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TESTING LABORATORY

AB 044

TEST REPORT
PN-IEC/EN 62208

Title of the Standard: Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements

Report Reference No. ..... :	**LA-13.061/1/E**	
Date of issue ..... :	**2013-09-26**	
Total number of pages ..... :	**13**	
Tested by ..... : (name + position + signature)	**Krzysztof Strawa** senior specialist	
Authorized by ..... : (name + position + signature)	**Dariusz Szczepanowski** manager of LA	
Testing application number ..... :	**C-A-13-054/13.052**	
Test item reference ..... :	**S-A-13-052**	
Scope of test:	☒ - type test	☐ - partial test
Test specification:		
Standard/procedure ..... :	EN 62208: 2011; IEC 62208: 2011 / BBJ	
Non-standard test methods ..... :	N/A	
Non-accredited test methods ..... :	N/A	
Applicant's name ..... :	**Z.P.H. ELEKTRO-PLAST Spółka z o.o.**	
Address ..... :	62-860 Opatówek, ul. Rogatka 14 POLAND	
Test item description ..... :	Empty enclosures	
Trade Mark ..... :	ELEKTRO-PLAST	
Manufacturer ..... :	Z.P.H. ELEKTRO-PLAST Spółka z o.o. 62-860 Opatówek, ul. Rogatka 14 POLAND	
Model/Typ reference ..... :	RHp-12, RH-24 and RH-54/3 „NEO series"	
Ratings ..... :	IP65, IK07, In = 100 A, Un = 230/400 V, 50 Hz, Ui = 500 V, II class Dimensions (H×W×D): - RHp-12: 305 mm x 335 mm x 135 mm, - RH-24: 420 mm x 330 mm x 138 mm, - RH-54/3: 580 mm x 430 mm x 138 mm	

List of Attachments:

Attachment No.:	Title of the attachment	Number of pages
Attachment No. 1	PHOTOS OF TESTING PRODUCT	5
Attachment No. 2	LIST OF TEST EQUIPMENT USED	1

Summary of testing:

Tests performed (in the case of partial tests): N/A	**Testing location / address** (if different from page 1): SEP - BBJ 20-150 Lublin, ul. Rapackiego 13
Number of tests with F(Fail) verdict	0
Summary conformity/non-conformity with standardization document (if apply)	N/A
Summary of compliance with National Differences (if apply): Provide list of standards.	N/A
Opinions and interpretation, if needed:	N/A
Other additional information (as requested by the applicant):	N/A

Copy of marking plates:

Test item particulars:	
Type of material	insulating enclosure
Method of fixing.....	wall mounting and under the plaster mounting
Intended location.....	indoor
Degree of protection	IP65
Rated insulation voltage (if applicable)	500 V
Samples to the tests were marked as follows: - Empty enclosure of type RHp-12 – sample No. 1/052, - Empty enclosure of type RH-24 – sample No. 2/052, - Empty enclosure of type RH-54/3 – sample No. 3/052	
Date (s) of receipt of test item.....	**2013-08-07**
Date (s) of performance of tests.....	**2013-09-09...2013-09-26**
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)**
Test report general remarks: **1. 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.** **2. "(See Enclosure #)" refers to additional information appended to the report..** **3. "(See appended table)" refers to a table appended to the report** **4. Throughout this report a comma is used as the decimal separator.** **5. Test Report Form is based on TRF Nr: IEC62208B, copyrighted by IECEE**	
Production place(s)	**Z.P.H. ELEKTRO-PLAST Spółka z o.o. 62-860 Opatówek, ul. Rogatka 14 Poland**

General product information:

Samples to the tests were chosen from family of empty enclosures of types RHp-8, RHp-12, RHp-18, RHp-24, RH-4, RH-6, RH-8, RH-12, RH-18, RH-24, RH-36, RH-54/3 and RH-72.

All the test from testing program were performed on the samples No. 1, 2 and 3.

