TEST REPORT

IEC 60730-1

Automatic electrical controls for household and similar use

Report reference No. ..... :	CPSA0116382
Date of issue ..... :	2012-07-20
Total number of pages ..... :	83 pages and attachment 14 pages
~~CB~~ Testing Laboratory ..... :	TÜV SÜD Korea Laboratory (TKL)
Address ..... :	#315 and 316, MARIO Tower, 222-12, Guro-Dong, Guro-Gu, 152-050, Seoul, Korea
Applicant's Name ..... :	SAMUSCO CO.
Address ..... :	Room 602 Partners Tower 2, #1128-3 Guro-Dong, Guro-Gu, Seoul 152-880, Republic of Korea
Test specification	
Standard ..... :	IEC 60730-1:1999 (3rd Edition) + A1:2003 + A2:2007
Test procedure ..... :	-
Procedure deviation ..... :	N/A
Non-standard test method ..... :	N/A
Test Report Form	IEC60730_1E
TRF originator. ..... :	Electrosuisse
Master TRF (date) ..... :	Dated 2008-07

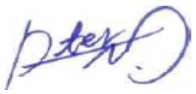
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Test item description	:	Motor-starting relays
Trade Mark	:	SAMUSCO
Manufacturer	:	SAMUSCO CO. Room 602 Partners Tower 2, #1128-3 Guro-Dong, Guro-Gu, Seoul 152-880, Republic of Korea
Model /Type reference	:	ECS112P, ECS112PS, ECS125P, ECS125PS, ECS125T, ECS125TS
Ratings	:	120 V~; 25 A(ECS125P, ECS125PS, ECS125T, ECS125TS), 12 A(ECS112P, ECS112PS); 50/60 Hz

☒ ~~CB~~ **Testing Laboratory**:	TÜV SÜD Korea Laboratory (TKL)
Testing location/ address ..... :	#315 and 316, MARIO Tower, 222-12, Guro-Dong, Guro-Gu, 152-050, Seoul, Korea
☐ **Associated CB Test Laboratory:**	N/A
Testing location/ address ..... :	N/A
Tested by (name + signature) ..... :	Chris, Seo 
Approved by (+ signature) ..... :	Peter, Lee 

☐ Testing procedure: TMP	
Tested by (name + signature) ..... :	N/A
Approved by (+ signature) ..... :	N/A
Testing location/ address ..... :	N/A

☐ Testing procedure: WMT	
Tested by (name + signature) ..... :	N/A
Witnessed by (+ signature) ..... :	N/A
Approved by (+ signature) ..... :	N/A
Testing location/ address ..... :	N/A

☐ Testing procedure: SMT	
Tested by (name + signature) ..... :	N/A
Approved by (+ signature) ..... :	N/A
Supervised by (+ signature) ..... :	N/A
Testing location/ address ..... :	N/A

☐ Testing procedure: RMT	
Tested by (name + signature) ..... :	N/A
Approved by (+ signature) ..... :	N/A
Supervised by (+ signature) ..... :	N/A
Testing location/ address ..... :	N/A

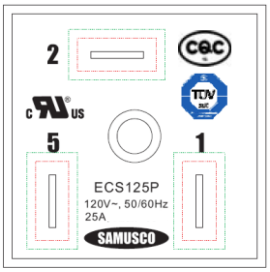
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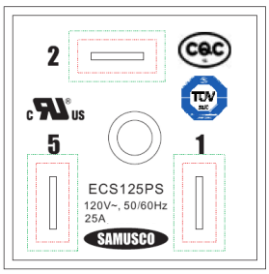
- All tests were conducted on model ECS125P.
- Attachment 1: European group differences and national differences (8 pages).
- Attachment 2: Test report for IEC 60730-2-10: 2006 (Second Edition) and/or EN 60730-2-10:2007 (6 pages).

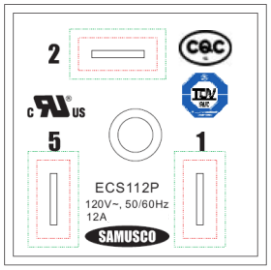
Summary of compliance with National Differences:

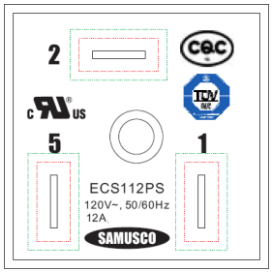
- This test was found to be in compliance with the test standards of IEC 60730-1:1999 (3rd Edition) + A1:2003 + A2:2007 and/or EN 60730-1:2000 + A1:2004 + A2:2008 + A12:2003 + A13:2004 + A14:2005 + A15:2007 + A16:2007 in conjunction with IEC 60730-2-10:2006 (Second Edition) and/or EN 60730-2-10:2007.

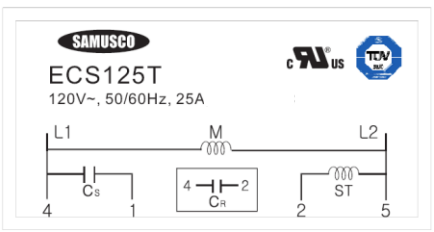
Copy of marking plate:

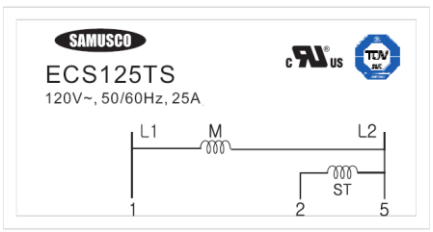












Test item particulars ..... :	Motor-starting relays
Classification of installation and use ..... :	Incorporated control for use in class I equipment
Supply Connection ..... :	Control with at least one terminal intended for the connection of fixed wiring
..... :	
..... :	
Possible test case verdicts:	
- 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 ..... :	2012-05-07
Date (s) of performance of tests ..... :	2012-05-08 until 2012-07-06

General remarks:

The test results presented in this report relate only to the object tested.
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"(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.

General product information:

- This test object is used for incorporation in class I equipment.

- Name and address of factory (ies):

1) SAMUSCO CO. (69564)
Room 602 Partners Tower 2, #1128-3 Guro-Dong, Guro-Gu, Seoul 152-880, REPUBLIC OF KOREA

- Model No.: ECS112P, ECS112PS, ECS125P, ECS125PS, ECS125T, ECS125TS
1) The model ECS125PS is identical to model ECS125P except for model designation.
2) The model ECS112P and ECS112PS is identical to model ECS125P except for current capacity of triac.
3) The model ECS125T is identical to model ECS125P except for terminal type, case and discharge resistance.
4) The model ECS125TS is identical to model ECS125P except for terminal type and case.

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Clause	Requirement – Test	Result – Remark	Verdict
3	GENERAL REQUIREMENTS		-
	Control designed and constructed in such a fashion not to cause injury to persons or damage to property		P

5	RATINGS		-
5.1	Maximum rated voltage (V) ..... :	120 V	P
5.2	Maximum rated current (A) ..... :	25 A	P

6	CLASSIFICATION		-
6.1	Nature of supply ..... :	~	—
6.2	Type of load and power factor ..... :	Substantially resistive load; 1,0	—
6.3	Purpose ..... :	Motor-starting relays. (This clause was considered in the part 2.)	—
6.4	Features of automatic action, Type 1 or Type 2 .... :	Type 1.B.	—
6.5	Degree of protection provided by enclosure per IEC 60529 and control pollution situation..... :	IP00; -Pollution degree 1 ; (ECS112P, ECS112PS, ECS125P, ECS125PS) -Pollution degree 2 ; ECS125T, ECS125TS	—
6.6	Method of connection..... :	Control with at least one terminal intended for the connection of fixed wiring.	—
6.7	Ambient temperature limits of the switch ahead: Tmin(°C).; Tmax (°C) ..... :	Tmax.: 60 °C	—
6.8	Protection against electric shock ..... :	Incorporated control for use in class I equipment.	—
6.9	Circuit disconnection or interruption ..... :	Electronic disconnection.	—
6.10	Number of cycles of actuation (M) of each manual action ..... :		—
6.11	Number of cycles of actuation (A) of each automatic action ..... :	100 000 cycles.	—
6.12	Temperature limits of the mounting surface of the control (°C or K) ..... :		—
6.13	Value of proof tracking index (PTI) for the insulation material used ..... :	IIIa; PTI 175 V	—
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 ..... :	Incorporated control.	—
6.16	Ageing requirements (type Y) of end-product equipment..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
6.17	Use of thermistor (Annex J) ..... :	No thermistor.	—
6.18	Use of software class (Annex H) ..... :	Software class A.	—

7	INFORMATION		-
7.2.1	Information provided by one or more of the methods specified in Table 7.2		P
	1 – Manufacturer's name or trademark (Method C):	SAMUSCO	P
	2 – Unique type reference (Method C)..... :	ECS112P, ECS112PS, ECS125P, ECS125PS, ECS125T, ECS125TS	P
	3 – Rated voltage or rated voltage range in volts (Method C) ..... :	120 V	P
	4 – Nature of supply (Method C) ..... :	~	P
	5 – Frequency, if other than for range 50 Hz to 60 Hz inclusive (Method C)..... :	50/60 Hz	P
	6 – Purpose of control (Method D) ..... :	Motor-starting relays. (This clause was considered in the part 2.)	P
	6a – Construction of control (Method D) ..... :	Incorporated control.	P
	7 – The type of load controlled by each circuit (Method C) ..... :	Substantially resistive load; 1,0	P
	15 – Degree of protection by enclosure: (Method C) ..... :	IP00	N/A
	17 – Terminals for external conductors (Method C):	Control with at least one terminal intended for the connection of fixed wiring.	P
	18 – Terminals for external conductors which accept a wider range of conductor sizes, (Method D) ..... :		N/A
	19 – Method of connection and disconnection for screwless terminals (Method D) ..... :	ECS112P, ECS112PS, ECS125P, ECS125PS	P
	20 – Details of any special conductors which are intended to be connected to terminals for internal conductors (Method D) ..... :		N/A
	21 – Maximum temperature of terminals for internal conductors, if higher than 85°C (Method X) ..... :		N/A
	22 – Temperature limits of the switch head, if Tmin lower than 0 °C, or Tmax other than 55 °C (Method C):		N/A
	23 – Temperature limits of mounting surfaces (Ts) if more than 20 K above Tmax (Method C)..... :		N/A
	24 – Classification of control according to protection against electric shock (Method X) ..... :	Incorporated control for use in class I equipment.	P

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Clause	Requirement – Test	Result – Remark	Verdict
	25 – For Class II controls, the symbol for Class II construction (Method C) ..... :	No an in-line cord control, a freestanding control, or an independently mounted control.	N/A
	26 – Number of cycles of actuation (M) for each manual action (Method X)..... :	No manual action type.	N/A
	27 – Number of automatic cycles (A) for each automatic action (Method X)..... :	100 000 cycles.	P
	28 – Ageing period (Y) for controls with Type 1M or 2M action (Method X) ..... :		N/A
	29 – Type of disconnection or interruption provided by each circuit (Method X)..... :	Electronic disconnection.	P
	30 – PTI of materials used for insulation (Method X) ..... :	IIIa; PTI 175 V	P
	31 – Method of mounting controls (Method D) ..... :		P
	31a – Method of providing earthing of control (Method D) ..... :		N/A
	32 – Method of attachment for non-detachable cords (Method D) ..... :		N/A
	33 – Intended transportation condition of control (Method X)..... :		N/A
	34 – Details of any limitation of operating time (Method D) ..... :		P
	35 – Period of electric stress across insulating parts (Method X) ..... :	Long period.	P
	36 – Limits of activating quality for any sensing element over which micro-disconnection is secure (Method X)..... :		P
	37 – Minimum and/or maximum rates of change of activating quantity, or minimum and/or maximum cycling rates for a sensing control (Method X)..... :		N/A
	38 – Values of overshoot of activating quantity for sensing controls (Method X)..... :		N/A
	39 – Type 1 or Type 2 action (Method D) ..... :	Type 1 action.	P
	40 – Additional features of Type 1 or Type 2 actions (Method D)..... :	Type 1.B.	P
	41 – Manufacturing deviation and condition of test appropriate to deviation (Method X) ..... :	No type 2 action.	N/A
	42 – Drift (Method X)..... :	No type 2 action.	N/A
	43 - Reset characteristics for cut-out action (Method D) ..... :		N/A
	44 - Hand-held control or control intended for hand-held equipment (Method X)..... :		N/A
	45 - Limitation to the number or distribution of flat push-on receptacles (Method D) ..... :		N/A
	46 - Operating sequence for controls with more than one circuit (Method D) ..... :	No type 2 action.	N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	47 - Extent of any sensing element (Method D) .... :		N/A
	48 - Operating value(s) or operating time (Method D):	Max. 1 s ON / Min. 20 s OFF	P
	49 - Control pollution degree (Method D)..... :	-Pollution degree 1 ; (ECS112P, ECS112PS, ECS125P, ECS125PS) -Pollution degree 2 ; ECS125T, ECS125TS	P
	50 - Control intended to be delivered exclusively to the equipment manufacturer (Method X) ..... :		P
	51 - Heat and fire resistance category (Method X)..... :	Category D.	P
	75 - Rated impulse voltage (Method D) ..... :	1500 V	P
	76 - Type of printed wiring board coating, (Method X):	No such part.	N/A
	77 – Temperature for ball pressure test (Method D) ..... :		P
	78 – Maximum declared torque on single brush mounting using thermoplastic material (Method D):	3,3 mm; 0,8 Nm	P
	79 – Pollution situation in the micro-environment of the creepage or clearance if cleaner than that of the control (Method D) ..... :		N/A
	80 – Rated impulse voltage for the creepage or clearance if different from that of the control (Method D) ..... :		N/A
	81 – Values designed for tolerances of distances for which the exclusion from fault mode “short” is claimed (Method D)..... :		N/A
	82 to 84 See Annex J	No thermistor.	N/A
	85 – For Class III controls, the symbol for Class III construction (Method C) ..... :		N/A
	86 – For SELV or PELV circuits, the ELV limits realized (Method D) ..... :		N/A
	87 – Accessible voltage of SELV/PELV circuit, if different from 8.1.1, product standard referred to for the application of the control, in which standard(s) the accessible SELV/PELV level(s) is (are) (Method D)..... :		N/A
	And product standard referred to for application, in which standard(s) the accessible SELV/PELV level(s) is (are) (Method D)..... :		N/A
	88 – See Annex U	This item was not used in IEC 60335 appliances.	N/A
7.2.3	For integral/separate controls Documentation (D) replaced with Declaration (X)		P
7.2.4	Marking for the integral control within the complex control included in the marking of the complex control		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
7.2.5	Documentation (D) satisfied by similar information in Marking (C).		P
7.2.5.1	Declaration (X) satisfied by similar information in Documentation (D) or Marking (C)		P
7.2.6	Information for Integrated control provided by Declaration (X).	No integrated control.	N/A
	Incorporated control provided with manufacturers name or trademark and unique type reference when other required marking provided by Documentation (D)	SAMUSCO; ECS112P, ECS112PS, ECS125P, ECS125PS, ECS125T, ECS125TS	P
	Information for incorporated control intended for exclusive delivery to the equipment.		P
7.2.7	Controls with limited space marked with manufacturer's name or trademark and the unique type reference while other required marking included in Documentation (D)		N/A
7.2.8	Additional pertinent information permitted if does not rise misunderstanding..... :		P
7.2.9	Appropriate IEC symbols used per 7.2.9 ..... :	A; V; ~; Hz;	P
7.3	Class II symbol		-
7.3.1	Used only for in-line cord, free-standing, and independently mounted controls	No an in-line cord control, a freestanding control, or an independently mounted control.	N/A
7.3.2	Outer square is approximately twice the size of the inner square		N/A
7.3.2.1	Largest dimension of the control (mm)..... :		—
	Side dimension of outer square (mm) ..... :		N/A
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
7.4.1	Marking placed on the main body, on non-detachable parts		N/A
	Required marking legible and durable		N/A
7.4.2	An arrow pointing towards the terminal identifies terminals of control intended for connection of supply conductors		N/A
	Additional markings required by the National Wiring Codes provided ..... :		N/A
7.4.3	Terminals for neutral external conductor identified by letter "N"		N/A
7.4.3.1	External earthing and continuity terminals of Class II and III controls and terminals for earthing for functional purposes identified by earth symbol		N/A
	– for protective earth by the earth symbol for protective earth, IEC 60417-5019 (2002-10)		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	– for functional earth by the earth symbol for functional earth, IEC 60417-5017 (2002-10).		N/A
7.4.3.2	All other terminals appropriately identified		N/A
	For use in Canada and the U.S.A, terminal intended for grounded supply conductor provided in white/grey colour.		N/A
	For use in Canada and the U.S.A, the wire binding screw intended for equipment earthing conductor is slotted/ hexagonal green-coloured head. Location is such that it is unlikely to be removed during servicing.		N/A
	For use in Canada and the U.S.A, the pressure wire connector intended for equipment earthing conductor is marked GROUND, GROUNDING, EARTH, or by a marking on the wiring diagram shipped with the control. Location is such that it is unlikely to be removed during servicing of control.		N/A
	Additional markings required by National Wiring Codes of Canada and U.S.A provided..... :		N/A
7.4.4	Symbols “+” and “-“ provided to indicate the direction to increase or decrease response value for the controls to be set by the user or the equipment manufacturer.		N/A
	Controls intended to be set by the equipment manufacturer or the installer accompanied by documentation (D) indicating proper method for securing the setting.		N/A
7.4.5	Replaceable parts destroyed during the normal operation marked to enable their identification from a Catalogue or similar document, even after they operated.	Controls intended to be replaced only during manufacturer servicing.	P
7.4.6	Controls intended to be connected only to SELV systems are marked with the class III symbol	Controls 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 for class III but have terminals for earthing continuity for functional purposes are not marked with the symbol for class III construction		N/A

