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Test Verification of Conformity

On the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the essential requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address	:	BUILD RAY ENTERPRISE CO., LTD. No.225, Gongxue 1st St., South Dist., Taichung City 40245, Taiwan
Product(s) Tested	:	Vibration Machine
Ratings and principal characteristics	:	24Vdc, 0.6A, Class III
Model(s)	:	BR-2406, BR-2407, BR-2410
Brand name	:	N/A
Relevant Standard(s)/Specification(s)	:	EN 60335-1:2002 + A1:2004 + A11:2004 + A12:2006 + A2:2006 EN 50366:2003 + A1:2006 NOTE: The equipment covered by this document is subject to mandatory compliance with - the European LVD Directive 2006/95/EC.
Verification Issuing Office Name & Address	:	Intertek Testing Services Taiwan Ltd. 5F, No. 423, Ruiguang Road, Neihu District, Taipei 114, Taiwan
Verification (Report Number(s))	:	ETS-071019/01 (ETS-071019, ETS-071019-01)

NOTE 1: This verification is part of the full test report(s) and should be read in conjunction with it.
NOTE 2: This verification supersedes all previous verifications with the noted Verification/Report number(s) dated before this verification issuance.

NOTE: This annex is part of the Test Verification of Conformity and should be read in conjunction with it.

Sammy Wu

SAMMY WU
SENIOR MANAGER
[illegible] DIVISION

August 26, 2008

TEST REPORT

IEC/EN 60335-1

Safety of household and similar electrical appliances

Report Reference No. ..... :	ETS-071019-01
Tested by (name+signature) ..... :	Kevin Huang
Approved by (name+signature) ..... :	Jack Wu
Date of issue ..... :	August 26, 2008
Total number of pages ..... :	Test report, 8 pages + Appendix 1, 52 pages + Appendix 2, 3 pages + Appendix 3, 3 pages + Appendix 4, 1 page + Appendix 5, 2 pages

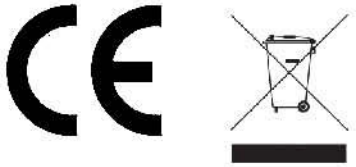
CB/CCA Testing Laboratory ..... :	Intertek Testing Services Taiwan Limited
Address ..... :	5F, No. 423, Ruiguang Rd., Neihu District, Taipei 114, Taiwan
Testing location/ procedure ..... :	Intertek Testing Services Taiwan Limited / CCA
Testing location/ address ..... :	6F, No. 423, Ruiguang Rd., Neihu District, Taipei 114, Taiwan
Applicant's name ..... :	BUILD RAY ENTERPRISE CO., LTD.
Address ..... :	No.225, Gongxue 1st St., South Dist., Taichung City 40245, Taiwan
Test specification:	
Standard ..... :	EN 60335-1:2002 + A1:2004 + A11:2004 + A12:2006 + A2:2006 EN 50366:2003 + A1:2006
Test procedure ..... :	CCA
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IECEN60335_1B
Test Report Form(s) Originator ..... :	Nemko AS
Master TRF ..... :	Dated 2006-10

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 ..... :	Vibration Machine
Trade Mark ..... :	N/A
Manufacturer ..... :	BUILD RAY ENTERPRISE CO., LTD.
Model/Type reference ..... :	BR-2406, BR-2407, BR-2410
Ratings ..... :	24Vdc, 0.6A, Class III

Copy of marking plate:

BUILD RAY ENTERPRISE CO., LTD.
Model: BR-2406
Rating: 24Vdc, 0.6A



Note: Model may be BR-2407, or BR-2410

Summary of Test:

From the result of our inspection and tests on the submitted samples, we conclude that they **comply** with the requirements of the standards.

Test item particulars	:	
Classification of installation and use	:	Stationary
Supply Connection	:	Power Adaptor (not included)
	:	
	:	
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	:	June 18, 2008
Date (s) of performance of tests	:	June 30, 2008

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 comma (point) is used as the decimal separator.

The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

General product information:

1. Appliances covered in this Report are Vibration Machines. These appliances are powered by a certified Class II power adaptor for power connection which is not included in this Report.

2. Models BR-2406 , BR-2407 , and BR-2410 are identical to each other except for appearances.

Amendment 1 Report (original certificate no.: ETS-071019/00):

The original Test Report Ref. ETS-071019, dated 2008 April 25 was modified on August 26, 2008 to include the following changes and/or additions, which were considered technical modifications:

1.Add alternative power adaptor (GME Technology Co., Ltd., Model: GFP241DA-2410-1)

EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
24	COMPONENTS		
24.1	Components comply with safety requirements in relevant IEC standards		P
	List of components	***(see appended table)***	***P***
	Components not tested and found to comply with relevant IEC standard for the number of cycles specified are tested in accordance with 24.1.1 to 24.1.9		N/A
	Components not tested and found to comply with relevant IEC standard, components not marked or not used in accordance with its marking, tested under the conditions occurring in the appliance		N/A
	Lampholders and starterholders not being tested and found to comply with the relevant IEC standard, tested as a part of the appliance and additionally according to the gauging and interchangeability requirements of the relevant IEC standard		N/A
24.1.1	Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14, or		N/A
	tested according to annex F		N/A
24.1.2	Safety isolating transformers complying with IEC 61558-2-6, or		N/A
	tested according to annex G	***Tested eith appliance for Adaptor to comply with EN 61558-1 and EN 61558-2-17 and EN 61558-2-6***	***P***
24.1.3	Switches complying with IEC 61058-1, the number of cycles of operation being at least 10 000, or		N/A
	tested according to annex H		N/A
	If the switch operates a relay or contactor, the complete switching system is subjected to the test		N/A
24.1.4	Automatic controls complying with IEC 60730-1 with relevant part 2. The number of cycles of operation being:		
	- thermostats: 10 000		N/A
	- temperature limiters: 1 000		N/A
	- self-resetting thermal cut-outs: 300		N/A
	- voltage maintained non-self-resetting thermal cut-outs: 1000		N/A
	- other non-self-resetting thermal cut-outs: 30		N/A
	- timers: 3 000		N/A

EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- energy regulators: 10 000		N/A
	Thermal motor protectors are tested in combination with their motor under the conditions specified in Annex D		N/A
	For water valves containing live parts and that are incorporated in external hoses for connection of an appliance to the water mains, the degree of protection declared for subclause 6.5.2 of IEC 60730-2-8 is IPX7		N/A
24.1.5	Appliance couplers complying with IEC 60320-1		N/A
	However, appliances classified higher than IPX0, the appliance couplers complying with IEC 60320-2-3		N/A
	Interconnection couplers complying with IEC 60320-2-2		N/A
24.1.6	Small lamp holders similar to E10 lampholders complying with IEC 60238, the requirements for E10 lampholders being applicable		N/A
24.1.7	If the remote operation of the appliance is via a telecommunication network, the relevant standard for the telecommunication interface circuitry in the appliance is IEC 62151		N/A
24.1.8	The relevant standard for thermal links is IEC 60691. Thermal links not complying with IEC 60691 are considered to be an intentionally weak part for the purposes of Clause 19		N/A
24.1.9	Relays, other than motor starting relays, tested as part of the appliance		N/A
	They are also tested in accordance with Clause 17 of IEC 60730-1, the number of operations in 24.1.4 selected according to the relay function in the appliance .....:	Certified relays are used.	N/A
G	ANNEX G (NORMATIVE) SAFETY ISOLATING TRANSFORMERS		
	The following modifications to this standard are applicable for safety isolating transformers:		***P***
7	Marking and instructions		
7.1	Transformers for specific use marked with:		
	-name, trademark or identification mark of the manufacturer or responsible vendor	***GME***	***P***
	-model or type reference	***GFP241DA-2410-1***	***P***
17	Overload protection of transformers and associated circuits		
	Fail-safe transformers comply with subclause 15.5 of IEC 61558-1		N/A

EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict
22	Construction		
	Subclauses 19.1 and 19.1.2 of IEC 61558-2-6 are applicable	***Complying with EN 61558-1 and EN 61558-2-17 and EN 61558-2-6***	***P***
29	Clearances, creepage distances and solid insulation		
29.1, 29.2 and 29.3	***The distances specified in items 2a, 2c and 3 in table 13 of IEC 61558-1 apply***		***P***

EN 60335-1			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
DC motor	Hsiang Neng	HN-24-5530T	24Vdc 2800rpm	Applicable parts of EN 60335	Tested with the appliance
Power Switch	Light Country Co., Ltd.	RC series	250Vac 10A 1E3 10T85/55	DIN EN 61058	VDE
Plastic cover	Chi Mei Corp.	PA-756	HB	Applicable parts of EN 60335	Tested with the appliance
Choke	J.X.E.	UU-15.7	35mH	Applicable parts of EN 60335	Tested with the appliance
- Bobbin	Chang Chun	T375J	V-0 150°C	Applicable parts of EN 60335	Tested with the appliance
- Magnet Wire	Pacific	UEW/U	130°C	Applicable parts of EN 60335	Tested with the appliance
- Varnish	Elantas Electrical Insulation Elantas Pdg Inc	V-1630FS	155°C	Applicable parts of EN 60335	Tested with the appliance
Adaptor	***GME***	***GFP241DA-2410-1***	***I/P: 100-240Vac O/P: 24Vdc, 1A***	***Applicable parts of EN 61558-1 and EN 61558-2-17 and EN 61558-2-6***	***Tested with the appliance, please refer to Appendix***
[1)] An asterisk indicates a mark which assures the agreed level of surveillance					

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
4.	**GENERAL REQUIREMENTS**		
	The transformer shall cause no danger to persons or surroundings.		P
5.	**GENERAL NOTES ON TESTS**		
	Test performed accordinlg to Cl. 5, e.g. nature of supply, sequence of testing, etc.		P
6.	**RATINGS**		
6.101	Rated output voltage shall not exceed:		
	1000 V a.c. or 1415 V ripple-free d.c. for separating transformers (EN 61558-2-17: 97)		N/A
	500 V a.c. or 708 V ripple-free d.c. for isolating transformers (EN 61558-2-17: 97)		N/A
	50 V a.c. or 120 V ripple-free d.c. for safety isolating transformers (EN 61558-2-17: 97)	24 Vdc	P
6.102	Rated output shall not exceed 10 kVA for single-phase transformer, 16 kVA for poly-phase transformer (EN 61558-2-17: 97)	Max. 24 VA (24 Vdc X 1.0 A)	P
6.103	Rated frequencies range from 500 Hz to 1 MHz: (EN 61558-2-17: 97)	The working frequency of transformer measured 30 kHz	P
6.104	Rated supply voltage shall not exceed 1000V a.c.: (EN 61558-2-17: 97)	100 – 240 Vac	P
7.	**CLASSIFICATION**		
7.1	According to protection against electric shock: Class I, II, III	Class II	P
7.2	According to protection against abnormal use:		
	-inherently short-circuit proof		N/A
	-non-inherently short-circuit proof		P
	-non-short-circuit proof		N/A
	-fail safe		N/A
7.3	According to protection against harmful ingress of water in accordance with IEC 60 529:	Ordinary transformer	P
7.4	According to their mobility:	Portable (desk-top)	P
7.5	According to their time of operation	Continuous operation	P
7.6	According to their intended use:	Associated	P

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
8	**MARKING AND OTHER INFORMATION**		
8.1	Transformer marked with:		P
	a) rated supply voltage or voltage range (V) .....:	100 – 240 Vac	P
	b) rated output voltage (V) .....:	24 Vdc	P
	c) rated output (VA, kVA or W) .....:	Max. 24 VA	N/A
	d) rated output current (A) .....:	1.0 A	P
	e) rated frequency (Hz) .....:	50 / 60 Hz	P
	f) rated power factor (if not 1) .....:		N/A
	g) symbol for nature of output current for transformers with rectifier	V⎓	P
	h) symbol for electrical function (according to Part 2)		P
	i) manufacturer's name or trademark	GME	P
	j) model or type reference	GFP241DA-2410-1	P
	k) vector group according to IEC 60 076 for three-phase transformer	Single phase transformer	N/A
	l) symbol for Class II	Provided	P
	m) symbol for Class III		N/A
	n) index IP (if not IP00 or IP20) or ordinary transformer	Ordinary transformer	N/A
	o) rated max. ambient temperature ta (if not 25 °C) .....:	40 °C	N/A
	p) short-time operation or intermittent operation: rated operating and resting time	Continuous operation	N/A
	- short-circuit voltage (% rated supply voltage) for stationary transformers > 1000 VA .....:		N/A
8.2	Marking for transformers IP00 or for associated transformers: type and trademark, instruction sheets	Fully complying with clause 8	N/A
8.3	Adjusted voltage easily and clearly discernible	One supply voltage range only	N/A
8.4	For each tapping or winding: rated output voltage and rated output		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
8.5	Symbol for short-circuit proof transformers or non-inherently short-circuit proof transformers		P
	Rated current (A or mA) and symbol for time current characteristics of the fuses for non-inherently short-circuit proof transformer with incorporated fuses and non-short-circuit proof transformer .....:	The fuse-link (F1) is not replaceable	N/A
	Manufacturer's model or type reference and rating of the device for non-inherently short-circuit proof transformers with incorporated replaceable protective device (other than fuses)		N/A
	Characteristic symbol for fail-safe transformers		N/A
8.6	Terminals for neutral: "N"		N/A
	Terminal for earthing		N/A
	Identification of input terminals: "PRI"		N/A
	Identification of output terminals: "SEC"		N/A
	Symbol for any point/terminal in connection with frame or core		N/A
8.7	Indication for correct connection	Convenient connector is provided	N/A
8.8	Instruction sheet for type X, Y, Z attachments	Direct plug-in equipment	N/A
8.9	Transformer for indoor use shall be marked on the label or in the instruction sheet with the words: "for indoor use only"	The sentence “FOR INDOOR USE ONLY” is provided on the marking plate	P
8.10	Symbol for Class II construction not confused with maker's name or trademark		P
8.11	Correct symbols:		
	Volts	V	P
	Amperes	A	P
	Volt amperes (or volt-amperes reactive for reactors)		N/A
	Watts		N/A
	Hertz	Hz	P
	Input		N/A
	Output		N/A
	Direct current		P
	Neutral		N/A
	Single-phase a.c.		P

