Test Report issued under the responsibility of:

TEST REPORT
IEC 60670-22
Boxes and enclosures for electrical accessories for household and similar fixed electrical installations
Part 22: Particular Requirements for connecting boxes and enclosures

Report Number. .....:	TGM-VA EE 36221
Date of issue .....:	2015-06-29
Total number of pages.....	44
Applicant's name.....:	Friedl GmbH
Address .....:	A-2201 Hagenbrunn, Kupferschmiedgasse 14
Test specification:	
Standard .....:	IEC 60670-22:2003 (1st Edition) with IEC 60670-1 (First Edition): 2002 + A1:2011
Test procedure.....:	OVE-Approval
Non-standard test method……..:	N/A
Test Report Form No.....:	IEC60670_1B_Mod_TGM
Test Report Form(s) Originator.....:	IMQ S.p.A._TGM-VA EE
Master TRF.....:	Dated 2012-02_Mod_TGM_2015-06

This report is not valid as a CB Test Report.

Test item description .....:	Connecting enclosure
Trade Mark .....:	FRIEDL
Manufacturer.....:	Friedl GmbH A-2201 Hagenbrunn, Kupferschmiedgasse 14
Model/Type reference .....:	FDM 1; FDM 2; FDM 3
Ratings .....:	1000V; IP68; Cl. II

Testing procedure and testing location:		
☒ **CB Testing Laboratory:**		
Testing location/ address .....:	Staatliche Versuchsanstalt – TGM Elektrotechnik und Elektronik A-1200 Wien, Wexstrasse 19-23	
Tested by (name + signature) .....:	Ing. Dominic Litzka	
Approved by (name + signature).....:	Dr. Wolfgang Nitsche	
☐ **Testing procedure: TMP**		
Testing location/ address .....:		
Tested by (name + signature) .....:		
Approved by (name + signature).....:		
☐ **Testing procedure: WMT**		
Testing location/ address .....:		
Tested by (name + signature) .....:		
Witnessed by (name + signature) .....:		
Approved by (name + signature).....:		
☐ **Testing procedure: SMT**		
Testing location/ address .....:		
Tested by (name + signature) .....:		
Approved by (name + signature).....:		
Supervised by (name + signature) .....:		

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

Annex 1: List of test equipment used (page 31-32)

Annex 2: European group differences and national differences (page 33 – 37)

Annex 3: Photo documentation (page 38 – 44)

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Test samples: FDM 1; FDM 2; FDM 3; FDM 3-FO Complete type test: cl. 8 Marking cl. 10 Protection against electric shock cl. 12 Construction cl. 13 Resistance to ageing, protection against ingress of solid objects and against harmful ingress of water cl. 14 Insulation resistance and electric strength cl. 15 Mechanical strength cl. 16 Resistance to heat cl. 18 Resistance of insulating material to abnormal heat and fire cl. 20 Resistance to corrosion	Staatliche Versuchsanstalt – TGM Elektrotechnik und Elektronik A-1200 Wien, Wexstrasse 19-23

Summary of compliance with National Differences

List of countries addressed: -

☒ The product fulfils the requirements of ÖVE/ÖNORM EN 60670-1:2014-03-01 and ÖVE/ÖNORM EN 60670-22:2007-09-01.

Copy of marking plate

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

Type: FDM 1

Copy of marking plate

Type: FDM 2

Copy of marking plate

Type: FDM 3 / FDM 3-FO

Test item particulars.....:

7.1	Nature of material	☐	7.1.1	Insulating
		☐	7.1.2	Metallic
		☒	7.1.3	Composite
7.2	Method of installation	☐	7.2.1	Flush, semi-flush or embedded in
		☐	7.2.1.1	Non-combustible walls, ceilings or floors
		☐	7.2.1.2	Combustible walls, ceilings or floors
		☐	7.2.1.3	Hollow walls, hollow ceilings, hollow floors or furniture
		☒	7.2.2	Surface mounting on
		☒	7.2.2.1	Non-combustible walls, ceilings, floors or furniture
		☒	7.2.2.2	Combustible walls, ceilings, floors or furniture
		☐	7.2.3	Placement
		☐	7.2.3.1	Suitable for installation into concrete during the casting process (see 7.6)
		☐	7.2.3.2	Suitable for all types of installation except into concrete
7.3	Nature of material	☒	7.3.1	With inlets for sheathed cables for fixed installations
		☒	7.3.2	With inlets for flexible cables
		☐	7.3.3	With inlets for plain or corrugated conduits
		☐	7.3.4	With inlets for threaded conduits
		☐	7.3.5	With inlets for other types of conductors/cables or conduits
		☐	7.3.6	With spouts (hub)
		☐	7.3.7	Without inlets. Inlet openings will be made during installation
7.4	Clamping means	☒	7.4.1	With cable retention
		☐	7.4.2	With cable anchorage
		☐	7.4.3	With clamping means for flexible conduit
		☐	7.4.4	Without clamping means
7.5	Minimum and maximum temperatures during installation	☒	7.5.1	-5 °C to +60 °C
		☐	7.5.2	-15 °C to +60 °C
		☐	7.5.3	-25 °C to +60 °C
7.6	Maximum temperature during the during the casting process	☐	7.6.1	+60 °C
		☐	7.6.2	+90 °C
7.7	Boxes and enclosures for hollow walls and the like according to 7.2.1.3	☐	7.7.1	Class Ha
		☐	7.7.2	Class Hb
		☐	7.7.2.1	for walls
		☐	7.7.2.2	for ceilings
		☐	7.7.3	degree of protection of the part mounted in the hollow wall
		☐	7.7.3.1	IP2X
		☐	7.7.3.2	> IP2X
7.8	The provision for fixing accessories to boxes	☐	7.8.1	Boxes supplied with screws
		☒	7.8.2	Boxes intended to receive screws
		☐	7.8.3	Boxes intended to receive claws
		☐	7.8.4	Boxes intended to receive other means

