IEC IECEE CB SCHEME

Ref. Certif. No.

JPTUV-031585-M1

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

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

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product Produit	AC/DC SWITCHING ADAPTOR
Name and address of the applicant Nom et adresse du demandeur	Mean Well Enterprises Co., Ltd. No. 28, Wu-Chuan 3rd Road Wu Ku Ind. Park, Taipei Hsien 248 Taiwan
Name and address of the manufacturer Nom et adresse du fabricant	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 Nom et adresse de l'usine	See additional page(s)
Rating and principal characteristics Valeurs nominales et caractéristiques principales	Input : AC 100-240V; 2.0A; 50/60Hz; Class I Output: refer to the test report
Trade mark (if any) Marque de fabrique (si elle existe)	Trademark of Mean Well
Model/type Ref. Ref. de type	GS160AX (X=12, 15, 20, 24, 48) GC160AX (X=12, 24, 48)
Additional information (if necessary) Information complémentaire (si nécessaire)	For model differences, refer to the test report. Re-issue of JPTUV-031585 dated 31.03.2010, due to first modification.
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1:2005 National differences see test report
As shown in the Test Report Ref. No.which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce Certificat	11020132 002

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

TÜVRheinland®

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Date: 15.06.2010

Signature: Dipl.-Ing. W. Hsu

10/061 CB 1.07

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

2. GUANGZHOU MEAN WELL
   ELECTRONICS CO., LTD
   2nd Floor
   No. A Building, Yuean Ind. Park
   Dongpu Town, TianHe, Guangzhou, P.R. China

3. SuZhou Mean Well Technology
   Co., Ltd.
   No. 77, Jian-min Road,
   Dong-qiao, Pan-yang Ind. Park,
   Huang-dai Town, Xiang-cheng District, Suzhou, Jiangsu 215152, P.R. China

Additional information (if necessary)
Information complémentaire (si nécessaire)

Date: 15.06.2010 Signature: Dipl.-Ing. W. Hsu

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT

IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements

Report Reference No. ..... :	11020132 002
Date of issue ..... :	Jun. 15, 2010
Total number of pages	22
CB/CCA Testing Laboratory ..... :	TÜV Rheinland Taiwan Ltd., Taichung Laboratory
Address ..... :	No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya Township, Taichung County, 428 Taiwan
Applicant's name ..... :	Mean Well Enterprises Co., Ltd.
Address ..... :	No. 28, Wu-Chuan 3rd Road, Wu Ku Ind. Park, Taipei Hsien 248 Taiwan
Manufacturer's name ..... :	Same as applicant
Address ..... :	Same as applicant
Factory's name ..... :	See page 6
Address ..... :	See page 6
Test specification:	
Standard ..... :	☒ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006 + A11:2009
Test procedure ..... :	CB
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IECEN60950_1C
Test Report Form(s) Originator ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2007-06

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.
This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA

Test item description ..... :	AC/DC SWITCHING ADAPTOR
Trade Mark ..... :	MEAN WELL
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	1. GS160AX (X=12, 15, 20, 24, 48) 2. GC160AX (X=12, 24, 48)
Ratings ..... :	See page 7

Testing procedure and testing location:	
☒ **CB/CCA Testing Laboratory:**	Refer to cover page
Testing location/ address..... :	Refer to cover page
☐ **Associated CB Laboratory:**	
Testing location/ address..... :	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
☐ Testing procedure: TMP	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Testing location/ address..... :	
☐ Testing procedure: WMT	
Tested by (name + signature)..... :	
Witnessed by (+ signature) ..... :	
Approved by (+ signature)..... :	
Testing location/ address..... :	
☐ Testing procedure: SMT	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Supervised by (+ signature)..... :	
Testing location/ address..... :	
☐ Testing procedure: RMT	
Tested by (name + signature)..... :	
Approved by (+ signature)..... :	
Supervised by (+ signature)..... :	
Testing location/ address..... :	

Summary of testing:	
Tests performed (name of test and test clause): All applicable tests as described in Test Case and Measurement Sections were performed. • The maximum operational ambient temperature as specified by the manufacturer is +45°C. • Pre-production samples without serial numbers. • Unless otherwise specified, the tests were performed on model GC160A48 to represent other similar model. • Load conditions: Operation at maximum specified DC-load with maximum power condition.	**Testing location:** All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 2.

Summary of compliance with National Differences:

EU Group Differences, EU Special National Conditions, EU A-Deviations, AT, AU, CA, CH, DE, DK, FI, FR, GB, IT, KR, NL, NO, PL, SE, SI, US.

Explanation of used codes: AT=Austria, AU=Australia, CA=Canada, CH=Switzerland, DE=Germany, DK=Denmark, FI=Finland, FR=France, GB=United Kingdom, IT=Italy, KR=Korea, NL=The Netherlands, NO=Norway, PL=Poland, SE=Sweden, SI=Slovenia, US=United States of America.

For National Differences see corresponding Attachment.

Copy of marking plate:

The above label is a draft of an artwork for marking plate pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.

Test item particulars ..... :	
Equipment mobility ..... :	[x] movable [] hand-held [x] transportable [] stationary [] for building-in [] direct plug-in
Connection to the mains ..... :	[x] pluggable equipment [] permanent connection [x] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains
Operating condition ..... :	[x] continuous [] rated operating / resting time:
Access location ..... :	[x] operator accessible [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values ..... :	±10%
Tested for IT power systems ..... :	[x] Yes [] No
IT testing, phase-phase voltage (V) ..... :	230V (for Norway)
Class of equipment ..... :	[x] Class I [] Class II [] Class III [] Not classified
Considered current rating (A) ..... :	16A (20A for North America)
Pollution degree (PD) ..... :	[] PD 1 [x] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	Not over 2000m
Altitude of test laboratory (m) ..... :	Not over 2000m
Mass of equipment (kg) ..... :	0.64
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing ..... :	
Date of receipt of test item ..... :	May, 2010
Date(s) of performance of tests ..... :	May to Jun., 2010

General remarks:

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

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

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

General product information:

Description of change(s):

1. Add new models GC160AX (X=12, 24, 48) which is similar to GS160AX (X=12, 24, 48) except for type designation, C31/C32 only as coupling capacitors, Green/yellow wire always provided, output ratings, T1 sources, EMI shield board sligthy changed and add one secondary control board CN201.
2. Change CB Testing Laboratory address.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments
1.	- Input test - Energy hazard measurement - SELV measurement (Normal conditions) - SELV measurement (fault conditions) - Humidity test - Working voltage measurement - Stress relief test - Heating test - Electric strength test - Abnormal test - Construction check	See appended tables and sub-clauses for test results and components list. New T1 is similar to original sources except for add FL2 fly wire, winding turns and diameter different. Original PCB had contains CN201 location for secondary control board CN201 used, no any impact for distance for add CN201 board.
2.	N/A	See cover page for new CBTL address.

Other comments:

Factories:

1. Mean Well Enterprises Co., Ltd.
   No. 28, Wu-Chuan 3rd Road, Wu Ku Ind. Park, Taipei Hsien 248, Taiwan
2. SuZhou Mean Well Technology Co., Ltd.
   No. 77, Jian-min Road, Dong-qiao, Pan-yang Ind. Park, Huang-dai Town, Xiang-cheng District, Suzhou, Jiangsu 215152, P.R. China
3. GUANGZHOU MEAN WELL ELECTRONICS CO., LTD
   2nd Floor, No. A Building, Yuean Ind. Park, Dongpu Town, TianHe, Guangzhou, P.R. China

The manufacturer's declaration, that the samples tested represent the products from each factory, is available.

Definition of variable(s):

Variable:	Range of variable:	Content:
For GS160AX		
X	12, 15, 20, 24, 48	To denote output rating.
For GC160AX		
X	12, 24, 48	To denote output rating.

History of amendments and modifications:

Ref. No. 11020132 001, dated Mar. 30, 2010 (original test report)
Ref. No. 11020132 002, dated Jun. 15, 2010 (modification)

Model Name	Input rating	DC Output rating
GS160A12	100-240Vac, 50/60Hz, 2.0A	12V/11.5A, 138W MAX.
GS160A15		15V/9.6A, 144W MAX.
GS160A20		20V/8A, 160W MAX.
GS160A24		24V/6.67A, 160W MAX.
GS160A48		48V/3.34A, 160W MAX.
GC160A12		13.6V/10A, 136W MAX.
GC160A24		27.2V/5.89A, 160.2W MAX.
GC160A48		54.4V/2.95A, 160.5W MAX.

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V) .....:	See copy of marking plates.	P
	Symbol for nature of supply, for d.c. only .....:	Mains from AC source.	N/A
	Rated frequency or rated frequency range (Hz) ...:	See copy of marking plates.	P
	Rated current (mA or A) .....:	See copy of marking plates.	P
	Manufacturer's name or trade-mark or identification mark .....:	See copy of marking plates.	P
	Model identification or type reference .....:	See copy of marking plates.	P
	Symbol for Class II equipment only .....:		N/A
	Other markings and symbols .....:	Other symbols do not give rise to misunderstanding.	P
1.7.2.1	General	Installation instruction provided with information regarding the maximum operational ambient temperature, max., input rating and output rating and safety caution.	P
2.9.2	Humidity conditioning	Tested for 48hrs.	P
	Relative humidity (%), temperature (°C) .....:	95% R.H., 40°C.	—
4.2.7	Stress relief test	After the test at temperature of 105°C during 7 hrs for each enclosure material source and no shrinkage, distortion or loosening of any enclosure part was noticeable on the equipment.	P

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity [1]
All components of models GC160AX (X=12, 24, 48) is identical to GS160AX (X=12, 15, 20, 24, 48) except for below.					
Y-Capacitors (Y1 or Y2 type (when G/Y wire provided)(C3, C4, C22, C30) (optional)	Murata	KX, KH	Max. 4700pF, min. 250V, 125°C	IEC60384-14	VDE, UL
	Walsin	AH, AC	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CS	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	Welson	WD, KL	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
Coupling Capacitors (C31, (C32) (optional) (Y1 type) (When G/Y wire is provided)	Murata	KX	Max. 4700pF, min. 250V, 125°C	IEC60384-14	VDE, UL
	Walsin	AH	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	Welson	WD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
Transformer (T1) (For GC160A12)	Yu Jing	TF-2134	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

	Elytone	TF-2134	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
(For GC160A24)	Yu Jing	TF-2135	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2135	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
(For GC160A48)	Yu Jing	TF-2136	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2136	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
-Triple Wire used in T1 (for Yu Jing)	Furukawa	TEX-E	130°C	IEC/EN 60950-1	TÜV
	Totoku	TIW-2	130°C	IEC/EN 60950-1	VDE, TÜV
-Triple Wire used in T1 (for Elytone)	Furukawa	TEX-E	130°C	IEC/EN 60950-1	TÜV
Supplementary information: 1. An asterisk indicates a mark that assures the agreed level of surveillance.					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U / f (V/Hz)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
Model : GC160A12						
90V / 50	1.72	--	153	FS1	1.72	Max. normal load.
100V / 50	1.53	2.0	152	FS1	1.53	See above.
240V / 50	0.64	2.0	148	FS1	0.64	See above.
254V / 50	0.61	--	148	FS1	0.61	See above.

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict
264V / 50	0.61	--	147	FS1	0.61	See above.
90V / 60	1.71	--	153	FS1	1.71	See above.
100V / 60	1.53	2.0	152	FS1	1.53	See above.
240V / 60	0.65	2.0	147	FS1	0.65	See above.
254V / 60	0.62	--	147	FS1	0.62	See above.
264V / 60	0.62	--	147	FS1	0.62	See above.
Model : GC160A24						
90V / 50	1.95	--	175	FS1	1.95	Max. normal load.
100V / 50	1.74	2.0	174	FS1	1.74	See above.
240V / 50	0.73	2.0	169	FS1	0.73	See above.
254V / 50	0.70	--	168	FS1	0.70	See above.
264V / 50	0.69	--	168	FS1	0.69	See above.
90V / 60	1.95	--	175	FS1	1.95	See above.
100V / 60	1.75	2.0	174	FS1	1.75	See above.
240V / 60	0.74	2.0	168	FS1	0.74	See above.
254V / 60	0.71	--	168	FS1	0.71	See above.
264V / 60	0.70	--	168	FS1	0.70	See above.
Model : GC160A48						
90V / 50	1.95	--	175	FS1	1.95	Max. normal load.
100V / 50	1.75	2.0	175	FS1	1.75	See above.
240V / 50	0.73	2.0	169	FS1	0.73	See above.
254V / 50	0.70	--	168	FS1	0.70	See above.
264V / 50	0.69	--	168	FS1	0.69	See above.
90V / 60	1.95	--	175	FS1	1.95	See above.
100V / 60	1.75	2.0	175	FS1	1.75	See above.
240V / 60	0.74	2.0	169	FS1	0.74	See above.
254V / 60	0.71	--	169	FS1	0.71	See above.
264V / 60	0.70	--	169	FS1	0.70	See above.
Supplementary information:						

2.1.1.5	TABLE: Energy hazard measurement				P
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
Model: GC160A12					

IEC/EN 60950-1				
Clause	Requirement + Test		Result - Remark	Verdict

13.6	10	13.7	11.3	148
Model: GC160A24				
27.2	5.89	27.2	6.64	169
Model: GC160A48				
54.4	2.95	54.3	3.56	170
Supplementary information: Test voltage: 240Vac, 60Hz				

2.2.2	TABLE: SELV measurement (under normal conditions)			P
Transformer	Location	Voltage (max.) (V)		Voltage Limitation; Component
		V peak	V d.c.	
Model: GC160A48				
T1	pin 8 to RTN	3.2	--	--
T1	pin 9,10 to RTN	--	40	--
T1	pin 11,12 to RTN	108	--	--
--	After D101 to RTN	--	1.2	D101
--	After R106 to RTN	102	--	--
--	After C103 to RTN	--	1.2	C103
T1	pin 13,14 to RTN	108	--	--
--	After D102 to RTN	--	1.2	D102
--	After R108 to RTN	106	--	--
--	After C112 to RTN	--	1.2	C112
T1	After FL1 to RTN	2	--	--
T1	After FL2 to RTN	16.8	--	--
Supplementary information: Test voltage: 240Vac, 60Hz				

2.2.3	TABLE: SELV measurement (under fault conditions)		P
Location	Voltage (max.) (V)	Comments	
Model: GC160A48			
Output +54.4V to RTN	0	D101 shorted then unit shutdown	
Output +54.4V to RTN	0	D102 shorted then unit shutdown	
Output +54.4V to RTN	52Vdc	C103 shorted then unit normal operation	
Output +54.4V to RTN	52Vdc	C112 shorted then unit normal operation	

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:
Test voltage: 240Vac, 60Hz

2.10.2	Table: working voltage measurement		P
Location	RMS voltage (V)	Peak voltage (V)	Comments
Model: GC160A12			
T1 pin 2 to 8	**231**	**392**	Highest Vrms & Vpk of T1
T1 pin 2 to 9, 10	218	368	
T1 pin 2 to 11, 12	227	376	
T1 pin 2 to 13, 14	206	360	
T1 pin 2 to FL1	221	384	
T1 pin 2 to FL2	**231**	**392**	Highest Vrms & Vpk of T1
T1 pin 2 to RTN	228	376	
T1 pin 3 to 8	183	376	
T1 pin 3 to 9, 10	181	352	
T1 pin 3 to 11, 12	181	336	
T1 pin 3 to 13, 14	186	352	
T1 pin 3 to FL1	175	360	
T1 pin 3 to FL2	183	352	
T1 pin 3 to RTN	182	360	
T1 pin 5 to 8	173	352	
T1 pin 5 to 9, 10	182	384	
T1 pin 5 to 11, 12	181	368	
T1 pin 5 to 13, 14	183	392	
T1 pin 5 to FL1	172	368	
T1 pin 5 to FL2	171	352	
T1 pin 5 to RTN	172	368	
T1 pin 6 to 8	172	360	
T1 pin 6 to 9, 10	181	368	
T1 pin 6 to 11, 12	182	376	
T1 pin 6 to 13, 14	182	376	
T1 pin 6 to FL1	172	352	
T1 pin 6 to FL2	173	360	
T1 pin 6 to RTN	172	352	

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Model: GC160A24			
T1 pin 2 to 8	236	400	
T1 pin 2 to 9, 10	219	360	
T1 pin 2 to 11, 12	**237**	384	Highest Vrms of T1
T1 pin 2 to 13, 14	208	352	
T1 pin 2 to FL1	225	384	
T1 pin 2 to FL2	236	400	
T1 pin 2 to RTN	230	384	
T1 pin 3 to 8	172	312	
T1 pin 3 to 9, 10	170	312	
T1 pin 3 to 11, 12	173	336	
T1 pin 3 to 13, 14	174	336	
T1 pin 3 to FL1	181	336	
T1 pin 3 to FL2	180	336	
T1 pin 3 to RTN	180	336	
T1 pin 5 to 8	171	352	
T1 pin 5 to 9, 10	191	392	
T1 pin 5 to 11, 12	189	384	
T1 pin 5 to 13, 14	193	**416**	Highest Vpk of T1
T1 pin 5 to FL1	172	368	
T1 pin 5 to FL2	172	352	
T1 pin 5 to RTN	173	368	
T1 pin 6 to 8	172	360	
T1 pin 6 to 9, 10	190	376	
T1 pin 6 to 11, 12	192	400	
T1 pin 6 to 13, 14	192	400	
T1 pin 6 to FL1	173	352	
T1 pin 6 to FL2	173	360	
T1 pin 6 to RTN	173	360	
Model: GC160A48			
T1 pin 2 to 8	234	391	
T1 pin 2 to 9, 10	217	400	
T1 pin 2 to 11, 12	**242**	440	Highest Vrms of T1
T1 pin 2 to 13, 14	184	376	

