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TEST PROTOCOL № TR 2022-33 / 1

The test was conducted by.....: Checked.....: Approved by.....: Date of protocol approval.....: Number of pages.....:	Debugging and testing engineer: Y.I. ROMANENKO The head of the laboratory: I.H. KOZHUSHKO Director of VC "VYPROBUVACH" LLC: S.V. Voytko 09.12.2022 22 p.
Name of the testing laboratory: Address, telephone..... : Certificate number : :: _	"VYPROBUVACH" LLC 08300, c. Boryspil, str. 17 Panas Myrnoho , phone/fax (044) 457-69-22 20408
Basis Address.....:	Agreement No. 31-22 dated October 24 , 2022, Application letter No. 2507-1 dated July 25, 2022 PE "VKF "Soznaniie" 08720, Ukraine, Kyiv region, Ukrainka, 20 Dniprovskyyi Ave., office 55
Standards Non-standardized test methods.....:	DSTU EN 61442:2016 (EN 61442:2005, IDT) ; DSTU IEC 60055-1:2017 (IEC 60055-1:1997+ AMD 1:2005, IDT) ; DSTU IEC 60060-1:2010 (IES 60060-1:1989, IDT) ; DSTU EN 61140:2015 (EN 61140:2002, IDT) . not held
Name of test products: Trademark Model and/or type Serial number(s) of the sample(s): Produce Product description.....:	Coupling cable connecting J L P-CF4 (S) SOZNANIIE, serial production of the company "RADPOL" SA (Poland). RADPOL S.A. _ (Poland) JLP-CF4 150-240 (S) SOZNANIIE, which is a model representative of serial production of the company "RADPOL" S.A (Poland). RADPOL SA; St. Batorego 14, 77-300 Chluhuw, Poland JLP-CF4 150-240 (S) SOZNANIIE - cable connecting couplings for voltage up to 1 kV inclusive, equipped with 4 bolt sleeves, soldered, non-soldered or combined grounding system

Abbreviations used in the text of the protocol: The requirement does not apply to the manufactured sample (s).....: Positive test result: Negative test result:	V/N P N
Sampling:	The samples were provided by the applicant, including Completion list (Passport) for the installation kit of one JLP-CF4 (S) SOZNANIIE heat-shrinkable connecting coupling, serially produced by the company "RADPOL" SA (Poland). The schematic diagram of the clutch assembly .
Sample identification	
Date of receiving the sample(s).....:	25.10.2022
Date(s) of testing...:	- 09.12.2022
Place of testing	08300, c. Boryspil, str. 17, Panasa Myrnoho
Test methods	establishing compliance of sample characteristics with requirements: DSTU EN 61442:2016 (EN 61442:2005, IDT) ; DSTU IEC 60055-1:2017 (IEC 60055-1:1997+AMD1:2005, IDT) ; DSTU IEC 60060-1:2010 (IES 60060-1:1989, IDT) ; DSTU EN 61140:2015 (EN 61140:2002, IDT) .
Test conditions	Temperature (18...19) °C; Relative air humidity (45...67) %. Electromagnetic disturbances in the external environment are normal
Test results	positive
Results of tests for compliance with safety requirements ..:	given on p. 10 of this protocol
Results of tests for compliance with EMC requirements.....:	-
Measurement uncertainty data ..:	given on p. 4 of this protocol

The product sample was tested .

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NATIONAL ACCREDITATION AGENCY OF UKRAINE

NATIONAL AUTHORITY OF UKRAINE FOR ACCREDITATION

CERTIFICATE OF ACCREDITATION



Registered in the Register

November 19, 2019

For № 20408

valid until November 18, 2024

Date of initial accreditation: November 19, 2014

NATIONAL ACCREDITATION AGENCY OF UKRAINE HEREBY CERTIFIES
COMPETENCE

**LIMITED LIABILITY COMPANY testing laboratory
RESPONSIBILITY "EXAMINATION CENTER "EXAMINATION CH"**

**Location of the legal entity:
08300, Boryspil, str. 17, Panasa Myrny,**

**Location of the LLC: 08300, Boryspil, str. 17, Panasa Myrny,
93067, Kyiv; St. Vyborzka 103, y
03164, Kyiv, str. Generala Naumov, 17**

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code (EDRPOU)

ACCORDING TO THE REQUIREMENTS OF DSTU ISO/IEC 1 7025:2017 (ISO/IEC 17025:2017) IN THE FIELD:

testing of electrical household and similar equipment and component products, electrical installation component parts, manual electromechanical machines, technological equipment for enterprises, regulating equipment for low voltage, cable conductor products, lamps, chemical current sources, means computer equipment, radio equipment, radio electronic equipment household appliances, radio equipment, toys according to safety and quality indicators.

The scope of accreditation is defined in the appendix to this certificate
The appendix is an integral part of this certificate and consists of 26 sheets

Acting Chairman

V. Yanchev

Kyiv, 01133, Generala Almazva street, 18/7 Registered in the accounting journal under № 1134 A

NALU is a signatory of: 1) EA VIA Agreements in the areas of "Testing", "Calibration", "Product Certification", "Certification of personnel", "Certification of management systems" and "Inspection"; 2) ILAC MRA agreements in the fields "Testing", "Calibration" and "Inspection"; 3) IAE MLA Agreements in the areas of "Product Certification", "Certification of personnel", "Certification of management systems".