7.101	Method of fixing the terminals or connecting devices in the connecting box	☐ 7.101.1	With integrated clamping units
		☐ 7.101.2	With incorporated terminals or connecting devices
		☐ 7.101.3	With provisions for subsequent incorporation of terminals or connecting devices
		☒ 7.101.4	Without fixing (for floating terminals or connecting devices)

IP code ..... :	IP68 (24h / 5m)
Rated insulation voltage ..... :	1000 V
Rated voltage of integrated or incorporated connecting device ..... :	-
Rated connecting capacity ..... :	-
Maximum number of conductors to be placed in the box (if marked or declared) ..... :	FDM 1: cables: Ø 5-14 mm (1-4x) FDM 2: cables: Ø 7-25 mm (1-4x) FDM 3: cables: Ø 10-42 mm (1x) Ø 10-33 mm (1x) Ø 8-26 mm (1-6x)
Dimension sheet(s), if any ..... :	-

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 ..... :	5301 / 2015-05-05
Date (s) of performance of tests ..... :	cw 20-26/2015

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 IECEE 02:

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).....: Friedl GmbH
A-2201 Hagenbrunn, Kupferschmiedgasse 14

General product information:

Connecting enclosure made of insulating material (polypropylene: PP4410 (Borealis); membrane: synthetic rubber: TC7AGZ (Kraiburg TPE)) – with holder made of metal (stainless steel (Lohr)) for surface mounting. Inlets for sheathed cables for fixed installations and flexible cables.
FDM 3-FO type variation of FDM 3 for fibre optic applications with shrinking set.

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict

8	**MARKING**		**P**
8.1	Boxes and enclosures are marked with:		P
	a) name, trade mark or identification mark of the manufacturer or the responsible vendor ..... :	FRIEDL	P
	Enclosures are marked in addition with:		P
	b) IP code against ingress of solid objects if higher than IP2X ..... :	IP6X	P
	c) IP code against harmful ingress of water if higher than IPX0 ..... :	IPX8	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		P
	e) type reference, which may be a catalogue number ..... :	FDM 1; FDM 2; FDM 3; FDM 3-FO	P
	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
	f) maximum temperature during the building process if 90 °C ..... :		N/A
	g) necessary information concerning the openings which can be made during installation for boxes and enclosures classified according to 7.3.7 ..... :		N/A
	h) minimum temperature during installation for boxes classified according to 7.5.2 and 7.5.3..... :		N/A
	i) minimum internal volume in cm^3 for boxes and enclosures classified according to 7.7.2, inside the box or enclosure, legible after installation of the box but before installation of wiring devices and wiring. :		N/A
	j) symbol Ha for boxes classified according to 7.7.1, symbol Hb for boxes classified according to 7.7.2. :		N/A
	k) the mass in kg, if the test force declared by the manufacturer is greater than 250 N for boxes and enclosures classified according to 7.101.1 ..... :		N/A
	k) rated insulation voltage for boxes with integrated or incorporated terminals or connecting devices (V).:	IEC 60670-22: 1000 V	P
	l) rated connecting capacity (mm2 or □ or AWG). :	IEC 60670-22	N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	m) maximum number of conductors to be placed in the box. ..... :	IEC 60670-22: FDM 1: cables: Ø 5-14 mm (1-4x) FDM 2: cables: Ø 7-25 mm (1-4x) FDM 3: cables: Ø 10-42 mm (1x); Ø 10-33 mm (1x); Ø 8-26 mm (1-6x)	P
	Further information given in the manufacturer's catalogue or in an instruction sheet ..... :	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		N/A
	After the test: marking still legible		N/A
9	**DIMENSIONS**		**N/A**
	Boxes and enclosures comply with the appropriate standard sheets, if any..... :	See appended Annex	N/A
10	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	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 26, which are accessible after installation		P
	Additional test at (35 ± 2) °C with probe 11 of IEC 61032 on enclosures according to 7.1.1 and 7.1.3 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
11	**PROVISION FOR EARTHING**		**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

