuean Industrial Park, Dongpu Town Tianhe, Guangzhou Guangdong, P.R. China

**Definition of variables:**

Variable:	Range of variable:	Content:
X	5, 7.5, 12, 13.5, 15, 24, 27, 48	To denote the output voltage

**General product information:**

*Brief description of the test sample:*

The equipment models SP-320-X are building-in switching power supplies for the use in information technology equipment.


All models are similar except for type designation, output rating, main transformer (T1) and rating of components (R55, R51, R52, R65, R66, C51-C55, R73, R74, ZD7-ZD9, D19, D20, L2, R22, R11 and C38).

Input and Output rating of all models		
Models No.	Input Rating	Output Rating
SP-320-5	100-240VAC, 50/60Hz, 5A	5Vdc, 55A
SP-320-7.5	100-240VAC, 50/60Hz, 5A	7.5Vdc, 40A
SP-320-12	100-240VAC, 50/60Hz, 5A	12Vdc, 25A
SP-320-13.5	100-240VAC, 50/60Hz, 5A	13.5Vdc, 22A
SP-320-15	100-240VAC, 50/60Hz, 5A	15Vdc, 20A
SP-320-24	100-240VAC, 50/60Hz, 5A	24Vdc, 13A
SP-320-27	100-240VAC, 50/60Hz, 5A	27Vdc, 11.7A
SP-320-48	100-240VAC, 50/60Hz, 5A	48Vdc, 6.7A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
1	GENERAL		<b>P</b>
1.5	Components		<b>P</b>
1.5.1	General	See below.	<b>P</b>
	Comply with IEC 60950 or relevant component standard	Components which were found to affect safety aspects comply with the requirements of this standard or with the safety aspects of the relevant IEC/EN component standards (see appended table 1.5.1).	<b>P</b>
1.5.2	Evaluation and testing of components	Components that are certified to IEC and /or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	<b>P</b>
1.5.3	Thermal controls	No thermal controls.	<b>N/A</b>
1.5.4	Transformers	Transformers used are suitable for its intended application and comply with the relevant requirements of the standard and particularly Annex C.	<b>P</b>
1.5.5	Interconnecting cables	No interconnection cable.	<b>N/A</b>
1.5.6	Capacitors in primary circuits .....	Between lines: X2 capacitor according to IEC 60384-14:1993 with 21 days damp heat test was used.  Between line/neutral and PB: Y2 capacitors according to IEC 60384-14:1993.	<b>P</b>
1.5.7	Double insulation or reinforced insulation bridged by components	See below.	<b>P</b>
1.5.7.1	General	Same as above.	<b>P</b>
1.5.7.2	Bridging capacitors	Y1-type capacitor (C31) according to IEC 60384-14:1993 is provided between primary and SELV circuit.	<b>P</b>
1.5.7.3	Bridging resistors	No bridging resistor.	<b>N/A</b>
1.5.7.4	Accessible parts	See clause 2.4.	<b>P</b>
1.5.8	Components in equipment for IT power systems	Phase to PB designed in according to phase-to-phase working voltage. The Y2 type capacitor used between phase-	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
		to-PB are rated accordingly.	

1.6	Power interface		<b>P</b>
1.6.1	AC power distribution systems	TN power system. IT power system for Norway.	<b>P</b>
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the operation at the maximum specified output load. Results see appended table.	<b>P</b>
1.6.3	Voltage limit of hand-held equipment	This appliance is not hand-held equipment.	<b>N/A</b>
1.6.4	Neutral conductor	The neutral is not identified in the equipment. Basic insulation for rated voltage between earthed parts and primary phases.	<b>P</b>

1.7	Marking and instructions		<b>P</b>
1.7.1	Power rating	All relevant markings are provided on labels.	<b>P</b>
	Rated voltage(s) or voltage range(s) (V) .....	100-240VAC	<b>P</b>
	Symbol for nature of supply, for d.c. only.....	AC source	<b>N/A</b>
	Rated frequency or rated frequency range (Hz) :	50/60Hz	<b>P</b>
	Rated current (mA or A) .....	5A	<b>P</b>
	Manufacturer's name or trademark or identification mark .....		<b>P</b>
	Type/model or type reference .....	SP-320-X (X= 5, 7.5, 12, 13.5, 15, 24, 27, 48)	<b>P</b>
	Symbol for Class II equipment only .....	Class I equipment.	<b>N/A</b>
	Other symbols .....	Additional symbols or markings do not give rise to misunderstanding.	<b>P</b>
	Certification marks .....	See the copy of marking plates.	<b>N/A</b>
1.7.2	Safety instructions	Installation instruction with directions to maintain the requirements of IEC 60950-1 with installation in end system. Included are directions regarding the maximum output, the maximum ambient temperature and that the requirements of the	<b>P</b>



IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
		IEC 60950-1 must be observed with the installation in the final system.	
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment .....	Full range voltage design, no necessary adjustment.	N/A
	Methods and means of adjustment; reference to installation instructions .....	Same as above.	N/A
1.7.5	Power outlets on the equipment .....	No power outlets provided.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....	Marking adjacent to fuse on PCB as:  FS1 F 6.3A/250V WARNING: FOR CONTINUED PROTECTION AGAINST FIRE REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.	P
1.7.7	Wiring terminals	See below.	N/A
1.7.7.1	Protective earthing and bonding terminals .....	Protective bonding terminal marking is shown adjacent to screw according to 60417-1-IEC-5017, however, it shall be evaluated in the final system assembly.	N/A
1.7.7.2	Terminal for a.c. mains supply conductors	Shall be evaluated in the final system assembly.	N/A
1.7.7.3	Terminals for d.c. mains supply conductors	No d.c. mains supply.	N/A
1.7.8	Controls and indicators	See below.	N/A
1.7.8.1	Identification, location and marking .....	No switches or controls.	N/A
1.7.8.2	Colours .....	No indicators.	N/A
1.7.8.3	Symbols according to IEC 60417 .....	No symbols used.	N/A
1.7.8.4	Markings using figures .....	No figures used.	N/A
1.7.9	Isolation of multiple power sources .....	Only one supply from the mains.	N/A
1.7.10	IT power distribution systems	Shall be evaluated when submitted for Norway national approval.	N/A
1.7.11	Thermostats and other regulating devices	No thermostats provided.	N/A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.12	Language(s) .....	Installation instruction and marking rating are in English. Versions in other languages will be provided when national certificate approval.	—
1.7.13	Durability	The labels were subjected to the permanence of marking test. The labels were rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit.  After this test there was no damage to the labels. The marking on the labels did not fade. There was no curling or lifting of the label's edges.	<b>P</b>
1.7.14	Removable parts	No removable parts provided.	<b>N/A</b>
1.7.15	Replaceable batteries	No batteries provided.	<b>N/A</b>
	Language(s).....		—
1.7.16	Operator access with a tool .....	Compliance has to be evaluated for the final system.	<b>N/A</b>
1.7.17	Equipment for restricted access locations .....	Same as above.	<b>N/A</b>

2	PROTECTION FROM HAZARDS		<b>P</b>
2.1	Protection from electric shock and energy hazards		<b>P</b>
2.1.1	Protection in operator access areas	See below.	<b>P</b>
2.1.1.1	Access to energized parts	The accessibility of hazardous or ELV are prevented with in the final system. The inspection with test pin and test finger should therefore be conducted with the approval of the end system.  Installation instruction requires, that the requirements of the IEC 60950-1 must be observed to the installation.	<b>N/A</b>
	Test by inspection .....	Same as above.	<b>N/A</b>
	Test with test finger .....	Same as above.	<b>N/A</b>
	Test with test pin .....	Same as above.	<b>N/A</b>
	Test with test probe .....	No TNV.	<b>N/A</b>
2.1.1.2	Battery compartments .....	No battery compartments.	<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.1.1.3	Access to ELV wiring	This equipment is for building-in. Compliance shall be investigated in the final system assembly.	<b>N/A</b>
	Working voltage (V <sub>peak</sub> or V <sub>rms</sub> ); minimum distance (mm) through insulation	Same as above.	—
2.1.1.4	Access to hazardous voltage circuit wiring	This equipment is for building-in. Compliance shall be investigated in the final system assembly.	<b>N/A</b>
2.1.1.5	Energy hazards ..... :	The energy may exceed 240VA between two points in accessible parts (o/p connector of secondary circuit). However, the prevention of bridging those conductors should be prevented in the final system assembly. Results see appended table 2.1.1.5.	<b>N/A</b>
2.1.1.6	Manual controls	No such manual controls.	<b>N/A</b>
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock, see below.	<b>P</b>
	Time-constant (s); measured voltage (V) ..... :	See appended table 2.1.1.7.	—
2.1.2	Protection in service access areas	This equipment is for building-in. Compliance shall be investigated in the final system assembly.	<b>N/A</b>
2.1.3	Protection in restricted access locations	Same as above.	<b>N/A</b>
2.2	SELV circuits		<b>P</b>
2.2.1	General requirements	See below.	<b>P</b>
2.2.2	Voltages under normal conditions (V)..... :	Between any conductor of the SELV circuits 42.4V peak or 60Vd.c. are not exceeded.	<b>P</b>
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 exceed and SELV limits not for longer than 0.2 seconds. Results see appended table 2.2.3.	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	Double or reinforced for the highest working voltage across a particular insulation is provided.	<b>P</b>
2.2.3.2	Separation by earthed screen (method 2)		<b>N/A</b>
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		<b>N/A</b>
2.2.4	Connection of SELV circuits to other circuits.....:	See 1.5.7, 2.2.2, 2.2.3 and 2.4.3.	<b>P</b>

2.3	TNV circuits		<b>N/A</b>
2.3.1	Limits		<b>N/A</b>
	Type of TNV circuits .....		—
2.3.2	Separation from other circuits and from accessible parts		<b>N/A</b>
	Insulation employed.....:		—
2.3.3	Separation from hazardous voltages		<b>N/A</b>
	Insulation employed.....:		—
2.3.4	Connection of TNV circuits to other circuits		<b>N/A</b>
	Insulation employed.....:		—
2.3.5	Test for operating voltages generated externally		<b>N/A</b>

2.4	Limited current circuits <i>The output connector is may be accessible to the user and connected to the primary circuit by one bridging capacitor (C31). Therefore, the circuit must be designed as limited current circuit.</i>		<b>P</b>
2.4.1	General requirements	See below.	<b>P</b>
2.4.2	Limit values	See appended table 2.4.2.	<b>P</b>
	Frequency (Hz) .....	See appended table 2.4.2.	—
	Measured current (mA).....:	See appended table 2.4.2.	—
	Measured voltage (V) .....	See appended table 2.4.2.	—
	Measured capacitance (µF).....:	C31=1000pF	—
2.4.3	Connection of limited current circuits to other circuits	Output circuit as limited current circuit connected to primary via one bridging capacitor.	<b>P</b>

2.5	Limited power sources		<b>N/A</b>
	Inherently limited output		<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Impedance limited output		N/A
	Overcurrent protective device limited output		N/A
	Regulating network limited output under normal operating and single fault condition		N/A
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N/A
	Output voltage (V), output current (A), apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A)		—

2.6	Provisions for earthing and bonding		<b>P</b>
2.6.1	Protective earthing	All parts (chassis) are reliable connected to PB. Refer to 2.6.1 a)	<b>P</b>
2.6.2	Functional earthing	Secondary functional earthing is separated to primary by double/reinforced insulation.	<b>P</b>
2.6.3	Protective earthing and protective bonding conductors	See below.	<b>P</b>
2.6.3.1	General	No power cord provided.	<b>N/A</b>
2.6.3.2	Size of protective earthing conductors	See sub-clause 2.6.3.4, rated current below 16A.	<b>N/A</b>
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG..... :		—
2.6.3.3	Size of protective bonding conductors	See sub-clause 2.6.3.4, rated current below 16A.	<b>P</b>
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG..... :		—
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current (A)..... :	See appended table.	<b>P</b>
2.6.3.5	Colour of insulation..... :	No green / yellow wires.	<b>N/A</b>
2.6.4	Terminals	Shall be evaluated in the final system assembly.	<b>N/A</b>
2.6.4.1	General	Same as above.	<b>N/A</b>
2.6.4.2	Protective earthing and bonding terminals	Same as above.	<b>N/A</b>
	Rated current (A), type and nominal thread diameter (mm)..... :	Same as above.	—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Same as above.	<b>N/A</b>
2.6.5	Integrity of protective earthing	See below.	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.5.1	Interconnection of equipment	This unit has its own earthing connection. Any other units connected via the output shall be provided SELV only. The equipment does not comprise class I and class II.	<b>P</b>
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device in protective bonding conductor.	<b>P</b>
2.6.5.3	Disconnection of protective earth	It shall be evaluated in the final system assembly.	<b>N/A</b>
2.6.5.4	Parts that can be removed by an operator	Same as above.	<b>N/A</b>
2.6.5.5	Parts removed during servicing	Same as above.	<b>N/A</b>
2.6.5.6	Corrosion resistance	All part comprising the connections are plated and metal to metal which comply with annex J.	<b>P</b>
2.6.5.7	Screws for protective bonding	Only ISO thread screw used in terminal block for protective bonding.  No self-tapping or spaced thread screws.  Equipment for building-in. To be evaluated during the final system approval.	<b>P</b>
2.6.5.8	Reliance on telecommunication network or cable distribution system	No TNV.	<b>N/A</b>

