

Test Report issued under the responsibility of:



TEST REPORT
IEC 60669-1
Switches for household and similar fixed-electrical installations
Part 1: General requirements

Report Number..... : T211-0398/19

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Name of Testing Laboratory **SIQ Ljubljana**
preparing the Report SIQ Ljubljana is accredited by Slovenian Accreditation with accreditation number LP-009 in the field of testing
Tržaška cesta 2, SI-1000 Ljubljana, Slovenia

Applicant's name..... : ALING – CONEL d.o.o.

Address..... : Železnička 10, RS-21432 Gajdobra, Serbia

Test specification:

Standard IEC 60669-1:2017

Test procedure..... : Partial type test

Non-standard test method..... : N/A

Test Report Form No. : IEC60669_1F

Test Report Form(s) Originator VDE

Master TRF Dated 2018-02-09

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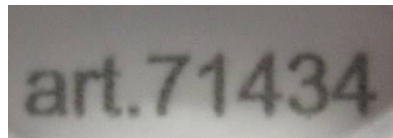
The test results presented in this report relate only to the object tested.

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Test item description	IP55 cover plate for flush mounted switches and socket-outlets	
Trade Mark	ALING – CONEL	
Manufacturer	ALING – CONEL d.o.o., Železnička 10, RS-21432 Gajdobra, Serbia	
Model/Type reference	art.71442.x; art.71432.x; art.71434.x; "See general product information for details"	
Ratings	IP55	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address		SIQ Ljubljana SIQ Ljubljana is accredited by Slovenian Accreditation with accreditation number LP-009 in the field of testing Tržaška cesta 2, SI-1000 Ljubljana, Slovenia
Tested by (name, function, signature)		Tibor Kokelj
Approved by (name, function, signature)		Tomaž Knez
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature)		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature)		
Approved by (name, function, signature)		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature)		
Approved by (name, function, signature)		
Supervised by (name, function, signature)		

List of Attachments (including a total number of pages in each attachment): - Attachment No.1: Technical documentation (4 pages) - Attachment No.2: Photos (3 pages)	
Summary of testing:	
Tests performed (name of test and test clause): Test related to IP55 requirements, construction, protection against electric shock and test of materials have been performed.	Testing location: SIQ Ljubljana Mašera-Spasičeva ulica 10 SI-1000 Ljubljana Slovenia
Summary of compliance with National Differences (List of countries addressed): /	

Copy of marking plate (example):



Test item particulars	IP55 cover plate
Pattern number	N/A
Contact opening (gap)	N/A
Degree of protection against access to hazardous parts and against harmful effects due to the ingress of solid foreign objects	IP5X
Degree of protection against harmful effects due to the ingress of water	IPX5
Method of actuating	N/A
Method of application	N/A
Method of installation	N/A
Type of terminals	N/A
Flexible cable outlet	N/A
Rated voltage (V)	N/A
Rated current (A)	N/A
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	2019-03-26
Date (s) of performance of tests	(2019-04-02) – (2019-05-16)

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60684-2:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided

☐ **Yes**
☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) : ALING – CONEL d.o.o.,
Železnička 10, RS-21432 Gajdobra,
Serbia

General product information and other remarks:

art.71442.x; art.71432.x; art.71434.x are separate cover plates, which are sold separately and can be used together with ALING-CONEL; EXPERIENCE family of products (switches/socket-outlets).

IP55 test was performed on smooth wall, as product is intended for mounting on such type of wall.


Differences between types:

Type	Size	Mounting means
art.71442.x	2M	Claws
art.71432.x	2M	Direct mounting
art.71434.x	4M	Direct mounting

x – color code:

0 = white

1 = grey

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	MARKING		P
8.1	General		-
	Switches are marked with:		-
	a) rated current(s) (A or AX)		N/A
	b) rated voltage(s) (V)		N/A
	c) symbol for nature of supply		N/A
	d) manufacturer's or responsible vendor's name, trade mark or identification mark	Aling - Conel symbol	P
	e) type reference	art.71442; art.71432; art.71434	P
	f) symbol for mini-gap construction (m)		N/A
	g) symbol for micro-gap construction (μ)		N/A
	h) symbol for semiconductor switching device (without contact gap) (ϵ)		N/A
	i) first IP characteristic numeral, if declared higher than 4, in which case the second characteristic numeral is also marked	IP55	P
	j) second IP characteristic numeral, if declared higher than 2, in which case the first characteristic numeral is also marked	IP55	P
	i & j) suitable for smooth and even wall only (IPXX)	Marked in instructions – for smooth wall only	P
	i & j) suitable for smooth and even wall and for rough wall (test wall of figure 21) ()	For smooth wall only	N/A
	k) length of insulation to be removed before the insertion of the conductor into the screwless-type terminal		N/A
	l) symbol for the suitability to accept rigid conductors only (r)		N/A
	In addition the following information shall be given in the manufacturer's documentation:		N/A
	m) for SBL loads: the rated power in watts and the type of load if the switch is tested according to 19.3 :		N/A
8.2	Symbols		P
	Symbols used: as required in the standard		P
	The symbol "AX" may be replaced by the symbol "X". For the marking with rated current and rated voltage the figures may be used alone		N/A
	The marking for the nature of supply shall be placed next to the marking for rated current and rated voltage		N/A
8.3	Visibility of markings		P
	Markings are clearly visible with normal or corrected vision, without additional magnification		P

