



TEST REPORT IEC 60730-2-9 Automatic electrical controls - Part 2-9: Particular requirements for temperature sensing controls	
Report Number.....: 64.100.14.05057.03 Date of issue.....: 2020-04-21 Total number of pages.....: 111	
Name of Testing Laboratory preparing the Report.....	TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
Applicant's name	Dongguan Tai Mei Electric Co., Ltd
Address	138# Third Floor, Junma East Road, Xinsi Village, Hengli Village, 52300 Dongguan City, PEOPLE'S REPUBLIC OF CHINA
Test specification: Standard.....: IEC 60730-2-9:2015, AMD1:2018 in conjunction with IEC 60730-1:2013, AMD1:2015 Test procedure.....: Type test Non-standard test method.....: N/A	
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Test item description	Temperature limiter	
Trade Mark		
Manufacturer.....	Same as applicant	
Model/Type reference	TM22 xxx, KSD301 xxx, KSD302 xxx, KI31 xxx, KSD303 xxx (‘xxx’ indicates operating temperature, for Ceramic enclosure ‘xxx’ can be 000-250, for Bakelite enclosure ‘xxx’ can be 000-150)	
Ratings	250V~, 50/60Hz, 16A(alternative 15A or 10A), action type: 1.B; Number of cycles of automatic action: 100 000 Operating temperature: 0-250°C for models with ceramic enclosure; 0-150°C for models with bakelite enclosure	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/> Testing Laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch	
Testing location/ address	Building12&13, Zhiheng Wisdomland Business Park Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen CHINA	
Tested by (name, function, signature)	Ice Feng (Project Handler)	
Approved by (name, function, signature) ..	Alice Gu (Reviewer)	
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature) ..		
Approved by (name, function, signature) ..		
<input type="checkbox"/> Testing procedure: CTF Stage 3:		
<input type="checkbox"/> Testing procedure: CTF Stage 4:		
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature) ..		
Approved by (name, function, signature) ..		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment): Attachment No.1: Photo document (4 pages).	
Summary of testing:	
Tests performed (name of test and test clause): <p>This test report is based on the previous test report 64.100.14.05057.02 for upgrading the standard.</p> <p>Test standard updated from EN 60730-2-9:2010 used in conjunction with EN60730-1:2011 to EN IEC 60730-2-9:2019+A1:2019 used in conjunction with EN 60730-1:2016+A1:2019.</p> <p>These products are bimetal type Temperature limiter. TM150 (with Bakelite enclosure) and TM250 (with Ceramic enclosure) were subjected to full test. Testing of 15A and 10A can be covered by 16A.</p>	Testing location: <p>TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building12&13, Zhiheng Wisdomland Business Park Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen CHINA</p>

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

		
KSD301	KSD301	KSD301
250V10A	250V15A	250V16A
***A5	***A5	***A5
		
KSD302	KSD302	KSD302
250V10A	250V15A	250V16A
***A5	***A5	***A5
		
KSD303	KSD303	KSD303
250V10A	250V15A	250V16A
***A5	***A5	***A5
		
TM22	TM22	TM22
250V10A	250V15A	250V16A
***A5	***A5	***A5
		
KI31	KI31	KI31
250V10A	250V15A	250V16A
***A5	***A5	***A5

Remark: The marking plate for other models are of the same pattern.

*** indicate operating temperature.

TEST ITEM PARTICULARS:	
Supply Connection	<input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> External Circuit - not Mains connected
Supply Connection – Type	<input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input type="checkbox"/> other: _____
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: _____
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input checked="" type="checkbox"/> Shall be considered in the end product
Manufacturer's specified maximum operating ambient:	
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP _____
Type of operation	<input type="checkbox"/> single operation; <input type="checkbox"/> bimetallic single operation; <input type="checkbox"/> non-bimetallic single operation; <input checked="" type="checkbox"/> others
Control type.....	<input type="checkbox"/> room thermostat; <input type="checkbox"/> fan control; <input type="checkbox"/> boiler thermostat; <input type="checkbox"/> modulating thermostat; <input type="checkbox"/> voltage maintained thermal cut-out; <input type="checkbox"/> agricultural thermostat; <input checked="" type="checkbox"/> other: control
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing	
Date of receipt of test item	2018-12-18,2020-04-15
Date (s) of performance of tests	2018-12-18-2019-01-08,2020-04-15 to 2020-04-21
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. This report makes reference to EMC Report and Software Report. When applicable to the evaluated control, the official IEC60730_1I (SOF) and IEC60730_1I (EMC) shall be used. This test report includes all clause from IEC 60730-2-9:2015 (4th Ed.) with Am. 1: 2018 and IEC 60730-1:2013 (5th Ed.) with Am. 1:2015</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... : Dongguan Tai Mei Electric Co., Ltd 138# Third Floor, Junma East Road, Xinsi Village, Hengli Village, 52300 Dongguan City, PEOPLE'S REPUBLIC OF CHINA	
General product information: 1. These products are bimetal type Temperature limiter. The contact is normal-close. The action type is Type 1.B. The Temperature limiter is for built-in use. 2. Operating temperature: 0-250°C for models with ceramic enclosure; 0-150°C for models with bakelite enclosure 3. Number of cycles of automatic action: 100 000; 4. Reset manner: auto reset 5. 15A 250V~, 10A 250V~ are alternative ratings for all models. 6. Add new models: KSD301 xxx, KSD303 xxx, KSD302 xxx, KI31 xxx, which are the same as TM22 xxx, except the model names	

IEC 60730-2-9			
Clause	Requirement + Test	Result - Remark	Verdict
3	GENERAL REQUIREMENTS		P
	Controls are so designed and constructed that in normal use, they function so as not to cause injury to persons or damage to surrounding property, even in the event of such carelessness as may occur in normal use		P
5	RATINGS		P
5.1	Maximum rated voltage (V)	250V~	P
5.2	Maximum rated current (A)	16A (alternative 15A or 10A)	P
6	CLASSIFICATION		P
6.1	Nature of supply	~	P
6.2	Type of load and power factor.....	Substantially resistive load with power factor not less than 0.95	P
6.3	Purpose	Temperature limiter	P
6.4	According to features of Automatic Action		N/A
	Features of automatic action, Type 1 or Type 2 ... :	Type 1	P
6.4.3.101	for sensing actions, leakage from the sensing element or from parts connecting sensing element to switch head (type 2.N); no increase in the operating value		N/A
6.4.3.102	an action operating after the thermal cycling test 17.101 (type 2.P)		N/A
6.4.3.103	an action which is initiated only after a push-and turn or pull-and turn actuation and in which only rotation is required to return the actuating member to the off or rest position (type 1.X or 2.X)		N/A
6.4.3.104	an action which is initiated only after push-and turn or pull-and turn actuation (type 1.Z or 2.Z)		N/A
6.4.3.105	- an action which cannot be reset under electrically loaded conditions (type 1.AK or 2.AK)		N/A
6.4.3.106	– an action which operates after declared agricultural environmental exposures (Type 1.AM or 2.AM)		N/A
6.5	Degree of protection provided by enclosure per IEC 60529 and control pollution situation	IP00	P
6.6	Method of connection	For internal conductors	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.7	Ambient temperature limits of the switch ahead: $T_{min}(^{\circ}C)$; $T_{max}(^{\circ}C)$	T_{max} : 0-270°C for models with ceramic enclosure; 0-170°C for models with bakelite enclosure	P
6.7.101	Controls for use in cooking appliances		N/A
6.7.102	Controls for use in or on ovens of the self-cleaning type		N/A
6.7.103	Controls for use in or on food-handling appliances		N/A
6.7.104	Non-bimetallic SODs limited for use in appliances for heating or employing liquids or steam		N/A
	Not suitable for instantaneous water heaters and storage water heaters		N/A
6.8	Protection against electric shock	Incorporated for class I equipment.	P
6.8.3	For an in-line cord control, a free standing control, an independently mounted control or a control integrated or incorporated in an assembly utilizing a non-electrical energy source		N/A
6.9	Circuit disconnection or interruption.....	Micro disconnection	P
6.10	Number of cycles of actuation (M) of each manual action.....		N/A
6.11	Number of cycles of actuation (A) of each automatic action.....	100 000	P
6.12	Temperature limits of the mounting surface of the control ($^{\circ}C$ or K)		N/A
6.13	Value of proof tracking index (PTI) for the insulation material used	PTI=175	P
6.14	Period of the electrical stress across insulating parts supporting live parts, and between live parts and earthed metal (short or long period).....	Long period	P
6.15	According to Construction		P
6.15.101	controls having parts containing liquid metal	Incorporated control	N/A
6.16	Ageing requirements (type Y) of end-product equipment.....		N/A
6.17	Use of thermistor (Annex J)		N/A
6.18	Classes of control functions (Annex H).....		N/A
7	INFORMATION		P
7.2	Methods of providing information		P
7.2.1	Methods of providing information (Addition to table 1)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	1 – Manufacturer's name / trademark (Method C) ...:		P
	2 – Unique type reference (Method C).....:	Refer to rating label for detail.	P
	3 – Rated voltage or rated voltage range in volts (Method C).....:	250V~	P
	4 – Nature of supply (Method C)	~	P
	5 – Frequency, if other than for range 50 Hz to 60 Hz inclusive (Method C).....:	50-60Hz	P
	6 – Purpose of control (Method D).....:	Temperature limiter	P
	6a – Construction of control (Method D)	Incorporated control	P
	7 – The type of load controlled by each circuit (Method C).....:	Substantially resistive load; 16A (alternative 15A or 10A)	P
	15 – Degree of protection by enclosure (Method C).....:	IP00	N/A
	17 – Terminals for external conductors (Method C).....:	For internal conductor	P
	18 – Terminals for external conductors accepting a wider range of conductor sizes, (Method D).....:		N/A
	19 – Method of connection and disconnection for screwless terminals (Method D)	Tab terminals	N/A
	20 – Details of any special conductors which are intended to be connected to terminals for internal conductors (Method D)		N/A
	21 – Maximum temperature of terminals for internal conductors, if higher than 85°C (Method X)	Nickel plated steel: 400°C H62: 210°C	P
	22 – Temperature limits of the switch head, if T_{min} is lower than 0°C, or T_{max} is other than 55°C (Method C).....:	T_{max} : 0-270°C for models with ceramic enclosure; 0-170°C for models with bakelite enclosure	P
	23 – Temperature limits of mounting surfaces (T_s) if more than 20 K above T_{max} (Method C)	T_s : 0-270°C for models with ceramic enclosure; 0-170°C for models with bakelite enclosure	N/A
	24 – Classification of control according to protection against electric shock (Method X).....:	IP Incorporated for class I equipment.	P
	25 – For Class II controls, the symbol for Class II construction (Method C)		N/A
	26 – Number of cycles of actuation (M) for each manual action (Method X).....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	27 – Number of automatic cycles (A) for each automatic action (Method X)	100 000	P
	28 – Ageing period (Y) for controls with Type 1M or 2M action (Method X)		N/A
	29 – Type of disconnection or interruption provided by each circuit (Method X)	Micro-disconnection	P
	30 – PTI of materials used for insulation (Method X)	175	P
	31 – Method of mounting controls (Method D)	Built-in	P
	31a – Method of providing earthing of control (Method D)		N/A
	32 – Method of attachment for non-detachable cords (Method D)	Built-in controls	N/A
	33 – Intended transportation condition of control (Method X)		N/A
	34 – Details of any limitation of operating time (Method D)		N/A
	35 – Period of electric stress across insulating parts (Method X)		N/A
	36 – Limits of activating quantity for any sensing element over which micro-disconnection is secure (Method X)		N/A
	37 – Minimum and/or maximum rates of change of activating quantity, or minimum and/or maximum cycling rates for a sensing control (Method X)		N/A
	38 – Values of overshoot of activating quantity for sensing controls (Method X)		N/A
	39 – Type 1 or Type 2 action (Method D)	Type 1	P
	40 – Additional features of Type 1 or Type 2 actions (Method D)	Type 1.B	P
	41 – Manufacturing deviation and condition of test appropriate to deviation (Method X)		N/A
	42 – Drift (Method X)		N/A
	43 - Reset characteristics for cut-out action (Method D)		N/A
	44 - Hand-held control or control intended for hand-held equipment (Method X)		N/A
	45 - Limitation to the number or distribution of flat push-on receptacles (Method D)		N/A
	46 - Operating sequence for controls with more than one circuit (Method D)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	47 - Extent of any sensing element (Method D)		N/A
	48 - Operating value(s) or operating time (Method D).....	0-250°C for models with ceramic enclosure; 0-150°C for models with bakelite enclosure	P
	49 - Control pollution degree (Method D)	Pollution degree 2	P
	50 - Control intended to be delivered exclusively to the equipment manufacturer (Method X)	Only to equipment manufacturer	N/A
	51 – Glow wire test temperatures (Method X)	For bakelite enclosure: Glow wire: 850°C	P
	52 to 60 See Annex H		N/A
	61 to 65 See Annex J		N/A
	66 to 74 See Annex H		N/A
	75 - Rated impulse voltage (Method D)	2500V	P
	76 - Type of printed wiring board coating, (Method X)		N/A
	77 – Temperature for ball pressure test (Method D).....	For bakelite enclosure: Ball pressure: 210°C	P
	78 – Maximum declared torque on single brush mounting using thermoplastic material (Method D).....		N/A
	79 – Pollution situation in the micro-environment of the creepage or clearance if cleaner than that of the control (Method D).....		N/A
	80 – Rated impulse voltage for the creepage or clearance if different from that of the control (Method D).....		N/A
	81 – Values designed for tolerances of distances for which the exclusion from fault mode “short” is claimed (Method D)		N/A
	82 to 84 See Annex J		N/A
	85 – For Class III controls, the symbol for Class III construction (Method C)		N/A
	86 – For SELV or PELV circuits, the ELV limits realized (Method D).....		N/A
	87 – Accessible voltage of SELV/PELV circuit, if different from 8.1.1, product standard referred to for the application of the control, in which standard(s) the accessible SELV/PELV level(s) are (Method D).....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	And product standard referred to for application, in which standard(s) the accessible SELV/PELV level(s) is (are) (Method D)		N/A
	88 – See Annex U		N/A
	89 – Emission tests and groups as declared according to CISPR 11 (Method X)		N/A
	90 – Immunity tests for protective controls for use according to IEC 60335 appliances (Method X)		N/A
	91 to 94 See Annex H		N/A
	95 – Maximum declared short-circuit current (Method D).....		N/A
	101 – Max. sensing element temperature (other than relevant to requirement 105); (Method: X).....		N/A
	102 - time factor; method; (Method: X)		N/A
	103 - bi-metallic SOD reset temperature (either - 35°C or 0°C; (Method: X).....		N/A
	104 - number of cycles for bi-metallic single-operation devices with 0°C reset; (Method: X)		N/A
	105 - maximum temperature for the sensing element for the test of 17.16.107; (Method: D)		N/A
	106 - controls having parts containing liquid metal; (Method: D).....		N/A
	107 - tensile yield strength; (Method: X).....		N/A
	108 - min. current for the test according to clause 23.101; (Method: D)		N/A
	109 - T_{Max1} max. ambient temp. in which control may continuously remain in operated condition so that Table 14.1 temperatures are not exceeded (Method: D).....		N/A
	110 - Time period, t_1 : max. time during which ambient temp. can be higher than T_{Max1} after the control has operated; (Method: D).....		N/A
	111 - Temp. limit above which automatic reset of a manual reset thermal cut-out or a voltage maintained thermal cut-out does not occur (not higher than -20 °C); (Method: X).....		N/A
	112 - For Type 2.P controls, the method of test; (Method: X)		N/A
	113 - The click rate N or switching operations per minute for the purposes of testing to CISPR 14-1; (Method: X)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	114 - Rated functioning temperature (T_f); (Method: C).....:		N/A
	115 - Ageing temperature for non-bimetallic SOD; (Method: D)		N/A
	116 - Rate of rise of temperature for testing non- bimetallic SOD; (Method: D)		N/A
	117 - Agricultural thermostat; (Method: D)		N/A
7.2.2	Information which is indicated as being required by marking (C) or by documentation (D) is provided for the testing authority		N/A
7.2.3	For integral/separate controls Documentation (D) replaced with Declaration (X)		P
7.2.4	Marking for the integral control within the complex control included in the marking of the complex control		N/A
7.2.5	Documentation (D) satisfied by similar information in Marking (C)		P
7.2.5.1	Declaration (X) satisfied by similar information in Documentation (D) or Marking (C)		P
7.2.6	Information for Integrated control provided by Declaration (X)		N/A
	Incorporated control provided with manufacturer's name or trademark and unique type reference when other required marking in Documentation (D)		N/A
	Information for incorporated control intended for exclusive delivery to the equipment		N/A
7.2.7	Controls with limited space marked with manufacturer's name or trademark and the unique type reference while other required marking included in Documentation (D)		N/A
7.2.8	Additional pertinent information permitted if does not rise misunderstanding.....:		P
7.2.9	Appropriate IEC symbols used per 7.2.9	V; A; ~	P
7.3	Class II symbol		N/A
7.3.1	Used only for in-line cord, free-standing, and independently mounted controls		N/A
7.3.2	Sides of the outer square are approximately twice the length of sides of the inner square		N/A
7.3.2.1	Largest dimension of the control (mm).....:		—
	The length of the side of outer square (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.2.2	Controls which include terminals for earthing continuity for functional purposes are not marked with the symbol for class II		N/A
7.4	Additional requirements for marking		P
7.4.1	Marking placed on the main body, on non-detachable parts		P
	Required marking legible and durable		P
7.4.2	An arrow pointing towards the terminal identifies terminals of control intended for connection of supply conductors	Self-evident	N/A
	Additional markings required by the National Wiring Codes provided..... :		N/A
7.4.3	Terminals for neutral external conductor identified by letter "N"		N/A
7.4.3.1	External earthing and continuity terminals of Class II and III controls and terminals for earthing for functional purposes identified by earth symbol		N/A
	– for protective earth by the earth symbol for protective earth, IEC 60417-5019 (2002-10)		N/A
	– For functional earth by the earth symbol for functional earth, IEC 60417-5017 (2002-10).		N/A
7.4.3.2	All other terminals appropriately identified..... :		N/A
	For use in Canada and the U.S.A, terminal intended for grounded supply conductor provided in white/grey colour		N/A
	For use in Canada and the U.S.A, the wire binding screw intended for equipment earthing conductor is slotted/ hexagonal green-coloured head. Location is such that it is unlikely to be removed during servicing.		N/A
	For use in Canada and the U.S.A, the pressure wire connector intended for equipment earthing conductor is marked GROUND, GROUNDING, EARTH, or by a marking on the wiring diagram shipped with the control. Location is such that it is unlikely to be removed during servicing of control		N/A
	Additional markings required by National Wiring Codes of Canada and U.S.A provided..... :		N/A
7.4.4	Symbols “+” and “-” provided to indicate the direction to increase or decrease response value for the controls to be set by the user or the equipment manufacturer		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Controls intended to be set by the equipment manufacturer or the installer accompanied by documentation (D) indicating proper method for securing the setting		N/A
7.4.5	Replaceable parts destroyed during the normal operation marked to enable their identification from a Catalogue or similar document, even after they operated		N/A
7.4.6	Controls intended to be connected only to SELV systems are marked with the class III symbol		N/A
	This requirement does not apply where the means of connection to the supply is so shaped that it can only mate with a particularly designed SELV or PELV arrangement		N/A
	Controls designed as for class III but have terminals for earthing continuity for functional purposes are not marked with the symbol for class III construction		N/A
7.4.7	Equipment carries a replaceable battery, and replacement by an incorrect type could result in an explosion		N/A
	- If the battery is intended to be replaced by the user, marking close to the battery or a statement in both the instructions for use and the service instructions are provided		N/A
	- If the battery is not intended to be replaced by the user, marking close to the battery or a statement in the service instructions are provided		N/A
7.4.8	The battery compartment of controls incorporating batteries that are intended to be replaced by the user are marked with the battery voltage and the polarity of the terminals		N/A
	If colours are used, the positive terminal is identified in red and the negative terminal in black		N/A
	Colour is not used as the only indication of polarity		N/A
7.4.9	The instructions for controls incorporating batteries intended to be replaced by the user include:		N/A
	- the type reference of the battery		N/A
	- the orientation of the battery with regard to polarity		N/A
	- the method of replacing batteries		N/A
	- warning against using incorrect type batteries		N/A
	- how to deal with leaking batteries		N/A
	The instructions for controls incorporating a battery that contains hazardous to the environment materials give details on how to remove the battery:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- the battery must be removed from the control before it is scrapped		N/A
	- the control must be disconnected from the supply mains when removing the battery		N/A
	- the battery is to be disposed of safely		N/A
7.4.10	See Annex V – Information regarding charging of batteries provided		N/A

8	PROTECTION AGAINST ELECTRIC SHOCK		P
8.1.1	Adequate protection provided against accidental contact with live parts in all unfavourable positions of normal use, and after all accessible detachable parts (other than lamps behind the detachable cover) were removed.	Built-in; All parts should be evaluated after appropriated installation in end product.	P
	Protection against accidental contact with live parts of the lamp provided to allow safe insertion and removal of the lamps.		N/A
	SELV or PELV circuits supplied at a voltage not exceeding 24 V are considered non-hazardous		N/A
	If SELV- or PELV-circuits supplied at higher than 24 volts are accessible, the current between the accessible part(s) and either pole of the supply source of the SELV/PELV circuits comply with H.8.1.10.1.		N/A
	Live parts connected to a SELV supply not exceeding 30 V considered to be non-hazardous in the countries specified in the remarks column..... :		N/A
8.1.1.1	SELV/PELV circuits supplied at a different voltage (other than 24V) considered non-hazardous if: - Control is used in an application governed by another product standard with different limit values; and, - Manufacturer declares the application, product standard governing the application and level of voltage of the application		N/A
8.1.2	Class II controls and controls for Class II equipment provided with protection against accidental contact with metal parts separated from hazardous live parts by only basic insulation	No such parts	N/A
8.1.3	Lacquer, enamel, paper, cotton, oxide film on metal parts, and beads and sealing compounds not relied upon for protection against accidental contact with hazardous live parts		N/A
	Self-hardening sealing compounds exempted from the above requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.4	For controls connected to gas or water supply mains any metal part electrically connected to pipes is separated from hazardous live parts by double insulation or reinforced insulation	No such connection	N/A
8.1.5	Class II controls and controls for Class II equipment for fixed installation: protection not impaired by the installation of control / equipment		N/A
8.1.6	Integrated and Incorporated controls: tests made to accessible parts when control is mounted as intended with detachable parts removed		N/A
8.1.7	In-line and free-standing controls: tests are made when control fitted with cord; cross-sectional area of cord (mm ²)		—
8.1.8	Independently mounted controls: tests are made when control mounted as in normal use, fitted with cable or with a conduit; cross-sectional area of cable (mm ²)		—
8.1.9	Tests using the standard test finger and test pin:		N/A
	- The standard test finger shown in Figure 2 was applied without force in every possible position	No such parts	N/A
	- Apertures preventing the entry of the finger were further tested by means of a straight unjointed test finger of the same dimensions which is applied with a force of 20 N		N/A
	- Unjointed test finger of the was applied with a force of 30 N		N/A
8.1.9.1	Standard test finger designed that each of the jointed sections can be turned through an angle of 90° with respect to the axis of the finger in the same direction only		N/A
8.1.9.2	Openings in insulating material and unearthed metal tested for accessibility of live parts by applying the test pin without force in every position		N/A
8.1.9.3	Hazardous live parts were not touched		N/A
8.1.9.4	For controls with double insulation construction, the metal parts were not accessible with the standard test finger, which are only separated from hazardous live parts by basic insulation		N/A
8.1.9.5	A part is regarded to be detachable if: - there is an instruction to remove a part during normal use or user maintenance; and, - there is no warning on the part that indicates "Disconnect from supply before removing"		N/A
	Live actuating means not accessible when actuating member is removed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.10	See Annex H		N/A
8.1.11	Between Class III and main/earth circuits, insulation external to the safety isolating transformer complies with Class II insulation		N/A
8.1.12	Live parts are hazardous if they exceed the values specified in 8.1.1 and it are not separated from the source by protective impedance and are not a PEN conductor or a part of the equipotential bonding system.....:		N/A
8.1.13	Controls having battery compartments that can be opened without a tool or provided with user instructions that the battery may be replaced by the user, provided with: - basic insulation between live parts and the inner surface of the battery compartment - if the control can be energized without the batteries, double or reinforced insulation is provided		N/A
8.2	Actuating members and means		N/A
8.2.1	Actuating members are not live		N/A
8.2.2	Live actuating means provided with fixed insulated actuating member		N/A
	Live actuating means not accessible when actuating member is removed		N/A
8.2.3	For controls other than Class III or for other than Class III equipment, actuating members and handles to be held in normal use are:		N/A
	- of insulating material, or		N/A
	- covered by insulating material		N/A
	If of metal, accessible parts (likely to become live in when insulation fails) separated from their actuating means or fixings by supplementary insulation		N/A
	Controls for fixed wiring or for stationary equipment, previous requirement not applicable if parts:		N/A
	- reliably connected to an earthing terminal/contact, or		N/A
	- shielded from live parts by earthed metal		N/A
	- separated from live parts by double or reinforced insulation		N/A
8.3	Capacitors		N/A
8.3.1	Class II in-line cord controls and independently mounted controls: capacitor not connected to accessible metal parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Controls for Class II equipment: capacitors not connected to metal likely to be connected to accessible metal parts (control correctly mounted)	No accessible metal parts	N/A
	Metal casings of capacitors separated by supplementary insulation from:		N/A
	- accessible metal parts		N/A
	- metal parts likely to be connected to accessible metal parts		N/A
8.3.2	Controls connected to the supply by means of a plug: no risk of electric shock (from capacitor) when touching the pins of the plug		N/A
8.3.2.1 – 8.3.2.4	Test method to show compliance to 8.3.2.....:		N/A
8.4	Covers and uninsulated live or hazardous parts; cover fixing screws:		N/A
	- not accessible, or		N/A
	- earthed, or		N/A
	- separated by double or reinforced insulation, or		N/A
	- not accessible after mounting in the equipment		N/A

