



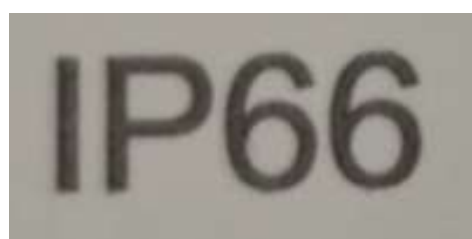
Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC 60670-22</b> <b>Boxes and enclosures for electrical accessories for household and similar fixed electrical installations</b> <b>Part 22: Particular requirements for connecting boxes and enclosure</b>	
Report Number.....	T211-0275/25
Date of issue.....	2025-04-01
Total number of pages .....	46 pages
Name of Testing Laboratory preparing the Report .....	SIQ Ljubljana Mašera-Spasićeva ulica 10, SI-1000 Ljubljana, Slovenia
Applicant's name .....	ALING – CONEL d.o.o.
Address.....	Železnička 10, 21432 Gajdobra, Serbia
<b>Test specification:</b>	
Standard .....	IEC 60670-22:2003, AMD1:2015 to be used in conjunction with IEC 60670-1:2015
Test procedure .....	CB Scheme
Non-standard test method .....	N/A
Test Report Form No. ....	IEC60670_22A
Test Report Form(s) Originator ....	IMQ
Master TRF .....	Dated 2017-02
<b>Copyright © 2017 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.</b>	
This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.	
<b>This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.</b>	
<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

<b>Test item description .....</b>	Surface-mounted installation boxes	
<b>Trade Mark .....</b>	ALING – CONEL	
<b>Manufacturer .....</b>	ALING – CONEL d.o.o., Železnička 10, 21432 Gajdobra, Serbia	
<b>Model/Type reference .....</b>	“See general product information”	
<b>Ratings .....</b>	IP44 or IP66 (See general product information for details)	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	SIQ Ljubljana
<b>Testing location/ address .....</b>		Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, Slovenia SIQ Ljubljana is accredited by Slovenian Accreditation with accreditation number LP-009 in the field of testing (SIST EN ISO/IEC 17025).
<b>Tested by (name, function, signature) .....</b>		Nejc Krajnik (Service provider)
<b>Approved by (name, function, signature) ..</b>		Tibor Kokelj (Approved signatory)
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature) .....</b>		
<b>Approved by (name, function, signature) ..</b>		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Witnessed by (name, function, signature) .</b>		
<b>Approved by (name, function, signature) ..</b>		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address .....</b>		
<b>Tested by (name, function, signature) .....</b>		
<b>Witnessed by (name, function, signature) .</b>		
<b>Approved by (name, function, signature) ..</b>		
<b>Supervised by (name, function, signature) :</b>		

<b>List of Attachments (including a total number of pages in each attachment):</b> <ul style="list-style-type: none"> <li>- Attachment No.1: National deviations (3 pages)</li> <li>- Attachment No.2: Documentation (9 pages)</li> <li>- Attachment No.3: Photos (5 pages)</li> </ul>	
<b>Summary of testing:</b>	
<b>Tests performed (name of test and test clause):</b> All applicable tests were performed. See test report for details.	<b>Testing location:</b> SIQ Ljubljana Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, Slovenia
<b>Summary of compliance with National Differences (List of countries addressed):</b> All CENELEC countries	
<input checked="" type="checkbox"/> The product fulfils the requirements of IEC 60670-22:2003, AMD1:2015 to be used in conjunction with IEC 60670-1:2015 <input checked="" type="checkbox"/> The product fulfils the requirements of EN 60670-22:2006 to be used in conjunction with EN 60670-1:2005, A1:2013	

**Copy of marking plate: (examples)**

Test item particulars .....		
7.1 Nature of material	<input checked="" type="checkbox"/> 7.1.1	Insulating
	<input type="checkbox"/> 7.1.2	Metallic
	<input type="checkbox"/> 7.1.3	Composite
	<input type="checkbox"/> 7.1.4	Natural or synthetic rubber or mixture of both
7.2 type of installation	<input type="checkbox"/> 7.2.1	Flush, semi-flush in solid walls, ceilings or floors
	<input type="checkbox"/> 7.2.1.1	not suitable for installation into concrete
	<input type="checkbox"/> 7.2.1.2	suitable for installation into concrete with a maximum temperature during the casting process of +60 °C
	<input type="checkbox"/> 7.2.1.3	suitable for installation into concrete with a maximum temperature during the casting process of +90 °C
	<input type="checkbox"/> 7.2.2	Flush, semi-flush in hollow walls, hollow ceilings, hollow floors or furniture
	<input type="checkbox"/> 7.2.2.1	Class Ha
	<input type="checkbox"/> 7.2.2.2	Class Hb for walls
	<input type="checkbox"/> 7.2.2.3	Class Hb for ceilings
	<input checked="" type="checkbox"/> 7.2.3	Surface mounting on walls, ceilings, floors or furniture
7.3 type of inlets (outlets)	<input type="checkbox"/> 7.3.1	With inlets for sheathed cables for fixed installations
	<input checked="" type="checkbox"/> 7.3.2	With inlets for flexible cables (art.9201.xx; art.92021.xx; art.92031.xx; art.92041.xx)
	<input type="checkbox"/> 7.3.3	With inlets for plain or corrugated conduits
	<input type="checkbox"/> 7.3.4	With inlets for threaded conduits
	<input type="checkbox"/> 7.3.5	With inlets for other types of conductors/cables or conduits
	<input type="checkbox"/> 7.3.6	With spouts (hub)
	<input checked="" type="checkbox"/> 7.3.7	Without inlets. Inlet openings will be made during installation (art.9202.xx; art.9203.xx; art.9204.xx)
7.4 Clamping means	<input type="checkbox"/> 7.4.1	With cable retention
	<input type="checkbox"/> 7.4.2	With cable anchorage
	<input type="checkbox"/> 7.4.3	With clamping means for flexible conduit
	<input checked="" type="checkbox"/> 7.4.4	Without clamping means
7.5 Minimum temperatures during installation	<input type="checkbox"/> 7.5.1	-5 °C
	<input type="checkbox"/> 7.5.2	-15 °C
	<input checked="" type="checkbox"/> 7.5.3	-25 °C
7.6 degree of protection against access to hazardous parts and against harmful effects:		IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)
7.7 The degree of protection against harmful effects due to the ingress of water:		IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)
7.8 The degree of protection of the part mounted inside the hollow walls of the boxes classified according to 7.2.2.1	<input type="checkbox"/> 7.8.1	IP2X
	<input type="checkbox"/> 7.8.2	>IP2X
	<input type="checkbox"/> 7.8.3	Boxes intended to receive claws
	<input type="checkbox"/> 7.8.4	Boxes intended to receive other means

7.9	The provision for fixing accessories to boxes	<input type="checkbox"/> 7.9.1 boxes supplied with screws <input type="checkbox"/> 7.9.2 boxes intended to received screws <input type="checkbox"/> 7.9.3 boxes intended to received claws <input checked="" type="checkbox"/> 7.9.4 boxes intended to received other means
7.101	Method of fixing the terminals or connecting devices in the connecting box	<input type="checkbox"/> 7.101.1 With integrated clamping units <input type="checkbox"/> 7.101.2 With incorporated terminals or connecting devices <input type="checkbox"/> 7.101.3 With provisions for subsequent incorporation of terminals or connecting devices <input checked="" type="checkbox"/> 7.101.4 Without fixing (for floating terminals or connecting devices)

**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 ..... : 2018-10-01; 2025-02-07

Date (s) of performance of tests ..... : (2018-11-19) – (2019-04-03); (2025-02-10) – (2025-03-31)

**General remarks:**

The test results presented in this report relate only to the object tested.  
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(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 6.2.5 of IEC60068-2-2:**

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, 21432 Gajdobra,  
 Serbia

**General product information:**

Article number	Size	Number of inlets	IP code	Temperature rating
art.9201.xx	Ø 65 x 35 mm	4	IP44	-25°C...+60°C
art.9202.xx	100 x 100 x 50 mm	0	IP66	-25°C...+60°C
art.9203.xx	150 x 110 x 70 mm	0	IP66	-25°C...+60°C
art.9204.xx	150 x 110 x 120 mm	0	IP66	-25°C...+60°C
art.92021.xx	100 x 100 x 50 mm	8	IP66	-25°C...+60°C
art.92031.xx	150 x 110 x 70 mm	10	IP66	-25°C...+60°C
art.92041.xx	150 x 110 x 120 mm	10	IP66	-25°C...+60°C

xx – color code:

where first x is the color of body;

second x is the color of lid;

0 = white; 1 = grey

History sheet			
Report No.	Date	Change	Revision No.
T211-0275/19	2019-04-04	Initial Test Report issued.	—
T211-0275/25	2025-04-01	Rating of art.9202.xx, art.9203.xx, art.9204.xx, art.92021.xx, art.92031.xx, art.92041.xx changed from IP56 to IP66. IP6X testing performed. Typos corrected. Documentation changed.	1.0

Use of uncertainty of measurement for decisions on conformity (decision rule):

No decision rule is specified by the test method, when comparing the measurement result with the applicable limit according to the specification in the test method. »Pass/Fail« decisions on conformity are made based on "simple acceptance" without applying the measurement uncertainty (ISO/IEC Guide 98-4:2012, 8.3.1.2).