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Markings as given in 8.1 a), b), c), d), e) and, if applicable, f), g), h), k), and l) shall be placed on the main part of the switch		N/A
	Parts such as cover plates, which are necessary for safety purposes and are intended to be sold separately, are marked with the manufacturer's or responsible vendor's name, trade mark or identification mark and type reference		P
	Markings as given in 8.1 i) and j), when applicable, are marked so as to be easily discernible when the switch is mounted and wired as in normal use		P
	Markings are placed on parts which cannot be removed without the use of a tool		P
8.4	Marking on terminals for phase conductors		-
	Terminals intended for the connection of phase conductors (supply conductors) are identified unless the method of connection is of no importance, is self-evident or is indicated on a wiring diagram		N/A
	Indications not placed on screws or other easily removable part		N/A
	Alternatively, the surface of such terminals shall be bare brass or copper, other terminals being covered with a metallic layer of another colour		N/A
	For switches of pattern numbers 2, 3, 03 and 6/2, terminals associated with any one pole have similar identification, if applicable, differing from that of the terminals associated with the other poles, unless the relationship is self-evident		N/A
8.5	Marking on terminals for neutral and earth conductors		N/A
	Neutral terminals: N.....:		N/A
	Earthing terminals: [earth symbol (IEC 60417-5019:2006-08)]:		N/A
	Markings not placed on screws or other easily removable parts		N/A
	Terminals for conductors not forming part of the main function of the switch:		N/A
	- clearly identified unless their purpose is self-evident, or		N/A
	- indicated in a wiring diagram fixed to the accessory		N/A
	Identification of switch terminals may be achieved by:		N/A
	- their marking with graphical symbols according to IEC 60417 or colours and/or alphanumeric system, or		N/A
	- their physical dimension or relative location		N/A
8.6	Marking of the switch position		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Switches marked to indicate the switch position: they are so marked that the direction of movement of the actuating member to its different positions or the actual position is clearly indicated		N/A
	Switches having more than one actuating member: marking indicates the effect achieved by the operation		N/A
	Marking clearly visible on the front of the switch		N/A
	Not possible to fix cover, cover plate, or removable actuating members in an incorrect position		N/A
	Symbols for "on" and "off" not used for indication of switch positions unless clearly indicate the direction of movement of the actuating members		N/A
8.7	Additional requirements for marking		N/A
	Special precautions necessary to take when installing the switch: details of these and clear information given in an instruction sheet which accompanies the switch		N/A
	Instruction sheets are written in the official language(s) of the country in which the switch is to be sold		N/A
8.8	Durability		P
	Marking durable and easily legible. Test: 15 s with water and 15 s with 95 % n-hexane.		P
10	PROTECTION AGAINST ELECTRIC SHOCK		P
10.1	Prevention of access to live parts		-
	Switches: live parts not accessible		P
	Switches designed to be fitted with pilot lights supplied at voltage other than ELV have means to prevent direct contact with the lamp		N/A
	Specimen is mounted as in normal use and fitted with conductors as specified		P
	Test probe B of IEC 61032 is applied in every possible position, an electrical indicator with a voltage between 40 V and 50 V being used to show contact with the relevant part		P
	Switches having enclosures or covers in thermoplastic or elastomeric material: additional test carried out at $35\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$. Switches are subjected for 1 min to a force of 75 N, applied through the tip of test probe 11 of IEC 61032		P
	Test finger applied to thin-walled knock-outs with a force of 10 N		N/A
	During the test: switches not deform and no live parts accessible with test probe 11 of IEC 61032	No deformation of a lid	P
10.2	Requirements for operating parts		-

