Test Report issued under the responsibility of:

TEST REPORT
IEC 62208
Empty enclosures for low-voltage switchgear and controlgear assemblies – General requirements

Report Number	:	**T211-0929/18**
Date of issue	:	**2018-11-19**
Total number of pages	:	31
Applicant's name	:	Tehnoplast d.o.o.
Address	:	Zdravka Jekića 119, RS-22305 Stari Banovci, Serbia
Test specification:		
Standard	:	IEC 62208:2011 (Second Edition)
Test procedure	:	CB Scheme
Non-standard test method	:	N/A
Test Report Form No.	:	IEC62208B
Test Report Form(s) Originator	:	OVE
Master TRF	:	Dated 2013-01

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.

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.

Test item description	:	Surface mounted installation boxes
Trade Mark	:	HYPRO
Manufacturer	:	Tehnoplast d.o.o., Zdravka Jekića 119, RS-22305 Stari Banovci, Serbia
Model/Type reference	:	N4D, N8D, N12D, N24D, N36D
Ratings	:	400 V a.c. or 1000 V d.c.; IP65; IK08

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	SIQ Ljubljana SIQ Ljubljana is accredited by Slovenian Accreditation with accreditation number LP-009 in the field of testing	
Testing location/ address.....:		Tržaška cesta 2, SI-1000 Ljubljana, Slovenia	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
	Tested by (name + signature).....:	Tibor Kokelj	
	Approved by (name + signature) .....:	Tomaž Knez	
☐	**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):
- Attachment No.1: UV resistance test report (7 pages),
- Attachment No.2: Technical documentation (3 pages),
- Attachment No.3: Photos (4 pages).

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
All applicable tests were performed	SIQ Ljubljana Mašera-Spasićeva ulica 10 SI-1000 Ljubljana Slovenia (All except 9.12) UV resistance (clause 9.12) Staatliche Versuchsanstalt – TGM Fachbereich Elektrotechnik und Elektronik Wexstraße 19-23 AT-1200 Wien Austria

Summary of compliance with National Differences
List of countries addressed: /

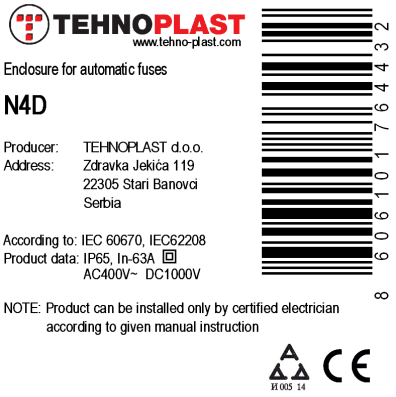
☒ **The product fulfils the requirements of IEC 62208:2011 (Second Edition) and EN 62208:2011**

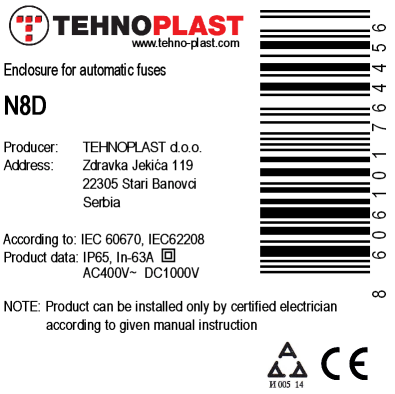
Copy of marking plate

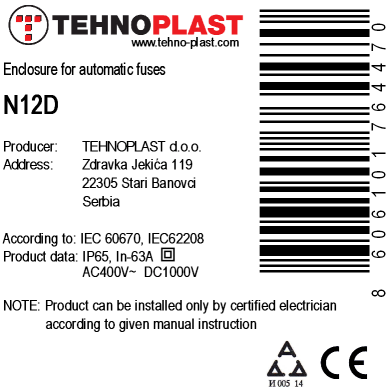
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

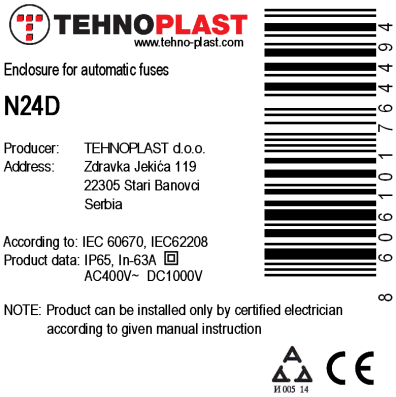
Marking on front side for 400 V a.c. version

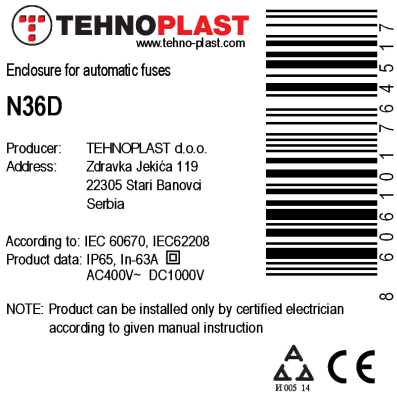
Marking on front side for 1000 V d.c. version











Test item particulars.....:	Classification
Type of material .....:	insulating / metallic / combination of insulating and metallic
Method of fixing .....:	floor standing / wall mounting / flush mounting / pole mounting
Intended location .....:	Outdoor / Indoor
Degree of protection.....:	IP65 / IK08
Rated insulation voltage (if applicable) .....:	400 V a.c. or 1000 V d.c.
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 .....:	2017-08-25
Date (s) of performance of tests .....:	(2017-11-15) – (2018-11-19)

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 4.2.5 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) ..... : 1. Tehnoplast d.o.o., Zdravka Jekića 119, RS-22305 Stari Banovci, Serbia

General product information:

Designation description:
N (XX) D

N mark for SURFACE MOUNTING enclosures
XX mark for number of modules that can be installed into enclosure
D mark for product series

For example, N24D - shows that product is SURFACE MOUNTING, originals used for 24 modules (two row size).