9	PROVISION FOR PROTECTIVE EARTHING		N/A
9.1.1	Accessible parts other than actuating members of in-line cord, free-standing and independently mounted controls of Class 0I or Class I which may become live:		N/A
	- connected to an earthing terminal, or		N/A
	- terminated within the control, or		N/A
	- connected to earthing contact of an equipment inlet		N/A
9.1.2	Accessible parts other than actuating members of integrated and incorporated controls for Class 0I and Class I equipment which may become live:		N/A
	- have provision for earthing, or		N/A
	- earthed by the fixing means		N/A
9.1.3	Earthing terminals, terminations or contacts not electrically connected to any neutral terminal		N/A
9.2	Control of Class II or Class III:		N/A
	- no provision for protective earthing		N/A
9.3	Adequacy of earth connections		N/A
9.3.1	Connection between earthing terminal and parts to be connected is of low resistance:		N/A
9.3.2	Fixed wiring and methods X and M earthing terminals meet requirements of 10.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.3.3	External earthing connections not made by screwless terminals		N/A
	for attachment methods Y and Z, screwless earthing terminals complying with IEC 60998-2-2 or 60998-2-3 are allowed		N/A
9.3.4	Size of accessible earthing terminals		N/A
	- accessible earthing terminals, range: 2.5 mm ² to 6 mm ²		N/A
	- Unable to loosen without the aid of a tool.		N/A
9.3.5	Size of non-accessible earthing terminals		N/A
	- size of current -carrying terminal (mm ²) :		—
	- size of earthing terminal (mm ²) :		—
9.3.6	Earthing terminals locked against accidental loosening		N/A
9.4	Corrosion resistance		N/A
9.4.1	Material of earthing terminals, body:		N/A
	- body of earthing terminals made of brass		N/A
	- other metal not less resistant to corrosion		N/A
	- screws or nuts made of brass		N/A
	- plated steel or other resistant material		N/A
9.4.2	Precaution against risk of corrosion between copper and frames or enclosures of aluminium or its alloys		N/A
9.5.1	Detachable part with earth connection		N/A
	- placing part in position: earth contact made before current-carrying connections		N/A
	- removing part: earth contact separated after disconnection of current-carrying connections.		N/A
9.5.2	Incorporated controls likely to be separated from its normal earthing means after mounting in equipment, provided with permanent earthing connection or conductor		N/A

10	TERMINALS AND TERMINATIONS		P
10.1	Terminals and terminations for external copper conductors		N/A
10.1.1	In terminals for fixed wiring and for cords using X and M attachment method connections made by screws, nuts or equally effective methods	Terminals and terminations for internal conductors	N/A
	Use of a special purpose tool not required		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.1.1.1	Terminals or terminations for cords using Y and Z attachment method comply with clause 10.2		N/A
	Need for special purpose tools		N/A
10.1.2	Screws and nuts which clamp external conductors:		N/A
	- metric ISO thread; size :		—
	- ISO equivalent; size :		—
	- do not serve to fix other components		N/A
	Exception: terminal also clamps internal conductors which are so arranged that they are not displaced when fitting the external conductor		N/A
10.1.3	Soldered, welded, crimped or similar terminations not used for non-detachable cords X and M attachments		N/A
10.1.4	Terminals for fixed wiring and non-detachable cords using attachment methods X or M:		N/A
	- Terminal No. or identification :		—
	- Current (A) carried by terminal :		—
	- Flexible cord or fixed wiring :		—
	- Smallest conductor cross-sectional area (mm ²) :		—
	- Largest conductor cross-sectional area (mm ²) . :		—
10.1.4.1	Terminal designed for wider range of conductor size declared :		N/A
10.1.4.2	Creepage and clearances between terminals for fixed wiring and between terminals and metal parts required in Canada and the USA		N/A
10.1.5	Terminals for fixed wiring and non-detachable cords using attachment methods X or M securely fixed		N/A
10.1.5.1	10 times fastening and loosening conductor of largest cross-section:		N/A
	- kind of wire used :		—
	- cross-sectional area (mm ²) :		—
	- applied torque value (Nm)..... :		—
	- terminals did not work loose		N/A
	- internal conductors not subjected to stress		N/A
	- creepage and clearances distances not reduced below values required in Cl. 20		N/A
10.1.6	Terminals for fixed wiring and non-detachable cords using attachment methods X or M clamp conductors between metal surfaces		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Screwless terminals for current ≤ 2 A with non-metallic surface		N/A
	No undue damage to the conductor after tightening or loosening (tests of 10.1.5)		N/A
10.1.7	Terminals for fixed wiring and non-detachable cords using attachment method X:		N/A
	- no special preparation of conductor required		N/A
10.1.7.1	- alternative means of connection applied		N/A
10.1.8	In terminals for fixed wiring and non-detachable cords using attachment methods X or M conductor remains secure while clamping		N/A
10.1.8.2	Terminals are fitted with conductors:		N/A
	- cross-sectional area (mm ²)		—
	- Flexible cord / Fixed wiring.....		—
	- Wires of fixed wiring conductors are straightened		N/A
10.1.8.3	- Torque applied on screws (Nm)		—
10.1.8.4	Neither the conductor nor the wire of a stranded conductor slipped out		N/A
10.1.9	Clamping reliability of the terminals		N/A
10.1.9.1	Appropriate conductors fitted; torque applied on screws (Nm): 2/3 of values in Table 20		N/A
10.1.9.2	Pull-out force applied for 1 min to the conductor		N/A
	- adjacent to the terminal, or		N/A
	- near the crimping or clamping device holding the conductor.		N/A
10.1.9.3	Conductor did not move appreciably after pull-out test		N/A
10.1.10	Terminals did not attain excessive temperatures during the test of Clause 14 (°C)		N/A
10.1.11	Terminals so are located that each core contained within any fixed wiring sheath or flexible cord sheath is terminated in reasonable proximity to the other cores within the same sheath		N/A
10.1.12	Test of escaped wire for terminals with attachment methods X or M		N/A
	- An 8 mm length of insulation is removed from the end of a stranded conductor		N/A
	- Free wire of stranded conductor makes no contact with accessible metal parts		N/A
	- Free wire of stranded conductor makes no contact with metal parts of Class II controls separated from accessible parts by supplementary insulation only		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Free wire of a conductor connected to the earthing terminal makes no contact with live parts		N/A
	- Free wire of a conductor connected to live terminals not accessible and does not short-circuit an action providing full or micro-disconnection		N/A
10.1.13	Contact pressure not transmitted via insulating material other than ceramic		N/A
	Sufficient resiliency in the appropriate metal parts to compensate for distortion of insulating material		N/A
10.1.14	Screws and threaded parts made of metal		N/A
10.1.15	In pillar and mantle type terminals adequate length of the conductor can be introduced		N/A
	In pillar and mantle type terminals conductor is beyond the edge of the screw		N/A
10.1.16	In U.S.A. and Canada flying leads are used		N/A
10.2	Terminals and terminations for internal conductors		N/A
10.2.1	Connection of conductors	Tab Termination	N/A
10.2.2	Terminals suitable for their purpose		P
10.2.3	In soldered terminals, soldering is not the only means to maintain conductor in position		N/A
	In soldered terminals, barriers are provided to prevent reduction in creepage and clearance		N/A
10.2.4	Flat push-on connectors		N/A
10.2.4.1	Dimension of tabs		N/A
	- measured (mm x mm)	4.8x0.8mm, 6.3x0.8mm	—
	- compliance with Fig. 14, 15, 16 or IEC/EN 61210	Fig.14	P
	- other dimensions allowed (mm x mm)		—
	- polarized acceptance of receptacles		N/A
10.2.4.2	Tabs forming part of a control consist of material appropriate to the maximum temperatures allowed	Nickel plated steel: 400°C; H62: 210°C	P
10.2.4.3	Tabs forming part of a control have adequate strength and allow the insertion and withdrawal of receptacles without damage to the control		P
10.2.4.4	Tabs forming part of a control are adequately spaced to allow the connection of the appropriate receptacles		P
	- no strain, no distortion to any of the tabs or adjacent parts		P
	- no reduction of creepage distance or clearances below values of Cl. 20		P

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Clause	Requirement + Test	Result - Remark	Verdict
10.3	Terminals and terminations for integrated conductors		N/A

11	CONSTRUCTION REQUIREMENTS		P
11.1.1	Insulating materials		P
	Wood, cotton, silk, ordinary paper etc. not used as insulation unless impregnated	Not used as insulation	P
11.1.2	Current carrying parts other than threaded parts of terminals, if made of brass:		P
	- contain at least 50% copper if cast or from bar		N/A
	- contain at least 58% copper if from rolled sheet	H62	P
11.1.3.1	Non-detachable cords of Class I controls provided with a green/yellow conductor insulation and properly connected		N/A
11.1.3.2	Non-detachable cords: green/yellow conductor not connected to other than earthing terminals		N/A
11.1.101	Parts containing liquid metal		N/A
	Controls declared under 106 of table 7.2, parts containing Hg, Na or Ka, are constructed of metal with tensile strength at least 4 x the circumferential or other stress on the parts at the temperature 1.2 x max. temperature of the sensing element		N/A
	Tested by inspection of manufacturer's declaration and according to clause 18.102		N/A
11.1.102	Insulating material used in non-bimetallic SODs, as defined in this standard, comply with the requirements of IEC 60216-1:2001 and are suitable for the application		N/A
11.2	Protection against electric shock		N/A
11.2.1	Double insulation		N/A
	- basic insulation and supplementary insulation can be tested separately, or		N/A
	- properties of both insulations are otherwise provided		N/A
11.2.2	Infringement of double or reinforced insulation in Class II controls:		N/A
	- creepage distances and clearances not reduced below values of Cl. 20 by wear		N/A
	- creepage distances and clearances not reduced to less than 50% of values of Cl. 20 by parts becoming loose (wires, screws, nuts, etc.)		N/A
11.2.3	Integrated conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.2.3.1	No reduction of creepage distances and clearances below values of Cl. 20; conductors rigid, fixed or insulated		N/A
11.2.3.2	Insulation, if any, cannot be damaged during mounting or in normal use		N/A
11.2.4	Sheath of flexible cord used as supplementary insulation:		N/A
	- not subjected to undue mechanical or thermal stresses		N/A
	- insulation properties comply with IEC 60227-1 or IEC 60245-1		N/A
11.2.5	Protective impedance		N/A
11.2.6	Protection against electric shock by use of SELV or PELV		N/A
11.2.7	Adequate measures are provided to prevent the interconnection of an integrated SELV circuit to an external PELV circuit and vice versa		N/A
	Supply from an external SELV source is only possible by a dedicated plug and socket system which cannot be fitted or interconnected with other connecting systems		N/A
11.2.8	Overcurrent protection capable of carrying the currents likely to flow in abnormal conditions for such periods of time if declared in requirement 96 of Table 1		N/A
11.3	Actuation and operation		N/A
11.3.1	Full-disconnection		N/A
	- contact separation in all poles not below values of Cl. 20 (exception: earth)		N/A
	- any subsequent action does not cause reduction of contact separation below the minimum values (Cl. 20)		N/A
	For declared all-pole disconnection contact operation in each pole substantially together		N/A
11.3.2	Micro-disconnection		P
	- one supply pole, at least, separated		P
	- separated pole meets electric strength requirements, Cl. 13		P
	- any subsequent action does not cause reduction of contact separation below value required by the Electric Strength Test		P
11.3.3	Reset buttons are so located or protected that they are not to be accidentally reset		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.3.4	Parts for setting by the manufacturer secured to prevent accidental shifting after setting		N/A
11.3.5.1	For contacts with d.c. rating > 0.1 A operated by actuation speed of approach and separation of contacts are independent of speed of actuation.		N/A
11.3.5.2	Systems of class C control functions include at least two switching elements to directly de-energize the safety relevant terminals		N/A
11.3.5.2.1	Measures to prevent common cause errors		N/A
	- Measures to protect against failure of two (or more) switching elements by an external short which prevent control from performing a safety shut-down. Acceptable methods are:		N/A
	- Overcurrent protection device,		N/A
	- Current limitation or		N/A
	- Internal fault detecting means		N/A
	Compliance (Short Circuit Test)		N/A
	- Safety related output terminals of the control connected to switch on short circuit current		N/A
	- With switch opened, control connected as in H.27.1.1.2 with outputs energized to simulate normal operation		N/A
	Controls with overcurrent protection devices:		N/A
	- Short-circuit current capability of power supply is at least 500A.....:		N/A
	Controls with current limitation devices		N/A
	- power supply does not limit the declared short-circuit current		N/A
11.3.5.2.1.1	Short-circuit applied between safety related output terminals		N/A
	- declared short-circuit current.....:		—
	- 1h duration or until no current flow through switch		N/A
	- if overcurrent protection device is replaceable and operated during the test, device is replaced and test is repeated two more times		N/A
	- test is repeated using same or separate sample		N/A
11.3.5.2.1.2	If internal fault detecting function of the control opens the switching elements or initiates a safety shut-down, the test is repeated two more times		N/A
	After test at least one switching element of the control de-energized the safety related output terminals, or		N/A
	- non-replaceable overcurrent protection device permanently interrupted the safety related output terminal's supply		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.3.6	Contacts for full- and micro-disconnection with d.c. rating ≤ 0.1 A or a.c. rating, operated by actuation can rest only in closed or open position		P
11.3.7	Contacts which cannot (or are not intended to) be operated on load nor arc under normal use		P
11.3.7.2	An arc not maintained by slowly opening the contacts		N/A
11.3.8	In any rest position of the actuating member		N/A
	- contacts are open or closed as intended		N/A
	- no hazard can occur within the control		N/A
11.3.9	In pull-cord actuated control the mechanism returns when pull-cord is released to allow next movement in the cycle		N/A
	- pull force vertically downwards (N): ≤ 45 N		—
	- pull force 45° to vertical (N): ≤ 70 N		—
	- function after release		N/A
	Second paragraph not applied to Type 1.X or 2.X or Type 1.Z or 2.Z		N/A
11.4	Actions		N/A
11.4.1	Combined action: Control remains operative after the failure of any portion unique to the other actions		N/A
11.4.2	Type 2 action with provision for setting by the manufacturer: clearly discernible if any subsequent interference with the setting has been made		N/A
11.4.3	Type 2 action: manufacturing deviation and drift within the required limits		N/A
11.4.3.101	Thermal cut out: capacitors not connected across the contacts		N/A
11.4.3.102	Constructions requiring a soldering operation to reset thermal cut-outs are not used		N/A
11.4.4	Type 1A or 2A action: operation provides full-disconnection		N/A
11.4.5	Type 1B or 2B action: operation provides micro-disconnection	1.B	P
11.4.6	Type 1C or 2C action: operation provides micro-interruption		N/A
11.4.7	Type 1D or 2D action: disconnection cannot be prevented and reset not possible while faults persists		N/A
11.4.8	Type 1E or 2E action: disconnection or opening of contacts cannot be prevented/inhibited by reset mechanism or against continuation of fault condition		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.4.9	Type 1F or 2F action: reset needs the aid of a tool		N/A
11.4.10	Type 1G or 2G action: reset possible under electrically loaded conditions		N/A
11.4.11	Type 1H or 2H action:		N/A
	- contacts cannot be prevented from opening		N/A
	- may reset automatically to "closed" if reset means is held in reset position		N/A
	- no automatic reset if reset means in normal position at any temperature above -35°C		N/A
11.4.12	Type 1J or 2J action:		N/A
	- contacts cannot be prevented from opening		N/A
	- no automatic reset if reset means is held in reset position		N/A
	- no automatic reset at any temperature above -35°C		N/A
11.4.13	Type 1K or 2K action: declared disconnection provided in the case of break in sensing element or in part between element and switch head		N/A
11.4.13.101	Type 2.K action: event of break (sensing element and switch head): declared disconnection/ interruption provided before declared operating value plus drift is exceeded		N/A
	Breaking the sensing element test		N/A
	Control heated within 10K of operating temperature; temperature [°C]..... :		N/A
	Temperature increased 1K/min; rising degree [K/min]..... :		N/A
	Contacts open before declared operating temperature plus drift exceeded; temperature [°C] . :		N/A
11.4.13.102	Also achieved by compliance a), b) or c)		N/A
	a) two sensing elements operating independently actuating one switch head:		N/A
	b.1) bi-metallic sensing elements: with exposed elements attached with at least double spot welding of the bimetal at both of its end:		N/A
	b.2) bi-metallic sensing elements so located/ installed in a control of such construction that the bimetal is not likely to be damaged during installation and use		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) if loss of fluid fill causes the contacts to remain closed: test with impact tool, fig. 11.4.13.102, dropped once, height 0.6m, tapered end, capillary on concrete surface		N/A
	No damage to the bulb or capillary permitting escape of fill when subjected to impact of Fig. 11.4.14.102 from height of 0.6 m.		N/A
11.4.14	Type 1L or 2L action: function independent of electrical supply or auxiliary energy source		N/A
11.4.15	Type 1M or 2M action: operation provided after declared ageing procedure.		N/A
11.4.16	See Annex H		N/A
11.4.17	See Annex J		N/A
11.4.101	Type 2.N action: event of leak (sensing element or part between sensing element and switch head): declared disconnection or interruption provided before declared operating value plus drift is exceeded		N/A
	Operating value (conditions acc. to part 1, clause 15); measured [°C] :		N/A
	If means for setting: set to highest value		N/A
	A hole is produced in the sensing element		N/A
	Measurement of operating value repeated; measured [°C] :		N/A
	No positive drift above declared value; declared value [°C]; measured [K] :		N/A
	Test replaced by theoretical computation of the physical mode of operation		N/A
	Canada and USA type 2.N tested according to 11.4.13.102 c)		N/A
11.4.102	Type 2.P action: operates in its intended manner after thermal cycling test according to clause 17.101		N/A
11.4.103	Bi-metallic single operation device doesn't reset above the declared reset value (requirement 103 of table 7.2), test according to clause 17.15		N/A
11.4.104	Type 1.X or 2.X action so designed that turn action can only be accomplished after the completion of a push or pull action. Rotation only required to return the actuation member of the control to the off or rest position, test according to clause 18.101		N/A
11.4.105	Type 1.Z or 2.Z action so designed that turn action can only be accomplished after the completion of a pull or push action, test according to Cl. 18.101 :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.4.106	A voltage maintained thermal cut-out is so designed that it does not reset above the reset value declared in table 7.2, item 111; (value)		N/A
11.4.107	Type 1.AM or 2.AM action is so designed that it operates in its intended manner after the declared agricultural environmental exposures. Tests according to Annex DD.		N/A
11.5	Openings in enclosures (drain holes)		N/A
	- minimum area (mm ²):	No drain holes	—
	- maximum area (mm ²):		—
	- minimum dimension (mm ²):		—
11.6	Mounting of controls		P
11.6.1	Control mounted according to manufacturer's declaration: does not adversely affect compliance with this standard		P
11.6.2	Control mounted as declared, if movement or removal could adversely affect compliance with this standard:		N/A
	- cannot rotate or be displaced		N/A
	- cannot be removed without the aid of a tool		N/A
	- when removal (even partial) is necessary for use, requirements of clauses 8, 13, and 20 are satisfied before and after removal		N/A
	Controls, other than with rotary actuation, fixed by a nut and single bushing:		N/A
	- tightening of the nut requires a tool		N/A
	- parts have adequate mechanical strength		N/A
	Screwless fixing of an incorporated control: a tool is required before the control can be removed from the equipment		N/A
11.6.3	Mounting of independently mounted controls		N/A
11.6.3.1	Independently mounted controls (other than for panel mounting)		N/A
	- fit a standard box as declared, or		N/A
	- supplied with a conduit box (if special), or		N/A
	- suitable for surface (plane) mounting		N/A
11.6.3.2	If special conduit box required, it is delivered with the control		N/A
	- box provided with entries for conduits specified in IEC 60423		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.6.3.3	Controls for surface mounting for buried installation (concealed wiring) provided with suitable holes on the backside.		N/A
11.6.3.4	Controls for surface mounting for exposed wiring provided with entries, knock-outs or glands.		N/A
11.6.3.5	Terminals (for external conductors) of controls or sub-bases accessible and usable when control is fixed and cover or the control is removed		N/A
11.6.3.6	In controls for mounting on an outlet box, wiring terminals, live parts and sharp edged metal parts located or protected to prevent from being forced against wiring		N/A
11.6.3.7	Back wiring terminals: recessed or protected to prevent contact with wiring installed in the box		N/A
11.6.3.101	For agricultural thermostats declared in Table 7.2, item 117, the mounting method is such that the integrity of the protection by the enclosure is not compromised.		N/A
11.7	Attachment of cords		N/A
11.7.1.1	In-line and free-standing controls, flexible cords withstand flexing during normal use		N/A
	Cords with attachment method X: cord-guard (if provided) not integral with flexible cord		N/A
11.7.1.2	Flexing Test for flexible cords.....:		N/A
11.7.2	Cord anchorages		N/A
11.7.2.1	Controls, other than integrated or incorporated, intended to be connected by non-detachable cords provided with cord anchorage so designed that:		N/A
	- conductor relieved from strain		N/A
	- conductor relieved from twisting		N/A
	- conductors covering protected from abrasion		N/A
11.7.2.2	Cord anchorages of Class II controls		N/A
	- made of insulating material		N/A
	- insulated from accessible metal parts by supplementary insulation		N/A
11.7.2.3	Cord anchorages of controls other than Class II:		N/A
	- made of insulating material, or		N/A
	- provided with insulating lining, if an insulation fault on the cord could make accessible metal parts live		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- provided with lining fixed to the cord anchorage (exception: bushing which forms part of a cord guard)		N/A
11.7.2.4	Cord anchorage design		N/A
	- cord cannot touch clamping screws of anchorage, if screws are accessible metal parts		N/A
	- cord not clamped by metal screws bearing directly on the cord		N/A
	- attachment method X or M: at least one part securely fixed to the control		N/A
	- attachment method X or M: replacement of cord does not require a special purpose tool		N/A
	- attachment method X: suitable for the different connectable cords		N/A
	- attachment method X: design and location make replacement of the cord easily possible		N/A
11.7.2.5	For other than attachment method Z: cord anchorage not made by make-shift methods		N/A
11.7.2.6	Attachment method X: in-line cord controls		N/A
	- glands not used as cord anchorage, unless		N/A
	- provision exists for clamping all types of cords		N/A
11.7.2.7	Screws to be operated when replacing the cord		N/A
	- not fixing other components, or		N/A
	- control is inoperable or manifestly incomplete if components are omitted or incorrectly mounted, or		N/A
	- component cannot be removed without the aid of a tool		N/A
11.7.2.9	Push test for control fitted with flexible cord(s)		N/A
	Screws of cord anchorage tightened 2/3 torque of cl. 19.1(Nm)		N/A
11.7.2.10	Push causes no damage		N/A
11.7.2.11	Pull test for control fitted with flexible cord(s)..... :		N/A
	Free-standing control, weight (kg)		—
	In-line cord controls (all others)		N/A
	No displacement		N/A
11.7.2.12	Torque Test on cable, torque (Nm)		N/A
11.7.2.13	Attachment method X		N/A
	- test with lightest cord: smallest cross-section used in 10.1.4: diameter (mm)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- test with next heavier type with largest cross-section: diameter (mm)		N/A
11.7.2.14	After test cord not damaged, and		N/A
	- measured longitudinal displacement (≤ 2 mm) of cord (mm)		N/A
	- conductors have not moved in the terminals over a distance > 1 mm		N/A
	- no appreciable strain at the connection		N/A
	- creepage distances and clearances not reduced below values of Cl. 20		N/A
11.8	Size of non-detachable cords		N/A
11.8.1	- rubber sheathed, not lighter than 60245; type		N/A
	- PVC sheathed, not lighter than 60227; type		N/A
	Exception: if specified in particular equipment standard or for connection to external SELV devices		N/A
11.8.2	Size of conductors in non-detachable cords:		N/A
	- nominal current (A)		—
	- required cross-sectional area (mm ²)		—
	- measured cross-sectional area (mm ²)		—
11.8.3	Space inside the control for flexible cords:		N/A
	- connecting cords of largest cross-section (10.1.4) (mm ²)		—
	- adequate space for easy introduction and connection		N/A
	- possibility to check the correct connection		N/A
	- cover can be fitted without risk of damage to the conductors		N/A
11.9	Inlet openings		N/A
11.9.1	Inlet openings for flexible external cords		N/A
	- designed to prevent damage of the covering of the cord when introducing connectors		N/A
	- provided with inlet bushing		N/A
11.9.1.1	Conduit entries and knock-outs of independently mounted controls designed and located that the introduction does not affect protection against electric shock or reduces distances and clearances		N/A
11.9.2	Inlet openings without inlet bushing made of insulating material		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.9.3	Inlet bushing		N/A
	- made of insulating material		N/A
	- shaped to prevent damage to the cord		N/A
	- reliably fixed		N/A
	- not removable without the aid of a tool		N/A
	- not integrated with the cord in case of attachment method X		N/A
11.9.4	Inlet bushing not made of rubber		N/A
	Exception: For attachment methods M, Y or Z, for Class 0, 0I or I controls, bushing integral with sheath of a cord of rubber		N/A
11.9.5	Enclosures of independently mounted controls (for permanent connection to fixed wiring) provided with cable/conduit entries, knock-outs or glands allowing correct connection of the appropriate cable or cord		N/A
11.10	Equipment inlets and socket-outlets		N/A
11.10.1	Engagement with connecting devices of other systems not possible		N/A
	Engagement causes no danger or damage		N/A
11.10.2	In-line cord controls with inlet or socket-outlets		N/A
	- unintended overloading of control cannot occur, rating of the control accordingly		N/A
	- protected against overload, protection means.....:		N/A
11.10.3	Controls with pins to be introduced into fixed socket-outlets comply with requirements of the socket-outlet system		N/A
	For in-line cord controls provided with a plug and a socket outlet, where the plug can be connected to a socket outlet rated for a higher load current than the control, the control provided with an incorporated fuse or a protective device to limit the current to the control's rating		N/A
	The plug and socket outlet part of the control complies with the appropriate standard for the plug and socket system		N/A
11.11	Requirements during mounting, maintenance and servicing		N/A
11.11.1	Covers and their fixing		N/A
11.11.1.1	Removal of covers does not affect setting of the controls other than integrated	No removable cover	N/A
11.11.1.2	Covers		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- cannot be displaced or replaced incorrectly		N/A
	- fixing of covers to be removed for mounting etc., does not serve to fix any parts other than actuating members or gaskets		N/A
11.11.1.3	Covers of enclosures giving access to fuses or any overload protective devices (Canada and U.S.)		N/A
11.11.1.4	Glass covering an opening (Canada and U.S.)		N/A
11.11.1.5	Non-detachable parts which provide protection against electric shock or contact with moving parts:		N/A
	- fixed in a reliable manner		N/A
	- withstand mechanical stress		N/A
	-snap-in devices have a locked position		N/A
11.11.1.5.1	Parts likely to be removed for installation or during servicing disassembled and assembled ten times		N/A
11.11.1.5.3	Control subjected to 50 N push force test		N/A
	- pull force (N)		N/A
	- finger nail pull force (N).....		N/A
	- if cover subjected to twisting force, torque applied		N/A
11.11.1.5.4	After push / pull test, parts remain locked in position and not detached.		N/A
11.11.1.6	Cover removable with one hand, not released when subjected to squeezing and pull force.		N/A
11.11.2	Fixing screws of covers which need to be removed for mounting etc., captive		N/A
11.11.3	Actuating member		N/A
11.11.3.1	Control not damaged by mounting or removal of actuating member		N/A
11.11.3.2	For Type 2 action with max/min. setting limited by means of the actuating member, the actuating member not removable without use of a tool		N/A
11.11.3.3	Actuating member cannot be fixed in an incorrect position for Type 1 action (actuating member providing OFF position) or Type 2 action (actuating member indicating condition of the control)		N/A
11.11.4	Parts forming supplementary or reinforced insulation and which might be omitted during re-assembly:		N/A
	- fixed and cannot be removed without being damaged, or		N/A
	- if omitted, control is inoperable or manifestly incomplete		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.11.5	Sleeving as supplementary insulation on integrated conductors: retained in position by a positive means		N/A
11.11.6	Pull-cords		N/A
	- insulated from live parts		N/A
	- fitting and replacement possible without live parts becoming accessible		N/A
11.11.7	Insulating linings, barriers etc.		N/A
	- adequate mechanical strength		N/A
	- secured in a reliable manner		N/A
11.12	Controls using software	See annex H	N/A
11.13	Protective controls and components of protective control system		N/A
11.13.1	- protective controls designed and constructed to be reliable and suitable for their intended duty		N/A
	- protective controls are independent of other functions		N/A
	- protective controls comply with appropriate design principles in order to obtain suitable and reliable protection		N/A
	Operating controls are not used as protective controls		N/A
11.13.2	The pressure of the limiting devices does not permanently exceed the maximum allowable pressure of the controlled application		N/A
	A short duration pressure surge of the limiting devices does not exceed 10% of the pressure surge		N/A
11.13.3	The temperature monitoring devices have an adequate response time on safety grounds, consistent with measurement function		N/A
11.13.4	Batteries		N/A
11.13.4.1	Controls containing batteries are designed to reduce the risk of fire, explosion and chemical leaks		N/A
	- under normal operation		N/A
	- under after a single fault in the control		N/A
	Controls containing user-replaceable batteries are designed to reduce likelihood of reverse polarity if results in a hazard		N/A
11.13.4.2	Battery circuits designed for total battery capacity > 1000 mAh are designed so that		N/A
	-output characteristics of battery charging circuit compatible with rechargeable battery		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Non-chargeable batteries: discharging rate exceeding battery manufacturer's recommendation and unintentional charging are prevented.		N/A
	- Rechargeable batteries: charging/discharging rate exceeding battery manufacturer's recommendation and reverse charging are prevented.		N/A
	- Replaceable batteries:		N/A
	- Have contacts that cannot be shorted with test finger (Figure 2); or		N/A
	- Inherently protected to avoid creating a hazard		N/A
11.13.4.3	If battery capacity > 1000 mAh contains liquid or gel electrolyte, a battery tray is provided		N/A
11.13.4.3.1	If battery tray is required, tray capacity is equal to volume of electrolyte		N/A
	- for all cells of the battery, or		N/A
	- for a single cell if battery design is such that simultaneous leakage from multiple cells is unlikely		N/A
11.13.4.4.1	Unintentional charging of non-rechargeable battery		N/A
	- single component failure.....:		N/A
	- duration: 7 h.....:		N/A
11.13.4.4.2	Excessive discharging rate:		N/A
	- open/short circuit a current/voltage limiting component.....:		N/A
11.13.4.4.3	See Annex V		N/A
11.13.4.4.4	Compliance after the tests of 11.13.4.4.1 and 11.13.4.4.2:		N/A
	-No chemical leaks caused by cracking, rupturing or bursting of the battery jacket		N/A
	-No spillage of liquid from any pressure relief device in the battery		N/A
	-No explosion of the battery, if such explosion could result in injury to a user		N/A
	-No emission of flame or expulsion of molten metal to the outside of the control enclosure		N/A
11.13.4.5	Electric Strength (13.2)		N/A
11.13.5	Smart Enabled Controls		N/A
11.13.5.1	So designed that external communication signals do not unintentionally override the operating parameters of a Type 2 Action Control nor interfere with any protective function		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Permitted to alter the operating parameters of a Type 2 control within defined limits so long the protective functions remain intact		N/A
11.13.5.2	Control that integrates operating and protective functions evaluated as a Protective Control		N/A
11.13.5.3	Transmitter or communication module external to control acting as the interface between control and telecommunication network comply with IEC 62151 or IEC 62368-1 and ensure protection against electric shock		N/A
11.13.5.4	Any transmitter or communication module part of the smart enabled control complies with the requirements		N/A
11.101	If time factor declared it was checked by one of the methods in Annex BB..... :		N/A
	In Germany: for controls intended to control boiling water or flue gas temperature in heat generating systems, values in Table BB.1 not exceeded		N/A

