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ASSOCIATION OF POLISH ELECTRICIANS
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TESTING LABORATORY

AB 044

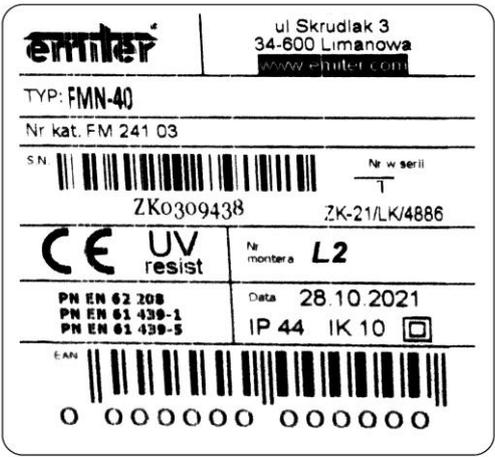
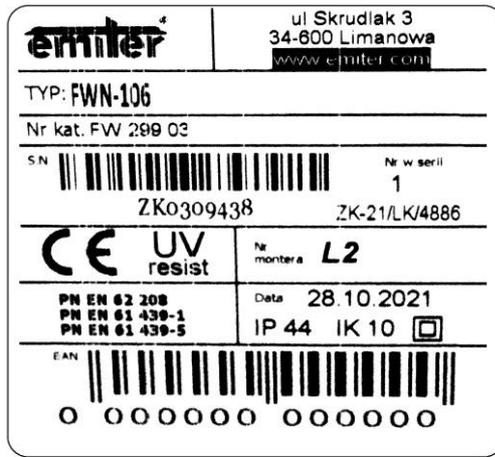
**TEST REPORT****IEC/EN 62208**

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

General requirements

Report reference No:	LA-21.124/21.052/1/E	
Date of issue	2022-01-13	
Total number of page	19 pages	
Tested by (name + function + signature)	Zbigniew Ostrowski Senior Specialist	
Authorizing by (name + function + signature)	Dariusz Szczepanowski Manager of LA Laboratory	
Testing application number	C-A-21-124/21.052	
Test items reference	S-A-21-052	
Scope of test	<input checked="" type="checkbox"/> - type test	<input type="checkbox"/> - partial test
Test specification:		
Standard/procedure	<input checked="" type="checkbox"/> EN 62208:2011 <input checked="" type="checkbox"/> IEC 62208:2011 Ed. 2	
Non-standard test methods	N/A	
Non-accredited test method	N/A	
Applicant's name	Zakład Usługowo-Produkcyjny EMITER Sp. j. Stanisław Bieda - Piotr Lis	
Address	34-600 Limanowa ul. Skrudlak 3	
Test item description	The enclosures for low-voltage switchgear and controlgear assemblies made of thermosetting insulating material	
Trade Mark		

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 without written approval of the BBJ Testing Laboratory

Manufacturer	Zakład Usługowo-Produkcyjny EMITER Sp. j. Stanisław Bieda - Piotr Lis 34-600 Limanowa ul. Skrudlak 3	
Model/Typ reference	OS ..., OSZ ..., OSi ..., OSZi ...	
Rating(s)	IP44(OS)/IP54(OSZ), IK10. Dimension (L x H x D): 1948 mm x 396 mm x 248 mm (OSZ 40 x 80 SK + FMW-40), 1125 mm x 396 mm x 245 mm (FMW-40), 1199 mm x 396 mm x 245 mm (FVN-106).	
List of Attachments:		
Attachment	Name of Attachments	Page number
No. 1	Summary of testing	1
No. 2	List of test equipment used	1
No. 3	The photos	3
No. 4	The test report No. LA-18.145/18.057/1 according to PN-EN 62208: 2011 for type enclosures OS ..., OSZ ..., OSi ..., OSZi ..., issued by the SEP-BBJ in Lublin on 2019-07-30	29
Summary of testing:		
Testing performed (in the case of partial tests): type tests according to PN-EN 62208: 2011 – Appendix No. 1	Testing location:/address (if different from page 1) Zakład Aparatów Niskiego Napięcia 20-150 Lublin, ul. M. Rapackiego 13, POLAND	
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): —	N/A	
Opinions and interpretation, if needed:	N/A	
Other additional information (as requested by the applicant): —	N/A	
Copies of marking plates:		
		
Foundation type: FMN-40 with enclosure type OS 40 x 80 SK - product object No.1	Foundation type: FVN-106 – product object No. 2	



		ul Skrudlak 3 34-600 Limanowa www.emiter.com	
TYP: OS 40x80 SK.			
Nr kat. GA 248 20			
S.N.		Nr w serii	1
ZK0309438		ZK-21/LK/4886	
	UV resist	Nr montera	L2
PN EN 62 208 PN EN 61 439-1 PN EN 61 439-5	Data	28.10.2021	
IP 44 IK 10			
EAN			
5 901571 601335			

Enclosure type OS 40 x 80 SK with foundation type FMN - 40 for low voltage switchgears made of thermosetting insulation material - product object No.1 and foundation made of thermosetting insulation material type FWN -106 - product object No. 2

Test item particulars:

The tests were carried out on one enclosure with a foundation made of thermosetting insulating material marked with the number S-A-21-052 / 1 and on a foundation made of thermosetting insulating material marked with number S-A-21-052/ 2. In the further part of the report, abbreviated numbering of the product object marking was adopted as No. 1 and No. 2.

