






Test Report issued under the responsibility of: Intertek Testing Services NA, Inc.

TEST REPORT IEC 60730-1 Automatic electrical controls for household and similar use	
Report Number.....	103720457DAL-002
Date of issue	24-May-2019
Total number of pages	85
Name of Testing Laboratory preparing the Report	Intertek Testing Services NA, Inc.
Applicant's name	Crestron Electronics Inc
Address	15 Volvo Dr. Rockleigh, NJ 07647 USA
Test specification:	
Standard	IEC 60730-1:2013, AMD1:2015
Test procedure.....	CB Scheme
Non-standard test method.....	N/A
Test Report Form No.....	IEC60730_11
Test Report Form(s) Originator....	UL(US)
Master TRF	2017-08-25
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Test item description..... :	LED Dimmer	
Trade Mark..... :		
Manufacturer	Crestron Electronics Inc	
Model/Type reference	M201903002	
Ratings	Supply rating (NET port): 24Vdc, 2W Signal rating (IN1): 12-24Vdc, 60-100W Signal rating (IN2): 12-24Vdc, 60-100W	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address..... :	Intertek Testing Services NA, Inc. 1809 10 th Street Suite #400 Plano, TX 75074 – USA	
Tested by (name, function, signature)..... :	Gabriel Zozaya / Priyank Darji	
Approved by (name, function, signature).... :	Sudesh Kamble	
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature).... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address..... :		
Tested by (name + signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):**Photos (Page 83-85)****Summary of testing:****Tests performed (name of test and test clause):**

Test	Clause
Secureness of terminals	10.1.5
Clamping reliability of terminals	10.1.9
Protection against humid conditions	12.2
Insulation Resistance Test	13.1
Electric Strength Test	13.2
Heating Test	14
Environmental stress of temperature	16.2
Threaded Parts	19.1.15
Indelibility of markings	A.2
Electronic controls – assessment against internal faults (Abnormal Operation)	H.27

Testing location:

Intertek Testing Services NA, Inc.
 1809 10th Street
 Suite #400
 Plano, TX 75074 – USA

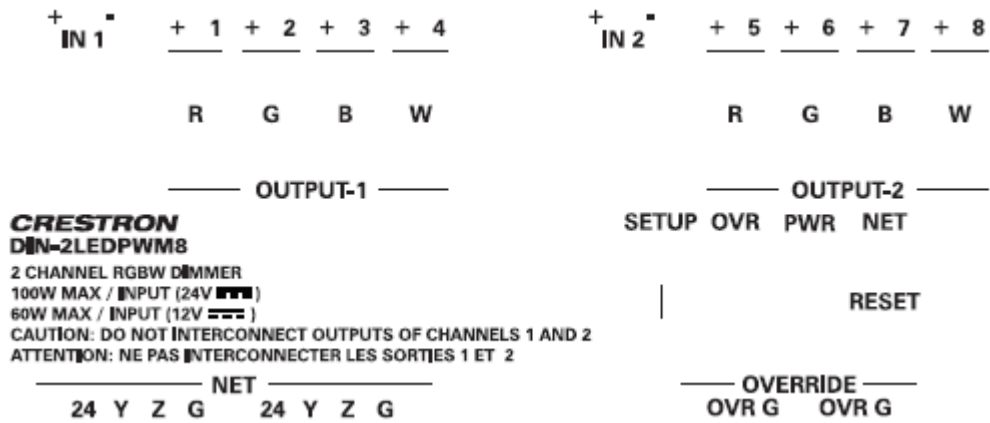
Summary of compliance with National Differences (List of countries addressed):

N/A – No national deviations Published

 The product fulfils the requirements of IEC 60730-1:2013, AMD1:2015

Copy of marking plate:

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



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Clause	Requirement + Test	Result - Remark	Verdict

TEST ITEM PARTICULARS:	
Supply Connection..... :	<input type="checkbox"/> AC <input type="checkbox"/> DC Mains <input checked="" type="checkbox"/> External Circuit - not Mains connected
Supply Connection – Type :	<input checked="" type="checkbox"/> permanent connection <input checked="" type="checkbox"/> mating connector <input type="checkbox"/> other: _____
Over voltage category (OVC) :	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: _____
Class of equipment :	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III
Manufacturer's specified maximum operating ambient:	40°C
IP protection class :	<input type="checkbox"/> IPX0 <input checked="" type="checkbox"/> IP20
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 :	17-Jan-2019
Date (s) of performance of tests..... :	23-Jan-2019 to 27-Mar-2019
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>This report makes reference to EMC Report and Software Report. When applicable to the evaluated control, the official IEC60730_1I (SOF) and IEC60730_1I (EMC) shall be used.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60730-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	Alltouch Muhlemattstrasse 22, CH4104 Oberwil Switzerland

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Clause	Requirement + Test	Result - Remark	Verdict

General product information and other remarks:

The product covered by this report is a Type 1.Y operating control. The product is a two channel LED dimmer. Each channel can operate up to four LED lights. A Cresnet control port (NET) is provided for integration with a Crestron control system.

Independently Mounted Control for panel mounting and has provision for DIN rail mounting. The control is intended to be supplied from certified class 2 power sources.

The control is intended to provide dimming function for two sets of LED channels. Each set requires separate source of external class 2 power.

Conditions of use:

The products covered in this report is incomplete in construction features or limited in performance capabilities and are intended for use and evaluation in other products.

Consideration should be given to the following when the component is used in or with another Product:

1. The supply port (NET port) of the unit must be connected to a Crestron power supply model DIN-PWS60 only.

IEC 60730-1			
Clause	Requirement + Test	Result - Remark	Verdict
3	GENERAL REQUIREMENTS		P
	Controls are so designed and constructed that in normal use, they function so as not to cause injury to persons or damage to surrounding property, even in the event of such carelessness as may occur in normal use		P
5	RATINGS		P
5.1	Maximum rated voltage (V)	24Vdc	P
6	CLASSIFICATION		P
6.1	Nature of supply	d.c. only	—
6.2	Type of load and power factor.....	Circuit for a substantially resistive load with a power factor not less than 0,95. Ratings: Supply: 24Vdc, 2W Signal 1: 12-24Vdc, 60-100W Signal 2: 12-24Vdc, 60-100W	—
6.3	Purpose	Operating Control	—
6.4	Features of automatic action, Type 1 or Type 2 ...	Type 1	—
6.5	Degree of protection provided by enclosure per IEC 60529 and control pollution situation	IP20	—
6.6	Method of connection.....	Terminals for fixed wiring	—
6.7	Ambient temperature limits of the switch ahead: $T_{min}(^{\circ}C)$; $T_{max}(^{\circ}C)$	0°C to 40°C	—
6.8	Protection against electric shock	Class III control	—
6.9	Circuit disconnection or interruption	Electronic disconnection	—
6.10	Number of cycles of actuation (M) of each manual action.....	30 cycles	—
6.11	Number of cycles of actuation (A) of each automatic action.....	300,000 cycles	—
6.12	Temperature limits of the mounting surface of the control (°C or K).....	No such limits	—
6.13	Value of proof tracking index (PTI) for the insulation material used	175 and up	—
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	—
6.15	Construction.....	Independently mounted control	—

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Clause	Requirement + Test	Result - Remark	Verdict
6.16	Ageing requirements (type Y) of end-product equipment	Independently mounted control. Not intended for mounting in end-product equipment.	—
6.17	Use of thermistor (Annex J)	No thermistor	—
6.18	Classes of control functions (Annex H)	Class A	—

7	INFORMATION		P
7.2.1	Information required for controls and the appropriate method for providing this information is as indicated in Table 1		P
	1 – Manufacturer's name or trademark (Method C)	Crestron, Method C	P
	2 – Unique type reference (Method C)	M201903002, Method C	P
	3 – Rated voltage or rated voltage range in volts (Method C)	12-24Vdc, Method C	P
	4 – Nature of supply (Method C)	d.c., Method C	P
	5 – Frequency, if other than for range 50 Hz to 60 Hz inclusive (Method C)		N/A
	6 – Purpose of control (Method D or E)	Operating control, Method D	P
	6a – Construction of control (Method X)	Independently mounted control, Method X	P
	7 – The type of load controlled by each circuit (Method C)	Circuit for a substantially resistive load with a power factor not less than 0,95. Ratings: Supply: 24Vdc, 2W Signal 1: 12-24Vdc, 60-100W Signal 2: 12-24Vdc, 60-100W Method C	P
	15 – Degree of protection by enclosure: (Method C)	IP20, Method X	P
	17 – Terminals for external conductors (Method C):	Marked on unit, Method C	P
	18 – Terminals for external conductors which accept a wider range of conductor sizes, (Method D or E)	Such terminals and conductor sizes are declared in the user manual	P
	19 – Method of connection and disconnection for screwless terminals (Method D)	Screw terminal block provided	N/A
	20 – Details of any special conductors which are intended to be connected to terminals for internal conductors (Method D)	No such internal conductor connection	N/A
	21 – Maximum temperature of terminals for internal conductors, if higher than 85°C (Method X)	No such internal conductor connection	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	22 – Temperature limits of the switch head, if T_{min} lower than 0°C, or T_{max} other than 55°C (Method C):	0-40°C	P
	23 – Temperature limits of mounting surfaces (T_s) (Method C).....:	Not more than 20K above T_{max}	N/A
	24 – Classification of control according to protection against electric shock (Method X).....:	Class III, Method X	P
	25 – For Class II controls, the symbol for Class II construction (Method C).....:	Class III	N/A
	26 – Number of cycles of actuation (M) for each manual action (Method X).....:	30 cycles	P
	27 – Number of automatic cycles (A) for each automatic action (Method X).....:	300,000 cycles	P
	28 – Ageing period (Y) for controls with Type 1M or 2M action (Method X).....:	Not Type x.M, Type 1 control operates during heating test	N/A
	29 – Type of disconnection or interruption provided by each circuit (Method X).....:	Electronic Disconnection, Method X	P
	30 – PTI of materials used for insulation (Method X).....:	175 and up	P
	31 – Method of mounting controls (Method D).....:	Independently Mounted Control for DIN-rail mounting	P
	31a – Method of providing earthing of control (Method D).....:	Class III control, no earthing	P
	32 – Method of attachment for non-detachable cords (Method D or E).....:	No cords	P
	33 – Intended transportation condition of control (Method X).....:	Not declared for anticipated environmental stress of temperature. Tested according to 16.2 of this standard under this project.	N/A
	34 – Details of any limitation of operating time (Method D or E).....:	No declared limits	N/A
	35 – Period of electric stress across insulating parts (Method X).....:	Long, Method X	P
	36 – Limits of activating quantity for any sensing element over which micro-disconnection is secure (Method X).....:	No sensing element	N/A
	37 – Minimum and/or maximum rates of change of activating quantity, or minimum and/or maximum cycling rates for a sensing control (Method X).....:	No sensing element	N/A
	38 – Values of overshoot of activating quantity for sensing controls (Method X).....:	No sensing element	N/A
	39 – Type 1 or Type 2 action (Method D or E).....:	Type 1, Method X	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	40 – Additional features of Type 1 or Type 2 actions (Method D or E)	Type 1.Y, Method X	N/A
	41 – Manufacturing deviation and condition of test appropriate to deviation (Method X)	None declared	N/A
	42 – Drift (Method X)	None declared	N/A
	43 – Reset characteristics for cut-out action (Method D or E)	Not a cut-out	N/A
	44 – Hand-held control or control intended for hand-held equipment (Method X).....	Not a hand-held control	N/A
	45 – Limitation to the number or distribution of flat push-on receptacles (Method D or E).....	No flat push-on receptacles	N/A
	46 – Manufacturing deviation and drift of its operating value, operating time or operating sequence is within the declared limits (Method D or E)	Operating sequence not relevant to safety of control	N/A
	47 – Extent of any sensing element (Method X)	No sensing element	N/A
	48 – Operating value(s) or operating time (Method D).....	Fully programmable and operating values and time is not critical to safety	N/A
	49 – Control pollution degree (Method D or E)	Pollution degree 2, Method D	P
	50 – Control intended to be delivered exclusively to the equipment manufacturer (Method X).....	intended to be delivered exclusively to the equipment manufacturer	P
	51 – Glow wire test temperatures (Method X).....		N/A
	52 to 60 See Annex H	See Annex H	P
	61 to 65 See Annex J	No thermistors	N/A
	66 to 74 See Annex H	See Annex H	P
	75 – Rated impulse voltage (Method D or E)	Not energized directly from the supply mains (Max voltage is 24Vdc)	N/A
	76 – Type of printed wiring board coating (Method X).....	None	N/A
	77 – Temperature for ball pressure test (Method X)	Materials of product that is inded to be fed from class 2 power sources.	N/A
	78 – Max declared torque on single bush mounting using thermoplastic material (Method D or E)	No bush mounting	N/A
	79 – Pollution situation in the micro-environment of the creepage or clearance if cleaner than that of the control (Method X)	Pollution Degree 2 considered	N/A
	80 – Rated impulse voltage for the creepage or clearance if different from that of the control (Method D or E)	Not energized directly from the supply mains	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	81 – Values designed for tolerances of distances for which the exclusion from fault mode “short” is claimed (Method X)	None claimed	N/A
	82 to 84 See Annex J	No thermistors	N/A
	85 – For Class III controls, the symbol for Class III construction (Method C)	EUT is marked with wording “Class 2 power supply”	N/A
	86 – For SELV or PELV circuits, the ELV limits realized (Method X)	24Vdc	P
	87 – Accessible voltage of SELV/PELV circuit, if different from 8.1.1, product standard referred to for the application of the control, in which standard(s) the accessible SELV/PELV level(s) is (are) (Method X)	24Vdc	N/A
	88 See Annex U	No relays	N/A
	89 – Emission tests and groups as declared according to CISPR 11 (Method X)	Not declared	N/A
	90 – Immunity tests for protective controls for use according to IEC 60335 appliances (Method X).....	Not a protective control	N/A
	91 to 94 See Annex H	See Annex H	P
	95 – Maximum declared short-circuit current (Method X)	Not declared	N/A
	96 – Overcurrent protective device external to the CONTROL (Method D or E)	None declared	N/A
	97 – For INCORPORATED CONTROLS or INTEGRATED CONTROLS, whether the overload test done at control level (Method X)	Independently mounted control	N/A
	98 – Maximum altitude at which the CONTROL can be used if greater than 2000m (Method X).....	Not intended for altitude greater than 2000m	N/A
7.2.2	Information which is indicated as being required by marking (C) or by documentation (D, E) is provided for the testing authority		P
7.2.3	For controls submitted in, on or with an equipment, the requirement for Documentation (D, E) replaced with Declaration (X)	Info noted	I
7.2.4	Marking for an INTEGRATED CONTROL within a more complex control is included in the marking of the complex control	Not an integrated control	N/A
7.2.5	Documentation (D, E) requirement is met by providing information by Marking (C)	Info noted	I
7.2.5.1	Declaration (X) requirement is met by providing information by Documentation (D, E) or Marking (C)		P
7.2.6	Information for INTEGRATED CONTROL provided by Declaration (X)	Not an integrated control	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Incorporated control provided with marking of manufacturer's name or trademark and unique type reference when other required marking is provided by Documentation (D, E)	Not an incorporated control	N/A
	Information for incorporated control intended for exclusive delivery to the equipment		N/A
7.2.7	Controls with lack of space are marked with manufacturer's name or trademark and the unique type reference, while other required marking included in Documentation (D, E)	Info noted	I
7.2.8	Additional marking or information permitted if does not give rise to misunderstanding	None	N/A
7.2.9	Appropriate IEC symbol(s) used per 7.2.9	V, A	P
7.3	Class II symbol		N/A
7.3.1	Used only for in-line cord, free-standing, and independently mounted controls	Class III control	N/A
7.3.2	Sides of the outer square are approximately twice the length of sides of the inner square		N/A
7.3.2.1	Largest dimension of the control (mm)		—
	The length of the side of outer square (mm)		—
7.3.2.2	Controls which include terminals for earthing continuity for functional purposes are not marked with the symbol for class II	Earthing not required.	N/A
7.4	Additional requirements for marking		P
7.4.1	Marking placed on the main body or on non-detachable parts		P
	Required marking is legible and durable	See Annex A	P
7.4.2	Terminals of controls intended for the connection of supply conductors are indicated by an arrow pointing towards the terminal	No such arrow pointer as the connection is to 24Vdc sources	N/A
7.4.3	Terminals for neutral external conductor are indicated by letter "N"	No neutral conductor connection	N/A
7.4.3.1	Earthing terminals for external earthing conductors or earthing continuity, and terminals for earthing for functional purposes are identified	No earthing	N/A
	– for protective earth by the earth symbol for protective earth, IEC 60417-5019 (2006-08)		N/A
	– for functional earth by the earth symbol for functional earth, IEC 60417-5017 (2011-07)		N/A
7.4.3.2	All other terminals are suitably identified		P