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	Exposed conductive parts of covers or cover-plates are connected through a low resistance connection to the earthing means		N/A
	Resistance ≤ 0,05 Ω (Ω)..... :		N/A
11.2	Boxes and enclosures of insulating material classified according to 7.7.2 (Class Hb)		N/A
	Provided with a minimum of one earthing strap with one screw terminal for earthing purposes with a connecting capacity ≥ 4 mm²		N/A
	Design of earthing strap according to Figure 2		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

12	**CONSTRUCTION**		**P**
	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
12.1	Lids, covers or cover-plates or part of them		P
	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

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	IEC 60670-22	N/A
12.1.1	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		P
12.1.2	Non-screw-type fixing operable without the use of a tool or a key		N/A
	Lids, covers or cover-plates whose fixing is not dependent on screws and whose removal is obtained by applying a force according to Table 2 in a direction approximately perpendicular to the mounting/supporting surface:		N/A
	- removal give access (with test probe A of IEC 61032) to live parts		N/A
	- removal give access (with test probe A of IEC 61032) to non-earthed conductive parts separated from live parts by basic insulation		N/A
	- removal give access (with test probe A of IEC 61032) 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 ≤ 25 V a.c. or 60 V d.c.		N/A
12.1.2.1	Verification of the non removal of the lids, covers or cover-plates		N/A
	Force according to Table 2 applied for 1 min in a direction perpendicular to the mounting surface... :	10 N / 20 N / 40 N / 80 N	N/A
	Lids, covers or cover-plates not come off		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 12		N/A
	Lids, covers or cover-plates not come off		N/A
12.1.2.2	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		N/A
	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 12		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		N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Lids, covers or cover-plates come off		N/A
	After the test: no damage		N/A
12.1.2.3	Verification of the outline of lids, covers and cover-plates		N/A
	Gauge of Figure 13 applied according to Figure 14 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 / not complying	—
12.1.2.4	Verification of grooves, holes and reverse tapers		N/A
	Gauge of Figure 16 applied according to Figure 17 with a force of (1 ± 0,2) N: gauge not enter more than 1 mm ..... :	complying / not complying	—
12.1.3	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 12.1.2		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		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 12		N/A
	Lids, covers or cover-plates not come off		N/A
12.2	Drain holes		N/A
	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^2 in area (mm^2) with a width or length ≥ 3mm (mm) ..... :		N/A
	Drain holes: effective		N/A
12.3	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% of mm ≥ mm	N/A
12.4	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		P
	- no damage the flexible cable where it enter, or		P
	- enclosure impairing its further use		P

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.5	Boxes and enclosures with inlets for applications other than flexible cables		P
	Inlet openings classified according to 7.3 other than 7.3.2, if any, allow the introduction of:		P
	- a conduit or a suitable fitting, and/or		N/A
	- the protective covering of the cable		P
	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
12.6	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) .....:		—
	Torque as specified in Table 3 applied for (15 ± 1) s (Nm) .....:		—
	After the test: displacement ≤ 2 mm (mm) .....:		N/A
	Cable anchorage: no damage		N/A
12.7	Boxes and enclosures with cable retention means		P
	Cable retention means of boxes and enclosures classified according to 7.4.1 retain the cable in place		P

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Boxes and enclosures according to 7.5.2 or 7.5.3, tested at (-15 ± 2) °C and (-15 ± 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 ± 1) N applied for 1 min:		P
	Type of cable/maximum nominal cross-sectional area (mm^2) .....:	FDM 1: cables: Ø 14 mm FDM 2: cables: Ø 25 mm FDM 3: cables: Ø 42 mm; Ø 33 mm; Ø 26 mm	—
	After the test: displacement ≤ 3 mm (mm) .....:	≤ 1 mm	P
	Type of cable/minimum nominal cross-sectional area (mm^2) .....:	FDM 1: cables: Ø 5 mm FDM 2: cables: Ø 7 mm FDM 3: cables: Ø 10 mm; Ø 8 mm	—
	After the test: displacement ≤ 3 mm (mm) .....:	≤ 1 mm	P
12.8	Knock-out inlets (outlets) intended to be removed by mechanical impact		N/A
12.8.1	General		N/A
	It is possible to remove knock-out by mechanical impact without damaging the box		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
12.8.2	Knock-out retention		N/A
	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 ± 1) N applied for (15 ± 1)s		N/A
	- provide direct access to live parts, a force of (40 ± 1) N applied for (60 ± 1) s		N/A
	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

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
12.8.3	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 ± 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	Screw fixings		P
	Fixing means effected by screws withstand mechanical stresses		P
	Screw or other fixing means made from insulating material without standardized thread are tested according to the manufacturer's instruction	Screwed connection of cover: FDM 1: 6 Nm FDM 2: 8 Nm	P
	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 12.9	P
12.10	Fixing of boxes and enclosures classified according to 7.2.1.1 and 7.2.1.2		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
	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 cm³ 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 23 is mounted on the specimen and the screw are tightened with a torque equal to 2/3 of that specified in table 4 ..... :		—

