

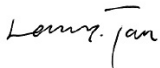
Test Report issued under the responsibility of:



TEST REPORT IEC 60730-1 Automatic electrical controls	
Report Number :	2504B0364SHA-001
Date of issue	2025-05-12
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Name of Testing Laboratory preparing the Report	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Applicant's name	Zhejiang Shuangyang Group Co., Ltd.
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Test specification:	
Standard	IEC 60730-1:2013, AMD1:2015, AMD2:2020
Test procedure	
Non-standard test method	N/A
TRF template used	IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No.	IEC60730_1K
Test Report Form(s) Originator	UL(US)
Master TRF	2020-08-14
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Test item description..... :	Mechanical plug-in time switch	
Trade Mark..... :		
Manufacturer	Same as applicant	
Model/Type reference	TS-MD1, TS-MD3, TS-MD20, TS-WD1, TS-WD3, TS-MD31	
Ratings	230V~ 50Hz 16(2)A Max.3680W	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	Testing Laboratory:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Testing location/ address..... :		Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China
Tested by (name, function, signature)..... :		Yaodong Jiang (Project Engineer) 
Approved by (name, function, signature).... :		Lorry Tan (Mandated Reviewer) 
☐	Testing procedure: CTF Stage 1:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature).... :		
☐	Testing procedure: CTF Stage 2:	
Testing location/ address..... :		
Tested by (name + signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
☐	Testing procedure: CTF Stage 3:	
☐	Testing procedure: CTF Stage 4:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):

Test report based on IEC 60730-1: 94 pages (page 1-93)

European Group Differences And National Differences Based On IEC 60730-1:2013, AMD1:2015, AMD2:2020: 7 pages (page 94-100)

Photograph attachment: 4 pages (page 101-112)

Summary of testing:

1. All the tests are performed on TS-MD1, TS-MD3, TS-MD20, TS-WD3, TS-MD31.
2. Test report 2504B0364SHA-003 concerns evaluation and testing for plug and socket outlet.
3. All test data and results are taken from 180300930SHA-001, 190400660SHA-001 except for sub-cl. 14, 21, 27.5.
4. The manufacturer declares to use this product together with 16A circuit breaker in the upstream, so sub-cl.27.5 overload test was carried out at the current of 16A×1,45 as declared.
5. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.
6. We conclude that the product(s) presented in this report complies (comply) with the standard according to the test results on the submitted samples.

Testing location:

Intertek Testing Services (Shanghai FTZ) Co., Ltd.

Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China

Summary of compliance with National Differences (List of countries addressed):

The product also fulfils the requirements of EN 60730-1: 2016 + A1: 2019 + A2:2022.

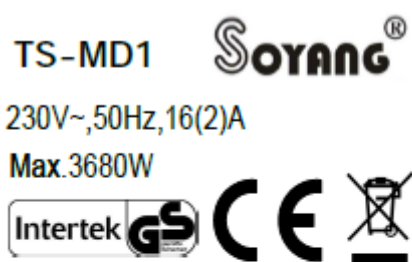
The text of the International Standard IEC 60730-1:2013 was approved by CENELEC as a European Standard with agreed common modifications.

The text of the International Standard IEC 60730-1:2013/A1:2015 was approved by CENELEC as a European Standard without any modification.

The text of the International Standard IEC 60730-1:2013/A2:2020 was approved by CENELEC as a European Standard without any modification.

Statement concerning the uncertainty of the measurement systems used for the tests

Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

Copy of marking plate:

Nicht hintereinander stecken
Spannungsfrei nur bei gezogenem Stecker
Nur zur Verwendung in trockenen Räumen
Keine Steckergeräte einstecken

vollständiger Name des Bevollmächtigten vertreter
vollständiger EU adresse des bevollmächtigten vertreter

Test Item Particulars	Electronic plug-in time switch		
Classification of installation and use	Category II		
Supply Connection	Direct plug-in		
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	2025-4-3		
Date (s) of performance of tests	2025-4-7 to 2024-5-7		
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 per sub-clause 4.2.5 of IEC60730-2:			
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	☐ Yes ☒ Not applicable		
When differences exist; they shall be identified in the General product information section.			
Name and address of factory (ies) : Same as applicant.			
General product information and other remarks:			
The products under evaluation are seven mechanical plug-in time switches: TS-MD1, TS-MD3, TS-MD20, TS-WD1 and TS-WD3, TS-MD31. They have similar construction and the differences between them are listed in the table below.			
Type	With indicator light	With manual switch	Time setting
TS-MD1	yes	yes	24h
TS-MD3	yes	yes	24h
TS-MD20	no	yes	24h
TS-WD1	yes	yes	Weekly
TS-WD3	yes	yes	Weekly
TS-MD31	yes	yes	24h
Note: TS-MD1 and TS-WD1 use different connection to plug from TS-MD3, TS-WD3 and TS-MD20.			
PAH test according to AfPS GS 2019:01 PAK is considered and passed, please refer to PAH test report 2504B0364SHA-PAH01 for detail.			
This test report should be read in conjunction with the Constructional Data Form (CDF).			
The test report 2504B0364SHA-003 concerns testing and evaluation for plug and socket outlet according to DIN VDE 0620-1/-2-1.			

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)	230V~	P

6	CLASSIFICATION		P
6.1	Nature of supply	AC	—
6.2	Type of load and power factor	Resistive and inductive	—
6.3	Purpose	Mechanical plug-in time switch	—
6.4	Features of automatic action, Type 1 or Type 2.....	1.B.R	—
6.5	Degree of protection provided by enclosure per IEC 60529 and control pollution situation	IP20, pollution degree 2	—
6.6	Method of connection.	Plug-in type	—
6.7	Ambient temperature limits of the switch ahead: $T_{min}(^{\circ}C)$; $T_{max}(^{\circ}C)$	0; 55	—
6.8	Protection against electric shock	Class I	—
6.9	Circuit disconnection or interruption.....	Micro-disconnection	—
6.10	Number of cycles of actuation (M) of each manual action.....	5000	—
6.11	Number of cycles of actuation (A) of each automatic action.....	5000	—
6.12	Temperature limits of the mounting surface of the control ($^{\circ}C$ 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.....	Plug-in time switch	—
6.16	Ageing requirements (type Y) of end-product equipment	No ageing requirements	—
6.17	Use of thermistor (Annex J)	No thermistor	—
6.18	Classes of control functions (Annex H).....	-	—

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

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)	SOYANG (logo)	P
	2 – Unique type reference (Method C)	See page 3	P
	3 – Rated voltage or rated voltage range in volts (Method C)	230V	P
	4 – Nature of supply (Method C)	~	P
	5 – Frequency, if other than for range 50 Hz to 60 Hz inclusive (Method C)	50Hz	P
	6 – Purpose of control (Method D or E)	Mechanical plug-in time switch	P
	6a – Construction of control (Method X)	Mechanical plug-in time switch	P
	7 – The type of load controlled by each circuit (Method C)	16(2)A	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)	No screwless terminals	N/A
	20 – Details of any special conductors which are intended to be connected to terminals for internal conductors (Method D or E)		N/A
	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):	0-55	P
	23 – Maximum temperature of mounting surface (T_{smax}) if it differs by more than 20 K from T_{max} (Method C)		N/A
	24 – Classification of control according to protection against electric shock (Method X)	Class I	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)	5000	P
	27 – Number of automatic cycles (A) for each automatic action (Method X)	5000	P

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Clause	Requirement + Test	Result - Remark	Verdict
	28 – Ageing period (Y) for controls with Type 1M or 2M action (Method X)		N/A
	29 – Type of disconnection or interruption provided by each circuit (Method X).....	Micro-disconnection	P
	30 – PTI of materials used for insulation (Method X)	175V	P
	31 – Method of mounting controls (Method D)	Plug-in	P
	31a – Method of providing earthing of control (Method D)	Plug-in	P
	32 – Method of attachment for non-detachable cords (Method D or E)	No cord connected	N/A
	33 – Intended transportation condition of control (Method X)	Nothing declared	N/A
	34 – Details of any limitation of operating time (Method D or E)	Continuous	N/A
	35 – Period of electric stress across insulating parts (Method X)	Long period	P
	36 – Limits of activating quantity for any sensing element over which micro-disconnection is secure (Method X)	No such sensing element	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)	No such sensing control	N/A
	38 – Values of overshoot of activating quantity for sensing controls (Method X)	No such sensing control	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)	1.B.R	P
	41 – Manufacturing deviation and condition of test appropriate to deviation (Method X).....	No manufacturing deviation declared	N/A
	42 – Drift (Method X)	No drift declared	N/A
	43 – Reset characteristics for cut-out action (Method D or E)	No reset characteristics declared	N/A
	44 – Hand-held control or control intended for hand-held equipment (Method X).....	Not intended for hand-held equipment	N/A
	45 – Limitation to the number or distribution of flat push-on receptacles (Method D or E).....	No receptacles	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)	No deviation and drift declared	N/A
	47 – Extent of any sensing element (Method X)	No sensing element	N/A

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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)	Not intended to be delivered exclusively to the manufacturer	N/A
	51 – Glow wire test temperatures (Method X)	550 / 850 °C	P
	52 to 60 See Annex H		P
	61 to 65 See Annex J	Not thermistor elements or controls using thermistors	N/A
	66 to 74 See Annex H		P
	75 – Rated impulse voltage (Method D or E)	2,5kV	P
	76 – Type of printed wiring board protection (Method X)		N/A
	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)	No single brush mounting	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	Not thermistor elements or controls using thermistors	N/A
	85 – For Class III controls, the symbol for Class III construction (Method C)	Not class III controls	N/A
	86 – For SELV or PELV circuits, the ELV limits realized (Method X)		N/A
	87 – Accessible voltage of SELV/PELV circuit, if different from 8.1.1, product standard referred to for the application of the control, in which 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		P

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Information provided for test authority	P
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
	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		N/A
7.3	Class II symbol		N/A
7.3.1	Used only for in-line cord, free-standing, and independently mounted controls		N/A
7.3.2	Sides of the outer square are approximately twice the length of sides of the inner square		N/A
7.3.2.1	Largest dimension of the control (mm)		—
	The length of the side of outer square (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.2.2	Controls which include terminals for earthing continuity for functional purposes are not marked with the symbol for class II		N/A
7.4	Additional requirements for marking		P
7.4.1	Marking placed on the main body 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
7.4.3.1	Earthing terminals for external earthing conductors or earthing continuity, and terminals for earthing for functional purposes are identified	No earthing terminals, Plug-in structure	N/A
	– for protective earth by the earth symbol for protective earth, IEC 60417-5019 (2006-08)		N/A
	– for functional earth by the earth symbol for functional earth, IEC 60417-5017 (2011-07)		N/A
7.4.3.2	All other terminals are suitably identified		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 "-")		P
	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	No replaceable parts	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)	Not intended to be connected only to SELV systems	N/A
	This requirement does not apply where the means of connection to the supply is so shaped that it can only mate with a particularly designed SELV or PELV arrangement		N/A
	Controls designed as 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	No replaceable battery	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- If the battery is intended to be replaced by the user, marking close to the battery or a statement in both the instructions for use and the service instructions are provided		N/A
	- If the battery is not intended to be replaced by the user, marking close to the battery or a statement in the service instructions are provided		N/A
7.4.8	The battery compartment of controls incorporating batteries that are intended to be replaced by the user are marked with the battery voltage and the polarity of the terminals	No replaceable battery	N/A
	If colours are used, the positive terminal is identified in red and the negative terminal in black		N/A
	Colour is not used as the only indication of polarity		N/A
7.4.9	The instructions for controls incorporating batteries intended to be replaced by the user include:		N/A
	- the type reference of the battery		N/A
	- the orientation of the battery with regard to polarity		N/A
	- the method of replacing batteries		N/A
	- warning against using incorrect type batteries		N/A
	- how to deal with leaking batteries		N/A
	The instructions for controls incorporating a battery that contains hazardous to the environment materials give details on how to remove the battery:		N/A
	- 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
	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	No SELV or PELV	N/A

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Application: Product standard: Voltage limits:	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		P
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
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(mm ²)..... :		—
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 (mm ²)..... :		—
8.1.9	Tests using the standard test finger and test pin:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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		P
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":	Identified parts:	N/A
8.1.11	Between Class III and main/earth circuits, insulation external to the safety isolating transformer complies with Class II insulation		N/A
8.1.12	Live parts are hazardous if they exceed the values specified in 8.1.1 and if are not separated from the source by protective impedance and are not a PEN conductor or a part of the equipotential bonding system.....:	Identified parts:	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

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

	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:		P
	- of insulating material, or		P
	- 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
8.3.1	For Class II in-line cord controls and independently mounted controls, capacitors are not connected to accessible metal parts	No accessible metal parts	N/A
	For controls for Class II equipment, capacitors are not connected to metal likely to be connected to accessible metal parts (control correctly mounted)		N/A
	Metal casings of capacitors separated by supplementary insulation from:		N/A
	- accessible metal parts	No accessible metal parts	N/A
	- metal parts likely to be connected to accessible metal parts		N/A
8.3.2	Controls connected to the supply by means of a plug designed that there is no risk of electric shock (from capacitor) when touching the pins of the plug		N/A
8.3.2.1 – 8.3.2.4	Test method to show compliance to 8.3.2 :		N/A
8.4	Covers and uninsulated live or hazardous parts; cover fixing screws:		N/A
	- not accessible, or		N/A
	- earthed, or		N/A
	- separated by double or reinforced insulation, or		N/A
	- not accessible after mounting in the equipment		N/A

9	PROVISION FOR PROTECTIVE EARTHING		P
9.1.1	Accessible parts other than actuating members of in-line cord, free-standing and independently mounted controls of Class 0I or Class I which may become live:		N/A
	- connected to an earthing terminal, or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- terminated within the control, or		N/A
	- connected to an earthing contact of an equipment inlet		N/A
9.1.2	Accessible parts other than actuating members of integrated and incorporated controls for Class 0I and Class I equipment which may become live:		P
	- have provision for earthing, or		N/A
	- earthed by the fixing means		P
9.1.3	Earthing terminals, terminations or contacts not electrically connected to any neutral terminal		P
9.2	Control of Class II or Class III:		N/A
	- no provision for protective earthing		N/A
9.3	Adequacy of earth connections		P
9.3.1	Connection between earthing terminal and parts to be connected is of low resistance :	See attached TABLE 9.3.1	P
9.3.2	Fixed wiring and methods X and M earthing terminals meet requirements of 10.1		N/A
9.3.3	External earthing connections not made by screwless terminals		N/A
	For attachment methods Y and Z, screwless earthing terminals complying with IEC 60998-2-2, 60998-2-3 or 60999-1		N/A
9.3.4	Size of accessible earthing terminals		N/A
	- accessible earthing terminals, range: 2.5 mm ² to 6 mm ²		N/A
	- unable to loosen without the aid of a tool		N/A
9.3.5	Size of non-accessible earthing terminals		N/A
	- size of current -carrying terminal (mm ²) :		—
	- size of earthing terminal (mm ²) :		—
9.3.6	Earthing terminals locked against accidental loosening		N/A
9.4	Corrosion resistance		P
9.4.1	Material of earthing terminals, body:		P
	- body of earthing terminals made of brass		N/A
	- other metal not less resistant to corrosion		N/A
	- screws or nuts made of brass		N/A
	- plated steel or other resistant material	Earthing contact, copper alloy	P
9.4.2	Precaution against risk of corrosion between copper and frames or enclosures of aluminium or its alloys		N/A
9.5.1	Detachable part with earth connection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- placing part in position: earth contact made before current-carrying connections		N/A
	- removing part: earth contact separated after disconnection of current-carrying connections		N/A
9.5.2	Incorporated controls likely to be separated from its normal earthing means after mounting in equipment, provided with permanent earthing connection or conductor		N/A

10	TERMINALS AND TERMINATIONS		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..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- cross-sectional area (mm ²)		—
	- applied torque value (Nm).....		—
	- terminals did not work loose		N/A
	- internal conductors not subjected to stress		N/A
	- creepage and clearances distances not reduced below values required in Cl. 20		N/A
10.1.6	Terminals for fixed wiring and non-detachable cords using attachment methods X or M clamp conductors between metal surfaces		N/A
	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
	- An 8 mm length of insulation is removed from the end of a stranded conductor		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 (connector used)		N/A
10.2.1	Connection of conductors.....:		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		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict

	- 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	No such material used	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	>58%	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		N/A
	- properties of both insulations are otherwise provided		N/A
11.2.2	Infringement of double or reinforced insulation in Class II controls:		N/A
	- creepage distances and clearances not reduced below values of Cl. 20 by wear		N/A
	- creepage distances and clearances not reduced to less than 50% of values of Cl. 20 by parts becoming loose (wires, screws, nuts, etc.)		N/A
11.2.3	Integrated conductors		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- not subjected to undue mechanical or thermal stresses		N/A
	- insulation properties comply with IEC 60227-1 or IEC 60245-1		N/A
11.2.5	Protective impedance		N/A
11.2.6	Protection against electric shock by use of SELV or PELV		N/A
11.2.7	Adequate measures are provided to prevent the interconnection of an integrated SELV circuit to an external PELV circuit and vice versa		N/A
	Supply from an external SELV source is only possible by a dedicated plug and socket system which cannot be fitted or interconnected with other connecting systems		N/A
11.2.8	Overcurrent Protection		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
	For declared all-pole disconnection contact operation in each pole substantially together		N/A
11.3.2	Micro-disconnection		P
	- one supply pole, at least, separated		P
	- separated pole meets electric strength requirements, Cl. 13		P
	- any subsequent action does not cause reduction of contact separation below value required by the Electric Strength Test		P
11.3.3	Reset buttons are so located or protected that they are not to be accidentally reset		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
11.3.5.2.1	Measures to prevent common cause errors		N/A
	- Measures to protect against failure of two (or more) switching elements by an external short which prevent control from performing a safety shut-down. Acceptable methods are:		N/A
	- Overcurrent protection device,		N/A
	- Current limitation or		N/A
	- Internal fault detecting means		N/A
	Compliance (Short Circuit Test)		N/A
	- Safety related output terminals of the control connected to switch on short circuit current		N/A
	- With switch opened, control connected as in H.27.1.1.2 with outputs energized to simulate normal operation		N/A
	Controls with overcurrent protection devices:		N/A
	- Short-circuit current capability of power supply is at least 500A		N/A
	Controls with current limitation devices		N/A
	- power supply does not limit the declared short-circuit current		N/A
11.3.5.2.1.1	Short-circuit applied between safety related output terminals		N/A
	- declared short-circuit current		—
	- 1h duration or until no current flow through switch		N/A
	- if overcurrent protection device is replaceable and operated during the test, device is replaced and test is repeated two more times		N/A
	- test is repeated using same or separate sample		N/A
11.3.5.2.1.2	If internal fault detecting function of the control opens the switching elements or initiates a safety shut-down, the test is repeated two more times		N/A
	After test at least one switching element of the control de-energized the safety related output terminals, or		N/A
	- non-replaceable overcurrent protection device permanently interrupted the safety related output terminal's supply		N/A
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	Micro-disconnection	P
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		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- contacts are open or closed as intended		P
	- no hazard can occur within the control		P
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): $\leq 45 \text{ N}$		—
	- pull force 45° to vertical (N): $\leq 70 \text{ N}$		—
	- 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
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	1.B	P
11.4.6	Type 1C or 2C action: operation provides micro-interruption		N/A
11.4.7	Type 1D or 2D action: disconnection cannot be prevented and reset not possible while faults persists		N/A
11.4.8	Type 1E or 2E action: disconnection or opening of contacts cannot be prevented/inhibited by reset mechanism or against continuation of fault condition		N/A
11.4.9	Type 1F or 2F action: reset needs the aid of a tool		N/A
11.4.10	Type 1G or 2G action: reset possible under electrically loaded conditions		N/A
11.4.11	Type 1H or 2H action:		N/A
	- contacts cannot be prevented from opening		N/A
	- may reset automatically to “closed” if reset means is held in reset position		N/A
	- no automatic reset if reset means in normal position at any temperature above -35°C		N/A
11.4.12	Type 1J or 2J action:		N/A
	- contacts cannot be prevented from opening		N/A
	- no automatic reset if reset means is held in reset position		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- no automatic reset at any temperature above -35°C		N/A
11.4.13	Type 1K or 2K action: declared disconnection provided in the case of break in sensing element or in part between element and switch head.		N/A
11.4.14	Type 1L or 2L action: function independent of electrical supply or auxiliary energy source		N/A
11.4.15	Type 1M or 2M action: operation provided after declared ageing procedure.		N/A
11.4.16	See Annex H		N/A
11.4.17	See Annex J		N/A
11.5	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	Plug-in type	P
11.6.2	Control mounted as declared, if movement or removal could adversely affect compliance with this standard:		N/A
	- cannot rotate or be displaced		N/A
	- cannot be removed without the aid of a tool		N/A
	- when removal (even partial) is necessary for use, requirements of clauses 8, 13, and 20 are satisfied before and after removal		N/A
	Controls, other than with rotary actuation, fixed by a nut and single bushing:		N/A
	- tightening of the nut requires a tool		N/A
	- parts have adequate mechanical strength		N/A
	Screwless fixing of an incorporated control: a tool is required before the control can be removed from the equipment		N/A
11.6.3	Mounting of independently mounted controls		N/A
11.6.3.1	Independently mounted controls (other than for panel mounting)		N/A
	- fit a standard box as declared, or		N/A
	- supplied with a conduit box (if special), or		N/A
	- suitable for surface (plane) mounting		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.6.3.2	If special conduit box required, it is delivered with the control		N/A
	- box provided with entries for conduits specified in IEC 60423		N/A
11.6.3.3	Controls for surface mounting for buried installation (concealed wiring) provided with suitable holes on the backside.		N/A
11.6.3.4	Controls for surface mounting for exposed wiring provided with entries, knock-outs or glands.		N/A
11.6.3.5	Terminals (for external conductors) of controls or sub-bases accessible and usable when control is fixed and cover or the control is removed		N/A
11.6.3.6	In controls for mounting on an outlet box, wiring terminals, live parts and sharp edged metal parts located or protected to prevent from being forced against wiring		N/A
11.6.3.7	Back wiring terminals: recessed or protected to prevent contact with wiring installed in the box		N/A
11.7	Attachment of cords		N/A
11.7.1.1	In-line and free-standing controls, flexible cords withstand flexing during normal use		N/A
	Cords with attachment method X: cord-guard (if provided) not integral with flexible cord		N/A
11.7.1.2	Flexing Test for flexible cords		N/A
11.7.2	Cord anchorages		N/A
11.7.2.1	Controls, other than integrated or incorporated, intended to be connected by non-detachable cords provided with cord anchorage so designed that:		N/A
	- conductor relieved from strain		N/A
	- conductor relieved from twisting		N/A
	- conductors covering protected from abrasion		N/A
11.7.2.2	Cord anchorages of Class II controls		N/A
	- made of insulating material		N/A
	- insulated from accessible metal parts by supplementary insulation		N/A
11.7.2.3	Cord anchorages of controls other than Class II:		N/A
	- made of insulating material, or		N/A
	- provided with insulating lining, if an insulation fault on the cord could make accessible metal parts live		N/A
	- provided with lining fixed to the cord anchorage (exception: bushing which forms part of a cord guard)		N/A

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

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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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		P
11.10.1	Engagement with connecting devices of other systems not possible		P
	Engagement causes no danger or damage		P
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		P
	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	Socket: DIN 49441-R1 Plug: DIN 49440-1	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
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:		P
	- fixed in a reliable manner		P
	- withstand mechanical stress		P
	- snap-in devices have a locked position		P
11.11.1.5.1	Parts likely to be removed for installation or during servicing disassembled and assembled ten times		P
11.11.1.5.3	Control subjected to 50 N push force test	50 N	P
	- pull force (N)	50 N / 30 N	P
	- finger nail pull force (N)	10 N	P
	- if cover subjected to twisting force, torque applied	2 Nm / 4 Nm	P
11.11.1.5.4	After push / pull test, parts remain locked in position and not detached.		P
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		P
11.11.3.1	Control not damaged by mounting or removal of actuating member		P
11.11.3.2	For Type 2 action with max/min. setting limited by means of the actuating member, the actuating member not removable without use of a tool		N/A
11.11.3.3	Actuating member cannot be fixed in an incorrect position for Type 1 action (actuating member providing OFF position) or Type 2 action (actuating member indicating condition of the control)		P
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

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Clause	Requirement + Test	Result - Remark	Verdict
	- adequate mechanical strength		N/A
	- secured in a reliable manner		N/A
11.12	Controls using software		N/A
11.13	Protective controls and components of protective control system		N/A
11.13.1	- protective controls designed and constructed to be reliable and suitable for their intended duty		N/A
	- protective controls are independent of other functions		N/A
	- protective controls comply with appropriate design principles in order to obtain suitable and reliable protection		N/A
	Operating controls are not used as protective controls		N/A
11.13.2	The pressure of the limiting devices does not permanently exceed the maximum allowable pressure of the controlled application		N/A
	A short duration pressure surge of the limiting devices does not exceed 10% of the pressure surge		N/A
11.13.3	The temperature monitoring devices have an adequate response time on safety grounds, consistent with measurement function		N/A
11.13.4	Batteries		N/A
11.13.4.1	Controls containing batteries are designed to reduce the risk of fire, explosion and chemical leaks		N/A
	- under normal operation		N/A
	- under after a single fault in the control		N/A
	Controls containing user-replaceable batteries are designed to reduce likelihood of reverse polarity if results in a hazard		N/A
11.13.4.2	Battery circuits designed for total battery capacity > 1000 mAh are designed so that		N/A
	-output characteristics of battery charging circuit compatible with rechargeable battery		N/A
	- 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

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

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Clause	Requirement + Test	Result - Remark	Verdict

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
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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.....:		P
	Entered water does not impair compliance with this standard		N/A
	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°C	—
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)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- 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
12.3.3	Measuring circuits used the figure number		—
12.3.4	During measurement all control circuits closed except controls tested to Figs. 26, 29, 30 checked with switch S1 in the open and closed position		N/A
12.3.5	Impedance of measuring circuits (Ω)		—
	Time constant (μ s)		—
12.3.6	Error and accuracy of measuring circuit $\leq 5\%$		N/A

13	ELECTRIC STRENGTH AND INSULATION RESISTANCE		P
13.1	Insulation resistance of in-line cord, free-standing and independently mounted controls		P
13.1.2	Reinforced or supplementary insulation measured to non-metal parts covered with metal foil		P
13.1.3	Test voltage applied for 1 min (V dc)	500Vdc	—
13.1.4	Insulation resistance measured		P
	- basic insulation $\geq 2 \text{ M}\Omega$	199M Ω	P
	- supplementary insulation $\geq 5 \text{ M}\Omega$		N/A
	- reinforced insulation $\geq 7 \text{ M}\Omega$	199M Ω	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.	50Hz	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
13.3.1	A test voltage, was applied between any live part and accessible metal parts, or		N/A
	– any live part & metal foil in contact with accessible surfaces of insulating material, connected together		N/A
	For control with a grounding pin or conductor, the grounding conductor was disconnected at the supply source		N/A
13.3.2	Test voltage (V)		—
13.3.3	The leakage current was measured within 5 s after the application of the test voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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 (mm ²)		—
14.2.1	Attachment method M, Y or Z: cords as declared or supplied (mm ²)		—
14.2.2	Terminals for flexible and fixed conductors: appropriate flexible cord (mm ²)		—
14.2.3	Terminals not for external conductors: conductors of minimum cross-sectional area or as declared in Clause 7.2 (mm ²)		—
14.3	In-line cord controls tested on a dull, black painted plywood		N/A
14.3.1	Independently mounted controls tested as in normal use		N/A
14.4	Electrical conditions		P
	- voltage (V): most unfavourable value between 0.94 and 1.06 times UR	253V	—
	- 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	17,6A (1,1 IR based on EU deviation)	—
14.4.1	For circuits and contacts other than for external loads, load(s) as specified by the manufacturer: voltage (V); current (A)		—
14.4.2	Actuating members placed in most unfavourable position		P
14.4.3	Contacts initially closed at rated current and voltage		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

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Clause	Requirement + Test	Result - Remark	Verdict
14.5.1	Temperature of the switch head between T_{max} and $(T_{max} + 5)^{\circ}\text{C}$, or T_{max} and 1.05 times T_{max} (whichever is greater) ($^{\circ}\text{C}$)		N/A
	Mounting surface of the switch head maintained between T_s max and either $(T_s \text{ max} + 5)^{\circ}\text{C}$ or 1.05 times (whichever is the greater if T_s max is higher than T_{max} by more than 20 K) ($^{\circ}\text{C}$)		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 $^{\circ}\text{C}$ (measured temperature corrected to a 25 $^{\circ}\text{C}$ reference value); measured temperature ($^{\circ}\text{C}$)		N/A
14.6	The temperatures specified for the switch head, the mounting surfaces and sensing element were attained in approximately 1 h		N/A
14.6.1	Electrical and thermal conditions maintained for 4 h, or for 1 h after steady state (h)	1h after steady state	P
14.6.2	For controls designed for short-time or intermittent operation, the resting time(s) declared in Table 1, requirement 34, were included in the 4 h		N/A
14.7	The temperature of the medium in which the switch head is located, and the value of the activating quantity to which the sensing element is exposed, was measured approx. 50 mm from the control		N/A
14.7.1	The temperature was determined by means of fine wire thermocouples or other equivalent means, so chosen and positioned that they have the minimum effect on the temperature of the part under test		P
14.7.3	Temperature on parts which are gripped in normal use other than actuating members		P
14.7.4	The temperature of electrical insulation is determined on the surface of the insulation.....	See attached TABLE 14.6 & 14.7	P
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		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

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Clause	Requirement + Test	Result - Remark	Verdict

16.2.1	Entire control (not energized) maintained for 24h at a temperature of (-10 ± 2)°C or as declared.....:	-10°C	P
	Entire control (not energized) maintained for 4h at a temperature of (60 ± 5)°C or as declared	60°C	P
16.2.2	The control was not energized during testing		P
16.2.3	Control capable of being actuated at room temperature to provide disconnection as declared (without dismantling)		P
	The control was held at room temperature for 8 h prior to actuation		P
16.2.4	For controls with type 2 actions, the appropriate test of Clause 15 were repeated		N/A

17	ENDURANCE		P
17.2	Electrical conditions for the tests.....:	See attached TABLE 17.2.1	P
	Type of circuit	Resistive or inductive	P
	Rated voltage (V) ; test voltage (V)	230V~	—
	Rated current (A) ; test current (A)	16(2)	—
	Rated frequency (Hz)	50Hz	—
17.3	Thermal conditions for parts other than temperature sensing elements		P
	Accessible parts: tested at room temperature (°C) :	25°C	—
	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		P
17.4.2	Slow speed test		N/A
	High speed test		N/A
	Accelerated speed test		P
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) ...:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
17.5	Dielectric Strength Test :	See attached TABLE 17.5.1	P
17.6	Ageing test for controls of 1M or 2M action		N/A
	- sensing element maintained at activating quantity as determined in 14		N/A
	- other parts maintained as specified in 17.3		N/A
	- electrically loaded as specified in 17.2 for breaking conditions		N/A
	- voltage (V)		—
	- current (A)		—
	- duration (h):		—
17.7	Over-voltage test of automatic action at accelerated rate		P
17.7.1	Electrical conditions: specified in 17.2		P
17.7.2	Thermal conditions: specified in 17.3		P
17.7.3	Method and rate of operation		P
	Control Type 1 action		P
	Method of operation	Automatic	—
	Rate of operation	No rate declared	—
	Control Type 2 action:		N/A
	Method of operation		—
	Rate of operation		—
	Type 2 controls are tested at the most unfavourable operating value declared in Table 1, Item 48		N/A
17.7.4	Type 2 sensing action: overshoot at each operation between values stated in 7.2		N/A
17.7.6	Automatic cycles: the smaller of 1/10 of numbers declared in 7.2, or 200; (number of cycles)	200	P
17.7.7	Actuating members placed in the most unfavourable position during test		P
17.8	Test of automatic action at accelerated rate		P
	Temperature required in 17.3 applied for the last 50% of each test		P
17.8.1	Electrical conditions: specified in 17.2		P
17.8.2	Thermal conditions: specified in 17.3		P
17.8.3	Method and rate of operation: specified in 17.7.3		P