Type	Size: width x height x depth (mm)
N4D	128 x 201 x 120
N8D	202 x 201 x 120
N12D	319 x 256 x 144
N24D	319 x 384 x 144
N36D	319 x 535 x 144

Declared static load and Pde:

Type	Static load per DIN rail	Pde
N4D	0,65 kg	10 W
N8D	1,3 kg	13 W
N12D	1,95 kg	16 W
N24D	1,95 kg	24 W
N36D	1,95 kg	26 W

Materials used:
- Terminals (Basf type Ultramid KR 4450)
- Enclosure (LG type LI911)

Manufacturer marks rated insulation voltage with 400 V a.c. or 1000 V d.c. depending on use of the equipment. Testing has been performed considering worst case (1000 V d.c.).

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
6	INFORMATION TO BE GIVEN REGARDING THE ENCLOSURE		P
6.2	Marking		P
	The enclosure shall be marked as follows:		P
	- Name, trade mark or identification mark of the enclosure manufacturer.	TEHNOPLAST	P
	- Type designation or identification number of the enclosure.	N4D or N8D or N12D or N24D or N36D	P
	The marking shall be durable and easily legible and may be inside the enclosure.		P
	Compliance is checked according to the test of 9.3 and by inspection.	See clause 9.3	P
	The marking for recycling of plastic parts follows ISO 11469.		N/A
6.3	Documentation		P
6.3.1	General		P
	The manufacturer's documentation includes:		P
	- relevant constructional and mechanical characteristics		P
	- enclosure classification (see Clause 4)		P
	- instruction necessary for the correct handling, assembling, mounting and service conditions of the enclosure		P
6.3.2	- dimension	See documentation	P
6.3.3	- mounting arrangements	DIN rails for mounting of equipment. Self-evident.	P
6.3.4	- permissible loads	In technical documentation	P
6.3.5	- lifting devices, if necessary	Not necessary	N/A
6.3.6	- provisions for protection against electric shock	Plastic enclosures	N/A
	- applicable service conditions (see Clause 7);	In technical documentation	N/A
	- location and size of protected space		N/A
	- data of thermal power dissipation capability;	In technical documentation	P
	- rated insulation voltage of enclosures constructed of an insulating material	400 V a.c. or 1000 V d.c.	P
	- degree of protection (IK code, see 8.7)	IK08	P
	- degree of protection (IP code, see 8.8)	IP65	P
7	SERVICE CONDITIONS		
7.1	Manufacturer has specified the locations for which the enclosure is intended	Indoor and outdoor	P
7.2	Normal service conditions		P

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1	Ambient air temperature		P
7.2.1.1	- for indoor locations (max. +40°C, average over 24 h ≤ 35°C; lower limit : -5°C)	Declared from – 25°C to 60°C	P
7.2.1.2	- for outdoor locations (max. +40°C, average over 24 h ≤ 35°C; lower limit : -25°C)	Declared from – 25°C to 60°C	P
7.2.2	Humidity conditions		P
7.2.2.1	- for indoor locations (≤ 50% RH at max. +40°C or for example 90% RH at +20°C)	≤ 50% RH at max. +40°C or 90% RH at +20°C	P
7.2.2.2	- for outdoor locations (up to 100% RH at max. +25°C)	up to 100% RH at max.+25°C	P
7.3	Special service conditions, if applicable		N/A
7.4	Conditions during transport and storage, if applicable		N/A
8	DESIGN AND CONSTRUCTION		P
8.1	General		P
	The enclosure constructed of materials capable of withstanding the mechanical, electrical and thermal stresses, as specified in clause 9, as well as the effects of humidity which are likely to be encountered in normal use.		P
	Protection against corrosion checked by the test of 9.13	Plastic enclosures	N/A
	For enclosures or parts of enclosures made of insulating materials, thermal stability, resistance to heat, fire and weathering shall be verified according to tests of 9.9 and 9.12	See clause 9.9	P
8.2	Static loads		P
	Compliance of the permissible load that the enclosure and its doors are able to carry is checked according to the test of 9.4	See clause 9.4	P
8.3	Lifting and transport support		N/A
	Where required, enclosures are provided with appropriate lifting devices or transport means (according to the test of 9.5)	No lifting devices or transport means	N/A
8.4	Access to the interior of the enclosure		P
	Doors or removable covers allow adequate access to the protected space. Access may be restricted by the use of a key or tool	Doors. No restricted access	P
	Cable gland plates and covers which are removable from the outside require the use of a tool.		P
8.5	Protective circuit		N/A