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Clause	Requirement + Test	Result - Remark	Verdict
7.4.4	Indication of the direction to increase or decrease response value for the controls intended to be set by the user or the equipment manufacturer is provided (ex. "+" and "-")	No response value settings. Only relevant push buttons provided.	N/A
	Controls intended to be set by the equipment manufacturer or the installer accompanied by documentation (D) indicating proper method for securing the setting		N/A
7.4.5	Replaceable parts destroyed during the normal operation marked to enable their identification from a Catalogue or similar document, even after they have operated	No replaceable parts	N/A
7.4.6	Controls intended to be connected only to SELV systems are marked with the graphic symbol IEC 60417-5180 (2003-02)	EUT is marked with wording "Class 2 power supply"	N/A
	This requirement does not apply where the means of connection to the supply is so shaped that it can only mate with a particularly designed SELV or PELV arrangement		N/A
	Controls designed as required for class III, but carry terminals for earthing continuity for functional purposes are not marked with the symbol for class III construction		I
7.4.7	Equipment carries a replaceable battery, and replacement by an incorrect type could result in an explosion	EUT doesn't carry battery	N/A
	- If the battery is intended to be replaced by the user, marking close to the battery or a statement in both the instructions for use and the service instructions are provided	EUT doesn't carry battery	N/A
	- If the battery is not intended to be replaced by the user, marking close to the battery or a statement in the service instructions are provided	EUT doesn't carry battery	N/A
7.4.8	The battery compartment of controls incorporating batteries that are intended to be replaced by the user are marked with the battery voltage and the polarity of the terminals	No battery compartments in EUT.	N/A
	If colours are used, the positive terminal is identified in red and the negative terminal in black		N/A
	Colour is not used as the only indication of polarity		N/A
7.4.9	The instructions for controls incorporating batteries intended to be replaced by the user include:		N/A
	- the type reference of the battery	EUT doesn't incorporate battery	N/A
	- the orientation of the battery with regard to polarity		N/A
	- the method of replacing batteries		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- warning against using incorrect type batteries		N/A
	- how to deal with leaking batteries		N/A
	The instructions for controls incorporating a battery that contains hazardous to the environment materials give details on how to remove the battery:		N/A
	- the battery must be removed from the control before it is scrapped	EUT doesn't incorporate battery	N/A
	- the control must be disconnected from the supply mains when removing the battery		N/A
	- the battery is to be disposed of safely		N/A
7.4.10	See Annex V – Information regarding charging of batteries provided	EUT doesn't incorporate battery	N/A

8	PROTECTION AGAINST ELECTRIC SHOCK		P
8.1.1	Adequate protection provided against accidental contact with live parts in all unfavourable positions of normal use, and after all accessible detachable parts (other than lamps behind the detachable cover) were removed		P
	Protection against accidental contact with live parts of the lamp provided to allow safe insertion and removal of the lamps	No lamp provided.	N/A
	SELV or PELV circuits supplied at a voltage not exceeding 24 V are considered non-hazardous..... :	Voltage doesn't exceed 24Vdc.	P
	If SELV- or PELV-circuits supplied at higher than 24 volts, or higher than declared according to requirement 87 of Table 1, are accessible, the current between the accessible part(s) and either pole of the supply source of the SELV/PELV circuits comply with H.8.1.10.1	Not higher than 24V	N/A
8.1.1.1	SELV/PELV circuits supplied at a different voltage value (other than 24V) considered non-hazardous :	Not higher than 24V	P
	- The control is used in an application governed by another product standard with different limit values; and,		N/A
	- The manufacturer declares the application, product standard governing the application and level of voltage of the application		N/A
8.1.2	Class II controls and controls for Class II equipment provided with protection against accidental contact with metal parts separated from hazardous live parts only by basic insulation	No such metal parts	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	None of these materials used for insulation	N/A
8.1.4	For controls connected to gas or water supply mains, any metal part conductively connected to pipes is separated from hazardous live parts by double insulation or reinforced insulation	Not connected to gas or water mains	N/A
8.1.5	For Class II controls and controls for Class II equipment intended for fixed installation, protection is not impaired by the installation of control		P
8.1.6	For integrated and incorporated controls, tests of 8.1.8 to 8.1.9.5 applied to accessible parts when control is mounted as intended with detachable parts removed	Independently mounted control	N/A
8.1.7	For in-line and free-standing controls, tests of 8.1.8 to 8.1.9.5 applied when control is fitted with flexible cord, with detachable parts removed and hinged covers which can be opened without a tool are opened; cross-sectional area of cord(mm ²)..... :	Independently mounted control	—
8.1.8	For independently mounted controls, the tests made when control mounted as in normal use, fitted with cable or with a conduit, with detachable parts removed and hinged covers which can be opened without a tool are opened; cross-sectional area of cable (mm ²)..... :	No hazardous voltages present. The maximum voltage is 24Vdc.	—
8.1.9	Tests using the standard test finger and test pin:		N/A
	- The standard test finger shown in Figure 2 applied without force in every possible position	No hazardous voltages present.	N/A
	- Apertures preventing the entry of the finger further tested by means of a straight unjointed test finger of the same dimensions applied with a force of 20 N		N/A
	If test finger entered, the finger shown in Figure 2 pushed through the aperture.		N/A
	If the unjointed test finger did not enter, the increased force of 30 N applied		N/A
	When the guard so displaced or the aperture so distorted that the test finger in Figure 2 can be inserted without force, the test with the latter finger repeated with electrical contact indicator		N/A
8.1.9.2	Openings in insulating material and unearthed metal tested for accessibility of live parts by applying the test pin without force in every position	No hazardous voltages present.	N/A
8.1.9.3	Hazardous live parts were not touched	No hazardous voltages present.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.9.4	For controls with double insulation construction, the metal parts were not accessible with the standard test finger, which are only separated from hazardous live parts by basic insulation	No metal parts	N/A
8.1.9.5	A part is regarded detachable if: - there is an instruction to remove a part during normal use or user maintenance; and, - there is no warning on the part that indicates "Disconnect from supply before removing":	Identified parts: None	N/A
8.1.11	Between Class III and main/earth circuits, insulation external to the safety isolating transformer complies with Class II insulation		N/A
8.1.12	Live parts are hazardous if they exceed the values specified in 8.1.1 and if are not separated from the source by protective impedance and are not a PEN conductor or a part of the equipotential bonding system.....:	No such protective impedance	N/A
8.1.13	Controls having battery compartments that can be opened without a tool or provided with user instructions indicating the battery may be replaced by the user, are provided with: - basic insulation between live parts and the inner surface of the battery compartment - if the control can be energized without the batteries, double or reinforced insulation is provided	No battery compartments	N/A
8.2	Actuating members and means		P
8.2.1	Actuating members are not live	No live actuating means	P
8.2.2	Live actuating means provided with fixed insulated actuating member		N/A
	Live actuating means not accessible when actuating member is removed		N/A
8.2.3	For controls other than Class III or for other than Class III equipment, actuating members and handles to be held in normal use are:		N/A
	- of insulating material, or	Class III equipment	N/A
	- covered by insulating material		N/A
	If of metal, accessible parts (likely to become live in when insulation fails) separated from their actuating means or fixings by supplementary insulation		N/A
	Controls for fixed wiring or for stationary equipment, previous requirement not applicable if parts:		N/A
	- reliably connected to an earthing terminal/contact, or		N/A
	- shielded from live parts by earthed metal		N/A
8.3	Capacitors		P

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

9	PROVISION FOR PROTECTIVE EARTHING		N/A
	No earthing necessary; Class II control		N/A

10	TERMINALS AND TERMINATIONS		
10.1	Terminals and terminations for external copper conductors		P
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	Not intended for cord Connection. Fixed wiring. Screw terminal blocks provided.	P
	Use of a special purpose tool not required		P
10.1.1.1	Terminals or terminations for cords using Y and Z attachment method comply with clause 10.2	No such terminals for non-detachable cords	N/A
	Need for special purpose tools		N/A
10.1.2	Screws and nuts which clamp external conductors:		P
	- metric ISO thread; size..... :	M3	—
	- ISO equivalent; size	5.5	—
	- do not serve to fix other components		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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	Not intended for cord Connection.	N/A
10.1.4	Terminals for fixed wiring and non-detachable cords using attachment methods X or M:		N/A
	- terminal No. or identification	Independently mounted control with mated connectors only	—
	- Current (A) carried by terminal	4A	—
	- Flexible cord or fixed wiring	Fixed wiring	—
	-conductor cross-sectional area - smallest (mm ²) :	0.2 mm ²	—
	-conductor cross-sectional area - largest (mm ²) .:	4 mm ² (solid) 2.5 mm ² (stranded)	—
10.1.4.1	Terminal designed for wider range of conductor size declared	See above	P
10.1.5	Terminals for fixed wiring and non-detachable cords using attachment methods X or M securely fixed	Terminals for fixed wiring only.	N/A
10.1.5.1	10 times fastening and loosening conductor of largest cross-section:		P
	- kind of wire used	Connector X1 and X2: 150V, 12A	—
	- cross-sectional area (mm ²)	Connector X1 and X2: 0.05 – 1.5mm ² (stranded)	—
	- applied torque value (Nm).....	0.5N-m Connector X1 and X2: 0.3N-m	—
	- terminals did not work loose		P
	- internal conductors not subjected to stress	No internal conductors	N/A
	- creepage and clearances distances not reduced below values required in Cl. 20		P
10.1.6	Terminals for fixed wiring and non-detachable cords using attachment methods X or M clamp conductors between metal surfaces	Fixed wiring. Screw terminal block provided	P
	Screwless terminals for current ≤ 2 A with non-metallic surface	Screw terminal	N/A
	No undue damage to the conductor after tightening or loosening (tests of 10.1.5)		P
10.1.7	Terminals for fixed wiring and non-detachable cords using attachment method X do not require special preparation of the conductor	Fixed wiring. No such special preparation required	N/A
10.1.7.1	Alternate means of connection for type X attachment	No such alternate means	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.1.8	In terminals for fixed wiring and non-detachable cords using attachment methods X or M conductor remains secure while clamping	Fixed wiring. Conductor remains secure.	P
10.1.8.2	Terminals are fitted with conductors:		N/A
	- cross-sectional area (mm ²)	Terminals are approved with range of wires specified.	—
	- Flexible cord / Fixed wiring	Terminals are approved with range of wires specified.	—
	- Wires of fixed wiring conductors are straightened		P
10.1.8.3	The wires of flexible cables and cords are twisted in one complete turn in 20 mm and conductor is inserted into the terminal	No flexible cords	N/A
	- Torque applied on screws (Nm)	No flexible cords	—
10.1.8.4	Neither the conductor nor the wire of a stranded conductor slipped out	Terminals are approved with range of wires specified.	N/A
10.1.9	Clamping reliability of the terminals	Wires don't get loosened.	P
10.1.10	Terminals did not attain excessive temperatures during the test of Clause 14 (°C).....	See Table 14.6 & 14.7	P
10.1.11	Terminals so are located that each core contained within any fixed wiring sheath or flexible cord sheath is terminated in reasonable proximity to the other cores within the same sheath		P
10.1.12	Test of escaped wire for terminals with attachment methods X or M		N/A
	- An 8 mm length of insulation is removed from the end of a stranded conductor	Fixed wiring (No non-detachable cords)	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		P
	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		P
10.1.15	In pillar and mantle type terminals adequate length of the conductor can be introduced	Not a pillar and mantle type terminal	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	In pillar and mantle type terminals conductor is beyond the edge of the screw		N/A
10.1.16	In U.S.A. and Canada flying leads are used	No flying leads	N/A
10.2	Terminals and terminations for internal conductors		N/A
10.2.1	Connection of conductors	No internal conductors	N/A
10.2.2	Terminals suitable for their purpose		N/A
10.2.3	In soldered terminals, soldering is not the only means to maintain conductor in position		N/A
	In soldered terminals, barriers are provided to prevent reduction in creepage and clearance		N/A
10.2.4	Flat push-on connectors		N/A
10.2.4.1	Dimension of tabs	No flat push-on connectors	N/A
	- measured (mm x mm).....		—
	- compliance with Fig. 14, 15, 16 or IEC/EN 61210		N/A
	- other dimensions allowed (mm x mm)		—
	- polarized acceptance of receptacles		N/A
10.2.4.2	Tabs forming part of a control consist of material appropriate to the maximum temperatures allowed		N/A
10.2.4.3	Tabs forming part of a control have adequate strength and allow the insertion and withdrawal of receptacles without damage to the control		N/A
10.2.4.4	Tabs forming part of a control are adequately spaced to allow the connection of the appropriate receptacles		N/A
	- no strain, no distortion to any of the tabs or adjacent parts		N/A
	- no reduction of creepage distance or clearances below values of Cl. 20		N/A
10.3	Terminals and terminations for integrated conductors		N/A

