

TEST REPORT

EN 61558-2-6

Safety of power transformers, power supply units and similar Part 2: Particular requirements for safety isolating transformers for general use

Report

Reference No. : JSH007090140-001

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Testing laboratory

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Client

Name : Changzhou Linke Electrical Equipment Co., Ltd.

Address : Zhuxiashu, Xilin Town, Changzhou, Jiangsu 213024, P.R China

Test specification

Standard : EN 61558-2-6:1997, EN 61558-1:1997+A1:1998 +A11: 2003

Test procedure : GS, CE-LVD

Procedure deviation : N/A

Non-standard test method : N/A

Test Report Form/blank test report

Test Report Form No. : TTRF_EN61558_2_6E

Test Report Form(s) Originator : Intertek ETL SEMKO shanghai

Master TRF : Dated 2006-09

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Test item

Description	Power supply (direct plug-in) for general purpose										
Trademark:	N/A										
Model and/or type reference:	LK-D120100, LK-D225050, LK-D270040, LK-D300040										
Manufacturer:	Changzhou Linke Electrical Equipment Co., Ltd.										
Rating(s):	Class II, IP20										
:	Input: 230-240VAC, 50/60Hz										
	Output: see list of models and output rating										
	<table> <tr> <th>Model</th><th>Output</th></tr> <tr> <td>LK-D120100</td><td>12Vd.c. 1000mA, 12W</td></tr> <tr> <td>LK-D225050</td><td>22,5Vd.c. 500mA, 11,25W</td></tr> <tr> <td>LK-D270040</td><td>27Vd.c. 400mA, 10,8W</td></tr> <tr> <td>LK-D300040</td><td>30Vd.c. 400mA, 12W</td></tr> </table>	Model	Output	LK-D120100	12Vd.c. 1000mA, 12W	LK-D225050	22,5Vd.c. 500mA, 11,25W	LK-D270040	27Vd.c. 400mA, 10,8W	LK-D300040	30Vd.c. 400mA, 12W
Model	Output										
LK-D120100	12Vd.c. 1000mA, 12W										
LK-D225050	22,5Vd.c. 500mA, 11,25W										
LK-D270040	27Vd.c. 400mA, 10,8W										
LK-D300040	30Vd.c. 400mA, 12W										
	Note: All models are direct plug-in type with integral EN50075 plug.										

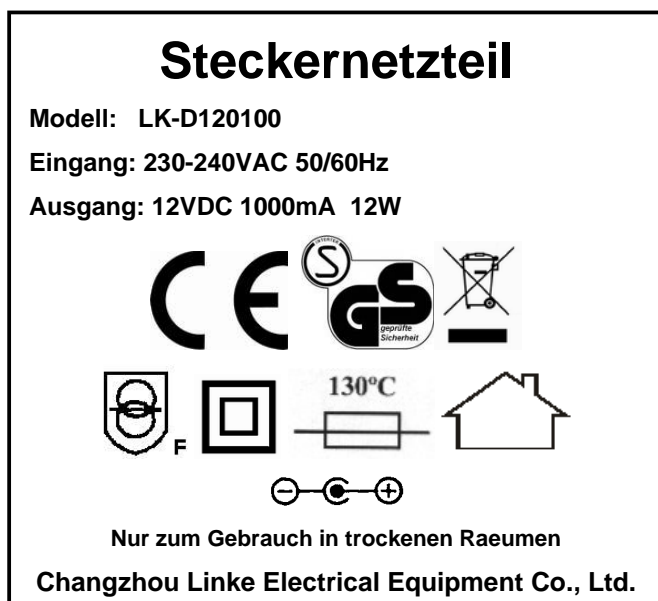
Particulars: test item vs. test requirements

Type of transformers.....	Safety isolating transformer
Application	stationary / portable / hand-held
Protection against electric shock	Class II
Short-circuit protection.....	:
- inherently short-circuit proof	Yes /No
- non-inherently short-circuit proof	Yes /No
- non short-circuit proof	Yes /No
- fail-safe.....	Yes/ No
Protection index.....	IP 20
Other characteristics.....	Weight: 0,46 kg
Rated ambient temperature ta (°C).....	—
Short-circuit voltage (V)	—

<p>Test case verdicts</p> <p>Test case does not apply to the test object..... : N/A</p> <p>Test item does meet the requirement : P(ass)</p> <p>Test item does not meet the requirement : F(ail)</p>
<p>Testing</p> <p>Date of receipt of test item : 2007-09-04</p> <p>Date(s) of performance of test : 2007-09-29 to 2007-11-23</p> <p>..... :</p>

<p>General remarks:</p> <p>This test report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>The test results presented in this report relate only to the item tested.</p> <p>Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>No obvious or conspicuous PAK/PAH deviation was observed.</p> <p>Product description:</p> <p>The products are power supply (direct plug-in) for general purpose. All of the models are similar in construction and same core size and overall dimension, except with different output parameters:</p> <p>Core size: EI 48 × 25</p> <p>Overall dimension(mm): 80 × 57 × 48</p> <p>Throughout this report LK-D120100 and LK-D300040 are tested as typical models, Figures shown before and after "r" are in the order of LK-D120100 / LK-D300040, single figure covers all models unless otherwise specified.</p> <p>The results indicates that the specimen complies with standard "EN 61558-2-6:97 and EN 61558-1:1997+ A1:1998+A11:2003".</p>

Copy of marking plate



Note:

All the other markings are the same as above but with respective model number and output rating.

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
8	MARKING AND OTHER INFORMATION		
8.1	Transformer marked with:		
	a) rated supply voltage or voltage range (V)	230-240VAC	P
	b) rated output voltage (V)	See page 4	P
	c) rated output (VA, kVA or W)	See page 4	P
	d) rated output current (mA)	See page 4	P
	e) rated frequency (Hz)	See page 4	P
	f) rated power factor (if not 1)		N/A
	g) symbol for nature of output current for transformers with rectifier		N/A
	h) symbol for electrical function (according to Part 2)		P
	i) manufacturer's name or trademark	See page 4	P
	j) model or type reference	See page 4	P
	k) vector group according to IEC 76 for three-phase transformer	Single phase	N/A
	l) symbol for Class II		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 t_a (if not 25 °C)		N/A
	p) short-time operation or intermittent operation: rated operating and resting time		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		N/A
8.3	Adjusted voltage easily and clearly discernible		N/A
8.4	For each tapping or winding: rated output voltage and rated output		N/A

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
8.5	Symbol for short-circuit proof transformers or non-inherently short-circuit proof transformers		N/A
	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		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		P
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		N/A
8.8	Instruction sheet for type X, Y, Z attachments	Direct plug-in type	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"		P
8.10	Symbol for Class II construction not confused with maker's name or trademark		P
8.11	Correct symbols:		
	Volts		P
	Amperes		P
	Volt amperes (or volt-amperes reactive for reactors)		N/A
	Watts		P
	Hertz		P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
	Input		N/A
	Output		N/A
	Direct current		N/A
	Neutral		N/A
	Single-phase a.c.		P
	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	Thermal-link	N/A
	Rated max. ambient temperature		N/A
	Frame or core terminal		N/A
	Protective earth		N/A
	IP number	IP20	N/A
	For indoor use only (text)		P
	Fail-safe safety isolating transformer (EN 61558-2-6:97)		P
	Non-short-circuit proof safety isolating transformer (EN 61558-2-6:97)		N/A
	Short-circuit proof safety isolating transformer (EN 61558-2-6:97)		N/A
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
8.13	Marking not on screws or other easily removable parts	On external enclosure	P
	Marking clearly discernible (transformer ready for use)		P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
	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		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
8.101	For transformers with supply connection by cable or cord and a plug: instruction sheet with informations about the installation of the output circuits (EN 61558-2-6:97)		N/A

