

Prüfbericht - Nr.: 11023934 002 <i>Test Report No.:</i>		Seite 1 von 66 <i>Page 1 of 66</i>			
Auftraggeber: <i>Client:</i>		LEE YEONG INDUSTRIAL CO., LTD No.29, Fu Hsine Rd., Tou Liu Industrial Zone Tou Liu City, Yunlin Hsien 640, Taiwan R.O.C.			
Gegenstand der Prüfung: <i>Test item:</i>		Reciprocating Saw			
Bezeichnung: <i>Identification:</i>	RS130B	Serien-Nr.: <i>Serial No.:</i>	Engineering sample		
Wareneingang-Nr.: <i>Receipt No.:</i>	TCH 29426	Eingangsdatum: <i>Date of receipt:</i>	25.01.2011		
Prüfört: <i>Testing location:</i>	TÜV Rheinland Taiwan Ltd. Taichung Office. No.9, Lane 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan, R.O.C.				
Prüfgrundlage: <i>Test specification:</i>	EN 60745-1:2009+A11 EN 60745-2-11:2010				
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>				
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland Taiwan Ltd. Taichung Office. No.9, Lane 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan, R.O.C.				
geprüft/ tested by: Stanley T.Y. Chuang		kontrolliert/ reviewed by: Andy Wen			
 08.06.2011 S. Chuang / Project Manager (TÜV Rheinland Taiwan Ltd.)		 09.06.2011 Andy Wen / Assistant Manager			
<u>Datum</u> <i>Date</i>	<u>Name/Stellung</u> <i>Name/Position</i>	<u>Unterschrift</u> <i>Signature</i>	<u>Datum</u> <i>Date</i>	<u>Name/Stellung</u> <i>Name/Position</i>	<u>Unterschrift</u> <i>Signature</i>
Sonstiges/ Other Aspects:					
Please also refer to report 11023934 001.					
Abkürzungen:		Abbreviations:			
P(ass) = entspricht Prüfgrundlage		P(ass) = passed			
F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed			
N/A = nicht anwendbar		N/A = not applicable			
N/T = nicht getestet		N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

Copy of marking plate:



General product information:

The products are hand-held tools designed as electric reciprocating saw. The rated voltage is 110-120 and 220-240V~ 50/60Hz with rated power of 1300W and 1600W. Details refer to user manual.

Model no.	Rated	No load speed	Stroke	Weight
RS130B	110-120V~,50/60Hz,1300W	1000-2800	26mm	3.7kg
RS130B	220-240V~,50/60Hz,1600W	1000-2800	26mm	3.7kg

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Clause	Requirement + Test	Result - Remark	Verdict
6	ENVIRONMENTAL REQUIREMENTS		-
6.1	Noise	See below	P
6.1.1	Noise reduction	The major noise is coming from motor and transmission parts.	P
6.1.2	Noise test code	See below	P
6.1.2.1	Noise emission values to be quoted in the user instructions as required by 7.8.1 shall be measured by the test procedure described in 6.1.2.1 to 6.1.2.6	Noise emission values are mentioned in the user manual.	P
6.1.2.2	The test methods described are engineering methods in accordance with EN ISO 3744.	In accordance with EN ISO 3744	P
	Instrumentation for the measurement of acoustic values shall be in accordance with EN ISO 3744.	In accordance with EN ISO 3744	P
	The sound power level shall be determined by using a hemispherical/cylinder measurement surface	As required	P
	A-weighted sound power level shall be calculated in accordance with EN ISO 3744.	In accordance with EN ISO 3744	P
6.1.2.3	A-weighted sound pressure level at the workstation shall be determined in accordance with EN ISO 11203.	As required	P
6.1.2.4	The installation and mounting conditions shall be the same for the determination of both sound power level and sound pressure level at the work station	The same condition is used	P
	The tool is held by the operator or suspended in such a way corresponding to normal use.	Held by the operator as specified in part 2	P
6.1.2.5	Measurements shall be carried out on a new tool, additional to that required by other tests.	Measurements are carried out on a new tool.	P
	Tools are tested under the two operating conditions "no load" or "load" as the appropriate for the type of tool and specified in the relevant part 2.	A-weighted sound pressure level: 110-120V: 98.4 dB(A) 220-240V: 100.3 dB(A) A-weighted sound power level: 110-120V: 109.4 dB(A) 220-240V: 111.3 dB(A)	P
	Tools shall be run in for a period of at least 1 minute before starting test.	Tools are run for 2 minutes before starting test.	P
	The measurement time under stable condition shall be at least 15 s.	30 s is used	P
6.1.2.6	Measurement uncertainties	As required	P
6.1.2.7	Information to be recorded	As required	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.8	Information to be reported	As required	P
6.1.2.9	Declaration and verification of noise emission values	As required	P
	L _{pA} [dB(A)] : K _{pA} [dB(A)] :	98.4 dB(A), 100.3 dB(A) 3 dB(A)	P
	L _{pCpeak} (dB) : K _{pCpeak} (dB) :		N/A
	LWA [dB(A)] : KWA [dB(A)] :	109.4 dB(A), 111.3 dB(A) 3 dB(A)	P
6.2	Vibration	See below	P
6.2.1	Vibration reduction	Considered	P
6.2.2	The vibration levels for hand-arm vibration to be quoted in the user instructions as required by 8.12.2Za	Noise emission values are mentioned in the user manual.	P
6.2.3	Symbols	As required	P
6.2.4.1	Direction of measurement	Related to the three orthogonal directions X, Y and Z	P
6.2.4.2	Location of measurement	At hand-held position	P
6.2.4.3	Magnitude of vibration	As required	P
6.2.4.4	Combination of vibration direction	Vibration measured: 3.90m/s ²	P
6.2.5	Instrumentation requirements	As required	P
6.2.6	Measurement shall be carried out on a new tool that is only used for the noise and vibration tests required by this standard. When the test procedure is not provided in a relevant Part 2 or there is no relevant Part 2, the operating conditions and working procedure shall be specified in sufficient detail as to achieve appropriate reproducibility.	Measurement is carried out on a new tool that is only used for the noise and vibration test.	P
6.2.7	Measurement procedure and validity	As required	P
6.2.7.1	Reported vibration value	As required	P
	Work mode - vibration emission value a (m/s ²).....:	Test under load 110-120V: 37.634 m/s ² 220-240V: 50.209 m/s ²	P
	Uncertainty K (m/s ²).....:	1.5 m/s ²	P
6.2.7.2	Declaration of the vibration emission value (instruction manual)	As required	P

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Clause	Requirement + Test	Result - Remark	Verdict

	Work mode - vibration emission value a (m/s ²).....:	Test under load 110-120V: 37.634 m/s ² 220-240V: 50.209 m/s ²	P
	Uncertainty K (m/s ²).....:	1.5 m/s ²	P
6.2.8	Measurement report	As required	P

7	CLASSIFICATION		-
7.1	Tool is Class I, II, or III with respect to protection against electric shock	Class II	P
7.2	Degree of protection against harmful ingress of water per IEC 60529.....:	IP 20	P
	Required degree of protection other than IPX0 specified by manufacturer or in relevant part 2		N/A

8	MARKINGS AND INSTRUCTIONS		-
8.1	Tool marked with rated voltage(s) or rated voltage range(s) (V).....:	110-120V~ and 220-240V~	P
	Tool for star-delta connection clearly marked with the two rated voltages (e.g. 230 Δ / 400 Y V).....:		N/A
	Nature of supply/frequency with symbol for nature of supply placed next to rated voltage (Hz).....:	50-60 Hz	P
	Rated input or current marked (W or A)	1300W and 1600W	P
	Rated input or rated current corresponds to highest loading possible for a tool with alternative components selectable by a control device		N/A
	Manufacturer's name, or trade mark, or identification mark and address of manufacturer or an agent responsible for marketing the tool.....:	LEE YEONG INDUSTRIAL CO., LTD No.29, Fu Hsine Rd., Tou Liu Industrial Zone Tou Liu City, Yunlin Hsien 640, Taiwan R.O.C.	P
	Model or type reference	RS130B	P
	Class II symbol for class II tools.....:	Class II	P
	IP number other than IPX0.....:	IP20	P
	Tool provided with "WARNING – To reduce the risk of injury, user must read instruction manual" or the sign M002 of ISO 7010 ⁸⁾		P
	Additional markings not leading to misunderstanding permitted.....:		P
	Business name and address of the manufacturer and, where applicable, his authorised representative		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Designation of the tool.....:	Reciprocating saw	P
	Designation of series or type.....:	RS130B	P
	Year of manufacture	See nameplate	P
8.2	Rated operating time, or rated operating time and rated resting time, respectively, marked on a short-time or intermittent operation tool, except when operating time limited by construction of tool.....:	Continuous operation	N/A
	Rated operating time precedes rated resting time, and they are separated by an oblique stroke.....:	Continuous operation	N/A
8.3	Correct use of symbol for voltage ranges and different voltage levels.....:		P
8.4	Change in voltage clearly discernible	The tool can't be adjusted to suit different rated voltages.	N/A
	Correct Wiring diagram fixed to tool		N/A
8.5	Rated power input		P
8.6	Use of correct symbols		P
	Correct dimensions and use for Class II symbol		P
	Other units and their symbols same as international standardised system		P
	No misunderstanding with use of additional symbols		P
8.7	A connection diagram affixed to a tool with more than two supply conductors, except when correct mode of operation is obvious as specified	Single supply	N/A
	The earthing conductor not a supply conductor	Class II tool	N/A
	Wiring diagram indicates how the windings are to be connected for tools for star-delta connection		N/A
8.8	Terminals, except for type Z attachments, marked on non-removable part with specified symbols		N/A
	Terminal exclusively for neutral connection marked with "N"	No neutral conductor is provided	N/A
	Earthing terminal marked with specified symbol	Class II tool	N/A
8.10	"Off" position indicated by figure O of IEC 60417-5008 (DB:2002-10) when a hazard could result by unexpected start up	Off position is obvious.	P
	Figure O not used for any other indication	Fulfil.	P
	Position of moving contacts of mains switch correspond to indications for different positions of its operating means	Fulfil.	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.11	Regulating devices and the like provided with markings as specified.....:	Not applicable	N/A
	Figures used for different positions with O for "off" position, and figures reflecting greater output for other positions	See above	N/A
8.12	Instruction manual and safety instructions provided together with an explanation of the symbols	The instruction manual is provided with the tool. The safety instructions are included in user manual.	P
	Instructions legible and contrasting in the official language(s) of the country where tool is sold, and include name and address of manufacturer, or supplier, or agent marketing the tool	The instruction is legible and contrast with the background	P
	Additional: The translations must be bear the words "Translation of the original instructions", and they must be accompanied by a copy of the "Original instructions".	See user manual	P
	Replacement: They include the business name and address of the manufacturer and, where applicable, his authorised representative. Any address is sufficient to ensure contact.	See user manual	P
	Additional: They include the designation of the tool and series or type as required by 8.1, including, description of machine such as "drill", "planer" etc.	See user manual	P
8.12.1	Safety instructions in English are verbatim and in any other official language are equivalent	Safety rules in English are verbatim	P
	Format of all Safety Warnings differentiate the context of all clauses by font or similar means and as illustrated in 8.12.1.1	See user manual	P
8.12.1.1	General Power Tool Safety Warnings	See user manual	P
8.12.1.2	Order of the Safety Instructions are in accordance with this clause	See user manual	P
8.12.2	Warnings required by this clause included in Instruction Manual when Safety Instructions are separate from instruction Manual	See user manual	P
	Warnings in English are verbatim and in any other official language are equivalent.....:	See user manual	P
	Instruction Manual provided with the required information in a) to d) of this clause as appropriate	See user manual	P
8.12.2 (Za)	Emissions (EN 60745-1:2009)	See user manual	P
	1) The noise emission according to 6.1.2.	See user manual	P

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Clause	Requirement + Test	Result - Remark	Verdict
	2) Recommendation for the operator to wear hearing protection.	See user manual	P
	3) The vibration emission according to 6.2.	See user manual	P
	Vibration emission < 2.5 m/s ² , stated in the instruction		NA
	Vibration emission > 2.5 m/s ² value given in the instruction	See user manual	P
	4) The following information:	See user manual	P
	- that the declared vibration total value has been measured in accordance with a standard test method and may be used for comparing one tool with another.	See user manual	P
	- that the declared vibration total value may also be used in a preliminary assessment of exposure.	See user manual	P
	5) A warning:	See user manual	P
	- that the vibration emission during actual use of the power tool can differ from the declared total value depending on the ways in which the tool is used; and	See user manual	P
	- of the need to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).	See user manual	P
8.13	Markings easily legible and withstood durability test		P
	Signs are in contrast to their background, clearly legible from a distance of not less than 500 mm		P
	Label material, grade designation, ink and printing process		P
	Signs complied with blue colour requirements of ISO 3864-2		P
8.14	Markings in 8.1 to 8.5 on a main part of the tool	On the enclosure	P
	Markings in 8.1, 8.2, 8.3, and 8.5 placed together	Placed together on the nameplate	P
	Markings clearly discernible from outside of the tool, but if necessary, after removal of a cover without aid of a tool	No cover can be removed without aid of a tool	NA
	Indications for switches and controls placed on or in vicinity of components	No indications for switches and controls	N/A
8.15	Thermal link or fuse-link marked appropriately	Not applicable	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9	PROTECTION AGAINST ACCESS TO LIVE PARTS		P
9.1	Accessible part not considered live		-
	- extra-low a.c. voltage: peak values not exceeding 42.4 V	See below	N/A
	- extra-low d.c. voltage: not exceeding 42.4 V	Not applicable	N/A
	- or separated from live parts by protective impedance, d.c. current not exceeding 2 mA	Not applicable	N/A
	- or separated from live parts by protective impedance, a.c. peak value not exceeding 0.7 mA	No protective impedance provided	N/A
	- for peak value 42.4 V up to and including 450 V capacitance not exceeding 0.1 µF		N/A
	- for peak value 450 V up to and including 15 kV capacitance not exceeding 0.1 µF	No protective impedance provided	N/A
9.2	Probe of Fig 1 did not contact live parts with detachable parts removed	No accidental contact with such metal parts is expected to occur	P
	Probe of Fig 1 did not contact live parts of the lamp with detachable parts removed	No lamp	N/A
	Screw type fuses or screw-type miniature circuit breakers accessible without aid of a tool excluded from this requirement	Not applicable	N/A
	Probe of Fig 1 did not contact live parts or live parts protected only by lacquer, enamel, ordinary paper, cotton, oxide film, beads, or sealing compound applied through an opening with 20 N force	Live parts or parts protected by the materials listed not accessible with the test pin	N/A
9.3	Test pin of Fig 2 did not contact live parts, through openings in class II tools or class II constructions	Test of apertures with the test pin (ø 3 mm)	P
9.4	Probe of Fig 1 did not contact basic insulation through openings in Class II tools or Class II constructions with all detachable parts removed	No contact of the test finger with basic insulation	P