11	CONSTRUCTION REQUIREMENTS		
11.1.1	Insulating materials		P
	Wood, cotton, silk, ordinary paper etc. not used as insulation unless impregnated	None of these used for insulating material	P
11.1.2	Current carrying parts other than threaded parts of terminals, if made of brass:		N/A
	- contain at least 50% copper if cast or from bar	No brass parts	N/A
	- contain at least 58% copper if from rolled sheet	No brass parts	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.1.3.1	Non-detachable cords of Class I controls provided with a green/yellow conductor insulation and properly connected	No cords. Fixed wiring.	N/A
11.1.3.2	Non-detachable cords: green/yellow conductor not connected to other than earthing terminals	No cords	N/A
11.2	Protection against electric shock		P
11.2.1	Double insulation		P
	- basic insulation and supplementary insulation can be tested separately, or	Reinforced insulation considered	N/A
	- properties of both insulations are otherwise provided		N/A
11.2.2	Infringement of double or reinforced insulation in Class II controls:		P
	- creepage distances and clearances not reduced below values of Cl. 20 by wear		P
	- creepage distances and clearances not reduced to less than 50% of values of Cl. 20 by parts becoming loose (wires, screws, nuts, etc.)		P
11.2.3	Integrated conductors		N/A
11.2.3.1	No reduction of creepage distances and clearances below values of Cl. 20; conductors rigid, fixed or insulated	No integrated conductors	N/A
11.2.3.2	Insulation, if any, cannot be damaged during mounting or in normal use		N/A
11.2.4	Sheath of flexible cord used as supplementary insulation:		N/A
	- not subjected to undue mechanical or thermal stresses	No cords	N/A
	- insulation properties comply with IEC 60227-1 or IEC 60245-1		N/A
11.2.5	Protective impedance	See Annex H.	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		P
	Supply from an external SELV source is only possible by a dedicated plug and socket system which cannot be fitted or interconnected with other connecting systems		P
11.2.8	Overcurrent protection capable of carrying the currents likely to flow in abnormal conditions for such periods of time if declared in requirement 96 of Table 1	No external overcurrent protective device declared. Control is intended to be supplied from class 2 power sources.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.3	Actuation and operation		N/A
11.3.1	Full-disconnection		N/A
	- contact separation in all poles not below values of Cl. 20 (exception: earth)	No full disconnection	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		N/A
	- one supply pole, at least, separated	No Micro disconnection	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	No reset buttons	N/A
11.3.4	Parts for setting by the manufacturer secured to prevent accidental shifting after setting	No parts for setting by manufacturer	N/A
11.3.5.1	For contacts with d.c. rating > 0.1 A operated by actuation speed of approach and separation of contacts are independent of speed of actuation.	No contacts	N/A
11.3.5.2	Systems of class C control functions include at least two switching elements to directly de-energize the safety relevant terminals	Not class C control	N/A
11.3.5.2.1	Measures to prevent common cause errors		N/A
	- Measures to protect against failure of two (or more) switching elements by an external short which prevent control from performing a safety shut-down. Acceptable methods are:		N/A
	- Overcurrent protection device,	Not a safety control; Control powered by class 2 sources.	N/A
	- Current limitation or		N/A
	- Internal fault detecting means		N/A
	Compliance (Short Circuit Test)		N/A
	- Safety related output terminals of the control connected to switch on short circuit current	Not a safety control; Control powered by class 2 sources.	N/A
	- With switch opened, control connected as in H.27.1.1.2 with outputs energized to simulate normal operation		N/A
	Controls with overcurrent protection devices:		N/A
	- Short-circuit current capability of power supply is at least 500A.....:	Not a safety control; Control powered by class 2 sources.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Controls with current limitation devices		N/A
	- power supply does not limit the declared short-circuit current		N/A
11.3.5.2.1.1	Short-circuit applied between safety related output terminals		N/A
	- declared short-circuit current	Not a safety control	—
	- 1h duration or until no current flow through switch		N/A
	- if overcurrent protection device is replaceable and operated during the test, device is replaced and test is repeated two more times		N/A
	- test is repeated using same or separate sample		N/A
11.3.5.2.1.2	If internal fault detecting function of the control opens the switching elements or initiates a safety shut-down, the test is repeated two more times		N/A
	After test at least one switching element of the control de-energized the safety related output terminals, or	Not a safety control	N/A
	- non-replaceable overcurrent protection device permanently interrupted the safety related output terminal's supply		N/A
11.3.6	Contacts for full- and micro-disconnection with d.c. rating ≤ 0.1 A or a.c. rating, operated by actuation can rest only in closed or open position		P
11.3.7	Contacts which cannot (or are not intended to) be operated on load nor arc under normal use		N/A
11.3.7.2	An arc not maintained by slowly opening the contacts		N/A
11.3.8	In any rest position of the actuating member		N/A
	- contacts are open or closed as intended	No actuating member	N/A
	- no hazard can occur within the control		N/A
11.3.9	In pull-cord actuated control the mechanism returns when pull-cord is released to allow next movement in the cycle		N/A
	- pull force vertically downwards (N): ≤ 45 N.....	Not a pull-cord actuated control	—
	- pull force 45° to vertical (N): ≤ 70 N.....		—
	- function after release		N/A
11.4	Actions		P
11.4.1	Combined action: Control remains operative after the failure of any portion unique to the other actions		P
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	Not type 2	N/A
11.4.3	Type 2 action: manufacturing deviation and drift within the required limits	Not type 2	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.4.4	Type 1A or 2A action: operation provides full-disconnection	No full-disconnection	N/A
11.4.5	Type 1B or 2B action: operation provides micro-disconnection	No Micro-Disconnection	N/A
11.4.6	Type 1C or 2C action: operation provides micro-interruption	No micro-interruption	N/A
11.4.7	Type 1D or 2D action: disconnection cannot be prevented and reset not possible while faults persists	Not type x.D	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	Not type x.E	N/A
11.4.9	Type 1F or 2F action: reset needs the aid of a tool	Not type x.F	N/A
11.4.10	Type 1G or 2G action: reset possible under electrically loaded conditions	Not type x.G	N/A
11.4.11	Type 1H or 2H action:	Not type x.H	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:	Not type x.J	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.	Not type x.K	N/A
11.4.14	Type 1L or 2L action: function independent of electrical supply or auxiliary energy source	Not type x.L	N/A
11.4.15	Type 1M or 2M action: operation provided after declared ageing procedure.	Not type x.M	N/A
11.4.16	See Annex H		P
11.4.17	See Annex J	No thermistors	N/A
11.5	Openings in enclosures (drain holes)	No drain holes	N/A
	- minimum area (mm ²):	No drain holes	—
	- maximum area (mm ²):	No drain holes	—
	- minimum dimension (mm ²):	No drain holes	—

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Clause	Requirement + Test	Result - Remark	Verdict
11.6	Mounting of controls		P
11.6.1	Control mounted according to manufacturer's declaration: does not adversely affect compliance with this standard	Mounting does not adversely affect compliance with this standard	P
11.6.2	Control mounted as declared, if movement or removal could adversely affect compliance with this standard:		N/A
	- cannot rotate or be displaced		N/A
	- cannot be removed without the aid of a tool		N/A
	- when removal (even partial) is necessary for use, requirements of clauses 8, 13, and 20 are satisfied before and after removal		N/A
	Controls, other than with rotary actuation, fixed by a nut and single bushing:		N/A
	- tightening of the nut requires a tool	Not fixed by a nut and bushing	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		P
11.6.3.1	Independently mounted controls (other than for panel mounting)	Intended for panel mounting	N/A
	- fit a standard box as declared, or		N/A
	- supplied with a conduit box (if special), or		N/A
	- suitable for surface (plane) mounting		N/A
11.6.3.2	If special conduit box required, it is delivered with the control	No special conduit box required	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.	Not for surface mounting for buried installation	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	Screw terminal blocks provided.	P
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	Not for mounting on an outlet box	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.6.3.7	Back wiring terminals: recessed or protected to prevent contact with wiring installed in the box	No back wiring terminals	N/A
11.7	Attachment of cords		N/A
11.7.1.1	In-line and free-standing controls, flexible cords withstand flexing during normal use	Not this type	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	No cords.	N/A
11.7.2	Cord anchorages		N/A
11.7.2.1	Controls, other than integrated or incorporated, intended to be connected by non-detachable cords provided with cord anchorage so designed that:	No cords.	N/A
	- conductor relieved from strain		N/A
	- conductor relieved from twisting		N/A
	- conductors covering protected from abrasion		N/A
11.7.2.2	Cord anchorages of Class II controls		N/A
	- made of insulating material		N/A
	- insulated from accessible metal parts by supplementary insulation		N/A
11.7.2.3	Cord anchorages of controls other than Class II:		N/A
	- made of insulating material, or		N/A
	- provided with insulating lining, if an insulation fault on the cord could make accessible metal parts live		N/A
	- provided with lining fixed to the cord anchorage (exception: bushing which forms part of a cord guard)		N/A
11.7.2.4	Cord anchorage design		N/A
	- cord cannot touch clamping screws of anchorage, if screws are accessible metal parts		N/A
	- cord not clamped by metal screws bearing directly on the cord		N/A
	- attachment method X or M: at least one part securely fixed to the control		N/A
	- attachment method X or M: replacement of cord does not require a special purpose tool		N/A
	- attachment method X: suitable for the different connectable cords		N/A
	- attachment method X: design and location make replacement of the cord easily possible		N/A
11.7.2.5	For other than attachment method Z: cord anchorage not made by make-shift methods		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.7.2.6	Attachment method X: in-line cord controls		N/A
	- glands not used as cord anchorage, unless		N/A
	- provision exists for clamping all types of cords		N/A
11.7.2.7	Screws to be operated when replacing the cord		N/A
	- not fixing other components, or		N/A
	- control is inoperable or manifestly incomplete if components are omitted or incorrectly mounted, or		N/A
	- component cannot be removed without the aid of a tool		N/A
11.7.2.9	Push test for control fitted with flexible cord(s)	No cords.	N/A
	Screws of cord anchorage tightened 2/3 torque of cl. 19.1(Nm)	No cords.	N/A
11.7.2.10	Push causes no damage		N/A
11.7.2.11	Pull test for control fitted with flexible cord(s)	No cords.	N/A
	Free-standing control, weight (kg)	No cords.	—
	In-line cord controls (all others).....	No cords.	N/A
	No displacement	No cords.	N/A
11.7.2.12	Torque Test on cable, torque (Nm)	No cords.	N/A
11.7.2.13	Attachment method X		N/A
	- test with lightest cord: smallest cross-section used in 10.1.4: diameter (mm)	No cords.	N/A
	- test with next heavier type with largest cross-section: diameter (mm)	No cords.	N/A
11.7.2.14	After test cord not damaged, and		N/A
	- measured longitudinal displacement (≤ 2 mm) of cord (mm).....		N/A
	- conductors have not moved in the terminals over a distance > 1 mm		N/A
	- no appreciable strain at the connection		N/A
	- creepage distances and clearances not reduced below values of Cl. 20		N/A
11.8	Size of non-detachable cords		N/A
11.8.1	- rubber sheathed, not lighter than 60245; type	No non-detachable cords	N/A
	- PVC sheathed, not lighter than 60227; type	No non-detachable cords	N/A
	Exception: if specified in particular equipment standard or for connection to external SELV devices	No non-detachable cords	N/A
11.8.2	Size of conductors in non-detachable cords:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- nominal current (A)	No non-detachable cords	—
	- required cross-sectional area (mm ²).....	No non-detachable cords	—
	- measured cross-sectional area (mm ²).....	No non-detachable cords	—
11.8.3	Space inside the control for flexible cords:		N/A
	- connecting cords of largest cross-section (10.1.4) (mm ²)	No cords.	—
	- adequate space for easy introduction and connection		N/A
	- possibility to check the correct connection		N/A
	- cover can be fitted without risk of damage to the conductors		N/A
11.9	Inlet openings		N/A
11.9.1	Inlet openings for flexible external cords	No such inlets openings	N/A
	- designed to prevent damage of the covering of the cord when introducing connectors		N/A
	- provided with inlet bushing		N/A
11.9.1.1	Conduit entries and knock-outs of independently mounted controls designed and located that the introduction does not affect protection against electric shock or reduces distances and clearances		N/A
11.9.2	Inlet openings without inlet bushing made of insulating material		N/A
11.9.3	Inlet bushing		N/A
	- made of insulating material	No inlet bushing	N/A
	- shaped to prevent damage to the cord		N/A
	- reliably fixed		N/A
	- not removable without the aid of a tool		N/A
	- not integrated with the cord in case of attachment method X		N/A
11.9.4	Inlet bushing not made of rubber		N/A
	Exception: For attachment methods M, Y or Z, for Class 0, 0I or I controls, bushing integral with sheath of a cord of rubber		N/A
11.9.5	Enclosures of independently mounted controls (for permanent connection to fixed wiring) provided with cable/conduit entries, knock-outs or glands allowing correct connection of the appropriate cable or cord		N/A
11.10	Equipment inlets and socket-outlets		N/A
11.10.1	Engagement with connecting devices of other systems not possible	No inlets or socket-outlets	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Engagement causes no danger or damage		N/A
11.10.2	In-line cord controls with inlet or socket-outlets		N/A
	- unintended overloading of control cannot occur, rating of the control accordingly		N/A
	- protected against overload, protection means:	No inlets or socket-outlets	N/A
11.10.3	Controls with pins to be introduced into fixed socket-outlets comply with requirements of the socket-outlet system		N/A
	For in-line cord controls provided with a plug and a socket outlet, where the plug can be connected to a socket outlet rated for a higher load current than the control, the control provided with an incorporated fuse or a protective device to limit the current to the control's rating		N/A
	The plug and socket outlet part of the control complies with the appropriate standard for the plug and socket system		N/A
11.11	Requirements during mounting, maintenance and servicing		P
11.11.1	Covers and their fixing		P
11.11.1.1	Removal of covers does not affect setting of the controls other than integrated	No such removal of covers required	N/A
11.11.1.2	Covers		P
	- cannot be displaced or replaced incorrectly		P
	- 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.)	No user replaceable fuses or protective devices	N/A
11.11.1.4	Glass covering an opening (Canada and U.S.)	No such glass covering	N/A
11.11.1.5	Non-detachable parts which provide protection against electric shock or contact with moving parts:	No such moving parts	N/A
	- fixed in a reliable manner		N/A
	- withstand mechanical stress		N/A
	-snap-in devices have a locked position		N/A
11.11.1.5.1	Parts likely to be removed for installation or during servicing disassembled and assembled ten times		N/A
11.11.1.5.3	Control subjected to 50 N push force test	No such moving parts	N/A
	- pull force (N)	No such moving parts	N/A
	- finger nail pull force (N)	No such moving parts	N/A
	- if cover subjected to twisting force, torque applied		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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.	Tools required to remove the enclosure cover	N/A
11.11.2	Fixing screws of covers which need to be removed for mounting etc., captive		N/A
11.11.3	Actuating member		P
11.11.3.1	Control not damaged by mounting or removal of actuating member		P
11.11.3.2	For Type 2 action with max/min. setting limited by means of the actuating member, the actuating member not removable without use of a tool	Type 1 action.	N/A
11.11.3.3	Actuating member cannot be fixed in an incorrect position for Type 1 action (actuating member providing OFF position) or Type 2 action (actuating member indicating condition of the control)		P
11.11.4	Parts forming supplementary or reinforced insulation and which might be omitted during re-assembly:		N/A
	- fixed and cannot be removed without being damaged, or	Control not intended to be disassembled	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	No sleeving used.	N/A
11.11.6	Pull-cords		N/A
	- insulated from live parts	No pull-cord	N/A
	- fitting and replacement possible without live parts becoming accessible		N/A
11.11.7	Insulating linings, barriers etc.		N/A
	- adequate mechanical strength	No insulating linings or barriers	N/A
	- secured in a reliable manner		N/A
11.12	Controls using software.....:	Class A	P
11.13	Protective controls and components of protective control system		N/A
11.13.1	- protective controls designed and constructed to be reliable and suitable for their intended duty	Not a protective control	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

