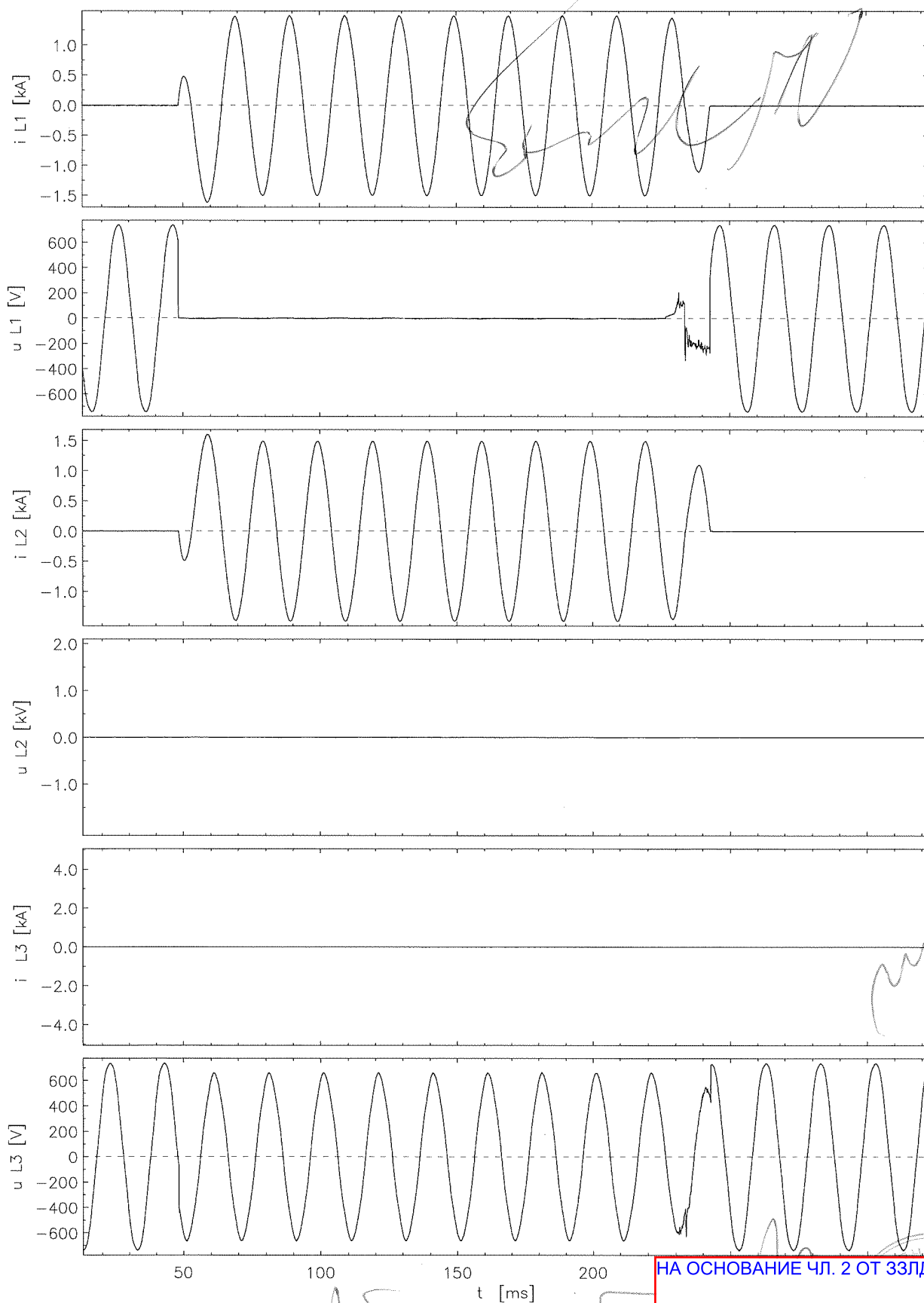


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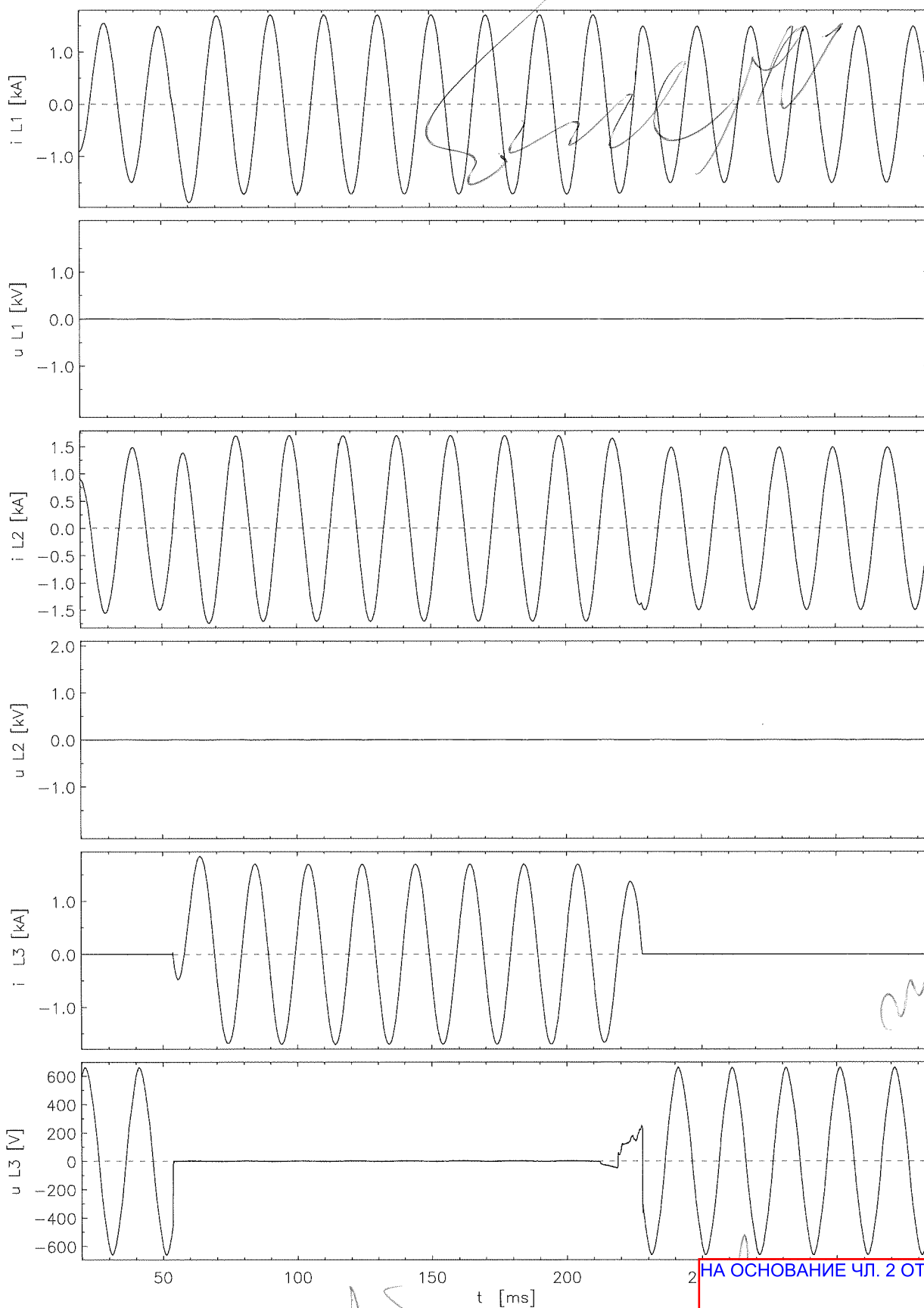


НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ВЯРН



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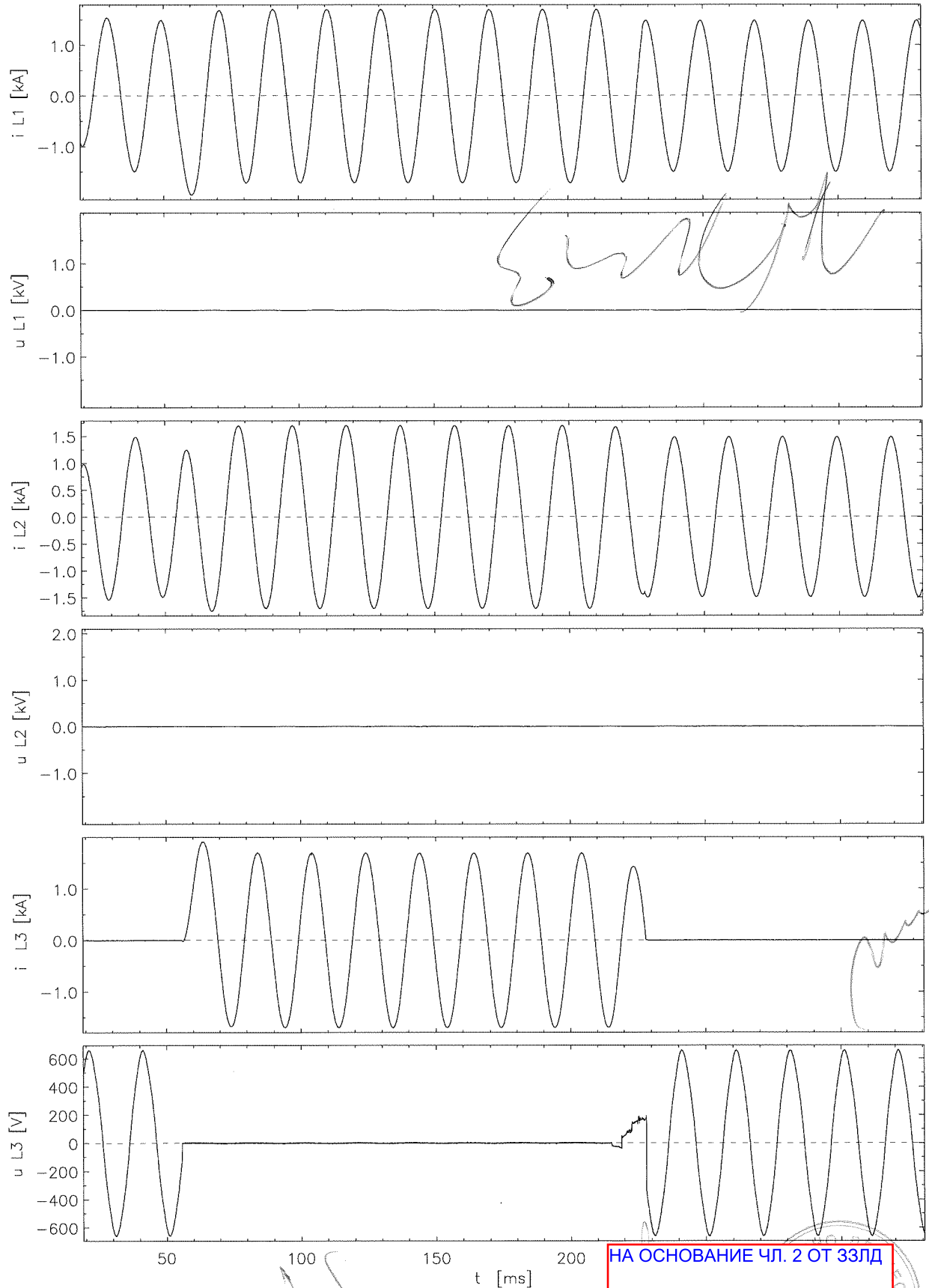