10	STARTING		-
10.1	Motors start under normal voltage conditions	See below	P
	Starting ten times at 0.85 times rated voltage without load (V)	Tool was tested 10 times under the conditions of: 0.85x110V~(50Hz) 0.85x220V~(50Hz)	P
10.2	Centrifugal and other automatic starting switches operated reliably 10 times at 1.1 of the rated voltage (V)	Not applicable	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.3	Overload protection devices did not operate under normal starting conditions as confirmed by 10.1 and 10.2	No overload protection device	N/A
11	INPUT AND CURRENT		-
11.1	Marked power input or current is at least 110% of measured no-load input or current.....:	See appended Table 11.1	P
12	HEATING		-
12.1	Excessive temperatures not attained under normal load	See appended Table 12.1 and Table 13.1A	P
	Measurements for heating elements repeated as specified	No heating element	N/A
12.2	Loading conditions during temperature test.....:	See appended Table 12.1	P
	Heating elements tested to IEC 60335-1 at 1.06 times rated voltage	No heating element	N/A
12.3	When possible, temperature rises of uniform windings determined by resistance method.....:	See appended Table 12.3	P
	Temperature rise of electrical insulation, other than windings, measured on surface of insulation	No space reducing	N/A
12.4	Tool operating time.....:	See appended Table 12.1	P
12.5	Temperature rises did not exceed values in Table 1, except as allowed by 12.6	No excessive temperature	P
	Protective devices did not operate	Not applicable	N/A
	Sealing compounds did not flow	Not applicable	N/A
12.6	When winding temperatures exceeded values in Table 1, three additional samples successfully subjected to following tests:	Winding temperature doesn't exceed values in table 1	N/A
	a) Heat treatment for 240 h at the specified cabinet temperature (°C):.....:		N/A
	b) No inter-turn short circuit after oven treatment		N/A
	c) Humidity treatment in accordance with 14.3		N/A
	d) No excessive leakage current after humidity treatment.....:	See appended Table 13.1B	N/A
	No flashover or breakdown occurred during electric strength after humidity treatment	See appended Table 15.2A	N/A
13	LEAKAGE CURRENT		-

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Clause	Requirement + Test	Result - Remark	Verdict
13.1	Leakage current was not excessive	See Tables 13.1A-13.1E	P
	Protective impedance disconnected	No protective impedance provided	N/A
13.2	Leakage current measured using circuit of Fig. 10		-

14	MOISTURE RESISTANCE		P
14.1	Degree of protection for tool enclosure according to tool classification (IP Code).....	IP20	P
14.1.1	Tool not connected to the supply and turned continuously through most unfavourable positions		N/A
	Lightest permissible flexible cord with smallest cross-sectional area specified on Table 8 used on the tool with type X attachment (A, mm ²).....		N/A
	Other tools tested as delivered		N/A
14.1.2	Tool rated IPX1 through IPX7 subjected to applicable tests of IEC 60529		N/A
	For IPX7 test, tool immersed in water containing 1.0 % NaCl		N/A
	Tool withstood electric strength test of 15 after moisture treatment	See appended Table 15.2B	N/A
	No trace of water on insulation causing reduction of creepage and clearance below values in 28.1		N/A
14.2	No trace of water on insulation causing reduction of creepage and clearance below those in 28.1 after spillage of liquid test	Tool is not intended to be spilled over by liquids	N/A
	Tool withstood electric strength test of 15 after spillage treatment	See appended Table 15.2B	N/A
	Tool subjected to test of 14.3 after standing in normal test –room atmosphere for 24 h		N/A
14.3	Tool subjected to humidity treatment test for 48 h	See below	P
	Relative humidity (93 ± 2) %	95%	P
	Temperature (20 - 30 °C ± 1K)	25°C	P
	No excessive leakage after humidity treatment.....	See appended Table 13.1D	P
	No flashover or breakdown occurred during electric strength after humidity treatment	See appended Table 15.2A	P
14.4	User not subject to an increased risk of electrical shock by liquid system during foreseeable use		N/A
	Tool operated for 1 min in each mode and did not exceed maximum allowed leakage current	See appended Table 13.1E	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tool did not exceed maximum allowable leakage current after drying for 24 h at ambient temperature	See appended Table 13.1E	N/A
14.5	Liquid system withstood the pressure in normal use without leaking		N/A
	Tool did not exceed maximum allowable leakage current during pressure application	See appended Table 13.1E	N/A
	Tool did not exceed maximum allowable leakage current after drying for 24 h at ambient temperature	See appended Table 13.1E	N/A
14.6	Residual current devices complied with IEC 61540 and met requirements a) to c)		N/A
	a) RCD disconnected only both mains conductors when leakage exceeded 10 mA with a maximum response of 300 ms		N/A
	Test conducted according to 9.9.2 of IEC 61540, and earthing conductor stayed connected		N/A
	b) RCD operated correctly for all 50 cycles		N/A
	c) RCD cannot be removed during use or routine normal maintenance (i.e., residual current device fixed to tool or power supply cord connected to tool)		N/A
	RCD fitted in supply cord provided with Type Y or Z attachment for connection to supply cord and interconnecting cord		N/A
15	ELECTRIC STRENGTH		-
15.1	Protective impedance disconnected	No protective impedance	N/A
15.2	No flashover or breakdown occurred during the test with the output current at least than 200 mA and the applied measured voltage +/- 3%	See Tables 15.2	P
	The insulation coating withstood the applied potential with the 5 kPa force applied	No insulation coating	N/A
	For the tool with integral heating elements, test voltages specified in IEC 60335-1 applied to the heating elements only and not to other parts of tool	No heating element	N/A
16	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS		-
16.1	No excessive temperatures occurred during short circuit in transformer or circuits associated with it for a tool supplied from a transformer	The tool doesn't incorporate circuits supplied from transformer	N/A
	Power limited by (short-circuit protective device).....		—
	Insulation on conductors was within 15 K of Table 1		N/A
	Transformer windings complied with Clause 18.9		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Transformer complies with IEC 61558-1		N/A

17	ENDURANCE		-
17.1	No hazards due to extended normal use		P
17.2	No load intermittent operation (2 x 24 h)		P
	Number of operations.....:	240Va.c. x 1,1 for 10000 actuations and 220Va.c. x 0,9 for 10000 actuations. 120Va.c. x 1,1 for 10000 actuations and 110Va.c. x 0,9 for 10000 actuations. Each cycle consists of the tool operating at a rate of one actuation every 1 s for 1 minute and a rest period of 3 minutes with the tool switched off.	P
	Number of hours for each operation	See above	P
	Test voltage at each operation (V)	See above	P
	Rate of operation (100s "on", 20s "off")	See above	N/A
	Test positions selected	See above	N/A
	Operation time for each position	See above	N/A
	Servicing of carbon brushes and lubricant.....:	Not required	N/A
	Forced cooling or rest periods if temperature exceeded values in Table 1	No exceeded temperature	N/A
	No electrical or mechanical failure		P
	No insulation damage		P
	No loose contacts or connections		P
	No flashover or breakdown occurred after spillage treatment.....:		P
	No operation of overload protection devices	Not applicable	N/A
17.3	Tools with Centrifugal switches operated for 10,000 cycles	No such switches	N/A
	Number of operations under normal load		N/A
	Rate of operations (s "on", s "off").....:		N/A
	Test voltage 0.9 x rated Voltage (V).....:		N/A
	No electrical or mechanical failure		N/A
	No insulation damage		N/A
	No loose contact or connections		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	No flashover or breakdown occurred	See Table 15.2D	N/A
	No opening of overload protection devices		N/A

18	ABNORMAL OPERATION		-
18.1	No hazard due to abnormal operation	No hazard	P
	Fuses, thermal cut-outs, over current protection devices used to provide the necessary protection	Not applicable	N/A
18.2	Tool with heating elements	No heating element	N/A
	Tool with a control device limiting temperature.....:		N/A
	Only one abnormal condition simulated each time		N/A
	Tests of Clauses 18.2-18.6 conducted consecutively when more than one test applicable to the same tool		N/A
	Tool tested until a non-self-resetting thermal cut-out operated, or until steady conditions.....:		N/A
	Test repeated on a second sample when a heating element permanently open-circuited		N/A
	Only one abnormal condition simulated each time		N/A
18.3	Tool with heating elements tested under the conditions of heating test, except with restricted heat dissipation	No heating element	N/A
	Test voltage provided a power 0.85 times rated power input (V)		—
18.4	Tool cooled down to room temperature and test of 18.3 repeated	Not applicable	N/A
	Test voltage provided a power input of 1.24 times rated power input (V)		N/A
18.5	Tested as in heating test, under normal operation with control limiting the temperature short-circuited	No such device	N/A
	Test voltage provided a power input of 1.15 times rated power input (V)		—
	Multiple controls short-circuited one at a time		N/A
18.6	Test on class I tool with tubular sheathed and embedded heating elements	Not applicable	N/A
	Test repeated with the supply polarity reversed and other end of element connected to earth		N/A
18.7	No load test for 1 min on cutting tools incorporating a commutator motor	See below	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test voltage 1.3 times rated voltage, or upper limit of voltage range (V).....:	Test voltage: 1.3x120V~(50Hz) 1.3x240V~(50Hz)	—
	After the tests of 18.2 to 18.7, safety of tool not impaired, and windings and connections not loose	After the test, safety of tool not impaired, and windings and connections not loose	P
18.8	Test on tools with induction motor and with moving parts locked	Not applicable	N/A
	a) Tool with a starting torque less than full-load torque		N/A
	Duration of locked conditions (s).....:		—
	b) Tool started by hand		N/A
	Duration of locked condition (s).....:		—
	c) tool with moving parts liable to be jammed, or moving parts that can be stopped by hand with the motor switched on		N/A
	Duration of locked condition (s).....:		—
	After the test, or at the instant of operation of fuses, thermal cut-outs, motor operated devices, and the like, the temperature of the windings complied with the values in Table 3		N/A
	Max winding temperature recorded (°C).....:		—
18.9	Test on tools with 3-phase motors with one phase disconnected	Not applicable	N/A
	30 s tests for tool switched on by hand or continuously loaded by hand; cold started		N/A
	5 min test for other tools.....:		N/A
	After the test, or at the instant of operation of fuses, thermal cut-outs, motor protection devices, and the like, the temperature of the windings complied with the limits in Table 3		N/A
	Max winding temperature recorded (°C).....:		—
18.10	No hazards occurred under fault conditions of 18.10.2	Not applicable	N/A
	Circuits complied with 18.10.1 and not subjected to fault conditions of 18.10.2		N/A
	Test of 18.10.3 conducted when safety of tool under a fault condition depended on operation of a miniature fuse-link complying with IEC 60127-3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tool withstood the particular test as a conductor of a PCB open-circuited, and		N/A
	– base material of PCB withstood test of Annex F,		N/A
	– creepage or clearances between live parts and accessible metal parts not reduced below values in 28 due to loosened conductors, and		N/A
	– tool withstood tests of 18.10.2 with the open-circuited conductor bridged		N/A
18.10.2	Fault conditions a) to f) conducted as applicable	See Table 18.10.2	N/A
18.10.3	Tests repeated with fuse-link replaced by an ammeter when during fault conditions of 18.10.2, safety of the tool depended on operation of a miniature fuse-link complying with IEC 60127-3,		N/A
	– Circuit not considered to be adequately protected when current measured was 2.1 times the rated current of fuse-link, and test conducted with fuse-link short-circuited (A)		N/A
	– Circuit considered adequately protected when current measured was 2.75 times the rated current of fuse-link (A)		N/A
	– Fuse-link short-circuited when current measured was 2.1-2.75 times the rated current of fuse-link, and test conducted as follows (A)		N/A
18.10.4	Tools incorporating electronic devices are so designed that no hazard results in the event of a failure in the electronic equipment		N/A
	Tool operated for 1 min, at a voltage equal to the rated voltage or the mean value of the voltage range, at no-load with the electronic device short-circuited.		N/A
	No hazard resulted when test repeated with electronic device open-circuited		N/A
	No damage due to fire and mechanical damage impairing safety and protection against electric shock following the tests of 18.10.1 to 18.10.4, and		N/A
	- Current through protective impedance was less than limits of Clause 9.1 (A)		N/A
	Tool considered to have withstood the test when speed-limiting device operated		N/A
18.11	Switches and devices for motor reversal withstood stresses occurring when rotation reversed 25 times under running conditions at rated voltage or upper limit of rated voltage range at no-load (V)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
18.12	Class I tool with class II construction and class II tool operated under extreme overload conditions without impairing protection against electric shock	Class II tool See below	P
	A separate sample operated for 15 min, until the tool open-circuited, or flame appeared	The sample is operated for 1 min	P
	Test circuit (KVA).....	15kVA	—
	160% normal load test current (A)	The tool is locked	—
	Overload condition existed for (_min, _sec)	15 min	—
	Condition continued until the tool open-circuited, or flame appeared or 15 minutes expired	Condition continued until 15 minutes expired	P
	Elements that opened in case an open circuit occurred	No such elements	N/A
	When flames appeared, immediately extinguished by CO ₂ extinguisher	As required	P
	Maximum leakage current measured throughout the abnormal test (mA).....	See Table 13.1E	P
	Tool that did not operate after 15 min, cooled to room temperature and subjected to a 1500 V Electric Strength test (live parts and accessible parts)	Not applicable	N/A
	Tool that operated after 15 min, cooled to room temperature and subjected to a 2500 V Electric Strength test (live parts and accessible parts)	The tool is subjected to a 2500 V electric strength test between the live part and accessible parts. Test result: Pass	P