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	Metallic enclosures shall ensure the electric continuity		N/A
	- by conductive structural parts of the enclosure	Plastic enclosures	N/A
	- by separate protective conductor to earth		N/A
	After remove of a removable part protective circuit of the remainder shall not be interrupted		N/A
	For lids, doors, removable covers and the like, the usual metal screwed connections and metal hinges may ensure continuity of the protective circuit provided no electrical equipment is attached to them		N/A
	Where these are intended for mounting electrical equipment, additional means shall be provided to ensure the continuity of the protective circuit.		N/A
	Compliance is checked according to the test of 9.11		N/A
	The enclosure manufacturer shall provide means to facilitate the connection of the external protective conductor by the final assembly manufacturer. The location and the designed I^2t withstand capacity under fault conditions of such means shall be indicated in the enclosures manufacturers' documentation.		N/A
8.6	Dielectric strength		P
	Enclosure constructed of an insulating material fulfil the dielectric test of 9.10	See clause 9.10	P
8.7	Degree of protection (IK-Code)		P
	Degree of protection according to IEC 62262	IK08	P
	Compliance is checked according to the test of 9.7	See clause 9.7	P
8.10	Degree of protection (IP-Code)		P
	Degree of protection according to IEC 60529	IP65	P
	Compliance is checked according to the test of 9.8	See clause 9.8	P
9	TYPE TESTS		P
9.2	General conditions of tests		P
	The enclosures under test are mounted and installed as in normal use according to the enclosure manufacturer's instructions		P
	Unless otherwise specified, the tests shall be carried out at an ambient temperature of between +10 °C and +40 °C	25°C	P
	Number of samples and order of test per sample according to Table 1	See Table 1	P
9.3	Marking		P

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	Markings made by moulding, pressing or similar and labels with a laminated plastic covering are not submitted to this test		P
	Test: 15 s rubbing with water and then 15 s rubbing with petroleum spirit		P
	After the test markings easily legible	Markings still legible	P
9.4	Static loads		
	The enclosure fitted with all its required components to support the permissible load is loaded with a weight of 1,25 times the permissible load as declared by the manufacturer	Declared loads (per DIN rail): N4D: 0,65 kg N8D: 1,3 kg Others types: 1,95 kg Test performed with (per DIN rail): N4D: 0,82 kg N8D: 1,63 kg Others types: 2,44 kg	P
	The loads are arranged on the mounting plate or switchgear and controlgear supports and on the door evenly distributed as specified by the enclosure manufacturer	Mounting only on DIN rail. Doors have no means for mounting equipment.	P
	Loads retained for 1h in the closed position		P
	Enclosure constructed of insulating material and metallic enclosures with parts (hinges, locks, etc.) of insulating material tested at 70°C	Tested at 70°C	P
	Closed door opened 5 times through 90°		P
	Resting in open position: 1 min.		P
	For enclosures constructed of insulating material and metallic enclosures with parts (hinges, locks, etc.) of insulating material, this part of the test may be carried out at ambient temperature external to the heating cabinet		P
	After the test enclosure shows no cracks or permanent distortions		P
	During the test no deflections which could impair any of its characteristics		P
9.5	Lifting		N/A
	Enclosure loaded as in 9.4 with its door closed, lifted with the specified lifting means and in the manner defined by the manufacturer	Enclosure: kg	N/A
	3 times: from standstill position in a vertical plane, returning to standstill position		N/A
	From standstill position to a height of ≥ 1m for 30 min, without any movement		N/A

IEC 62208				
Clause	Requirement + Test	Result - Remark		Verdict
	3 times: from standstill position to a height of ≥ 1m and moved 10 ± 0,5 m horizontally; then set down. One cycle: 1 min ± 5 s at uniform speed			N/A
	After the test enclosure shows no cracks or permanent distortions			N/A
	During the test no deflections which could impair any of its characteristics			N/A
9.6	Axial loads of metal inserts			N/A
	Axial load according to table 2 applied for 10s	Size: M	Load: N	N/A
	After the test:			N/A
	- the insert is in its original position			N/A
	- no sign of movement			N/A
	- no cracks and splits in the material			N/A
9.7	Degree of protection against external mechanical impacts (IK code)			P
	- according to IEC 62282 by means of a test hammer suitable for the dimensions of the enclosure, the enclosure is fixed on a rigid support as for normal use			P
	The impact energy shall be applied:	IK08 / Impact Energy = 5 J		P
	- 3 times to each exposed surfaces in normal use whose largest dimensions is not above 1m			P
	- 5 times to each exposed surfaces in normal use whose largest dimensions is greater than 1m			N/A
	Impacts applied with even distributed over the faces of the enclosure			P
	After the test:			P
	- enclosure continue to provide the IP code and dielectric strength			P
	- removable covers are removed and reinstalled			P
	- doors opened and closed			P
9.8	Degree of protection (IP-Code)			P
9.8.1	Degree of protection against access to hazardous parts and against the ingress of solid foreign objects indicated by first characteristic numeral			P
9.8.1.1	Protection against access to hazardous parts			P
	Subclauses 12.1 and 12.2 of IEC 60529 apply	IP65		P
	Access probe shall not enter the protected space			P
9.8.1.2	Degree of protection against the ingress of solid foreign objects			
	For enclosures IP2X, IP3X, IP4X, 13.2 and 13.3 of IEC 60529 apply.			N/A