8	PROTECTION AGAINST ELECTRIC SHOCK		-
8.1.1	Adequate protection provided against accidental contact with live parts in all unfavourable positions of normal use, and after all accessible detachable parts (other than lamps behind the detachable cover) were removed.		P

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Clause	Requirement – Test	Result – Remark	Verdict
	Protection against accidental contact with live parts of the lamp provided to allow safe insertion and removal of the lamps.	No lamps.	N/A
	Live parts connected to a SELV supply not exceeding 24 V considered to be non-hazardous.		N/A
	Live parts connected to a SELV supply not exceeding 30 V considered to be non-hazardous in the countries specified in the remarks column... :	USA and Canada.	N/A
8.1.2	Class II controls and controls for Class II equipment provided with protection against accidental contact with metal parts separated from hazardous live parts by only basic insulation.		N/A
8.1.3	Lacquer, enamel, paper, cotton, oxide film on metal parts, and beads and sealing compounds not relied upon for protection against accidental contact with hazardous live parts.		N/A
	Self-hardening sealing compounds exempted from the above requirements.		N/A
8.1.4	For controls connected to gas or water supply mains any metal part electrically connected to pipes is separated from hazardous live parts by double insulation or reinforced insulation.		N/A
8.1.5	Class II controls and controls for Class II equipment for fixed installation: protection not impaired by the installation of control / equipment		N/A
8.1.6	Integrated and Incorporated controls: tests made to accessible parts when control is mounted as intended with detachable parts removed.		P
8.1.7	In-line and free-standing controls: tests are made when control fitted with cord; cross-sectional area of cord (mm²) ..... :	No in-line and free-standing controls.	—
8.1.8	Independently mounted controls: tests are made when control mounted as in normal use, fitted with cable or with a conduit; cross-sectional area of cable (mm²) ..... :	No independently mounted controls.	—
8.1.9	Tests using the standard test finger and test pin:		-
	- not permissible to touch bare live parts.	No such parts.	N/A
	- controls with double insulation: not permissible to touch metal parts with test finger which are separated from live parts by basic insulation.	No such 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 part are hazardous if they exceed the values specified in 8.1.1 and it are not separated from the source by protective impedance and are not a PEN conductor or a parts of the equipotential bonding system.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
8.2	Actuating members and means		-
8.2.1	Actuating members are not live	No actuating members.	N/A
8.2.2	Live actuating means provided with fixed insulated actuating member		N/A
	Live actuating means not accessible when actuating member is removed		N/A
8.2.3	Controls other than Class III or for other than Class III equipment: actuating members and handles to be held in normal use are:		-
	- of insulating material, or		N/A
	- covered by insulating material		N/A
	If of metal: accessible parts (if likely to become live in the event of an insulation fault) 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:		-
	- reliably connected to an earthing terminal/contact, or		N/A
	- shielded from live parts by earthed metal		N/A
	- separated from live parts by double or reinforced insulation.		N/A
8.3	Capacitors		-
8.3.1	Class II in-line cord controls and independently mounted controls: capacitor not connected to accessible metal parts	No in-line cord controls and independently mounted controls.	N/A
	Controls for Class II equipment: capacitors not connected to metal likely to be connected to accessible metal parts (control correctly mounted)	Incorporated control for use in class I equipment.	N/A
	Metal casings of capacitors separated by supplementary insulation from:		-
	- accessible metal parts		N/A
	- metal parts likely to be connected to accessible metal parts		N/A
8.3.2	Controls connected to the supply by means of a plug: no risk of electric shock (from capacitor) when touching the pins of the plug	Controls was not connected to the supply by means of a plug.	N/A
	Capacitance (µF) >0.1µF .....:		N/A
	Average voltage (V) < 34 V .....:		N/A
8.4	Covers and uninsulated live or hazardous parts; cover fixing screws:		-
	- 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		P

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Clause	Requirement – Test	Result – Remark	Verdict
9	PROVISION FOR PROTECTIVE EARTHING		-
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:		-
	- connected to an earthing terminal, or		N/A
	- 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:		-
	- have provision for earthing, or		N/A
	- earthed by the fixing means		N/A
9.1.3	Earthing terminals, terminations or contacts not electrically connected to any neutral terminal		N/A
9.2	Control of Class II or Class III:		-
	- no provision for protective earthing		N/A
	- interconnection terminal for earthing, if any, separated from live parts by double insulation or reinforced insulation		N/A
9.3	Adequacy of earth connections		-
9.3.1	Connection between earthing terminal and parts to be connected is of low resistance:		-
	- test current (A): 1.5 times rated current (min. 25 A) .....:		—
	- duration (h): until steady conditions .....:		N/A
	- voltage drop (V), integrated conductors included, external or internal conductors excluded .....:		—
	- calculated resistance (Ω):≤0.1 Ω.....:		N/A
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
9.3.4	Size of accessible earthing terminals		-
	- 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		-
	- 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		-
9.4.1	Material of earthing terminals, body:		-

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Clause	Requirement – Test	Result – Remark	Verdict
	- body of earthing terminals made of brass	No earthing terminals.	N/A
	- other metal not less resistant to corrosion.....:		N/A
	- screws or nuts made of brass		N/A
	- plated steel or other resistant material.....:		N/A
9.4.2	Precaution against risk of corrosion between copper and frames or enclosures of aluminum or its alloys		N/A
9.5.1	Detachable part with earth connection:		-
	- 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		-
10.1	Terminals and terminations for external copper conductors		-
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:		-
	- 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:		-
	- 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) ..:		—

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Clause	Requirement – Test	Result – Remark	Verdict
10.1.4.1	Terminal designed for wider range of conductor size declared .....:		—
10.1.4.2	Creepage and clearances between terminals for fixed wiring and between terminals and metal parts required in Canada and the USA		N/A
10.1.5	Terminals for fixed wiring and non-detachable cords using attachment methods X or M securely fixed		N/A
10.1.5.1	10 times fastening and loosening conductor of largest cross-section:		-
	- kind of wire used .....:		—
	- cross-sectional area (mm²) .....:		—
	- 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:		-
	- no special preparation of conductor required		N/A
10.1.7.1	- alternative means of connection applied		N/A
10.1.8	In terminals for fixed wiring and non-detachable cords using attachment methods X or M conductor remains secure while clamping		N/A
10.1.8.2	Terminals fitted with conductors:		-
	- cross-sectional area (mm²) ..... :		—
	- Flexible cord / Fixed wiring ..... :		—
10.1.8.3	Torque applied on screws (Nm) ..... :		—
10.1.8.4	Neither the conductor nor the wire of a stranded conductor slipped out		N/A
10.1.9	Clamping reliability of the terminals		-
10.1.9.1	Appropriate conductors fitted; torque applied on screws (Nm): 2/3 of values in Table 19.1		N/A
10.1.9.2	Pull-out force applied for 1 min to the conductor:		-
	- adjacent to the terminal, or		N/A
	- near the crimping or clamping device holding the conductor.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
10.1.9.3	Conductor did not move appreciably after pull-out test		N/A
10.1.11	Location of terminals in reasonable proximity		N/A
10.1.12	Test of escaped wire for terminals with attachment methods X or M		N/A
	Free wire of stranded conductor makes no contact with accessible metal parts		N/A
	Free wire of stranded conductor makes no contact with metal parts of Class II controls separated from accessible parts by supplementary insulation only		N/A
	Free wire of a conductor connected to the earthing terminal makes no contact with live parts		N/A
	Free wire of a conductor connected to live terminals not accessible and does not short-circuit an action providing full or micro-disconnection		N/A
10.1.13	Contact pressure not transmitted via insulating material other than ceramic		N/A
	Sufficient resiliency in the appropriate metal parts to compensate for distortion of insulating material		N/A
10.1.14	Screws and threaded parts made of metal		N/A
10.1.15	In pillar and mantle type terminals adequate length of the conductor can be introduced		N/A
	In pillar and mantle type terminals conductor passes beyond the edge of the screw		N/A
10.1.16	Flying Leads used in U.S.A. and Canada		N/A
10.2	Terminals and terminations for internal conductors		-
10.2.1	Connectable conductors	No such parts.	N/A
10.2.2	Terminals suitable for their purpose		P
10.2.3	In soldered terminals: soldering is not the only means to maintain conductor in position	No such parts.	N/A
	In soldered terminals: barriers provided to prevent reduction in creepage and clearance.		N/A
10.2.4	Flat push-on connectors		-
10.2.4.1	Dimension of tabs:		-
	- measured (mm x mm) ..... :		—
	- compliance with Fig. 14, 15, 16 or IEC/EN 61210		P
	- other dimensions allowed (mm x mm) ..... :		—
	- polarized acceptance of receptacles allowed.		N/A
10.2.4.2	Tabs forming part of a control consist of material appropriate to the maximum temperatures allowed (table 10.2.4.2)		P
10.2.4.3	Mechanical strength of tabs.		P

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Clause	Requirement – Test	Result – Remark	Verdict
10.2.4.4	Space between tabs; applying appropriate receptacles on each tab:		-
	- no strain, no distortion to any of the tabs or adjacent parts		P
	- no reduction of creepage distance or clearances below values of Cl. 20		P
10.3	Terminals and terminations for integrated conductors		N/A

11	CONSTRUCTION REQUIREMENTS		-
11.1.1	Insulating materials		-
	Wood, cotton, silk, ordinary paper etc. not used as insulation unless impregnated, or		N/A
11.1.2	Current carrying part other than threaded parts of terminals, if made of brass:		-
	- 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
11.2	Protection against electric shock		-
11.2.1	Double insulation:		-
	- basic insulation and supplementary insulation can be tested separately, or		N/A
	- properties of both insulations are otherwise provided		N/A
11.2.1.1	Insulation regarded as reinforced insulation if requirements of 11.2.1 not met		N/A
11.2.2	Infringement of double or reinforced insulation in Class II controls:		-
	- 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		-
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:		-
	- not subjected to undue mechanical or thermal stresses		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	- insulation properties comply with IEC 60227 or IEC 60245		N/A
11.2.6	Protection against electric shock by use of SELV or PELV See Annex T.		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
11.3	Actuation and operation		-
11.3.1	Full-disconnection:		-
	- 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:		-
	- one supply pole, at least, separated		N/A
	- separated pole meets electric strength requirements, Cl. 13		N/A
	- any subsequent action does not cause reduction of contact separation below value required by the Electric Strength Test		N/A
11.3.3	Reset buttons are so located or protected that they are not to be accidentally reset		N/A
11.3.4	Parts for setting by the manufacturer secured to prevent accidental shifting		N/A
11.3.5	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
11.3.6	Contacts for full- and micro-disconnection with d.c. rating ≤ 0.1 A or a.c. rating, operated by actuation can rest only in closed or open position		N/A
11.3.7	Contacts which cannot (or are not intended to) be operated on load nor arc under normal use		N/A
11.3.7.2	An arc not maintained by slowly opening the contacts		N/A
11.3.8	In any rest position of the actuating member		-
	- contacts are open or closed as intended		N/A
	- no hazard can occur within the control		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
11.3.9	In pull-cord actuated control the mechanism returns when pull-cord is released to allow next movement in the cycle		-
	- pull force vertically downwards (N): ≤ 45 N ..... :		—
	- pull force 45° to vertical (N): ≤ 70 N ..... :		—
	- function after release		N/A
11.4	Actions		-
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	No type 2 action.	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.		N/A
11.4.6	Type 1C or 2C action: operation provides micro-interruption.		N/A
11.4.7	Type 1D or 2D action: disconnection cannot be prevented and reset not possible while faults persists		N/A
11.4.8	Type 1E or 2E action: disconnection or opening of contacts cannot be prevented/inhibited by reset mechanism or against continuation of fault condition		N/A
11.4.9	Type 1F or 2F action: reset needs the aid of a tool		N/A
11.4.10	Type 1G or 2G action: reset possible under electrically loaded conditions		N/A
11.4.11	Type 1H or 2H action:		N/A
	- contacts cannot be prevented from opening		N/A
	- may reset automatically to “closed” if reset means is held in reset position		N/A
	- no automatic reset if reset means in normal position at any temperature above –35 °C		N/A
11.4.12	Type 1J or 2J action:		N/A
	- contacts cannot be prevented from opening		N/A
	- no automatic reset if reset means is held in reset position		N/A
	- no automatic reset at any temperature above –35 °C		N/A
11.4.13	Type 1K or 2K action: declared disconnection provided in the case of break in sensing element or in part between element and switch head.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
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
11.5	Openings in enclosures (drain holes)		-
	- minimum area (mm^2): ..... :	No drain holes.	—
	- maximum area (mm^2): ..... :		—
	- minimum dimension (mm^2): ..... :		—
11.6	Mounting of controls		-
11.6.1	Control mounted according to manufacturer's declaration: does not adversely affect compliance with this standard		P
11.6.2	Control mounted as declared, if movement or removal could adversely affect compliance with this standard:		-
	- cannot rotate or be displaced		P
	- cannot be removed without the aid of a tool		P
	- 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:		-
	- 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		-
11.6.3.1	Independently mounted controls (other than for panel mounting):		N/A
	- fit a standard box as declared, or		N/A
	- supplied with a conduit box (if special), or		N/A
	- suitable for surface (plane) mounting		N/A
11.6.3.2	If special conduit box is required:		-
	- box 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

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Clause	Requirement – Test	Result – Remark	Verdict
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		-
11.7.1.1	In-line and free-standing controls, flexible cords withstand flexing during normal use	No in-line and free-standing controls, flexible cords.	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		-
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:	No cord anchorages.	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:		-
	- 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:		-
	- 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
11.7.2.4	Cord anchorage design:		-
	- 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