Enclosure type + foundation / or foundation	Product object number
OS 40 x 80 SK, without equipment + foundation FMW-40,	1
foundation FWN-106, without equipment,	2

Product information:

The type of material	enclosures and foundations made of thermosetting insulation material
Method of fixing	freestanding enclosures and foundations
Place of installation/The intended location	outdoor
Service conditions	normal
Degree of protection (IP code)	IP44(OS ...)/IP54 (OSZ ..., FMW-40, FWN-106)
Degree of protection (IK code)	IK10
Rated insulation voltage	U _i = 690 V AC
Dokumentation	catalog cards: Enclosure: OS 40 x 80 SK, foundations: FMW-40, FWN-106
Power dissipation equipment installed in the enclosure	see Appendix No. 4 -Table 9.14
Static loads	60 kg – see Table 9.14
Lifting and transport support	---
Date(s) of receipt of test item	2021-10-29



Data of test beginning	2021-12-28
Date(s) of performance of tests	2022-01-13
Possible test case verdicts:	
Test case does not apply to the test object	N/A
Test item does meet the requirement	P(Pass)
Test item does not meet the requirement	F(Fail)
Test report general remarks:	
<p>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.</p> <p>2. "(See Enclosure #)" refers to additional information appended to the report.</p> <p>3. "(See appended table)" refers to a table appended to the report.</p> <p>4. Throughout this report a comma is used as the decimal separator.</p> <p>5. Test Report Form is based on TRF No.: N/A</p>	
Production place(s)	Zakład Usługowo-Produkcyjny EMITER Sp. j. Stanisław Bieda - Piotr Lis 34-600 Limanowa ul. Skrudlak 3

General product information:

The tested enclosure and foundations are intended for use as parts of switchgears in accordance with the standards of the EN 61439 series. Electrical equipment can be installed either inside the enclosure on the rear wall in the mounting sockets provided for this purpose, on the mounting strip or on the mounting plate. Foundation elements are made of glass-fiber reinforced polyester with a hardener.

The tested foundations with enclosures can be used for the construction of switchgears in protection class II.

The enclosure and foundations were selected for testing as representatives of all types of enclosures, presented in the manufacturer's technical documentation ("Enclosures " catalog) and in Table 1 below.

Table 1: LIST OF ENCLOSURES TYPE OS ...

Enclosures					
OS 26x40	OSZ 26x2x40	OS 66x80/3+5/8	OS 80x80/8/5+3	OS 26/53x60	OSZ 53x2x80-2
OS 26x60	OSZ 26x2x60	OSZ 66x80/3+5/8	OSZ 80x80/8/5+3	OS 26/53x80	OS 53x2x60
OS 26x80	OSZ 26x2x80	OS 66x80/8/5+3	OS 80x80/5+3/8	OSZ 26/53x60	OS 53x2x80
OSZ 26x40	OS 66x40	OSZ 66x80/8/5+3	OSZ 80x80/5+3/8	OSZ 26/53x80	OSZ 53x2x40
OSZ 26x60	OS 66x60	OS 66x80/5+3/8	OS 80x80/4+4/4+4	OS 53/26x40	OSZ 53x2x60
OSZ 26x80	OS 66x80	OSZ 66x80/5+3/8	OSZ 80x80/4+4/4+4	OS 53/26x60-2	OSZ 53x2x80
OS 40x40	OSZ 66x40	OS 80x40	OS 80x80/3+5/3+5	OS 53/26x80-2	OS 26x2/53x40
OS 40x50	OSZ 66x60	OS 80x50	OSZ 80x80/3+5/3+5	OSZ 53/26x40	OS 26x2/53x60-2
OS 40x60	OSZ 66x80	OS 80x60	OS 80x80/5+3/5+3	OSZ 53/26x60-2	OS 26x2/53x80-2
OS 40x80	OS 26/40x40	OS 80x80	OSZ 80x80/5+3/5+3	OSZ 53/26x80-2	OSZ 26x2/53x40
OSZ 40x40	OS 26/40x60	OSZ 80x40	OS 80x80/4+4/3+5	OS 53/26x60	OSZ 26x2/53x40-2
OSZ 40x50	OS 26/40x80	OSZ 80x50	OSZ 80x80/4+4/3+5	OS 53/26x80	OSZ 26x2/53x60-2
OSZ 40x60	OSZ 26/40x40	OSZ 80x60	OS 80x80/3+5/4+4	OSZ 53/26x60	OSZ 26x2/53x80-2
OSZ 40x80	OSZ 26/40x60	OSZ 80x80	OSZ 80x80/3+5/4+4	OSZ 53/26x80	OS 26x2/53x60