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>MARKING</b>		<b>P</b>
8.1	Boxes and enclosures are marked with:		P
	a) name, trade mark or identification mark of the manufacturer or the responsible vendor ..... :	ALING - CONEL symbol	P
	Enclosures are marked in addition with:		P
	b) IP code for degree of protection against access to hazardous part and against ingress of solid objects if higher than IP4X ..... :	IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)	P
	c) IP code against harmful ingress of water if higher than IPX2 ..... :	IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)	P
	d) marking on cover of flush enclosures for rough surfaces and where IP is dependent on the surface (Fig. 5) ..... :	IP ^^^	N/A
	IP code is marked on the outside of the enclosure so as to be easily discernible when the enclosure is mounted and wired as for normal use	Moulded on front surface; Laser engraved	P
	e) type reference, which may be a catalogue number ..... :	art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx; art.9201.xx	P
	f) for box classified as 7.2.2.2 and 7.2.2.3 the minimum internal volume shall be marked on the inside of the enclosure		N/A
	Information marked on the boxes and enclosures or provided by the manufacturer on the smallest package unit or in the instructions of the manufacturer:		P
	g) maximum temperature during the building process if 90 ° for box classified as 7.2.1.3		N/A
	h) necessary information concerning the openings which can be made during installation for boxes and enclosures classified according to 7.3.7 ..... :	In instructions	P
	i) minimum temperature during installation for boxes classified according to 7.5.2 and 7.5.3 ..... :	-25°C to 60°C	P
	j) symbol Ha for boxes classified according to 7.2.2.1, symbol Hb for boxes classified according to 7.2.2.2 and 7.2.2.3 :		N/A
	k) rated insulation voltage for boxes with integrated or incorporated terminals or connecting devices		N/A
	l) rated connecting capacity (mm <sup>2</sup> or □ or AWG) :		N/A
	m) maximum number of conductors to be placed in the box. .... :		N/A



IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	n)boxes and enclosures classified accord to 7.101.1 or 7.101.2 shall be marked with rated current		N/A
	Further information given in the manufacturer's catalogue or in an instruction sheet .....		P
	Higher degree of protection achieved by the use of special parts: an instruction sheet is provided and it indicates the higher degree of protection		N/A
8.2	Marking is durable and easily legible		P
	Rubbing test 15 s with water and 15 s with petroleum spirit		P
	After the test: marking still legible		P
<b>9</b>	<b>DIMENSIONS</b>		N/A
	Boxes and enclosures comply with the appropriate standard sheets, if any .....		N/A
<b>10</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		<b>P</b>
	In boxes and enclosures assembled, equipped and installed as for normal use in accordance with the manufacturer's instructions: live parts are not accessible		P
	Test probe 11 of IEC 61032 applied for 1 min with a force of 20 N do not penetrate in the internal volume of the enclosure, as show in Figure 2, which are accessible after installation		P
	Additional test at $(35 \pm 2) ^\circ\text{C}$ with probe 11 of IEC 61032 on enclosures according to 7.1.1 and 7.1.3 and 7.1.4 with parts of thermoplastic or electrometric material applied to:		P
	- all places, except membranes or the like, where yielding of insulating material could impair the safety, with a force of 75 N		P
<b>11</b>	<b>PROVISION FOR EARTHING</b>		N/A
11.1	Boxes and enclosures with exposed conductive parts		N/A
	- provided with an earthing means of low resistance		N/A
	- have provision for the fitting of such an earthing means		N/A
	Earthing means or provision for the fitting are located so that:		N/A
	- the means is readily accessible, and		N/A
	- the removal of an accessory, does not disturb the continuity of the earthing circuit, and		N/A
	- the means is not part of a removable cover		N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Exposed conductive parts of covers or cover-plates are connected through a low resistance connection to the earthing means		N/A
	Resistance $\leq 0,05 \Omega (\Omega)$ ..... :		N/A
	the earthing means or the provision for the fitting of such an earthing means shall be located so that:		N/A
	the means is readily accessible through the open face of the box		N/A
	the removal of an accessory mounted in the box does not disturb the continuity of the earthing circuit		N/A
	the means is not part of a removable cover, back, or side of the box		N/A
11.2	Boxes and enclosures of insulating material classified according to 7.2.2.2 and 7.2.2.3		N/A
	Provided with a minimum of one earthing strap with one screw terminal for earthing purposes with a connecting capacity $\geq 4 \text{ mm}^2$		N/A
	Design of earthing strap according to Figure 4		N/A
	Earthing strap is securely fastened to the box or enclosure		N/A
	Compliance is checked by the test in 16.3.2		N/A
11.3	Boxes and enclosures with removable sides according to 7.1.2		N/A
	Constructed so that the electrical bond between separable parts includes at least one threaded screw connection		N/A
11.4	Earthing terminal threads		N/A
	Threads of earthing terminal are not stripped		N/A
	Torque of Table 4 applied on screw (Nm) ..... :		N/A
	Greater values may be used if so stated by the manufacturer		N/A
	During the test: no damage such as impairing the further		N/A

<b>12</b>	<b>CONSTRUCTION</b>	<b>P</b>
12.1	Boxes and enclosures are constructed without sharp edges	P
	The inner and outer surfaces of a box or cover have the following characteristics:	P
	- not subject to peeling, scaling or flaking, and	P
	- smooth and free from blisters, crack and other defects	P
12.2	Lids, covers or cover-plates or part of them	P

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
12.2.1	Lids, covers or cover-plates or parts of them, such as protective membranes, which are intended to ensure protection against electric shock, are held in place effectively		P
	the fixing means of cover or cover plate be captive		P
	Fixing means of covers or cover plates if serve also to fix the connecting device, it maintains the connecting device in correct position after removal of the cover or cover plate		N/A
12.2.2	Screw-type fixing		P
	Box or enclosure intended to accept a lid, cover or cover plate by means of screw fixing is provided with means to accommodate the intended screws		P
	Lids, covers or cover-plates whose fixing is of the screw-type	art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx	P
12.2.3	Non-screw-type fixing operable without the use of a tool or a key		P
12.2.3.1	a box or enclosure intended to accept a lid, cover, or cover plate with non-screw-type fixing operable without the use of a tool or a key shall be provided with means to fix the lid, cover or cover plate	art.9201.xx (operable with use of a tool)	P
	Lids, covers or cover-plates whose removable is obtained by applying a force according to the requirements in table 2 in a direction perpendicular to the mounting surface when their removal may give access with test probe B of IEC 61032		P
	- to live parts		P
	- to non-earthed conductive parts separated from live parts by basic insulation		N/A
	- only to insulating parts, earthed conductive parts, conductive parts separated from live parts by double or reinforced insulation, or live parts of SELV circuits according to IEC 61140 having a voltage $\leq 25$ V a.c. or 60 V d.c.		N/A
12.2.3.2	Verification of the non-removal of the lids, covers or cover-plates		P
	Force according to Table 2 applied for 1 min in a direction perpendicular to the mounting surface .. :	10 N / 20 N / 40 N / <u>80 N</u>	P
	Lids, covers or cover-plates not come off		P
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, $(1 \pm 0,1)$ mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Lids, covers or cover-plates not come off	Surface-mounting boxes	N/A
12.2.3.3	Verification of the removal of the lids, covers or cover-plates		N/A
	Force not exceeding 120 N applied 10 times in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates come off	Operable with use of a tool	N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test: no damage		N/A
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, (1 ± 0,1) mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Force not exceeding 120 N applied 10 times in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates come off	Surface-mounting boxes	N/A
	Lids, covers or cover-plates come off		N/A
	After the test: no damage		N/A
12.2.3.4	Verification of the outline of lids, covers and cover-plates		P
	Gauge of Figure 6 applied according to Figure 7 for verification of the outline of lids, covers or cover-plates: distances between face C of gauge and outline of side under test, not decrease ..... : complying / <u>not complying</u>		—
12.2.3.5	Verification of grooves, holes and reverse tapers		P
	Gauge of Figure 9 applied according to Figure 10 with a force of (1 ± 0,2) N: gauge not enter more than 1 mm ..... : <u>complying</u> / not complying		—
12.2.4	Non screw-type fixing operable with the use of a tool or key		P
	Lids, covers or cover-plates whose fixing is not dependent on screws and whose removal is obtained by using a tool and/or a key according to the manufacturer's instructions: tests according to 12.2.3		P
	Force not exceeding 120 N applied in a direction perpendicular to the mounting/supporting surface: lids, covers or cover-plates need not come off	art.9201.xx	P
	For flush-mounting boxes or enclosures, test repeated on new specimens with a sheet of hard material, (1 ± 0,1) mm thick, fitted on the wall around the supporting frame according to Figure 5		N/A
	Lids, covers or cover-plates not come off		N/A
12.3	Drain holes		P
	Surface and semi-flush mounting enclosures having IPX1 to IPX6 allow the opening of a drain hole ≥ 5 mm in diameter (mm Ø) or 20 mm <sup>2</sup> in area (mm <sup>2</sup> ) with a width or length ≥ 3mm (mm) ..... :		P
	Drain holes: effective		P
12.4	Mounting of enclosures		P
	Enclosures have provisions for their suitable attachment according to the method of installation		P
	Conductive parts of fixing means inside the box or enclosure are surrounded by insulation which projects above the top of the fixing means by an amount of ≥ 10 % of the maximum width of the cavity for the fixing means (mm) ..... : > 10 %		P