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Clause	Requirement – Test	Result – Remark	Verdict
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:		-
	- 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:		-
	- 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) ..... :		—
11.7.2.10	Push causes no damage		N/A
11.7.2.11	Pull test for control fitted with flexible cord(s)		-
	Free-standing control, weight (kg) ..... :	Force: N: pulls:	N/A
	In-line cord controls (all others) ..... :	Force: N: pulls:	N/A
	no displacement allowed		N/A
11.7.2.12	Torque Test on cable, torque (Nm)		N/A
11.7.2.13	Attachment method X:		-
	- test with lightest cord: smallest cross-section used in 10.1.4: diameter (mm) ..... :		—
	- test with next heavier type with largest cross-section: diameter (mm) ..... :		—
11.7.2.14	Test results:		-
	- cord not damaged		N/A
	- measured longitudinal displacement (≤ 2 mm) of cord (mm) ..... :		N/A
	- conductors have not moved in the terminals over a distance > 1 mm		N/A
	- no appreciable strain at the connection		N/A
	- creepage distances and clearances not reduced below values of Cl. 20		N/A
11.8	Size of non-detachable cords		-
11.8.1	- rubber sheathed, not lighter than 60245; type .... :	No such parts.	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 ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
11.8.2	Size of conductors in non-detachable cords:		-
	- nominal current (A) ..... :		—
	- required cross-sectional area (mm²) ..... :		—
	- measured cross-sectional area (mm²) ..... :		N/A
11.8.3	Space inside the control for flexible cords:		-
	- connecting cords of largest cross-section (10.1.4) (mm²) ..... :		—
	- 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		-
11.9.1	Inlet openings for flexible external cords:		-
	- designed to prevent damage of the covering of the cord when introducing connectors	No inlet openings.	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 introduction does not affect protection against electric shock or reduces distances and clearances (Cl. 20)		N/A
11.9.2	Inlet openings without inlet bushing made of insulating material		N/A
11.9.3	Inlet bushing:		-
	- made of insulating material		N/A
	- shaped to prevent damage to the cord		N/A
	- reliably fixed		N/A
	- not removable without the aid of a tool		N/A
	- not integrated with the cord in case of attachment method X		N/A
11.9.4	Inlet bushing not made of rubber		N/A
	Exception: For attachment methods M, Y or Z, for Class 0, 0I or I controls, bushing integral with sheath of a cord of rubber		N/A
11.9.5	Enclosures of independently mounted controls (for permanent connection to fixed wiring) provided with cable/conduit entries, knock-outs or glands allowing correct connection of the appropriate cable or cord		N/A
11.10	Equipment inlets and socket-outlets		-
11.10.1	Engagement with connecting devices of other systems not possible	No inlets and socket-outlets.	N/A
	Engagement causes no danger or damage		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
11.10.2	In-line cord controls with inlet or socket-outlets:		-
	- unintended overloading of control cannot occur, rating of the control accordingly		N/A
	- protected against overload, protection means .... :		N/A
11.10.3	Controls with pins to be introduced into fixed socket-outlets comply with requirements of the socket-outlet system		N/A
11.11	Requirements during mounting, maintenance and servicing		-
11.11.1	Covers and their fixing		-
11.11.1.1	Removal of covers does not affect setting of the controls other than integrated	No such parts.	N/A
11.11.1.2	Covers:		-
	- cannot be displaced or replaced incorrectly		N/A
	- fixing of covers to be removed for mounting etc., does not serve to fix any parts other than actuating members or gaskets.		N/A
11.11.1.3	Covers of enclosures giving access to fuses or any overload protective devices (Canada and U.S.)		N/A
11.11.1.4	Glass covering an opening (Canada and U.S.)		N/A
11.11.1.5	Non-detachable parts which provide protection against electric shock or contact with moving parts:		-
	- fixed in a reliable manner		N/A
	- withstand mechanical stress		N/A
	-snap-in devices have a locked position.		N/A
11.11.1.5.1	- parts likely to be removed for installation or during servicing disassembled and assembled ten times		N/A
11.11.1.5.3	- control subjected to 50 N push force test ..... :		N/A
	- pull force (N) ..... :		N/A
	- finger nail pull force (N) ..... :		N/A
	- if cover subjected to twisting force, torque applied ..... :		N/A
11.11.1.5.4	After push / pull test, parts remain locked in position and not detached.		N/A
11.11.1.6	Cover removable with one hand, not released when subjected to squeezing and pull force.		N/A
11.11.2	Fixing screws of covers which need to be removed for mounting etc., captive		N/A
11.11.3	Actuating member		-
11.11.3.1	Control not damaged by mounting or removal of actuating member		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
11.11.3.2	For Type 2 action with max/min. setting limited by means of the actuating member, the actuating member not removable without use of a tool		N/A
11.11.3.3	Actuating member cannot be fixed in an incorrect position for Type 1 action (actuating member providing OFF position) or Type 2 action (actuating member indicating condition of the control):		N/A
11.11.4	Parts forming supplementary or reinforced insulation and which might be omitted during re-assembly:		-
	- 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:		-
	- insulated from live parts		N/A
	- fitting and replacement possible without live parts becoming accessible		N/A
11.11.7	Insulating linings, barriers etc.:		-
	- adequate mechanical strength		N/A
	- secured in a reliable manner		N/A
11.12	Controls using software ..... :	See annex H	P
11.13	Protective controls and components of protective control system		-
11.13.1	- protective controls designed and constructed to be reliable and suitable for their intended duty		N/A
	- protective controls are independent of other functions		N/A
	- protective controls comply with appropriate design principles in order to obtain suitable and reliable protection		N/A
	Operating controls are not used as protective controls		N/A
11.13.2	The pressure of the limiting devices does not permanently exceed the maximum allowable pressure of the controlled application		N/A
	A short duration pressure surge of the limiting devices does not exceed 10% of the pressure surge		N/A
11.13.3	The temperature monitoring devices have an adequate response time on safety grounds, consistent with measurement function		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
12	MOISTURE AND DUST RESISTANCE		-
12.1.1	Protection against ingress of water and dust IP Classification of the product ..... :	IP00	—
12.1.2	Electric Strength Test, 13.2 after tests according to IEC 60529		N/A
	Entered water does not impair compliance with this standard		N/A
	No reduction of creepage distances and clearances below values of Cl. 20		N/A
12.1.6	Sealing means aged in heating cabinet at temperature (°C): (70 ± 2) °C for duration (h): 10 days (240 h)		-
12.1.6.2	Parts then left at room temperature, duration (h): > 16 h ..... :	No such parts.	N/A
12.2	Protection against humid conditions		-
12.2.6	Detachable parts: removed and tested with main part, if necessary		N/A
12.2.7	2 days (48 h) Humidity Test for IPx0 controls	IP00; 2days; 48 h	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)		-
	- in-line, free-standing and independently mounted controls according to Insulation Resistance (13.1)	No in-line, free-standing and independently mounted controls.	N/A
	- Electric Strength (13.2)		N/A
	- integrated and incorporated controls according to Electric Strength (13.2)		P
12.3	Leakage current test for in-line cord and free -standing controls		-
12.3.1	Supply voltage; 1.06 Vr (V) ..... :	No in-line cord and free -standing controls.	—
	Max. rated current (A) ..... :		—
	Max. declared ambient temperature, °C ..... :		—
12.3.2	Leakage current measured between live and accessible parts		N/A
12.3.3	Measuring circuits used: figure number ..... :		—
12.3.4	During measurement all control circuits closed except controls tested to Figs. 26, 29 and 30 checked with switch S1 in the open and closed position		N/A
12.3.5	Impedance of measuring circuits (Ω) ..... :		—
	Time constant (μs) ..... :		—
12.3.6	Error and accuracy of measuring circuit ≤5% ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
12.3.7	Max. leakage current		N/A

13	ELECTRIC STRENGTH AND INSULATION RESISTANCE		-
13.1	Insulation resistance of in-line cord, free-standing and independently mounted controls	No in-line cord, free-standing and independently mounted controls.	N/A
13.1.2	Reinforced or supplementary insulation measured to non-metal parts covered with metal foil		N/A
13.1.3	Test voltage applied (Vdc) ..... :	500 Vd.c.	—
13.1.4	Insulation resistance measured		-
	- basic insulation`≥ 2 MΩ ..... :		P
	- supplementary insulation ≥ 5 MΩ..... :		N/A
	- reinforced insulation ≥ 7 MΩ ..... :		N/A
13.2	Electric Strength Test	(see appended table)	P
13.2.2	Insulating surfaces covered with metal foil		P
13.2.3	50 or 60 Hz test voltage applied for 1 min. ..... :	60 Hz; 1 min.	—
13.3	Leakage current of in-line cord and free-standing controls after the tests of 13.1 or 13.2		-
	Test voltage (V) ..... :	No in-line cord and free-standing controls.	—
13.3.3	Leakage current measured.		N/A

14	HEATING		-
14.1.2	Temperatures recorded during Heating Test did not exceed the values in Table 14.1	(see appended table)	P
14.2	Terminals fitted with external conductors of the intermediate cross-sectional area (mm²) ..... :		—
14.2.1	Attachment method M, Y or Z: cords as declared or supplied (mm²) ..... :		—
14.2.2	Terminals for flexible and fixed conductors: appropriate flexible cord (mm²) ..... :		—
14.2.3	Terminals not for external conductors: conductors of minimum cross-sectional area or as declared in 7.2 (mm²) ..... :		—
14.3	In-line cord controls tested on a dull, black painted plywood	No in-line cord controls.	N/A
14.3.1	Independently mounted controls tested as in normal use	No independently mounted controls.	N/A
14.4	Electrical conditions:		-
	- voltage (V): most unfavourable value between 0.94 and 1.06 times UR ..... :		—
	- voltage (V) if circuit not voltage sensitive: min. 10% of UR ..... :	>10% of UR	—

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Clause	Requirement – Test	Result – Remark	Verdict
	- current (A): most unfavourable value between 0.94 and 1.06 times I R ..... :	1,06 times IR	—
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		N/A
14.4.3	Contacts initially closed at rated current and rated voltage		P
14.4.3.1	Temperature sensing controls:		-
	- temperature of sensing element is raised or lowered (5 ± 1) °C from operating temperature such that contacts are then in closed position	No temperature sensing controls.	N/A
	- operating temperature (°C) ..... :		—
	- temperature for heating test (°C) ..... :		—
	If the whole control is declared as the sensing element: heating test conducted under conditions of 14.4.3.1 and 14.5.1		N/A
	If all contacts are open under 14.4.3.1 conditions parts are considered to have reached the higher of Tmax or temperature determined under 14.5.1 (°C) ..... :		N/A
14.4.3.2	For controls other than temperature sensing, sensing element maintained as near to the point of opening as practical		N/A
14.4.3.4	The most arduous operating sequence or segment selected for other automatic controls		P
14.5.1	Temperature of the switch head between Tmax and (Tmax + 5) °C, or Tmax and 1.05 times Tmax (whichever is greater) (°C) ..... :	65 °C(Tmax + 5 °C)	P
	Mounting surface of the switch head maintained between Ts max and (Ts max + 5) °C, or between Ts max and 1.05 times Ts max (whichever is greater) (°C) ..... :		N/A
14.5.2	In-line cord controls, independently mounted controls and parts of these controls accessible when control is mounted, tested at room temperature between 15 and 30 C (measured temperature corrected to a 25 °C reference value); measured temperature (°C) ..... :		N/A

15	MANUFACTURING DEVIATION AND DRIFT		-
15.1	Adequate consistency of declared operating value etc. required for parts of controls providing Type 2 actions	Type 1 action.	N/A
15.2	Measurement of deviation and drift		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
16	ENVIRONMENTAL STRESS		-
16.1	Control can withstand the level of stress likely to occur in transportation and storage		N/A
16.2	Environmental stress of temperature		N/A
	Entire control (not energized) maintained for 24h at a temperature of (-10 ± 2) °C or as declared .... :		—
	Entire control (not energized) maintained for 4h at a temperature of (60 ± 5) °C or as declared ..... :		—
	Control capable of being actuated at room temperature to provide disconnection as declared (without dismantling)		N/A

17	ENDURANCE		-
17.2	Electrical conditions for the tests		-
	Type of circuit	Substantially resistive load; 1,0	P
	Rated voltage(V) ; test voltage (V) ..... :	240 V; 276 V	—
	Rated current(A) ; test current(A) ..... :	25 A; 30,1 A	—
	Rated frequency(Hz)) ..... :	50/60 Hz	—
17.3	Thermal conditions for parts other than temperature sensing elements		-
	Accessible parts: tested at room temperature (°C) :		—
	Mounting surface temperature: Ts max (°C) ..... :		—
	Remainder of switch head, temperature: Tmax(°C) ..... :		—
	If Tmin is less than 0 °C; switch head maintained at Tmin (°C) ..... :		—
17.4	Manual and mechanical conditions for the tests		N/A
17.4.2	Slow speed test		N/A
	Accelerated speed test		N/A
17.4.4	Controls with limited movement of the actuating member		-
	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:		-
	- 3/4 of cycles clockwise (number of cycles) ..... :		—
	- 1/4 of cycles anti-clockwise (number of cycles)... :		—
	Controls with rotary actuation, designed for actuation in one direction only tested in designed direction		N/A
17.4.5	Additional lubrication not applied during tests		N/A
17.5	Dielectric Strength Test		P

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Clause	Requirement – Test	Result – Remark	Verdict
17.6	Ageing test for controls of 1M or 2M action		-
	- sensing element maintained at activating quantity as determined in 14	No type 1M or 2M action.	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		-
17.7.1	Electrical conditions: specified in 17.2	276 V	P
17.7.2	Thermal conditions: specified in 17.3	65 °C	P
17.7.3	Method and rate of operation		-
	Control Type 1 action		P
	Method of operation ..... :		—
	Rate of operation ..... :	1 cycle / 21 sec. (Max. 1 s ON / Min. 20 s OFF)	—
	Control Type 2 action:		-
	Method of operation ..... :		—
	Rate of operation ..... :		—
17.7.4	Type 2 sensing action: overshoot at each operation between values stated in 7.2	Type 1 action.	N/A
17.7.6	Number of automatic cycles: the smaller of 1/10 of number declared in 7.2, or 200; (number of cycles) .	200 cycles.	P
17.7.7	Actuating members placed in the most unfavourable position during test		N/A
17.8	Test of automatic action at accelerated rate		-
	Temperature required in 17.3 applied for the last 50% of each test		N/A
17.8.1	Electrical conditions: specified in 17.2	250 V	P
17.8.2	Thermal conditions: specified in 17.3	65 °C	P
17.8.3	Method and rate of operation: specified in 17.7.3	Type 1 action.	P
17.8.4	Number of automatic cycles:		-
	- number declared in 7.2 ..... :	100,000 cycles.	—
	- number of cycles 17.8 ..... :	99,800 cycles.	—
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		-
17.9.1	Number of automatic cycles: 25% remainder (17.8.4) ..... :	This clause is not applicable in the part 2.	—

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Clause	Requirement – Test	Result – Remark	Verdict
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	This clause is not applicable in the part 2.	N/A
17.10.1	Electrical conditions: specified in 17.2		N/A
17.10.2	Thermal conditions: specified in 17.3		N/A
17.10.3	Method of operation: specified in 17.4 for accelerated speed		N/A
	Number of cycles: the smaller of 1/10 of number declared or 100 (see 7.2) ..... :		—
	Sensing elements maintained at suitable values of activating quantity or prime movers positioned that actuation causes operation		N/A
17.11	Test of manual action at slow speed		-
17.11.1	Electrical conditions: specified in 17.2	This clause is not applicable in the part 2.	N/A
17.11.2	Thermal conditions: specified in 17.3		N/A
17.11.3	Method of operation: specified in 17.4 for slow speed		N/A
17.11.4	Number of cycles: 1/10 of declared number or 100 (see 7.2) ..... :		—
	Actuating causes operation		N/A
17.12	Test of manual action at high speed (applies only to actions which have more than one pole and where polarity reversal occurs during the action)		-
	- number of poles ..... :	This clause is not applicable in the part 2.	—
	- 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