OS 40x80/4+4	OSZ 26/40x80	OS 40x2x40	OS 80x80/4+4/5+3	OS 26x3x40	OS 26x2/53x80
OSZ 40x80/4+4	OS 26x2/40x40	OS 40x2x50	OSZ 80x80/4+4/5+3	OS 26x3x60	OSZ 26x2/53x60
OS 40x80/3+5	OS 26x2/40x60	OS 40x2x60	OS 80x80/5+3/4+4	OS 26x3x80	OSZ 26x2/53x80
OSZ 40x80/3+5	OS 26x2/40x80	OS 40x2x80	OSZ 80x80/5+3/4+4	OSZ 26x3x40	OS 53/2x26x40
OS 40x80/5+3	OSZ 26x2/40x40	OSZ 40/53X40-2	OS 40/53X40	OSZ 26x3x60	OS 53/2x26x60-2
OSZ 40x80/5+3	OSZ 26x2/40x60	OSZ 40/53X60-2	OS 40/53X60-2	OSZ 26x3x80	OS 53/2x26x80-2
OS 53x60	OSZ 26x2/40x80	OSZ 40/53X80-2	OS 40/53X80-2	OS 93x60	OSZ/2x26x40
OS 53x80	OS 40/26x40	OSZ 40x2x40	OS 80x80/3+5/5+3	OS 93x80	OSZ 53/2x26x40-2
OSZ 53x60	OS 40/26x60	OSZ 40x2x50	OSZ 80x80/3+5/5+3	OSZ 93x40	OSZ 53/2x26x60-2
OSZ 53x80	OS 40/26x80	OSZ 40x2x60	OS 80x80/5+3/3+5	OSZ 93x60	OSZ 53/2x26x80-2
OS 53x40	OSZ 40/26x40	OSZ 40x2x80	OSZ 80x80/5+3/3+5	OS 106x60	OS 53/2x26x60
OS 53x60-2	OSZ 40/26x60	OS 80x80/8/4+4	OS 26/53x40	OS 106x80	OS 53/2x26x80
OS 53x80-2	OSZ 40/26x80	OSZ 80x80/8/4+4	OS 26/53x60-2	OSZ 106x40	OSZ 53/2x26x60
OSZ 53x40	OS 66x80/8/4+4	OS 80x80/4+4/8	OS 26/53x80-2	OSZ 106x60	OSZ 53/2x26x80
OSZ 53x60-2	OSZ 66x80/8/4+4	OSZ 80x80/4+4/8	OSZ 26/53x40	OSZ 106x80	OS 26x4x40
OSZ 53x80-2	OS 66x80/4+4/8	OS 80x80/8/3+5	OS 26/53x40-2	OS 53x2x40	OS 26x4x60

OS 26x2x40	OSZ 66x80/4+4/8	OSZ 80x80/8/3+5	OSZ 26/53x40-2	OS 53x2x60-2	OS 26x4x80
OS 26x2x60	OS 66x80/8/3+5	OS 80x80/3+5/8	OSZ 26/53x60-2	OS 53x2x80-2	OSZ 26x4x40
OS 26x2x80	OSZ 66x80/8/3+5	OSZ 80x80/3+5/8	OSZ 26/53x80-2	OSZ 53x2x40	OSZ 26x4x60
				OSZ 53x2x40-2	OSZ 53/2x26x40
				OSZ 53x2x60-2	OSZ 26x4x80

Enclosures with insulators

OSi 26x80	OSZi 26x80	OSi 40x80	OSZi 40x80	OSi 53x80	OSi 53x80-2
OSZi 53x80x2	OSi 66x80	OSZi 66x80	OSi 80x80	OSZi 80x80	OSi 106x80
OSZi 106x80	Osi 93x80	OSZi 93x80			

Foundation	Foundation	Foundation	Foundation	Foundation with a partition	Cable pocket	Cable pocket with partition
F - 26	FW - 26	FMN-26	FWN-26	FP - 26	K - 26	KP - 26
F - 40	FW - 40	FMN-33	FWN-33	FP - 40	K - 40	KP - 40
F - 53	FW - 53	FMN-40	FWN-40	FP - 53	K - 53	KP - 53
F - 66	FW - 66	FMN-53	FWN-53	FP - 66	K - 66	KP - 66
F - 80	FW - 80	FMN-66	FWN-66	FP - 80	K - 80	KP - 80
F - 93	FW - 93	FMN-80	FWN-80	FP - 93	K - 93	KP - 93
F -106	FW -106	FMN-93	FWN-93	FP-106	K -106	KP - 106
FN - 26		FMN-106	FWN-106			
FN - 40		FMPN-26	FWPN-26			
FN - 53		FMPN-40	FWPN-40			
FN - 66		FMPN-53	FWPN-53			
FN - 80		FMPN-66	FWPN-66			
FN - 93		FMPN-80	FWPN-80			
FN -106		FMPN-93	FWPN-93			
		FMPN-106	FWPN-106			

Table 1:



Enclosures:					
STN 26X42	SSTN 26X42	STN 26X58	SSTN 26X58	STN 26X84	SSTN 26X84
STN 40X42	SSTN 40X42	STN 40X58	SSTN 40X58	STN 40X84	SSTN 40X84
STN 53X42	SSTN 53X42	STN 53X58	SSTN 53X58	STN 53X84	SSTN 53X84
STN 53X42/2	SSTN 53X42/2	STN 53X58/2	SSTN 53X58/2	STN 53X84/2	SSTN 53X84/2
STN 66X42	SSTN 66X42	STN 66X58	SSTN 66X58	STN 66X84	SSTN 66X84
STN 66X42/2L	SSTN 66X42/2L	STN 66X58/2L	SSTN 66X58/2L	STN 66X84/2L	SSTN 66X84/2L
STN 66X42/2P	SSTN 66X42/2P	STN 66X58/2P	SSTN 66X58/2P	STN 66X84/2P	SSTN 66X84/2P
STN 80X42	SSTN 80X42	STN 80X58	SSTN 80X58	STN 80X84	SSTN 80X84
STN 80X42/2	SSTN 80X42/2	STN 80X58/2	SSTN 80X58/2	STN 80X84/2	SSTN 80X84/2
STN 80X42/2L	SSTN 80X42/2L	STN 80X58/2L	SSTN 80X58/2L	STN 80X84/2L	SSTN 80X84/2L
STN 80X42/2P	SSTN 80X42/2P	STN 80X58/2P	SSTN 80X58/2P	STN 80X84/2P	SSTN 80X84/2P
STN 80X42/3	SSTN 80X42/3	STN 80X58/3	SSTN 80X58/3	STN 80X84/3	SSTN 80X84/3
STN 106X58	SSTN 106X58	STN 106X84	SSTN 106X84	STN 106X58/2	SSTN 106X58/2
STN 106X84/2	SSTN 106X84/2	STN 106X58/3L	SSTN 106X58/3L	STN 106X84/3L	SSTN 106X84/3L
STN 106X58/3P	SSTN 106X58/3P	STN 106X84/3P	SSTN 106X84/3P	STN 106X58/3S	SSTN 106X58/3S
STN 106X84/3S	SSTN 106X84/3S	STN 106X58/4	SSTN 106X58/4	STN 106X84/4	SSTN 106X84/4
STN 40x84/2	SSTN 40x84/2				
STN 26X42/32	SSTN 26X42/32	STN 26X58/32	SSTN 26X58/32	STN 26X84/32	SSTN 26X84/32
STN 40X42/32	SSTN 40X42/32	STN 40X58/32	SSTN 40X58/32	STN 40X84/32	SSTN 40X84/32
STN 53X42/32	SSTN 53X42/32	STN 53X58/32	SSTN 53X58/32	STN 53X84/32	SSTN 53X84/32
STN 53X42/2/32	SSTN 53X42/2/32	STN 53X58/2/32	SSTN 53X58/2/32	STN 53X84/2/32	SSTN 53X84/2/32
STN 66X42/32	SSTN 66X42/32	STN 66X58/32	SSTN 66X58/32	STN 66X84/32	SSTN 66X84/32
STN 66X42/2L/32	SSTN 66X42/2L/32	STN 66X58/2L/32	SSTN 66X58/2L/32	STN 66X84/2L/32	SSTN 66X84/2L/32
STN 66X42/2P/32	SSTN 66X42/2P/32	STN 66X58/2P/32	SSTN 66X58/2P/32	STN 66X84/2P/32	SSTN 66X84/2P/32
STN 80X42/32	SSTN 80X42/32	STN 80X58/32	SSTN 80X58/32	STN 80X84/32	SSTN 80X84/32
STN 80X42/2/32	SSTN 80X42/2/32	STN 80X58/2/32	SSTN 80X58/2/32	STN 80X84/2/32	SSTN 80X84/2/32
STN 80X42/2L/32	SSTN 80X42/2L/32	STN 80X58/2L/32	SSTN 80X58/2L/32	STN 80X84/2L/32	SSTN 80X84/2L/32
STN 80X42/2P/32	SSTN 80X42/2P/32	STN 80X58/2P/32	SSTN 80X58/2P/32	STN 80X84/2P/32	SSTN 80X84/2P/32
STN 80X42/3/32	SSTN 80X42/3/32	STN 80X58/3/32	SSTN 80X58/3/32	STN 80X84/3/32	SSTN 80X84/3/32
STN 106X58/32	SSTN 106X58/32	STN 106X84/32	SSTN 106X84/32	STN 106X58/2/32	SSTN 106X58/2/32
STN 106X84/2/32	SSTN 106X84/2/32	STN 106X58/3L/32	SSTN 106X58/3L/32	STN 106X84/3L/32	SSTN 106X84/3L/32
STN 106X58/3P/32	SSTN 106X58/3P/32	STN 106X84/3P/32	SSTN 106X84/3P/32	STN 106X58/3S/32	SSTN 106X58/3S/32
STN 106X84/3S/32	SSTN 106X84/3S/32	STN 106X58/4/32	SSTN 106X58/4/32	STN 106X84/4/32	SSTN 106X84/4/32
Foundations:					
FTN 26	FTN 40	FTN 53	FTN 66	FTN 80	FTN 106
FTN 26/32	FTN 40/32	FTN 53/32	FTN 66/32	FTN 80/32	FTN 106/32
Cable pockets:					
KKN 26	KKN 40	KKN 53	KKN 66	KKN 80	KKN 106
KKDN 26	KKDN 40	KKDN 53	KKDN 66	KKDN 80	KKDN 106
KKN 26/32	KKN 40/32	KKN 53/32	KKN 66/32	KKN 80/32	KKN 106/32
KKDN 26/32	KKDN 40/32	KKDN 53/32	KKDN 66/32	KKDN 80/32	KKDN 106/32



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Clause	Requirement + Test	Result - Remark	Verdict
9.3	Marking	object product No.1 and No. 2	P
	Marking made by moulding, pressing, engraving or similar shall not be submitted to the following test		P
	Labels with a laminated plastic covering shall not be submitted to the following test		N/A
	The test is made by rubbing the marking by hand for 15 s with a piece of cloth soaked in water and then for 15 s with a piece of cloth soaked with petroleum spirit	rubbed the marking by hand for 15 s with a piece of cloth soaked in water and then for 15 s with a piece of cloth soaked with petroleum spirit.	P
	NOTE: The petroleum spirit is defined as a solvent hexane with a content of aromatics of maximum 0,1 % in volume, a kauributanol value of 29, an initial boiling point of 65 °C, a final boiling point of 69 °C and a density of approximately 0,68 g/cm ³	applied to the test n-Hexan C ₆ H ₁₄	P
	Test evaluation		—
	After the test the marking shall be easily legible		P
9.4	Static loads	product object No.1	P
	Max. permitted static load	the permissible load: 60 kg; SeeTable 9.14	—
	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	the load testing: 1,25 x 60 kg = 75 kg - for enclosure. SeeTable 9.14	—
	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		P
	The loads are retained for 1 h in the closed position	1 h	P
	For enclosures constructed of insulating material and metallic enclosures with parts (hinges, locks, etc.) of insulating material, this shall be carried out at 70 °C	70 °C	P
	The closed door is opened five times through 90 °, resting at least 1 min in the open position	five times; 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
	Test evaluation		—