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Clause	Requirement + Test	Result - Remark	Verdict
17.8.4	Number of automatic cycles:		P
	- number declared in 7.2	5000	—
	- number of cycles 17.8	4800	—
17.8.4.1	For slow-make, slow-break automatic actions, number of automatic cycles: (75% of cycles in Clause 17.8.4)		—
17.9	Test of automatic action at slow rate		N/A
17.9.1	Number of automatic cycles: 25% remainder (17.8.4)		—
17.9.2	Electrical conditions: specified in 17.2		—
	Thermal conditions: specified in 17.3		—
17.9.3	Method of operation and monitoring		—
	- imposing change of value of activating quantity on sensing element (rate of change of activating quantity as declared in 7.2)		N/A
	- by the prime mover		N/A
	Sensing controls: overshoot between values of 7.2		N/A
17.9.4	Controls of which only the make or break is slow automatic action: rest of actions accelerated by agreement between testing authority and manufacturer		N/A
17.10	Overvoltage (overload) test of manual action at accelerated speed		P
17.10.1	Electrical conditions: specified in 17.2		P
17.10.2	Thermal conditions: specified in 17.3		P
17.10.3	Method of operation: specified in 17.4 for accelerated speed		P
	Number of cycles: the smaller of 1/10 of number declared or 100 (see 7.2)	100	—
	Sensing elements maintained at suitable values of activating quantity or prime movers positioned that actuation causes operation		N/A
17.11	Test of manual action at slow speed		P
17.11.1	Electrical conditions: specified in 17.2		P
17.11.2	Thermal conditions: specified in 17.3		P
17.11.3	Method of operation: specified in 17.4 for slow speed		P
17.11.4	Number of cycles: 1/10 of declared number or 100 (see 7.2)	100	—
	Actuating causes operation		N/A
17.12	Test of manual action at high speed (applies only to actions which have more than one pole and where polarity reversal occurs during the action)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of poles		—
	- polarity reversal occurs during action		N/A
17.12.1	Electrical conditions: specified in 17.2		N/A
17.12.2	Thermal conditions: specified in 17.3		N/A
17.12.3	Method of operation: specified in 17.4 for high speed		N/A
17.12.4	Number of cycles: 100		—
	Sensing elements maintained at suitable value of activating quantity		N/A
	Prime movers so positioned to ensure actuating causes appropriate operation		N/A
17.13	Test of manual action at accelerated speed		P
17.13.1	Electrical conditions: specified in 17.2		P
17.13.2	Thermal conditions: specified in 17.3		P
17.13.3	Method of operation: specified in 17.4 for accelerated speed		P
17.13.4	Number of cycles: number declared in 7.2, item 26 less number made during tests of 17.10, 17.11 and 17.12; total number	4800	—
17.14	Evaluation of compliance		P
	Actions function in the intended and declared manner:		P
	- automatically		P
	- manually		P
	The following requirements are still met:		P
	- Cl. 14, heating: terminals for external conductors: measured (°C)		N/A
	- Cl. 14, heating: other terminals: measured (°C) ...	Max.70 °C; 85°C	P
	- Cl. 14, heating: current-carrying parts: measured (°C)	Max.70 °C; 230°C	P
	- Cl. 14, heating: supporting surfaces: measured (°C)		N/A
	- Cl. 8, protection against electric shock		P
	- 17.5, electric strength (without previous humidity treatment, test voltage 75% of values 13.2)		P
	- Cl. 20, distances and clearances		P
	- for tests 17.5 and 20, if special samples were submitted for Cl. 13: tested at appropriate condition to ensure contacts are open		N/A
	- requirements of Cl. 15 for type 2 actions still met		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- manual actions: declared circuit disconnection can be obtained		P
	No evidence that any transient fault has occurred between live parts and:		P
	- earthed metal parts		P
	- accessible metal parts		N/A
	- actuating members		P

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:		P
	- have adequate mechanical strength, or		P
	- 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	See page 3	—
	- Tested sample: identification No.	#1	—
18.1.5	After the tests of Clause 18 there is:		P
	- 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		N/A
	- Still possible to remove and replace detachable/external parts without these parts or insulating linings breaking.		P
	- 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		N/A
18.1.6	In Canada and the USA, threads for the connection of metal conduit tapped all the way through an enclosure wall or an equivalent construction:		N/A
	- have no sharp edges		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- have no more than 3 and no less than 5 full threads in the metal		N/A
	- a suitable conduit bushing can be properly attached		N/A
18.1.6.1	In Canada and the USA, threads for the connection of metal conduit not tapped all the way through an enclosure wall, conduit hub or the like:		N/A
	- have less than 3,5 full threads in the metal with a conduit stop.....		N/A
	- have a smooth well-rounded inlet hole with internal diameter approximately the same as that of the corresponding size of rigid metal conduit.		N/A
18.1.6.2	In the USA, at least 5 full threads for support by rigid metal conduit		N/A
18.1.6.3	In Canada and the USA, a conduit hub or nipple attached to the enclosure by swaging, staking or similar means withstands:		N/A
	- direct pull of 890 N for 5 min.		N/A
	- bending force of 67,8 Nm for 5 min to the conduit at right angles to its axis and the lever arm		N/A
	- torque of 67,8 Nm applied to the conduit for 5 min in a direction tending to tighten the connection and the lever arm		N/A
18.2	Impact resistance		P
18.2.1 - 18.2.6	In-line cord controls, free-standing, independently mounted controls: test by means of impact test apparatus IEC 60068-2-75.....		N/A
18.4	Alternate compliance – Impact resistance		N/A
	enclosure material		—
	with supporting frame (yes / no)		—
	maximum width, maximum length		—
	thickness required; measured (mm)		N/A
18.4.1	cast metal not less than 3 mm thick, not more than 6 mm thick at threaded holes for conduit.....		N/A
	die-cast metal other than at plain or threaded holed for conduit:		—
	- not less than 1,6 mm thick for an area $\leq 150 \text{ mm}^2$:		N/A
	- no dimension greater than 150 mm.....		N/A
	- $\geq 2,4 \text{ mm}$ thick for larger areas		N/A
18.5	Free-standing controls		N/A
18.5.1	Additional tests of 18.5.2 and 18.5.3 required (test apparatus Fig. 4)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
18.5.2	- input terminals: 2 m of flexible, lightest cord (used in 10.1.4); cord; cross-sectional area.....:		—
	- output terminals: 2 m of flexible, lightest cord (if intended); cord; cross-sectional area.....:		—
	- pull (N), increasing value, applied on the cord (Table 9)		—
	- pull and fall test (3 times)		N/A
18.5.3	After the test of 18.5.2, complies with 18.1.5		N/A
18.6	In-line cord controls		N/A
18.6.1	In-line cord control tested in tumbling barrel (Fig. 5).....:		N/A
18.6.2	- attachment method X: flexible cord(s), smallest cross-section (Cl. 10.1.4) (mm ²), length approx. 50 mm		—
	- attachment M, Y or Z: cord(s) as declared or supplied, length 50 mm; cord; cross-sectional area (mm ²)		—
18.6.3	- mass of sample (g) ; number of falls		—
18.6.4	In-line cord control with mass > 200 g complies with 18.5		N/A
18.6.5	Barrel turned at a rate of five revolutions/min; 10 falls/min		N/A
18.6.6	control complies with 18.1.5 (special attention paid to flexible cord(s))		N/A
18.7	Pull-cord actuated controls		N/A
18.7.1	Pull-cord actuated controls tested to 18.7.2 and 18.7.3		N/A
18.7.2	Control mounted as declared: forces applied to the pull-cord, each 1 min:		N/A
18.7.3	- rated current (A)		—
	- force in normal direction (N).....:		—
	- force in most unfavourable direction (N)		—
18.7.4	control complies with 18.1.5		N/A
18.8	Foot actuated controls		N/A
18.8.1	Foot actuated control tested in accordance with 18.8.2 to 18.8.4		N/A
18.8.2	Control subjected to a force, increased from 250 N to 750 N over 1 min, and maintained for 1 min with 50 mm diameter steel plate		N/A
18.8.3	Force applied three times to control (fitted with cords) placed in different, most unfavourable positions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

18.8.4	Control complies with 18.1.5		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)	15	P
	- axial push force of 30 N applied for (min)	30	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

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

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Clause	Requirement + Test	Result - Remark	Verdict
19.1.10	Compliance was checked by Clauses 19.1.1 to 19.1.9 inclusive by inspection and by the test of Clauses 19.1.11 to 19.1.15		N/A
19.1.11	Threaded parts tightened and loosened:		N/A
	- one of threaded parts non-metallic material: 10 times		N/A
	- both parts of metallic material: 5 times		N/A
19.1.12	Screws in thread of non-metallic material: completely removed and reinserted each time		N/A
	Terminal screws and nuts: conductor fitted in the terminal (used in 10.1.4 or 10.2.1); cross-sectional area (mm ²)		—
19.1.14	Conductor moved each time the threaded part is loosened		N/A
	- no damage impairing the further use of the threaded part		N/A
	- no breakage of screws		N/A
	- no damage to the slot head or washers		N/A
19.1.15	Torque test was made by means of a suitable test screwdriver, spanner or key, applying a torque without jerks according to Table 20	See attached TABLE 19.1.15	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

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Clause	Requirement + Test	Result - Remark	Verdict

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

20	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
	PCB: coating conforming requirement of IEC 60664-3 for type 2:		N/A
	PCB: coating meets requirements of 20.3		N/A
	PCB: creepage and clearance between conductors prior to coating does not exceed permissible values in Table 1 of IEC 60664-3:2003 (see Annex Q)		N/A
	Creepage and clearance between terminals for the connection of external conductors used for factory attachment or connection to ELV circuits is not less than 2 mm		N/A
	Creepage distances, clearances and distances through solid insulation in switch mode power supplies and other high frequency switching circuits where the fundamental frequency is above 30 kHz and less than 10 MHz are dimensioned in accordance with IEC 60664-4		N/A
20.1	Clearances		P
	Clearances are not less than case A from Table 22 taking into account the pollution degree and the rated impulse voltage required to serve the overvoltage categories of Table 21.....:	See attached Table 20	P
	Smaller distances used for basic insulation and functional insulation meet the impulse withstand requirement of Cl. 20.1.12; being rigid and construction is such that there is no likelihood of the distances being reduced by distortion or by movement of the parts; but the clearance is not less than the values for case B from Table 22		N/A
20.1.1	Basic Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7	See attached Table 20	P
20.1.1.1	Supplied from dedicated battery which has no provision for charging an external mains supply		N/A
20.1.2	Functional Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7, or	See attached Table 20	P
	For electronic controls Cl. H27.1.3 met		N/A
20.1.3	Methods of measurement: Annex B and Fig. 17		P

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Clause	Requirement + Test	Result - Remark	Verdict
20.1.3.1	Controls with equipment inlet and/or socket-outlet with connector / plug inserted and without		P
20.1.3.2	Controls with terminals for external conductors: without conductors and with conductors of largest cross-sectional area (mm ²) (Cl. 10.1.4)		—
20.1.3.3	Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm ²) (Cl. 10.2.1) ..		—
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		P
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:		P
20.1.7.2	Full disconnection – values from Table 22, case A applies to parts separated by switching element including contacts		N/A
20.1.8	Clearances of supplementary insulation: not less than basic insulation, Table 22, case A		N/A
20.1.9	Clearances of reinforced insulation: not less than those in Table 22, case A using the next higher step for rated impulse voltage	See attached Table 20	P
20.1.10	Clearances of functional and basic insulation on secondary side in controls supplied from a double insulated transformer comply with Table 21 based on the secondary voltage		N/A
	Clearances in controls supplied from a transformer without separate windings; rated impulse determined from Table 21		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
20.1.11	ELV circuits derived from supply using protective impedance, clearance of functional insulation determined from Table 21 and based on maximum working voltage in the ELV circuit.....:		N/A
20.1.12	Impulse voltage test, CI 6.1.2.2.1 of IEC 60664-1:2007 applied between live parts and metal separated by basic or functional insulation (V).....:		N/A
20.1.13	For earthed secondary winding of a transformer, (or an earthed screen between windings) clearances on the secondary side: basic insulation > limits in Table 22 but using the next lower step for rated impulse voltage.....:		N/A
	For circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage		N/A
20.2	Creepage distances		P
20.2.1	Creepage distances for basic insulation, per Table 23 for the rated voltage and based on material group and pollution degree		P
	- measurements.....:	See attached Table 20	P
	- 2 N force applied by standard test finger to bare conductors		N/A
	- 30 N force applied to accessible surfaces applied by standard test finger	30N	P
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	30N	P
20.2.3	Creepage distance for supplementary insulation: not less than basic insulation - based on material group and pollution degree		N/A
20.2.4	Reinforced insulation: double the value of basic insulation - based on material group and pollution degree		P
20.3	Solid Insulation		P
	Solid insulation is capable of durably withstanding electrical and mechanical stresses as well as possible thermal and environmental influences		P
20.3.2	For working voltages $\leq 300V$, supplementary and reinforced insulation between metal parts		P
	- minimum 0.7mm thick; measured (mm)	>1,0mm	P

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

21	RESISTANCE TO HEAT, FIRE AND TRACKING		P
21.1	All non-metallic parts of the control were resistant to heat, fire and tracking.		P
21.2	Integrated, incorporated and in-line cord controls		P
21.2.1	Accessible parts (control correctly mounted):		P
	- ball-pressure test 1 (G.5.1) at temperature (°C) ...:	75°C	—
	diameter of the impression ≤ 2.0mm (mm)	See attached TABLE 21	P
	- glow-wire test (G2.) at 550 °C.....:	See attached TABLE 21	P
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:		P
	- ball-pressure test 2 at temperature (°C)	125°C	—
	diameter of the impression ≤ 2.0mm (mm)	See attached TABLE 21	P
	Glow-wire temperature levels according to IEC 60695-2-11		P
	- 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	P
21.2.4	Other parts (except small parts unlikely to be ignited):		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- glow-wire test (G2.) at 550 °C..... :	See attached TABLE 21	N/A
21.2.7	Resistance to tracking:		P
	Test procedure, see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 1, requirement 30	See attached TABLE 21	P
	Controls designed for operation at ELV levels were not subjected to a tracking test.		N/A
21.3	Independently-mounted controls		N/A
21.3.1	Preconditioning		N/A
	Controls without T rating:		N/A
	- circuit of switching part and driving mechanism not connected, detachable parts (covers) removed		N/A
	- temperature (°C): (80 ± 2) °C, 1 x 24 h	80°C	—
	Controls with T rating up to 85°C:		N/A
	- switching circuit and driving mech.- not connected, without covers: temperature (°C): (80 ± 2)°C, 1 x 24 h		—
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h		—
	Controls with T rating higher than 85 °C:		N/A
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h		—
21.4	Controls with mercury-tube switch, subjected to short-circuit test:		N/A
	- working voltage, ac/dc		—
	- maximum power rating (VA)		—
	- short-circuit current (A)		—
	- fuse rating (A)		—
	- no ignition of cotton placed around openings		N/A
	- no emission of flame or molten metal (except mercury from the enclosure housing the switch)		N/A
	- wiring not damaged except tube leads		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

22	RESISTANCE TO CORROSION		P
22.1.1	Ferrous parts protected against corrosion		P
22.1.2	Test not required on temperature sensing elements and other component parts adversely affected by protective treatment		P
22.1.4	Control or parts stored in a humidity cabinet for 14 days:		P
	- temperature (°C): (40 ± 2) °C	40 °C	—
	- relative humidity (%): 93-97%	95%	—
22.1.5	Control or parts dried in a heating cabinet: for 10 min:		P
	- Temperature (°C): (100 ± 5) °C	100 °C	—
	After parts were dried: no evidence of corrosion on surfaces		P
22.1.6	Traces of rust on sharp edges and yellowish film that was removable by rubbing were ignored		N/A

23	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – EMISSION		N/A
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24	COMPONENTS		P
24.1	Transformers intended to supply power to a SELV-circuit or PELV-circuit are of the safety isolating type and comply with the relevant requirements of IEC 61558-2-6		N/A
	Capacitors connected between two line conductors for between a line conductor and the neutral or between hazardous live parts and protective earth are in accordance with IEC 60384-14 and used in accordance with its rated values		N/A
	Fuses comply with requirements of IEC 60127-1 or IEC 60269-1		N/A
	Varistors used as surge protective devices are to withstand the impulses corresponding to installation class for which is intended to be used.		N/A
	Varistors connected to the supply mains, should comply with IEC 61051-1, IEC 61051-2 or IEC 61051-2-2		N/A
24.1.1	Controls that incorporate a transformer as the source of supply to a SELV-circuit or PELV-circuit were subjected to an output test with the primary energized at the upper limit of the rated voltage		N/A
	Switch mode power supplies or transformers used in converters comply with the requirements of IEC 61558-2-16		N/A