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Clause	Requirement – Test	Result – Remark	Verdict
	Prime movers so positioned to ensure actuating causes appropriate operation		N/A
17.13	Test of manual action at accelerated speed		-
17.13.1	Electrical conditions: specified in 17.2	This clause is not applicable in the part 2.	N/A
17.13.2	Thermal conditions: specified in 17.3		N/A
17.13.3	Method of operation: specified in 17.4 for accelerated speed		N/A
17.13.4	Number of cycles: number declared in 7.2, item 26 less number made during tests of 17.10, 17.11 and 17.12; total number ..... :		—
17.14	Evaluation of compliance		-
	Actions function in the intended and declared manner:		-
	- automatically		P
	- manually		N/A
	The following requirements are still met:		-
	- Cl. 14, heating: terminals for external conductors: measured (°C) ..... :		P
	- Cl. 14, heating: other terminals: measured (°C) . :		N/A
	- Cl. 14, heating: current-carrying parts: measured (°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
	- manual actions: declared circuit disconnection can be obtained		N/A
	No evidence that any transient fault has occurred between live parts and:		-
	- earthed metal parts		N/A
	- accessible metal parts		N/A
	- actuating members		N/A

18	MECHANICAL STRENGTH		-
18.1.1	Control constructed to withstand mechanical stress		P

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Clause	Requirement – Test	Result – Remark	Verdict
18.1.2	Actuating members of class I and class II controls or for class I and class II equipment:		-
	- adequate mechanical strength, or	No such parts.	N/A
	- 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) to be tested by the equipment standard	Incorporated controls.	P
18.1.4	Tests of 18.2 to 18.8 carried out sequentially on one sample:		-
	- tested sample: type reference ..... :		—
	- tested sample: identification No. ..... :		—
18.1.5	Compliance (after the tests of Cl. 18):		-
	- no damage to impair compliance with this standard, in particular		N/A
	- Cl. 8, protection against electric shock		N/A
	- Cl. 13, electric strength and insulation resistance		N/A
	- Cl. 20, creepage distance and clearances		N/A
	- insulating linings, etc. have not worked loose		N/A
	- detachable parts: removal and replacing still possible		N/A
	- actuating to provide full- or micro-disconnection still possible		N/A
	- supplementary or reinforced insulation tested to clause 13		N/A
18.1.6	In USA and Canada, mechanical strength requirements for threaded entries.		N/A
18.2	Impact resistance		-
18.2.1 - 18.2.6	In-line cord controls, free-standing and independently mounted controls: test by means of impact test apparatus IEC 60068-2-75	No in-line cord controls, free-standing and independently mounted controls.	N/A
18.4	Alternate compliance - Impact resistance (see tab 18.4.1DV or 18.4.2DV)		-
	enclosure material		N/A
	with supporting frame (yes / no)		N/A
	max. with, max length,		N/A
	thickness required; measured:		N/A
18.5	Free standing controls		-
18.5.1	Additional tests of 18.5.2 and 18.5.3 required (test apparatus Fig. 4)	No free standing controls.	N/A
18.5.2	Input terminals: 2 m of flexible, lightest cord (used in 10.1.4); cord; cross-sectional area (mm²) ..... :		—
	Output terminals: 2 m of flexible, lightest cord (if intended); cord; cross-sectional area (mm²) ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
	Pull and fall test (3 times):		-
	- pull (N), increasing value, applied on the cord (Table 11.7.2) ..... :		—
	- sample falls onto the base, height 0.500 m (Fig. 4)		N/A
18.6	In-line cord controls		-
18.6.1	Additional test in a tumbling barrel required (Fig. 5)	No in-line cord controls.	N/A
18.6.2	Cords:		-
	- 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	Tumbling barrel :		-
	- mass of sample (g) ; number of falls ..... :		N/A
18.6.4	If mass > 200 g: sample tested to clause 18.5		N/A
18.6.6	Connection of flexible cord(s) after test		N/A
18.7	Pull-cord actuated controls		-
18.7.2	Control mounted as declared: forces applied to the pull-cord, each 1 min:		-
18.7.3	- rated current (A) ..... :	No pull-cord actuated controls.	—
	- force in normal direction (N) ..... :	50 / 100 N	—
	- force in most unfavorable direction (N) ..... :	25 / 50 N	—
18.7.4	No damage to the control after the tests, compliant to clauses 8, 13 and 20		N/A
18.8	Foot-actuated controls		-
18.8.2	Control subjected to a force (increased from 250 N to 750 N and maintained for 1 min) by steel pressure plate ..... :	No foot-actuated controls	—
18.8.3	Force applied three times to control (fitted with cords) placed in different, most unfavourable positions		N/A
18.8.4	No damage to the control after the tests, compliant to clauses 8, 13 and 20		N/A
18.9	Actuating member and actuating means		-
18.9.1	Controls supplied (or intended to be fitted) with actuating members, tests:		-
	- axial pull force (N) ..... :		—
	- axial push force of 30 N applied for (min) ..... :		—
18.9.2	Controls submitted without actuating member: pull and push of 30 N applied to the actuating means		N/A
18.9.3	During and after the tests, control showed no damaged nor movement of the actuating members.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
19	THREADED PARTS AND CONNECTIONS		-
19.1	Threaded parts to be moved during mounting or servicing		-
19.1.2	Threaded parts: easily replaceable if completely removed; excluded: constructions restricting complete removal	No such parts.	N/A
19.1.3	Thread:		-
	- metric ISO thread or thread of equivalent effectiveness		N/A
	- for other than ISO, BA, SI or Unified thread: torque values increased by 20%		N/A
19.1.4	Screw generating a thread:		-
	- thread forming (swaging) type screws		N/A
	- thread cutting type screw not used		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 are 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		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:		-
	- diameter < 3 mm: threaded part of metal		N/A
	- diameter ≥ 3 mm: non-metallic allowed, but not used for electrical connection		N/A
19.1.11	Threaded parts tightened and loosened:		-
	- 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 10.2.10); cross-sectional area (mm²) ..... :		—
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		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
19.2	Current-carrying connections		-
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
	- movement is limited		P
19.2.3	Contact pressure:		-
	- not transmitted through non-metallic material, or		P
	- sufficient resilience in the metallic part		N/A
	Non-metallic material: suitability considered with respect to stability of dimension within temperatures applicable to the control; max. temperature (°C) ..... :		—
19.2.4	Space threaded screws:		-
	- 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	No such parts.	N/A
19.2.5.1	Thread cutting screws used to provide earthing continuity: at least two screws used for each connection		N/A
19.2.6	Current-carrying connection whose parts rely on pressure for correct function: resistant to corrosion (not inferior to that of brass)		N/A
	If not plated, e.g. bimetallic blades: parts are clamped into contact with parts resistant to corrosion		N/A

20	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		-
	PCB: coating conforming requirement of IEC 60664-3:		N/A
	PCB: coating meets requirements of 20.3		N/A
	PCB: No creepage and clearance applies to conductor under coating (see Annex Q)		N/A
20.1	Clearances		-
20.1.1	Basic Insulation - Case A applies except as permitted in Cl. 20.1.7		P
20.1.2	Operational Insulation - Case A applies except as permitted in Cl. 20.1.7 or		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	No such parts.	N/A
20.1.3.2	Controls with terminals for external conductors: without conductors and with conductors of largest cross-sectional area (mm²) (10.1.4) ..... :		—
20.1.3.3	Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm²) (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		P
20.1.5	Standard test finger applied to apertures as specified in 8.1: distances between live parts and metal foil not reduced below required values		P
20.1.6	Force (standard test finger) to be applied in an endeavour to reduce distances:		-
20.1.6.1	- 2 N force applied by standard test finger to any point on bare live parts accessible before control is mounted..... :	No such parts.	—
	- 30 N force applied by standard test finger to accessible surfaces after control mounted..... :	No such parts.	—
20.1.7	For basic and operational insulation, smaller distances permitted but no less than values specified in Case B of table 20.2, provided that:		-
	- control meets the impulse test, Cl 20.1.12	Case B does not apply.	N/A
	- all parts are rigid and secure		N/A
	- no likelihood of the distance being reduced		N/A
	Impulse voltage applied across clearance of operational insulation		N/A
20.1.7.1	For micro-disconnection and interruption:		-
	- clearance distance not specified		P
	- other parts- not less than contact separation		N/A
20.1.7.2	Full disconnection - case A applies to parts separated by switching element incl. contacts		N/A
20.1.8	Clearances of supplementary insulation: not less than basic insulation, case A		N/A
20.1.9	Clearances of reinforced insulation: next higher step for rated impulse voltage used.		N/A
20.1.10	Clearances of operational and basic insulation in controls supplied from a double insulated transformer		N/A
	Clearances in controls supplied from a transformer without separate windings		N/A
20.1.11	ELV circuits derived from supply using protective impedance, clearance of operational insulation determined from table 20.1 and based on max. working voltage in the ELV circuit		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
20.1.12	Impulse voltage test, Cl 4.1.1.2.1 of IEC 60664-1 applied between live parts and metal (V) ..... :		N/A
20.1.13	If the secondary winding of a transformer is earthed, (or an earthed screen between windings) clearances on the sec. side: basic insulation > limits in Table 20.2 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		-
20.2.1	Creepage distances for basic insulation, per table 20.3 and based on material group and pollution degree:		-
	- measurements	(see appended table)	P
	- 2 N force applied by standard test finger to bare conductors ..... :	No such parts.	—
	- 30 N force applied to accessible surfaces applied by standard test finger ..... :	No such parts.	—
20.2.2	Creepage distance for operational insulation, per table 20.4 and based on material group and pollution degree		-
	- measurements	(see appended table)	P
	- 2 N force applied by standard test finger to bare conductors ..... :	No such parts.	—
	- 30 N force applied to accessible surfaces applied by standard test finger ..... :	No such parts.	—
20.2.3	Supplementary insulation: not less than basic		N/A
20.2.4	Reinforced insulation: double the value of basic		N/A
20.3	Solid Insulation		-
	Solid insulation is capable of durably withstanding electrical and mechanical stresses as well as possible thermal and environmental influences		N/A
20.3.2	For working voltages ≤ 300V, supplementary and reinforced insulation between metal parts		-
	- minimum 0.7mm thick; measured (mm) ..... :		N/A
20.3.2.1	Insulation is applied in thin sheet form, other than mica or similar scaly material		N/A
	- the supplementary insulation consists of at least two layers and each layer complies with Cl. 13.2 for supplementary insulation		N/A
	- the reinforced insulation consists of at least three layers and any two layers complies with Cl. 13.2 for reinforced insulation		N/A
20.3.2.2	The supplementary insulation or reinforced insulation is inaccessible and meets one of the following:		-
	- max. temperature measured per Cl. 27 and H.27 does not exceed permissible values in Table 14.1		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	- conditioned insulation complies with Cl. 13.2 at the oven and room temperatures		N/A

21	RESISTANCE TO HEAT, FIRE AND TRACKING		-
	For Canada and USA 1 see annex D		-
21.2	Integrated, incorporated and in-line cord controls		-
21.2.1	Accessible parts (control correctly mounted):		-
	- ball-pressure test 1 conducted at temperature (°C) ..... :	No such parts.	—
	diameter of the impression ≤ 2.0mm (mm) ..... :		N/A
	- horizontal burning test (G1.), or		N/A
	- glow-wire test (G2.) at 550 °C		N/A
21.2.2	Parts retaining current-carrying parts in position (other than electrical connections):		-
	- ball-pressure test 2 conducted at temperature (°C) ..... :	No such parts.	—
	diameter of the impression ≤ 2.0mm (mm) ..... :		N/A
	- horizontal burning test (G1.), or		N/A
	- glow-wire test (G2.) at 550 °C		N/A
21.2.3	Parts maintaining or retaining electrical connections in position: categories A, B, C or D according to Annex F		-
	Category A:		-
	- ball-pressure test 2 conducted at temperature (°C) ..... :		—
	diameter of the impression ≤ 2.0mm (mm) ..... :		N/A
	- horizontal burning test (G1.), or		N/A
	- glow-wire test (G2.) at 550 °C		N/A
	Category B:		-
	- ball-pressure test 2 conducted at temperature (°C) ..... :		—
	diameter of the impression ≤ 2.0mm (mm) ..... :		N/A
	- horizontal burning test (G1.), or		N/A
	- glow-wire test (G2.) at 550 °C		N/A
	Parts within 50 mm of parts supporting current-carrying parts: needle-flame test (G3.)		N/A
	Category C:		-
	- ball-pressure test 2 conducted at temperature (°C) ..... :		—
	diameter of the impression ≤ 2.0mm (mm) ..... :		N/A
	- glow-wire test (G2.) at 750 °C		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Category D:		-
	- ball-pressure test 2 conducted at temperature (°C) ..... :		—
	diameter of the impression ≤ 2.0mm (mm) ..... :	125 °C	P
	- glow-wire test (G2.) at 850 °C	850 °C	P
21.2.4	Other parts (except small parts unlikely to be ignited):		-
	- horizontal burning test (G1.), or	No such parts.	N/A
	- glow-wire test (G2.) at 550 °C		N/A
21.2.5	Ball-pressure test 1, test procedures (tests not to be made on parts of ceramic material)		-
	Preconditioning: 24 h, 15-35 °C, RH 45-75% ..... :		—
	Temperature during ball pressure, the higher of:		-
	- (20 ± 2) K (or (15 ± 2) K if control for appliances within IEC 355-1) in excess of the maximum temperature during test Cl. 14 (°C), or ..... :		—
	- 75 ± 2°C, or ..... :		—
	- as declared (°C) ..... :		—
	Ball (steel) diameter: 5 mm, force: 20 N, duration: 1 h		N/A
21.2.6	Ball-pressure test 2, test procedures (tests not to be made on parts of ceramic material)		-
	Preconditioning: 24 h, 15-35 °C, RH 45-75% ..... :	24 h; 25 °C; 60 %	—
	Temperature Tb during ball pressure:		N/A
	- Tb (°C): 100 °C if Tmax = 30-54 °C ..... :		—
	- Tb (°C): 125 °C if Tmax = 55-84 °C ..... :	125 °C	—
	- Tb (°C): 125 °C for controls to be incorporated in appliances EN 60 335-1 ..... :		—
	- Tb (°C): (Tmax + 40) °C if Tmax ≥ 85 °C ..... :		—
	- Tb (°C): 20 K in excess of the max. temperature during tests of Cl. 14 (°C), if higher ..... :		—
	- Compliance with Annex H		P
	Ball (steel) diameter: 5 mm, force: 20 N, duration: 1 h	5 mm; 20 N; 1 h; See table 21	P
21.2.7	Resistance to tracking:		-
	Test procedure see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 7.2, item 30:	PTI 175 V	P
	Creepage distance of non-metallic parts under evaluation.	See table 21	P
21.3	Independently-mounted controls		-
21.3.1	Preconditioning	No independently-mounted controls.	N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Controls without T rating:		-
	- circuit of switching part and driving mechanism not connected, detachable parts (covers) removed		N/A
	- temperature (°C): (80 ± 2) °C, 1 x 24 h ..... :		—
	Controls with T rating up to 85 °C:		-
	- 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:		-
	- switching circuit and driving mech. connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h ..... :		—
21.3.2	Insulating parts retaining live parts: requirements, tests and test results see 21.2.3, category B or D		N/A
21.3.3	Accessible non-metallic parts: requirements, tests and test results see 21.2.1		N/A
21.3.4	Other non-metallic parts: requirements, tests and test results see 21.2.4		N/A
21.3.5	Independently mounted controls: requirements, tests and test result see 21.2.7, resistance to tracking		N/A
21.4	Controls with mercury-tube switch, subjected to short-circuit test:		-
	- working voltage, ac/dc ..... :	No such parts.	—
	- maximum power rating (VA) ..... :		—
	- short-circuit current (A) ..... :		—
	- fuse rating (A) ..... :		—
	- no ignition of cotton placed around openings		N/A
	- no emission of flame or molten metal (except mercury from the enclosure housing the switch)		N/A
	- wiring not damaged except tube leads		N/A