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Clause	Requirement + Test	Result - Remark	Verdict
	After the test, with the test loads in place, the enclosure shall show no cracks or permanent distortions and during the test no deflections which could impair any of its characteristics	no changes	P
9.5	Lifting		N/A
	Applies to enclosures with provisions for lifting		N/A
	The enclosure loaded as in 9.4 with its door closed is lifted with the specified lifting means and in the manner defined by the enclosure manufacturer		N/A
	From the standstill position, the enclosure is raised up three times in a vertical plane returning to the standstill position		N/A
	The enclosure is raised up and suspended for 30 min. at a height of ≥ 1 m for 30 min without any movement		N/A
	Next the enclosure raised to a height of ≥ 1 m is moved ($10 \pm 0,5$) m horizontally, then set down. This cycle, should be carried out for $1 \text{ min} \pm 5 \text{ s}$ and repeated three times at uniform speed		N/A
	Test evaluation		—
	After the test, with the test loads in place, the enclosure shall show no cracks or permanent distortions and during the test no deflections which could impair any of its characteristics		N/A
9.6	Axial loads of metal inserts		N/A
	This test applies to all kind of enclosures when threaded metal inserts are provided to retain the mounting plate or switchgear and controlgear supports in place		N/A
	The test shall be carried out by applying an axial load for 10 s to representative samples, as indicated in Table 2		N/A
	During the test, the enclosure shall fully rest on a supporting platform to allow the application of the above-mentioned load		N/A
	Test evaluation:		—
	- at the end of the test, the insert shall still be in its original position; any sign of movement is not acceptable		N/A
	- cracks and splits in the material containing the insert are also not acceptable		N/A
	NOTE: Small cracks or air bubbles that were visible before the test, but not caused by the application of the axial load, are ignored		—



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Clause	Requirement + Test	Result - Remark	Verdict
9.7	Degree of protection against external mechanical impacts (IK code)	IK10, product object No.1	P
	Verification of the degree of protection against mechanical impacts according to IEC 62262;	IEC 62262	P
	Test hammer compliance with IEC 60068-2-75;	IEC 60068-2-75	P
	Housing mounted on a rigid basis as in normal use:		P
	Type of test device	pendulum hammer	—
	Ambient temperature (20 ± 5 °C)	21 °C	—
	Impact energy	20 J	—
	Number and points of blows:		—
	- 3 times to each exposed surface in normal use; largest dimension ≤ 1 m	11 x 3 times to each exposed surface with largest dimension ≤ 1 m; product object No.1	P
	- 5 times to each exposed surface in normal use; largest dimension > 1 m		N/A
	No applying to the enclosure components (e.g. locks, hinges, etc.)		P
	Test evaluation:		—
	- the behavior of the degree of protection (IP Code)	no deterioration of IP44 degree	P
	- compliance with the dielectric strength test	Up = 2835 V, 50 Hz; 1min - for Ui =690 V AC	P
	- removable covers can be removed and reinstalled		P
	- no degradation of performance doors and locks		P
	Result of degree of protection (IK code) :	IK10	P
9.8	Degree of protection (IP code)	IP44; see Appendix No. 4 IP44: (product object No. 1)	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	IP4X	P
9.8.1.1	Protection against access to hazardous parts		P
	Subclauses 12.1 and 12.2 of IEC 60529:1989 apply;	test wire Ø = 1 mm, L = 100 mm, pressed in with a force of 1 N	P
	The acces probes shall not enter the protected space;	not enter the protected space	P



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Clause	Requirement + Test	Result - Remark	Verdict
9.8.1.2	Degree of protection against the ingress of solid foreign objects.	product object No. 1: IP4X	P
	For IP2X, IP3X, IP4X enclosures, 13.2 and 13.3 of IEC 60529: 1989 apply;	product object No.1	P
	For IP5X enclosures, cl. 13.4, category 2 (without vacuum pump) and cl. 13.5 of IEC 60529: 1989 apply;		N/A
	Ingress of talcum powder into protected space is verified as follows:		N/A
	<ul style="list-style-type: none">Ingress of talcum powder is verified by using a watch transparent door installed at the centre of the base of the protected space of the enclosure in order to pick up the talcum powder entering the protected space during the test. After the test, talcum powder shall not form deposits of more than 1 g/ m².		N/A
	<ul style="list-style-type: none">In practice the weight of the watch transparent door is measured before and at the end of the test and the difference between both measures is representative of the amount of the talcum powder which has entered the protected space.		N/A
	For IP6X enclosures, cl. 13.6 of IEC 60529: 1989 apply;		N/A
	No talcum powder shall be observable inside the enclosure at the end of the test;		N/A
	Where the enclosure tested according to cl. 9.7 is too large for the verification of IP 5X or 6X, an additional smaller enclosure having the same design details may be used for this test.		N/A
9.8.2	Degree of protection against ingress of water as indicated by second characteristic numeral	IPX4 – product object No. 1	P
	Subclauses 14.1 and 14.2 of IEC 60529:1989 apply;		P
	Ingress of water is verified by the use of dry absorbent paper positioned to occupy the base area of each protected space, as described in cl. 9.8.2;		P
	After the test, no signs of water in the residual space;		P
	Ingress of water is verified by the use of dry absorbent paper positioned to occupy the base area of each protected space.		P
	For doors or covers intended to accommodate equipment, a strip of paper, bent to form a 90 ° angle profile, is attached to the base of the declared protected space for that surface.		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	The paper should project from the surface equal to the depth of the protected space or a maximum of 30 mm.		P
	Where the enclosure has any uncovered aperture, a section of absorbent paper, equal to or greater than the size of the aperture, is positioned on the surface of the protected space in its immediate vicinity.		N/A
	Immediately after the test, all indicator papers shall still be dry.		P
	In practice, a coloured blotting or filter paper will show very clearly any moisture by its discolouration.		P
9.8.3	Degree of protection against hazardous parts as indicated by additional letter		N/A
	Clause 15 of IEC 60529:1989 apply;		N/A
	The access probe shall not touch the surface of the protected space;		N/A
	Result of degree of protection (IP code)	product object No. 1: IP44	P