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	For IP 5X enclosures, 13.4, category 2 (without vacuum pump) and 13.5 (without vacuum pump) of IEC 60529 apply. Ingress of talcum powder into protected space is verified as described		N/A
	For enclosures IP6X, 13.6 of IEC 60529 apply. No talcum powder shall be observable inside the enclosure at the end of the test	No talcum powder inside	P
9.8.2	Degree of protection against ingress of water as indicated by the second characteristic numeral		P
	Test according to clauses 14.1 and 14.2 of IEC 60529	IP65	P
	After the test, water has not ingressed into the protected space	No water	P
9.8.3	Degree of protection against hazardous parts as indicated by additional letter.		N/A
	Test according to clause 15 of IEC 60529	No additional letter	N/A
	The access probe does not touch the surface of the protected space.		N/A
9.9	Properties of insulating materials		P
9.9.1	Thermal stability		P
	Test according to IEC 60068-2-2 Test Bb, temperature 70°C, with natural air circulation, for a duration of 168 h		P
	After the treatment:		P
	Enclosures are kept at ambient temperature and relative humidity between 45% and 55% for 4 days (96h)		P
	- enclosure shows no crack without additional magnifications	No cracks	P
	- material became not sticky or greasy	Material not sticky/greasy	P
	The forefinger wrapped in a dry piece of rough close is pressed with a force of 5N against the enclosure.		P
	No traces of the cloth remain to the enclosure and the material of the enclosure doesn't stick to the cloth.	No traces of cloth remain	P
9.9.2	Resistance to normal heat		N/A
	The suitability of the insulating materials to resist effects of heat shall be verified either by reference to the insulation temperature index (determined e.g. by the methods of IEC 60216 series), or by compliance to IEC 60085	IEC	N/A
9.9.3	Resistance to abnormal heat and to fire		P
	Test in accordance with the principles of IEC 60695-2-10 and the details of IEC 60695-2-11.		P

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	Tested as described in clause 4 of IEC 60695-2-11		P
	Apparatus used as described in clause 5 of IEC 60695-2-11		P
	Preconditioning of the samples:		P
	Storage at 15-35°C / RH 35-45 % for 24h	24 h; 25°C; 39 %	P
	Thermocouple of test apparatus calibrated in accordance with clause 6 of IEC 60695-2-10		P
	During test:		
	- clause 8 of IEC 60695-2-10 followed		P
	- clause 10 of IEC 60695-2-11 followed		P
	Temperature of the tip of the glow wire:		P
	- for parts retaining current-carrying parts in position: 960 ± 15°C	Terminals Material: Basf type Ultramid KR 4450	P
	Time at which sample ignited:	t_i = 1 s	P
	Time when sample extinguished:	t_e = 30 s	P
	- for parts intended to be installed in hollow Walls: 850 ± 15°C		N/A
	Time at which sample ignited:	t_i = s	N/A
	Time when sample extinguished:	t_e = …..s	N/A
	All other parts: 650 ± 15°C	Enclosure (all external parts) Material: LG type LI911	P
	Time at which sample ignited:	t_i = 0 s	P
	Time when sample extinguished:	t_e = 0 s	P
	No visible flame, no sustained glowing or flames and glowing extinguish within (30 ±1)s	Terminals: Started burning immediately. Stop burning immediately after GW removal. Enclosure: No fire	P
	No burning of the tissue paper, no scorching of the pinewood board	Terminals: No drops Enclosure: No drops	P
9.10	Verification of dielectric strength		P
9.10.1	General		P
	This test applies to enclosures where insulating material is used, even in combination with non-insulating materials		P
9.10.2	Preconditioning		P
	Enclosures are placed in a humidity cabinet (relative humidity between 91% and 95%) and an air temperature of (40±2)°C for 2 days (48h)	93,5 % RH; 40°C	P
9.10.3	Enclosures without metal elements inside the protective space		N/A

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	An r.m.s voltage according to 10.9.4 of IEC 61439-1 is applied for 1 min between 2 metal foils, one in contact with the external surface and the other inside the enclosure at the limit of the protected space		N/A
	Applied voltage:	U = V	N/A
9.10.4	Enclosure having metal elements in the protected space		P
	All internal metallic parts are connected to a bar, a voltage according to 10.9.4 of IEC 61439-1 is applied for 1 min. between a metal foil in contact with the external surface and the bar.	Internal DIN rail and terminals connected together - external part of enclosure wrapped in ALU foil	P
	Applied voltage:	Rated 400 V a.c.: Test voltage = (1890 a.c. x 1,5) V Rated 1000 V d.c.: Test voltage = (3820 d.c. x 1,5) V Note: values from Table 8 of IEC/EN 61439-1	P
9.10.5	Results to be obtained		P
	- samples show no damage impairing their further use		P
	- no flashover or breakdown occurs during the test		P
9.11	Continuity of the productive circuit		N/A
	Exposed conductive parts of the enclosure connected to the protective circuit	Enclosure of insulating material	N/A
	Resistance not exceeding 0,1 Ω	Measured: Ω	N/A
9.12	Resistance to ultra-violet (UV) radiation		P
	This test applies only to enclosures and external parts of enclosures intended to be installed outdoors and which are constructed of insulating materials or metals that are entirely coated by synthetic material. Representative samples of such parts shall be subjected to the following test		P
	UV test according to ISO 4892-2 method A, cycle 1 with a total test period of 500 h	Material: LG type LI911 See attachment no. 1	P
	For enclosures constructed of insulating materials compliance is checked by verification		P
	- flexural strength (according to ISO 178) of insulating materials have 70% min. retention	See attachment no. 1	P
	- charpy impact (according to ISO / EN ISO 179) of insulating materials have 70% min. retention	See attachment no. 1	P
	After the test samples are subjected to the glow wire test of 9.9.3	See attachment no. 1	P

