TEST REPORT
IEC 60730-1
Automatic electrical controls

Report Number. ..... :	SHES220200278901
Date of issue ..... :	2022-04-22
Total number of pages ..... :	66 pages
Tested by (name, function, signature) ..... :	Zino Zhang
Approved by (name, function, signature) ..... :	Vince Cheng
Testing Laboratory ..... :	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Testing location/ address ..... :	588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China.
Applicant's name ..... :	Lumi United Technology Co., Ltd.
Address ..... :	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No.3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Test specification:	
Standard ..... :	IEC 60730-1:2013, AMD1:2015, AMD2:2020
Test procedure ..... :	SGS-CSTC
Non-standard test method ..... :	N/A
Test item description ..... :	Smart Radiator Thermostat E1
Trade Mark ..... :	Aqara
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	SRTS-A01
Ratings ..... :	Powered by 2 x 1,5VDC AA battery

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List of Attachments (including a total number of pages in each attachment): Attachment 1: 4 pages of photo documentation
Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Full tests.	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd No. 588 West Jindu Rd, Xinqiao Town, Songjiang District 201612 Shanghai CHINA

Summary of compliance with National Differences (List of countries addressed): Europe ☒ The product fulfils the requirements of EN 60730-1:2016+A1:2019.

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Copy of marking plate:

Test Item Particulars ..... :	Thermostat
Classification of installation and use ..... :	Independent
Supply Connection ..... :	Battery
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..... :	2022-02-21
Date (s) of performance of tests ..... :	2022-02-21 to 2022-03-16
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. **"(See appended table)" refers to a table appended to the report.** **Throughout this report a ☒ comma / ☐ point is used as the decimal separator.**	
Manufacturer's Declaration :	
The application for obtaining a 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..... :	☐ **Yes** ☒ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... :	Siterwell Electronics Co., Ltd No.666 Qingfeng Road, Jiangbei District, Ningbo, 315034, Zhejiang Province, China
General product information and other remarks: The product is a class III thermostat, for the temperature control of warm water radiator, for indoor use only, Powered by 2 x 1,5VDC AA battery.	

Components					
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Plastic enclosure	KINGFA SCI & TECH CO LTD	JH960 HT	V-0; Min thickness 1.5mm; 75ºC	--	Test with appliance UL E171666
PCB	Interchangeable	Interchangeable	V-1 or better; 130ºC	--	UL

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IEC 60730-1			
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).....:	2 x 1,5VDC	P
6	**CLASSIFICATION**		P
6.1	Nature of supply .....:	DC	—
6.2	Type of load and power factor.....:	Motor load	—
6.3	Purpose.....:	Temperature control	—
6.4	Features of automatic action, Type 1 or Type 2....:	Type 1	—
6.5	Degree of protection provided by enclosure per IEC 60529 and control pollution situation .....:	IP20 Pollution degree 2	—
6.6	Method of connection. .....:	Battery	—
6.7	Ambient temperature limits of the switch ahead: T_{min}(°C).; T_{max} (°C).....:	0 to 55 °C	—
6.8	Protection against electric shock.....:	Class III	—
6.9	Circuit disconnection or interruption .....:	Electronic disconnection	—
6.10	Number of cycles of actuation (M) of each manual action.....:	10000	—
6.11	Number of cycles of actuation (A) of each automatic action.....:	10000	—
6.12	Temperature limits of the mounting surface of the control (°C or K) .....:	-	—
6.13	Value of proof tracking index (PTI) for the insulation material used .....:	175V	—
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	—
6.15	Construction.....:	Independent	—
6.16	Ageing requirements (type Y) of end-product equipment.....:	-	—

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Clause	Requirement + Test	Result - Remark	Verdict
6.17	Use of thermistor (Annex J) .....:	-	—
6.18	Classes of control functions (Annex H).....:	-	—