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
	Three-phase a.c.		N/A
	Three-phase and neutral a.c.		N/A
	Power factor		N/A
	Class II construction		P
	Class III construction		N/A
	Fuse-link		N/A
	Rated max. ambient temperature	40 °C	N/A
	Frame or core terminal		N/A
	Protective earth		N/A
	IP number		N/A
	For indoor use only (text)	The sentence “FOR INDOOR USE ONLY” is provided on the marking plate	P
	Fail-safe separating transformer (EN 61558-2-17:97)		N/A
	Non-short-circuit proof separating transformer (EN 61558-2-17:97)		N/A
	Short-circuit proof separating transformer (EN 61558-2-17:97)		N/A
	Fail-safe isolating transformer (EN 61558-2-17:97)		N/A
	Non-short-circuit proof isolating transformer (EN 61558-2-17:97)		N/A
	Short-circuit proof isolating transformer (EN 61558-2-17:97)		N/A
	Fail-safe safety isolating transformer (EN 61558-2-17:97)		N/A
	Non-short circuit proof safety isolating transformer (EN 61558-2-17:97)		N/A
	Short-circuit proof safety isolating transformer (EN 61558-2-17:97)		P
8.12	Figures, letters or other visual means for different positions of regulating devices and switches		N/A
	OFF position indicated by figure 0		N/A
	Greater output, input etc. indicated by higher figure		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
8.13	Marking not on screws or other easily removable parts	On the bottom enclosure	P
	Marking clearly discernible (transformer ready for use)		P
	Marking for terminals clearly discernible if necessary after removal of the cover		N/A
	Marking for terminals: no confusion between input and output		N/A
	Marking for interchangeable protective devices positioned adjacent to the base	No such devices within the EUT	N/A
	Marking for interchangeable protective devices clearly discernible after removal of cover and protective device		N/A
8.14	Special informations for installation if necessary		N/A
8.15	Marking durable and easily legible		P
9	**PROTECTION AGAINST ACCESSIBILITY OF HAZARDOUS LIVE PARTS**		
9.1	Live parts are not hazardous live if:		
	- in case of a plug: 5 s after the interruption of the supply the voltage between the pins shall not exceed 35 V (peak) a.c. or 60 V ripple free d.c.	Measured 0 Vpeak after 5 s	P
	The live part is not hazardous live if separated from the supply by double or reinforced insulation (see 19.8) and between any parts of contacts the following values do not exceed:		
	a) touch voltage < 35 V (peak) a.c. or 60 V d.c.	1) Between output terminals measured Max. 24.5 Vdc 2) Between L/N and output terminal measured Max. 178 Vpeak (also see 9.1 b)	P
	b) if the voltage higher than limited in a) touch current according to Annex J		
	for a.c. U2: 0,35 V peak (0,7 mA peak)	Measured Max. U2 = 0.28 Vpeak	P
	for d.c. U1: 1 V d.c. peak (2 mA d.c.)		N/A
	for a.c. U1: 35 V peak (70 mA a.c. higher frequencies)	Measured Max. U1 = 5.2 Vpeak	P
	c) discharge: < 50 µC (between 60 V and 15 kV)	0.1 µC	P
	d) energy: < 350 mJ (> 15 kV)		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
9.2	Safety isolating transformers (EN 61558-2-17:97):		
	- if the no-load output voltage is ≤ 35 V peak a.c. or ≤ 60 V ripple free d.c., live parts may be accessible (EN 61558-2-17:97)	Measured Max. 24.5 Vdc	P
	Transformers > IP00 shall have an adequate protection against accidental contact:		
	- with hazardous live parts		P
	- with metal parts separated from hazardous live parts for Class II transformers by basic insulation even after removal of detachable parts except for:		N/A
	- lamps with caps other than E10		N/A
	- type D fuse-carriers		N/A
	Isolating and safety isolating transformers (EN 61558-2-17:97):		
	- if the no-load output voltage is > 35 V peak a.c. or > 60 V ripple free d.c. (EN 61558-2-17:97):	Measured Max. 24.5 Vdc	N/A
	- only one pole of parts connected to the output circuit may become accessible (EN 61558-2-17: 97)		N/A
	Lacquers, enamel, paper, cotton, oxide film on metal parts not used for protection against accidental contact with hazardous live parts:		
	- compliance is checked by inspection and by relevant tests according to IEC 60 529	Ordinary transformer	N/A
	- ordinary transformer: test according to fig. 2 (test finger)		P
	- Class II transformers and Class II parts of Class I construction are tested with the test pin shown in fig. 3		N/A
	- hazardous live parts shall not be touchable by test finger		P
	- for Class II transformers: metal parts separated by basic insulation from hazardous live parts not touchable by test finger		P
	- hazardous live parts shall not be touchable with the test pin		P
10	**CHANGE OF INPUT VOLTAGE SETTING**		
	Voltage setting not possible to change without a tool	No voltage setting device	N/A
	Different rated supply voltages:		
	- indication of voltage on the transformer discernible		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
11	**OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD**		
11.1	Difference from rated value (without rectifier; with rectifier):		
	a) inherently short-circuit proof transformers with one rated output voltage for output voltage: ≤ 10 %; ≤ 15 %		N/A
	b) inherently short-circuit proof transformers with one more than 1 rated output voltage for highest output voltage: ≤ 10 %; ≤ 15 %		N/A
	c) idem for other output voltages: ≤ 15 %; ≤ 20 %		N/A
	d) other transformers for output voltages: ≤ 5 %; ≤ 10 % d.c.	(see appended table 11 / 12)	P
12	**NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)**		
	Remark: with rectifier measuring on both sides of the rectifier	It didn't measure before rectifier because of user does not have access	P
12.101	No-load output voltage (EN 61558-2-17:97):		
	- separating transformers ≤ 1000 V a.c. or ≤ 1415 V ripple-free d.c. (EN 61558-2-17:97)		N/A
	- isolating transformers ≤ 500 V a.c. or ≤ 708 V ripple-free d.c. (EN 61558-2-17:97)		N/A
	- safety isolating transformers ≤ 50 V a.c. or ≤ 120 V ripple-free d.c. (EN 61558-2-17:97)	Measured Max. 24.5 Vdc	P
13	**SHORT-CIRCUIT VOLTAGE**		
	Difference from marking for short-circuit voltage ≤ 20%		N/A
14	**HEATING**		
14.1	No excessive temperature in normal use		P
14.1.1	Classified material according to IEC 60 085 and IEC 60 216 insulating class temperature index		P
14.1.2	No classified material but the measured temperature does not exceed the value of Class A		N/A
14.1.3	No classified material but the measured temperature exceeds the value for Class A, the live parts of the transformers are submitted to the test of 14.3		N/A
14.2	Upri (V): 1,06 times rated supply voltage .....:	90 Vac (0.9 times of 100 Vac) and 254.4 Vac (1.06 times of 240 Vac)	—

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
	Cos ϕ = rated power factor .....:	—	—
	Room temperature: rated ambient temperature (° C) .....:	40 °C	—
	Type X, Y, Z attachments: 1 pull (5 N) to the connection windings		N/A
	Temperature of windings:		
	- Class A: ≤ 100 °C		N/A
	- Class E: ≤ 115 °C		N/A
	- Class B: ≤ 120 °C	(see appended table 14)	P
	- Class F: ≤ 140 °C		N/A
	- Class H: ≤ 165 °C		N/A
	- other classes		N/A
	Temperature of external enclosures of stationary transformers:		
	- metal: ≤ 70 K		N/A
	- other material: ≤ 80 K		N/A
	Temperature of external enclosure of stationary transformer ≤ 85 °C (not touchable with the IEC test finger)		N/A
	Temperature of external enclosures, handles, etc. of portable transformers:		
	- continuously held parts of metal: ≤ 55 °C		N/A
	- continuously held parts of other material: ≤ 75 °C		N/A
	- not continuously held parts of metal: ≤ 60 °C		N/A
	- not continuously held parts of other material: ≤ 80 °C	(see appended table 14)	P
	Temperature of terminals for external conductors ≤ 70 °C		N/A
	Temperature of terminals of switches ≤ 70 °C		N/A
	Temperature of internal and external wiring:		
	- rubber: ≤ 65 °C		N/A
	- PVC: ≤ 70 °C	(see appended table 14)	P
	Temperature of parts where safety can be affected:		
	- rubber: ≤ 75 °C		N/A
	- phenol-formaldehyde: ≤ 105 °C		N/A
	- urea-formaldehyde: ≤ 85 °C		N/A
	- impregnated paper and fabric: ≤ 85 °C		N/A
	- impregnated wood: ≤ 85 °C		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
	- PVC, polystyrene and similar thermoplastic material: ≤ 65 °C	(see appended table 14)	P
	- varnished cambric: ≤ 75 °C		N/A
	Temperature rise of supports ≤ 85 °C	(see appended table 14)	P
	Temperature of printed boards:		
	- bonded with phenol-formaldehyde: ≤ 105 °C	(see appended table 14)	P
	- melamine-formaldehyde: ≤ 105 °C		N/A
	- phenol-furfural: ≤ 105 °C		N/A
	- polyester: ≤ 105 °C		N/A
	- bonded with epoxy: ≤ 140 °C		N/A
	Electric strength between input and output windings (18.3, 1 min.); test voltage (V) .....:	4200 Vac (see appended table 18.3)	P
14.3	Cycling test (10 cycles):		
	- no-load current (mA) (18.4) .....:		N/A
	- no-load input (18.4)		N/A
14.3.1	- heat run (temperature in table 2)		N/A
14.3.2	- moisture treatment (48 h, 17.2)		N/A
14.3.3	- vibration test: 30 min; amplitude 0,35 mm; frequency range: 10 Hz, 55 Hz, 100 Hz		N/A
14.3.4	After each test:		N/A
	- insulation resistance (18.1 and 18.2)		N/A
	- electric strength, no breakdown (18.3); 2 min; test voltage 35% of specified value (table VI)		N/A
	- electric strength, no breakdown (18.4); no load; duration (min): 2 min; Upri (V): 2 times rated supply voltage; frequency (Hz): 2 times rated frequency .....:		N/A
	- no-load current ≤ 30% (18.4) deviates from the first measurement .....:		N/A
	- no-load input ≤ 30% (18.4) deviates from the first measurement .....:		N/A
14.101	Switching frequencies ≤ 40 kHz (kHz) (EN 61558-2-17:97) .....:	Measured Max. 30 kHz	P
	Values of table 1 are used (EN 61558-2-17:97)		N/A
	Special specimen with a thermocouple or equivalent placed in the hottest area is used (EN 61558-2-17:97)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
15	**SHORT-CIRCUIT AND OVERLOAD PROTECTION**		
15.1	Upri (V): rated supply voltage factor .....:	254.4 Vac (1.06 times of 240 Vac)	—
	Max. temperature of winding protected inherently (insulation class): ≤ 150 °C (A); ≤ 165 °C (E); ≤ 175 °C (B); ≤ 190 °C (F); ≤ 210 °C (H)		N/A
	Max. temperature of winding protected by protective device during the time T given in table 4 (insulation class): ≤ 200 °C (A); ≤ 215 °C (E); ≤ 225 °C (B); ≤ 240 °C (F); ≤ 260 °C (H)	(see appended table 15)	P
	Max. temperature of winding protected by protective device after first hour, peak value (insulation class): ≤ 175 °C (A); ≤ 190 °C (E); ≤ 200 °C (B); ≤ 215 °C (F); ≤ 235 °C (H)		N/A
	Max. temperature of winding protected by protective device after first hour, arithmetic mean value (insulation class): ≤ 150 °C (A); ≤ 165 °C (E); ≤ 175 °C (B); ≤ 190 °C (F); ≤ 210 °C (H)	(see appended table 15)	P
	Max. temperature of external enclosures (accessible by test finger) ≤ 105 °C	(see appended table 15)	P
	Max. temperature of insulation of wiring (rubber and PVC) ≤ 85 °C	(see appended table 15)	P
	Temperature rise of supports ≤ 105 °C	(see appended table 15)	P
	The specimen used for tests of Cl. 14 is also used for this subclause (EN 61558-2-17:97)		P
15.2	For inherently short-circuit proof transformers and for transformers with rectifiers: temperature rises ≤ values in table 3		N/A
15.3	For non-inherently short-circuit proof transformers and for transformers with rectifiers: temperature rises ≤ values in table 3	(see appended table 15)	P
15.3.1	Output terminals short-circuited: protection device operates	(see appended table 15)	P
15.3.2	If protected by a fuse according to IEC 60 269-2 or IEC 60 269-3 or a technically equivalent fuse, transformer is loaded with time T and a current equal to k times values according to table 4		N/A
15.3.3	If protected by a fuse according to IEC 60 127 or ISO 8820 or a technically equivalent fuse, transformer is loaded for the longest pre-arcing time with the redundant current as specified in the standard sheet		N/A
15.3.4	If protected by a circuit-breaker according to IEC 60 898 the transformer is loaded with a current equal to 1,45 times the value of the circuit-breaker		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
15.3.5	If other overload protection than a fuse (IEC 60 127) or a circuit-breaker (IEC 60 898) test with 0,95 times of operating current	(see appended table 15)	P
15.3.6	If thermal cut-outs, test with 0,95 times of operating current		N/A
15.4	For non-short-circuit proof transformers: temperature rises ≤ values in table 3		N/A
15.5	For fail-safe transformers:		
	- Upri (V): 1,06 times rated supply voltage .....:		—
	- Isec (A): 1,5 times rated output current .....:		—
	- time until steady-state conditions t1 (h) .....:		—
	- time until failure t2 (h): ≤ t1; ≤ 5 h .....:		N/A
	During the test:		
	- no flames, molten material, etc.		N/A
	- temperature of enclosure ≤ 175 °C		N/A
	- temperature of plywood support ≤ 125 °C		N/A
	After the test:		
	- electric strength (Cl. 18, 1 min, test voltage: 35% of specified value); no flashover or breakdown for primary-to-secondary only for safety isolating, isolating and separating transformer and for primary-to-body for all kinds of transformer		N/A
	- bare hazardous live parts not accessible by test finger through holes of enclosure		N/A

16	**MECHANICAL STRENGTH**		
16.1	After tests of 16.2, 16.3 and 16.4:		
	- no damage		P
	- hazardous live parts not accessible by test pin according to 9.2		P
	- no damage for insulating barriers		P
	- handles, levers, etc. have not moved on shafts		N/A
16.2	For stationary and portable transformers: 3 blows, impact energy 0,5 Nm		P
16.3	For portable transformers: 100 falls, 25 mm		P
16.4	Transformers with integrated pins, the following tests are carried out:		
	a) plug-in transformers: tumbling barrel test: Mass ≤ 250 g, 50 falls; > 250 g, 25 falls.		N/A
	b) torque test of the plug pins with 0,4 Nm		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	c) pull force according to table 5 for each pin		N/A
17	**PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE**		
17.1	IP number marked on the transformer	Ordinary transformer	N/A
	Test according to 17.1.1 and for other IP ratings test according to IEC 60 529:		N/A
	- stable operating temperature before starting the test for < IPX8		N/A
	- transformer mounted and wired as in normal use		N/A
	- fixed transformer mounted as in normal use by the tests according to 17.1.1 A to J		N/A
	- portable transformers placed in the most unfavourable position and wired as in normal use		N/A
	- glands tightened with a torque equal to two-thirds of 25.6		N/A
	After the tests:		
	- dielectric strength test according to 18.3		N/A
	Inspection:		
	a) in dust-proof transformers no deposit of talcum powder		N/A
	b) no deposit of talcum powder inside dust-tight transformers		N/A
	c) no trace of water on live parts or insulation if hazard for the user or surroundings no reduction of creepage distances		N/A
	d) no accumulation of water in transformers ≥ IPX1 so as to impair safety		N/A
	e) no trace of water entered in any part of watertight transformer		N/A
	f) no entry into the transformer by the relevant test probe		N/A
17.1.1	Tests:		
	A) Solid-object-proof transformers: first IP numeral 2 test finger (IEC 60 529) and test pin (fig. 3)	IP 20	P
	B) Solid-object-proof transformers:		
	- first IP numeral 3, wire 2,5 mm; force 3 N		N/A
	- first IP numeral 4, wire 1 mm; force 1 N		N/A
	C) Dust-proof transformers, first characteristic IP numeral 5; dust chamber according to IEC 60 529, fig. 2:		
	a) transformer has operating temperature		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	b) transformer, still operating, is placed in the dust chamber		N/A
	c) the door of the dust chamber is closed		N/A
	d) fan/blower is switched on		N/A
	e) after 1 min transformer is switched off for cooling time of 3 h		N/A
	D) Dust-tight transformers (IPX6) test according to C)		N/A
	E) Drip-proof transformers (IPX1) test according to fig. 3 of IEC 60 529 for 10 min		N/A
	F) Rain-proof transformers (IPX3) test according to fig. 4 of IEC 60 529 for 10 min in operation and 10 min switched off (the tube shall oscillate 2 x 120 °C)		N/A
	G) Splash-proof transformers (IPX4) test according to fig. 4 of IEC 60 529 (see F) for 10 min in operation and 10 min switched off (the tube shall oscillate 2 x 360 °C)		N/A
	H) Jet-proof transformer (IPX5) test according to fig. 6 of IEC 60 529		N/A
	I) Watertight transformers (IPX7)		N/A
	J) Pressure watertight transformers (IPX8)		N/A
17.2	After moisture test (48 h for ≤ IP20, 168 h for other transformers):		
	- insulation resistance and electric strength (Cl. 18)	(see appended tables 18.2 and 18.3	P