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

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

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

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

27	ABNORMAL OPERATION		P
27.2	Burnout test (for controls incorporating electro-magnets)		N/A
27.2.1	Control mechanism blocked in position when control is de-energized:		N/A
	- energized at rated frequency and rated voltage (17.2.2, 17.2.3 and 17.2.3.2)		N/A
	- duration: 7 h or until burnout		N/A
27.2.2	Compliance (burnout test):		N/A
	- no emission of flame or molten metal after test		N/A
	- no evidence of damage impairing compliance with this standard		N/A
	- no evidence of dielectric breakdown (Cl. 13.2)		N/A
27.2.3	Blocked mechanical output test (abnormal temperature test)		N/A
	During blocked output test: Temperatures did not exceed indicated limits in Table 26	See attached TABLE 27.2.3	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	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	P
	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
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		P
27.6	Battery short-circuit test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

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

28	GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION		P
	Meets requirement per annex H	See the 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 or 2% deionized (distilled) water with specified solvent.....	12 strokes	—
	- solvents: n-hexane	12 strokes	—
	- solvents: deionized (distilled) water	12 strokes	—
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
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		P
A3.1	Rubbed in the apparatus (Fig. 8) with dry lint, weight 750 g, duration (s): 15 s	15 s	P
A3.2	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 750 g, duration (s): 15 s	15 s	P

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Clause	Requirement + Test	Result - Remark	Verdict

A3.3	Drops of detergent standing on the marked surface: duration (h): 4 h	4 h	—
	Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping	40 °C	—
A3.4	After sample was dried, marking rubbed (apparatus Fig. 8) with detergent soaked lint, weight 750 g, duration (s): 15 s	15 s	P
A3.5	Marking rubbed in apparatus with petroleum spirit soaked lint, weight 750 g, duration (s): 15 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.		P
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
	- 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		N/A
H.6	Classification, additions:		—
H.6.4.3.13	- electronic disconnection on operation (Type 1.Y - 2.Y)		—
H.6.9.5	- electronic disconnection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

H.6.18	Class of control function (A, B, C)..... :		—
H.7	Information in addition to Table 1 provided		N/A
	36 - Replacement: limits of activating quantity for any sensing element over which electronic or micro-disconnection is secure; clause: 11.3.2, H11.4.16, H17.14, H18.1.5, H27.1.1, H.28; (Method: X) :		N/A
	52 - The minimum parameters of any heat dissipater (e.g. heat sink) not provided with an electronic control but essential to its correct operation; clause: 14; (Method: D) :		N/A
	53 - Type of output waveform if other than sinusoidal; clause: H25; (Method: X) :		N/A
	54 - Details of the leakage current waveform produced after failure of the basic insulation; clause: H27; (Method: X) :		N/A
	55 - The relevant parameters of those electronic devices or other circuit components considered as unlikely to fail (see paragraph 1 of H27.1.1.4); clause: H27; (Method: X) :		N/A
	56 - Type of output waveform(s) produced after failure of an electronic device or other circuit component (see item g) of H27.1.1.3); clause: H27; (Method: X) :		N/A
	57 - The effect on controlled output(s) after electronic circuit component failure if relevant (item c) of H27.1.1.3); clause: H27; (Method: X)..... :		N/A
	58a - For integrated and incorporated electronic controls, if any protection against mains borne perturbations, magnetic and electro-magnetic disturbances is claimed, which of the tests of Cl. H26 must be performed and the effect on controlled output(s) and function after a failure to operate as a result of each test; clause: H26.2, H26.15; (Method: X) :		N/A
	58b - For other than integrated and incorporated electronic controls, the effect on controlled output(s) and function after a failure to operate as a result of the tests of Cl. H26; clause: H26.2, H26.15; (Method: X) :		N/A
	59 - Any component on which reliance is placed for electronic disconnection which is disconnected as required by footnote n to Table 12; clause: 13.2, H27.1; (Method: X) :		N/A
	60 - Category (surge immunity); clause: H26.8.2, Annex R; (Method: X)..... :		N/A
	66 - Software sequence documentation; clause: H11.12.2.9; (Method: X) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	67 - Program documentation; clause: H11.12.2.9, H11.12.2.12; (Method: X)		N/A
	68 - Software fault analysis; clause: H11.12, H27.1.1.4; (Method: X)		N/A
	69 - Software class(es) and structure; clause: H.11.12.2, H.11.12.3, H.27.1.2.2.1, H.27.1.2.3.1; (Method: D).....		N/A
	70 - Analytical measures and fault/error control techniques employed; clause: H.11.12.1.2, H.11.12.2.2, H.11.12.2.4; (Method: X).....		N/A
	71 - Software fault/error detection time(s) for controls with software Classes B or C; clause: H2.17.10, H11.12.2.6; (Method: X)		N/A
	72 - Control response(s) in case of detected fault/error; clause: H.11.12.2.7; (Method: X)		N/A
	73 - Controls subjected to a second fault analysis and declared condition as a result of the second fault; clause H.27.1.2.3; (Method: X)		N/A
	74 - External load and emission control measures to be used for test purposes; clause H.23.1.1; (Method: X)		N/A
	91 - Fault reaction time; cl. H.2.23.2, H.27.1.2.2.2, H.27.1.2.2.3, H.27.1.2.3.2, H.27.1.2.3.3 , H.27.1.2.4.2, H.27.1.2.4.3; (Method: X).....		N/A
	92 - Class or classes of control function(s); clause H.6.18, H.27.1.2.2, H.27.1.2.3; (Method: X)		N/A
	93 – Maximum number of reset actions within a time period; H.11.12.4.3.6, H.11.12.4.3.6; (Method: D).....		N/A
	94 – Number of remote reset actions; H.17.1.4.3; (Method: X)		N/A
H.8	Protection against electric shock		N/A
H.8.1.10	Accessible parts separated from the supply by protective impedance; identification of circuit.....		—
H.8.1.10.1	Maximum current between accessible parts and the protective earth conductor in normal configuration and with supply poles interchanged:		N/A
	- 0.7 mA (peak value) a.c.; current (mA)		N/A
	- 2 mA d.c.; current (mA)		N/A
	- if frequency $f > 1$ kHz: current (mA): $0.7 \times f$ (kHz) < 70 mA; f (kHz)		N/A
	Maximum capacitance		N/A
	- peak value (V)		N/A
	- $42.4 \text{ V} < V \leq 450 \text{ V}$ capacitance $C (\mu\text{F}): \leq 0.1 \mu\text{F}$		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 V ² ≤ 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
	- resistors comply with IEC 60065:2001, Amendment 1:2005, cl. 14.1		N/A
	- capacitors comply with IEC 60384-14, class Y		N/A
	Requirements of H.8.1.10 still met: leakage current (mA)		N/A
H.11.4	Actions:		N/A
H.11.4.16	- Type 1.Y and 2.Y action provides electronic disconnection.		N/A
H.11.4.16.1	Test carried out with control:		N/A
	- connected to maximum load		—
	- supplied with rated voltage (V)		—
	- at temperature T _{max} (°C)		—
H.11.4.16.2	Current through electronic disconnection not exceeding the lower of:		N/A
	- 5 mA (mA)		N/A
	- 10% of the rated current (mA)		N/A
H.11.12	Controls using software		N/A
H.17	Endurance		N/A
H.17.1	General requirements		N/A
H.17.1.4	Electronic controls with Type 1 action: no endurance test (unless necessary for testing of associated components)	See clause 17	N/A
H.17.1.4.1	Electronic controls with Type 2 action: thermal cycling test (H.17.1.4.2) executed		N/A
H.17.1.4.2	Thermal cycling test: conditions forming the basis of the test:		N/A
	a) Duration (h)		—
	b) Electrical conditions:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- loaded, according to manufacturer's declaration .:		—
	- voltage (V): 1.1 times V_r:		—
	- for 30 min. of each 24 h period: voltage (V): 0.9 times V_r		—
	- during each 24 h period: duration of supply switched off (s); 30 s		—
	- change of voltage not synchronized with change of temperature		—
	c) Thermal conditions: temperature (ambient and/or mounting surface) varied between:		—
	- T_{max} (T_s max) (°C)		—
	- T_{min} (T_s min) (°C)		—
	- rate of change: 1 °C/min		—
	- extremes maintained: 1 h		—
	d) Rate of operation: cycled at the fastest rate possible, max. 6 cycles/min) (cycles/min)		—
	If operational mode to be set by the user:		N/A
	- 1/3 test period: maximum setting		N/A
	- 1/3 test period: intermediate setting		N/A
	- 1/3 test period: minimum setting		N/A
	According to these requirements:		—
	- duration of heating period (h)		—
	- duration of maintaining max.temperature (h)		—
	- duration of cooling period (h)		—
	- duration of maintaining min. temperature (h)		—
	- duration of 1 complete cycle (h)		—
	- total number of cycles executed		—
H.17.1.4.3	Controls with remote reset actions		N/A
	Independently mounted devices: test for a minimum 1000 reset actions		N/A
	Integrated/Incorporated devices: minimum reset cycles as declared by the manufacturer		N/A
	After the test, the reset device can rest the system as intended		N/A
	Unintended resets did not occur.		N/A
H.17.14	Evaluation of compliance: For types 1.Y and 2.Y controls, Clause H.11.4.16 met		N/A
H.18	Mechanical Strength		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

H.18.1.5	For controls providing electronic disconnection (type 1.Y or 2.Y), the requirements of H.11.4.16 were met		N/A
H.20	Creepage distances, clearances and distances through insulation		N/A
H.20.1.15	Electronic controls		N/A
H.20.1.15.1	Spacing between live parts (supply) and accessible surfaces and parts		N/A
H.20.1.15.2	Across protective impedances: double or reinforced insulation		N/A
	Across each component: supplementary insulation		N/A
H.20.1.15.3	Providing functional insulation		N/A
H.23	Electromagnetic compatibility (EMC) requirements – Emission		N/A
H.25	Normal operation		N/A
H.25.1	The output waveform of electronic controls was as declared		N/A
	The output waveform of the control was examined under all normal operating conditions and was either sinusoidal or as declared in Table 1, requirement 53		N/A

H.26	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – IMMUNITY		N/A
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H.27	Abnormal operation		N/A
H.27.1	Electronic controls – assessment against internal faults		N/A
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	In the ON 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	N/A
H.27.1.1.6	Motor load, if failure or malfunction causes change in the supply waveform to the controlled motor:		N/A
	1) load (normal waveform) adjusted to 6 times rated load, or		N/A
	- locked rotor rating declared		N/A
	2) fault conditions introduced		N/A
	3) test conditions per H.27.1.2		N/A
	a) unfavourable voltage (V)		—
	c) ambient temperature (°C)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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 for 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.27.1.2.1	Design and construction requirements		N/A
H.27.1.2.1.1	Fault avoidance and fault tolerance		N/A
	Controls incorporating control functions of class B or C are designed according to H.27.1.2 taking into account the failure modes of Table H.24 and H.11.12 for software, if applicable		N/A
	The system configuration is either: • inherently failsafe or		N/A
	• components with direct safety-critical functions are guarded by safeguards in accordance to H.11.12 software class B or C		N/A
	- safeguards are built into hardware and can be supplemented by software		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- safeguards can cause a completely independent safety-shut-down		N/A
	Time slot monitoring is sensitive to both an upper and a lower limit of the time interval.		N/A
	In a class C control function if a single fault in a primary safeguard can render the safeguard inoperative, a secondary safeguard is provided		N/A
	The reaction time of the secondary safeguard is in accordance with Clause H.27.1.2.3.		N/A
	Components are dimensioned on the basis of the worst-case conditions which can arise in the control, as stated by the manufacturer		N/A
H.27.1.2.1.2	Documentation		N/A
	The documentation is based on H.11.12.3.2		N/A
	The functional analysis of the control and the safety related programs under its control are documented in a clear hierarchical way in accordance with the safety philosophy and the program requirements		N/A
	Minimum documentation provided for assessment:		N/A
	A description of the system philosophy, the control flow, data flow and timings.		N/A
	A clear description of the safety philosophy of the system with all safeguards and safety functions clearly indicated. Sufficient design information is provided to enable the safety functions or safeguards to be assessed		N/A
	Documentation for any software within the system		N/A
	Programming documentation is supplied in a programming design language declared by the manufacturer.....:		N/A
	Safety related data and safety related segments of the operating sequence are identified and classified according to H.11.12.3.2		N/A
	There is a clear relationship between the various parts of the documentation		N/A
H.27.1.2.2	Class B control function		N/A
H.27.1.2.2.1	Design and construction requirements		N/A
	A class B control function is designed such that under single fault conditions it remains in or proceeds to the defined state.		N/A
	Software complies with software class B		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The assessment is performed according to H.27.1.2.2.2 and H.27.1.2.2.3 and under the test conditions and criteria of H.27.1.2.5		N/A
H.27.1.2.2.2	First fault		N/A
	Any first fault (see Table H.24) in any one component or any one fault together with any other fault arising from that first fault results in either:		N/A
	a) the control becomes inoperative with all safety related output terminals de-energized or assumes a status in which they ensure a safe situation; or		N/A
	b) the control reacts within the fault reaction time (see Table 1, requirement 91) by proceeding to a defined state, provided that subsequent reset from the defined state under the same fault condition results in the system returning to the same defined state; or		N/A
	c) the control continuous to operate, the fault is identified during the next start-up sequence, the result is a) or b); or:		N/A
	d) the control remains operational in accordance with the safety related functional requirements of the relevant part 2		N/A
H.27.1.2.2.3	Fault introduced during defined state		N/A
	Any first fault (together with any other fault arising from that fault) in any one component (see Table H.24), induced while the control stays in the defined state, results in either:		N/A
	a) The control remains in defined state, safety related output terminals remaining de-energized; or		N/A
	b) The control becomes inoperative with all safety related output terminals remaining de-energized; or		N/A
	c) the control comes again in operation resulting in a) or b) as mentioned in this clause under the condition that the safety related output terminals are energized not longer than the fault reaction time (see Table 1, requirement 91)		N/A
	If the cause of the original defined state condition no longer remains and the control comes in operation again, it operates in accordance with the safety related functional requirements of the relevant part 2		N/A
	The relevant part 2 specifies the fault reaction time as well as the applicability of c):		N/A
H.27.1.2.3	Class C control function		N/A
H.27.1.2.3.1	Design and construction requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	A class C control function is designed such that under first and second fault conditions it remains in or proceeds to the defined state.		N/A
	Software complies with software class C		N/A
	The assessment is performed according to H.27.1.2.3.2, H.27.1.2.3.3 and H.27.1.2.4 and under the test conditions and criteria of H.27.1.2.5.		N/A
H.27.1.2.3.2	First fault		N/A
	Any first fault (see Table H.24) in any one component or any one fault together with any other fault arising from that first fault results in either:		N/A
	a) the control becomes inoperative with all safety related output terminals de-energized or assumes a status in which they ensure a safe situation;		N/A
	b) the control reacts within the fault reaction time (see Table 1, requirement 91) by proceeding to a defined state, providing that subsequent reset from the defined state condition under the same fault condition results in the system returning to the defined state;		N/A
	c) the control continuous to operate, the fault is identified during the next start-up sequence, the result is a) or b);		N/A
	d) the control remains operational in accordance with the safety related functional requirements of the relevant part 2		N/A
	The relevant part 2 specifies the fault reaction time as well as the applicability of c)		N/A
H.27.1.2.3.3	Second fault		N/A
	Any further independent fault considered together with the first fault results in either H.27.1.2.3.2 a), b), c) or d). During assessment, the second fault has only to be considered to occur:		N/A
	a) Either when a start-up sequence has been performed between the first and the second fault, or		N/A
	b) 24 h after the first fault.		N/A
	The relevant part 2 specifies the applicability of a) or b) and the fault reaction time (see Table 1, requirement 91)		N/A
H.27.1.2.4	Faults during defined state		N/A
H.27.1.2.4.2	First fault introduced during defined state		N/A
	Any first fault (together with any other fault arising from that fault) in any one component (see Table H.24), induced while the control is staying in the safety-shut-down position, results in either:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) The control remaining in a defined state, safety related output terminals remaining de-energized or in a status in which they ensure a safe situation;		N/A
	b) The control becoming inoperative with all safety related output terminals remaining de-energized or assuming a status in which they ensure a safe situation;		N/A
	c) The control comes again in operation resulting in a) or b) under the condition that the safety related output terminals are energized no longer than the fault reaction time (see Table 1, requirement 91)		N/A
	If the cause of the original safety shut-down condition no longer remained and the control came again in operation, it operated according to the safety related functional requirements of relevant Part 2 and the second fault assessment was carried out in accordance with H.27.1.2.3.3.		N/A
H.27.1.2.4.3	Second fault introduced during defined state		N/A
	Any second fault (together with any other fault arising from that fault) in any one component (see Table H.24), induced while the control is staying in the defined state, results in either H.27.1.2.4.2 a), b) or c)		N/A
	Fault reaction time specified in relevant part 2		N/A
	It may specify a different time span in which the second fault does not occur, if different from 24 h . :		N/A
H.27.1.2.5	Circuit and construction evaluation		N/A
H.27.1.2.5.1	Test conditions		N/A
	The fault is considered to have occurred at any stage in the control program sequence.		N/A
	The control is operated or considered to operate under the following conditions:		N/A
	a) at the most unfavourable voltage in the range 85 % to 110 % of the rated supply voltage (V)		—
	b) loaded with the most unfavourable load declared by the manufacturer.....		—
	c) in an ambient temperature of $(20 \pm 5) ^\circ\text{C}$, unless there are significant reasons for conducting the test at another temperature within the manufacturer's declared range; ($^\circ\text{C}$)		—
	d) with any actuating member placed in the most unfavourable position;		N/A
	e) with tissue paper placed on the supporting surface(s) of the control;		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	f) with sparks of about 3 mm in length and having an energy of not less than 0,5 J applied to those components which are likely to liberate flammable gases during the test		N/A
H.27.1.2.5.2	Test criteria		N/A
	During the appraisal, it is verified that under the conditions described above, the following criteria are satisfied.		N/A
	a) The control does not emit flames, hot metal or hot plastics, the tissue paper does not ignite, no explosion results from the liberation of flammable gases and any flame produced does not continue to burn for more than 10 s after switching off the spark generator		N/A
	When a control is incorporated with any appliance, any enclosure afforded by the appliance is taken into consideration		N/A
	b) If the control continues to function, it complies with Clauses 8 and 13 or Clauses 8 and 13 of the relevant part 2.		N/A
	If it ceases to function, it still continues to comply with Clause 8 or Clause 8 of the relevant part 2		N/A
	c) There is no loss of protective function		N/A
	After tests there is no deterioration of the various parts of the control that result in failure to comply with Clause 20 or Clause 20 of the relevant part 2.		N/A
H.27.1.2.5.3	Assessment		N/A
	A thorough appraisal of the circuit is carried out to determine its performance under the specified fault conditions. (This appraisal includes theoretical analysis and a component failure simulation test)		N/A
	Fault simulations may also be carried out to simulate faults within complex devices, e. g. EPROM emulation tests.		N/A
	Only the safety related software (software class B and C) as identified according to H.27.1.2.1.2 are subjected to further assessment. (For class identification a fault tree analysis may be used)		N/A
H.27.4	Electronic disconnection: withstands abnormal overvoltage conditions		N/A
H.27.4.1	- control loaded as indicated in Cl. 17.2; rated voltage (V)		—
	- control subjected to 1,15 x VR for 5 s during electronic disconnection; test voltage (V)		—
H.27.4.2	- control provides electronic disconnection as determined by the test of H.11.4.16.2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