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	For compliance, enclosures constructed of metals entirely coated by synthetic material, the adherence of the insulating material shall have a minimum retention of category 3 according to ISO 2409 (a cross-cut area greater than 15 %, but not greater than 35 % is affected)	See attachment no. 1	P
	Samples show no cracks or deterioration	See attachment no. 1	P
9.13	Resistance to corrosion		N/A
9.13.1	General		N/A
	Metallic enclosures and external metallic parts of insulating and combined enclosures are tested to verify that they ensure protection against corrosion	Enclosure of insulating material	N/A
	In all cases hinges, locks and fastenings have to be tested		N/A
9.13.2	Test procedure		N/A
9.13.2.1	Severity test A		N/A
	This test is applicable to:		N/A
	- metallic indoor enclosures		N/A
	- external metallic parts of indoor enclosures		N/A
	- internal metallic parts of indoor and outdoor enclosures upon which intended mechanical operation may depend		N/A
	The test consists of:		N/A
	- 6 cycles of 24 h each to damp heat cycling test according to IEC 60068-2-30 (Test Db) at (40 ± 3) ºC and relative humidity of 95 %		N/A
	- 2 cycles of 24 h each to salt mist test according to IEC 60068-2-11; (Test Ka: Salt mist), at a temperature of (35 ± 2) ºC		N/A
9.13.2.2	Severity test B		N/A
	This test is applicable to:		N/A
	- metallic outdoor enclosures		N/A
	- external metallic parts of outdoor enclosures		N/A
	The test comprises two identical 12 day periods		N/A
	Each 12 day period comprises:		N/A
	- 5 cycles of 24 h each to damp heat cycling test according to IEC 60068-2-30 (Test Db) at (40 ± 3) ºC and relative humidity of 95 %		N/A
	- 7 cycles of 24 h each to salt mist test according to IEC 60068-2-11; (Test Ka: Salt mist), at a temperature of (35 ± 2) ºC		N/A

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict
9.13.3	Results to be obtained		N/A
	After the test, the enclosure or samples shall be washed in running tap water for 5 min, rinsed in distilled or demineralized water then shaken or subjected to air blast to remove water droplets. The specimen under test shall then be stored under normal service conditions for 2 h		N/A
	Compliance is checked by visual inspection to determine that:		N/A
	- there is no evidence of iron oxide, cracking or other deterioration more than that allowed by ISO 4628-3 for a degree of rusting Ri1		N/A
	- the mechanical integrity is not impaired		N/A
	- seals are not damaged		N/A
	- doors, hinges, locks, and fastenings work without abnormal effort		N/A
9.14	Thermal power dissipation capability		P
	The thermal power dissipation data provided by the manufacturer (see 6.3.1) is determined by following test:		P
	- either in accordance with 10.10.4.2.2 of IEC 61439-1:2011	N4D: Declared: 10 W; Measured: 14 W N8D: Declared: 13 W; Measured: 22 W N12D: Declared: 16 W; Measured: 38 W N24D: Declared: 24 W; Measured: 54 W N36D: Declared: 26 W; Measured: 62 W Limit of 30 K applied (according to IEC 60670-24) for Pde. Note: measured value represents power at which enclosure temperature stabilized at Tamb+30 K	P
	- or by a calculation method, e.g. according to IEC/TR 60890		N/A

Table 1 Number of samples to be tested and order of test per sample

Subclause:	**Test**	**Sample 1** Order / verdict	**Sample 2** Order / verdict	**Sample 3** Order / verdict	**Representative sample** (see 9.12) Verdict
9.4	Static loads	1 / P			
9.5	Lifting	2 / N/A			

IEC 62208			
Clause	Requirement + Test	Result - Remark	Verdict

9.6	Axial loads of metal inserts	3 / N/A			
9.7	Degree of protection against external mechanical impacts (IK code)	4 / P			
9.8	Degree of protection against access to hazardous parts and against ingress of solid objects and/or water (IP code)	5 / P			
9.9.1	Thermal stability		1 / P		
9.9.2	Resistance to heat		2 / P		
9.9.3	Resistance to abnormal heat and fire		3 / P		
9.10	Dielectric strength	6 / P			
9.11	Continuity of the protective circuit	7 / N/A		3 / N/A	
9.12	Resistance to ultra-violet (UV) radiation				[a] / N/A
9.13	Resistance to corrosion			2 / N/A	
9.14	Thermal power dissipation capability			1 [b] / P	
9.3	Marking	8 / P			

[a] Tests carried out on representative sample only
[b] Only appliance if verified by test

Attachment No. 1
(UV resistance test report)