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 2 to FL1	226	384	
T1 pin 2 to FL2	223	400	
T1 pin 2 to RTN	218	384	
T1 pin 3 to 8	180	336	
T1 pin 3 to 9, 10	163	352	
T1 pin 3 to 11, 12	163	352	
T1 pin 3 to 13, 14	172	392	
T1 pin 3 to FL1	181	344	
T1 pin 3 to FL2	181	344	
T1 pin 3 to RTN	182	344	
T1 pin 5 to 8	172	352	
T1 pin 5 to 9, 10	212	424	
T1 pin 5 to 11, 12	214	432	
T1 pin 5 to 13, 14	220	**472**	Highest Vpk of T1
T1 pin 5 to FL1	173	368	
T1 pin 5 to FL2	172	352	
T1 pin 5 to RTN	173	368	
T1 pin 6 to 8	173	368	
T1 pin 6 to 9, 10	212	408	
T1 pin 6 to 11, 12	215	448	
T1 pin 6 to 13, 14	216	456	
T1 pin 6 to FL1	172	352	
T1 pin 6 to FL2	172	360	
T1 pin 6 to RTN	172	352	
U3 3 to 1	211	408	
U3 3 to 2	210	408	
U3 4 to 1	210	400	
U3 4 to 2	209	408	
U4 3 to 1	212	408	
U4 3 to 2	210	408	
U4 4 to 1	201	392	
U4 4 to 2	210	408	
C31 primary to C32 secondary	172	352	

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:
Test voltage: 240Vac, 60Hz

4.5	TABLE: Thermal requirements					P
	Supply voltage (V) .....:	90	90	264	264	—
	Ambient T_{min} (°C) .....:	--	--	--	--	—
	Ambient T_{max} (°C) .....:	See below	See below	See below	See below	—
Maximum measured temperature T of part/at::		T (°C)				Allowed T_{max} (°C)
Model : GC160A48						
Unit position		Label upward	Label downward	Label upward	Label downward	--
1. Inlet body		68.4	68.0	58.5	56.1	70
2. Internal wire		78.8	78.3	64.0	60.6	90
3. C3 body		71.9	70.0	60.6	56.8	125
4. LF1 coil		84.8	84.4	67.4	63.9	130
5. C1 body		91.4	89.8	73.2	69.1	100
6. LF2 coil		101	101	72.2	69.1	130
7. C4 body		78.8	78.3	64.4	61.6	125
8. HS1 of BD1		101	98.4	77.1	73.2	130
9. L1 coil		104	103	77.2	73.8	130
10. C2 body		92.9	91.5	72.2	68.6	110
11. L2 coil		102	99.6	78.4	74.5	125
12. C5 body		99.4	98.0	80.0	76.5	105
13. PCB near the RTH2		94.2	93.5	80.3	77.2	130
14. T1 core		95.3	93.3	83.2	79.4	110
15. T1 top coil		97.9	96.4	85.5	82.1	110
16. T1 bottom coil		98.8	97.1	85.8	82.2	110
17. U4 body		91.9	90.8	80.3	76.8	100
18. C32 body		95.8	93.9	82.8	79.2	125
19. LF101 coil		86.2	84.3	77.9	74.5	105
20. Small PCB on Secondary		89.6	87.7	80.1	76.4	130
21. Output wire		72.2	70.7	67.0	64.3	90
22. Inside of enclosure		89.6	84.0	74.0	67.6	120

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

23. Outside of enclosure	81.6	71.0	69.2	59.3	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=25.9°C, 26.1°C, 27.4°C and 26.0°C respectively	45.0	45.0	45.0	45.0	--
Model : GC160A12					
Unit position	Label upward	Label downward	Label upward	Label downward	--
1. Inlet body	66.6	68.0	59.2	57.2	70
2. Internal wire	79.8	80.2	66.5	63.8	90
3. C3 body	93.8	92.4	75.6	73.1	125
4. LF1 coil	75.1	73.8	63.7	60.7	130
5. C1 body	86.5	85.5	69.7	66.9	100
6. LF2 coil	107	106	77.5	75.4	130
7. C4 body	80.1	80.2	66.6	64.4	125
8. HS1 of BD1	103	102	79.7	77.5	130
9. L1 coil	109	108	80.5	78.5	130
10. C2 body	95.4	95.1	74.7	72.5	110
11. L2 coil	105	103	81.2	78.8	125
12. C5 body	103	102	83.1	81.1	105
13. PCB near the RTH2	99.6	99.0	85.7	83.9	130
14. T1 core	103	102	90.0	87.9	110
15. T1 top coil	104	103	90.1	88.2	110
16. T1 bottom coil	105	103	90.4	88.4	110
17. U4 body	98.1	97.3	85.3	83.1	100
18. C32 body	104	103	90.2	88.3	125
19. LF101 coil	102	101	92.7	90.9	105
20. Small PCB on Secondary	97.3	96.5	87.3	85.6	130
21. Output wire	79.3	76.5	73.0	69.8	90
22. Inside of enclosure	94.9	89.9	82.2	77.8	120
23. Outside of enclosure	85.0	74.9	72.9	61.4	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=28.4°C, 28.1°C, 26.7°C and 26.5°C respectively	45.0	45.0	45.0	45.0	--
Model : GC160A24					

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Unit position	Label upward	Label downward	Label upward	Label downward	--
1. Inlet body	63.9	62.2	52.9	51.7	70
2. Internal wire	69.0	68.2	55.3	54.7	90
3. C3 body	74.7	74.0	58.1	57.2	125
4. LF1 coil	83.4	83.0	62.2	61.4	130
5. C1 body	82.8	83.7	62.6	62.4	100
6. LF2 coil	96.9	97.9	66.5	66.1	130
7. C4 body	71.6	68.4	57.1	54.9	125
8. HS1 of BD1	102	99.1	73.8	71.4	130
9. L1 coil	105	103	75.5	74.0	130
10. C2 body	83.2	81.9	63.2	61.2	110
11. L2 coil	103	101	72.3	71.0	125
12. C5 body	99.4	97.2	74.1	72.5	105
13. PCB near the RTH2	96.6	95.5	78.6	77.9	130
14. T1 core	100	98.6	82.8	81.8	110
15. T1 top coil	98.6	96.2	80.8	79.2	110
16. T1 bottom coil	101	98.5	82.2	80.7	110
17. U4 body	96.4	94.9	78.9	77.9	100
18. C32 body	98.5	96.4	80.7	79.3	125
19. LF101 coil	87.5	85.2	76.7	75.5	105
20. Small PCB on Secondary	85.4	84.1	74.6	73.5	130
21. Output wire	73.7	71.5	67.0	65.4	90
22. Inside of enclosure	92.7	87.8	76.0	72.5	120
23. Outside of enclosure	85.3	72.7	69.7	61.8	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=27.4°C, 27.1°C, 27.6°C and 27.1°C respectively	45.0	45.0	45.0	45.0	--

Supplementary information:

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

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

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2. Unit specified with maximum of 45°C ambient temperature and all temperatures were calculated for a maximum ambient temperature of 45°C.

Winding components (providing safety isolation):
- Class B Tmax = 120°C - 10°C= 110°C

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			P
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Reinforced:				
Unit: primary to secondary		DC	4242	No
Unit: primary to enclosure with foil		DC	4242	No
T1: primary to secondary		AC	3000	No
T1: core to primary		AC	3000	No
Basic:				
Unit: primary to earth		DC	3000	No
Supplementary information:				

5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) :	25°C, if not otherwise specified.	—
	Power source for EUT: Manufacturer, model/type, output rating .....:	--	—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Model: GC160A12						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.1 to 0.16	Unit cycling protection, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.13 to 0.37	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.1 to 0.21	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.12 to 0.21	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.1 to 0.41	Unit cycling protection, No hazards.
T1 pin (FL1 – FL2)	s-c	240Vac	1h, 24min	FS1	0.65	Unit normal operation, Max. temperature of T1= 70.7°C, U4=65.2°C, ambient =25.5°C, no hazards.

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	20hr, 31min	FS1	0.81	Temperature constant at loaded 3A+output loaded 10A, increased to 3.5A+ output loaded 10A then unit shutdown. Max. temperature of T1= 103°C, U4=95°C, ambient =27.9°C, no hazards.
+13.6V Output	o-l	240Vac	3hr, 44min	FS1	0.65	Temperature constant at loaded 10.2A, increased to 10.5A then unit shutdown. Max. temperature of T1= 82°C, U4=77°C, ambient =26.6°C, no hazards.
+13.6V Output	s-c	240Vac	30min	FS1	0.1 to 0.3	Unit cycling protection, No hazards.
Model: GC160A24						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.12 to 0.18	Unit cycling protection, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.1 to 0.37	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.13 to 0.24	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.13 to 0.22	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.13 to 0.4	Unit cycling protection, No hazards.
T1 pin (FL1 – FL2)	s-c	240Vac	30 min	FS1	0.1 to 0.49	Unit cycling protection, No hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	20hr, 31min	FS1	0.97	Temperature constant at loaded 2A+output loaded 5.89A, increased to 2.5A+ output loaded 5.89A then unit shutdown. Max. temperature of T1= 101°C, U4=93°C, ambient =27.9°C, no hazards.
+27.2V Output	o-l	240Vac	3hr, 44min	FS1	0.75	Temperature constant at loaded 6A, increased to 6.2A then unit shutdown. Max. temperature of T1=78°C, U4=72°C, ambient =26.6°C, no hazards.
+27.2V Output	s-c	240Vac	30min	FS1	0.1 to 0.28	Unit cycling protection, No hazards.
Model: GC160A48						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.13 to 0.2	Unit cycling protection, No hazards.

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.13 to 0.48	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.13 to 0.20	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.13 to 0.20	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.13 to 0.49	Unit cycling protection, No hazards.
T1 pin (FL1 – FL2)	s-c	240Vac	1h, 30min	FS1	0.74	Unit normal operation, Max. temperature of T1= 68.6°C, U4=62.9°C, ambient =27.2°C, no hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	20hr, 31min	FS1	1.06	Temperature constant at loaded 2.5A+output loaded 2.95A, increased to 3A+ output loaded 2.95A then unit shutdown. Max. temperature of T1= 91°C, U4=84°C, ambient =27.9°C, no hazards.
+54.4V Output	o-l	240Vac	3hr, 44min	FS1	0.82	Temperature constant at loaded 3.5A, increased to 3.8A then unit shutdown. Max. temperature of T1=74°C, U4=70°C, ambient =26.6°C, no hazards.
+54.4V Output	s-c	240Vac	30min	FS1	0.11 to 0.16	Unit cycling protection, No hazards.

Supplementary information:

- Used abbreviations: s-c=short circuit, o-l=overload.

C.2	TABLE: Insulation of transformers		P
	Transformer part name ..... :	T1	—
	Manufacturer ..... :	See appended table 1.5.1.	—
	Type ..... :	See appended table 1.5.1.	—

Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Primary /input winding and secondary/output winding (internal)	472	250	4.2	12.8	5.0	12.8
Primary/input winding and core (internal)			4.2	5.6	5.0	5.6
Secondary/output winding and core (internal)			--	--	--	--

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Primary/input part and secondary/output part (external)			4.2	32.9	5.0	32.9
Primary/input part and core (external)			4.2	7.9	5.0	7.9
Primary/input part and secondary/output winding (external)			4.2	14.3	5.0	14.3
Secondary/output part and core (external)			--	--	--	--
Secondary/output part and primary/input winding (external)			4.2	25.0	5.0	25.0

Description of design:	
(a) Bobbin	
Primary/input pins :	5-6, 3-2
Secondary/output pins.....:	8-FL1, 11/12-9/10-13/14, Core-FL2-8
Material (manufacturer, type, ratings) .....:	Sumitomo, type PM-9820 or PM-9630, V-0, 150°C
Thickness (mm).....:	Min. 0.5mm
(b) General	

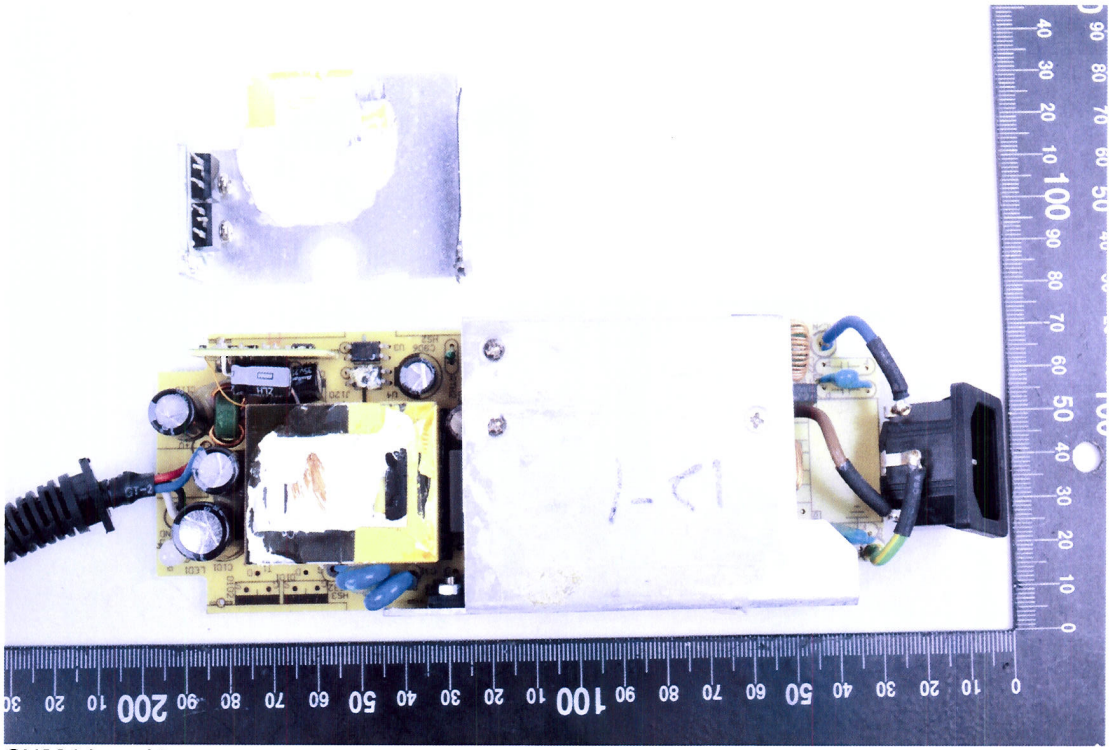
Concentric windings on Phenolic bobbin for LP-39 3C94 size core (Horizontal orientation), core is considered as secondary parts, transformer construction as below.

- Primary N22 windings are tirple wire details see appended table 1.5.1 and subclause 2.10.5.12, Annex U.
- The partition width is 6.5mm in Phenolic bobbin middle for separate primary inside winding and secondary inside winding, one plastic cover width is 4.1mm min. inset to core near primary side for separate primary inside winding to core.
- There are two insulation tapes around primary winding outer.
- All winding ends additionally fixed with tubing.
- Core near primary side wrapt two insulation tapes.
- Primary N22 windings from pin5 to pin6 across middle partition of bobbin then around secondary winding outer, add insulation tape and tubing in two different windings for prevent mechanical stress.
- Secondary fly wire FL2 solder on pin 8 and pin8 via one winding connected to EMI copper which glue on core.

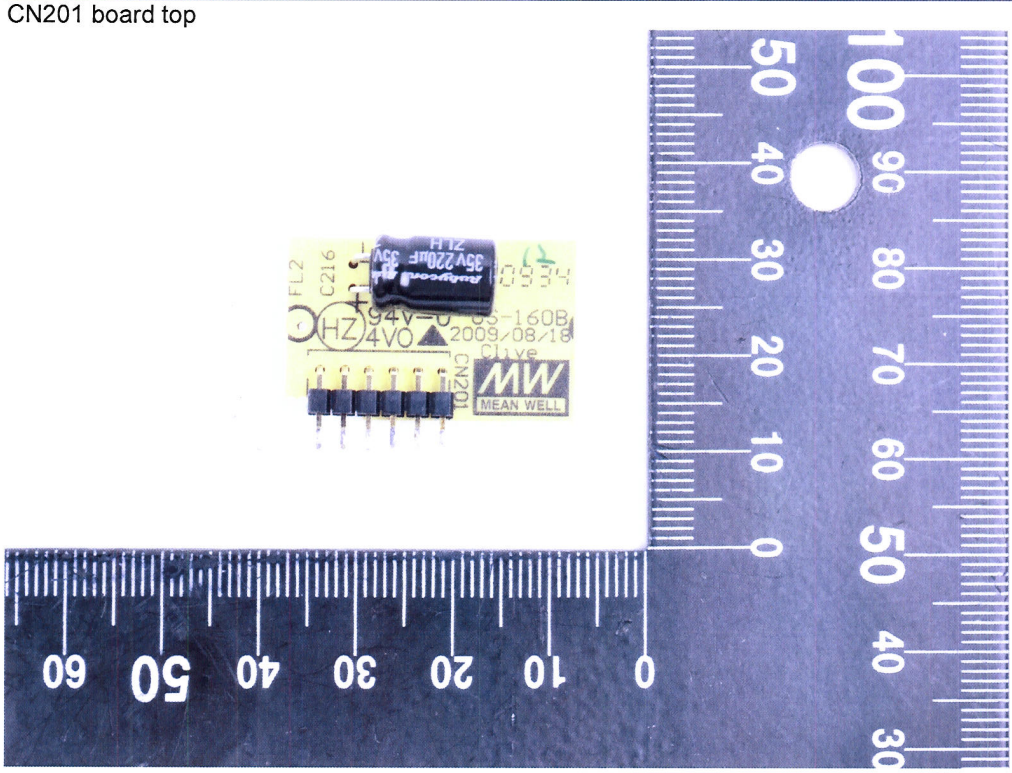
Supplementary information: All transformer source are similar except for model name, primary/secondary wire diameter and turns.