19	MECHANICAL HAZARDS		-
19.1	Adequate protection against injury provided against moving and dangerous parts	Adequate protection of moving parts	P
	Protective enclosures, covers, and the like have adequate mechanical strength and cannot be removed without the aid of a tool	The enclosure provides sufficient mechanical strength and is only removable with the aid of a tool	P
	For fixed guards that are to be removed at the place of use as part of the routine maintenance procedure, as described in the instruction manual, the fastening shall remain attached to the guard or to the tool. Replacement of brushes is not considered as part of the routine maintenance.	No removable fixed guard	N/A
	No dangers from adjusting the guards	No adjusting guard	N/A
	No dangers due to movement or release of working elements during normal use	By practical inspection	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No contact with dangerous moving parts using standard test finger (Fig 1)	No access to dangerous moving parts with the test finger	P
19.2	No sharp edges, burrs, flashes and the like	No such edges or the like	P
19.3	No contact of moving parts with test finger (Fig 1) with removal of dust collection system	No contact of moving parts with test finger.	P
19.4	Adequate grasping surfaces	The tool body and handle with adequate grasping surface are provided	P
19.5	Provision for visual checking of the contact of cutting tool with work piece	Visual check for contact with the work piece is ensured	P
19.6	The no-load speed of the spindle did not exceed 110 % of the rated no-load speed		P

20	MECHANICAL STRENGTH		-
20.1	Adequate mechanical strength in normal use	See below	P
	No flashover or breakdown occurred after tests of 20.2-20.4 and 15	See Table 15.2E	P
	No damage impairing compliance with this standard, and no live parts became accessible		P
20.2	Three blows applied to every weak point of enclosure by spring-operated impact test apparatus in Clause 5 of IEC 60068-2-75	See below	P
	Brush cap impact energy (Nm)	0.5 Nm applied.	P
	Other part impact energy (Nm)		—
	Blows applied to protective devices, handles, levers, and knobs when necessary.....	Impact energy is applied as the above-mentioned requirement. Three blows, 1.0 Nm, were applied on the following points: switch, enclosure, handles	P
	No damage impairing compliance with standard	No damage of the tool, no live parts have become accessible	P
	No accessibility of live parts	See above	P
	No cracks visible to naked eye	See above	P
	Inner cover withstood test	Not applicable	N/A
20.3	Hand-held tool withstood impact of 3 varied drops on a concrete surface from 1 m	Tested as required	P
	No damage impairing compliance with standard	No damage of the tool, no live parts have become accessible	P
	No accessibility of live parts	See above	P

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Clause	Requirement + Test	Result - Remark	Verdict
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	No cracks visible to naked eye	See above	P
	Inner cover withstood test	Not applicable	N/A
20.4	Adequate mechanical strength of brush holder and their caps	Not applicable	N/A
	Brush cap removed and replace 10 times applying specified tightening torque	See above	N/A
	Tightening torque (Nm)		—
	No damage impairing compliance with standard		N/A
	No accessibility of live parts		N/A
	No cracks visible to naked eye		N/A
	No damage to threads		N/A
20.5	Handles and grasping surfaces have adequate mechanical strength to provide insulation between grasping area and output shaft		P
	A separate sample subjected to a single impact from 1m onto a concrete surface on each handle and each recommended grasping surface followed by an electric strength test of 1250 V a.c.		P
	No damage impairing compliance with standard		P
	No accessibility of live parts		P
	No cracks visible to naked eye		P
	No flashover or breakdown of insulation	See Table 15.2E	P

21	CONSTRUCTION		-
21.1	Accidental changing of setting did not occur in tools with different voltages or different speed settings	The tool is designed with single voltage range	N/A
21.2	Accidental changing of settings of control devices did not occur	No control device is used.	N/A
21.3	Removal of parts ensuring required degree of protection against moisture not possible without aid of a tool	Secured by tool	P
21.4	Fixing of handles, knobs and the like, used to indicate position of switches or similar components in a wrong position, was not possible	No such handles, knobs or other devices	N/A
21.5	Replacement of a flexible cable or cord requiring displacement of a switch was possible without subjecting internal wiring to undue stress	No displacement of the switch is necessary for the replacement of the power cord, no stress to internal wiring	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After repositioning of the switch and before reassembling the tool, verification of correct positioning of internal wiring was possible	See above	N/A
21.6	Wood, cotton, silk, paper and similar fibrous or hygroscopic material not used as insulation, unless impregnated or chemically rendered non-fibrous	No use of such materials	N/A
21.7	Asbestos not used	Not applicable	P
21.8	Ordinary driving belts not relied upon to ensure electrical insulation	No driving belts are used	N/A
	Special belt design employed to allow use as electrical insulation	See above	N/A
21.9	Insulating barriers of Class II tools, and parts of Class II tools serving as supplementary or reinforced insulation are:	No such omissible parts	N/A
	- fixed such that they cannot be removed without being seriously damaged		N/A
	- so designed that they cannot be replaced in an incorrect position, and when omitted, the tool will be inoperable or manifestly incomplete		N/A
21.10	Use of the sheath (jacket) of a flexible cable or cord as supplementary insulation inside the tool is independent of mechanical and thermal stresses	Not applicable	N/A
21.11	No assembly gap with a width greater than 0.3 mm in supplementary insulation giving access to live parts	No assembly gap with a width greater than 0.3 mm	P
21.12	No hazards from parts of Class I tool such as wire, screw, nut, washer or spring becoming loose or falling out of position, and accessible metal not made live	See below	P
	Clearance and creepage distances of Class II tool or class II construction not reduced to less than 50% of values shown in Table 10	Class II tool	N/A
	Class II tool or Class II construction, other than those of the all-insulated type, provided with an insulating barrier between accessible metal and motor parts and other live parts	Reduction of creepages or clearances for other reasons are unlikely to occur	P
	Class I tool with adequately fixed parts, barriers, and sufficiently large creepage and clearances	Tool is of the insulation-encased type	N/A
	All wires secured in place independent of terminal connection or solder	As required	P
21.13	Supplementary and reinforced insulation not impaired by deposition of dirt, or dust resulting from wear of parts within the tool to the extent that creepage and clearances would be reduced	No deposition of dirt and dust is probably expected	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Ceramic material not tightly sintered and similar materials, and beads alone, not used as supplementary or reinforced insulation	Not applicable	N/A
	Parts of natural or synthetic rubber used as supplementary insulation are resistant to aging	No natural or synthetic rubber is used	N/A
	Rubber parts so arranged and dimensioned that creepage distances not reduced below values in 28.1, even when cracks occurred	Not applicable	N/A
	Insulated material for embedded heating conductors serves only as basic insulation	Not applicable	N/A
	Aging test for rubber parts for 70 h at 100±2°C	Not applicable	N/A
	Rubber parts tested		—
21.14	Internal wiring, windings, and the like including insulation in general not exposed to oil, grease, and similar substances	No exposures of internal parts with liquids expected.	N/A
	Adequate insulation properties of oil, grease, and similar substances used for lubrication of gears and the like with no effect on insulation	See above	N/A
21.15	No access to brushes without aid of a tool		P
	When tightening screw-type brush-caps, two surfaces clamped together		P
	Locking device retaining brushes in position do not depend upon brush spring tension		P
	Screw-type brush-caps accessible from the outside of the tool made of or covered with insulating material of adequate strength, and not projecting beyond surrounding surface of the tool		P
	Properties of insulating materials		-
	– tested according to Cl. 20.2 and 20.4 for screw-type brush-caps accessible from outside of tool		P
	– tested as specified for supplementary insulation for class I and class III tools		N/A
	– tested as specified for reinforced insulation for class II tools		P
21.16	Tool employing a liquid system protects the user against increased risk of shock due to presence of liquid under normal use and faults of liquid system	Class II tool	N/A
	Tools employing liquid system constructed as Class III tools, or		N/A
	- class I or II and provided with a residual current device, and complying with 14.4-14.6, or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- class I or class II and designed for use in combination with an isolating transformer and complying with 14.4 and 14.5		N/A
21.17	Accidental operation of switches and reset buttons on non-self-resetting controls did not occur when tool dragged across a horizontal surface	Tool placed on a horizontal support in the most unfavourable position, the switch was not actuated.	P
21.18	Tools, other than those provided with a flexible shaft, fitted with a mains switch which can be switched off by the user without releasing the grasp on the tool	The main switch can be actuated when holding the tool by the user in normal work position	P
	A switch locking in "on" position considered to meet the requirement of 21.18, provided it unlocks automatically when the trigger or actuating member is activated	Fulfil	P
21.18.1	Switch could not be locked in "on" position and did not remain in "on" position after trigger released when a risk with continued operation existed	See above.	P
21.18.2	Switch was locked in "off" position when a risk associated with inadvertent starting existed	No risk associated with inadvertent starting existed.	P
21.19	Protection against electrical shock not affected when screws accessible from the outside replaced by longer screws simulating routine servicing	All screw holes are closed inside	P
	Creepage and clearances not reduced below values in 28.1	No such decreasing is possible	P
21.20	Tool marked with the first numeral of IP system complies with IEC 60529.....:	Not marked	N/A
21.21	No risk of electrical shock from charged capacitors when touching pins of the plug	See below	P
	Max. voltage measured between pins of the plug after one second after each disconnection (V)	Measured: <1V	P
	Line capacitors rated 0.1 µF		P
21.22	Non-detachable parts secured reliably and withstood mechanical stress under normal use	Enclosures are secured by screws	P
	Snap-in devices have an obvious locked position and have fixing properties that do not deteriorate	Not applicable	N/A
	Parts disassembled and assembled 10 times prior to test showed no signs of deterioration		N/A
	Parts affected by temperature tested immediately after conditions of Clause 12		N/A
	All weak parts of the tool subjected to the 10 s push force of 50 N		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	50 N pull force applied to cover or weak part when shaped prevented easy slippage of fingertips		N/A
	30 N pull force applied to cover or weak parts when projection of the gripped part was less than 10 mm in the direction of removal		N/A
	Test fingernail of Fig. 7 inserted in apertures and joints with a force of 10 N to enable a force of 30 N for 10 s by means of a loop while applying push/pull forces		N/A
	A torque of 2 Nm applied at the same time as pull or push force on parts 50 mm or smaller and likely to be subjected to twisting,		N/A
	A torque of 4 Nm applied at the same time as pull or push force on parts larger than 50 mm and likely to be subjected to twisting,		N/A
	Projection was less than 10 mm and required a torque of (Nm)		N/A
	Parts not detached, and remained in locked position		N/A
21.23	Handles, knobs, etc., withstood axial force of 30 N for 1 minute	Securely fixed	N/A
21.24	Storage hooks and similar devices for flexible cords are smooth and well rounded	Not applicable	N/A
21.25	Current-carrying parts and other parts resistant to corrosion under normal use	No such parts	N/A
	After tests of Clause 30, no sign of corrosion on relevant parts	See above	N/A
21.27	Insulation between SELV and other parts of non-class II tool meets requirements for double or reinforced insulation	No such parts	N/A
21.28	Parts separated by protective impedance comply with requirements for double or reinforced insulation	No such parts	N/A
21.30	Shafts of operating knobs, handles, levers, and the like not live, except when removal of such parts does not make the shaft accessible to test finger	No such parts	N/A
21.31	Handles, levers, and knobs of non-class III tool held or actuated in normal use do not become live during an insulation fault	Handle is made of plastic	P
	Metallic handles, levers, and knobs with shaft and securing means likely to become live due to basic insulation fault, adequately covered by insulating material or their accessible parts separated from their shafts or securing means by insulation	See above	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Covering or insulating material complies with Electric Strength test in Clause 15, Table 2, item 4	See clause 15	P
21.32	Tool likely to cut into concealed wiring or cord, has handles and grasping surfaces made of insulating material, or metal covered by insulating material, or their accessible parts are separated by insulating barrier(s) from accessible metal parts that may become live by the output shaft	Handle is made of plastic	P
	Insulated, stick type, auxiliary handle is provided with a flange 12 mm high above grasping surface between grasping area and accessible parts that may become live by the output shaft	Flange >12mm high	P
21.33	Capacitors in class II tools not connected to accessible metal parts, and their metallic casings are separated from accessible metal parts by supplementary insulation	Capacitor is not connected to accessible metal parts	P
	Capacitors tied to accessible metal parts comply with Clauses 9.1 and 21.36	See above	N/A
21.34	Capacitors not connected between contacts of the thermal cut-outs	No such capacitor	P
21.35	Lamp holders used only for connection of lamps	No lampholder is used	N/A
21.36	Protective impedance consists of at least two separate components with impedance unlikely to change significantly during lifetime of tool	Not applicable	N/A
	When a component short or open-circuited, values in Clause 9.1 were not exceeded		N/A
	Resistors comply with 14.1 of IEC 60065 and capacitors comply with 14.2 of IEC 60065		N/A
21.37	Air-intake ventilation openings not excessively large		P
	It was not possible to insert a steel ball 6 mm in diameter through air-intake openings other than those adjacent to fan		P
21.Z1	Additional: In normal use a dust hazard to health is expected following point must be fulfilled:	The tool will not produce dust which is hazardous to health in the normal use	N/A
	a) Integral dust collection devices, or	Not applicable	N/A
	b) Devices, which allow the connection of external dust collection equipment, or	See above	N/A
	if not reasonably protected practicable, no dust is thrown in the direction of the operator.		P