J	ANNEX J – REQUIREMENTS FOR CONTROLS USING THERMISTORS		N/A
J.4.2.5	Unless otherwise specified, representative samples as indicated in Table J.3 are subjected to the tests specified in J.17.8.		N/A
	New samples are used for all tests other than the overload and endurance test.		N/A
J.4.3.2	The rated voltage (Vr) of a thermistor is the input voltage of a thermistor as declared by the manufacturer.		N/A
J.4.3.2.11	The electrical and thermal ratings of a thermistor are in accordance with Table J.4 and based on its intended application.		N/A
J.4.3.5.4.	Type 1 controls using thermistors as temperature sensing devices where self-heating is negligible are not subjected to the tests for thermistors.		N/A
J.4.3.5.4.1	Thermistors used in type 1 action controls that comply with IEC 60738 or IEC 60539 are subjected to the thermal runaway test of J.17.18.5 only provided that it complies with the applicable declaration (e.g. number of cycles) of the control.		N/A
	Compliance to IEC 60738-1 or IEC 60539 not required if thermistors comply with requirements of Annex J		N/A
J.6.4.3.3	According to features of automatic action provide the equivalent of electronic disconnection and are classified as type 1.YJ or 2.YJ action.		N/A
J.6.15	According to construction, addition:		N/A
J.6.15.6	- control using NTC or PTC thermistors		N/A
J.6.15.7	Ceramic element		N/A
J.6.15.8	Polymer element		N/A
J.6.17	According to use of the thermistor, addition:		N/A
J.6.17.1	- thermistor control element		N/A
J.6.17.1.1	PTC current limiter		N/A
J.6.17.1.2	PTC motor starter		N/A
J.6.17.1.3	PTC degausser		N/A
J.6.17.1.4	NTC inrush current limiter		N/A
J.6.17.2	- self-controlled heater		N/A
J.6.17.3	- thermistor sensing element		N/A
J.6.17.3.1	PTC sensor		N/A
J.6.17.3.2	NTC sensor		N/A
J.7	Information, addition to Table 1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	J61 - according to the use of a thermistor; clause: J6.7; (Method: X)		N/A
	J62 - resistance/temperature characteristics; clauses: J15.7, J17.17.1, J12.2.1; (Method: X)		N/A
	J63 - resistance/temperature characteristics drift; clause: J17.18.2; (Method: X)		N/A
	J64 - Number of cycles; clause: J17.18.2; (Method: X)		N/A
	J65 - Method of resistance/temperature measurements; clauses: J15.7, J17.18.1; (Method: X)		N/A
	J82 – PTC current limiters where the maximum current is reduced to less than or equal to 8 A in less than or equal to 5 s; clauses: J15.7.6.1.1; (Method: X)		N/A
J.11.3.10	Thermistors used in controls to provide functional safety or as controls to provide functional safety for a controlled application provide type 2 action (type 2.YJ), or		N/A
	- for other applications at least type 1.YJ		N/A
J.11.4.17	Type 1.YJ or 2.YJ action: operation provides an inherent change in resistance.....	Type of action:	—
J.15.7	Calibration tests for PTC thermistors		N/A
J.15.7.1	Sequence of calibration tests of J.15.7.4 to J.15.7.8		N/A
	-ceramic thermistors (J.15.7.4 to J.15.7.8)		N/A
	-polymeric thermistors (J.15.7.5, J.15.7.6, J.15.7.7, J.15.7.8 and J.15.7.4)		N/A
J.15.7.2	In the “as-received” condition, each PTC thermistor		N/A
	- subjected to the tests specified in Table J.6		N/A
	- Compliance to Table J.6		N/A
J.15.7.3	Following the tests described in J.17.17 a), the same PTC samples:		N/A
	-subjected to the tests in table J.6		N/A
	-compliance to Table J.6 for each test		N/A
	For PTC sensors: -compliance with table J.7 for each test		N/A
J.15.7.4	R/T measurement for PTC thermistors.....	See attached data	N/A
J.15.7.5	Hold current test for PTC current limiters	See attached data	N/A
J.15.7.6	Time-to-trip test for PTC current limiters.....	See attached data	N/A
J.15.7.6.1	Thermistor with multiple trip current and times		N/A
	-tested at the maximum current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	-tested at the minimum current		N/A
	-current not to exceed the maximum current point on the time-to-trip versus current curve		N/A
J.15.7.6.1.1	Thermistor declared in item 82 of Table J.5 tripped at the declared trip current and corresponding rated voltage within the specified time-to-trip		N/A
J.15.7.7	Surface temperature of PTC thermistors other than current limiters		N/A
	- temperature measured at maximum voltage and steady-state current.....:		N/A
J.15.7.7.1	Surface temperature of current limiting thermistor:		N/A
	a)operating condition in hold state at rated maximum voltage and hold current.....:	See attached data	N/A
	b)operating condition in tripped state at rated maximum voltage and steady-state current	See attached data	N/A
J.15.7.8	Inrush current measurement		N/A
J.15.7.8.1	PTC thermistors used as self-controlled heaters, motor starters and degaussers, inrush current of thermistor measured by oscilloscope at maximum voltage under rated load.....:	See attached data	N/A
J.15.8	Calibration tests for NTC thermistors		N/A
J.15.8.1	In the “as-received” condition, each NTC thermistor		N/A
	- subjected to the tests specified in Table J.8		N/A
	- Compliance to Table J.8		N/A
J.15.8.2	Following the tests described in J.17.17 b), the same NTC samples:		N/A
	-subjected to the tests in table J.8		N/A
	-compliance to Table J.8 for each test.		N/A
	For NTC sensors:		N/A
	-compliance with table J.9 for each test.		N/A
J.15.8.3	R/T measurement for NTC thermistors	See attached data	N/A
J.15.8.4	Surface temperature test (Inrush current limiting)		N/A
J.15.8.4.1	Surface temperature measured while thermistor		N/A
	-operating at maximum voltage and current with rated capacitance in parallel with the load		N/A
	-temperature within manufacturer’s specified limits		N/A
J.15.8.5	Inrush current measurement (inrush-current limiting)		N/A
J.15.8.5.1	Inrush-current of thermistor measured using oscilloscope at max. voltage and current with the rated capacitance value in parallel with the load.....:	See attached data	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.15.8.6	Resistance and beta value for NTC thermistors		N/A
J.15.8.6.1	Beta value within limits specified by the manufacturer		N/A
	-Resistance at 25 degree C.....:	See attached data – (multiple models)	N/A
	-Resistance at R_1 @ T_1:	See attached data – (multiple models)	N/A
	-Resistance at R_2 @ T_2:	See attached data – (multiple models)	N/A
J.17.17	Endurance		N/A
	a) sequence of tests for PTC thermistors		N/A
	b) sequence of tests for NTC thermistors		N/A
J.17.17.1	After the tests of J.17.18.1 to J.17.8.4, the performance of the control is checked by the tests of J.15.7 or J.15.8		N/A
J.17.17.2	After the appropriate tests of J.17.18		N/A
	-the control complies with clauses 8 and 13		N/A
	-no emission of flames or expulsion of particles		N/A
J.17.18	Conditioning tests		N/A
J.17.18.1	Heat-cold-humidity		N/A
	Following the conditioning specified in J.17.18.1.1, thermistor complies with tables J.6, J.7, J.8 or J.9		N/A
J.17.18.1.1	Indoor temperature use:		N/A
	1) 24 h at measured surface temperature or max declared operating temperature but not less than 70 deg C		N/A
	2) 168 h in a non-condensing atmosphere having a relative humidity of 90% to 95% at 40 deg C		N/A
	3) 8 h at 0 deg C or manufacturer's specified ambient temperature, whichever is lower		N/A
	Outdoor temperature use:		N/A
	1) 4 h immersed in water at 25 deg C		N/A
	2) 8 h, at minus 35 deg C or at the manufacturer's specified ambient temperature, whichever is lower:		N/A
	3) 24 h, at measured surface temperature or max declared operating temperature but not less than 70 deg C.....:		N/A
	4) 168 h, in a non-condensing atmosphere, having a relative humidity of 90% to 95% at 40 deg C		N/A
J.17.18.2	Extended cycling (PTC)		N/A
J.17.18.2.1	Overload		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
J.17.18.3.2	Active ageing		N/A
	In addition to J.17.18.3.1.1, a current limiter is energized in its tripped state at maximum voltage and carrying steady-state current for 1000 hours	Max voltage: Steady-state current:	N/A
J.17.18.4	Cold operational cycling (PTC)		N/A
J.17.18.4.1	Following the test specified in J.17.18.4.2, the thermistor complied with Table J.6		N/A
J.17.18.4.2	3 samples of a thermistor are subjected to 1000 cycles of operation at an ambient temperature of 0°C or at the manufacturer's specified ambient, whichever is lower (°C).....:		N/A
	Self-controlled heater – specified in J.17.18.2.2.1 a)		N/A
	Control thermistor – as specified in J.17.18.2.2.1 b)		N/A
J.17.18.5	Thermal runaway		N/A
	Thermistors are energized and operated under maximum rated conditions, initially		N/A
	Voltage increased until breakdown occurs or		N/A
	Test voltage is 2 x working voltage		N/A
J.17.18.6	Cold thermal cycling		N/A
J.17.18.6.1	After the cycling specified in J.17.18.6.1.1, the thermistors complied with tables J.7 or J.9, as appropriate.		N/A
J.17.18.6.1.1	Sensing thermistors subjected to:		N/A
	-1000 cycles of cold thermal cycling		N/A
	-each cycle starts at 0°C or at the manufacturer's specified ambient, whichever is lower to the maximum sensing temperature.		N/A
	Test range.....:		N/A
J.17.18.7	Extended cycling (NTC)		N/A
J.17.18.7.1	Overload		N/A
J.17.18.7.1.1	Following the tests specified in J.17.18.7.1.2 or J.17.18.7.1.3 and J.17.18.7.2.1, thermistors are checked for compliance with table J.8		N/A
J.17.18.7.1.2	For an inrush current limiter:		N/A
	-50 cycles of operation at V_{max} and 120% I_{max}		N/A
J.17.18.7.1.3	For a sensing thermistor:		N/A
	-50 cycles of operation starting at 25°C ± 5K and increasing the temperature to 120% of maximum sensing temperature		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
J.17.18.7.2	Endurance		N/A
J.17.18.7.2.1	Samples subjected to overload test, J.17.18.7.1 are operated at the conditions specified in a) or b) for the number of cycles specified in Table J.12		N/A
	a) inrush-current limiting – tested at V_{max} and I_{max} with rated capacitance value in parallel with the load		N/A
	V_{max}		N/A
	I_{max}		N/A
	Number of cycles		N/A
	b) Sensing – cycled between $25^{\circ}\text{C} \pm 5\text{K}$ and the maximum operating temperature.		N/A
	Maximum sensing temperature		N/A
	Number of cycles		N/A
J.17.18.8	Cold operational cycling (for inrush current-limiting NTC thermistors)		N/A
J.17.18.8.1	Following the cycling specified in J.17.18.8.2, thermistors checked for compliance with Table J.8		N/A
J.17.18.8.2	Three samples subjected to 1000 cycles of operation at V_{max} conducting I_{max} of current, at an ambient temperature of 0°C or at manufacturer's specified temperature, whichever is lower.....		N/A
	Each cycle covered that portion of the R/T curve from the starting temperature to steady-state conditions		N/A
J.20	Creepage distances, clearances and distances through insulation		N/A
J.20.1.14	Clearance		N/A
J.20.1.14.1	Clearance between live parts connected electrically to the mains supply and accessible surfaces or parts in compliance with requirements of 20.1		N/A
J.20.1.14.2	Clearance between live parts providing functional insulation in compliance with requirements of 20.1		N/A
J.20.2.5	Creepage distance		N/A
J.20.2.5.1	Creepage distance between live parts connected electrically to the mains supply and accessible surfaces or parts were in compliance with the requirements of 20.2		N/A
J.20.2.5.2	Creepage distance between live parts providing functional insulation was in compliance with the requirements of 20.2.		N/A
J.24	Components		N/A
J.24.2.1	Subclause J.24.2.1 was applicable to thermistors previously tested under IEC 60738-1, IEC 60738-1-1 or IEC 60539.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

J.27	Abnormal operation		N/A
J.27.1	Consideration of fault modes made in accordance with Table H.24 for thermistors used in protective controls		N/A

L	ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES	P
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N	ANNEX N (NORMATIVE) – POLLUTION DEGREES	P
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P	ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST	N/A
P.2	PCB base material complies with IEC 61249 series	N/A
P.3	Electric strength of coating	N/A
	- test conducted after conditioning - Clauses P.3.3 and P.3.4	N/A
	- based on functional insulation	N/A
	- test voltage per table 12.....:	—
P.3.2	Ageing test:	N/A
	- five samples subjected to 130° C ± 2°C.....:	—
	- duration: 1000 hours	N/A
P.3.3	Humidity Conditioning:	N/A
	- performed on same samples used in Cl. P.3.2	N/A
	- conditioned in humidity chamber at a temperature of (35 ± 1)° C and (90 ± 5)% relative humidity	N/A
	- duration: 48 hours	N/A
	After conditioning, each sample was subjected to the electric strength test with complying test results.	N/A
P.3.4	Environmental cycle conditioning:	N/A
	- five samples subjected to three complete cycles of conditioning per table P.1	N/A
	After conditioning, each sample was subjected to the electric strength test with complying test results.	N/A
P.3.5	After conditioning, each sample wrapped in aluminium foil was subjected to the electric strength test, Cl. P.3.1 between:	N/A
P3.6	- leads A, B, and C individually and common lead (figure P.1)	N/A
	- no evidence of flashover or breakdown	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