Product: AC/DC SWITCHING ADAPTOR

Type Designation: GC160AX (X=12, 24, 48)



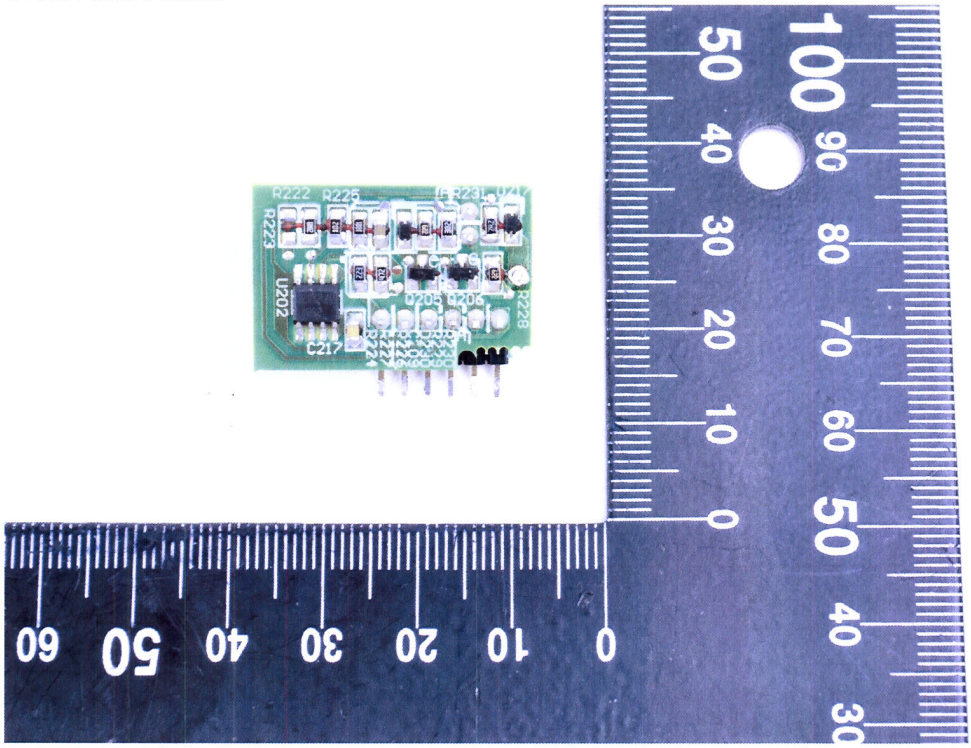
CN201 board top

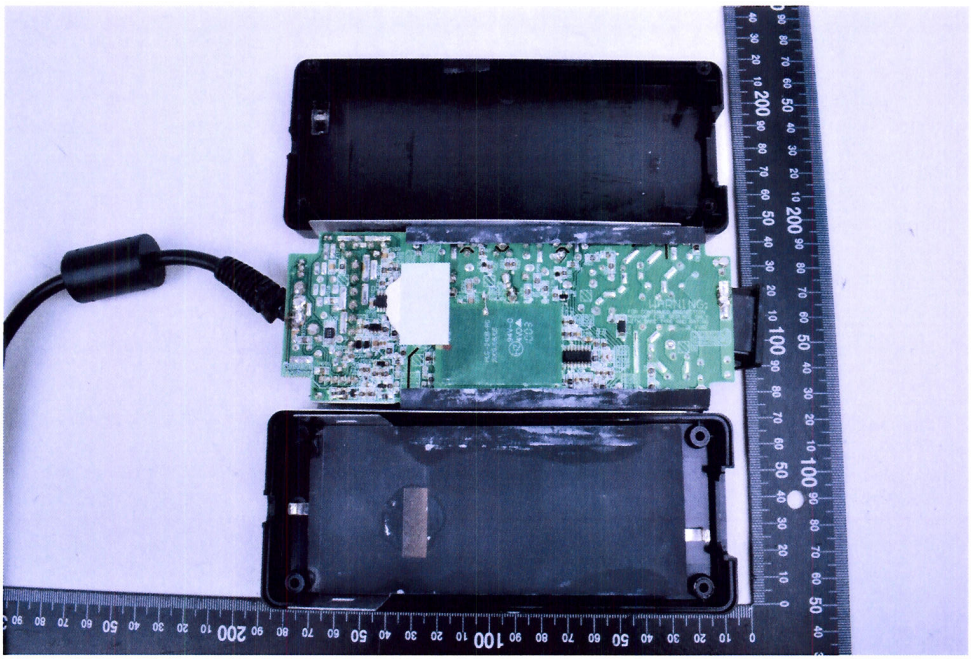


Product: AC/DC SWITCHING ADAPTOR

Type Designation: GC160AX (X=12, 24, 48)

CN201 board board





IEC IECEE CB SCHEME

Ref. Certif. No.

JPTUV-031585

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

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

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product Produit	AC/DC SWITCHING ADAPTOR
Name and address of the applicant Nom et adresse du demandeur	Mean Well Enterprises Co., Ltd. No. 28, Wu-Chuan 3rd Road Wu Ku Ind. Park, Taipei Hsien 248 Taiwan
Name and address of the manufacturer Nom et adresse du fabricant	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 Nom et adresse de l'usine	See additional page(s)
Rating and principal characteristics Valeurs nominales et caractéristiques principales	Input : AC 100-240V; 2.0A; 50/60Hz; Class I Output: refer to the test report
Trade mark (if any) Marque de fabrique (si elle existe)	Trademark of Mean Well
Model/type Ref. Ref. de type	GS160AX (X=12, 15, 20, 24, 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 la	IEC 60950-1:2005 National differences see test report
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce Certificat	11020132 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

TÜVRheinland®

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Mail: info@jpn.tuv.com
Web: www.tuv.com

Date: 31.03.2010

Signature: W. Hsu

Dipl.-Ing. W. Hsu

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

2. GUANGZHOU MEAN WELL
   ELECTRONICS CO., LTD
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   Dongpu Town, TianHe, Guangzhou, P.R. China

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   Co., Ltd.
   No. 77, Jian-min Road,
   Dong-qiao, Pan-yang Ind. Park,
   Huang-dai Town, Xiang-cheng District, Suzhou, Jiangsu 215152, P.R. China

Additional information (if necessary)
Information complémentaire (si nécessaire)

Date: 31.03.2010 Signature: Dipl.-Ing. W. Hsu

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT

IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements

Report Reference No. ..... :	11020132 001
Date of issue ..... :	Mar. 30, 2010
Total number of pages	85
CB/CCA Testing Laboratory ..... :	TÜV Rheinland Taiwan Ltd., Taichung Laboratory
Address ..... :	10F, No. 219, Min Chuan Rd., Taichung 403, Taiwan
Applicant's name ..... :	Mean Well Enterprises Co., Ltd.
Address ..... :	No. 28, Wu-Chuan 3rd Road, Wu Ku Ind. Park, Taipei Hsien 248, Taiwan
Manufacturer's name ..... :	Same as applicant
Address ..... :	Same as applicant
Factory's name ..... :	See page 7
Address ..... :	See page 7
Test specification:	
Standard ..... :	☒ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006 + A11:2009
Test procedure ..... :	CB
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IECEN60950_1C
Test Report Form(s) Originator ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2007-06

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.
This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA

Test item description ..... :	AC/DC SWITCHING ADAPTOR
Trade Mark ..... :	MEAN WELL
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	GS160AX (X=12, 15, 20, 24, 48)
Ratings ..... :	See page 7

Testing procedure and testing location:	
☒ **CB/CCA Testing Laboratory:**	Refer to cover page
Testing location/ address..... :	Refer to cover page
☐ **Associated CB Laboratory:**	N/A
Testing location/ address..... :	
Tested by (name + signature) .....:	Bonny Gu Bonny Gu
Approved by (+ signature).....:	Jean Chen Jean Chen
☐ Testing procedure: TMP	N/A
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Testing location/ address..... :	
☐ Testing procedure: WMT	N/A
Tested by (name + signature) .....:	
Witnessed by (+ signature).....:	
Approved by (+ signature).....:	
Testing location/ address..... :	
☐ Testing procedure: SMT	N/A
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Supervised by (+ signature) .....:	
Testing location/ address..... :	
☐ Testing procedure: RMT	N/A
Tested by (name + signature) .....:	
Approved by (+ signature).....:	
Supervised by (+ signature) .....:	
Testing location/ address..... :	

Summary of testing:	
Tests performed (name of test and test clause): All applicable tests as described in Test Case and Measurement Sections were performed. • The maximum operational ambient temperature as specified by the manufacturer is +45°C. • Pre-production samples without serial numbers. • Unless otherwise specified, the tests were performed on model GS160A48 to represent other similar model. • Load conditions: Operation at maximum specified DC-load with maximum power condition.	**Testing location:** All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 2.
Summary of compliance with National Differences: EU Group Differences, EU Special National Conditions, EU A-Deviations, AT, AU, CA, CH, DE, DK, FI, FR, GB, IT, KR, NL, NO, PL, SE, SI, US. Explanation of used codes: AT=Austria, AU=Australia, CA=Canada, CH=Switzerland, DE=Germany, DK=Denmark, FI=Finland, FR=France, GB=United Kingdom, IT=Italy, KR=Korea, NL=The Netherlands, NO=Norway, PL=Poland, SE=Sweden, SI=Slovenia, US=United States of America. For National Differences see corresponding Attachment.	

Copy of marking plate: See next page

The above label is a draft of an artwork for marking plate pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.

The above label is a draft of an artwork for marking plate pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.

Test item particulars ..... :	
Equipment mobility ..... :	[x] movable [] hand-held [x] transportable [] stationary [] for building-in [] direct plug-in
Connection to the mains..... :	[x] pluggable equipment [] permanent connection [x] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains
Operating condition ..... :	[x] continuous [] rated operating / resting time:
Access location ..... :	[x] operator accessible [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values ..... :	-10%, +10%
Tested for IT power systems ..... :	[x] Yes [] No
IT testing, phase-phase voltage (V) ..... :	230Vac
Class of equipment ..... :	[x] Class I [] Class II [] Class III [] Not classified
Considered current rating (A) ..... :	16A (20A for North America)
Pollution degree (PD) ..... :	[] PD 1 [x] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	Not over 2000m
Altitude of test laboratory (m) ..... :	Not over 2000m
Mass of equipment (kg) ..... :	0.64
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing ..... :	
Date of receipt of test item .....:	Mar., 2010
Date(s) of performance of tests .....:	Mar., 2010

General remarks:

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

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

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

General product information:

The equipment models GS160AX (X=12, 15, 20, 24, 48) are AC/DC SWITCHING ADAPTOR (desk top type) for DC supply of information technology equipment.

Models GS160AX (X=12, 15, 20, 24, 48) are similar to each other except for model name, output ratings, primary/secondary wire diameter and turns of transformer, some components sources and ratings.

The Green/Yellow wire is optional provided, when Green/Yellow wire provided then C3/C4/C22/C30 as Y capacitors, when Green/Yellow wire not provided then C3/C4 as coupling capacitors and without C22/C30.

The top enclosure is secured to the bottom enclosure by four screws.

The suitable power supply cord will be provided and evaluated when national approval.

Other comments:

Factories:

1. Mean Well Enterprises Co., Ltd.
   No. 28, Wu-Chuan 3rd Road, Wu Ku Ind. Park, Taipei Hsien 248, Taiwan
2. Suzhou Mean Well Technology Co Ltd.
   No. 77, Jian-min Road, Dong-qiao, Pan-yang Ind. Park, Huang-dai Town, Xiang-cheng District, Suzhou, Jiangsu 215152, P.R. China
3. GUANGZHOU MEAN WELL ELECTRONICS CO., LTD
   2nd Floor, No. A Building, Yuean Ind. Park, Dongpu Town, TianHe, Guangzhou, P.R. China

The manufacturer's declaration, that the samples tested represent the products from each factory, is available.

Attachments to this Test Report:

- Photo Documentation
- National Differences
- Measurement Section

Model Name	Input rating	DC Output rating
GS160A12	100-240Vac, 50/60Hz, 2.0A	12V/11.5A, 138W MAX.
GS160A15		15V/9.6A, 144W MAX.
GS160A20		20V/8A, 160W MAX.
GS160A24		24V/6.67A, 160W MAX.
GS160A48		48V/3.34A, 160W MAX.