22	RESISTANCE TO CORROSION		-
22.1.1	Ferrous parts protected against corrosion	No such parts.	N/A
22.1.2	Test not required on temperature sensing elements and other component parts adversely affected by protective treatment		N/A
22.1.4	Control or parts stored in a humidity cabinet for 14 days:		-
	- temperature (°C): (40 ± 2) °C ..... :		—
	- relative humidity (%): 93-97% ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
22.1.5	Control or parts dried in a heating cabinet: for 10 min:		-
	- Temperature (°C): (100 ± 5) °C ..... :		—
	After parts have been dried: no evidence of corrosion on surfaces.		N/A

23	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS - EMISSION		-
23.1	Free standing and independently mounted controls which cycle under normal operation evaluated:		-
	- to CISPR 14-1 with modifications and/or CISPR 22, class B or	Incorporated controls are not subjected to the tests of this clause.	N/A
	- to clauses 23.1.1 and 23.1.2		N/A
	- to show minimum time between contact operations during normal operation < 10 minutes		N/A
23.1.1	Electrical and thermal conditions for EMC test as specified in 17.2 and 17.3:		-
	- for sensing controls: rate of change is α_1 and β_1		N/A
	- for non-sensing controls: operated at the lowest contact operating speed.		N/A
	- inductive loads - pf 0.6; resistive loads - pf 1		N/A
23.1.2	Control operated for 5 cycles		N/A
	- duration of radio interference; < 20ms ..... :		N/A

24	COMPONENTS		-
24.1	Transformers intended to supply power to a safety extra-low voltage circuit (SELV):		-
	- complies with relevant requirements of IEC 61558-2-6	No transformers.	N/A
	Capacitors for radio interference suppression: comply with requirements of IEC 60384-14		N/A
	Fuses: comply with requirements of IEC 60127 or IEC 60269	No fuses.	N/A
24.1.1	Safety isolating transformer supplies external isolated limited secondary circuits.		N/A
	Output test conducted with the primary energized at upper limit of rated voltage		N/A
	Secondary output voltage (V), power (VA) and current (A)..... :	See table 24.1.1	N/A
24.2	Components other than those of 24.1: checked when carrying out the tests of this standard or/and		P
	complies with appropriate safety standard	See table 24	P
24.3	Annex U is not applicable to relays used as components in a control.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
25	NORMAL OPERATION		-
	Meets requirements per annex H ..... :	See annex H	P

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

27	ABNORMAL OPERATION		-
27.2	Burnout test (for controls incorporating electro-magnets)		-
27.2.1	Control mechanism blocked in position when control is de-energized:		-
	- energized at rated frequency and rated voltage (17.2.2, 17.2.3 and 17.2.3.2)	Controls are not incorporated electro-magnets.	N/A
	- duration: 7 h or until burnout ..... :		N/A
27.2.2	Compliance (burnout test):		-
	- 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)		-
	During blocked blocked output test: temperatures did not exceed indicated limits in Table 27.2.3.	No motors.	N/A
	Test not required on controls, if no protective device cycles and temperatures do not exceed limits of 14.1		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
27.3	Over-voltage and under-voltage test (for controls incorporating electro-magnets)	Controls are not incorporated electro-magnets.	N/A

28	GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION		-
	Meets requirement per annex H ..... :	See annex H	P

A	ANNEX A – INDELIBILITY OF MARKING	-
A.1	Classification of markings	-

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Clause	Requirement – Test	Result – Remark	Verdict
A.1.1	Markings which are not mandatory		P
A.1.2	Markings which are mandatory but not accessible to the final user		P
A.1.3	Markings which are mandatory and accessible to the final user		N/A
A.1.4	Permanence of marking test:		-
	- solvents: neutral liquid detergent		—
	- solvents: petroleum spirit		—
	- solvents: water		—
A2	Test of indelibility of markings classified in A1.2		-
A2.1	Drops of detergent standing on the marked surface: duration (h): 4 h ..... :	4 h	—
	Drops removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping	Warm water (40 °C)	—
A2.2	Allowed to dry completely at (25 ± 5) °C	25 °C	—
A2.3	Rubbed in the apparatus (Fig. 8) with dry lint, weight 250 g, duration (s): 15 s ..... :	15 s	P
A2.4	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 250 g, duration (s): 15 s ..... :	15 s	P
A2.6	Marking after these tests still legible		P
A3.	Test of indelibility of markings classified A1.3		N/A
A3.1	Rubbed in the apparatus (Fig. 8) with dry lint, weight 750 g, duration (s): 15 s ..... :		N/A
A3.2	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 750 g, duration (s): 15 s ..... :		N/A
A3.3	Drops of detergent standing on the marked surface: duration (h): 4 h ..... :		—
	Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping		—
A3.4	After sample was dried, marking rubbed (apparatus Fig. 8) with detergent soaked lint, weight 750 g, duration (s): 15 s ..... :		N/A
A3.5	Marking rubbed in apparatus with petroleum spirit soaked lint, weight 750 g, duration (s): 15 s ..... :		N/A
A3.7	Marking after these tests still legible		N/A

D	ANNEX D – HEAT, FIRE AND TRACKING		-
	Canada and USA national difference		N/A

G	ANNEX G – HEAT AND FIRE RESISTANCES TESTS		-
G1	Burning test: Performed in accordance with IEC 60707 with amendments.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
G2.	Glow-wire test: Performed in accordance with IEC 60695-2-1 with amendments.		P
G3.	Needle-flame test: Performed in accordance with IEC 60695-2-2 with amendments.		P
G4.	Proof tracking test: Performed in accordance with IEC 60112 with amendments.		P

H	ANNEX H – REQUIREMENTS FOR ELECTRONIC CIRCUITS		-
H.6	Classification, additions:		—
H.6.4.3.13	- electronic disconnection on operation (Type 1.Y - 2.Y)..... :		—
H.6.9.5	- electronic disconnection		—
H.6.18	Software class (A, B,C) ..... :	Software class A.	—
H.7	Information in addition to Table 7.2 provided:		-
	36 - replacement: limits of activating quantity for any sensing element over which micro-disconnection or electronic disconnection is secure; clause: 11.3.2, H2.4.6; method: X		P
	52 - the minimum parameters of any heat dissipator (e.g. heat sink) not provide 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 H27.1.3.1); 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 H27.1.3); clause: H27 ; method: X		N/A
	57 - the effect on controlled output(s) after electronic circuit component failure if relevant (item c) of H27.1.3); 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, H26.13; 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, H26.13; method: X		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	59 - any component on which reliance is placed for electronic disconnection which is disconnected as required by note 14 to Table 13.2; clause: 13.2, H27.1; method: X		N/A
	60 - category (surge immunity); clause: H26.8.2, H26.10.4; method: X		N/A
	66 - software sequence documentation; clause: H11.12.10; method: X	Software class A is not required.	N/A
	67 - program documentation; clause: H11.12.10, H11.12.13; method: X	Software class A is not required.	N/A
	68 - software fault analysis; clause: H11.12, H27.1.3.1; method: X	Software class A is not required.	N/A
	69 - software class(es) and structure; clause: H6.18, H11.12.2; method: D	Software class A.	P
	70 - analytical measures and fault/error control techniques employed; clause: H11.12.6, H11.12.7; method: X	Software class A is not required.	N/A
	71 - software fault/error detection time(s) for controls of software Classes B or C; clause: H2.17.10, H11.12.8; method: X	Software class A is not required.	N/A
	72 - control response(s) in case of detected fault/error; clause: H11.12.8.1; method: X	Software class A is not required.	N/A
	73 - Controls subjected to second fault analysis and declared condition		N/A
	74 - external load and emission control		N/A
H.8	Protection against electric shock		-
H.8.1.10	Accessible parts separated from the supply by protective impedance; identification of circuit ..... :	No such parts.	—
H.8.1.10.1	Maximum current between accessible parts and either pole of the supply:		-
	- 0.7 mA (peak value) a.c.; current (mA) ..... :		N/A
	- 2 mA d.c.; current (mA) ..... :		N/A
	- if frequency f > 1 kHz: current (mA): 0.7 x f (kHz) < 70 mA; f (kHz) ..... :		N/A
	Maximum capacitance:		-
	- peak value (V) ..... :		N/A
	- 42.4 V < V ≤ 450 V: capacitance C (μF): ≤ 0.1 μF ..... :		N/A
	- 450 V < V ≤15 kV: capacitance C (μF): C x V ≤ 45 μC; calculated Cmax (μF) ..... :		N/A
	- V > 15 kV: capacitance C (μF): C x V² ≤ 350 μJ; calculated Cmax (μF) ..... :		N/A
H.11	Constructional requirements		-
H.11.2.5	Protection against electric shock – protective impedance (chain):		N/A
	- consists of at least 2 impedances in series		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	- 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.27.1 note 13)		N/A
	- resistors comply with IEC 60065, cl. 14.1		N/A
	a), b) short-circuiting and open-circuiting each impedance in turn		N/A
	c) applying a fault condition to any other part which might influence the leakage current		N/A
	Requirements of H.8.1.10 still met: leakage current (mA) ..... :		N/A
H.11.4	Actions:		-
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:		-
	- connected to maximum load		—
	- supplied with rated voltage (V) ..... :		—
	- at temperature Tmax (°C) ..... :		—
H.11.4.16.2	Current through electronic disconnection not exceeding the lower of:		-
	- 5 mA (mA) ..... :		N/A
	- 10% of the rated current (mA) ..... :		N/A
H.11.12	Controls using software		-
H.11.12.1	Controls with software Class B or C: complies with clauses H11.12.2 to H11.12.13	H.11.12.1 to H.11.12.13 inclusive are not applicable to control functions classified as software class A.	N/A
H.11.12.2	Controls using software Class C: software structure ..... :		—
	Controls using software Class B: software structure ..... :		—
H.11.12.2.1	Other structure, equivalent safety level H.11.12.2. :		N/A
H.11.12.3	Redundant memory with comparison on two areas of the same component: storage in a different form		N/A
H.11.12.4	Software Class C using dual channel structures with comparison: additional fault/error detection		N/A
H.11.12.5	Software other than Class A: means for recognition and control of errors in transmission to external safety-related data paths		N/A
H.11.12.6	Software Class C: used combination of analytical measures, Table H.11.12.6		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
H.11.12.6.1	Software Class C, tests used during software development:		-
	- systematic tests (H.2.17.8) and inspection (H.2.17.5), or		N/A
	- walk-through (H.2.17.9), or		N/A
	- static analysis (H.17.7.2)		N/A
H.11.12.7	Controls with function other than software Class A: manufacturer provided within the control measures to address the fault/errors in safety-related segments and data indicated in Table H.11.12.7 and identified in Table 7.2, requirement 68		N/A
H.11.12.7.1	Other measures permitted, if they can be shown to satisfy the minimum fault/error requirements of the acceptable measures shown in Table H.11.2.7.1, example of measures to control fault/errors in a single chip microcomputer (8 bit)		N/A
H.11.12.8	Software fault/error detection:		-
	- occurs not later than declared time(s), Table 7.2, requirement 71		N/A
	- acceptability of declared time(s): evaluated during fault analysis		N/A
	values declared in H.7.2 req. 71 may be limited by the relevant Part 2		N/A
H.11.12.8.1	Detection of fault/error:		-
	- results in the response declared in Table 7.2, requirement 72		N/A
	- if Class C: independent means provided		N/A
H.11.12.9	Class C, dual channel structure, loss of dual channel capability: deemed to be an error		N/A
H.11.12.10	Software referenced:		-
	- to relevant parts of the operating sequence		N/A
	- to the associated hardware functions		N/A
H.11.12.11	Where labels used for memory locations: labels are unique		N/A
H.11.12.12	Software protected from users alteration of safety-related segments and data		N/A
H.11.12.13	Software and safety-related hardware under its control: initialized to and terminate at a declared state, Table 7.2, requirement 66		N/A
H.13	Electric strength and insulation resistance		-
H.13.2	Across electronic disconnection ..... :		N/A
H.17	Endurance		-
H.17.1	General requirements		-

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Clause	Requirement – Test	Result – Remark	Verdict
H.17.1.4	Electronic controls with Type 1 action: no endurance test (unless necessary for testing of associated components)		P
H.17.1.4.1	Electronic controls with Type 2 action: thermal cycling test (H.17.1.4.2) executed		N/A
H.17.1.4.2	Thermal cycling test: conditions forming the basis of the test:		-
	a) Duration (h) ..... :		—
	b) Electrical conditions:		—
	- loaded, according to manufacturer's declaration . :		—
	- voltage (V): 1.1 times Vr ..... :		—
	- for 30 min. of each 24 h period: voltage (V): 0.9 times Vr ..... :		—
	- during each 24 h period: duration of supply switched off (s); 30 s ..... :		—
	- change of voltage not synchronised with change of temperature		—
	c) Thermal conditions: temperature (ambient and/or mounting surface) varied between:		—
	- Tmax (Ts max) (°C) ..... :		—
	- Tmin (Ts 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:		-
	- 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 maximum temperature (h) ..... :		—
	- duration of cooling period (h) ..... :		—
	- duration of maintaining minimum temperature (h) ..... :		—
	- duration of 1 complete cycle (h) ..... :		—
	- total number of cycles executed ..... :		—
H.17.14	Evaluation of compliance: For types 1.Y and 2.Y controls, Clause H.11.4.16 met	No type 1.Y and 2.Y controls.	N/A

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Clause	Requirement – Test	Result – Remark	Verdict
H.18	Mechanical strength		-
H.18.1.5	controls providing electronic disconnection (Type 1.Y and 2.Y), requirements of H11.4.16 are met		N/A
H.20	Creepage distances, clearances and distances through insulation		-
H.20.1.9	Electronic controls		-
H.20.1.9.1	Spacing between live parts (supply) and accessible surfaces and parts	No such parts.	N/A
H.20.1.9.2	Spacing between live parts and SELV circuits		N/A
H.20.1.9.3	Across protective impedances: double or reinforced insulation		N/A
	Across each component: supplementary insulation		N/A
H.20.1.9.4	Providing operational insulation		N/A
H.21	Resistance to heat, fire and tracking		-
H.21.2.6	Ball-pressure test 2, addition:		-
	- temperature (°C) achieved during test H.27.1.3, if higher than given in the preceding paragraphs .... :		—
H.23	Electromagnetic compatibility (EMC) requirements – emission		-
H.23.1	Electronic controls do not emit excessive electric or electromagnetic disturbances	Incorporated controls are not subjected to the tests of this clause.	N/A
H.23.1.1	Low frequency emission, disturbances in supply systems: controls other than integrated or incorporated that directly control an external load except pilot duty: comply with IEC 61000-3-2 and IEC 61000-3-3.		N/A
H.23.1.2	Radio frequency emission: free-standing, independently mounted and in-line cord controls using software, oscillating circuits etc comply with CISPR 14-1 and/or CISPR 22, Class B		N/A
H.25	Normal operation		-
H.25.1	- output waveform sinusoidal, examined under all normal operating conditions, or		N/A
	- as declared, see 7.2, item 53		N/A
H.26	Electromagnetic compatibility (EMC) requirements - immunity		-
H.26.2	Controls with Type 1 or 2 action: tests levels as indicated in Table H.26.2.1	This clause must be considered in the end product.	N/A
H.26.2.1	Integrated and incorporated controls Type 1 action: tests H.26.8 and H.26.9, if declared in Table 7.2, requirement 58a		N/A
H.26.2.2	Integrated and incorporated controls Type 2 action:		-
	- tests H.26.5		N/A
	- any other tests of H.26. declared in Table 7.2, requirement 58a		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
H.26.3	Separate samples used for each test: multiple test on a single sample (option of the control manufacturer)		N/A
H.26.5	Voltage dips and voltage interruptions in the power supply network ..... :	(See Table H.26.5)	N/A
	Test values for voltage dips and interruptions applied to all the test levels		N/A
H.26.5.3	Test procedure according to IEC 61000-4-11		N/A
	The voltage dips and interruptions, at random phase with respect to the mains frequency, performed at least three times in the relevant operating modes with a waiting time of at least 10 s		N/A
H.26.5.4	Voltage variation test ..... :	(See Table H.26.5.4)	N/A
H.26.5.4.3	The control subjected to each of the specified voltage test cycles three times with 10 s intervals between each test cycle for the most representative modes of operation		N/A
H.26.6	Influence of voltage unbalance		-
H.26.6.1	Test applies only to three-phase equipment		N/A
H.26.6.4	Test carried out with an unbalanced factor of 2%, no dangerous influence on equipment; unbalance factor (%) ..... :		N/A
H.26.8	Surge immunity test conducted in accordance with IEC 61000-4-5		N/A
H.26.8.2	Severity levels:		-
	Installation class ..... :		—
	Power supply: coupling mode		-
	Line-to-line, test level (kV peak) ..... :		N/A
	Line-to-earth, test level (kV peak) ..... :		N/A
	Unbalanced operated circuits and lines: coupling mode		-
	Line-to-line, test level (kV peak) ..... :		N/A
	Line-to-earth, test level (kV peak) ..... :		N/A
	Balanced operated circuits and lines: coupling mode		N/A
	Line-to-line, test level (kV peak) ..... :		N/A
	Line-to-earth, test level (kV peak) ..... :		N/A
H.26.8.3	Test procedure: impulse intervals ≥ 60 s: Five pulses of each polarity (+,-):		-
	- between any external conductor and neutral		N/A
	- between external conductors/terminals (signal, data, control etc), if designed for cables > than 10 m		N/A
H.26.9	Fast transient burst test: conducted in accordance with IEC 61000-4-4		-
	Test level ..... :		—