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
12.5	Boxes and enclosures with inlets for flexible cables		P
	Inlets (outlets) provided in boxes and enclosures classified according to 7.3.2, the flexible cables can be easily introduced, and	art.9201.xx; art.92021.xx; art.92031.xx; art.92041.xx	P
	- no damage the flexible cable where it enter, or		P
	- enclosure impairing its further use		P
12.6	Boxes and enclosures with inlets for applications other than flexible cables		N/A
	Inlet openings classified according to 7.3 other than 7.3.2, if any, allow the introduction of:		N/A
	- a conduit or a suitable fitting, and/or		N/A
	- the protective covering of the cable		N/A
	Inlet opening for conduit entries:		N/A
	- capable of accepting either conduits of sizes, or a combination of sizes, according to IEC 60423 and/or IEC 60981		N/A
	- same requirement in at least two inlet openings if there are more than one		N/A
12.7	Boxes and enclosures with a cable anchorage(s)		N/A
	In boxes and enclosures classified according to 7.4.2 the connection of the conductors of the flexible cable are relieved from strain		N/A
	Clear how relief from strain and prevention of twisting is intended to be effected		N/A
	Cable anchorages are:		N/A
	- suitable for the different types of flexible cable		N/A
	- at least one part of it is integral with, or permanently fixed to, one of the component parts of the box		N/A
	- of insulating material or provided with an insulating lining fixed to the metal parts		N/A
	Test of effectiveness of the cable anchorage:		N/A
	- external dimensions of flexible cable (mm) ..... :		—
	- clamping screws tightened with a torque equal to 2/3 of that specified in Table 4 (Nm) ..... :		—
	- glands tightened with a torque equal to that specified in Table 5 ..... :		—
	It is not possible to push the flexible cable into the specimen by more than 1 mm with a force specified in Table 3 (N)..... :		N/A
	Pull force as specified in Table 3 applied 50 times for 1 s (N)..... :		—

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque as specified in Table 3 applied for $(15 \pm 1)$ s (Nm)..... :		—
	After the test: displacement $\leq 2$ mm (mm)..... :		N/A
	Cable anchorage: no damage		N/A
12.8	Boxes and enclosures with cable retention means		N/A
	Cable retention means of boxes and enclosures classified according to 7.4.1 retain the cable in place		N/A
	Boxes and enclosures according to 7.5.2 or 7.5.3, tested at $(-15 \pm 2)$ °C and $(-25 \pm 2)$ °C respectively		N/A
	Test with cables as declared by the manufacturer, fitted according to the manufacturer's instructions and loaded with an axial force of $(20 \pm 1)$ N applied for 1 min:		N/A
	Type of cable/maximum nominal cross-sectional area (mm <sup>2</sup> ) ..... :		—
	After the test: displacement $\leq 3$ mm (mm)..... :		N/A
	Type of cable/minimum nominal cross-sectional area (mm <sup>2</sup> ) ..... :		—
	After the test: displacement $\leq 3$ mm (mm)..... :		N/A
12.9	Knock-out inlets (outlets) intended to be removed by mechanical impact		N/A
12.9.1	General		N/A
	It is possible to remove knock-out by mechanical impact without damaging the box	No knock-outs	N/A
	Chips or burrs are not accepted in knock-out for cables		N/A
	Chips and burrs are disregarded in knock-out for conduits and/or for use with a grommet or a membrane		N/A
	In order to close an open knock-out in a box or an enclosure according 7.1.2 a blanking-plug used without a locknut:		N/A
	- not become dislodged, and		N/A
	- its effectiveness not be impaired, and		N/A
	- it fulfil all requirements for knock-outs		N/A
12.9.2	Knock-out retention		
	Boxes and enclosures having knock-outs, accessible after installation by means of a 6 mm diameter mandrel with a flat end that:		N/A
	- not provide access to live parts, a force of $(30 \pm 1)$ N applied for $(15 \pm 1)$ s		N/A
	- provide direct access to live parts, a force of $(40 \pm 1)$ N applied for $(60 \pm 1)$ s		N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Box with multi-stage knock-outs, the force applied to the smallest		N/A
	During the test: knock-out remains in place		N/A
	Degree of protection unchanged 1 h after the test		N/A
12.9.3	Knock-out removal		N/A
	Removal test of knock-outs with a tool as stated by the manufacturer, without conditioning:		N/A
	During the test: no displacement of a larger stage of multi-stage knock-outs when a smaller stage is removed		N/A
	After the test: no sharp edges, box and enclosure is not damaged		N/A
	Removal test of knock-outs with a tool as stated by the manufacturer, immediately following a conditioning at the minimum temperature specified according to 7.5 for 5 h $\pm$ 10 min (boxes and enclosures according to 7.1.1 or 7.1.3)		N/A
	Test temperature (°C)..... :		—
	During the test: no displacement of a larger stage of multi-stage knock-outs when a smaller stage is removed		N/A
	After the test: no sharp edges, box and enclosure is not damaged		N/A
12.9.4	Flat surfaces surrounding knock-outs		N/A
	Knock-outs intended for the use of grommets, glands or fittings shall be located in flat surfaces		N/A
	projections in the flat surface shall be prohibited		N/A
12.10	Screw fixings		P
	Fixing means effected by screws withstand mechanical stresses	art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx	P
	Screw or other fixing means made from insulating material without standardized thread are tested according to the manufacturer's instruction		N/A
	Thread-forming or thread-cutting screws used only if supplied together with one of the pieces with which they are intended to be inserted		N/A
	Verification of the mechanical strength of screws	See appended table 12.10	P
12.11	Fixing of boxes and enclosures classified according to 7.2.1		N/A
	Fixing means provided for flush type boxes and enclosures other than for hollow walls.....:		N/A
	Screws not supplied with box or enclosures can be provided according to the manufacturer's instruction		N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Screws, additional mechanical supports or design features, are considered adequate fixing means		N/A
	Boxes and enclosures not fulfilling at least one of the above requirement and having an internal volume less than 400 cm <sup>3</sup> tested as follow:		N/A
	- the block is filled by the following material.....:		N/A
	- assembly is kept at ambient temperature for 10 (+1/0) days		—
	- auxiliary device described in Figure 13 is mounted on the specimen and the screw are tightened with a torque equal to 2/3 of that specified in table 4.....:		—
	After the test, displacement of the specimen from the mounting block ≤ 0,5 mm:		N/A
12.12	Boxes and enclosures classified according to 7.2.2.1		N/A
	Boxes and enclosures for hollow walls or the like classified according to 7.2.2.1 provide suitable means for fixing the box or the enclosure to hollow walls , hollow ceilings, hollow floor or furniture		N/A
	Fixing means not rely the on the cable management system		N/A
	Box or enclosure mounted in a test wall:		N/A
	- according to the manufacturer's instructions		—
	- sheet of plywood 500 mm wide x 500 mm high, (10 ± 1) mm thick		—
	a) Pull and torque test: lever loaded with a torque of 3 Nm (Figure 15a) and a force of 100 N (Figure 15b) for 1 min		N/A
	After this tests: no damage, displacement of the lever no more than 2 ° (°) .....:		N/A
	b) Displacement test: lever loaded with a torque of 3 Nm (Figure 15c) for 1 min		N/A
	After the test: edge of the box not displaced by more than 1 mm (mm) .....:		N/A
12.13	boxes and enclosures classified according to 7.2.2.2 and 7.2.2.3		N/A
	boxes and enclosures for hollow walls or the like classified according to 7.2.2.2 and 7.2.2.3 shall have suitable means for fixing the box to hollow walls and hollow ceiling		N/A
	the fixing means shall not rely on cable management system		N/A
	the compliances is checked by the tests in 12.13.2, 12.13.3, 12.13.4 or 12.13.6 as applicable		N/A
12.13.2	Boxes intended for mounting to a wood structural member of a wall		N/A
	Box mounted to a (45 x 90) mm wood structural member in a vertical position; force of 225 N applied for 5 min		N/A



IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test: no pulling out of the nails or screws		N/A
	No movement of the face of the box of more than 3 mm (mm) .....		N/A
12.13.3	Boxes intended for mounting to a wood structural member of a ceiling		N/A
	Box mounted to a (35 x 190) mm wood structural member in vertical position; force of 225 N applied for 1 min		N/A
	During the test: deflection of the face of the box does not exceed 6 mm (mm) .....		N/A
12.13.4	Boxes intended for mounting to a steel-stud structural member of a wall		N/A
	Box mounted to a steel-stud structural member according to Figure 16; force of 180 N applied for 5 min in the direction to push the box into the wall opening		N/A
	During the test with a force of 180 N applied for 5 min in the direction to push the box into the wall opening: deflection of the box does not exceed 2 mm (mm) .....		N/A
	During the test with a force of 180 N applied for 5 min in the direction to pull the box out of the wall opening: deflection of the box does not exceed 2 mm (mm) .....		N/A
12.13.5	Internal volume of boxes and enclosures classified according to 7.2.2.2 and 7.2.2.3		N/A
	Verification of the declared internal volume for boxes, enclosures, raised covers and box extensions		N/A
	Verification of the volume of each partitioned section for box or enclosure with a partition		N/A
	Checked by the test of clause 12.16		N/A
12.13.6	Boxes intended for mounting in a finished structure		N/A
	Supporting means not crack or break nor the face of the box be permanently displaced more than 3,2 mm from the plane of the face of the test surface when measured 1 minute after the test load is removed		N/A
	Six boxes intended for use in walls or eight boxes intended for use in ceilings are installed in prescribed plywood sheet or in a finished surface in accordance with the manufacturer's instructions		—
	Screws for the box supporting means are tightened as follow:		N/A
	- in accordance with the manufacturer's instructions or		N/A
	- in accordance with column 4 of Table 4.		N/A
	Following installation, a force of 222 N is applied for 5 min		N/A
12.14	Cable gland entry		N/A
	Torque test: glands provided with a metal rod tightened and loosened 10 times with a torque specified in Table 5 for 1 min ± 5 s		N/A
	- diameter of test rod (mm) .....		—

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- type of material (metal / insulating)..... :		—
	- torque (Nm) ..... :		—
	After the test: no damage		N/A
12.15	Boxes and enclosures with inlets (outlets) or spouts (hubs) for conduits		N/A
12.15.1	Boxes and enclosures classified according to 7.3.4 and conical spouts as in 7.3.6 withstand the tests of 12.15.2, 12.15.3 and 12.15.4		N/A
	Boxes and enclosures classified according to 7.4.3 withstand the tests of 12.15.2 and 12.15.3		N/A
12.15.2	Enclosures with inlet spout for conduits: a minimum size piece of conduit pressed for 1 min $\pm$ 5 s with a force of $(100 \pm 2)$ N		N/A
	During the test: inlet spout prevents further entry of the conduit into the box		N/A
12.15.3	Pull-out test after the test according to 12.15.2: conduit with the minimum size corresponding to the insert opening loaded for 1 min with a tensile force of $(20 \pm 2)$ N		N/A
	During the test: conduit not come loose from the inlet spout of the enclosure		N/A
12.15.4	Resistance to bending strain of an inlet spout: piece of conduit inserted into the inlet spout with a compressible force of $(100 \pm 2)$ N and loaded with a bending moment of 3 Nm for 1 min in six different directions with an interval of $(60 \pm 2)^\circ$		N/A
	During the test: inlet spout not come loose or damaged and conduit stays within the inlet spout		N/A
12.16	Internal volume of boxes and enclosures		N/A
	Declared internal volume of the box or enclosure and each partitioned section of a box or enclosure, raised cover and box extension is measured		N/A
	The volume of a side pocket provided to increase the volume of a box or enclosure is calculated using a depth-of-pocket not more than the smallest dimension of the opening into that side pocket		N/A
	Difference in the volume of water in the measuring cylinder measured before and after the filling of the box, enclosure or raised cover indicates the volume of the box .....		N/A
12.101	Connecting boxes have adequate space to allow the correct connection of conductor specified in the relevant sections of Part 2 of IEC 60998		N/A
	Maximum number of conductors of maximum cross-sectional areas or the most unfavourable combination .....		N/A
	Test made on boxes classified according to 7.101.4 only if l) and m) of 8.1 are marked or declared	Not declared	N/A
12.102	Retention means for terminals or connecting devices withstand the mechanical stresses	For floating terminals or connecting devices	N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Connected conductors in accordance with the relevant Part(s) 2 of IEC 60998 for the type of connecting device used..... :		—
	After the test: no harmful deformation, cracks or similar damage ..... :		N/A
12.103	Connecting boxes classified according to 7.101.1, 7.101.2 and 7.101.3 comply with temperature rise requirements of 16.102		N/A

<b>13</b>	<b>RESISTANCE TO AGEING, PROTECTION AGAINST INGRESS OF SOLID OBJECTS AND AGAINST HARMFUL INGRESS OF WATER</b>		<b>P</b>
13.1	Resistance to ageing		P
13.1.1	Specimens of insulating and composite boxes and enclosures, glands, grommets and replaceable membranes placed in a heating cabinet at $(70 \pm 2)^\circ\text{C}$ for $(168 \pm 4)$ h and then kept at room temperature for $(96 \pm 4)$ h		P
	Glands tightened with a torque equal to 2/3 of the torque applied during the test of 12.14 (Nm) ..... :	/	—
	Greater torque value stated by the manufacturer, if any (Nm) ..... :	/	—
	After the test: no harmful deformation or similar damage		P
13.1.2	Grommets, blanking-plug and entry membranes in inlet openings and protecting membranes are reliably fixed and are not displaced by the mechanical and thermal stresses occurring in normal use		P
	Specimens that have been subjected to the treatment specified in 13.1.1 placed in a heating cabinet at $(40 \pm 2)^\circ\text{C}$ for $2\text{ h} \pm 15\text{ min}$		P
	Immediately after this period the tip of test probe 11 of IEC 61032 is applied for $(5 \pm 1)$ s with a force of $(30 - 2)$ N. During the tests: grommets, blanking-plug and/or membranes not deformed to such an extent that live parts of any included accessory become accessible	No accessibility to live parts	P
	Grommets, blanking-plug and/or membranes likely to be subjected to an axial pull: axial pull of $(30 - 2)$ N applied for $(5 \pm 1)$ s. During the tests: grommets, blanking-plug and/or membranes not deformed to such an extent that live parts of any included accessory become accessible	No accessibility to live parts	P
	Test repeated on same enclosures fitted with grommets, blanking-plug and/or membranes not subjected to any treatment		P
	After the test: no harmful deformation, cracks or similar damage		P

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
13.1.3	Grommets, blanking-plug and entry membranes in inlet openings of boxes and enclosures classified according to 7.5.2 and 7.5.3: introduction of the cables and conduit permitted when the ambient temperature is low		P
	Test on enclosures fitted with grommets, blanking-plug and/or membranes not subjected to any ageing treatment kept for 2 h in a refrigerator		P
	Test temperature (°C) ..... : -25°C		—
	Immediately after conditioning: it is possible to pierce any blind grommets, blanking-plug and entry membranes and to introduce cables and conduit of the maximum diameter intended		P
	After the test: no harmful deformation, cracks or similar damage		P
13.2	Protection against the ingress of solid objects		P
	Enclosures provide a degree of protection against the ingress of solid objects in accordance with the declared IP code ..... : IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)		P
	for box and enclosures classified according to 7.2.2.1 the above requirements applies also to the part mounted inside the hollow wall according to classification 7.8		N/A
	compliance is checked by the appropriate test of IEC 60529 under the following tests conditions		P
	Enclosures mounted as in normal use according to the manufacturer's instructions		P
	box and enclosures classified according to 7.2.2.1, the test on the part mounted inside the wall is made on a box mounted so that the rear part is accessible for the test		N/A
	unless otherwise stated herein, where the enclosure has drain holes, at least one open drain hole shall be in the lowest position		P
	- type of cable, smallest cross-sectional area (mm²) ..... : According to instruction sheet		—
	- type of cable, largest cross-sectional area (mm²): According to instruction sheet		—
	Enclosures mounted as in normal use with screwed glands or grommets fitted with conduits as declared by the manufacturer:		N/A
	- smallest diameter or dimensions (mm) ..... : —		—
	- largest diameter or dimensions (mm)..... : —		—

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Fixing screws of the cover or cover-plate tightened with a torque equal to 2/3 of the value of Table 4 used for the test of 12.10 (Nm) .....	0,80 Nm (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx) as specified by manufacturer in instructions	—
	Greater torque value stated by the manufacturer, if the relevant information is provided (Nm) .....	-	—
	- IP5X: test performed as specified in IEC 60529 category 2 with the drain holes, if any, not opened		N/A
	- IP≤4X: test probe does not pass through any opening other than drain holes	art.9201.xx	P
	- IP≤4X: test probe applied on drain holes does not touch live parts within the enclosure	art.9201.xx	P
	- IP5X: dust does not cover the whole inner surface		N/A
	- IP6X: there is no dust inside the box or enclosure	art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx	P
13.3	Protection against harmful ingress of water		P
13.3.1	Enclosures with IP>X0 provide a degree of protection against harmful ingress of water in accordance with the declared IP code .....	IP44 (art.9201.xx); IP66 (art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx)	P
	Enclosure dimensions: reference surface S (m²) / perimeter (m) .....	Reference surfaces – see below	—
	Appropriate test performed on surface, flush or semi-flush enclosures as specified in IEC 60529 under the following conditions:		P
	- dimension S ≤ 0,04 m² or perimeter ≤ 0,8 m according to 13.3.2 and 13.3.3	art.92021.xx; art.92031.xx; art.92041.xx; art.9202.xx; art.9203.xx; art.9204.xx, art.9201.xx	P
	- dimension S > 0,04 m² and perimeter > 0,8 m according to 13.3.2 and 13.3.4		N/A
	Enclosures with screwed glands or grommets fitted with cables as declared by the manufacturer:		N/A
	- type of cable, smallest cross-sectional area (mm²) .....	According to instruction sheet	—
	- type of cable, largest cross-sectional area (mm²):	According to instruction sheet	—
	Enclosures with screwed glands or grommets fitted with conduits as declared by the manufacturer:		N/A
	- smallest diameter or dimensions (mm) .....		—
	- largest diameter or dimensions (mm) .....		—
	Fixing screws of the cover or cover-plate tightened with a torque equal to 2/3 of the value of Table 4 used for the test of 12.10 (Nm) .....		—