CONTENTS OF THE PROTOCOL

No. z/p	Name	Page
1.	Content	4
2.	Data errors	5
3.	Photo	6
4.	Testing equipment	7 - 8
5.	Test object	9
6.	The purpose of the tests	9
7.	Test program and methodology	9
8.	Selection of samples	9
9.	Identification of samples	9
10.	Technical characteristics and parameters of test objects	9-10
11	Results of compliance tests security	11
12.	Appendices	
	Appendix 1. Test No. 1	12
	Appendix 2. Test No. 2	13
	Appendix 3. Test No. 3	14
	Appendix 4. Test No. 4	15
	Appendix 5. Test No. 5	16
	Appendix 6. Test No. 6	17
	Appendix 7. Test No. 7	18
	Appendix 8. Test No. 8	19
	Appendix 9. List of components (Passport) for the assembly kit of one JLP-CF4 (S) SOZNANIIE heat-shrinkable connecting coupling, serially produced by the company "RADPOL" SA . (Poland).	20-21
	Appendix 10. Technical drawing clutch assembly JLP-CF4 150-240 (S) SOZNANIIE	22

Measurement uncertainty data

Measured values during tests	Uncertainty of measurements within
Active transient resistance	$\pm 10\%$
Resistance	$\pm 20\%$
Leakage current	$\pm 5\%$
Capacity	$\pm 20\%$
Test voltage	$\pm 3\%$
Charge	$\pm 20\%$
Discharge energy	$\pm 20\%$
Applied effort	$\pm 20\%$
Temperature	$\pm 2\%$
Angle of inclination	$\pm 1\%$
Mass	$\pm 10\%$
Pressure	$\pm 20\%$

Coupling cable connecting J L P-CF4 (S) SOZNANIE



Cable AABI 4x240-1kV _



Testing equipment and measuring tools

Name	Marking (type)	Factory and/or inventory number	Range of measurements, price of division, uncertainty
1 Hygrometer	VIT-1	b/n	20 - 90% Uncertainty $\pm 7\%$
2 Hygrometer	M-34	No. 2173	10 - 100%, $\pm 1.5\%$ resolution not determined #1117-t°-15° ± 0.29 20.0° ± 0.29 50.0° ± 0.27 #1095-t° -15° ± 0.32 20.0 ± 0.27 50.0 ± 0.27
3 Stopwatch	STC-1	No. 5890183	0 - 999.999 s error ± 0.001 s
4 The ruler is metal	LM-1000	20	0 - 1000 mm, ± 1 mm uncertainty, mm 0-1 - 0.01 0-100 - 0.1 0-500 - 0.1 0-1000 - 0.1
5 Calipers	SHTS-III-500	No. 44514	0 h 500 mm, c.d $\pm 0,1$ mm Uncertainty of measurements u= 0.1 mm
6 Digital meter	A565-003-01	No. 090595	-50 - 800 °C, class 0.15/0.05
7 Micrometer	MK-25,	No. U117606	0- 25 mm cl. 2
8 Measuring current transformer	T-0.66	No. 32001	The current on the primary winding is from 20-2000A. Accuracy class 1, 0.5s, 0.5, 0.2. The current on the secondary winding is 5 A
9 Autotransformer voltage regulator	LATR SUNTEK 1000VA		Voltage 0...300V 50/60Hz, load up to 30 A
10 Millivoltmeter	B7-38	No. 008482	10 ⁻⁵ - 2410 ⁻⁴ mA, 10 μ V - 1000 V, uncertainty 0.2 k Ω - 0.0016 2 k Ω - 0.0018 200k Ω - 0.35 20000 k Ω - 3.5
11 Millivolt ammeter	M2038	No. 10402	30 mV - 600 V, 0.75 mA - 30 A, class 0.5
12 Logometer	M-64	No. 4034851	Digital temperature controller, connected to the TC Accuracy class - 1.5. 0 - 600 °C. Resistance - 5 Ohm; 288 Ohm
thirt een Thermocouple - thermoelectric converter - 003-001	thermocouple XA, instrument A565-003-001	No. 111299	0 - 1300 °C, class 0.1/0.06
14 Electronic timer-stopwatch	TSE-1	No. 3300123	Digital, programmable, for counting time (0.0 sec-99 hours, 59 sec), power supply 220V/50Hz
15 Load transformer	UBKT		The largest load is 10 kA; for 30 seconds 220/380 V
16 Cycle counter	SI-8	No. 3300122	
17 Climatic camera	KTK-3000	No. 236644	t from 5 to +100 °C error $\pm 1.5^\circ\text{C}$, humidity from 20 to 95% error $\pm 3\%$
18 Salt fog camera	KST-04	No. 45	wateriness of salt fog from 2 to 3 g/m ³ , Dispersion from 1 to 3 μ m
19 Climatic camera	KRK-630	No. 148	temperature from 5 to -70 °C, error $\pm 1.5^\circ\text{C}$
20 Measuring set with transformer block I508M I508M	K50	No. 4502	The final values of the measurement ranges of the device measuring set K50: - voltmeter - 150V, 300V, 450V, 600V; - ammeter - 1A, 2A, 5.5A, 10A, 25A, 50A;