7	**INFORMATION**		P
7.2.1	Information required for controls and the appropriate method for providing this information is as indicated in Table 1		P
	1 – Manufacturer's name or trademark (Method C).....:		P
	2 – Unique type reference (Method C).....:	SRTS-A01	P
	3 – Rated voltage or rated voltage range in volts (Method C).....:	Powered by 2 x 1,5VDC AA battery	P
	4 – Nature of supply (Method C) .....:	⎓	P
	5 – Frequency, if other than for range 50 Hz to 60 Hz inclusive (Method C).....:		N/A
	6 – Purpose of control (Method D or E) .....:	Temperature control	P
	6a – Construction of control (Method X) .....:	Independently mounted control	P
	7 – The type of load controlled by each circuit (Method C).....:	Motor load	P
	15 – Degree of protection by enclosure: (Method C).....:	IP20	P
	17 – Terminals for external conductors (Method C):		N/A
	18 – Terminals for external conductors which accept a wider range of conductor sizes, (Method D or E) .....:		N/A
	19 – Method of connection and disconnection for screwless terminals, if not readily identifiable (Method D).....:		N/A
	20 – Details of any special conductors which are intended to be connected to terminals for internal conductors (Method D or E).....:	Battery	P
	21 – Maximum temperature of terminals for internal conductors, if higher than 85°C (Method X) .....:		N/A
	22 – Temperature limits of the switch head, if T_{min} lower than 0°C, or T_{max} other than 55°C (Method C):		N/A
	23 – Maximum temperature of mounting surface ($T_{s\ max}$) if it differs by more than 20 K from T_{max} (Method C).....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	24 – Classification of control according to protection against electric shock (Method X) .....:	Class III	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).....:	10000	P
	27 – Number of automatic cycles (A) for each automatic action (Method X) .....:	10000	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) .....:	Electronic disconnection	P
	30 – PTI of materials used for insulation (Method X).....:	175V	P
	31 – Method of mounting controls (Method D) .....:		P
	31a – Method of providing earthing of control (Method D).....:		N/A
	32 – Method of attachment for non-detachable cords (Method D or E) .....:		N/A
	33 – Intended transportation condition of control (Method X).....:		N/A
	34 – Details of any limitation of operating time (Method D or E) .....:		N/A
	35 – Period of electric stress across insulating parts (Method X).....:	Long period	P
	36 – Limits of activating quality 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 or E) .....:	Type 1	P
	40 – Additional features of Type 1 or Type 2 actions (Method D or E) .....:		N/A
	41 – Manufacturing deviation and condition of test appropriate to deviation (Method X) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	42 – Drift (Method X) .....:		N/A
	43 – Reset characteristics for cut-out action (Method D or E) .....:		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 or E).....:		N/A
	46 – Manufacturing deviation and drift of its operating value, operating time or operating sequence is within the declared limits (Method D or E) .....:		N/A
	47 – Extent of any sensing element (Method X).....:		N/A
	48 – Operating value(s) or operating time (Method D).....:		N/A
	49 – Control pollution degree (Method D or E).....:	Pollution degree 2	P
	50 – Control intended to be delivered exclusively to the equipment manufacturer (Method X) .....:		N/A
	51 – Glow wire test temperatures (Method X).....:	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 or E) .....:	500V	P
	76 – Type of printed wiring board protection (Method X).....:	Type 1	P
	77 – Temperature for ball pressure test (Method X).....:	125°C	P
	78 – Max declared torque on single brush mounting using thermoplastic material (Method D or E) .....:		N/A
	79 – Pollution situation in the micro-environment of the creepage or clearance if cleaner than that of the control (Method X).....:		N/A
	80 – Rated impulse voltage for the creepage or clearance if different from that of the control (Method D or E) .....:		N/A
	81 – Values designed for tolerances of distances for which the exclusion from fault mode “short” is claimed (Method X) .....:		N/A
	82 to 84 See Annex J		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	85 – For Class III controls, the symbol for Class III construction (Method C) .....:		P
	86 – For SELV or PELV circuits, the ELV limits realized (Method X).....:		P
	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 the accessible SELV/PELV level(s) is (are) (Method X) .....:		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 X).....:		N/A
	96 – Overcurrent protective device external to the CONTROL (Method D or E) .....:		N/A
	97 – For INCORPORATED CONTROLS or INTEGRATED CONTROLS, whether the overload test done at control level (Method X)..... :		N/A
	98 – Maximum altitude at which the CONTROL can be used if greater than 2000m (Method X).....:		N/A
7.2.2	Information which is indicated as being required by marking (C) or by documentation (D, E) is provided for the testing authority .....:		N/A
7.2.3	For controls submitted in, on or with an equipment, the requirement for Documentation (D, E) replaced with Declaration (X)		N/A
7.2.4	Marking for an INTEGRATED CONTROL within a more complex control is included in the marking of the complex control		N/A
7.2.5	Documentation (D, E) requirement is met by providing information by Marking (C)		P
7.2.5.1	Declaration (X) requirement is met by providing information by Documentation (D, E) or Marking (C)		P
7.2.6	Information for INTEGRATED CONTROL provided by Declaration (X)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Incorporated control provided with marking of manufacturer's name or trademark and unique type reference when other required marking is provided by Documentation (D, E)		N/A
	Information for incorporated control intended for exclusive delivery to the equipment		N/A
7.2.7	Controls with lack of space are marked with manufacturer's name or trademark and the unique type reference, while other required marking included in Documentation (D, E)		N/A
7.2.8	Additional marking or information permitted if does not give rise to misunderstanding		P
7.2.9	Appropriate IEC symbol(s) used per 7.2.9 ..... :		P
7.3	Class II symbol		N/A
7.4	Additional requirements for marking		P
7.4.1	Marking placed on the main body or on non-detachable parts		P
	Required marking is legible and durable		P
7.4.2	Terminals of controls intended for the connection of supply conductors are indicated by an arrow pointing towards the terminal		N/A
7.4.3	Terminals for neutral external conductor are indicated by letter "N"		N/A
7.4.4	Indication of the direction to increase or decrease response value for the controls intended to be set by the user or the equipment manufacturer is provided (ex. "+" and "-")		N/A
	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 have operated		N/A
7.4.6	Controls intended to be connected only to SELV systems are marked with the graphic symbol IEC 60417-5180 (2003-02)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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 required for class III, but carry 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
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
7.4.9	The instructions for controls incorporating batteries intended to be replaced by the user include:		P
	- the type reference of the battery		P
	- the orientation of the battery with regard to polarity		P
	- the method of replacing batteries		P
	- warning against using incorrect type batteries		P
	- how to deal with leaking batteries		P
	The instructions for controls incorporating a battery that contains hazardous to the environment materials give details on how to remove the battery:		N/A
	- 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) have been removed		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Protection against accidental contact with live parts of the lamp ensured to allow safe insertion and removal of the lamps		N/A
	Accessible parts connected to SELV systems or PELV systems where voltage does not exceed SELV limits of 2.1.5 are not considered to be hazardous live parts ..... :	SELV	P
	Accessible parts connected to a SELV system or PELV system where the voltage exceeds SELV limits of 2.1.5 or the voltage limits declared in item 87 of Table 1, current measured between the simultaneously accessible parts and between accessible parts and earth should not exceed the limits of H.8.1.10.1 under fault-free (normal) and single-fault conditions.		N/A
8.1.1.1	SELV/PELV circuits supplied at a different voltage value considered non-hazardous ..... :		N/A
	- The control is used in an application governed by another product standard with different limit values; and,		N/A
	- The 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 only by basic insulation		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
8.1.4	For controls connected to gas or water supply mains, any metal part conductively connected to pipes is separated from hazardous live parts by double insulation or reinforced insulation		N/A
8.1.5	For Class II controls and controls for Class II equipment intended for fixed installation, protection is not impaired by the installation of control		N/A
8.1.6	For integrated and incorporated controls, tests of 8.1.8 to 8.1.9.5 applied to accessible parts when control is mounted as intended with detachable parts removed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.7	For in-line and free-standing controls, tests of 8.1.8 to 8.1.9.5 applied when control is fitted with flexible cord, with detachable parts removed and hinged covers which can be opened without a tool are opened; cross-sectional area of cord(mm²).....:		—
8.1.8	For independently mounted controls, the tests made when control mounted as in normal use, fitted with cable or with a conduit, with detachable parts removed and hinged covers which can be opened without a tool are opened; cross-sectional area of cable (mm²) .....:		—
8.1.9	Tests using the standard test finger and test pin:		P
	- The standard test finger shown in Figure 2 applied without force in every possible position		P
	- Apertures preventing the entry of the finger further tested by means of a straight unjointed test finger of the same dimensions applied with a force of 20 N		P
	If test finger entered, the finger shown in Figure 2 pushed through the aperture.		N/A
	If the unjointed test finger did not enter, the increased force of 30 N applied		P
	When the guard so displaced or the aperture so distorted that the test finger in Figure 2 can be inserted without force, the test with the latter finger repeated with electrical contact indicator		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		P
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 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
8.1.11	Between Class III and main/earth circuits, insulation external to the safety isolating transformer complies with Class II insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.12	Live parts are hazardous if they exceed the values specified in 8.1.1 and if 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 indicating the battery may be replaced by the user, are 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		P
8.2.1	Actuating members are not live		P
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
8.3	Capacitors		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