12	TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL (acc. to IEC 60529:1989)		P
12.1	Access probes		P
	- the access probes as specified in Table 6;	as specified in Table 6	P
12.2	Test conditions		P
	First characteristic numeral 1, access probe		N/A
	- test sphere Ø 50 mm;		N/A
	- force 50 N ± 10 %		—
	First characteristic numeral 2, access probe:		N/A
	- jointed test finger Ø 12 mm / 80 mm;		N/A
	- force 10 N ± 10 %		—
	First characteristic numeral 3, access probe:		N/A
	- test rod Ø 2,5 mm / 100 mm, stop face sphere Ø 35 mm;		N/A
	- force 3 N ± 10 %		—
	First characteristic numerals 4, 5 and 6, access probe:	product object No. 1: IP44	P



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Clause	Requirement + Test	Result - Remark	Verdict
	- test wire Ø 1,0 mm / 100 mm, stop face sphere Ø 35 mm;	access probe: test wire Ø 1,0 mm / 100 mm	P
	- force 1 N ± 10 %	force 1 N	—
	Testing the clearance between the probe and the hazardous parts:		P
	- contact indication with the signal lamp;	no contact indication	P
12.3	Acceptance conditions		P
	- keeping adequate clearance between the access probe and hazardous parts as specified in sub-clauses 12.3.1, 12.3.2 and 12.3.3;		P
	- for numeral IP1X, no complete passage of access probe Ø 50 mm through the opening;		N/A
	- for numeral IP2X, no passage of the stop face of the test finger through the opening;		N/A

13	TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL (acc. to IEC 60529:1989)		P
13.1	Test means:		P
	- the test means as specified in Table 7;	as specified in Table 7	P
13.2	Test conditions		P
	First characteristic numeral 1, object probe:		N/A
	- test sphere Ø 50 mm;		N/A
	- force 50 N ± 10 %		—
	First characteristic numeral 2, object probe:		N/A
	- test sphere Ø 12,5 mm;		N/A
	- force 30 N ± 10 %		—
	First characteristic numeral 3, object probe:		N/A
	- test rod Ø 2,5 mm;		N/A
	- force 3 N ± 10 %		—
	First characteristic numeral 4, object probe:	IP4X; product object No. 1	P
	- test rod Ø 1,0 mm;	test rod Ø 1,0 mm	P
	- force 1 N ± 10 %	force 1 N	—
13.3	Acceptance conditions		P
	- for numeral IP 1X, -2X, -3X and -4X, no passage of full diameter of probe through opening;		P
13.4	Dust test for first characteristic numerals 5 and 6:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- test chamber as in Fig. 2;		N/A
	- talcum powder < 75 µm;		N/A
	- category specified in the product standard;		N/A
	- category informed by the manufacturer;		N/A
	- category 1: vacuum ≤ 2 kPa;		N/A
	- category 2: no vacuum pump;		N/A
	A volume of air 80 times the volume of the sample is tried to draw into the enclosure / max. 60 volumes per hour / depression ≤ 2 kPa;		N/A
	Test continued (h).....:		N/A
	The volume of air drawn in the test (dm ³).....:		N/A

13.5	Special conditions for first characteristic numeral 5		N/A
13.5.1	Test conditions		N/A
	- category 1		N/A
	- category 2 specified in the product standard		N/A
13.5.2	Acceptance conditions		N/A
	- permissible accumulation of talcum powder in a quantity which does not interfere with the correct operation of the equipment or impair safety		N/A
	- as specified in the product standard		N/A
13.6	Special conditions for first characteristic numeral 6		N/A
13.6.1	Test conditions		N/A
	- category 1;		N/A
13.6.2	Acceptance conditions		N/A
	- no deposit of dust inside the enclosure;		N/A

14	TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL (acc. to IEC 60529:1989)		P
14.1	Test means		P
	Test means as specified in Table 8;	as specified in Table 8	P
14.2	Test conditions		P
	Main test conditions as specified in Table 8:	as specified in Table 8	P
	- water temperature	17 °C	—