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРЖ

ПЛОВДИВ

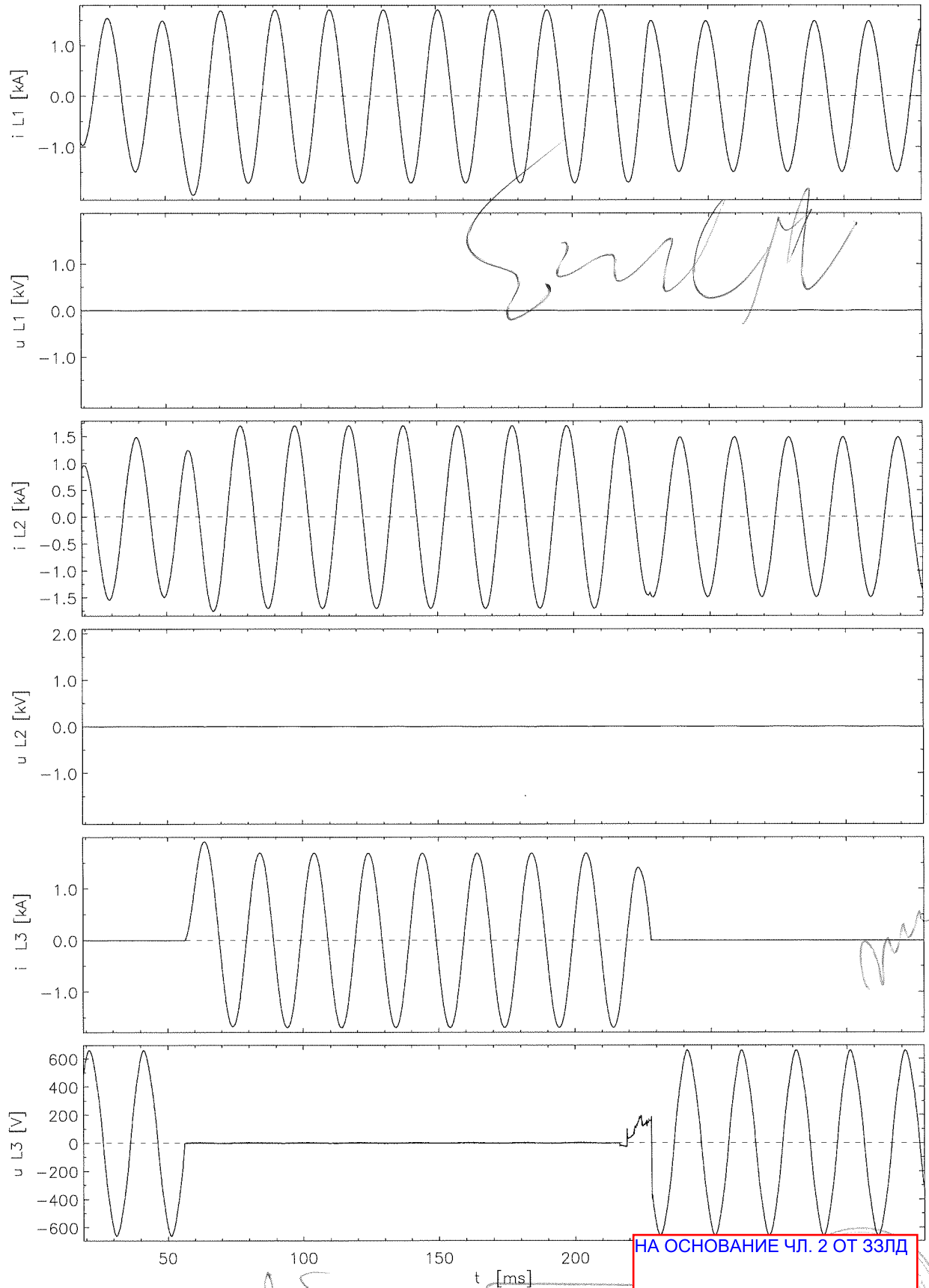
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ВЯРНО С ОРН