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
13.3.2	Surface-mounting enclosures mounted as for normal use		P
	Flush type and semi-flush type enclosures fixed in a test wall:		N/A
	- according to the manufacturer's instructions		N/A
	- according to Figure 19		N/A
	Enclosures fitted with cables having conductors of the largest and smallest cross-sectional area as declared by the manufacturer .....		—
	IPX3 and IPX4 enclosures: use of oscillating tube (Figure 4) or spray nozzle according to IEC 60529 (Figure 5) .....		—
13.3.3	Immediately after the test no more than 0,2 ml x S (cm <sup>2</sup> ) water in the enclosure (ml).....		P
	Specimens (except connecting boxes classified according to 7.101.4) withstand an electric strength test specified in 14.3 started within 5 min of the completion of IP test		N/A
13.3.4	Immediately after the test: indicator paper still dry		N/A

<b>14</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		<b>P</b>
14.1	Insulation resistance and electric strength of enclosures classified according to 7.1.1, 7.1.3 and 7.1.4 is adequate		P
	Specimens placed in a humidity cabinet containing air with relative humidity between 91 % and 95 % and air temperature between 20 °C and 30 °C for:		P
	- 2 days (48 h) for enclosures classified IPX0		N/A
	- 7 days (168 h) for enclosures classified IP>X0		P
	After this treatment: no damage		P
14.2	Insulation resistance measured 1 min after application of 500 V d.c.	See appended table 14.2	P
14.2.101	Boxes with integrated or incorporated terminals or connecting devices: each clamping unit connected with conductors of smallest and largest cross-sectional area (mm <sup>2</sup> ).....		—
14.3	Electric strength: a.c. test voltage applied for 1 min	See appended table 14.3	P

<b>15</b>	<b>MECHANICAL STRENGTH</b>		<b>P</b>
15.1	Boxes and enclosures have adequate mechanical strength		P
	Non-metallic boxes and enclosures for use in cast concrete classified according to 7.2.1.2 or 7.2.1.3 : by the test of 15.2		N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Non-metallic boxes and enclosures for use in cast concrete and able to withstand 90°C during the process classified according to 7.2.1.3, by the test of 15.3		N/A
	for non-metallic boxes and enclosures classified according to :		N/A
	a) 7.2.3, by the test of 15.4		P
	b) 7.2.1 or 7.2.2 and also classified according to : 7.5.2 or 7.5.3, by the test of 15.4		P
	for non-metallic boxes and enclosures, the parts which are intended to be accessible after completion of the building process, by the test of 15.4		P
	for boxes and enclosures classified according 7.1.4, by the test of 15.5		N/A
	when an enclosure is too large to fit the test apparatus shown in annex D using the spring hammer (of IEC 600068-2-75:1997)		N/A
15.2	Impact test at low temperature		P
	- ( -5 ± 2) °C for boxes and enclosures classified according to 7.5.1		N/A
	- ( -15 ± 2) °C for boxes and enclosures classified according to 7.5.2		N/A
	- ( -25 ± 2) °C for boxes and enclosures classified according to 7.5.3		P
	Specimens subjected to 5 blows with a mass of 1 kg falling from a height of 100 mm: no damage		P
	after the test no damage		P
	damage to the finish, small dents which do not reduce creepage distance or clearance below the value specified in table 102 and the small chips which do not adversely affect the protection against electric shock or harmful ingress of water are disregarded		N/A
15.3	Compression test		N/A
15.3.1	Boxes and enclosures are placed in a heating cabinet at (90 ± 5) °C for (60 + 15) min		N/A
	After cool down to ambient temperature: neither deformation nor damage		N/A
	Boxes and enclosures then placed between two flat hardwood plates and loaded with a force of (500 ± 5) N for 1 min ± 5 s		N/A
	No deformation or damage		N/A
15.4	Impact test for boxes and enclosures		P

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Specimens subjected to blows by means of an impact test apparatus as described in IEC 60068-2-75 (test EHA) with equivalent mass of 250 g	See appended table 15.4	P
	Boxes classified according to 7.5.2 and 7.5.3 performed at the following temperature:		P
	- (-15 ± 2) °C for boxes classified according to 7.5.2		N/A
	- (-25 ± 2) °C for boxes classified according to 7.5.3		P
	After the test: no damage		P
15.5	Compression test for enclosures made of nature or synthetic rubber or a mixture of both		N/A
	box and enclosure classified according to 7.1.4 shall withstand a load which can be expected in normal use		N/A
	a) Cover loaded with a force of 50N for 1min, deflecting ≤ 3mm		N/A
	b) pressure of 50N/cm <sup>2</sup> for 1 min.		N/A
	after the test, no damage and compliance with this standard		N/A

<b>16</b>	<b>RESISTANCE TO HEAT</b>		<b>P</b>
16.1	Part of insulating material necessary to retain current-carrying parts		N/A
	Parts of insulating material necessary to retain current-carrying parts and/or parts of the earthing circuit in position: ball-pressure test according to IEC 60695-10-2 at (125 ± 2) °C for (60 +5) min	See appended table 16.1-16.2	N/A
16.2	Part of insulating material not necessary to retain current-carrying parts		P
	Parts of insulating material not necessary to retain current-carrying parts and/or parts of the earthing circuit in position, even though in contact with them, and parts necessary to retain earthing terminals in position: ball-pressure test according to 16.1 but at (70 ± 2) °C	See appended table 16.1-16.2	P
	Parts of insulating material of flush-mounted enclosures classified according to 7.6.2: ball-pressure test according to 16.1 but at (90 ± 2) °C	See appended table 16.1-16.2	N/A
16.3	Boxes and enclosures of insulating materials classified according to 7.2.2.2 or 7.2.2.3		N/A
16.3.1	Mechanical strength		N/A
	Boxes and enclosures of insulating materials classified according to 7.2.2.2 or 7.2.2.3 :adequate mechanical strength at high temperature		N/A
	Rigid crossbar (Figure 25) secured across the face of the box with screws tightened with a torque according to Table 4 (Nm)..... :		—
	Total force of 180 N applied for 24 h to the face of the box at:		N/A



IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- (80 ± 2) °C for boxes and enclosures classified according to 7.2.2.2		N/A
	- (105 ± 2) °C for boxes and enclosures classified according to 7.2.2.3		N/A
	After the assembly has been cooled down to ambient temperature:		N/A
	- screws not have pulled out more than 6,3 mm (mm)..... :		N/A
	- torque used for removal the screws not exceeding 2,3 Nm (Nm) ..... :		N/A
16.3.2	Part of insulating material necessary to retain current-carrying parts of earthing circuit		N/A
	Parts of insulating material necessary to retain earthing strap subjected to a pull test of 45 N for 5 min as follow:		N/A
	- one specimen tested in the condition as delivered and		N/A
	- one specimen tested after conditioning at 90 °C for 168 h		N/A
	Thread of the earthing terminal not stripped when applying a torque according to Table 4 (Nm) .....		N/A
	After each test: the earthing strap not become detached from the specimen		N/A
16.101	Connecting devices having parts of insulating material are sufficiently resistant to heat		N/A
16.101.1	Specimens or portions of them kept for 1 h in a heating cabinet at (85 ± 2) °C		P
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test:		P
	- no access to live parts with probe B of IEC 61032 applied with a force not exceeding 5 N		P
	- markings still legible		P
16.101.2	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 according to 16.1	See appended table 16.101.2	P
16.101.3	Parts of insulating material necessary to retain current-carrying parts and parts of the earthing circuit in position: ball-pressure test according to IEC 60695-10-2 at (125 ± 2) °C for (60 +5) min		N/A
16.102	In connecting devices integrated in connecting boxes the temperature rise in normal use do not exceed 45 K		N/A
	Temperature rise test		N/A

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
<b>17</b>	<b>CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND</b>		N/A
	Creepage distances, clearances and distances through sealing compound are not less than the values shown in Table 102 (not applicable to boxes for floating terminals or connecting devices classified according to 7.101.4	See appended table 17	N/A
<b>18</b>	<b>RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE</b>		<b>P</b>
	Glow-wire test according to Clauses 4 to 10 if IEC 60695-2-11	See appended table 18	P
<b>19</b>	<b>RESISTANCE TO TRACKING</b>		N/A
	Parts of insulating material retaining live parts in position of boxes and enclosures having IP>X0: PTI 175, 50 drops, solution A of IEC 60112	No parts retaining live parts in position	N/A
<b>20</b>	<b>RESISTANCE TO CORROSION</b>		<b>N/A</b>
	Test made after having removed all grease by immersion in a degreasing agent for (10 ± 1) min, (10 ± 1) min in a 10 % solution of ammonium chloride, (10 ± 1) min in a box containing air saturated with moisture and (10 ± 1) min at (100 ± 5) °C		N/A
	No signs of rust		N/A
<b>21</b>	<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>		N/A
	No tests necessary		—