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Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General	See below.	P
	Comply with IEC 60950 or relevant component standard	See attachment table 1.5.1.	P
1.5.2	Evaluation and testing of components	Components, which are certified to IEC and/or national standards, are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls		N/A
1.5.4	Transformers	Transformers used are suitable for the intended application and comply with the relevant requirements of the standard and particularly with those of Annex C.	P
1.5.5	Interconnecting cables	Interconnection o/p cable to other device is carrying only SELV and energy level didn't exceed 240VA.	P
1.5.6	Capacitors bridging insulation	Between lines: min. X2 capacitors according to IEC 60384-14 with 21 days damp heat test. Between line and ground: min. Y2 capacitors according to IEC 60384-14 with 21 days damp heat test. Primary and secondary bridged by two or four capacitors, which used was certified as Y1 capacitor according to IEC 60384-14 with 21 days damp heat test.	P
1.5.7	Resistors bridging insulation	See below.	P
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	Bleeder resistors are located after fuse and fuse treat as providing protective device while short circuit.	P
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems	Phase to earth designed in according to phase-to-phase working voltage. The Y2 min. subclass capacitor used between phase-to-earth is rated accordingly.	P
1.5.9	Surge suppressors		N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A
1.6	Power interface		P
1.6.1	AC power distribution systems	TN power system and IT power system (for Norway).	P
1.6.2	Input current	See appended table 1.6.2.	P
1.6.3	Voltage limit of hand-held equipment		N/A
1.6.4	Neutral conductor	The neutral is not identified in the equipment. Basic insulation for rated voltage between earthed parts and primary phases. Reinforced insulation for rated voltage between secondary parts and primary phases.	P
1.7	Marking and instructions		P
1.7.1	Power rating	See below.	P
	Rated voltage(s) or voltage range(s) (V) .....:	See copy of marking plates.	P
	Symbol for nature of supply, for d.c. only.....:	Mains from AC source.	N/A
	Rated frequency or rated frequency range (Hz) ....:	See copy of marking plates.	P
	Rated current (mA or A) .....:	See copy of marking plates.	P
	Manufacturer's name or trade-mark or identification mark .....:	See copy of marking plates.	P
	Model identification or type reference .....:	See copy of marking plates.	P
	Symbol for Class II equipment only .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Other markings and symbols .....:	Other symbols do not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	See below.	P
1.7.2.1	General	Installation instruction provided with information regarding the maximum operational ambient temperature, max., input rating and output rating and safety caution.	P
1.7.2.2	Disconnect devices		P
1.7.2.3	Overcurrent protective device		N/A
1.7.2.4	IT power distribution systems	For Norway compliance has to be evaluated during the national approval.	N/A
1.7.2.5	Operator access with a tool	No operator accessible area which needs to be accessed by use of a tool.	N/A
1.7.2.6	Ozone		N/A
1.7.3	Short duty cycles		N/A
1.7.4	Supply voltage adjustment .....:		N/A
	Methods and means of adjustment; reference to installation instructions .....:		N/A
1.7.5	Power outlets on the equipment .....:		N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	Fuse marking on PCB near fuse: FS1 T4A/250V	P
1.7.7	Wiring terminals	See below.	P
1.7.7.1	Protective earthing and bonding terminals .....:	Appliance inlet used.	P
1.7.7.2	Terminals for a.c. mains supply conductors		N/A
1.7.7.3	Terminals for d.c. mains supply conductors		N/A
1.7.8	Controls and indicators	No safety related controls, indicator or color used.	N/A
1.7.8.1	Identification, location and marking .....:		N/A
1.7.8.2	Colours .....:		N/A
1.7.8.3	Symbols according to IEC 60417 .....:		N/A
1.7.8.4	Markings using figures .....:		N/A
1.7.9	Isolation of multiple power sources .....:	Only one supply from the mains.	N/A
1.7.10	Thermostats and other regulating devices .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling nor lifting of the label edge.	P
1.7.12	Removable parts		N/A
1.7.13	Replaceable batteries .....:		N/A
	Language(s) .....:		—
1.7.14	Equipment for restricted access locations.....:	Equipment is not intended for use in restricted access locations.	N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.5	Energy hazards .....:	See attachment measurement section table 2.1.1.5. Energy does not exceed 240VA between any two points in output connector of secondary circuit.	P
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock, see below.	P
	Measured voltage (V); time-constant (s) .....:	See attachment measurement section table 2.1.1.7.	—
2.1.1.8	Energy hazards – d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply ..:		N/A
	b) Internal battery connected to the d.c. mains supply .....:		N/A
2.1.1.9	Audio amplifiers .....:		N/A
2.1.2	Protection in service access areas	No maintenance work in operation mode necessary.	N/A
2.1.3	Protection in restricted access locations	The unit is not limited to be used in restricted access locations.	N/A
2.2	SELV circuits		P
2.2.1	General requirements	See below, the secondary circuits were tested as SELV.	P
2.2.2	Voltages under normal conditions (V) .....:	42.4Vpeak or 60Vdc are not exceeded between any conductor of the SELV circuits under normal operation. See attachment measurement section table 2.2.2.	P
2.2.3	Voltages under fault conditions (V) .....:	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71V peak and 120Vd.c. were compliance Figure 2E and limits 42.4V peak and 60Vd.c. were not exceeded for longer than 0.2 and were compliance Figure 2E. See attachment measurement section table 2.2.3.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.2.4	Connection of SELV circuits to other circuits .....:	See sub-clauses 1.5.6, 2.2.2, 2.2.3 and 2.4.3.	P
2.3	TNV circuits		N/A
2.3.1	Limits		N/A
	Type of TNV circuits .....:		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions .....:		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed.....:		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed.....:		—
2.3.5	Test for operating voltages generated externally		N/A
2.4	Limited current circuits		P
2.4.1	General requirements	The output connector is accessible to the user and connected to the primary circuit by two or four Y1 bridging capacitors.	P
2.4.2	Limit values	See measurement section table 2.4.2.	P
	Frequency (Hz).....:	Same as above.	—
	Measured current (mA).....:	Same as above.	—
	Measured voltage (V) .....:	Same as above.	—
	Measured circuit capacitance (nF or µF).....:	Same as above.	—
2.4.3	Connection of limited current circuits to other circuits	Output circuit as limited current circuit connected to other circuits.	P
2.5	Limited power sources		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) Regulating network limited output under normal operating and single fault condition		N/A
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA).....:		—
	Current rating of overcurrent protective device (A)		—
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	One optional green/yellow wire was soldered, hooked on the PE-pin of the appliance inlet other side was fixed to the PCB (PB trace) by soldered and solder pin.	P
2.6.2	Functional earthing	Secondary functional earthing is separated to primary by reinforced or double insulation.	P
2.6.3	Protective earthing and protective bonding conductors	See below.	P
2.6.3.1	General	See below.	P
2.6.3.2	Size of protective earthing conductors	No power cord provided.	N/A
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
2.6.3.3	Size of protective bonding conductors	Evaluation by test. See sub-clause 2.6.3.4, rated current below 16A.	P
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
	Protective current rating (A), cross-sectional area (mm^2), AWG .....:		
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min) .....:	See measurement section table 2.6.3.4.	P
2.6.3.5	Colour of insulation.....:	See clause 2.6.1.	P
2.6.4	Terminals	See below.	P
2.6.4.1	General	See below.	P
2.6.4.2	Protective earthing and bonding terminals	The appliance inlet considered as main protective earthing terminal and protective bonding conductors are evaluation by 2.6.3.4 test.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A), type, nominal thread diameter (mm) .....:		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Appliance inlet provided. Only one protective bonding conductor provided.	P
2.6.5	Integrity of protective earthing	See below.	P
2.6.5.1	Interconnection of equipment	The equipment has its own earthing connection, any other units interconnected to it via the DC output connector shall provide SELV only.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device provided in protective bonding conductors.	P
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect earth without disconnecting mains as an appliance inlet is used.	P
2.6.5.4	Parts that can be removed by an operator	Appliance Inlet used, the earth connection is made before and broken after the hazardous voltage removed. No other operator removable parts.	P
2.6.5.5	Parts removed during servicing	It is not necessary to disconnect earthing except for the removing of the earthed parts itself.	P
2.6.5.6	Corrosion resistance	All safety earthing connections in compliance with Annex J.	P
2.6.5.7	Screws for protective bonding	No such screws.	N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A
2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Equipment relies on a rated fuse or 16 A (20A for North America) 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.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Instructions when protection relies on building installation	Not applicable for pluggable equipment type A.	N/A
2.7.2	Faults not simulated in 5.3.7	The protection device is well dimensioned and mounted.	P
2.7.3	Short-circuit backup protection	Pluggable equipment type A, the building installation is considered as providing short circuit backup protection.	P
2.7.4	Number and location of protective devices .....:	Over current protection by one built-in fuse.	P
2.7.5	Protection by several devices	Only one fuse provided.	N/A
2.7.6	Warning to service personnel .....:	No service work necessary.	N/A
2.8	Safety interlocks		N/A
2.8.1	General principles		N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches and relays		N/A
2.8.7.1	Contact gaps (mm) .....:		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test		N/A
2.8.8	Mechanical actuators		N/A
2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used.	P
2.9.2	Humidity conditioning	Tested for 120hrs.	P
	Relative humidity (%), temperature (°C) .....:	95% R.H., 40°C.	—
2.9.3	Grade of insulation	The adequate levels of safety insulation is provided and maintained to comply with the requirements of this standard.	P
2.9.4	Separation from hazardous voltages	See below.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Method(s) used .....:	Method 1 used.	—
2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See below.	P
2.10.1.1	Frequency .....:	EUT freguency under 30kHz.	P
2.10.1.2	Pollution degrees .....:	Pollution degree 2.	P
2.10.1.3	Reduced values for functional insulation	See sub-clause 5.3.4.	P
2.10.1.4	Intervening unconnected conductive parts	No such conductive parts.	N/A
2.10.1.5	Insulation with varying dimensions	Not applicable.	N/A
2.10.1.6	Special separation requirements	No TNV circuit.	N/A
2.10.1.7	Insulation in circuits generating starting pulses	No lamps.	N/A
2.10.2	Determination of working voltage	See below.	P
2.10.2.1	General	The rms and the peak voltage were measured on the switching power supply. The unit was connected to a 240V TN power system.	P
2.10.2.2	RMS working voltage	See attachment measurement section table 2.10.2.	P
2.10.2.3	Peak working voltage	See attachment measurement section table 2.10.2.	P
2.10.3	Clearances	See below and alternative method of annex G is not considered.	P
2.10.3.1	General	Annex F and minimum clearances considered.	P
2.10.3.2	Mains transient voltages	Normal transient voltage considered.	P
	a) AC mains supply .....:	Overvoltage category II for primary circuit and transient voltage 2500Vpeak.	P
	b) Earthed d.c. mains supplies .....:		N/A
	c) Unearthed d.c. mains supplies .....:		N/A
	d) Battery operation .....:		N/A
2.10.3.3	Clearances in primary circuits	See attachment table 2.10.3 and 2.10.4.	P
2.10.3.4	Clearances in secondary circuits	See sub-clause 5.3.4.	N/A
2.10.3.5	Clearances in circuits having starting pulses	No lamps.	N/A
2.10.3.6	Transients from a.c. mains supply .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.3.7	Transients from d.c. mains supply .....:		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems .....:		N/A
2.10.3.9	Measurement of transient voltage levels		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply .....:		N/A
	For a d.c. mains supply .....:		N/A
	b) Transients from a telecommunication network .:		N/A
2.10.4	Creepage distances	See below.	P
2.10.4.1	General	See attachment measurement section table 2.10.3 and 2.10.4.	P
2.10.4.2	Material group and comparative tracking index	CTI rating for all materials are min. 100.	P
	CTI tests .....:	Material group IIIb is assumed to be used.	—
2.10.4.3	Minimum creepage distances	See attachment measurement section table 2.10.3 and 2.10.4.	P
2.10.5	Solid insulation	Complied with 2.10.5.2 to 2.10.5.14 and 5.2.	P
2.10.5.1	General	See below.	P
2.10.5.2	Distances through insulation	See attachment measurement section table 2.10.5.	P
2.10.5.3	Insulating compound as solid insulation	Certified sources of photo couplers used. No other components applied for. See sub-clause 2.10.5.2 and 2.10.10.	P
2.10.5.4	Semiconductor devices	For photo couplers see sub-clause 2.10.5.3.	P
2.10.5.5.	Cemented joints		N/A
2.10.5.6	Thin sheet material – General	Considered.	P
2.10.5.7	Separable thin sheet material	See measurement section tables C.2 and attachment table 2.10.3 & 2.10.4 for detail applicable.	P
	Number of layers (pcs) .....:	See above.	—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure	Not applicable.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure	See below.	P
	Electric strength test	See attachment table 2.10.5.	—
2.10.5.11	Insulation in wound components	See sub-clause 2.10.5.12.	P
2.10.5.12	Wire in wound components	Certified source of triple insulated wire used in T1.	P
	Working voltage .....:	See measurement section tables C.2.	P
	a) Basic insulation not under stress .....:		N/A
	b) Basic, supplementary, reinforced insulation .....:	Reinforced insulation, extruded or spirally type.	P
	c) Compliance with Annex U .....:	Certified source.	P
	Two wires in contact inside wound component; angle between 45° and 90° .....:	Prevented by tube and tape.	P
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage .....:		N/A
	- Basic insulation not under stress .....:		N/A
	- Supplementary, reinforced insulation .....:		N/A
2.10.6	Construction of printed boards	See below.	P
2.10.6.1	Uncoated printed boards	See measurement section table 2.10.3 and 2.10.4.	P
2.10.6.2	Coated printed boards		N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs) .....:		N/A
2.10.7	Component external terminations	See attachment table 2.10.3 and 2.10.4.	P
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		P
2.10.10	Test for Pollution Degree 1 environment and insulating compound		P
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	Internal wirings and output cable are UL recognized wiring which is PVC insulated, rated VW-1, 300V, min. 90°C, the wiring gauge is suitable for current intended to be carried.	P
3.1.2	Protection against mechanical damage	Wires do not touch sharp edges. Where they touch heatsinks additional tubing is provided so that the heatsink cannot damage the insulation and cause hazard.	P
3.1.3	Securing of internal wiring	Internal wires are secured by solder with glue or solder with solder pin so that a loosening of the terminal connection is unlikely.	P
3.1.4	Insulation of conductors		N/A
3.1.5	Beads and ceramic insulators	Not used.	N/A
3.1.6	Screws for electrical contact pressure	Not used.	N/A
3.1.7	Insulating materials in electrical connections	All connections are metal to metal.	P
3.1.8	Self-tapping and spaced thread screws		N/A
3.1.9	Termination of conductors	All conductors are reliable secured.	P
	10 N pull test	10N pull test performed for all relevant conductors. No hazards caused hereby.	P
3.1.10	Sleeving on wiring		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.2	Connection to a mains supply		P
3.2.1	Means of connection	Appliance inlet used.	P
3.2.1.1	Connection to an a.c. mains supply	Same as above.	P
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections		N/A
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter of cable and conduits (mm) .....:		—
3.2.4	Appliance inlets	The appliance inlet complies with IEC/EN 60320-1. The power cord can be inserted without difficulties and is not intended to support the equipment.	P
3.2.5	Power supply cords	No power supply cords provided.	N/A
3.2.5.1	AC power supply cords	Same as above.	N/A
	Type .....:		—
	Rated current (A), cross-sectional area (mm²), AWG .....:		—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N) .....:		—
	Longitudinal displacement (mm) .....:		—
3.2.7	Protection against mechanical damage	No parts under this unit likely to damage the power supply cord. Enclosure without sharp edges.	P
3.2.8	Cord guards		N/A
	Diameter or minor dimension D (mm); test mass (g) .....:		—
	Radius of curvature of cord (mm).....:		—
3.2.9	Supply wiring space		N/A

3.3	Wiring terminals for connection of external conductors		N/A
3.3.1	Wiring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A), cord/cable type, cross-sectional area (mm^2).....:		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm) .....:		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	Disconnection from the mains supply		P
3.4.1	General requirement	See below.	P
3.4.2	Disconnect devices	Appliance inlet is provided as disconnection device.	P
3.4.3	Permanently connected equipment	Not permanently connected equipment.	N/A
3.4.4	Parts which remain energized	When power cord is removed from inlet (or wall socket) no remaining parts with hazardous voltage in the equipment.	P
3.4.5	Switches in flexible cords	Not such components.	N/A
3.4.6	Number of poles - single-phase and d.c. equipment	The appliance inlet disconnects both poles simultaneously.	P
3.4.7	Number of poles - three-phase equipment	Single phase.	N/A
3.4.8	Switches as disconnect devices	Refer to 3.4.2.	N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment	Interconnection of the power supply to the other equipment by secondary output connectors only.	N/A
3.4.11	Multiple power sources	Single mains supply.	N/A
3.5	Interconnection of equipment		P
3.5.1	General requirements	See below.	P
3.5.2	Types of interconnection circuits .....:	Interconnection circuits of SELV and LCC via secondary output connector.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N/A
3.5.4	Data ports for additional equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N/A
	Angle of 10°	The unit mass less than 7kg.	N/A
	Test force (N) .....:		N/A

4.2	Mechanical strength		P
4.2.1	General	See below. After tests, unit complies with the requirements of sub-clauses 2.1.1, 2.6.1 and 2.10.	P
4.2.2	Steady force test, 10 N	10N applied to all components other than enclosure.	P
4.2.3	Steady force test, 30 N	No internal enclosure.	N/A
4.2.4	Steady force test, 250 N	250N on top, side, bottom of enclosure for all source and no damaged.	P
4.2.5	Impact test	See below.	P
	Fall test	No hazard as result from steel sphere ball impact test applied for top/side/bottom enclosure.	P
	Swing test	No hazard as result from steel sphere ball impact test for top/side/bottom enclosure.	P
4.2.6	Drop test; height (mm) .....:	The adapter has been subjected to 3 drops of top/bottom/side of enclosure for all source from 1 m height on a hard wooden surface. No hazard as result after drop test for all sources of enclosure material.	P
4.2.7	Stress relief test	After the test at temperature of 95°C during 7 hrs for each enclosure material source and no shrinkage, distortion or loosening of any enclosure part was noticeable on the equipment.	P
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified .....:		N/A
4.2.9	High pressure lamps		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.2.10	Wall or ceiling mounted equipment; force (N) .....:		N/A
4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2	Handles and manual controls; force (N).....:	No handles or controls provided.	N/A
4.3.3	Adjustable controls	No controls provided.	N/A
4.3.4	Securing of parts	Mechanical fixings in such a way designed that they will withstand mechanical stress occurring in normal use.	P
4.3.5	Connection by plugs and sockets	Mismatching of connectors neither possible nor result in any hazards.	P
4.3.6	Direct plug-in equipment		N/A
	Torque .....:		—
	Compliance with the relevant mains plug standard .....:		N/A
4.3.7	Heating elements in earthed equipment		N/A
4.3.8	Batteries		N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease	Insulation in intended use not considered to be exposed to oil or grease.	N/A
4.3.10	Dust, powders, liquids and gases	Equipment is intended use not considered to be exposed to these.	N/A
4.3.11	Containers for liquids or gases	Neither container for liquids nor gases provided.	N/A
4.3.12	Flammable liquids .....:	No flammable liquids provided.	N/A
	Quantity of liquid (l) .....:		N/A
	Flash point (°C) .....:		N/A
4.3.13	Radiation	See below.	P
4.3.13.1	General	See below.	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.13.2	Ionizing radiation		N/A
	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		N/A
	Part, property, retention after test, flammability classification .....:		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....:		N/A
4.3.13.5	Laser (including LEDs)	The LED as indicating lights used.	P
	Laser class .....:		—
4.3.13.6	Other types .....:		N/A
4.4	Protection against hazardous moving parts		N/A
4.4.1	General		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	General	No exceeding temperature.	P
4.5.2	Temperature tests	See attachment table 4.5.	P
	Normal load condition per Annex L .....:	See Annex L.	—
4.5.3	Temperature limits for materials	See attachment table 4.5.	P
4.5.4	Touch temperature limits	See attachment table 4.5.	P
4.5.5	Resistance to abnormal heat .....:	Phenolic bobbin material used in T1, L1 which is acceptable without test.	N/A
4.6	Openings in enclosures		P
4.6.1	Top and side openings	No openings.	P
	Dimensions (mm) .....:		—
4.6.2	Bottoms of fire enclosures	No openings.	P
	Construction of the bottom, dimensions (mm) .....:		—
4.6.3	Doors or covers in fire enclosures		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.6.4	Openings in transportable equipment	No openings.	P
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm) .....:		—
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks) .....:		—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	See below.	P
	Method 1, selection and application of components wiring and materials	Use of materials with the required flammability classes.	P
	Method 2, application of all of simulated fault condition tests	Not applied for.	N/A
4.7.2	Conditions for a fire enclosure	See below.	P
4.7.2.1	Parts requiring a fire enclosure	Following parts require a fire enclosure: ▪ Components in primary circuits ▪ Components in secondary circuits supplied by power sources that exceed the limits of limited power source. ▪ Insulating wiring. Fire enclosure is required.	P
4.7.2.2	Parts not requiring a fire enclosure	See 4.7.2.1.	N/A
4.7.3	Materials		P
4.7.3.1	General	PCB is rated accordingly. See appended table 1.5.1 for details.	P
4.7.3.2	Materials for fire enclosures	See appended table 1.5.1 for details.	P
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A
4.7.3.4	Materials for components and other parts inside fire enclosures	The material is made of min. V-2 material.	P
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6.	P
5.1.2	Configuration of equipment under test (EUT)	See below.	P
5.1.2.1	Single connection to an a.c. mains supply	EUT has only single AC mains connection.	P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit	Equipment of figure 5A used.	P
5.1.4	Application of measuring instrument	Using measuring instrument in annex D.	P
5.1.5	Test procedure	The touch current was measured from primary to DC output connector, primary to enclosure with metal foil and primary to protective earthing terminal.	P
5.1.6	Test measurements	See measurement section table 5.1.6.	P
	Supply voltage (V) .....:	See measurement section table 5.1.6.	—
	Measured touch current (mA) .....:	See measurement section table 5.1.6.	—
	Max. allowed touch current (mA) .....:	See measurement section 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		N/A
5.1.7.1	General .....:		N/A
5.1.7.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	No TNV.	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system	No TNV.	N/A
	Supply voltage (V) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
5.1.8.2	Summation of touch currents from telecommunication networks	No connected to TNV.	N/A
	a) EUT with earthed telecommunication ports .....:		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A