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.	No capacitor across the supply	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.	MAX 24 V a.c.(peak) (LK-D300040)	P
	b) if the voltage higher than limited in a) touch current according to Annex J		N/A
	for a.c. U ₂ : 0,35 V peak (0,7 mA peak)		N/A
	for d.c. U ₁ : 1 V d.c. peak (2 mA d.c.)		N/A
	for a.c. U ₁ : 35 V peak (70 mA a.c. higher frequencies)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	c) discharge: < 50 μ C (between 60 V and 15 kV)		N/A
	d) energy: < 350 mJ (> 15 kV)		N/A
9.2	If the no-load output voltage is \leq 35 V peak a.c. or 60 V ripple-free d.c., live parts may be accessible (EN 61558-2-6:97)	MAX 41 V d.c. (LK-D300040)	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:		P
	- lamps with caps other than E10		N/A
	- type D fuse-carriers		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		P
	- ordinary transformer: test according to fig. 2 (test finger)		N/A
	- Class II transformers and Class II parts of Class I construction are tested with the test pin shown in fig. 3		P
	- 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

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict

	If the no-load output voltage is > 35 V peak a.c. or > 60 V ripple-free d.c. (EN 61558-2-6:97):		
	- only one pole of parts connected to the output circuit may become accessible (EN 61558-2-6:97)		N/A

10	CHANGE OF INPUT VOLTAGE SETTING		
	Voltage setting not possible to change without a tool	No such device	N/A
	Different rated supply voltages:		
	- indication of voltage on the transformer discernible		N/A
10.101	Portable transformers only one rated supply voltage.		P
	-unless the output voltage not exceeds the limits if the higher marked voltage is accidentally connected to the lower voltage winding. (EN 61558-2-6:97)		N/A

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: $\leq 10\%$; $\leq 15\%$		N/A
	b) inherently short-circuit proof transformers with one more than 1 rated output voltage for highest output voltage: $\leq 10\%$; $\leq 15\%$		N/A
	c) idem for other output voltages: $\leq 15\%$; $\leq 20\%$		N/A
	d) other transformers for output voltages: $\leq 5\%$; $\leq 10\%$ d.c.	(see appended table)	P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
11.2	If a transformer is marked with rated output, rated output voltage, rated output current and rated output factor, these values shall be substantially in agreement with each other.		P
	If no rated current is assigned to the transformer, the rated output for the purpose of this specification can be calculated from the rated output and the rated output voltage.		N/A

12	NO-LOAD OUTPUT VOLTAGE (see supplementary requirements in Part 2)		
	Remark: with rectifier measuring on both sides of the rectifier		N/A
12.101	No-load output voltage ≤ 50 V a.c. or ≤ 120 V ripple-free d.c. (EN 61558-2-6:97)	MAX 41 V d.c. (LK-D300040)	P
12.102	Difference between output voltage at no load and at rated output (EN 61558-2-6:97)		P
	Rated output (VA) (EN 61558-2-6:97)	(see appended table)	P
	Required value (%) (EN 61558-2-6:97)	(see appended table)	P

13	SHORT-CIRCUIT VOLTAGE		
	Difference from marking for short-circuit voltage $\leq 20\%$		N/A

14	HEATING		
14.1	No excessive temperature in normal use	(see appended table)	P
14.1.1	Classified material according to IEC 60 085 and IEC 60 216 insulating class temperature index	Class B	P
14.1.2	No classified material but the measured temperature does not exceed the value of Class A		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
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	254,4	—
	Cos ϕ = rated power factor	N/A	—
	Room temperature: rated ambient temperature (°C)	23	—
	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)	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)	P
	Temperature of terminals for external conductors ≤ 70 °C		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	Temperature of terminals of switches $\leq 70^{\circ}\text{C}$		N/A
	Temperature of internal and external wiring:		
	- rubber: $\leq 65^{\circ}\text{C}$		N/A
	- PVC: $\leq 70^{\circ}\text{C}$	(see appended table)	P
	Temperature of parts where safety can be affected:		
	- rubber: $\leq 75^{\circ}\text{C}$		N/A
	- phenol-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	- urea-formaldehyde: $\leq 85^{\circ}\text{C}$		N/A
	- impregnated paper and fabric: $\leq 85^{\circ}\text{C}$		N/A
	- impregnated wood: $\leq 85^{\circ}\text{C}$		N/A
	- PVC, polystyrene and similar thermoplastic material: $\leq 65^{\circ}\text{C}$		N/A
	- varnished cambric: $\leq 75^{\circ}\text{C}$		N/A
	Temperature of supports $\leq 85^{\circ}\text{C}$	(see appended table)	P
	Temperature of printed boards:		
	- bonded with phenol-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	- melamine-formaldehyde: $\leq 105^{\circ}\text{C}$		N/A
	- phenol-furfural: $\leq 105^{\circ}\text{C}$		N/A
	- polyester: $\leq 105^{\circ}\text{C}$		N/A
	- bonded with epoxy: $\leq 140^{\circ}\text{C}$		N/A
	Electric strength between input and output windings (18.3, 1 min); test voltage (V):	3912V	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

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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 $\leq 30\%$ (18.4) deviates from the first measurement		N/A
	- no-load input $\leq 30\%$ (18.4) deviates from the first measurement		N/A

15	SHORT-CIRCUIT AND OVERLOAD PROTECTION		
15.1	Upri (V): rated supply voltage factor	254,4 V	—
	Max. temperature of winding protected inherently (insulation class): $\leq 150\text{ °C}$ (A); $\leq 165\text{ °C}$ (E); $\leq 175\text{ °C}$ (B); $\leq 190\text{ °C}$ (F); $\leq 210\text{ °C}$ (H)	Fail-safe transformer see 15.5	N/A
	Max. temperature of winding protected by protective device during the time T given in table 4 (insulation class): $\leq 200\text{ °C}$ (A); $\leq 215\text{ °C}$ (E); $\leq 225\text{ °C}$ (B); $\leq 240\text{ °C}$ (F); $\leq 260\text{ °C}$ (H)		N/A
	Max. temperature of winding protected by protective device after first hour, peak value (insulation class): $\leq 175\text{ °C}$ (A); $\leq 190\text{ °C}$ (E); $\leq 200\text{ °C}$ (B); $\leq 215\text{ °C}$ (F); $\leq 235\text{ °C}$ (H)		N/A
	Max. temperature of winding protected by protective device after first hour, arithmetic mean value (insulation class): $\leq 150\text{ °C}$ (A); $\leq 165\text{ °C}$ (E); $\leq 175\text{ °C}$ (B); $\leq 190\text{ °C}$ (F); $\leq 210\text{ °C}$ (H)		N/A
	Max. temperature of external enclosures (accessible by test finger) $\leq 105\text{ °C}$		N/A
	Max. temperature of insulation of wiring (rubber and PVC) $\leq 85\text{ °C}$		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	Temperature rise of supports $\leq 105\text{ }^{\circ}\text{C}$		N/A
15.2	For inherently short-circuit proof transformers and for transformers with rectifiers: temperature rises \leq values in table 3		N/A
15.3	For non-inherently short-circuit proof transformers and for transformers with rectifiers: temperature rises \leq values in table 3		N/A
15.3.1	Output terminals short-circuited: protection device operates		N/A
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
	If the transformer is protected by miniature fuses in accordance to IEC 60127 an additional overload test shall be performed with 1.5times of the rated fuse current until steady state condition (EN61558-1: A11)		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
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		N/A
15.3.6	If thermal cut-outs, test with 0,95 times of operating current		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
15.4	For non-short-circuit proof transformers: temperature rises \leq values in table 3		N/A
15.5	For fail-safe transformers:		P
	- Upri (V): 1,06 times rated supply voltage	254,4	—
	- Isec (A): 1,5 times rated output current	1500 / 600mA	—
	- time until steady-state conditions t1 (h)	(see appended table)	—
	- time until failure t2 (h): \leq t1; \leq 5 h	(see appended table)	—
	During the test:		
	- no flames, molten material, etc.		P
	- temperature of enclosure \leq 175 °C	Max 79°C (LK-D300040)	P
	- temperature of plywood support \leq 125 °C	Max 43°C (LK-D300040)	P
	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	1370 V	P
	- bare hazardous live parts not accessible by test finger through holes of enclosure		P