12	MOISTURE AND DUST RESISTANCE		P
12.1.1	Protection against ingress of water and dust IP Classification of the product..... :		P
12.1.2	Electric Strength Test of 13.2 after preparation in accordance with 12.1.3-12.1.6 followed by tests according to IEC 60529..... :	IP00	P
	Entered water does not impair compliance with this standard		N/A
	No reduction of creepage distances and clearances below values of Cl. 20		N/A
12.1.6	Sealing means aged suspending freely in a heating cabinet, ventilated by natural circulation		N/A
	- aging temperature (°C), 70 ± 2°C..... :		—
	- aging time (h), 240h..... :		—
12.1.6.2	Immediately after ageing, the parts were taken out of the cabinet and left at room temperature, avoiding direct daylight		N/A
	- time before reassembly (h), 16h..... :		—
	- sealing means are then tightened with a torque equal to two-thirds of that given in Table 20		N/A
12.2	Protection against humid conditions		N/A
12.2.1	Controls withstood simulated, normal use humid conditions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
12.2.3	Electric Strength Test of 13.2 is conducted immediately after the humidity treatment		N/A
12.2.4	Control shows no damage		N/A
12.2.5	Cable inlet openings, and drain holes are left open		N/A
12.2.6	Detachable parts are removed and tested with the main part		N/A
12.2.7	2 days (48 h) Humidity Test for IPx0 controls	48h	P
	7 days (168 h) Humidity Test for other controls		N/A
12.2.8	Relative humidity (%): 91-95%	93%	—
	Temperature (°C): (20 - 30 ± 1) °C	25°C	—
12.2.9	Tests executed immediately after the humidity treatment (after the reassembly of detached parts)		N/A
	- in-line, free-standing and independently mounted controls according to Insulation Resistance (13.1)		N/A
	- Electric Strength (13.2)		P
	- integrated and incorporated controls according to Electric Strength (13.2)		P
12.3	Leakage current test for in-line cord and free - standing controls		N/A
12.3.3	Measuring circuits; the figure number used.....		—
12.3.4	During measurement all control circuits closed except controls tested to Figs. 26, 29, 30 checked with switch S1 in the open and closed position		N/A
12.3.5	Impedance of measuring circuits (Ω)		—
	Time constant (μs).....		—
12.3.6	Error and accuracy of measuring circuit ≤5%		N/A
12.3.7	The max. leakage current, after the temperature of the control has stabilized, did not exceed the values given in 13.3.4		N/A
12.101	Refrigeration controls		N/A
12.101.1	Tests according to 12.101.2 up to 12.101.6		N/A
12.101.2	Controls using potting compound, softening test		N/A
	Two samples stored 16h at max. operating temperature plus 15°C in climatic cabinet		N/A
	Potting material not unduly soften distort, crack or deteriorate		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
12.101.3	Heating-freezing cycle test		N/A
	The two samples of 12.101.2 plus one untested sample placed in water at a temperature between T_{max} and $(T_{max} + 5)^{\circ}C$, or T_{max} and 1.05 times T_{max} (whichever is greater) for 2h; temperature [$^{\circ}C$]..... :		N/A
	Then transferred to water below $5^{\circ}C$ for 2h, and afterwards stored for 2h in a climatic cabinet at a temperature between T_{min} and $(T_{min} - 5)^{\circ}C$ temperature of the water [$^{\circ}C$] & temperature of the climatic cabinet [$^{\circ}C$]..... :		N/A
	10 heating and freezing cycles executed		N/A
	In Canada and USA: defrost controls cycles one time		N/A
12.101.4	Tested samples stored overnight in water at room temperature after completion of each heating-freezing cycle		N/A
12.101.5	After the last freezing period samples thawed in water at room temperature		N/A
	Insulation resistance measured from current-carrying parts to grounded parts (Ω), and :		—
	- from current-carrying parts to the surface of potting and/or insulating material (Ω)..... :		—
	Insulation resistance not less than 50 000 Ω .		N/A
12.101.6	Electric strength test ($2 \times V_r + 1000V$) while samples still moist		N/A
	- between current-carrying parts and grounded parts, and		N/A
	- between current-carrying parts and the surface of the potting and/or insulating material		N/A
	-no flashover or breakdown occurred		N/A

13	ELECTRIC STRENGTH AND INSULATION RESISTANCE		N/A
13.1	Insulation resistance of in-line cord, free-standing and independently mounted controls		N/A
13.1.2	Reinforced or supplementary insulation measured to non-metal parts covered with metal foil		N/A
13.1.3	Test voltage applied for 1 min (V dc)	500	—
13.1.4	Insulation resistance measured		N/A
	- basic insulation $\geq 2 M\Omega$		N/A
	- supplementary insulation $\geq 5 M\Omega$		N/A
	- reinforced insulation $\geq 7 M\Omega$		N/A
13.2	Electric Strength Test	See attached TABLE 13.2	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
13.2.2	Insulating surfaces covered with metal foil		P
13.2.3	50 or 60 Hz test voltage applied for 1 min.:	See attached TABLE 13.2	P
	for USA and Canada: independently mounted room thermostats for direct control of an electric space-heating equipment with resistance load		N/A
13.3	Leakage current of in-line cord and free-standing controls after the tests of 13.1 or 13.2 for the sample that was subjected to the tests of 12.3		N/A
13.3.1	A test voltage, was applied between any live part and accessible metal parts, or		N/A
	– any live part & metal foil in contact with accessible surfaces of insulating material, connected together		N/A
	For control with a grounding pin or conductor, the grounding conductor was disconnected at the supply source		N/A
13.3.2	Test voltage (V).....:		—
13.3.3	The leakage current was measured within 5 s after the application of the test voltage :		N/A

14	HEATING		P
14.1	Controls and their supporting surfaces did not exceed normal use temperatures		P
14.1.2	Temperatures recorded during Heating Test did not exceed the values in Table 13		P
14.2	Terminals fitted with external conductors of the intermediate cross-sectional area (mm²).....:	Terminal 4.8x0.8mm fitted with internal conductor 1.5 mm²	—
14.2.1	Attachment method M, Y or Z: cords as declared or supplied (mm²)		—
14.2.2	Terminals for flexible and fixed conductors: appropriate flexible cord (mm²).....:		—
14.2.3	Terminals not for external conductors: conductors of minimum cross-sectional area or as declared in Clause 7.2 (mm²)		—
14.3	In-line cord controls tested on a dull, black painted plywood		N/A
14.3.1	Independently mounted controls tested as in normal use		N/A
14.4	Electrical conditions		P
	- voltage (V): most unfavourable value between 0.94 and 1.06 times UR		—
	- voltage (V) if circuit not voltage sensitive: min. 10% of UR	250V	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- current (A): most unfavourable value between 0.94 and 1.06 times I R	17.6A	—
14.4.1	For circuits and contacts other than for external loads, load(s) as specified by the manufacturer: voltage (V); current (A)		—
14.4.2	Actuating members placed in most unfavourable position		P
14.4.3	Contacts initially closed at rated current and voltage		P
14.4.3.1	Temperature sensing controls:		P
	- temperature of sensing element is raised or lowered (5 ± 1) °C from operating temperature such that contacts are then in closed position		P
	- operating temperature (°C)	TM 150 (with Bakelite enclosure): 128.6/128.9/130.1 TM 250 (with Ceramic enclosure): 221.8/224.2/225.2	—
	- temperature for heating test (°C)	TM 150 (with Bakelite enclosure): 127.8/127.8/129.3 TM 250 (with Ceramic enclosure): 220.6/222.8/223.8	—
	For a voltage maintained thermal cut-out, the required test sequence was followed		N/A
14.4.3.1.101	Where the whole control has been declared as the sensing element, the heating test, at the request of the manufacturer, was conducted after the successful completion of tests in Cl. 17		N/A
14.4.3.2	For controls other than temperature sensing, sensing element maintained as near to the point of opening as practical		N/A
14.4.3.4	The most arduous operating sequence or segment selected for other automatic controls		N/A
14.5	Controls were tested in an appropriate heating and/or refrigerating apparatus		N/A
14.5.1	Temperature of the switch head between T_{max} and ($T_{max} + 5$)°C, or T_{max} and 1.05 times T_{max} (whichever is greater) (°C)		—
	Mounting surface of the switch head maintained between T_s max and (T_s max+ 5)°C, or T_s max and 1.05 times T_s max (whichever is greater) (°C)		N/A
14.5.2	In-line cord controls, independently mounted controls and parts of these controls accessible when control is mounted, tested at room temperature between 15 and 30 C (measured temperature corrected to a 25 °C reference value); measured temperature (°C)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
14.6	The temperatures specified for the switch head, the mounting surfaces and sensing element were attained in approximately 1 h		N/A
14.6.1	Electrical and thermal conditions maintained for 4 h, or for 1 h after steady state (h)		P
14.6.2	For controls designed for short-time or intermittent operation, the resting time(s) declared in Table 1, requirement 34, were included in the 4 h		N/A
14.7	The temperature of the medium in which the switch head is located, and the value of the activating quantity to which the sensing element is exposed, was measured approx. 50 mm from the control		N/A
14.7.1	The temperature was determined by means of fine wire thermocouples or other equivalent means, so chosen and positioned that they have the minimum effect on the temperature of the part under test		N/A
14.7.3	Temperature on parts which are gripped in normal use other than actuating members		N/A
14.7.4	The temperature of electrical insulation is determined on the surface of the insulation.....		P
14.101	Controls classified under 6.7.101 to 6.7.103 inclusive (cooking appliance, self-cleaning, food handling)		N/A
14.101.1	Test of 17.16.101 may be conducted after the conditioning of 14.102 and 14.102.1, if temperature of insulating parts exceeds the permitted (this is a mean to comply with note 12):		N/A
14.102	An untested sample is conditioned for 1000h in an oven		N/A
	temperature; required [°C]; measured [°C].....		N/A
	- control was not energized		N/A
14.102.1	If the elevated temperature was localized, such or near a terminal, the 1000h conditioning is conducted between T_{max} and $T_{max}+5\%$ for normal conditions		N/A
	- Contacts closed, non-cycling		N/A
	- Bi-metallic heaters energized with the corresponding current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
15	MANUFACTURING DEVIATION AND DRIFT		N/A
15.1	Adequate consistency of declared operating value etc. required for parts of controls providing Type 2 actions (applicable to controls where the output of the control is dynamic with respect to the activating quantity, e.g. Electromechanical thermostat)		N/A
	Deviation and drift acc. to annex AA unless otherwise declared by manufacturer.....:		N/A
15.2	Measurement of deviation and drift		N/A
15.3	Controls completely or partially destroyed during normal operation, the tests of the appropriate sub-clauses of clause 17 sufficient		N/A
15.4	Controls dependant on the mounting on or incorporation into equipment for their operation, deviation and drift declared differently. The manufacturers deviation and drift expressed as a bandwidth or spread and the drift by an alternation of value separately as tolerance value to the declared operating value		N/A
	The declared manufacturing deviation and drift expressed separately as a tolerance value to the declared operating value		N/A
15.5	Determination of Consistency		N/A
15.5.1	Control mounted as declared		N/A
15.5.2	For sensing controls, normal operation of the control used to control the apparatus - preferred		N/A
15.5.3	Apparatus simulated as much as practicable the conditions of service.		N/A
15.5.3.101	Setting by the user set at the maximum operating temperature; temperature [°C]..... :		—
	Otherwise declared; temperature [°C]..... :		—
15.5.3.102	Portion of control (bi-metallic or similar) exposed to a controlled ambient temperature		N/A
	Placed in a circulating oven (to determine the operating value)		N/A
15.5.3.103	Bi-metallic and similar type of controls		N/A
	Temperature determined by a 0.25mm thermo-couple on an identical control not electrically connected, adjacent to the control under test		N/A
15.5.3.104	Fluid expansion control		N/A
	0.25mm (max) thermocouple attached to the sensing portion		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
15.5.3.105	Fluid expansion or contraction type controls		N/A
	Sensing part (intended use ore as declared) placed in a circulating air oven or in a liquid bath		N/A
15.5.3.106	Temperature of the oven rapidly increased or decreased to 10K below/ above expected operation temperature; temperature [°C]..... :		N/A
	Condition of equilibrium achieved		N/A
	Rate of temperature change reduced to max. 0.5K/min or as declared; degree of change [K/min]:		N/A
15.5.3.107	Operation sensed by a suitable device:		N/A
	Current max. 0.05A; current [A]..... :		—
	Voltage; voltage [V] :		—
15.5.3.108	Operating values recorded (see cl 15.2)		N/A
15.5.3.109	Single operation devices, satisfactory disconnection:		N/A
	Voltage, table 13.2 applied; voltage [V] :		—
15.5.4 & 5	Not applicable		N/A
15.5.6	The appropriate operating value, operating time or operating sequence recorded for each sample. No two samples differ from each other by an amount exceeding the declared manufacturing deviation		N/A
15.6	Determination of consistency for controls not dependent for their operation on the method of mounting on, or incorporation in equipment		N/A
15.6.1	Manufacturing deviation and drift – absolute value....		N/A
15.6.2	Operating values measured for all samples within the limits declared by manufacturer (see cl. 15.2)		N/A
15.6.3	Test apparatus simulated the most arduous conditions of use.		N/A
15.6.4	If drift value is declared, the measured values are used as reference values to determine drift after the tests of Cl 16 and Cl 17		N/A
	The manufacturing deviation according to Annex AA.		N/A
15.7 & 15.8	See Annex J		N/A

16	ENVIRONMENTAL STRESS		P
	This entire clause is not applicable for bimetallic SOD		P
16.1	Control can withstand the level of stress likely to occur in transportation and storage		P