18	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		
18.2	Insulation resistance between:		
	- live parts and body for basic insulation ≥ 2 MΩ		N/A
	- live parts and body for reinforced insulation ≥ 7 MΩ	Measured between hazardous live parts and plastic enclosure covered with metal foil	P
	- input circuits and output circuits for basic insulation ≥ 2 MΩ		N/A
	- input circuits and output circuits for double or reinforced insulation ≥ 5 MΩ	Measured between primary circuits and secondary circuits	P
	- each input circuit and all other input circuits connected together ≥ 2 MΩ		N/A
	- each output circuit and all other output circuits connected together ≥ 2 MΩ		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- hazardous live parts and metal parts with basic insulation (Class II transformers) ≥ 2 MΩ		N/A
	- body and metal parts with basic insulation (Class II transformers) ≥ 5 MΩ		N/A
	- metal foil in contact with inner and outer surfaces of enclosures ≥ 2 MΩ	Measured between inner and outer surfaces of enclosures of insulating materials	P
18.3	Electric strength test (1 min): no flashover or breakdown:		
	1) basic insulation between input circuits and output circuits; working voltage (V); test voltage (V) .....:		N/A
	2) double or reinforced insulation between input circuits and output circuits; working voltage (V); test voltage (V) .....:	240 Vac; 4200 Vac	P
	3) basic or supplementary insulation between:		
	a) live parts of different polarity; working voltage (V); test voltage (V) .....:	240 Vac; 2100 Vac; tested between line and neutral	P
	b) live parts and the body if intended to be connected to protective earth .....:		N/A
	c) inlet bushings and cord guards and anchorages .....:		N/A
	d) live parts and an intermediate conductive part :		N/A
	e) intermediate conductive parts and body .....:		N/A
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V) ....:	240 Vac; 4200 Vac	P
18.4	This subclause does not apply (EN 61558-2-17:97)		P

19	**CONSTRUCTION**		
19.1	Isolating and safety isolating transformers (EN 61558-2-17:97)		
	Input and output circuits electrically separated (EN 61558-2-17:97)		P
	No possibility of any connection between these circuits (EN 61558-2-17:97)		P
19.1.1	The insulation between input and output winding(s) consist of double or reinforced insulation (exception see 19.1.3) (EN 61558-2-17:97)		P
	Class I transformers (EN 61558-2-17:97):		
	- insulation between input windings and body consist of basic insulation (EN 61558-2-17:97)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- insulation between output windings and body consist of supplementary insulation (EN 61558-2-17:97)		N/A
	Class II transformers (EN 61558-2-17:97):		
	- insulation between input windings and body consist of double or reinforced insulation (EN 61558-2-17:97)	Consist of double insulation or reinforced insulation	P
	- insulation between output windings and body consist of double or reinforced insulation (EN 61558-2-17:97)		N/A
19.1.2	Class I transformers (EN 61558-2-17:97):		
	- the insulation between input and output windings via intermediate metal parts (not connected to the body) consist of double or reinforced insulation (EN 61558-2-17:97)		N/A
	Class II transformers (EN 61558-2-17:97):		
	- the insulation between input windings and body, and between output windings and body via intermediate metal part consist of double or reinforced insulation (EN 61558-2-17:97)	Consist of double insulation or reinforced insulation between input and body	P
	Class I and Class II transformers (EN 61558-2-17:97):		
	- the insulation between intermediate metal part and input or output windings consist of at least basic insulation (EN 61558-2-17:97)		N/A
19.1.3	Class I transformers with protective screening (EN 61558-2-17:97):		
	- insulation between input winding and protective screen consist of basic insulation (rated for the input voltage) (EN 61558-2-17:97)		N/A
	- insulation between output winding and protective screen consist of basic insulation (rated for the output voltage) (EN 61558-2-17:97)		N/A
	- the protective screen consist of metal foil or a wire wound screen extending the full width of the windings (EN 61558-2-17:97)		N/A
	- at a wire wound screen no space between the turns (EN 61558-2-17:97)		N/A
	- the cross-section of the screen is at least corresponding to the rated current of the overload device (EN 61558-2-17:97)		N/A
	- lead-out wires of the screen soldered or fixed in an equally reliable manner (EN 61558-2-17:97)		N/A
19.2	Fiercely burning material not used	No such materials	P
	Unimpregnated cotton, silk, paper and fibrous material not used as insulation	No such materials	P
	Wax, impregnants, etc. not used	No such materials	P

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Clause	Requirement – Test	Result - Remark	Verdict
19.3	Portable transformer: short-circuit proof or fail-safe	Short-circuit proof transformer	P
19.4	Class II transformers: contact between accessible metal parts and conduits or metal sheaths of supply wiring impossible		N/A
19.5	Class II transformers: part of supplementary or reinforced insulation, during reassembly after routine servicing not omitted	No service is required for the EUT	N/A
19.6	Class I and II transformers: creepage distances and clearances over supplementary or reinforced insulation if wire, screw, nut, etc. become loose or fall out of position not ≤ 50% specified values (Cl. 26)	Two independent fixing methods are used	P
19.7	Parts connected to accessible metal parts by resistors or capacitors shall be separated from hazardous live parts by double or reinforced insulation		N/A
19.8	Resistors or capacitors connected between hazardous live parts and accessible metal parts consist of:		
	- at least two separate components		N/A
	- if one component is short-circuited or open circuited, values specified in Cl. 9 shall not be exceeded		N/A
	- components according to IEC 60 065, 14.1 or capacitor Y1 according to IEC 60 384-14		N/A
19.9	Insulation material input/output and supplementary insulation of rubber resistant to ageing	No rubber is used	N/A
	Creepage distances (if cracks) ≥ specified values (Cl. 26)		N/A
19.10	Protection against accidental contact by insulating coating:		
	a) ageing test (section I, IEC 60 068-2-2), test Ba: 168 h; 70 °C	No insulating coating	N/A
	b) impact test (spring-operated impact hammer according to IEC 60 068-2-63; 0,5 ± 0,05 J)		N/A
	c) scratch test (hardened steel pin) electric strength test according to Cl. 18		N/A
19.11	Handles, levers, knobs, etc.:		
	- insulating material		N/A
	- supplementary insulation covering		N/A
	- separated from shafts or fixing by supplementary insulation		N/A
19.12	Windings construction		
19.12.1	In all types of transformer, precautions shall be taken to prevent:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- undue displacement of input or output windings or turns thereof	The first turn and end turn of the windings are wrapped around conductor before soldering, and fixed by adhesive tapes	P
	- undue displacement of internal wiring or wires for external connection	The terminations of internal wiring are fixed by glue and soldering	P
	- undue displacement of parts of windings or of internal wiring in case of rupture or loosening	The first turn and end turn of the windings are wrapped around conductor before soldering, and fixed by adhesive tapes	P
19.12.2	Serrated tape:		
	- distance through insulation according to table 13		N/A
	- one additional layer of serrated tape, and		N/A
	- one additional layer without serration		N/A
	- in case of cheekless bobbins the end turns of each layer shall be prevented from being displaced		N/A
19.12.3	Insulated windings wires:		
	- to all types of transformers for basic or supplementary insulation taken separately		N/A
	- transformers for switch mode power supplies for all types of insulation even in combination		N/A
	a) Winding wire with basic or supplementary insulation:		
	- comply with Annex K		N/A
	- the insulation of the conductor: two layers		N/A
	b) Winding wire with double or reinforced insulation:		
	- comply with Annex K	Approved TIW is used	N/A
	- the insulation of the conductor: three layers		N/A
	- two adjacent insulated wires: separated by double insulation, each insulation (basic and supplementary) is rated for the working voltage of the insulation system		N/A
	c) Routine test according to Annex K.3 for windings giving double or reinforced insulation:		
	- thermal cycling test according to 14.3	Approved TIW is used	N/A
	- test according to 27.3		N/A
	- in table 13, table C.1 and table D.2, box 2) c), no value is required		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
19.13	Handles, operating levers and the like shall be fixed		N/A
19.14	Protection against electric shock: covers securely fixed, 2 independent fixing means, one with tool	The enclosures are fixed together by ultrasonic welding	P
19.15	Transformer with pins for fixed socket-outlets: no strain on socket-outlet		N/A
	Additional torque ≤ 0,25 Nm		N/A
19.16	Protection index for portable transformers:		
	≤ 200 VA ≥ IP20 and instructions for use	The sentence “FOR INDOOR USE ONLY” is provided on the marking plate	P
	> 200 VA ≤ 2,5 kVA ≥ IPX4 (single-phase)		N/A
	> 200 VA ≤ 6,3 kVA ≥ IPX4 (polyphase)		N/A
	> 2,5 kVA (single-phase) ≥ IP21		N/A
	> 6,3 kVA (polyphase) ≥ IP21		N/A
19.17	Transformers IPX1-IPX6 totally enclosed, except for drain hole (diameter ≥ 5 mm or 20 mm² with width ≥ 3 mm); drain hole not required for transformer completely filled with insulating materials		N/A
	Transformers ≥ IPX7 totally enclosed		N/A
19.18	Transformers ≥ IPX1 with a moulded, if any		N/A
19.19	Class I transformers with a non-detachable flexible cable or cord with earthing conductor and a plug with earthing contact		N/A
19.20	Live parts of SELV and PELV-circuits: separation not less than PRI/SEC of a safety isolating transformer		P
19.20.1	SELV circuits and parts not connected to earth, to live parts, or protective conductors forming part of other circuits		P
	Nominal voltage (V) > 25 V a.c. or 60 V d.c., the required insulation fulfils the high voltage test according to table 8 .....:		N/A
19.20.2	PELV-circuits double or reinforced insulation is necessary		N/A
19.21	PELV-circuits: protection against contact fulfils the min. test voltage required for the primary circuit		N/A
19.22	Class II transformers shall not be provided with means for protective earthing	No earth connection	P
	For fixed transformers an earthing conductor with double or reinforced insulation to accessible metal parts is allowed		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
19.23	Class III transformers shall not be provided with means for protective earthing		N/A
19.101	No connections between output winding and body or protective circuit, if any (EN 61558-2-17:97)		P
	For associated transformers these connections are allowed in compliance with the relevant equipment standard (EN 61558-2-17:97)		P
19.102	Isolating and safety isolating transformers (EN 61558-2-17:97)		P
	The distance between input and output terminals for the connection of external wiring ≥ 25 mm (EN 61558-2-17:97)		N/A
20	**COMPONENTS**		
20.1	Switches, plugs, fuses, lampholders, flexible cables and cords comply with relevant IEC standard	(see appended table 20)	P
	Appliance couplers for main supply shall comply with:		
	- IEC 60 320 for IPX0		N/A
	- IEC 60 309 for other		N/A
	Automatic controls shall comply with IEC 60 730-1		N/A
20.2	Disconnection from the supply:		
	- all-poles switches with contact separation ≥ 3 mm		N/A
	- flexible cable and cord with plug		N/A
	- instruction sheet: disconnection by all-poles switches (with normal gap) incorporated in fixed wiring		N/A
20.3	Socket-outlets in the output circuit shall not comply with socket-outlets of the input circuit		N/A
	Plugs and socket-outlets for SELV for general use comply with the requirements of IEC 60 906-3	The EUT is considered as an associated transformer	N/A
	Plugs and socket-outlets for PELV systems shall comply with:		
	- plugs shall not be able to enter in socket-outlets of other standardized voltage systems		N/A
	- socket-outlets shall not admit plugs of other standardized voltage systems		N/A
	- no protective earthing contact on socket-outlets		N/A
	Plugs and socket-outlets for PELV systems shall comply with:		
	- plugs shall not be able to enter in socket-outlets of other standardized voltage systems		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- socket-outlets shall not admit plugs of other standardized voltage systems		N/A
20.4	Thermal cut-outs, overload releases etc. have adequate breaking capacity		N/A
20.5.1	Thermal cut-out tested as component shall comply with IEC 60 730-1		N/A
20.5.2	Thermal cut-out tested as a part of the transformer, number of cycles of automatic action:		
	- 3000 cycles for thermal cut-outs with self-resettable reset		N/A
	- 300 cycles for thermal cut-outs which are non-self-resettable		N/A
	- 30 cycles for thermal cut-outs which are only resettable by a tool		N/A
20.5.3	Test of a PTC resistor:		N/A
	5 cycles: transformer short-circuited for 48 h by 1,1 times of the input voltage and max. ta		N/A
	5 cycles: transformer short-circuited for 48 h by 0,9 times of the input voltage and min. ta (if declared)		N/A
20.6	Thermal-links shall comply with IEC 60 691		N/A
20.6.2	Thermal-links tested as a part of the transformer:		
	- ageing test 300 h by 35 °C or ta + 10 °C		N/A
	- after opening the thermal-link shall have an insulation resistance of at least 0,2 MΩ		N/A
	- 10 cycles for replaceable thermal-links		N/A
	- 3 new specimens for not replaceable thermal-links		N/A
20.7	Self-resetting devices not used if mechanical, electrical, etc. hazards		N/A
20.8	Overload protection by thermal cut-outs which can be reset by soldering operation not allowed		N/A
20.9	Overload protection devices do not operate during test (20 times switched on and off, no load); Upri (V): 1,06 times rated supply voltage .....:	254.4 Vac (1.06 times of 240 Vac)	P

21	**INTERNAL WIRING**		
21.1	Internal wiring and electrical connections protected or enclosed		P
	Wireways smooth and free from sharp edges	All internal wirings are fixed away from sharp edges; the wiring path are smooth and free from sharp edges	P