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Clause	Requirement + Test	Result - Remark	Verdict
	Knobs, operating levers, push buttons, rockers and the like: of insulating material, unless:		N/A
	- accessible metal parts separated from metal parts of mechanism by double or reinforced insulation, or		N/A
	- reliably connected to earth	No protective earth	N/A
	Requirement does not apply to removable keys or intermediate parts, such as chains or rods		N/A
10.3	Requirements for accessible metal parts		-
10.3.1	Accessible parts of switches when in normal use are made of insulating material as specified.	No accessible metal parts	N/A
10.3.2	Metal covers or cover plates are protected by supplementary insulation made by insulating linings or insulating barriers.		N/A
	Insulating linings or insulating barriers:		-
	- cannot be removed without being permanently damaged, or designed that		N/A
	- cannot be replaced in an incorrect position; if they are omitted, accessories are rendered inoperable or manifestly incomplete; there is no risk of accidental contact between live parts and metal covers or cover plates; precautions are taken to prevent creepage distances or clearances becoming less than the values specified in clause 23		N/A
	Linings or barrier comply with the tests of clauses 16 and 23		N/A
10.3.3	Earthing of metal covers or cover plates: connection of low resistance		N/A
10.4	Requirements for insulation of the mechanism		-
	Metal parts of the mechanism which are not insulated from live parts: not protrude from enclosure		N/A
	Switches operated by means of a removable key or similar device: metal parts of mechanism insulated from live parts		N/A
10.5	Requirements for insulation of the mechanism with respect to the surrounding environment		-
	Metal parts of mechanism not accessible and insulated from accessible metal parts, unless		N/A
	- separated from live parts (creepage distances and clearances have at least twice the value specified in clause 23), or		N/A
	- reliably connected to earth		N/A
	Unenclosed stack-type switches having a metal spindle pivoting in a metal base plate: creepage distances and clearances between live parts and the spindle, and between metal parts of the mechanism and base plate, have at least twice the values specified in clause 23		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.6	Requirements for switches operated indirectly		-
	Switches operated by means of a removable key or an intermediate part: key or an intermediate part can only touch parts which are insulated from live parts		N/A
	Key or intermediate part: insulated from metal parts of mechanism, unless		N/A
	Creepage distances and clearances between live parts and metal parts of mechanism have at least twice the values specified in clause 23		N/A
10.7	Requirements for switches with replaceable pull cord		-
	Cord-operated switches: impossible to touch live parts when fitting or replacing the pull cord		N/A
13	CONSTRUCTIONAL REQUIREMENTS		P
13.1	Mechanical requirements for insulating means		-
	Insulating lining, barriers and like: adequate mechanical strength and secured in a reliable manner		P
13.2	Installation requirements		-
	Switches constructed so as to permit:		-
	- easy introduction into the terminal and reliable connection of the conductors in the terminals, except for lead wires of pilot lights		N/A
	- correct positioning of the conductors		N/A
	- easy fixing of the switch to a wall or in a box	Claws / Direct mounting into the box via screws	P
	- adequate space between the underside of the main part and the surface on which the main part is mounted or between the sides of the main part and the enclosure (cover or box)		N/A
	Surface-type switches: fixing means do not damage insulation of the cable		N/A
	Switches comprising screwless terminals: connecting and/or disconnecting means of the screwless terminals cannot be activated by the conductors during and after installation of the switch in a box or on a wall		N/A
	Compliance is checked by inspection and in case of doubt by the following test		N/A
	The test is carried out with a solid copper conductor having the smallest cross-sectional area, as specified in 12.3.2 (mm ²)		N/A
	If it is not possible to exert a force onto the connecting / disconnecting means, the product is deemed to comply with the requirements of this sub clause without further tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During the application of the pull, the conductor do not come out of the screwless terminal		N/A
	Switches classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors or activating the connecting and/or disconnecting means of screwless terminals		P
13.3	Fixing of covers, cover plates and actuating members		-
13.3.1	Covers, cover-plates and actuating members or parts of them intended to ensure protection against electric shock:		-
	- held in place at two or more points by effective fixings		N/A
	- fixed by means of a single fixing, e.g. by a screw, provided that they are located by another means (e.g. by a shoulder)		N/A
	Where the fixing of covers, cover plates or actuating members of switches of design A serves to fix the main part there are means to maintain the main part in position, even after removal of the covers, cover plates or actuating members.		N/A
13.3.2	Covers, cover plates or actuating members whose fixing is of the screw-type:		-
	Compliance checked by inspection only		N/A
13.3.3	Covers, cover plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting / supporting surface (see table 12):		-
	- when their removal may give access, with the test probe B of IEC 61032, to live parts:	by the tests of 20.5	N/A
	- when their removal may give access, with the test probe B of IEC 61032, to non-earthed metal parts separated from live parts in such a way that creepage distances and clearances have the values at least equal to those shown in table 23:	by the tests of 20.6	N/A
	- when their removal may give access, with the test probe B of IEC 61032, only to	by the tests of 20.7	N/A
	- insulating parts, or		N/A
	- earthed metal parts, or		N/A
	- metal parts separated from live parts in such a way that creepage distances and clearances have at least twice the values shown in table 23, or		N/A
	- live parts of SELV circuits not greater than 25 V AC and 60 V DC:		N/A
13.3.4	Covers, cover-plates or actuating members whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's instructions given in an instruction sheet or catalogue:		-