List of the types of product:

Hermetic distribution boards of type RH							
Cat No.	Name	Type	Version	Terminals N and PE	Dimensions [mm]		
					A (width)	B (height)	C (depth)
36.(0,3...0,4)	RH-4	1 x 4	B, Z, ZB	Yes	172	260	138
36.(3...6)	RH-6	1 x 6	B, Z, ZB	Yes	225	260	138
36.(7...10)	RH-8	1 x 8	B, Z, ZB	Yes	260	260	138
36.(11...14)	RH-12	1 x 12	B, Z, ZB	Yes	330	260	138
36.(711...714)	RH-12	1 x 12	S/S, S, S/Z, S/ZS	Yes	330	260	138
36.(17...20)	RH-18	1 x 18	B, Z, ZB	Yes	435	260	138
36.(717...720)	RH-18	1 x 18	S/S, S, S/Z, S/ZS	Yes	435	260	138
36.(17...20)	RH-24	2 x 12	B, Z, ZB,	Yes	330	420	138
36.(717...720)	RH-24	2 x 12	S/S, S, S/Z, S/ZS	Yes	330	420	138
36.(135...138)	RH-36	2 x 18	B, Z, ZB	Yes	435	420	138
36.(142...145)	RH-36	3 x 12	S/S, S, S/Z, S/ZS	Yes	330	580	138
36.(153...156)	RH-54	3 x 18	B, Z, ZB	Yes	435	580	138

Hermetic distribution boards of type RHp										
Cat No.	Name	Type	Version	Terminals N and PE	Dimensions [mm]					
					Width		Height		Depth	
					A	AM	B	BM	C	D
36.(807...810)	RHp-8	1 x 8	B, Z, ZB	Yes	260	275	290	305	135	30
36.(119...122)	RHp-12	1 x 12	B, Z, ZB	Yes	330	345	290	305	135	30
36.(179...182)	RHp-18	1 x 18	B, Z, ZB	Yes	435	450	290	305	135	30
36.(239...242)	RHp-24	2 x 12/24/	B, Z, ZB	Yes	330	345	450	465	135	30

Notes:
- B - white door
- Z - lock
- ZB - lock, white door
- S/S - grey, grey door
- S - grey
- S/Z - grey, lock
- S/ZS - grey, lock, grey door