22	INTERNAL WIRING	-
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Clause	Requirement + Test	Result - Remark	Verdict
22.1	Wireways smooth and free from sharp edges, burrs, etc.	Wireways are smooth and without sharp edges	P
	Holes in metal through which insulated wires pass provided with bushings or, except as required by relevant part 2, have smooth, well-rounded edges with a radius of 1,5 mm	No such holes	N/A
	Wiring prevented from coming into contact with moving parts	Contact of wiring with moving parts is unlikely to occur	P
22.2	Internal wiring and electrical connections adequately protected or enclosed	Adequate protection of the wiring by proper shape of the surrounding enclosure	P
22.3	Internal wiring adequately rigid, fixed or insulated such that, in normal use, creepage and clearances cannot be reduced below values in 28.1	The internal wirings are properly insulated and fixed. Under normal use, creepage distances and clearances are not reduced.	P
	The insulation not damaged in normal use	No damage of insulation during normal use	P
	Insulation of internal wiring electrically equivalent to insulation of cords complying with IEC 60227 or IEC 60245		P
	No breakdown resulted upon application of a 2000 V electric voltage for 15 min between conductor and metal foil wrapped around insulation	Not applicable	N/A
	Sleeves used as supplementary insulation on internal wiring remain in position by clamps at both ends requiring its removal by breaking or cutting	Not applicable	N/A
22.4	Use of green/yellow conductors for earthing terminals only	Class II tool	N/A
22.5	Aluminium wires not used for internal wiring	Not applicable	N/A
22.6	Stranded conductors with lead-tin soldering are only used with spring terminals with constant contact pressure, except when clamping means pose no risk of bad contact	Not applicable	N/A

23	COMPONENTS		-
23.1	Components comply with relevant IEC standards		P
	Components used in accordance with their markings		P
	Applied exceptions		N/A
23.1.1	Capacitors in auxiliary windings of motors marked with their rated voltage and rated capacitance	Not applicable	N/A
23.1.2	Fixed capacitors for radio interference suppression comply with IEC 60384-14	Approved capacitor is used	P

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Clause	Requirement + Test	Result - Remark	Verdict
23.1.3	Small lamp holders similar to E10 lamp holders meet requirements for E10 lamp holders	No lamp holders	N/A
23.1.4	Insulating and safety insulating transformers comply with IEC 61558-1	Not applicable	N/A
23.1.5	Appliance couplers other than those used for IPX0 tools comply with IEC 60309, and those used for IPX0 comply with IEC 60320	Not applicable	N/A
	Instructions provided to inform user to connect the tool with non-IEC appliance couplers	See above	N/A
23.1.6	Automatic controls not complying with IEC 60730-1 tested according to this standard, and additionally according to 11.3.5 – 11.3.8 and 17 of IEC 60730-1	No automatic controls	N/A
	IEC 60730-1 tests conducted under conditions occurring in the tool		N/A
	Type of controls used and number of operations completed per Cl. 17 of IEC 60730-1 (cycles)		N/A
	Correct markings used on automatic controls		N/A
	Tests of Clause 17 of IEC 60730-1 were not conducted on automatic controls because tool complies with this standard when protective device short-circuited		N/A
	Thermostats and temperature limiters tested in accordance with a specific exception in footnote b) of Table 1 of Clause 12	Not applicable	N/A
23.1.7	Unless otherwise specified, tests on components per other standards conducted separately according to the relevant standard	Not applicable	N/A
	Component, marked and used per its markings		N/A
	Components not mentioned in Table 1 of Clause 12 tested as part of the tool		N/A
23.1.8	If no IEC standard, or when component not marked or used not as marked, component tested under conditions occurring in the tool, and number of samples as required by similar specifications.....	Approved components are used	N/A
23.1.9	Capacitor voltage did not exceed 1.1 times its rated voltage (V)	No capacitor connected in series with motor winding	N/A
23.1.10	Adequate breaking capacity of mains switches with no electrical mechanical failure	Approved component is used.	P
	Mains switches rated for min. 50K cycles of operations	Approved component is used.	N/A
	Switch operated 50 times with motor stalled	Approved component is used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For electronic control device switching off before opening the main contacts, switch operated five times with the electronic device short-circuited	Not applicable	N/A
23.1.11	Switches, not separately tested and found to comply with IEC 61058-1 under the conditions occurring in the tool, comply with Annex I	Approved component is used. Certificate is provided	N/A
	Test of 17.2.4.4 of IEC 61058-1 conducted for a min. of 50000 cycles of operation		N/A
	Switches operated only with the aid of a tool and intended for no load operation were not subjected to tests of Clause 17 of IEC 61058-1		N/A
	The above also applied to switches operated by hand and interlocked not to be operated under load		N/A
	Switches without interlock tested per IEC 61058-1, 17.2.4.4 for a min. of 100 cycles of operation		N/A
	Tests of 17.2.4.4 of IEC 61058-1 not conducted on a switch when tool met the requirements of this standard when the switch short-circuited		N/A
23.2	Tool not fitted with switches or automatic controls in flexible cords	Not fitted	P
	Tool not fitted with devices causing the protection device in the fixed wiring to operate	Not fitted	P
	Tool not fitted with thermal cut-outs which can be reset by a soldering operation	Not fitted	P
23.3	Overload protection devices are non-self-resetting	No overload protection device	N/A
23.4	Plugs and socket-outlets used as terminal devices for heating elements and plugs and socket-outlets for ELV circuits not interchangeable with plugs and socket-outlets in IEC 60884, and with connectors and tool inlets complying with IEC 60320	Not applicable	N/A
23.5	Motors connected to the supply mains with insulation inadequate for the rated voltage comply with Annex B	Not applicable	N/A
24	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS		-
24.1	Tool rated in voltage or frequency for connection to public supplies provided with a supply cord with a plug	See below	P
	Tool intended to be connection to non-public power supplies provided with a supply cord without a plug	Non-detachable cord with a plug is used	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Tool provided with appliance inlet for connection to a supply having at least same degree of protection against moisture as required for the tool, and with locking device preventing accidental disconnection	Not applicable	N/A
	Tool provided with a supply cord for connection to a supply ≤ 0.5 m and fixed with an in-line connector (cable coupler) and its mating counterpart	Not applicable	N/A
	The in-line connector provided with at least the same degree of protection against moisture as required for the tool	See above	N/A
	Locking devices complied with pull test of 24.14		P
24.2	Supply cord assembled to the tool by attachment type (specify X, Y, or Z)	Type X attachment is used	P
	Supply cord with type X and type Y attachment is ordinary flexible cord or a special cord only available from the manufacturer or its agent.....	As required	P
	Special cord includes part of the tool	Not applicable	N/A
24.3	Plugs fitted with only one flexible cord	As required	P
24.4	Supply cord not lighter than ordinary tough rubber sheathed flexible cord or ordinary PVC sheathed flexible cord	H05VV-F is provided	P
	PVC cords not used if external metal parts exceed 75 K temperature rise	No temperature rise of external parts exceeded 75 K during the test acc. to 11.1	P
	Power supply cords of single-phase tool with a plug and rated current ≤ 16 A supplied with a plug complying with IEC 60884 or IEC 60309	Approved plug is provided	P
	Class I tools fitted with plugs complying with IEC 60309, Sheet 2-1	Class II tool	N/A
	Class II tools fitted with plugs complying with IEC 60309, Sheet 2	Approved plug is provided	P
	Class III tools fitted with plugs complying with IEC 60309, Sheet 2-1	Class II tool	N/A
	Body of plug covered with, rubber, polyvinyl chloride, or a material with equivalent mechanical strength ...	H05VV-F with sufficient strength is provided	P
	Supply cords of class I, single-phase tool rated > 16 A ≤ 63 A, and multi-phase tool rated ≤ 63 A, provided with a plug complying with IEC 60309 and standard Sheet 2-III based on current	Class II tool	N/A
	Supply cords of class II, single-phase tool rated > 16 A ≤ 63 A, and multi-phase tool rated ≤ 63 A, provided with a plug complying with IEC 60309 and standard Sheet 2	Less than 16A	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Supply cords of class III, single-phase tool rated > 16 A ≤ 63 A, and multi-phase tool rated ≤ 63 A, provide with a plug complying with IEC 60309 and standard Sheet 2-III	Class II tool	N/A
24.5	Nominal cross-section area of supply cord per Table 6 (mm ²).....:	Acc. to the table 6, the cross sectional area of the conductors of the power cord is 1.5 mm ² , with a rated tool current of less than 16A	P
24.6	Supply cord of class I tool has green/yellow core connected to internal earthing terminal of the tool, and to earthing contact of plug	Class II tool	N/A
24.7	Lead-tin solder not used to consolidate leads under pressure, except when clamping means used prevent risk of a bad contact	Solder is not used	N/A
	Clamping screws alone not used for securing soldered leads		N/A
24.8	Moulding supply cord to any part has no effect on the insulation of the cord	No effect the insulation of the cord	P
24.9	Inlet openings provided with a bushing, or no risk of damaging protective covering of supply cord	Cord guard made of insulating material is provided	P
24.10	Inlet bushings shaped to prevent damage to supply cord	Not applicable	N/A
	Inlet bushings reliably fixed and not removable without the aid of a tool		N/A
24.12	Cord guards provided with adequate mechanical strength and retain these properties throughout extended normal use	See below	P
	Flexing test performed in apparatus shown in Fig. 9	The tool is tested as shown in Fig. 9	P
	Weight attached to cable or cord (kg).....:	The weight of 3.8kg is attached Remark: The weight of the tool is less than 3.8kg	—
	Oscillating member moved backwards and forwards through an angle of 90° (45° on either side of the vertical) with rate of flexings 60/minute	The tool is tested as required	P
	After 10,000 flexings, sample turned through 90° about the centre of the cord guard	20000 operations are done	—
	After the test, cord guard not loosened, and no damage to cord guard and flexible cable impairing compliance with this standard	Cord guard not loosened, and no damage to cord guard and flexible cable	P
	Number of strands versus number of broken strands of each conductor not more than 10%.....:	Less than 5%	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Cord guard did not slip out from its location after completion of ten 1 sec lifts	No slip of cord guard after test	P
24.13	Cord guard of insulating material provided to protect against excessive bending at inlet opening	See below	P
	Guard fixed reliably and projects outside tool a distance beyond inlet opening of at least 5 times the overall diameter of cable or cord	Cord for type X attachment	P
	Cord guard integral to tool minimum 100 mm longer than guard	Overall diameter: 7 mm (5x7mm=35mm) Projection measured: 49.3mm	P
	Mass attached to the free end of cable or cord (g)...	Attached mass: 490 g	-
	Temperature sensitive cord guard tested at 23±2°C	Not sensitive cord guard	-
	Curvature of cable or cord is nowhere less than 1.5 of external diameter of cable	Angle: 45° Required radius: min. 10.5mm R> 20 mm	P
24.14	Conductors relieved from strain, twisting and protected from abrasion	See below	P
	It is not possible to push the cord into the tool	By practical test, the cord can't be pushed into the tool	P
	Pull force was applied 25 times at the force prescribed in Table 7 (N).....:	The mass of tool is less than 4kg. Pull force: 60 N Number of test cycles: 25 Torque: 0.25 Nm	-
	After pull test, cord, other than automatic cord reel, subjected to torque in Table 7 for 1 min (Nm)	Duration of torque test: 1 min	P
	The cord was not damaged during the tests	No damages	P
	Cord longitudinal displacement (mm)	No longitudinal displacement	P
	Conductors movement in the terminals (mm)	No noticeable movement of the conductors in the terminal	P
	No appreciable strain at the connection	No appreciable strain	P
	Creepage and clearances not reduced below values in Cl. 28.1	No reduction of creepage and clearances	P
24.15	Cord anchorage either accessible only with the aid of a tool, or the cord can only be fitted using a tool	Removal of the cord guard requires the use of a tool	P
24.16	Cord anchorage for type X attachment	Type X attachment is used	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Cord anchorage allows easy replacement of cord	The cord anchorage provides 2 clamping screws Only a screwdriver is required for the replacement of the cord	P
	It is evident how strain relief and prevention of twisting are accomplished by the cord anchorage	As required	P
	Anchorage is suitable for different types of cord, or tool designed to be fitted with only one type of cord	Tool is designed to be fitted with only one type of cord	P
	Cord anchorage screws separated by supplementary insulation	Plastic material is used for cord anchorage No accessible metal parts in the vicinity of the cord anchorage	P
	Cord is not clamped by metal screw bearing directly on the cord	No such bearing	P
	At least one part of cord anchorage securely fixed to the tool, unless it is part of the specially prepared cord	The cord anchorage provides 2 clamping screws	P
	Screws intended to fix the cord in place are not used to secure any other part, or it is clear the tool is inoperative	No fixing of other parts	P
	Parts fastened to the cord anchorage by the same screw could not be removed without the aid of a tool	No such parts	N/A
	Cord anchorage is such that in case of labyrinths, the labyrinths cannot be bypassed in a way that the requirement of Clause 24.14 is not met	Not applicable	N/A
	For type X attachment, gland not used as cord anchorage for power supply cord	Gland is not used	P
	Cord anchorage in class I tool is of insulating material or provided with an insulating lining	Class II tool	N/A
	Cord anchorage in class II tool is of insulating material, and when metallic, meet requirements for supplementary insulation	Plastic material is used for cord anchorage	P
	Type X has one or more nuts to secure cord anchorage to tool	No nuts used	N/A
	Clamping member complies with Figure 6		N/A
	Tests of Cl. 24.14 conducted with lightest type of cord of smallest cross-section and next heavier type as in Cl. 25.2 (sizes, mm ²)		N/A
	Specially prepared cord tested with the cord as delivered		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Conductors inserted into terminals, terminal screws tightened sufficiently to prevent conductors from easily changing their position, torque set at:		N/A
24.17	Adequate cord anchorages are provided for type Y and Z attachments and complied with 24.14	Type X attachment is used	N/A
24.18	Knots and tying strings for type X attachment are not used	Not used	P
24.19	The insulated conductors of the supply cord are insulated from accessible metal parts by basic insulation for class I tool, and supplementary insulation for class II tools	Type X attachment is used	N/A
	- insulation consists of a separate insulating lining fixed to cord anchorage		N/A
	- a sleeve or grommet is fixed to the cord		N/A
	- for class I tools, insulation consists of sheath of the sheathed cord		N/A
24.20	For type X attachment space for supply cables or supply cord provided inside or as a part of tool	See below	P
	- space permits verification of correct connection and positioning of conductors	Enough space for verification of correct connection and positioning of conductors	P
	- space permits covers to be fitted without risk of damage to supply conductors or their insulation	Enough space for covers to be fitted	P
	- uninsulated end of conductor, when detached from a terminal, cannot come into contact with accessible metal parts	No contact with accessible metal parts	P
	Installation test conducted with cables or flexible cords of the largest cross-sectional area as per Clause 25.2 (mm ²):	Not applicable	N/A
	For pillar terminals (with conductors that are not separately clamped 30 mm or less from terminal), and for other terminals with screw clamping, a force of 2 N applied to the wire in any direction and adjacent to the terminal, screw or stud	Not applicable	N/A
	The uninsulated end of the conductor did not come into contact with accessible metal parts	Not applicable	N/A
24.21	Appliance inlet has no accessible live parts		N/A
	- appliance inlet allows easy insertion of connector		N/A
	- after insertion of connector, tool not supported by the connector during any position of normal use on a flat surface		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Standard test finger applied for tool inlet other than appliance inlet per IEC 60320		N/A
	Appliance inlet complies with IEC 60320		N/A
25	TERMINALS FOR EXTERNAL CONDUCTORS		-
25.1	Type X attachment, other than specially prepared cord, provided with terminal connections made by screws, nuts, or equally effective devices	The cord is provided with crimp terminals fixing by screws	P
	Use of screw-type terminals per IEC 60998-2-1	Not applicable	N/A
	Use of screwless-type terminals per IEC 60998-2-2	Not applicable	N/A
	Use of clamping units according to IEC 60999-1 considered equally effective devices	Not applicable	N/A
	Screws and nuts do not fix other components	See above	N/A
	Screws and nuts allowed to also clamp internal conductors when they are unlikely to be displaced when fitting supply conductors	Not applicable	N/A
	For tool with type X attachment, soldered connections allowed to be used for connection of external conductors, when soldering alone is not used to maintain conductor in position	Not applicable	N/A
	When provided, barriers prevent creepages and clearances between live parts and other metal parts from being reduced to < 50% of values in 28.1, the conductor can be fixed by soldering alone	Type X attachment is used	N/A
	For type Y and Z attachments, soldered, welded, crimped and similar connections allowed for the connection of external conductors	Not applicable	N/A
	Class II tools, conductor so positioned or fixed that soldering, crimping, or welding alone not relied upon to maintain the conductor in the position	Not applicable	N/A
	Barriers prevent creepages and clearances between live parts and other metal parts from being reduced to < 50% of values in 28.1 for the Class of tool using Type Y or Z attachments	Not applicable	N/A
	Conductors connected by soldering are held in place near termination independent of solder	Not applicable	N/A
	Conductor is "hooked in" before soldering and the hole through which it passes is not too large	Not applicable	N/A
	Terminals of a component built into the tool used to secure external conductors	Not applicable	N/A
	Leads additionally fixed near terminations	Not applicable	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Stranded conductors secured at insulation and conductor	Not applicable	N/A
25.2	Terminals for type X attachment fitted with special connection or accommodate nominal cross-sectional areas as in Table 8	See below	N/A
	Cables or cords of the specified smallest and largest cross-sectional areas can be fitted (mm ²)	Crimp termination is used	N/A
	Supply cord terminals withstood pull force of 5 N	No damage of the connection	P
25.3	For type X attachment, when clamping means tightened or loosened, terminal did not loosen up, no stress on internal wiring, and creepage and clearances not reduced	Crimp termination is used	N/A
	Torque applied per IEC 60999-1, Clause 9.6 at 2/3 torque of that in Table 4 of IEC 60999-1 (Nm)		N/A
	Terminals secured by two screws to prevent loosening	Not applicable	N/A
	Correct position of supply terminals maintained by switches and similar devices with recesses and verified after connection of supply cable and repositioning of device		N/A
	Sealing compound without other means of locking not used	Not applicable	N/A
	Self-hardening resins used only on terminals that are not subject to torsion in normal use	Not applicable	N/A
25.4	Type X attachment using terminals to clamp the conductor between metal surfaces do so without damage to conductor after torque test per Cl. 25.3	Not applicable	N/A
25.5	Type X attachments which require no special preparation of conductor for correct connection, and conductor does not slip out when clamping screws or nuts tightened	Crimp termination is used	N/A
	Type X specially prepared cord used		—
	There were no deep or sharp indentations on the conductors after torque test per Clause 25.3		N/A
25.6	End of conductor inserted in the hole of pillar type terminals is visible, or can pass beyond threaded hole for a distance of half nominal diameter of screw, or 2.5 mm, the greater of the two (mm)	Crimp termination is used	N/A
25.7	For type X attachment, terminals clearly recognizable and accessible after opening the tool	As requirement by visual inspection	P
	All terminals located behind one cover, or one part of the enclosure	Located behind the enclosure	P