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Clause	Requirement + Test	Result - Remark	Verdict
9	**PROVISION FOR PROTECTIVE EARTHING**		N/A
10	**TERMINALS AND TERMINATIONS**		N/A
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		N/A
	Use of a special purpose tool not required		N/A
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 ..... :		—
	-conductor cross-sectional area - smallest (mm^2) :		—
	-conductor cross-sectional area - largest (mm^2) . :		—
10.1.4.1	Terminal designed for wider range of conductor size declared ..... :		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) ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	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 do not require special preparation of the conductor		N/A
10.1.7.1	Alternate means of connection for type X attachment		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	The wires of flexible cables and cords are twisted in one complete turn in 20 mm and conductor is inserted into the terminal		N/A
	- 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
10.1.10	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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	- 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	See attached TABLE 10.2.1	N/A
10.2.2	Terminals suitable for their purpose		N/A
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) .....:		—
	- compliance with Fig. 14, 15, 16 or IEC/EN 61210		N/A
	- other dimensions allowed (mm x mm) .....:		—
	- polarized acceptance of receptacles allowed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.2.4.2	Tabs forming part of a control consist of material appropriate to the maximum temperatures allowed		N/A
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		N/A
10.2.4.4	Tabs forming part of a control are adequately spaced to allow the connection of the appropriate receptacles		N/A
	- no strain, no distortion to any of the tabs or adjacent parts		N/A
	- no reduction of creepage distance or clearances below values of Cl. 20		N/A
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		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		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
11.1.4	Intentionally Weak Traces		N/A
	Intentionally weak traces should be used to protect against hazards caused by failure of component included in Table H.24 of the standard.		N/A
11.2	Protection against electric shock		P
11.2.1	Double insulation		N/A
	- basic insulation and supplementary insulation can be tested separately, or		P
	- properties of both insulations are otherwise provided		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
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 .....:	SELV	P
11.2.7	Adequate measures are provided to prevent the interconnection of an integrated SELV circuit to an external PELV circuit and vice versa		P
	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		N/A
	Controls are to be capable of carrying current 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		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	For declared all-pole disconnection contact operation in each pole substantially together		N/A
11.3.2	Micro-disconnection		N/A
	- one supply pole, at least, separated		N/A
	- separated pole meets electric strength requirements, Cl. 13		N/A
	- any subsequent action does not cause reduction of contact separation below value required by the Electric Strength Test		N/A
11.3.3	Reset buttons are so located or protected that they are not to be accidentally reset		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
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
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		N/A
11.3.7	Contacts which cannot (or are not intended to) be operated on load nor arc under normal use		N/A
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
11.4	Actions		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
11.4.3	Type 2 action: manufacturing deviation and drift within the required limits		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		N/A
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
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:		-
	- contacts cannot be prevented from opening		P
	- 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		P
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		P
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
11.4.14	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		P
11.4.17	See Annex J		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.5	Openings in enclosures (drain holes)		N/A
	- minimum area (mm^2): .....:		—
	- 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
11.7	Attachment of cords		N/A
11.8	Size of non-detachable cords		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

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Clause	Requirement + Test	Result - Remark	Verdict
11.9.2	Inlet openings without inlet bushing made of insulating material		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
11.11.1.2	Covers		N/A
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
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
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

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Clause	Requirement + Test	Result - Remark	Verdict
11.13.4	Batteries		P
11.13.4.1	Controls containing batteries are designed to reduce the risk of fire, explosion and chemical leaks		P
	- under normal operation		P
	- under after a single fault in the control		P
	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
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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
11.13.5.5	Compliance of 11.13.5 is checked by evaluating the control in accordance with the requirements of H.27.1 and other relevant requirements.		N/A
12	**MOISTURE AND DUST RESISTANCE**		P
12.1.1	Protection against ingress of water and dust IP Classification of the product..... :	IP20	—
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 .....:	IP20	P
	Entered water does not impair compliance with this standard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No reduction of creepage distances and clearances below values of Cl. 20		P
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		P
12.2.1	Controls withstood simulated, normal use humid conditions		P
12.2.3	Electric Strength Test of 13.2 is conducted immediately after the humidity treatment		P
12.2.4	Control shows no damage		P
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	—
12.2.9	Tests executed immediately after the humidity treatment (after the reassembly of detached parts)		P
	- in-line, free-standing and independently mounted controls according to Insulation Resistance (13.1)		P
	- Electric Strength (13.2)		P
	- integrated and incorporated controls according to Electric Strength (13.2)		N/A
12.3	Leakage current test for in-line cord and free - standing controls	See attached TABLE 12.3	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
13	**ELECTRIC STRENGTH AND INSULATION RESISTANCE**		P
13.1	Insulation resistance of in-line cord, free-standing and independently mounted controls		P
13.2	Electric Strength Test ..... :	See attached TABLE 13.2	P
13.2.2	Insulating surfaces covered with metal foil		P
13.2.3	50 or 60 Hz test voltage applied for 1 min. .....:	100V	P
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
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).....:		—
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		P
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 .....:		—
	- current (A): most unfavourable value between 0.94 and 1.06 times I R .....:		—
14.4.1	For circuits and contacts other than for external loads, load(s) as specified by the manufacturer: voltage (V); current (A) .....:	Powered by 2 x 1,5VDC AA battery	—