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Clause	Requirement + Test	Result - Remark	Verdict
	- temperature of the specimen under test	21 °C	—
	- difference of the temperatures ≤ 5 K	4 K	P
	- surface area of enclosure $S \pm 10\%$ (m ²)	product object No. 1: $S = 1,73$ m ²	—
14.2.1	IPX1 drip box / Fig. 3a		N/A
	duration 10 min		—
14.2.2	IPX2 drip box / Fig. 3b		N/A
	duration 4 x 2,5 min		—
14.2.3	IPX3 oscillating tube Fig. 4		N/A
	spray $\pm 60^\circ$ from vertical		—
	duration 2 x 5 min		—
	IPX3 spray nozzle Fig. 5		N/A
	spray $\pm 60^\circ$ from vertical		—
	duration ≥ 5 min		—
14.2.4	IPX4 oscillating tube Fig. 4	IPX4 pipe with oscillating motion $R = 800$ mm as shown in fig. 4, water flow 3,5 l / min, test time: 10 min	P
	spray $\pm 180^\circ$ from vertical	spray $\pm 180^\circ$ from vertical	—
	duration 10 min	10 min	—
	IPX4 spray nozzle Fig. 5		N/A
	spray $\pm 180^\circ$ from vertical		—
	duration ≥ 5 min		—
14.2.5	IPX5 water jet hose nozzle Fig. 6; $\varnothing 6,3$ mm		N/A
	duration ≥ 3 min		—
14.2.6	IPX6 water jet hose nozzle Fig. 6; $\varnothing 12,5$ mm		N/A
	duration ≥ 3 min		—
14.2.7	IPX7 immersion tank		N/A
	duration 30 min		—
14.2.8	IPX8 immersion tank by agreement		N/A
	water level; above top (m)		—
	water level; above bottom (m)		—
	test duration (min.)		—
14.3	Acceptance conditions		P
	- as specified in the product standard;	EN 62208:2011	P



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Clause	Requirement + Test	Result - Remark	Verdict
	- no entered water inside the enclosure, or	no entering of water inside the enclosures	P
	- entering of water with no influence to the correct operation, and		N/A
	- no impaired safety by water, and		N/A
	- no deposit of water on insulation parts, no reaching live parts or windings, nor accumulation near the cable end or entering the cable;		N/A
	- efficacy of the drain holes;		N/A

15	TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE ADDITIONAL LETTER (acc. to IEC 60529:1989)		N/A
15.1	Access probes as given in the Table 6		N/A
15.2	Test conditions		N/A
	Additional letter A; access probe A:		N/A
	- test sphere Ø 50 mm;		N/A
	- force 50 N ± 10 %		—
	Additional letter B; access probe B:		N/A
	- jointed test finger Ø 12 mm / 80 mm;		N/A
	- force 10 N ± 10 %		—
	Additional letter C; access probe C:		N/A
	- test rod Ø 2,5 mm / 100 mm;		N/A
	- stop face sphere Ø 35 mm;		N/A
	- force 3 N ± 10 %		—
	Additional letter D; access probe D:		N/A
	- test wire Ø 1,0 mm / 100 mm;		N/A
	- stop face sphere Ø 35 mm;		N/A
	- force 1 N ± 10 %		—
15.3	Acceptance conditions		N/A
	- keeping adequate clearance between the access probe and hazardous parts as specified in sub-clauses 12.3.1, 12.3.2 and 12.3.3;		N/A
	- no fully penetration of the stop face of the probe through the opening		N/A
	Result of degree of protection (IP code)	product object No. 1: IP44	P



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Clause	Requirement + Test	Result - Remark	Verdict
9.9	Properties of insulating materials	see Appendix No. 4	P
9.10	Dielectric strength	$U_i = 690 \text{ V AC}$, product object No. 1	P
9.10.1	General		P
	This test applies to enclosures where insulating material is used, even in combination with non-insulating materials.	enclosure made of insulating material	P
	Compliance is checked as follows:		P
9.10.2	Preconditioning		P
	The enclosures are placed in a humidity cabinet containing air with relative humidity maintained at between 91 % and 95 %. The air temperature, where the enclosures are placed, is maintained at $(40 \pm 2) \text{ }^\circ\text{C}$.	40 °C, 95 %	P
	The enclosures are kept in the cabinet for two days (48 h).	48 h	P
	In most cases, the enclosures may be brought to the specified temperature by keeping them at this temperature for at least 4 h before the humidity treatment.		P
	A relative humidity of between 91 % and 95 % can be obtained by placing in the cabinet a saturated solution of sodium sulphate (Na_2SO_4) or potassium nitrate (KNO_3) in water having a sufficiently large contact surface with the air.		P
	In order to achieve the specified conditions within the cabinet, it is necessary to ensure a constant circulation of air and, in general, to use a cabinet which is thermally insulated.		P
9.10.3	Enclosures without metal elements inside the protected space		P
	An r.m.s. voltage of substantially sine-wave form at a value according to cl. 10.9.4 of IEC 61439-1:2011 is applied for 1 min between two metal foils, one in contact with the external surface and the other inside the enclosure at the limit of the protected space.	$U_i = 690 \text{ V AC}$; $U_p = 1,5 \times 1890 \text{ V} = 2835 \text{ V}$, AC, 50 Hz; 1 min	P
	Initially not more than half the prescribed voltage is applied. It is then raised rapidly to the full value.		P
9.10.4	Enclosures having metal elements inside the protected space		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	All internal metallic parts are connected to a bar, and an r.m.s. voltage of substantially sine wave form at a value according to cl. 10.9.4 of IEC 61439-1:2011 is applied for 1 min between a metal foil in contact with the external surface and the bar.		N/A
	Initially, not more than half the prescribed voltage is applied. It is then raised rapidly to the full value.		N/A
	NOTE: A hole in the external surface of the enclosure enables the voltage to be connected to the bar. Creepage and clearance distances between the bar and the external surface should be taken into account.		N/A
9.10.5	Results to be obtained		P
	The samples shall show no damage impairing their further use; no flashover or breakdown shall occur during the test.		P
9.11	Continuity of the protective circuit		N/A
9.12	Resistance to ultra-violet (UV) radiation	see Appendix No. 4	P
9.13	Resistance to corrosion	see Appendix No. 4	P
9.13.1	General		N/A
	Ferrous metallic enclosures and external ferrous metallic parts of insulating and combined enclosures shall be tested to verify that they ensure protection against corrosion.		N/A
	If it is not possible to carry out the test on the enclosure, the test shall be carried out on enclosure elements showing the same constructional detail as the enclosure itself: material, thickness, layer of coating, etc. In all cases hinges, locks and fastenings shall be tested.		N/A
	The enclosure subjected to the test shall be mounted as for normal use according to the manufacturer's instructions.		N/A
	The enclosure or samples shall be new and in a clean condition.		N/A
	NOTE: For special service conditions (cl. 7.3) other criteria may apply, subject to an agreement between manufacturer and user.		N/A
9.13.2	Test procedure		N/A
	Enclosures shall be subjected to the following test:		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