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After the test, according to Figure Z3, displacement of the specimen from the mounting block ≤ 0,5 mm:		N/A
12.11	Boxes and enclosures classified according to 7.7.1 (Class Ha)		N/A
	Boxes and enclosures for hollow walls or the like classified according to 7.7.1 provide suitable means for fixing the box or the enclosure to hollow walls or the like		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 18a) and a force of 100 N (Figure 18b) 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 18c) for 1 min		N/A
	After the test: edge of the box not displaced by more than 1 mm (mm) ..... :		N/A
12.12	Fixing of boxes and enclosures classified according to 7.7.2 (Class Hb)		N/A
	Boxes and enclosures for hollow wall or like classified according to 7.7.2 provide suitable means for fixing the box or the enclosure to hollow walls or the like		N/A
	Fixing means not rely the on the cable management system		N/A
12.12.1	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
	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
12.12.2	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
12.12.3	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 19; force of 180 N applied for 5 min in the direction to push the box into the wall opening		N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
12.12.4	Internal volume of boxes and enclosures classified according to 7.7.2 (Class Hb)		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 12.15		N/A
12.12.5	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
12.13	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) ..... :		—
	- type of material (metal / insulating) ..... :		—
	- torque (Nm) ..... :		—
	After the test: no damage		N/A
12.14	Boxes and enclosures with inlets (outlets) for conduits or spouts (hubs)		N/A
	Boxes and enclosures classified according to 7.3.4 and conical spouts as in 7.3.6 withstand the tests of 12.14.1, 12.14.2 and 12.14.3		N/A
	Boxes and enclosures classified according to 7.4.3 withstand the tests of 12.14.1 and 12.14.2		N/A
12.14.1	Enclosures with inlet spout for conduits: a minimum size piece of conduit pressed for 1 min ± 5 s with a force of (100 ± 2) N		N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	During the test: inlet spout prevents further entry of the conduit into the box		N/A
12.14.2	Pull-out test after the test according to 12.14.1: conduit with the minimum size corresponding to the insert opening loaded for 1 min with a tensile force of (20 ± 2) N		N/A
	During the test: conduit not come loose from the inlet spout of the enclosure		N/A
12.14.3	Resistance to bending strain of an inlet spout: piece of conduit inserted into the inlet spout with a compressible force of (100 ± 2) N and loaded with a bending moment of 3 Nm for 1 min in six different directions with an interval of (60 ± 2) °		N/A
	During the test: inlet spout not come loose or damaged and conduit stays within the inlet spout		N/A
12.15	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	IEC 60670-22	N/A
	Maximum number of conductors of maximum cross-sectional areas or the most unfavourable combination ..... :	IEC 60670-22	N/A
	Test made on boxes classified according to 7.101.4 only if l) and m) of 8.1 are marked or declared	IEC 60670-22	N/A
12.102	Retention means for terminals or connecting devices withstand the mechanical stresses	IEC 60670-22	N/A
	Connected conductors in accordance with the relevant Part(s) 2 of IEC 60998 for the type of connecting device used..... :	IEC 60670-22	N/A
	After the test: no harmful deformation, cracks or similar damage ..... :	IEC 60670-22	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	IEC 60670-22	N/A

13	**RESISTANCE TO AGEING, PROTECTION AGAINST INGRESS OF SOLID OBJECTS AND AGAINST HARMFUL INGRESS OF WATER**	**P**
13.1	Resistance to ageing	P