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Clause	Requirement + Test	Result - Remark	Verdict
16.2	Environmental stress of temperature		P
16.2.1	Entire control (not energized) maintained for 24h at a temperature of $(-10 \pm 2)^{\circ}\text{C}$ or as declared.....:	-	P
	Entire control (not energized) maintained for 4h at a temperature of $(60 \pm 5)^{\circ}\text{C}$ or as declared.....:		P
16.2.2	The control was not energized during testing		P
16.2.3	Control capable of being actuated at room temperature to provide disconnection as declared (without dismantling)		P
	The control was held at room temperature for 8 h prior to actuation		P
16.2.4	For controls with type 2 actions, the appropriate test of Clause 15 were repeated		N/A

17	ENDURANCE		P
17.2	Electrical conditions for the tests		P
	Type of circuit	Substantially resistive	P
	Rated voltage (V) ; test voltage (V)	250 V	—
	Rated current (A) ; test current (A)	16	—
	Rated frequency (Hz)	50 /60 Hz	—
17.3	Thermal conditions for parts other than temperature sensing elements		—
	Accessible parts: tested at room temperature ($^{\circ}\text{C}$) :		—
	Mounting surface temperature: T_s max ($^{\circ}\text{C}$)		—
	Remainder of switch head, temperature: T_{\max} ($^{\circ}\text{C}$) .:		—
	If T_{\min} is less than 0°C ; switch head maintained at T_{\min} ($^{\circ}\text{C}$)		—
17.3.1	For temperature sensing controls, when the whole control is declared as sensing element and T_{\min} less than 0°C , tests of 17.8 conducted at T_{\min} and 5% of cycles declared in Table 7.2, Item 27		N/A
	Operating Temperature, ($^{\circ}\text{C}$)		—
	Number of cycles		—
17.4	Manual and mechanical conditions for the tests		N/A
17.4.2	Slow speed test		N/A
	High speed test		N/A
	Accelerated speed test		N/A
17.4.4	Controls with limited movement of the actuating member		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Dwell period at each reversal of direction (s)		—
	Applied torque (rotary controls) (Nm).....		—
	Applied force (non-rotary controls) (N).....		—
	Controls with rotary actuation, movement not limited in either direction:		N/A
	- 3/4 of cycles clockwise (number of cycles)		—
	- 1/4 of cycles anti-clockwise (number of cycles)....		—
	Controls with rotary actuation, designed for actuation in one direction only tested in designed direction		N/A
17.4.5	Additional lubrication not applied during tests		N/A
17.5	Dielectric Strength Test		N/A
17.6	Ageing test for controls of 1M or 2M action		N/A
	- sensing element maintained at activating quantity as determined in 14		N/A
	- other parts maintained as specified in 17.3		N/A
	- electrically loaded as specified in 17.2 for breaking conditions		N/A
	- voltage (V)		—
	- current (A).....		—
	- duration (h):		—
17.7	Over-voltage test of automatic action at accelerated rate		P
17.7.1	Electrical conditions: specified in 17.2		P
17.7.2	Thermal conditions: specified in 17.3		P
17.7.3	Method and rate of operation		P
	Control Type 1 action		P
	Method of operation		—
	Rate of operation		—
	Control Type 2 action:		N/A
	Method of operation		—
	Rate of operation		—
	Type 2 controls are tested at the most unfavourable operating value declared in Table 1, Item 48		N/A
17.7.4	Type 2 sensing action: overshoot at each operation between values stated in 7.2		N/A
17.7.6	Automatic cycles: the smaller of 1/10 of numbers declared in 7.2, or 200; (number of cycles)	200	P

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Clause	Requirement + Test	Result - Remark	Verdict
17.7.7	Actuating members placed in the most unfavourable position during test		P
17.8	Test of automatic action at accelerated rate		N/A
	Temperature required in 17.3 applied for the last 50% of each test		N/A
17.8.1	Electrical conditions: specified in 17.2		N/A
17.8.2	Thermal conditions: specified in 17.3		N/A
17.8.3	Method and rate of operation: specified in 17.7.3		N/A
17.8.4	Number of automatic cycles:		N/A
	- number declared in 7.2		—
	- number of cycles 17.8		—
17.8.4.1	For slow-make, slow-break automatic actions, number of automatic cycles: (75% of cycles in Clause 17.8.4).....		—
17.8.4.101	Independently mounted and in-line cord controls, number of automatic cycles as indicated in CC.1 (For Canada, USA see CC.2); (number)..... :		P
	Higher number declared; (number)..... :	3 cycles/min	—
	Test voltage (V_R)(V)..... :	250 V	—
	Test current making (A, $\cos\phi$, ms)..... :	16.0A, $\cos\phi=0.95$	—
	Test current breaking(A, $\cos\phi$, ms)	16.0A, $\cos\phi=0.95$	—
	Number of cycles (no)	99 800	—
17.9	Test of automatic action at slow rate		N/A
17.9.1	Number of automatic cycles: 25% remainder (17.8.4)		—
17.9.2	Electrical conditions: specified in 17.2		—
	Thermal conditions: specified in 17.3		—
17.9.3	Method of operation and monitoring		—
	- imposing change of value of activating quantity on sensing element (rate of change of activating quantity as declared in 7.2)		N/A
	- by the prime mover		N/A
	Sensing controls: overshoot between values of 7.2		N/A
17.9.4	Controls of which only the make or break is slow automatic action: rest of actions accelerated by agreement between testing authority and manufacturer		N/A
17.10	Overvoltage (overload) test of manual action at accelerated speed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.10.1	Electrical conditions: specified in 17.2		N/A
17.10.2	Thermal conditions: specified in 17.3		N/A
17.10.3	Method of operation: specified in 17.4 for accelerated speed		N/A
	Number of cycles: the smaller of 1/10 of number declared or 100 (see 7.2)		—
	Sensing elements maintained at suitable values of activating quantity or prime movers positioned that actuation causes operation		N/A
17.11	Test of manual action at slow speed		N/A
17.11.1	Electrical conditions: specified in 17.2		N/A
17.11.2	Thermal conditions: specified in 17.3		N/A
17.11.3	Method of operation: specified in 17.4 for slow speed		N/A
17.11.4	Number of cycles: 1/10 of declared number or 100 (see 7.2)		—
	Actuating causes operation		N/A
17.12	Test of manual action at high speed (applies only to actions which have more than one pole and where polarity reversal occurs during the action)		N/A
	- number of poles		—
	- polarity reversal occurs during action		N/A
17.12.1	Electrical conditions: specified in 17.2		N/A
17.12.2	Thermal conditions: specified in 17.3		N/A
17.12.3	Method of operation: specified in 17.4 for high speed		N/A
17.12.4	Number of cycles: 100		—
	Sensing elements maintained at suitable value of activating quantity		N/A
	Prime movers so positioned to ensure actuating causes appropriate operation		N/A
17.13	Test of manual action at accelerated speed		N/A
17.13.1	Electrical conditions: specified in 17.2		N/A
17.13.2	Thermal conditions: specified in 17.3		N/A
17.13.3	Method of operation: specified in 17.4 for accelerated speed		N/A
17.13.4	Number of cycles: number declared in 7.2, item 26 less number made during tests of 17.10, 17.11 and 17.12; total number		—
17.14	Evaluation of compliance		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Actions function in the intended and declared manner:		P
	- automatically		P
	- manually		N/A
	The following requirements are still met:		P
	- Cl. 14, heating: terminals for external conductors: measured (°C)		N/A
	- Cl. 14, heating: other terminals: measured (°C) ...	Refer to TABLE: heating test after endurance test	P
	- Cl. 14, heating: current-carrying parts: measured (°C)		N/A
	- Cl. 14, heating: supporting surfaces: measured (°C)		N/A
	- Cl. 8, protection against electric shock	Refer to TABLE: electric strength test	P
	- 17.5, electric strength (without previous humidity treatment, test voltage 75% of values 13.2)		P
	- Cl. 20, distances and clearances		P
	- for tests 17.5 and 20, if special samples were submitted for Cl. 13: tested at appropriate condition to ensure contacts are open		P
	- requirements of Cl. 15 for type 2 actions still met		N/A
	- manual actions: declared circuit disconnection can be obtained		N/A
	No evidence that any transient fault has occurred between live parts and:		N/A
	- earthed metal parts		N/A
	- accessible metal parts		N/A
	- actuating members		N/A
17.15	Single operation devices		N/A
17.15.1	Bi-metallic single operation devices subjected to additional tests		N/A
17.15.1.1	6 samples (after appropriate test clause 15): maintained 7h at -35°C or 0°C (as declared in table 7.2, requirement 103)		N/A
	No reset, test acc. to 15.5.3.109		N/A
17.15.1.2	6 untested Bi-metallic SOD's conditioned 720h at the lower temp. of either:		N/A
	90 % of the declared operating value ± 1 K, or		N/A
	(7 \pm 1) K below the declared operating value.		N/A
17.15.1.2.1	Devices do not operate (detected acc. 15.5.3.107):		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.15.1.2.2	The appropriate tests of cl. 15 repeated on the six samples subjected to conditioning of 17.15.1.2, and		N/A
	The temperature measured is within the declared deviation limits (results see attached sheet no.) ... :		N/A
17.15.1.3	For bi-metallic SOD's		N/A
	- with a declared reset temperature of -35 °C		N/A
	6 untested samples subjected to an over-voltage test for one cycle under the electrical conditions of table 17.2-1 or table 17.2-2, as appropriate		N/A
	Overload test in Canada and the USA		N/A
17.15.1.3.1	For bi-metallic SOD's with a declared reset temperature of 0 °C		N/A
	1 sample subjected to an over-voltage test of 50 cycles under the electrical conditions of table 17.2-1 or table 17.2-2, as appropriate; voltage [V]; current [A]; cos θ , number of executed cycles :		N/A
	overload test in Canada and the USA ; voltage [V]; current [A]; cos ϕ , number of executed cycles..... :		N/A
17.15.2	Non-bimetallic SODs		N/A
17.15.2.1	Automatic temperature sensing functions other than the non-bimetallic portion of the control comply with 7.16.101, 17.16.103 and 17.16.104, respectively		N/A
17.15.2.2	Six samples conditions to either 750 h or the specified number of cycles divided by 4..... :		N/A
	Temperature declared in Table 1, req 115 °C :		N/A
	SOD did not operate during aging period		N/A
17.15.2.3	Test of Clause 15 conducted on six untested samples and six samples subjected to conditioning of 17.15.2.2		N/A
	Temperatures within declared deviation limits, °C :		N/A
	Electrical conditions, V_{Rmax} and I_{Rmax} :		N/A
	Sensing element held at declared reset temperature, SOD held at temperature declared in Table 1, °C..... :		N/A
	Test continued 7h without resetting		N/A
	All samples subjected to tests of Clause 13 at temperature limits declared in Table 1, req. 36		N/A
17.16	Tests for particular purpose controls, additional sub-clauses		N/A
17.16.101	Thermostats		N/A
	17.1 to 17.5 applicable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	17.6 applicable to actions type 1.M or 2.M, value "X": the greater of 5K \pm 1K or \pm 5% of the original activating quantity.....		N/A
	17.7 and 17.8 are applicable		N/A
	17.9 applicable to slow make and break automatic action		N/A
	17.9.3.1 not applicable		N/A
	17.10 to 17.13 applicable to thermostats with manual action and means for setting by the user.		N/A
	In addition, controls specified under 14.4.3.1.101 comply with CI 14		N/A
	17.15 not applicable		N/A
17.16.102	For USA: independently mounted room thermostats above 50 V for direct control of an electric space-heating equipment with resistance load.		N/A
	For Canada: Clauses 17.16.102.1 – 17.16.102.5 apply to such controls above 30 V		N/A
17.16.102.1	Over-current test for 50cycles, 6 cycles/min sample 1 and 2		N/A
	Operating values acc. tab. 17.2-2 IEC 60730-1.... :		—
17.16.102.2	Endurance test for 6000cycles, 1 cycle/min sample 1 and 2		N/A
	Operating values 110% x In, 110% x Un ON-time 50% \pm 20		N/A
17.16.102.3	Endurance test for additional 30000cycles, 1 cycle/min sample 1		N/A
	Operating values In, Un, ON-time 50% \pm 20 :		—
17.16.102.4	Overload test for 50 cycles, making and breaking 120% of rated voltage (Un) and current (In).		N/A
	Endurance test on same sample for 30000 cycles at rated voltage (Un) and current (In).		N/A
17.16.102.5	Samples completed the required number of cycles		N/A
	Electric strength test of 13.2		N/A
17.16.103	Temperature limiters		N/A
	17.1 to 17.5 is applicable:		P
	17.6 is applicable to actions type 1.M or 2.M, value "X": the greater of 5K \pm 1K or \pm 5% of the original activating quantity..... :		N/A
	17.7 and 17.8 are applicable, except if reset operation is obtained by actuation		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Actuation: 17.4 (for accelerated speed) as permitted by mechanism or declared, table 7.2, requirement 37.		N/A
	17.9 applicable to slow make and break automatic action		N/A
	17.9.3.1 not applicable		N/A
	17.10 to 17.13 not applicable to normal reset manual action (tested according to 17.7 to 17.9) applicable if other manual actions not tested during automatic tests		N/A
	17.14 is applicable		P
	In addition, controls specified under 14.4.3.1.101 complies with CI 14		N/A
	17.15 not applicable		N/A
17.16.104	Thermal cut-outs		N/A
	17.1 to 17.5 applicable		N/A
	17.6 applicable to actions type 2.M, value "X": the greater of $5K \pm 1K$ or $\pm 5\%$ of the original activating quantity		N/A
	17.7 and 17.8 are applicable, except if reset operation is obtained by actuation		N/A
	Actuation: 17.4 (for accelerated speed) as permitted by mechanism or declared, table 7.2, req. 37		N/A
	17.9 applicable to slow make and break automatic action, for manual reset: conditions specified for 17.7 and 17.8 being used		N/A
	17.9.3.1 not applicable		N/A
	17.10 to 17.13 not applicable to normal reset manual action (tested according to 17.7 to 17.9) applicable if other manual actions not tested during automatic tests		N/A
	17.14 applicable		N/A
	In addition, controls specified under 14.4.3.1.101 complies with CI 14		N/A
	17.15 not applicable		N/A
17.16.104.1	For voltage maintained thermal cut-outs, the test of 17.16.108 is applicable		N/A
17.16.105	USA and Canada: controls with two or more electrical ratings		N/A
	Rating 1: type of load; voltage; current cycles (not less than 25% of declared cycles)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rating 2: type of load; voltage; current cycles (not less than 25% of declared cycles)		N/A
17.16.106	Evaluation of materials		N/A
	Tests are conducted as indicated in 14.101.1		N/A
	-Test of 17.7: 50 operations		N/A
	-Test of 17.8: 1000 operations		N/A
	-Conducted at ambient temperature of 20°C ± 5°C		N/A
	After the test, control complies with clause 17.5		N/A
17.16.107	Over-temperature test of sensing element		N/A
	Controls declared under req. 105 of table 7.2, the sensing element portion of a previously untested sample is exposed to 250 thermal cycles		N/A
	Ambient temperature; temperature [°C] :		—
	Rate of temperature change; rate [K/min] :		—
	Temperature extremes are maintained for 30min. :		—
	After the test control complies with clause 17.14		N/A
17.16.108	Voltage maintained thermal cut-out: These requirements apply to a voltage maintained thermal cut-out		N/A
	- in the operated condition with the voltage across it		N/A
	6 untested voltage maintained thermal cut-outs are conditioned for 7 h at a temperature of -20 °C (or lower, if declared); temperature [°C] :		N/A
	Operation of the voltage maintained thermal cut-outs detected as indicated in 15.5.3.107.		N/A
	During and at the conclusion of the conditioning, none operated.		N/A
17.101	Thermal cycling test for temperature sensing controls type 2.P actions		N/A
17.101.1	After the tests according to clause 17.6 and the evaluation after 17.14 the control subjected to a thermal cycling test 50,000 cycles		N/A
	Temperature between 50% and 90% in 17.4 recorded cut-off temperature; temperature [°C].... :		N/A
	Switch-head is held at ambient temperature		N/A
	Manufacturers declaration		N/A
	Test procedures as declared in tab. 7.2 req. 112		N/A
17.101.2	Two bath method		N/A
	Baths filled with synthetic oil, water or air :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	-first bath, 90% of switch-off temperature (measured acc. to clause 17.4); temperature [°C]		N/A
	-second bath 50% of switch-off temperature (measured acc. to clause 17.4); temperature [°C] :		N/A
	-sensing element alternatively immersion of at least 5 x time-constant, number of cycles: 50'000; time-constant [s]		N/A
17.101.3	Temperature change method		N/A
	Water cooled bath containing synthetic oil		N/A
	Cylindrical aluminium box immersed in the bath, containing the two temperature sensing elements		N/A
	Cylindrical aluminium box is heated by resistive wire		N/A
	Temperature is controlled by a second identical sample		N/A
	-if not otherwise declared (req. 37 acc. to table 7.2), degree of temperature change is $35 \pm 10\text{K/min}$:		N/A
	Number of temperature cycles: 50,000		N/A
17.101.4	After this test the control is subjected additional 20 temperature cycles..... :		N/A
	Temperature is risen to $1.1 \times$ switch-off temperature; temperature [°C]..... :		N/A
	Manual reset means did not reset, other conditions acc. to clause 17.101.2		N/A
17.101.5	After the test, switch head is lubricated thoroughly		N/A
	Measuring of operating temperature acc. to clause 15; temperature [°C]		N/A
	Control complies with the declared deviation and drift		N/A

18	MECHANICAL STRENGTH		P
18.1.1	Control is constructed to withstand the mechanical stress that occurs in normal use.		P
18.1.2	Actuating members of class I and class II controls and actuating members for class I and class II equipment:		N/A
	- have adequate mechanical strength, or		N/A
	- are such that protection against electric shock is maintained if actuating member is broken		N/A
18.1.3	For integrated and incorporated controls impact resistance (18.2) tested by the equipment standard		P
18.1.4	Tests of 18.2 to 18.8 carried out sequentially on one sample:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tested sample: type reference		—
	- Tested sample: identification No.		—
18.1.5	After the tests of Clause 18 there is:		N/A
	- no damage to impair compliance with this standard, in particular		N/A
	- Cl. 8, protection against electric shock		N/A
	- Cl. 13, electric strength and insulation resistance		N/A
	- Cl. 20, creepage distance and clearances		N/A
	- insulating linings, barriers and the like have not worked loose		N/A
	- Still possible to remove and replace detachable/external parts without these parts or insulating linings breaking.		N/A
	- Still possible to actuate the control to any position intended to provide full disconnection and micro-disconnection.		N/A
	- supplementary or reinforced insulation tested to clause 13		N/A
18.1.6	In Canada and the USA, threads for the connection of metal conduit tapped all the way through an enclosure wall or an equivalent construction:		N/A
	- have no sharp edges		N/A
	- have no more than 3 and no less than 5 full threads in the metal.....		N/A
	- a suitable conduit bushing can be properly attached		N/A
18.1.6.1	In Canada and the USA, threads for the connection of metal conduit not tapped all the way through an enclosure wall, conduit hub or the like:		N/A
	- have less than 3.5 full threads in the metal with a conduit stop		N/A
	- have a smooth well-rounded inlet hole with internal diameter approximately the same as that of the corresponding size of rigid metal conduit.		N/A
18.1.6.2	In the USA, at least 5 full threads for support by rigid metal conduit		N/A
18.1.6.3	In Canada and the USA, a conduit hub or nipple attached to the enclosure by swaging, staking or similar means withstands:		N/A
	- direct pull of 890 N for 5 min.		N/A
	- bending force of 67,8 Nm for 5 min to the conduit at right angles to its axis and the lever arm		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- torque of 67,8 Nm applied to the conduit for 5 min in a direction tending to tighten the connection and the lever arm		N/A
18.2	Impact resistance		N/A
18.2.1 - 18.2.6	In-line cord controls, free-standing, independently mounted controls: test by means of impact test apparatus IEC 60068-2-75.....:		N/A
18.4	Alternate compliance – Impact resistance		N/A
	enclosure material		—
	with supporting frame (yes / no)		—
	maximum width, maximum length		—
	thickness required; measured (mm)		N/A
18.4.1	cast metal not less than 3 mm thick, not more than 6 mm thick at threaded holes for conduit		N/A
	die-cast metal other than at plain or threaded holed for conduit:		—
	- not less than 1.6 mm thick for an area $\leq 150 \text{ mm}^2$:		N/A
	- no dimension greater than 150 mm.....:		N/A
	- $\geq 2.4 \text{ mm}$ thick for larger areas.....:		N/A
18.5	Free-standing controls		N/A
18.5.1	Additional tests of 18.5.2 and 18.5.3 required (test apparatus Fig. 4)		N/A
18.5.2	- input terminals: 2 m of flexible, lightest cord (used in 10.1.4); cord; cross-sectional area.....:		—
	- output terminals: 2 m of flexible, lightest cord (if intended); cord; cross-sectional area.....:		—
	- pull (N), increasing value, applied on the cord (Table 9)		—
	- pull and fall test (3 times)		N/A
18.5.3	After the test of 18.5.2, complies with 18.1.5		N/A
18.6	In-line cord controls		N/A
18.6.1	In-line cord control tested in tumbling barrel (Fig. 5).....:		N/A
18.6.2	- attachment method X: flexible cord(s), smallest cross-section (Cl. 10.1.4) (mm^2), length approx. 50 mm		—
	- attachment M, Y or Z: cord(s) as declared or supplied, length 50 mm; cord; cross-sectional area (mm^2)		—
18.6.3	- mass of sample (g) ; number of falls		—

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Clause	Requirement + Test	Result - Remark	Verdict
18.6.4	In-line cord control with mass > 200 g complies with 18.5		N/A
18.6.5	Barrel turned at a rate of five revolutions/min; 10 falls/min		N/A
18.6.6	control complies with 18.1.5 (special attention paid to flexible cord(s))		N/A
18.7	Pull-cord actuated controls		N/A
18.7.1	Pull-cord actuated controls tested to 18.7.2 and 18.7.3		N/A
18.7.2	Control mounted as declared: forces applied to the pull-cord, each 1 min:		N/A
18.7.3	- rated current (A).....:		—
	- force in normal direction (N).....:		—
	- force in most unfavourable direction (N)		—
18.7.4	control complies with 18.1.5		N/A
18.8	Foot actuated controls		N/A
18.8.1	Foot actuated control tested in accordance with 18.8.2 to 18.8.4		N/A
18.8.2	Control subjected to a force, increased from 250 N to 750 N over 1 min, and maintained for 1 min with 50 mm diameter steel plate		N/A
18.8.3	Force applied three times to control (fitted with cords) placed in different, most unfavourable positions		N/A
18.8.4	Control complies with 18.1.5		N/A
18.9	Actuating member and actuating means		N/A
18.9.1	Controls supplied (or intended to be fitted) with actuating members, tests:		N/A
	- axial pull force (N)		N/A
	- axial push force of 30 N applied for (min)		N/A
18.9.2	Controls submitted without actuating member or with an easily removable actuating member: pull and push of 30 N applied to the actuating means		N/A
18.9.3	During and after the tests, control shows no damage or movement of the actuating members so as to impair compliance with this standard.		N/A
18.101	Push- and turn or pull and turn actuation		N/A
18.101.1	Controls with actions classified as type 1.X or 2.X or type 1.Z or 2.Z subjected to the tests of 18.101.2 and 18.101.3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
18.101.2	The axial force to push or pull the actuating member not less than 10 N..... :		N/A
	Axial push or pull force of 140N did not affect compliance with clause 18.1.5		N/A
	Control intended to use with special knob withstood without damage or effect on control function a torque of 4Nm		N/A
	Alternatively, if the means preventing rotation of the shaft is defeated when a torque of at least 2 Nm is applied, the effect was such that either the means wasn't damaged but overridden to close the contacts, in which case subsequent actuation at a torque less than 2Nm require both push- and turn or pull and turn to operate the contacts, or		N/A
	No operation of the contacts occurred nor could be made to occur		N/A
	The torque required to reset the control to the initial contact condition, if necessary after the application of the push or pull, was not greater than 0.5 Nm		N/A
	A torque of 6 Nm applied to the setting means. Any breakage or damage to the means preventing rotation of the shaft didn't result in failure to comply with the requirements of Clauses 8, 13 and 20		N/A
	For controls intended for use with a knob having a grip diameter or length greater than 50 mm, the values of torque are increased proportionally		N/A
18.101.3	Controls with Type 1.X or 2.X or Type 1.Z or 2.Z actions are actuated for the declared number of manual actions		N/A
	After the test, control comply with requirements of clause 18.101.1		N/A
	For case in which the means preventing rotation is not damaged but is overridden to operate the contacts, the first 1/16th of the declared manual cycles performed without first pushing or pulling the actuating member		N/A
18.102	Parts containing liquid metal		N/A
18.102.1	Controls containing liquid metal withstood for 1min without leakage or rupture a hydraulic pressure equal to five times the maximum internal pressure achieved during operation		N/A
18.102.1.1	The method of test and the number of samples was be agreed between manufacturer and the testing authority..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
18.102.1.2	After the test of 18.102.1, the hydraulic pressure was increased until rupture occurs		N/A
	The rupture occurred at the bellows or diaphragm or other part, that is within the switch head or control enclosure		N/A
18.102.2	The control did not leak or rupture when heated to 1.2 times the maximum temperature of sensing element		N/A
18.102.3	When the bellows or diaphragm of a separate sample is deliberately punctured with a sharp, pointed metal rod, liquid metal was contained in the switch head or control enclosure		N/A
18.102.4	Acceptability of rupture evaluated in the appliance		N/A