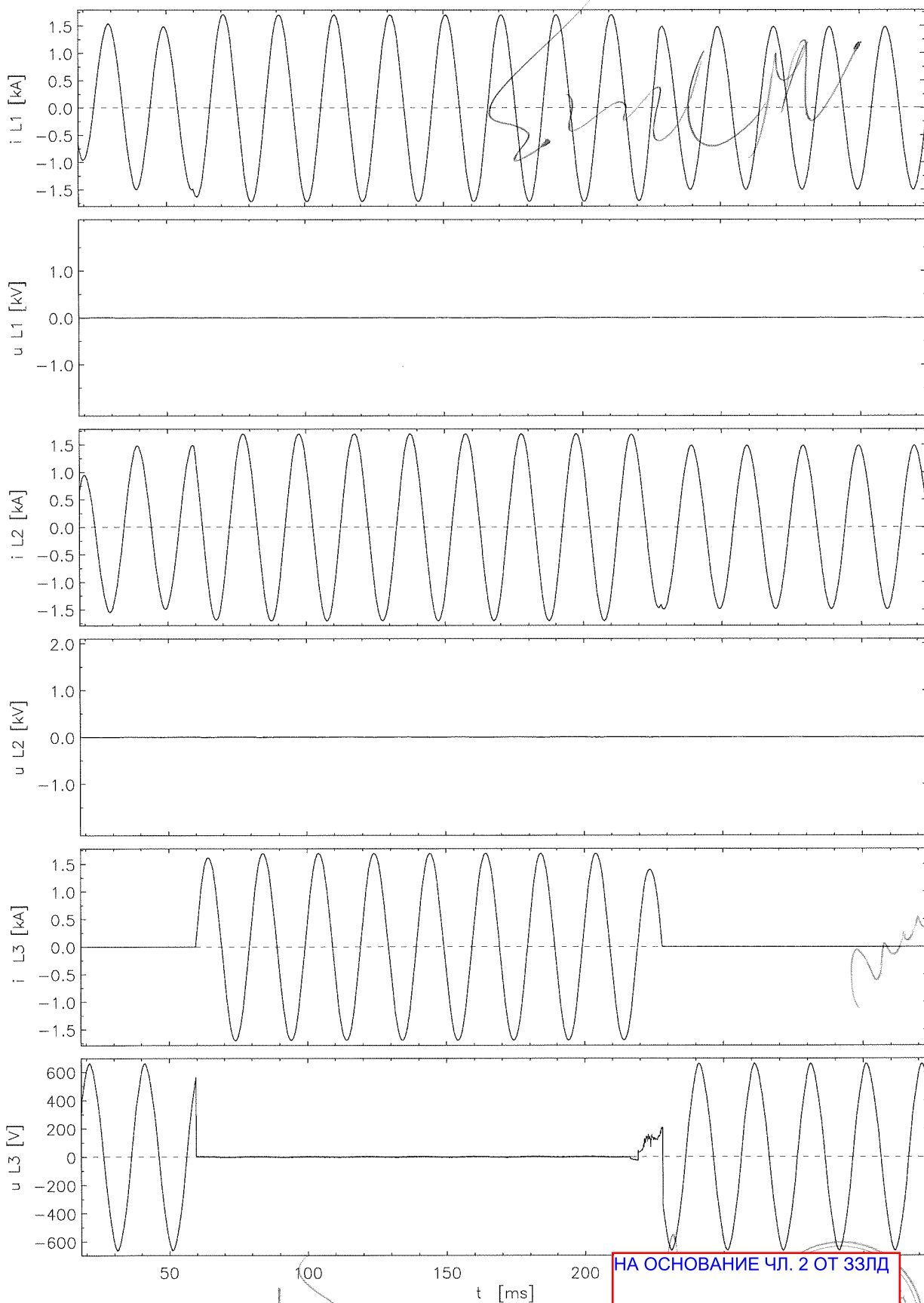
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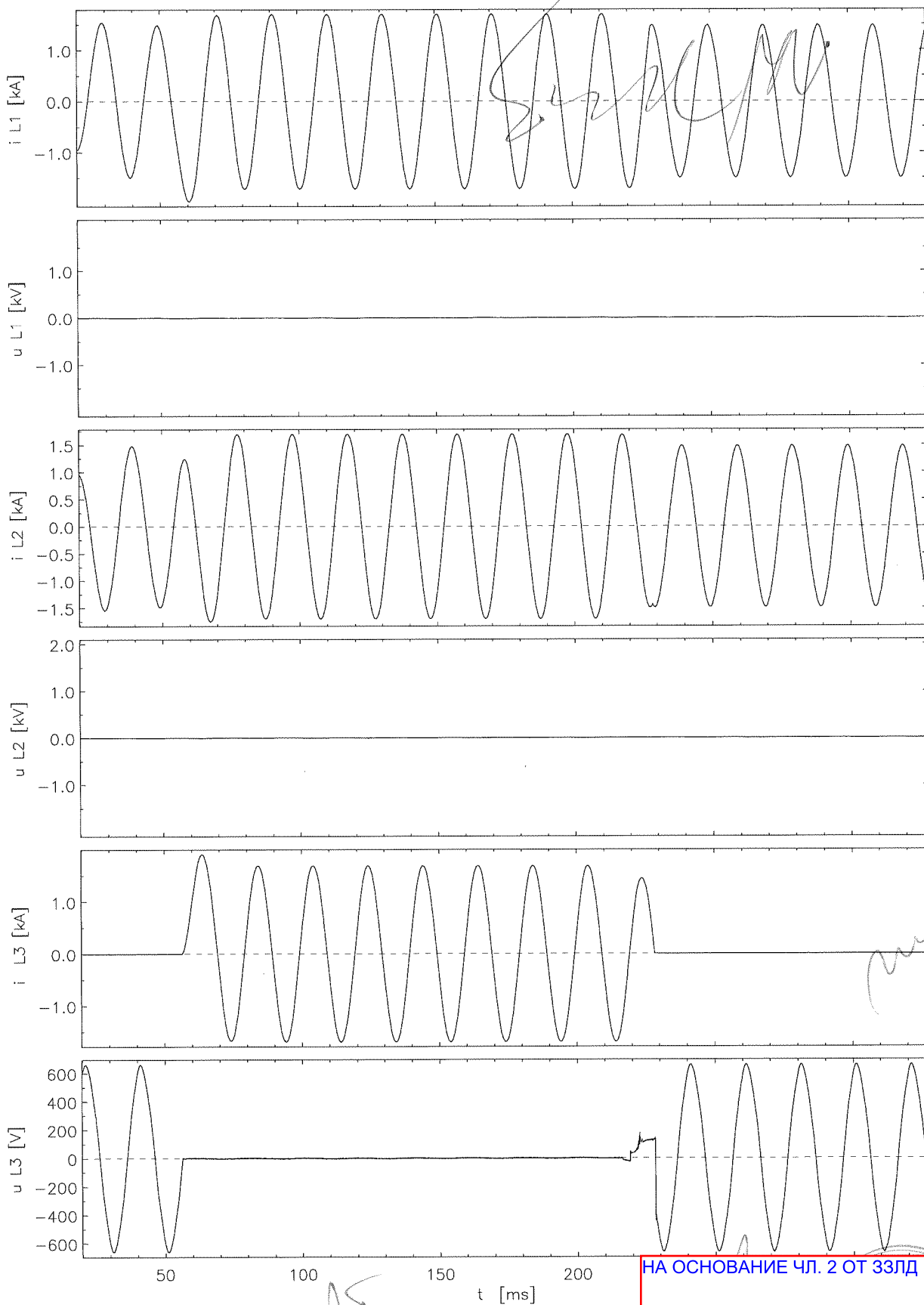