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
13.1.1	Specimens of insulating and composite boxes and enclosures, glands, grommets and replaceable membranes placed in a heating cabinet at (70 ± 2) °C for (168 + 4) h and then kept at room temperature for (96 + 4) h		P
	Glands tightened with a torque equal to 2/3 of the torque applied during the test of 12.13 (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 ± 2) °C for 2 h ± 15 min		P
	Immediately after this period the tip of test probe 11 of IEC 61032 is applied for (5 ± 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		P
	Grommets, blanking-plug and/or membranes likely to be subjected to an axial pull: axial pull of (30 -2) N applied for (5 ± 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		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
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		N/A
	Test on enclosures fitted with grommets, blanking-plug and/or membranes not subjected to any ageing treatment kept for 2 h in a refrigerator		N/A
	Test temperature (°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		N/A
	After the test: no harmful deformation, cracks or similar damage		N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
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 ..... :	IP6X	P
	Enclosures mounted as in normal use with screwed glands or grommets fitted with cables as declared by the manufacturer:		P
	- type of cable, smallest cross-sectional area (mm²) ..... :	FDM 1: cables: Ø 5 mm FDM 2: cables: Ø 7 mm FDM 3: cables: Ø 10 mm; Ø 8 mm	—
	- type of cable, largest cross-sectional area (mm²):	FDM 1: cables: Ø 14 mm FDM 2: cables: Ø 25 mm FDM 3: cables: Ø 42 mm; Ø 33 mm; Ø 26 mm	—
	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) ..... :		—
	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 12.9 (Nm) ..... :		—
	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		N/A
	- IP≤4X: test probe applied on drain holes does not touch live parts within the enclosure		N/A
	- IP5X: dust does not cover the whole inner surface		N/A
	- IP6X: there is no dust inside the box or enclosure		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 ..... :	IPX8	P
	Enclosure dimensions: reference surface S (m²) / perimeter (m).....:		—
	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		P
	- dimension S > 0,04 m² and perimeter > 0,8 m according to 13.3.2 and 13.3.4		N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Enclosures with screwed glands or grommets fitted with cables as declared by the manufacturer:		P
	- type of cable, smallest cross-sectional area (mm²) ..... :		—
	- type of cable, largest cross-sectional area (mm²):		—
	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 12.9 (Nm) ..... :	FDM 3: 1,33 Nm	—
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 5		N/A
	Enclosures fitted with cables having conductors of the largest and smallest cross-sectional area as declared by the manufacturer..... :	FDM 1: cables: Ø 5 mm / Ø 14 mm FDM 2: cables: Ø 7 mm / Ø 25 mm FDM 3: cables: Ø 10 mm; Ø 8 mm / Ø 42 mm; Ø 33 mm; Ø 26 mm	—
	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 (cm²) water in the enclosure (ml)..... :	no water entry	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	IEC 60670-22	N/A
13.3.4	Immediately after the test: indicator paper still dry		N/A

14	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
14.1	Insulation resistance and electric strength of enclosures classified according to 7.1.1 and 7.1.3 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

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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^2) .....:	IEC 60670-22	N/A
14.3	Electric strength: a.c. test voltage applied for 1 min	See appended table 14.3	P
15	**MECHANICAL STRENGTH**		**P**
	Boxes and enclosures have adequate mechanical strength		P
15.1	Impact test at low temperature		N/A
	Non-metallic boxes and enclosures for use in cast concrete according to 7.2.3.1: impact test with a vertical hammer test apparatus (Figure 8) placed together with the specimens for 2 h ± 15 min in a refrigerator at:		N/A
	- (-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		N/A
	Specimens subjected to 5 blows with a mass of 1 kg falling from a height of 100 mm: no damage		N/A
15.2	Compression test		N/A
15.2.1	Boxes and enclosures according to 7.2.3.1 and 7.6.2: specimen 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
15.2.2	Boxes and enclosures according to 7.7.2: tests are under consideration		—
15.3	Impact test for boxes and enclosures		P
	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 15.3	P
	Boxes classified according to 7.5.2 and 7.5.3 performed at the following temperature:		N/A
	- (-15 ± 2) °C for boxes classified according to 7.5.2		N/A
	- (-25 ± 2) °C for boxes classified according to 7.5.2		N/A
	After the test: no damage		P

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict

16	**RESISTANCE TO HEAT**		**P**
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 7.7.2		N/A
16.3.1	Mechanical strength		N/A
	Boxes and enclosures of insulating materials classified according to 7.7.2 (Class Hb): adequate mechanical strength at high temperature		N/A
	Rigid crossbar (Figure 20) 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
	- (80 ± 2) °C for boxes and enclosures classified according to 7.7.2.1		N/A
	- (105 ± 2) °C for boxes and enclosures classified according to 7.7.2.2		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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	IEC 60670-22:	N/A
16.101.1	Speciments or portions of them kept for 1 h in a heating cabinet at (85 ± 2) °C		N/A
	During the test: no change impairing their further use and sealing compound, if any, not flow	IEC 60670-22:	N/A
	After the test:		N/A
	- no access to live parts with probe B of IEC 61032 applied with a force not exceeding 5 N	IEC 60670-22:	N/A
	- markings still legible	IEC 60670-22:	N/A
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	IEC 60670-22: See appended table 16.101.2	N/A
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	IEC 60670-22: See appended table 16.101.3	N/A
16.102	In connecting devices integrated or incorporated in connecting boxes the temperature rise in normal use do not exceed 45 K	IEC 60670-22:	N/A
	Temperature rise test	IEC 60670-22: See appended table 16.102	N/A
17	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND**		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	IEC 60670-22: See appended table 17	N/A
18	**RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE**		**P**
	Glow-wire test according to Clauses 4 to 10 if IEC 60695-2-11	See appended table 18	P
19	**RESISTANCE TO TRACKING**		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	See appended table 19	N/A

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict
20	**RESISTANCE TO CORROSION**		P
	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		P
	No signs of rust		P
21	**ELECTROMAGNETIC COMPATIBILITY (EMC)**		N/A
	No tests necessary		—

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict

12.9	**TABLE: mechanical strength of screws**				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)	no damage
FDM 3 (fixing means for cover)	4,85	III	2,0	5	P
supplementary information: -					