19	THREADED PARTS AND CONNECTIONS		P
19.1	Threaded parts to be moved during mounting or servicing		N/A
19.1.1	Treaded parts, electrical or otherwise which are likely to be operated while the control is being mounted or during servicing, withstand the mechanical stresses occurring in normal use.		N/A
19.1.2	Threaded parts: easily replaceable if completely removed		N/A
19.1.3	Metric ISO thread or thread of equivalent effectiveness.....:		N/A
19.1.4	Screw generating a thread:		N/A
	- thread cutting type screw not used		N/A
	- thread forming (swaging) type screws		N/A
19.1.5	Space threaded type screws: provided with means to prevent loosening		N/A
19.1.6	Threaded parts of non-metallic material not used if replacement by a dimensionally similar metal screw could impair compliance with Cl. 13 or 20:		N/A
19.1.7	Threaded parts: not of soft material or material liable to creep		N/A
19.1.8	Screws operating in a non-metallic thread: correct introduction of the screw into its counterpart ensured		N/A
19.1.9	In-line cord controls, threaded parts transmitting contact pressure:		N/A
	- diameter < 3 mm: threaded part of metal		N/A
	- diameter ≥ 3 mm: non-metallic allowed, but not used for electrical connection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
19.1.10	Compliance was checked by Clauses 19.1.1 to 19.1.9 inclusive by inspection and by the test of Clauses 19.1.11 to 19.1.15		N/A
19.1.11	Threaded parts tightened and loosened:		N/A
	- one of threaded parts non-metallic material: 10 times		N/A
	- both parts of metallic material: 5 times		N/A
19.1.12	Screws in thread of non-metallic material: completely removed and reinserted each time		N/A
	Terminal screws and nuts: conductor fitted in the terminal (used in 10.1.4 or 10.2.1); cross-sectional area (mm ²)		—
19.1.14	Conductor moved each time the threaded part is loosened		N/A
	- no damage impairing the further use of the threaded part		N/A
	- no breakage of screws		N/A
	- no damage to the slot head or washers		N/A
19.1.15	Torque test made by means of a suitable test screwdriver, spanner or key, applying a torque without jerks according to Table 20		N/A
19.2	Current-carrying connections		P
19.2.1	- Not disturbed by mounting or servicing capable of withstanding the stresses in normal use.		P
19.2.2	- subjected to torsion in normal use locked against movement		N/A
19.2.3	Contact pressure:		P
	- not transmitted through non-metallic material, or		P
	- sufficient resilience in the metallic part		N/A
19.2.4	Space threaded screws:		N/A
	- screws clamp current-carrying parts directly in contact with each other		N/A
	- provided with means of locking		N/A
19.2.4.1	- used to provide earthing continuity: at least two screws used for each connection		N/A
19.2.5	Thread cutting screws: screws produce a full-form standard machine screw thread		N/A
19.2.5.1	Thread cutting screws used to provide earthing continuity: at least two screws used for each connection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
19.2.6	Current-carrying connection whose parts rely on pressure for correct function: resistant to corrosion (not inferior to that of brass)		P
	If not plated, e.g. bimetallic blades: parts are clamped into contact with parts resistant to corrosion		N/A

20	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
	PCB: coating conforming requirement of IEC 60664-3 for type 2:		N/A
	PCB: coating meets requirements of 20.3		N/A
	PCB: creepage and clearance between conductors prior to coating does not exceed permissible values in Table 1 of IEC 60664-3:2003 (see Annex Q)		N/A
	Creepage and clearance between terminals for the connection of external conductors used for factory attachment or connection to ELV circuits is not less than 2 mm		N/A
	Creepage distances, clearances and distances through solid insulation in switch mode power supplies and other high frequency switching circuits where the fundamental frequency is above 30 kHz and less than 10 MHz are dimensioned in accordance with IEC 60664-4		N/A
20.1	Clearances		P
	Clearances are not less than case A from Table 22 taking into account the pollution degree and the rated impulse voltage required to serve the overvoltage categories of Table 21.....:	See attached Table 20	P
	Smaller distances used for basic insulation and functional insulation meet the impulse withstand requirement of Cl. 20.1.12; being rigid and construction is such that there is no likelihood of the distances being reduced by distortion or by movement of the parts; but the clearance is not less than the values for case B from Table 22		N/A
20.1.1	Basic Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7		P
20.1.1.1	Supplied from dedicated battery which has no provision for charging an external mains supply		N/A
20.1.2	Functional Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7, or	See attached Table 20	P
	For electronic controls Cl. H27.1.3 met		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
20.1.3	Methods of measurement: Annex B and Fig. 17		P
20.1.3.1	Controls with equipment inlet and/or socket-outlet with connector / plug inserted and without		N/A
20.1.3.2	Controls with terminals for external conductors: without conductors and with conductors of largest cross-sectional area (mm ²) (Cl. 10.1.4)		—
20.1.3.3	Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm ²) (Cl. 10.2.1) .:	Receptacle of flat quick-connection termination with 1.5 mm ² wire	—
20.1.4	Distances through slots or openings of insulating material measured to metal foil in contact with the surface, foil pushed into corners with test finger shown in Figure 2		N/A
20.1.5	Standard test finger applied to apertures as specified in Cl. 8.1: distances between live parts and metal foil not reduced below required values		N/A
20.1.6	Force (standard test finger) applied in an endeavour to reduce distances:		N/A
20.1.6.1	- 2 N force applied by standard test finger to any point on bare live parts accessible before control is mounted	Internal live parts	P
	- 30 N force applied by standard test finger to accessible surfaces after control mounted.....		N/A
20.1.7	For basic and functional insulation, smaller distances permitted but no less than values specified in Case B of Table 22, provided that:		N/A
	- control meets the impulse test, Clause 20.1.12 and all parts are rigid and secure		N/A
	- no likelihood of the distance being reduced by distortion, by movement of the parts, or during assembly		N/A
	Impulse voltage applied across clearance of functional insulation		N/A
20.1.7.1	For micro-disconnection and micro-interruption:		P
20.1.7.2	Full disconnection – values from Table 22, case A applies to parts separated by switching element including contacts.....		N/A
20.1.8	Clearances of supplementary insulation: not less than basic insulation, Table 22, case A.....		N/A
20.1.9	Clearances of reinforced insulation: not less than those in Table 22, case A using the next higher step for rated impulse voltage	See attached Table 20	N/A
20.1.10	Clearances of functional and basic insulation on secondary side in controls supplied from a double insulated transformer comply with Table 21 based on the secondary voltage.....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clearances in controls supplied from a transformer without separate windings; rated impulse determined from Table 21.....:		N/A
20.1.11	ELV circuits derived from supply using protective impedance, clearance of functional insulation determined from Table 21 and based on maximum working voltage in the ELV circuit.....:		N/A
20.1.12	Impulse voltage test, CI 6.1.2.2.1 of IEC 60664-1:2007 applied between live parts and metal separated by basic or functional insulation (V)		N/A
20.1.13	For earthed secondary winding of a transformer, (or an earthed screen between windings) clearances on the secondary side: basic insulation > limits in Table 22 but using the next lower step for rated impulse voltage		N/A
	For circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage		N/A
20.2	Creepage distances		P
20.2.1	Creepage distances for basic insulation, per Table 23 for the rated voltage and based on material group and pollution degree		P
	- measurements	See attached Table 20	P
	- 2 N force applied by standard test finger to bare conductors		P
	- 30 N force applied to accessible surfaces applied by standard test finger		N/A
20.2.2	Creepage distance for functional insulation, per Table 24 for working voltage and based on material group and pollution degree		P
	- measurements	See attached Table 20	P
	- 2 N force applied by standard test finger to bare conductors		P
	- 30 N force applied to accessible surfaces applied by standard test finger		N/A
20.2.3	Creepage distance for supplementary insulation: not less than basic insulation - based on material group and pollution degree		N/A
20.2.4	Reinforced insulation: double the value of basic insulation - based on material group and pollution degree		N/A
20.3	Solid Insulation		N/A
	Solid insulation is capable of durably withstanding electrical and mechanical stresses as well as possible thermal and environmental influences		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
20.3.2	For working voltages $\leq 300V$, supplementary and reinforced insulation between metal parts		N/A
	- minimum 0.7mm thick; measured (mm).....:		N/A
20.3.2.1	Insulation is applied in thin sheet form, other than mica or similar scaly material		N/A
	- the supplementary insulation consists of at least two layers and each layer complies with Cl. 13.2 for supplementary insulation		N/A
	- the reinforced insulation consists of at least three layers and any two layers complies with Cl. 13.2 for reinforced insulation		N/A
20.3.2.2	The supplementary insulation or reinforced insulation is inaccessible and meets one of the following:		N/A
	- maximum temperature measured per Cl. 27 and H.27 doesn't exceed permissible values in Table 13		N/A
	- conditioned insulation complies with Cl. 13.2 at the oven and room temperatures.....:		N/A
	For optocouplers, the conditioning procedure carried out at a temperature of 25 K in excess of the maximum temperature measured on the optocoupler during the tests of Clauses 14, 27 and H.27 while operated under the most unfavourable conditions which occur during these tests		N/A

21	RESISTANCE TO HEAT, FIRE AND TRACKING		P
21.1	All non-metallic parts of the control were resistant to heat, fire and tracking.		P
21.2	Integrated, incorporated and in-line cord controls		—
21.2.1	Accessible parts (control correctly mounted):		N/A
	- ball-pressure test 1 (G.5.1) at temperature (°C) ..:		—
	diameter of the impression $\leq 2.0mm$ (mm)		N/A
	- glow-wire test (G2.) at 550 °C		N/A
21.2.2	Parts retaining current-carrying parts in position (other than electrical connections):		N/A
	- ball-pressure test 2 (G.5.2) at temperature (°C) ..:		—
	diameter of the impression $\leq 2.0mm$ (mm)		N/A
	- glow-wire test (G2.) at 550°C		N/A
21.2.3	Parts maintaining or retaining electrical connections in position:		P
	- ball-pressure test 2 at temperature (°C).....:	210°C for bakelite enclosure	—
	diameter of the impression $\leq 2.0mm$ (mm)	1.12mm	P
	Glow-wire temperature levels according to IEC 60695-2-11		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- glow-wire test (G2.) at 650 °C		N/A
	- glow-wire test (G2.) at 750 °C		N/A
	- glow-wire test (G2.) at 850 °C	for bakelite enclosure	P
21.2.4	Other parts (except small parts unlikely to be ignited):		N/A
	- glow-wire test (G2.) at 550 °C		N/A
21.2.7	Resistance to tracking:		P
	Test procedure, see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 1, requirement 30.....	Bakelite: 175V	P
	Controls designed for operation at ELV levels were not subjected to a tracking test.		P
21.3	Independently-mounted controls		N/A
21.3.1	Preconditioning		N/A
	Controls without T rating:		N/A
	- circuit of switching part and driving mechanism not connected, detachable parts (covers) removed		N/A
	- temperature (°C): (80 ± 2) °C, 1 x 24 h		—
	Controls with T rating up to 85°C:		N/A
	- switching circuit and driving mech.- not connected, without covers: temperature (°C): (80 ± 2)°C, 1 x 24 h.....		—
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h.....		—
	Controls with T rating higher than 85 °C:		N/A
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h.....		—
21.4	Controls with mercury-tube switch, subjected to short-circuit test:		N/A
	- working voltage, ac/dc		—
	- maximum power rating (VA)		—
	- short-circuit current (A)		—
	- fuse rating (A)		—
	- no ignition of cotton placed around openings		N/A
	- no emission of flame or molten metal (except mercury from the enclosure housing the switch)		N/A
	- wiring not damaged except tube leads		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
22	RESISTANCE TO CORROSION		N/A
22.1.1	Ferrous parts protected against corrosion	Nickel plated steel	P
22.1.2	Test not required on temperature sensing elements and other component parts adversely affected by protective treatment		P
22.1.4	Control or parts stored in a humidity cabinet for 14 days:		N/A
	- temperature (°C): (40 ± 2) °C		—
	- relative humidity (%): 93-97%		—
22.1.5	Control or parts dried in a heating cabinet: for 10 min:		N/A
	- Temperature (°C): (100 ± 5) °C		—
	After parts were dried: no evidence of corrosion on surfaces		N/A
22.1.6	Traces of rust on sharp edges and yellowish film that was removable by rubbing were ignored		N/A

23	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – EMISSION		N/A
23.1	Free-standing and independently mounted controls, which cycle during normal operation, are so constructed that they do not generate excessive radio interference and were evaluated to:		N/A
	- CISPR 14-1 (in 4.2.3.3 of CISPR 14-1:2005, the value of 200 ms is replaced by 20 ms) and/or CISPR 22, class B or		N/A
	- to clauses 23.1.1 and 23.1.2 or		N/A
	- to show minimum time between contact operations during normal operation < 10 minutes		N/A
23.1.1	Electrical and thermal conditions for EMC test as specified in 17.2 and 17.3:		N/A
	- for sensing controls: rate of change is α_1 and β_1		N/A
	- For non-sensing controls: operated at the lowest contact operating speed.		N/A
	- inductive loads – pf 0.6; resistive loads – pf 1		N/A
23.1.2	Control operated for 5 cycles		N/A
	- duration of radio interference; < 20ms		N/A
23.2	Controls for ISM (Industrial, Scientific and Medical) equipment and free-standing, independently mounted and in-line cord controls for use with ISM equipment's comply with CISPR 11		N/A
23.101	Thermostats constructed so they do not generate radio interference for a time period exceeding 20 ms		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
23.101.1	Three untested sample subjected to the test		N/A
	Thermal and electrical conditions acc. to 17.2 and 17.3, except		N/A
	Test conducted at the lowest declared voltage and lowest declared current (table 7.2, requirement 108)		N/A
	The rate of temperature change are $\alpha 1$ and $\beta 1$		N/A
	If not declared; 1 K/15 min for sensing elements in gases 1 K/min for sensing elements in other media :		N/A
	For controls declared for use with inductive loads, the power factor is 0.2		N/A
	For controls declared for use with purely resistive loads, the power factor is 1.0		N/A
23.101.2	Test procedure		N/A
	Five cycles of operation with the contacts opening and five cycles of operation with contacts closing		N/A
	The duration of radio interference is measured by an oscilloscope connected to the control so as to measure the voltage drop across the contacts		N/A

24	COMPONENTS		N/A
24.1	Transformers intended to supply power to a SELV-circuit or PELV-circuit are of the safety isolating type and comply with the relevant requirements of IEC 61558-2-6		N/A
	Capacitors connected between two lines conductors for between a line conductor and the neutral or between hazardous live parts and protective earth are in accordance with IEC 60384-14 and used in accordance with its rated values		N/A
	Fuses comply with requirements of IEC 60127-1 or IEC 60269-1		N/A
24.1.1	Controls that incorporate a transformer as the source of supply to a SELV-circuit or PELV-circuit were subjected to an output test with the primary energized at the upper limit of the rated voltage		N/A
	Switch mode power supplies or transformers used in converters comply with the requirements of IEC 61558-2-16		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Under any non-capacitive conditions of loading (from no load to the short-circuiting of any or all secondary SELV- or PELV-circuit terminals) and without disturbing internal connections, the secondary output voltage did not exceed limits specified in 2.1.5		N/A
	The secondary output power at the terminals to an isolated limited secondary circuit did not exceed 100 VA and the secondary output current did not exceed 8 A after 1 min of operation with overcurrent protection.....:		N/A
24.2	Components other than those of 24.1: checked when carrying out the tests of this standard or/and complies with appropriate safety standard.....:	See attached TABLE 24.1 / 24.2	N/A
24.3	Annex U not applicable to relays used as components in a control.....:		N/A
24.4.1	Overload test for switch mode power supplies not covered under 24.2.1		N/A
24.4.1.1	Each output winding, or section of tapped winding, is overloaded in turn, one at a time, while the other windings are kept loaded or unloaded, whichever load conditions of normal use is the least favourable		N/A
24.4.1.2	The overload is carried out by connecting a variable resistor (or an electronic load) across the winding or the rectified output		N/A
	The resistor is adjusted as quickly as possible and readjusted after 1 min to maintain the overload		N/A
	No further readjustments are done after that		N/A
24.4.1.3	Any protective devices such as a fuse, manual reset circuit protector, thermal protector, etc. remained in the circuit		N/A
24.4.1.4	When overcurrent protection is provided by a current-breaking device, the overload test current is the maximum current which the overcurrent protection device is just capable of passing for 1 h		N/A
24.4.1.5	When no overcurrent protection is provided, the maximum overload is the maximum power output obtainable from the power supply		N/A
24.4.1.6	In case of voltage fold-back, the overload was slowly increased to the point where the output voltage drops by 5 %. The overload is then established at the point where the output voltage recovers and held for the duration of the test:		N/A
24.4.1.7	The duration of the test was 1 h or until ultimate results are reached, (h).....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
24.4.1.8	The maximum open-circuit voltage of each winding (directly at the winding of the transformer) and the maximum load current are measured and recorded such that the maximum output power may be determined.....	See attached Table 24.4.1.8-24.4.1.10	N/A
24.4.1.9	The maximum open circuit voltage measurements was made during normal operation and under single component failure.....	See attached Table 24.4.1.8-24.4.1.10	N/A
24.4.10	For SELV applications, where the maximum open circuit voltage measured directly at the secondary of the transformer exceeds the limits specified in 2.1.5, the measurement of the maximum output voltage of each winding may be made after certain protective impedances	See attached Table 24.4.1.8-24.4.1.10	N/A
24.4.1.11	While still in heated condition, the transformer was subjected to electric strength test of 13.2		N/A
24.5	Annex J is not applicable to thermistors used in controls that are declared to be Type 1 action, SELV/PELV and low power specified in H.27.1.1.1		N/A

25	NORMAL OPERATION		N/A
	Meets requirements per annex H	See annex H	N/A
25.2	Over-voltage and under-voltage test (for controls incorporating electro-magnets).....		N/A

26	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – IMMUNITY		N/A
	Meets requirements per Cl. H.26.....		N/A

27	ABNORMAL OPERATION		N/A
27.2	Burnout test (for controls incorporating electro-magnets)		N/A
27.2.1	Control mechanism blocked in position when control is de-energized:		N/A
	- energized at rated frequency and rated voltage (17.2.2, 17.2.3 and 17.2.3.2)		N/A
	- duration: 7 h or until burnout		N/A
27.2.2	Compliance (burnout test):		N/A
	- no emission of flame or molten metal after test		N/A
	- no evidence of damage impairing compliance with this standard		N/A
	- no evidence of dielectric breakdown (Cl. 13.2)		N/A
27.2.3	Blocked mechanical output test (abnormal temperature test)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During blocked output test: Temperatures did not exceed indicated limits in Table 26.....:	See attached TABLE 27.2.3	N/A
	Test not required on controls, if no protective device cycles and temperatures exceed limits in Table 13		N/A
	Test carried out at room-temperature and rated voltage (V) for 24h		N/A
27.2.3.2	The average temperature was within the limits during both the second and the twenty-fourth hours of the test		N/A
27.2.3.3	During the test, power was continually supplied to the motor		N/A
27.2.3.4	Immediately upon completion of the test, the motor was capable of withstanding the electric strength test (Clause 13)		N/A
27.5	Overload tests		N/A
	Controls without protective devices and without incorporated fuses loaded for 1 h with the conventional tripping current for the fuse, anticipated during installation	Shall be considered in the end product.	N/A
	Controls protected by protective devices (including fuses) loaded such that an overload current of 0.95 times the protective device rating flows through the circuit for 4 hours or until temperatures stabilize, whichever is shorter		N/A
	Controls protected by incorporated fuses -fuses shunted by links of negligible impedance -control loaded to 2.1 times the rated current of the fuse - temperature rise measured after the control has been loaded for 30 min. - values 2,1 times can be de-rated by 0,5 %K if test is carried out at a higher temperature compared to normal room temperature		N/A
	Controls protected both by incorporated fuses and by protective devices loaded to the lowest load (most onerous) of either test method		N/A
	Controls protected by protective devices which will short-circuit only in case of overload are tested both as controls with protective devices and as controls without protective devices.....:		N/A
27.5.2	Overload tests carried out on in-line cord controls as indicated in 11.10.2 and provided with a plug and socket outlet		N/A
27.5.3	For controls not covered by 27.5.2		N/A
27.6	Battery short-circuit test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Batteries that can be removed without the aid of a tool and terminals that can be short-circuited by a thin straight bar are subjected to a short-circuit condition across its terminals with the battery being fully charged, for 1 h or ultimate condition exists.		N/A
27.6.1	Compliance: - no emission of flame or molten metal and no evidence of damage to the control - requirements of 13.2 met		N/A

28	GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION		N/A
	Meets requirement per annex H.....:		N/A

A	ANNEX A – (NORMATIVE) INDELIBILITY OF MARKING		P
A.1	Classification of markings		P
A.1.1	Markings which are not mandatory		N/A
A.1.2	Markings which are mandatory but not accessible to the final user	Moulding	P
A.1.3	Markings which are mandatory and accessible to the final user		N/A
A.1.4	Permanence of marking test		P
	- solvents: neutral liquid detergent or 2% deionized (distilled) water with specified solvent.....:		—
	- solvents: n-hexane.....:		—
	- solvents: deionized (distilled) water.....:		—
A2	Test of indelibility of markings classified in A1.2		P
A2.1	Drops of detergent standing on the marked surface, duration (h): 4 h.....:		—
	Drops removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping.....:		—
A2.2	Allowed to dry completely at (25 ± 5) °C.....:		—
A2.3	Rubbed in the apparatus (Fig. 8) with dry lint, weight 250 g, duration (s): 15 s		P
A2.4	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 250 g, duration (s): 15 s		P
A2.6	Marking after these tests still legible		P
A3	Test of indelibility of markings classified A.1.3		P
A3.1	Rubbed in the apparatus (Fig. 8) with dry lint, weight 750 g, duration (s): 15 s		P