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Clause	Requirement + Test	Result - Remark	Verdict
25.8	Terminal devices not accessible without the aid of a tool	The terminal is accessible after the opening of the enclosure, requiring the aid of a screwdriver	P
25.9	For tool with type X attachment, terminal devices located or shielded to prevent a strand of wire from escaping	Crimp termination is used. Stranded wire test is not necessary.	N/A
	In case of class II tool, live parts and metal parts separated from accessible metal parts by supplementary insulation		N/A
	8 mm long free wire of the stranded supply conductor did not touch any accessible metal part		N/A
	8 mm long free wire of stranded conductor connected to an earthing terminal did not touch any live part		N/A
26	PROVISION FOR EARTHING		-
26.1	Accessible metal parts of class I tool permanently connected to an earthing terminal or termination within the tool	Class II tools	N/A
	Accessible metal parts of class I tool permanently connected to the earthing contact of the tool inlet		N/A
	Printed circuit boards are not used to provide continuity of protective earthing circuit		N/A
	No electrical connection between earthing terminals or contacts and neutral terminal		N/A
	No provisions for earthing in Class II and III tools		N/A
	Metal parts behind a decorative cover that do not withstand test of Clause 20 considered accessible metal parts		N/A
26.2	Clamping means of earthing terminals adequately locked against accidental loosening		N/A
	Earthing connections not possible to loosen without the aid of a tool		N/A
	Terminals with screw clamping comply with the relevant requirements of Clause 25, and screwless terminals comply with IEC 60998-2-2		N/A
	For specially prepared cords, terminals comply with IEC 60760		N/A
	Screwless terminals tested per IEC 60998-2-2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
26.3	Earth connection of detachable parts was made before the current-carrying connections established when placing the part in position, and the current carrying connections separated before earth connection was broken when removing the part		N/A
	If cord slips out of cord anchorage, current-carrying conductors become taut before earthing conductor		N/A
26.4	No risk of corrosion between metal parts of earthing terminals and copper of earthing conductor		N/A
	Parts transmitting current in case of an insulation fault, other than parts of metal frame or enclosure, are coated or uncoated metal with adequate resistance to corrosion		N/A
	Thickness of electroplated coating (µm).....:		N/A
	Parts of coated or uncoated metal providing or transmitting contact pressure only, adequately protected against rusting		N/A
	Protection provided against risk of corrosion resulting from contact between copper and aluminium (or aluminium alloy)		N/A
	Parts subjected to a treatment such as chromate conversion coating are used only to provide or transmit contact pressure		N/A
	Thickness of coating of steel measured in accordance with ISO 2178 or ISO 1463 (µm).....:		N/A
	Resistance to rusting test.....:	See also Clause 30.	N/A
26.5	Resistance of earthing circuit (max. 0.1 Ω).....:		N/A
	Test current (A).....:		—
	Voltage drop between the earthing terminal and accessible metal part (V).....:		—

27	SCREWS AND CONNECTIONS		-
27.1	Fixings and electrical connections (includes earthing connections) withstood mechanical stresses occurring in normal use	Screws for fixing can withstand mechanical stresses occurring in normal use	P
	Screws not made of soft metal such as zinc or aluminium	Screws is not made of soft metal such as zinc or aluminium	P
	Diameter of screws of insulation material (mm).:	No such materials used	N/A
	Screws transmitting electrical contact pressure screw into metal	Not applicable	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Screws made from insulating material are not used if their replacement by a metal screw could impair supplementary or reinforced insulation	No screws are made from insulating material used	P
	Screws removed when replacing the supply cord with type X attachment, or during maintenance, are not of insulating material where their replacement by a metal screw could impair basic insulation	No screws made from insulating material used	P
	Screws and nuts tightened and loosened 10 times for screw engaged with a thread of insulating material	Screw tested: a fixing screw, with a diameter of 3.8mm. Test torque: 1.2 Nm	P
	Nuts and other screws tightened and loosened five times	Not applicable	N/A
	Screws engaging with a thread of insulating material completely removed and reinserted each time	Tested as required	P
	When testing terminal screws and nuts, a flexible conductor of the largest cross-sectional area per Clause 25.2 placed in the terminal (mm ²).....:	Not applicable	N/A
	Torque per column I of Table 9 applied to metal screw without head (Nm)	Not applicable	N/A
	Torque per column II of Table 9 applied to other metal screws and nuts (Nm)	Test torque: 1.2 Nm	P
	Torque per column II of Table 9 applied to screws of insulating material, having a hexagonal head with dimension across flats exceeding the overall thread diameter (Nm)	No screws made from insulating material used	N/A
	Torque (column II, Table 9) applied to screws of insulating material, with cylindrical head and a socket for a key, having cross-corner dimension exceeding overall thread diameter (Nm)	No screws made from insulating material used	N/A
	Torque per column II of Table 9 applied to screws of insulating material, with a head having a slot or cross slots, the length of which exceeds 1.5 times the overall thread diameter (Nm)	No screws made from insulating material used	N/A
	Torque per column III of Table 9 applied to other screws of insulating material (Nm).....:	Not applicable	N/A
	Conductor moved each time the screw or nut was loosened	Not applicable	N/A
	No damage impairing further use of fixing or electrical connections	Not applicable	N/A
27.2	Contact pressure not transmitted through insulating material other than ceramic, unless compensated for shrinkage or distortion	Not applicable	N/A
27.3	Space-threaded screws not used for connection of current-carrying parts	No such screws are used	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No thread-cutting screws used for connection of current-carrying parts	Not applicable	N/A
	Use of two space-threaded or thread-cutting screws in earthing circuits	Not applicable	N/A
27.4	Screws making both mechanical and electrical connections are locked against loosening	Not applicable	N/A
	Rivets for current-carrying connections subjected to torsion in normal use locked against loosening	Not applicable	N/A

28	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		-
28.1	Creepage and clearances not less than the values in Table 10, except for cross-over points of motor windings	See Table 28.1	P
	When a resonance voltage occurs, creepage and clearance are not less than specified for the voltage imposed by the resonance; these values increased by 4 mm in case of reinforced insulation	No resonance voltage	N/A
	Creepage and clearances for a tool with an appliance inlet measured with an appropriate connector inserted	No appliance inlet	N/A
	Creepage and clearances on tools with Type X attachment measured with supply conductor of largest cross-section per Clause 25.2 (mm ²)		N/A
	Measurements repeated without the conductors		N/A
	Creepage and clearances on a tool with other attachment measured on the "as delivered" tool	No appliance inlet	N/A
	Measurements on tool with belt made with the belt in place and belt tension adjusted to the most unfavourable position within its adjustment range	No belts provided	N/A
	Measurements repeated with the belt removed		N/A
	Movable parts placed in the most unfavourable position; nuts and screws with non-circular heads tightened in the most unfavourable position	As required	P
	Clearances between terminals and accessible metal parts also measured with screws and nuts unscrewed as far as possible and they were not less than 50% of Table 10	See Table appended 28.1	P
	Distances through slots or openings in external parts of insulating material measured to metal foil in contact with accessible surface with the foil pushed into corners using standard test finger	See appended Table 28.1	P