			Active resistance of the series circuit - 1 Ohm, 0.2 Ohm, 0.06 Ohm, 0.02 Ohm, 0.01 Ohm, 0.006 Ohm; The inductance of the serial circuit of the device measuring set K50 - 0.35mH, 0.07mH, 0.02mH, 0.006mH, 0.002mH, 0.001mH; Nominal currents with the inclusion of the I508M current transformer - 100A, 250A, 500A, 600A; The nominal current of the parallel circuit is 10.5mA; Nominal resistance of the parallel circuit of the device measuring kit K50 (between the phase and zero clamp): - at a nominal voltage of 150V - 14286 Ohms; - at a nominal voltage of 300V - 28571 ohms; - at a nominal voltage of 450V - 42857 Ohms; - at a nominal voltage of 500V - 57143 Ohms;	
21	Impact resistance stand	ST-800	No. 39/81	beat frequency up to 3 Hz, acceleration up to 800 q, mass of products to400 kr
22	Installation of a/in breakthrough	UPU-1M	No. 1301	0 - 10 kV class 4.0
23	Non-contact thermometer	HPI	No. U2082002001	-100 °C to +500 °C
24	Vibrostand	ST-5000/300/1	No. 28/81	dia. frequencies (0 - 1000) Hz, max. Amplitude ± 3 mm,
25	Kilovoltmeter	C196	No. 0720	7.5, 15 and 30 kV, absol. uncertain 2000V – 0.081621423 15000V - .065810388 30000 is 0.065482301
26	27 Dynamometer	DPU-0.02-2	No. 2695	0.02-0.2kN class 2.0
27	Dynamometer	DPU-0.2-2	No. 1045	0.20-2.0kN, class 2.0
2 8	Test stand for cables 4903.270	4903.270.00 PM	No. 8964	AC voltage 30V Direct current 50 A
29	Stands for testing the electrical strength of insulation	U503.00.PM U461.00.PM	b/n	0-30 kV, class 1.0; 0 - 3 kV, class 1.0; 0 - 10 min Uncertainty ± 0.015 min
3 0	Megaohmmeters	M4100/1 M4100/ 3	No. 459145, No. 52120	(0-200), (0-1000) kΩ (0 - 20), (0 - 100), (0 - 200) MΩ, class 1.0 100, 500, 1000 V
31	High-voltage stationary test stand type AII-70 Kenotron Kilovoltmeter Microammeter M 24	AII-70 KRM-150 M 24	No. 12199 No. 1097 No. 10419 #710	AC voltage 50 kV DC voltage 70kV Certification certificate No. RY 0051/15, issued on 06/09/15, valid until 06/09/20.
32	High-voltage pulse testing device of the HYN-500 type	SMR-10/770/MULT7 Wavesurfer 424 HYN-500	No. 851887 No. 893181 No. LCRY 0301116503 No. 899974/852356	Lightning pulse 5-220kV (uncertainty ±0.21%) Pulse duration 0.5-4000ms (uncertainty 0.01÷0.29%)

1.1 Test objects:

Cable connecting couplings of the JLP-CF4 150-240 (S) SOZNANIIE brand, which are representative samples of couplings manufactured in series by the RADPOL S. A. company, were tested . (Poland).

Cable end couplings for internal, external installation TLP-CF4 150-240 (S) SOZNANIIE, which are representative samples of couplings manufactured serially by the company RADPOL S.A. _ (Poland).

Description of the preparation and installation of samples for testing.

For testing, tested samples **No. 1, No. 2, No. 3** and control samples **No. 4, No. 5, No. 6** were mounted (to determine the heating temperature of the tested sample).

No. 1 . The tested sample consists of a section of a four-wire AABl cable 4x240-1kV with a length of 17 m., on which two tested connecting heat-shrink couplings of the type JLP-CF4 150-240 (S) SOZNANIIE are mounted, which is a representative sample of serial production of the company "RADPOL" S. A . (Poland), and two end couplings of the internal, external installation type TLP-CF4 150-240 (S) SOZNANIIE, which is a sample representative of serial production of the company "RADPOL" S. A . (Poland) . The distance between end couplings and connecting ones is not less 5 m, between connecting ones is not less 3 m.

No. 2. The tested sample consists of a section of a four-wire AABl cable 4x240-1kV with a length of 17 m., on which two tested connecting heat-shrink couplings of the type JLP-CF4 150-240 (S) SOZNANIIE are mounted, which is a representative sample of serial production of the company "RADPOL" S. A . (Poland), and two end couplings of the internal, external installation type TLP-CF4 150-240 (S) SOZNANIIE, which is a sample representative of serial production of the company "RADPOL" S. A . (Poland) . The distance between end couplings and connecting ones is not less 5 m, between connecting ones is not less 3 m.

No. 3. The tested sample consists of a section of a four-core AABl cable 4x240-1kV with a length of 13 m., on which a tested connecting heat-shrinkable coupling of the type JLP-CF4 150-240 (S) SOZNANIIE is mounted, which is a representative sample of serial production of the company "RADPOL" S. A . (Poland), and two end couplings of the internal, external installation type TLP-CF4 150-240 (S) SOZNANIIE, which is a sample representative of serial production of the company "RADPOL" S. A . (Poland) . The distance between the final couplings and the connecting one is not less than 5 m.

No. 4. The control sample (to determine the heating temperature of the test sample) consists of a section of four-wire AABl cable 4x240-1kV with a length 7 m of produced by the company "RADPOL" SA (Poland). The distance between the couplings is not less 5 m.

No. 5. The control sample (to determine the heating temperature of the test sample) consists of a section of four-wire AABl cable 4x240-1kV with a length 7 m of produced by the company "RADPOL" SA (Poland). The distance between the couplings is not less 5 m.

No. 6. The control sample (to determine the heating temperature of the test sample) consists of a section of four-wire AABl cable 4x240-1kV with a length 7 m of produced by the company "RADPOL" SA (Poland). The distance between the couplings is not less 5 m.

Assembly of couplings was performed by representatives of PE "VKF "Soznaniie".

1.2 Purpose, program and test methodology:

The purpose of the tests is to check compliance with the requirements of paragraph 1, 2, 3, 4, 5, 7, 8 table. **DSTU IEC 60055-1:2017** (IEC 60055-1:1997+AMD1:2005, IDT), **DSTU EN 61140:2015** (EN 61140:2002, IDT) presented JLP-CF4 150-240 (S) SOZNANIIE, which is a sample representative of mass-produced couplings of the RADPOL S. A. company . (Poland), for 4-wire power cables with paper oil-impregnated insulation with armor or without armor, for voltage up to 1 kV inclusive.