IEC/EN 62208			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
6	INFORMATION TO BE GIVEN REGARDING THE ENCLOSURE		—
6.2	Marking		—
	The enclosure shall be marked as follows:		—
	- Name, trade mark or identification mark of the enclosure manufacturer.	ELEKTRO-PLAST	P
	- Type designation or identification number of the enclosure.	- RHp-12 - RH-24 - RH-54/3	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.		P
	The marking for recycling of plastic parts follows ISO 11469.	>ABS<	P
6.3	Documentation		—
6.3.1	General		—
	The manufacturer's documentation includes:		—
	- 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	- RHp-12: 305 mm x 335 mm x 135 mm, - RH-24: 420 mm x 330 mm x 138 mm, - RH-54/3: 580 mm x 430 mm x 138 mm	P
6.3.3	- mounting arrangements	wall mounting and under the plaster mounting	P
6.3.4	- permissible loads	See 8.2	P
6.3.5	- lifting devices, if necessary		N/A
6.3.6	- provisions for protection against electric shock	II class	P
	- applicable service conditions (see Clause 7);	-25 °C do +60 °C	P
	- location and size of protected space		P
	- data of thermal power dissipation capability;		P
	- rated insulation voltage of enclosures constructed of an insulating material	500 V	P
	- degree of protection (IK code, see 8.7)	IK07	P
	- degree of protection (IP code, see 8.8)	IP65	P
	Data for the thermal power dissipation capability		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
7	SERVICE CONDITIONS		—
7.1	Manufacturer has specified the locations for which the enclosure is intended	Indoor locations	P
7.2	Normal service conditions		—
7.2.1	Ambient air temperature		—
7.2.1.1	- for indoor locations (max. +40°C, average over 24 h ≤ 35°C; lower limit : -5°C)	Special conditions: -25 °C…+60 °C	P
7.2.1.2	- for outdoor locations (max. +40°C, average over 24 h ≤ 35°C; lower limit : -25°C)		N/A
7.2.2	Humidity conditions		—
7.2.2.1	- for indoor locations (≤ 50% RH at max. +40°C or for example 90% RH at +20°C)		P
7.2.2.2	- for outdoor locations (up to 100% RH at max. +25°C)		N/A
7.3	Special service conditions, if applicable	Special conditions: -25 °C…+60 °C	P
7.4	Conditions during transport and storage, if applicable		P
8	DESIGN AND CONSTRUCTION		—
8.1	General		—
	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		P
	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		P
8.2	Static loads		—
	Compliance of the permissible load that the enclosure and its doors are able to carry is checked according to the test of 9.4	- RHp-12: 5,0 kg, - RH-24: 10,0 kg, - RH-54/3: 15,0 kg	
8.3	Lifting and transport support		—
	Where required, enclosures are provided with appropriate lifting devices or transport means (according to the test of 9.5)		N/A
8.4	Access to the interior of the enclosure		—
	Doors or removable covers allow adequate access to the protected space. Access may be restricted by the use of a key or tool	Key and tool	P
	Cable gland plates and covers which are removable from the outside require the use of a tool.	Tool	P
8.5	Protective circuit		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Metallic enclosures shall ensure the electric continuity		—
	- by conductive structural parts of the enclosure		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		—
	Enclosure constructed of an insulating material fulfil the dielectric test of 9.10		P
8.7	Degree of protection (IK-Code)		—
	Degree of protection according to IEC 62262	IK07	P
	Compliance is checked according to the test of 9.7		P
8.10	Degree of protection (IP-Code)		—
	Degree of protection according to IEC 60529	IP65	P
	Compliance is checked according to the test of 9.8		P
9	TYPE TESTS		—
9.2	General conditions of tests		—
	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		P
	Number of samples and order of test per sample according to Table 1		N/A
9.3	Marking		—
	Markings made by moulding, pressing or similar and labels with a laminated plastic covering are not submitted to this test		—