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Clause	Requirement + Test	Result - Remark	Verdict
	By the same tests of 13.3.3 except that the covers, cover plates, actuating members or parts of them need not come out when applying a force not exceeding 120 N in directions perpendicular to the mounting / supporting surface		P
13.4	Openings in normal use		-
	Switches: no free openings in their enclosures according to their IP classification		P
13.5	Attachment of knobs		-
	Knobs of rotary switches securely attached to the shaft or part operating the mechanism		N/A
	- axial pull be applied for 1 min to try to pull off the actuating member		N/A
	- axial pull is likely to be applied in normal use, the force is 30 N		N/A
	- axial pull is unlikely to be applied in normal use, the force is 15 N		N/A
	- knob of switches having only one direction of operation: turned 100 times in the reverse direction		N/A
	During the test: knob not become detached		N/A
13.6	Mounting means		-
	Screws or other means for mounting the switch on a surface or in a box or enclosure: easily accessible from the front	Claws / Direct mounting into the box via screws	P
	Fixing means not serve any other fixing purpose		P
13.7	Combination of switches		-
	Combinations of switches, or of switches and socket-outlets, comprising separate bases: correct position of each main part is ensured		N/A
	Fixing of each main part be independent of the fixing of the combination to the mounting surface		N/A
13.8	Accessories combined with switches		-
	Accessories combined with switches: comply with their standard		N/A
13.9	Surface-type switches having an IP code higher than IP20		-
	Surface-type switches with IP > 20 are in according to their classification when fitted with conduits or with sheathed cables		N/A
	Surface-type switches with IPX4, IPX5 and IPX6 have provisions for opening a drain hole		N/A
	Switches provided with a drain hole: it is not less than 5 mm in diameter, or 20 mm ² in area with a width and a length not less than 3 mm : Ø mm / mm ²		N/A
	Drain hole: effective		N/A
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
13.10	Installation in a box		-
	Switches to be installed in a box: conductor ends can be prepared after the box is mounted in position, but before the switch is fitted in the box		N/A
	Main part has adequate stability when mounted in the box		N/A
13.11	Connection of a second current-carrying conductor		-
	Surface-type switches with IP > IPX0, pattern numbers 1, 5 and 6, with more than one inlet opening, provided with:		-
	- fixed additional terminal complying with the requirements of clause 12, or		N/A
	- adequate space for a floating terminal		N/A
13.12	Inlet openings		-
	Inlet openings: allow the introduction of the conduit or the sheath of the cable		N/A
	Surface-type switches: intended conduit or the sheath of the cable can enter at least 1 mm into the enclosure		N/A
	Inlet openings for conduit entries of surface-type switches: capable of accepting conduit sizes of 16, 20, 25 or 32 or a combination of at least two of these sizes not excluding two of the same size		N/A
	Inlet openings for cable entries of surface-type switches: capable of accepting cables having the dimensions specified in table 13 or be as specified by the manufacturer: rated current (A); limits of external diameter of cables min/max (mm).....		N/A
13.13	Provision for back entry from a conduit		-
	Surface-type switches: provision for back entry (if are intended)		N/A
13.14	Switch provided with membranes or the like for inlet openings		-
	Switch is provided with membranes or the like for inlet openings: replaceable		N/A
13.15	Requirements for membranes in inlet openings		-
13.15.1	Membranes are reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N/A
	Test on membranes subjected to the ageing treatment specified in 15.1 and fitted with the switches		-
	Switches placed at 40 °C for 2 h. Force of 30 N applied for 5 s by means of the tip of test probe 11 of IEC 61032. During the test: no deformation, live parts not accessible		N/A
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated with membranes not subjected to any treatment		N/A
13.15.2	Membranes be so designed and made of such material that: Introduction of the cables into the switch is permitted when the ambient temperature is low.		N/A
	Test on membranes not subjected to the ageing treatment, those without opening being suitably pierced:		-
	Switches kept at a temperature of $(-15 \pm 2) ^\circ\text{C}$ for 2 h: possibility to introduce cables of the heaviest type through the membranes		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A
13.16	Pilot light units		-
	Pilot light units comply with IEC 60669-2-1:2002, IEC 60669-2-1:2002/AMD1:2008 and IEC 60669-2-1:2002/AMD2:2015, 101.1.1.1 and Clause 102, as far as applicable		N/A
15	RESISTANCE TO AGEING, PROTECTION PROVIDED BY ENCLOSURES OF SWITCHES, AND RESISTANCE TO HUMIDITY		P
15.1	Resistance to ageing		-
	Switches are resistant to ageing		P
	Parts intended for decorative purposes only, such as certain lids, are removed		N/A
	Switches and boxes placed for 7 days (168 h) in a heating cabinet at $70 ^\circ\text{C} \pm 2 ^\circ\text{C}$		P
	- no crack visible after test with normal or corrected vision without additional magnification		P
	- no sticky or greasy material as a result of heat		P
	- no trace of cloth (forefinger pressed with 5 N)		P
	- no damage		P
15.2	Protection provided by enclosures of switches		-
15.2.1	General		-
	Enclosure of the switch provides protection against access to hazardous parts, against harmful effect due to ingress of solid foreign objects and against effects due to ingress of water in accordance with the IP classification of the switch	IP55	P
15.2.2	Protection against access to hazardous parts and against harmful effects due to ingress of solid foreign objects		-
15.2.2.1	General		-
	Glands: torque (Nm) (2/3 of torque applied in 20.4) :		N/A
	Screws of the enclosure: torque (Nm) (2/3 table 5)		N/A
	Parts which can be removed without the aid of a tool are removed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Glands are not filled with sealing compound or the like		N/A
15.2.2.2	Protection against access to hazardous parts		-
	Appropriate test according to IEC 60529: IP55		P
15.2.2.3	Protection against harmful effects due to ingress of solid foreign objects		-
	Appropriate test according to IEC 60529: IP55		P
	For the test of the first characteristic numeral 5, enclosures of switches are considered to be of category 2 (see IEC 60529:1989 and IEC 60529:1989/AMD1:1999, 13.4); dust not penetrate in a quantity to interfere with satisfactory operation or impair safety	No dust inside	P
	For the test of the first characteristic numeral 6, enclosures of switches are considered to be of category 1 (see IEC 60529:1989, 13.6); no dust penetrate		N/A
15.2.3	Protection against harmful effects due to ingress of water		-
	Enclosure of switches provide a degree of protection against harmful effects due to ingress of water in accordance with their IP classification	IP55	P
	Appropriate test according to IEC 60529: IP55		P
	Flush-type and semi-flush-type switches fixed:		-
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		P
	- in a test wall according to figure 21		N/A
	Screws of the enclosure: torque (Nm) (2/3 table 5): 0,53 Nm		P
	Glands: torque (Nm) (2/3 of torque applied in table 22):		N/A
	Specimens withstand an electric strength test specified in 16.3 which is started within 5 min of completion of the test to 15.2		P
15.3	Resistance to humidity		-
	Switches proof against humidity which may occur in normal use		P
	Compliance checked by a humidity treatment described in 15.3, carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 %. Specimens kept in the cabinet for:		-
	- 2 days (48 h) for switches with IPX0		N/A
	- 7 days (168 h) for switches with IP>X0	IP55	P
	After this treatment: specimens show no damage		P
16	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
16.1	General		P
	One pole of any pilot lights (if available), are disconnected for this test		N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation resistance and electric strength of switches be adequate		P
16.2	Test for measuring the insulation resistance		-
	The insulation resistance measured 1 min after application of 500 V DC	See appended table 16.2	P
	In addition, if electrically independent pattern numbers are combined in a common base, additional tests for each combination performed		N/A
16.3	Electric strength test		-
	Electric strength: AC test voltage applied for 1 min	See appended table 16.3	P
	In addition, if electrically independent pattern numbers are combined in a common base, additional tests for each combination performed		N/A
20	MECHANICAL STRENGTH		P
20.1	General		-
	Accessories, surface mounting boxes, screwed glands and shrouds have adequate mechanical strength so as to withstand the stresses imposed during installation and use		P
20.2	Pendulum hammer test		-
	For all types of switches and for boxes: impact test (9 blows)	See appended table 20.2	P
	After the test: no damage, live parts no become accessible		P
20.3	Test on the main parts of surface-type switches		-
	Main parts of surface-type switches are first fixed to a cylinder of rigid steel sheet of radius equal to 4,5 times the distance between fixing holes (mm).. :		N/A
	Main parts are then fixed in a similar manner to a flat steel sheet		N/A
	Torque applied to fixing screws (Nm) :		N/A
	During and after the test: main parts show no damage		N/A
20.4	Screwed glands		-
	Screwed glands of switches with that have IP code higher than IP20: torque test		-
	- diameter of cylindrical metal test rod (mm) :		N/A
	- type of material..... :	metal / moulded material	N/A
	- torque for 1 min (table 22) (Nm)..... :		N/A
	After the test: no damage of glands and enclosure of the specimens		N/A
20.5	Covers, cover plates or actuating members – accessibility to live parts		-
20.5.1	General		-
	Force necessary for covers, cover-plates or actuating members to come off or not to come off (accessibility with the test finger to live parts)		-