2.7	Overcurrent and earth fault protection in primary circuits		<b>P</b>
2.7.1	Basic requirements	Equipment relies on fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short-circuit. Over current protection is provided by the built-in fuse.	<b>P</b>
	Instructions when protection relies on building installation		<b>N/A</b>
2.7.2	Faults not covered in 5.3	The protection devices are well dimensioned and mounted.	<b>P</b>
2.7.3	Short-circuit backup protection	Pluggable equipment type A. Building installation is considered as providing short-circuit backup protection.	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.7.4	Number and location of protective devices .....	Over current protection by one built-in fuse.	<b>P</b>
2.7.5	Protection by several devices	Only one fuse provided.	<b>N/A</b>
2.7.6	Warning to service personnel .....	With reversible plug of the final system to the mains, hazardous voltage may be still presented in the equipment after the internal fuse opens. However, as it is considered that the plug to the mains will be disconnected during service work, no marking were requested.	<b>N/A</b>

2.8	Safety interlocks		<b>N/A</b>
2.8.1	General principles		<b>N/A</b>
2.8.2	Protection requirements		<b>N/A</b>
2.8.3	Inadvertent reactivation		<b>N/A</b>
2.8.4	Fail-safe operation		<b>N/A</b>
2.8.5	Moving parts		<b>N/A</b>
2.8.6	Overriding		<b>N/A</b>
2.8.7	Switches and relays		<b>N/A</b>
2.8.7.1	Contact gaps (mm) .....		<b>N/A</b>
2.8.7.2	Overload test		<b>N/A</b>
2.8.7.3	Endurance test		<b>N/A</b>
2.8.7.4	Electric strength test		<b>N/A</b>
2.8.8	Mechanical actuators		<b>N/A</b>

2.9	Electrical insulation		<b>P</b>
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used.	<b>P</b>
2.9.2	Humidity conditioning	Carried out for 120 h.	<b>P</b>
	Humidity (%) .....	95% R.H.	—
	Temperature (°C) .....	40°C	—
2.9.3	Grade of insulation	Adequate levels of safety insulation were provided and maintained to comply with the requirements of this standard.	<b>P</b>

2.10	Clearances, creepage distances and distances through insulation		<b>P</b>
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IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.10.1	General	See 2.10.3, 2.10.4 and 2.10.5.	<b>P</b>
2.10.2	Determination of working voltage	<ul style="list-style-type: none"> <li>▪ Unit was connected to a 240V TN power system.</li> <li>▪ 2.10.10 not applied for.</li> </ul> Results see appended table 2.10.2.	<b>P</b>
2.10.3	Clearances	See below.	<b>P</b>
2.10.3.1	General	Alternate method of Annex G was not considered.	<b>P</b>
2.10.3.2	Clearances in primary circuits	See appended table 2.10.3 & 2.10.4.	<b>P</b>
2.10.3.3	Clearances in secondary circuits	Refer to 5.3.4.	<b>N/A</b>
2.10.3.4	Measurement of transient voltage levels	Alternate Annex G not considered.	<b>N/A</b>
2.10.4	Creepage distances	See appended table 2.10.3 & 2.10.4.	<b>P</b>
	CTI tests .....	CTI rating for all materials of minimum 100.	—
2.10.5	Solid insulation	See below.	<b>P</b>
2.10.5.1	Minimum distance through insulation	Photo couplers and tube in DC fan wiring are provided distance through insulation of 0.4 mm minimum. Details see appended table 2.10.5.	<b>P</b>
2.10.5.2	Thin sheet material	Insulation tapes provided as reinforced insulation in T1.	<b>P</b>
	Number of layers (pcs) .....	3 layers.	—
	Electric strength test	See appended table 5.2.	—
2.10.5.3	Printed boards	Not applied for.	<b>N/A</b>
	Distance through insulation		<b>N/A</b>
	Electric strength test for thin sheet insulating material		—
	Number of layers (pcs) .....		<b>N/A</b>
2.10.5.4	Wound components		<b>N/A</b>
	Number of layers (pcs) .....		<b>N/A</b>
	Two wires in contact inside wound component; angle between 45° and 90° .....		<b>N/A</b>
2.10.6	Coated printed boards	No coated printed boards.	<b>N/A</b>
2.10.6.1	General		<b>N/A</b>



IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.10.6.2	Sample preparation and preliminary inspection		<b>N/A</b>
2.10.6.3	Thermal cycling		<b>N/A</b>
2.10.6.4	Thermal ageing (°C) .....		<b>N/A</b>
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		<b>N/A</b>
	Electric strength test		—
2.10.7	Enclosed and sealed parts .....	No hermetically sealed components.	<b>N/A</b>
	Temperature $T_1 = T_2 + T_{ma} - T_{amb} + 10K$ (°C) .....		<b>N/A</b>
2.10.8	Spacings filled by insulating compound .....	Photo couplers are approved component. Other components did not applied for (see appended table 2.10.5).	<b>P</b>
	Electric strength test	Same as above.	—
2.10.9	Component external terminations	See appended table 2.10.3 and 2.10.4.	<b>P</b>
2.10.10	Insulation with varying dimensions	No reduction of distances considered.	<b>N/A</b>

3	WIRING, CONNECTIONS AND SUPPLY		<b>P</b>
3.1	General		<b>P</b>
3.1.1	Current rating and overcurrent protection	All internal wires are UL recognized wiring which is PVC insulated, rated VW-1, min. 80°C, 300 V. Internal wiring is PVC insulated, the wiring gauge is suitable for current intended to be carried.	<b>P</b>
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks which could damage the insulation and cause hazard.	<b>P</b>
3.1.3	Securing of internal wiring	The wires are secured by mechanical cramp terminal, quick terminal or glue so that a loosening of the terminal connection is unlikely.	<b>P</b>
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.	<b>P</b>
3.1.5	Beads and ceramic insulators	Not used.	<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.1.6	Screws for electrical contact pressure	Electrical connections screwed two or more complete threads into metal. No screws of insulating material for electrical connections, or where supplementary or reinforced insulation could be impaired by a metal replacement.	<b>P</b>
3.1.7	Insulating materials in electrical connections	All connections are metal to metal.	<b>N/A</b>
3.1.8	Self-tapping and spaced thread screws	No self- tapping or spaced thread screws are used.	<b>N/A</b>
3.1.9	Termination of conductors	All conductors are reliably secured.	<b>P</b>
	10 N pull test	10 N pull test performed for all relevant conductors. No hazards caused hereby.	<b>P</b>
3.1.10	Sleeving on wiring	Sleevings on DC fan wiring reliable kept in position by the used of heat shrunkable tube.	<b>P</b>

3.2	Connection to an a.c. mains supply or a d.c. mains supply <i>Building-in type SPS should be evaluated in the final system assembly.</i>		<b>N/A</b>
3.2.1	Means of connection .....		<b>N/A</b>
3.2.1.1	Connection to an a.c. mains supply		<b>N/A</b>
3.2.1.2	Connection to a d.c. mains supply		<b>N/A</b>
3.2.2	Multiple supply connections		<b>N/A</b>
3.2.3	Permanently connected equipment		<b>N/A</b>
	Number of conductors, diameter (mm) of cable and conduits .....		—
3.2.4	Appliance inlets		<b>N/A</b>
3.2.5	Power supply cords		<b>N/A</b>
3.2.5.1	AC power supply cords		<b>N/A</b>
	Type .....		—
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....		—
3.2.5.2	DC power supply cords		<b>N/A</b>
3.2.6	Cord anchorages and strain relief		<b>N/A</b>
	Mass of equipment (kg), pull (N) .....		—
	Longitudinal displacement (mm) .....		—

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guards		N/A
	D (mm); test mass (g) .....		—
	Radius of curvature of cord (mm).....		—
3.2.9	Supply wiring space		N/A

3.3	Wiring terminals for connection of external conductors <i>Building-in type SPS should be evaluated in the final system assembly.</i>		N/A
3.3.1	Wiring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm <sup>2</sup> ).....		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type and nominal thread diameter (mm) .....		—
3.3.6	Wiring terminals design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A

3.4	Disconnection from the mains supply <i>Building-in type SPS should be evaluated in the final system assembly.</i>		N/A
3.4.1	General requirement		N/A
3.4.2	Disconnect devices		N/A
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Single-phase equipment and d.c. equipment		N/A
3.4.7	Three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.5	Interconnection of equipment		<b>P</b>
3.5.1	General requirements	See below.	<b>P</b>
3.5.2	Types of interconnection circuits .....	Interconnection circuits of SELV through sec. connector.	<b>P</b>
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	<b>N/A</b>

4	PHYSICAL REQUIREMENTS		<b>P</b>
4.1	Stability <i>Building-in type SPS, shall be evaluated in the final system assembly.</i>		<b>N/A</b>
	Angle of 10°		<b>N/A</b>
	Test: force (N).....		<b>N/A</b>

4.2	Mechanical strength		<b>P</b>
4.2.1	General	See below. After tests, unit complies with the requirements of sub-clauses 2.1.1, 2.6.1 and 2.10.	<b>P</b>
4.2.2	Steady force test, 10 N	10 N applied to all components other than enclosure.	<b>P</b>
4.2.3	Steady force test, 30 N	No internal enclosure.	<b>N/A</b>
4.2.4	Steady force test, 250 N	Building-in type SPS.	<b>N/A</b>
4.2.5	Impact test	Building-in type SPS.	<b>N/A</b>
	Fall test		<b>N/A</b>
	Swing test		<b>N/A</b>
4.2.6	Drop test	Building-in type SPS.	<b>N/A</b>
4.2.7	Stress relief test	Building-in type SPS.	<b>N/A</b>
4.2.8	Cathode ray tubes	No CRT in the unit.	<b>N/A</b>
	Picture tube separately certified .....	Same as above.	<b>N/A</b>
4.2.9	High pressure lamps	No high pressure lamp provided.	<b>N/A</b>
4.2.10	Wall or ceiling mounted equipment; force (N) ... :	Not wall or ceiling mounted equipment.	<b>N/A</b>

4.3	Design and construction		<b>P</b>
4.3.1	Edges and corners	Building-in type SPS, shall be evaluated in the final system assembly.	<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.2	Handles and manual controls; force (N) .....	No handles or controls provided.	<b>N/A</b>
4.3.3	Adjustable controls	No such components.	<b>N/A</b>
4.3.4	Securing of parts	Mechanical fixings in such a way designed that they will withstand mechanical stress occurring in normal use.	<b>P</b>
4.3.5	Connection of plugs and sockets	No plug and sockets.	<b>N/A</b>
4.3.6	Direct plug-in equipment	Not a direct plug-in equipment.	<b>N/A</b>
	Dimensions (mm) of mains plug for direct plug-in .....		<b>N/A</b>
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N) .....		<b>N/A</b>
4.3.7	Heating elements in earthed equipment	No such elements.	<b>N/A</b>
4.3.8	Batteries	No batteries.	<b>N/A</b>
4.3.9	Oil and grease	Insulation in intended use not considered to be exposed to oil or grease.	<b>N/A</b>
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	<b>N/A</b>
4.3.11	Containers for liquids or gases	No container for liquids or gases provided.	<b>N/A</b>
4.3.12	Flammable liquids .....	No flammable liquids provided.	<b>N/A</b>
	Quantity of liquid (l) .....		<b>N/A</b>
	Flash point (°C) .....		<b>N/A</b>
4.3.13	Radiation; type of radiation .....	See below.	<b>P</b>
4.3.13.1	General	No ionizing radiation or laser or flammable liquids presents.	<b>N/A</b>
4.3.13.2	Ionizing radiation		<b>N/A</b>
	Measured radiation (pA/kg) .....		—
	Measured high-voltage (kV) .....		—
	Measured focus voltage (kV) .....		—
	CRT markings .....		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		<b>N/A</b>
	Part, property, retention after test, flammability classification .....		<b>N/A</b>
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....		<b>N/A</b>
4.3.13.5	Laser (including LEDs)	The LED used as indicating light.	<b>P</b>
	Laser class .....		—