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Clause	Requirement + Test	Result - Remark	Verdict
	2 N force applied by test finger to bare conductors and uninsulated capillary tubes of thermostats and similar devices while measurement made	No such parts or devices	N/A
	30 N force applied by test finger to enclosure	30 N force applied on the enclosure	P
	Measurements made according to Annex A	See appended Table 28.1	P
	Creepage on an interposed barrier consisting of two parts not cemented together also measured through the joint	Not applicable	N/A
	Clearances on an interposed barrier measured over the barrier or, when barrier consisted of two parts with mating surfaces not cemented together, through the joint.	See appended Table 28.1	P
	Creepage and clearances on a tool having parts with double insulation and no metal between basic insulation and supplementary insulation		N/A
	PWB with peak voltage stresses ≤ 150 V per mm between parts of different potential provided with a min. distance of 0.2 mm, when protected against deposition of dirt		N/A
	-PWB with 100 V per mm provided with a min. distance of 0.5 mm, when not protected against deposition of dirt	Not applicable	N/A
	Values of the table applied when limits mentioned above resulted in higher values than in the table	Not applicable	N/A
	Reduced creepage distances applied for peak voltages 50 V if Proof Tracking Index (PTI) of PWB, per Annex G, greater than 175 (PTI).....:	Not applicable	N/A
	Distances reduced further since the tool complied with the requirements of Clause 18 distances short-circuited one at a time	Not applicable	N/A
	Creepage and clearances within optocouplers not measured when individual insulation adequately sealed, with air excluded between material layers	Not applicable	N/A
	For live parts of different polarity separated by basic insulation only, creepage and clearances reduced as tool complied with Clause 18 when creepage and clearances short-circuited	Not applicable	N/A
28.2	Distance through insulation between metal parts was 1.0 mm for working voltages 130 V when separated by supplementary insulation	Not applicable	N/A
	Distance through insulation between metal parts was 1.5 mm for working voltages 130 V when separated by reinforced insulation N		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Distance through the insulation was 1.0 mm for reinforced insulation used between windings and accessible metal		N/A
	Distance through insulation between metal parts was 1.0 mm for working voltages > 130V 250V when separated by supplementary insulation, and 2.0 mm when separated by reinforced insulation		N/A
	– requirement waived as insulation applied was in thin sheet form, other than mica or similar, and for supplementary insulation consisting of at least two layers, one layer having withstood electrical strength test for supplementary insulation		N/A
	– requirement waived as insulation applied was of at least three layers and for reinforced insulation, two layers in contact having withstood the electric strength test for reinforced insulation		N/A
	– requirement waived as max. temperature rise determined during test of Cl. 12 did not exceed values in 12.5 for inaccessible supplementary or reinforced insulation		N/A
	–requirement waived as inaccessible reinforced or supplementary insulation, after conditioning for 168h at temperature 50 K greater than max rise determined per Cl. 12, withstood an electric strength test per Cl. 15 at the oven temperature and room temperature (°C).....:		N/A
	For optocouplers, 168 h of conditioning at 50 K higher than the max. temperature rise measured on optocouplers during tests of Clauses 12 and 18, while operating under most difficult conditions		N/A

29	RESISTANCE TO HEAT, FIRE AND TRACKING		-
29.1	External parts of non-metallic material, insulating material supporting live parts, connections and thermoplastics providing supplementary or reinforced insulation sufficiently resistant to heat	See below	P
	Relevant parts subjected to ball-pressure test subsequent to a 24 h exposure to 15 °C-35 °C, and a relative humidity between 45 % and 75 %	The switch is an approved component. The plastic cover of the handgrip and motor enclosure were tested according to the requirements of this clause at 75°C for 1 hour. See table 29.1	P
	For coil formers, parts supporting or retaining terminals in position subjected to test	See Table 29.1	P

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Clause	Requirement + Test	Result - Remark	Verdict
29.2	Part of non-metallic material, except for decorative trims, knobs, and other parts not likely to be ignited or propagate flames originating from inside the tool, are resistant to ignition and spread of fire	Certificates are provided	P
	Parts of non-metallic material other than material classified at least HB40 per IEC 60695-11-10, provided test sample not thicker than relevant part, comply with glow-wire test of IEC 60695-2-11:	See Table 29.2	P
	Soft, foamy, and similar materials which cannot be subjected to glow wire test complied with ISO 9772 for category HBF material with test sample not thicker than relevant part		N/A
29.3	Insulating materials resistant to tracking	Certificates are provided	P
	Proof tracking test of Annex G conducted on insulating materials used under severe or extra-severe duty conditions:	See Table 29.3A	N/A
	For parts of insulating material used under severe duty conditions, test voltage was 175 V		N/A
	When specimens did not withstand above test and there was no hazard other than fire, surrounding parts subjected to needle-flame test of Annex F	See Table 29.3B	N/A
	For parts of insulating material used under extra-severe duty conditions, test voltage was 250 V		N/A
	When specimens did not withstand above test, but withstood test conducted at 175 V, and there was no hazard other than fire, surrounding parts subjected to needle-flame test of Annex F	See Table 29.3B	N/A
	Needle-flame test on all parts of non-metallic material positioned within a distance of 50 mm from any place where a tracking path may occur		N/A
	A separate barrier or enclosure shielding parts from the tracking path, subjected to needle-flame test		N/A

30	RESISTANCE TO RUSTING		-
30.1	Ferrous parts adequately protected against rusting	The enclosure is made of plastic. The metal parts are treated against rusting.	P
	Parts subjected to test		—
	All grease removed from the parts to be tested by immersing them in a degreasing agent for 10 min		N/A
	Parts were immersed for 10 min in a 10 % solution of ammonium chloride in water at (20 ± 5) °C		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Without drying, all drops shook off, and parts placed for 10 min in a box containing air saturated with moisture at (20 ± 5) °C		N/A
	After parts dried for 10 min in a heating cabinet at (100 ± 5) °C, no evidence of rust on surfaces		N/A
	Small helical springs and the like and parts exposed to abrasion covered by a layer of grease		N/A
31	RADIATION, TOXICITY, AND SIMILAR HAZARDS		-
31.1	Tool did not emit harmful radiation, present a toxic or similar hazard		P
31.2	Tool fitted with a laser of category II or lower, according to IEC 60825-1		N/A
ANNEX B	MOTORS NOT ISOLATED FROM THE SUPPLY MAINS AND HAVING BASIC INSULATION NOT DESIGNED FOR THE RATED VOLTAGE OF THE TOOL		-
B.1.1	Motors with working voltage 42 V		N/A
B.9.1	Metal parts of motor considered bare live parts		N/A
B.12.3	Temperature rise of body of motor determined in place of the temperature rise of the windings		N/A
B.12.5	Temperature rise of the body of the motor in contact with insulating materials did not exceed values in Table 1 for the relevant insulating material	See Table 12.1	N/A
B.18. 201	Tool operated at rated voltage with the terminals of motor and its capacitors short circuited		N/A
	Tool operated at rated voltage with the supply to the motor open circuited		N/A
	Tool operated at rated voltage with shunt resistor open circuited during operation of motor		N/A
B.21.101	For class I tools with a motor supplied by a rectifier circuit, dc circuit insulated from accessible parts of the tool by double or reinforced insulation		N/A
ANNEX F	NEEDLE-FLAME TEST		-
	Needle-flame test according to IEC 60695-11-5	See Table 29.3B	N/A
ANNEX G	PROOF TRACKING TEST		-
	Proof tracking test according to IEC 60112 and as modified in this Annex	See Table 29.3A	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX I	SWITCHES		-
	Switches tested to comply with this standard and the following Clauses of IEC 61058-1, as modified	Approved switch is provided	N/A
	Prior to test with tool, switch operated 20 times with no load		N/A
8	Incorporated switch marked with manufacturer's name or trade mark and the type reference	See Table 23.1	N/A
15	The dielectric strength of mechanical and electronic switches was adequate		N/A
17.1.1	Switches are for declared specific loads.....		N/A
17.1.2	Sequence of tests for all switches except electronic switches as indicated in this Annex		N/A
17.2.1.1	Switches loaded at rated voltage under the conditions occurring in the tool		N/A
	Circuits and contacts not intended for external loads operated with the designated loads		N/A
	Switches for 20 mA load as classified in 7.1.2.6 not subjected to electrical endurance tests		N/A
17.2.4.4	Test at accelerated speed (TC4)		
	For all switches except electronic switches, the electrical conditions were as specified in 17.2.1		N/A
	For electronic switches, electrical conditions were as specified in Table 15		N/A
	Thermal conditions were as specified in 17.2.2		N/A
	Total number of operations were 50 000		N/A
	Method of operation was as specified for accelerated speed in 17.2.3		N/A
20	Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies		N/A
	Requirements applied to creepage and clearances for live parts of different potential, for operational insulation and across full disconnection and micro-disconnection		N/A

ANNEX K	BATTERY TOOLS AND BATTERY PACKS		N/A
K.8.1	Detachable or separable battery packs marked with the information required by the standard	Not relevant	N/A
	Rated voltage(s) or voltage range(s), (V).....		—
	Symbol for nature of supply.....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Name, trademark or other identification mark		—
	Model or type reference		—
	Manufacturer's address or country of origin		—
	Any mandatory marks		—
K.8.12.1.1	Safety Rules for battery tool use and care		N/A
K.9	No two conductive, simultaneously accessible parts where the voltage between them is hazardous		N/A
	Conductive, simultaneously accessible parts provided with protective impedance		N/A
	Short circuit current between two simultaneously accessible parts (mA).....		N/A
	Capacitance between two simultaneously accessible parts (µF)		N/A
K.12.1	No operation of thermal cut-outs and overload releases during heating test		N/A
	Temperature rises met values in Table K.1	See Table K12.1	N/A
K.15.1	Electric strength test on insulating materials for 1 min to 750 V with a substantially sinusoidal wave from having a frequency of 50 Hz or 60 Hz		N/A
K.18.1	No charring or burning of gauze or tissue paper resulted when battery tool and battery pack were subjected any abnormal operations	See Table K.18.1	N/A
K.19.201	Tools marked with a direction of movement and it is not possible to connect a battery pack such that the marking is not correct		N/A
K.20.1	Battery tools and battery packs have adequate mechanical strength after tests of 20.2 and K.20.3		N/A
	Battery tools and battery packs met requirements of clauses K.9, K.19 and either K.18.1 (f) or K.28.1 after tests of 20.2 and 28.1		N/A
K.20.3	Adequate mechanical strength after drop tests on a concrete surface from a height of 1 m		N/A
	The test was repeated successfully with the battery pack removed from the tool		N/A
	The test was repeated successfully on the battery pack by itself		N/A
K.21.201	Tool will not accept general purpose batteries		N/A
K.23.1.10	Power switches have adequate breaking capacity and present no electrical or mechanical failure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.23.1.11	Power switches withstood, without excessive wear or other harmful effect, the mechanical, electrical, and thermal stresses occurring in normal use		N/A
	Cycle rate and voltage applied		—
K.24.201	External flexible cable or cord have anchorages such that the conductors are relieved from strain, including twisting, where they are connected within the tool, and protected from abrasion		N/A
K.28.1	Creepage distances and clearances not less than the values in millimetres shown in Table K.2		N/A
	For part having a hazardous voltage between them, the sum total of the measured distances between each of these parts and their nearest accessible surface is not less than 1,5 mm clearance and 2,0 mm creepage (Fig. K.1)		N/A
K.29.1	External parts of tools and battery pack made of non-metallic materials subject to ball pressure test	See Table 29.1	N/A
K.29.2	The distance between parts of opposite polarity on external enclosure (Figure K.1)		N/A

ANNEX L	BATTERY TOOLS AND BATTERY PACKS PROVIDED WITH MAINS CONNECTION OR NON-ISOLATED SOURCES		-
L.8.1	Non-isolated sources that can supply a tool, or tool that can be supplied directly from the mains, marked with as required by the standard:		N/A
	Rated voltage(s) or voltage range(s), (V).....		—
	Symbol for nature of supply.....		—
	Rated input, (W) or rated current (A)		—
	Name, trademark or other identification mark		—
	Model or type reference		—
	Symbol for class II		—
	Manufacturer's address or country of origin		—
	Any mandatory marks		—
L.8.1.201	Tools, other than those that can be supplied directly from the mains, detachable battery packs marked with required information		N/A
	Rated voltage(s) or rated voltage range(s), (V)		—
	Symbol for nature of supply.....		—
	Name, trademark or other identification mark		—
	Model or type reference		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturer's address or trade mark.....:		—
	Additional markings that do not give rise to misunderstanding.....:		—
L.8.12.1.1	Safety Rules for battery tool use and care		N/A
L.9	Battery tool and/or battery pack constructed and enclosed with adequate protection against electric shock		N/A
L.9.201	No two conductive, simultaneously accessible parts where the voltage between them is hazardous		N/A
	Conductive, simultaneously accessible parts provided with protective impedance		N/A
	Short circuit current between two simultaneously accessible parts (mA).....:		N/A
	Capacitance between two simultaneously accessible parts (µF).....:		N/A
	Test finger, figure 1, applied without force		N/A
	Test finger, figure 1, applied with 20 N force		N/A
L.10	Applies only to directly connected mains	See Clause 10	N/A
	Temperatures were not exceeded with charger operating and tool operating at no load		N/A
L.11	Applies only to directly connected mains	See Clause 11	N/A
L.12	Applies only to directly connected mains.	See Clause 12	N/A
L.13	Applies only to directly connected mains	See Clause 13	N/A
L.14	Applies only to directly connected mains	See Clause 14	N/A
L.15	Applies only to directly connected mains. Electric strength test with electronic devices bypassed	See Clause 15	N/A
L.16	Applies only to directly connected mains	See Clause 16	N/A
L.17	Applies only to directly connected mains	See Clause 17	N/A
	Tools not capable of continuous operation operated under battery power for the duration of the test and met the requirements of L.15 w/ charger connected		N/A
L.18	Applies only to directly connected mains	See Clause 18	N/A
L.18.201	No charring or burning of gauze or tissue paper resulted when battery tool and battery pack were subjected any abnormal operations	See Table L.18.201	N/A
L.19	Applies only to directly connected mains		N/A
L.19.201	Tool is marked with a direction of movement and it is not possible to connect a battery pack such that the marking is not correct		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
L.20	Applies only to directly connected mains	See Clause 20	N/A
L.20.201	Battery tool with its battery pack attached withstood drop tests on a concrete surface from 1 m		N/A
	The test was repeated successfully with the battery pack removed from the tool		N/A
	The test was repeated successfully on the battery pack by itself		N/A
	Battery tool and battery pack met requirements of L.9, L.19 and either L.18.201(f) or L.28.201		N/A
L.23.1.10.2 01	Switches had adequate breaking capacity and presented no electrical or mechanical failure		N/A
L.23.1.11.2 01	Switches withstood, without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use.		N/A
L.24.21	Appliance inlet will not allow direct connection to mains		N/A
L.24.201	External flexible cable or cord have anchorages such that the conductors are relieved from strain, including twisting, where they are connected within the tool, and protected from abrasion		N/A
L.26	Applies only to directly connected mains	See Clause 26	N/A
L.27	Screws and connections comply with Clause 27	See Clause 27	N/A
L.28	Applies only to directly connected mains	See Clause 28	N/A
L.28.201	Creepage distances and clearances not less than the values in millimetres shown in Table L.1		N/A
	For parts having a hazardous voltage between them, the sum of the measured distances between each of these parts and their nearest accessible surface is not less than 1.5 mm clearance and 2.0 mm creepage (Fig. L.1)		N/A
L.29.1	Applies only to directly connected mains	See Table 29.1	N/A