14.2	**TABLE: insulation resistance**	P
test voltage applied between:	measured (MΩ)	required (MΩ)
FDM 1: enclosure (inside / outside)	>15	5
FDM 2: enclosure (inside / outside)	>15	5
FDM 3: enclosure (inside / outside)	>15	5
supplementary information: -		

14.3	**TABLE: electric strength**		P
	rated insulation voltage (V) .....:	1000	—
test voltage applied between:		test voltage (V)	flashover / breakdown (Yes/No)
FDM 1: enclosure (inside / outside)		5600	No
FDM 2: enclosure (inside / outside)		5600	No
FDM 3: enclosure (inside / outside)		5600	No
supplementary information: -			

15.3	**TABLE: impact test**			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	
FDM 1: E	4	240	mounting with holder*	
FDM 2: F	4	320	mounting with holder*	
FDM 3: G	4	400	mounting with holder*	
supplementary information: * according to manufacturer decleration				

IEC 60670-1			
Clause	Requirement + Test	Result - Remark	Verdict

16.1-16.2	**TABLE: ball pressure test of insulating materials**		P
	allowed impression diameter (mm) .....:	≤ 2 mm	—

part under test	test temperature (°C)	impression diameter (mm)
FDM 1: enclosure (inside / outside)	70	<1,4
FDM 2: enclosure (inside / outside)	70	<1,4
FDM 3: enclosure (inside / outside)	70	<1,4
supplementary information: -		

16.101.2	**TABLE: ball pressure test of insulating materials of connecting devices**		N/A
	allowed impression diameter (mm) .....:	≤ 2 mm	—

part under test	test temperature (°C) (1)	impression diameter (mm)
-	-	-
supplementary information: - (1) (70 ± 2) °C / (40 ± 2) °C + highest temperature rise determined during the test of 16.102.4		

16.101.3	**TABLE: ball pressure test of insulating materials of connecting devices**		N/A
	allowed impression diameter (mm) .....:	≤ 2 mm	—

part under test	test temperature (°C)	impression diameter (mm)
-	125	-
supplementary information: -		

16.102	**TABLE: temperature rise test**						N/A
	Rated connecting capacity (mm^2) .....:	-					—
	Test specifications according to IEC 60998.....:	-					—

specimen	type of conductors (rigid solid / rigid stranded / flexible)	largest nominal cross-sectional area (mm^2)	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 60670-1			
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)
-	≥	-	≥	-	≥	-
supplementary information: -						

18	**TABLE: glow-wire test**				N/A
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)
-	-	-	-	-	-
supplementary information: -					

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

List of test equipment used:

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
10	Protection against electric shock	IL.02.530Ü / test probe 11	-	2014-11-11
		IL.00.079Ü / force sensor	0-200N	2014-08-19
		IL.00.037Ü / force meter	0-200N	2014-08-19
		SW.00.633Ü / stop watch	-	2013-11-29
		SW.00.360Ü / climate chamber	-40°C / +180°C	2014-08-26
12.1	Construction	IL.00.079Ü / force sensor	0-200N	2014-08-19
		IL.00.037Ü / force meter	0-200N	2014-08-19
		SW.00.633Ü / stop watch	-	2013-11-29
12.7		SW.00.505Ü / slide gauge	0-150mm	2013-09-17
		IL.00.079Ü / force sensor	0-200N	2014-08-19
		IL.00.037Ü / force meter	0-200N	2014-08-19
		SW.00.633Ü / stop watch	-	2013-11-29
12.9		IL.02.243Ü / torque spanner	1-6Nm	2014-08-27
13.1	Resistance to ageing, protection against ingress of solid objects and against harmful ingress of water	SW.00.633Ü / stop watch	-	2013-11-29
		SW.00.360Ü / climate chamber	-40°C / +180°C	2014-08-26
		IL.02.530Ü / test probe 11	-	2014-11-11
13.2		IL.02.709H, IL.02.711Ü, IL.02.712Ü / test arrangement IP6X	-	2014-11-24
		SW.00.633Ü / stop watch	-	2013-11-29
13.3		IL.16.015H / test arrangement IPX8	-	-
		SW.00.633Ü / stop watch	-	2013-11-29
14.1	Insulation resistance and electric strength	SW.00.360Ü / climate chamber	-40°C / +180°C	2014-08-26
14.2		SW.00.552Ü / resistance measurement device	29,99GΩ DC 500V	2014-09-23
14.3		CH.02.055Ü, CH02.001H, CH.02.006H / HV test arrangement	-	2013-10-29
15.3	Mechanical strength	SW.00.529Ü, SW.00.027H / impact test apparatus	-	2013-10-18
		SW.00.632Ü / measuring tape	-	2015-03-06
16.2	Resistance to heat	SW.00.633Ü / stop watch	-	2013-11-29
		SW.00.360Ü / climate chamber	-40°C / +180°C	2014-08-26
		SW.00.015Ü / ball pressure test apparatus	20N, 5mm	2013-04-29
		HG.00.350H, HG.00.380N / micro scope	-	2015-04-14