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Clause	Requirement – Test	Result - Remark	Verdict
21.2	Openings in sheet metal: edges rounded (radius ≥ 1,5 mm) or bushings of insulating material		N/A
21.3	Bare conductors: distances adequately maintained		P
21.4	When external wires are connected to terminal, internal wiring shall not work loose	No terminal provided	N/A
21.5	Insulation of heat-resistant and non-hygroscopic material for insulated conductors subject to temperature rise > limiting values given in 14.2	No temperatures exceed the limiting values	P
22	**SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS**		
22.1	All cables, flexible cords etc. shall have appropriate current and voltage ratings	(see appended table 20)	P
22.2	Input and output wiring inlet and outlet openings for external wiring: separate entries without damage to protective covering of cable or cord	Approved appliance inlet is provided	N/A
	Input and output wiring inlet and outlet openings for flexible cables or cords: insulating material or bushing of insulating material		P
	Bushings for external wiring: reliably fixed, not of rubber unless part of cord guard		P
22.3	Fixed transformer:		
	- possible to connect after fixing	Not a fixed transformer	N/A
	- inside space for wires allow easy introduction and connection of conductors		N/A
	- fitting of cover without damage to conductors		N/A
	- contact between insulation of external supply wires and live parts of different polarity not allowed		N/A
22.4	Length of power supply cord for portable transformers between 2 m and 4 m; without 0,5 mm^2		N/A
22.5	Power supply cords:		
	- for transformers IPX0 for indoor use only code designation 53 of IEC 60 245-1 or code designation 53 of IEC 60 227-1	Approved appliance inlet is provided	N/A
	- for transformers IPX0 for outdoor use: H05 RN...		N/A
22.6	Power supply cords for single-phase portable transformers with input current ≤ 16 A:		
	- cord set fitted with an appliance coupler in accordance with IEC 60 320	Approved appliance inlet is provided	P
22.7	Nominal cross-sectional area (mm^2); input current (A) at rated output not less than shown in table 9 :		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
22.8	Class I transformer with power supply flexible cable: green/yellow core connected to earthing terminal		N/A
	Plug for single-phase transformer with input current at rated output ≤ 16 A according to IEC 60 083, IEC 60 906-1 or IEC 60 309		N/A
22.9	Type X, Y, or Z attachments: see relevant Part 2	Approved appliance inlet is provided	N/A
22.9.1	For type Z attachment: moulding enclosure and power supply cable do not affect insulation of cable		N/A
22.9.2	Inlet openings or inlet bushing: without risk of damage to protective covering of power supply cord		N/A
	Insulation between conductor and enclosure:		
	- for Class I transformer: insulation of conductor plus separate basic insulation		N/A
	- for Class II transformer: insulation of conductor plus double or reinforced insulation		N/A
22.9.3	Inlet bushings:		
	- no damage to power supply cord		N/A
	- reliably fixed		N/A
	- not removable without tool		N/A
	- not integral with power supply cord (for type X attachment)		N/A
	- not of natural rubber except for Class I transformer with type X, Y and Z attachments		N/A
22.9.4	For portable transformers which are moved while operating:		
	- cord guards, if any, of insulating material and fixed		N/A
	Compliance is tested by the oscillating test according to fig. 7:		
	- loaded force during the test according to fig. 7		N/A
	- 10 N for a cross-sectional area > 0,75		N/A
	- 5 N for a cross-sectional area ≤ 0,75		N/A
	After the test according to fig. 7:		
	- no short-circuit between the conductors		N/A
	- no breakage of more than 10% of stands of any conductor		N/A
	- no separation of the conductor from the terminal		N/A
	- no loosening of any cord guards		N/A
	- no damage of the cord or cord guard		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- no broken strands piercing the insulation and not becoming accessible		N/A
22.9.5	Cord anchorages for type X attachment:		
	- glands in portable transformers not used unless possibility for clamping all types and sizes of cable		N/A
	- moulded-on designs, tying the cable into a knot and tying the end with string not allowed		N/A
	- labyrinths, if clearly how, permitted		N/A
	- replacement of cable easily possible		N/A
	- protection against strain and twisting clearly how		N/A
	- suitable for different types of cable unless only one type of cable for transformer		N/A
	- the whole flexible cable or cord with covering can be mounted into the cord anchorage		N/A
	- if tightened or loosened no damage		N/A
	- no contact between cable or cord and accessible or electrically connected clamping screws		N/A
	- cord clamped by metal screw not allowed		N/A
	- one part securely fixed to transformer		N/A
	- screws do not serve to fix any other component unless if omitted or incorrectly mounted the transformer is inoperative or clearly incomplete; compliance or parts not removable without tool		N/A
	- for Class I transformer: insulating material or insulated from metal parts		N/A
	- for Class II transformers: insulating material or supplementary insulation from metal parts		N/A
	Cord anchorages for type X, Y, Z attachments: cores of external flexible cable or cord insulated from accessible metal parts by:		
	- basic insulation (Class I transformers), separate insulating barrier/cord anchorage		N/A
	- supplementary insulation (Class II transformers), special lining/cable or cord sheath of cable sheath of cable		N/A
	Cord anchorages for type X and Y attachments:		
	- replacement of external flexible cable or cord does not impair compliance with standard		N/A
	- the whole flexible cable or cord with covering can be mounted into the cord anchorage		N/A
	- if tightened or loosened no damage		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- no contact between cable or cord and accessible or electrically connected clamping screws		N/A
	- cord clamped by metal screws not allowed		N/A
	- knots in cord not used		N/A
	- labyrinths, if clearly how, permitted		N/A
	Test for type X attachments one test with a cord with smallest and one test with a cord with the largest cross-sectional area:		
	- for the test with clamping screws or tightened with torque 2/3 of that specified in table 11		N/A
	Tests for type X with special cords, type Y, type Z		N/A
	- not possible to push cable into transformer		N/A
	- 25 pulls of 1 s		N/A
	- 1 min torque according to table 10		N/A
	- mass (kg); pull (N); torque (Nm) .....:		—
	- during test: cable not damaged		N/A
	- after test: longitudinal displacement ≤ 2 mm for cable or cord and ≤ 1 mm for conductors in terminals		N/A
	- creepage distances and clearances ≥ values specified in Cl. 26 .....:		N/A
22.9.6	Space for supply cables or external flexible cable or cord for fixed wiring and for type X, and Y attachments:		
	- before fitting cover, possibility to check correct connection and position of conductors		N/A
	- cover fitted without damage to supply cords		N/A
	- for portable transformers: contact with accessible metal parts if conductor becomes loose not allowed unless for type X, Y attachments terminations of cords do not slip free of conductor		N/A
	Space for external cords or cable for type X attachment and for connection to fixed wiring, in addition:		
	- conductor easily introduced and connected		N/A
	- possibility of access to terminal for external conductor after removal of covers without special purpose tool		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
23	**TERMINALS FOR EXTERNAL CONDUCTORS**		
23.1	Transformer for connection to fixed wiring and transformer without power supply cords with type Y and Z attachments: only connections by screws, nuts terminals	No terminals for external conductors	N/A
	Terminals are integral part of the transformer:		
	- comply with IEC 60 999-1 under transformer conditions		N/A
	Other terminals:		
	- separately checked according to IEC 60 998-2-1, IEC 60 998-2-2 or IEC 60 947-7-1		N/A
	- used in accordance with their marking		N/A
	- checked according to IEC 60 999-1 under transformer conditions		N/A
	Transformer with type X attachments: soldered connection permitted if reliance not placed upon soldering, crimping or welding alone unless by barriers, creepage distances and clearances between hazardous live parts and metal parts should conductor break away ≥ 50% of specified value (Cl. 26)		N/A
	Transformer with type Y and Z attachments for external conductors: soldered, welded, crimped, etc. connections allowed		N/A
	For Class II transformer: reliance not placed upon soldering, crimping or welding alone unless by barriers, creepage distances and clearances between hazardous live parts and metal parts should conductor break away ≥ 50% of specified value (Cl. 26)		N/A
23.2	Terminals for type X with special cords Y and Z attachments shall be suitable for their purpose:		
	- test by inspection according to 23.1 and 23.2		N
	- pull of 5 N to the connection before test according to 14.2		N
23.3	Other terminals than Y and Z attachments shall be so fixed that when the clamping means is tightened or loosened:		
	- terminal does not work loose		N/A
	- internal wiring is not subjected to stress		N/A
	- creepage distances and clearance are not reduced below the values specified in Cl. 26		N/A
23.4	Other terminals than Y and Z attachments shall be so designed that:		

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Clause	Requirement – Test	Result - Remark	Verdict
	- they clamp the conductor between metallic surfaces with sufficient contact pressure		N/A
	- without damage to the conductor		N/A
	- test by inspection according to 23.3 and 23.4		N/A
	- 10 times fastening and loosening a conductor with the largest cross-sectional area with 2/3 of the torque specified in Cl. 25		N/A
23.5	Terminals for fixed wiring and for type X: located near their associated terminals of different polarities and the earthing terminal if any		N/A
23.6	Terminal blocks not accessible without the aid of a tool		N/A
23.7	Transformer with type X attachments: stranded conductor test (8 mm removed):		
	- Class I transformers: no connection between live parts and accessible metal parts		N/A
	- free wire of earthing terminal: no touching of live parts		N/A
	- Class II transformers: no connection between live parts and accessible metal parts, no connection between live parts and metal parts separated from accessible metal parts by supplementary insulation		N/A
	Terminals for a current > 25 A:		
	- pressure plate, or		N/A
	- two clamping screws		N/A
23.8	When terminal, other than protective earthing conductor, screws loosened as far as possible, no contact:		
	- between terminal screws and accessible metal parts		N/A
	- between terminal screws and accessible metal parts for Class II transformers		N/A
24	**PROVISION FOR PROTECTIVE EARTHING**		
24.1	Class I transformers: accessible parts connected to earthing terminal	Class II equipment	N/A
	Class II transformers: no provision for earthing		P
24.2	Protective earthing terminal for connection to fixed wiring and for type X attachment transformers: comply with Cl. 23, adequately locked, not possible to loosen without a tool		N/A
24.3	No risk of corrosion from contact between metal of earthing terminal and other terminal		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	In case of earthing terminal body of A1, no risk of corrosion from contact between Cu and A1		N/A
	Body of earthing terminal or screws/nuts of brass or other metal resistant to corrosion		N/A
24.4	Resistance of connection between earthing terminal and metal parts ≤ 0,1 Ω with a min. 25 A or 1,5 times rated input current at 1 min		N/A
24.5	Class I transformers with external flexible cables or cords:		
	- current-carrying conductors becoming taut before the earthing conductor		N/A
25	**SCREWS AND CONNECTIONS**		
25.1	Screwed connections withstand mechanical stresses	No screws provided	N/A
	Screws transmitting contact pressure or likely to be tightened by the user or having a diameter < 2,8 mm, shall screw into metal		N/A
	Screws not of metal which is soft or liable to creep (Zn, Al)		N/A
	Screws of insulating material: not used for electrical connection		N/A
	Screws not of insulating material if their replacement by metal screws can impair supplementary or reinforced insulation		N/A
	Screws to be removed (replacement etc. of power supply cord) not of insulating material if their replacement by metal screws can impair basic insulation		N/A
	No damage after torque test: diameter (mm); torque (Nm); ten times .....:		N/A
	No damage after torque test: diameter (mm); torque (Nm); five times .....:		N/A
25.2	Screws in engagement with thread of insulating material:		
	- length of engagement ≥ 3 mm + 1/2 screw diameter or 8 mm		N/A
	- correct introduction into screw hole		N/A
25.3	Electrical connections: contact pressure not transmitted through insulating material		N/A
25.4	In case of use of thread-forming (sheet metal) screws for connection of current-carrying parts: clamping and locking means provided	No such screws	N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	Thread-cutting (self-tapping) screws used for the connection of current-carrying parts allowed if they generate a full form machine screw thread and if not operated by the user	No such screws	N/A
	Thread-cutting screws and thread-forming screws used for earthing continuity allowed if at least 2 screws for each connection are used and it is not necessary to disturb the connection in normal use	No such screws	N/A
25.5	Screws for current-carrying mechanical connections locked against loosening		N/A
	Rivets for current-carrying connections subject to torsion locked against loosening		N/A
26	**CREEPAGE DISTANCES AND CLEARANCES**		
26.1	Specified values according to:		
	- table 13, material group IIIa	Considered as material group IIIa	P
	- table C, material group II		N/A
	- table D, material group I		N/A
	1. Insulation between input and output circuits (basic insulation):		
	a) measured values ≥ specified values (mm) .....:		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		
	a) measured values ≥ specified values (mm) .....:	(see appended table 26.1)	P
	b) measured values ≥ specified values (mm) .....:	No earthed metal screen	N/A
	c) measured values ≥ specified values (mm) .....:	(see appended table 26.1)	P
	3. Insulation between adjacent input circuits: measured values ≥ specified values (mm) .....:	Only one set of input circuit	N/A
	Insulation between adjacent output circuits: measured values ≥ specified values (mm) .....:	Only one set of output circuit	N/A
	4. Insulation between terminals for external connection:		
	a) measured values ≥ specified values (mm) .....:	No terminals for external connection	N/A
	b) measured values ≥ specified values (mm) .....:		N/A
	c) measured values ≥ specified values (mm) .....:		N/A
	5. Basic or supplementary insulation:		
	a) measured values ≥ specified values (mm) .....:	(see appended table 26.1)	P
	b) measured values ≥ specified values (mm) .....:		N/A
	c) measured values ≥ specified values (mm) .....:		N/A
	d) measured values ≥ specified values (mm) .....:		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	e) measured values ≥ specified values (mm) .....:		N/A
	6. Reinforced or double insulation: measured values ≥ specified values (mm) .....:	(see appended table 26.1)	P
	7. Distance through insulation:		
	a) measured values ≥ specified values (mm) .....:	No requirements	N/A
	b) measured values ≥ specified values (mm) .....:		N/A
	c) measured values ≥ specified values (mm) .....:	(see appended table 26.1)	P
	Creepage distances and clearances are measured:		
	- for fixed wiring and type X attachments with max. and min. size		N/A
	- for type X with a special cord, Y or Z attachments with the supply cable as delivered		N/A
	- for layers of serrated tapes the values are so determined as if the serration coincided through the different layers		N/A
	- for printed wiring shall be used the unreduced values for live parts as in table 13, C.1 or D.1, except if printed wiring complies with IEC 60 664-3		P
	If the pollution generates high and persistent conductivity caused, for instance, by conductive dust or by rain or snow:		
	- clearances of P3 increased with min. 1,6 mm		N/A
	- value X in Annex A increased with 4,0 mm		N/A
26.2	Creepage distances (cr)	The EUT is considered as P2	N/A
	A) To test the potting or impregnation, three transformers are used:		
	- thermal class		N/A
	- working voltage		N/A
	Test with three transformers		N/A
	Two of the three specimens are subjected to:		
	- the relevant humidity treatment according to 17.2 (48 h)		N/A
	- the relevant dielectric strength test of 18.3 multiplied with factor 1,25		N/A
	One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,25 immediately at the end of the last cycle with high temperature		N/A
	Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 µs waveform)		N/A
	Impulse test voltage		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	Requirements of reduced values as stated for pollution degree 1 (P1) are fulfilled (see 26.1)		N/A
	B) To test parts which are connected (stuck) together:		
	- thermal class		N/A
	- working voltage		N/A
	Test with three specially prepared specimens		N/A
	Two of the three specimens are subjected to:		
	- the humidity treatment according to 17.2 (48 h)		N/A
	- the relevant dielectric strength test of 18.3 multiplied with factor 1,6		N/A
	One of the three specimens is subjected to the relevant dielectric strength test of 18.3 multiplied by the factor 1,6 immediately at the end of the last cycle with high temperature		N/A
	Impulse dielectric test according to 4.1.1.2.1 of IEC 60 664-1 (1,2 / 50 µs waveform)		N/A
	Impulse test voltage		N/A
	Requirements of reduced values as stated for pollution degree 1 (P1) are fulfilled (see 26.1)		N/A
26.3	Insulation in thin sheet form:		
	- consist of at least three layers (separable or non-separable)	Approved TIW is used	P
	- fulfils the requirements of distance through insulation shown in square brackets in boxes 2 and 7 of table 13 (C.1 / D.1)		N/A
	- separate or separable layers fulfil the thermal classification according to IEC 60 085 and IEC 60 216 for each layer		N/A
	- non-separable layers fulfil the thermal classification of the transformer in the whole composite sheet		N/A
	Mandrel test of insulation in thin sheet form:		
	- with two thirds of the number of separate or separable layers in any combination, high voltage test: 5,5 kV one minute, no flashover or breakdown		N/A
	- with the whole composite sheet of non-separable layers, high voltage test: 5,5 kV one minute, no flashover or breakdown		N/A
	- with one of the two layers according to note 6 of table 13 (C.1/D.1) without requirements of thickness, high voltage test: 5,5 kV one minute, no flashover or breakdown		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	The figures within square brackets in boxes 2 and 7 of table 13 (C.1/D.1) are used for insulation in thin sheet form as follows:		
	- rated output > 100 VA, values in square brackets apply		N/A
	- rated output ≥ 25 VA ≤ 100 VA, 2/3 of the value in square brackets apply		N/A
	- rated output < 25 VA, 1/3 of the values in square brackets apply		N/A
	- test according to 14.3, if smaller distances through insulation are used		N/A
	Solid insulation consist of a thickness of:		
	- solid insulation only		N/A
	- or solid insulation plus one or more air layers (min. 2 layers of insulation)		N/A
	Reduced values of table 13 (C.1/D.1) may be used for serrated tape if:		
	- min. 4 layers serrated tape		N/A
	- and one additional layer without serration covering the location of the serration		N/A
26.101	If the frequencies are ≤ 40 kHz table 13, C.1 and D.1 are applicable (EN 61558-2-17:97)	Measured Max. 30 kHz	P
26.102	If the frequencies are > 40 kHz the values of table 13, C.1 and D.1 are used with a multiplying factor of 1,1 (EN 61558-2-17:97)		N/A
	Box 2 of table 13, C.1 and D.1 is not applicable for separating transformers (EN 61558-2-17:97)		N/A
	Box 1 of table 13, C.1 and D.1 is not applicable for isolating and safety isolating transformers (EN 61558-2-17:97)		P
26.103	If the transformers fulfil the requirements according to 14.3 and 26.2 (no mechanical stress) the following distances through insulation can be used (EN 61558-2-17:97):		
	- working voltages ≤ 50 V a.c. (71 V peak or d.c.) no thickness (EN 61558-2-17:97)		N/A
	- supplementary insulation thickness ≥ 0,4 mm (EN 61558-2-17:97)		N/A
	- reinforced insulation with working voltage ≤ 600 V: thickness ≥ 0,4 mm (EN 61558-2-17:97)		N/A
	- supplementary insulation in thin sheet form at least two layers (EN 61558-2-17:97)		N/A
	- one layer will pass the electric strength test (see also 26.3 mandrel test) (EN 61558-2-17:97)		N/A
	- reinforced insulation in thin sheet at least three layers (EN 61558-2-17:97)	Approved TIW is used	P