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Clause	Requirement + Test	Result - Remark	Verdict
14.4.2	Actuating members placed in most unfavourable position		P
14.4.3	Contacts initially closed at rated current and voltage		N/A
14.4.3.1	Temperature sensing controls:		N/A
	- temperature of sensing element is raised or lowered (5 ± 1) °C from operating temperature such that contacts are then in closed position		N/A
	- operating temperature (°C) .....:		—
	- temperature for heating test (°C) .....:		—
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) .....:		N/A
	Mounting surface of the switch head maintained between T_s max and either (T_s max+ 5)°C or 1.05 times (whichever is the greater if Ts max is higher than T_{max} by more than 20 K) (°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
14.6	The temperatures specified for the switch head, the mounting surfaces and sensing element were attained in approximately 1 h		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		P
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.....:	See attached TABLE 14.6 & 14.7	N/A
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
15.2	Measurement of deviation and drift .....:	See attached TABLE 15.2 a) and 15.2 b)	N/A
16	**ENVIRONMENTAL STRESS**		P
16.1	Control can withstand the level of stress likely to occur in transportation and storage		P
16.2	Environmental stress of temperature		P
16.2.1	Entire control (not energized) maintained for 24h at a temperature of (-10 ± 2)°C or as declared.....:	-10°C; 24h	P
	Entire control (not energized) maintained for 4h at a temperature of (60 ± 5)°C or as declared.....:	60°C; 4h	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**		N/A
17.2	Electrical conditions for the tests .....:	See attached TABLE 17.2.1	N/A
	Type of circuit		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated voltage (V) ; test voltage (V) .....:	Powered by 2 x 1,5VDC AA battery	—
	Rated current (A) ; test current (A) .....:		—
	Rated frequency (Hz) .....:		—
17.3	Thermal conditions for parts other than temperature sensing elements		N/A
	Accessible parts: tested at room temperature (°C) :	25	—
	Mounting surface temperature: T_s max (°C) .....:		—
	Remainder of switch head, temperature: T_{max}(°C).:		—
	If T_{min} is less than 0 °C; switch head maintained at T_{min} (°C) .....:		—
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
	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 ..... :	See attached TABLE 17.5.1	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).....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- duration (h): .....:		—
17.7	Over-voltage test of automatic action at accelerated rate		N/A
17.7.1	Electrical conditions: specified in 17.2		N/A
17.7.2	Thermal conditions: specified in 17.3		N/A
17.7.3	Method and rate of operation		N/A
	Control Type 1 action		N/A
	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) .....:		N/A
17.7.7	Actuating members placed in the most unfavourable position during test		N/A
17.8	Test of automatic action at accelerated rate		N/A
17.9	Test of automatic action at slow rate		N/A
17.10	Overvoltage (overload) test of manual action at accelerated speed		N/A
17.11	Test of manual action at slow speed		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
17.13	Test of manual action at accelerated speed		N/A
17.14	Evaluation of compliance		N/A
	Actions function in the intended and declared manner:		N/A
	- automatically		N/A
	- manually		N/A
	The following requirements are still met:		N/A
	- Cl. 14, heating: terminals for external conductors: measured (°C) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Cl. 14, heating: other terminals: measured (°C) ..:		N/A
	- 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		N/A
	- 17.5, electric strength (without previous humidity treatment, test voltage 75% of values 13.2)		N/A
	- Cl. 20, distances and clearances		N/A
	- for tests 17.5 and 20, if special samples were submitted for Cl. 13: tested at appropriate condition to ensure contacts are open		N/A
	- 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
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		N/A
18.1.4	Tests of 18.2 to 18.8 carried out sequentially on one sample:		P
	- tested sample: type reference .....:	SRTS-A01	—
	- Tested sample: identification No. .....:	A1	—
18.1.5	After the tests of Clause 18 there is:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- no damage to impair compliance with this standard, in particular		P
	- Cl. 8, protection against electric shock		P
	- Cl. 13, electric strength and insulation resistance		P
	- Cl. 20, creepage distance and clearances		P
	- insulating linings, barriers and the like have not worked loose		P
	- 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.		P
	- supplementary or reinforced insulation tested to clause 13		P
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
18.2	Impact resistance		P
18.2.1 - 18.2.6	In-line cord controls, free-standing and independently mounted controls: test by means of impact test apparatus IEC 60068-2-75	See attached TABLE 18.2.1	P
18.4	Alternate compliance – Impact resistance		N/A
18.5	Free-standing controls		N/A
18.6	In-line cord controls		N/A
18.7	Pull-cord actuated controls		N/A
18.8	Foot actuated controls		N/A
18.9	Actuating member and actuating means		P
18.9.1	Controls supplied (or intended to be fitted) with actuating members, tests:		P
	- axial pull force (N) .....:	30	P
	- axial push force of 30 N applied for (min) .....:	1	P
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.		P

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Clause	Requirement + Test	Result - Remark	Verdict
19	**THREADED PARTS AND CONNECTIONS**		**P**
19.1	Threaded parts to be moved during mounting or servicing		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		P
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
19.2.6	Current-carrying connection whose parts rely on pressure for correct function: resistant to corrosion (not inferior to that of brass)		N/A
	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)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	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		P
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.....:	See attached Table 20	P
20.1.1.1	Supplied from dedicated battery which has no provision for charging an external mains supply		P
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		P
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 (mm²) (Cl. 10.1.4) .....:		—
20.1.3.3	Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm²) (Cl. 10.2.1) .:		—
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		P
20.1.6	Force (standard test finger) applied in an endeavour to reduce distances:		P
20.1.6.1	- 2 N force applied by standard test finger to any point on bare live parts accessible before control is mounted .....:		N/A
	- 30 N force applied by standard test finger to accessible surfaces after control mounted.....:	30N	P
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	Micro-disconnection and micro-interruption:		N/A
20.1.7.2	Full disconnection – values from Table 22, case A applies to parts separated by switching element including contacts.....:	See attached Table 20	N/A
20.1.8	Clearances of supplementary insulation: not less than basic insulation, Table 22, case A .....:	See attached Table 20	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.....:	See attached Table 20	N/A
	Clearances in controls supplied from a transformer without separate windings; rated impulse determined from Table 21.....:	See attached Table 20	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.....:	See attached Table 20	N/A
20.1.12	Impulse voltage test, Cl 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