16	MECHANICAL STRENGTH		
16.1	After tests of 16.2 and 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 J		P
16.3	For portable transformers: 100 falls, 25 mm		N/A

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Clause	Requirement – Test	Result - Remark	Verdict

16.4	Transformers with integrated pins, the following tests are carried out:		
	a) plug-in transformers: tumbling barrel test: 50 x ≤ 250 g; 25 x > 250 g	25 times of all models.	P
	b) torque test of the plug pins with 0,4 Nm		P
	c) pull force according to table 5 for each pin		P

17	PROTECTION AGAINST HARMFUL INGRESS OF WATER AND MOISTURE		
17.1	IP number marked on the transformer	Ordinary	N/A
	Test according to 17.1.1 and for other IP ratings test according to IEC 60 529:		
	- 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

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Clause	Requirement – Test	Result - Remark	Verdict
	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)		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
	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 (IP6X) 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

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Clause	Requirement – Test	Result - Remark	Verdict
	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 \leq IP20, 168 h for other transformers):		
	- insulation resistance and electric strength (Cl. 18)	48 hours moisture test RH: 93%, Temp: 24°C	P

18	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
18.2	Insulation resistance between:		
	- live parts and body for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	- live parts and body for reinforced insulation $\geq 7 \text{ M}\Omega$	Input circuit and enclosure	P
	- input circuits and output circuits for basic insulation $\geq 2 \text{ M}\Omega$		N/A
	- input circuits and output circuits for double or reinforced insulation $\geq 5 \text{ M}\Omega$	Input circuit and output circuit	P
	- each input circuit and all other input circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	- each output circuit and all other output circuits connected together $\geq 2 \text{ M}\Omega$		N/A
	- hazardous live parts and metal parts with basic insulation (Class II transformers) $\geq 2 \text{ M}\Omega$	Input circuit and core; Output circuit and core	P
	- body and metal parts with basic insulation (Class II transformers) $\geq 5 \text{ M}\Omega$	Enclosure and core	P
	- metal foil in contact with inner and outer surfaces of enclosures $\geq 2 \text{ M}\Omega$		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

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Clause	Requirement – Test	Result - Remark	Verdict
	2) double or reinforced insulation between input circuits and output circuits; working voltage (V); test voltage (V)	Working voltage: 269,1 V Test voltage: 3912 V	P
	3) basic or supplementary insulation between:		
	a) live parts of different polarity; working voltage (V); test voltage (V)	Working voltage: 240 V Test voltage: 3640 V	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 :	Input circuit and core: 1956V Output circuit and core: 1956V	P
	e) intermediate conductive parts and body	Core and enclosre: 1820 V	P
	4) Reinforced insulation between the body and live parts; working voltage (V); test voltage (V) ... :	Working voltage: 240V Test voltage: 3640V	P
18.4	Upri (V): 2 times rated input voltage; no load; frequency (Hz): 2 times rated frequency; duration (min): 5 min	480V; 120 Hz	—
	No breakdown between:		
	- turns of winding		P
	- input and output windings		P
	- adjacent input or output windings		N/A
	- windings and iron core		P

19	CONSTRUCTION		
19.1	Insulation input output specified in relevant Part 2		P
	Input and output circuits electrically separated (EN 61558-2-6:97)		P
	No possibility of any connection between these circuits (EN 61558-2-6:97)		P

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Clause	Requirement – Test	Result - Remark	Verdict
19.1.1	The insulation between input and output winding(s) consist of double or reinforced insulation (exception see 19.1.3) (EN 61558-2-6:97)		P
	Class I transformers (EN 61558-2-6:97):		
	- insulation between input windings and body consist of basic insulation (EN 61558-2-6:97)		N/A
	- insulation between output windings and body consist of supplementary insulation (EN 61558-2-6:97)		N/A
	Class II transformers (EN 61558-2-6:97):		
	- insulation between input windings and body consist of double or reinforced insulation (EN 61558-2-6:97)		P
	- insulation between output windings and body consist of double or reinforced insulation (EN 61558-2-6:97)		P
19.1.2	Class I transformers (EN 61558-2-6:97):		
	- the insulation between input and output windings via intermediate metal parts (not connected to the body) consist of double or reinforced insulation (EN 61558-2-6:97)		N/A
	Class II transformers (EN 61558-2-6:97):		
	- the insulation between input windings and body, and between output windings and body via intermediate metal part consist of double or reinforced insulation (EN 61558-2-6:97)		P
	Class I and Class II transformers (EN 61558-2-6:97):		
	- the insulation between intermediate metal part and input or output windings consist of at least basic insulation (EN 61558-2-6:97)		P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
19.1.3	Class I transformers with protective screening (EN 61558-2-6:97):		
	- insulation between input winding and protective screen consist of basic insulation (rated for the input voltage) (EN 61558-2-6:97)		N/A
	- insulation between output winding and protective screen consist of basic insulation (rated for the output voltage) (EN 61558-2-6:97)		N/A
	- the protective screen consist of metal foil or a wire wound screen extending the full width of the windings (EN 61558-2-6:97)		N/A
	- at a wire wound screen no space between the turns (EN 61558-2-6:97)		N/A
	- the cross-section of the screen is at least corresponding to the rated current of the overload device (EN 61558-2-6:97)		N/A
	- lead-out wires of the screen soldered or fixed in an equally reliable manner (EN 61558-2-6:97)		N/A
19.1.4	Protective screening (19.1.3) is not allowed for transformers with plug connection to the mains (EN 61558-2-6:97)		N/A
19.2	Fiercely burning material not used	No such substances used	P
	Unimpregnated cotton, silk, paper and fibrous material not used as insulation		P
	Wax, impregnants, etc. not used		P
19.3	Portable transformer: short-circuit proof or fail-safe	Fail-safe transformer	P
19.4	Class II transformers: contact between accessible metal parts and conduits or metal sheaths of supply wiring impossible	No conduits or metal sheaths of supply wiring	N/A

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Clause	Requirement – Test	Result - Remark	Verdict
19.5	Class II transformers: part of supplementary or reinforced insulation, during reassembly after routine servicing not omitted		P
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 $\leq 50\%$ specified values (Cl. 26)		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	No such component	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		N/A
	Creepage distances (if cracks) \geq 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		N/A
	b) impact test (spring-operated impact hammer according to IEC 60 068-2-63; $0,5 \pm 0,05$ J)		N/A
	c) scratch test (hardened steel pin) electric strength test according to Cl. 18		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
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:		
	- undue displacement of input or output windings or turns thereof		P
	- undue displacement of internal wiring or wires for external connection		P
	- undue displacement of parts of windings or of internal wiring in case of rupture or loosening		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:		N/A
	- 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		N/A
	- the insulation of the conductor: three layers		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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		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
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	a notch or a rim and sealed by ultrasonic	P
19.15	Transformer with pins for fixed socket-outlets: no strain on socket-outlet		P
	Additional torque $\leq 0,25$ Nm	Max 0,23Nm (LK-D300040)	P
19.16	Protection index for portable transformers:		
	≤ 200 VA \geq IP20 and instructions for use	IP20	P
	> 200 VA $\leq 2,5$ KVA \geq IPX4 (single-phase)		N/A
	> 200 VA $\leq 6,3$ KVA \geq IPX4 (polyphase)		N/A
	$> 2,5$ KVA (single-phase) \geq IP21		N/A
	$> 6,3$ KVA (polyphase) \geq IP21		N/A
19.17	Transformers IPX1-IPX6 totally enclosed, except for drain hole (diameter ≥ 5 mm or 20 mm ² with width ≥ 3 mm); drain hole not required for transformer completely filled with insulating materials		N/A
	Transformers \geq IPX7 totally enclosed		N/A
19.18	Transformers \geq IPX1 with a moulded, if any		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
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		N/A
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	FELV-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		P
	For fixed transformers an earthing conductor with double or reinforced insulation to accessible metal parts is allowed		N/A
19.23	Class III transformers shall not be provided with means for protective earthing		N/A
19.101	Portable transformers with rated output ≤ 630 VA in Class II construction (EN 61558-2-6:97)		P
19.102	No connections between output winding and body or protective circuit, if any (EN 61558-2-6:97)		P
	For associated transformers these connections are allowed in compliance with the relevant equipment standard (EN 61558-2-6:97)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
19.103	No capacitors which electrically connect input and output circuits (EN 61558-2-6:97)		P
19.104	The distance between input and output terminals for the connection of external wiring ≤ 25 mm (EN 61558-2-6:97)	No such terminals	N/A