Test method: the tests were carried out in accordance with **DSTU EN 61442:2016** (EN 61442:2005, IDT) (clauses 4.1, 5, 6, 9, 11), **DSTU IEC 60060-1 :2010** (IEC 60060-1 :1989, IDT).

1.3 Sampling: Samples are selected and provided for testing by the customer, therefore, the procedure for selecting samples provided for testing in relation to the assessment of product compliance with the requirements of technical regulations is not provided for by the relevant normative documents.

1.4 Identification of samples: Identification of samples provided for testing was carried out by the customer, therefore, the procedure for identification of samples provided for testing in relation to the assessment of product compliance with the requirements of technical regulations is not provided for by the relevant regulatory documents.

Technical characteristics and parameters of test objects

JLP-CF4 150-240 (S) SOZNANIIE - cable coupling for 4-core cable with paper insulation with armor or without armor, for voltage up to 1 kV inclusive. Complete with 4-bolt connecting sleeves, soldered, non-soldered or combined grounding system.

Technical characteristics of the AABI 4x240-1kV cable on which couplings are installed:

AABI cable is a paper-insulated aluminum four-wire conductor with a steel-aluminum protective cover and mylar tape.

The working temperature of AABI varies in the range from -50° C to +50° WITH.

The permissible temperature of long-term heating of the core is no more than 80° C, when overloaded, up to 100°C is allowed.

Flexibility class - 1.

Outer diameter, 60.5 mm.

Application of AABI 4x240-1kV :

It is used for conducting electric lines in the open air, as well as in soils with low and medium corrosion activity, used for stationary laying. Thanks to the steel-aluminum armoring, it is laid with a high probability of mechanical damage. Suitable for use in regions with cold and temperate climates.

Construction AABI 4x240-1kV	
Conductive wire	Aluminum
Insulation	Oil-soaked
Shell	Aluminum
Pillow	Bitumen, crepe paper, mylar tape, PVC film
Armor	Two steel plates overlapping each other's seams
Outer shell	Glass yarn is a dense fibrous material
Scroll	Twisted insulated wires

Structure of AABI 4x240-1kV:

Single-wire aluminum current-conducting cores are sectoral in cross section. Each core is insulated with a special paper made of sulfated, unbleached cellulose impregnated with a viscous solution. Cable paper bundles are added to the core as a filler. An electrically conductive screen is located on top of the belt insulation. The inner protective cover is aluminum.

A cushion is placed on the aluminum armor to absorb mechanical impacts, including crushing contains a mylar tape that protects **the AABI brand cable** from impact

corrosion _ External booking is made of two steel strips, which are laid without gaps and covered with a layer of dense polymer composition.

Results of compliance tests:

For samples of cable couplings **JLP-CF4 150-240 (S) SOZNANIIE**, which are representative samples of couplings serially produced by the company **RADPOL SA (Poland)**.

No n/p	Requirements	Test method	Test parameters	Conclusion on compliance of the samples with the requirements of regulatory
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				documentation
1.	item 1 of table 3 DSTU IEC 60055-1	r.5 DSTU EN 61442 DSTU IEC 60060-1	Constant voltage test for 15 minutes at $6 U_r$ 6 kV	P
2.	item 1 of table 3 DSTU IEC 60055-1	p. 4.1 DSTU EN 61442 DSTU IEC 60060-1	AC voltage test during 5 minutes at $4.5 U_r$ 4 , 5 kV	P
3.	item 2 of table 3 DSTU IEC 60055-1	p. 6 DSTU EN 61442	Testing with 10 pulses of different polarity U 20kV	P
4.	item 3 of table 3 DSTU IEC 60055-1	p. 9 DSTU EN 61442	Testing by heating cycles in air 3 cycles at $1.5 U_0$ 1 , 5 kV	P
5.	item 4 of table 3 DSTU IEC 60055-1	p. 9 DSTU EN 61442	Testing by heating cycles in water 60 cycles at $1.5 U_0$ 1 , 5 kV	P
6.	item 5 of table 3 DSTU IEC 60055-1	p. 11 DSTU EN 61442	Short circuit test (conductor) 2 short circuits within 5 s 12.9 kA	P
7.	item 7 of table 3 DSTU IEC 60055-1	p. 6 DSTU EN 61442	Testing with 10 pulses of different polarity U 20kV	P
8.	item 8 of table 3 DSTU IEC 60055-1	p. 4.1 DSTU EN 61442 DSTU IEC 60060-1	AC voltage test during 15 minutes at $2.5 U_r$ 2 , 5 kV	P
9.	DSTU EN 61140	DSTU EN 130 1 8	Visual control . general requirements	P

RESULTS

Based on the test results, the presented samples of the JLP-CF4 150-240 (S) SOZNANIIE cable connecting heat-shrink couplings , which are representative samples of the couplings mass-produced by the RADPOL SA company (Poland), meet the requirements: **DSTU IEC 60055-1 :2017** (IEC 60055-1:1997+AMD1:2005, IDT), **DSTU EN 61140:2015** (EN 61140:2002, IDT) , (in the conducted volume).

Commissioning and testing engineer: Yu.I. ROMANENKO

The head of the laboratory: I. H. KOZHUSHKO

Test №1

Constant voltage test, in accordance with clause 1 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the methodology of section 5 of **DSTU EN 61442** (EN 61442:2005, IDT), **DSTU IEC 60060 -1** (IEC 60060-1:1989, IDT).

Start date: 11.11.2022

End date: 11.11.2022

Relative humidity 54%

The temperature is 20°C

Atmospheric pressure 980 mbar

Test description.