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Clause	Requirement – Test	Result - Remark	Verdict
	- any two layers will pass the electric strength test (see also 26.3 mandrel test) (EN 61558-2-17:97)		P
27	**RESISTANCE TO HEAT, ABNORMAL HEAT, FIRE AND TRACKING**		
27.1	Ball-pressure test: diameter of impression ≤ 2 mm; heating cabinet temperature (°C) .....:	(see appended table 27.1 / 27.4)	P
27.2	Glow-wire test (650 °C):	According to annex E	P
	- any flame or glowing of the specimen extinguish within 30 s of withdrawing the glow-wire	(see appended table 27.2 / 27.4)	P
	- no ignition of a single layer of tissue paper	(see appended table 27.2 / 27.4)	P
27.3	Insulating material retaining live parts in position of transformers ≥ IP20: no source of ignition for surroundings in case of abnormal heat or fire		P
	Two special prepared specimens for the test in which short-circuit windings are built-in		P
27.3.1	Portable transformers are placed on a dull painted plywood support		P
	Stationary transformers fixed in the most unfavourable position on a dull painted support:		
	- if this position for use is vertical or ceiling transformer and support 200 mm above a pinewood board with tissue paper		N/A
	Self-resettable devices are short-circuit		N/A
	Input circuits protected with 10 times rated current, min. 16 A (fuse)		N/A
	Test time for protective devices of the transformer without load:		
	- max. 15 days, or		N/A
	- definitive interruption in the input circuit		N/A
	If non-self-resettable or replaceable protective devices are used the following cycle test is necessary:		
	- non-self-resettable: 30 cycles with no load until interruption and 2 h cool down		N/A
	- replaceable protective device: 10 cycles with no load until interruption and 2 h cool down		N/A
	During the tests:		
	- no flames occur		P
	-support temperature shall not exceed 125 °C		P
	- no ignition of the tissue paper		P
27.3.2	After the tests:		

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Clause	Requirement – Test	Result - Remark	Verdict
	a) transformer with definitive interruption in the input circuit withstands the test with 35% of the values according to table 8		N/A
	b) transformer with no definitive interruption withstands the test voltage (100%) according to table 8 of Cl. 18: hazardous live parts are not touchable by the stranded test finger		N/A
27.4	Insulating material retaining live parts in position: resistant to abnormal heat and to fire	(see appended table 27.1 / 27.4)	P
	Ball-pressure test; test temperature (°C) .....:	125 °C for bobbin of T1	P
	Glow-wire test (850 °C) for insulating material retaining external conductor terminals (if > 0,5 A):		
	- any flame or glowing of the specimen extinguish within 30 s of withdrawing the glow-wire		P
	- no ignition of a single layer of tissue paper		P
27.5	For IP other than IPX0: insulating parts retaining live parts in position of material resistant to tracking at least material of group IIIa	Ordinary transformer	N/A
	Test (175 V): no flashover or breakdown before 50 drops		N/A
28	**RESISTANCE TO RUSTING**		
	Ferrous parts protected against rusting		P
Annex A	**Measurements of creepage distance**		
	Methods of measuring creepage distances and clearances		P
Annex B	**Testing a series of transformer**		
	Methods have to pick out samples for testing a series.		N/A
Annex C	**Tables C.1 for Material group II**		
	Clearance and creepage distance table for material group II (400 <=CTI 600)		
	This annex of part 1 is applicable except as follows:		
	Box 1 of table C. 1 is not applicable for isolating and safety isolating transformers		N/A
	Box 2 of table C. 1 is not applicable for separating transformers		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
Annex D	**Tables C.1 for Material group I**		
	Clearance and creepage distance table for material group I (>=CTI 600)		
	This annex of part 1 is applicable except as follows:		
	Box 1 of table D. 1 is not applicable for isolating and safety isolating transformers		N/A
	Box 2 of table D. 1 is not applicable for separating transformers		N/A
Annex E	**Glow-wire test**		
	Glow wire test is carried out in accordance with IEC 659-2-1/0		P
Annex F	**Requirements for switches complying with IEC 61 058**		
F.1	a) Manually operated mechanical switches shall comply with IEC 61058 with the conditions specified under F.1 a) and F.5		N/A
	b) Manually operated mechanical switches tested as part of the apparatus shall comply with the conditions specified under F.2, F.3, F.4 and F.5		N/A
Annex G	**Tracking test**		
	Test methods to specify the CTI index.	Considered as Material Group IIIa	N/A
Annex H	**Electronic circuits**		
H.15	Short-circuit and overload protection		
H.15.6	Circuits designed and applied so that fault conditions do not render the appliance unsafe		P
	During and after each test:		
	- temperatures do not exceed values specified in table 3 of Cl. 15		P
	- transformer complies with conditions specified in 15.1		P
	If a conductor of a PCB becomes open circuited, the transformer is considered to have withstood the particular test, provided that all six conditions as specified are met		N/A
H.15.7	Fault conditions a) to f) of B.15.8 are not tested if the following conditions are met:		
	- electronic circuit is a low-power circuit as specified		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- safety of the appliance as specified does not rely on correct functioning of the electronic circuit	The fusible resistor (F1) is considered as protective device of equipment	P
H.15.8	Fault conditions tested as specified when relevant:		
	a) short-circuit of creepage distances and clearances, if less than specified in Cl. 26		P
	b) open circuit at the terminals of any component		P
	- short-circuit of capacitors, unless they comply with IEC 60 384-14		P
	d) short-circuit of any two terminals of an electronic component as specified		P
	e) any failure of an integrated circuit as specified		P
	f) low-power circuit: low-power points are connected to the supply source		N/A
	Cl. 15 is repeated with a simulated fault as indicated in a) to e), if the transformer incorporates an electronic circuit to ensure compliance with Cl. 15		P
	Fault condition e) is applied for encapsulated and similar components		P
	PTC's and NTC's are not short-circuited if they are used as specified		N/A
H.15.9	If for a fuse-link complying with IEC 60 127-3 rated fuse current I1 is used, current I2 is measured as specified:		
	- if I2 < 2,1 x I1 test of 15.8 is repeated with fuse-link short-circuited		N/A
	- if I2 > 2,75 x I1, no other tests are necessary		N/A
	If I2 > 2,1 x I1 and I2 < 2,75 x I1 test of 15.8 is repeated as specified		N/A
	For fuses other than those complying with IEC 60 127-3, the test is carried out as specified 15.3.2 to 15.3.5		N/A
H.26	Creepage distances, clearances and distances through insulation		
H.26.1	For conductive pattern's on PCB's, except their edges, creepage distances between different polarity may be reduced as specified		P
	For peak voltages > 50 V reduced creepage distances only apply if proof tracking index (PTI) has a resistance to tracking corresponding to at least material group IIIa		N/A
	The distances may be further reduced as specified (see H.15)		N/A
	Creepage distances and clearances within optocouplers are not measured as specified		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
H.26.2	For optocouplers the conditioning procedure of 26.2 is carried out as specified		N/A
Annex K	**Insulated winding wires for use as multiple layer insulation**		
K.1	Wire construction:		
	- insulated winding wire with min. two layers for basic or supplementary insulation		N/A
	- insulated winding wire with min. three layers for reinforced insulation	Approved TIW is used	P
	- winding insulation material .....:		N/A
K.2	Conformance test		
K.2.1	Test 13 of IEC 60 851-5 nominal conductor diameter ≥ 0,018 mm ≤ 0,1 mm		N/A
	Test as specified in 4.2.1 and 4.2.2 of IEC 60 851-5		N/A
	Nominal conductor diameter > 0,1 mm, ≤ 2,5 mm, test as specified in 4.3.1 and 4.3.2 of IEC 60 851-5		N/A
	Nominal conductor diameter < 2,5 mm, test as specified in 4.4.1 and 4.4.2 of IEC 60 851-5		N/A
	High voltage test immediately after the above specified tests:		
	- test voltage for two layers 3 kV		N/A
	- test voltage for three layers 5,5 kV		N/A
K.2.2	Adherence and flexibility, test as specified under 5.1.4 of IEC 60 851-3		
	- high voltage test immediately after this test		N/A
	- test voltage for two layers 3 kV		N/A
	- test voltage for three layers 5,5 kV		N/A
K.2.3	Heat shock, test as specified under 3.1 or 3.2 of IEC 60 851-6:		
	- high voltage test immediately after this test		N/A
	- test voltage for two layers 3 kV		N/A
	- test voltage for three layers 5,5 kV		N/A
K.2.4	Retention of dielectric strength after bending, test as specified under test 13 of 4.6.1 c) of IEC 60 851-5		
	- high voltage test immediately after this test		N/A
	- test voltage for two layers 3 kV		N/A
	- test voltage for three layers 5,5 kV		N/A

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Clause	Requirement – Test	Result - Remark	Verdict

Annex V	**SYMBOLS TO BE USED FOR THERMAL CUT-OUTS**		
	Symbols, when used are placed on the transformer		N/A

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Clause	Requirement – Test	Result - Remark	Verdict

11 / 12	TABLE: output voltage and output current under load; no-load output voltage					P
Clause		11		12		12
type / rated output	rated voltage (V)	sec. voltage (V)	delta Usec (%)	Usec (V) no-load output	delta Usec no-load output (%)	further information
24 Vdc	100 Vac	24.38 Vdc	+ 1.6 %	24.51 Vdc	—	—
24 Vdc	240 Vac	24.38 Vdc	+ 1.6 %	24.51 Vdc	—	—

Note: -

14	TABLE: HEATING			P
	t1 (°C) ……:	25	25	—
	t2 (°C) ……:	25	25	—
	test voltage (V) ……:	90 Vac	254.4 Vac	—
	input power/current (W/A) ……:	29.3 W / 0.55 A	29.0 W / 0.23 A	
	output current (A) ……:	1.0 A	1.0 A	
temperature rise dT of part/at:		Temperature (℃)		Limit (℃)
Appliance inlet		52.1	48.2	55 (70 – 15)
CX1 / HS1		59.5	56.6	85 (100 – 15)
LF1 / DB1		88.2	62.4	115 (130 – 15)
PCB under Q1		73.8	71.1	115 (130 – 15)
T1 core / C1		71.4	74.0	105 (class B)
T1 coil		65.3	68.7	105 (class B)
CY1 / D4		65.0	65.4	110 (125 – 15)
Output wire		54.4	56.4	65 (80 – 15)
Enclosure inside		55.1	57.2	65 (80 – 15)
Enclosure outside		49.6	50.9	65 (80 – 15)
	winding temperature rise measurements:			

temperature rise dT winding:	R_1 (Ω)	R_2 (Ω)	dT (K)	required dT (K)	insulation class
—	—	—	—	—	—

Note: --

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

15	TABLE: SHORT-CIRCUIT AND OVERLOAD PROTECTION		P
	ROOM TEMPERATURE (°C) ……..:	25 ℃	—
	TEST VOLTAGE ……..:	254.4 Vac	
	TESTED ON MODEL……..:	See page 1	

Parts / Condition	Duration / Input Current	Result	Parts measured	Temperature (°C)	Limit (°C)
Output terminal / overloaded	18 hours / 0.452 A	Steady state, no hazard.	T1 coil	113.2	175
			T1 core	123.8	175
			Ext. enclosure	74.9	105
			Wire (with tubing)	84.9	125
			Suppport	69.0	105
Output terminal / shorted	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
BD1 / Short	< 1 second / > 4.2 A	F1 opened, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
C1 / Short	< 1 second / > 4.2 A	F1 opened, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
Q1 (G-S) / Short	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

15	TABLE: SHORT-CIRCUIT AND OVERLOAD PROTECTION (CONTINUED)		P
	ROOM TEMPERATURE (°C) ……..:	25 ℃	—
	TEST VOLTAGE ……..:	254.4 Vac	
	TESTED ON MODEL……..:	See page 1	

Parts / Condition	Duration / Input Current	Result	Parts measured	Temperature (°C)	Limit (°C)
Q1 (G-D) / Short	< 1 second / > 4.2 A	F1 opened, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
U1 (Pin 1-2) / Short	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
U1 Pin 1 / open	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
U1 Pin 3 / open	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
U1 (Pin 3-4) / Short	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

15	TABLE: SHORT-CIRCUIT AND OVERLOAD PROTECTION (CONTINUED)		P
	ROOM TEMPERATURE (°C) ……..:	25 ℃	—
	TEST VOLTAGE ……..:	254.4 Vac	
	TESTED ON MODEL……..:	See page 1	

Parts / Condition	Duration / Input Current	Result	Parts measured	Temperature (°C)	Limit (°C)
U3 (VCC to COMP)	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
T1 (Pin 8-9) / Short	< 1 second / > 4.2 A	F1 opened, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
D4 / short	< 1 second / > 4.2 A	F1 opened, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
R14 / Short	10 mins / 0.03 A	Unit shut down, No damage, No Hazard.	T1 coil	--	225
			T1 core	--	225
			Ext. enclosure	--	105
			Wire (with tubing)	--	125
			Suppport	--	105
Note: --					

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

18.2	TABLE: Insulation resistance according to table 7		P
Insulation resistance R between:		R (MΩ)	Required min. R (MΩ)
Primary circuit and user accessible parts (RI)		> 70	7
Primary circuit and secondary circuit (RI)		> 50	5
Transformer: Primary winding and secondary winding (RI)		> 50	5
Inner and outer surfaces of enclosure of insulating materials		> 20	2
Line and Neutral after fusible resistor (F1) opened (BI)		> 20	2

Note:

1. **BI:** basic insulation **SI:** supplementary insulation **RI:** reinforced insulation
2. The core of transformer (T1) is considered as intermediate metal part.