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

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	See attachment table 5.3.	P
5.3.2	Motors		N/A
5.3.3	Transformers	Having shorted the output of the transformer no hazard was created. No high temperature of the transformer were observed. Results of the short-circuit tests see attachment table 5.3 and C.2.	P
5.3.4	Functional insulation.....:	Requirement c). Test results see attachment table 5.3.	P
5.3.5	Electromechanical components		N/A
5.3.6	Audio amplifiers in ITE .....:		N/A
5.3.7	Simulation of faults	See attachment table 5.3.	P
5.3.8	Unattended equipment	None of the listed components was provided.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions	See below.	P
5.3.9.1	During the tests	No fire occurred, no molter metal emition.	P
5.3.9.2	After the tests	Electric strength tests primary to SELV, primary to earth and primary to enclosure with metal foil were passed.	P

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Clause	Requirement + Test	Result - Remark	Verdict
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements		N/A
	Supply voltage (V) .....:		—
	Current in the test circuit (mA) .....:		—
6.1.2.2	Exclusions .....:		N/A
6.2	Protection of equipment users from overvoltages on telecommunication networks		N/A
6.2.1	Separation requirements		N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test		N/A
6.2.2.2	Steady-state test		N/A
6.2.2.3	Compliance criteria		N/A
6.3	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A) .....:		—
	Current limiting method .....:		—
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A
7.1	General		N/A
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test		N/A
7.4.3	Impulse test		N/A
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		P

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Clause	Requirement + Test	Result - Remark	Verdict
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)		P
A.2.1	Samples, material.....:		—
	Wall thickness (mm).....:		—
A.2.2	Conditioning of samples; temperature (°C) .....:		N/A
A.2.3	Mounting of samples .....:		N/A
A.2.4	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C .....:		—
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s).....:		—
	Sample 2 burning time (s).....:		—
	Sample 3 burning time (s).....:		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N/A
	Sample 1 burning time (s).....:		—
	Sample 2 burning time (s).....:		—
	Sample 3 burning time (s).....:		—
A.3	Hot flaming oil test (see 4.6.2)		N/A
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

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

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position .....:	T1	—
	Manufacturer .....:	See attachment table 1.5.1.	—
	Type .....:	See attachment table 1.5.1.	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated values .....:	See attachment table 1.5.1.	—
	Method of protection.....:	Over current protection by circuit design.	—
C.1	Overload test	See attachment table 5.3.	P
C.2	Insulation	See attachment table 5.2.	P
	Protection from displacement of windings.....:	Refer to measurement section table C.2.	P
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument	Figure D.1 used.	P
D.2	Alternative measuring instrument		N/A
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1	Clearances		N/A
G.1.1	General		N/A
G.1.2	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V)		N/A
G.2.1	AC mains supply .....:		N/A
G.2.2	Earthed d.c. mains supplies .....:		N/A
G.2.3	Unearthed d.c. mains supplies .....:		N/A
G.2.4	Battery operation .....:		N/A
G.3	Determination of telecommunication network transient voltage (V) .....:		N/A
G.4	Determination of required withstand voltage (V)		N/A
G.4.1	Mains transients and internal repetitive peaks .....:		N/A
G.4.2	Transients from telecommunication networks .....:		N/A
G.4.3	Combination of transients		N/A
G.4.4	Transients from cable distribution systems		N/A
G.5	Measurement of transient voltages (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
G.6	Determination of minimum clearances .....:		N/A
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(s) used .....:	Complied.	—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability; operating voltage (V) .....:		N/A
K.3	Thermostat endurance test; operating voltage (V) :		N/A
K.4	Temperature limiter endurance; operating voltage (V) .....:		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment	Continuous operation at rated output load.	P
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringing signal		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.3.1.1	Frequency (Hz) .....:		—
M.3.1.2	Voltage (V) .....:		—
M.3.1.3	Cadence; time (s), voltage (V) .....:		—
M.3.1.4	Single fault current (mA) .....:		—
M.3.2	Tripping device and monitoring voltage .....:		N/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V) .....:		N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N/A
	a) Preferred climatic categories .....:		N/A
	b) Maximum continuous voltage .....:		N/A
	c) Pulse current .....:		N/A
R	Annex R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
			—

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Clause	Requirement + Test	Result - Remark	Verdict

U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
		Certified components used.	—

V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction	See below.	P
V.2	TN power distribution systems	Single-phase TN power system considered and used for testing.	P

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

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

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

Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		P

AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A

BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—

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Clause	Requirement + Test	Result - Remark	Verdict

EN 60950-1:2006 – CENELEC COMMON MODIFICATIONS		
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations	P
General	Delete all the “country” notes in the reference document according to the following list: 1.4.8 Note 2; 1.5.1 Note 2 & 3; 1.5.7.1 Note 1.5.8 Note 2; 1.5.9.4 Note; 1.7.2.1 Note 4, 5 & 6 2.2.3 Note; 2.2.4 Note; 2.3.2 Note 2.3.2.1 Note 2; 2.3.4 Note 2; 2.6.3.3 Note 2 & 3 2.7.1 Note; 2.10.3.2 Note 2; 2.10.5.13 Note 3 3.2.1.1 Note; 3.2.4 Note 3.; 2.5.1 Note 2 4.3.6 Note 1 & 2; 4.7 Note 4; 4.7.2.2 Note 4.7.3.1 Note 2; 5.1.7.1 Note 3 & 4; 5.3.7 Note 1 6 Note 2 & 5; 6.1.2.1 Note 2; 6.1.2.2 Note 6.2.2 Note 6.; 2.2.1 Note 2; 6.2.2.2 Note 7.1 Note 3; 7.2 Note; 7.3 Note 1 & 2 G.2.1 Note 2; Annex H Note 2	P
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.	N/A
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC	N/A
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	Replace the subclause as follows: Basic requirements To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): 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; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		P
2.7.2	This subclause has been declared 'void'.		P
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N/A
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F". In Table 3B, replace the first four lines by the following: | Up to and including 6 | | 0,75 [a] | | Over 6 up to and including 10 | (0,75) [b] 1,0 | | Over 10 up to and including 16 | (1,0) [c] 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a]. In NOTE 1, applicable to Table 3B, delete the second sentence.		N/A
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: | Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A.		N/A
4.3.13.6	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.	N/A
Biblio-graphy	Additional EN standards.	—

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS	—

ZB	SPECIAL NATIONAL CONDITIONS	P
1.2.4.1	In **Denmark**, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.	N/A
1.5.7.1	In **Finland**, **Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.	N/A
1.5.8	In **Norway**, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	P
1.5.9.4	In **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.	N/A
1.7.2.1	In **Finland**, **Norway** and **Sweden**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”	N/A
1.7.5	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.	N/A
2.2.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	N/A
2.3.2	In **Finland**, **Norway** and **Sweden** there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.	N/A
2.3.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

2.6.3.3	In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.	P
2.7.1	In the **United Kingdom**, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.	N/A
2.10.5.13	In **Finland**, **Norway** and **Sweden**, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.	N/A
3.2.1.1	In **Switzerland**, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: 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	N/A
3.2.1.1	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 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.	N/A
3.2.1.1	In **Spain**, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used 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. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In the **United Kingdom**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
3.2.1.1	In **Ireland**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		N/A
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.		N/A
3.2.5.1	In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N/A
3.3.4	In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		N/A
4.3.6	In the **United Kingdom**, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
4.3.6	In **Ireland**, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N/A
5.1.7.1	In **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that - is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and - has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and - is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.1	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: 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 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - 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 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400; - 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.		N/A
6.1.2.2	In **Finland**, **Norway** and **Sweden**, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		N/A
7.2	In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N/A
7.3	In **Norway** and **Sweden**, there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.		N/A
7.3	In **Norway**, for installation conditions see EN 60728-11:2005.		N/A

ZC	A-DEVIATIONS (informative)	P

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Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	**Sweden** (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted.	N/A
1.5.1	**Switzerland** (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.	N/A
1.7.2.1	**Denmark** (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 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.”	N/A
1.7.2.1	**Germany** (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.	P
1.7.5	**Denmark** (Heavy Current Regulations) With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.	N/A
1.7.13	**Switzerland** (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.	N/A
5.1.7.1	**Denmark** (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.	N/A

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1.5.1	TABLE: List of critical components				P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity [1.]
Enclosure	Sabic Innovative Plastics	945	V-0, 120°C, min. 1.1mm thick	UL94	UL
AC Inlet	Pronic	PST-101	10A, 250V	IEC/EN 60320-1	VDE, UL
	Rong Feng	SS-120	10A, 250V	IEC/EN 60320-1	VDE, UL
	Supercom	SC-8	10A, 250V	IEC/EN 60320-1	VDE, UL
	TECX-UNIONS	TU-301-Series	10A, 250V	IEC/EN 60320-1	VDE, UL
PCB	--	--	V-1 or better, min. 130°C	UL 796	UL
Fuse (FS1)	Conquer	MST-series	T4A, 250V	IEC/EN 60127-3	VDE, UL
	Walter	2010-Series(s)	T4A, 250V	IEC/EN 60127-3	VDE, UL
Bleeder Resistors (R1, R2)	--	--	Max. 1.5 MΩ, min. 1/4W	--	--
Y-Capacitors (Y1 or Y2 type (when G/Y wire provided)(C3, C4, C22, C30) (optional)	Murata	KX, KH	Max. 4700pF, min. 250V, 125°C	IEC60384-14	VDE, UL
	Walsin	AH, AC	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CS	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	Welson	WD, KL	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
X-Capacitors (C1, C2) (optional) (X1 or X2 type)	Arcotronics	R.46	Max. 0.82uF, 300V, 110°C	IEC 60384-14	ENEC(03), UL
	Arcotronics	R.49	Max. 0.82uF, 310V, 110°C	IEC 60384-14	ENEC(03), UL

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Clause	Requirement + Test	Result - Remark	Verdict

	Epcos	B3292#	Max. 0.82uF, 305V, 105°C	IEC 60384-14	VDE, UL
	Iskra	KNB 1530	Max. 0.82uF, 275V, 100°C	IEC 60384-14	VDE, UL
	Iskra	KNB 1560	Max. 0.82uF, 300V, 125°C	IEC 60384-14	VDE, UL
	Liow Gu	GS-L	Max. 0.82uF, 275V, 100°C	IEC 60384-14	VDE, UL
	Pilkor	PCX2 335M	Max. 0.82uF, 275V, 105°C	IEC 60384-14	ENEC(14), UL
	Pilkor	PCX2 337	Max. 0.82uF, 275V, 100°C	IEC 60384-14	VDE, UL
	Ultra Tech	HQX	Max. 0.82uF, 275V, 100°C	IEC 60384-14	VDE, UL
	Vishay BC Components	339	Max. 0.82uF, 275V, 105°C	IEC 60384-14	ENEC(02), UL
	Cheng Tung	CTX	Max. 0.82uF, 300V, 100°C	IEC 60384-14	VDE, UL
	Shiny Space	SX1	Max. 0.82uF, 300V, 100°C	IEC 60384-14	VDE, UL
Bridge Rectifier (BD1)	--	--	Min. 4A, min. 600V	--	--
Storage Capacitor (C5)	--	--	150 µF, min. 420V, min. 105°C	--	--
Power Transistors (Q5, Q6)	--	--	Min.12A, min. 500V	--	--
Coupling Capacitors (C31, (C32) (optional) (Y1 type) (When G/Y wire is provided)	Murata	KX	Max. 4700pF, min. 250V, 125°C	IEC60384-14	VDE, UL
	Walsin	AH	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL

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	Welson	WD	Max. 4700pF, min. 250V, 125°C	IEC 60384-14	VDE, UL
Or Coupling Capacitors (C3, C4 : max.1000pF C31, C32: max.3300pF (C22 ,C30: not provide) (optional) (Y1 type) (When G/Y wire is not provided)	Murata	KX	min. 250V, 125°C	IEC60384-14	VDE, UL
	Walsin	AH	min. 250V, 125°C	IEC 60384-14	VDE, UL
	TDK	CD	min. 250V, 125°C	IEC 60384-14	VDE, UL
	Welson	WD	min. 250V, 125°C	IEC 60384-14	VDE, UL
Photo Coupler (U3, U4)	Lite-on	LTV-817	dti=0.8mm int. dcr=5.2mm ext. dcr=7.8mm 100°C	EN 60747-5-2 IEC 60950-1 IEC 60747-5-2 EN 60950-1	VDE, FI, UL, CUL, CSA
	Sharp	PC123	dti=0.7mm int. dcr=5mm ext. dcr=8mm, thermal cycling test, 110°C	EN 60747-5-2 IEC 60950-1 IEC 60747-5-2 EN 60950-1	VDE, FI, UL, CUL, CSA
	Cosmo	K1010	dti=0.7mm int. dcr=5.3mm ext. dcr=8mm, thermal cycling test, 115°C	EN 60747-5-2 IEC 60950-1 IEC 60747-5-2 EN 60950-1	VDE, FI, UL, CUL, CSA
Transformer (T1) (For GS160A12)	Yu Jing	TF-2102	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2102	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland

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Clause	Requirement + Test	Result - Remark	Verdict

(For GS160A15)	Yu Jing	TF-2103	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2103	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
(For GS160A20)	Yu Jing	TF-2104	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2104	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
(For GS160A24)	Yu Jing	TF-2105	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2105	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
(For GS160A48)	Yu Jing	TF-2106	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
	Elytone	TF-2106	Class B	Applicable parts in IEC 60950-1 and evaluated acc. To IEC 60085	Accepted by TÜV Rheinland
-Triple Wire used in T1 (for Yu Jing)	Furukawa	TEX-E	130°C	IEC/EN 60950-1	TÜV
	Totoku	TIW-2	130°C	IEC/EN 60950-1	VDE, TÜV

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- Triple Wire used in T1 (for Elytone)	Furukawa	TEX-E	130°C	IEC/EN 60950-1	TÜV
Choke (LF1) (optional)	Mean Well	TR-889	130°C	--	--
Choke (LF2) (Optional)	Mean Well	TR-948	130°C	--	--
PFC Choke (L1)	Mean Well	TF-2101	130°C	--	--
Choke (L2) (optional)	Mean Well	TR-949	125°C	--	--
Mylar sheet	--	--	Min. VTM-2 or V-2, min. 0.4 mm thick.	UL 94	UL
Thermistor (RTH2) (optional)	--	--	Min. 150mW, max. 330k ohms at 25°C	--	--

Supplementary information:

1. An asterisk indicates a mark that assures the agreed level of surveillance.
2. For optical isolator, dti= inside distance through insulation, int. dcr = internal creepage distance, ext. dcr = external creepage distance.

1.6.2	TABLE: Electrical data (in normal conditions)					P
U / f (V/Hz)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
Model : GS160A12						
90V / 50	2.00	--	179	FS1	2.00	Max. normal load.
100V / 50	1.79	2.0	178	FS1	1.79	See above.
240V / 50	0.75	2.0	173	FS1	0.75	See above.
254V / 50	0.72	--	173	FS1	0.72	See above.
264V / 50	0.71	--	173	FS1	0.71	See above.
90V / 60	2.00	--	180	FS1	2.00	See above.
100V / 60	1.79	2.0	178	FS1	1.79	See above.
240V / 60	0.76	2.0	173	FS1	0.76	See above.
254V / 60	0.73	--	173	FS1	0.73	See above.
264V / 60	0.72	--	173	FS1	0.72	See above.
Model : GS160A15						
90V / 50	1.84	--	165	FS1	1.84	Max. normal load.