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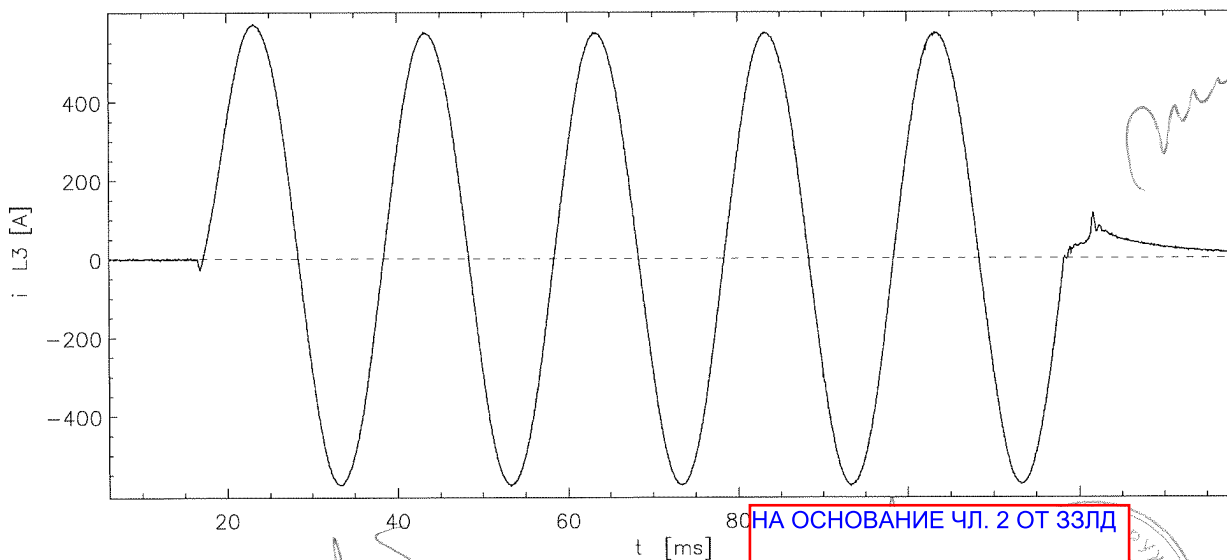
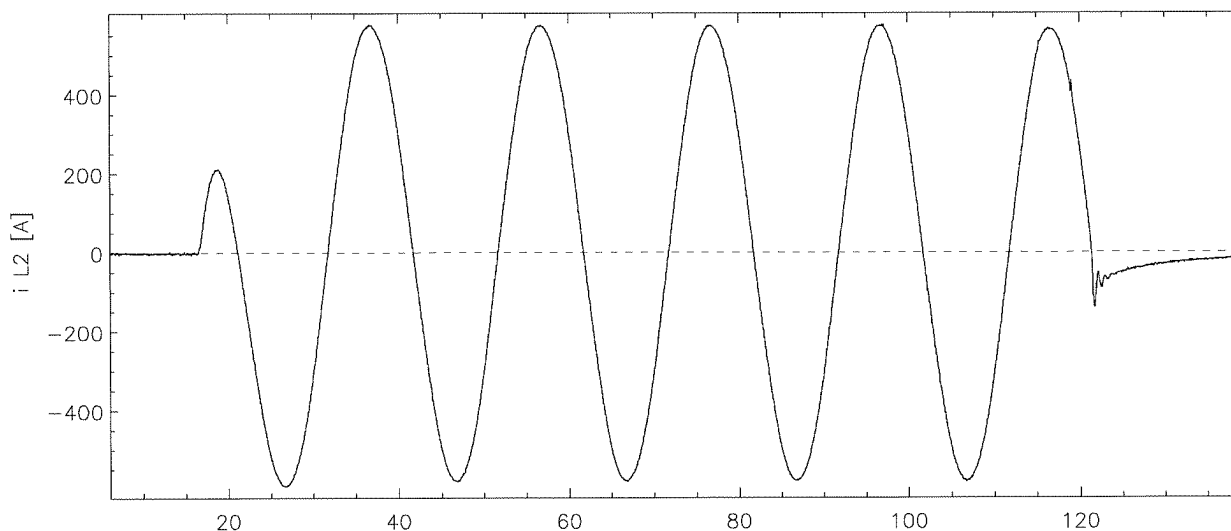