The constant voltage test was carried out in accordance with item 1 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of section 5 of **EN 61442** (EN 61442:2005, IDT) , **DSTU IEC 60060-1** (IEC 60060-1:1989, IDT) on samples **#1, #2, #3**. The sample was tested with a constant voltage of 6 kV for 15 minutes. The test voltage was applied in phases between one of the cores and the grounded other cores and the metal screen.

Samples **No. 1** , **No. 2**, **No. 3** passed the test without insulation breakdown and overlap. The test is considered passed .

No	Phase	High-voltage	Duration of exposure	Test result
1	AND	6 kV	15 min.	There was no breakdown
1	IN	6 kV	15 min.	There was no breakdown
1	WITH	6 kV	15 min.	There was no breakdown
2	AND	6 kV	15 min.	There was no breakdown
2	IN	6 kV	15 min.	There was no breakdown
2	WITH	6 kV	15 min.	There was no breakdown
3	AND	6 kV	15 min.	There was no breakdown
3	IN	6 kV	15 min.	There was no breakdown
3	WITH	6 kV	15 min.	There was no breakdown

The result of the electrical strength test: **Positive.**

Test №2.

AC voltage testing in accordance with clause 1 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of section 4 of **DSTU EN 61442** (EN 61442:2005, IDT), **DSTU IEC 60060-1** (IEC 60060-1:1989, IDT).

Start date: 14.11.2022

End date: 14.11.2022

Relative humidity 54%

The temperature is 22°C

Atmospheric pressure 980 mbar

Test description.

After test **No. 1**, we conduct an alternating voltage test in accordance with item 1 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the methodology of section 4 of **EN 61442** (EN 61442:2005, IDT), **DSTU IEC 60060-1** (IEC 60060-1:1989, IDT) on samples **#1, #2, #3**. The samples were tested with an alternating voltage of 4.5 kV of industrial frequency. Each trial lasted 5 minutes. The test voltage was applied in phases between one of the cores and the grounded other cores and the metal screen. The voltage was continuously increased to the specified value and then held constant for the specified duration of the test. Samples **No. 1, No. 2, No. 3** passed the test without breakdown of insulation and overlap.

	Phase	High-voltage	Duration of exposure	Test result
1	AND	4 , 5 kV	5 min.	There was no breakdown
1	IN	4 , 5 kV	5 min.	There was no breakdown
1	WITH	4 , 5 kV	5 min.	There was no breakdown
2	AND	4.5 kV	5 min.	There was no breakdown
2	IN	4.5 kV	5 min.	There was no breakdown
2	WITH	4.5 kV	5 min.	There was no breakdown
3	AND	4.5 kV	5 min.	There was no breakdown
3	IN	4.5 kV	5 min.	There was no breakdown
3	WITH	4.5 kV	5 min.	There was no breakdown

The result of the electrical strength test: **Positive**

Test № 3.

Impulse voltage test, in accordance with point 2 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), according to the methodology of Chapter 6 of **DSTU EN 61442** (EN 61442:2005, IDT)

Start date: 11/15/2022

End date: 11/15/2022

Relative humidity 57%

The temperature is 19 °C

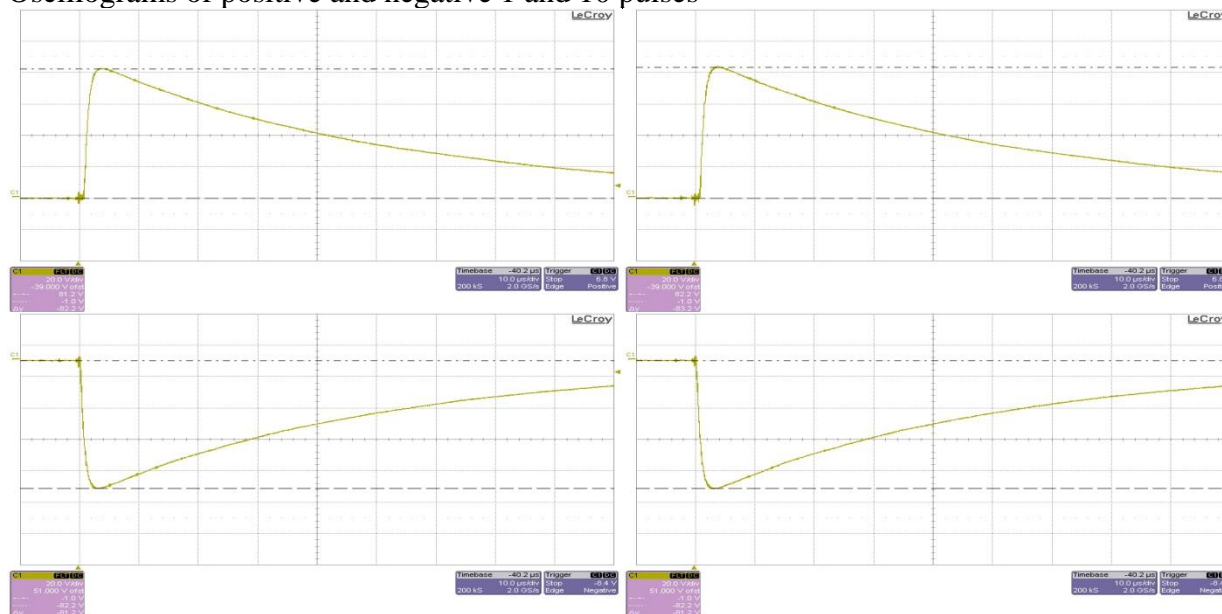
Atmospheric pressure 9 90 mbar

Test description.