20	COMPONENTS		
20.1	Switches, plugs, fuses, lampholders, flexible cables and cords comply with relevant IEC standard	Details of components see appended table	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
	Thermal-links shall comply with IEC 60 691		P
	Switches shall comply with IEC 61 058		N/A
20.2	Disconnection from the supply:		
	- all-poles switches with contact separation ≥ 3 mm		N/A
	- flexible cable and cord with plug	Direct plug-in type	P
	- 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		P
	Plugs and socket-outlets for SELV systems with both a rated current ≤ 3 A and a rated voltage ≤ 24 V comply with the following requirements: (EN 61558-1: A11)		P
	-Plugs not be able to enter socket-outlets of other standardised voltage system (EN 61558-1: A11)		P

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Clause	Requirement – Test	Result - Remark	Verdict
	-Socket-outlets not admit plugs of the other standardised voltage systems; (EN 61558-1: A11)		P
	-Socket-outlets not have a protective earthing contact (EN 61558-1: A11)		P
	Other plugs and socket-outlets for SELV systems comply with the requirements of IEC 60 906-3 and IEC 60884-2-4 (EN 61558-1: A11)		N/A
	Other plugs and socket-outlets systems are allowed for associated transformers only		P
	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
20.4	Thermal cut-outs, overload releases etc. have adequate breaking capacity	Non-replaceable thermal link inside primary winding	P
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:		
	5 cycles: transformer short-circuited for 48 h by 1,1 times of the input voltage and max. ta		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	5 cycles: transformer short-circuited for 48 h by 0,9 times of the input voltage and min. t_a (if declared)		N/A
20.6	Thermal-links shall comply with IEC 60 691	Certified thermal link, rated 1A/2A, 130°C (When short-circuit output, Max. Input current 0,6A)	P
20.6.2	Thermal-links tested as a part of the transformer:		
	- ageing test 300 h by 35 °C or $t_a + 10$ °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	No such device	N/A
20.8	Overload protection by thermal cut-outs which can be reset by soldering operation not allowed	Thermal link	P
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 ...	254,4V 20 times, Intervals 10 s	P

21	INTERNAL WIRING		
21.1	Internal wiring and electrical connections protected or enclosed		P
	Wireways smooth and free from sharp edges		P
21.2	Openings in sheet metal: edges rounded (radius $\geq 1,5$ mm) or bushings of insulating material		N/A
21.3	Bare conductors: distances adequately maintained		N/A
21.4	When external wires are connected to terminal, internal wiring shall not work loose		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
21.5	Insulation of heat-resistant and non-hygroscopic material for insulated conductors subject to temperature rise > limiting values given in 14.2		N/A

22	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS		
22.1	All cables, flexible cords etc. shall have appropriate current and voltage ratings	Direct plug-in type	N/A
22.2	Input and output wiring inlet and outlet openings for external wiring: separate entries without damage to protective covering of cable or cord		N/A
	Input and output wiring inlet and outlet openings for flexible cables or cords: insulating material or bushing of insulating material		N/A
	Bushings for external wiring: reliably fixed, not of rubber unless part of cord guard		N/A
22.3	Fixed transformer:		
	- possible to connect after fixing		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 with a mass \geq 3 kg: not lighter than H05 RR-F or H05 VV-F or H05 VVH2-F		N/A
	- for transformers greater than IPX0: not lighter than H05 RN-F, except for indoor use only		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	- for transformers IPX0 with a mass < 3kg: not lighter than H03 VV-F		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		N/A
22.7	Nominal cross-sectional area (mm ²); input current (A) at rated output not less than shown in table 9 :		N/A
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		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

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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 strands 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
	- 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

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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 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
	- 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

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Clause	Requirement – Test	Result - Remark	Verdict
	Test for type X attachments one test with a cord with smallest and one test with a cord with the largest cross-sectional area:		
	Tests for type X with special cords, type Y, type Z		N/A
	- for the test with clamping screws or tightened with torque 2/3 of that specified in table 11		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 \geq 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 such terminals	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 $\geq 50\%$ 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 $\geq 50\%$ of specified value (Cl. 26)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
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/A
	- pull of 5 N to the connection before test according to 14.2		N/A
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:		
	- 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

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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		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
	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 $\leq 0,1 \Omega$ with a min. 25 A or 1,5 times rated input current at 1 min		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
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 screw	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 $\geq 3 \text{ mm} + 1/2 \text{ screw diameter}$ 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

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Clause	Requirement – Test	Result - Remark	Verdict
25.4	In case of use of thread-forming (sheet metal) screws for connection of current-carrying parts: clamping and locking means provided		N/A
	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		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		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		
	Box 1 of table 13 (table C.1 and D.1) is not applicable (EN 61558-2-6:97)		P
26.1	Specified values according to:		
	- table 13, 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 \geq specified values (mm)		N/A
	2. Insulation between input and output circuits (double or reinforced insulation):		
	a) measured values \geq specified values (mm)	Input to output: $C_r = C_I = 10,6 > 5,4$	P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)	$1,6 > 0,9$	P
	3. Insulation between adjacent input circuits: measured values \geq specified values (mm)		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	Insulation between adjacent output circuits: measured values \geq specified values (mm)		N/A
	4. Insulation between terminals for external connection:		
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	5. Basic or supplementary insulation:		
	a) measured values \geq specified values (mm)	Cr=Cl: 3,5 > 2,44	P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	d) measured values \geq specified values (mm)	Input to core: Cr=Cl = 5,3 > 2,8 Output to core: Cr=Cl=5,3 > 2,8	P
	e) measured values \geq specified values (mm)	Core to enclosure: Cr > Cl = 4,8 > 2,5	P
	6. Reinforced or double insulation: measured values \geq specified values (mm)	Input to enclosure Cr > Cl = 6,8 > 4,8	P
	7. Distance through insulation:		
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)	Enclosure: 3,0 > 0,8	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		N/A

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Clause	Requirement – Test	Result - Remark	Verdict
	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)		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	(see appended table)	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 μ s 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
	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

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Clause	Requirement – Test	Result - Remark	Verdict
	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 μ s 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)		N/A
	- 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

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Clause	Requirement – Test	Result - Remark	Verdict
	- 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
	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 $\geq 25 \text{ VA} \leq 100 \text{ VA}$ 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

27	RESISTANCE TO HEAT, ABNORMAL HEAT, FIRE AND TRACKING		
27.1	Ball-pressure test: diameter of impression $\leq 2 \text{ mm}$; heating cabinet temperature (°C)	Enclosure: 119°C ; 1,6mm PC 923(+1) 1,5mm PC D-030G-VO(+2) 1,5mm D-120 Bobbin: 125°C ; 1,2mm PA66 A9000 1,3mm PA66 303-G20	P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
27.2	Glow-wire test (650 °C):		
	- any flame or glowing of the specimen extinguish within 30 s of withdrawing the glow-wire	Enclosure: PC 923(+1), PC D-030G-VO(+2), D-120 Bobbin: PA66 A9000, PA66 303-G20	P
	- no ignition of a single layer of tissue paper		P
27.3	Insulating material retaining live parts in position of transformers \geq 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	Fail-safe transformer	N/A
27.3.1	Portable transformers are placed on a dull painted plywood support		N/A
	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