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.13.6	Other types .....		N/A
4.4	Protection against hazardous moving parts		N/A
4.4.1	General	The DC fan is protected by the fan guard, however this unit is a building-in type SPS. Shall be evaluated in the final system assembly.	N/A
4.4.2	Protection in operator access areas		N/A
4.4.3	Protection in restricted access locations		N/A
4.4.4	Protection in service access areas		N/A
4.5	Thermal requirements		P
4.5.1	Maximum temperatures	Refer to appended table 4.5.1	P
	Normal load condition per Annex L..... :	See 1.6.2.	P
4.5.2	Resistance to abnormal heat	Phenolic bobbin material used in T1, LF1 and LF2, which is acceptable without test. For others, see appended table 4.5.2.	P
4.6	Openings in enclosures <i>Building-in type SPS, shall be evaluated in the final system assembly.</i>		N/A
4.6.1	Top and side openings		N/A
	Dimensions (mm) .....		—
4.6.2	Bottoms of fire enclosures		N/A
	Construction of the bottom .....		—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C)/time (weeks) .....		—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Compliance has to be demonstrated for the final equipment.	N/A
	Method 1, selection and application of components wiring and materials		N/A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Method 2, application of all of simulated fault condition tests		<b>N/A</b>
4.7.2	Conditions for a fire enclosure	See below.	<b>N/A</b>
4.7.2.1	Parts requiring a fire enclosure	<p>With having the following parts:</p> <ul style="list-style-type: none"> <li>▪ components in primary</li> <li>▪ components in secondary (not supplied by LPS)</li> <li>▪ components having unenclosed arcing parts at hazardous voltage or energy level</li> <li>▪ internal wirings</li> </ul> <p>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.</p>	<b>N/A</b>
4.7.2.2	Parts not requiring a fire enclosure	See 4.7.2.1.	<b>N/A</b>
4.7.3	Materials		<b>P</b>
4.7.3.1	General	PCB rated V-1 or better.	<b>P</b>
4.7.3.2	Materials for fire enclosures	Building-in type SPS.	<b>N/A</b>
4.7.3.3	Materials for components and other parts outside fire enclosures	Same as above.	<b>N/A</b>
4.7.3.4	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2 or better.	<b>P</b>
4.7.3.5	Materials for air filter assemblies	No air filter provided.	<b>N/A</b>
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	<b>N/A</b>

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		<b>P</b>
5.1	Touch current and protective conductor current		<b>P</b>
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6.	<b>P</b>
5.1.2	Equipment under test (EUT)	EUT has only one mains connection.	<b>P</b>
5.1.3	Test circuit	Equipment of figure 5A used.	<b>P</b>
5.1.4	Application of measuring instrument	Using measuring instrument in annex D.	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.1.5	Test procedure	The touch current was measured from mains to metal enclosure.	<b>P</b>
5.1.6	Test measurements	See below.	<b>P</b>
	Test voltage (V) .....	See appended table 5.1.6.	—
	Measured touch current (mA) .....	See appended table 5.1.6.	—
	Max. allowed touch current (mA) .....	See appended table 5.1.6.	—
	Measured protective conductor current (mA) ....		—
	Max. allowed protective conductor current (mA) :		—
5.1.7	Equipment with touch current exceeding 3.5 mA .....	Neither stationary permanently connected equipment nor stationary pluggable equipment type B.	<b>N/A</b>
5.1.8	Touch currents to and from telecommunication networks and cable distribution systems and from telecommunication networks	No TNV circuit connection.	<b>N/A</b>
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distribution system		<b>N/A</b>
	Test voltage (V) .....		—
	Measured touch current (mA) .....		—
	Max. allowed touch current (mA) .....		—
5.1.8.2	Summation of touch currents from telecommunication networks .....		<b>N/A</b>
5.2	Electric strength		<b>P</b>
5.2.1	General	See appended table 5.2.	<b>P</b>
5.2.2	Test procedure	See appended table 5.2.	<b>P</b>
5.3	Abnormal operating and fault conditions		<b>P</b>
5.3.1	Protection against overload and abnormal operation	Output overload test, the most unfavourable load tested. (See appended table 5.3).	<b>P</b>
5.3.2	Motors	Certified DC fan used.	<b>P</b>



IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.3	Transformers	With the shorted o/p of the transformers, no high temperature of the transformer was recorded.  Results of the short-circuit tests see appended table 5.3 and Annex C.	<b>P</b>
5.3.4	Functional insulation .....	Method c). Results see in appended table 5.3.	<b>P</b>
5.3.5	Electromechanical components	No electromechanical component provided.	<b>N/A</b>
5.3.6	Simulation of faults	Results see appended table 5.3.	<b>P</b>
5.3.7	Unattended equipment	None of the listed components was provided.	<b>N/A</b>
5.3.8	Compliance criteria for abnormal operating and fault conditions	Neither fire burns the equipment nor molten metal was emitted. Electric strength test primary to SELV, primary to PB were passed.	<b>P</b>

6	CONNECTION TO TELECOMMUNICATION NETWORKS		<b>N/A</b>
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		<b>N/A</b>
6.1.1	Protection from hazardous voltages		<b>N/A</b>
6.1.2	Separation of the telecommunication network from earth		<b>N/A</b>
6.1.2.1	Requirements		<b>N/A</b>
	Test voltage (V) .....		—
	Current in the test circuit (mA) .....		—
6.1.2.2	Exclusions.....		<b>N/A</b>

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

6.3	Protection of the telecommunication wiring system from overheating		<b>N/A</b>
	Max. output current (A).....		—

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Current limiting method..... :		—

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

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

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s) .....		—
	Sample 2 burning time (s) .....		—
	Sample 3 burning time (s) .....		—
A.2.7	Alternative test acc. to IEC 60695-2-2, cl. 4 and 8		N/A
	Sample 1 burning time (s) .....		—
	Sample 2 burning time (s) .....		—
	Sample 3 burning time (s) .....		—
A.3	Hot flaming oil test (see 4.6.2)		N/A
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A

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

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
B.10	Test for series motors		<b>N/A</b>
	Operating voltage (V) .....		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		<b>P</b>
	Position .....	T1	—
	Manufacturer .....	Refer to appended table 1.5.1.	—
	Type .....	Refer to appended table 1.5.1.	—
	Rated values .....	Class B	—
	Method of protection .....	By protection circuit.	—
C.1	Overload test	See appended table 5.3.	<b>P</b>
C.2	Insulation	See appended table C.2	<b>P</b>
	Protection from displacement of windings .....	See appended table C.2	<b>P</b>

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

E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		<b>N/A</b>
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F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)		<b>P</b>
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G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		<b>N/A</b>
G.1	Summary of the procedure for determining minimum clearances		<b>N/A</b>
G.2	Determination of mains transient voltage (V) .....		<b>N/A</b>
G.2.1	AC mains supply		<b>N/A</b>
G.2.2	DC mains supply		<b>N/A</b>
G.3	Determination of telecommunication network transient voltage (V).....		<b>N/A</b>
G.4	Determination of required withstand voltage (V) .:		<b>N/A</b>
G.5	Measurement of transient levels (V).....		<b>N/A</b>
G.6	Determination of minimum clearances .....		<b>N/A</b>

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Clause	Requirement – Test	Result – Remark	Verdict
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A

J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P
	Metal used .....	Complied.	—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability; operating voltage (V) .....		N/A
K.3	Thermostat endurance test; operating voltage (V) .....		N/A
K.4	Temperature limiter endurance; operating voltage (V) .....		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A

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

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

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Clause	Requirement – Test	Result – Remark	Verdict
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V)..... :		N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 2.10.3.4, 6.2.2.1, 7.3.2 and clause G.5)		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P	ANNEX P, NORMATIVE REFERENCES		P
Q	ANNEX Q, BIBLIOGRAPHY		P
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
			—
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
			—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P
V.2	TN power distribution systems	Considered.	P
V.3	TT power systems		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
V.4	IT power systems	IT-power system for Norway.	<b>P</b>



W	ANNEX W, SUMMATION OF TOUCH CURRENTS		<b>N/A</b>
W.1	Touch current from electronic circuits		<b>N/A</b>
W.1.2	Earthed circuits		<b>N/A</b>
W.2	Interconnection of several equipments		<b>N/A</b>
W.2.1	Isolation		<b>N/A</b>
W.2.2	Common return, isolated from earth		<b>N/A</b>
W.2.3	Common return, connected to protective earth		<b>N/A</b>

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

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

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
CENELEC COMMON MODIFICATIONS [C], SPECIAL NATIONAL CONDITIONS [S] AND A-DEVIATIONS (NATIONAL DEVIATIONS) [A] (EN 60950-1:2001, Annex ZB and Annex ZC)			<b>P</b>
General	C: Delete all the "country" notes in the reference document according to the following list:  1.1.5 Note 2    1.5.8 Note 2    1.6.1 Note 1.7.2 Note 4    1.7.12 Note 2    2.6 Note 2.2.3 Note    2.2.4 Note    2.3.2 Note 2, 7, 8 2.3.3 Note 1, 2    2.3.4 Note 2,3    2.7.1 Note 2.10.3.1 Note 4    3.2.1.1 Note    3.2.3 Note 1, 2 3.2.5.1 Note 2    4.3.6 Note 1,2    4.7.2.2 Note 4.7.3.1 Note 2    6.1.2.1 Note    6.1.2.2 Note 6.2.2 Note    6.2.2.1 Note 2    6.2.2.2 Note 7 Note 4    7.1 Note G2.1 Note 1, 2    Annex H Note 2	Deleted.	<b>P</b>
1.2.4.1	S (DK): Certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.	No power cord provided.	<b>N/A</b>
1.5.1	A (SE, Ordinance 1990:944 and CH, Ordinance on environmentally hazardous substances SR 814.013, Annex 3.2, Mercury): Add NOTE – Switches containing mercury such as thermostats, relays and level controllers are not allowed.	No such switches used.	<b>N/A</b>
1.5.8	S (NO): Due to the IT power system used (see annex V, Fig. V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	Considered.	<b>P</b>
1.7.2	S (FI, NO, SE): CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.  The marking text in the applicable countries shall be as follows:	Shall be evaluated in the final system assembly.	<b>N/A</b>
	FI: "Laite on liitettävä suojamaadoitus-koskettimilla varustettuun pistorasiaan"	Same as above.	<b>N/A</b>
	NO: "Apparatet må tilkoples jordet stikkontakt"	Same as above.	<b>N/A</b>
	SE: "Apparaten skall anslutas till jordat uttag"	Same as above.	<b>N/A</b>
	A (DK, Heavy Current Regulations): Supply cords of class I equipment, which is delivered without a plug, must be provided with a visible tag with the following text:  Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes	No power cord provided.	<b>N/A</b>



IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	en klemme mærket  eller  If essential for the safety of the equipment, the tag must in addition be provided with a diagram which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende 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. For stationary equipment the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.	No socket-outlets provided.	<b>N/A</b>
1.7.5	A (DK, Heavy Current Regulations): CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.	Class I equipment.	<b>N/A</b>
1.7.12	A (DE, Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment {Equipment safety law}], of 23 <sup>rd</sup> October 1992, Article 3, 3 <sup>rd</sup> paragraph, 2 <sup>nd</sup> 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 <sup>th</sup> January 1996, article 2, 4 <sup>th</sup> 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.	Shall be evaluated in the final system assembly.	<b>N/A</b>
1.7.15	A (CH, Ordinance on environmentally hazardous substances SR 814.013): Annex 4.10 of SR 814.013 applies for batteries.	No batteries provided.	<b>N/A</b>
	A (DE, Regulation on protection against hazards by X-ray, of 8 <sup>th</sup> January 1987, Article 5 [Operation of X-ray emission source], clauses 1 to 4):  a) A licence is required by those who operate an X-ray emission source.  b) A licence in accordance with Cl. 1 is not required by those who operate an X-ray emission source on which the electron acceleration voltage does not exceed 20 kV if	This national differences was deleted by A11 of EN 60950-1.	<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	<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>		
2.2.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.		N/A
2.3.2	S (NO): Requirements according to this annex, 6.1.2.1 apply.	No TNV.	N/A
2.3.3 and 2.3.4	S (NO): Requirements according to this annex, 1.7.2 and 6.1.2.1 apply.	No TNV.	N/A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
2.6.3.3	S (GB): The current rating of the circuit shall be taken as 13 A, not 16 A.	Considered.	<b>P</b>
2.7.1	<p>C: Replace the subclause as follows:</p> <p><i>Basic requirements</i></p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</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>	Replaced.	<b>P</b>
	S (GB): To protect against excessive currents and short-circuits in the PRIMARY CIRCUIT OF DIRECT PLUG-IN EQUIPMENT, protective device shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT.	Not a direct plug-in equipment.	<b>N/A</b>
2.7.2	C: Void.	Void.	<b>N/A</b>
2.10.2	C: Replace in the first line "(see also 1.4.7)" by "(see also 1.4.8)".	Replaced.	<b>P</b>
2.10.3.1	S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage and will remain at 230 V in case of a single earth fault	Considered.	<b>P</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.2.1.1	<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 60884-1 and one of the following dimension sheets:</p> <p>SEV 6532-2.1991, Plug type 15, 3P+N+PE 250/400 V, 10 A            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> <p>In general, EN 60309 applies for plugs for currents exceeding 10A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998:</p> <p>SEV 5932-2.1998, Plug type 25, 3L+N+PE 230/400 V, 16 A            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</p>	No power cord provided.	N/A
	<p>S (DK): Supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p>	Same as above.	N/A
	<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 in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance</p>	Same as above.	N/A

IEC 60950-1 / EN 60950-1									
Clause	Requirement – Test	Result – Remark	Verdict						
	with UNE-EN 60309-2.								
	<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 Socket 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>	Same as above.	<b>N/A</b>						
	<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) Regulations 1997.</p>	Same as above.	<b>N/A</b>						
3.2.3	C: Delete Note 1 and in Table 3A, delete the conduit sizes in parentheses.	Deleted.	<b>N/A</b>						
3.2.5.1	<p>C: Replace</p> <p>"60245 IEC 53" by "H05 RR-F";            "60227 IEC 52" by "H03 VV-F or H03 VVH2-F";            "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2".</p> <p>In Table 3B, replace the first four lines by the following:</p> <table border="0"> <tr> <td>Up to and including 6</td> <td>0,75<sup>1)</sup></td> </tr> <tr> <td>Over 6 up to and including 10</td> <td>(0,75)<sup>2)</sup> 1,0</td> </tr> <tr> <td>Over 10 up to and including 16</td> <td>(1,0)<sup>3)</sup> 1,5</td> </tr> </table> <p>In the Conditions applicable to Table 3B delete the words "in some countries" in condition <sup>1)</sup>.</p> <p>In Note 1, applicable to Table 3B, delete the second sentence.</p>	Up to and including 6	0,75 <sup>1)</sup>	Over 6 up to and including 10	(0,75) <sup>2)</sup> 1,0	Over 10 up to and including 16	(1,0) <sup>3)</sup> 1,5	Replaced.	<b>N/A</b>
Up to and including 6	0,75 <sup>1)</sup>								
Over 6 up to and including 10	(0,75) <sup>2)</sup> 1,0								
Over 10 up to and including 16	(1,0) <sup>3)</sup> 1,5								
3.2.5.1	S (GB): A power supply cord with conductor of 1,25 mm <sup>2</sup> is allowed for equipment with a rated current over 10 A and up to and including 13 A.	Same as above.	<b>N/A</b>						
3.3.4	<p>C: In table 3D, delete the fourth line: conductor sizes for 10 to 13 A, 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 13 to 16 A.</p>	Deleted.	<b>N/A</b>						

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
3.3.4	S (GB): The range of conductor sizes of flexible cords to be accepted by terminals for equipment with A RATED CURRENT of over 10 A up to and including 13 A is: - 1,25 mm <sup>2</sup> to 1,5 mm <sup>2</sup> nominal cross-sectional area.	Same as above.	N/A
4.3.6	S (GB): The torque test is performed using a socket outlet complying with BS 1363 and the plug part OF DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C.	Not a direct plug-in equipment.	N/A
	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.	Same as above.	N/A
4.3.13.6	C: Add the following note:  NOTE Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this recommendation are currently under development.	Added.	N/A
6.1.2.1	S (FI, NO, SE): Add the following text between the first and second paragraph:  If this insulation is solid, including insulation forming part of a component, it shall at least consist of either  - two layers of thin sheet material, each of which shall pass the electric strength test below, or  - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.  If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES AND CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition  - passes the tests and inspection criteria of 2.10.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.7 shall be performed using 1,5 kV), and	No TNV.	N/A

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>- is subject to ROUTING TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950:2000, 6.2.2.1;</li> <li>- the additional testing shall be performed on all the test specimens as described in EN 132400;</li> <li>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.</li> </ul>		
6.1.2.2	<p>S (FI, NO, SE): The exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a service person.</p>	Same as above.	<b>N/A</b>
7.1	<p>S (FI, NO, SE): Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>	Same as above.	<b>N/A</b>
G.2.1	<p>S (NO): Due to the IT power distribution system used (see annex V, Fig. V.7), the A.C. MAINS SUPPLY voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault.</p>	Annex G not applied for.	<b>N/A</b>
Annex H	<p>C: Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the operator access area, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see note). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete Note 2.</p>	Replaced.	<b>N/A</b>

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
Annex P	C: Replace the text of this annex by: See annex ZA.	Replaced.	<b>P</b>
Annex Q	C: Replace the title of IEC 61032 by "Protection of persons and equipment by enclosures – Probes for verification".  Add the following notes for the standards indicated:  IEC 60127 NOTE Harmonized as EN 60127 (Series) (not modified) IEC 60269-2-1 NOTE Harmonized as HD 630.2.1 S4:2000 (modified) IEC 60529 NOTE Harmonized as EN 60529:1991 (not modified) IEC 61032 NOTE Harmonized as EN 61032:1998 (not modified) IEC 61140 NOTE Harmonized as EN 61140:2001 (not modified) ITU-T Recommendation K.31 NOTE in Europe, the suggested document is EN 50083-1.		<b>P</b>



IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
Annex ZA	<p><b>C: NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR RELEVANT EUROPEAN PUBLICATIONS</b></p> <p>This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).</p> <p>NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.</p>		<b>P</b>
	—	IEC 60050-151	
	—	IEC 60050-195	
	EN 60065:1998 + corr. June 1999	IEC 60065 (mod):1998	
	EN 60073:1996	IEC 60073:1996	
	HD 566 S1:1990	IEC 60085:1984	
	HD 214 S2:1980	IEC 60112:1979	
	HD 611.4.1.S1:1992	IEC 60216-4-1:1990	
	HD 21 <sup>1)</sup> Series	IEC 60227 (mod) Series	
	HD 22 <sup>2)</sup> Series	IEC 60245 (mod) Series	
	EN 60309 Series	IEC 60309 Series	
	EN 60317-43:1997	IEC 60317-43:1997	
	EN 60320 Series	IEC 60320 (mod) Series	
	HD 384.3 S2:1995	IEC 60364-3 (mod):1993	
	HD 384.4.41 S2:1996	IEC 60364-4-41 (mod):1992 <sup>3)</sup>	
	EN 132400:1994 <sup>4)</sup> + A2:1998 + A3:1998 + A4:2001	IEC 60384-14:1993	
	EN 60417-1	IEC 60417-1	
	HD 625.1 S1:1996 + corr. Nov. 1996	IEC 60664-1 (mod):1992	
	EN 60695-2-2:1994	IEC 60695-2-2:1991	
	EN 60695-2-11:2001	IEC 60695-2-11:2000	
	—	IEC 60695-2-20:1995	
	—	IEC 60695-10-2:1995	
	—	IEC 60695-11-3:2000	
	—	IEC 60695-11-4:2000	
	EN 60695-11-10:1999	IEC 60695-11-10:1999	
	EN 60695-11-20:1999	IEC 60695-11-20:1999	
	EN 60730-1:2000	IEC 60730-1:1999 (mod)	

IEC 60950-1 / EN 60950-1			
Clause	Requirement – Test	Result – Remark	Verdict
	EN 60825-1:1994 + corr. Febr. 1995 + A11:1996 + corr. July 1997	IEC 60825-1:1993	
	EN 60825-2:2000	IEC 60825-2:2000	
	—	IEC 60825-9:1999	
	EN 60851-3:1996	IEC 60851-3:1996	
	EN 60851-5:1996	IEC 60825-5:1996	
	EN 60851-6:1996	IEC 60851-6:1996	
	—	IEC 60885-1:1987	
	EN 60990:1999	IEC 60990:1999	
	—	IEC 61058-1:2000	
	EN 61965:2001	IEC 61965:2000	
	EN ISO 178:1996	ISO 178:1993	
	EN ISO 179 Series	ISO 179 Series	
	EN ISO 180:2000	ISO 180:1993	
	—	ISO 261:1998	
	—	ISO 262:1998	
	EN ISO 527 Series	ISO 527 Series	
	—	ISO 386:1984	
	EN ISO 4892 Series	ISO 4892 Series	
	—	ISO 7000:1989	
	EN ISO 8256:1996	ISO 8256:1990	
	—	ISO 9772:1994	
	EN ISO 9773:1998	ISO 9773:1998	
	—	ITU-T:1988 Recommendation K.17	
	—	ITU-T:2000 Recommendation K.21	
	1) The HD 21 series is related to, but not directly equivalent with the IEC 60227 series 2) The HD 22 series is related to, but not directly equivalent with the IEC 60245 series 3) IEC 60364-4-41:1992 is superseded by IEC 60364-4-41:2001 4) EN 132400, Sectional Specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains (Assessment level D), and its amendments are related to, but not directly equivalent to IEC 60384-14		

1.5.1	TABLE: list of critical components					P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity <sup>1</sup>	
1. Chassis	--	--	Metal, Min 0.6 mm thick	--	--	
2. PCB	--	--	V-1 or better, min. 130°C	UL 94	UL	
3. Terminal Block (TB1)	Dinkle	DT-4 series	20A, 300Vac	--	UL	
	Dinkle	DT-43 series	21A, 300Vac	--	UL	
	Dinkle	DT-45 series; DT-49 series	25A, 300Vac	--	UL	
	Howder	HB-95 series; HI-20 series	10A, 250Vac	--	UL	
	Switchlab	T14 series, T24 series, T34 series, T35 series	20A, 300Vac	--	UL	
	Switchlab	T44 series	15A, 300Vac	--	UL	
	Dinkle	EK-950	25A, 450Vac	IEC/EN 60998	TÜV, UL	
	JITE	BTB-654 series	20A, 300Vac	--	UL	
4. DC Fan	Sunon Wealth	KDE1206PTV1	12Vdc, 0.15 A, 23.5 CFM	IEC/EN 60950-1	TÜV, UL	
	Yen Sun	FD126025 HB	12Vdc, 0.18 A, 25.4 CFM	IEC/EN 60950-1	TÜV, UL	
	Yen Sun	FD126025 HS	12Vdc, 0.18 A, 21.3 CFM	IEC/EN 60950-1	TÜV, UL	
	Delta	AFB0612H	12Vdc, 0.14 A, 23.38 CFM	IEC/EN 60950-1	UL, VDE	
5. Y-Capacitors (C3, C4, C22, C23, C30) (Optional)	Murata	KC	Max. 4700pF, Min. 250V, 85°C	IEC 60384-14:1993	VDE, UL, FI	
	Murata	KH, KX	Max. 4700pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI	
	Pan Overseas	AC, AH	Max. 4700pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI	
	TDK	CS	Max. 4700pF, Min. 250V, 85°C	IEC 60384-14:1993	VDE, UL, FI	
	TDK	CD	Max. 4700pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI	