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Clause	**Requirement + Test**	**Result - Remark**		**Verdict**
	Test: 15 s rubbing with water and then 15 s rubbing with petroleum spirit			P
	After the test markings easily 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	Enclosure: - RHp-12: 5,0 kg, - RH-24: 10,0 kg, - RH-54/3: 15,0 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			N/A
	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			P
	Closed door opened 5 times through 90°			N/A
	Resting in open position: 1 min.			N/A
	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			N/A
	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			—
	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
	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			—
	Axial load according to table 2 applied for 10s	Size: — M	Load: — N	N/A
	After the test:			—
	- the insert is in its original position			N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	- 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)		—
	- 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:	IK07 / Impact Energy = 2 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		N/A
	After the test:		—
	- 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)		—
9.8.1	Degree of protection against access to hazardous parts and against the ingress of solid foreign objects indicated by first characteristic numeral		—
9.8.1.1	Protection against access to hazardous parts		—
	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
	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		P
9.8.2	Degree of protection against ingress of water as indicated by the second characteristic numeral		—
	Test according to clauses 14.1 and 14.2 of IEC 60529		P
	After the test, water has not ingressed into the protected space		P
9.8.3	Degree of protection against hazardous parts as indicated by additional letter.		—
	Test according to clause 15 of IEC 60529		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	The access probe does not touch the surface of the protected space.		N/A
9.9	Properties of insulating materials		—
9.9.1	Thermal stability		—
	Test according to IEC 60068-2-2 Test Bb, temperature 70°C, with natural air circulation, for a duration of 168 h	90 °C (special conditions: -25 °C...+60 °C)	P
	After the treatment:		—
	Enclosures are kept at ambient temperature and relative humidity between 45% and 55% for 4 days (96h)	20 °C; 50 %; 96 h	P
	- enclosure shows no crack without additional magnifications		P
	- material became not sticky or 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.		P
9.9.2	Resistance to normal heat		—
	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 60085 Thermal class: Y (90 °C)	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
	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:		—
	Storage at 15-35°C / RH 35-45 % for 24h		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:		—
	- for parts retaining current-carrying parts in position: 960 ± 15°C	Material of the "N" terminal	P
	Time at which sample ignited:	t_i = 7 s	—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Time when sample extinguished:	t_e = 36 s	—
	- for parts intended to be installed in hollow Walls: 850 ± 15°C	Enclosure of sample No. 1	P
	Time at which sample ignited:	t_i = 15 s	—
	Time when sample extinguished:	t_e = 40 s	—
	All other parts: 650 ± 15°C		P
	Time at which sample ignited:	t_i = 0 s	—
	Time when sample extinguished:	t_e = 0 s	—
	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
9.10	Verification of dielectric strength		—
9.10.1	General		—
	This test applies to enclosures where insulating material is used, even in combination with non-insulating materials		—
9.10.2	Preconditioning		—
	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)	40 °C; 93 %; 48 h	P
9.10.3	Enclosures without metal elements inside the protective space		—
	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		—
	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.		P
	Applied voltage:	U = 2835 V	P
9.10.5	Results to be obtained		—
	- 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		—
	Exposed conductive parts of the enclosure connected to the protective circuit		N/A
	Resistance not exceeding 0,1 Ω	Measured: — Ω	N/A
9.12	Resistance to ultra-violet (UV) radiation		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	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		N/A
	For enclosures constructed of insulating materials compliance is checked by verification		—
	- flexural strength (according to ISO 178) of insulating materials have 70% min. retention		N/A
	- charpy impact (according to ISO / EN ISO 179) of insulating materials have 70% min. retention		N/A
	After the test samples are subjected to the glow wire test of 9.9.3		N/A
	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		N/A
9.13	Resistance to corrosion		—
9.13.1	General		—
	Metallic enclosures and external metallic parts of insulating and combined enclosures are tested to verify that they ensure protection against corrosion		P
	In all cases hinges, locks and fastenings have to be tested		P
9.13.2	Test procedure		—
9.13.2.1	Severity test A		—
	This test is applicable to:		—
	- 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	Metallic parts of terminals, rail TH 35, screws	P
	The test consists of:		—
	- 6 cycles of 24 h each to damp heat cycling test according to IEC 60068-2-30 (Test Db) at (40 ± 3) °C and relative humidity of 95 %		P
	- 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) °C		P
9.13.2.2	Severity test B		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	This test is applicable to:		—
	- metallic outdoor enclosures		N/A
	- external metallic parts of outdoor enclosures		N/A
	The test comprises two identical 12 day periods		—
	Each 12 day period comprises:		—
	- 5 cycles of 24 h each to damp heat cycling test according to IEC 60068-2-30 (Test Db) at (40 ± 3) °C 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) °C		N/A
9.13.3	Results to be obtained		—
	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		P
	Compliance is checked by visual inspection to determine that:		—
	- 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		P
	- the mechanical integrity is not impaired		P
	- seals are not damaged		P
	- doors, hinges, locks, and fastenings work without abnormal effort		P
9.14	Thermal power dissipation capability		—
	The thermal power dissipation data provided by the manufacturer (see 6.3.1) is determined by following test:		—
	- either in accordance with 10.10.4.2.2 of IEC 61439-1:2011		N/A
	- or by a calculation method, e.g. according to IEC/TR 60890	Method / Standard: PN-HD 528 S2:2002 Result: - RHp-12: 36,8 W, - RH-24: 56,3 W, - RH-54/3: 81,4 W	P