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Clause	Requirement + Test	Result - Remark	Verdict
11.13.2	The pressure of the limiting devices does not permanently exceed the maximum allowable pressure of the controlled application		N/A
	A short duration pressure surge of the limiting devices does not exceed 10% of the pressure surge		N/A
11.13.3	The temperature monitoring devices have an adequate response time on safety grounds, consistent with measurement function		N/A
11.13.4	Batteries		N/A
11.13.5	Smart Enabled Controls		P
11.13.5.1	So designed that external communication signals do not unintentionally override the operating parameters of a Type 2 Action Control nor interfere with any protective function	Not type 2 action	N/A
	Permitted to alter the operating parameters of a Type 2 control within defined limits so long the protective functions remain intact	Not type 2 action	N/A
11.13.5.2	Control that integrates operating and protective functions evaluated as a Protective Control	Not a protective control	N/A
11.13.5.3	Transmitter or communication module external to control acting as the interface between control and telecommunication network comply with IEC 62151 or IEC 62368-1 and ensure protection against electric shock	No such transmitter or communication module part of EUT.	N/A
11.13.5.4	Any transmitter or communication module part of the smart enabled control complies with the requirements	No such transmitter or communication module part of EUT.	N/A

12	MOISTURE AND DUST RESISTANCE		P
12.1.1	Protection against ingress of water and dust IP Classification of the product	IP20	—
12.1.2	Electric Strength Test of 13.2 after preparation in accordance with 12.1.3-12.1.6 followed by tests according to IEC 60529.....	No tests required according to IEC 60529	N/A
	Entered water does not impair compliance with this standard	Not rated for water protection	N/A
	No reduction of creepage distances and clearances below values of Cl. 20		N/A
12.1.6	Sealing means aged suspending freely in a heating cabinet, ventilated by natural circulation		N/A
	- aging temperature (°C), 70 ± 2°C	No sealing means	—
	- aging time (h), 240h	No sealing means	—

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Clause	Requirement + Test	Result - Remark	Verdict
12.1.6.2	Immediately after ageing, the parts were taken out of the cabinet and left at room temperature, avoiding direct daylight	No sealing means	N/A
	- time before reassembly (h), 16h	No sealing means	—
	- sealing means are then tightened with a torque equal to two-thirds of that given in Table 20		N/A
12.2	Protection against humid conditions		P
12.2.1	Controls withstood simulated, normal use humid conditions	Test performed	P
12.2.3	Electric Strength Test of 13.2 is conducted immediately after the humidity treatment	See Table 13.2	P
12.2.4	Control shows no damage		P
12.2.5	Cable inlet openings, and drain holes are left open	No inlet openings	N/A
12.2.6	Detachable parts are removed and tested with the main part	No detachable parts	N/A
12.2.7	2 days (48 h) Humidity Test for IPx0 controls	2 days (48 h) test	P
	7 days (168 h) Humidity Test for other controls		N/A
12.2.8	Relative humidity (%): 91-95%	93%	—
	Temperature (°C): (20 - 30 ± 1) °C	25°C	—
12.2.9	Tests executed immediately after the humidity treatment (after the reassembly of detached parts)		P
	- in-line, free-standing and independently mounted controls according to Insulation Resistance (13.1)		P
	- Electric Strength (13.2)		P
	- integrated and incorporated controls according to Electric Strength (13.2)	Independently mounted control	N/A
12.3	Leakage current test for in-line cord and free - standing controls	Not in-line or free-standing	N/A
12.3.3	Measuring circuits used the figure number	N/A	—
12.3.4	During measurement all control circuits closed except controls tested to Figs. 26, 29, 30 checked with switch S1 in the open and closed position		N/A
12.3.5	Impedance of measuring circuits (Ω).....	N/A	—
	Time constant (μs).....	N/A	—
12.3.6	Error and accuracy of measuring circuit ≤5%		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

13	ELECTRIC STRENGTH AND INSULATION RESISTANCE		P
13.1	Insulation resistance of in-line cord, free-standing and independently mounted controls		P
13.1.2	Reinforced or supplementary insulation measured to non-metal parts covered with metal foil		P
13.1.3	Test voltage applied for 1 min (V dc)	500Vdc	—
13.1.4	Insulation resistance measured		N/A
	- basic insulation $\geq 2 \text{ M}\Omega$	Reinforced insulation	N/A
	- supplementary insulation $\geq 5 \text{ M}\Omega$	Reinforced insulation	N/A
	- reinforced insulation $\geq 7 \text{ M}\Omega$	$\geq 10 \text{ M}\Omega$	P
13.2	Electric Strength Test	See attached TABLE 13.2	P
13.2.2	Insulating surfaces covered with metal foil		P
13.2.3	50 or 60 Hz test voltage applied for 1 min.	2500Vdc	P
13.3	Leakage current of in-line cord and free-standing controls after the tests of 13.1 or 13.2 for the sample that was subjected to the tests of 12.3		N/A
13.3.1	A test voltage, was applied between any live part and accessible metal parts, or	Not in-line cord and free-standing controls	N/A
	– any live part & metal foil in contact with accessible surfaces of insulating material, connected together		N/A
	For control with a grounding pin or conductor, the grounding conductor was disconnected at the supply source		N/A
13.3.2	Test voltage (V).....	Not in-line cord and free-standing controls	—
13.3.3	The leakage current was measured within 5 s after the application of the test voltage		N/A

14	HEATING		P
14.1	Controls and their supporting surfaces did not exceed normal use temperatures		P
14.1.2	Temperatures recorded during Heating Test did not exceed the values in Table 13		P
14.2	Terminals fitted with external conductors of the intermediate cross-sectional area (mm ²)	0.2 mm ² - 4 mm ² (solid) 0.2 mm ² - 2.5 mm ² (stranded)	—
14.2.1	Attachment method M, Y or Z: cords as declared or supplied (mm ²).....	No such cords	—
14.2.2	Terminals for flexible and fixed conductors: appropriate flexible cord (mm ²)	Fixed conductors	—

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Clause	Requirement + Test	Result - Remark	Verdict
14.2.3	Terminals not for external conductors: conductors of minimum cross-sectional area or as declared in Clause 7.2 (mm ²).....:	Terminals provided for external conductors only.	—
14.3	In-line cord controls tested on a dull, black painted plywood	Not in-line cord control	N/A
14.3.1	Independently mounted controls tested as in normal use	Independently mounted	P
14.4	Electrical conditions		P
	- voltage (V): most unfavourable value between 0.94 and 1.06 times UR	24.8Vdc	—
	- voltage (V) if circuit not voltage sensitive: min. 10% of UR	Voltage sensitive circuit	—
	- current (A): most unfavourable value between 0.94 and 1.06 times I R	5.1A	—
14.4.1	For circuits and contacts other than for external loads, load(s) as specified by the manufacturer: voltage (V); current (A)	No such circuits	—
14.4.2	Actuating members placed in most unfavourable position	Actuating members are fixed.	N/A
14.4.3	Contacts initially closed at rated current and voltage	No contacts	N/A
14.4.3.1	Temperature sensing controls:		N/A
	- temperature of sensing element is raised or lowered (5 ± 1) °C from operating temperature such that contacts are then in closed position	Not a temperature sensing control	N/A
	- operating temperature (°C)	N/A	—
	- temperature for heating test (°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	Not a sensing control	N/A
14.4.3.4	The most arduous operating sequence or segment selected for other automatic controls		P
14.5	Controls were tested in an appropriate heating and/or refrigerating apparatus		N/A
14.5.1	Temperature of the switch head between T _{max} and (T _{max} + 5)°C, or T _{max} and 1.05 times T _{max} (whichever is greater) (°C)	T _{max} for switch head is 40°C	N/A
	Mounting surface of the switch head maintained between T _s max and (T _s max+ 5)°C, or T _s max and 1.05 times T _s max (whichever is greater) (°C)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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)	Control was tested at an ambient of 22°C	P
14.6	The temperatures specified for the switch head, the mounting surfaces and sensing element were attained in approximately 1 h	No sensing element	N/A
14.6.1	Electrical and thermal conditions maintained for 4 h, or for 1 h after steady state (h)	Electrical and thermal conditions maintained for more than 4 h	P
14.6.2	For controls designed for short-time or intermittent operation, the resting time(s) declared in Table 1, requirement 34, were included in the 4 h		N/A
14.7	The temperature of the medium in which the switch head is located, and the value of the activating quantity to which the sensing element is exposed, was measured approx. 50 mm from the control		N/A
14.7.1	The temperature was determined by means of fine wire thermocouples or other equivalent means, so chosen and positioned that they have the minimum effect on the temperature of the part under test		P
14.7.3	Temperature on parts which are gripped in normal use other than actuating members		N/A
14.7.4	The temperature of electrical insulation is determined on the surface of the insulation	See attached TABLE 14.6 & 14.7	P

15	MANUFACTURING DEVIATION AND DRIFT		N/A
15.1	Adequate consistency of declared operating value etc. required for parts of controls providing Type 2 actions (applicable to controls where the output of the control is dynamic with respect to the activating quantity, e.g. Electromechanical thermostat)	No declared deviation or drift; Type 1 control	N/A
15.2	Measurement of deviation and drift..... :	No declared deviation or drift; Type 1 control	N/A

16	ENVIRONMENTAL STRESS		P
16.1	Control can withstand the level of stress likely to occur in transportation and storage		P
16.2	Environmental stress of temperature		P
16.2.1	Entire control (not energized) maintained for 24h at a temperature of (-10 ± 2)°C or as declared..... :	-25°C for 24h	P
	Entire control (not energized) maintained for 4h at a temperature of (60 ± 5)°C or as declared..... :	60°C for 4h	P

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Clause	Requirement + Test	Result - Remark	Verdict
16.2.2	The control was not energized during testing	The control was not energized	P
16.2.3	Control capable of being actuated at room temperature to provide disconnection as declared (without dismantling)		P
	The control was held at room temperature for 8 h prior to actuation		P
16.2.4	For controls with type 2 actions, the appropriate test of Clause 15 were repeated	Not a type 2 action	N/A

17	ENDURANCE		---
17.2	Electrical conditions for the tests	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
	Type of circuit		N/A
	Rated voltage (V) ; test voltage (V)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Rated current (A) ; test current (A)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Rated frequency (Hz)	Electronic controls are exempt from endurance test per H.17.1.4.	—
17.3	Thermal conditions for parts other than temperature sensing elements		N/A
	Accessible parts: tested at room temperature (°C) :	No temperature sensing elements	—
	Mounting surface temperature: T_s max (°C)	No temperature sensing elements	—
	Remainder of switch head, temperature: T_{max} (°C) .:	No temperature sensing elements	—
	If T_{min} is less than 0 °C; switch head maintained at T_{min} (°C)	No temperature sensing elements	—
17.4	Manual and mechanical conditions for the tests		N/A
17.4.2	Slow speed test		N/A
	High speed test		N/A
	Accelerated speed test		N/A
17.4.4	Controls with limited movement of the actuating member		N/A
	Dwell period at each reversal of direction (s)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Applied torque (rotary controls) (Nm)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Applied force (non-rotary controls) (N)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Controls with rotary actuation, movement not limited in either direction:		N/A
	- 3/4 of cycles clockwise (number of cycles)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	- 1/4 of cycles anti-clockwise (number of cycles) ...:	Electronic controls are exempt from endurance test per H.17.1.4.	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Controls with rotary actuation, designed for actuation in one direction only tested in designed direction	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.4.5	Additional lubrication not applied during tests		N/A
17.5	Dielectric Strength Test	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.6	Ageing test for controls of 1M or 2M action		N/A
	- sensing element maintained at activating quantity as determined in 14	No sensing element	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)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	- current (A).....	Electronic controls are exempt from endurance test per H.17.1.4.	—
	- duration (h):	Electronic controls are exempt from endurance test per H.17.1.4.	—
17.7	Over-voltage test of automatic action at accelerated rate		N/A
17.7.1	Electrical conditions: specified in 17.2		N/A
17.7.2	Thermal conditions: specified in 17.3		N/A
17.7.3	Method and rate of operation		N/A
	Control Type 1 action		N/A
	Method of operation	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Rate of operation	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Control Type 2 action:		N/A
	Method of operation	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Rate of operation	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Type 2 controls are tested at the most unfavourable operating value declared in Table 1, Item 48	Type 1 control	N/A
17.7.4	Type 2 sensing action: overshoot at each operation between values stated in 7.2		N/A
17.7.6	Automatic cycles: the smaller of 1/10 of numbers declared in 7.2, or 200; (number of cycles)	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.7.7	Actuating members placed in the most unfavourable position during test	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.8	Test of automatic action at accelerated rate		N/A
	Temperature required in 17.3 applied for the last 50% of each test	Electronic controls are exempt from endurance test per H.17.1.4.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.8.1	Electrical conditions: specified in 17.2		N/A
17.8.2	Thermal conditions: specified in 17.3		N/A
17.8.3	Method and rate of operation: specified in 17.7.3		N/A
17.8.4	Number of automatic cycles:		N/A
	- number declared in 7.2	Electronic controls are exempt from endurance test per H.17.1.4.	—
	- number of cycles 17.8	Electronic controls are exempt from endurance test per H.17.1.4.	—
17.8.4.1	For slow-make, slow-break automatic actions, number of automatic cycles: (75% of cycles in Clause 17.8.4)		—
17.9	Test of automatic action at slow rate		N/A
17.9.1	Number of automatic cycles: 25% remainder (17.8.4)	Electronic controls are exempt from endurance test per H.17.1.4.	—
17.9.2	Electrical conditions: specified in 17.2		—
	Thermal conditions: specified in 17.3		—
17.9.3	Method of operation and monitoring	No sensing element	—
	- imposing change of value of activating quantity on sensing element (rate of change of activating quantity as declared in 7.2)		N/A
	- by the prime mover		N/A
	Sensing controls: overshoot between values of 7.2		N/A
17.9.4	Controls of which only the make or break is slow automatic action: rest of actions accelerated by agreement between testing authority and manufacturer		N/A
17.10	Overvoltage (overload) test of manual action at accelerated speed		N/A
17.10.1	Electrical conditions: specified in 17.2	Electronic controls are exempt from endurance test per H.17.1.4.	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)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Sensing elements maintained at suitable values of activating quantity or prime movers positioned that actuation causes operation		N/A
17.11	Test of manual action at slow speed		N/A
17.11.1	Electrical conditions: specified in 17.2	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.11.2	Thermal conditions: specified in 17.3	Electronic controls are exempt from endurance test per H.17.1.4.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
17.11.3	Method of operation: specified in 17.4 for slow speed	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
17.11.4	Number of cycles: 1/10 of declared number or 100 (see 7.2)	Electronic controls are exempt from endurance test per H.17.1.4.	—
	Actuating causes operation		N/A
17.12	Test of manual action at high speed (applies only to actions which have more than one pole and where polarity reversal occurs during the action)		N/A
	- number of poles	Electronic controls are exempt from endurance test per H.17.1.4.	—
	- polarity reversal occurs during action		N/A
17.12.1	Electrical conditions: specified in 17.2		N/A
17.12.2	Thermal conditions: specified in 17.3		N/A
17.12.3	Method of operation: specified in 17.4 for high speed		N/A
17.12.4	Number of cycles: 100		—
	Sensing elements maintained at suitable value of activating quantity		N/A
	Prime movers so positioned to ensure actuating causes appropriate operation		N/A
17.13	Test of manual action at accelerated speed		N/A
17.13.1	Electrical conditions: specified in 17.2	Electronic controls are exempt from endurance test per H.17.1.4.	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	Electronic controls are exempt from endurance test per H.17.1.4.	—
17.14	Evaluation of compliance		N/A
	Actions function in the intended and declared manner:		N/A
	- automatically	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
	- manually		N/A
	The following requirements are still met:		N/A
	- Cl. 14, heating: terminals for external conductors: measured (°C)	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
	- Cl. 14, heating: other terminals: measured (°C) ...:	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
	- Cl. 14, heating: current-carrying parts: measured (°C)	Electronic controls are exempt from endurance test per H.17.1.4.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Cl. 14, heating: supporting surfaces: measured (°C)	Electronic controls are exempt from endurance test per H.17.1.4.	N/A
	- Cl. 8, protection against electric shock		N/A
	- 17.5, electric strength (without previous humidity treatment, test voltage 75% of values 13.2)		N/A
	- Cl. 20, distances and clearances		N/A
	- for tests 17.5 and 20, if special samples were submitted for Cl. 13: tested at appropriate condition to ensure contacts are open		N/A
	- requirements of Cl. 15 for type 2 actions still met		N/A
	- manual actions: declared circuit disconnection can be obtained		N/A
	No evidence that any transient fault has occurred between live parts and:		N/A
	- earthed metal parts		N/A
	- accessible metal parts		N/A
	- actuating members		N/A