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Clause	Requirement + Test	Result - Remark	Verdict
A3.2	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 750 g, duration (s): 15 s		P
A3.3	Drops of detergent standing on the marked surface: duration (h): 4 h	4	—
	Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping.....	40	—
A3.4	After sample was dried, marking rubbed (apparatus Fig. 8) with detergent soaked lint, weight 750 g, duration (s): 15 s		P
A3.5	Marking rubbed in apparatus with petroleum spirit soaked lint, weight 750 g, duration (s): 15 s		P
A3.7	Marking after these tests still legible		P
B	ANNEX B – (NORMATIVE) MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES IN AIR		N/A
	For determining and measuring creepage distances and clearances, principles per Annex B were applied		N/A
C	ANNEX C – (NORMATIVE) COTTON USED FOR MERCURY SWITCH TEST		N/A
	(not applicable for CENELEC countries)		N/A
C2	Absorbent cotton made from corded fibres, bleached white, free from adhering impurities and fatty material, meeting all requirements in Annex C used for the test		N/A
D	ANNEX D – (INFORMATIVE) HEAT, FIRE AND TRACKING		N/A
	Canada and USA national difference	See attached information	N/A
E	ANNEX E – (NORMATIVE) CIRCUIT FOR MEASURING LEAKAGE CURRENT		N/A
	A suitable circuit for measuring leakage current was selected for tests		N/A
F	ANNEX F – (INFORMATIVE) FIRE HAZARD TESTING		P
	Information for controls integrated or incorporated into appliances according to the IEC 60335 series were considered		P
G	ANNEX G – HEAT AND FIRE RESISTANCES TESTS		P
G.2	Glow-wire test: Performed in accordance with IEC 60695-2-10 and IEC 60695-2-11.		P
G.4	Proof tracking test: Performed in accordance with IEC 60112.		P

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Clause	Requirement + Test	Result - Remark	Verdict
G.5	Ball pressure test: Performed in accordance with IEC 60695-10-2.		P
G.5.1	Ball-pressure test 1 (tests not to be made on parts of ceramic material and glass)		P
	Temperature during ball pressure, the higher of:		P
	- 20 ± 2 K in excess of the maximum temperature during test Cl. 14 or 17.14 (°C), if higher or..... :		—
	- $75 \pm 2^\circ\text{C}$, or :		—
	- as declared (°C) :		—
	Ball (steel) diameter: 5mm, force: 20N, duration: 1 h		P
G.5.2	Ball-pressure test 2 (tests not to be made on parts of ceramic material and glass)		P
	Temperature T_b during ball pressure:		P
	- T_b (°C): 100°C if $T_{\max} = 30$ to 54°C :		—
	- T_b (°C): 125°C if $T_{\max} = 55$ to 84°C :		—
	- T_b (°C): 125°C for controls to be incorporated in appliances (IEC 60335-1) :		—
	- T_b (°C): $(T_{\max} + 40)^\circ\text{C}$ if T_{\max} less than 85°C :	210°C	—
	- T_b (°C): 20 K in excess of the max. temperature during tests of Cl. 14 or 17.14 (°C), if higher :		—
	- Compliance with Annex H.27.1.1.3		P
	Ball (steel) diameter: 5mm, force: 20N, duration: 1 h		P

H	ANNEX H – REQUIREMENTS FOR ELECTRONIC CIRCUITS		N/A
H.6	Classification, additions:		—
H.6.4.3.13	- electronic disconnection on operation (Type 1.Y - 2.Y)..... :		N/A
H.6.9.5	- electronic disconnection		N/A
H.6.18	According to classes of control functions		N/A
H.6.18.1 – H.6.18.3	Class of control function (A, B, C)..... :		N/A
H.7	Information in addition to Table 1 provided		N/A
	36 - Replacement: limits of activating quantity for any sensing element over which electronic or micro-disconnection is secure; clause: 11.3.2, H11.4.16, H17.14, H18.1.5, H27.1.1, H.28; (Method: X) :		N/A
	52 - The minimum parameters of any heat dissipater (e.g. heat sink) not provided with an electronic control but essential to its correct operation; clause: 14; (Method: D) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	53 - Type of output waveform if other than sinusoidal; clause: H25; (Method: X)		N/A
	54 - Details of the leakage current waveform produced after failure of the basic insulation; clause: H27; (Method: X)		N/A
	55 - The relevant parameters of those electronic devices or other circuit components considered as unlikely to fail (see paragraph 1 of H27.1.1.4); clause: H27; (Method: X)		N/A
	56 - Type of output waveform(s) produced after failure of an electronic device or other circuit component (see item g) of H27.1.1.3); clause: H27; (Method: X)		N/A
	57 - The effect on controlled output(s) after electronic circuit component failure if relevant (item c) of H27.1.1.3); clause: H27; (Method: X) ... :		N/A
	58a - For integrated and incorporated electronic controls, if any protection against mains borne perturbations, magnetic and electro-magnetic disturbances is claimed, which of the tests of Cl. H26 must be performed and the effect on controlled output(s) and function after a failure to operate as a result of each test; clause: H26.2, H26.15; (Method: X)		N/A
	58b - For other than integrated and incorporated electronic controls, the effect on controlled output(s) and function after a failure to operate as a result of the tests of Cl. H26; clause: H26.2, H26.15; (Method: X)		N/A
	59 - Any component on which reliance is placed for electronic disconnection which is disconnected as required by footnote n to Table 12; clause: 13.2, H27.1; (Method: X)		N/A
	60 - Category (surge immunity); clause: H26.8.2, Annex R; (Method: X)		N/A
	66 - Software sequence documentation; clause: H11.12.2.9; (Method: X)		N/A
	67 - Program documentation; clause: H11.12.2.9, H11.12.2.12; (Method: X)		N/A
	68 - Software fault analysis; clause: H11.12, H27.1.1.4; (Method: X)		N/A
	69 - Software class(es) and structure; clause: H.11.12.2, H.11.12.3, H.27.1.2.2.1, H.27.1.2.3.1; (Method: D)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	70 - Analytical measures and fault/error control techniques employed; clause: H.11.12.1.2, H.11.12.2.2, H.11.12.2.4; (Method: X)		N/A
	71 - Software fault/error detection time(s) for controls with software Classes B or C; clause: H2.17.10, H11.12.2.6; (Method: X)		N/A
	72 - Control response(s) in case of detected fault/error; clause: H.11.12.2.7; (Method: X)		N/A
	73 - Controls subjected to a second fault analysis and declared condition as a result of the second fault; clause H.27.1.2.3; (Method: X)		N/A
	74 - External load and emission control measures to be used for test purposes; clause H.23.1.1; (Method: X)		N/A
	91 - Fault reaction time; cl. H.2.23.2, H.27.1.2.2.2, H.27.1.2.2.3, H.27.1.2.3.2, H.27.1.2.3.3, H.27.1.2.4.2, H.27.1.2.4.3; (Method: X)		N/A
	92 - Class or classes of control function(s); clause H.6.18, H.27.1.2.2, H.27.1.2.3; (Method: X)		N/A
	93 – Maximum number of reset actions within a time period; H.11.12.4.3.6, H.11.12.4.3.6; (Method: D)		N/A
	94 – Number of remote reset actions; H.17.1.4.3; (Method: X)		N/A
H.8	Protection against electric shock		N/A
H.8.1.10	Accessible parts separated from the supply by protective impedance; identification of circuit		—
H.8.1.10.1	Maximum current between accessible parts and the protective earth conductor in normal configuration and with supply poles interchanged:		N/A
	- 0.7 mA (peak value) a.c.; current (mA)		N/A
	- 2 mA d.c.; current (mA)		N/A
	- if frequency $f > 1$ kHz: current (mA): $0.7 \times f$ (kHz) < 70 mA; f (kHz)		N/A
	Maximum capacitance		N/A
	- peak value (V)		N/A
	- $42.4 \text{ V} < V \leq 450 \text{ V}$ capacitance C (μF): $\leq 0.1 \mu\text{F}$		N/A
	- $450 \text{ V} < V \leq 15 \text{ kV}$: capacitance C (μF): $C \times V \leq 45 \mu\text{C}$; calculated C_{max} (μF)		N/A
	- $V > 15 \text{ kV}$: capacitance C (μF): $C \times V^2 \leq 350 \mu\text{J}$; calculated C_{max} (μF)		N/A
H.11	Constructional requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
H.11.2.5	Protection against electric shock – protective impedance (chain):		N/A
	- consists of at least 2 impedances in series		N/A
	- connected between live and accessible parts		N/A
	- consists of components in which the probability of a reduction in impedance during life can be ignored and the possibility of a short circuit is negligible		N/A
	- type of resistors (Table H.24 footnote c)		N/A
	- resistors comply with IEC 60065:2001, Amendment 1:2005, cl. 14.1		N/A
	- capacitors comply with IEC 60384-14, class Y		N/A
	Requirements of H.8.1.10 still met: leakage current (mA)		N/A
H.11.4	Actions:		N/A
H.11.4.16	- Type 1.Y and 2.Y action provides electronic disconnection.		N/A
H.11.4.16.1	Test carried out with control:		N/A
	- connected to maximum load		—
	- supplied with rated voltage (V)		—
	- at temperature T_{max} (°C)		—
H.11.4.16.2	Current through electronic disconnection not exceeding the lower of:		N/A
	- 5 mA (mA)		N/A
	- 10% of the rated current (mA)		N/A
H.11.12	Controls with software Class B or C	See IEC 60730-1 Software Report	N/A
H.17	Endurance		N/A
H.17.1	General requirements		N/A
H.17.1.4	Electronic controls with Type 1 action: no endurance test (unless necessary for testing of associated components)	Type 1	N/A
H.17.1.4.1	Electronic controls with Type 2 action: thermal cycling test (H.17.1.4.2) executed		N/A
H.17.1.4.2	Thermal cycling test: conditions forming the basis of the test:		N/A
	a) Duration (h)		—
	b) Electrical conditions:		—
	- loaded, according to manufacturer's declaration .:		—
	- voltage (V): 1.1 times V_r		—
	- for 30 min. of each 24 h period: voltage (V): 0.9 times V_r		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- during each 24 h period: duration of supply switched off (s); 30 s		—
	- change of voltage not synchronized with change of temperature		—
	c) Thermal conditions: temperature (ambient and/or mounting surface) varied between:		—
	- T_{\max} (T_s max) (°C)		—
	- T_{\min} (T_s min) (°C)		—
	- rate of change: 1 °C/min		—
	- extremes maintained: 1 h		—
	d) Rate of operation: cycled at the fastest rate possible, max. 6 cycles/min) (cycles/min)		—
	If operational mode to be set by the user:		N/A
	- 1/3 test period: maximum setting		N/A
	- 1/3 test period: intermediate setting		N/A
	- 1/3 test period: minimum setting		N/A
	According to these requirements:		—
	- duration of heating period (h)		—
	- duration of maintaining max.temperature (h)		—
	- duration of cooling period (h)		—
	- duration of maintaining min. temperature (h)		—
	- duration of 1 complete cycle (h)		—
	- total number of cycles executed		—
H.17.1.4.3	Controls with remote reset actions		N/A
	Independently mounted devices: test for a minimum 1000 reset actions.....		N/A
	Integrated/Incorporated devices: minimum reset cycles as declared by the manufacturer.....		N/A
	After the test, the reset device can rest the system as intended		N/A
	Unintended resets did not occur.		N/A
H.17.14	Evaluation of compliance: For types 1.Y and 2.Y controls, Clause H.11.4.16 met		N/A
H.18	Mechanical Strength		N/A
H.18.1.5	For controls providing electronic disconnection (type 1.Y or 2.Y), the requirements of H.11.4.16 were met		N/A
H.20	Creepage distances, clearances and distances through insulation		N/A
H.20.1.15	Electronic controls		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
H.20.1.15.1	Spacing between live parts (supply) and accessible surfaces and parts		N/A
H.20.1.15.2	Across protective impedances: double or reinforced insulation		N/A
	Across each component: supplementary insulation		N/A
H.20.1.15.3	Providing functional insulation		N/A
H.23	Electromagnetic compatibility (EMC) requirements – Emission		N/A
H.23.1	Electronic controls do not emit excessive electric or electromagnetic disturbances		N/A
H.23.1.1	Low frequency emission, disturbances in supply systems: controls other than integrated or incorporated that directly control an external load except pilot duty: comply with IEC 61000-3-2 and IEC 61000-3-3.		N/A
H.23.1.2	Radio frequency emission: free-standing, independently mounted and in-line cord controls using software, oscillating circuits, etc. comply with CISPR 14-1 and/or CISPR 22, Class B, as in Table H.12		N/A
	Free-standing, independently mounted and in-line cord controls for use with ISM equipment comply with CISPR 11		N/A
	For integrated and incorporated electronic controls test carried out under declared conditions if so requested by the manufacturer		N/A
H.25	Normal operation		N/A
H.25.1	The output waveform of electronic controls was as declared		N/A
	The output waveform of the control was examined under all normal operating conditions and was either sinusoidal or as declared in Table 1, requirement 53		N/A
H.26	Electromagnetic compatibility (EMC) requirements – Immunity		N/A
H.26.1	Electronic controls are so constructed as to withstand the effects of mains-borne perturbations and electromagnetic phenomena which occur in normal use		N/A
	The EMC requirements of the part 1 are met in addition to the following :		N/A
H.26.2.101	After each test, one or more of the following criteria in Table H.101 applied to the control		N/A
H26.2.102	The control remained in its current condition and thereafter continued to operate as declared within the limits verified in clause 15, if applicable		N/A
H26.2.103	The control assumed the condition declared in tab. 1, req. 109 and thereafter operated as in H26.2.102		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
H26.2.104	The control assumed the conditions declared in tab. 1, req. 109 - such that it cannot be reset automatically or manually. The output wave form was sinusoidal or as declared in Tab. 1, req. 53		N/A
H26.2.105	The control remained in the condition declared in tab. 1, req. 109. A non-resetting control can only reset manually. After the temperature which caused cut-out to occur was removed, it operated as in H26.2.102 or remained in the declared condition as in H26.2.104		N/A
H26.2.106	The control may return to its initial state and thereafter operated as in H26.2.102		N/A
H26.2.107	The output and functions were as declared in tab. 1, req. 58a or 58b and the control complied with the requirement of 17.5		N/A
H.26.5	Voltage dips, voltage interruptions and voltage variations in the power supply network		N/A
H.26.5.2	Voltage variation test		N/A
H26.5.2.2	Test procedure		
H.26.5.2.2	The control subjected to each of the specified voltage test cycles three times with 10 s intervals between each test cycle		N/A
	Control declared under Table 1, req 109, each test cycle performed 3 times when control is in the declared condition and when it is not.		N/A
H.26.8	Surge immunity test conducted in accordance with IEC 61000-4-5		N/A
H26.8.3	Test procedure		N/A
H26.8.3.101	For controls declared under tab. 1 req. 109, the tests are performed when the control is in the declared condition and when it is not:		N/A
H.26.9	Fast transient burst test: conducted in accordance with IEC 61000-4-4		N/A
H26.9.3	Test procedure		N/A
H.26.9.3.101	For controls declared under tab. 1, req. 109, the tests are performed when the control is in the declared condition and when it is not:		N/A
H.26.10	Ring wave immunity test: (U.S. and Canada difference)		N/A
H26.10.5	Test procedure		N/A
H26.10.5.101	For controls declared under tab.1, req. 109, the tests are performed when the control is in the declared condition and when it is not		N/A
H.26.12	Radio-frequency electromagnetic field immunity		N/A
H.26.12.2	Immunity to conducted disturbances		N/A
H.26.12.2.2	Test procedure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
H26.12.2.2.101	For controls declared under tab.1, req. 109, sweeping performed when the control is in the declared condition and when it is not		N/A
H.26.12.3	Immunity to radiated disturbances		N/A
H.26.12.3.2	Test Procedure		N/A
H.26.12.3.2.101	For controls declared under Table 1, req. 109, sweeping is performed when the control is in the declared condition and when it is not		N/A
H.26.13	Test of influences of supply frequency variations in accordance with IEC 61000-4-28		N/A
H.26.13.3	Test Procedure		N/A
H.26.13.3.101	For controls declared under Table 1, req. 109 the test is performed when the control is in the declared condition and when it is not.		N/A
H.26.14	Power frequency magnetic field immunity test in accordance with IEC 61000-4-8		N/A
H.26.14.3	Test Procedure		N/A
H.26.14.3.101	For controls declared under Table 1, item 109, the test is performed when the control is in the declared condition and when it is not.		N/A
H.26.15	Evaluation of compliance		N/A
H.26.15.2	In addition, the control met the requirements of table H.101		N/A
H.26.15.4	In addition, the control met the requirements of table H.101		N/A
H.27	Abnormal operation		N/A
H.27.1	Electronic controls – assessment against internal faults		N/A
H.27.1.1.1	Fault conditions specified in H.27.1.1.5 not applied if:		N/A
	- electronic circuit is a low-power circuit and		N/A
	- protection against electric shock, fire hazard or dangerous malfunction does not rely on the correct functioning of the electronic circuit		N/A
	- measurement of low-power circuit according to Cl. H.27.1.1.1 :	See attached Table H.27.1.1.1	N/A
	- circuit under evaluation :		N/A
	- max. power consumed by the variable resistor (W): ≤ 15 W, 5 s :		N/A
	Electronic circuits operating to ensure compliance with Cl. H.27: relevant test to be repeated with a single fault simulated as indicated in H.27.1.4, items 1) to 5)		N/A
H.27.1.1.2	Operating conditions:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) at most unfavourable voltage (V): range: 0.9-1.1 times VR :		N/A
	b) load producing the most onerous effect: kind of load; significant values..... :		N/A
	c) ambient temperature (°C): (20 ± 5) °C or other. :		N/A
	d) fuse (supply), rating (A) such that test result not influenced by operation of the fuse..... :		N/A
	e) actuating member set in most unfavourable position :		N/A
	Controls declared under req. 109 of tab. 1 tested when the control is in declared condition and when it is not		N/A
H.27.1.1.3	Requirements, evaluation of compliance:		N/A
	a) no emission of flames or hot metal or hot plastics		N/A
	b) temperature of supplementary and reinforced insulation:		N/A
	- not exceeding 1.5 times value specified in Cl. 14		N/A
	- exception: thermoplastic material		N/A
	c) change in the output as declared in Table 1, requirement 57		N/A
	d) control continuous to comply with requirements of Cl. 8 and Cl. 13		N/A
	e) no deterioration of parts that would result in failure to comply with requirements of Cl. 20		N/A
	f) no rupture of fuse use supply, or		N/A
	- rupture with operation of an internal protecting device		N/A
	Internal protecting device not required since sample, after replacement of the fuse in the supply, complied:		N/A
	- with a), b) and d) of H.27.1.1.3		N/A
	- with requirements of Cl. 20 for accessible distances from active parts to accessible surfaces (control mounted as for its intended use)		N/A
	g) output waveform as declared in Table 1, requirement 56		N/A
H.27.1.1.5	Electronic circuit fault conditions per table H.24		N/A
H.27.1.1.6	Motor load, if failure or malfunction causes change in the supply waveform to the controlled motor:		N/A
	1) load (normal waveform) adjusted to 6 times rated load, or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- locked rotor rating declared		N/A
	2) fault conditions introduced		N/A
	3) test conditions per H.27.1.2		N/A
	a) unfavourable voltage (V).....		N/A
	c) ambient temperature (°C).....		N/A
	d) fuse rating (A)		N/A
	e) actuating member		N/A
	evaluation of compliance per H.27.1.3 a) to e)		N/A
H.27.1.2	Protection against internal faults to ensure functional safety		N/A
H.27.1.2.1	Design and construction requirements		N/A
H.27.1.2.1.1	Fault avoidance and fault tolerance		N/A
	Controls incorporating control functions of class B or C are designed per H.27.1.2 taking into account the failure modes of Table H.24 and H.11.12 for software, if applicable		N/A
	The system configuration is either inherently failsafe		N/A
	Or, components with direct safety-critical functions are guarded by safeguards according to H.11.12 software class B or C,		N/A
	safeguards are built into hardware and can be supplemented by software		N/A
	safeguards can cause a completely independent safety-shut-down		N/A
	Time slot monitoring is sensitive to both an upper and a lower limit of the time interval		N/A
	In a class C control function if a single fault in a primary safeguard can render the safeguard inoperative, a secondary safeguard is provided		N/A
	The reaction time of the secondary safeguard is in accordance with Clause H.27.1.2.3		N/A
	Components are dimensioned on the basis of the worst-case conditions which can arise in the control, as stated by the manufacturer		N/A
H.27.1.2.1.2	Documentation		N/A
	The documentation is based on H.11.12.3.2		N/A
	The functional analysis of the control and the safety related programs under its control are documented in a clear hierarchical way in accordance with the safety philosophy and the program requirements		N/A
	Minimum documentation provided for assessment:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	A description of the system philosophy, the control flow, data flow and timings		N/A
	A clear description of the safety philosophy of the system with all safeguards and safety functions clearly indicated. Sufficient design information is provided to enable the safety functions or safeguards to be assessed		N/A
	Documentation for any software within the system		N/A
	Programming documentation is supplied in a programming design language declared by the manufacturer.....		N/A
	Safety related data and safety related segments of the operating sequence are identified and classified according to H.11.12.3.2		N/A
	There is a clear relationship between the various parts of the documentation		N/A
H.27.1.2.2	Class B control function		N/A
H.27.1.2.2.1	Design and construction requirements		N/A
	A class B control function is designed such that under single fault conditions it remains in or proceeds to the defined state.		N/A
	Software complies with software class B		N/A
	The assessment is performed according to H.27.1.2.2.2 and H.27.1.2.2.3 and under the test conditions and criteria of H.27.1.2.5		N/A
H.27.1.2.2.2	First fault		
	Any first fault (see Table H.24) in any one component or any one fault together with any other fault arising from that first fault results in either:		N/A
	a) the control becomes inoperative with all safety related output terminals de-energized or assumes a status in which they ensure a safe situation; or		N/A
	b) the control reacts within the fault reaction time (see Table 1, requirement 91) by proceeding to the defined state provided that a subsequent restart under the same fault conditions results in the system returning to the same defined state condition		N/A
	c) for systems with non-permanent operation, the control shall continue to operate as intended, the fault shall be detected during the next start-up sequence. The compliance criteria shall be a) or b);		N/A
	d) the control continues to operate as intended		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The fault reaction time declared by the manufacturer (see Table 1, requirement 91).....:		N/A
	For permanent operation as declared by the manufacturer (see Table 1, requirement 120).....:		N/A
	For the control function where a mechanical actuator is part of the defined state a test up to but not including the switching contacts is sufficient. If the test of the defined state fails, the control initiates the safety shut-down; frequency of test is as declared by the manufacturer		N/A
H.27.1.2.2.3	Fault introduced during defined state		N/A
H.27.1.2.3	Class C control function		N/A
H.27.1.2.3.1	Design and construction requirements		N/A
	A class C control function is designed such that under first and second fault conditions it remains in or proceeds to the defined state		N/A
	The assessment is performed according to H.27.1.2.3.2, H.27.1.2.3.3 and H.27.1.2.4 and under the test conditions and criteria of H.27.1.2.5.		N/A
H.27.1.2.3.2	First fault		N/A
	Any first fault (see Table H.24) in any one component or any one fault together with any other fault arising from that first fault results in either:		N/A
	a) the control becomes inoperative with all safety related output terminals de-energized or assumes a status in which they ensure a safe situation;		N/A
	b) the control reacting within the fault reaction time (see Table 1, requirement 91) by proceeding to defined state provided that subsequent reset from the lock-out condition under the same fault condition results in the system returning to the defined state condition;		N/A
	c) for systems with non-permanent operation, the control continues to operate as intended, the fault detected during the next start-up sequence where compliance criteria are a) or b).....:		N/A
	d) The control continues to operate as intended.		N/A
	The fault reaction time as declared by the manufacturer (see Table 1, requirement 91)		N/A
	For permanent operation as declared by the manufacturer (see Table 1, requirement 120)		N/A
H.27.1.2.3.3	Second fault		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Any further independent fault considered together with the first fault resulted in the conditions of H.27.1.2.3.2 a), b), c) or d).		N/A
	During assessment, for systems with non-permanent operation, the second fault is considered to occur when a start-up sequence has been performed after the first fault.		N/A
	During assessment, for systems with permanent operation, the second fault occurs 24 hrs after the first fault		N/A
	The control performed within the declared fault reaction time and satisfied the condition of H.27.1.2.3.2 c), if applicable.		N/A
H.27.1.2.4	Faults during defined state		N/A
H.27.1.2.5	Circuit and construction evaluation		N/A
H.27.1.2.5.1	Test conditions		N/A
	The fault is considered to have occurred at any stage in the control program sequence.		N/A
	The control is operated or considered to operate under the following conditions:		N/A
	a) at the most unfavourable voltage in the range 85 % to 110 % of the rated supply voltage (V)		—
	b) loaded with the most unfavourable load declared by the manufacturer		—
	c) in an ambient temperature of $(20 \pm 5) ^\circ\text{C}$, unless there are significant reasons for conducting the test at another temperature within the manufacturer's declared range; ($^\circ\text{C}$)		—
	d) with any actuating member placed in the most unfavourable position;		N/A
	e) with tissue paper placed on the supporting surface(s) of the control;		N/A
	f) with sparks of about 3 mm in length and having an energy of not less than 0,5 J applied to those components which are likely to liberate flammable gases during the test		N/A
H.27.1.2.5.2	Test criteria		N/A
	During the appraisal, it is verified that under the conditions described above, the following criteria are satisfied.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) The control does not emit flames, hot metal or hot plastics, the tissue paper does not ignite, no explosion results from the liberation of flammable gases and any flame does not burn for more than 10 s after switching off the spark generator		N/A
	When a control is incorporated with any appliance, any enclosure afforded by the appliance is taken into consideration		N/A
	b) If the control continues to function, it complies with Clauses 8 and 13 or Clauses 8 and 13 of the relevant part 2.		N/A
	If it ceases to function, it still continues to comply with Clause 8 or Clause 8 of the relevant part 2		N/A
	c) There is no loss of protective function		N/A
	After tests there is no deterioration of the various parts of the control that result in failure to comply with Clause 20 or Clause 20 of the relevant part 2.		N/A
H.27.1.2.5.3	Assessment		N/A
	A thorough appraisal of the circuit is carried out to determine its performance under the specified fault conditions. (This appraisal includes theoretical analysis and a component failure simulation test)		N/A
	Fault simulations may also be carried out to simulate faults within complex devices, e. g. EPROM emulation tests.		N/A
	Only the safety related software (software class B and C) as identified according to H.27.1.2.1.2 are subjected to further assessment. (For class identification a fault tree analysis may be used)		N/A
H.27.4	Electronic disconnection: withstands abnormal overvoltage conditions		N/A
H.27.4.1	- control loaded as indicated in Cl. 17.2; rated voltage (V)		—
	- control subjected to 1,15 x VR for 5 s during electronic disconnection; test voltage (V)		—
H.27.4.2	- control provides electronic disconnection as determined by the test of H.11.4.16.2		N/A