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
20.5.2	Verification of the non-removal of covers, cover-plates or actuating member		-
	Force applied for 1 min in direction perpendicular to the mounting surface.....: 40 N / 80 N		N/A
	Covers, cover-plates or actuating members not come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 13)		N/A
	Covers, cover-plates or actuating members not come off		N/A
	After the test: no damage		N/A
20.5.3	Verification of the removal of covers, cover plates or actuating members		-
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers, cover-plates or actuating members come off		N/A
	Test repeated on new specimens with a sheet of hard material, 1 mm \pm 0,1 mm thick, fitted around the supporting frame (fig. 13)		N/A
	Covers, cover-plates or actuating members come off		N/A
	After the test: no damage		N/A
20.6	Covers, cover plates or actuating members – accessibility to non-earthed metal parts separated from live parts		-
	Test is made as described in 20.5, but applying, for 20.5.2, the following forces: 10 N / 20 N		N/A
20.7	Covers, cover plates or actuating members – accessibility to insulating parts, earthed metal parts, the live parts of SELV \leq 25 V AC or metal parts separated from live parts		-
	Test is made as described in 20.5, but applying, for 20.5.2, the force of 10 N for all covers, cover plates, or actuating members		N/A
20.8	Covers, cover plates or actuating members – application of gauges		-
	Test with gauge of figure 14 applied according to figure 15 for verification of the outline of covers, cover-plates or actuating members: distances between face C of gauge and outline of side under test, not decrease: <u>complying</u> / not complying		P
20.9	Grooves, holes and reverse tapers		-
	Test with gauge according to figure 17 applied as shown in figure 18 (1 N): gauge not enter more than 1 mm: <u>complying</u> / not complying		P
20.10	Additional test for cord-operated switch		-
	Operating members of cord-operated switch have adequate strength		N/A
	Pull test: pull 100 N for 1 min (normal use); pull of 50 N for 1 min (unfavourable direction). After the test:		-