After the alternating voltage test, we perform the impulse voltage test in accordance with item 2 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of chapter 6 of **EN 61442** (EN 61442:2005, IDT) on samples **#1, #2** with the use of samples **#4, #5** (for temperature control). The test was carried out with normalized pulses of lightning voltage of 1.3/51 μ s, 10 pulses of positive and negative polarity. Prior to the impulse voltage tests, the samples were heated using a current source to a core temperature of 80-85° C and kept for 2 hours. The value of the test pulse voltage was 20 kV. The test voltage was applied in phases between one of the cores and the grounded other cores and the metal screen.

Samples **No. 1, No. 2** passed the test without insulation breakdown and overlap.

Oscillograms of positive and negative 1 and 10 pulses



Test result: **Positive.**

Test № 4

Testing by heating cycles in air in accordance with clause 3 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), according to the methodology of Chapter 9 of **DSTU EN 61442** (EN 61442:2005, IDT)

Start date:	11/16/2022
End date:	11/17/2022
Relative air humidity	48-57%
The temperature is	20°C
Atmospheric pressure	995-1100 mbar

Test description.

After the impulse voltage test, we conduct the test with heating cycles in air in accordance with item 3 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of section 9 of **EN 61442** (EN 61442:2005, IDT) on samples **#1, #2** using samples **#4, #5** (for control of temperature indicators). The samples were heated using a current source and subjected to three heating-cooling cycles in air with constant application of a test voltage of 1.5 kV. The cable with mounted couplings was connected in a ring. The temperature was monitored on the control sections of the cable. The load was carried out using a current transformer. The current was monitored using a measuring transformer. Each heating cycle consisted of a heating period lasting 2 hours, holding for 3 hours. and a cooling period of 3 hours, to a core temperature that does not exceed the ambient temperature by more than 5° C. The temperature of the conductor was 80-85° C. At the end of the warm-up period in the first test cycle, the current was corrected and remained constant during the next test cycle. The ambient temperature during the heating cycle was 20 °C.

Voltage changes no more than 3%

Samples **No. 1, No. 2** passed the test without insulation breakdown and overlap.

Test result: **Positive.**

All samples passed the test. There was no breakdown

Test № 5

Testing with heating cycles under water in accordance with clause 4 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), according to the method of Chapter 9 of **DSTU EN 61442** (EN 61442:2005, IDT)

Start date:	11/18/2022
End date:	07.12.2022
Relative humidity	48-57 %
The temperature is	20°C
Atmospheric pressure	995-1100 mbar

Test description.

After testing with heating cycles in air, we conduct testing with heating cycles under water in accordance with item 4 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of section 9 of **EN 61442** (EN 61442:2005, IDT) on samples **No. 1, No. 2** using samples **No. 4, No. 5** (for temperature control). The samples were heated with a current source and subjected to 60 heating-cooling cycles in air for the end and under water for the couplings, with a constant application of a test voltage of 1.5 kV. The cable with mounted couplings was connected in a ring. The temperature was monitored on the control section of the cable. The load was carried out using a current transformer. The current was monitored using a measuring transformer. Each heating cycle consisted of a heating period lasting 2 hours, holding for 3 hours. and a cooling period of 3 hours, to a core temperature that does not exceed the ambient temperature by more than 5° C. The temperature of the conductor was 80- 85 °C. At the end of the heating period in the first test cycle, the current was corrected and remained constant during the next test cycle. The section with the connecting couplings was immersed in a container with water.

The ambient temperature during the heating cycle was 20° C.

The water conductivity was 70±10 ms/m.

Voltage changes no more than 3%

Samples **No. 1, No. 2** passed the test without insulation breakdown and overlap.

Test result: **Positive.**

All samples passed the test. There was no proba

Test № 6

Thermal short circuit of the conductor in accordance with clause 5 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), according to the method of section 11, **DSTU EN 61442** (EN 61442:2005, IDT)

Start date: 07.12.2022

End date: 07.12.2022

Relative humidity 57%

The temperature is 23°C

Atmospheric pressure 10 60 mbar

Test description.

We conduct a short-circuit current test in accordance with item 5 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of chapter 11 of **EN 61442** (EN 61442:2005, IDT) on sample **#3** using sample **#6** (for temperature control). The maximum permissible temperature in the event of a short circuit of the cable conductor according to the technical specifications of the cable manufacturers AABl 4x240-1 kV should be at least 250° C, so the short-circuit current value is required should be 12.9 kA. The cores of the cable were connected in series and connected to a current source. The short-circuit load was applied twice after cooling the conductor to a temperature of 5-10° C above the initial temperature (room temperature 23° C). The time of each test was 5 seconds

Sample **No. 3** passed the test without insulation breakdown and overlap.

Test result: **Positive.**

Visual inspection revealed no damage in both test trials.

Test № 7

Impulse voltage test, in accordance with clause 7 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), according to the method of section 6 of **DSTU EN 61442** (EN 61442:2005, IDT)