Date of issue: 2018-11-07
This report enfolds 6 pages.

tgm
Staatliche Versuchsanstalt
Elektrotechnik und Elektronik
FEDERAL INSTITUTE OF TECHNOLOGY
ELECTRICAL AND
ELECTRONIC ENGINEERING

Test Report

TGM – VA EE 37734

Resistance to ultra-violet (UV) radiation of material for empty enclosures for low-voltage switchgear and controlgear assemblies

Material: ASA (Acrylonitrile Acrylic Styrene)
Trademark / Type: LG / LI911

partial type test tested according to:
IEC/EN 62208:2011 clause 9.12

Commissioned by:	Tehnoplast D.O.O.
Address:	Serbia, 22305 Stari Banovci, Zdravka Jekica 119
Order reached:	2018-07-31
Sign of order:	Mr. Nebojša Zubović
Receiving of test sample(s):	5964 / 2018-07-18
Testing period:	cw 36-44/2018
TGM-number:	295/1/18

1 Test item

material for empty enclosures for low-voltage switchgear and controlgear assemblies

2 Description

material for empty enclosures for low-voltage switchgear and controlgear assemblies:

material: ASA (Acrylonitrile Acrylic Styrene)
trademark: LG
type: LI911
production date and lot: 8D355 C1810426
max. material thickness for the enclosure: 3mm
colour: grey

3 Pictures

picture 1: Material: Trademark / Type: LG / LI911-8D355 C1810426

4 Test procedure and results

Test procedure: IEC/EN 62208:2015 clause 9.12 – partial type test:

IEC/ EN 62208			
Clause	Requirement + Test	Result - Remark	Verdict
9.12	Resistance to ultra-violet (UV) radiation		
	This test applies only to enclosures and external parts of enclosures intended to be installed outdoors and which are constructed of insulating materials or metals that are entirely coated by synthetic material. Representative samples of such parts shall be subjected to the following test		
	UV test according to ISO 4892-2 method A, cycle 1 with a total test period of 500 h		P
	For enclosures constructed of insulating materials compliance is checked by verification		
	- flexural strength (according to ISO 178) of insulating materials have 70% min. retention	>80 % ($\sigma_{fC\ before\ UV\ test}$: 65,4 MPa* $\sigma_{fC\ after\ UV\ test}$: 67,5 MPa*) *mean value of 5 single values	P
	- charpy impact (according to ISO / EN ISO 179) of insulating materials have 70% min. retention	>80 % ($a_{cU\ before\ UV\ test}$: 85,48 kJ/m²* $a_{cU\ after\ UV\ test}$: 86,02 kJ/m²*) *mean value of 5 single values	P
	After the test samples are subjected to the glow wire test of 9.9.3	see below, clause 9.9.3	P
	For compliance, enclosures constructed of metals entirely coated by synthetic material, the adherence of the insulating material shall have a minimum retention of category 3 according to ISO 2409 (a cross-cut area greater than 15 %, but not greater than 35 % is affected)		N/A
	Samples show no cracks or deterioration		P
9.9.3	Resistance to abnormal heat and to fire		
	Test in accordance with the principles of IEC 60695-2-10 and the details of IEC 60695-2-11.		P
	Preconditioning of the samples:		
	Storage at 15-35°C / RH 35-45 % for 24h		P

IEC/ EN 62208			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature of the tip of the glow wire:		
	- for parts retaining current-carrying parts in position: 960 ± 15°C		N/A
	Time at which sample ignited:		
	Time when sample extinguished:		
	- for parts intended to be installed in hollow Walls: 850 ± 15°C		N/A
	Time at which sample ignited:		
	Time when sample extinguished:		
	All other parts: 650 ± 15°C		P
	Time at which sample ignited:	No visible flames or glowing	
	Time when sample extinguished:	No visible flames or glowing	
	No visible flame, no sustained glowing or flames and glowing extinguish within (30 ±1)s		P
	No burning of the tissue paper, no scorching of the pinewood board		P

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)

5 Measuring and test equipment

designation	manufacturer	type	ID
force meter	SPIRAL	2224448	HG.00.342Ü
glow wire test apparatus	VAE	VE 21	HG.00.272H
temperature measuring device	Fluke	51 II	HG.00.425Ü
climate measuring device	Testo	635-2	SW.00.639Ü
slide calliper	Mitutoyo	500-444	SW.00.505Ü
climate chamber	WEISS	WK1/340	SW.00.360Ü
stop watch	RS Pro	309 RS	SW.00.743Ü
tissue paper	-	20g/m²	TK.00.076H
UV test apparatus	ATLAS	Beta LM	PM 4132
striking element	ZWICK	HIT 25P	PM 5157
mechanical universal test apparatus	ZWICK	Z020	PM 5119

6 Summary

The test item described under clause 2. and pictured under clause 3. was tested according to the following standards:

IEC/EN 62208:2011 clause 9.12

The test item complies with the above mentioned standard.

tgm Staatliche Versuchsanstalt

This present report

includes 6 pages

0 appendix(es) (with 0 pages)