18	MECHANICAL STRENGTH		----
18.1.1	Control is constructed to withstand the mechanical stress that occurs in normal use.		P
18.1.2	Actuating members of class I and class II controls and actuating members for class I and class II equipment:		P
	- have adequate mechanical strength, or		P
	- are such that protection against electric shock is maintained if actuating member is broken	No risk of shock; control is ELV.	P
18.1.3	For integrated and incorporated controls impact resistance (18.2) tested by the equipment standard	Independently mounted control	N/A
18.1.4	Tests of 18.2 to 18.8 carried out sequentially on one sample:		N/A
	- tested sample: type reference	No risk of shock; control is ELV. Testing not required.	—
	- Tested sample: identification No.	No risk of shock; control is ELV. Testing not required.	—
18.1.5	After the tests of Clause 18 there is:		N/A
	- no damage to impair compliance with this standard, in particular	No risk of shock; control is ELV. Testing not required.	N/A
	- Cl. 8, protection against electric shock	No risk of shock; control is ELV. Testing not required.	N/A
	- Cl. 13, electric strength and insulation resistance	No risk of shock; control is ELV. Testing not required.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Cl. 20, creepage distance and clearances	No risk of shock; control is ELV. Testing not required.	N/A
	- insulating linings, barriers and the like have not worked loose		N/A
	- Still possible to remove and replace detachable/external parts without these parts or insulating linings breaking.	No such parts	N/A
	- Still possible to actuate the control to any position intended to provide full disconnection and micro-disconnection.		N/A
	- supplementary or reinforced insulation tested to clause 13		N/A
18.1.6	In Canada and the USA, threads for the connection of metal conduit tapped all the way through an enclosure wall or an equivalent construction:		N/A
	- have no sharp edges	No provision for connection of metal conduit	N/A
	- have no more than 3 and no less than 5 full threads in the metal.....:		N/A
	- a suitable conduit bushing can be properly attached		N/A
18.1.6.1	In Canada and the USA, threads for the connection of metal conduit not tapped all the way through an enclosure wall, conduit hub or the like:		N/A
	- have less than 3,5 full threads in the metal with a conduit stop	No provision for connection of metal conduit	N/A
	- have a smooth well-rounded inlet hole with internal diameter approximately the same as that of the corresponding size of rigid metal conduit.		N/A
18.1.6.2	In the USA, at least 5 full threads for support by rigid metal conduit	No provision for connection of metal conduit	N/A
18.1.6.3	In Canada and the USA, a conduit hub or nipple attached to the enclosure by swaging, staking or similar means withstands:		N/A
	- direct pull of 890 N for 5 min.		N/A
	- bending force of 67,8 Nm for 5 min to the conduit at right angles to its axis and the lever arm		N/A
	- torque of 67,8 Nm applied to the conduit for 5 min in a direction tending to tighten the connection and the lever arm		N/A
18.2	Impact resistance		N/A
18.2.1 - 18.2.6	In-line cord controls, free-standing, independently mounted controls: test by means of impact test apparatus IEC 60068-2-75.....:		N/A
18.4	Alternate compliance – Impact resistance		NA

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Clause	Requirement + Test	Result - Remark	Verdict
	enclosure material	Non-Metallic	—
	with supporting frame (yes / no)		—
	maximum width, maximum length		—
	thickness required; measured (mm)	Not a cast metal enclosure	N/A
18.4.1	cast metal not less than 3 mm thick, not more than 6 mm thick at threaded holes for conduit	Not a cast metal enclosure	N/A
	die-cast metal other than at plain or threaded holed for conduit:		—
	- not less than 1,6 mm thick for an area $\leq 150 \text{ mm}^2$:		N/A
	- no dimension greater than 150 mm.....	Not a cast metal enclosure	N/A
	- $\geq 2,4$ mm thick for larger areas	Not a cast metal enclosure	N/A
18.5	Free-standing controls		N/A
18.5.1	Additional tests of 18.5.2 and 18.5.3 required (test apparatus Fig. 4)	Not 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.....	Not free-standing controls	—
	- output terminals: 2 m of flexible, lightest cord (if intended); cord; cross-sectional area	Not free-standing controls	—
	- pull (N), increasing value, applied on the cord (Table 9)	Not free-standing controls	—
	- pull and fall test (3 times)		N/A
18.5.3	After the test of 18.5.2, complies with 18.1.5		N/A
18.6	In-line cord controls		N/A
18.6.1	In-line cord control tested in tumbling barrel (Fig. 5).....	Not an in-line cord control	N/A
18.6.2	- attachment method X: flexible cord(s), smallest cross-section (Cl. 10.1.4) (mm^2), length approx. 50 mm	Not an in-line cord control	—
	- attachment M, Y or Z: cord(s) as declared or supplied, length 50 mm; cord; cross-sectional area (mm^2)	Not an in-line cord control	—
18.6.3	- mass of sample (g) ; number of falls	Not an in-line cord control	—
18.6.4	In-line cord control with mass > 200 g complies with 18.5		N/A
18.6.5	Barrel turned at a rate of five revolutions/min; 10 falls/min		N/A
16.6.6	control complies with 18.1.5 (special attention paid to flexible cord(s))		N/A
18.7	Pull-cord actuated controls		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
18.7.1	Pull-cord actuated controls tested to 18.7.2 and 18.7.3	Not pull-cord actuated	N/A
18.7.2	Control mounted as declared: forces applied to the pull-cord, each 1 min:		N/A
18.7.3	- rated current (A)	Not pull-cord actuated	—
	- force in normal direction (N)	Not pull-cord actuated	—
	- force in most unfavourable direction (N)	Not pull-cord actuated	—
18.7.4	control complies with 18.1.5		N/A
18.8	Foot actuated controls		N/A
18.8.1	Foot actuated control tested in accordance with 18.8.2 to 18.8.4	Not foot actuated	N/A
18.8.2	Control subjected to a force, increased from 250 N to 750 N over 1 min, and maintained for 1 min with 50 mm diameter steel plate	Not foot actuated	N/A
18.8.3	Force applied three times to control (fitted with cords) placed in different, most unfavourable positions	Not foot actuated	N/A
18.8.4	Control complies with 18.1.5		N/A
18.9	Actuating member and actuating means		N/A
18.9.1	Controls supplied (or intended to be fitted) with actuating members, tests:		N/A
	- axial pull force (N)	No actuating member. Actuating means only	N/A
	- axial push force of 30 N applied for (min)	No actuating member. Actuating means only	N/A
18.9.2	Controls submitted without actuating member or with an easily removable actuating member: pull and push of 30 N applied to the actuating means		N/A
18.9.3	During and after the tests, control shows no damage or movement of the actuating members so as to impair compliance with this standard.		N/A
19	THREADED PARTS AND CONNECTIONS		N/A
19.1	Threaded parts to be moved during mounting or servicing		N/A
19.1.1	Threaded parts, electrical or otherwise which are likely to be operated while the control is being mounted or during servicing, withstand the mechanical stresses occurring in normal use.	No such threaded parts, except threads for screws for approved terminals blocks	N/A
19.1.2	Threaded parts: easily replaceable if completely removed		P
19.1.3	Thread		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- metric ISO thread or thread of equivalent effectiveness	Screws part of approved terminal blocks	P
19.1.4	Screw generating a thread:		N/A
	- thread cutting type screw not used	Screws part of approved terminal blocks	N/A
	- thread forming (swaging) type screws		N/A
19.1.5	Space threaded type screws: provided with means to prevent loosening		N/A
19.1.6	Threaded parts of non-metallic material not used if replacement by a dimensionally similar metal screw could impair compliance with Cl. 13 or 20:		N/A
19.1.7	Threaded parts: not of soft material or material liable to creep		N/A
19.1.8	Screws operating in a non-metallic thread: correct introduction of the screw into its counterpart ensured		N/A
19.1.9	In-line cord controls, threaded parts transmitting contact pressure:		N/A
	- diameter < 3 mm: threaded part of metal	Not an in-line cord control	N/A
	- diameter ≥ 3 mm: non-metallic allowed, but not used for electrical connection		N/A
19.1.10	Compliance was checked by Clauses 19.1.1 to 19.1.9 inclusive by inspection and by the test of Clauses 19.1.11 to 19.1.15		N/A
19.1.11	Threaded parts tightened and loosened:		N/A
	- one of threaded parts non-metallic material: 10 times	Screws part of approved terminal blocks	N/A
	- both parts of metallic material: 5 times		N/A
19.1.12	Screws in thread of non-metallic material: completely removed and reinserted each time		N/A
	Terminal screws and nuts: conductor fitted in the terminal (used in 10.1.4 or 10.2.1); cross-sectional area (mm ²)	Screws part of approved terminal blocks	—
19.1.14	Conductor moved each time the threaded part is loosened		N/A
	- no damage impairing the further use of the threaded part		N/A
	- no breakage of screws		N/A
	- no damage to the slot head or washers		N/A
19.1.15	Torque test was made by means of a suitable test screwdriver, spanner or key, applying a torque without jerks according to Table 20	See Table 20	P
19.2	Current-carrying connections		P

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Clause	Requirement + Test	Result - Remark	Verdict
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	Screws part of approved terminal blocks	N/A
19.2.3	Contact pressure:		N/A
	- not transmitted through non-metallic material, or	Screws part of approved terminal blocks	N/A
	- sufficient resilience in the metallic part	Screws part of approved terminal blocks	N/A
19.2.4	Space threaded screws:		N/A
	- screws clamp current-carrying parts directly in contact with each other		N/A
	- provided with means of locking		N/A
19.2.4.1	- used to provide earthing continuity: at least two screws used for each connection		N/A
19.2.5	Thread cutting screws: screws produce a full-form standard machine screw thread		N/A
19.2.5.1	Thread cutting screws used to provide earthing continuity: at least two screws used for each connection		N/A
19.2.6	Current-carrying connection whose parts rely on pressure for correct function: resistant to corrosion (not inferior to that of brass)	Screws part of approved terminal blocks	N/A
	If not plated, e.g. bimetallic blades: parts are clamped into contact with parts resistant to corrosion		N/A