	Welson	KL, WD	Max. 4700pF, Min. 250V, 125°C	IEC 60384- 14:1993	VDE, UL, FI
6. X-Capacitors (C1, C10) (Optional)	Arcotronics	R.46	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Cheng Tung	CTX	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Epcos	B3292#	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Iskra	KNB 1530, KNB 1560	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Liow Gu	GS-L	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Pilkor	PCX2335	Max. 1.0µF Min. 250Vac, 85°C	IEC 60384- 14:1993	VDE, UL
	Pilkor	PCX2335M, PCX2337	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Teapo	XG-VS	Max. 1.0µF Min. 250Vac, 85°C	IEC 60384- 14:1993	VDE, UL
	Shiny Space	SX1	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
	Ultra Tech	HQX	Max. 1.0µF Min. 250Vac, 100°C	IEC 60384- 14:1993	VDE, UL
7. Fuse (FS1)	Conquer	GFE	F6.3A, 250V	--	UL
	Conquer	GBM	F6.3A, 250V	--	UL
	Jenn feng	MFG	F6.3A, 250V	--	UL
	Sleek	50FG	F6.3A, 250V	--	UL
	Bel	5SF	F6.3A, 250V	IEC 60127-2	VDE, UL
	Conquer	UFE	F6.3A, 250V	IEC 60127-2	VDE, UL
	Walter	FSD	F6.3A, 250V	IEC 60127-2	VDE, UL
8. Bleeder Resistor (R1)	Pilkor	SR37	680kΩ, 1/2W	IEC 60065 cl. 14.1 a)	VDE
	Futaba	RM series	680kΩ, 1/2W	IEC 60065 cl. 14.1 a, b)	Semko

9. Varistor (ZNR1)(Optional)	Centra Science	CNR-07D-14D471K.	300Vac, 385Vdc	--	UL
	Don's	7D-14D471	300Vac, 385Vdc	--	UL
	Fuji	Series C, Series E	300Vac, 385Vdc	--	UL
	Joyin	JVR-07N-14N471K	300Vac, 385Vdc	--	UL
	Nippon chemi-con	7-14V471K 7-15G471K	300Vac, 385Vdc	--	UL
	Matsushita	07-14K471U	300Vac, 385Vdc	--	UL
	Song Long	SAS471KD07-14	300Vac, 385Vdc	--	UL
	Uppermost	V07K-V14K300	300Vac, 385Vdc	--	UL
	Welson	WNR-471KD07-14	300Vac, 385Vdc	--	UL
10. Storage Capacitors (C5, C6)	--	--	150 $\mu$ F, 400V, min. 85°C	--	--
11. Bridging Capacitor (C31) (Y1 type) (Optional)	Murata	KX	Max. 1000pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI
	Pan Overseas	AH	Max. 1000pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI
	TDK	CD	Max. 1000pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI
	Welson	WD	Max. 1000pF, Min. 250V, 125°C	IEC 60384-14:1993	VDE, UL, FI
12. Photo Coupler (U3, U4)	Isocom	ISP621-1x, ISP817x	Dti=0.6mm Int. dcr=4.1mm Ext. dcr=9mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, FI, UL
	Lite-on	LTV817	Dti=0.8mm Int. dcr=5.2mm Ext. dcr=7.8mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, UL
	NEC	PS256..-	Dti=0.4mm Int. dcr=4mm Ext. dcr=7mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, FI, UL
	Sharp	PC123	Dti=0.7mm Int. dcr=5mm Ext. dcr=8mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, UL

	Toshiba	TLP721.	Dti=0.8mm Int. dcr>4mm Ext. dcr=8mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, FI, UL
	Cosmo	K1010	Dti=0.5mm Int. dcr=5.3mm Ext. dcr=8mm 100°C	EN 60747-5-2 IEC 60950-1	VDE, UL
13. Transformer (T1) for SP-320-5	Long Sail	TF-879	Class B	applicable parts in IEC 60950-1 and acc. to IEC 60085	accepted by TÜV Rheinland
	Yao Sheng	TF-879	Class B	Same above.	Same above.
	Jet Signal	TF-879	Class B	Same above.	Same above.
For SP-320-7.5	Long Sail	TF-880	Class B	Same above.	Same above.
	Yao Sheng	TF-880	Class B	Same above.	Same above.
	Jet Signal	TF-880	Class B	Same above.	Same above.
For SP-320-12	Long Sail	TF-881	Class B	Same above.	Same above.
	Yao Sheng	TF-881	Class B	Same above.	Same above.
	Jet Signal	TF-881	Class B	Same above.	Same above.
For SP-320-13.5, SP-320-15	Long Sail	TF-883	Class B	Same above.	Same above.
	Yao Sheng	TF-883	Class B	Same above.	Same above.
	Jet Signal	TF-883	Class B	Same above.	Same above.
For SP-320-24	Long Sail	TF-884	Class B	Same above.	Same above.
	Yao Sheng	TF-884	Class B	Same above.	Same above.
	Jet Signal	TF-884	Class B	Same above.	Same above.
For SP-320-27	Long Sail	TF-885	Class B	Same above.	Same above.
	Yao Sheng	TF-885	Class B	Same above.	Same above.
	Jet Signal	TF-885	Class B	Same above.	Same above.
For SP-320-48	Long Sail	TF-886	Class B	Same above.	Same above.
	Yao Sheng	TF-886	Class B	Same above.	Same above.
	Jet Signal	TF-886	Class B	Same above.	Same above.
14. Line Filter (LF1, LF2) (Optional)	Long Sail	TF-360	120°C	--	--
15. Choke (L1) (Optional)	Long Sail	TR-337	130°C	--	--

16. Thermistor (RTH1) (Optional)	--	--	3A, 10 Ω	--	--
17. Thermal Switch (TSW1) for all models except for SP-320-5	SEKI	ST-22	1A, 250Vac, 80°C	IEC/EN 60730-1	VDE, UL
For SP-320-5 only	SEKI	ST-22	1A, 250Vac, 70°C	IEC/EN 60730-1	VDE, UL
18. Mylar sheet	--	--	Min. V-2, min. 0.2 mm thick	--	UL

**Note(s):**

1. An asterisk indicates a mark that assures the agreed level of surveillance.
2. Used abbreviations: Dti = distance through insulation, Int. dcr = internal creepage distance, Ext. dcr = external creepage distance.

1.6.2		TABLE: electrical data (in normal conditions)					P
Fuse #	Irated (A)	U (V/Hz)	P (W)	I (A)	Ifuse (A)	Condition/status	
<b>Model: SP-320-5</b>							
FS1	--	90/50	384	4.27	4.27	Loaded at +5Vdc/55A	
FS1	--	90/60	385	4.28	4.28	Same above.	
FS1	5	100/50	377	3.77	3.77	Same above.	
FS1	5	100/60	377	3.78	3.78	Same above.	
FS1	5	240/50	349	1.48	1.48	Same above.	
FS1	5	240/60	349	1.49	1.49	Same above.	
FS1	--	264/50	348	1.36	1.36	Same above.	
FS1	--	264/60	348	1.37	1.37	Same above.	
<b>Model: SP-320-27</b>							
FS1	--	90/50	397	4.37	4.37	Loaded at +27Vdc/11.7A	
FS1	--	90/60	397	4.38	4.38	Same above.	
FS1	5	100/50	389	3.89	3.89	Same above.	
FS1	5	100/60	389	3.90	3.90	Same above.	
FS1	5	240/50	357	1.52	1.52	Same above.	
FS1	5	240/60	357	1.52	1.52	Same above.	
FS1	--	264/50	357	1.38	1.38	Same above.	
FS1	--	264/60	357	1.39	1.39	Same above.	

<b>Model: SP-320-48</b>						
FS1	--	90/50	398	4.43	4.43	Loaded at +48Vdc/6.7A
FS1	--	90/60	398	4.43	4.43	Same above.
FS1	5	100/50	391	3.90	3.90	Same above.
FS1	5	100/60	391	3.90	3.90	Same above.
FS1	5	240/50	362	1.53	1.53	Same above.
FS1	5	240/60	362	1.54	1.54	Same above.
FS1	--	264/50	361	1.40	1.40	Same above.
FS1	--	264/60	361	1.41	1.41	Same above.
Note(s):						

2.1.1.5	TABLE: max. V, A, VA test				P
Voltage (rated) (Vdc)	Current (rated) (A)	Voltage (max.) (Vdc)	Current (max.) (A)	VA (max.) (VA)	
<b>Model: SP-320-5</b>					
+5	55	+5.06	66	321	
<b>Model: SP-320-27</b>					
+27	11.7	+27.05	14	349	
<b>Model: SP-320-48</b>					
+48	6.7	+48.0	8	376	
Note(s):					
Supply Voltage: 240V, 60Hz					

2.1.1.7	TABLE: discharge test			P
Condition	$\tau$ calculated (s)	$\tau$ measured (s)	t u→ 0V (s)	Comments
L-N (fuse in)	1.36	0.02	--	Vo=378 of 37% Vo=140, measured voltage after 1 sec=0V
L-N (fuse out)	0.68	0.66	--	Vo=384 of 37% Vo=142, measured voltage after 1 sec=86V



Note(s):	
Fuse in:	
Overall capacity:	2.0 $\mu$ F (C1=C10=1.0 $\mu$ F)
Discharge resistor:	680k $\Omega$ (R1=680k $\Omega$ )
Fuse out:	
Overall capacity:	1.0 $\mu$ F (C1=1.0 $\mu$ F)
Discharge resistor:	680k $\Omega$ (R1=680k $\Omega$ )

2.2.2	TABLE: Hazardous voltage measurement			<b>P</b>
Transformer	Location	Max. Voltage		Voltage Limitation Component
		V peak	V d.c.	
<b>Model: SP-320-5</b>				
T1	9/10/11-12/13/14	12.8	--	--
T1	15-12/13/14	22.4	--	--
T1	16-12/13/14	2.6	--	--
<b>Model: SP-320-27</b>				
T1	9/10/11-12/13/14	38	--	--
T1	15-12/13/14	30	--	--
T1	16-12/13/14	4	--	--
<b>Model: SP-320-48</b>				
T1	9/10/11-12/13/14	60	--	--
	After D19	--	56	D19
T1	15-12/13/14	24	--	--
T1	16-12/13/14	8	--	--
Note(s):				
Supply Voltage: 240V, 60Hz				

2.2.3	TABLE: SEL voltage measurement		<b>P</b>
Location	Voltage measured (V)	Comments	
<b>Model: SP-320-48</b>			
+48V output to Return	0	D19 shorted	
Note(s):			

2.4.2	TABLE: limited current circuit measurement					<b>P</b>
Location	Voltage (V)	Current (mA)	Freq. (Hz)	Limit (mA)	Comments	
C31 sec. pin to PE	0.6	0.3	60	0.7	C31=1000pF (Y1 type)	
Note(s):						
1) Output measured with a 2 kΩ non-inductive resistor as load.						

2.5	TABLE: limited power source measurement			<b>N/A</b>
	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)				
Note(s):				

2.6.3.4	TABLE: ground continue test		<b>P</b>
Location	Resistance measured (mΩ)	Comments	
Earth Pin of Terminal block to metal enclosure	6	25A, 1 minute	
Earth Pin of Terminal block to metal enclosure	3	40A, 2 minutes	
Note(s):			

2.10.2	TABLE: working voltage measurement			<b>P</b>
Location	RMS voltage (V)	Peak voltage (V)	Comments	
Model: SP-320-5				
T1 Pin 1 to pin 9/10/11	316	688		
T1 Pin 1 to pin 12/13/14	302	680		
T1 Pin 1 to pin 15	333	704		
T1 Pin 1 to pin 16	320	680		
T1 Pin 2 to pin 9/10/11	409	720		

T1 Pin 2 to pin 12/13/14	402	704	
T1 Pin 2 to pin 15	<b>415</b>	<b>728</b>	* Highest Vrms and Vpk
T1 Pin 2 to pin 16	403	712	
T1 Pin 3 to pin 9/10/11	302	400	
T1 Pin 3 to pin 12/13/14	303	400	
T1 Pin 3 to pin 15	303	416	
T1 Pin 3 to pin 16	302	400	
T1 Pin 4/6 to pin 9/10/11	167	352	
T1 Pin 4/6 to pin 12/13/14	166	360	
T1 Pin 4/6 to pin 15	168	368	
T1 Pin 4/6 to pin 16	166	352	
T1 Pin 5 to pin 9/10/11	166	352	
T1 Pin 5 to pin 12/13/14	166	368	
T1 Pin 5 to pin 15	166	352	
T1 Pin 5 to pin 16	167	360	
T1 Pin 7 to pin 9/10/11	332	560	
T1 Pin 7 to pin 12/13/14	325	544	
T1 Pin 7 to pin 15	335	568	
T1 Pin 7 to pin 16	331	552	
U3 pin 3 to pin 1	166	352	
U3 pin 3 to pin 2	168	360	
U3 pin 4 to pin 1	167	352	
U3 pin 4 to pin 2	167	352	
U4 pin 3 to pin 1	188	344	
U4 pin 3 to pin 2	166	352	
U4 pin 4 to pin 1	188	344	
U4 pin 4 to pin 2	188	344	
<b>Model: SP-320-27</b>			
T1 Pin 1 to pin 9/10/11	342	712	
T1 Pin 1 to pin 12/13/14	301	648	
T1 Pin 1 to pin 15	341	704	
T1 Pin 1 to pin 16	325	680	
T1 Pin 2 to pin 9/10/11	<b>437</b>	<b>752</b>	* Highest Vrms and Vpk
T1 Pin 2 to pin 12/13/14	397	696	