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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none">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) °C and relative humidity of 95 % and:		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) °C.		N/A
9.13.2.2	Severity test B		N/A
	This test is applicable to:		N/A
	<ul style="list-style-type: none">metallic outdoor enclosures;		N/A
	<ul style="list-style-type: none">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) °C and relative humidity of 95 % and:		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		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.		N/A
	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
	<ul style="list-style-type: none">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. However, surface deterioration of the protective coating is allowed. In case of doubt associated with paints and varnishes, reference shall be made to ISO 4628-3 to verify that the samples conform to the specimen Ri1;		N/A
	<ul style="list-style-type: none">the mechanical integrity is not impaired;		N/A
	<ul style="list-style-type: none">seals are not damaged;		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	• 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 cl. 6.3.1) shall be determined by test in accordance with cl. 10.10.4.2.2 of IEC 61439-1:2011, or by a calculation method, e.g. according to IEC/TR 60890.	see Appendix No. 4	P

9.14	TABLE: Information concerning enclosures						P
Product object No.	Type	Dimension (L x H x D): (mm)	Code IK	Code IP	Static load (kg)		The calculated power loss of equipment installed in the enclosure (W)
					static	test	
1	OS 40 x80 SK + with foundation FMW-40	1948 mm x 396 mm x 248 mm	IK10	IP44	60 kg	75 kg	---



1. Summary of testing: Test program and order of tests performed on the sample (K) according to PN-EN 62208: 2011:					
Clause	Test	Product object No.			Comply
		1	2	---	
9.3	Marking				P
9.4	Static load	1			P
9.5	Lifting	2			N/A
9.6	Axial loads of metal inserts				P
9.7	Degree of protection against external mechanical impacts (IK code)	3			P
9.8	Degree of protection (IP code)	4		---	P
9.9	Properties of insulating materials ¹⁾				P
9.9.1	Thermal stability ¹⁾				P
9.9.2	Resistance to normal heat ¹⁾				P
9.9.3	Resistance to abnormal heat and fire ¹⁾				P
9.10	Dielectric strength	5			P
9.11	Continuity of the protective circuit				N/A
9.12	Resistance to ultra-violet (UV) radiation UV ¹⁾				P
9.13	Resistance to corrosion ¹⁾	2	2	---	P
9.14	Thermal power dissipation capability ¹⁾	1	1	---	P

NOTE: type test
1) - Assessment made on the basis of the test report according to the report No. LA-18.145/18.057/1 of 2019-07-25 – Annex No. 4

List of test equipment used:

Clause	Measurement/ testing	Testing/ measuring equipment/material used	Range used	Calibration date
9.3	Znakowanie	thermohygrometer W-02506	temp. i wilg. wzgl.	2021-11-03
		dynamometer FB200 W-2548	od 0 N do 5 N	2019-03-05
		electronic stop watch W-52162	od 0 s do 15 s	2021-10-15
		n-Heksan C ₆ H ₁₄	---	2013-11-01
9.4	Obciążenie statyczne	thermohygrometer W-02506	temp. i wilg. wzgl.	2021-11-03
		electronic stop watch W-52162	1 h	2021-10-15
		weighbridge 801/2713	75 kg	2021-01-11
		set of weights W-52149	0,5 kg ... 10 kg	2013-04-04
		climatic chamber 801/02724	70 °C	2019-09-26
9.7	Sprawdzenie stopnia ochrony przed zewnętrznymi uderzeniami mechanicznymi (Kod IK)	thermohygrometer W-02506	temp. i wilg. wzgl.	2021-11-03
		shuttle device 801/50607	1000 mm	2008-09-18
		shock element 801/50607A	5 kg	2021-02-18
		test wire W-52200	przekrój 1 mm	2019-01-16
		tape measure W-52157	3 m	2014-01-14
9.8	Sprawdzenie stopnia ochrony (Kod IP)	termohigrometr W-02506	temp. i wilg. wzgl.	2021-11-03
		dynamometer FB200 W-2548	od 0 N do 5 N	2019-03-05
		test wire W-52200	Ø = 1,0 mm	2019-01-16
		electronic stop watch W-52162	od 0 s do 10 min.	2021-10-15
		water meter W-02558	3,5 l/min.	2021-03-08
		oscillating tube Fig. 4	R = 800 mm, 3,5 l/ min, 10 min.	2021-03-08
9.10	Sprawdzenie wytrzymałości dielektrycznej	thermohygrometer W-02506	temp. i wilg. wzgl.	2021-11-03
		electronic stop watch W-52162	od 0 s do 10 min.	2021-10-15
		electric insulation strength tester 801/02716	od 0 s do 1 min	2012-05-18
		climatic chamber 801/02724	40 °C, 93 %, 48 h	2019-09-26

Attachment No.: 3

The photos:



Attachment No.: 3



The enclosure made of thermosetting insulation material type OS 40 x 80 SK + foundation type FMN-40 – product object marked with No. 1

Attachment No.: 3



Foundation made of thermosetting insulating material of the type: FWN -106 - product object marked with number 2