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Clause	Requirement + Test				Result - Remark	Verdict
100V / 50	1.64	2.0	164	FS1	1.64	See above.
240V / 50	0.68	2.0	158	FS1	0.68	See above.
254V / 50	0.65	--	158	FS1	0.65	See above.
264V / 50	0.64	--	158	FS1	0.64	See above.
90V / 60	1.84	--	165	FS1	1.84	See above.
100V / 60	1.64	2.0	164	FS1	1.64	See above.
240V / 60	0.69	2.0	158	FS1	0.69	See above.
254V / 60	0.66	--	158	FS1	0.66	See above.
264V / 60	0.65	--	158	FS1	0.65	See above.
Model : GS160A20						
90V / 50	2.04	--	183	FS1	2.04	Max. normal load.
100V / 50	1.83	2.0	182	FS1	1.83	See above.
240V / 50	0.77	2.0	177	FS1	0.77	See above.
254V / 50	0.73	--	177	FS1	0.73	See above.
264V / 50	0.72	--	177	FS1	0.72	See above.
90V / 60	2.05	--	184	FS1	2.05	See above.
100V / 60	1.83	2.0	183	FS1	1.83	See above.
240V / 60	0.78	2.0	177	FS1	0.78	See above.
254V / 60	0.74	--	177	FS1	0.74	See above.
264V / 60	0.73	--	177	FS1	0.73	See above.
Model : GS160A24						
90V / 50	1.98	--	176	FS1	1.98	Max. normal load.
100V / 50	1.77	2.0	175	FS1	1.77	See above.
240V / 50	0.74	2.0	170	FS1	0.74	See above.
254V / 50	0.71	--	170	FS1	0.71	See above.
264V / 50	0.71	--	170	FS1	0.71	See above.
90V / 60	1.98	--	176	FS1	1.98	See above.
100V / 60	1.77	2.0	175	FS1	1.77	See above.
240V / 60	0.75	2.0	171	FS1	0.75	See above.
254V / 60	0.72	--	170	FS1	0.72	See above.
264V / 60	0.72	--	170	FS1	0.72	See above.
Model : GS160A48						
90V / 50	2.00	--	178	FS1	2.00	Max. normal load.

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Clause	Requirement + Test				Result - Remark	Verdict
100V / 50	1.80	2.0	177	FS1	1.80	See above.
240V / 50	0.75	2.0	172	FS1	0.75	See above.
254V / 50	0.72	--	170	FS1	0.72	See above.
264V / 50	0.71	--	170	FS1	0.71	See above.
90V / 60	2.00	--	178	FS1	2.00	See above.
100V / 60	1.80	2.0	176	FS1	1.80	See above.
240V / 60	0.76	2.0	172	FS1	0.76	See above.
254V / 60	0.73	--	170	FS1	0.73	See above.
264V / 60	0.72	--	170	FS1	0.72	See above.
Supplementary information:						

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Functional:						
Distance under fuse or Distance between Line and neutral before fuse	420	250	1.5	See below	2.5	See below
- Under FS1				2.7		2.7
- Line to neutral				5.2		5.2
Basic / supplementary:						
Primary component (10N) to earth component (10N)	420	250	2.0	See below	2.5	See below
- Line wire solder to Neutral wire solder of AC inlet				7.8		7.8
Reinforced:						
Primary component (10N) to secondary component (10N)	420	250	4.0	See below	5.0	See below
- HS1 to HS3				9.3		9.3
- C906 to T1 core				9.7		9.7
- Line wire solder to EMI shield top				5.1		5.1
- Neutral wire solder to EMI shield top				5.0		5.0
- C30 primary pin to outer enclosure				9.1		9.1

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Clause	Requirement + Test	Result - Remark	Verdict

- Neutral wire solder to enclosure outer				5.7		5.7
- HS1 to enclosure outer				6.4		6.4
- HS1 solder to EMI shield				5.1		5.1
- Neutral wire solder to EMI shield side				7.8		7.8
- R3 to EMI shield side				5.4		5.4
- Neutral wire to EMI shield side				5.5		5.5
Primary trace to secondary trace	420	250	4.0	See below	5.0	See below
- R3 trace to secondary/earth trace				5.3		5.3
- under C22/C3				5.8		5.8
- under C4/C30				7.0		7.0
- under C31 and C32				11.0		11.0
- under U3/U4				5.0		7.0
- under T1	464	254	4.2	5.8	5.1	5.8

Supplementary information:

1) Functional insulation shorted, see sub-clause 5.3.4.
2) There is one Mylar sheet under main board and between EMI shield to keep reinforce insulation from primary component to secondary component.
3) There is one Π shape Mylar sheet cover top components to keep reinforce insulation from primary component to secondary component.
4) Glud component: L/N wires, secondary fly wires of T1, primary fly wires, output wires.
5) One rectangular cut-slot (1.0mm x 20.5mm) under U4, U3.

2.10.5	TABLE: Distance through insulation measurements				P
Distance through insulation (DTI) at/of:	U peak (V)	U r.m.s. (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
Photo coupler (reinforced insulation)	420	250	AC 3000	0.4	[1)]
Mylar sheet (reinforced insulation)	420	250	AC 3000	0.4	[1)]
Enclosure (reinforced insulation)	420	250	AC 3000	0.4	[1)]
One layer insulation tape of T1 (reinforced insulation)	420	250	AC 3000	--	--

Supplementary information:

[1)] For details refer to table 1.5.1.

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Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries									N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available										
Is it possible to install the battery in a reverse polarity position?										
	Non-rechargeable batteries			Rechargeable batteries						
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging		
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. current during normal condition										
Max. current during fault condition										
Test results:										Verdict
- Chemical leaks										
- Explosion of the battery										
- Emission of flame or expulsion of molten metal										
- Electric strength tests of equipment after completion of tests										
Supplementary information:										

4.5	TABLE: Thermal requirements					P
	Supply voltage (V) .....:	90	90	264	264	—
	Ambient T_{min} (°C) .....:	--	--	--	--	—
	Ambient T_{max} (°C) .....:	See below	See below	See below	See below	—
Maximum measured temperature T of part/at::		T (°C)				Allowed T_{max} (°C)
Model : GS160A-12						
Unit position		Label upward	Label downward	Label upward	Label downward	--

IEC/EN 60950-1					
Clause	Requirement + Test	Result - Remark			Verdict
1. Inlet body		67.1	64.9	56.4	55.7	70
2. Internal wire		75.2	73.7	60.7	60.1	90
3. C3 body		72.3	68.8	59.2	58.0	125
4. LF1 coil		79.9	77.3	62.5	61.7	130
5. C1 body		84.2	81.9	67.0	66.3	100
6. LF2 coil		95.4	94.3	68.3	67.1	130
7. C4 body		78.5	75.7	62.2	60.5	125
8. HS1 of BD1		94.2	91.9	71.5	70.4	130
9. L1 coil		94.3	91.9	73.1	72.1	130
10. C2 body		89.2	88.3	68.0	67.0	110
11. L2 coil		98.2	95.6	71.9	71.1	125
12. C5 body		92.9	90.4	74.6	73.9	105
13. PCB near the RTH2		90.0	87.3	75.7	74.6	130
14. T1 top coil		93.4	90.7	83.0	82.4	110
15. T1 bottom coil		96.1	93.7	86.1	85.6	110
16. T1 core		95.2	92.3	82.9	82.1	110
17. U4 body		88.9	86.6	78.6	78.0	100
18. C32 body		94.7	92.0	83.7	82.6	125
19. LF101 coil		92.6	89.7	85.9	86.1	105
20. Output wire		52.8	64.1	43.9	53.3	90
21. Inside of enclosure		82.4	78.8	71.9	69.9	120
22. Outside of enclosure		75.3	70.2	63.2	59.8	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=48.7°C, 47.1°C, 46.8°C and 46.5°C respectively		45.0	45.0	45.0	45.0	--
Model : GS160A-15						
Unit position		Label upward	Label downward	Label upward	Label downward	--

IEC/EN 60950-1					
Clause	Requirement + Test	Result - Remark			Verdict
1. Inlet body		55.2	49.7	49.9	45.5	70
2. Internal wire		73.2	63.1	59.2	51.3	90
3. C3 body		74.5	64.3	59.8	53.1	125
4. LF1 coil		84.7	78.1	64.6	59.2	130
5. C1 body		86.2	84.3	67.9	65.3	100
6. LF2 coil		96.2	97.5	68.4	67.4	130
7. C4 body		74.6	75.0	60.2	57.9	125
8. HS1 of BD1		91.0	91.1	70.8	69.5	130
9. L1 coil		94.2	94.9	71.9	71.1	130
10. C2 body		87.6	87.8	67.2	65.6	110
11. L2 coil		95.0	96.3	70.5	69.7	125
12. C5 body		90.1	91.8	72.8	72.9	105
13. PCB near the RTH2		80.9	82.1	69.7	69.8	130
14. T1 top coil		83.7	84.4	74.6	74.1	110
15. T1 bottom coil		82.8	85.7	74.4	75.6	110
16. T1 core		85.0	85.5	74.1	73.6	110
17. U4 body		78.5	80.7	70.9	72.3	100
18. C32 body		83.5	84.7	72.9	72.7	125
19. LF101 coil		80.3	81.6	76.4	77.4	105
20. Output wire		53.5	54.6	52.6	53.1	90
21. Inside of enclosure		79.6	74.8	68.1	63.8	120
22. Outside of enclosure		72.5	56.1	62.0	50.6	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=45.4°C, 45.6°C, 45.3°C and 46.4°C respectively		45.0	45.0	45.0	45.0	--
Model : GS160A-20						
Unit position		Label upward	Label downward	Label upward	Label downward	--

IEC/EN 60950-1					
Clause	Requirement + Test	Result - Remark			Verdict
1. Inlet body		51.4	57.0	47.7	49.7	70
2. Internal wire		67.6	64.1	54.2	55.2	90
3. C3 body		65.5	58.4	53.7	51.7	125
4. LF1 coil		80.1	71.4	59.4	57.4	130
5. C1 body		79.7	74.0	61.9	60.5	100
6. LF2 coil		84.3	87.1	59.6	62.7	130
7. C4 body		62.7	73.1	52.7	57.3	125
8. HS1 of BD1		88.7	87.5	65.7	66.7	130
9. L1 coil		90.9	89.1	67.9	68.7	130
10. C2 body		78.8	83.1	60.3	63.5	110
11. L2 coil		87.8	90.1	63.6	66.4	125
12. C5 body		88.4	87.3	69.2	70.5	105
13. PCB near the RTH2		82.3	81.3	70.2	70.8	130
14. T1 top coil		88.8	88.1	78.0	78.5	110
15. T1 bottom coil		88.2	88.5	77.2	78.6	110
16. T1 core		85.4	84.3	74.5	74.8	110
17. U4 body		84.0	84.5	73.4	74.8	100
18. C32 body		87.7	87.9	76.8	78.3	125
19. LF101 coil		81.7	82.2	75.2	74.2	105
20. Output wire		63.7	54.1	58.5	50.7	90
21. Inside of enclosure		79.0	73.6	67.1	64.3	120
22. Outside of enclosure		45.4	73.5	44.2	58.5	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=47.5°C, 46.6°C, 45.9°C and 45.9°C respectively		45.0	45.0	45.0	45.0	--
Model : GS160A-24						
Unit position		Label upward	Label downward	Label upward	Label downward	--

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Clause	Requirement + Test	Result - Remark			Verdict
1. Inlet body		56.9	57.1	50.9	50.8	70
2. Internal wire		58.7	63.9	52.9	49.9	90
3. C3 body		77.6	85.3	64.5	61.8	125
4. LF1 coil		71.4	81.1	59.9	57.1	130
5. C1 body		61.1	62.9	54.2	51.0	100
6. LF2 coil		86.7	95.4	63.6	61.3	130
7. C4 body		89.8	92.6	71.9	70.3	125
8. HS1 of BD1		88.4	92.9	67.7	66.1	130
9. L1 coil		86.8	92.4	67.8	64.6	130
10. C2 body		78.7	85.5	62.7	61.9	110
11. L2 coil		93.3	98.7	69.0	66.7	125
12. C5 body		90.8	94.3	72.2	70.4	105
13. PCB near the RTH2		83.6	86.7	72.3	72.4	130
14. T1 top coil		86.5	88.7	75.8	75.5	110
15. T1 bottom coil		89.2	91.2	79.0	79.0	110
16. T1 core		87.0	89.3	74.5	73.6	110
17. U4 body		85.0	87.3	73.8	73.8	100
18. C32 body		85.6	87.3	73.6	72.7	125
19. LF101 coil		78.1	76.9	71.2	72.4	105
20. Output wire		70.2	66.7	64.6	66.3	90
21. Inside of enclosure		77.1	78.5	68.2	66.6	120
22. Outside of enclosure		66.9	66.1	60.4	58.7	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=46.8°C, 47.0°C, 46.6°C and 46.9°C respectively		45.0	45.0	45.0	45.0	--
Model : GS160A-48						
Unit position		Label upward	Label downward	Label upward	Label downward	--

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Clause	Requirement + Test	Result - Remark	Verdict

1. Inlet body	53.9	51.2	48.9	48.1	70
2. Internal wire	64.3	59.2	53.0	51.4	90
3. C3 body	54.7	51.9	48.9	48.3	125
4. LF1 coil	70.6	65.6	55.1	53.5	130
5. C1 body	73.2	68.8	58.3	56.9	100
6. LF2 coil	82.8	76.9	58.8	56.8	130
7. C4 body	58.8	54.4	50.7	49.4	125
8. HS1 of BD1	84.6	79.5	63.6	61.7	130
9. L1 coil	86.3	80.3	62.7	60.5	130
10. C2 body	75.8	70.6	58.5	56.5	110
11. L2 coil	87.8	82.6	64.8	62.9	125
12. C5 body	84.3	79.6	65.0	63.1	105
13. PCB near the RTH2	77.8	74.0	65.9	64.6	130
14. T1 top coil	80.1	76.1	68.1	66.7	110
15. T1 bottom coil	80.6	76.7	68.1	66.7	110
16. T1 core	82.5	78.4	68.5	66.9	110
17. U4 body	74.6	71.3	64.4	63.2	100
18. C32 body	81.4	77.6	67.9	66.2	125
19. LF101 coil	72.4	70.6	64.8	64.6	105
20. Output wire	62.5	61.8	57.6	58.8	90
21. Inside of enclosure	75.1	69.9	59.7	57.8	120
22. Outside of enclosure	65.1	55.4	57.5	52.1	95
Max. ambient temperature Tma (°C): Note: ambient air during test were Tamb=45.6°C, 45.2°C, 45.4°C and 45.5°C respectively	45.0	45.0	45.0	45.0	--

Supplementary information:

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

1. The temperatures were measured under worst case normal mode defined in 1.2.2.1 and as described in sub-clause 1.6.2 and at voltages as described above.
2. Unit specified with maximum of 50°C ambient temperature and all temperatures were calculated for a maximum ambient temperature of 50°C.

Winding components (providing safety isolation):

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Clause	Requirement + Test	Result - Remark	Verdict

- Class B Tmax = 120°C - 10°C= 110°C

4.5.5	TABLE: Ball pressure test of thermoplastic parts		N/A
	Allowed impression diameter (mm) .....:	≤ 2 mm	—

Part	Test temperature (°C)	Impression diameter (mm)

Supplementary information:
Bobbin of T1 are made of Phenolic material, which is accepted without test.

4.7	Table: Resistance to fire				P

Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence

Supplementary information:
For details refer to table 1.5.1.

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests		P

Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Reinforced:			
Unit: primary to secondary	DC	4242	No
Unit: primary to enclosure with foil	DC	4242	No
T1: primary to secondary	AC	3000	No
T1: core to primary	AC	3000	No
Basic:			
Unit: primary to earth	DC	3000	No
Supplementary information:			

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Clause	Requirement + Test	Result - Remark	Verdict

5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) :	25°C, if not otherwise specified.	—
	Power source for EUT: Manufacturer, model/type, output rating ..... :	--	—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Model: GS160A12						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.1 to 0.2	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.1 to 0.17	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.1 to 0.17	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.1 to 0.20	Unit cycling protection, No hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	6.1hr	FS1	0.91	Temperature constant at loaded 4.5A+output loaded 11.5A, increased to 5.0A+ output loaded 11.5A then unit shutdown. Max. temperature of T1= 127°C, U4=120°C, ambient =24.7°C, no hazards.
T1 pin(8) (After D203 to RTN)	o-l	240Vac	6.7hr	FS1	0.81	Temperature constant at loaded 2.8A+output loaded 11.5A, increased to 3.3A+ output loaded 11.5A then unit shutdown. Max. temperature of T1= 95°C, U4=91°C, ambient =24.7°C, no hazards.
+12V Output	o-l	240Vac	6.5hr	FS1	0.87	Temperature constant at loaded 15A, increased to 15.5A then unit shutdown. Max. temperature of T1= 110°C, U4=108°C, ambient =24.8°C, no hazards.
+12V Output	s-c	240Vac	30min	FS1	0.1 to 0.17	Unit cycling protection, No hazards.
Model: GS160A15						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.11 to 0.22	Unit cycling protection, No hazards.