IEC 60670-22					
Clause	Requirement + Test			Result - Remark	Verdict
12.10	<b>TABLE: mechanical strength of screws</b>				P
threaded part identification (e.g. fixing means for cover)		diameter of screw thread (mm)	column number – Table 4 (I, II, III or IV)	applied torque – Table 4 (Nm)	times (5/10)
Enclosure screws		3,58 mm	II	0,80 Nm	10
no damage					
P					
supplementary information:					

14.2	<b>TABLE: insulation resistance</b>			P
test voltage applied between:		measured (MΩ)	required (MΩ)	
Inside of enclosure – outside of enclosure		> 100 MΩ	> 5 MΩ	
supplementary information:				

14.3	<b>TABLE: electric strength</b>			P
	rated insulation voltage (V) .....	500 V		—
test voltage applied between:		test voltage (V)	flashover / breakdown (Yes/No)	
Inside of enclosure – outside of enclosure		3000 V	No	
supplementary information:				

15.4	<b>TABLE: impact test</b>			P
part of enclosure tested per Table 7 (A, B, C, D, E, F, G)		Total number of blows per part – Figure 10	height of fall (mm)	comments
A		5	80	No damage
F		4	320	No damage
supplementary information:				

16.1-16.2	<b>TABLE: ball pressure test of insulating materials</b>			P
-----------	--	--	--	---

IEC 60670-22			
Clause	Requirement + Test	Result - Remark	Verdict
	allowed impression diameter (mm) .....	≤ 2 mm	—
part under test		test temperature (°C)	impression diameter (mm)
Enclosure material (ELIX ABS P2H--AT)		70°C	< 1,0 mm
supplementary information:			

<b>16.101.3</b>	<b>TABLE: ball pressure test of insulating materials of connecting devices</b>		<b>N/A</b>
	allowed impression diameter (mm) .....	≤ 2 mm	—
part under test		test temperature (°C)	impression diameter (mm)
supplementary information:			

<b>16.102</b>	<b>TABLE: temperature rise test</b>						<b>N/A</b>
	Rated connecting capacity (mm <sup>2</sup> ) .....						—
	Test specifications according to IEC 60998.....						—
specimen	type of conductors (rigid solid / rigid stranded / flexible)	largest nominal cross-sectional area (mm <sup>2</sup> )	test circuit figure (101 / 102)	test current (Table 101) (A)	measured dT (K)	allowed dT (K)	temperature rise of external parts of insulating material (16.101.2)
supplementary information:							

IEC 60670-22									
Clause	Requirement + Test			Result - Remark			Verdict		
17	TABLE: creepage distances, clearances and distances through sealing compound						N/A		
	rated voltage (V) .....						—		
creepage distance dcr, clearance cl and distance through sealing compound dtsc at/of:				required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	required dtsc (mm)	dtsc (mm)
Between live parts of different polarity				≥		≥		≥	
Between live parts and surface on which the box is mounted				≥		≥		≥	
supplementary information:									

18	<b>TABLE: glow-wire test</b>					P
part under test		material designation	test temperature (°C)	visible flame and sustained glowing (Y/N)	flames and glowing extinction time	ignition of the tissue paper (Y/N)
Enclosure		ELIX ABS P2H--AT	650°C	N	/*	N
Groomet		PVC MN 7404	650°C	N	/*	N
supplementary information: *No ignition.						

19	TABLE: resistance to tracking			N/A
part under test		material designation	test voltage (V)	flashover / breakdown (Yes/No)
			175	
supplementary information:				

## Attachment No. 1 (National deviations)

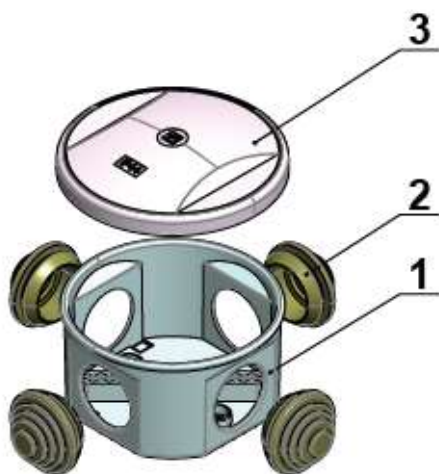
<b>ATTACHMENT TO TEST REPORT IEC 60670-22</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> Boxes and enclosures for electrical accessories for household and similar fixed electrical installations Part 22: Particular requirements for connecting boxes and enclosures	
<b>Differences according</b> .....	EN 60669-22:2006 used in conjunction with EN 60670-1:2005 + A1:2013
<b>Attachment Form No.</b> .....	EU_GD_IEC60670_22 (to be used with Test Report Form No. IEC60670_22A)
<b>Attachment Form Originator</b> .....	SIQ Ljubljana
<b>Master Attachment Form</b> .....	2018-07

EN 60669-22			
Clause	Requirement + Test	Result - Remark	Verdict
<b>2</b>	<b>Normative references</b>		<b>P</b>
	Replace the reference to IEC 60999-1 by:		P
	IEC 60999 (series), Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units		P
<b>3</b>	<b>Definitions</b>		<b>P</b>
3.107	Replace by:		P
	3.107 Terminal Conductive part of one pole comprising one or more clamping unit(s) and insulation if necessary		P
<b>4</b>	<b>General requirements</b>		<b>P</b>
	Replace the text by:		P
	This clause of Part 1 is applicable with the following addition		P
	Terminals and connecting devices incorporated in connecting boxes shall comply with the requirements of the EN 60998 series; integrated clamping units shall comply with the requirements of the EN 60999 series.		P
<b>6</b>	<b>Ratings</b>		<b>P</b>
6.1	Replace by:		P
	6.1 The preferred values of the rated voltage of the integrated or incorporated connecting devices are 250 V, 300 V, 400 V, 500 V, 600 V, 690 V, 800 V, 1 000 V a.c. and 1 500 V d.c.		N/A
6.2	Delete notes 1, 2, 3 and 4		P
<b>8</b>	<b>Marking</b>		<b>P</b>
8.1	Add the following paragraph after m)		P
	The information l) and m) are optional for boxes classified according to 7.101.4		N/A
8.101	Replace the second line by:		P

EN 60669-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated connecting capacity ..... mm <sup>2</sup> or □		N/A
<b>17</b>	<b>Creepage distances, clearances and distances through sealing compound</b>		<b>P</b>
	Add after the first paragraph:		P
	This test does not apply to boxes for floating terminals or connecting devices classified according to 7.101.4.		P
	Delete the last but one paragraph.		P
Annex ZA (normative)			
	The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.		P
	Addition:  IEC 60998 (mod) Series Connecting devices for low-voltage circuits for household and similar purposes EN 60998 Series  IEC 60999 Series Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units EN 60999 Series		P
Annex ZB (normative)			
	Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.  NOTE If it affects harmonization, it forms part of the European Standard.  For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.		P
<b>6.2</b>	<b>United Kingdom</b>		<b>N/A</b>
	In the United Kingdom, a standard connecting capacity of 1,25 mm <sup>2</sup> is used		N/A