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Clause	Requirement + Test	Result - Remark	Verdict
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.....:	See attached Table 20	N/A
	For circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage .....:	See attached Table 20	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		N/A
	- measurements.....:	See attached Table 20	N/A
	- 2 N force applied by standard test finger to bare conductors		N/A
	- 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		N/A
	- 30 N force applied to accessible surfaces applied by standard test finger		P
20.2.3	Creepage distance for supplementary insulation: not less than basic insulation - based on material group and pollution degree.....:	See attached Table 20	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
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		N/A
21.2.1	Accessible parts (control correctly mounted):		N/A
	- ball-pressure test 1 (G.5.1) at temperature (°C) ..:		—
	diameter of the impression ≤ 2.0mm (mm) .....:	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 550 °C.....:	See attached TABLE 21	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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 ≤ 2.0mm (mm) ..... :	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 550°C..... :	See attached TABLE 21	N/A
21.2.3	Parts maintaining or retaining electrical connections in position:		N/A
	- ball-pressure test 2 at temperature (°C)..... :		—
	diameter of the impression ≤ 2.0mm (mm) ..... :	See attached TABLE 21	N/A
	Glow-wire temperature levels according to IEC 60695-2-11		N/A
	- glow-wire test (G2.) at 650 °C..... :	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 750 °C..... :	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 850 °C..... :	See attached TABLE 21	N/A
21.2.4	Other parts (except small parts unlikely to be ignited):		N/A
	- glow-wire test (G2.) at 550 °C..... :	See attached TABLE 21	N/A
21.2.7	Resistance to tracking:		N/A
	Test procedure, see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 1, requirement 30 ..... :	See attached TABLE 21	N/A
	Controls designed for operation at ELV levels were not subjected to a tracking test.		N/A
21.3	Independently-mounted controls		P
21.3.1	Preconditioning		P
	Controls without T rating:		P
	- circuit of switching part and driving mechanism not connected, detachable parts (covers) removed		P
	- temperature (°C): (80 ± 2) °C, 1 x 24 h..... :	80°C, 24h	—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
22	**RESISTANCE TO CORROSION**		N/A
22.1.1	Ferrous parts protected against corrosion		N/A
22.1.2	Test not required on temperature sensing elements and other component parts adversely affected by protective treatment		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
23	**ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – EMISSION**	Refer to EMC report	—
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
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 is 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
24.5	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**		P
	Meets requirements per annex H.....:	See annex H	P
25.2	Over-voltage and under-voltage test (for controls incorporating electro-magnets).....:	See attached TABLE 25.2	N/A
26	**ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – IMMUNITY**		-
	Meets requirements per Cl. H.26.....:	Refer to EMC report	-
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- no evidence of dielectric breakdown (Cl. 13.2)		N/A
27.2.3	Blocked mechanical output test (abnormal temperature test)		N/A
	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.....:	See attached TABLE 27.5	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 .....:	See attached TABLE 27.5	N/A
	Controls protected by incorporated fuses complying with IEC 60127-1 should have those fuses replaced by links of negligible impedance and the control is to be loaded to 2.1 times the rated current of the fuse. The temperature rise is measured after the control has been loaded for 30 min. The load value of 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 .....:	See attached TABLE 27.5	N/A
	Controls protected both by incorporated fuses and by protective devices are loaded to the lowest load of either test method.....:	See attached TABLE 27.5	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.....:	See attached TABLE 27.5	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
	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**		P
	Meets requirement per annex H:		P
A	**ANNEX A – 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		N/A
A.1.3	Markings which are mandatory and accessible to the final user		P
A.1.4	Permanence of marking test		P
	- solvents: neutral liquid detergent.....:		—
	- solvents: petroleum spirit.....:		—
	- solvents: water.....:		—
A2	Test of indelibility of markings classified in A1.2		N/A
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		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
A2.4	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 250 g, duration (s): 15 s		N/A
A2.6	Marking after these tests still legible		N/A
A3	Test of indelibility of markings classified A.1.3		—
A3.1	Rubbed in the apparatus (Fig. 8) with dry lint, weight 750 g, duration (s): 15 s		P
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 .....:		—
	Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping.....:		—
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
D	**ANNEX D – HEAT, FIRE AND TRACKING**		N/A
	Canada and USA national difference		N/A
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.		N/A
G.5	Ball pressure test: Performed in accordance with IEC 60695-10-2.		P
G.5.1	Ball-pressure test 1		P
	Temperature during ball pressure, the higher of:		P
	- 20 °C ± 2 K in excess of the maximum temperature during test Cl. 14 (°C), or.....:	See attached TABLE 21	—
	- 75 ± 2°C, or .....:	See attached TABLE 21	—
	- as declared (°C).....:	See attached TABLE 21	—
G.5.2	Ball-pressure test 2		P
	Temperature during ball pressure test is Tb ± 2 °C where Tb is equal to the higher of:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- Tb (°C): 100 °C if Tmax = 30-54 °C .....:	See attached TABLE 21	—
	- Tb (°C): 125 °C if Tmax = 55-84 °C.....:	See attached TABLE 21	—
	- Tb (°C): (Tmax + 40) °C if Tmax 〈 85 °C.....:	See attached TABLE 21	—
	- Tb (°C): 20 K in excess of the max. temperature during tests of Cl. 14 (°C), if higher.....:	See attached TABLE 21	—
H	**ANNEX H – REQUIREMENTS FOR ELECTRONIC CIRCUITS**		P
H.6	Classification, additions:		—
H.6.4.3.13	- electronic disconnection on operation (Type 1.Y - 2.Y).....:		—
H.6.9.5	- electronic disconnection		P
H.6.18	Class of control function (A, B, C).....:		—
H.7	**Information in addition to Table 1 provided**		—
	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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) ..... :	See IEC 60730-1 Software Report	N/A
	67 - Program documentation; clause: H11.12.2.9, H11.12.2.12; (Method: X) ..... :	See IEC 60730-1 Software Report	N/A
	68 - Software fault analysis; clause: H11.12, H27.1.1.4; (Method: X) ..... :	See IEC 60730-1 Software Report	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) ..... :	See IEC 60730-1 Software Report	N/A
	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) ..... :	See IEC 60730-1 Software Report	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) ..... :	See IEC 60730-1 Software Report	N/A
	72 - Control response(s) in case of detected fault/error; clause: H.11.12.2.7; (Method: X) ..... :	See IEC 60730-1 Software Report	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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) ..... :		P
	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 x f (kHz) < 70 mA; f (kHz) ..... :		N/A
	Maximum capacitance		N/A
	- peak value (V) ..... :		N/A
	- 42.4 V < V ≤ 450 V capacitance C (μF): ≤ 0.1 μF ..... :		N/A
	- 450 V < V ≤15 kV: capacitance C (μF): C x V ≤ 45 μC; calculated C max (μF) ..... :		N/A
	- V > 15 kV: capacitance C (μF): C x V² ≤ 350 μJ; calculated C max (μF) ..... :		N/A
H.11	**Constructional requirements**		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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:		P
H.11.4.16	- Type 1.Y and 2.Y action provides electronic disconnection.		P
H.11.4.16.1	Test carried out with control:		P
	- connected to maximum load		—
	- supplied with rated voltage (V) .....:	Powered by 2 x 1,5VDC AA battery	—
	- at temperature T_{max} (°C) .....:	25	—
H.11.4.16.2	Current through electronic disconnection not exceeding the lower of:		P
	- 5 mA (mA) .....:		P
	- 10% of the rated current (mA) .....:		N/A
H.11.12	**Controls using software**.....:	See IEC 60730-1 Software Report	N/A
H.17	**Endurance**		—
H.17.1	General requirements		—
H.17.1.4	Electronic controls with Type 1 action: no endurance test (unless necessary for testing of associated components)		P
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 Vr .....:		—
	- for 30 min. of each 24 h period: voltage (V): 0.9 times Vr .....:		—
	- during each 24 h period: duration of supply switched off (s); 30 s .....:		—
	- change of voltage not synchronized with change of temperature		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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**		P
H.18.1.5	For controls providing electronic disconnection (type 1.Y or 2.Y), the requirements of H.11.4.16 were met		P
H.20	**Creepage distances, clearances and distances through insulation**		P
H.20.1.15	Electronic controls		P