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Clause	Requirement – Test	Result - Remark	Verdict
	During the tests:		
	- no flames occur		N/A
	-support temperature shall not exceed 125 °C		N/A
	- no ignition of the tissue paper		N/A
27.3.2	After the tests:		
	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		P
	Ball-pressure test; test temperature (°C) : Parts fixing integral pins: 125°C; 1,4mm PCB: 125°C; 1,0mm		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	Parts fixing pins of plug and output terminal	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		N/A
	Test (175 V): no flashover or breakdown before 50 drops		N/A
28	RESISTANCE TO RUSTING		
	Ferrous parts protected against rusting	iron core impregnated with varnish	P

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict
F	ANNEX F, REQUIREMENTS FOR SWITCHES COMPLYING WITH IEC 61058		
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

H	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		P
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
	- safety of the appliance as specified does not rely on correct functioning of the electronic circuit		N/A
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		N/A
	b) open circuit at the terminals of any component		N/A
	- short-circuit of capacitors, unless they comply with IEC 60 384-14		P

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Clause	Requirement – Test	Result - Remark	Verdict
	d) short-circuit of any two terminals of an electronic component as specified	One rectify diode of the bridge	P
	e) any failure of an integrated circuit as specified		N/A
	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		N/A
	Fault condition e) is applied for encapsulated and similar components		N/A
	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 $I_2 < 2,1 \times I_1$ test of 15.8 is repeated with fuse-link short-circuited		N/A
	- if $I_2 > 2,75 \times I_1$, no other tests are necessary		N/A
	If $I_2 > 2,1 \times I_1$ and $I_2 < 2,75 \times I_1$ 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		N/A
	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

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Clause	Requirement – Test	Result - Remark	Verdict
	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
H.26.2	For optocouplers the conditioning procedure of 26.2 is carried out as specified		N/A

K	ANNEX K, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION		
K.1	Wire construction:		N/A
	- insulated winding wire with min. two layers for basic or supplementary insulation		N/A
	- insulated winding wire with min. three layers for reinforced insulation		N/A
	- winding insulation material		N/A
K.2	Conformance test		N/A
K.2.1	Test 13 of IEC 60 851-5 nominal conductor diameter $\geq 0,018 \text{ mm} \leq 0,1 \text{ mm}$		N/A
	Test as specified in 4.2.1 and 4.2.2 of IEC 60 851-5		N/A
	Nominal conductor diameter $> 0,1 \text{ mm}, \leq 2,5 \text{ mm}$, test as specified in 4.3.1 and 4.3.2 of IEC 60 851-5		N/A
	Nominal conductor diameter $< 2,5 \text{ mm}$, 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

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Clause	Requirement – Test	Result - Remark	Verdict
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

	COMMON MODIFICATIONS		
20.3	Add a note after the second paragraph		P
22.5	Replace "code designation 53 of IEC 60245-1" by "code designation H05 RR-F"		N/A
	Add: >IPX0 no lighter cord than H05 RN-F, except for transformer for indoor use		N/A
	Add: IPX0 with a mass < 3Kg, no lighter cord than H03 VV-F		N/A
23.1	Replace: IEC 60947-7-2 by IEC 60947-7-1		N/A

ZA	ANNEX ZA (NORMATIVE) - SPECIAL NATIONAL CONDITIONS		
8.7	(DENMARK) Requirements regarding marking tag of power supply cord and connecting of earthing wire		N/A
22.8	(DENMARK) Requirements regarding plug for a transformer having a rated current < 10A.		N/A
22.8	(SWEDEN) Requirements regarding the plug for a transformer having a rated current < 16A		N/A

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Clause	Requirement – Test	Result - Remark	Verdict

Appended tables:

11	TABLE: OUTPUT VOLTAGE AND OUTPUT CURRENT UNDER LOAD				P
	Ambient temperature		23		—
	Rated supply voltage and frequency		230-240VAC 50/60 Hz		—
Model		Load output voltage (V)	Rated output voltage (V)	Different (%)	Required (%)
LK-D120100		12,08	12,0	+0,6	≤ ± 10
LK-D300040		30,50	30,0	+1,6	≤ ± 10
Note: the value show above is the average values measured at 230V and 240V supply, tested by the 50Hz.					

12	TABLE: NO-LOAD OUTPUT VOLTAGE				P
	Ambient temperature		23		—
	Rated supply voltage and frequency		230-240VAC 50/60 Hz		—
Model	No-load output voltage (V)	Load output voltage (V)	Different (%)	Rated output (W)	Required (%)
LK-D120100	17,4	12,08	+44,0	12,0	≤ 50
LK-D300040	40,0	30,50	+31,1	12,0	≤ 50
Note: the value show above is the average values measured at 230V and 240V supply, tested by the 50Hz.					

EN 61558-2-6			
Clause	Requirement – Test	Result - Remark	Verdict

14	TABLE: HEATING				P	
	t1 (°C).....:	23			—	
	t2 (°C).....:	23			—	
	test voltage (V).....:	254,4			—	
Model	temperature rise of part/at:	dT (K)			required dT (K)	
LK-D120100/ LK-D300040	External enclosure	41/37			55	
	Support	13/15			60	
	Internal wire (input)	36/34			55	
	Internal wire (output)	47/26			55	
	PCB	92/65			105	
	Core	79/58			For ball pressure	
	winding temperature rise measurements:				—	
Model		R ₁ (Ω)	R ₂ (Ω)	dT (K)	required dT (K)	insulation class
LK-D120100	Primary	162,90	220,55	91	95	B
	Secondary	0,560	0,7564	90	95	B
LK-D300040	Primary	170,30	223,31	80	95	B
	Secondary	2,570	3,364	80	95	B

15.5	TABLE: Short-circuit and overload protection for fail-safe transformer				P
	Room temperature (°C).....:	25		—	
	Test voltage (V).....:	254,4		—	
Model	Overload, time until steady-state or failure conditions t1	Short circuit output, time until failure t2	Enclosure temperature ≤ 175°C	Wood support temperature ≤ 125°C	
LK-D120100	16min	--	76	40	
LK-D300040	50min	--	79	43	
Note: Three samples have been tested, only the highest value is recorded.					

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Clause	Requirement – Test	Result - Remark	Verdict

20	TABLE: Components				
object/part No.	Manufacturer/ Trademark	type/model	Technical data	standard	Marks of conformity ¹⁾
Enclosure	GE Plastics China Co.,Ltd.	PC923(+1) (UL E161723)	V-0 Thickness 3,06mm	EN 61558-2-6	Tested with appliance
Enclosure alternative	NYTEX COMPOSITES CO LTD	ABS/PC D- 030G-VO(+2) (UL E135714)	V-0 Thickness 3,06mm	EN 61558-2-6	Tested with appliance
Enclosure alternative	ZHENJIANG GPPC CHEMICAL CO LTD	ABS D-120 (UL E206417)	V-0 Thickness 3,06mm	EN 61558-2-6	Tested with appliance
Bobbin	NANJING DELLON PLASTICS ALLOY CO LTD	PA66 A9000 (UL E255621)	94V-0 130°C Thickness 0,8mm	EN 61558-2-6	Tested with appliance
Bobbin alternative	PANYU TIANYU PLASTIC INDUSTRIAL CO LTD	PA66 303- G20 (UL E152735)	94V-0 130°C Thickness 0,8mm	EN 61558-2-6	Tested with appliance
Insulating tape	Suzhou Jingyi Special Adhesive Tape Co., Ltd.	J312Y (UL E188295)	130°C	EN 61558-2-6	Tested with appliance
Magnet wire	CHANGZHOU DAYANG WIRE & CABLE CO LTD	NW75C (UL E158909)	130 °C	EN 61558-2-6	Tested with appliance
Magnet wire alternative	LIAONING DONGGANG MAGNET WIRE CO LTD	NW28C (UL E229247)	130 °C	EN 61558-2-6	Tested with appliance
Internal wire	CHANGZHOU OUHUA ELECTRONIC CO LTD	1618 (UL E307456)	22AWG, 80°C, 300V	EN 61558-2-6	Tested with appliance
Internal wire alternative	WUJIANG ZHICHENG ELECTRONICS FACTORY	1617 (UL E237831)	22AWG, 105°C, 600V	EN 61558-2-6	Tested with appliance
Transformer	Changzhou Linke Electrical Equipment Co., Ltd.	LK-D120100/ LK-D225050/ LK-D270040/ LK-D300040	EI 48×25 Class B	EN 61558-2-6	Tested with appliance
Thermal link	Hubei Honghu Blue Light Electronic Ltd.	RH130-1, RH130-2	AC250V 1A/2A, 130 °C	EN 60691	TUV Rh (R 50077755)