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Clause	Requirement – Test	Result – Remark	Verdict
	Repetition frequency (kHz) ..... :		—
	Generator drive ..... :		—
	Minimum number of applications: 1 (+ , -) polarity; number of applications ..... :		—
	Operating conditions: see Part 2		N/A
	A.C. power supply (Table H.26.9.2) between:		N/A
	- reference ground plane and each power supply line.		N/A
	- reference ground plane to protective earth terminal		N/A
	- reference ground plane to all combinations of power supply lines and also earth line		N/A
	D.C. power supply: capacitive clamps		N/A
	Data lines: capacitive clamps		N/A
H.26.10	Ring wave test: (U.S. difference)		N/A
H.26.11	Electrostatic discharge test: conducted in accordance with IEC 61000-4-2, clause 5, severity level 3:		-
	- contact discharge to accessible metal parts ..... :		—
	- air discharge to accessible insulating parts ..... :		—
H.26.12	Radio-frequency electromagnetic field immunity		-
H.26.12.2.1	Test levels for conducted disturbances per table H.26.12.2.1 applied		N/A
H.26.12.2.2	Test executed in accordance with IEC 61000-4-6		-
	- sweep rate 1.5 x 10^3 decades/sec		—
	- step size ≤ 1% of f_o if frequency range swept incrementally		—
H.26.12.3	Immunity to radiated electromagnetic fields		-
H.26.12.3.1	Test level for radiated electromagnetic fields per table H.26.12.3.1 applied		N/A
H.26.12.3.2	Test executed in accordance with IEC 61000-4-3		-
	- each side of the control exposed		N/A
	- entire frequency range applied in both the horizontal and vertical antenna orientation		N/A
	- sweep rate 1.5 x 10^3 decades/sec		N/A
	- step size ≤ 1% of f_o if frequency range swept incrementally		N/A
H.26.13	Test of influences of supply frequency variations in accordance with IEC 61000-4-28		-
H.26.13.2	Test values of table H.26.13.2 applied		N/A
	- test level 2 applied		N/A
	- test level 3 applied		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
H.26.14	Power frequency magnetic field immunity test in accordance with IEC 61000-4-8		-
H.26.14.2	Test levels of table H.26.14.2 applied		N/A
	- test level 2 applied – 3 A/m		N/A
	- test level 3 applied – 10 A/m		N/A
H.26.15	Evaluation of compliance		-
H.26.15.1	After the tests of H.26.2 to H.26.12, the control meets applicable requirements of:		-
	- Cl. 8, protection against electric shock		N/A
	- Cl. 17.5, electric strength requirements after the endurance tests		N/A
	- Cl. 20, creepage and clearance distances		N/A
H.26.15.2	The control meets requirements of H.17.14, or		N/A
	- output(s) and functions as declared in table 7.2, items 58a and 58b		N/A
H.26.15.3	Different output and functions declared by manufacturer after testing at level 2 or 3		N/A
H.26.15.4	Compliance criteria given in part 2 and based on operating output conditions and functional specifications of the control under test:		-
	- normal performance with no loss of protective functions and control within declared limits.		N/A
	- Loss of protective function within declared limits		N/A
	- Loss of protective function with safety shut down		N/A
	- Loss of protective function with unsafe operation		N/A
H.27.1.1	Fault conditions specified in H.27.1.4 not applied if:		-
	- 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		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.27.1.2	Operating conditions:		-
	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 ..... :		—
	c) ambient temperature (°C): (20 ± 5) °C or other :		—

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Clause	Requirement – Test	Result – Remark	Verdict
	d) fuse (supply), rating (A) such that test result not influenced by operation of the fuse ..... :		—
	e) actuating member in the most unfavourable position ..... :		—
H.27.1.3	Requirements, evaluation of compliance:		-
	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 7.2, requirement 57		N/A
	d) control continuous to comply with requirements of Cl. 8 and Cl. 13		N/A
	e) no deterioration of parts that would result in failure to comply with requirements of Cl. 20		N/A
	f) no rupture of fuse use supply, or		N/A
	- rupture with operation of an internal protecting device		N/A
	Internal protecting device not required since sample, after replacement of the fuse in the supply, complied:		-
	- with a), b) and d) of H.27.1.3		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 7.2, requirement 56		N/A
H.27.1.4	Electronic circuit fault conditions per table H.27.1	See table H.27.1	N/A
H.27.1.5	Motor load, if failure or malfunction causes change in the supply waveform to the controlled motor:		-
	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) ..... :		—
	d) fuse rating (A) ..... :		—
	e) actuating member ..... :		—
	4) evaluation of compliance per H.27.1.3 a) to e)		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
H.27.4	Electronic disconnection: withstood abnormal overvoltage conditions		-
H.27.4.1	- control loaded as indicated in Cl. 17.2; rated voltage (V) ..... :	No type 1.Y and 2.Y controls.	—
	- control subjected to 1,15 x VR for 5 s during electronic disconnection; test voltage (V) ..... :		—
H.27.4.2	- control provides electronic disconnection as determined by the test of H.11.4.16.2		N/A

J	ANNEX J – REQUIREMENTS FOR CONTROLS USING THERMISTORS		-
J.4.3.5.4.	Type 1 controls using thermistors as temperature sensing devices where selfheating is negligible are not subjected to the tests for thermistors.	No thermistor.	N/A
J.6.4.3.3	According to features of automatic action provide the equivalent of micro-interruption		N/A
J.6.15.5	According to construction, addition: control using NTC or PTC thermistors		N/A
J.6.17	According to use of the thermistor, addition:		-
J.6.17.1	- thermistor control element		N/A
J.6.17.2	- self-controlled heater		N/A
J.6.17.3	- thermistor sensing element		N/A
J.7	Information, addition to Table 7.2		-
	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
J.12.2.1	Protection against humid conditions, addition: Type 2 controls using thermistors		-
	- resistance/temperature measurements performed before and after the test		N/A
	- resistance/temperature characteristics and drift within the declared limits		N/A
J.15.7	Manufacturing deviation and drift, addition: resistance/temperature characteristics determined, (indicated in J.12.2.1 and J.17.17) using the method declared (manufacturer) in Table 7.2, requirement 65		N/A
J.17	Endurance, addition: sequence of tests:		-
	a) Type 1 controls using thermistors:		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	- thermal runaway by increased voltage (PTC), J.17.8.5.		N/A
	- Overcurrent test (NTC), J17.18.6		N/A
	b) Type 2 controls using thermistors: 1) Resistance/Temperature measurements before and after each of the following		-
	- extended cycling, J.17.18.2		N/A
	- thermal conditioning, J.17.18.3		N/A
	- cold environmental electrical cycling, J.17.18.4		N/A
	- thermal runaway (PTC), J.17.18.5		N/A
	- overcurrent test (NTC), J.17.18.6		N/A
J.17.17.1	Compliance, after tests J17.18.1 to J17.18.4:		-
	- performance of the control not adversely affected		N/A
	- function as intended and declared		N/A
	Type 2 controls using thermistors, resistance/temperature characteristic(s):		-
	- determined as indicated in b) of J.17.17		N/A
	- as declared, Table 7.2, requirement 63		N/A
J.17.17.2	Compliance after tests J.17.18.5 and J.17.18.6		-
	- control complies with requirements of Cl. 8 and 13		N/A
	- no emission of flames or expulsion of particles		N/A
J.17.18	Test conditions: test conducted on 3 samples; identification numbers; number ..... :		—
J.17.18.1	Method of resistance/temperature measurement (Table 7.2, requirement 65): R/T curve established taking into consideration, self-heating, thermal dissipation and voltage effect		N/A
J.17.18.2	Extended cycling, thermistor subjected to:		-
	- number of cycles declared (manufacturer); Table 7.2, requirement 64; number of cycles ..... :		—
	- cycling over the portion of the resistance/ temperature curve used in the application		N/A
	Self-controlled heaters and thermistor control elements		-
	Cycled electrically under:		N/A
	- max. rated voltage (V) ..... :		—
	- max. load conditions ..... :		—
	Thermistor sensing elements		-
	- Cycled thermally		N/A
J.17.18.3.1	Unswitched mode, thermal conditioning:		-
	- without energization		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	- temperature just below the step-like change in resistance occurs, resistance/temperature declaration; Table 7.2, requirement 62; temperature (°C) ..... :		—
	- duration (h): 1000 h ..... :		—
J.17.18.3.2	Switched mode, thermal conditioning:		-
	- without energization		N/A
	- temperature: 30 K above temperature increment in which step-like change occurs; temperature (°C) ..... :		—
	- duration (h): 1000 h ..... :		—
J17.18.4	Cold environmental electrical cycling:		-
	- control in a chamber at 0 °C or Tmin (the lower); temperature (°C) ..... :		—
	- thermistor cycled at max. rated electrical conditions		N/A
	- over the significant portion of the resistance/ temperature curve; temperature (°C) ..... :		—
	- number of cycles: 1000 cycles ..... :		—
J.17.18.5	Thermal runaway by increased voltage:		-
	- thermistors energized with max. rated conditions (until thermally stabilized)		N/A
	- voltage increased (appropriate rate: 0.1 times every 2 min) until breakdown occurs or 2 x working voltage is reached; voltage (V) ..... :		—
J.17.18.6	Overcurrent test (NTC)		-
	- thermistor to be operated at max. rated conditions (A) (until thermally stabilized) ..... :		—
	- current increased (0.1 times every 4 min) until 1.5 times max. working current is reached; current (A) ..... :		—
J.24.2.1	Components, addition: thermistors tested under IEC 60738-1, IEC 60738-1-1 or IEC 60539		N/A

L	ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES	P

N	ANNEX N (NORMATIVE) – POLLUTION DEGREES	P

P	ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST		-
P.2	PCB base material complies with IEC 60249 and IEC 60326		N/A

IEC 60730-1			
Clause	Requirement – Test	Result – Remark	Verdict
P.3	Electric strength of coating		-
	- test conducted after conditioning - Clauses P.3.3 and P.3.4		N/A
	- based on operational insulation		N/A
	- test voltage per table 13.2 ..... :		—
P.3.2	Ageing test:		-
	- five samples subjected to 130° C ± 2° C ..... :		—
	- duration: 1000 hours		N/A
P.3.3	Humidity Conditioning:		-
	- performed on same samples used in Cl. P.3.2		N/A
	- conditioned in humidity chamber at a temperature of (35 ± 1)^{o} 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:		-
	- 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 aluminum foil was subjected to the electric strength test, Cl. P.3 between:		-
	- leads A, B, and C individually and common lead (figure P.1)		N/A
	- no evidence of flashover or breakdown		N/A

Q	ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST		-
Q.1	Printed wiring board conforming to requirements for type 1 coating (IEC 60664-3): complies with creepage requirements of Cl. 20, pollution degree 1		N/A
Q.2	Printed wiring board conforming to requirements for type 2 coating (IEC 60664-3): complies with requirements for solid insulation, Cl. 20.3		N/A
Q.3	Samples: production printed boards or standard test boards (figs. Q.1 and Q.2) used:		-
	- Thirteen (13) samples for type 1		N/A
	- Seventeen (17) samples for type 2		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
Q.4 + Q5	Compliance for type 1 or 2 coating: checked by tests of IEC 60664-3, Cl. 5 with test levels or conditions specified in Cl. Q.5		-

T	ANNEX T (NORMATIVE) - REQUIREMENTS FOR SELV AND PELV		-
T.2	Protection against electric shock by SELV or PELV		-
T.2.1	SELV Protection against electric shock is provided by the following measures		-
	– 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,		-
	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:		-
	– 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

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Clause	Requirement – Test	Result – Remark	Verdict
T.3	ELV, protective separation, simple separation, protective bonding as elements of SELV and PELV		N/A
T.3.1	Limitation of voltage provides that the voltage between simultaneously accessible parts does not exceed relevant ELV limits as specified in 2.1.5 and as specified in 8.1.1.		N/A
T.3.2	Protective separation between a SELV/PELV-circuit and other live circuits is achieved by means of:		N/A
	– basic insulation and supplementary insulation, each rated for the highest voltage present, i.e. double insulation, or		N/A
	– reinforced insulation rated for the highest voltage present, or		N/A
	– protective screening according to T.3.2.1 with the protective screen being separated from		N/A
	each adjacent circuit by basic insulation rated for the highest adjacent circuit voltage (see also T.2.1, last paragraph), or		N/A
	– a combination of these provisions.		N/A
	If conductors of different circuits are contained together in a multiconductor cable or in another grouping of conductors, they are insulated for the highest voltage present, so that double insulation or reinforced insulation is achieved.		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		-
	– through a safety isolating transformer, or		N/A
	– a converter with separate windings providing equivalent insulation and meeting following requirements:		N/A
	Control declared IPX7 was subjected to second fault analysis (item 73 of Table H.7.2) for the circuits and insulation between windings of the converter and 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 part being protected (e.g. a SELV-circuit or a PELV circuit).		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	The protective screen is 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 values 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 Clause 9 of this standard.		N/A
	For the installation of controls which consist of parts of the fixed electrical installation of a building, the requirements for protective bonding in IEC standards for installation of buildings apply.		N/A

U	ANNEX U - REQUIREMENTS FOR RELAYS WHEN USED AS CONTROLS IN IEC 60335 APPLIANCES		-
U.6	Classification	This item was not used in IEC 60335 appliances.	—
U.6.3	According to their purpose		—
U.6.6	According to method of connection		—
U.6.8	According to protection against electric shock		—
U.6.8.4	For a relay: insulation between coil and contact circuits:		—
U.6.8.5	For a relay: insulation between live parts and test function, manual action actuating member:		—
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 subclause:		N/A
U.14.4	Tests were conducted under the following conditions:		N/A
	UCoil × 0,9 + contacts loaded or ICoil × 0,9 + contacts loaded		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	UCoil × 1,1 + contacts loaded or ICoil × 1,1 + contacts loaded		N/A
	ICoil =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 available, relays were mounted to plain pwb material, conductors according to Tab 10.2.1 were 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 Clause 14, under the conditions stated by U.14.4, for terminals, current carrying parts, and supporting surfaces are met. (see table 14.1 Note 1)		N/A
U.17.16	Test for particular purpose controls		N/A
	Relays were endurance tested according to the following schedule:		-
	Ageing test of 17.6		N/A
	Over-voltage test of automatic action of 17.7		N/A
	Test of automatic action at accelerated rate of 17.8		N/A
	Test of automatic action at slow rate of 17.9		N/A
	Overcurrent test of manual action at accelerated speed of 7.10		N/A
	Test of manual action at slow speed of 7.11		N/A
	Test of manual action at high speed of 17.12		N/A
	Test of manual action at accelerated speed of 17.13 if applicable		N/A
U.20	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SOLID INSULATION		N/A
	Assessment was conducted with relay energised, de-energised, 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