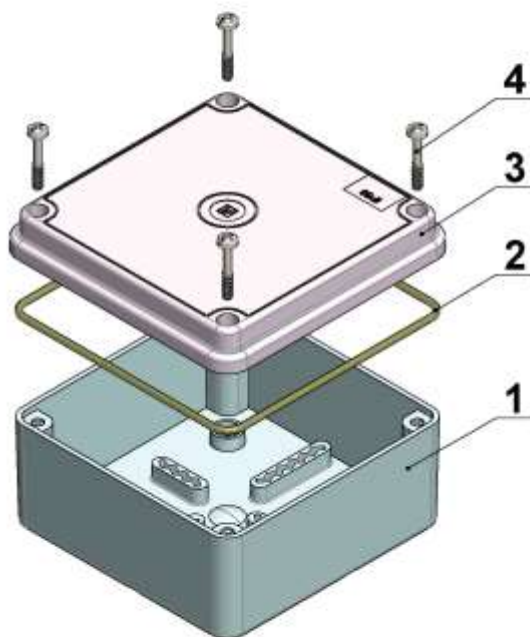


## Attachment No. 2 (Technical documentation)

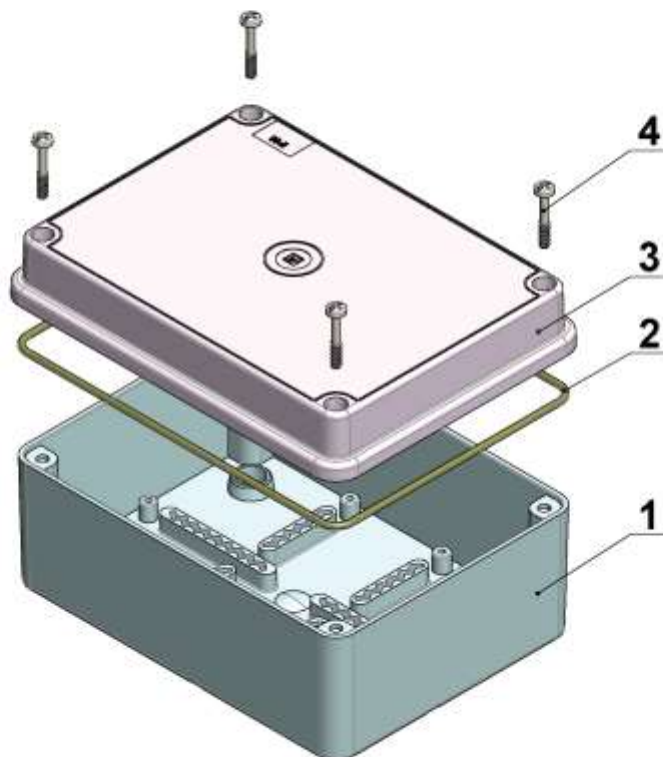


3	Poklopac kutije 65 x 35 ABS	art.9201.03	1	ABS		
2	Uvodnica	art.9201.02	4	PVC 50 Shore		
1	Kutija 65 x 35 ABS	art.9201.01	1	ABS		
Poz.	Naziv	Oznaka	Kom.	Materijal	Dim./ Sifra za nabavku	Napomena
	Materijal				Povrsinska zaštita	Termička obrada
	Dim./Sifra za nabavku				ID Broj	Masa
	Siklop	Kom.			013727	0.041
						Razmera
						1:2
Pripadnost	9200-Kutije instalacione_NA ZID				Naziv	
	Tolerancije slobodnih mera				KUTIJA RAZV. SA 4	
					UVODA NA ZID FI65X35	
					IP44 ABS G/W 650°C	
	Datum	Ime			Oznaka	
Konstruisao	28.09.18.	Jovica Ristić			art.9201	
Crtao	28.09.18.	Jovica Ristić			Revizija	
Pregledao	29.09.18.	Jovica Ristić			01	
Odobrio	29.09.18.	Jovica Ristić				

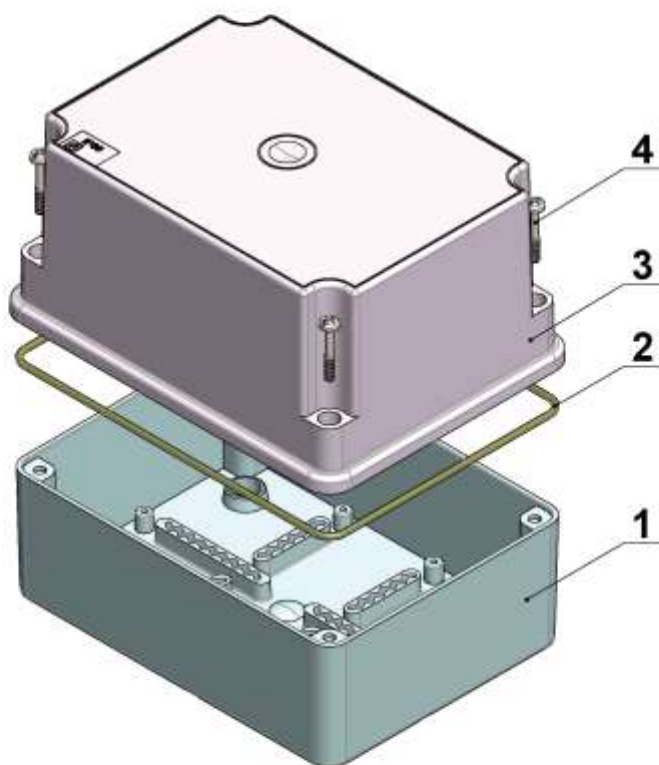
ALING-CONEL  
GAJDOBRA



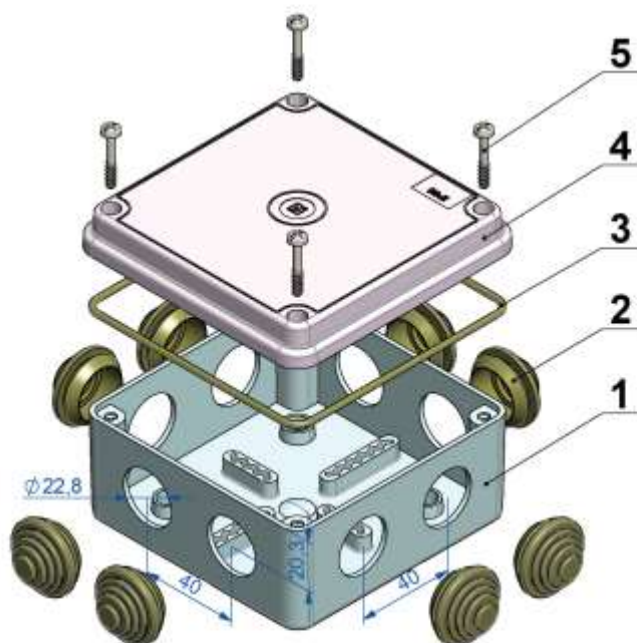
4	Vijak za plastiku F3,5x22 ISO 7049	art.9202.04	4	5.8	1000201	gal CuNi 5	
3	Poklopac razvodne 100x100 ABS	art.9202.02	1	ABS			
2	Zaptivka razvodne 100x100	art.9202.03	1	PVC 50 Shore			
1	Kutija razvodne 100x100 ABS	art.9202.01	1	ABS			
Poz.	Naziv	Oznaka	Kom.	Materijal	Dim. / Šifra za nabavku	Napomena	
	Materijal				Površinska zaštita	Termička obrada	
	Dim./Šifra za nabavku				ID Broj	Masa	Razmera
Sklop	Kom.				013742	115.692	1:2
Prilagodnost				Naziv			
9200-Kutije instalacione_NA ZID				KUTIJA RAZVODNA NA ZID 100X100X50 IP66 ABS G/W 650°C			
Tolerancije slobodnih mera				Oznaka			
Konstruisao	Datum	Ime					
Crtao	29.09.18.	Jovica Ristić					
Pregledao	31.03.25	Jovica Ristić					
Odobrio	31.03.25	Jovica Ristić					
 ALING-CONEL GAJDOBRA				Revizija			
				art.9202			02



4	Vijak za plastiku F3,5x22 ISO 7049	art.9202.04	4	5.8	1000201	gal CuNi 5
3	Poklopac razvodne 150x110x70 ABS	art.9203.02	1	ABS		
2	Zaptivka razvodne 150x110	art.9203.03	1	PVC 50 Shore		
1	Kutija razvodne 150x110 ABS	art.9203.01	1	ABS		
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.			013744	191.281	1:2
Prilagodnost 9200-Kutije instalacione_NA ZID				Naziv		
				KUTIJA RAZVODNA NA ZID 150X110X70 IP66 ABS G/W 650°C		
				Oznaka		
				art.9203		
				Revizija		
				02		

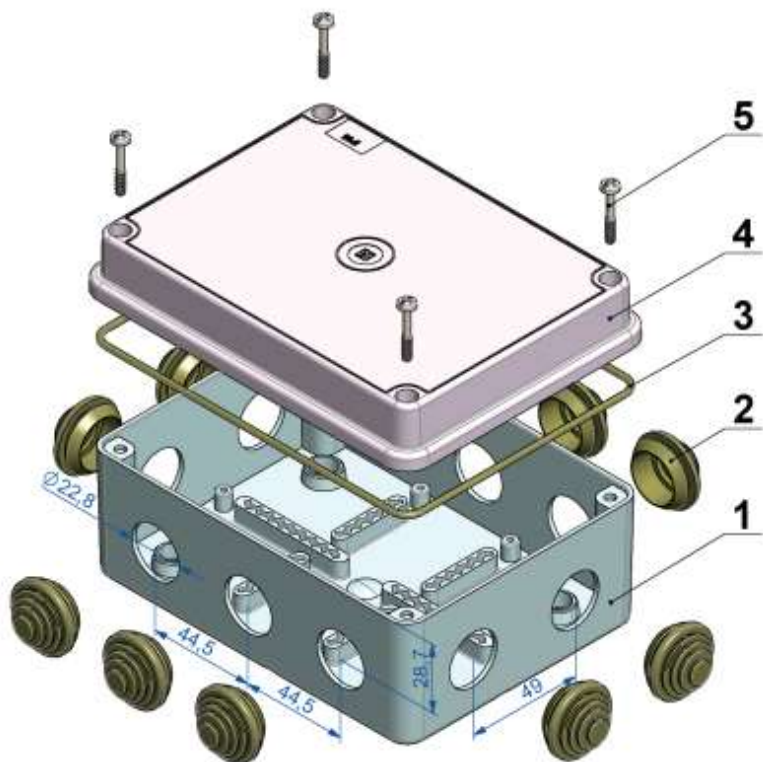


4	Vijak za plastiku F3,5x22 ISO 7049	art.9202.04	4	5.8	1000201	gal CuNi 5		
3	Poklopac razvodne 150x110x120 ABS	art.9204.02	1	ABS				
2	Zaptivka razvodne 150x110	art.9203.03	1	PVC 50 Shore				
1	Kutija razvodne 150x110 ABS	art.9203.01	1	ABS				
Poz.	Naziv		Oznaka	Kom.	Materijal	Dim./Šifra za nabavku	Napomena	
		Materijal			Površinska zaštita		Termička obrada	
					ID Broj		Masa	Razmera
		Dim./Šifra za nabavku			013747		241.524	1:2
	Sklop	Kom.						
Pripadnost					Naziv			
9200-Kutije instalacione_NA ZID					KUTIJA RAZVODNA NA ZID 150X110X120 IP66 ABS G/W 650°C			
			Tolerancije slobodnih mera					
	Datum	Ime						
Konstruisao	29.09.18.	Jovica Ristić						
Crtao	29.09.18.	Jovica Ristić						
Pregledao	31.03.25	Jovica Ristić						
Odobrio	31.03.25	Jovica Ristić						
			 ALING-CONEL GAJDOBRA		Oznaka		Revizija	
					art.9204		02	