Offical in charge: Dominic Litzka Vienna, 2018-11-07

Rund-siegel

Ing. Dominic Litzka
Authorized Expert

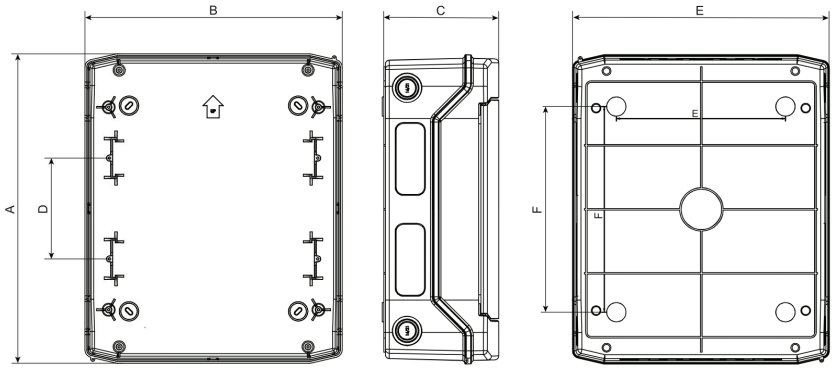
Dipl.-Ing. Andreas Dvorak
Head of Department

Dipl.-Ing. Wolfgang Kern
Principal

Accredited as testing body
by decree BMwA 92714/589-IX/2/97

Attachment No. 2
(Technical documentation)

GP



	A	B	C	D	E	F	Pde	Static load
N4D	201 mm	128 mm	120 mm	-	-	140 mm	10 W	0.65 kg
N8D	201 mm	202 mm	120 mm	-	100 mm	140 mm	13 W	1.30 kg
N12D	259 mm	319 mm	144 mm	-	210 mm	130 mm	16 W	1.95 kg
N24D	384 mm	319 mm	144 mm	125 mm	210 mm	255 mm	24 W	1.95 kg
N36D	535 mm	319 mm	144 mm	125 mm	210 mm	380 mm	26 W	1.95 kg

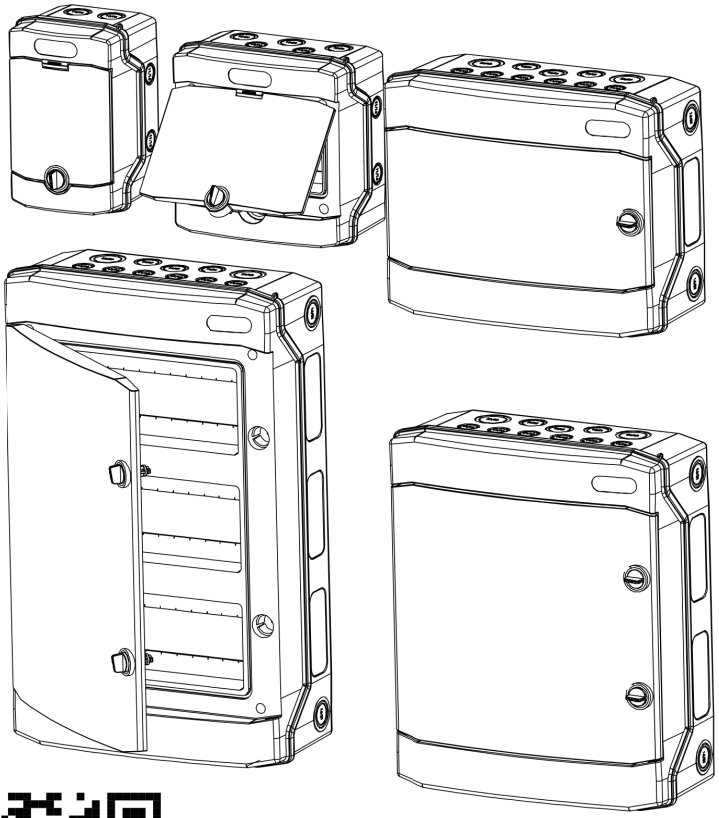
To preserve IP65 protection of enclosure use metric cable glands with IP65 protection degree. During assembly of cable glands use sharp tool to open hole on prepared place on enclosure in order to preserve IP65 protection degree.

For indoor locations (≤ 50% RH at max. +40°C or for example 90% RH at +20°C)
For outdoor locations (max. +40°C average over 24h ≤ 35°C, lower limit: -25°C)
For outdoor locations (up to 100% RH at max. +25°C)