20	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION		P
	PCB: coating conforming requirement of IEC 60664-3 for type 2:	Coating is not critical. Spacings requirements met.	N/A
	PCB: coating meets requirements of 20.3	Coating is not critical. Spacings requirements met.	N/A
	PCB: creepage and clearance between conductors prior to coating does not exceed permissible values in Table 1 of IEC 60664-3:2003 (see Annex Q)	Coating is not critical. Spacings requirements met.	N/A
	Creepage and clearance between terminals for the connection of external conductors used for factory attachment or connection to ELV circuits is not less than 2 mm		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances, clearances and distances through solid insulation in switch mode power supplies and other high frequency switching circuits where the fundamental frequency is above 30 kHz and less than 10 MHz are dimensioned in accordance with IEC 60664-4		N/A
20.1	Clearances		P
	Clearances are not less than case A from Table 22 taking into account the pollution degree and the rated impulse voltage required to serve the overvoltage categories of Table 21	Minimum clearance of 1.5mm maintained.	P
	Smaller distances used for basic insulation and functional insulation meet the impulse withstand requirement of Cl. 20.1.12; being rigid and construction is such that there is no likelihood of the distances being reduced by distortion or by movement of the parts; but the clearance is not less than the values for case B from Table 22		N/A
20.1.1	Basic Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7	See attached Table 20	P
20.1.1.1	Supplied from dedicated battery which has no provision for charging an external mains supply		N/A
20.1.2	Functional Insulation - case A from Table 22 applies except as permitted in Cl. 20.1.7, or	See attached Table 20	P
	For electronic controls Cl. H27.1.3 met		P
20.1.3	Methods of measurement: Annex B and Fig. 17		P
20.1.3.1	Controls with equipment inlet and/or socket-outlet with connector / plug inserted and without	No inlets or outlets	N/A
20.1.3.2	Controls with terminals for external conductors: without conductors and with conductors of largest cross-sectional area (mm ²) (Cl. 10.1.4)	1.5 mm ²	—
20.1.3.3	Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm ²) (Cl. 10.2.1) ..	No such controls with terminals for internal conductors	—
20.1.4	Distances through slots or openings of insulating material measured to metal foil in contact with the surface, foil pushed into corners with test finger shown in Figure 2	No openings which will accept the test finger	N/A
20.1.5	Standard test finger applied to apertures as specified in Cl. 8.1: distances between live parts and metal foil not reduced below required values	No such apertures	N/A
20.1.6	Force (standard test finger) applied in an endeavour to reduce distances:		N/A
20.1.6.1	- 2 N force applied by standard test finger to any point on bare live parts accessible before control is mounted	No bare live parts	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 30 N force applied by standard test finger to accessible surfaces after control mounted		N/A
20.1.7	For basic and functional insulation, smaller distances permitted but no less than values specified in Case B of Table 22, provided that:		N/A
	- control meets the impulse test, Clause 20.1.12 and all parts are rigid and secure	Case B not used	N/A
	- no likelihood of the distance being reduced by distortion, by movement of the parts, or during assembly		N/A
	Impulse voltage applied across clearance of functional insulation		N/A
20.1.7.1	For micro-disconnection and micro-interruption:		N/A
20.1.7.2	Full disconnection – values from Table 22, case A applies to parts separated by switching element including contacts	Electronic disconnection	N/A
20.1.8	Clearances of supplementary insulation: not less than basic insulation, Table 22, case A	Reinforced insulation	N/A
20.1.9	Clearances of reinforced insulation: not less than those in Table 22, case A using the next higher step for rated impulse voltage	3mm minimum clearance for reinforced insulation.	P
20.1.10	Clearances of functional and basic insulation on secondary side in controls supplied from a double insulated transformer comply with Table 21 based on the secondary voltage	See attached Table 20	P
	Clearances in controls supplied from a transformer without separate windings; rated impulse determined from Table 21	Controls not supplied from transformer without separate windings	N/A
20.1.11	ELV circuits derived from supply using protective impedance, clearance of functional insulation determined from Table 21 and based on maximum working voltage in the ELV circuit	No protective impedances	N/A
20.1.12	Impulse voltage test, CI 6.1.2.2.1 of IEC 60664-1:2007 applied between live parts and metal separated by basic or functional insulation (V)	Impulse voltage test not used	N/A
20.1.13	For earthed secondary winding of a transformer, (or an earthed screen between windings) clearances on the secondary side: basic insulation > limits in Table 22 but using the next lower step for rated impulse voltage	No transformer	N/A
	For circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage	12-24Vdc	P
20.2	Creepage distances		P
20.2.1	Creepage distances for basic insulation, per Table 23 for the rated voltage and based on material group and pollution degree		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- measurements..... :	See attached Table 20	P
	- 2 N force applied by standard test finger to bare conductors	No bare conductors	N/A
	- 30 N force applied to accessible surfaces applied by standard test finger	Polymeric enclosure provided	N/A
20.2.2	Creepage distance for functional insulation, per Table 24 for working voltage and based on material group and pollution degree		P
	- measurements..... :	See attached Table 20	P
	- 2 N force applied by standard test finger to bare conductors	No bare conductors	N/A
	- 30 N force applied to accessible surfaces applied by standard test finger	Polymeric enclosure provided	N/A
20.2.3	Creepage distance for supplementary insulation: not less than basic insulation - based on material group and pollution degree	See attached Table 20	N/A
20.2.4	Reinforced insulation: double the value of basic insulation - based on material group and pollution degree		P
20.3	Solid Insulation		P
	Solid insulation is capable of durably withstanding electrical and mechanical stresses as well as possible thermal and environmental influences		P
20.3.2	For working voltages $\leq 300V$, supplementary and reinforced insulation between metal parts		N/A
	- minimum 0.7mm thick; measured (mm)..... :	No metal parts	N/A
20.3.2.1	Insulation is applied in thin sheet form, other than mica or similar scaly material		N/A
	- the supplementary insulation consists of at least two layers and each layer complies with Cl. 13.2 for supplementary insulation		N/A
	- the reinforced insulation consists of at least three layers and any two layers complies with Cl. 13.2 for reinforced insulation		N/A
20.3.2.2	The supplementary insulation or reinforced insulation is inaccessible and meets one of the following:		N/A
	- maximum temperature measured per Cl. 27 and H.27 doesn't exceed permissible values in Table 13		N/A
	- conditioned insulation complies with Cl. 13.2 at the oven and room temperatures..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	For optocouplers, the conditioning procedure carried out at a temperature of 25 K in excess of the maximum temperature measured on the optocoupler during the tests of Clauses 14, 27 and H.27 while operated under the most unfavourable conditions which occur during these tests	Approved optocouper employed	N/A
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21	RESISTANCE TO HEAT, FIRE AND TRACKING		---
21.1	All non-metallic parts of the control were resistant to heat, fire and tracking.		N/A
21.2	Integrated, incorporated and in-line cord controls		N/A
21.2.1	Accessible parts (control correctly mounted):		N/A
	- ball-pressure test 1 (G.5.1) at temperature (°C) ...:	Approved polymeric materials used with suitable ratings	—
	diameter of the impression ≤ 2.0mm (mm)	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 550 °C.....:	See attached TABLE 21	N/A
21.2.2	Parts retaining current-carrying parts in position (other than electrical connections):		N/A
	- ball-pressure test 2 (G.5.2) at temperature (°C) ...:	Approved polymeric materials used with suitable ratings	—
	diameter of the impression ≤ 2.0mm (mm)	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 550°C.....:	See attached TABLE 21	N/A
21.2.3	Parts maintaining or retaining electrical connections in position:		N/A
	- ball-pressure test 2 at temperature (°C)	Approved polymeric materials used with suitable ratings	—
	diameter of the impression ≤ 2.0mm (mm)	See attached TABLE 21	N/A
	Glow-wire temperature levels according to IEC 60695-2-11		N/A
	- glow-wire test (G2.) at 650 °C.....:	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 750 °C.....:	See attached TABLE 21	N/A
	- glow-wire test (G2.) at 850 °C.....:	See attached TABLE 21	N/A
21.2.4	Other parts (except small parts unlikely to be ignited):		N/A
	- glow-wire test (G2.) at 550 °C.....:	See attached TABLE 21	N/A
21.2.7	Resistance to tracking:		N/A
	Test procedure, see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 1, requirement 30	See attached TABLE 21	N/A
	Controls designed for operation at ELV levels were not subjected to a tracking test.		N/A
21.3	Independently-mounted controls		N/A
21.3.1	Preconditioning		N/A
	Controls without T rating:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- circuit of switching part and driving mechanism not connected, detachable parts (covers) removed		N/A
	- temperature (°C): (80 ± 2) °C, 1 x 24 h		—
	Controls with T rating up to 85°C:		N/A
	- switching circuit and driving mech.- not connected, without covers: temperature (°C): (80 ± 2)°C, 1 x 24 h		—
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h		—
	Controls with T rating higher than 85 °C:		N/A
	- switching circuit and driving mech. Connected, with covers: temperature (°C): (Tmax ± 2) K, 6 x 24 h		—
21.4	Controls with mercury-tube switch, subjected to short-circuit test:		N/A
	- working voltage, ac/dc	No mercury-tube switch	—
	- maximum power rating (VA)	N/A	—
	- short-circuit current (A)	N/A	—
	- fuse rating (A)	N/A	—
	- no ignition of cotton placed around openings		N/A
	- no emission of flame or molten metal (except mercury from the enclosure housing the switch)		N/A
	- wiring not damaged except tube leads		N/A
22	RESISTANCE TO CORROSION		N/A
22.1.1	Ferrous parts protected against corrosion	No ferrous 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:		N/A
	- temperature (°C): (40 ± 2) °C	No ferrous parts	—
	- relative humidity (%): 93-97%	No ferrous parts	—
22.1.5	Control or parts dried in a heating cabinet: for 10 min:		N/A
	- Temperature (°C): (100 ± 5) °C	No ferrous parts	—
	After parts were dried: no evidence of corrosion on surfaces		N/A
22.1.6	Traces of rust on sharp edges and yellowish film that was removable by rubbing were ignored		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
23	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – EMISSION		---
23.1	Free-standing and independently mounted controls, which cycle during normal operation, are so constructed that they do not generate excessive radio interference and were evaluated to:		N/A
	- CISPR 14-1 (in 4.2.3.3 of CISPR 14-1:2005, the value of 200 ms is replaced by 20 ms) and/or CISPR 22, class B or	Emission testing not performed as part of this project.	N/A
	- to clauses 23.1.1 and 23.1.2 or		N/A
	- to show minimum time between contact operations during normal operation < 10 minutes		N/A
23.1.1	Electrical and thermal conditions for EMC test as specified in 17.2 and 17.3:		
	- for sensing controls: rate of change is α_1 and β_1	Not a sensing control	N/A
	- For non-sensing controls: operated at the lowest contact operating speed.		N/A
	- inductive loads – pf 0.6; resistive loads – pf 1		N/A
23.1.2	Control operated for 5 cycles		N/A
	- duration of radio interference; < 20ms.....: :		N/A
23.2	Controls for ISM (Industrial, Scientific and Medical) equipment and free-standing, independently mounted and in-line cord controls for use with ISM equipment's comply with CISPR 11		N/A
24	COMPONENTS		N/A
24.1	Transformers intended to supply power to a SELV-circuit or PELV-circuit are of the safety isolating type and comply with the relevant requirements of IEC 61558-2-6	No transformers in EUT.	N/A
	Capacitors connected between two line conductors for between a line conductor and the neutral or between hazardous live parts and protective earth are in accordance with IEC 60384-14 and used in accordance with its rated values	No across the line capacitor	N/A
	Fuses comply with requirements of IEC 60127-1 or IEC 60269-1		P
24.1.1	Controls that incorporate a transformer as the source of supply to a SELV-circuit or PELV-circuit were subjected to an output test with the primary energized at the upper limit of the rated voltage	No transformers in EUT.	N/A
	Switch mode power supplies or transformers used in converters comply with the requirements of IEC 61558-2-16		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
24.4.1.8	The maximum open-circuit voltage of each winding (directly at the winding of the transformer) and the maximum load current are measured and recorded such that the maximum output power may be determined.....	See attached TABLE 24.4.1.8-24.4.1.10	N/A
24.4.1.9	The maximum open circuit voltage measurements was made during normal operation and under single component failure	See attached TABLE 24.4.1.8-24.4.1.10	N/A
24.4.10	For SELV applications, where the maximum open circuit voltage measured directly at the secondary of the transformer exceeds the limits specified in 2.1.5, the measurement of the maximum output voltage of each winding may be made after certain protective impedances	See attached TABLE 24.4.1.8-24.4.1.10	N/A
24.4.1.11	While still in heated condition, the transformer was subjected to electric strength test of 13.2		N/A
24.5	Annex J is not applicable to thermistors used in controls that are declared to be Type 1 action, SELV/PELV and low power specified in H.27.1.1.1	No thermistors	N/A

25	NORMAL OPERATION		---
	Meets requirements per annex H	See annex H	P
25.2	Over-voltage and under-voltage test (for controls incorporating electro-magnets)	Control does not incorporate electromagnets.	N/A

26	ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – IMMUNITY		---
	Meets requirements per Cl. H.26.....	See clause H.26	P

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

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

28	GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION		
	Meets requirement per annex H		P

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

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Clause	Requirement + Test	Result - Remark	Verdict
A3.2	Rubbed in the apparatus (Fig. 8) with water-soaked lint, weight 750 g, duration (s): 15 s		N/A
A3.3	Drops of detergent standing on the marked surface: duration (h): 4 h	Markings are not accessible to the final user (Panel mounted control)	—
	Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping	Markings are not accessible to the final user (Panel mounted control)	—
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	EUT is intended to be certified from certified class 2 power supply.	N/A
G	ANNEX G – HEAT AND FIRE RESISTANCES TESTS		----
	Enclosure contains no hazardous live parts (risk of shock)		N/A
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)	Type 1.Y	—
H.6.9.5	- electronic disconnection		P
H.6.18	Class of control function (A, B, C).....	Class A	—
H.7	Information in addition to Table 1 provided		P
	36 - Replacement: limits of activating quantity for any sensing element over which electronic or micro-disconnection is secure; clause: 11.3.2, H11.4.16, H17.14, H18.1.5, H27.1.1, H.28; (Method: X)	No activating quantity or sensing element	P
	52 - The minimum parameters of any heat dissipater (e.g. heat sink) not provided with an electronic control but essential to its correct operation; clause: 14; (Method: D)	No heat dissipator	N/A
	53 - Type of output waveform if other than sinusoidal; clause: H25; (Method: X)	DC waveform	N/A
	54 - Details of the leakage current waveform produced after failure of the basic insulation; clause: H27; (Method: X)	Not declared	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	55 - The relevant parameters of those electronic devices or other circuit components considered as unlikely to fail (see paragraph 1 of H27.1.1.4); clause: H27; (Method: X)	No high-reliability components used for essential safety	N/A
	56 - Type of output waveform(s) produced after failure of an electronic device or other circuit component (see item g) of H27.1.1.3); clause: H27; (Method: X)	Not declared	N/A
	57 - The effect on controlled output(s) after electronic circuit component failure if relevant (item c) of H27.1.1.3); clause: H27; (Method: X).....	Not declared	N/A
	58a - For integrated and incorporated electronic controls, if any protection against mains borne perturbations, magnetic and electro-magnetic disturbances is claimed, which of the tests of Cl. H26 must be performed and the effect on controlled output(s) and function after a failure to operate as a result of each test; clause: H26.2, H26.15; (Method: X)	Independently mounted control	N/A
	58b - For other than integrated and incorporated electronic controls, the effect on controlled output(s) and function after a failure to operate as a result of the tests of Cl. H26; clause: H26.2, H26.15; (Method: X)	None	N/A
	59 - Any component on which reliance is placed for electronic disconnection which is disconnected as required by footnote n to Table 12; clause: 13.2, H27.1; (Method: X)	No such component	N/A
	60 - Category (surge immunity); clause: H26.8.2, Annex R; (Method: X).....	Class 2 installation	P
	66 - Software sequence documentation; clause: H11.12.2.9; (Method: X)	Class A control	N/A
	67 - Program documentation; clause: H11.12.2.9, H11.12.2.12; (Method: X).....	Class A control	N/A
	68 - Software fault analysis; clause: H11.12, H27.1.1.4; (Method: X)	Class A control	N/A
	69 - Software class(es) and structure; clause: H.11.12.2, H.11.12.3, H.27.1.2.2.1, H.27.1.2.3.1; (Method: D).....	Class A control	N/A
	70 - Analytical measures and fault/error control techniques employed; clause: H.11.12.1.2, H.11.12.2.2, H.11.12.2.4; (Method: X).....	Class A control	N/A
	71 - Software fault/error detection time(s) for controls with software Classes B or C; clause: H2.17.10, H11.12.2.6; (Method: X)	Class A control	N/A
	72 - Control response(s) in case of detected fault/error; clause: H.11.12.2.7; (Method: X)	Class A control	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	73 - Controls subjected to a second fault analysis and declared condition as a result of the second fault; clause H.27.1.2.3; (Method: X)	Class A control	N/A
	74 - External load and emission control measures to be used for test purposes; clause H.23.1.1; (Method: X)		N/A
	91 - Fault reaction time; cl. H.2.23.2, H.27.1.2.2.2, H.27.1.2.2.3, H.27.1.2.3.2, H.27.1.2.3.3 , H.27.1.2.4.2, H.27.1.2.4.3; (Method: X).....	Class A control	N/A
	92 - Class or classes of control function(s); clause H.6.18, H.27.1.2.2, H.27.1.2.3; (Method: X).....	Class A control	P
	93 – Maximum number of reset actions within a time period; H.11.12.4.3.6, H.11.12.4.3.6; (Method: D).....	Not declared	N/A
	94 – Number of remote reset actions; H.17.1.4.3; (Method: X)	No remote reset actions	N/A
H.8	Protection against electric shock		P
H.8.1.10	Accessible parts separated from the supply by protective impedance; identification of circuit.....	No protective impedance	—
H.8.1.10.1	Maximum current between accessible parts and the protective earth conductor in normal configuration and with supply poles interchanged:		N/A
	- 0.7 mA (peak value) a.c.; current (mA)	No PE conductor	N/A
	- 2 mA d.c.; current (mA)		N/A
	- if frequency $f > 1$ kHz: current (mA): $0.7 \times f$ (kHz) < 70 mA; f (kHz)		N/A
	Maximum capacitance		N/A
	- peak value (V)		N/A
	- $42.4 \text{ V} < V \leq 450 \text{ V}$ capacitance C (μF): $\leq 0.1 \mu\text{F}$		N/A
	- $450 \text{ V} < V \leq 15 \text{ kV}$: capacitance C (μF): $C \times V \leq 45 \mu\text{C}$; calculated C_{max} (μF)		N/A
	- $V > 15 \text{ kV}$: capacitance C (μF): $C \times V^2 \leq 350 \mu\text{J}$; calculated C_{max} (μF)		N/A
H.11	Constructional requirements		N/A
H.11.2.5	Protection against electric shock – protective impedance (chain):	No protective impedance	N/A
	- consists of at least 2 impedances in series		N/A
	- connected between live and accessible parts		N/A
	- consists of components in which the probability of a reduction in impedance during life can be ignored and the possibility of a short circuit is negligible		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- type of resistors (Table H.24 footnote c)		N/A
	- resistors comply with IEC 60065:2001, Amendment 1:2005, cl. 14.1		N/A
	- capacitors comply with IEC 60384-14, class Y		N/A
	Requirements of H.8.1.10 still met: leakage current (mA)		N/A
H.11.4	Actions:		
H.11.4.16	- Type 1.Y and 2.Y action provides electronic disconnection.	Type 1.Y	P
H.11.4.16.1	Test carried out with control:		P
	- connected to maximum load		P
	- supplied with rated voltage (V)	24.8Vdc	P
	- at temperature T _{max} (°C)	22°C	P
H.11.4.16.2	Current through electronic disconnection not exceeding the lower of:		P
	- 5 mA (mA)	250µA	P
	- 10% of the rated current (mA)	0.4A	P
H.11.12	Controls using software	Class A control	N/A
H.17	Endurance		N/A
	Type 1 electronic control, no thermal cycling test required		N/A
H.18	Mechanical Strength		P
H.18.1.5	For controls providing electronic disconnection (type 1.Y or 2.Y), the requirements of H.11.4.16 were met	Type 1.Y	P
H.20	Creepage distances, clearances and distances through insulation		P
H.20.1.15	Electronic controls		P
H.20.1.15.1	Spacing between live parts (supply) and accessible surfaces and parts		P
H.20.1.15.2	Across protective impedances: double or reinforced insulation	No protective impedances	N/A
	Across each component: supplementary insulation		N/A
H.20.1.15.3	Providing functional insulation		P
H.23	Electromagnetic compatibility (EMC) requirements – Emission		N/A
H.23.1	Electronic controls do not emit excessive electric or electromagnetic disturbances	Emission testing id not part of this report. By others	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