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Clause	Requirement – Test		Result - Remark		Verdict
Thermal link alternative	The Third Radio Factory of Yangzhong, Jiangsu	WR130	AC250V 2A, 130 °C	EN 60691	TUV Rh (R 50079815)
Thermal link alternative	Dan Yang New Frequency Electronic Ind. Co., Ltd.	RH130	AC250V 2A, 130 °C	EN 60691	VDE/ 40007439
Thermal link alternative	Aupo Electronics Ltd.	A4-1A	AC250V 1A, 130 °C	EN 60691	VDE/ 40005586
Thermal link alternative	CHANGZHOU YUAN DA SCIENCE INSTITUTE	WR130	AC250V 1A/2A, 130 °C	EN 60691	VDE/ 40018290
Core	Jiangyin Shuogai Electronic Plant	DW600	EI 48	EN 61558-2-6	Tested with appliance
Output cord	UNIRISE ELECTRIC WIRE & CABLE CO LTD	2468 (UL E176095)	24AWG, 80°C, 300V, length: 1,8m	EN 61558-2-6	Tested with appliance
PCB	Kingboard Laminates Co.,Ltd.	KB-6150FR-4 (UL E123995)	130°C Thickness 1,6mm	EN 61558-2-6	Tested with appliance
Alt. PCB	Changzhou Juncheng Telecommunication Component Factory	KB-5151 (UL E248439)	130°C Thickness 1,6mm	EN 61558-2-6	Tested with appliance
Heat Shrinkable Tube	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	YDPU2 (UL E203950)	600V 125° C	EN 61558-2-6	Tested with appliance
¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance					