Q	ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST		N/A
Q.1	Printed circuit boards conforming to all requirements for type 1 protection (as per IEC 60664-3:2016) is to comply with minimum creepage distance requirements of Cl. 20 of this document, pollution degree 1		N/A
Q.2	Printed circuit board conforming to requirements for type 2 protection (as per IEC 60664-3:2016) is to comply with the minimum requirements for solid insulation, Cl. 20.3 of this document.		N/A
Q.3	Six Samples of production printed boards are required. Testing of the protection:		N/A
	- test specimens according to IEC 60664-3:2016, Annex C, which specifically applies for printed circuit boards; the specimen used for testing should have the same minimum distances as those from production; or		N/A
	- specimens from production; or		N/A
	- any printed circuit board, as long as the test specimens are representative of those from production;		N/A
	Testing of mouldings and potting materials		N/A
	- production specimens are to be used, or they are to be representative of those from production.		N/A
Q.4 + Q5	Compliance for type 1 or 2 protection: checked by tests of IEC 60664-3:2016, Cl. 5 test levels or conditions specified in Table Q.1 apply		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
	Separation between protective screen and every circuit by basic insulation rated for the highest voltage present.		N/A
	Requirements for the elements of SELV are given in Clause T.3.		N/A
T.2.2	PELV - Protection against electric shock is provided by the following measures:		N/A
	– limitation of voltage, ELV according to T.3.1 in a circuit which may be earthed and/or the exposed-conductive-parts of which may be earthed (the PELV-system), and		N/A
	– protective separation according to T.3.2 of the PELV-system from all circuits other than SELV and PELV		N/A
	It is not necessary to provide basic insulation between the protective screen and the PELV-system.		N/A
	Where live parts of the PELV-system are accessible (touchable) simultaneously with conductive parts which, in case of a fault, could assume the potential of the primary circuit, protection against electric shock depends on protective-equipotential-bonding (T.3.4) of all such conductive parts. Such parts are bonded to the protective earthing terminal or termination of the control		N/A
	Requirements for the elements of PELV are given in Clause T.3.		N/A
T.3	ELV, protective separation, simple separation, protective bonding as elements of SELV and PELV		N/A
T.3.1	Limitation of voltage 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.		N/A
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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
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

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Clause	Requirement + Test	Result - Remark	Verdict

U	ANNEX U - REQUIREMENTS FOR RELAYS WHEN USED AS CONTROLS IN IEC 60335 APPLIANCES		N/A
U.6	Classification		N/A
U.6.3	According to their purpose		N/A
U.6.6	According to method of connection		N/A
U.6.8	According to protection against electric shock		N/A
U.6.8.5	For a relay: insulation between coil and contact circuits:		N/A
U.6.8.6	For a relay: insulation between live parts and test function, manual action actuating member		N/A
U.7	Information		N/A
	3 - Rated voltage for both coil and contacts (method C)		N/A
	4 - Nature of supply for both coil and contacts (method C)		N/A
	88 – Max. intended click rate U.23 (method D)		N/A
U.14	Heating		N/A
	Replacement of sub-clause:		N/A
U.14.4	Tests conducted under the following conditions:		N/A
	$U_{Coil} \times 0,9$ + contacts loaded or $I_{Coil} \times 0,9$ + contacts loaded		N/A
	$U_{Coil} \times 1,1$ + contacts loaded or $I_{Coil} \times 1,1$ + contacts loaded		N/A
	$I_{Coil} = 0$ + contacts loaded (N.C. contacts).		N/A
	Relays were mounted as specified		N/A
	– PWB connected relays were mounted to PWB if submitted with relays to be tested.		N/A
	If not, relays were mounted to plain PWB material; conductors per Table 6 soldered to PWB pins		N/A
U.17	Endurance		N/A
U.17.14	Evaluation of compliance		N/A
	Replace the second list item as follows:		N/A
	– The requirements of Cl. 14, under the conditions stated by U.14.4, for terminals, current carrying parts, and supporting surfaces are met		N/A
U.17.16	Test for particular purpose controls		N/A
	Relays were endurance tested according to the following schedule:		N/A
	Ageing test of 17.6		N/A
	Over-voltage test of automatic action of 17.7		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Test of automatic action at accelerated rate of 17.8		N/A
	Test of automatic action at slow rate of 17.9		N/A
	Overcurrent test of manual action at accelerated speed of 7.10		N/A
	Test of manual action at slow speed of 7.11		N/A
	Test of manual action at high speed of 17.12		N/A
	Test of manual action at accelerated speed of 17.13		N/A
U.20	Creepage distances, clearances and distances through solid insulation		N/A
	Assessment was conducted with relay energized, de-energized, and manually operated		N/A
U.23	Electromagnetic compatibility (EMC) requirements – emission		N/A
	Consideration must be given as to whether EMC requirements are applicable to relays.		N/A
U.24	Components		N/A
	Relays incorporating electronic components were assessed according to Annex H.		N/A

V	ANNEX V (NORMATIVE) – REQUIREMENTS FOR CONTROLS POWERED BY SECONDARY BATTERIES (rechargeable battery for test only)		N/A
	For controls powered by batteries that can be recharged in the control the following modifications were applied		N/A
V.4.3.2.11	Operation of the control		N/A
	– the control, supplied by its fully charged battery, is operated as specified in this standard or the relevant part 2		N/A
	– the charged battery initially discharged to such an extent that the control cannot operate		N/A
	– if possible, the control is supplied from the supply mains through its battery charger, the battery being initially discharged to such an extent that the control cannot operate. The control is operated as specified in the relevant part 2		N/A
	– if the control incorporates inductive coupling between two parts that are detachable from each other, the control is supplied from the supply mains with the detachable part removed.		N/A
V.7.4	Additional requirements for marking		N/A
V.7.4.10	The instructions give information regarding charging of batteries		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
V.8.5	Battery operated controls so designed that at a user accessible external point of disconnection of a d.c. mains supply, the maximum accessible voltage is less than or equal to the limits of a SELV/PELV circuit, and		N/A
	– the available power is less than 15 W at the end of 5 s.		N/A
V.8.5.1	Verification test		N/A
	- conducted with the d.c. mains supply disconnected from a fully charged battery control		N/A
	- the control operated from its internal battery		N/A
	The max. power recorded at the end of 5 s after the variable load was adjusted so that the maximum power was drawn through the circuit:		—
	The voltage and the power recorded were within the limits specified in V.8.5		N/A
V.11.13.4.4.3	A fully charged rechargeable battery was used as provided with, or recommended by the manufacturer for use with, the equipment.		N/A
V.11.13.4.4.3.1	For overcharging of a rechargeable battery, the battery is charged under each of the following conditions in turn		N/A
V.11.13.4.4.3.1.1	The battery charging circuit adjusted with the battery disconnected to give 106 % of the rated output voltage of the charger, or max. charging voltage available from the charger, whichever is the higher, and the battery is then charged for 7 h.		N/A
V.11.13.4.4.3.1.2	After battery charging circuit adjusted to 100 % of the rated output voltage of the charger, the battery was charged while subjected to any single component failure that is likely to occur in the charging circuit and result in overcharging of the battery. The battery then charged for a single period of 7 h with that simulated failure in place.		N/A
V.11.13.4.4.3.2	The battery is reverse-charged while subjected to any single component failure that is likely to occur in the charging circuit and that would result in reverse charging of the battery. The battery is then reverse-charged for a single period of 7 h with that simulated failure in place.		N/A
V.11.13.4.4.3.3	The battery is subjected to rapid discharge by open-circuiting or short-circuiting any current-limiting or voltage-limiting components in the load circuit of the battery under test.		N/A
V.11.13.4.4.3.4	Compliance checked in accordance with clauses 11.13.4.4.4 and 11.13.4.5.		N/A

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.2	TABLE: Risk of electric shock test		N/A
	Total (V _{TOTAL}) (V) :		—
	Average (V _{TOTAL} /10) :		—
	Capacitance (μF) >0.1μF :		—
test #	Measured voltage between pins (V _{RMS})	Average voltage (V): < 34 V	
Supplementary information:			

9.3.1	TABLE: Connection between earthing terminal and parts is of low resistance		P
	Rated current, I_r (A)	16	—
	No-load voltage (V)	12	—
	Test current, $1.5 \cdot I_r$, but not $<25A$ (A)	25	—
terminal No.	Duration, until steady conditions (min)	Measured potential drop (V)	calculated resistance (Ω): $\leq 0.1 \Omega$
	1	0,5	0,02
Supplementary information:			

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

10.1.9.1	TABLE: Clamping reliability of the terminals				N/A
	Applied torque, 2/3 of values in Table 20 (Nm)..... :				—
	Pull force (N) :				—
terminal No.	fixed wiring		flexible conductor		Conductor movement
	smallest (mm)	largest (mm)	smallest (mm)	largest (mm)	
					<10mm
					<10mm
					<10mm
					<10mm
Supplementary information:					

10.2.1	TABLE: Connection of conductors		N/A
terminal No.	nominal current (A)	cross-sectional area (mm²)	
Supplementary information:			

10.2.4.3	TABLE: Axial push and pull test				N/A
Tab identification	size (mm x mm)	axial push (N)	axial pull (N)	result code	
Supplementary information:					

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

11.7.1.2.1	TABLE: Flexing test					N/A
flexible cords used in product	No. of conductors in cord	rated current (A)	rated voltage (V)	No. of flexings	rate of flexings per min.	% broken
Supplementary information:						

11.7.2.9	TABLE: Push test (option –T /-TP)			N/A
Cord identification	Cross-sectional area (mm²)	Torque applied on terminals (Nm)	Comments	
Supplementary information:				

11.7.2.11+1 1.7.2.12	TABLE: Pull test				N/A
Control type	Pull (N)	No. of pulls applied	Torque (Nm)	Comments	
Supplementary information:					

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

12.3	TABLE: Leakage current test (for in-line cord and free -standing controls)			N/A
	Supply voltage; 1.06 Vr (V)			—
	Max. rated current (A)			—
	Max. declared ambient temperature, °C			—
	Max. leakage current from 13.3.4 (mA).....			—
Circuit identification		Position of switch S1	Class of control	Measured leakage current, (mA)
Supplementary information:				

13.2	TABLE: Electric strength test					P
Test location/circuit	Type of insulation	Type/model	Working voltage, (V)	Test voltage (V)	Flashover/breakdown (Yes/No)	
Between live parts and accessible surface	Reinforced insulation	TS-MD1	230	2860	No	
Between live parts and earthing	Basic insulation	TS-MD1	230	1430	No	
Across contacts of relay	Micro-disconnection	TS-MD1	230	460	No	
Supplementary information:						

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

13.3.3	TABLE: Leakage current test (for in-line cord and free -standing controls)		N/A
	Supply voltage; 1.06 Vr (V)		—
	Max. leakage current from 13.3.4 (mA)		—
Circuit identification	Position of switch S1	Class of control	Measured leakage current, (mA)
Supplementary information:			

14.6 + 14.7	TABLE: Heating test		P
	Test voltage (V).....:	253	-
	Ambient (°C).....:	25	-
thermocouple locations	max. temperature measured, (°C)	temperature limit, (°C)	Verdict
Windings	60	90	Pass
Enclosure (inside)	67	110	Pass
Enclosure (accessible)	57	85	Pass
Dial	57	85	Pass
Terminal	64	85	Pass
Cord insulation	60	75	Pass
Supplementary information:			

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

15.2 a)	TABLE: Manufacturing deviation				N/A
Condition	Sample Nos.	Declared values		Measured values	
		open	close	open	close
Supplementary information:					

15.2 b)	TABLE: Manufacturing drift				N/A
Condition	Sample No.	Measured values (deviation) from as received condition		Measured values (drift)	
		open	close	open	close
After Environmental Stress test					
After Endurance test (T _{max})					
After Endurance test (T _{min})					
Supplementary information:					

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

17.2.1	TABLE: Circuits loaded according to declared ratings					P
circuits		a.c./d.c.	Voltage U _R (V)	Current (A)	Time constant (ms) / power factor (cos phi)	Verdict
substantially resistive (6.2.1), making and breaking						
resistive or inductive (6.2.2), making						
resistive or inductive (6.2.2), breaking						
declared specific load (6.2.3), making		a.c.	230	16	0,63	Pass
declared specific load (6.2.3), breaking		a.c.	230	16	0,98	Pass
20 mA load (6.2.4), making & breaking						
declared motor load (6.2.5), making						
declared motor load (6.2.5), breaking						
pilot duty load (6.2.6), making						
pilot duty load (6.2.6), breaking						
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
	Between live parts and accessible surface	Reinforced insulation	2145	No
	Between live parts and earthing	Basic insulation	1073	No
	Across contacts of relay	Micro-disconnection	345	No
Supplementary information:				

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

18.2.1	TABLE: Impact resistance			P
Impacts per surface	Surface tested	Impact energy (Nm)	Verdict	
3	Accessible enclosure	0,5	P	
Supplementary information:				

19.1.15	TABLE: Threaded part torque test			N/A
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Torque (Nm)	Verdict
Supplementary information:				

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

20	TABLE: Creepage distance and clearance measurements						P
	Requirements creepage distance and clearance met					P	
	Supply working voltage (V):				230	—	
	Overvoltage category:				II	—	
	Rated impulse voltage according to table 20.1(V):				2,5KV	—	
	Requirements for case B (20.1.7, 20.1.12) met (cl 20.1 Note 2) ...:				No	N/A	
Creepage distance Cd and clearance CI across (type of insulation)		Nominal Volt, (V)	Pollution degree	Required Cd, (mm)	Cd measured (mm)	Required CI (mm)	CI measured (mm)
Basic insulation		230	2	2,5	>3,0 (by gauge)	1,5	>2.0 (by gauge)
Operational insulation		230	2	2,5	>3,0 (by gauge)	1,5	>2.0 (by gauge)
Supplementary insulation							
Reinforced insulation		230	2	5	>6.0 (by gauge)	3	>6.0 (by gauge)
full disconnection (parts separated by the switching contacts)							
micro-disconnection		230	2	-	-	1.0	>2.0 (by gauge)
electronic disconnection							
Supplementary information: Abbreviations for types of insulation: F - functional, B - basic, S – supplementary, R - reinforced							

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

21A	TABLE: Ball Pressure Test and Tracking Test					P
Ball Pressure max. allowed impression diameter (mm) :					2mm	—
Test sample description		Ball Pressure test		Tracking test		
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	Proof tracking index (PTI)	Voltage, (V)	Result
Dial	Idemitsu Kosan Co., Ltd.	75	1.2	-	-	Pass
Shutter	Idemitsu Kosan Co., Ltd.	75	1.2	-	175	Pass
Bobbin	Idemitsu Kosan Co., Ltd.	125	1.2	-	175	Pass
Enclosure	Idemitsu Kosan Co., Ltd.	125	1.2	-	175	Pass
Supplementary information:						

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		
Dial	Idemitsu Kosan Co., Ltd.	√						Pass
Shutter	Idemitsu Kosan Co., Ltd.	√						Pass
Bobbin	Idemitsu Kosan Co., Ltd.						√	Pass
Enclosure	Idemitsu Kosan Co., Ltd.						√	Pass
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 [(te – ti) ≤ 2s] (Yes/No):								Yes
If no, then surrounding parts passed the needle-flame test of annex E (Yes/No)..... :								N/A
The test specimen passed the test by virtue of most of the flaming material being withdrawn with the glow-wire (Yes/No)?..... :								Yes
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.								