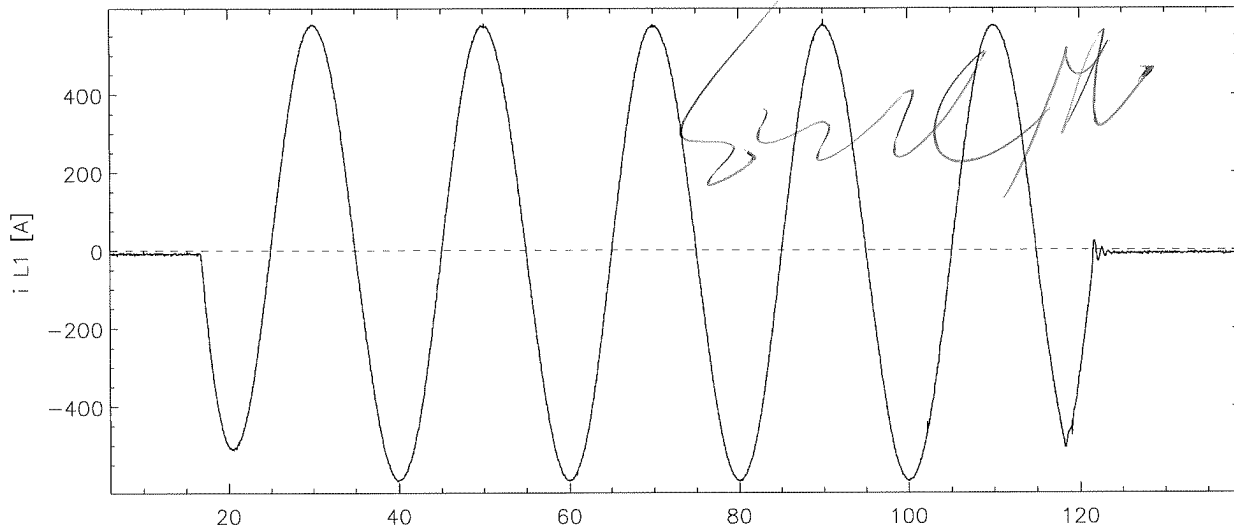
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ВЯРНО С О