Start date: 08.12.2022
End date: 08.12.2022

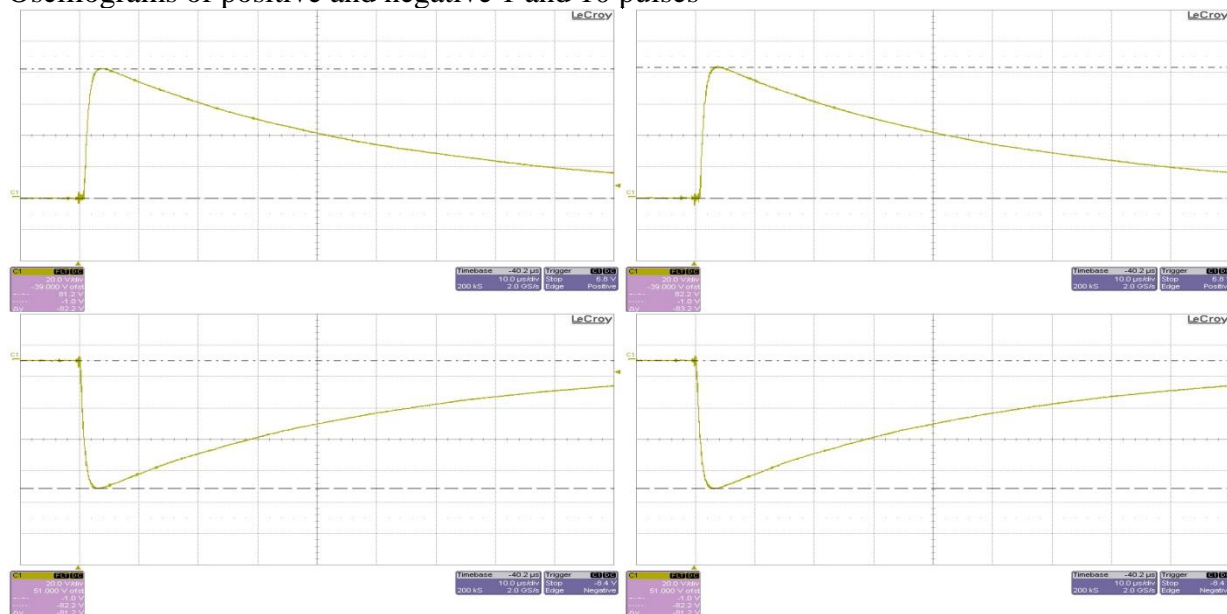
Relative humidity 67%
The temperature is 20° WITH
Atmospheric pressure 1020 mbar

Test description .

We conduct impulse voltage tests in accordance with item 7 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the method of chapter 6 of **EN 61442** (EN 61442:2005, IDT) on samples **#1, #2, #3** using samples **#4, #5, #6** (for temperature control). The test was carried out with normalized pulses of lightning voltage of 1.3/51 μ s, 10 pulses of positive and negative polarity. Prior to the impulse voltage tests, the samples were heated using a current source to a core temperature of 80-85° C and kept for 2 hours. The value of the test pulse voltage was 20 kV. The test voltage was applied in phases between one of the cores and the grounded other cores and the metal screen.

Samples **No. 1, No. 2, No. 3** passed the test without breakdown of insulation and overlap.

Oscillograms of positive and negative 1 and 10 pulses



Test result: **Positive.**

There was no breakdown.

Test № 8

AC voltage testing in accordance with clause 8 of table 3 of **DSTU IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT), the method of section 4 of **DSTU EN 61442** (EN 61442:2005, IDT), **DSTU IEC 60060-1** (IEC 60060-1:1989, IDT).

Start date: 09.12.2022

End date: 09.12.2022

Relative humidity 52%

The temperature is 21°C

Atmospheric pressure 950 mbar

Test description.

After test **No. 7**, we conduct an alternating voltage test in accordance with item 8 of the table. 3 **IEC 60055-1** (IEC 60055-1:1997+AMD1:2005, IDT) according to the methodology of section 4 **EN 61442** (EN 61442:2005, IDT), **DSTU IEC 60060-1** (IEC 60060-1:1989, IDT) on samples **#1, #2, #3**. The test voltage was applied in phases between one of the cores and the grounded other cores and the metal screen. The samples were tested with an alternating voltage of 2.5 kV of industrial frequency for 15 minutes. The voltage was continuously increased to the specified value and then held constant for the specified test duration.

Voltage changes are no more than 3%.

Samples **No. 1, No. 2, No. 3** passed the test without breakdown of insulation and overlap.

No	Phase	High-voltage	Duration of exposure	Test result
1	AND	2.5 kV	15 min.	There was no breakdown
1	IN	2.5 kV	15 min.	There was no breakdown
1	WITH	2.5 kV	15 min.	There was no breakdown
2	AND	2.5 kV	15 min.	There was no breakdown
2	IN	2.5 kV	15 min.	There was no breakdown
2	WITH	2.5 kV	15 min.	There was no breakdown
3	AND	2.5 kV	15 min.	There was no breakdown
3	IN	2.5 kV	15 min.	There was no breakdown
3	WITH	2.5 kV	15 min.	There was no breakdown

Test result: **Positive.**

All samples passed the test, no breakdown occurred.

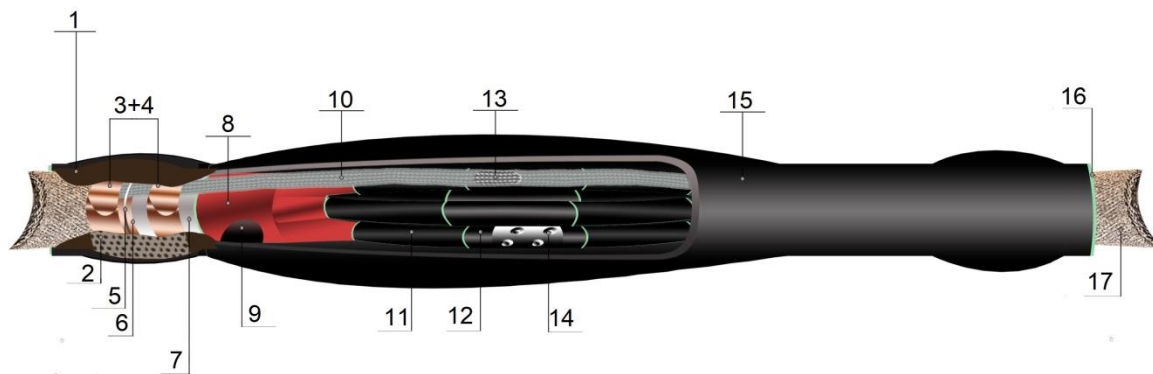
COMPLETE INFORMATION (PASSPORT)

on a set for the installation of one joint heat-shrink joint JLP - CF 3.4 (S) SOZNANIIE, serially produced by the company " RADPOL " SA (Poland).