8.3.2	TABLE: risk of electric shock test	Controls was not connected to the supply by means of a plug.	N/A
	Total (V_{TOTAL}) (V)		
	Average (V_{TOTAL}/10)		

trial #	voltage between pins (V_{RMS})	

10.1.9.1							N/A
terminal No.	applied torque	fixed wiring		flexible conductor		pull force	
	(Nm)	smallest (mm)	largest (mm)	smallest (mm)	largest (mm)	(N)	

10.2.1	TABLE: Connectable conductors	No such parts.	N/A

terminal No.	nominal current (A)	

10.2.4.3	TABLE: axial push and pull Test			P
tab identification	size (mm x mm)	axial push (N)	axial pull (N)	
-	6,3	80	70	-

11.7.1.2.1	TABLE: flexing test			No flexible cord.		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.	

11.7.2.9	TABLE: push test	No flexible cord.	N/A
cord identification	cross-sectional area (mm^2)		

11.7.2.11+11.7.2.12	TABLE: pull test	No flexible cord.	N/A
control type	pull (N)	No. of pulls applied	

12.3	TABLE: leakage current test for in-line cord and free -standing controls		No in-line cord and free -standing controls.	N/A
circuit identify-cation	position of switch S1	class of control	required leakage current (mA)	

13.2	TABLE: electric strength test				P
test location / circuit	type of insulation	type/model	working voltage (V)	test voltage (V)	breakdown / flashover
Between terminals and the enclosure (with metal foil)	Basic insulation	ECS125P	120	1330	No

13.3.3	TABLE: leakage current of in-line cord and free-standing controls		No in-line cord and free -standing controls.	N/A
circuit identifi-cation	position of switch S1	class of control	Max. leakage current (mA)	Measured (mA)
	Open			
	Closed			

14.6 + 14.7	TABLE: heating test		P
thermocouple locations	max. temperature measured, (^{o}C)	Limit (^{o}C)	
Current carrying parts(brass, terminal 2)	76,9	230	-
Enclosure(under)	75,5	For Cl. 21	
PCB near triac	92,5	110	
Triac body	85,1	-	
Current carrying parts(brass, terminal 1)	79,5	230	
Enclosure(center)	68,6	For Cl. 21	-
Ambient	65,3	-	-

15.2 a)	TABLE: manufacturing deviation		No type 2 action.		N/A
condition	sample Nos.	declared values			
		open	close	open	

15.2 b)	TABLE: manufacturing drift		No type 2 action.		N/A
condition	sample Nos.	measured values (deviation) from as - Received condition.			
		open	close	open	
After Environmental Stress test					
After Endurance test (T_{max})					
After Endurance test (T_{min})					

17.5.1	TABLE: dielectric strength		P
insulation or disconnection tested	test potential applied between the following circuits	test potential applied between the following circuits	breakdown / flashover
Basic insulation	Between terminals and the enclosure (with metal foil)	998 V	No

19.1.15	TABLE: threaded part torque test			P
threaded part identification	diameter of thread (mm)	column number (I, II, or III)	torque	

20	TABLE: creepage distance and clearance measurements		P
	requirements creepage distance and clearance met		P
	supply working voltage (V):	120 V	P
	installation category	II	P
	rated impulse voltage accord. to table 20.1(V):	1500 V	P
	requirements for case B (20.1.7, 20.1.12) met	Case B does not apply.	N/A

creepage distance Cd and clearance Cl across:	nominal Volt. (V)	pollution degree	required Cd (mm)	Cd (mm)	required Cl (mm)	Cl (mm)
operational insulation terminal	-	-	-	-	-	-
basic insulation ((for model ECS112P, ECS112PS, ECS125P, ECS125PS)	120	1	0,5	>0,5	0,5	>0,5
basic insulation (for model ECS125T, ECS125TS)	120	2	1,5	>1,5	0,5	>0,5
supplementary insulation	-	-	-	-	-	-
reinforced ins. power supply Prim. Sec	-	-	-	-	-	-
reinforced insulation terminal to cover	-	-	-	-	-	-
full disconnection	-	-	-	-	-	-
micro-disconnection	-	-	-	-	-	-
electronic disconnection	-	-	-	-	-	-

21	Resistance to heat fire and tracking						P

Specimen					**Ball pressure**			**Glow wire**		**Tracking test**	
Description			Material	Colour	Temp ϑ[°C]	Impr. ∅mm	OK ✓	Temp ϑ[°C]	OK ✓	Voltage U[V]	OK ✓
1	Enclosure	-	-	black	125	1,7	✓	850	✓	175	✓

24.1.1	TABLE: transformers supplying external SELV circuit	No transformers.	N/A

secondary winding tested	maximum output voltage (V)	maximum output current (A)	

24.2	TABLE: components		P

object/part No.	manufacturer/ trademark	type/model	technical data	standard	
Enclosure (Bottom) / (Top, terminal block) (for ECS125T, ECS125TS)	LG Chemical Ltd.	LUPOY GP-1006F(m)	V-0, min. 80 °C	EN 60730-1 EN 60730-2-10	UL Tested in appliance
Enclosure (Bottom) / (Top, terminal block) (for ECS125T, ECS125TS) (alt.)	LG Chemical Ltd.	LUMID GP-2151BF(#)	V-0, min. 110 °C	EN 60730-1 EN 60730-2-10	UL Tested in appliance
Printed Circuit Board	Doosan Corporation Electro-Materials BG	DS-7405	V-0, min. 110 °C	EN 60730-1 EN 60730-2-10	UL Tested in appliance
Epoxy	Chemtech Co., Ltd.	EF-120R(#)/ EF-120H(#)	V-0, 90 °C	EN 60730-1 EN 60730-2-10	UL Tested in appliance
Epoxy(alt.)	Green Star Co., Ltd.	SE-770/ MH-770	V-0, 90 °C	EN 60730-1 EN 60730-2-10	UL Tested in appliance
Epoxy(alt.)	Daejoo Electronic Materials Co., Ltd.	DC-5480BK/ DH-588	V-0, 90 °C	EN 60730-1 EN 60730-2-10	Tested in appliance
Resistor (R12, R13) ((for ECS125T)	Various	Metal oxide film type	390 Ω - 10 kΩ, 3 W	EN 60730-1 EN 60730-2-10	Tested in appliance
Resistor (R8, R9) (for ECS125T, ECS125TS)	Various	Metal oxide film type	1 kΩ - 7 kΩ, 3 W	EN 60730-1 EN 60730-2-10	Tested in appliance
Resistor (R8, R9) (for ECS112P, ECS112PS, ECS125P, ECS125PS)	Various	Thick film chip type	5 kΩ - 7 kΩ, 1 W	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS112P, ECS112PS)	STMicroelectronics N V	T1235-600G	600 V, 12 A	EN 60730-1 EN 60730-2-10	Tested in appliance

Power switching semiconductor (Triac) (for ECS112P, ECS112PS) (alt.)	STMicroelectronics N V	T1235-800G	800 V, 12 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125P, ECS125PS)	STMicroelectronics N V	T2535-600G	600 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125P, ECS125PS) (alt.)	STMicroelectronics N V	T2535-800G	800 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125T, ECS125TS)	STMicroelectronics N V	BTB24-600BW	600 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125T, ECS125TS) (alt.)	STMicroelectronics N V	BTA24-600BW	600 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125T, ECS125TS) (alt.)	STMicroelectronics N V	BTB24-800BW	800 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance
Power switching semiconductor (Triac) (for ECS125T, ECS125TS) (alt.)	STMicroelectronics N V	BTA24-800BW	800 V, 25 A	EN 60730-1 EN 60730-2-10	Tested in appliance

27.2.3	TABLE: blocked output test		No motors.	N/A
thermocouple locations	max. temperature measured, (^{o}C)		Limit (^{o}C)	
	2nd hour	24th hour		

27.3	TABLE: over-voltage and under-voltage test				N/A
test	operating condition	rated voltage (V)	test voltage 85/110% (V)	temperature (^{o}C)	
Overvoltage transformer	T_{max}				
Undervoltage transformer	T_{max}				
Overvoltage valve	T_{min}				
Undervoltage valve	T_{min}				

H.26.5	TABLE: voltage dips and interruptions						N/A
comment codes trials			operating condition	voltage dip	voltage interruption	test voltage	rated voltage	
1	2	3		(%)	(%)	(V)	(V)	
				30				
				60				
				—	100			
				—	100			

H.26.5.4	TABLE: Voltage variation test						N/A
comment codes trials			operating condition	Rated voltage	Test voltage	Voltage variation	duration	
1	2	3		(V)	(V)	(%)	(s)	
						100		
						40		
						40		
						100		
						100		
					0	0		
					0	0		
						100		

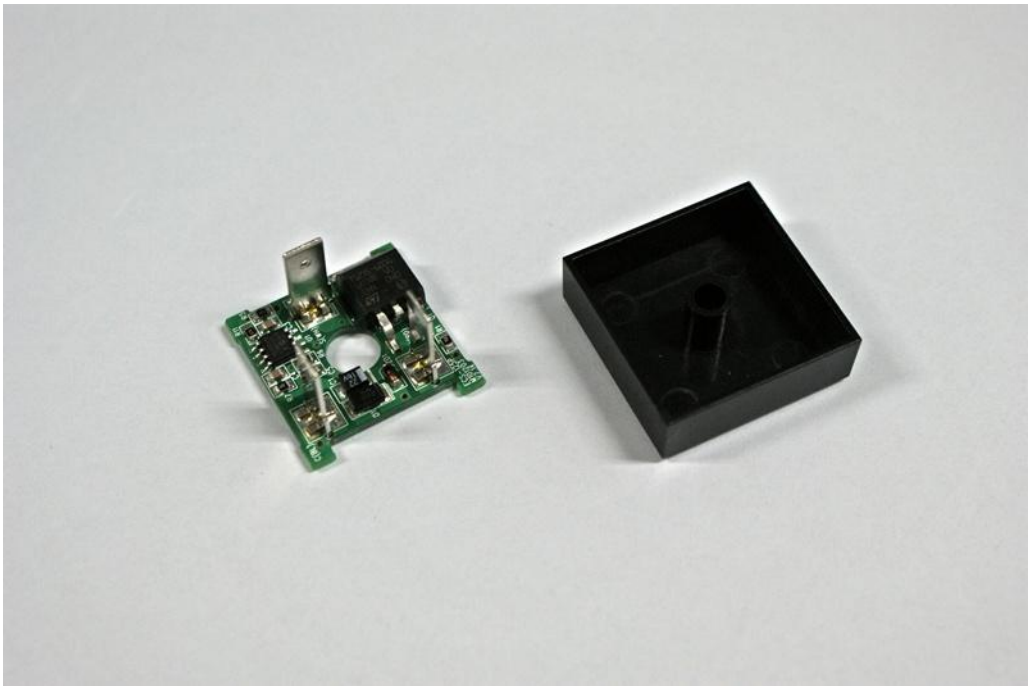
H27.1	TABLE: Electrical/electronic component fault modes											N/A
Component	short circuiting	open circuit	a) No flames	b) 1.5 x max temp. of Cl. 14	c) as declared (H57)	d) protect. against el. shock	d) electric strength, insulation	e) creepage and clearance	f) no rupture of ext. fuses or	f) complies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

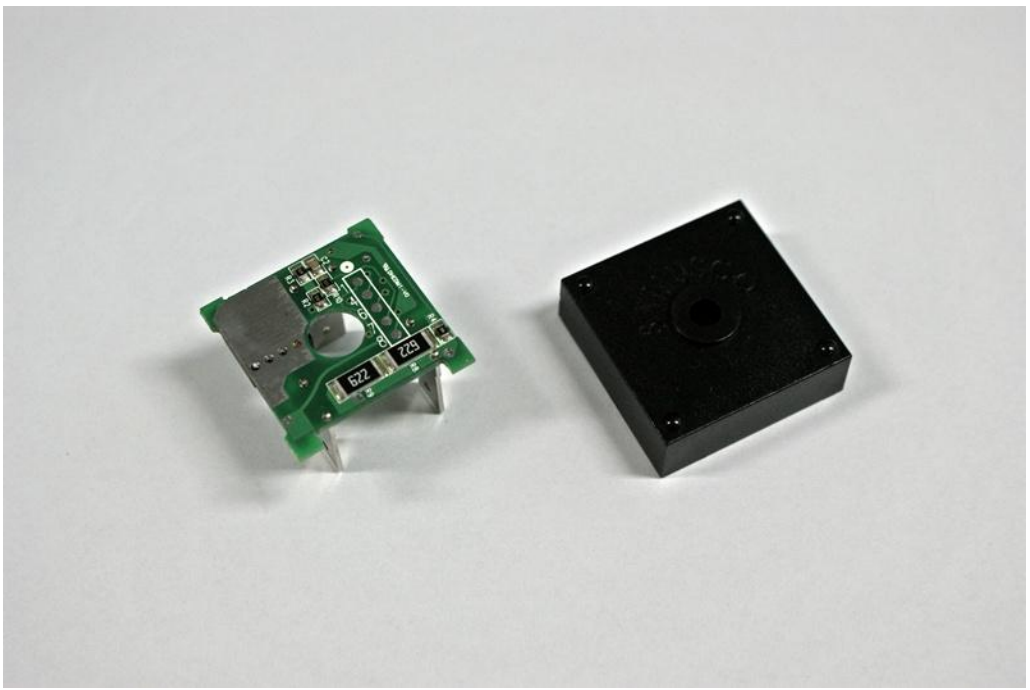
PHOTOS

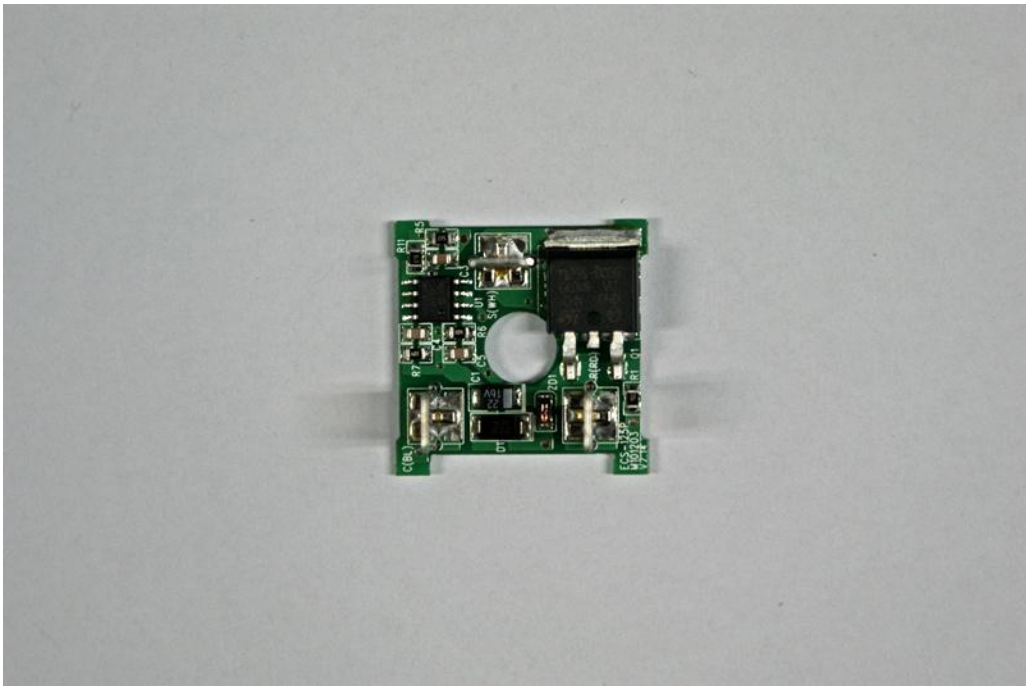
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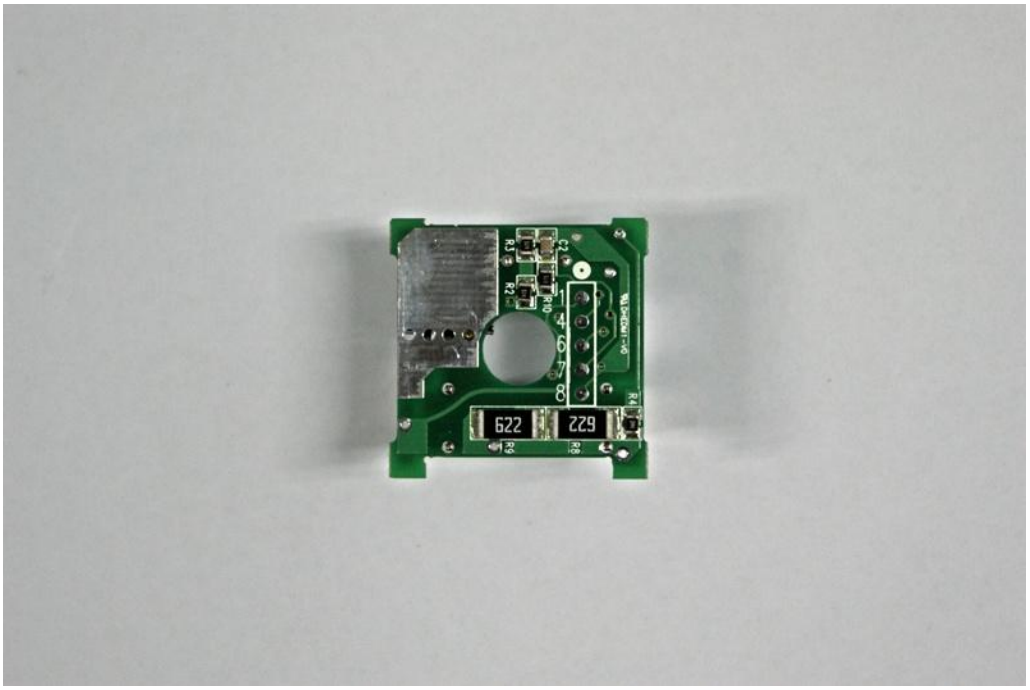