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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		P
H.20.1.15.2	Across protective impedances: double or reinforced insulation		P
	Across each component: supplementary insulation		P
H.20.1.15.3	Providing functional insulation		P
H.23	**Electromagnetic compatibility (EMC) requirements – Emission**	Refer to EMC report	—
H.25	**Normal operation**		P
H.25.1	The output waveform of electronic controls was as declared		P
	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		P
H.26	**Electromagnetic compatibility (EMC) requirements – Immunity**	Refer to EMC report	—
H.27	**Abnormal operation**		P
H.27.1	Electronic controls – assessment against internal faults		P
H.27.1.1.1	Fault conditions 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 .....:		—
	- max. power consumed by the variable resistor (W): ≤ 15 W, 5 s .....:		—
	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
	a) at most unfavourable voltage (V): range: 0.9-1.1 times VR .....:		—
	b) load producing the most onerous effect: kind of load; significant values .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	c) ambient temperature (°C): (20 ± 5) °C or other .:		—
	d) supply fuse rating (A) such that test result not influenced by operation of the fuse .....:		—
	e) actuating member in the most unfavourable position .....:		—
	f) supply to the control is to have the capability of supplying a short-circuit current of at least 500A..:		—
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. 13.2 for basic insulation		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 .....:	See attached TABLE H27.1	P
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
	- locked rotor rating declared		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	2) fault conditions introduced		N/A
	3) test conditions per H.27.1.2		N/A
	a) unfavourable voltage (V) .....:		—
	c) ambient temperature (°C) .....:		—
	d) fuse rating (A) .....:		—
	e) actuating member .....:		—
	evaluation of compliance per H.27.1.3 a) to e)		N/A
H.27.1.1.7	Test terminated by functioning of another component other than an overcurrent protective device, are to meet the following criteria, in addition to H.27.1.1.3:		N/A
	To ensure consistency and repeatability, the test is to be repeated on two additional samples resulting in the same component terminating the test.		N/A
	To ensure the disconnection is reliable, an electric strength potential corresponding to functional insulation, are to be applied across the “functioned” component.		N/A
H.27.1.1.8	Test is terminated by the functioning of an intentionally weak trace, an analysis should be conducted on the open trace and the control is to comply with the criteria of items a), c) and d) of H.27.1.1.3. The analysis of the opening trace is to consist of at least the following:		N/A
	a) upon functioning, an electric strength potential based on the value fo functional insulation across the two ends of the opened trace.		N/A
	b) test repeated on two additional samples with complying results.		N/A
	To ensure reproducibility of test results, the following information is recorded: -Dimensions of weak trace (width, length, thickness, shape)……: -Material of PCB…..: -Other relevant technical information….:		N/A
H.27.1.2	Protection against internal faults to ensure functional safety		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) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
J	**ANNEX J – REQUIREMENTS FOR CONTROLS USING THERMISTORS**		N/A
L	**ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES**		P
N	**ANNEX N (NORMATIVE) – POLLUTION DEGREES**		P
P	**ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST**		N/A
Q	**ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST**		N/A
T	**ANNEX T (NORMATIVE) - REQUIREMENTS FOR SELV AND PELV**		P
T.2	Protection against electric shock by SELV or PELV		P
T.2.1	SELV - Protection against electric shock is provided by the following measures:		P
	– limitation of voltage, ELV according to T.3.1 in a circuit (the SELV-system), and		P
	– 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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
T.3.1	Limitation of voltage in circuits connected to a SELV system or a PELV system is to provide a voltage between accessible parts or between accessible parts and earth that fulfils the requirements in 8.1.1 according to the SELV limits of 2.1.5 or as declared according to Item 87 of Table 1.		P
T.3.2	Protective separation between a SELV/PELV-circuit and other live circuits is achieved by means of:		N/A
	– 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

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	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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
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 ASCONTROLS IN IEC 60335 APPLIANCES**		N/A
V	**ANNEX Q (NORMATIVE) – REQUIREMENTS FOR CONTROLS POWERED BY SECONDARY BATTERIES (RECHARGEABLE)**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

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)	
Live parts and body	Basic	SRTS-A01	3	500	No	
Supplementary information:						

14.6 + 14.7	TABLE: Heating test			P
	Test voltage (V)……:	3		-
	Ambient (°C)……:	20,6		-
thermocouple locations	max. temperature measured, (°C)	temperature limit, (°C)	Verdict	
Terminal	25,9	85	P	
Surface	22,5	85	P	
Supplementary information:				

17.5.1	TABLE: Dielectric strength			P
Insulation or disconnection tested	Test potential applied between the following circuits	Test voltage applied (V)	Flashover/ breakdown	
Live parts and body	Basic	375	No	

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Clause	Requirement + Test	Result - Remark	Verdict

18.2.1	TABLE: Impact resistance		P
impacts per surface	surface tested	impact energy (Nm)	Verdict
3	accessible surfaces	0,5	P
Supplementary information:			

20	TABLE: Creepage distance and clearance measurements		Verdict
	Requirements creepage distance and clearance met		P
	Supply working voltage (V) ..... :	3	—
	Overvoltage category ..... :	II	—
	Rated impulse voltage according to table 20.1(V) ..... :	--	—
	Requirements for case B (20.1.7, 20.1.12) met (cl 20.1 Note 2)... :	--	

Creepage distance Cd and clearance Cl across (type of insulation)	Nominal Volt, (V)	Pollution degree	Required Cd, (mm)	Cd measured (mm)	Required Cl (mm)	Cl measured (mm)
Functional						
Basic	3	2	1,2	>1,2	0,2	>0,2
Supplementary						
full disconnection						
micro-disconnection						
electronic disconnection	--	--	--	--	---	--
Supplementary information: Abbreviations for types of insulation: F - functional, B - basic, S – supplementary, R - reinforced						