Test-No. 2103754



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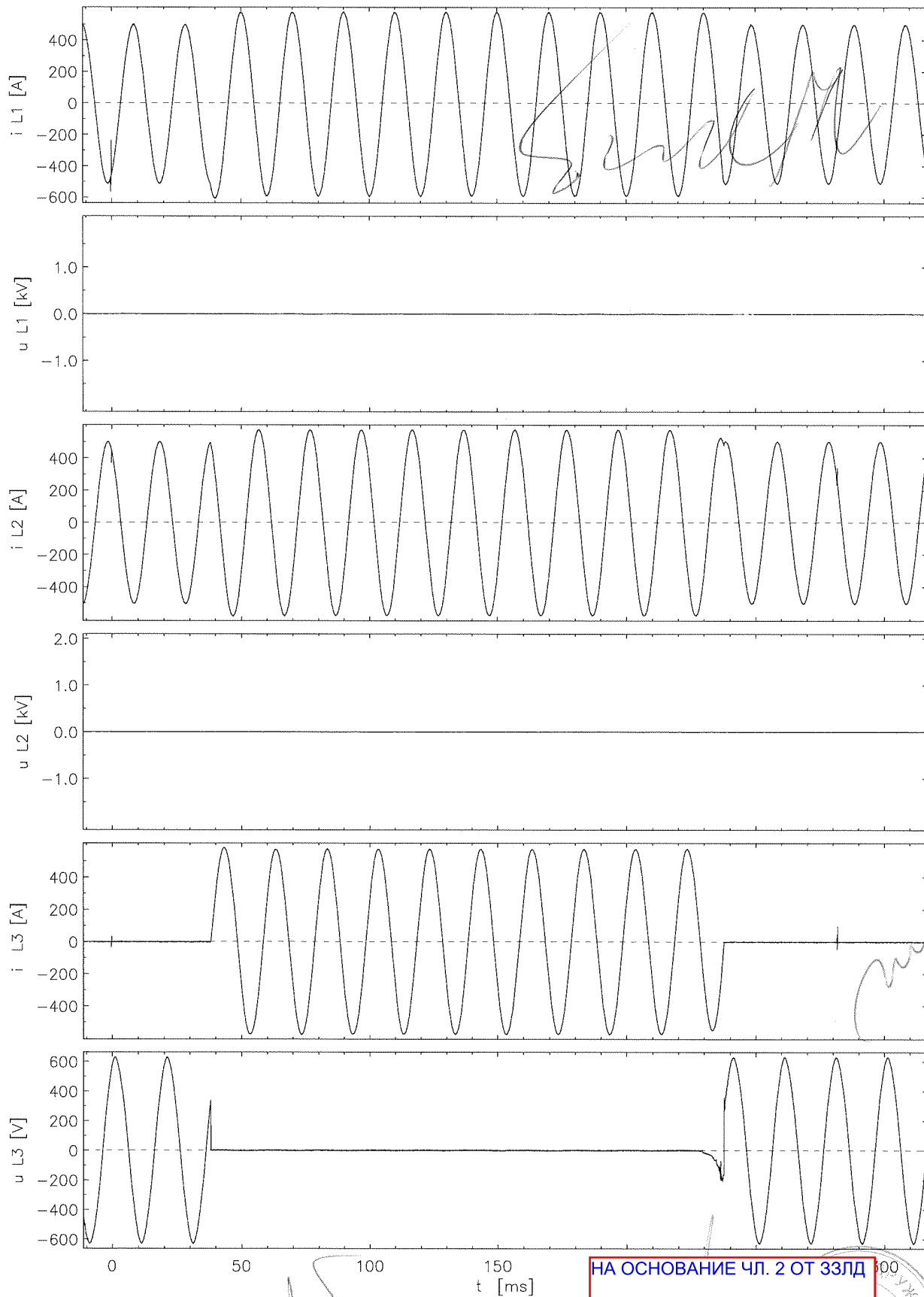


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ВЯРНО С

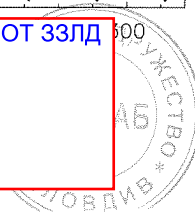


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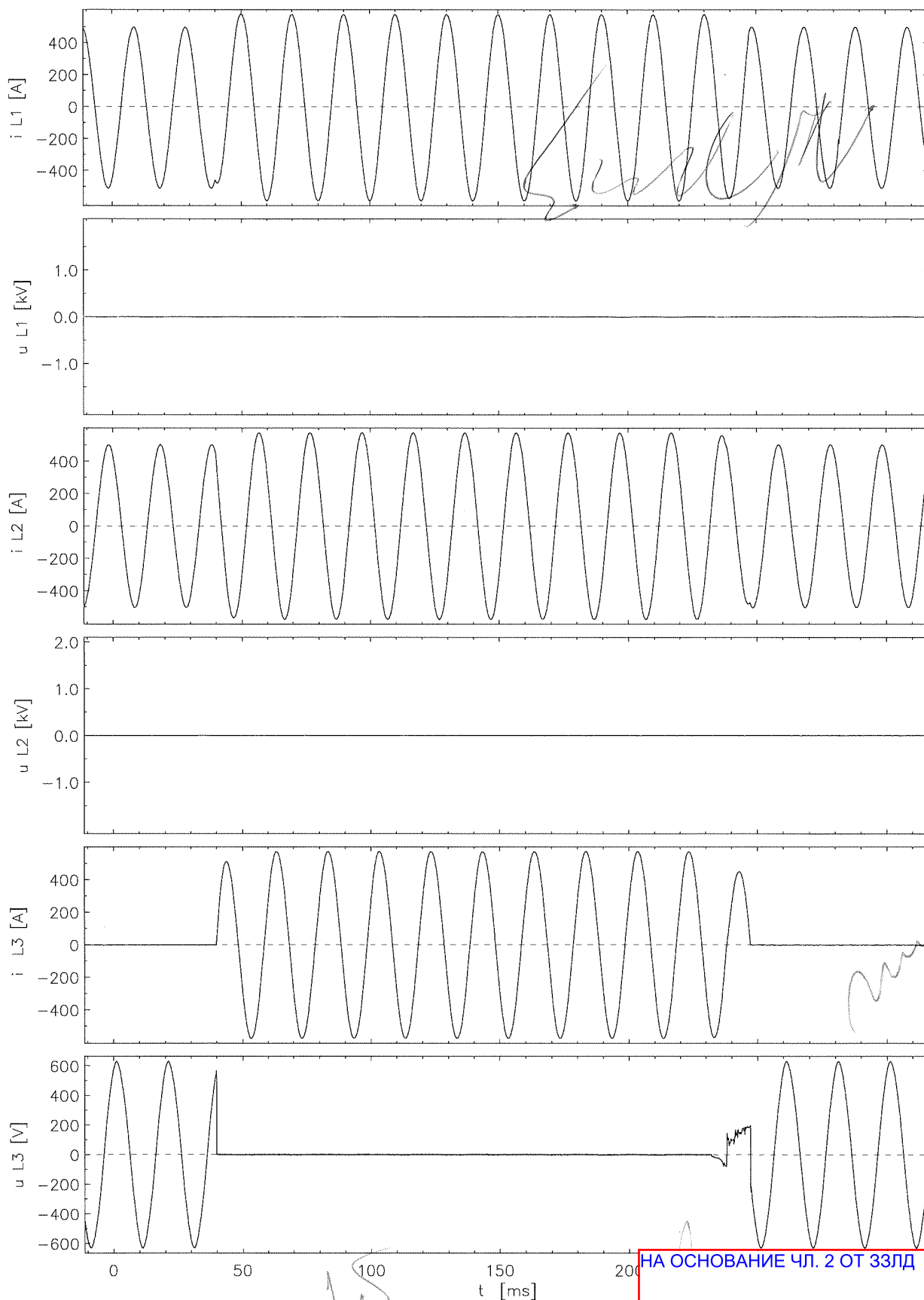