T1 Pin 2 to pin 15	421	736	
T1 Pin 2 to pin 16	412	720	
T1 Pin 3 to pin 9/10/11	306	432	
T1 Pin 3 to pin 12/13/14	305	432	
T1 Pin 3 to pin 15	306	415	
T1 Pin 3 to pin 16	305	400	
T1 Pin 4/6 to pin 9/10/11	168	376	
T1 Pin 4/6 to pin 12/13/14	167	368	
T1 Pin 4/6 to pin 15	167	360	
T1 Pin 4/6 to pin 16	166	352	
T1 Pin 5 to pin 9/10/11	166	360	
T1 Pin 5 to pin 12/13/14	170	376	
T1 Pin 5 to pin 15	165	352	
T1 Pin 5 to pin 16	166	360	
T1 Pin 7 to pin 9/10/11	347	592	
T1 Pin 7 to pin 12/13/14	320	536	
T1 Pin 7 to pin 15	341	576	
T1 Pin 7 to pin 16	334	552	
U3 pin 3 to pin 1	170	360	
U3 pin 3 to pin 2	169	352	
U3 pin 4 to pin 1	171	360	
U3 pin 4 to pin 2	170	360	
U4 pin 3 to pin 1	165	344	
U4 pin 3 to pin 2	166	352	
U4 pin 4 to pin 1	158	336	
U4 pin 4 to pin 2	158	336	
<b>Model: SP-320-48</b>			
T1 Pin 1 to pin 9/10/11	356	728	
T1 Pin 1 to pin 12/13/14	272	624	
T1 Pin 1 to pin 15	327	704	
T1 Pin 1 to pin 16	303	680	
T1 Pin 2 to pin 9/10/11	<b>427</b>	<b>760</b>	* Highest Vrms and Vpk
T1 Pin 2 to pin 12/13/14	369	640	
T1 Pin 2 to pin 15	409	696	

T1 Pin 2 to pin 16	401	680	
T1 Pin 3 to pin 9/10/11	305	448	
T1 Pin 3 to pin 12/13/14	305	472	
T1 Pin 3 to pin 15	301	416	
T1 Pin 3 to pin 16	300	400	
T1 Pin 4/6 to pin 9/10/11	170	392	
T1 Pin 4/6 to pin 12/13/14	171	384	
T1 Pin 4/6 to pin 15	167	368	
T1 Pin 4/6 to pin 16	166	352	
T1 Pin 5 to pin 9/10/11	169	384	
T1 Pin 5 to pin 12/13/14	175	392	
T1 Pin 5 to pin 15	166	352	
T1 Pin 5 to pin 16	166	360	
T1 Pin 7 to pin 9/10/11	346	600	
T1 Pin 7 to pin 12/13/14	313	496	
T1 Pin 7 to pin 15	334	552	
T1 Pin 7 to pin 16	336	536	
T1 Pin 7 to U3 pin 2	295	528	
T1 Pin 7 to ZD9	295	520	
T1 Pin 4/6 to R75	169	368	
T1 Pin 5 to R75	169	376	
U3 pin 3 to pin 1	176	368	
U3 pin 3 to pin 2	176	368	
U3 pin 4 to pin 1	174	368	
U3 pin 4 to pin 2	175	368	
U4 pin 3 to pin 1	166	352	
U4 pin 3 to pin 2	165	352	
U4 pin 4 to pin 1	159	344	
U4 pin 4 to pin 2	158	336	
Between C31	165	352	
T1 pin 5 to U3 pin 2	197	364	
T1 pin 7 to U3 pin 2	246	408	

Note(s):

Supply Voltage: 240V, 60Hz

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements						P
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)	
Primary components (with 10N) to secondary components (with 10N)	420	250	4.0	See below	5.0	See below	
- C10 Body to C37 body				10.0		10.0	
- LF2 to ZD7				5.9		5.9	
Primary components (with 10N) to metal chassis (PE)	420	250	2.0	See below	2.5	See below	
HS of BD1 to top metal chassis				7.6		7.6	
Primary trace to side metal chassis				3.8		3.8	
L1 to clip of Q1 (PE)				9.8		9.8	
Pins of Q1 to side metal chassis (PE)				6.8		6.8	
Primary trace to earthing trace (PE)	420	250	2.0	See below	2.5	See below	
Under C3/C4				5.0		5.0	
Under C30				5.4		5.7	
Under C22/C23				5.3		5.3	
Line trace to Neutral trace before fuse	420	250	1.5	3.0	2.5	3.0	
Under Fuse	420	250	1.5	6.0	2.5	6.0	
Primary trace to secondary trace	420	250	4.0	See below	5.0	See below	
Under U3/U4 with cut slot				6.0		8.2	
Under C31 with cut slot				6.8		7.5	
BD1 to R75 with cut slot				5.8		7.6	
C10 to R75 with cut slot				6.6		8.6	
T1 pin 4/6 to R75				8.6		8.6	
T1 pin 7 to ZD9				6.6		21.0	
Under T1	760	437	5.0	13.3	9.0	13.3	

Note(s):

- 1) Functional insulation shorted, see sub-clause 5.3.4.
- 2) Glued components (safety relevant): L1, C7.
- 3) Tubed components (safety relevant): Q1, Q2, D3.
- 4) The secondary wires were fixed in position reliable by quick terminal or soldering pin.
- 5) One cut slot (2.0 mm in width) is under C31.
- 6) One cut slot (2.0 mm in width) is under U3/U4.
- 7) One cut slot (2.0 mm in width) is between U3, pin 3 and T1, pin 5.
- 8) One cut slot (2.0 mm in width) is between BD1 and R75.
- 9) One cut slot (2.0 mm in width) is between C10 and R75.
- 10) There is one mylar sheet (thickness 0.2 min.) is placed between main board and bottom metal chassis.
- 11) The DC Fan wires is tubed by heat shrunkable tube.

2.10.5	TABLE: distance through insulation measurements			P
Distance through insulation di at/of:	U r.m.s. (V)	Test voltage (V)	Required di (mm)	di (mm)
Photo couplers (reinforced insulation)	240	AC 3000	0.4	<sup>1)</sup>
Heat shrunkable tube on DC Fan wires (supplementary insulation)	240	AC 1500	0.4	0.4

Note(s):

- 1) For details refer to table 1.5.1.

4.5.1	TABLE: maximum temperatures			P
test voltage (V) .....	A) 90Vac/60Hz B) 264Vac/60Hz			—
t1 (°C) .....	--			—
t2 (°C) .....	--			—
Maximum temperature T of part/at:	T (°C)		allowed T <sub>max</sub> (°C)	
<b>Test voltage</b>	<b>A)</b>	<b>B)</b>		--
<b>Model: SP-320-5</b>				
LF1 coil	75.8	54.3		120
LF2 coil	98.9	60.4		120
H.S. body of BD1	121.9	73.6		--
L1 coil	92.6	67.7		130
C6 body	73.1	59.5		85
PCB under RTH1	108.0	74.2		130

T1 bottom coil	105.1	100.8	110		
T1 core	77.8	67.3	110		
L2 coil	80.1	77.4	105		
Tamb	24.4	25.7	--		
<b>Model: SP-320-27</b>					
LF1 coil	83.9	53.1	120		
LF2 coil	87.4	55.1	120		
H.S. body of BD1	107.5	65.9	--		
L1 coil	90.5	62.9	130		
C6 body	69.3	56.0	85		
PCB under RTH1	124.5	78.6	130		
T1 bottom coil	80.5	77.1	110		
T1 core	59.1	51.8	110		
L2 coil	67.8	65.4	105		
Tamb	26.0	25.7	--		
<b>Model: SP-320-48</b>					
LF1 coil	87.2	55.1	120		
LF2 coil	100.3	58.7	120		
H.S. body of BD1	108.1	68.9	--		
L1 coil	89.0	66.4	130		
C6 body	75.0	58.6	85		
PCB under RTH1	103.9	72.1	130		
T1 bottom coil	79.2	78.1	110		
T1 core	54.2	69.9	110		
L2 coil	61.7	63.2	105		
Tamb	31.8	28.0	--		
Temperature T of winding:	R <sub>1</sub> (Ω)	R <sub>2</sub> (Ω)	T (°C)	allowed T <sub>max</sub> (°C)	insulation class



Note(s):	
<ol style="list-style-type: none"> <li>The temperatures were measured under worst normal mode defined in 1.2.2.1 and as described in sub-clause 1.6.2 and at voltages as described above.</li> <li>The maximum ambient temperature permitted by the manufacturer's specification is 50°C.  <u>Winding components (providing safety isolation):</u>            - Class B → T<sub>max</sub> = 120°C – 10°C = 110°C</li> <li>All values for T(°C) are re-calculated from T<sub>amb</sub> respectively.</li> <li>The heating tests have been performed on the components side is up.</li> <li>The heating tests have been performed on models have a internal DC Fan with air flow 21.3 CFM min.</li> </ol>	

4.5.2	TABLE: ball pressure test of thermoplastic parts		<b>P</b>
	allowed impression diameter (mm) .....	≤ 2 mm	—
Part	Test temperature (°C)	Impression diameter (mm)	
Bobbin of LF1/LF2 (Chang Chun, type PBT-4130)	125	0.9	
Terminal block (Switchlab) (plastic mfr.: Shinkong, D202G15)	125	1.2	
Terminal block (Dinkel) (plastic mfr.: Rhodia, B 50H1(r1))	125	1.3	
Terminal block (Howder) (plastic mfr.: EI DUPONT, FE13001)	125	0.9	
Terminal block (JITE)	125	1.1	
Note(s): Bobbin of T1, LF1, LF2 (T373J/T375J, Chang Chun) is made of Phenolic material, which is accepted without test.			

4.6.1, 4.6.2	TABLE: enclosure openings		<b>N/A</b>
Location	Size (mm)	Comments	
Note(s):			

4.7	TABLE: resistance to fire			<b>P</b>
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class
PCB	--	--	--	V-1

Note(s):

5.1.6	TABLE: touch current measurement				<b>P</b>
Condition	L → terminal A (mA)	N → terminal A (mA)	Limit (mA)	Comments	
Unit on	1.65	1.56	3.5	To metal chassis (PE)	

Note(s):  
 Supply voltage: 264V, 60Hz  
 Overall capacity: C3=C4=C22=C23=C30=4700pF; C31=1000pF

5.2	TABLE: electric strength tests and impulse tests			<b>P</b>
Test voltage applied between:		Test voltage (V)	Breakdown	
Unit, primary and secondary		DC 4242	No	
Unit, primary and metal chassis (PE)		DC 3000	No	
T1, primary winding and secondary winding		AC 3000	No	
T1, primary winding and core		AC 2200	No	
T1, secondary winding and core		AC 2200	No	
Two layers of insulation tape used in the T1		AC 3000	No	
Tube for covering Q1, Q2 and D3		DC 3000	No	

Note(s):