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Clause	Requirement + Test				Result - Remark	Verdict

T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.11 to 0.22	Unit cycling protection, No hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	7.2hr	FS1	0.81	Temperature constant at loaded 5A+output loaded 9.6A, increased to 6A+ output loaded 9.6A then unit shutdown. Max. temperature of T1= 115°C, U4=110°C, ambient =23.7°C, no hazards.
T1 pin(8) (After D203 to RTN)	o-l	240Vac	7.3hr	FS1	0.85	Temperature constant at loaded 3A+output loaded 9.6A, increased to 4A+ output loaded 9.6A then unit shutdown. Max. temperature of T1=110°C, U4=108°C, ambient =24.9°C, no hazards.
+15V Output	o-l	240Vac	5.9hr	FS1	0.77	Temperature constant at loaded 10A, increased to 11A then unit shutdown. Max. temperature of T1= 83°C, U4=80°C, ambient =22.3°C, no hazards.
+15V Output	s-c	240Vac	30min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
Model: GS160A20						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.11 to 0.23	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.11 to 0.23	Unit cycling protection, No hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	2.2hr	FS1	0.78	Temperature constant at loaded 2.3A+output loaded 8A, increased to 3.5A+ output loaded 8A then unit shutdown. Max. temperature of T1= 112°C, U4=109°C, ambient =27.6°C, no hazards.

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict

T1 pin(8) (After D203 to RTN)	o-l	240Vac	4.7hr	FS1	0.88	Temperature constant at loaded 1.2A+output loaded 8A, increased to 1.5A+ output loaded 8A then unit shutdown. Max. temperature of T1= 94°C, U4=83°C, ambient =23.8°C, no hazards.
+20V Output	o-l	240Vac	5.9hr	FS1	0.89	Temperature constant at loaded 9A, increased to 9.3A then unit cycling protection. Max. temperature of T1= 85°C, U4=83°C, ambient =22.3°C, no hazards.
+20V Output	s-c	240Vac	30min	FS1	0.11 to 0.18	Unit cycling protection, No hazards.
Model: GS160A24						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.11 to 0.2	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.11 to 0.16	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.11 to 0.16	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.11 to 0.2	Unit cycling protection, No hazards.
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	6.2hr	FS1	0.98	Temperature constant at loaded 2A+output loaded 6.67A, increased to 2.8A+ output loaded 6.67A then unit shutdown. Max. temperature of T1= 106°C, U4=95°C, ambient =24.7°C, no hazards.
T1 pin(8) (After D203 to RTN)	o-l	240Vac	7.8hr	FS1	0.92	Temperature constant at loaded 1.5A+output loaded 6.67A, increased to 2A+ output loaded 6.67A then unit shutdown. Max. temperature of T1= 82°C, U4=80°C, ambient =24.9°C, no hazards.
+24V Output	o-l	240Vac	5.1hr	FS1	0.87	Temperature constant at loaded 7.7A, increased to 8A then unit cycling protection. Max. temperature of T1= 71°C, U4=70°C, ambient =26.3°C, no hazards.

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict

+24V Output	s-c	240Vac	30min	FS1	0.11 to 0.16	Unit cycling protection, No hazards.
Model: GS160A48						
T1 pin (2 – 3)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
T1 pin (5 – 6)	s-c	240Vac	30 min	FS1	0.12 to 0.22	Unit cycling protection, No hazards.
T1 pin (9, 10 – 11, 12)	s-c	240Vac	30 min	FS1	0.12 to 0.17	Unit cycling protection, No hazards.
T1 pin (9, 10 – 13, 14)	s-c	240Vac	30 min	FS1	0.12 to 0.17	Unit cycling protection, No hazards.
T1 pin (8 – FL1)	s-c	240Vac	30 min	FS1	0.12 to 0.22	Unit cycling protection, No hazards.
Q5 (G-S)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
Q5 (G-D)	s-c	240Vac	30 min	FS1	--	FS1 opened, Q5/Q6 damaged, repeat two time with all fuse sources the results were same, No hazards.
Q5 (D-S)	s-c	240Vac	30 min	FS1	--	FS1 opened, Q5/Q6 damaged, repeat two time with all fuse sources the results were same, No hazards.
U3 (1 – 2)	s-c	240Vac	2h, 42m	FS1	0.76	Unit normal operation, The maximum temperature of T1= 68.6°C, U4=65.8°C, ambient= 23.1°C. No hazards.
U3 (3 – 4)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
U3 Pin 1	o-c	240Vac	1h, 22m	FS1	0.76	Unit normal operation, The maximum temperature of T1= 68.1°C, U4=65.9°C, ambient= 23.8°C. No hazards.
U4 (1 – 2)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
U4 (3 – 4)	s-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
U4 Pin 1	o-c	240Vac	30 min	FS1	0.11	Unit shut down, No hazards.
BD1(+ - L)	s-c	240Vac	30 min	FS1	--	FS1 opened, No hazards.
C5	s-c	240Vac	30 min	FS1	--	FS1 opened, No hazards.

IEC/EN 60950-1						
Clause	Requirement + Test				Result - Remark	Verdict
T1 pin (11,12,13,14) (After D101, D102 to RTN)	o-l	240Vac	7.3hr	FS1	0.79	Temperature constant at loaded 2.5A+output loaded 3.34A, increased to 3A+ output loaded 3.34A then unit shutdown. Max. temperature of T1= 99°C, U4=82°C, ambient =23.7°C, no hazards.
T1 pin(8) (After D203 to RTN)	o-l	240Vac	8.3hr	FS1	0.95	Temperature constant at loaded 3.2A+output loaded 3.34A, increased to 3.7A+ output loaded 3.34A then unit shutdown. Max. temperature of T1= 96°C, U4=94°C, ambient =24.7°C, no hazards.
+48V Output	o-l	240Vac	5.1hr	FS1	0.89	Temperature constant at loaded 4A, increased to 4.3A then unit cycling protection. Max. temperature of T1= 76°C, U4=74°C, ambient =26.3°C, no hazards.
+48V Output	s-c	240Vac	30min	FS1	0.11 to 0.16	Unit cycling protection, No hazards.
Supplementary information: • Used abbreviations: s-c=short circuit, o-c=open circuit, o-l=overload. • The components were damaged when tested had been repeated two times with same test outcome.						

List of test equipment used:

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
Supplementary information: Information: No listing of test equipment used necessary for chosen test procedure.				

Clause	Requirement + Test	Result - Remark	Verdict

2.1.1.5	TABLE: Energy hazard measurement				P
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
Model: GS160A12					
12	11.5	12.3	15.5	169	
Model: GS160A15					
15	9.6	15.3	13.8	178	
Model: GS160A20					
20	8	20.6	10.3	196	
Model: GS160A24					
24	6.67	24.3	8.9	203	
Model: GS160A48					
48	3.34	48.4	4.7	211	
Supplementary information: Test voltage: 240Vac, 60Hz					

2.1.1.7	TABLE: Discharge test			P
Condition	τ calculated (s)	τ measured (s)	t u→ 0V (s)	Comments
Fuse in (L-N)	4.92	--	--	U_{OC} = 374V, 37% of U_{OC} = 138V, $U_{t=1s}$= 2V
Supplementary information: 1. Test condition: 264V, 60Hz 2. Overall capacitance: 1.64μF (C1=C2=0.82μF) 3. Discharge resistor: 3MΩ (R1= R2=1.5MΩ)				

2.2.2	TABLE: SELV measurement (under normal conditions)			P
Transformer	Location	Voltage (max.) (V)		Voltage Limitation Component
		V peak	V d.c.	
Model: GS160A12				
T1	pin 8 to RTN	12.8	--	--
T1	pin 9,10 to RTN	--	13.6	--
T1	pin 11,12 to RTN	24.8	--	--
T1	pin 13,14 to RTN	25.6	--	--
Model: GS160A15				

Clause	Requirement + Test	Result - Remark	Verdict

T1	pin 8 to RTN	16	--	--
T1	pin 9,10 to RTN	--	16	--
T1	pin 11,12 to RTN	30.4	--	--
T1	pin 13,14 to RTN	--	31.2	--
Model: GS160A20				
T1	pin 8 to RTN	16	--	--
T1	pin 9,10 to RTN	--	22.4	--
T1	pin 11,12 to RTN	40.8	--	--
T1	pin 13,14 to RTN	40.8	--	--
Model: GS160A24				
T1	pin 8 to RTN	14.8	--	--
T1	pin 9,10 to RTN	--	24.8	--
T1	pin 11,12 to RTN	48.8	--	--
--	After D101 to RTN	2.2	--	D101
T1	pin 13,14 to RTN	48	--	--
--	After D102 to RTN	2.2	--	D102
Model: GS160A48				
T1	pin 8 to RTN	15.2	--	--
T1	pin 9,10 to RTN	--	50	--
T1	pin 11,12 to RTN	98	--	--
--	After D101 to RTN	1.6	--	D101
T1	pin 13,14 to RTN	96	--	--
--	After D102 to RTN	1.6	--	D102
Supplementary information: Test voltage: 240Vac, 60Hz				

2.2.3	TABLE: SELV measurement (under fault conditions)	P

Location	Voltage (max.) (V)	Comments
Model: GS160A24		
Output +24V to RTN	24.2	D101 shorted then unit normal operation
Output +24V to RTN	24.2	D102 shorted then unit normal operation
Model: GS160A48		
Output +48V to RTN	48.3	D101 shorted then unit normal operation
Output +48V to RTN	48.3	D102 shorted then unit normal operation

Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information: Test voltage: 240Vac, 60Hz

2.4.2	TABLE: Limited current circuit measurement					P
Location		Voltage (V)	Current (mA)	Freq. (Hz)	Limit (mA)	Comments
C32 secondary pin to PE		0.84	0.42	60	0.7	C31=C32=3300pF; C3=C4=1000pF
C32 secondary pin to PE		0.6	0.3	60	0.7	C31=C32=4700pF
Supplementary information: 1. Test voltage: 240Vac, 60Hz and output measured with a 2kΩ non-inductive resistor as load. 2. All coupling capacitors are Y1 type therefore no shorted test for any coupling capacitor.						

2.5	TABLE: Limited power source measurement		N/A
	Limits	Measured	Verdict
According to Table 2B(Normal)			
current (in A)			
apparent power (in VA)			
Supplementary information:			

2.6.3.4	TABLE: Resistance of earthing measurement	P
Location	Resistance measured (mΩ)	Comments
Earth pin of AC inlet to output "-" trace	3	Test Current= 32 A, applied for 2 minutes
Earth pin of AC inlet to output "-" trace	3	Test Current= 40 A, applied for 2 minutes
C30/C4 trace to C3/C22 trace	9	Test Current= 32 A, applied for 2 minutes
C30/C4 trace to C3/C22 trace	10	Test Current= 40 A, applied for 2 minutes
Supplementary information: Test voltage: 12Vdc		

2.10.2	Table: working voltage measurement		P
Location	RMS voltage (V)	Peak voltage (V)	Comments
Model: GS160A12			

Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 2 to 8	228	392	
T1 pin 2 to 9, 10	216	**408**	Highest Vpk of T1
T1 pin 2 to 11, 12	**229**	384	Highest Vrms of T1
T1 pin 2 to 13, 14	213	368	
T1 pin 2 to FL1, RTN	226	384	
T1 pin 3 to 8	184	328	
T1 pin 3 to 9, 10	176	328	
T1 pin 3 to 11, 12	174	312	
T1 pin 3 to 13, 14	179	336	
T1 pin 3 to FL1, RTN	183	336	
T1 pin 5 to 8	172	352	
T1 pin 5 to 9, 10	182	376	
T1 pin 5 to 11, 12	180	368	
T1 pin 5 to 13, 14	185	392	
T1 pin 5 to FL1, RTN	170	352	
T1 pin 6 – 8	172	360	
T1 pin 6 – 9, 10	180	360	
T1 pin 6 – 11, 12	181	368	
T1 pin 6 – 13, 14	181	367	
T1 pin 6 – FL1, RTN	171	352	
U3 3 – 1	180	360	
U3 3 – 2	200	392	
U3 4 – 1	170	384	
U3 4 – 2	188	384	
U4 3 – 1	178	368	
U4 3 – 2	178	360	
U4 4 – 1	178	360	
U4 4 – 2	177	360	
C31 primary – C32 secondary	172	352	
Model: GS160A15			
T1 pin 2 to 8	**231**	**400**	Highest Vrms & Vpk of T1
T1 pin 2 to 9, 10	208	368	
T1 pin 2 to 11, 12	223	384	
T1 pin 2 to 13, 14	210	352	

Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 2 to FL1, RTN	229	384	
T1 pin 3 to 8	166	288	
T1 pin 3 to 9, 10	158	272	
T1 pin 3 to 11, 12	158	272	
T1 pin 3 to 13, 14	162	288	
T1 pin 3 to FL1, RTN	165	288	
T1 pin 5 to 8	170	352	
T1 pin 5 to 9, 10	181	384	
T1 pin 5 to 11, 12	180	368	
T1 pin 5 to 13, 14	183	400	
T1 pin 5 to FL1, RTN	171	368	
T1 pin 6 – 8	170	360	
T1 pin 6 – 9, 10	180	368	
T1 pin 6 – 11, 12	181	368	
T1 pin 6 – 13, 14	181	376	
T1 pin 6 – FL1, RTN	170	344	
U3 3 – 1	180	360	
U3 3 – 2	182	360	
U3 4 – 1	176	352	
U3 4 – 2	177	352	
U4 3 – 1	180	360	
U4 3 – 2	180	368	
U4 4 – 1	178	360	
U4 4 – 2	178	360	
C31 primary – C32 secondary	170	344	
Model: GS160A20			
T1 pin 2 to 8	**230**	400	Highest Vrms of T1
T1 pin 2 to 9, 10	220	360	
T1 pin 2 to 11, 12	227	384	
T1 pin 2 to 13, 14	208	360	
T1 pin 2 to FL1, RTN	227	384	
T1 pin 3 to 8	170	304	
T1 pin 3 to 9, 10	160	280	
T1 pin 3 to 11, 12	160	280	

Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 3 to 13, 14	164	296	
T1 pin 3 to FL1, RTN	171	304	
T1 pin 5 to 8	172	352	
T1 pin 5 to 9, 10	187	392	
T1 pin 5 to 11, 12	186	368	
T1 pin 5 to 13, 14	188	**408**	Highest Vpk of T1
T1 pin 5 to FL1, RTN	175	368	
T1 pin 6 – 8	171	352	
T1 pin 6 – 9, 10	185	368	
T1 pin 6 – 11, 12	186	384	
T1 pin 6 – 13, 14	186	392	
T1 pin 6 – FL1, RTN	172	344	
U3 3 – 1	185	368	
U3 3 – 2	203	400	
U3 4 – 1	205	384	
U3 4 – 2	206	384	
U4 3 – 1	185	368	
U4 3 – 2	184	368	
U4 4 – 1	184	368	
U4 4 – 2	183	368	
C31 primary – C32 secondary	172	352	
Model: GS160A24			
T1 pin 2 to 8	**232**	400	Highest Vrms of T1
T1 pin 2 to 9, 10	215	360	
T1 pin 2 to 11, 12	231	376	
T1 pin 2 to 13, 14	223	384	
T1 pin 2 to FL1, RTN	222	384	
T1 pin 3 to 8	172	304	
T1 pin 3 to 9, 10	162	288	
T1 pin 3 to 11, 12	161	288	
T1 pin 3 to 13, 14	167	304	
T1 pin 3 to FL1, RTN	177	320	
T1 pin 5 to 8	171	352	
T1 pin 5 to 9, 10	190	392	

Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 5 to 11, 12	187	376	
T1 pin 5 to 13, 14	191	**416**	Highest Vpk of T1
T1 pin 5 to FL1, RTN	171	368	
T1 pin 6 – 8	171	360	
T1 pin 6 – 9, 10	187	376	
T1 pin 6 – 11, 12	187	392	
T1 pin 6 – 13, 14	187	392	
T1 pin 6 – FL1, RTN	170	344	
U3 3 – 1	186	376	
U3 3 – 2	202	368	
U3 4 – 1	177	360	
U3 4 – 2	181	360	
U4 3 – 1	185	368	
U4 3 – 2	184	368	
U4 4 – 1	186	368	
U4 4 – 2	186	368	
C31 primary – C32 secondary	170	352	
Model: GS160A48			
T1 pin 2 to 8	233	392	
T1 pin 2 to 9, 10	215	384	
T1 pin 2 to 11, 12	**254**	424	Highest Vrms of T1
T1 pin 2 to 13, 14	186	368	
T1 pin 2 to FL1, RTN	230	384	
T1 pin 3 to 8	173	320	
T1 pin 3 to 9, 10	156	320	
T1 pin 3 to 11, 12	162	320	
T1 pin 3 to 13, 14	166	344	
T1 pin 3 to FL1, RTN	175	320	
T1 pin 5 to 8	171	352	
T1 pin 5 to 9, 10	206	416	
T1 pin 5 to 11, 12	206	424	
T1 pin 5 to 13, 14	212	**464**	Highest Vpk of T1
T1 pin 5 to FL1, RTN	172	368	
T1 pin 6 – 8	172	360	

Clause	Requirement + Test	Result - Remark	Verdict

T1 pin 6 – 9, 10	206	400	
T1 pin 6 – 11, 12	201	440	
T1 pin 6 – 13, 14	214	440	
T1 pin 6 – FL1, RTN	172	352	
U3 3 – 1	208	400	
U3 3 – 2	233	408	
U3 4 – 1	196	384	
U3 4 – 2	205	384	
U4 3 – 1	206	400	
U4 3 – 2	206	400	
U4 4 – 1	205	400	
U4 4 – 2	204	400	
C31 primary – C32 secondary	172	352	
Supplementary information: Test voltage: 240Vac, 60Hz			

4.6.1, 4.6.2	Table: Enclosure opening measurements	P
Location	Size (mm)	Comments
Top/sides/bottom	--	None.
Supplementary information:		

5.1.6	TABLE: Touch current and protective conductor current measurement			P
Condition	L→ terminal A (mA)	N → terminal A (mA)	Limit (mA)	Comments
Without G/Y wire				
Fuse in	0.23	0.23	0.25	To output "-" with switch "e" close.
Fuse in	0.01	0.01	0.25	To enclosure with foil and switch "e" close.
With G/Y wire				
Fuse in	0.8	1.2	3.5	To output "-" with switch "e" open.
Fuse in	0.8	1.2	3.5	To earth with switch "e" open.
Fuse in	0.01	0.01	0.25	To enclosure with foil and switch "e" close.

Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

- Test voltage: 264Vac, 60Hz
- Overall capacity: C3=C4=1000 PF, C31=C32=3300PF for Without G/Y wire;
  C31=C32=4700PF, C3=C4=C22=C30=4700 PF for With G/Y wire

C.2	TABLE: Insulation of transformers		P
	Transformer part name.....:	T1	—
	Manufacturer.....:	See appended table 1.5.1.	—
	Type.....:	See appended table 1.5.1.	—

Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Primary /input winding and secondary/output winding (internal)	464	254	4.2	12.8	5.1	12.8
Primary/input winding and core (internal)			4.2	5.6	5.1	5.6
Secondary/output winding and core (internal)			--	--	--	--
Primary/input part and secondary/output part (external)			4.2	32.9	5.1	32.9
Primary/input part and core (external)			4.2	7.9	5.1	7.9
Primary/input part and secondary/output winding (external)			4.2	14.3	5.1	14.3
Secondary/output part and core (external)			--	--	--	--
Secondary/output part and primary/input winding (external)			4.2	25.0	5.1	25.0

Description of design:	
(a) Bobbin	
Primary/input pins :	5-6, 3-2
Secondary/output pins ..... :	8-FL1, 11-9/10-13
Material (manufacturer, type, ratings)..... :	Sumitomo, type PM-9820 or PM-9630, V-0, 150°C
Thickness (mm) ..... :	Min. 0.5mm
(b) General	

Clause	Requirement + Test	Result - Remark	Verdict

Concentric windings on Phenolic bobbin for LP-39 3C94 size core (Horizontal orientation), core is considered as secondary parts, transformer construction as below.

- Primary N22 windings are tirple wire details see appended table 1.5.1 and subclause 2.10.5.12, Annex U.
- The partition width is 6.5mm in Phenolic bobbin middle for separate primary inside winding and secondary inside winding, one plastic cover width is 4.1mm min. inset to core near primary side for separate primary inside winding to core.
- There are two insulation tapes around primary winding outer.
- All winding ends additionally fixed with tubing.
- Core near primary side wrapt two insulation tapes.

Primary N22 windings from pin5 to pin6 across middle partition of bobbin then around secondary winding outer, add insulation tape and tubing in two different windings for prevent mechanical stress.

Supplementary information: All transformer source are similar except for model name, primary/secondary wire diameter and turns.

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Differences according to.....: EN 60950-1:2006+A11:2009

	CENELEC COMMON MODIFICATIONS (EN)	
ZA	Normative references to international publications with their corresponding European publications	—

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		P
1.2.13.14	In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex.		N/A
1.5.7.1	**Replace** the existing SNC by the following: In **Finland, Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N/A
1.7.2.1	**Add** as new SNC: In **Norway** and **Sweden**, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).” NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will		N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	also be accepted in Norway): “Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.” Translation to Swedish: ”Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”		
1.7.5	**Add** the following paragraph to the existing SNC for **Denmark**: For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.	No socket outlet provided.	N/A
7.3	**Delete** the existing SNC for Norway and Sweden (based on NOTE 1 of IEC 60950-1:2005 + corr. 1). **Add** as new SNC (based on future NOTE 3 of IEC 60950-1:200X): In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.		N/A

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		P
1.5.1	**Sweden** **Delete** the A-deviation.	Considered.	P
1.7.2.1	**Denmark** **Delete** the A-deviation.	Considered.	P
1.7.5	**Denmark** **Delete** the A-deviation.	Considered.	P
5.1.7.1	**Denmark** **Delete** the A-deviation.	Considered.	P

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Canadian National Differences		P
	SPECIAL NATIONAL CONDITIONS		
1.1.1	All equipment is to be designed to allow installation 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.	P
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	Considered.	P
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the CEC/NEC. For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the CEC are required to have special construction features and identification markings.	The interconnecting cable is not exceeding 3.05 m.	P
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 "Normal Operating Conditions." Likewise, a voltage rating shall not be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions."	Single-phase equipment.	N/A
1.7.7	Wiring terminals intended to supply Class 2 outputs in accordance with CEC Part 1 or NEC shall be marked with the voltage rating and “Class 2” or equivalent. Marking shall be located adjacent to the terminals and shall be visible during wiring.	Not applied for.	N/A
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.	No such fuse.	N/A

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 and receptacles (such as supplied in power distribution units) 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 special transformer overcurrent protection.	No such components provided.	N/A
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.	Overall acceptance has to be evaluated during the national approval process.	N/A
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.	Overall acceptance has to be evaluated during the national approval process.	N/A
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, wiring, marking and installation instruction requirements.		N/A
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 permanent connection equipment.	N/A
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 Tables 11 and 12 of the CEC and Article 400 of the NEC.	No power supply cord provided.	N/A
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Not permanent connection equipment.	N/A
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CSA C22.2 No. 0.	No wiring terminals.	N/A
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm^2).	No binding screws.	N/A
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for Canadian/US wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified (1.7.7).	No such wiring.	N/A
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12 A, or if the motor has a nominal voltage rating greater than 120 V, or is rated more than 1/3 hp (locked rotor current over 43 A).	Equipment is not such a device.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	No such device incorporated.	N/A
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.	Not such application.	N/A
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No liquids provided.	N/A
4.3.13.5	Equipment with lasers is required to meet the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations 21 CFR 1040, as applicable.	No laser provided.	N/A
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m^3 (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	Not such application.	N/A
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m^2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.	Not such application.	N/A
Annex H	Equipment that produces ionizing radiation is required to comply with the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations, 21 CFR 1020, as applicable.	No ionizing radiation.	N/A
OTHER DIFFERENCES			
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements. These components include: 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 interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring,	UL approved components used. Refer to table 1.5.1 of IEC 60950-1 test report for details.	P

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cutoffs, thermostats, (multi-layer) transformer winding wire, transient voltage surge suppressors, tubing, wire connectors, and wire and cables.		
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as either a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply. This maximum operating voltage shall include consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment.		N/A
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vpeak or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.	No TNV circuits.	N/A
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.	No TNV circuits.	N/A
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified.	Overall acceptance has to be evaluated during the national approval process.	N/A
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	N/A
4.2.11	For equipment intended for mounting on racks and provided with slide/rails allowing the equipment to slide away from the rack for installation, service and maintenance, additional construction, performance and marking requirements are applicable to determine the adequacy of the slide/rails.	Not such application.	N/A
4.3.2	Equipment with handles is required to comply with special loading tests.	No handles.	N/A
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV circuits.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are to be overloaded. During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test shall be repeated twice (three tests total) using new components as necessary.	Complied. Refer to table 5.3 of IEC 60950-1 test report for details.	P
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 circuits.	N/A
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 circuits.	N/A
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.	No TNV circuits.	N/A
Annex NAF	Document (paper) shredders likely to be used in a home or home office (Pluggable Equipment Type A plug configuration) are required to comply with additional requirements, including markings/instructions, protection against inadvertent reactivation of a safety interlock, disconnection from the mains supply (via provision of an isolating switch), and protection against operator access (accessibility determined via new accessibility probe & probe/wedge).	Not such application.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	Korean National Differences		P
	Corresponding National Standard: K 60950-1		P
1.5.101	Addition: Plugs for the connection of the apparatus to the supply mains shall comply with the Korean requirement (KSC 8305).	To be evaluated when submitted for national approval.	N/A
8	Addition: EMC The apparatus shall comply with the relevant CISPR standards.	To be evaluated when submitted for national approval.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
	US National Differences		P
SPECIAL NATIONAL CONDITIONS BASED ON FEDERAL REGULATIONS			
1.1.1	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, 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.	P
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	Considered.	P
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type 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.	The interconnecting cable is not exceeding 3.05 m.	P
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.	Single-phase equipment.	N/A
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.	No such fuse.	N/A
2.7.1	Suitable NEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) 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 special transformer overcurrent protection.	No such components provided.	N/A
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC.	Overall acceptance has to be evaluated during the national approval process.	N/A
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.	Overall acceptance has to be evaluated during the national approval process.	N/A
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, wiring, marking and installation instruction requirements.		N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
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 permanent connection equipment.	N/A
3.2.5	Power supply cords are required to be no longer than 4.5 m in length and minimum length shall be 1.5 m. Flexible power supply cords are required to be compatible with Article 400 of the NEC.	No power supply cord provided.	N/A
3.2.9	Permanently connected equipment must have a suitable wiring compartment and wire bending space.	Not permanent connection equipment.	N/A
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm2).	No binding screws.	N/A
3.3.4	Terminals for permanent wiring, including protective earthing terminals, must be suitable for U.S wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified (1.7.7).	No such wiring.	N/A
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12 A, or if the motor has a nominal voltage rating greater than 120 V, or is rated more than 1/3 hp (locked rotor current over 43 A).	Equipment is not such a device.	N/A
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	No such device incorporated.	N/A
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.	Not such application.	N/A
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No liquids provided.	N/A
4.3.13.5	Equipment with lasers is required to meet the Code of Federal Regulations 21 CFR 1040.	No laser provided.	N/A
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m3 (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	Not such application.	N/A
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.	Not such application.	N/A
Annex H	Equipment that produces ionizing radiation must comply with Federal Regulations, 21 CFR 1020	No ionizing radiation.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict

OTHER NATIONAL DIFFERENCES			
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These components include: attachment plugs, 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 interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cutoffs, thermostats, (multi-layer) transformer winding wire, transient voltage surge suppressors, tubing, wire connectors, and wire and cables.	UL approved components used. Refer to table 1.5.1 of IEC 60950-1 test report for details.	P
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as either a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply. This maximum operating voltage it to include consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment.		N/A
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vpeak or 60 Vd.c., the max. acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.	No TNV circuits.	N/A
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.	No TNV circuits.	N/A
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified.	Overall acceptance has to be evaluated during the national approval process.	N/A
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.	No CRT.	N/A

National Differences			
Clause	Requirement – Test	Result – Remark	Verdict
4.2.11	For equipment intended for mounting on racks and provided with slide/rails allowing the equipment to slide away from the rack for installation, service and maintenance, additional construction, performance and marking requirements are applicable to determine the adequacy of the slide/rails.	Not such application.	N/A
4.3.2	Equipment with handles is required to comply with special loading tests.	No handles.	N/A
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	No TNV circuits.	N/A
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are to be overloaded. During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test shall be repeated twice (three tests total) using new components as necessary.	Complied. Refer to table 5.3 of IEC 60950-1 test report for details.	P
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 circuits.	N/A
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 circuits.	N/A
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.	No TNV circuits.	N/A
Annex NAF	Document (paper) shredders likely to be used in a home or home office (Pluggable Equipment Type A plug configuration) are required to comply with additional requirements, including markings/instructions, protection against inadvertent reactivation of a safety interlock, disconnection from the mains supply (via provision of an isolating switch), and protection against operator access (accessibility determined via new accessibility probe & probe/wedge).	Not such application.	N/A

Product: AC/DC SWITCHING ADAPTOR

Type Designation: GS160AX (X=12, 15, 20, 24, 48)

Product: AC/DC SWITCHING ADAPTOR

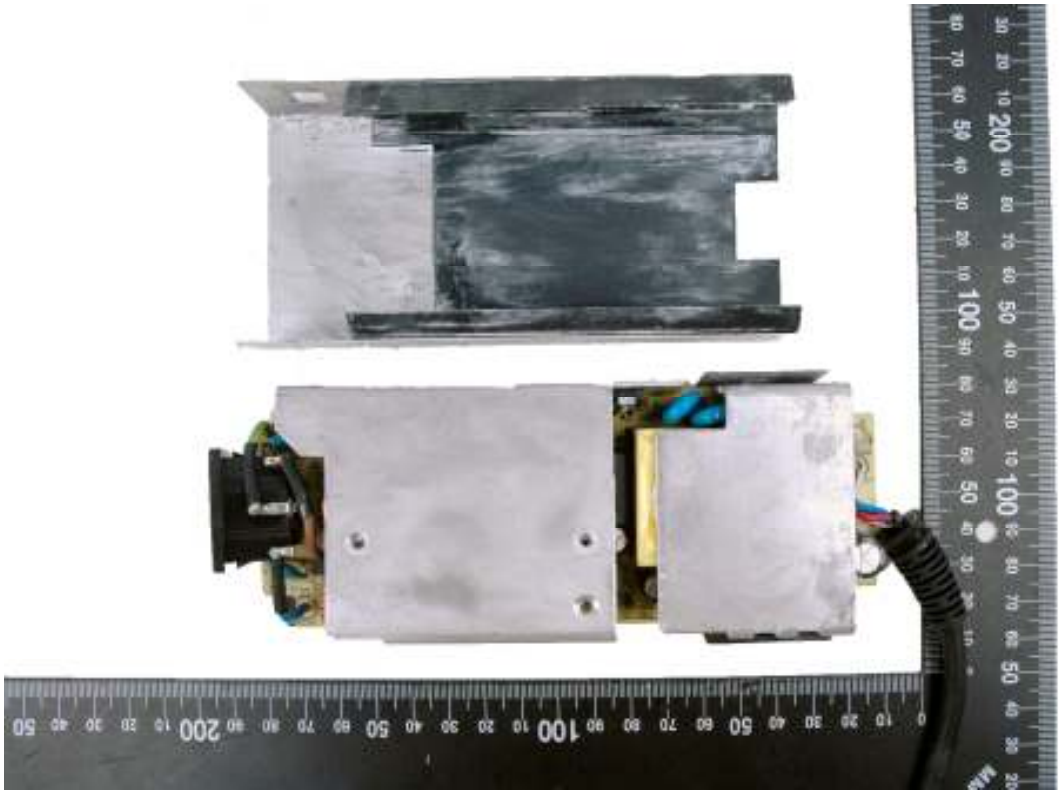
Type Designation: GS160AX (X=12, 15, 20, 24, 48)

With G/Y wire

Product: AC/DC SWITCHING ADAPTOR

Type Designation: GS160AX (X=12, 15, 20, 24, 48)

With G/Y wire



Without G/Y wire

Product: AC/DC SWITCHING ADAPTOR

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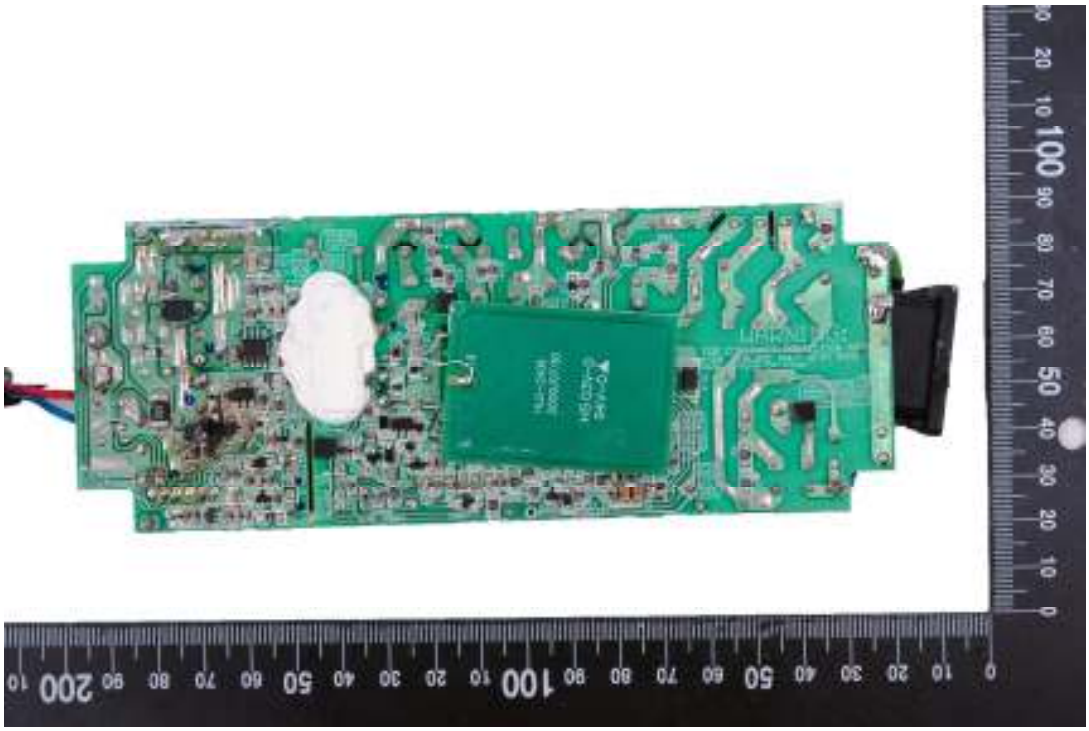

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Type Designation: GS160AX (X=12, 15, 20, 24, 48)