Appendix no. 1 Photos of the products

Overall view 1



Overall view 2



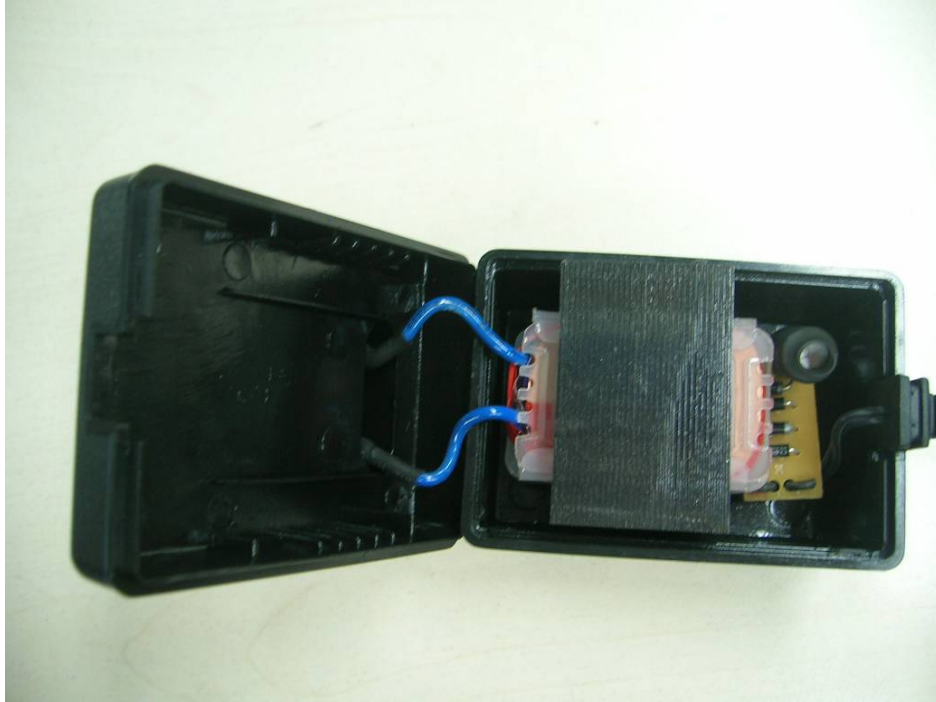
Overall view 1



Overall view 2



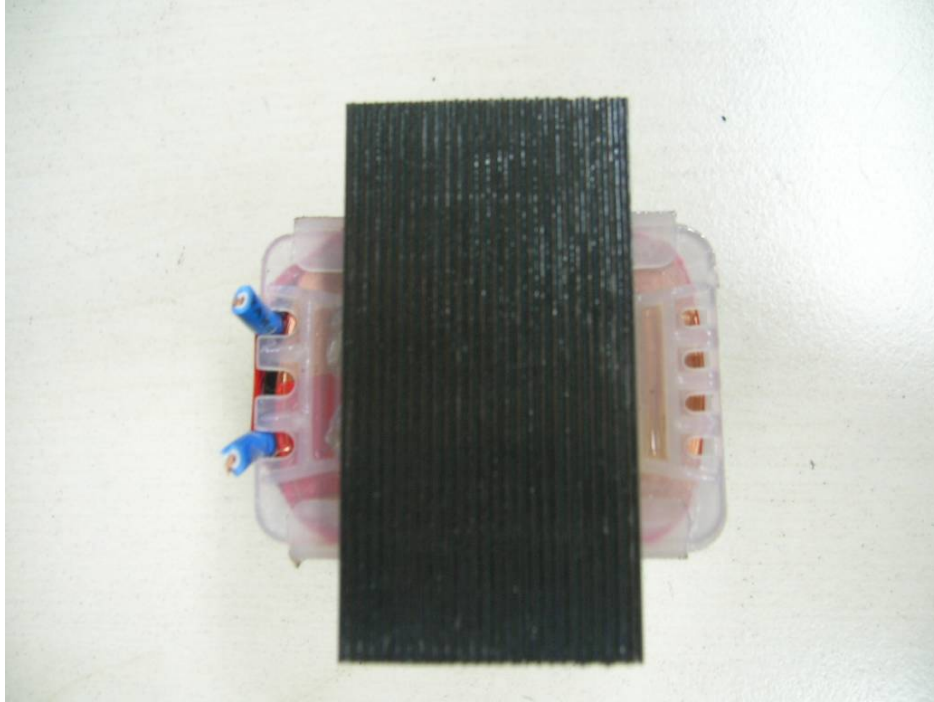
Internal view 1



Internal view 2



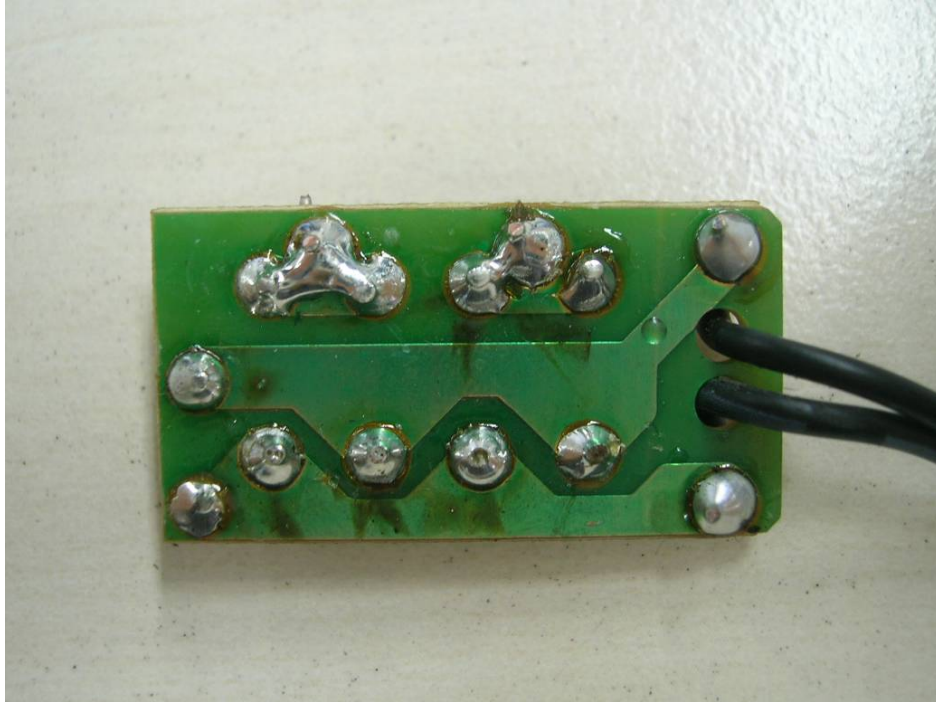
Transformer 1



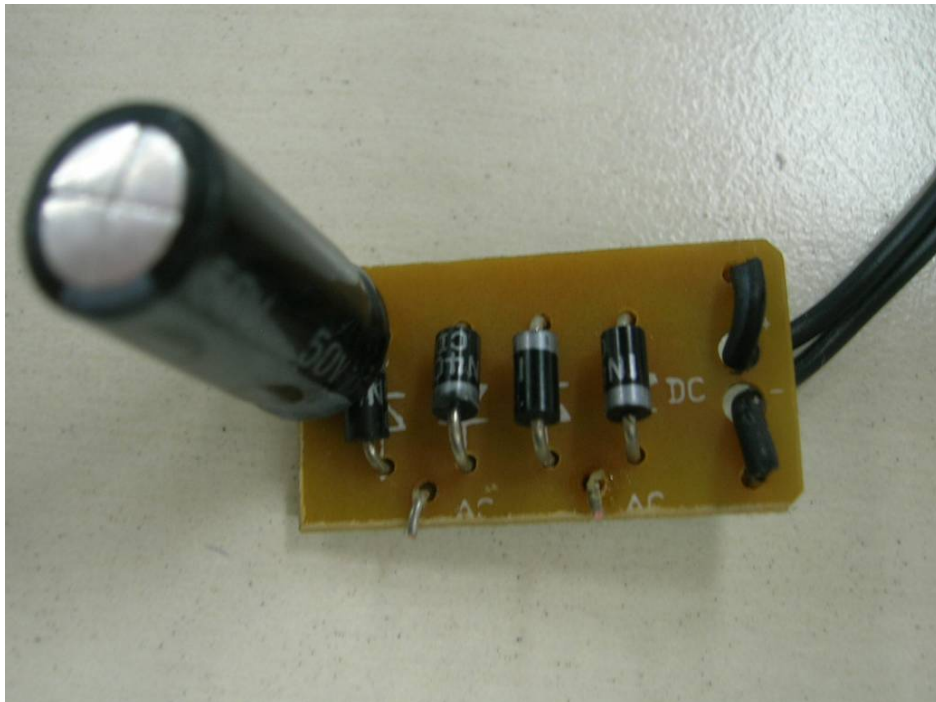
Transformer 2



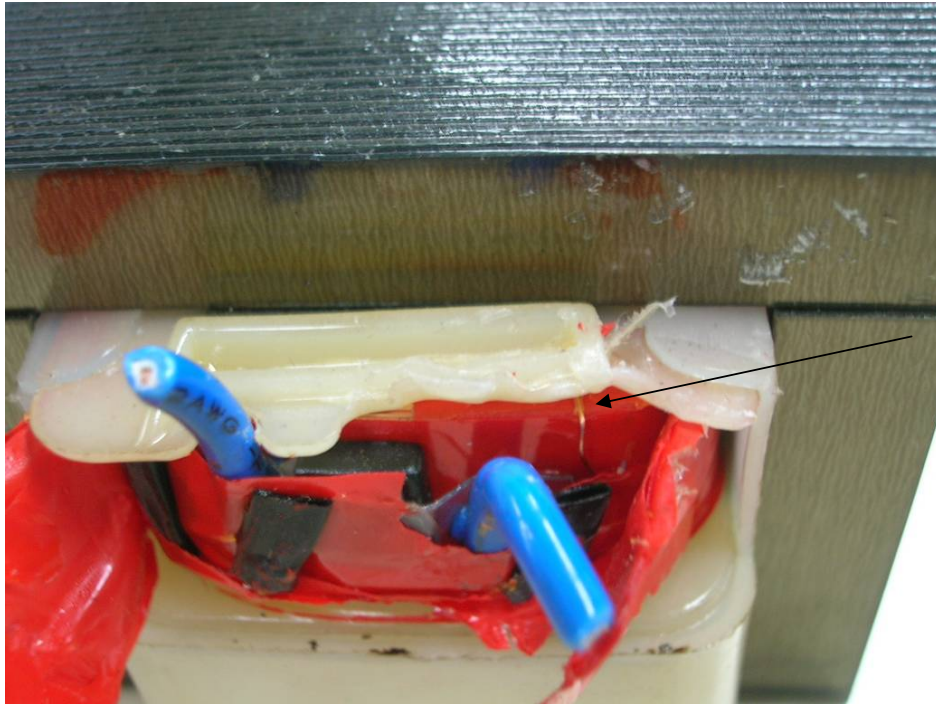
PCB 1



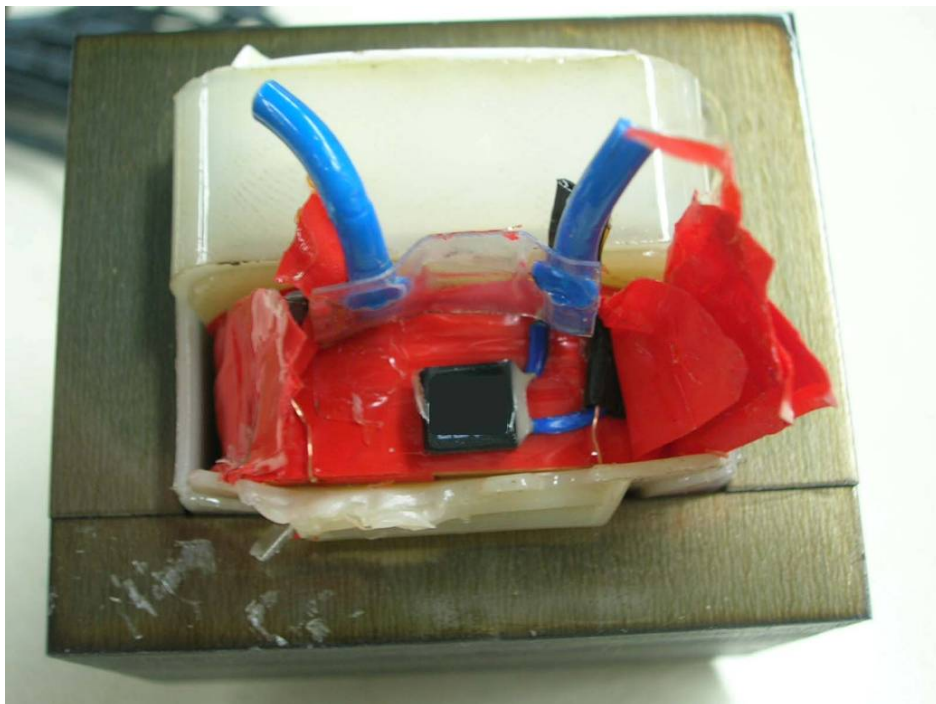
PCB 2



Crossover



Thermal-link



Appendix no. 2 Equipment combined with two-pole plug (Class II)