ANNEX M	SAFETY OF WORKING STANDS FOR OPERATION WITH HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS		-
M.5.201	The test results for the working stand are dependent on the tool used on the working stand and the tool/working stand combination which lead to the most unfavourable results was tested		N/A
	The working stand does not adversely affect the safety of the tool when used in combination		N/A
M.7.1	Working stand designed for tool of Class		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.8.1	The working stand is marked with capacities, such as power, weight, dimensions, as specified in part 2		N/A
M.8.12.1.1	All required General Working Stand Safety Warnings are provided		N/A
M.8.12.2a)	Information, instructions and warnings provided as stated in 201) and 202)		N/A
M.17.2	The test was performed in the normal operating position of the working stand		N/A
M.19.201	The working stand can be used without fixing to the floor or to the tool and it has adequate stability		N/A
	The working stand did not overturn after testing		N/A
M.19.202	Screws which make a mechanical connection between different parts of the working stand did not become loose in normal use		N/A
M.19.203	All required protective devices are delivered with the working stand as stated in the relevant part 2		N/A
M.19.204	The use of the tool with the stand does not impair the safety of the hand-held tool when removed from the stand and used as a stand-alone product		N/A
M.21.17	Switches are located so that accidental operation is unlikely to occur		N/A
	It was not possible to start the electric tool by means of the sphere.....:		N/A
M.21.18	The mains switch of the working stand or the tool is located so that it can be switched on and off by the user from the operator's position		N/A
	The relevant part 2 states whether the working stand needs to be fitted with a switch to start and stop the installed electric tool		N/A
M.21.201	There is no risk of injury to the operator and it is not necessary to traverse an area that may involve a risk of injury when reaching for a control		N/A
	The area involves a risk of injury, but is guarded or so located that it cannot be entered unintentionally		N/A
M.21.202	The working stand is equipped with facilities needed to fix the hand-held electric tools which are intended to be installed		N/A
M.21.203	The reactivation of the electric tool/working stand does not cause a hazard after a voltage recovery		N/A
M.21.204	The working stand is designed such that in normal use the dust-collection device on the tool can be used without any restriction		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.23.1.10	Main switches are rated for at least the tool with the highest rated input or rated current recommended by the manufacturer and are rated for 10 000 cycles of operation		N/A
	The mains switches did not have electrical or mechanical failure after the test		N/A
	Mains switches marked with individual ratings were also tested in accordance with IEC 61058-1		N/A
M.23.1.11	IEC 61058-1 compliance switches were not separately tested, but comply with Annex I		N/A
	Test of 17.2.4.4 of IEC 61058-1 was carried out for 10 000 cycles of operation		N/A
M.25.201	Terminals for external conductors comply with IEC 60204-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

9.1	TABLE: Protection against access to live parts				N/A
	Measurement between relevant parts and poles of supply source	Rated voltage U (V)	Measured voltage (V)	Measured current (A)	Measured capacitance (µF)
Supplementary information: None					

11.1	TABLE: Input data under no load conditions							P
Rated voltage U (V)			Rated input (W)	Input current (A)	Input power (W)	Speed of spindle (/min)	Rated speed.	Deviation
Lower Voltage Limit (V)	Upper Voltage Limit (V)	Mean Value of Range						
110	-	-	1300	-	487	2820	2800	-62.5%
-	120	-	1300	-	486	2816	2800	-62.6%
220	-	-	1600	-	503	2793	2800	-68.6%
-	240	-	1600	-	506	2796	2800	-68.4%
Supplementary information: None.								

12.1	TABLE: Input data under rated load conditions							P
Rated voltage U (V)			Rated input (W)	Input current (A)	Input power (W)	Speed of spindle (/min)	Output power (W)	Torque (Nm)
Lower Voltage Limit (V)	Upper Voltage Limit (V)	Mean Value of Range						
Supplementary information: None.								

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Clause	Requirement + Test	Result - Remark	Verdict

12.1	TABLE: Temperature Rise Measurements				P
Test voltage (V)	103.4		127.2		--
Ambient temperature (t1°C)	22.6		22.6		--
Ambient temperature (t2°C)	24.4		24.6		--
Input current (A)	11.59		11.93		--
Input Wattage (W)	1172		1492		--
Load speed (/min)	2105		2755		--
Torque (Nm) (maintained)	12.06Nm(1.23kg-m)				--
Operating time (min).....	Runs to the steady condition.				
Measurement at:	T(°C)	ΔT(K)	T(°C)	ΔT(K)	Allowed Limit
Stator winding 1	79.7	55.3	76.5	51.9	155-25
Stator winding 2	69.6	45.2	66.9	42.3	155-25
Motor housing, closed to bearing	43.6	19.2	45.9	21.3	--
Internal wire	27.1	2.7	27.2	2.6	105-25
Switch ambient	33.6	9.2	32.9	8.3	30(T55)
Power cord	29.7	5.3	28.8	4.2	50
Rear handle	24.7	0.3	23.1	1.5	--
Enclosure	32.2	7.8	31.1	6.5	--
Soft starter, heat sink	39.6	15.2	38.0	13.4	--
Capacitor	28.4	4.0	28.0	3.4	50
Supplementary Information:					
Note: See Table 13.1A for Leakage Current Test after Temperature Test					

12.1	TABLE: Temperature Rise Measurements				P
Test voltage (V)	206.8		254.4		--
Ambient temperature (t1°C)	22.4		22.5		--
Ambient temperature (t2°C)	22.6		22.6		--
Input current (A)	6.88		7.29		--
Input Wattage (W)	1381		1801		--
Load speed (/min)	2161		2665		--

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Clause	Requirement + Test	Result - Remark			Verdict	
	Torque (Nm) (maintained)	15.59Nm(1.59kg-m)			--	
	Operating time (min).....	Runs to the steady condition.				
	Measurement at:	T(°C)	ΔT(K)	T(°C)	ΔT(K)	Allowed Limit
	Stator winding 1	92.7	70.1	92.6	70.0	155-25
	Stator winding 2	76.3	53.7	76.3	53.7	155-25
	Motor housing, closed to bearing	55.7	33.1	59.5	36.9	--
	Internal wire	29.9	7.3	30.3	7.7	105-25
	Switch ambient	33.0	10.4	33.7	11.1	30(T55)
	Power cord	25.4	2.8	25.4	2.8	50
	Rear handle	23.4	0.8	23.6	1.0	--
	Enclosure	41.3	18.7	44.2	21.6	--
	Soft starter, heat sink	35.6	13.0	35.1	12.5	--
	Capacitor	30.9	8.3	31.5	8.9	50
Supplementary Information:						
Note: See Table 13.1A for Leakage Current Test after Temperature Test						

12.3	TABLE: Temperature Rise of Windings						P
Part under test (windings and core laminations)	T ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	ΔT (K)	Limit(K)	Insulation Class
Winding (110-120V)	22.6	0.22	24.4	0.3	91.69	130	155
Winding (220-240V)	22.4	0.77	22.6	1.04	89.88	130	155
Supplementary Information: armature winding: Ω, °C (diagonal)							
Note: See Table 13.1A for Leakage Current Test after Temperature Test							

13.1A	TABLE: Leakage Current – Clause 12.1					P
Points of application	Test voltage (1.06 X rated V)	Freq. (Hz)	Selector Switch Position (ON/ OFF ¹)	Allowed leakage current (mA)	Measured leakage (mA)	

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Clause	Requirement + Test	Result - Remark	Verdict

L/N to enclosure	1.06 X 240 V	50	ON (position 1,2)	0.25	0.02/0.02
			OFF (position 1,2)		0.01/0.01
L/N to enclosure	1.06 X 120 V	50	ON (position 1,2)	0.25	0.05/0.05
			OFF (position 1,2)		0.05/0.005

Supplementary Information: Double-poles disconnected switch.
 Note ⁽¹⁾ – Testing with tool in the “OFF” position is required when tool employs a single pole switch and a capacitor

13.1B	TABLE: Leakage Current – Clause 12.6 d)	N/A
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Points of application	Test voltage (1.06 X rated V)	Freq. (Hz)	Selector Switch Position (ON / OFF ¹)	Allowed leakage current (mA)	Measured leakage (mA)

Supplementary Information:
 Note ⁽¹⁾ – Testing with tool in the “OFF” position is required when tool employs a single pole switch and a capacitor

13.1C	TABLE: Leakage Current – Clause 12.6 f)	N/A
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Points of application	Test voltage (1.06 X rated V)	Freq. (Hz)	Selector Switch Position (ON / OFF ¹)	Allowed leakage current (mA)	Measured leakage (mA)

Supplementary Information:
 Note ⁽¹⁾ – Testing with tool in the “OFF” position is required when tool employs a single pole switch and a capacitor

13.1D	TABLE: Leakage Current – Clause 14.3	P
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Points of application	Test voltage (1.0 X rated V)	Freq. (Hz)	Selector Switch Position (ON / OFF ¹)	Allowed leakage current (mA)	Measured leakage (mA)
L/N to enclosure	1.06 X 240 V	50	ON (position 1,2)	0.25	0.005/0.005
			OFF (position 1,2)		0.001/0.001
L/N to enclosure	1.06 X 120 V	50	ON (position 1,2)	0.25	0.005/0.005
			OFF (position 1,2)		0.005/0.005

Supplementary Information: none.
 Note ⁽¹⁾ – Testing with tool in the “OFF” position is required when tool employs a single pole switch and a capacitor

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Clause	Requirement + Test	Result - Remark	Verdict

13.1E	TABLE: Leakage Current – Clauses 14.4, 14.5 and 18.12					P
Points of application	Test voltage (V)	Freq. (Hz)	Selector Switch Position (ON/OFF ¹)	Allowed leakage current ² (mA)	Measured leakage current (mA)	Mode ³ , test condition ⁴ and/or additional Comments
L/N to enclosure	1.06 X 240 V	50	ON (position 1,2) OFF (position 1,2)	2	0.005/0.05 0.05/0.001	
L/N to enclosure	1.06 X 120 V	50	ON (position 1,2) OFF (position 1,2)	2	0.05/0.05 0.05/0.005	

Supplementary Information: Test has been done after test of clause 18.2.
 Note ⁽¹⁾ – Testing with tool in the “OFF” position is required when tool employs a single pole switch and a capacitor
 Note ⁽²⁾ – 2 mA for a class II tool, 5 mA for a class I tool
 Note ⁽³⁾ – Applicable mode, see Clause 14.4
 Note ⁽⁴⁾ – Test condition such as 1.0 % NaCl solution at specified pressure for 1 h (Clause 14.5), disable residual current device (Cause 14.5), measurement after tool allowed to dry for 24 h at room temperature, etc.

15.2A	TABLE: Electric Strength Test – Applied after Clause 12.6 d) and 14.3				P
Test voltage applied between:	Class of tool	Test voltage (V)	Results after Clause 12.6 d)	Results after Clause 14.3	
Between the conductors and basic insulation of internal wiring	Class II	1250	-	P	
Between the body and internal diameter of cord guard wrapped with metal foil	Class II	2500	-	P	
Between plug and the body	Class II	3750	-	P	
Supplementary Information: none					

15.2B	TABLE: Electric Strength Test – Applied after Clause 14.1.2 and 14.2 and 14.3				P
Test voltage applied between:	Class of tool	Test voltage (V)	Results after Clause 14.1.2	Results after Clause 14.2	Results after Clause 14.3
Between the conductors and basic insulation of internal wiring	Class II	1250	-	-	P
Between the body and internal diameter of cord guard wrapped with metal foil	Class II	2500	-	-	P
Between plug and the body	Class II	3750	-	-	P
Supplementary Information: None.					

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Clause	Requirement + Test	Result - Remark	Verdict

15.2C	TABLE: Electric Strength Test – Applied after Clause 17.2			P
Test voltage applied between:	Class of tool	Test voltage (V)	Results	
Between the conductors and basic insulation of internal wiring	Class II	937.5	P	
Between the body and internal diameter of cord guard wrapped with metal foil	Class II	1875	P	
Between plug and the body	Class II	2812.5	P	
Supplementary Information: None				

15.2D	TABLE: Electric Strength Test – Applied after Clause 17.3			N/A
Test voltage applied between:	Class of tool	Test voltage (V)	Results	
Between live parts and accessible parts separated from live parts by basic insulation only	Class III	500		
	Other tools	1250		
Between live parts and accessible parts separated from live parts by reinforced insulation	Class II and II Builds	3750		
	Other tools	3750		
For parts with double insulation, between metal parts separated from live parts by basic insulation only, and live parts	Class II and II Builds	1250		
	Other tools	1250		
For parts with double insulation, between metal parts separated from live parts by basic insulation only, and accessible parts	Class II and II Builds	2500		
	Other tools	2500		
Between metal enclosures or covers lined with insulating material and metal foil in contact with the inner surface of the lining	Class II and II Builds	2500		
	Other tools	1250		
Between metal foil in contact with handles and the like and their shafts	Class II and II Builds	2500		
	Other tools	2500		
Between accessible parts and internal diameter of cord guard wrapped with metal foil	Class II and II Builds	2500		
	Other tools	1250		

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Clause	Requirement + Test	Result - Remark	Verdict
	Between winding/capacitor connection and accessible parts	Class II and II Builds 2U + 1000	
	Between winding/capacitor connection and metal parts separated from live parts by basic insulation only	Other tools 2U + 1000	
Supplementary Information:			

15.2E	TABLE: Electric Strength Test – Applied after Clause 20.2, 20.3, 20.4 and 20.5						P
Test voltage applied between:	Class of tool	Test voltage (V)	Results after 20.2	Results after 20.3	Results after 20.4	Results after 20.5	
Between the conductors and basic insulation of internal wiring	Class II	1250	-	P			
Between the body and internal diameter of cord guard wrapped with metal foil	Class II	2500	-	P			
Between plug and the body	Class II	3750	-	P			
Supplementary Information: none.							