18.3	TABLE: Dielectric strength test according to table 8		P
Test voltage applied between:		test voltage (V)	breakdown
Primary circuit and user accessible parts (RI)		4200 Vac	No
Primary circuit and secondary circuit (RI)		4200 Vac	No
Transformer: Primary winding and secondary winding (RI)		4200 Vac	No
Transformer: Core and secondary winding (RI)		4200 Vac	No
Line and Neutral after fusible resistor (F1) opened (BI)		2100 Vac	No

Note:

1. **BI:** basic insulation **SI:** supplementary insulation **RI:** reinforced insulation
2. The core of transformer (T1) is considered as primary winding.
   Working voltage is 240 Vac, BI / SI: 2100 Vac; RI: 4200 Vac

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

20	**TABLE: Components**				**P**
object/part No.	manufacturer/ Trademark	type/model	technical data	standard	Mark(s) of conformity [1)]
Fuse (F1)	WALTER ELECTRONIC CO LTD	TSD	T 2 A, 250 V	IEC 60127-3	VDE
Alt.	various	various	T 2 A, 250 V	IEC 60127-3	S, VDE or other EU certification marks
X-Capacitor (CX1)	Cheng Tung Industrial Co., Ltd.	CTX	Max. 0,22 uF, Min. 250 Vac, 100 °C	IEC 60384-14 / 1993	VDE
Alt.	various	various	Max. 0,22 uF, Min. 250 Vac, 100 °C	IEC 60384-14 / 1993	S, VDE or other EU certification marks
Bleeding resistor (R1A, R1B)	various	various	510 KΩ, 0.25 W	Applicable parts of IEC 61558	Tested in appliance
Line Filter (LF1) (option)	various	various	130 °C	Applicable parts of IEC 61558	Tested in appliance
Bridge diode (DB1 – DB4)	various	various	Min. 1 A, 1000 V	Applicable parts of IEC 61558	Tested in appliance
Ripple capacitor (C1)	various	various	Max. 47 µF, Min. 400 V, 105 ℃	Applicable parts of IEC 61558	Tested in appliance
MOSFET (Q1)	various	various	Min. 4 A, 600 V	Applicable parts of IEC 61558	Tested in appliance
Y-capacitor (CY1)	Murata	KX	Max. 2200 pF, Min. 250 V, 125 ºC, Y1	IEC 60384-14, 2nd edition	VDE
Alt.	various	various	Max. 2200 pF, Min. 250 V, 125 ºC, Y1	IEC 60384-14, 2nd edition	S, VDE or other EU certification marks
Y-capacitor (CY2)	Murata	KX	Max. 4700 pF, Min. 250 V, 125 ºC, Y1	IEC 60384-14 / 1993	VDE
Alt.	various	various	Max. 4700 pF, Min. 250 V, 125 ºC, Y1	IEC 60384-14 / 1993	S, VDE or other EU certification marks
Opto-coupler (U1)	Sharp	PC817	>4 / >8 / >0.4 mm	IEC 60950-1	VDE, TUV
Alt.	Lite-on	LTV817	>4 / >8 / >0.4 mm	IEC 60950-1	VDE, TUV
Alt.	(Fairchild) QTC	H11A817	>4 / >8 / >1.0 mm	IEC 60950-1	VDE, TUV

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

20	TABLE: Components (continued)				P
object/part No.	manufacturer/ Trademark	type/model	technical data	standard	Mark(s) of conformity [1)]
Secondary diode (D4)	various	various	Min. 5 A, 60 V	Applicable parts of IEC 61558	Tested in appliance
Output cord	various	various	300 V, VW-1, 18 AWG, 80 °C	Applicable parts of IEC 61558	Tested in appliance
Transformer:					
Transformer (T1)	HONG KOK ELECTRONICS CO., LTD.	GFP241-24-CEC	Class B, 130 °C	Applicable parts of IEC 61558	Tested in appliance
Magnet wires	Feng Ching Metal Corp.	UEW	Class B, 130 °C	Applicable parts of IEC 61558	Tested in appliance, UL
Alt.	Feng Ching Metal Corp.	UEW	Class B, 130 °C	Applicable parts of IEC 61558	Tested in appliance, UL
TIW	Furukawa	TEX-B	Min. 130 °C	IEC 60950-1	VDE, TUV
Plastic Material List:					
Enclosure	SABIC INNOVATIVE	940(f1)	Min. V-0, 1.5 mm thick, 120 °C	Applicable parts of IEC 61558, UL 94	Tested in appliance, UL
Bobbin of T1	Chang Chun	T375J	Min. V-0, 0.75 mm thick, 150 °C	Applicable parts of IEC 61558, UL 94	Tested in appliance, UL
Alt.	Sumitomo Bakelite	PM9820, PM9630	Min. V-0, 0.75 mm thick, 150 °C	Applicable parts of IEC 61558, UL 94	Tested in appliance, UL
Insulating tape	3M	1350F-1, 1350F-2	Min. 130 °C	Applicable parts of IEC 61558, UL 510	Tested in appliance, UL
Heat shrinkable tubing	various	various	Min. 125 °C	Applicable parts of IEC 61558, UL 224	Tested in appliance, UL
Mylar sheet	various	various	Min. 125 °C	Applicable parts of IEC 61558, UL 94	Tested in appliance, UL
PCB	Eastop International Ltd	ET-002	Min. V-0, 130 °C	Applicable parts of IEC 61558, UL 796	Tested in appliance, UL
Alt.	various	various	Min. V-0, 130 °C	Applicable parts of IEC 61558, UL 796	Tested in appliance, UL

Note:

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

2) All the plastic material mentioned are checked and found to be acceptable for using in this product. Checking date: Same as this report issued data, see also page 1.

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

26.1	TABLE: clearance and creepage distance measurements				P
clearance cl and creepage distance dcr ata/of:	U r.m.s (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
On PCB solder side:					
Line and Neutral before F1 (BI)	240	3.0	3.0	3.0	3.0
Before and after F1 (BI)	240	3.0	3.0	3.0	3.0
Primary and secondary (RI)	240	5.5	6.0	6.0	6.0
On PCB component side:					
Line and Neutral before F1 (BI)	240	3.0	3.5	3.0	3.5
Before and after F1 (BI)	240	3.0	3.5	3.0	3.5
Primary and secondary (RI)	240	5.5	6.5	6.0	6.5
Transformer (T1):					
Primary winding to secondary winding (RI)	295	5.5	7.0	6.0	7.0
Core to secondary winding (RI)	295	5.5	7.0	6.0	7.0
Core to secondary component (RI)	295	5.5	7.0	6.0	7.0

Note:

1. BI: basic insulation SI: supplementary insulation RI: reinforced insulation
2. The core of transformer (T1) is considered as Primary winding.

26.1	TABLE: distance through insulation measurements				P
distance through insulation di at/of:	U r.m.s. (V)	test voltage (V)	required di (mm)	di (mm)	
Plastic enclosure (RI)	240	4200 Vac	1.0	1.5	

Note:

BI: basic insulation SI: supplementary insulation RI: reinforced insulation

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

27.1/27.4	**Ball pressure test**		**P**
Required impression diameter (mm) ……:		≤ 2 mm	
Tested parts		Test temperature (°C)	Impression diameter (mm)
Enclosure		73	0.9
Bobbin of T1		125	0.7
PCB		125	0.7
Note: All the material listed in the table 20 are tested.			

27.2/27.4	**Glow wire test**				**P**
Tested parts	Test temperature (°C)	Ignition of tissue paper ?	Scorching of pinewood board?	Visible flame?	te ≤ ta+30s ?
Enclosure	650	No	No	No	Yes

Note:

1. After abnormal heated, no hazard.
2. All the material listed in the table 20 are tested.

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
	IEC 61558-1, 1st ed. + A1 **(EN 61558-1: 1997+ A1: 1998 + A11: 2003)** **GROUP DIFFERENCES, NATIONAL DEVIATIONS AND SPECIAL NATIONAL CONDITIONS IN THE CENELEC COUNTRIES** **S = Special National Condition** **D = National Deviation** **C = CENELEC Common Modification**		
8.7	S (FR): (Décret n ° 66.660 du 8 septembre 1966 en application de la loi n ° 60.1375 du 21 décembre 1960) The general French regulations prescribe that transformers having a rated supply voltage of 127 V require also the value 220 V.		N/A
	S (DK): Supply cords of Class I transformers which are supplied without a plug, shall be provided with a visible tag containing the following text: Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket eller (Important! The conductor having green/yellow insulation shall only be connectec to a terminal marked or) If it is essential for the safety of the transformer, the tag shall be provided either with a wiring diagram showing the connection of the other conductors or with the following text: For tilslutning af de ovrige ledere, se medfolgende installationsvejledning. (For the connection of the other conductors, see the enclosed instructions for installation.)		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
15	**Short circuit and overload protection**		
15.3.3	*C: Replacement:* *If protected by miniature fuses in accordance with IEC 60127, or by road vehicles blade type electric fuse-links according to ISO 8820, or by a technically equivalent fuse, the transformers is loaded for a period corresponding to the longest pre-arcing time with the relevant current as specified in the appropriate standard sheet.* NOTE A technically equivalent fuse is a fuse-link having the same time-current characteristic as one of those in indicated in IEC 60127 or in ISO 8820. *If the **transformer** is protected by miniature fuses in accordance to IEC 60127, an additional overload test shall be performed with 1,5 times of the rated fuse current until steady state condition.*	Transformer secondary overloaded is measured the max. input current 0.452 A and it could be covered the additional overload test	P
20	**Components**		
20.3	C: *Replacement of the second paragraph:* Plugs and socket-outlets for SELV systems with both a rated current ≤ 3 A and a rated voltage ≤ 24 V shall comply with the following requirements: plugs shall not be able to enter socket-outlets of other standardized voltage systems; socket-outlets shall not admit plugs of other standardized voltage systems; socket-outlets shall not have a protective earthing contact.		N/A
	Other plugs and socket-outlets for SELV systems shall comply with the requirements of IEC 60906-3 and IEC 60884-2-4.		N/A
	C: Add a note after the second paragraph: NOTE: As IEC 60906-3 covers only 6, 12, 24, 48 V, the attention of the appliance manufacturer is called that: either their appliance with intermediate supply voltage shall be able to withstand the immediate upper voltage; or, to ask for SC 23C of IEC to design intermediate values.		N/A
	Other plugs and socket-outlets systems are allowed for associated transformers only.		P

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
22.5	C: Replace “code designation 53 of IEC 60245-1” by “code designation H05 RR-F” and replace “code designation 53 of IEC 60227-1” by “code designation H05 VV-F or H05 VVH2-F”.		N/A
	Add: Power supply cords of transformers with protection index greater than IPX0 shall be not lighter than ordinary polychloroprene sheathed cord (code designation H05 RN-F), except for transformers for indoor use only.		N/A
	Add: For IPX0 transformers with a mass less than 3 kg, the power supply cords shall be not lighter than H03 VV-F.		N/A
22.8	S (DK): (Danish Heavy Current Regulation, section 107-2-D1) Replace the second paragraph by the following: Supply cords of single-phase transformers having a rated current not exceeding 10 A shall be provided with a plug according to the following:		N/A
	Stationary Class I transformers having a protection index IP 20 Section 107-2-D1 Standard Sheet DK 2-1a or IEC 60083, Standard Sheet C 2b, C 3b or C4		N/A
	Stationary Class I transformers having a protection index higher than IP20 and portable Class I transformers with a rated input exceeding 630 V Section 107-2-D1 Standard Sheet DK 2-1a		N/A
	Class II transformers IEC 60083, Standard Sheet C5 or C8		N/A

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
	If multi-phase transformers and single-phase transformers having a rated current exceeding 10 A are provided with a supply cord and plug, the plug shall comply with the following table:		N/A
	S (SE): Power supply flexible cabled and cords of single-phase transformers having an input current at rated output not exceeding 16 A, shall be provided with a plug complying with CEE Publication 7, Standard sheets to be applied as follows: Class I transformers Standard sheet IV, VI or VII; Class II transformers Standard sheet XVI or XVIII.		N/A
23.1	C: Replace in the third paragraph "IEC 60947-7-2" by "IEC 60947-7-1".		N/A
Annex S	C: Bibliography Add the following notes for the standards indicated: IEC 60038 NOTE: Harmonized as HD 472 S1:1989 (modified). IEC 60555-1 NOTE: Harmonized as EN 60555-1:1987 (not modified). CISPR 11 NOTE: Harmonized as EN 55011:1991 (modified). CISPR 14 NOTE: Harmonized as EN 55014-1:1993 (not modified).		P
	D (DK): Information concerning national differences is given by DEMKO on request. See also Group Differences.		N/A
	D (SE): See Group Differences.		N/A

Class	Plug **	
	Section 107-2-D1 Standard sheet	EN 60309-2 Standard sheet
I	DK 6-1a	2-II, 2-IV
II	DK 6-1a*	2-II, 2-IV*

* Earthing contact not connected.
** These plugs are also allowed for transformers having a rated current equal to or less than 10 A.