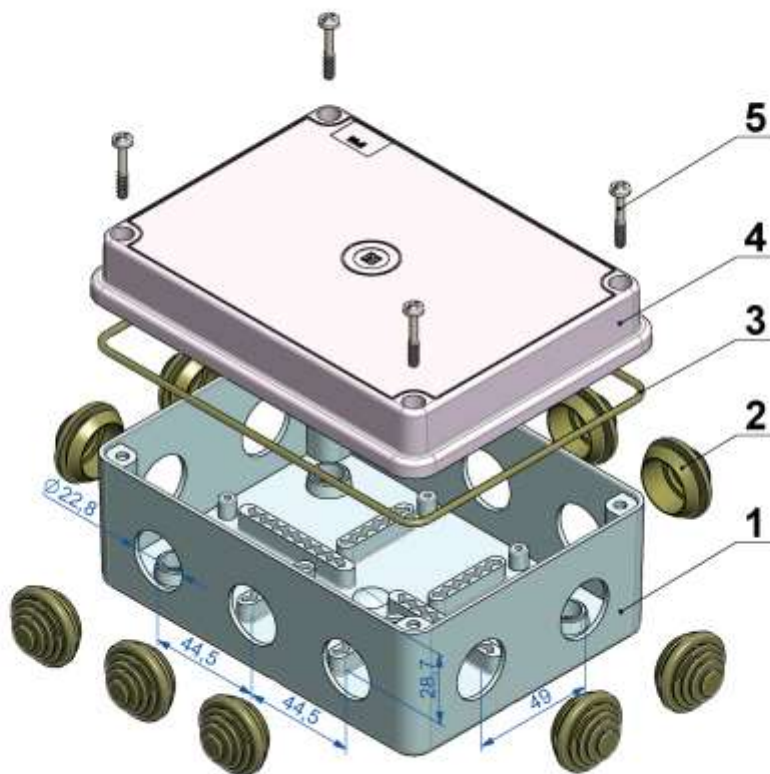


5	Vijak za plastiku F3,5x22 ISO 7049		art.9202.04	4	5.8	1000201	gal CuNi 5	
4	Poklopac razvodne 100x100 ABS		art.9202.02	1	ABS			
3	Zaptivka razvodne 100x100		art.9202.03	1	PVC 50 Shore			
2	Uvodnica		art.9201.02	8	PVC 50 Shore			
1	Kutija razvodne 100x100 ABS		art.9202.01	1	ABS			
Poz.	Naziv		Oznaka	Kom.	Materijal	Dim./Šifra za nabavku		Napomena
		Materijal				Površinska zaštita		Termička obrada
						ID Broj		Masa
		Dim./Šifra za nabavku				013743		136.450
	Sklop	Kom.						Razmera
								1:2
Priпадnost					Naziv			
9200-Kutije instalacione_NA ZID					KUTIJA RAZV. SA 8 UVODA			
					NA ZID 100X100X50 IP66			
					ABS G/W 650°C			





5	Vijak za plastiku F3,5x22 ISO 7049		art.9202.04	4	5.8	1000201	gal CuNi 5	
4	Poklopac razvodne 150x110x70 ABS		art.9203.02	1	ABS			
3	Zaptivka razvodne 150x110		art.9203.03	1	PVC 50 Shore			
2	Uvodnica		art.9201.02	10	PVC 50 Shore			
1	Kutija razvodne 150x110 ABS		art.9203.01	1	ABS			
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.				013745	217.229	1:2
Pripadnost					Naziv			
9200-Kutije instalacione_NA ZID					KUTIJA RAZV. SA 10 UVODA NA ZID 150X110X70 IP66 ABS G/W 650°C			
			Tolerancije slobodnih mera		ALING-CONEL GAJDOBRA			
	Datum	Ime						
Konstruisao	29.09.18.	Jovica Ristić						
Crtao	29.09.18.	Jovica Ristić						
Pregledao	31.03.25	Jovica Ristić						
Odobrio	31.03.25	Jovica Ristić			Oznaka		Revizija	
					art.92031		02	



5	Vijak za plastiku F3,5x22 ISO 7049	art.9202.04	4	5.8	1000201	gal CuNi 5	
4	Poklopac razvodne 150x110x70 ABS	art.9203.02	1	ABS			
3	Zaptivka razvodne 150x110	art.9203.03	1	PVC 50 Shore			
2	Uvodnica	art.9201.02	10	PVC 50 Shore			
1	Kutija razvodne 150x110 ABS	art.9203.01	1	ABS			
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.			013745	217.229	1:2
Pripadnost					Naziv		
9200-Kutije instalacione_NA ZID					KUTIJA RAZV. SA 10 UVODA NA ZID 150X110X70 IP66 ABS G/W 650°C		
			Tolerancije slobodnih mera				
	Datum	Ime					
Konstruisao	29.09.18.	Jovica Ristić					
Crtao	29.09.18.	Jovica Ristić					
Pregledao	31.03.25	Jovica Ristić					
Odobrio	31.03.25	Jovica Ristić					
				Oznaka		Revizija	
				art.92031		02	



## PURPOSE

Junction boxes are intended for joining isolation cables in conditions where a higher degree of protection is required (IP44 or IP66). Can be used for cables of diameters Ø6 - Ø18 mm. They are made in accordance with the standards IEC 60670-1 and IEC 60870-22 for the temperature range of use from -25°C to +60°C.

Junction boxes with a degree of protection IP66 and can be used as the housing for the installation of switchgear and similar devices (relays, contactor, ...). Also, all equipment for installation must be subsequently provided with an appropriate degree of protection (minimum IP66) to maintain the degree of protection of the box.

- The housing may change the color after prolonged usage under the sunlight
- The declared degree of protection can only be achieved by proper installation

## INSTALLATION INSTRUCTION

Open the box and fill holes in the pre-drilled places (on the boxes with IP66 protection, can be drilled 4 holes or 2 diagonally).



Fig. 1  
Opening the round box with IP44 protection is shown in Fig. 1

If it is necessary to make wider than holes, make them with the screwdriver or drill on Fig. 2 (for IP66 boxes) or on Fig. 3 (for IP44 boxes).



Fig. 2

Fig. 3

To ensure that the seal has standard glands, drill holes according to the sketch shown in Fig. 4. Use glands art. 531 or standard glands art. 535 or 435 and screw them Fig. 6 that provides protection IP66 or IP67. If used, press it into the drilled hole and be careful that gland is not deformed from the inside. Depending on the diameter of the cable whose connection is made in the box, cut off the tip of the gland as shown in Fig. 5.

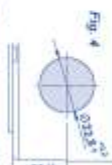


Fig. 4

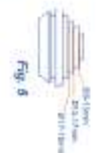


Fig. 5

Secure the box onto the base with screws through the drilled holes. For fastening, use screws BA.5 mm diameter to ensure the necessary degree of protection without diameter max. 27.5 mm for IP44 boxes and max. Ø8.5 mm for IP66 boxes. Do not tighten screws too much on a rough surface. If the box deformation occurs, this can cause sealing problems. After inserting the cables and connecting the cables, close the cover of the box. Tighten the screws on the IP66 boxes with max. 0.8 Nm to ensure enough pressure on the seals.

## GENERAL WARNING

- During the wire connection inside the box turn off the power supply (network fuse).
- Before full IP protection for all wires glands and glands are assembled correctly. It is possible to be damaged during installation.
- Do not use inappropriate or damaged glands.

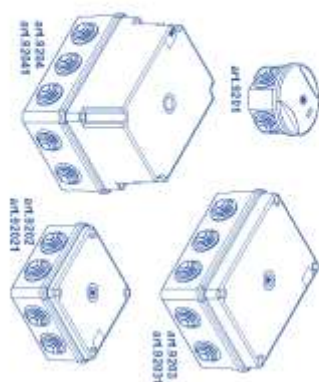
## ALING-CONEL

New Quality Dimension

SRBIA: +31432 5400000 • BEOGRAD: 18  
TEL: +381 21 7792 874, 7792 883 • FAX: +381 21 7792 778  
E-MAIL: info@aling-conel.com • www.aling-conel.com

## INSTRUCTION MANUAL

### WALL MOUNTED JUNCTION BOX IP44 AND IP66



## Attachment No. 3 (Photos)