16.1	TABLE: Overload Protection of Transformers and Associated Circuits			N/A
Test voltage				—
Ambient temperature (°C)				—
Input current (A) / Input Wattage (W).....				—
Applied short-circuit or overload.....				—
Measurement at:	Temperature rise, (°C)	Allowed Limit		
Transformer winding (thermocouple)				
Transformer winding (T ₁)R-R				
Transformer winding (T ₂)R-R				
Transformer Lamination				
Internal wiring				
Capacitor				
Printed circuit board				
SELV circuits				
Supplementary Information:				

18.10.2	TABLE: Fault Condition Tests		N/A
	Ambient temperature (°C).....		—

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Clause	Requirement + Test	Result - Remark	Verdict

Component	Fault Condition	Test Voltage (V)	Test Duration	Fuse-link Current (A)	Comment/Result
Supplementary Information: None.					

23.1	TABLE: List of Critical Components					P
Object/Part No.	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity ¹⁾	
Power plug	Ta An Electric	TP-50/TP-52	AC250V/16A	VDE 0620	VDE	
	Ta An Electric	TP-41	AC250V/16A	VDE 0620	VDE	
Power plug (for U.K.)	Ta An Electric	TP-66	AC250V/13A	BS 1363-1	ASTA	
	Ningbo Znpou	P1234	AC250V/16A	EN 60309-1 EN 60309-2	SEMKO	
	Ningbo Znpou	P1134	AC130V/16A	EN 60309-1 EN 60309-2	SEMKO	
Power cord (220-240V)	Ta An Electric	H05VV-F	1.0 mm ²	VDE 0281-5	VDE	
	Lu Chiang Electric	H05VV-F	1.0 mm ²	VDE 0281-5	VDE	
	I-Sheng Electric	H05VV-F	1.0 mm ²	VDE 0281-5	VDE	
Power cord (110-120V)	Ta An Electric	H05VV-F	1.5 mm ²	VDE 0281-5	VDE	
	Lu Chiang Electric	H05VV-F	1.5 mm ²	VDE 0281-5	VDE	
	I-Sheng Electric	H05VV-F	1.5 mm ²	VDE 0281-5	VDE	
Switch (220-240V)	Chily	8301	250V/ 8(8)A	DIN EN 61058	VDE	
	Defond	DGU-1115	250V/ 8(8)A	EN 61058-1	ENEC	
Switch (110-120V)	Defond	DGU-1115	125V/ 15(15)A	EN 61058-1	ENEC	
	Jiaben	FA1-6-10/2	125V/ 16(16)A	EN 61058-1	TUV	
Enclosure	Nan Ya Plastics	2210G6	HB	E130155	UL	
Magnet wire	Tai-I Electric	PEW	155°C	E85640	UL	
Insulations	Jindal Polyester	JPEL	105°C	E176671	UL	
PCB board	Eternal Chemical	ETL-XPC-801	V-0,130°C	E95862	UL	
Internal wiring	Great Sheng	1007	AVLV2	E253346	UL	
Cooling fan	Ginar Technology	AN0720SN	HB	E154352	UL	
Capacitor	Carli Electronics	MPX	0.1uF	EN60384-14	ENEC	
¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance						

28.1	TABLE: Clearance and Creepage Distance Measurements					P
Clearance cl and Creepage Distance (dcr) Between:	Up (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required dcr (mm)	Dcr (mm)
Between live parts of different polarity (terminals of switch)	240	230	2.0	>9.1	2.0	>11.5

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Clause	Requirement + Test			Result - Remark		Verdict
Between internal wiring and enclosure fixing screw (over basic insulation)	240	230	4.0	>5.2	4.0	>6.0
Between internal wiring and accessible enclosure (over basic insulation)	240	230	4.0	>4.5	4.0	>5.2
Between winding with tubing and accessible enclosure (over basic insulation)	240	230	4.0	>6.0	4.0	>6.0
Between enamelled winding and accessible metal	240	230	6.0	>14.5	6.0	>15.0
Supplementary information: the tab of brush holder is covered with the heating-shrinkable tube.						

28.2	TABLE: Distance Through Insulation Measurements				N/A
Distance Through Insulation di Between:	U r.m.s. (V)	Test Voltage (V)	Required di (mm)	Di (mm)	
Supplementary information: none					

29.1	TABLE: Ball Pressure Test			P
Part under test	Plastic material type	Test Temperature (°C)	Impression Diameter (mm)	
Enclosure	HB (see table 23.1)	75	<2mm	
Supplementary information: None.				

29.2	TABLE: Glow Wire Test					P
Test Conditions.....:	Test according to IEC 60695-2-11					—
Test temperature (°C)	550°C					—
Test Specimen	Material type	Specified Layer placed underneath Test Specimen	Material ignited, Yes/No	Specified Layer under Test Specimen ignited, Yes/No	Other remarks	
Main enclosure	550	No	No	No	P	
Supplementary information: none						

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Clause	Requirement + Test	Result - Remark	Verdict

29.3A	TABLE: Proof Tracking Test, Annex G			N/A
Test Conditions.....:	Test according to IEC 60112			—
Test solution	400Ωcm at 25°C			—
Test Voltage (V).....:	175V			—
Specimen under test	Material type	Tracking occurred, Yes/No	Rate of Tracking	Other remarks
Supplementary information: none				

29.3B	TABLE: Needle-flame Test, Annex F				N/A
Test Conditions.....:	Test according to IEC 60695-2-2				—
Duration of flame application (s)					—
Test temperature (°C)					—
Specimen under test	Material type	Material ignited, Yes/No	Tissue Paper Ignited, Yes/No	Pine-wood Scorched, Yes/No	Other remarks
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

K12.1	TABLE: Normal Temperature Test for Battery Tool			N/A
Test voltage				—
Ambient temperature (°C)				—
Input current (A) / Input Wattage (W)				—
Speed control setting:				—
Measurement at:		Temperature rise, (°C)	Allowed Limit	
Enclosure, outside, gripping surface				
Enclosure, outside, near motor				
Enclosure outside, gear housing				
Enclosure, inside, near motor				
Enclosure, inside, near heat sink				
Internal wiring				
Switch body				
External, metal gear case				
Battery terminal support				
Battery pack				
Supplementary Information: Status of overload protector at end of test <input type="checkbox"/> No change <input type="checkbox"/> Opened during the Test <input type="checkbox"/> N/A				

K.18.1	TABLE: Battery Tool Abnormal Operation					N/A
Abnormal conditions	Resistance (max. 10 mΩ)	Protector Operated?	Test repeated 3 more times	Charring or burning of test materials?	Other remarks	
a) Terminals of detachable battery pack with exposed terminals shorted						
b) Motor terminals shorted						
c) Motor rotor locked						
d) Cord between battery tool and separable battery pack shorted						
e) Cord provided the tool and the charger shorted						
f) Any two uninsulated parts of opposite polarity in battery tools shorted						

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary Information:

L.18.201	TABLE: Battery Tool Abnormal Operation					N/A
Abnormal conditions	Resistance (max. 10 mΩ)	Protector Operated?	Test repeated 3 more times	Charring or burning of test materials?	Other remarks	
a) Terminals of detachable battery pack with exposed terminals shorted						
b) Motor terminals shorted						
c) Motor rotor locked						
d) Cord between battery tool and separable battery pack shorted						
e) Cord provided the tool and the charger shorted						
f) Any two uninsulated parts of opposite polarity in battery tools shorted						
Supplementary Information:						

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Clause	Requirement + Test	Result - Remark	Verdict
6	Environmental requirements This clause of Part 1 is applicable except as follows:		-
6.1.2.4	Modification: Reciprocating saws are suspended in such a way as to correspond to normal use..		P
6.1.2.5	Modification: Reciprocating saws are tested at no-load.		P
6.2.4.2	Addition: Figure Z101 and Z102 show the positions for different saws.		-
6.2.6.3	Modification: Reciprocating saws are tested under load according to the conditions shown in Tables Z101,Z102 and Z103.		P
	Jig saws are tested sawing both board and sheet metal . Sabre saws are tested cutting board and wooden beams.		N/A
	Sabre and jig saws with speed setting devices shall be adjusted to the settings to cut the work piece material required in the test.		P
	Table Z101 - Test conditions for sabre and jig saws cutting board		P
	Table Z102 - Test conditions for jig saws cutting sheet metal		N/A
	Table Z103 – Test conditions for sabre saws cutting wooden beams		P
6.2.7.1	Reported vibration value		N/A
	For jig saws, the results a_h for two operation modes shall be reported: $a_{h,B}$ = mean vibration “cutting board” in accordance with Table Z101 $a_{h,M}$ = mean vibration “cutting sheet metal” in accordance with Table Z102.		N/A
	Reported vibration value		N/A
6.2.7.2	Declaration of the vibration total value		P
	The vibration total value of the handle with the highest emission and the uncertainty K shall be declared:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	For jig saws the value of $\alpha_{h,B}$ with the work mode description "cutting boards" and the value of $\alpha_{h,M}$ with the work mode description "cutting sheet metal";		N/A
	For sabre saws the value of $\alpha_{h,B}$ with the work mode description "cutting boards" and the value of $\alpha_{h,WB}$ with the work mode description "cutting wooden beams";		P
7	Classification This clause of Part 1 is applicable.		P
8	Marking and instructions This clause of Part 1 is applicable, except as follows:		-
8.12.1.1	Addition: –Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring or its own cord. Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.		P
8.12.2	a)Addition: Z101) Information on the correct use of the dust collection system, if any		N/A
	Z102) Advice to wear a dust mask		P
9	Protection against access to live parts This clause of Part 1 is applicable.		P
10	Starting This clause of Part 1 is applicable.		P
11	Input and current This clause of Part 1 is applicable.		P
12	Heating This clause of Part 1 is applicable		P

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Clause	Requirement + Test	Result - Remark	Verdict
13	Leakage current This clause of Part 1 is applicable.		P
14	Moisture resistance This clause of Part 1 is applicable.		P
15	Electric strength This clause of Part 1 is applicable.		P
16	Overload protection of transformers and associated circuits This clause of Part 1 is applicable.		P
17	Endurance This clause of Part 1 is applicable.		P
18	Abnormal operation This clause of Part 1 is applicable.		P
19	Mechanical hazards This clause of Part 1 is applicable except as follows:		P
19.1	Replacement: a) For jigsaws A guard shall be provided to prevent inadvertent contact with the cutting edge of the saw blade above the guide plate.		N/A
	The jig saw is set for the right-angled cut. The test probe of Figure 101a) is positioned above the base plate as shown in Figure 101b) and Figure 101c). The longitudinal axis of the test probe shall be perpendicular to the toothed edge of the saw blade. The test probe shall be equally shared about the central plane of the saw blade. When the test probe is moved towards the saw blade, it shall not be able to touch its toothed edge.		N/A
	b) For other types of reciprocating saws		P
	If a reciprocating saw is designed with a grip zone adjacent and behind the reciprocating saw blade, a barrier shall be provided to prevent inadvertent contact with the saw blade. The barrier shall have a minimum height of 6mm as measured from the grip surface and be located between the grip zone and the saw blade. A barrier is not required if the tool is supplied with an auxiliary front handle	Barrier provided.	P
20	Mechanical strength This clause of Part 1 is applicable.		P

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Clause	Requirement + Test	Result - Remark	Verdict
21	Construction This clause of Part 1 is applicable, except as follows:		P
21.Z1	This subclause of Part 1 is not applicable.		-
22	Internal wiring This clause of Part 1 is applicable.		P
23	Components This clause of Part 1 is applicable.		P
24	Supply connection and external flexible cords This clause of Part 1 is applicable.		P
25	Terminals for external conductors This clause of Part 1 is applicable.		P
26	Provision for earthing This clause of Part 1 is applicable.		N/A
27	Screws and connections This clause of Part 1 is applicable.		P
28	Creepage distances, clearances and distances through insulation This clause of Part 1 is applicable.		P
29	Resistance to heat, fire and tracking This clause of Part 1 is applicable.		P
30	Resistance to rusting This clause of Part 1 is applicable.		P
31	Radiation, toxicity and similar hazards This clause of Part 1 is applicable.		P
Annexes	The annexes of Part 1 are applicable except as follows.		-
Annex K	(normative) Battery tools and battery packs		N/A
K.1.1	Addition: All clauses of this Part 2 apply unless otherwise specified in this annex.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.8.12.1.1	Replacement of this subclause of Part 2		N/A
	- Hold Power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring or its own cord. Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock		N/A
Annex L	(normative) Battery tools and battery packs provided with mains connection or non-isolated sources		N/A
L.1.1	Addition: All clauses of this Part 2 apply unless otherwise specified in this annex.		N/A

Annex ZZA (Informative)	Coverage of Essential Requirements of Directive 98/37/EC	P
Annex ZZB (Informative)	Coverage of Essential Requirements of Directive 2006/42/EC	P

- End of Test Report -