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Clause	Requirement + Test	Result - Remark	Verdict
	- switch show no damage		N/A
	- operating member not broken and cord-operated switch still operate		N/A
21	RESISTANCE TO HEAT		P
21.1	General		-
	Switches and boxes are sufficiently resistant to heat		P
	Decorative parts are not subjected to the test		P
21.2	Basic heating test		-
	Switches kept for 1 h in a heating cabinet at a temperature of 100 °C ± 2 °C		-
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test: no access to live parts, markings still legible		P
21.3	Ball-pressure test on parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position		-
	Parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position: ball-pressure test (1 h, 125 °C)	See appended table 21.3	N/A
21.4	Ball-pressure test on parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position		-
	Parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)	See appended table 21.4	P
24	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		-
24.1	Resistance to abnormal heat and to fire		-
	Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety are not unduly affected by abnormal heat and fire		P
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11	See appended table 24.1	P
24.2	Resistance to abnormal heat and to fire		-
	Parts of insulating material retaining live parts in position of switches with IP>X0: of material resistant to tracking	No parts retaining current carrying parts in position	N/A
	Tracking test with solution A of IEC 60112	See appended table 24.2	N/A

IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
16.2	TABLE: Insulation resistance		P
Item per table 15	test voltage applied between:	measured (MΩ)	required (MΩ)
1	All poles together – outside of enclosure	> 100	> 5
Supplementary information: For this test general purpose switch was inserted in enclosure and appropriate test was performed			

16.3	TABLE: Dielectric strength		P
	Rated voltage (V)	250 V	
item per table 15	test voltage applied between:	test voltage (V)	flashover / breakdown (Yes/No)
1	All poles together – outside of enclosure	2000 V	No
Supplementary information: For this test general purpose switch was inserted in enclosure and appropriate test was performed			

20.2	TABLE: Impact resistance			P
part of enclosure tested per table 21 (A, B, C, D)	blows per part	height of fall (mm)	comments	
A	5	80	No damage	
Supplementary information:				

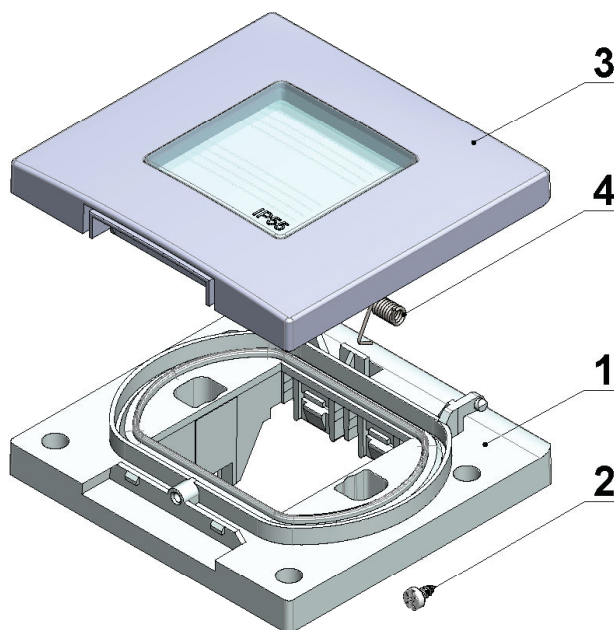
21.3	TABLE: Ball pressure test of thermoplastic materials				N/A
	Allowed impression diameter (mm)		≤ 2 mm		
part under test		material designation		test temperature (°C)	impression diameter (mm)
Supplementary information:					