ANNEX J	REQUIREMENTS FOR THERMISTOR ELEMENTS AND CONTROLS USING THERMISTORS		N/A
J.4.2.5	Unless otherwise specified, representative samples as indicated in Table J.3 are subjected to the tests specified in J.17.8.		N/A
	New samples are used for all tests other than the overload and endurance test.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.4.3.2	The rated voltage (Vr) of a thermistor is the input voltage of a thermistor as declared by the manufacturer.		N/A
J.4.3.2.11	The electrical and thermal ratings of a thermistor are in accordance with Table J.4 and based on its intended application.		N/A
J.4.3.5.4.	Type 1 controls using thermistors as temperature sensing devices where self-heating is negligible are not subjected to the tests for thermistors.		N/A
J.4.3.5.4.1	Thermistors used in type 1 action controls that comply with IEC 60738 or IEC 60539 are subjected to the thermal runaway test of J.17.18.5 only.		N/A
	Compliance to IEC 60738-1 or IEC 60539 not required if thermistors comply with requirements of Annex J		N/A
J.4.3.5.101	For the purpose of declaring the number of endurance cycles in Table 1, requirement 64, thermistors were evaluated for the function performed in the control :		N/A
J.6.4.3.3	According to features of automatic action provide the equivalent of electronic disconnection and are classified as type 1.YJ or 2.YJ action.		N/A
J.6.15	According to construction, addition:		N/A
J.6.15.6	- control using NTC or PTC thermistors		N/A
J.6.15.7	Ceramic element		N/A
J.6.15.8	Polymer element		N/A
J.6.17	According to use of the thermistor, addition:		N/A
J.6.17.1	- thermistor control element		N/A
J.6.17.1.1	PTC current limiter		N/A
J.6.17.1.2	PTC motor starter		N/A
J.6.17.1.3	PTC degausser		N/A
J.6.17.1.4	NTC inrush current limiter		N/A
J.6.17.2	- self-controlled heater		N/A
J.6.17.3	- thermistor sensing element		N/A
J.6.17.3.1	PTC sensor		N/A
J.6.17.3.2	NTC sensor		N/A
J.7	Information, addition to Table 1		N/A
	J61 - according to the use of a thermistor; clause: J6.7; (Method: X) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	J62 - resistance/temperature characteristics; clauses: J15.7, J17.17.1, J12.2.1; (Method: X) :		N/A
	J63 - resistance/temperature characteristics drift; clause: J17.18.2; (Method: X) :		N/A
	J64 - Number of cycles; clause: J17.18.2; (Method: X) :		N/A
	J65 - Method of resistance/temperature measurements; clauses: J15.7, J17.18.1; (Method: X) :		N/A
	J82 – PTC current limiters where the maximum current is reduced to less than or equal to 8 A in less than or equal to 5 s; clauses: J15.7.6.1.1; (Method: X) :		N/A
J.11.3.10	Thermistors used in controls to provide functional safety or as controls to provide functional safety for a controlled application provide type 2 action (type 2.YJ), or		N/A
	- for other applications at least type 1.YJ		N/A
J.11.4.17	Type 1.YJ or 2.YJ action: operation provides an inherent change in resistance..... :		—
J.15.7	Calibration tests for PTC thermistors		N/A
J.15.7.1	Sequence of calibration tests of J.15.7.4 to J.15.7.8		N/A
	-ceramic thermistors (J.15.7.4 to J.15.7.8)		N/A
	-polymeric thermistors (J.15.7.5, J.15.7.6, J.15.7.7, J.15.7.8 and J.15.7.4)		N/A
J.15.7.2	In the “as-received” condition, each PTC thermistor		N/A
	- subjected to the tests specified in Table J.6		N/A
	- Compliance to Table J.6		N/A
J.15.7.3	Following the tests described in J.17.17 a), the same PTC samples:		N/A
	-subjected to the tests in table J.6		N/A
	-compliance to Table J.6 for each test		N/A
	For PTC sensors: -compliance with table J.7 for each test		N/A
J.15.7.4	R/T measurement for PTC thermistors :		N/A
J.15.7.5	Hold current test for PTC current limiters :		N/A
J.15.7.6	Time-to-trip test for PTC current limiters :		N/A
J.15.7.6.1	Thermistor with multiple trip current and times		N/A
	-tested at the maximum current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	-tested at the minimum current		N/A
	-current not to exceed the maximum current point on the time-to-trip versus current curve		N/A
J.15.7.6.1.1	Thermistor declared in item 82 of Table J.5 tripped at the declared trip current and corresponding rated voltage within the specified time-to-trip		N/A
J.15.7.7	Surface temperature of PTC thermistors other than current limiters		N/A
	- temperature measured at maximum voltage and steady-state current.....:		N/A
J.15.7.7.1	Surface temperature of current limiting thermistor:		N/A
	a) operating condition in hold state at rated maximum voltage and hold current		N/A
	b) operating condition in tripped state at rated maximum voltage and steady-state current		N/A
J.15.7.8	Inrush current measurement		N/A
J.15.7.8.1	PTC thermistors used as self-controlled heaters, motor starters and degaussers, inrush current of thermistor measured by oscilloscope at maximum voltage under rated load		N/A
J.15.8	Calibration tests for NTC thermistors		N/A
J.15.8.1	In the "as-received" condition, each NTC thermistor		N/A
	- subjected to the tests specified in Table J.8		N/A
	- Compliance to Table J.8		N/A
J.15.8.2	Following the tests described in J.17.17 b), the same NTC samples:		N/A
	-subjected to the tests in table J.8		N/A
	-compliance to Table J.8 for each test.		N/A
	For NTC sensors:		N/A
	-compliance with table J.9 for each test.		N/A
J.15.8.3	R/T measurement for NTC thermistors.....:		N/A
J.15.8.4	Surface temperature test (Inrush current limiting)		N/A
J.15.8.4.1	Surface temperature measured while thermistor		N/A
	-operating at maximum voltage and current with rated capacitance in parallel with the load		N/A
	-temperature within manufacturer's specified limits		N/A
J.15.8.5	Inrush current measurement (inrush-current limiting)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.15.8.5.1	Inrush-current of thermistor measured using oscilloscope at max. voltage and current with the rated capacitance value in parallel with the load		N/A
J.15.8.6	Resistance and beta value for NTC thermistors		N/A
J.15.8.6.1	Beta value within limits specified by the manufacturer		N/A
	-Resistance at 25 degree C.....		N/A
	-Resistance at R_1 @ T_1		N/A
	-Resistance at R_2 @ T_2		N/A
J.17.17	Endurance		N/A
	a) sequence of tests for PTC thermistors		N/A
	b) sequence of tests for NTC thermistors		N/A
J.17.17.1	After the tests of J.17.18.1 to J.17.8.4, the performance of the control is checked by the tests of J.15.7 or J.15.8		N/A
J.17.17.2	After the appropriate tests of J.17.18		N/A
	-the control complies with clauses 8 and 13		N/A
	-no emission of flames or expulsion of particles		N/A
J.17.18	Conditioning tests		N/A
J.17.18.1	Heat-cold-humidity		N/A
	Following the conditioning specified in J.17.18.1.1, thermistor complies with tables J.6, J.7, J.8 or J.9		N/A
J.17.18.1.1	Indoor temperature use:		N/A
	1) 24 h at measured surface temperature or max declared operating temperature but not less than 70 deg C.....		N/A
	2) 168 h in a non-condensing atmosphere having a relative humidity of 90% to 95% at 40 deg C.....		N/A
	3) 8 h at 0 deg C or manufacturer's specified ambient temperature, whichever is lower.....		N/A
	Outdoor temperature use:		N/A
	1) 4 h immersed in water at 25 deg C		N/A
	2) 8 h, at minus 35 deg C or at the manufacturer's specified ambient temperature, whichever is lower:		N/A
	3) 24 h, at measured surface temperature or max declared operating temperature but not less than 70 deg C.....		N/A
	4) 168 h, in a non-condensing atmosphere, having a relative humidity of 90% to 95% at 40 deg C.....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.17.18.2	Extended cycling (PTC)		N/A
J.17.18.2.1	Overload		N/A
J.17.18.2.1.1	Following the tests specified in J.17.18.2.1.2, J.17.18.2.1.3 or J.17.18.2.1.4 and J.17.18.2.2.1, a thermistor complied with Table J.6 or Table J.7, as appropriate		N/A
J.17.18.2.1.2	For self-controlled heater, 50 cycles at:		N/A
	-120% of maximum voltage		N/A
J.17.18.2.1.3	For a control thermistor, 50 cycles at:		N/A
	a)120% of rated maximum current (I_{max})		N/A
	b)120% of rated short-circuit current (I_{sc})		N/A
J.17.18.2.1.4	For a sensing thermistor, 50 cycles at:		N/A
	-120% of maximum sensing temperature		N/A
J.17.18.2.2	Endurance		N/A
J.17.18.2.2.1	Following the overload test, the three samples were operated at the conditions specified in a), b) or c) for the number of cycles in Table J.10		N/A
	a)self-controlled heater @ V_{max} or I_{max} Number of cycles		N/A
	b)control – V_{max} and the following currents.....		N/A
	1) Current limiter - $\geq I_L$ or I_{Lun} Number of cycles		N/A
	2) Degausser - I_{max} Number of cycles		N/A
	3) Motor Starter – I_{max} Number of cycles		N/A
	c) sensing – between 25 deg C to maximum operating temperature		N/A
J.17.18.3	Thermal conditioning		N/A
J.17.18.3.1	Passive ageing		N/A
	Following the conditioning specified in J.17.18.3.1.1 and J.17.18.3.2.1, the thermistors complied with Tables J.6, J.7, J.8 or J.9 as appropriate.		N/A
J.17.18.3.1.1	For all types except sensors:		N/A
	Test temperature – 30K above T_s but not less than 70 deg C; Duration – 1000 hours		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For sensors:		N/A
	Test temperature – 30K above the maximum sensing temperature, Duration – 1000 hours		N/A
J.17.18.3.2	Active ageing		N/A
	In addition to J.17.18.3.1.1, a current limiter is energized in its tripped state at maximum voltage and carrying steady-state current for 1000 hours	Max voltage: Steady-state current:	N/A
J.17.18.4	Cold operational cycling (PTC)		N/A
J.17.18.4.1	Following the test specified in J.17.18.4.2, the thermistor complied with Table J.6		N/A
J.17.18.4.2	3 samples of a thermistor are subjected to 1000 cycles of operation at an ambient temperature of 0°C or at the manufacturer's specified ambient, whichever is lower (°C).....		N/A
	Self-controlled heater – specified in J.17.18.2.2.1 a)		N/A
	Control thermistor – as specified in J.17.18.2.2.1 b)		N/A
J.17.18.5	Thermal runaway		N/A
	Thermistors are energized and operated under maximum rated conditions, initially		N/A
	Voltage increased until breakdown occurs or		N/A
	Test voltage is 2 x working voltage		N/A
J.17.18.6	Cold thermal cycling		N/A
J.17.18.6.1	After the cycling specified in J.17.18.6.1.1, the thermistors complied with tables J.7 or J.9, as appropriate.		N/A
J.17.18.6.1.1	Sensing thermistors subjected to:		N/A
	-1000 cycles of cold thermal cycling		N/A
	-each cycle starts at 0°C or at the manufacturer's specified ambient, whichever is lower to the maximum sensing temperature.		N/A
	Test range		N/A
J.17.18.7	Extended cycling (NTC)		N/A
J.17.18.7.1	Overload		N/A
J.17.18.7.1.1	Following the tests specified in J.17.18.7.1.2 or J.17.18.7.1.3 and J.17.18.7.2.1, thermistors are checked for compliance with table J.8		N/A
J.17.18.7.1.2	For an inrush current limiter:		N/A
	-50 cycles of operation at V_{max} and 120% I_{max}		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.17.18.7.1.3	For a sensing thermistor:		N/A
	-50 cycles of operation starting at 25°C ± 5K and increasing the temperature to 120% of maximum sensing temperature.....:		N/A
J.17.18.7.2	Endurance		N/A
J.17.18.7.2.1	Samples subjected to overload test, J.17.18.7.1 are operated at the conditions specified in a) or b) for the number of cycles specified in Table J.12		N/A
	a) inrush-current limiting – tested at V_{max} and I_{max} with rated capacitance value in parallel with the load		N/A
	V_{max}		N/A
	I_{max}		N/A
	Number of cycles		N/A
	b) Sensing – cycled between 25°C ± 5K and the maximum operating temperature.		N/A
	Maximum sensing temperature.....:		N/A
	Number of cycles		N/A
J.17.18.8	Cold operational cycling (for inrush current-limiting NTC thermistors)		N/A
J.17.18.8.1	Following the cycling specified in J.17.18.8.2, thermistors checked for compliance with Table J.8		N/A
J.17.18.8.2	Three samples subjected to 1000 cycles of operation at V_{max} conducting I_{max} of current, at an ambient temperature of 0°C or at manufacturer's specified temperature, whichever is lower		N/A
	Each cycle covered that portion of the R/T curve from the starting temperature to steady-state conditions		N/A
J.20	Creepage distances, clearances and distances through insulation		N/A
J.20.1.14	Clearance		N/A
J.20.1.14.1	Clearance between live parts connected electrically to the mains supply and accessible surfaces or parts in compliance with requirements of 20.1		N/A
J.20.1.14.2	Clearance between live parts providing functional insulation in compliance with requirements of 20.1		N/A
J.20.2.5	Creepage distance		N/A
J.20.2.5.1	Creepage distance between live parts connected electrically to the mains supply and accessible surfaces or parts were in compliance with the requirements of 20.2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.20.2.5.2	Creepage distance between live parts providing functional insulation was in compliance with the requirements of 20.2.		N/A
J.24	Components		N/A
J.24.2.1	Subclause J.24.2.1 was applicable to thermistors previously tested under IEC 60738-1, IEC 60738-1-1 or IEC 60539.		N/A
J.27	Abnormal operation		N/A
J.27.1	Consideration of fault modes made in accordance with Table H.24 for thermistors used in protective controls		N/A

K	ANNEX K (INFORMATIVE) – NOMINAL VOLTAGES OF SUPPLY SYSTEMS FOR DIFFERENT MODES OF OVERVOLTAGE CONTROL	N/A
	Nominal voltages of supply systems for different modes of overvoltage control were considered as indicated in Annex K.	N/A

L	ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES	N/A
	Requirements for overvoltage categories based on IEC 60664-1 considered	N/A

M	ANNEX M (INFORMATIVE) – Typical usage	N/A
	Consideration was given for Overvoltage Category based on control situation	N/A

N	ANNEX N (NORMATIVE) – POLLUTION DEGREES	N/A
	Degrees of Pollution in the micro-environment per Annex N considered	N/A

P	ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST	N/A
P.2	PCB base material complies with IEC 61249 series	N/A
P.3	Electric strength of coating	N/A
	- test conducted after conditioning - Clauses P.3.3 and P.3.4	N/A
	- based on functional insulation	N/A
	- test voltage per table 12:	—
P.3.2	Ageing test:	N/A
	- five samples subjected to 130° C ± 2°C.....:	—
	- duration: 1000 hours	N/A
P.3.3	Humidity Conditioning:	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- performed on same samples used in Cl. P.3.2		N/A
	- conditioned in humidity chamber at a temperature of $(35 \pm 1)^{\circ}\text{C}$ and $(90 \pm 5)\%$ relative humidity		N/A
	- duration: 48 hours		N/A
	After conditioning, each sample was subjected to the electric strength test with complying test results.		N/A
P.3.4	Environmental cycle conditioning:		N/A
	- five samples subjected to three complete cycles of conditioning per table P.1		N/A
	After conditioning, each sample was subjected to the electric strength test with complying test results.		N/A
P.3.5	After conditioning, each sample wrapped in aluminium foil was subjected to the electric strength test, Cl. P.3.1 between:		N/A
P3.6	- leads A, B, and C individually and common lead (figure P.1)		N/A
	- no evidence of flashover or breakdown		N/A

Q	ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST		N/A
Q.1	Printed wiring board conforming to requirements for type 1 coating (IEC 60664-3): complies with creepage requirements of Cl. 20, pollution degree 1		N/A
Q.2	Printed wiring board conforming to requirements for type 2 coating (IEC 60664-3): complies with requirements for solid insulation, Cl. 20.3		N/A
Q.3	Samples: production printed boards or standard test boards (figs. Q.1 and Q.2) used:		N/A
	- Thirteen (13) samples for type 1		N/A
	- Seventeen (17) samples for type 2		N/A
Q.4 + Q5	Compliance for type 1 or 2 coating: checked by tests of IEC 60664-3:2003, Amendment 1:2010, Cl. 5 with test levels or conditions specified in Cl. Q.5		N/A

R	ANNEX R (INFORMATIVE) – EXPLANATORY NOTES FOR SURGE IMMUNITY TEST		N/A
	Considerations for surge immunity tests per Annex R were addressed appropriately		N/A

T	ANNEX T (NORMATIVE) - REQUIREMENTS FOR SELV AND PELV		N/A
T.2	Protection against electric shock by SELV or PELV		N/A
T.2.1	SELV - Protection against electric shock is provided by the following measures:		N/A
	– limitation of voltage, ELV according to T.3.1 in a circuit (the SELV-system), and		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– protective-separation, according to T.3.2, of the SELV-system from all circuits other than SELV and PELV, and		N/A
	– simple-separation, according to T.3.3, of the SELV-system from other SELV-systems, from PELV-systems and from earth		N/A
	Intentional connection of exposed-conductive-parts of the control to a protective conductor or to an earth-conductor is not permitted		N/A
	In special locations where SELV is required and where protective screening according to T.3.2.1 is applied,		N/A
	Separation between protective screen and every circuit by basic insulation rated for the highest voltage present.		N/A
	Requirements for the elements of SELV are given in Clause T.3.		N/A
T.2.2	PELV - Protection against electric shock is provided by the following measures:		N/A
	– limitation of voltage, ELV according to T.3.1 in a circuit which may be earthed and/or the exposed-conductive-parts of which may be earthed (the PELV-system), and		N/A
	– protective separation according to T.3.2 of the PELV-system from all circuits other than SELV and PELV		N/A
	It is not necessary to provide basic insulation between the protective screen and the PELV-system.		N/A
	Where live parts of the PELV-system are accessible (touchable) simultaneously with conductive parts which, in case of a fault, could assume the potential of the primary circuit, protection against electric shock depends on protective-equipotential-bonding (T.3.4) of all such conductive parts. Such parts are bonded to the protective earthing terminal or termination of the control		N/A
	Requirements for the elements of PELV are given in Clause T.3.		N/A
T.3	ELV, protective separation, simple separation, protective bonding as elements of SELV and PELV		N/A
T.3.1	Limitation of voltage provides that the voltage between simultaneously accessible parts does not exceed relevant ELV limits as specified in 2.1.4 and as specified in 8.1.1.		N/A
T.3.2	Protective separation between a SELV/PELV-circuit and other live circuits is achieved by means of:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– basic insulation and supplementary insulation, each rated for the highest voltage present, i.e. double insulation, or		N/A
	– reinforced insulation rated for the highest voltage present, or		N/A
	– protective screening according to T.3.2.1 with the protective screen being separated from		N/A
	each adjacent circuit by basic insulation rated for the highest adjacent circuit voltage (see also T.2.1, last paragraph), or		N/A
	– a combination of these provisions		N/A
	If conductors of different circuits are contained in a multi-conductor cable or other conductors grouping, they are insulated for the highest voltage present to achieve double insulation or reinforced insulation		N/A
	If any component is connected between the separated circuits, that component complies with the requirements for protective impedance.		N/A
	When the supply of SELV or PELV circuits is obtained from supply mains of higher voltages, it is either		N/A
	– through a safety isolating transformer, or		N/A
	– a converter with separate windings providing equivalent insulation, and		N/A
	Control declared IPX7 subjected to second fault analysis (item 73 of Table 1) for the circuits and insulation between windings of the converter; as result of second fault the ELV value of 0 V was not exceeded. The current between the poles of the output complied with H.8.1.10.		N/A
	Compliance is checked by inspection, measurement and when performing the appropriate test(s) in the order of this standard.		N/A
T.3.2.1	Protective screening consists of a conductive screen interposed between hazardous-live-parts of the control, installation, or system and the protected part (e.g. a SELV-circuit or a PELV circuit).		N/A
	The protective screen permanently connected to the protective earthing and the connection complies with Clause 9; and		N/A
	– itself complies with the requirements of Clause 9		N/A
T.3.3	Basic insulation is required between SELV- / PELV-circuits and other SELV-/ PELV-systems or earth and is rated for the highest voltage present		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Component connected between the separated circuits withstands the electric stresses specified for the insulation which it bridges and its impedance limits the prospective current flow through the component to the steady-state current indicated in H.8.1.10 and H.11.2.5 for protective impedance.		N/A
T.3.4	Protective bonding		N/A
	The requirements for protective bonding - see clause 9 of this standard		N/A
	For the installation of controls which consist of parts of the fixed electrical installation of a building, the requirements for protective bonding in IEC standards for installation of buildings apply.		N/A