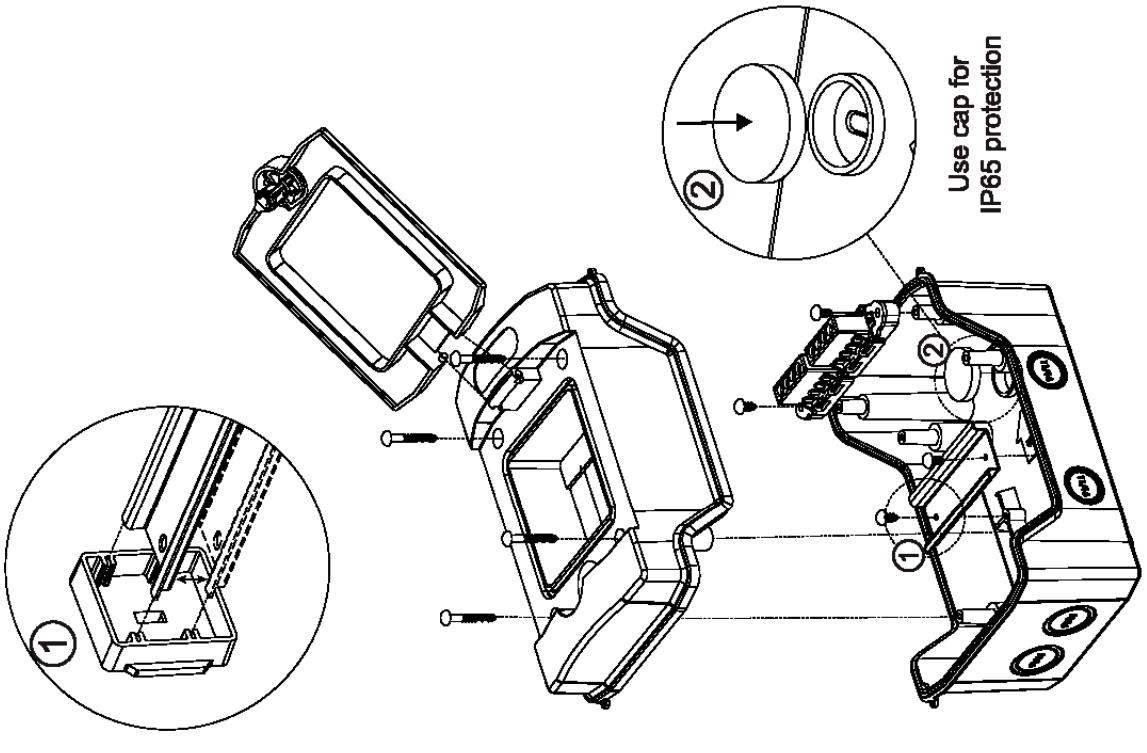
Temperature range: -25°C ... +60 °C. Rating Voltage: AC 400 V; IP65, Class II; IK08
According to: IEC 60670; IEC 62208
Rating Voltage: AC400V, DC1000V

www.tehno-plast.com

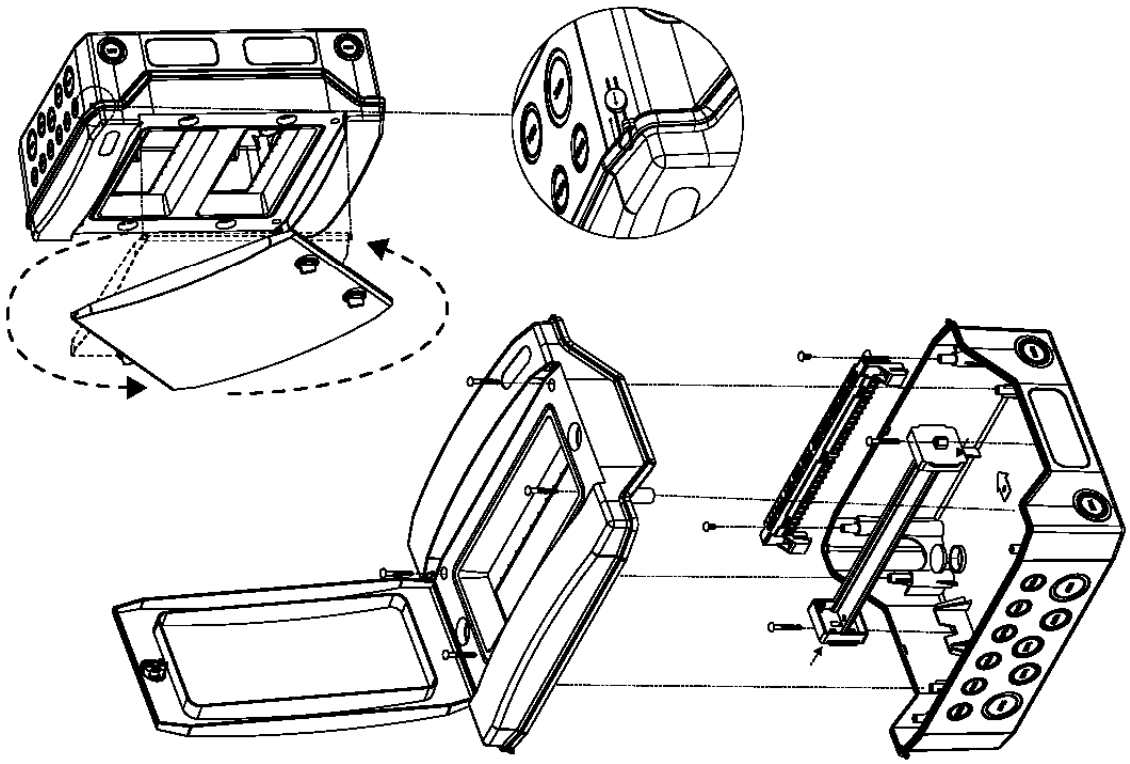
TEHNOPLAST



Zdravka Jekića 119, 22305 Stari Banovci, Serbia
Phone: +381 22 351 223
e-mail: office@tehno-plast.com



DIN RAIL MOUNTING



DIN RAIL MOUNTING

Attachment No. 3
(Photos)


TENNOPLAST
25.08.2017
C20172219
S20176257