21.4	TABLE: Ball pressure test of thermoplastic materials			P
	Allowed impression diameter (mm)	≤ 2 mm		
part under test		material designation	test temperature (°C) ⁽¹⁾	impression diameter (mm)
Main part		ELIX ABS P2H--AT	70°C	< 1,0 mm
Supplementary information:				

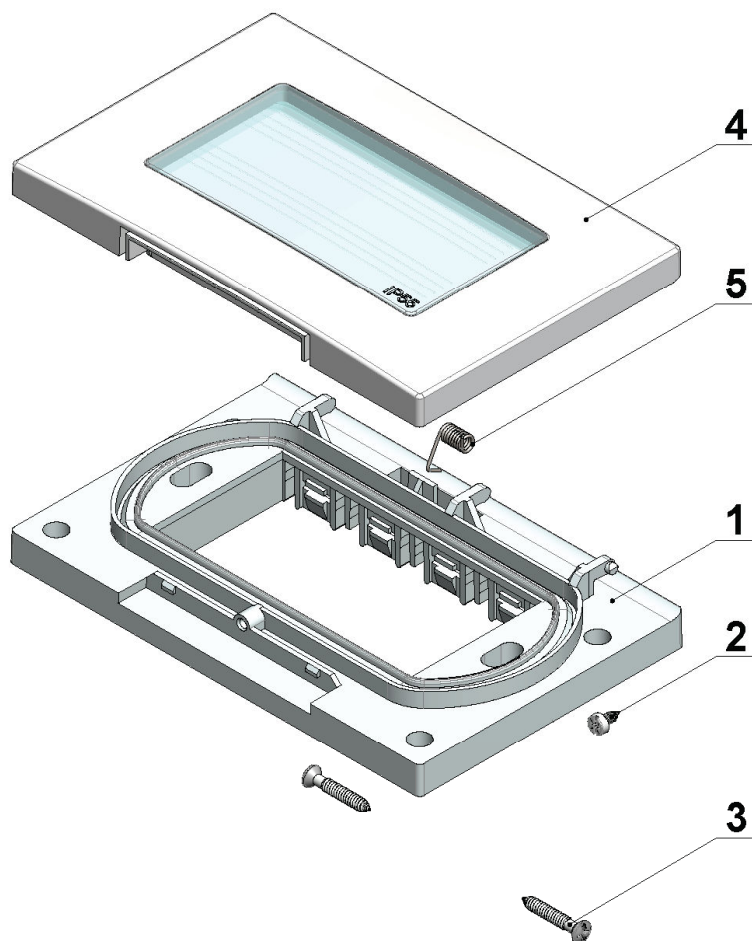
IEC 60669-1			
Clause	Requirement + Test	Result - Remark	Verdict
24.1	TABLE: Glow-wire test		P
part under test	material designation	test temperature (°C)	remarks
Main part	ELIX ABS P2H--AT	650°C	P
Transparent cover	PVC T6001	650°C	P
Supplementary information:			

24.2	TABLE: Resistance to tracking		N/A
	Number of drops.....:	50	
part under test	material designation	test voltage (V)	flashover / breakdown (Yes/No)
		175	
Supplementary information: No current carrying parts			

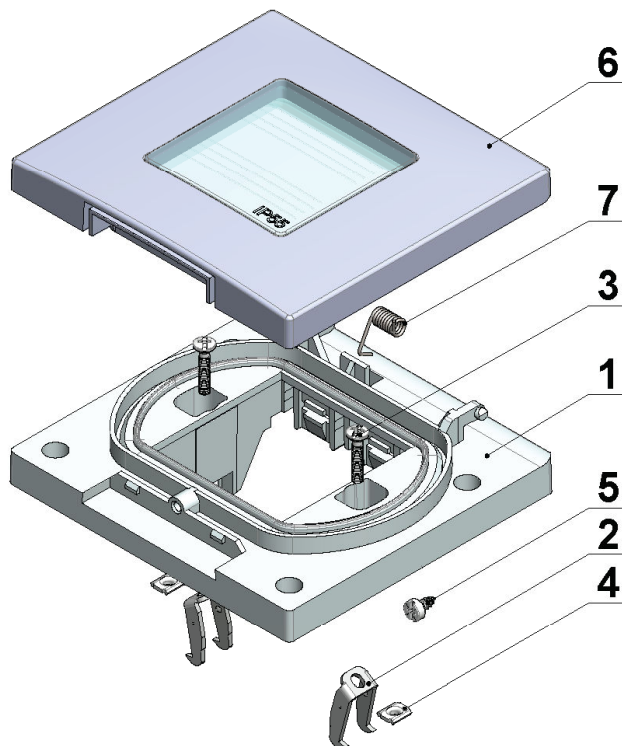
Enclosure No. 1 (Technical documentation)