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
18	Resistance of insulating material to abnormal heat and fire	SW.00.632Ü / measuring tape	-	2015-03-06
		SW.00.633Ü / stop watch	-	2013-11-29
		SW.00.505Ü / slide gauge	0-150mm	2013-09-17
		HG.00.272H, HG.00.196Ü / glow wire test apparatus, temperature measuring device	-	2014-10-21
20	Resistance to corrosion	SW.00.633Ü / stop watch	-	2013-11-29
		SW.00.360Ü / climate chamber	-40°C / +180°C	2014-08-26
		SW.00.520Ü / measuring glass	5ml	2014-01-13

IEC60670_1B – ATTACHMENT_Mod_TGM-VA EE			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60670-22 WITH IEC 60670-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Boxes and enclosures for electrical accessories for household and similar fixed electrical installations

Part 22: Particular Requirements for connecting boxes and enclosures

Differences according to.....: EN 60670-22:2006 with EN 60670-1:2005 + corr.2010 + A1:2013

Attachment Form No. .....: EU_GD_IEC60670_1B_Mod_TGM_2015-06

Attachment Originator.....: IMQ S.p.A. Mod_TGM-VA EE

Master Attachment .....: 2014-06_Mod_TGM_2015-06

Clause	Requirement + Test	Result - Remark	Verdict
	CENELEC COMMON MODIFICATIONS (EN)		P
2	**NORMATIVE REFERENCES**		**P**
	Delete the reference to IEC 60981:1989		—
	Replace the reference to IEC 60999-1 by IEC 60999 (series)		—
3	**DEFINITIONS**		**P**
3.107	**Replace:**		—
	terminal conductive part of one pole comprising one or more clamping unit(s) and insulation if necessary		—
4	**GENERAL REQUIREMENTS**		**P**
	Addition:		—
	Terminals and connecting devices incorporated in connecting boxes comply with EN 60998 series .....:	N/A	—
	Integrated clamping units comply with EN 60999 series .....:	N/A	—
6	**RATINGS**		**P**
6.1	**Replace:**		—
	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, 1000 V a.c. and 1500 V d.c. .....:	1000 V	—
6.2	**Delete** notes 1, 2, 3 and 4		—

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7	**CLASSIFICATION**		**P**
	Delete from Table 1 classifications 7.7.1, 7.7.2, 7.7.2.1 and 7.7.2.2		—
Table 1	IEC modification not applicable		—

8	**MARKING**		**P**
8.1	**Replace** i) by:		P
	i) void		P
	Replace j) by:		P
	j) the letter H or information for boxes and enclosure classified according to 7.2.1.3		N/A
	Replace 2nd sentence of item d) by:		P
	When the declared IP code is higher than IP4X or higher than IPX2 it is on the outside of the enclosure so as to be easily discernible when the enclosure is mounted and wired as for normal use		P
8.2	**Delete** in NOTE 1 the word “impression”		—
8.101	**Replace** the second line:		N/A
	Rated connecting capacity (mm^2 or □) .....:		N/A

10	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	The probe is applied to all places, where yielding of insulating material could impair the safety, with a force of 75 N except membranes, grommets, knock-outs and the like		P
	Add the following note:		N/A
	Knock-outs are tested according to 12.8.2		N/A

11	**PROVISION FOR EARTHING**		**N/A**
11.2	**Delete** this subclause		—

12	**CONSTRUCTION**		**P**
12.1.2	**Replace** three times “test probe A” by “test probe B”		—
	Replace in Table 2 “test finger” by “test probe B” of EN 61032		—
12.2	**Replace** in the NOTE the words "at least 5 mm" by "at least 2 mm"	mm	N/A
12.3	**Add** the following after the 2nd paragraph:		P
	- In case there is a cavity, the head of the screw can be protected by an additional cap of insulating material		N/A
	In this case the manufacturers instruction give information concerning the cap to be used		N/A
	- In case there is no cavity the head of the screw are protected with a cap of insulating material in this case, the cap are delivered with the box		N/A