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Clause	Requirement + Test	Result - Remark	Verdict
H.23.1.2	Radio frequency emission: free-standing, independently mounted and in-line cord controls using software, oscillating circuits etc comply with CISPR 14-1 and/or CISPR 22, Class B, as indicated in Table H.12		N/A
	Free-standing, independently mounted and in-line cord controls for use with ISM equipment comply with CISPR 11		N/A
H.25	Normal operation		N/A
H.25.1	The output waveform of electronic controls was as declared		N/A
	The output waveform of the control was examined under all normal operating conditions and was either sinusoidal or as declared in Table 1, requirement 53	DC waveform only. No testing required.	
H.26	Electromagnetic compatibility (EMC) requirements – Immunity		----
	Electromagnetic compatibility (EMC) requirements	<p>Following EMC immunity tests are applicable:</p> <p>Surge Immunity Test (H.26.8) Fast transient burst test (H.26.9)</p> <p>Other tests of H.26 deemed not applicable.</p> <p>See Intertek report 103720457DAL-003 for test results.</p>	P
H.27	Abnormal operation		P
H.27.1	Electronic controls – assessment against internal faults		P
H.27.1.1.1	Fault conditions in H.27.1.1.5 not applied if:		N/A
	- electronic circuit is a low-power circuit and	Not a low-powered circuit	N/A
	- protection against electric shock, fire hazard or dangerous malfunction does not rely on the correct functioning of the electronic circuit		N/A
	- measurement of low-power circuit according to Cl. H.27.1.1.1	Not a low-powered circuit	N/A
	- circuit under evaluation	Not a low-powered circuit	—
	- max. power consumed by the variable resistor (W): $\leq 15 \text{ W}$, 5 s	Not a low-powered circuit	—
	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)		P
H.27.1.1.2	Operating conditions:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) at most unfavourable voltage (V): range: 0.9-1.1 times VR	24.88Vdc	—
	b) load producing the most onerous effect: kind of load; significant values	Lighting load	—
	c) ambient temperature (°C): (20 ± 5) °C or other ..	22.3°C	—
	d) fuse (supply), rating (A) such that test result not influenced by operation of the fuse	5A	—
	e) actuating member in the most unfavourable position	All actuating means (all eight light channels) were kept ON	—
H.27.1.1.3	Requirements, evaluation of compliance:		P
	a) no emission of flames or hot metal or hot plastics		P
	b) temperature of supplementary and reinforced insulation:		P
	- not exceeding 1.5 times value specified in Cl. 14		P
	- exception: thermoplastic material		N/A
	c) change in the output as declared in Table 1, requirement 57		N/A
	d) control continuous to comply with requirements of Cl. 8 and Cl. 13.2 for basic insulation		P
	e) no deterioration of parts that would result in failure to comply with requirements of Cl. 20		P
	f) no rupture of fuse use supply, or		P
	- 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:		P
	- with a), b) and d) of H.27.1.1.3		P
	- with requirements of Cl. 20 for accessible distances from active parts to accessible surfaces (control mounted as for its intended use)		P
	g) output waveform as declared in Table 1, requirement 56		N/A
H.27.1.1.5	Electronic circuit fault conditions per table H.24	See attached TABLE H27.1	P
H.27.1.1.6	Motor load, if failure or malfunction causes change in the supply waveform to the controlled motor:		N/A
	1) load (normal waveform) adjusted to 6 times rated load, or	No motor loads	N/A
	- locked rotor rating declared		N/A
	2) fault conditions introduced		N/A
	3) test conditions per H.27.1.2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) unfavourable voltage (V)		—
	c) ambient temperature (°C)		—
	d) fuse rating (A)		—
	e) actuating member		—
	evaluation of compliance per H.27.1.3 a) to e)		N/A
H.27.1.2	Protection against internal faults to ensure functional safety		N/A
	Class A control		N/A
H.27.4	Electronic disconnection: withstands abnormal overvoltage conditions		P
H.27.4.1	- control loaded as indicated in Cl. 17.2; rated voltage (V)	24.88Vdc	—
	- control subjected to 1,15 x VR for 5 s during electronic disconnection; test voltage (V)	27.6Vdc	—
H.27.4.2	- control provides electronic disconnection as determined by the test of H.11.4.16.2		P
J	ANNEX J – REQUIREMENTS FOR CONTROLS USING THERMISTORS		—
	No thermistors		N/A
L	ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES		—
N	ANNEX N (NORMATIVE) – POLLUTION DEGREES		—
P	ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST		—
			N/A
Q	ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST		—
			N/A
T	ANNEX T (NORMATIVE) - REQUIREMENTS FOR SELV AND PELV		—
T.2	Protection against electric shock by SELV or PELV		P
T.2.1	SELV - Protection against electric shock is provided by the following measures:		P
	– limitation of voltage, ELV according to T.3.1 in a circuit (the SELV-system), and		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– protective-separation, according to T.3.2, of the SELV-system from all circuits other than SELV and PELV, and		N/A
	– simple-separation, according to T.3.3, of the SELV-system from other SELV-systems, from PELV-systems and from earth		N/A
	Intentional connection of exposed-conductive-parts of the control to a protective conductor or to an earth-conductor is not permitted		N/A
	In special locations where SELV is required and where protective screening according to T.3.2.1 is applied,		N/A
	Separation between protective screen and every circuit by basic insulation rated for the highest voltage present.		N/A
	Requirements for the elements of SELV are given in Clause T.3.		P
T.2.2	PELV - Protection against electric shock is provided by the following measures:		N/A
	– limitation of voltage, ELV according to T.3.1 in a circuit which may be earthed and/or the exposed-conductive-parts of which may be earthed (the PELV-system), and		N/A
	– protective separation according to T.3.2 of the PELV-system from all circuits other than SELV and PELV		N/A
	It is not necessary to provide basic insulation between the protective screen and the PELV-system.		N/A
	Where live parts of the PELV-system are accessible (touchable) simultaneously with conductive parts which, in case of a fault, could assume the potential of the primary circuit, protection against electric shock depends on protective-equipotential-bonding (T.3.4) of all such conductive parts. Such parts are bonded to the protective earthing terminal or termination of the control		N/A
	Requirements for the elements of PELV are given in Clause T.3.		N/A
T.3	ELV, protective separation, simple separation, protective bonding as elements of SELV and PELV	Supplied with 24Vdc input	P
T.3.1	Limitation of voltage provides that the voltage between simultaneously accessible parts does not exceed relevant ELV limits as specified in 2.1.4 and as specified in 8.1.1.		P
T.3.2	Protective separation between a SELV/PELV-circuit and other live circuits is achieved by means of:		P

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

U	ANNEX U - REQUIREMENTS FOR RELAYS WHEN USED AS CONTROLS IN IEC 60335 APPLIANCES		N/A
	Not relays employed in EUT.		

8.3.2	TABLE: Risk of electric shock test		N/A
	Total (V_{TOTAL}) (V)	No plug attached	—
	Average ($V_{TOTAL}/10$)		—
	Capacitance (μF) $>0.1\mu F$		—
test #	Measured voltage between pins (V_{RMS})	Average voltage (V): $< 34 V$	
Supplementary information:			

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Clause	Requirement + Test		Result - Remark	Verdict
9.3.1	TABLE: Connection between earthing terminal and parts is of low resistance			N/A
	Rated current, I_r (A)			—
	No-load voltage (V)			—
	Test current, $1.5 \cdot I_r$, but not $<25A$ (A)			—
terminal No.	Duration, until steady conditions (min)	Measured potential drop (V)	calculated resistance (Ω): $\leq 0.1 \Omega$	
Supplementary information:				

10.1.9.1	TABLE: Clamping reliability of the terminals				P
	Applied torque, 2/3 of values in Table 20 (Nm).....			0.33N-m for terminal CON1, CON2 0.2N-m for terminal X1, X2	—
	Pull force (N)			30N	—
terminal No.	fixed wiring		flexible conductor		Conductor movement
	smallest (mm)	largest (mm)	smallest (mm)	largest (mm)	
CON1	0.75	1.5	N/A	N/A	No
CON3	0.75	1.5	N/A	N/A	No
X1	0.75	1.5	N/A	N/A	No
X2	0.75	1.5	N/A	N/A	No
Supplementary information: Sample ID: DAL1901171037-001 Test Equipment #: 3, 11, 12 Ambient Conditions: 23.2°C, 51.3%RH					

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Clause	Requirement + Test	Result - Remark	Verdict

10.2.1	TABLE: Connection of conductors		P
terminal No.	nominal current (A)	cross-sectional area (mm ²)	
CON1	4.25	2.0	
CON3	4.25	2	
X1	1.05	1.5	
X2	1.05	1.5	
Supplementary information: Sample ID: DAL1901171037-001 Test Equipment #: 6, 12 Ambient Conditions: 23.2°C, 51.3%RH			

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

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

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Clause	Requirement + Test	Result - Remark	Verdict

11.7.2.9	TABLE: Push test (option –T /-TP)			N/A
Cord identification	Cross-sectional area (mm ²)	Torque applied on terminals (Nm)	Comments	
Supplementary information:				

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

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Clause	Requirement + Test	Result - Remark	Verdict

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

13.2	TABLE: Electric strength test					P
Test location/circuit	Type of insulation	Type/model	Working voltage, (V)	Test voltage (V)	Flashover/breakdown (Yes/No)	
Terminal CON1 to PCB stand-off	Basic	M201903002	24Vdc	500Vdc	No	
Terminal CON1 to PCB stand-off	Basic	M201903002	24Vdc	500Vdc	No	
Terminal CON1 to Terminal X1	Electronic Disconnection	M201903002	24Vdc	100Vdc	No	
Supplementary information: Sample ID: DAL1901171037-001 Test Equipment #: 1, 2, 12 Ambient Conditions: 22.3°C, 49.1%RH						

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Clause	Requirement + Test	Result - Remark	Verdict

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

14.6 + 14.7	TABLE: Heating test				P
thermocouple locations	max. temperature measured, (°C)	max. temperature correct to max ambient, (°C)	temperature limit, (°C)	Verdict	
MOSFET T6	45.9	59.7	175	P	
Terminal X2	40.6	54.4	85	P	
Diode D6	47.1	60.9	150	P	
PCB	45.6	59.4	150	P	
Voltage Regulator IC12	68.4	82.2	150	P	
Diode D9	46.3	60.1	150	P	
Case - top	32.4	46.2	85	P	
MOSFET T3	47.3	61.1	175	P	
Optocoupler OC10	36.2	50	110	P	
IC11	45.1	58.9	125	P	
Terminal CON2	39.2	53	85	P	
Case - side	36.1	49.9	85	P	
Terminal CON5	31.9	45.7	85	P	
Supplementary information: Max Temperatures adjusted to Max ambient of 40°C, test Performed at 26.2°C. Ambient Conditions: 26.2°C, 35.7%RH Sample ID: DAL1901171037-001 Test Equipment # 5, 6, 8, 9, 12					

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Clause	Requirement + Test	Result - Remark	Verdict

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

Supplementary information:

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

Supplementary information:

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

17.2.1	TABLE: Circuits loaded according to declared ratings				N/A	
	circuits	a.c./d.c.	Voltage U_R (V)	Current (A)	Time constant (ms) / power factor (cos phi)	Verdict
	substantially resistive (6.2.1), making and breaking					
	resistive or inductive (6.2.2), making					
	resistive or inductive (6.2.2), breaking					
	declared specific load (6.2.3), making					
	declared specific load (6.2.3), breaking					
	20 mA load (6.2.4), making & breaking					
	declared motor load (6.2.5), making					
	declared motor load (6.2.5), breaking					
	pilot duty load (6.2.6), making					
	pilot duty load (6.2.6), breaking					
Supplementary information:						

17.5.1	TABLE: Dielectric strength			N/A
	Insulation or disconnection tested	Test potential applied between the following circuits	Test voltage applied (V)	Flashover/ breakdown
Supplementary information:				

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

18.2.1	TABLE: Impact resistance			N/A
Impacts per surface	Surface tested	Impact energy (Nm)	Verdict	

19.1.15	TABLE: Threaded part torque test				N/A
Threaded part identification	Diameter of thread (mm)	Column number (I, II, or III)	Torque (Nm)	Verdict	
Screw of terminal CON1	3mm	II	0.5	P	
Screw of terminal CON1	2mm	II	0.3	P	
Supplementary information: Sample ID: DAL1901171037-001 Test Equipment #: 3, 11, 12 Ambient Conditions: 23.2°C, 51.3%RH					