5.3	TABLE: fault condition tests							<b>P</b>
ambient temperature (°C) .....		25, if not otherwise specified.					—	
model/type of power supply .....		--					—	
manufacturer of power supply .....		--					—	
rated markings of power supply .....		--					—	
No.	Component no.	Fault	Test voltage (Vac)	Test time	Fuse no.	Fuse current (A)	Result	
<b>Model: SP-320-48</b>								
01	BD1 (L-+)	s-c	240	1 sec	FS1	--	Fuse opened, no hazards.	
02	C8	s-c	240	1 sec	FS1	--	Fuse opened, no hazards.	
03	Q2 (S-G)	s-c	240	10 min	FS1	0.09	Unit shutdown, no hazards.	
04	Q2 (S-D)	s-c	240	1 sec	FS1	--	Fuse opened, Q2	

							damaged, no hazards.
05	Q2 (G-D)	s-c	240	1 sec	FS1	--	Fuse opened, Q2 damaged, no hazards.
06	U3 (3-4)	s-c	240	60 min	FS1	0.01-0.07	Cycle protection, T1 coil=42°C, no hazards.
07	U4 (3-4)	s-c	240	60 min	FS1	0.09	Unit shutdown, T1 coil=37°C, no hazards.
08	U3 (1-2)	s-c	240	90 min	FS1	0.1-0.5	Cycle protection, T1 coil=47°C, no hazards.
09	U4 (1-2)	s-c	240	90 min	FS1	1.51	Cycle protection, T1 coil=52°C, no hazards.
10	T1 (5-6)	s-c	240	90 min	FS1	0.16-0.29	Cycle protection, T1 coil=113°C, Tamb=29°C, no hazards.
11	T1 (9-12)	s-c	240	90 min	FS1	0.09	Unit shutdown, T1 coil=32°C, no hazards.
12	T1 (15-16)	s-c	240	90 min	FS1	0.16-0.3	Cycle protection, T1 coil=125°C, Tamb=30°C, no hazards.
13	DC Fan	lock	240	60 min	FS1	0.08-0.2	Cycle protection, T1 coil=90°C, Tamb =26.3°C, no hazards.
14	Ventilation openings	block	240	150 min	FS1	1.54	Temperature was stabled, T1 coil=48.8°C, Tamb =27°C, no hazards.
15	T1 (9/10/11-12/13/14)	o-l	240	170 min	FS1	1.77	Temperature were stabled at : 47.89V/ 7.8A, Cycle protection when output current increased to 8A, T1 coil=54°C, T1 core=44°C, Tamb =24°C, no hazards.
<b>Model: SP-320-27</b>							
16	T1 (5-6)	s-c	240	90 min	FS1	0.11-0.26	Cycle protection, T1 coil=85°C, Tamb =30°C, no hazards.
17	T1 (9-12)	s-c	240	90 min	FS1	0.09	Unit shutdown, T1 coil=33°C, no hazards.
18	T1 (15-16)	s-c	240	90 min	FS1	0.1-0.24	Cycle protection, T1 coil=95°C, Tamb =28°C, no hazards.
19	DC Fan	lock	240	90 min	FS1	0.08-0.22	Cycle protection, T1 coil=109°C, Tamb =24°C, no hazards.
20	Ventilation	block	240	180 min	FS1	1.52	Temperature was stabled, T1 coil=50.5°C, Tamb

	openings						=24°C, no hazards.
21	T1 (9/10/11-12/13/14)	o-l	240	230 min	FS1	1.79	Temperature were stabled at : 27.1V/ 14A, Cycle protection when output current increased to 15A, T1 coil=67°C, T1 core=44°C, Tamb =26°C, no hazards.
<b>Model: SP-320-5</b>							
22	T1 (5-6)	s-c	240	90 min	FS1	0.14-0.28	Cycle protection, T1 coil=111.5°C, Tamb =29°C, no hazards.
23	T1 (9-12)	s-c	240	90 min	FS1	0.24-0.08	Cycle protection, T1 coil=68°C, Tamb =30°C, no hazards.
24	T1 (15-16)	s-c	240	90 min	FS1	0.1-0.18	Cycle protection, T1 coil=121°C, Tamb =29°C, no hazards.
25	DC Fan	lock	240	60 min	FS1	0.09-0.3	Cycle protection, T1 coil=76°C, Tamb =26.3°C, no hazards.
26	Ventilation openings	block	240	150 min	FS1	1.5	Temperature was stabled, T1 coil=64.3°C, Tamb =27°C, no hazards.
27	T1 (9/10/11-12/13/14)	o-l	240	160 min	FS1	1.69	Temperature were stabled at: 4.79V/ 65A, Cycle protection when output current increased to 67A, T1 coil=80°C, T1 core=48°C, Tamb =24°C, no hazards.
28	+5V output	o-l	240	150 min	FS1	1.68	Temperature was stabled at load: 65A, unit cycle protection when output current increased to 67A. T1 coil=78°C, Tamb =24°C, no hazards.
29	+5V output	s-c	240	150 min	FS1	0.09-0.31	Cycle protection, T1=66.2°C, Tamb =25°C, no hazards.
30	+27V output	o-l	240	210 min	FS1	1.78	Temperature was stabled at load: 14A, unit cycle protection when output current increased to 15A. T1 coil=64°C, Tamb =24.5°C, no hazards.
31	+27V output	s-c	240	150 min	FS1	0.08-0.22	Cycle protection,

							T1=68.2°C, air=26°C, no hazards.
32	+48V output	o-l	240	150 min	FS1	1.76	Temperature was stabled at load: 7.8A, unit cycle protection when output current increased to 8A. T1 coil=50°C, Tamb =24°C, no hazards.
33	+48V output	s-c	240	150 min	FS1	0.08-0.2	Cycle protection, T1=54°C, Tamb =24°C, no hazards.

Note(s):

- 1) Used abbreviations: where s-c=short-circuited, o-c=open-circuited, o-l=overloaded.
- 2) Maximum temperatures limitation of safety isolation transformers based on a test temperature of 50°C:  
- Class B: Tmax = 175 °C - (50-25) °C = 150 °C

C.2	Safety isolation transformer	<b>P</b>
Construction details:		
Transformer T1		
Mfr.: See appended table 1.5.1.		
Type: See appended table 1.5.1.		
All types transformers are identical in construction except for turn ratio and gauge of secondary winding and vendor name.		
Recurring peak voltage	760V 0-p	
Required clearances for reinforced insulation (from tables 2H and 2J)	(4.0 + 1.0) mm	
Effective voltage rms	437V	
Required creepage distances for reinforced insulation (from table 2L)	MG I: 5.0 mm MG III: 9.0 mm	
Measured min. creepage distances		
Location	inside (mm)	outside (mm)
prim-sec	5.0 via margin tape (MG I)	14.0 via bobbin (MG III)
prim-core	5.0 via margin tape (MG I)	7.0 via bobbin (MG III)
sec-core	5.0 via margin tape (MG I)	7.0 via bobbin (MG III)

prim-prim	%	%
Measured min. clearances		
Location	inside (mm)	outside (mm)
prim-sec	5.0	14.0
prim-core	5.0	7.0
sec-core	5.0	7.0
prim-prim	%	%
Construction:		
<p>Concentric windings on ETD-39 type bobbin. Outer winding is primary. Three layers of insulation tape between primary and secondary windings. The margin tape is 5.0 mm at both sides of transformer. Winding ends additionally fixed with tape. One layer insulation tape wrapped on bobbin prior to any windings. There are two layers of insulation tape wrapped around of the core of transformer.</p> <p>The margin tape and insulation tape used are classified as MG I material which is UL Recognized component and tested according to IEC 60112 by UL.</p> <p>Margin tape: 3M Co., Ltd. Type 44(a), 44T-A(a), MG I, UL File No. E17385(N).  Four Pillars Enterprise Co., Ltd. Type 35661, MG I, UL File No. E50292(N).  Bondtec Pacific Co Ltd. Type 201S, 201-45+\$, MG I, UL File No. E175868(N).</p> <p>Insulation tape: Four Pillars Enterprise Co., Ltd. Type 35660Y*b, MG I, UL File No. E50292(N).  Bondtec Pacific Co Ltd. Type 370S+\$, MG I, UL File No. E175868(N).  Jing Jiang. CT, MG I, UL File No. E165111(N).</p>		
Pin numbers		
Prim.	4-1, 5-6, 3-7-2, E1/E2-3	
Sec.	9/10/11-12/13/14, 15-16	
Bobbin		
Material	Chang Chun Plastic, phenolic type T373J or T375J, V-0, 150°C	
Thickness	min. 1.0 mm	
Electric strength test		
With AC 3000V after humidity treatment		
Result	Pass	



National Differences					
Clause	Requirement – Test			Result – Remark	Verdict
	Over 0.2 up to and including 3	0.5 <sup>1)</sup>	18 [0.8]		
	Over 3 up to and including 7.5	0.75	16 [1.3]		
	Over 7.5 up to and including 10	(0.75) <sup>2)</sup> 1.00	16 [1.3]		
	Over 10 up to and including 16	(1.0) <sup>3)</sup> 1.5	14 [2]		
	Replace footnote 1) with the following: 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 mm <sup>2</sup> three-core supply flexible cords are not permitted; see AS/NZS 3191). Delete Note 1.				
4.3.6	Replace paragraph three with: 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.			Not a direct plug-in equipment.	<b>N/A</b>
4.3.13.5	Add the following to the end of the first paragraph: ", or AS/NZS 2211.1"			Added.	<b>N/A</b>
4.7	Add the following paragraph: For alternative tests refer to clause 4.7.201.			Added. However, equipment under test and materials used materials and components in compliance with requirements of IEC 60950-1. Alternative test methods were not considered.	<b>N/A</b>
4.7.201	Add the following after clause 4.7.3.6: 4.7.201 Resistance to fire - Alternative tests			Added.	<b>N/A</b>
4.7.201.1	General Parts of non-metallic material shall be resistant to ignition and spread of fire. This requirement does not apply to decorative trims, knobs and other parts unlikely to be ignited or to propagate flames originating from inside the			Same as above.	<b>N/A</b>



National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>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"> <li>- small mechanical parts, the mass of which does not exceed 4 g, such as mounting parts, gears, cams, belts and bearings;</li> <li>- small electrical components, such as capacitors with a volume not exceeding 1750 mm<sup>3</sup>, 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</li> </ul> <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 tests of 4.7.201.2, 4.7.201.3, 4.7.201.4 and 4.7.201.5.</p> <p>For the base materials of printed boards, compliance is checked by the test of 4.7.201.5.</p> <p>The tests shall be carried out on parts of non-metallic material, which have been removed from the apparatus. When the glow-wire test is carried out, the parts shall be placed in the same orientation, as they would be in normal use.</p> <p>These tests are not carried out on internal wiring.</p>		
4.7.201.2	<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>Parts 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 shall be 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>	Same as above.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
4.7.201.3	<p>Testing of insulating materials</p> <p>Parts of insulating materials 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><b>5 Severities</b></p> <p>Replace with:</p> <p>The duration of application of the test flame shall be 30 s ± 1 s.</p> <p><b>8 Test procedure</b></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> <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><b>10 Evaluation of test results</b></p>	Same as above.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>Replace with:</p> <p>The duration of burning (<math>t_b</math>) 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>		
4.7.201.4	<p>Testing in the event of non-extinguishing material</p> <p>If parts, other than enclosures, do not withstand the glow-wire tests of 4.7.201.3, by failure to extinguish within 30 s after the removal of the glow-wire tip, the needle-flame test detailed in 4.7.201.3 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 4.7.201.3. Parts shielded by a separate barrier which meets the needle-flame test need not to be 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 clause 4.7.201 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 clause 4.7.201 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 flame, positioned above the point of the material supporting in contact with or in close proximity to connections.</p>	Same as above.	<b>N/A</b>
4.7.201.5	<p>Testing of printed boards</p> <p>The base material of printed boards is subjected to needle-flame test to Clause 4.7.201.3. The flame is applied to the edge of the board where the heat sink effect is lowest when the board is positioned as in normal use. The flame shall not be applied to an edge, consisting of broken perforations, unless the edge is less than 3 mm for a potential ignition source.</p>	Same as above.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>The test is not carried out if the –</p> <ul style="list-style-type: none"> <li>- Printed board does not carry any potential ignition source;</li> <li>- 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</li> <li>- 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 fill the openings completely.</li> </ul> <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>		
6.2.2	<p>Add the following after the first paragraph:</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> <p>Delete the note.</p>	No TNV.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
6.2.2.1	<p>Delete Note 2.</p> <p>Add the following after the first paragraph:</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 <math>\mu</math>s impulses. The interval between successive impulses is 60 s and the initial voltage, <math>U_c</math>, is:</p> <ul style="list-style-type: none"> <li>- for 6.2.1 a): 7.0 kV for hand-held telephones and for headsets and 2.5 kV for other equipment; and</li> <li>- for 6.2.1b) and 6.2.1c): 1.5 kV.</li> </ul> <p>NOTE 201 - The 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines.</p> <p>NOTE 202 – 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>	No TNV.	<b>N/A</b>
6.2.2.2	<p>Delete the note.</p> <p>Add the following after the second paragraph:</p> <p>In Australia (this variation does not apply in New Zealand), the a.c. test voltage is:</p> <ul style="list-style-type: none"> <li>- for 6.2.1a): 3 kV; and</li> <li>- for 6.2.1b) and 6.2.1c): 1.5 kV.</li> </ul> <p>NOTE 201 – Where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used.</p> <p>NOTE 202 – The 3 kV and 1.5 kV values have been determined considering the low frequency induced voltages from the power supply distribution system.</p>	No TNV.	<b>N/A</b>
Annex P	<p>Add the following Normative References to Annex P:</p> <p>IEC 60065, Audio, Video and similar electronic apparatus - Safety requirements</p> <p>AS/NZS 3112, Approval and test specification - Plugs and socket-outlets</p> <p>AS/NZS 3191, Approval and test specification - Electric flexible cords</p> <p>AS/NZS 4695.707, Fire hazard testing of</p>	Added.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	electrotechnical products - Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source		