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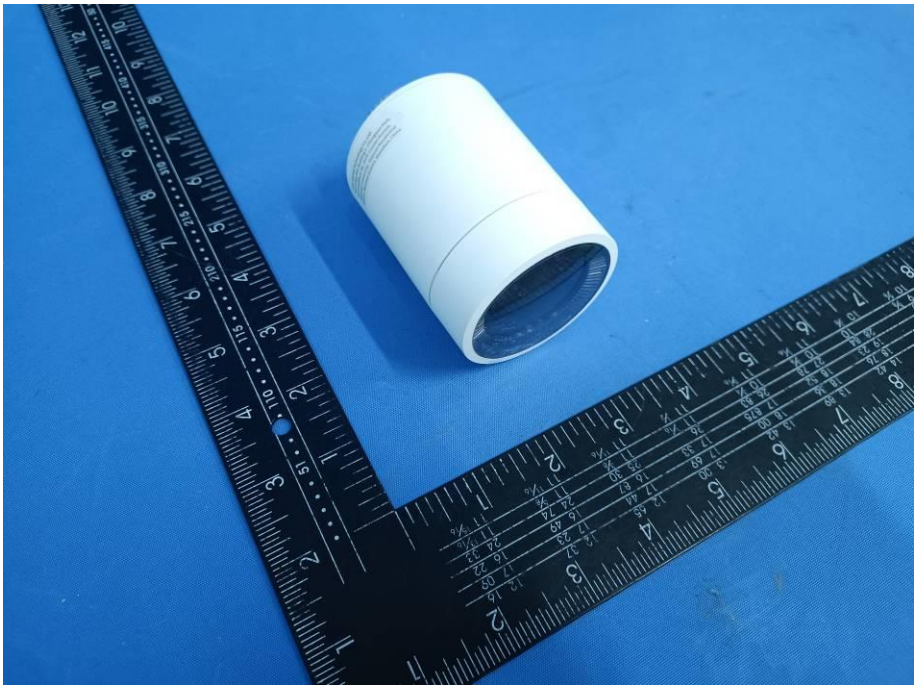
Clause	Requirement + Test	Result - Remark	Verdict

21A	TABLE: Resistance to heat and fire - Glow wire tests							P
Object/ Part No./ Material	**Manufacturer/ trademark**	**Glow wire test (GWT); (°C)**						**Verdict**
		550	**650**		**750**		**850**	
			te	**ti**	**te**	**ti**		
PCB	--	--	--	--	0	0	X	P
Enclosure	--	X	0	0	--	--	--	P
Object/ Part No./ Material	**Manufacturer/ trademark**	**Glow-wire flammability index (GWFI), °C**				**GW ignition temp. (GWIT), °C**		**Verdict**
		550	**650**	**750**	**850**	**675**	**775**	
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
The test specimen passed the glow wire test (GWT) with no ignition [(t_e – t_i) ≤ 2s] (Yes/No):								Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No) ..... :								No
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)? ..... :								No
Ignition of the specified layer placed underneath the test specimen (Yes/No)..... :								No
Supplementary information: 550 °C GWT not relevant (or applicable) to parts of material classified at least HB40 or if relevant HBF The GWIT pre-selection option, the 850 °C GWFI pre-selection option, and the 850 °C GWT are not relevant (or applicable) for attended appliances.								

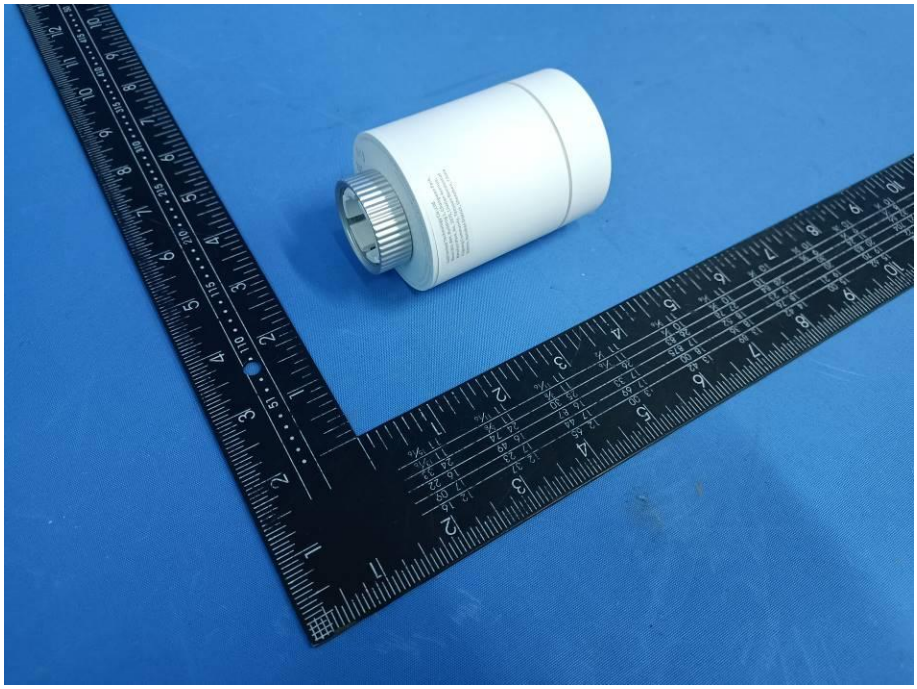
H27.1	TABLE: Electrical / electronic component fault modes			P
Component No.	**Fault Condition**	**Supply voltage(V)**	**Test time (min)**	**Observation**
Battery	S-C	2 x 1,5VDC AA battery	10min	Unit shut down. No damage, no hazard.
Battery	polarity reversed	2 x 1,5VDC AA battery	10min	Unit not work. No damage, no hazard.