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Clause	Requirement + Test	Result - Remark	Verdict

20	TABLE: Creepage distance and clearance measurements						Verdict
	Requirements creepage distance and clearance met						P
	Supply working voltage (V): 24Vdc						—
	Overvoltage category: II						—
	Rated impulse voltage according to table 20.1(V): 330						—
	Requirements for case B (20.1.7, 20.1.12) met (cl 20.1 Note 2)...: Case B not used						N/A
Creepage distance Cd and clearance Cl across (type of insulation)	Nominal Volt, (V)	Pollution degree	Required Cd, (mm)	Cd measured (mm)	Required Cl (mm)	Cl measured (mm)	
Supply voltage PWB spacing (B)	24	2	0.2	0.2	1.2	2	
full disconnection							
micro-disconnection							
electronic disconnection							
Supplementary information: Sample ID: DAL1901171037-001 Test Equipment #: 7, 12 Ambient Conditions: 23.2°C, 51.3%RH Abbreviations for types of insulation: F - functional, B - basic, S – supplementary, R - reinforced							

21A	TABLE: Ball Pressure Test and Tracking Test						N/A
	Ball Pressure max. allowed impression diameter (mm): —						
Test sample description		Ball Pressure test		Tracking test			
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	Proof tracking index (PTI)	Voltage, (V)	Result	
Supplementary information:							

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

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

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

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

Supplementary information:

24.1 / 24.2	TABLE: List of critical components				
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹
Enclosure Material	Various	Various	Flame Class: V-2 Material: Polycarbonate (PC) Thickness: 1.5mm minimum, RTI (Elec): 80	UL 746C	UR
PCB material	Various	Various	Single layer, Thickness: 1.5mm minimum, Flame Class: V-0, Max Operating Temperature: 105°C	UL 796 or UL 796F or UL 746	UR
2 Wire Terminal Block, Male	Pheonix	1711725	300V, 15A, 105°C, 12- 30AWG	UL 1059, CSA-C22.2 No. 158	cURus
	PTR	AKZ700/2-5,05-V- Green	300V, 15A, 105°C, 14- 22AWG	UL 1059, CSA-C22.2 No. 158	cURus
	Sauro	MSQ-02005	150V, 24A, 12-30AWG, 105°C	UL 1059, CSA-C22.2 No. 158	cURus
	Wurth	691 253 510 002	300V, 20A, 105°C	UL 1059, CSA-C22.2 No. 158, EN 61984	cURus, VDE
2 Wire Terminal Block, Female	Pheonix	1843606	300V, 8A, 115°C	UL 1059, CSA-C22.2 No. 158	cURus
	PTR	STL1550/2G-3.5-V	300V, 10A, 105°C	UL 1059, CSA-C22.2 No. 158	cURus, VDE

IEC 60730-1					
Clause	Requirement + Test			Result - Remark	Verdict
	Euroclamp	PV02-3,5-V-P	300V, 11A, 105°C	UL 1059, CSA-C22.2 No. 158	cURus
4 Wire Terminal block	Pheonix	1843622	300V, 8A, 115°C	UL 1059, CSA-C22.2 No. 158	cURus
	PTR	STL1550/4G-3.5-V	300V, 10A, 105°C	UL 1059, CSA-C22.2 No. 158, EN 61984	cURus, VDE
	Euroclamp	PV04-3,5-V-P	300V, 11A, 105°C	UL 1059, CSA-C22.2 No. 158	cURus
8 Wire Terminal block	Sauro	MTS-08008	150V, 12A, 105C, 14-30AWG	UL 1059, CSA-C22.2 No. 158	cURus
	Euroclamp	MVS-138-3.5-V	300V, 10A, 105C, Wire range: 16-30AWG	UL 1059, CSA-C22.2 No. 158	cURus
TVS Diode	Littelfuse	SMAJ48A	48V, 1A, Operating Temperature: -65 to 150°C	ANSI/UL 497B	UR
Voltage Regulator	ON Semiconductor	MC78M12CD	40Vdc, 700mA, Operating Junction Temperature: 150°C	Evaluated to IEC 60730-1, Clause 12, 13 and 14 under this project	-
Power MOSFET	Infineon Technologies	IRLR3636	16V, 143W, Tj max: 175°C	Evaluated to IEC 60730-1, Clause 12, 13, 14 and H.27 under this project	-
Photocoupler	LiteON	LTV-355T	35V, 170mW, -55 to 110°C, Viso: 3750Vac	UL 1577, CSA CA No. 5A, EN 60747-5-5	cURus, VDE
Surface mount PTC	Excel Cell Electronic Co Ltd	ERF-SN010-60	60Vdc, Itrip:0.25A, Imax:100A, 85°C	UL 1434 / UL 60730-1, CSA E60730-1 / CSA LTR No. I-003	cURus

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

Microcontroller	STMicroelectronics	STM32F101CBT6	4V, 150mA, -65 to +150°C	Evaluated to IEC 60730-1, Clause 12, 13 and 14 under this project	-
Dual Gate Driver	Texas Instruments	CD40109B	20V, 500mW, -55 to +125°C	Evaluated to IEC 60730-1, Clause 12, 13 and 14 under this project	-

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.

2) Description line content is optional. Main line description needs to clearly detail the component used for testing

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

Supplementary information:

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

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

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

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

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

27.5	TABLE: Overload Heating test			N/A
thermocouple locations	Max. temperature measured, (°C)	Temperature limit, (°C)	Verdict	
Supplementary information:				

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

H27.1	TABLE: Electrical / electronic component fault modes											P
Component	short circuiting	open circuit	a) No flames	b) 1.5 x max temp. of Cl. 14	c) as declared (H57)	d) protect. against el. shock	d) electric strength, basic insulation	e) creepage and clearance	f) no rupture of ext. fuses or	f) complies with a), b) and d)	g) as declared in H58	Observations
MOSFET T2	X		Pass	Pass	N/A	Pass	Pass	Pass	Pass	Pass	N/A	The unit output to LED stays ON.

IEC 60730-1													
Clause	Requirement + Test											Result - Remark	Verdict
Voltage Regulator IC12	X		Pass	Pass	N/A	Pass	Pass	Pass	Pass	Pass	N/A	The unit does not operate switch lights	
Diode D9	X		Pass	Pass	N/A	Pass	Pass	Pass	Pass	Pass	N/A	The unit works as intended.	
Supplementary Information: Sample ID: DAL1902131724-005, DAL1902131724-006, DAL1902131724-007 Ambient Conditions: 24.2°C, 43.2%RH Test Equipment#: 5, 6, 8, 9, 12													

List of test equipment used:

A completed list of used test equipment shall be provided in the Test Reports when a Customer's Testing Facility according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 or CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

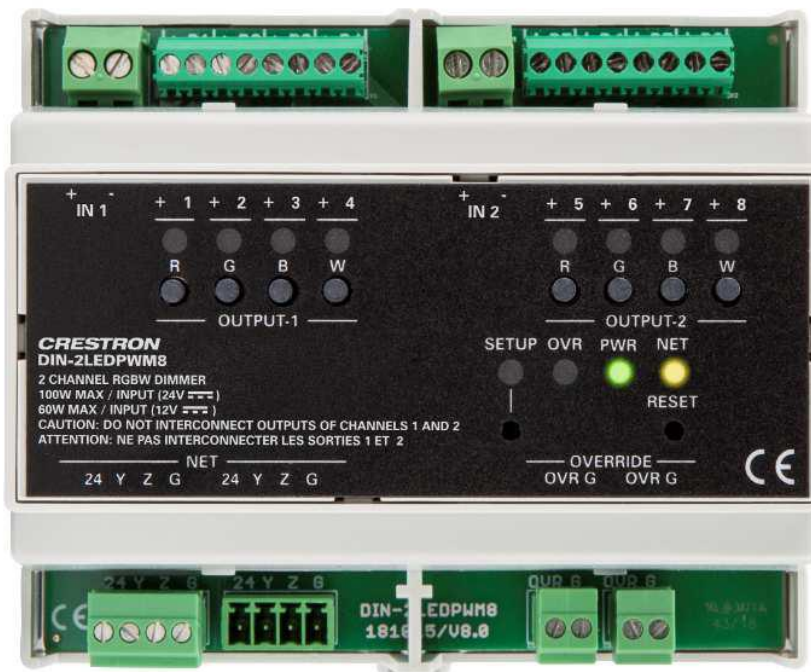
#	Equipment Description	Manufacturer's Name	Model #	Serial #	Intertek Asset #	Calibration due date
1	Temperature and Humidity Chamber 480V, 3Ph, 60 Hz, 29FLA	Cincinnati Sub Zero	ZPH-32-3.5-3.5-SC/AC	ZP1434409	2954	31-Oct-2019
2	AC/DC/IR/GB Hipot Safety Tester	Vitretek Corporation	V74	21611	1858	13-Feb-2019
3	Torque Gage	CDI	1502LDIN	0711603796	983	15-Feb-2020
4	DC Power Supply	Wuxi Qiaowei	QW-MS3010D	20170513-USA	3980	VBU
5	Digital Multimeter	Fluke	179	16500761	1861	27-Nov-2019
6	True RMS AC/DC Mini Clamp Meter	Extech	380947	12220910	1297	15-Mar-2019
7	Digimatic Caliper 6"	Mitutoyo	500-196-30	14027502	3039	22-Jan-2020
8	Data Acquisition Switch Unit	Agilent	AGI 34972A LXI	MY49009747	3003	26-Sep-2019
9	Armature Multiplexer 20 Channel	Agilent	34901A	MY41181769	3016	11-Feb-2020
10	Cheesecloth	Ergonomics	FC10	157	4321	VBU
11	Force Gauge	Mark-10	M3-200	3644543	1860	28-Dec-2019
12	Humidity Temperature Pen	Extech	445580	958123	260	10-Jan-2020
13	Label Tester	Ergonomics, Inc.	DM10	12	1630	ICO
14	Non-ionic Detergent	SP Scienceware	Aquet	17094-0030	4554	VBU

Photos:

Exterior view:



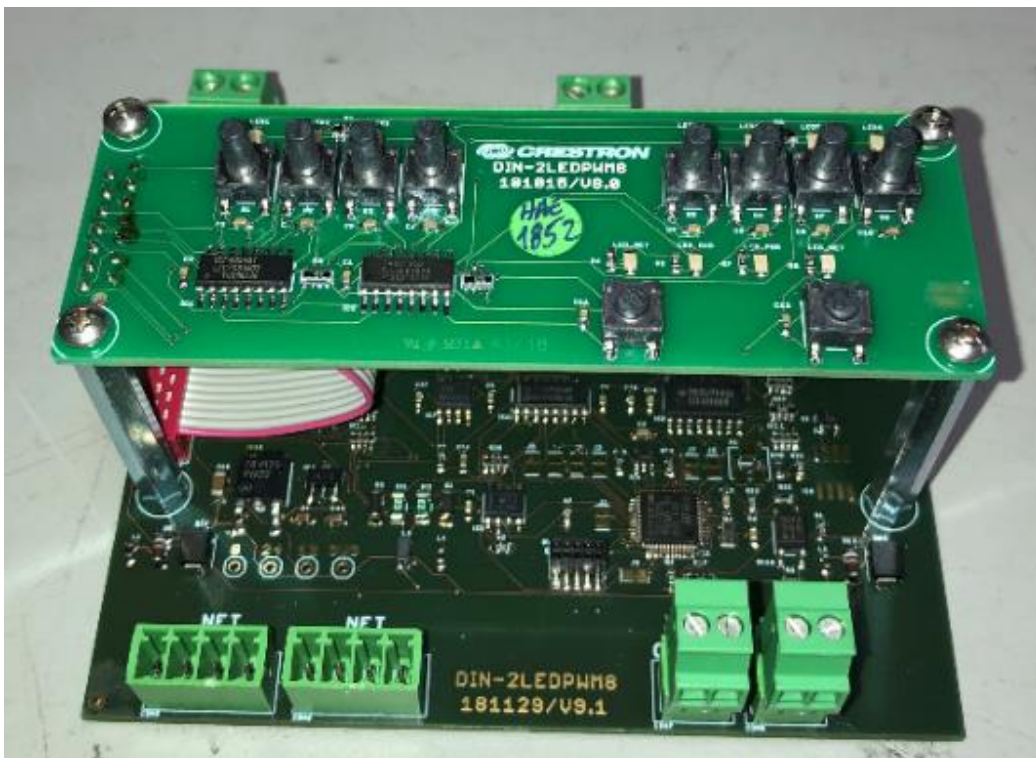
Exterior view, front side:



Rear cover:

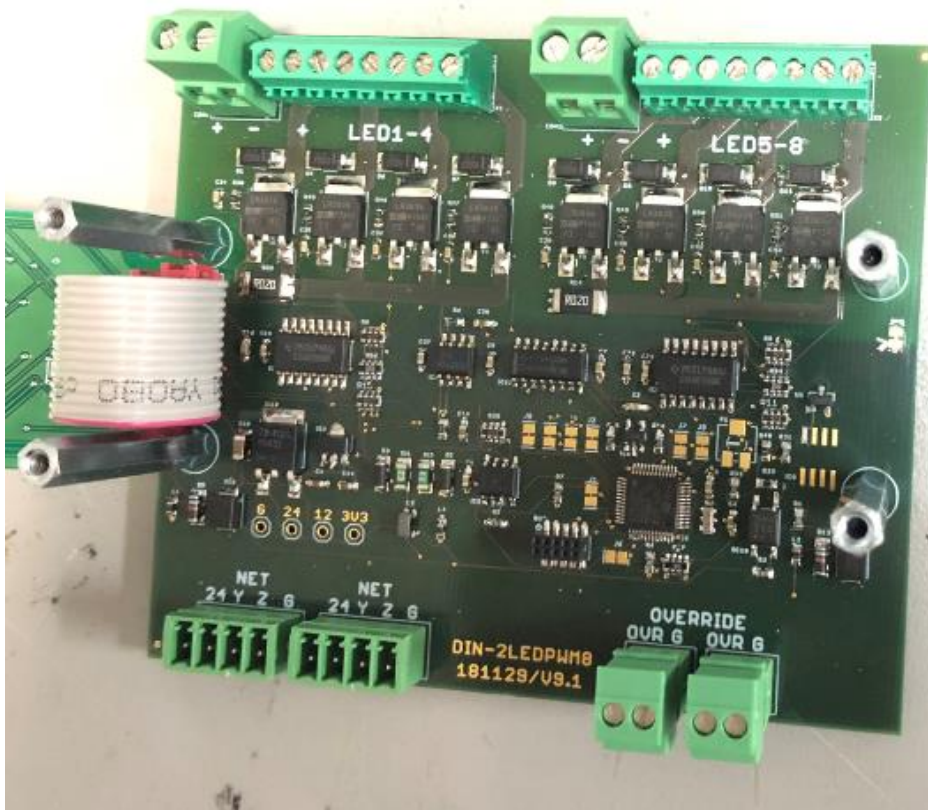


Interior view, Top PCB assembly – front side:



TRF No. IEC60730_11

Interior view, Bottom PCB assembly – front side



Interior view, PCB assembly, reverse side