n/p	Names of parts and assembly materials		Unit ex.	JLP CF4 16-50(S) SOZNA NIJE	JLP-CF4 70-120(S) SOZNA NOT	JLP-CF4 150-240(S) SOZNA NOT	JLP-CF 3 16-50(S) SOZNA NIJE	JLP-CF 3 70- 1 20 (S) SOZNA NIJE	JLP-CF 3 150-240(S) SOZNA NOT
1.	A heat-shrinkable glove with an insulating adhesive sublayer, type:								
	AK 4 25-95		pie ce	2	-	-	-	-	-
	AK 4 35-150		pie ce	-	2	-	-	-	-
	AK 4 95-300		pie ce	-	-	2	-	-	-
	AK 3 25-120		pie ce	-	-	-	2	-	-
	AK 3 95-300		pie ce	-	-	-	-	2	2
2	Tube No. 1 RDK for sealing the coupling								
	95/25 x 1000 ⁻⁵⁰ mm		pie ce	1	-	-	1	-	-
	105/32x1200 ⁻⁵⁰ mm		pie ce	-	1	1	-	1	1
3	RC / RCH 1 earth wire insulation tube								
	12.7/6.4x900mm		pie ce	1	1	-	1	1	-
	19/9.5x900mm		pie ce	-	-	1	-	-	1
4	Sleeve film		pie ce	1	1	1	1	1	1
5	Tube No. 2 RP K H 1 for insulation of cable cores								
	22/6x150mm		pie ce	4	-	-	3	-	-
	22/6x250mm		pie ce	4	4	4	3	3	3
	22/6x320mm		pie ce	-	4	-	-	3	-
	22/6330 MM		pie ce	-	-	4	-	-	3
6	Cuff tube No. 3 RP K H 1 for isolating the contact connection								
	30/8x150mm		pie ce	4	-	-	3	-	-
	30/8x200mm		pie ce	-	4	-	-	3	-
	40/16x200mm		pie ce	-	-	4	-	-	3
7	The grounding wire is tinned copper (Plecionka miedzianaynowana)								
	cross-section 16 mm2 length850 MM		pie ce	1	-	-	1	-	-
	cross-section 16 mm2 length1050 MM		pie ce	-	1	-	-	1	-
	cross-section 25 mm2 length1050 MM		pie ce	-	-	1	-	-	1
8	PVC electrical insulating tape		pie ce	1	1	1	1	1	1
9	The wire is galvanized 1.2 mm		m	2.5	2.5	2.5	2.5	2.5	2.5
10	*Cable sleeves with screw cross-section, mm2:								

	16 - 50	pie ce	4	-	-	3	-	-
	70 - 120	pie ce	-	4	-	-	3	-
	150 - 240	pie ce	-	-	4	-	-	3
11	*Solder brand A	kg	0.05	0.05	0.05	0.05	0.05	0.05
12	*Contact plate (grater)	pie ce	4	4	4	4	4	4
thi rte en	* Solder POS - 30	kg	0.075	0.075	0.075	0.075	0.075	0.075
14	* PPT spring (Zacisk spruzynowy) S 1	pie ce	4	-	-	4	-	-
	* PPT spring (Zacisk spruzynowy) S 2	pie ce	-	4	-	-	4	-
	* PPT spring (Zacisk spruzynowy) S 4	pie ce	-	-	4	-	-	4
15	*Soldering fat	pie ce	1	1	1	1	1	1
16	Alcohol napkin (chusteczki czyszczące)	pie ce	2	2	2	2	2	2
17	Mesh for bandaging tape-sealant of the grounding node (budowlana) 100x300mm	pie ce	2	2	2	2	2	2
18	Tape for sealing the grounding node (Masa zecylajaca(pancerz)) 25x1.5x200mm	pie ce	4	-	-	4	-	-
	25x1.5x300mm	pie ce	-	4	4	-	4	4
19	Linen threads (sznurek przewiazkowy)	m	3.0	3.0	3.0	3.0	3.0	3.0
20	AK glove sealant (Palczatka dough) 40x1x150mm	pie ce	2	2	-	2	2	-
	40x1x200mm	pie ce	-	-	2	-	-	2
21	Installation instructions	pie ce	1	1	1	1	1	1
22	Used gloves	couple	1	1	1	1	1	1
23	Cardboard box _	pie ce	1	1	1	1	1	1
Note: *- delivered to order								

Technical drawing clutch assembly JLP-CF4 150-240 (S) SOZNANIE



1. Tape for sealing the grounding node (**Masa uszczelniająca(pancerz)**). 2. Mesh for bandage tape-sealant knot grounding (**budowlana**). 3. PPT spring. 4. Contact plate (grater). 5. The wire is galvanized. 6. Cable armor. 7. Metal sheath of the cable. 8. Heat-shrinkable glove with **AK** adhesive underlayer. 9. **AK** glove sealant (**Masa uszczelniająca(pancerz)**). 10. Tube for insulation of grounding wire №4 **RS/RCH 1**. 11. Tube №2 **RPKH 1** for insulation of cable cores. 12. Tube-cuff №3 **PKHH 1** for isolating the contact connection. 13. Copper grounding wire tinned (**Plecionka miedziana cynowana**). 14. Screw cable sleeves. 15. Tube № **1RDK** for sealing the coupling. 16. Hot melt glue. 17. Cable.