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	In this case the manufacturers instruction are give information concerning the cap to be used		N/A
	The cap stay in position during normal use		N/A
	Compliance is checked by the following test: The caps are fixed to the boxes according to the manufacturer's instructions and subjected to the ageing test of 13.1		—
	After 1 h, the cap not come detached		N/A
12.5	IEC modification not applicable		P
	Delete in the second paragraph the words "and/or IEC 60981"		—
	Delete NL in NOTE 2	See Annex ZB	—
12.8	**Replace** the title by:		N/A
	Knock-outs		N/A
	Replace the 1st, 2nd, 3rd paragraphs by:		N/A
	It is possible to remove knock-outs without damaging the box		N/A
	Knock-outs intended for use with cables are free from chips or burrs		N/A
	knock-outs intended for use with conduits and/or a grommet or a membrane, chips and burrs are disregarded		N/A
	Replace the 7st paragraph by:		N/A
	This requirement does not apply to a blanking-plug which is assembled by threading into a threaded inlet		N/A
12.8.4	**Replace** the 1st paragraph by:		N/A
	Knock-outs intended for the use of grommets, glands or fittings are be located in flat surfaces to permit grommets, glands or fittings to be placed fully against these surfaces when installed as intended		N/A
12.9	**Delete** the NOTE	See Annex ZB	P
	Add before the 3rd paragraph of the following:		P
	Screws or other fixing means made from insulating material which have to be tightened by any tool for fixing covers be tested according to the manufacturer's instructions		N/A
12.10	**Replace** the text of this subclause by:		N/A
	Flush type boxes and enclosures other than for hollow walls are provided with obvious fixing means for their suitable attachment to the wall		N/A
	No test prescribed for boxes and enclosures provided with screws, additional mechanical supports and obvious design features, which prevent the displacement of the box or the enclosure		N/A
	Test for boxes and enclosures having an internal volume less than 0,4 dm^3		N/A
	Boxes and parts of enclosures to be embedded in masonry: specimen is mounted into the mounting block shown in Figure 22		N/A
	Auxiliary device of Figure 23 mounted on the specimen and screws tightened with a torque equal to 2/3 of that specified in Table 4 (Nm) .....:		—

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	Specimen not displaced by more than 0,5 mm from the mounting block after SW fallen 10 times from a height of 50 mm onto PW according to the test apparatus of Figure 24 (mm) .....:		N/A
12.11	**Replace** the title and the 1st sentence by:		N/A
	Boxes and enclosures classified according to 7.2.1.3		N/A
	Boxes and enclosures for hollow walls classified according to 7.2.1.3 are provide suitable means for fixing the box or the enclosure to hollow walls		N/A
12.12	**Delete** this subclause		—
12.13	**Replace** Table 5 (different torque values for cable glands tested with a test rod having a diameter up to and including 8 mm)		N/A
12.14	**Delete** in the second paragraph the words “or IEC 60981”		—
15	**MECHANICAL STRENGTH**		P
15.1	**Replace** the third paragraph by:		N/A
	Specimen subjected to an impact test with a vertical hammer test apparatus (fig. 8)		—
15.2	**Renumber** reference 15.2.1 into 15.2		—
	Delete 15.2.2		—
16	**RESISTANCE TO HEAT**		P
16.3	**Delete** this subclause		—
17	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND**		N/A
	Add after the first paragraph:		—
	Test not applicable to boxes for floating terminals or connecting devices classified according to 7.101.4		N/A
	Delete the last but one paragraph		N/A
	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		**P**
8.1	**United Kingdom**		**P**
	Add after e):		**P**
	The marking of the type reference is not used		P
9	**Spain**		**N/A**
	Boxes comply with the standard sheets specified in the Spanish Standard UNE 20451		N/A
	Screws included in some of these standard sheets because screws are considered as a dimensional requirement		N/A
11.1	**Denmark**		**P**
	Due to the lack of an earthing conductor in many existing old buildings, boxes and enclosures requiring earth connection cannot normally be used		P

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12.5	**Czech Republic, Netherlands, United Kingdom**		**N/A**
	Inlets according to 7.3.3 in boxes intended to receive switches or socket-outlets have spout(s) with adequate inlet stops		N/A
12.7	**Germany, Denmark**		**N/A**
	A cable retention is required for boxes and enclosures for hollow walls due to installation practices		N/A
12.9	**Czech Republic, Netherlands**		**N/A**
	Flush-type boxes have metal inserts and are provided with metal screws having ISO metric thread		N/A
12.9	**United Kingdom**		**P**
	With the exception of products within the scope of EN 60670-22 or EN 60670-23, boxes are provided with metal threads so as to ensure safety and thread-forming or thread-cutting screws are not used		P
13.2	**Germany, Norway, Denmark**		**N/A**
	A minimum protection degree of IP30 is required for boxes and enclosures for hollow walls due to installation practices		N/A

	ANNEX ZC A-deviations		**N/A**
9	**Malta** (Electrical Accessories Regulations, 2004)		N/A
	United Kingdom (UK Plug and Socket Safety Regulations, 1994)		N/A
	Boxes intended to accommodate socket-outlets or connection units to BS 1363 have provision for two M3.5 fixing screws at the following fixing centres, in accordance with BS 4662:		N/A
	- at centres of 60,3 mm ± 0,2 mm on the horizontal or vertical centrelines for boxes intended to accommodate 1-gang socket-outlets or connection units (mm) ..... :		N/A
	- at centres of 120,6 mm ± 0,3 mm on the horizontal or vertical centrelines for boxes intended to accommodate 2-gang socket-outlets or connection units (mm) ..... :		N/A
	- at centres of 180,9 mm ± 0,4 mm on the horizontal or vertical centrelines for boxes intended to accommodate 3-gang socket-outlets or connection units (mm) ..... :		N/A

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Variation: FDM 3-FO

Holder: FDM 1/2/3