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict
Annex ZA (normative)	Special national conditions National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard or Harmonization Document. For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.		P

EN 61558-2-17			
Clause	Requirement – Test	Result - Remark	Verdict

	IEC 61558-2-17, 1st ed. **(EN 61558-2-17: 1997)** **GROUP DIFFERENCES, NATIONAL DEVIATIONS AND SPECIAL NATIONAL CONDITIONS IN THE CENELEC COUNTRIES** **S = Special National Condition** **D = National Deviation** **C = CENELEC Common Modification**	

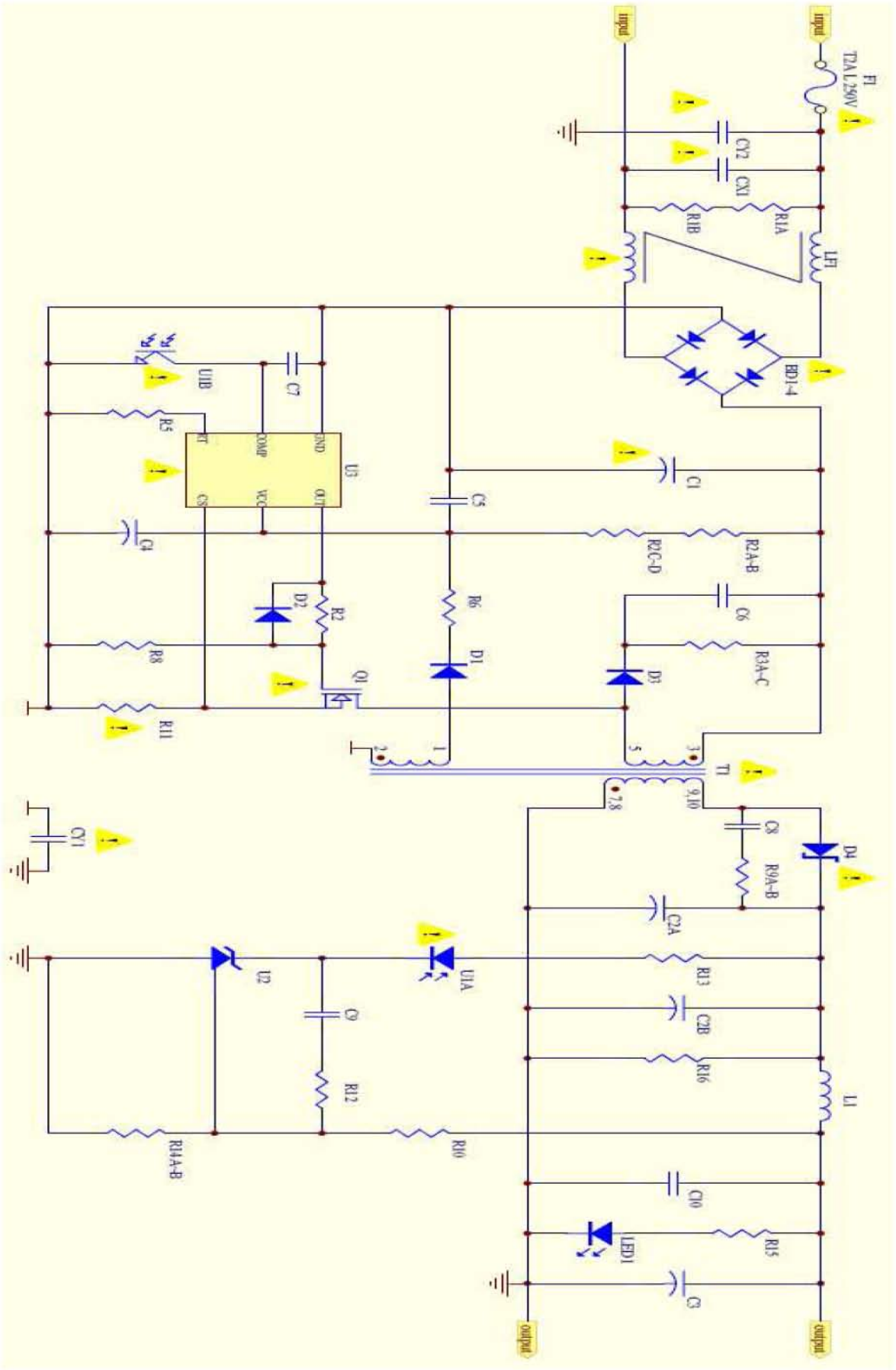
14	C: Replace the text by: This clause of part 1 is applicable except as follows: Table 1: Modification:		P
22.4	C: Renumber this subclause 22.5. Replace “code designation 53 of IEC 60245-1” by “code designation H05 RR-F” and replace “code designation 53 of IEC 60227-1” by “code designation H05 VV-F or H05 VVH2-F”.		N/A
22.5	C: Renumber this subclause 22.7.		N/A

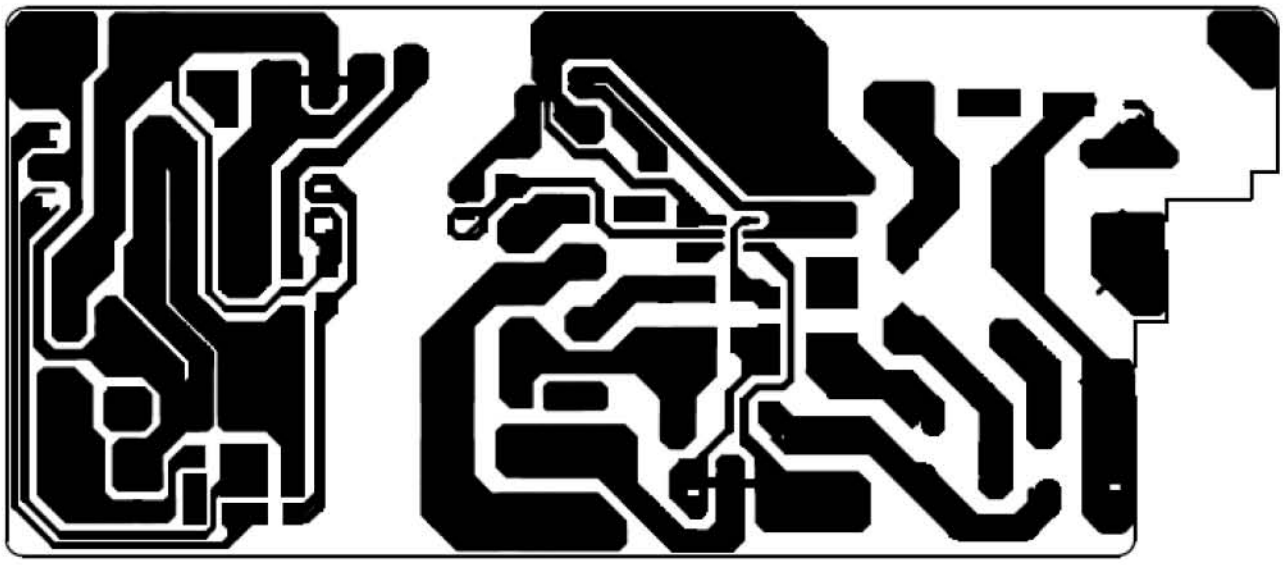
Parts	Temperature °C
External **enclosures** 3), handles and the like of **portable transformers**:	
- if, in normal use, these parts are continuously held (for example for **hand held transformers**):	
• for metal	50
• for other materials	60
- if, in normal use, these parts are not continuously held:	
• for metal	50
• for other materials	60

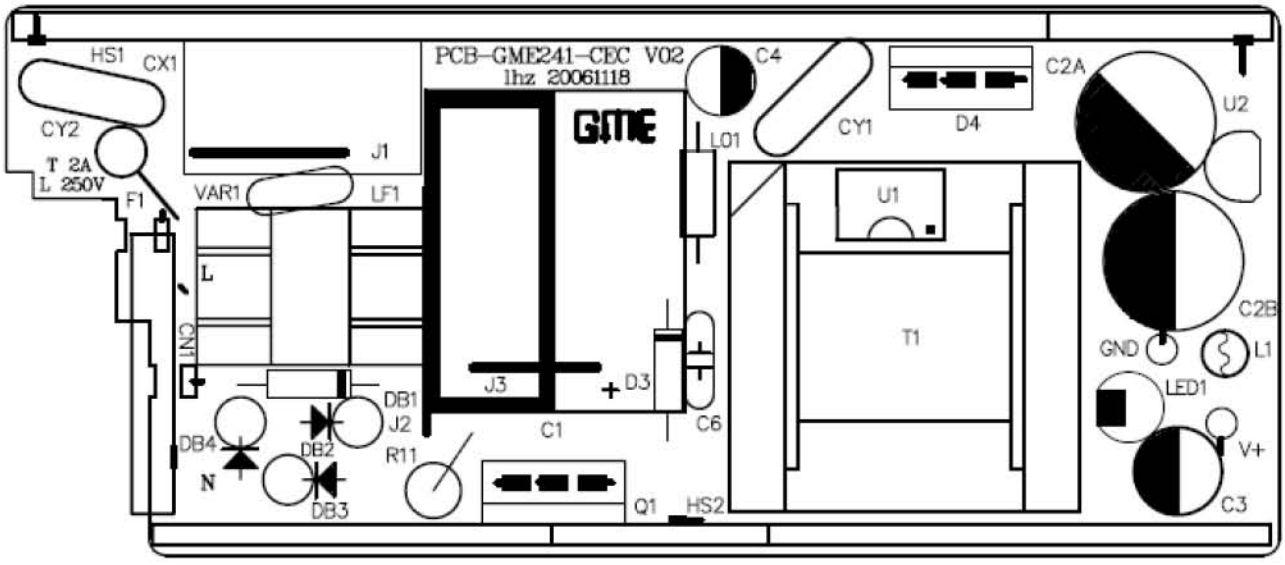
EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
6.	**RATINGS**		
6.101	Rated output voltage shall not exceed 50 V a.c. and/or 120V ripple-free d.c.:	24 Vdc	P
6.102	Rated output shall not exceed 10 kVA for single-phase transformer, 16 kVA for poly-phase transformer except for special safety isolating transformers.:	Max. 24 VA (24 Vdc X 1.0 A)	P
6.103	Rated frequency shall not exceed 500 Hz.:	50 / 60 Hz	P
6.104	Rated supply voltage shall not exceed 1000 V a.c.:	100 – 240 Vac	P
8.	**MARKING AND OTHER INFORMATION**		
8.11	Correct symbols are used	See marking label	P
8.101	For transformer intended for connection to the supply with a cable or cord and plug, the instruction sheet shall state that the installation shall be installed and protected in accordance with national wiring rules		N/A
9.	**PROTECTION AGAINST ACCESSIBILITY TO HAZARDOUS LIVE PART**		
9.2	Transformer constructed and enclosed against accidental contact with hazardous live parts and for Class II transformers metal parts separated by from hazardous live parts by basic insulation even after removal of detachable parts except for:		
	-live parts at no-load output voltage ≤ 35V (peak) a.c. or ≤ 60 V ripple free d.c.	Measured Max. 24.5 Vdc	P
	-one of the poles of output circuit when no-load output voltage > 35 V (peak) a.c. or 60 V ripple free d.c.		N/A
10	***CHANGE OF INPUT VOLTAGE SETTING***		
10.101	Portable transformers only one rated supply voltage.		
	-unless the output voltage not excesses the limits if the higher marked voltage is accidentally connected to the lower voltage winding.		P
12	**NO-LOAD OUTPUT VOLTAGE**		
12.101	No-load voltage value not exceed 50 V a.c. or 120 V ripple-free d.c.:	Measured Max. 24.5 Vdc	P
12.102	Difference between output voltage at no-load and at rated output		
	-inherently short-circuit proof transformer: rated output (VA); required value (%):		N/A

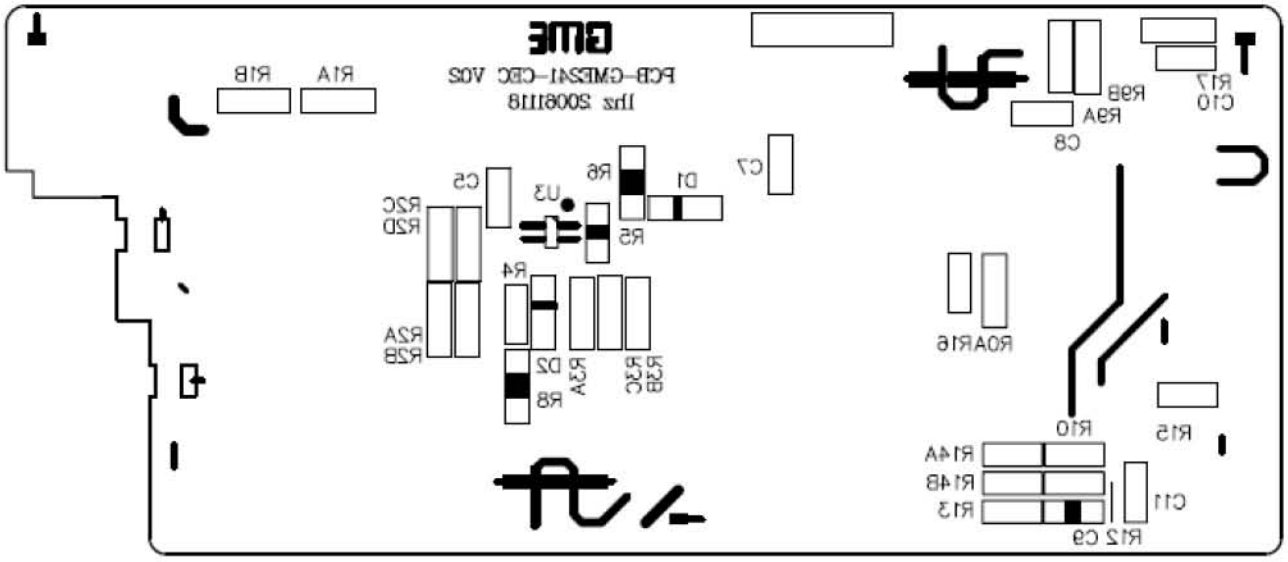
EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
	-other transformer: rated output (VA); required value (%)	(see appended tables 11/12)	P
19.	**CONSTRUCTION**		
19.1	Input and output circuit electrically separated.		P
19.1.1	The insulation between input and output winding(s) shall consist of double or reinforced insulation.		
	-Class I: Input windings and body, basic insulation. Output windings and body, supplementary insulation		N/A
	-Class II: Input windings and body, and output windings and body, double or reinforced insulation.		P
19.1.2	For an intermediate metal part (e.g the iron core), not connected to the body located between the windings.		
	-Class I: Insulation between input and output windings via metal part, double or reinforced insulation.		N/A
	-Class II: Insulation between input and output windings via metal part and between body and metal part, double or reinforced insulation and at least basic insulation between input winding and metal part and output winding and metal part.		P
19.1.3	For Class I transformer the insulation may consist of basic insulation protective screening if:		
	-Insulation between input winding and protective screen consists of basic insulation.		N/A
	-Insulation between output winding and protective screen consists of basic insulation.		N/A
	-Protective screen shall consist of metal foil or of a wire wound screen.		N/A
	-Cross-section area or lead-out wire or protective screen:		N/A
	-Lead wire fixed reliable		N/A
19.1.4	Basic insulation plus protective screening not allowed if connection to mains by plug.		N/A
19.101	Portable transformer, rated output ≤ 630 VA shall be of Class II		N/A
19.102	No connection between the output winding and body or earthing circuits.		P
19.103	No capacitors between input and output circuit.		N/A
19.104	Input and output terminals, distance ≥ 25 mm.		N/A
20	**COMPONENTS**		

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
20.3	SELV plug and socket-outlets shall comply with IEC 60 884-2-4 and IEC 60 906-3		N/A