Supplementary tests on plug portion according to EN50075:1990

1. Dimensions (Clause 7 of EN 50075)

Plugs shall comply with standard size. (Standard sheet 1) P

2. Protection Against Electric Shock (Clause 8 of EN 50075)

2.1. Live parts of plugs with the exception of the bare metal parts of the pins, shall not be accessible. (Clause 8.1 of EN 50075) P

2.2. It shall not be possible to make connection between a pin of a plug and a live socket contact of a socket-outlet while the other pin is accessible. (Clause 8.2 of EN 50075) P

2.3. External parts of plugs with the exception of pins, shall be insulating material. (Clause 8.3 of EN 50075) P

3. Construction (Clause 9 of EN 50075)

3.1. The plug cannot be opened by hand or by using a general purpose tool. (Clause 9.1 of EN 50075) P

3.2. Pins of plugs shall be solid and shall have adequate mechanical strength. (Clause 9.3 of EN 50075) P

3.3. Pins of plugs shall be locked against rotation and adequately fixed into the body of the plug. (Clause 9.4 of EN 50075) P

3.4. Plugs shall be provided with soldered, crimped or equally effective permanent connection. (Clause 9.5 of EN 50075) P

3.5. Plug shall be shaped in such a way and made of such a material that they can easily be withdrawn by hand from a socket-outlet. (by gripping the charger enclosure, Clause 9.6 of EN 50075) P

4. Resistance to Humidity (Clause 10 of EN 50075) N/A

The integrated pins were tested together with the battery charger. (See test report for charger)

5. Insulation Resistance and Electric Strength (Clause 11 of EN 50075) N/A

(See test report for charger)

6. Mechanical Strength (Clause 13 of EN 50075)

Plug shall have adequate mechanical strength to withstand the stresses imposed during use. P

- | | |
|---|-------------------|
| <p>6.1. The plugs are pressed between two flat surfaces with a force of 150N for 5min. 15min after removal of the force, the plug shall not show such deformation as would result in undue alteration of the dimensions which ensure safety. (Clause 13.1 of EN 50075)</p> | <p>P</p> |
| <p>6.2. The plug are tested in a tumbling barrel.
(Clause 13.2 of EN 50075, fall number is shown in test report for transformer)
After the test, the plug shall show no damage within the meaning of this standard, in particular:
--- no part shall become detached or loosened.
--- the pin shall not turn when a torque of 0.4Nm is applied.
Note: A section of the pin is square constructed for preventing the rotation.</p> | <p>P</p> |
| <p>6.3. The pins is held in a suitable clamp in such a position that the straight part of a steel wire (D=1+-0.02mm,U-shaped) rests on the plug pin. The plug is caused to move backwards and forwards, so that the wire rubs along the pin. The number of the movements is 20 000, and the rate of the operation is 25 movements per min. (Clause 13.3 of EN 50075)</p> <p>After the test, the pin show no damage which may effect safety or impair the further use of the plug, in particular, the insulating sleeve shall not have punctured or rucked up.</p> | <p>P</p> <p>P</p> |
| <p>6.4. A pull force of 40N is applied for 60s on each pin in turn in the direction of the longitudinal axis of the pin. The pull is applied 60min after the plug has been placed in a heating cabinet of 70 °C. After the plug cooling down to ambient temperature, any pin shall not have displaced in the body of the plug more than 1mm. (Clause 13.4 of EN 50075)</p> | <p>P</p> |
| <p>7. Resistance to Heat and to Ageing (Clause 14 of EN 50075)</p> | <p>P</p> |
| <p>8. Current-carrying Parts and Connections (Clause 15 of EN 50075)</p> | |
| <p>8.1. Connection, electrical and mechanical , shall withstand the mechanical stresses occurring in normal use, and electrical connections shall be designed that contact pressure is not transmitted through insulating material. (Clause 15.1 & 15.2 of EN 50075)</p> | <p>P</p> |
| <p>8.2. Current-carrying parts shall be of copper or an alloy containing at least 58% of copper. (Clause 15.3 of EN 50075)</p> | <p>P</p> |
| <p>9. Creepage Distance, Clearances, and Distances Through Insulation (Clause 16 of EN 50075)</p> | <p>P</p> |
| <p>10. Resistance of Insulating Material to Abnormal Heat and to fire (Clause 17 of EN 50075)</p> | <p>P</p> |

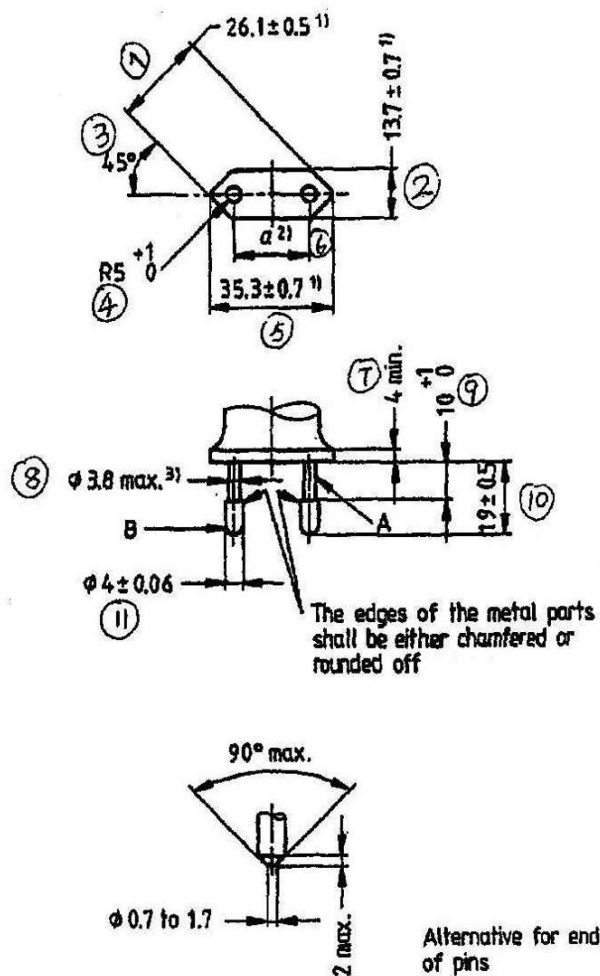
Appendix no. 3

	<p style="text-align: center;">DIMENSIONS Checked by means of measurement according to EN50075 Standard sheet 1 (see appendix no. 4)</p>	P
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Position	Requirement (mm)	Measured (mm)	Verdict
1	25,6 – 26,6	25,8	P
2	13 – 14,4	13,8	P
3	45°	45°	P
4	R5 – 6	R5,5	P
5	34,6 – 36	35,1	P
6	18-19,2 in the plane of the engagement face	18,5	P
	17-18 at the ends of the pins	17,3	P
7	4min	-	N/A
8	φ3,8max	φ3,4	P
9	10-11	10,3	P
10	18,5 – 19,5	18,9	P
11	φ3,94 - φ4,06	φ3,96	P
	Dimensions of position 1, 2 and 3 shall not be exceeded within a distance of 18mm from the engagement face of the plug	18,1	P
	The edges of the metal parts shall be either chamfered or rounded off	Rounded off	P

Appendix no. 4

EN50075 :1990 Standard sheet 1



Dimensions in millimetres

A = insulating collar

B = metal pin

¹⁾ These dimensions shall not be exceeded within a distance of 18 mm from the engagement face of the plug.

²⁾ Dimension a is:

18 mm to 19,2 mm in the plane of the engagement face;

17 mm to 18 mm at the ends of the pins.

³⁾ This dimension may be increased to 4 mm within a distance of 4 mm from the engagement face of the plug.

Pin ends shall be rounded, or conical as shown in detail sketch.

The sketches are not intended to govern design except as regards the dimensions shown.