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

24.1	TABLE: Transformers supplying external SELV circuit				N/A
secondary winding tested		maximum output voltage (V)	maximum output current (A)	maximum power (VA)	
Supplementary information:					

24.1 / 24.2		TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
Please refer to the latest edition of the Constructional Data Form (CDF) issued for this test report.						
Supplementary information:						
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.						
2) Description line content is optional. Main line description needs to clearly detail the component used for testing						

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

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

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

25.2	TABLE: Over-voltage and under-voltage test					N/A
test	operating condition	rated voltage (V)	test voltage 85/110% (V)	temperature (°C)	Observation	
Over-voltage transformer	T _{max}					
Under-voltage transformer	T _{max}					
Over-voltage valve	T _{min}					
Under-voltage valve	T _{min}					
Supplementary information:						

27.2.3	TABLE: Blocked output test			N/A
Thermocouple locations	Max. temperature measured, (°C)		Temperature limit (°C)	Verdict
	2 nd hour	24 th hour		
Supplementary information:				

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict

27.5	TABLE: Overload Heating test		P
thermocouple locations	Max. temperature measured, (°C)	Temperature limit, (°C)	Verdict
Enclosure (accessible)	65,2	127,5	Pass
Supplementary information: Tested at 16x1,45=23,2A and the limit above is according to b) of H.27.1.1.3. a), c), d), e), f) and g) of the sub clause are also met. Ambient temperature for test is 25°C.			

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

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

ATTACHMENT TO TEST REPORT IEC 60730-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
AUTOMATIC ELECTRICAL CONTROLS FOR HOUSEHOLD AND SIMILAR USE
Part 1: General requirements

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
5.	RATING		P
5.1	Controls with terminals for direct connection to supply mains: single phase usage at 230V / multiphase usage at 400V covered (EN 60730-1)		N/A

7.	INFORMATION		P
7.2.1	Methods of information:		P
	EMC standard / test method 23.1 (Method X) (EN 60730-1)	See annex ZD	N/A
	declared voltage and current for emission test 23.1.1 (Method D) (EN 60730-1)	See annex ZD	N/A
7.4.3	Replace explanatory paragraph with: see EN 60730-1 Annex ZB		N/A
7.4.3.2	Replace explanatory paragraphs with: See EN 60730-1 Annex ZB		N/A

8.	PROTECTION AGAINST ELECTRIC SHOCK		P
8.1.1.1	Delete the explanatory paragraph (note)		—
8.3.2.4	Replace first sentence by: The voltage shall not exceed 34V peak		P
8.4	Delete the explanatory paragraphs.....		—

9.	PROVISION FOR PROTECTIVE EARTHING		N/A
9.1	Add "See annex ZB" after 1:st paragraph		N/A
9.2	Add "See annex ZB" after 1:st paragraph		N/A
9.3.2	Delete the explanatory paragraphs and Table 2.....		—
9.3.3	Format the text as a proper requirement.....		N/A
9.3.4	Delete the explanatory paragraph		—
9.5.1	Delete the entire subclause.....		—

10.	TERMINALS AND TERMINATIONS		N/A
10.1.4.1	Sub-clause deleted		—
10.1.14	Sub-clause deleted		—
10.1.15	Sub-clause deleted		—
10.2	Terminals and terminations for internal conductors		—
10.2.1	Connectable conductors:		N/A

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
	- no terminals required if conductor permanently connected by manufacturer		N/A

11.	CONSTRUCTIONAL REQUIREMENTS		P
11.2.1.1	Delete the explanatory paragraph		—
11.3.2	Delete “or” in the sixth line. Add “(7.2 in previous edition)” after Table 1		—
11.5	Delete the explanatory paragraph		—
11.8	Size of cords – non-detachable		N/A
11.8.1	Non-detachable cords:		N/A
	Replace: “60245 IEC 53” by “H05RR-F of HD 22.4” - rubber sheathed, not lighter than H05 RR-F; type:		N/A
	Replace: “60227 IEC 53” by “H05VV-F of HD 21.5” - PVC sheathed, not lighter than H05 VV-F; type...:		N/A
	- exception: if specified in particular equipment standard; standard:		N/A
11.9.4	Bushing is integral with the sheath of cord of rubber	see Annex ZB	N/A
11.11	Requirements during mounting, maintenance and servicing		N/A
11.11.1	Covers and their fixing		N/A
11.11.1.2	Delete the explanatory paragraphs		—
11.11.1.3	Sub-clause deleted		—
11.11.1.4	Sub-clause deleted		—

12.	MOISTURE AND DUST RESISTANCE		P
12.1	Protection against ingress of water and dust		P
12.1.6	Delete the explanatory paragraph		—
12.1.6.2	Replace the last sentence by: Glands and sealing means are tightened by torque equal to 2/3 of values in Table 20 (Nm)		N/A
12.2.9	Sub-clause deleted		N/A

13.	ELECTRIC STRENGTH AND INSULATION RESISTANCE		P
13.2.4	Sub-clause deleted		N/A

14.	HEATING		P
14.4	Electrical conditions:		P
	- voltage (V): most unfavourable value between 0.9 and 1.1 times U_R		N/A

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
	- voltage (V) if circuit not voltage sensitive: min. 10% of U_R	230	P
	- current (A): most unfavourable value between 0.9 and 1.1 times I_R	17,6A	P
14.Z1	If $T_{Meas} \geq T_{Max}$ specified in 14.1, 6 samples were subjected to the following tests:		N/A
	Moving parts, if any, were locked and a current was passed individually through each winding to reach T_{Max} measured under the conditions of test 14.1		N/A
	Current is increased to reach $T_{Max} + T_{Increase}$ ($T_{Increase}$ chosen in table 14.Z1) and held constant for the first period of the corresponding $Time_{Total}$		N/A
	$Time_{Total}$ (corresponding to chosen $T_{Increase}$) is divided in 4 equal periods each followed by humidity treatment acc. 12.2 (deviation: electric strength at level 50 % of 13.2)		N/A
	Failure of only one of the six samples during the first of the four periods of the test is ignored.		N/A
	If 1 of the 6 samples fails during the 2 nd , 3 rd or 4 th period of the test, the remaining five samples are subjected to an additional fifth test cycle		N/A
	Failure of any of the remaining five controls will entail a rejection.		N/A

15.	MANUFACTURING DEVIATION AND DRIFT		N/A
15.1	Delete the explanatory paragraph		—

16.	ENVIRONMENTAL STRESS		P
16.2.1	Add "See annex ZB" at the end of the dashed paragraph. Delete the explanatory paragraph		N/A

17.	Endurance		P
17.1.3	Add explanatory paragraph: For tests sequence and conditions of non-resettable thermal cut-outs, see 17.16		—
17.1.3.1	Delete text in brackets in second and fifth dashed paragraph		N/A
17.2.2	Electrical loads according to Table 14, at rated voltage V_R increased to $1.15V_R$ (V)		P
17.2.3	Sub-clause deleted		—
17.3.1	Replace last sentence of third dashed paragraph: If $T_{min} < 0^\circ\text{C}$ additional test carried out with switch head maintained between T_{min} and $(T_{min} - 5)^\circ\text{C}$		N/A

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
	Controls for Type 1 action: Clause 16 and 17		N/A
	Controls for Type 2 action: clause 15, 16 and 17		N/A
17.5.1	Delete the explanatory paragraph		—
17.7.1	Delete the words in brackets		—
17.7.7	Delete the explanatory paragraph		—
17.8.4.1	Delete the explanatory paragraph		—
17.10	Delete the words in brackets		—
17.10.1	Delete the words in brackets		—
17.10.3	Sub-clause deleted		N/A
17.12.4	Sub-clause deleted		—

18.	MECHANICAL STRENGTH		P
18.1	General requirements		—
18.1.6	Sub-clause deleted		—
18.2.1	Delete the words “except as provided by 18.4”		—
18.3	Void		N/A
18.4	Sub-clause deleted		—

19.	THREADED PARTS AND CONNECTIONS		P
19.1	Threaded parts moved during mounting or servicing		—
19.1.7	Replace “screws” by “threaded parts”.		—
19.2.4.1	Delete the explanatory paragraph		—
19.2.5.1	Delete the explanatory paragraph		—

20.	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
	Delete the explanatory paragraph after note 4		—
20.1 – 20.1.7	Replace “impulse withstand test” by “impulse voltage test”		—
	Replace “impulse test” by “impulse voltage test”		—
	Replace Table 22 except notes		—

21.	RESISTANCE TO HEAT, FIRE AND TRACKING		P
21.1	Delete the explanatory paragraph		—
21.2.7	Compliance is checked by the tests of Clause G.4, carried out at a voltage corresponding to the PTI value declared for Table 1, requirement 30.	175V	P

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
21.3	Test sequence 21.2.1 – 21.2.7 applies, preceded by preconditioning of 21.1.3		P
	For parts which maintain or retain in position electrical connections the glow-wire shall be carried out at 850°C		P
23.	EMC REQUIREMENTS EMISSION		N/A
23.1	Compliance checked by method declared by manufacture, see 601 in 7.2 and Table H.10		—
23.1.1	Add before first dashed paragraph: Test conducted at lowest declared voltage and lowest declared current, see 602 in 7.2		—
23.1.2	Duration of radio interference is measured by oscilloscope, or measuring equipment according to EN 55016-1-1		N/A

27.	ABNORMAL OPERATION		N/A
27.2	Replace “Burnout test” by “locked mechanism test”		—
	Locked mechanism test (for controls incorporating Electro-magnets)		N/A
27.2.1	In 1:st paragraph, delete 17.2.3.1 and 17.2.3.2		—
27.2.3.1	Delete the explanatory paragraph		—
27.5	Delete the explanatory paragraph		—

C	ANNEX C – COTTON USED FOR MERCURY SWITCH TEST		N/A
	Clause deleted		—

D	ANNEX D – HEAT, FIRE AND TRACKING		P
	Clause deleted		—

H	ANNEX H – REQUIREMENTS FOR ELECTRONIC CIRCUITS		N/A
H7.	Information, addition to Table 7.2:		N/A
	H36 – replacement: limits of activating quantity for any sensing element over which micro-disconnection or electronic disconnection is secure; After clause: 11.3.2, add H2.4.6; method: X		N/A
H13.2	Delete the row “Across electronic disconnection”		N/A
H26.	EMC REQUIREMENTS IMMUNITY. Operation with mains borne perturbations, magnetic, and electromagnetic disturbances		N/A

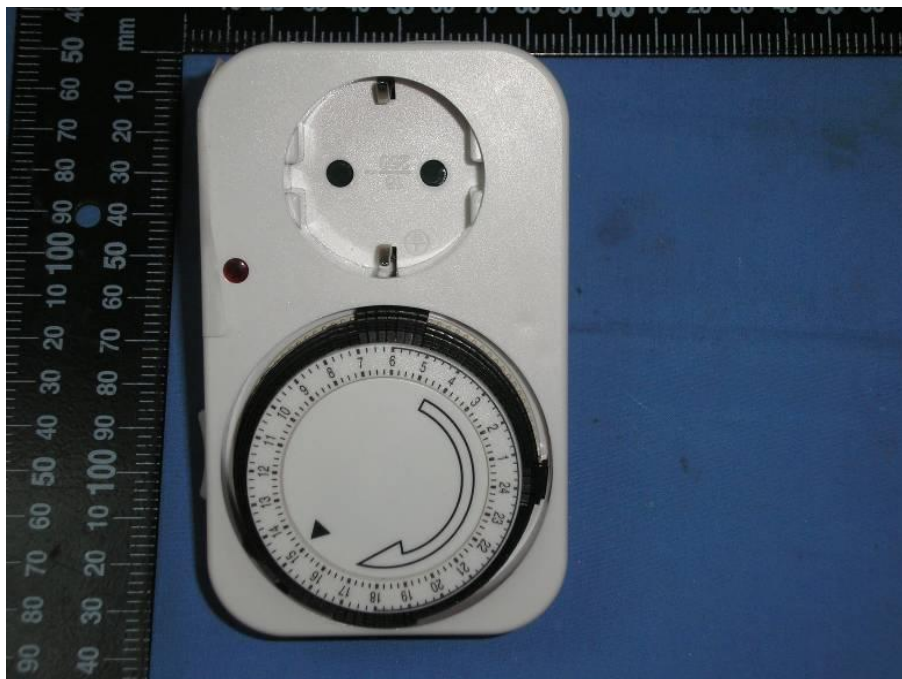
EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
H26.1	For controls of Type 1 action, intended for “free standing controls, independently mounted and/ or in-line controls”, the tests of Annex ZD apply instead of clause H26.		N/A
H26.7	Influence of d.c. in a.c. networks (sub-clause deleted)		—
H26.10	Sub-clause deleted		—

J	ANNEX J – REQUIREMENTS FOR CONTROLS USING THERMISTORS		N/A
J17.17	- thermal runaway by increased voltage (PTC), J17.18.5.		N/A
	- thermal runaway by increased current (NTC), J17.18.6		N/A

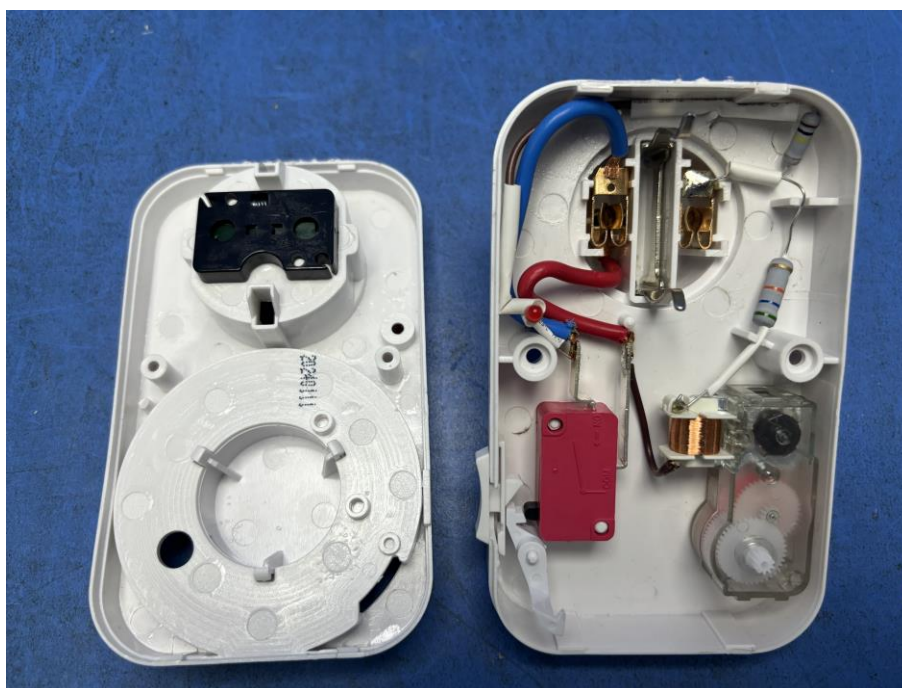
ZB	ANNEX ZB OF EN 60 730-1, SPECIAL NATIONAL CONDITIONS		N/A
ZB 2.7	AUSTRIA, BELGIUM, DENMARK, FRANCE, GERMANY, ITALY, NORWAY, UNITED KINGDOM		N/A
ZB 2.7.2	RS class 0 not allowed		N/A
ZB 2.7.3	RS class 01 not allowed		N/A
ZB 2.7.5.3	RS class 01 not allowed		N/A
ZB 4.3.3.1	RS class 0 and 01 not allowed		N/A
ZB 4.3.3.3	RS class 0 and 01 not allowed		N/A
ZB 6.8.2.1	RS class 0 not allowed		N/A
ZB 6.8.2.2	RS class 01 not allowed		N/A
ZB 6.8.3.1	RS class 0 not allowed		N/A
ZB 6.8.3.2	RS class 01 not allowed		N/A
	UNITED KINGDOM		N/A
ZB 7.4.3	Terminals exclusively for live external conductor: indicated: "L"		N/A
ZB 7.4.3.2	Letter "L" must not be used in another way		N/A
	AUSTRIA, BELGIUM, DENMARK, FRANCE, GERMANY, ITALY, NORWAY, UNITED KINGDOM		N/A
ZB 9.1.1	RS class 01 not allowed		N/A
ZB 9.1.1	RS class 01 not allowed		N/A
	FINLAND , NORWAY AND SWEDEN		N/A
ZB 16.2.1	- replace "-10±2 °C" by "-25±2 °C" (control must be stored 24h at -25±2 °C)		N/A

EN 60730-1/2016			
Clause	Requirement + Test	Result - Remark	Verdict
ZC	ANNEX ZC (informative) A-DEVIATIONS		N/A
ZC 11.1.2	(SWEDEN) Mercury not allowed in switches and controls, such as level switches, thermostats and relays		N/A
ZC 11.1.3	(UNITED KINGDOM) add to requirement: These regulations apply to all plugs for domestic use at a voltage of not less than 200V and in General allow only plugs to BS 1363 to be fitted		N/A
ZD	ANNEX ZD (normative) EMC IMMUNITY FOR CONTROLS		N/A