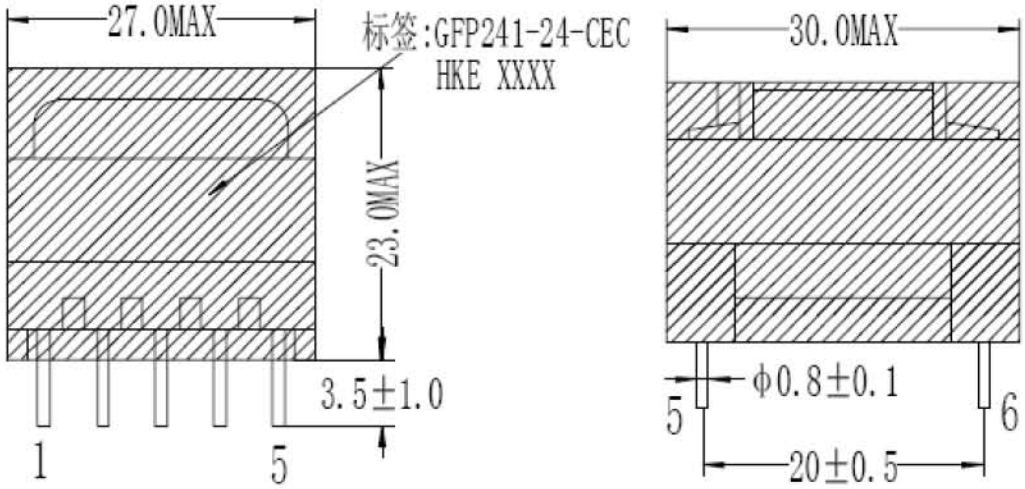

input
input
F1
T2A L250V
CY2
CX1
R1B
R1A
LF1
BD1-4
U1B
C7
R5
U3
C5
C1
C4
R2C-D
R2A-B
D2
R2
R6
C6
R8
D1
D3
R3A-C
Q1
R11
T1
CY1
C8
D4
R9A-B
C2A
U2
U1A
R13
C9
C2B
R12
R16
L1
R14A-B
R10
C10
LED1
R15
C3
output
output

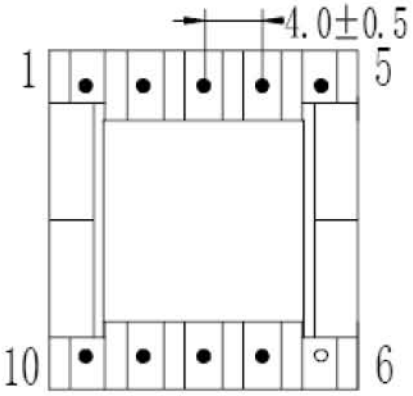



PCB-GME241-CEC V02
1hz 20061118
GME
HS1
CX1
CY2
T 2A
L 250V
F1
VAR1
LF1
J1
L
CN1
N
DB1
J2
DB2
DB3
DB4
R11
J3
C1
D3
C6
LO1
C4
CY1
D4
C2A
U2
U1
T1
C2B
GND
L1
LED1
V+
C3
Q1
HS2

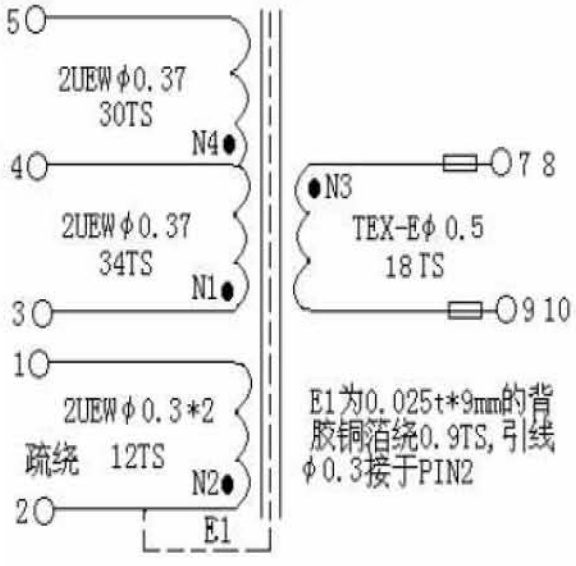

R1B
R1A
R7
C10
R9B
R9A
C8
C7
D1
R6
C5
U3
R2C
R2D
R5
R4
R2A
R2B
D2
R8
R3A
R3C
R3B
R0A
R16
R10
R15
R14A
R14B
R13
C11
R12
C9

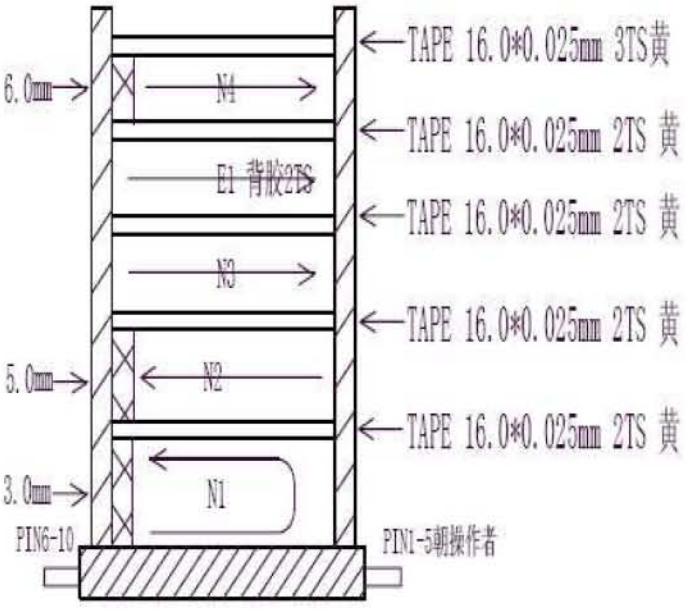
UNIT:mm

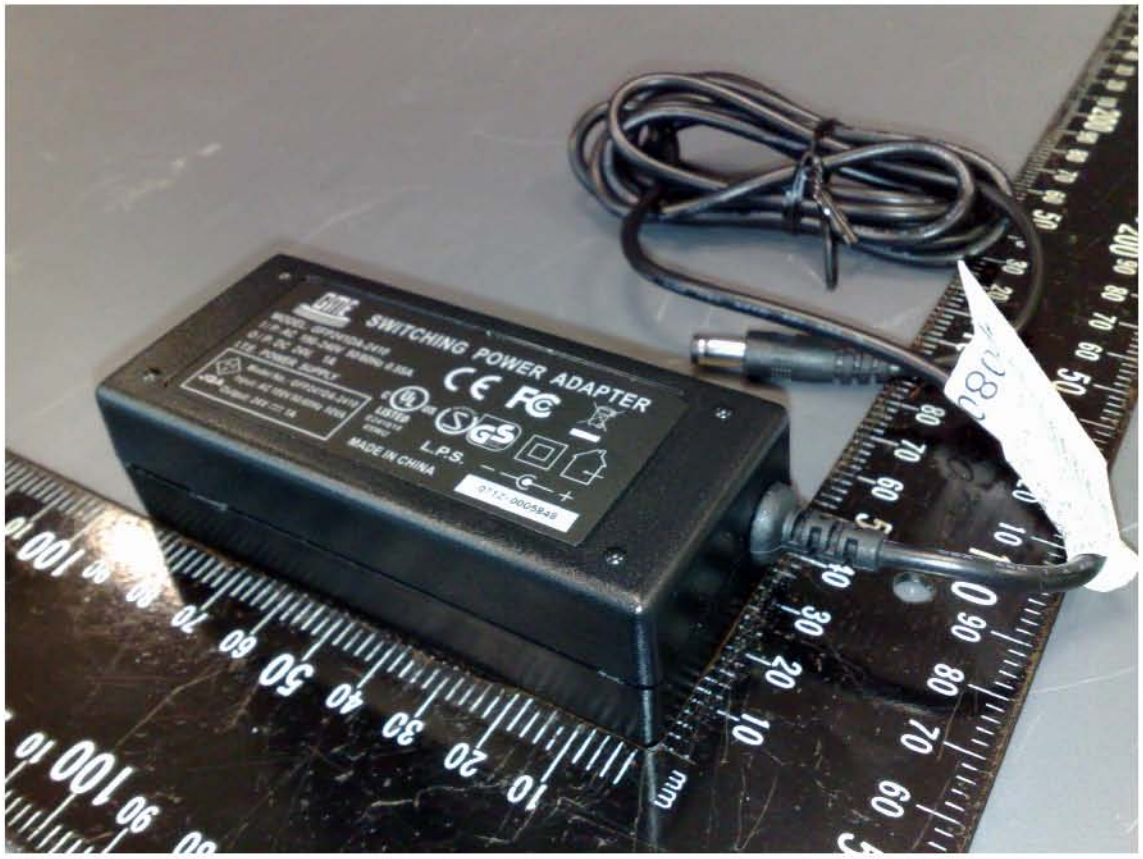


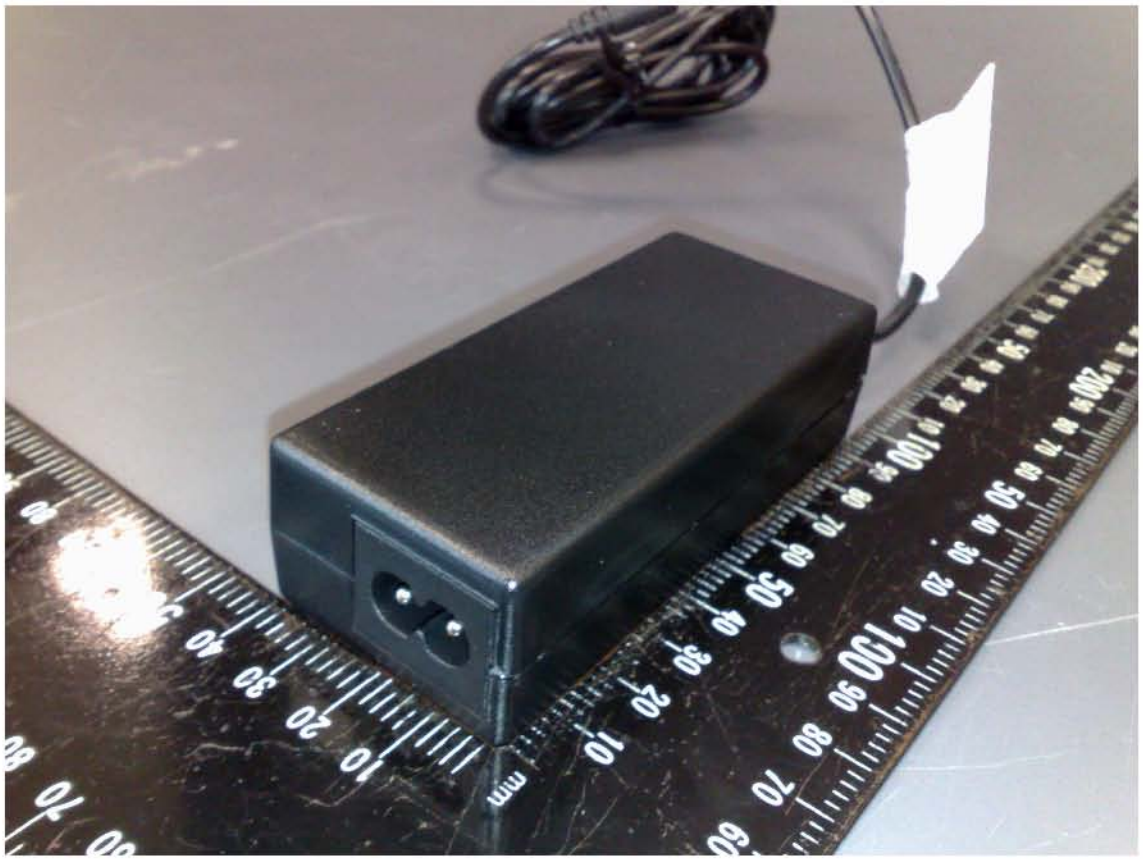


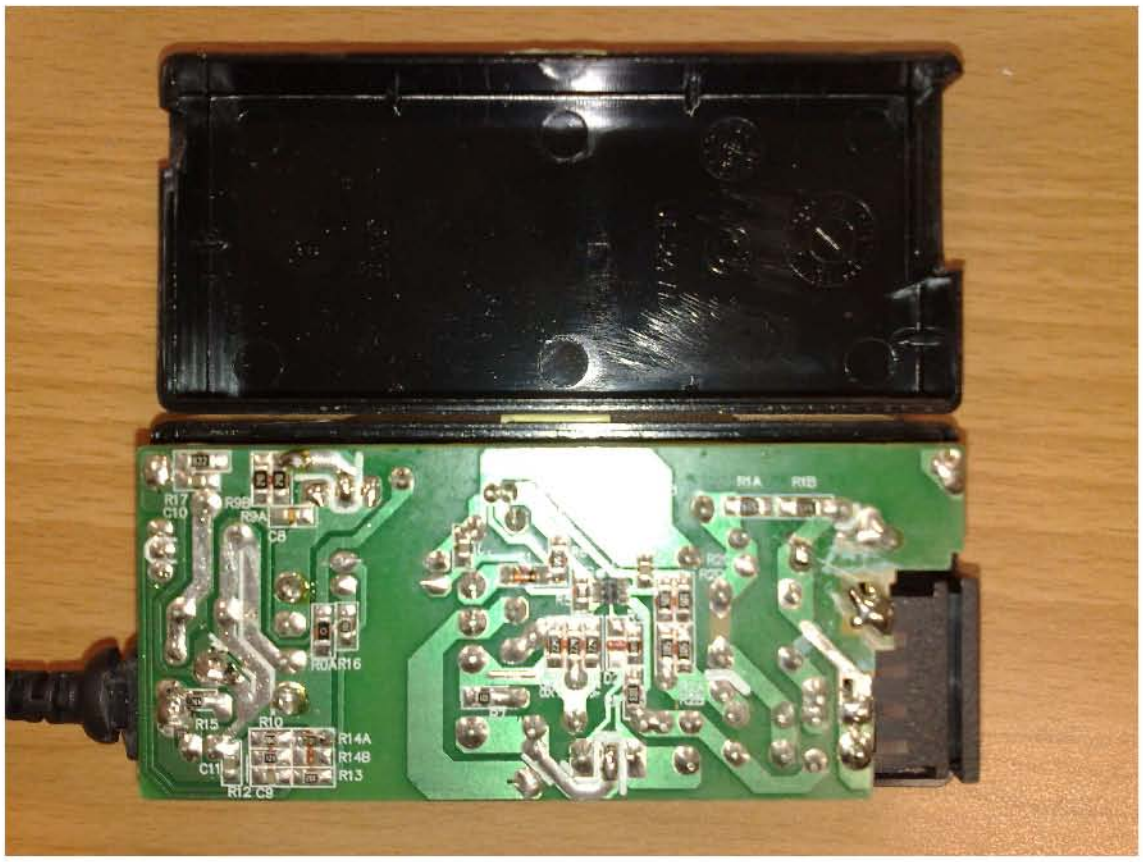
CUT OFF PIN6,
CUT OFF PIN4 1/2且不可超过档点






SWITCHING POWER ADAPTER
L.P.S.
MADE IN CHINA




R17
C10
R9B
R9A
C8
R16
R15
R10
C11
R12
C9
R14A
R14B
R13
R1A
R1B