4	Opruga poklopca kućišta IP55		art.71422.05		1	1.1200		gal Zn 5
3	Poklopac kućišta IP55 EXP 2M sklop		PSK.71422.2		1			
2	Vijak za lim A2,9x6,5		1000191		1	5.8	1000191	gal Zn 5
1	Blok kućišta u zid sa vijcima IP55 EXP 2M sklop		PSK.71432.1		1			
Poz.	Naziv		Oznaka		Kom.	Materijal	Dim./ Šifra za nabavku	Napomena
		Materijal				Površinska zaštita		Termička obrada
		Dim./Šifra za nabavku				ID Broj	Masa	Razmera
	Sklop	Kom.				008500	80.508	1:1.5
Pripadnost 71000-Prirubnice i nosaci_EXPERIENCE						Naziv		
				Tolerancije slobodnih mera		KUĆIŠTE MODULA EXP ZA U ZID IP55 SA VIJCIMA 2M		
	Datum	Ime						
Konstruisao	18.10.17.	Ognjen Samardžić		 ALING-CONEL GAJDOBRA				
Crtao	18.10.17.	Ognjen Samardžić						
Pregledao	15.01.19	Jovica Ristić						
Odobrio	15.01.19	Jovica Ristić						
						Oznaka	Revizija	
						art.71432		02



5	Opruga poklopca kućišta IP55		art.71422.05	1	1.1200		gal Zn 5
4	Poklopac kućišta IP55 EXP 4M sklop		PSK.71424.2	1			
3	Vijak 3,5x20 za prirubnicu		art.6513.02	2	5.8	1000147	gal Zn 5 žuto
2	Vijak za lim A2,9x6,5		1000191	1	5.8	1000191	gal Zn 5
1	Blok kućišta u zid sa vijcima IP55 EXP 4M sklop		PSK.71434.1	1			
Poz.	Naziv		Oznaka	Kom.	Materijal	Dim./Šifra za nabavku	Napomena
		Materijal			Površinska zaštita	Termička obrada	
		Dim./Šifra za nabavku			ID Broj	Masa	Razmera
Sklop	Kom.				008477	106.421	1:1.5
Prilagodnost					Naziv		
71000-Prirubnice i nosaci_EXPERIENCE					KUĆIŠTE MODULA EXP ZA U ZID IP55 SA VIJCIMA 4M		
			Tolerancije slobodnih mera		Oznaka art.71434		
Konstruisao	Datum	Ime	 ALING-CONEL GAJDOBRA				
Crtao	18.10.17.	Ognjen Samardžić					
Pregledao	15.01.19	Jovica Ristić					
Odobrio	15.01.19	Jovica Ristić					
					Revizija 02		



7	Opruga poklopca kućišta IP55	art.71422.05	1	1.1200		gal Zn 5	
6	Poklopac kućišta IP55 EXP 2M sklop	PSK.71422.2	1				
5	Vijak za lim A2,9x6,5	1000191	1	5.8	1000191	gal Zn 5	
4	Navrtka stegača	art.605.23	2	1.0330 (DC01)	605.23	Cinkovanje	
3	Vijak M3x14 ISO 7047 modifikovan	1000197	2	5.8	1000197	gal Zn 5	
2	Stegač uža	art.605.22	2	1.0330 (DC01)	605.22	Cinkovanje	
1	Blok kućišta u zid sa stegačima IP55 EXP 2M sklop	PSK.71442.1	1				
Poz.	Naziv		Oznaka	Kom.	Materijal	Dim./Šifra za nabavku	Napomena
		Materijal			Površinska zaštita	Termička obrada	
		Dim./Šifra za nabavku			ID Broj	Masa	Razmera
Sklop	Kom.				008500	86.457	1:1.5
Pripadnost					Naziv		
71000-Prirubnice i nosaci_EXPERIENCE					KUĆIŠTE MODULA EXP ZA U ZID IP55 SA STEGAČIMA 2M		
					Tolerancije slobodnih mera		
	Datum	Ime	<div> ALING-CONEL GAJDOBRA</div>				
Konstruisao	19.10.17	Ognjen Samardžić					
Crtao	18.10.17.	Ognjen Samardžić					
Pregledao	15.01.19	Jovica Ristić					
Odobrio	15.01.19	Jovica Ristić					
					Oznaka	Revizija	
					art.71442		02

Enclosure No. 2 (Photos)