Attachment 1 Photo documentation

General view

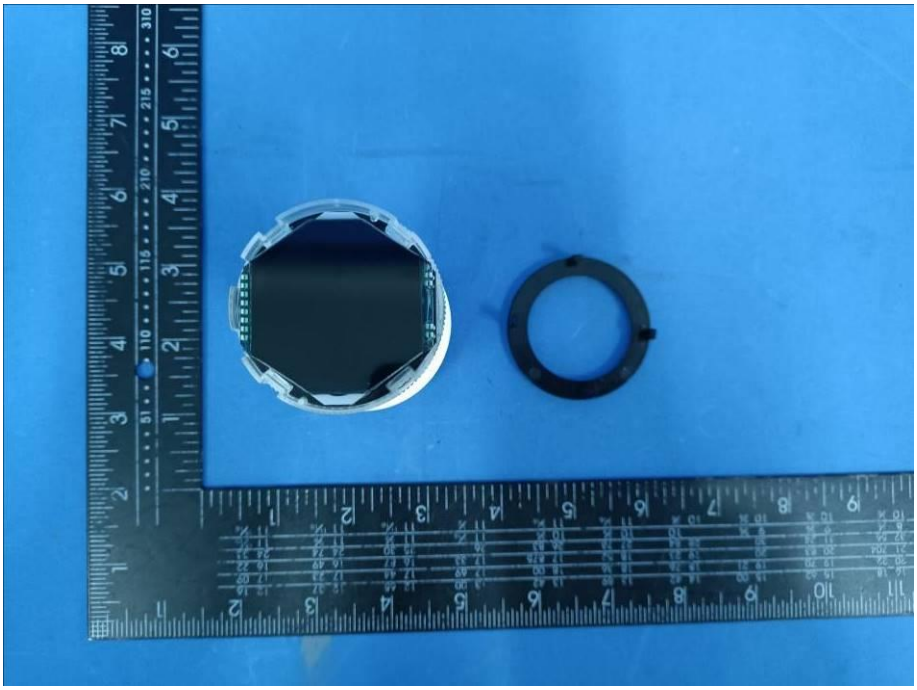


General view

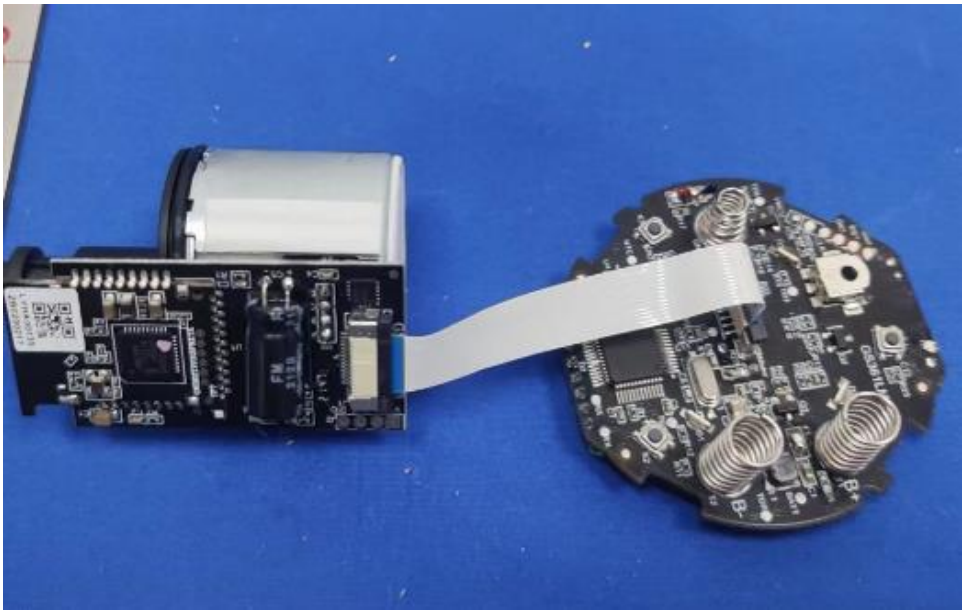


Internal view

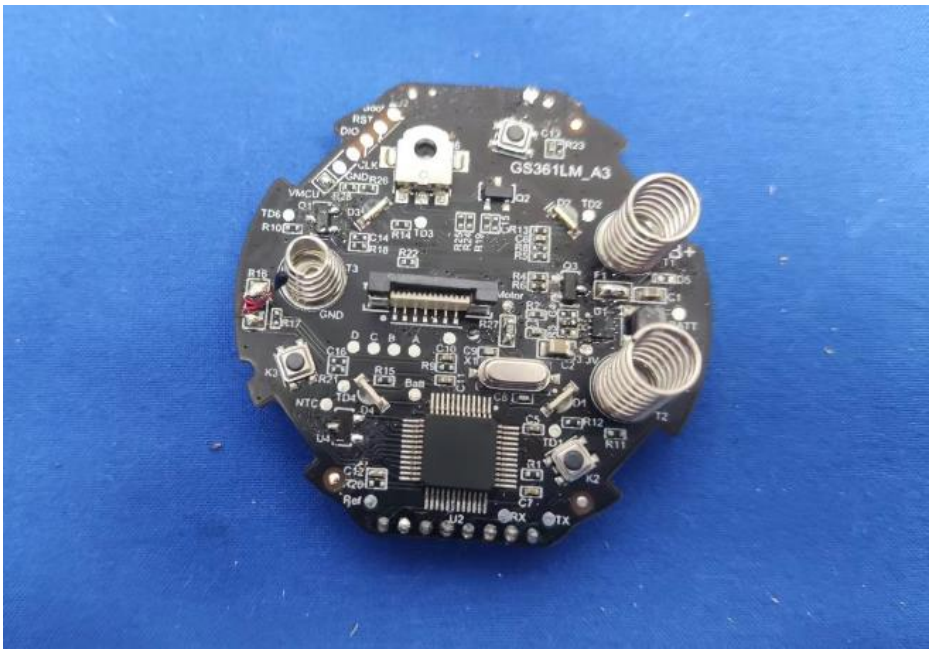
Internal view



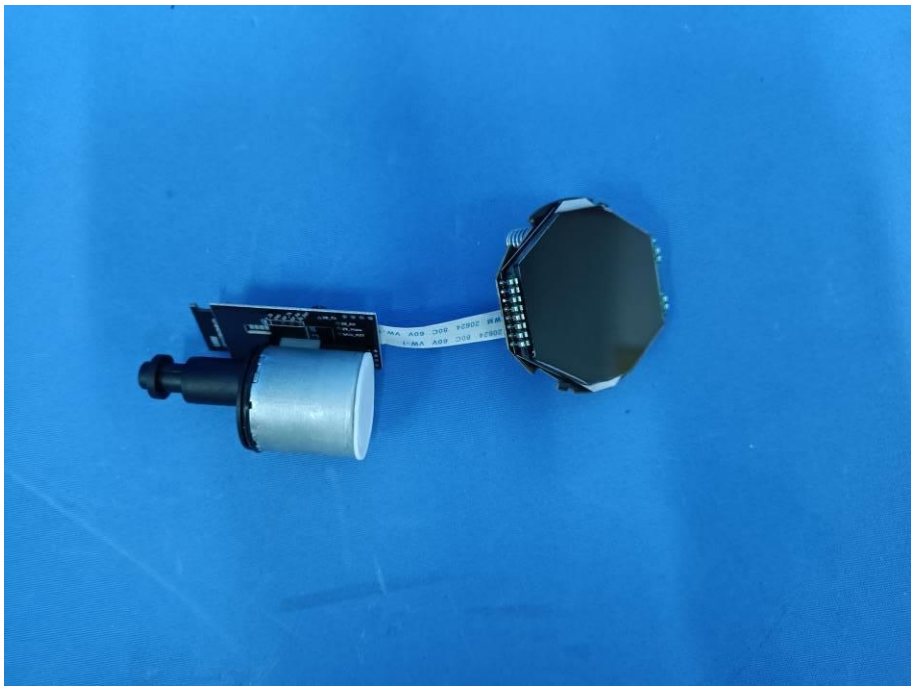
Internal view



Internal view



Internal view



------End of report-----