Photo attachment



TS-MD1

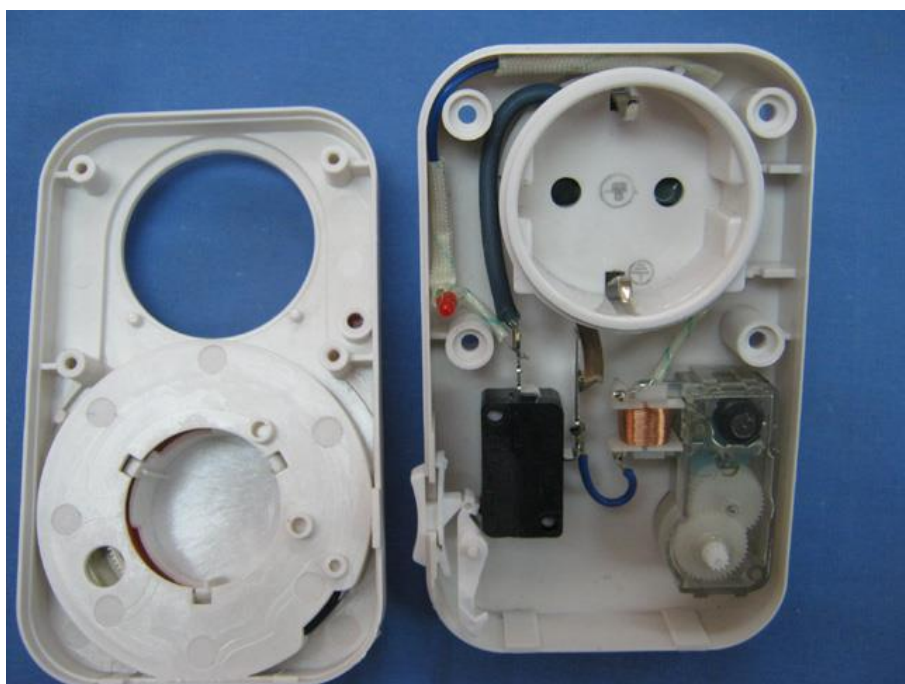


TS-MD1

Photo attachment



TS-MD3



TS-MD3

Photo attachment

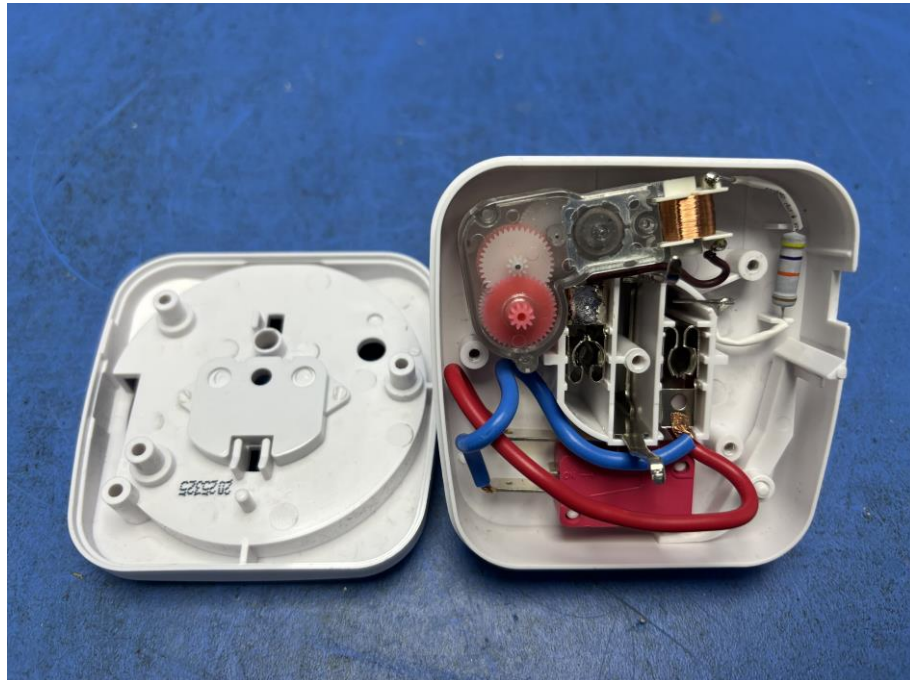


TS-MD20



TS-MD20

Photo attachment



TS-MD20

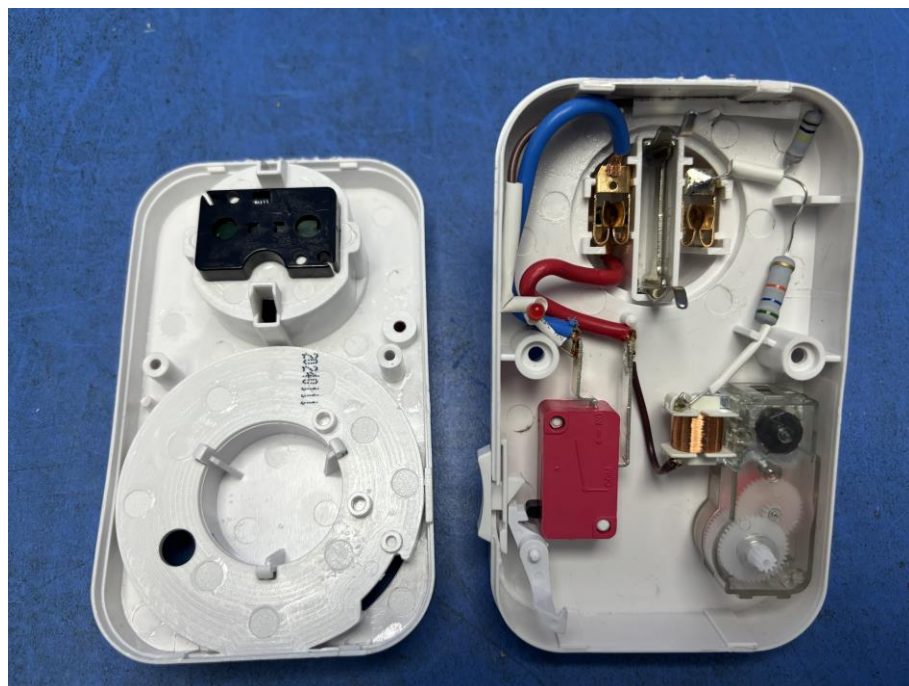


TS-WD1

Photo attachment



TS-WD1

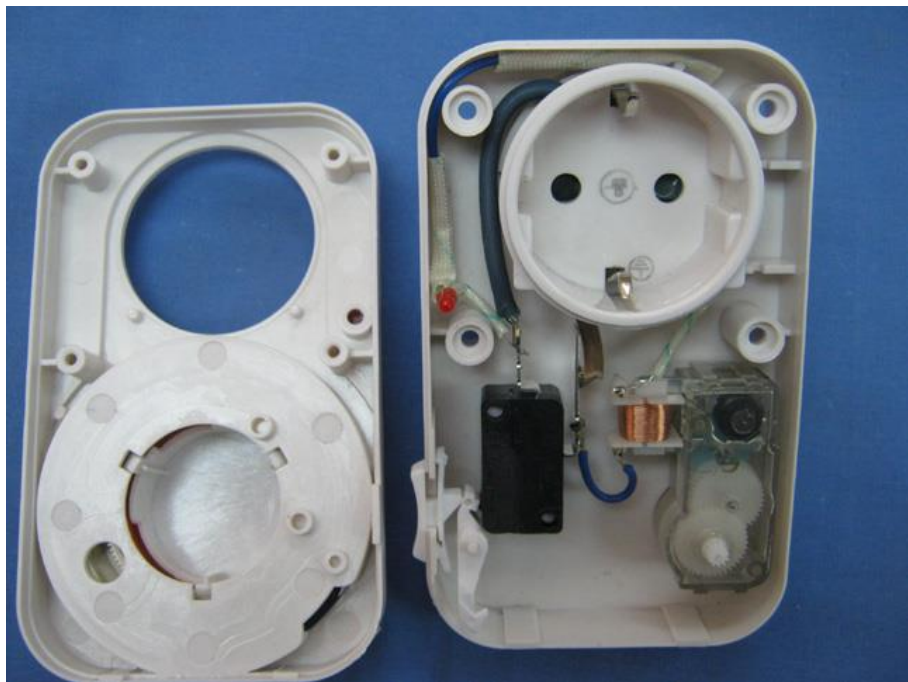


TS-WD1

Photo attachment

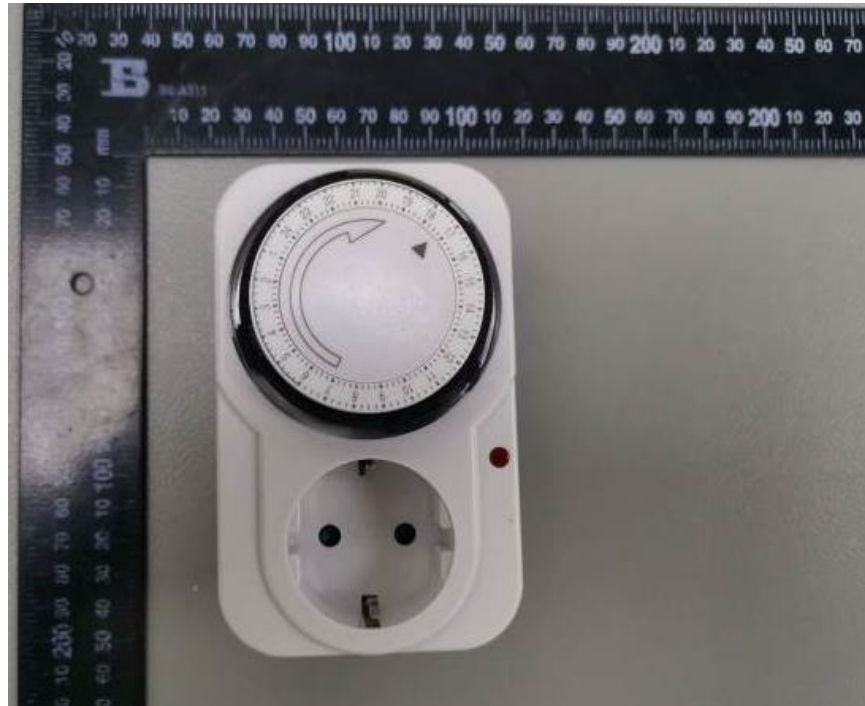


TS-WD3



TS-WD3

Photo attachment

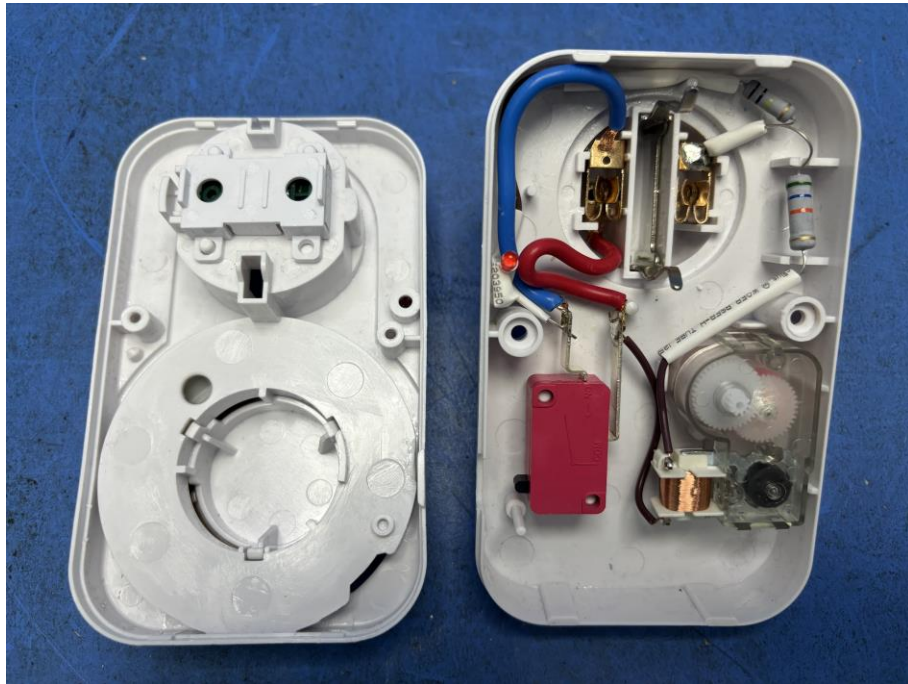


External view of TS-MD31



External view of TS-MD31

Photo attachment

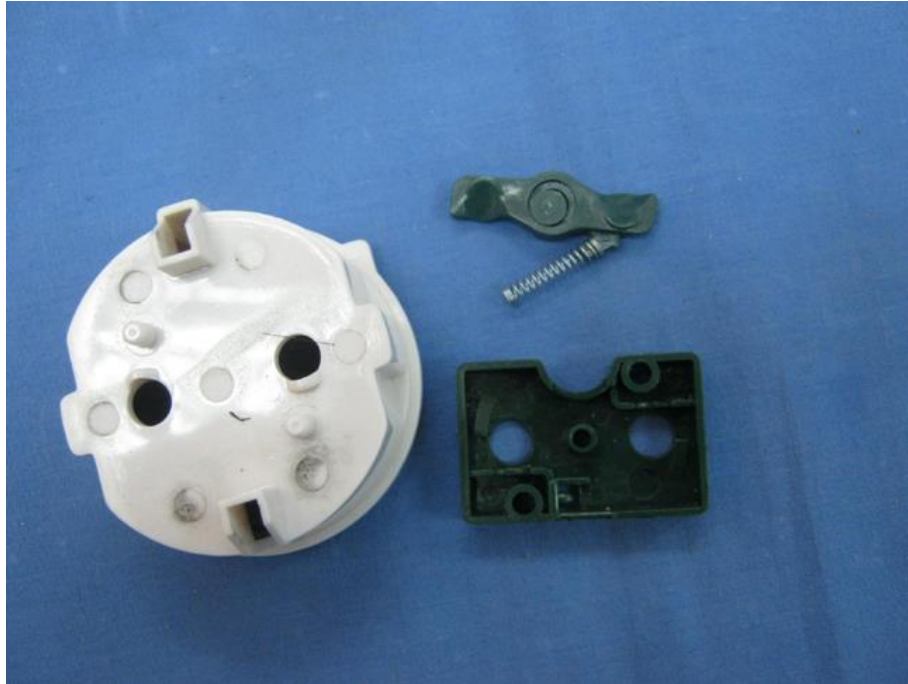


Internal view of TS-MD31



Micro-gap switch

Photo attachment



Socket outlet and shutter



Earthing contact

Photo attachment



Close-up view of assembly screw



Close-up view of another assembly screw

Photo attachment

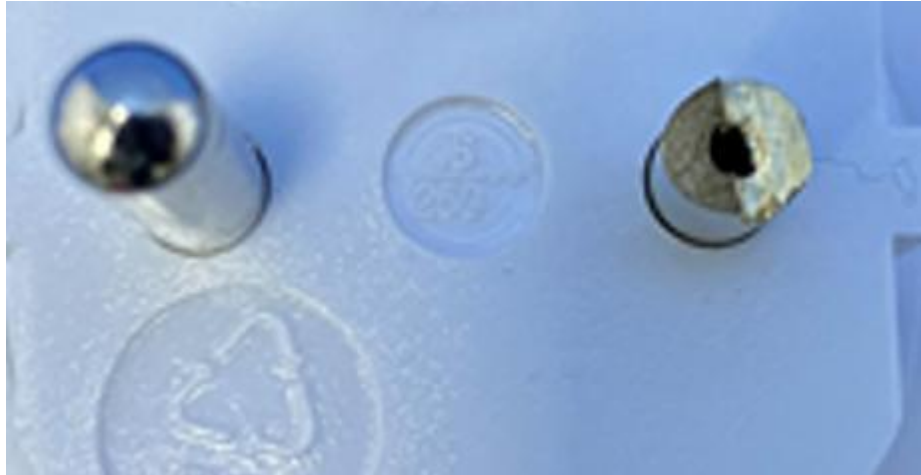


Close-up view of another assembly screw



Close-up view of another assembly screw

Photo attachment



Non-solid pins