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Model No.:ECS112P





Model No.:ECS112PS



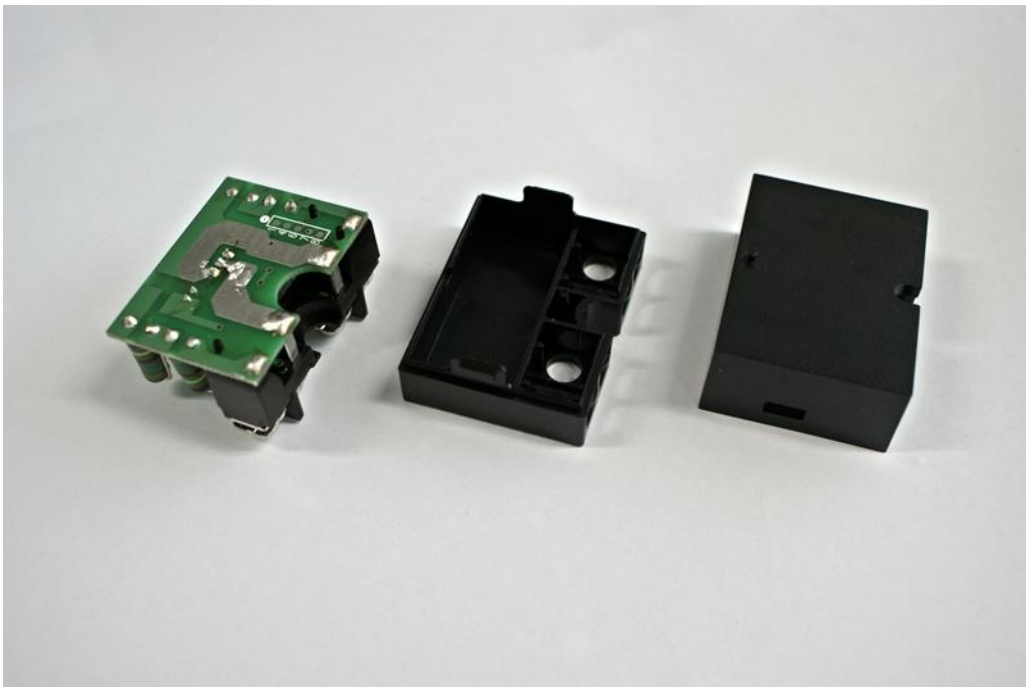


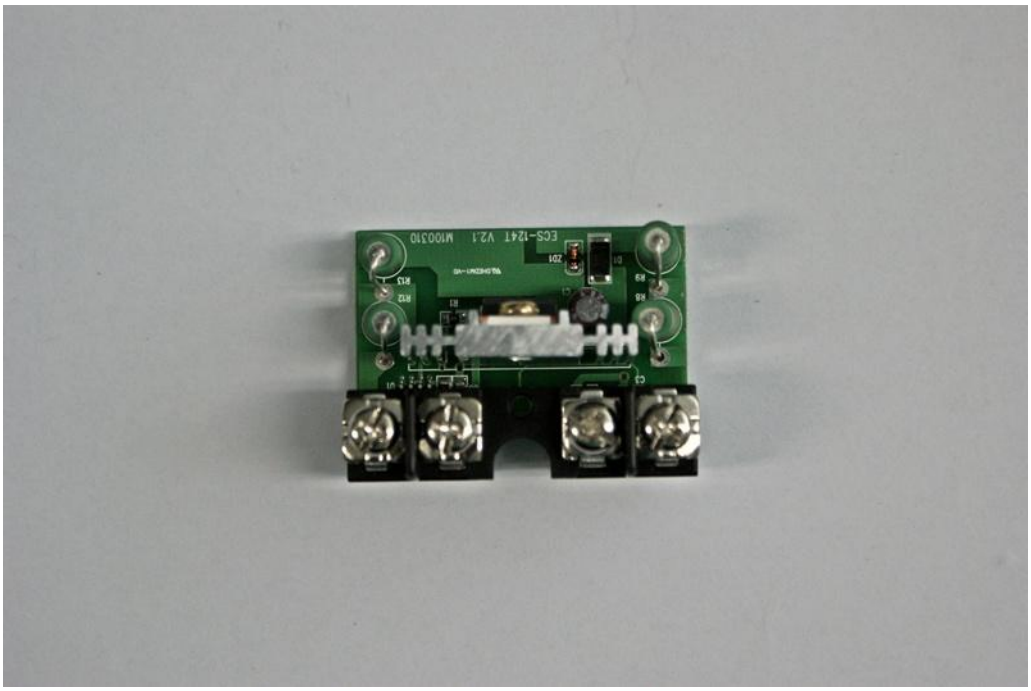
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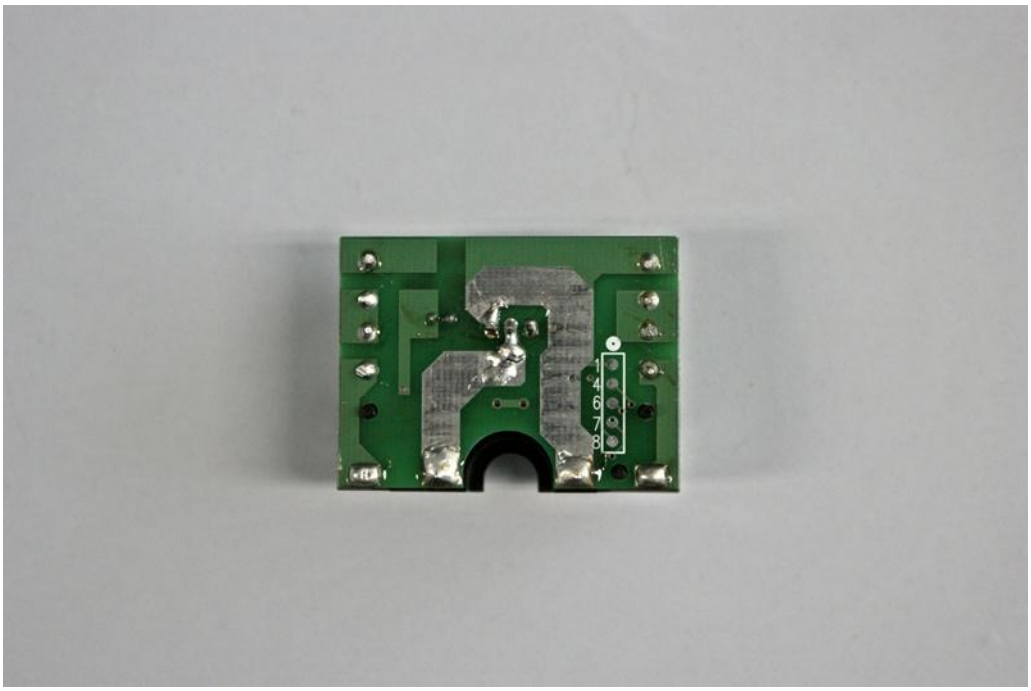





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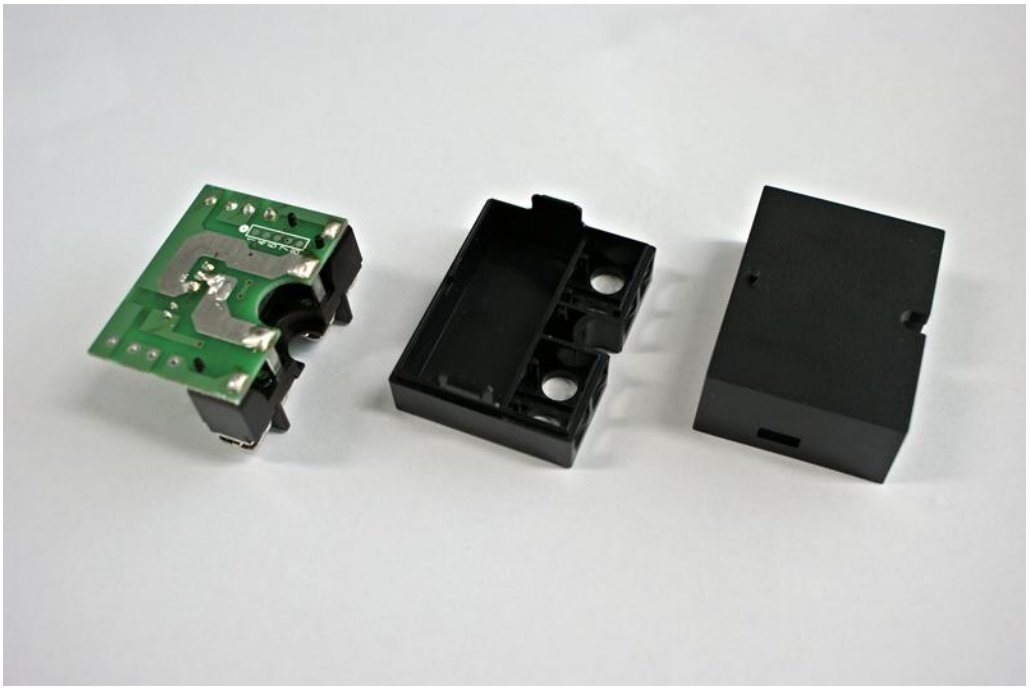


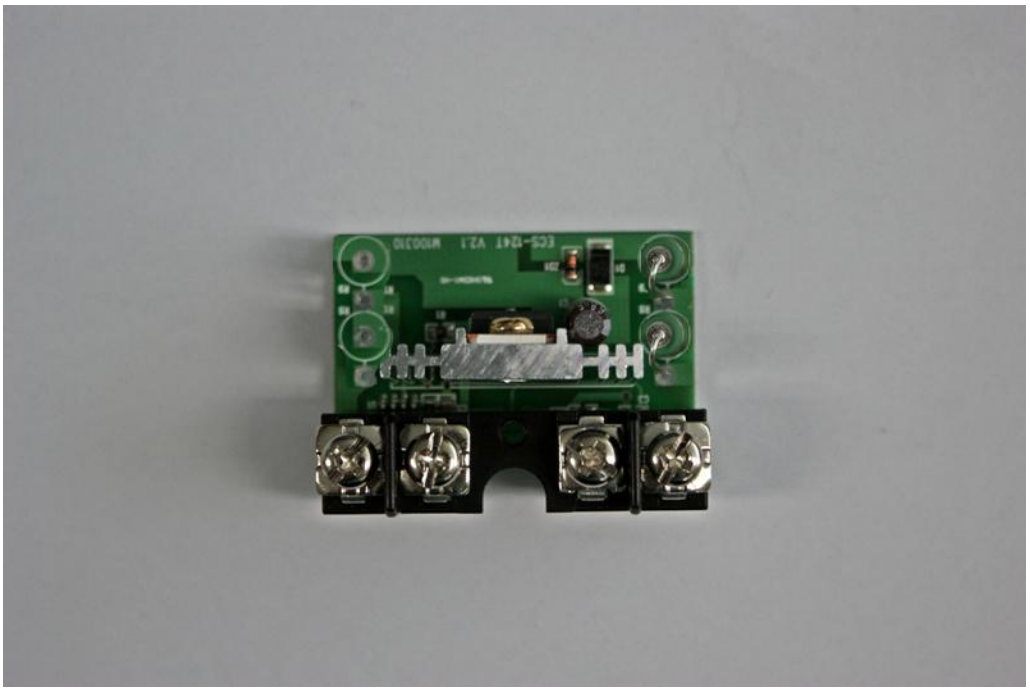
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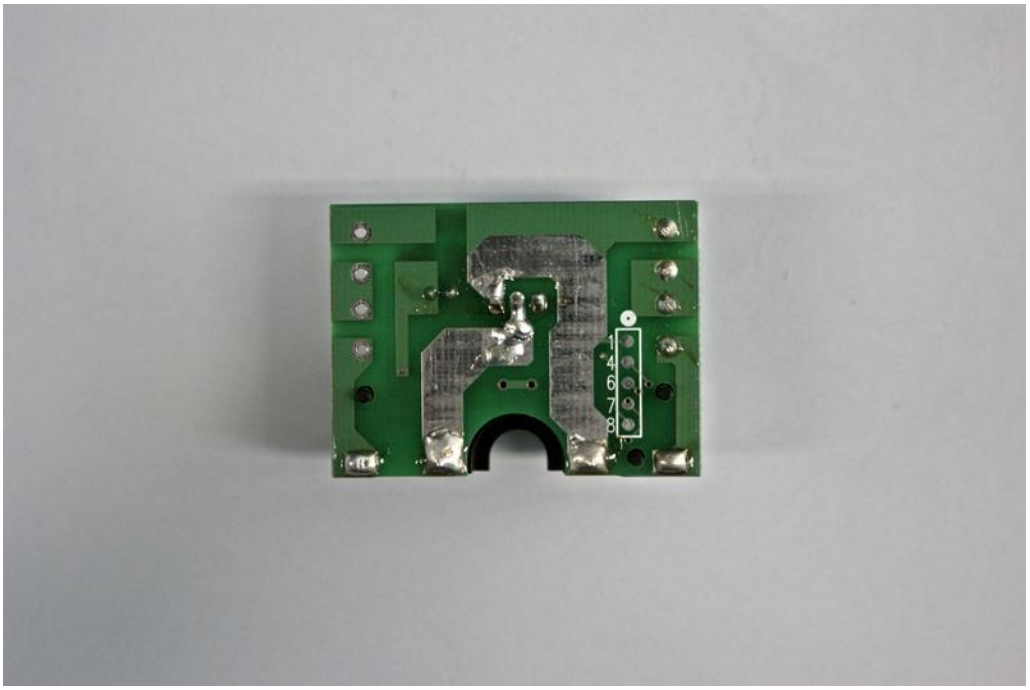





CS125TS







- The end of test report -