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Canadian National Differences according to CB Bulletin No. 110A, June 2006 (CAN/CSA C22.2 No. 60950-1/UL60950-1)  (IEC Publication 60950-1:2001)		<b>P</b>
<b>EXPLANATION FOR ABBREVIATIONS</b>			
P=Pass, F=Fail, N/A=Not applicable. Placed in the column to the right.			
<b>Special National Conditions</b>			
1.1.1	All equipment is to be designed to allow installations in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	Unit was evaluated according to IEC 60950-1. The requirements have to be checked during national approval.	<b>N/A</b>
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	Considered.	<b>P</b>
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 that are not types specified in the NEC are required to have special construction features and identification markings.	Shall be evaluated when national approval.	<b>N/A</b>
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings.  A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 “Normal Operating Conditions.” Likewise, a voltage rating shall not be lower than the specified “Normal Operating Conditions,” unless it is part of a range that extends into the “Normal Operating Conditions.”	Single phase.	<b>N/A</b>
2.5	Where a fuse is used to provide Class 2, Limited Power Source, or TNV current limiting, it shall not be operator-accessible unless it is not interchangeable.	Not applied for.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.7.1	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets, receptacles and medium-base or smaller lampholders if the supply branch circuit protection is not suitable.  Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require transformer overcurrent protection.	No standard supply outlets.	<b>N/A</b>
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC/CEC.	No power cord provided.	<b>N/A</b>
3.2.1	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	No power cord provided.	<b>N/A</b>
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.	Not a permanently connected equipment.	<b>N/A</b>
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, and Tables 11 and 12 of the CEC.	No power cord provided.	<b>N/A</b>
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Not a permanently connected equipment.	<b>N/A</b>
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.	<b>N/A</b>
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm <sup>2</sup> ).	No wire binding screws.	<b>N/A</b>
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 be specially marked when specified (1.7.7).	No terminals for permanent wiring.	<b>N/A</b>
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 nominal voltage rating greater than 120V, or is rated more than 1/3 hp (locked rotor current over 43 A)	No motor control devices.	<b>N/A</b>
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	No such switch.	<b>N/A</b>



National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.	No battery systems.	<b>N/A</b>
4.3.12	The maximum quantify of flammable liquid stored in equipment is required to comply with NFPA 30.	No flammable liquid.	<b>N/A</b>
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No laser.	<b>N/A</b>
4.7	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.	<b>N/A</b>
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m <sup>2</sup> 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.	No such enclosure.	<b>N/A</b>
Annex H	Equipment that produces ionizing radiation is required to comply with the Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No ionizing radiation.	<b>N/A</b>
Other differences			
1.5.1	<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) 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>B) 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</p>	Components are UL approved, see appended table 1.5.1.	<b>P</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	<p>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>C) 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>D) 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 V <sub>peak</sub> or 60 V <sub>d.c.</sub> , 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.	<b>N/A</b>
2.3.2	In the event of a single fault, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.	No TNV.	<b>N/A</b>
2.6.3.3	When subject to impedance testing, protective earthing and bonding are required to be subjected to the additional test conditions specified.	See IEC 60950-1 test report.	<b>P</b>
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, writing, marking and installation instruction requirements.	No d.c. power system.	<b>N/A</b>
4.2.8.1	Enclosures around CRTs with a face diameter of 160mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	<b>N/A</b>
4.3.2	Equipment with handles is required to comply with special loading tests.	No handles.	<b>N/A</b>
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV.	<b>N/A</b>
6.2.1	Enamel coating on winding wire not considered electrical separation unless subjected to special investigation.	No TNV.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
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.	<b>N/A</b>
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.	<b>N/A</b>
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.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	Korean National Differences according to CB Bulletin, No. 110A, June 2006 (IEC Publication 60950-1:2001)		<b>P</b>
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N/A=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 requirement (KSC 8305).	No plug provided.	<b>N/A</b>
7	Addition: EMC The apparatus shall comply with the relevant CISPR standards.	To be evaluated when submitted for national approval.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
APPENDIX	US National Differences according to CB Bulletin, No. 110A, June 2006 (UL 60950-1)  (IEC Publication 60950-1:2001)		<b>P</b>
EXPLANATION FOR ABBREVIATIONS P=Pass, F=Fail, N/A=Not applicable. Placed in the column to the right.			
<b>Special National Conditions</b>			
1.1.1	All equipment is to be designed to allow installations in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	Unit was evaluated according to IEC 60950-1. The requirements have to be checked during national approval.	<b>N/A</b>
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	Considered.	<b>P</b>
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 that are not types specified in the NEC are required to have special construction features and identification markings.	Shall be evaluated when national approval.	<b>N/A</b>
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings.  A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 “Normal Operating Conditions.” Likewise, a voltage rating shall not be lower than the specified “Normal Operating Conditions,” unless it is part of a range that extends into the “Normal Operating Conditions.”	Single phase.	<b>N/A</b>
2.5	Where a fuse is used to provide Class 2, Limited Power Source, or TNV current limiting, it shall not be operator-accessible unless it is not interchangeable.	Not applied for.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
2.7.1	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets, receptacles and medium-base or smaller lampholders if the supply branch circuit protection is not suitable.  Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require transformer overcurrent protection.	No standard supply outlets.	<b>N/A</b>
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC/CEC.	No power cord provided.	<b>N/A</b>
3.2.1	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	No power cord provided.	<b>N/A</b>
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.	Not a permanently connected equipment.	<b>N/A</b>
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, and Tables 11 and 12 of the CEC.	No power cord provided.	<b>N/A</b>
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Not a permanently connected equipment.	<b>N/A</b>
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.	<b>N/A</b>
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm <sup>2</sup> ).	No wire binding screws.	<b>N/A</b>
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 be specially marked when specified (1.7.7).	No terminals for permanent wiring.	<b>N/A</b>
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 nominal voltage rating greater than 120V, or is rated more than 1/3 hp (locked rotor current over 43 A)	No motor control devices.	<b>N/A</b>
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	No such switch.	<b>N/A</b>

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.	No battery system.	<b>N/A</b>
4.3.12	The maximum quantify of flammable liquid stored in equipment is required to comply with NFPA 30.	No flammable liquid.	<b>N/A</b>
4.3.13	Equipment with lasers is required to meet Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No laser.	<b>N/A</b>
4.7	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.	<b>N/A</b>
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m <sup>2</sup> 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.	No such enclosure.	<b>N/A</b>
Annex H	Equipment that produces ionizing radiation is required to comply with the Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No ionizing radiation.	<b>N/A</b>
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, battery packs (rechargeable type, used with transportable equipment), cathode ray tubes, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), 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,</p>	Components are UL approved, see appended table 1.5.1.	<b>P</b>

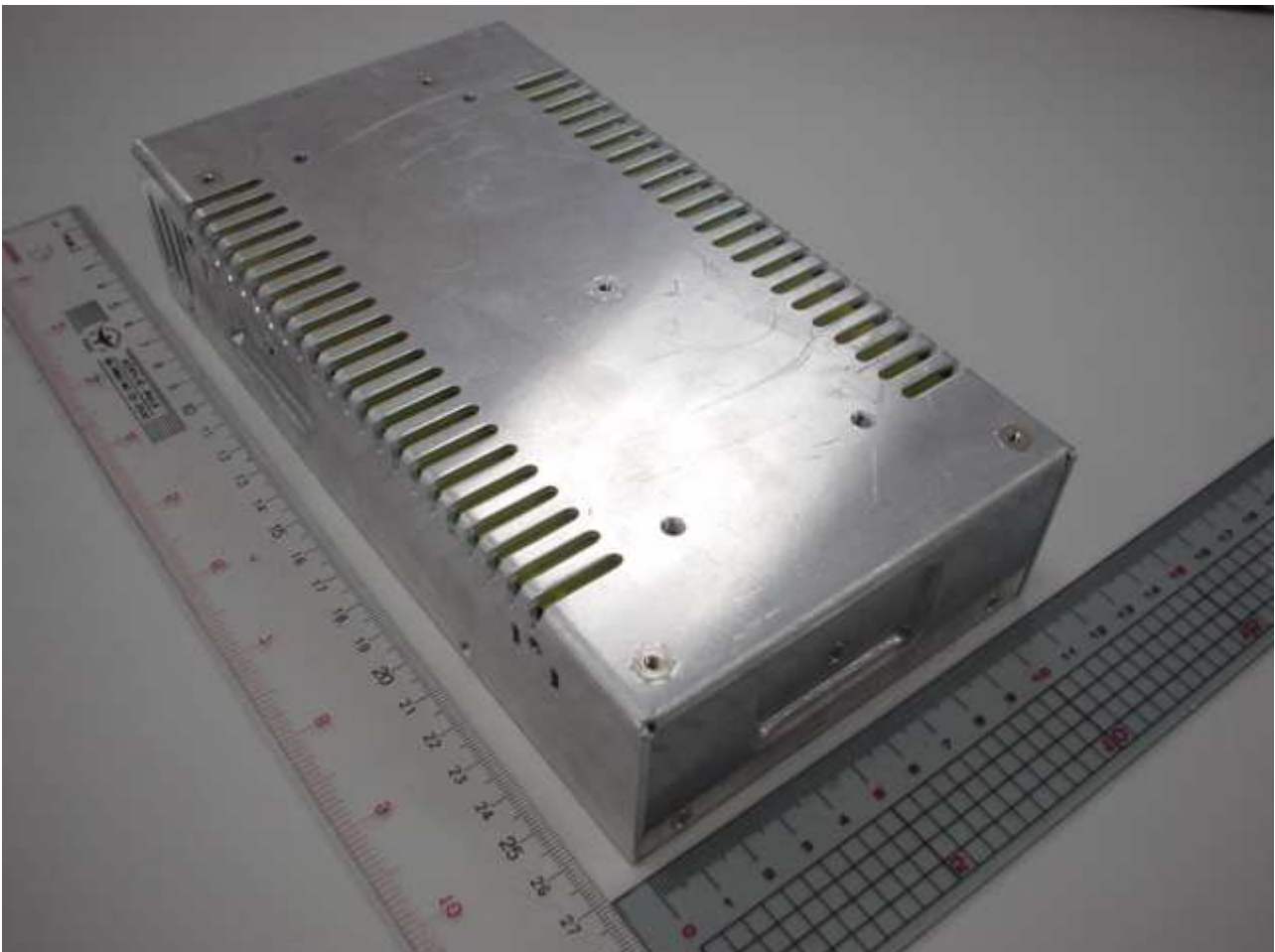
National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	receptacles, solid state controls, supplementary protectors, surge suppressors, switches (including interlock switches), thermal cutoffs, thermostats, multi-layer transformer winding wire, tubing, wire connectors, and wire and cables.		
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 V <sub>peak</sub> or 60 V <sub>d.c.</sub> , 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 <sub>d.c.</sub> under normal operating conditions.	No TNV.	<b>N/A</b>
2.3.2	In the event of a single fault, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.	No TNV.	<b>N/A</b>
2.6.3.4	When subject to impedance testing, protective earthing and bonding are required to be subjected to the additional test conditions specified.	See IEC 60950-1 test report.	<b>P</b>
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, writing, marking and installation instruction requirements.	No d.c. power system.	<b>N/A</b>
4.2.8.1	Enclosures around CRTs with a face diameter of 160mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	<b>N/A</b>
4.3.2	Equipment with handles is required to comply with special loading tests.	No handles.	<b>N/A</b>
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV.	<b>N/A</b>
6.2.1	Enamel coating on winding wire not considered electrical separation unless subjected to special investigation.	No TNV.	<b>N/A</b>
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.	<b>N/A</b>
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.	<b>N/A</b>



National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
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.	<b>N/A</b>

Type Designation: SP-320-X (X=5, 7.5, 12, 13.5, 15, 24, 27, 48)

Report Number: 11008391 001



Type Designation: SP-320-X (X=5, 7.5, 12, 13.5, 15, 24, 27, 48)

Report Number: 11008391 001





Type Designation: SP-320-X (X=5, 7.5, 12, 13.5, 15, 24, 27, 48)

Report Number: 11008391 001