U	ANNEX U - REQUIREMENTS FOR RELAYS WHEN USED AS CONTROLS IN IEC 60335 APPLIANCES		N/A
U.6	Classification		N/A
U.6.3	According to their purpose		N/A
U.6.6	According to method of connection		N/A
U.6.8	According to protection against electric shock		N/A
U.6.8.5	For a relay: insulation between coil and contact circuits:		N/A
U.6.8.6	For a relay: insulation between live parts and test function, manual action actuating member		N/A
U.7	Information		N/A
	3 - Rated voltage for both coil and contacts (method C)		N/A
	4 - Nature of supply for both coil and contacts (method C)		N/A
	88 – Max. intended click rate U.23 (method D)		N/A
U.14	Heating		N/A
	Replacement of sub-clause:		N/A
U.14.4	Tests conducted under the following conditions:		N/A
	$U_{Coil} \times 0,9$ + contacts loaded or $I_{Coil} \times 0,9$ + contacts loaded		N/A
	$U_{Coil} \times 1,1$ + contacts loaded or $I_{Coil} \times 1,1$ + contacts loaded		N/A
	$I_{Coil} = 0$ + contacts loaded (N.C. contacts).		N/A
	Relays were mounted as specified		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– PWB connected relays were mounted to PWB if submitted with relays to be tested.		N/A
	If not, relays were mounted to plain PWB material; conductors per Table 6 soldered to PWB pins		N/A
U.17	Endurance		N/A
U.17.14	Evaluation of compliance		N/A
	Replace the second list item as follows:		N/A
	– The requirements of Cl. 14, under the conditions stated by U.14.4, for terminals, current carrying parts, and supporting surfaces are met		N/A
U.17.16	Test for particular purpose controls		N/A
	Relays were endurance tested according to the following schedule:		N/A
	Ageing test of 17.6		N/A
	Over-voltage test of automatic action of 17.7		N/A
	Test of automatic action at accelerated rate of 17.8		N/A
	Test of automatic action at slow rate of 17.9		N/A
	Overcurrent test of manual action at accelerated speed of 7.10		N/A
	Test of manual action at slow speed of 7.11		N/A
	Test of manual action at high speed of 17.12		N/A
	Test of manual action at accelerated speed of 17.13		N/A
U.20	Creepage distances, clearances and distances through solid insulation		N/A
	Assessment was conducted with relay energized, de-energized, and manually operated		N/A
U.23	Electromagnetic compatibility (EMC) requirements – emission		N/A
	Consideration must be given as to whether EMC requirements are applicable to relays.		N/A
U.24	Components		N/A
	Relays incorporating electronic components were assessed according to Annex H.		N/A

V	ANNEX Q (NORMATIVE) – REQUIREMENTS FOR CONTROLS POWERED BY SECONDARY BATTERIES (RECHARGEABLE)		N/A
	For controls powered by batteries that can be recharged in the control the following modifications were applied		N/A
V.4.3.2.11	Operation of the control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– the control, supplied by its fully charged battery, is operated as specified in this standard or the relevant part 2.....:		N/A
	– the charged battery initially discharged to such an extent that the control cannot operate		N/A
	– if possible, the control is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the control cannot operate. The control is operated as specified in the relevant part 2		N/A
	– if the control incorporates inductive coupling between two parts that are detachable from each other, the control is supplied from the supply mains with the detachable part removed.		N/A
V.7.4	Additional requirements for marking		N/A
V.7.4.10	The instructions give information regarding charging of batteries		N/A
V.8.5	Battery operated controls so designed that at a user accessible external point of disconnection of a d.c. mains supply, the maximum accessible voltage is less than or equal to the limits of a SELV/PELV circuit, and		N/A
	– the available power is less than 15 W at the end of 5 s.		N/A
V.8.5.1	Verification test		N/A
	- conducted with the d.c. mains supply disconnected from a fully charged battery control		N/A
	- the control operated from its internal battery		N/A
	The max. power recorded at the end of 5 s after the variable load was adjusted so that the maximum power was drawn through the circuit		—
	The voltage and the power recorded were within the limits specified in V.8.5		N/A
V.11.13.4.4.3	A fully charged rechargeable battery was used as provided with, or recommended by the manufacturer for use with, the equipment.		N/A
V.11.13.4.4.3.1	For overcharging of a rechargeable battery, the battery is charged under each of the following conditions in turn		N/A
V.11.13.4.4.3.1.1	The battery charging circuit adjusted with the battery disconnected to give 106 % of the rated output voltage of the charger, or max. charging voltage available from the charger, whichever is the higher, and the battery is then charged for 7 h.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
V.11.13.4.4 .3.1.2	After battery charging circuit adjusted to 100 % of the rated output voltage of the charger, the battery was charged while subjected to any single component failure that is likely to occur in the charging circuit and result in overcharging of the battery. The battery then charged for a single period of 7 h with that simulated failure in place.		N/A
V.11.13.4.4 .3.2	The battery is reverse-charged while subjected to any single component failure that is likely to occur in the charging circuit and that would result in reverse charging of the battery. The battery is then reverse-charged for a single period of 7 h with that simulated failure in place.		N/A
V.11.13.4.4 .3.3	The battery is subjected to rapid discharge by open-circuiting or short-circuiting any current-limiting or voltage-limiting components in the load circuit of the battery under test.		N/A
V.11.13.4.4 .3.4	Compliance checked in accordance with clauses 11.13.4.4.4 and 11.13.4.5.		N/A

AA	ANNEX AA MAXIMUM MANUFACTURING DEVIATION AND DRIFT		N/A
	Allowable deviation and drift (Annex AA is Normative in US and Canada)		N/A
	Type of control		—
	Temperature range		—
	Maximum allowable deviation from declared operating value		N/A
	% of declared value.....		N/A
	Declared value [K].....		N/A
	Declared value [°C]		N/A
	Calculated values		N/A
	Minimum operating temperature [°C].....		N/A
	Maximum operating temperature [°C].....		N/A
	Measured operating values (see clause 15)		N/A
	Maximum allowable drift from initial measured value		N/A
	% of declared value.....		N/A
	Declared value [K].....		N/A
	Measured value [°C].....		N/A
	Calculated values		N/A
	Minimum operating temperature [°C].....		N/A
	Maximum operating temperature [°C].....		N/A
	Measured operating values see clause 15.....		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Notes a) through e) observed		N/A

BB	ANNEX BB (INFORMATIVE) – TIME FACTOR	N/A
	The time factor considerations and measurement per Annex BB were considered	N/A

CC	ANNEX CC (INFORMATIVE) – NUMBER OF CYCLES	N/A
	The number of cycles for independently mounted and in-line cord controls per Annex CC was addressed during testing	N/A

DD	ANNEX DD (NORMATIVE) – CONTROLS FOR USE IN AGRICULTURAL CONFINEMENT BUILDINGS	N/A
	The number of cycles for independently mounted and in-line cord controls per Annex CC was addressed during testing	N/A
DD.5	Pre-conditioning applied..... :	N/A
DD.7.1	For the following tests, if any of the samples exposed for 10 days do not meet the requirements of DD.9.2, the 30 day test was discontinued..... :	N/A
DD.7.2	Moist carbon dioxide – sulphur dioxide – air mixture	N/A
	Two samples were placed in the test chamber, one exposed for 10 days and the other for 30 days of carbon dioxide equivalent to 1 % of the volume of the test chamber and with an equal amount of sulphur dioxide introduced into the test chamber each working day. A required quantity of water was maintained at the bottom of the chamber.	N/A
	The temperature of the test chamber maintained at (35 ± 2) °C.	N/A
DD.7.3	Moist hydrogen sulphide – air mixture	N/A
	Two samples were placed in the test chamber, one exposed for 10 days and the other for 30 days of hydrogen sulphide equivalent to 1 % of the volume of the test chamber, introduced into the test chamber each working day. The test was run continuously. A required quantity of water was maintained at the bottom of the chamber	N/A
	The temperature of the test chamber is maintained at (25 ± 5) °C.	N/A
DD.7.4	Moist ammonia – air mixture	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Two samples were placed in the test chamber, one exposed for 10 days and the other for 30 days. An ammonium hydroxide-water solution was placed in the bottom of the chamber, which produced a 1 % by volume ammonia vapour above the solution, the remaining vapour being composed of air and water.		N/A
	The temperature of the test chamber is maintained at $(35 \pm 2) ^\circ\text{C}$.		N/A
DD.7.5	Urea – water vapour		N/A
	Two samples were placed in the test chamber, one exposed for 10 days and the other for 30 days. A saturated urea-water solution was placed in the bottom of the chamber.		N/A
	The temperature of the test chamber is maintained at $(35 \pm 2) ^\circ\text{C}$.		N/A
DD.7.6	Warm humid air		N/A
	Two samples are placed in the test chamber, one exposed for 10 days and the other for 30 days.		N/A
	The humidity of the test chamber is maintained at $(98 \pm 2) \%$ relative humidity.		N/A
	The temperature of the test chamber is maintained at $(60 \pm 1) ^\circ\text{C}$.		N/A
DD.7.7	Disinfectant – germicide – water mixture exposure		N/A
	One sample was exposed to 1 300 cycles of intermittent spraying and drying of disinfectant germicide-water mixture. The spray-dry cycle consists of 10 min spray followed by 50 min of no spray		N/A
	The temperature of the test chamber is maintained at $(35 \pm 2) ^\circ\text{C}$.		N/A
DD.7.8.1	Dust penetration		N/A
	One sample was exposed to the dust test in IEC 60529 for first characteristic numeral 5.		N/A
	Enclosure category (1 or 2)..... :		N/A
DD.7.8.2	Dust heating, abnormal		N/A
	For controls incorporating heat-producing devices (e.g. transformer, relay, electronic switching device), one sample was mounted and electrically connected as intended in a test chamber.		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Wheat and corn dust passed through a 0,075 mm mesh width screen is blown into the top of the chamber and allowed to fall vertically onto the sample until the blanket on top of the sample stabilized and blower deenergized.		N/A
	The test chamber temperature was raised to Tmax or 40 °C, whichever is greater, and the sample energized at Vr and Ir until chamber temperature stabilized		N/A
DD.8	Recovery		N/A
	Samples tested in accordance with DD.7.2 through DD.7.8.1, inclusive, are rinsed with water and allowed to dry at room temperature.		N/A
DD.9.1	Evaluation; General		N/A
	Gaskets and other materials intended to seal the enclosure did not deteriorate excessively		N/A
	External adjustments and other mechanisms remain operable. Compliance checked by actuation and inspection		N/A
	Samples of the control complete each of the six corrosive exposure tests without undue corrosion which may affect integrity of the enclosure so as to impair its function within the meaning of this standard. Compliance is checked by inspection.		N/A
DD.9.2	For the tests of DD.7.2 through DD.7.7, each sample met the requirements of Clause 8, 17.5 and Clause 20 after the overvoltage test of 17.1.3.1 conducted at room temperature		N/A
	For Canada and the USA, the overvoltage test was replaced by an overload test		N/A
DD.9.3	For the test of DD.7.8.1, dust did not have entered the enclosure		N/A
EE	ANNEX EE (INFORMATIVE) – Guide to the application of temperature sensing controls within the scope of IEC 60730-2-9		N/A
	The guidelines for the automatic temperature sensing controls per Annex EE were considered.		N/A



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Clause	Requirement + Test	Result - Remark	Verdict

10.2.4.3	TABLE: Axial push and pull test			P
Tab identification	size (mm x mm)	axial push (N)	axial pull (N)	result code
Terminal	4.8x0.8	60	50	ND
Terminal	6.3x0.8	80	70	ND
Supplementary information: ND - No Displacement / Damage D - Displacement / Damage				

13.2	TABLE: Electric strength test					P
test location / circuit	type of insulation	type/model	working voltage (V)	test voltage (V)	flashover/ breakdown (Yes/No)	
Between terminals	Operational insulation	TM 150, TM 250	250	500.0	No	
Between contacts	Micro-disconnection	TM 150, TM 250	250	500.0	No	
Between terminals and cap	Basic insulation	TM 150, TM 250	250	1450.0	No	
Supplementary information:						

14.6 + 14.7	TABLE: heating test				P
parts of the appliance		Max. measured temperature (°C)			Max. permissible temperature (°C)
		1#	2#	3#	
TM 150 (with Bakelite enclosure):					
Terminal 1		180.5	179.2	175.5	210
Terminal 2		177.3	177.7	169.6	210
TM 250 (with Ceramic enclosure):					
Terminal 1		260.9	248.3	254.2	400
Terminal 2		260.6	255.1	255.3	400

17.2.1	TABLE: circuits loaded according to declared ratings	P
---------------	---	---

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Clause	Requirement + Test		Result - Remark		Verdict
circuits	a.c./ d.c.	voltage U _R (V)	current (A)	time constant (ms) / power factor (cos phi)	verdict
substantially resistive (6.2.1), making and breaking	a.c.	2500	16A	cos phi=1	P
resistive or inductive (6.2.2), making	---	---	---	---	---
resistive or inductive (6.2.2), breaking	---	---	---	---	---
declared specific load (6.2.3), making	---	---	---	---	---
declared specific load (6.2.3), breaking	---	---	---	---	---
20 mA load (6.2.4), making and breaking	---	---	---	---	---
declared motor load (6.2.5), making	---	---	---	---	---
declared motor load (6.2.5), breaking	---	---	---	---	---
pilot duty load (6.2.6), making	---	---	---	---	---
pilot duty load (6.2.6), breaking	---	---	---	---	---

17	TABLE: heating test after endurance test			P	
parts of the appliance		Max. measured temperature (°C)		Max. permissible temperature (°C)	
		1#/2#/3#			
TM 150(with Bakelite enclosure):					
Terminal 1		171.9	177.0	166.8	210
Terminal 2		177.1	174.9	174.6	210
TM 250 (with ceramic enclosure):					
Terminal 1		253.8	258.9	257.9	400
Terminal 2		262.8	262.6	266.1	400

17.5.1	TABLE: electric strength test			P	
test location / circuit	type of insulation	type/model	working voltage (V)	test voltage (V)	flashover/ breakdown
Between terminals	Operational insulation	TM 150, TM 250	250	375.0	No
Between contacts	Micro-disconnection	TM 150, TM 250	250	375.0	No
Between terminals and cap	Basic insulation	TM 150, TM 250	250	1088.0	No



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Clause	Requirement + Test			Result - Remark			Verdict
20	TABLE: Creepage distance and clearance measurements						Verdict
	requirements creepage distance and clearance met						P
	supply working voltage (V) :			250			—
	overvoltage category..... :			I or II			—
	rated impulse voltage according to table 20.1(V) :			2500			—
	requirements for case B (20.1.7, 20.1.12) met..... :			(cl20.1 Note 2)			P
creepage distance Cd and clearance CI across (type of insulation)		Nominal Volt. (V)	Pollution degree	required Cd (mm)	Cd (mm)	required CI (mm)	CI (mm)
Between terminal: ceramic enclosure		250	2	2.5	3.38	1.5	3.38
Between terminal: bakelite enclosure		250	2	2.5	3.29	1.5	3.29
Between terminals and cap: ceramic enclosure		250	2	2.5	3.3	1.5	3.3
Between terminals and cap: bakelite enclosure		250	2	2.5	3.2	1.5	3.2
micro- disconnection: ceramic enclosure		250	2	2.5	3.2	—	—
micro- disconnection: bakelite enclosure		250	2	2.5	3.1	—	—
Supplementary information: (*) Legend for type of Insulation: OP – operational insulation B – Basic Insulation RI – Reinforced Insulation SI – Supplementary Insulation DI – Double Insulation							

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Clause	Requirement + Test		Result - Remark	Verdict
21.2.7	TABLE: resistance to tracking			P
non-metallic part under consideration		creepage path under test	applied test voltage (V)	comments
Silicon sheathing tube		-	175	No flash
Supplementary information:				

24.1 / 24.2		TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity	
1. Terminal	Zhongshan City Song Xing Hardware Factory	H62	4.8x0.8mm, 6.3x0.8mm; Operating temperature≤150° C;	--	Test with appliance	
2. Terminal	Zhongshan City Song Xing Hardware Factory	Nickel plated steel	All operating temperature;	--	Test with appliance	
3. Movable contact arm	Longhengfa Hardware Electrical Appliance Fittings Factory	Beryllium Bronze	Thickness 0.15±0.03mm	--	Test with appliance	
4. Static contact arm	Longhengfa Hardware Electrical Appliance Fittings Factory	H62	Thickness 0.73~0.82mm Operating temperature≤150° C	--	Test with appliance	
5. Static contact arm	Longhengfa Hardware Electrical Appliance Fittings Factory	Nickel plated steel	All operating temperature	--	Test with appliance	
6. Movable contact	Foshan District of Shunde City, Yu Gang Alloy Co., Ltd.	AgNi(10)/Cu	Min. thickness 0.2mm for AgNi(10)	--	Test with appliance	
7. Static contact	Foshan District of Shunde City, Yu Gang Alloy Co., Ltd.	AgNi(10)/Cu	Min. thickness 0.2mm for AgNi(10)	--	Test with appliance	
8. Bimetal	Foshan HeYao Hardware Co. Ltd.	P675R	Thickness 0.15~0.2mm Operating temperature≤150° C	--	Test with appliance	



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Clause	Requirement + Test		Result - Remark		Verdict
9. Bimetal	Foshan HeYao Hardware Co. Ltd.	E3	Operating temperature $\geq 130^{\circ}\text{C}$	--	Test with appliance
10. Guide frame	Hunan province Xinhua County Shunda Electronic Ceramic Co., Ltd.	--	Ceramic	--	Test with appliance
11. Guide frame	Foshan city Lige Electric Appliance Fittings Co. Ltd.	Bakelite	PF2A5-151J(b)	--	Test with appliance

24.4.1.6	TABLE: Switch mode power supply overload test									N/A
Winding	Winding T, ($^{\circ}\text{C}$)	Overload (Measured) values			a) No flames	b) 1.5 x max temp. of Cl. 14	c) as declared (T1,57)	d) Clause 8 and 13.2 for BI	e) creepage and clearance	f) no rupture of ext. fuse
		Max Voltage (V) peak	Max overload current	Max Power (W)						
—	—	—	—	—	—	—	—	—	—	—
Supplementary information:										

24.4.1.8-24.4.1.10	TABLE: SELV output measurement test				N/A
Winding	Max. Voltage (V peak/DC)		Protective impedance	SELV measurement, (V)	
	Normal Operation	Single component fault			
—	—	—	—	—	
Supplementary information:					

27.2.3	TABLE: Blocked output test				N/A
thermocouple locations		max. temperature measured, ($^{\circ}\text{C}$)		Limit ($^{\circ}\text{C}$)	Verdict
		2 nd hour	24 th hour		
—		—	—	—	—
Supplementary information:					

IEC 60730-2-9					
Clause	Requirement + Test			Result - Remark	Verdict
27.3	TABLE: Over-voltage and under-voltage test				N/A
test	operating condition	rated voltage, (V)	Test voltage 85/110% (V)	Temperature, (°C)	Observation
Over-voltage transformer	T _{max}	—	—	—	—
Under-voltage transformer	T _{max}	—	—	—	—
Over-voltage valve	T _{min}	—	—	—	—
Under-voltage valve	T _{min}	—	—	—	—
Supplementary information:					

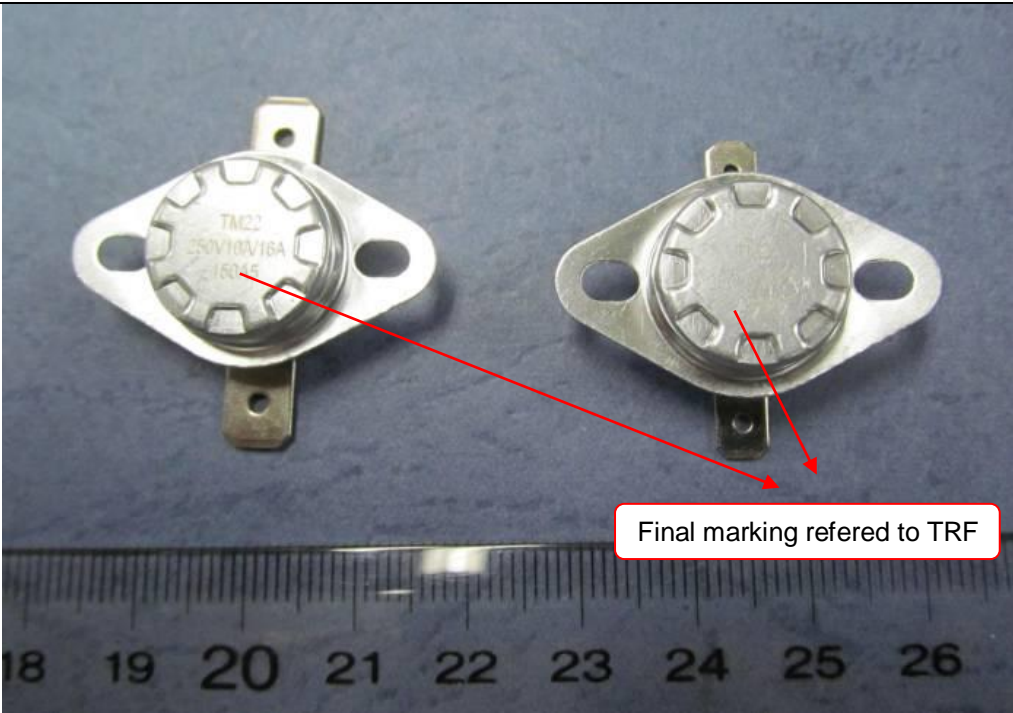
27.5	TABLE: Overload Heating test for in-line cord controls			N/A
thermocouple locations		max. temperature measured, (°C)	Limit, (°C)	Verdict
—		—	—	—
Supplementary information:				

H.27.1.1.1	TABLE: Low power point determination		N/A
Component or Circuit Under Evaluation		Measured Wattage (W)	
—		—	
Supplementary information:			

H27.1	TABLE: Electrical / electronic component fault modes											N/A
Component	short circuiting	open circuit	a) No flames	b) 1.5 x max temp. of Cl. 14	c) as declared (H57)	d) protect. against el. shock	d) electric strength, basic insulation	e) creepage and clearance	f) no rupture of ext. fuses or	f) complies with a), b) and d)	g) as declared in H58	Observations
—	—	—	—	—	—	—	—	—	—	—	—	—
Supplementary information:												

--- END OF REPORT ---

Attachment No. 1

Details of:	TM22 xxx series, with bakelite enclosure and ceramic enclosure
View:	


Details of:	TM22 xxx series, with bakelite enclosure and ceramic enclosure
View:	


Attachment No. 1

Details of:	TM22 xxx series, internal detail view
View: <input type="checkbox"/> General <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Top <input type="checkbox"/> Bottom	


Details of:	TM22 xxx series, components
View: <input type="checkbox"/> General <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Top <input type="checkbox"/> Bottom	

Attachment No. 1

Details of:	Cl and cr between terminals of ceramic enclosure products: 3.38mm	
View:		
<input type="checkbox"/> General		
<input type="checkbox"/> Front		
<input checked="" type="checkbox"/> Rear		
<input type="checkbox"/> Right		
<input type="checkbox"/> Left		
<input type="checkbox"/> Top		
<input type="checkbox"/> Bottom		

Details of:	Cl and cr between terminals of bakelite enclosure products: 3.29mm	
View:		
<input type="checkbox"/> General		
<input type="checkbox"/> Front		
<input checked="" type="checkbox"/> Rear		
<input type="checkbox"/> Right		
<input type="checkbox"/> Left		
<input type="checkbox"/> Top		
<input type="checkbox"/> Bottom		

Attachment No. 1

Details of:	For ceramic enclosure products: cl and cr between live parts and metal cap: 3.3mm
View: <input type="checkbox"/> General <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Top <input type="checkbox"/> Bottom	

Details of:	For bakelite enclosure products: cl and cr between live parts and metal cap: 3.2mm
View: <input type="checkbox"/> General <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Top <input type="checkbox"/> Bottom	