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ВЯРНО С



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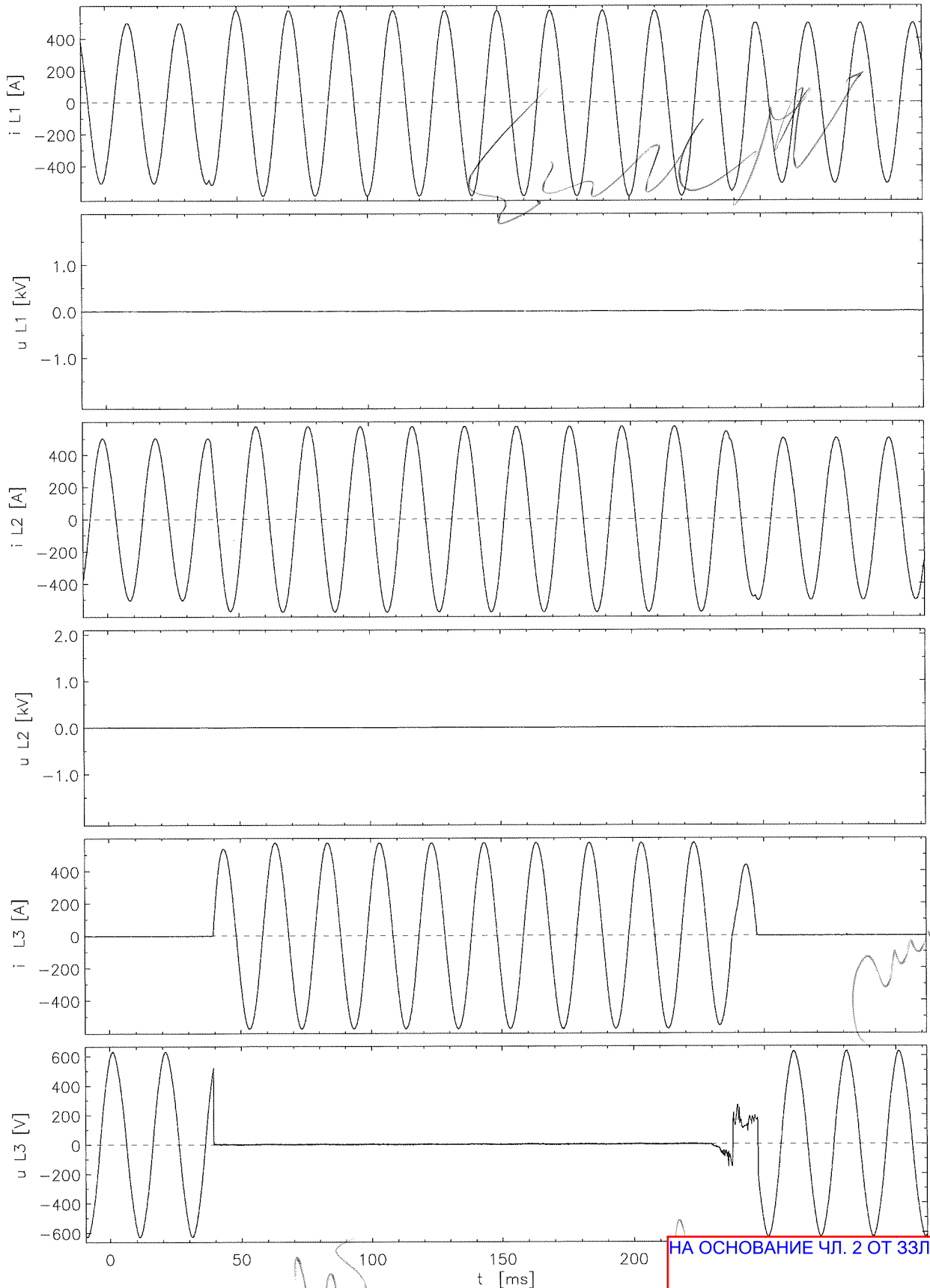


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ВЯРНО С ОТ



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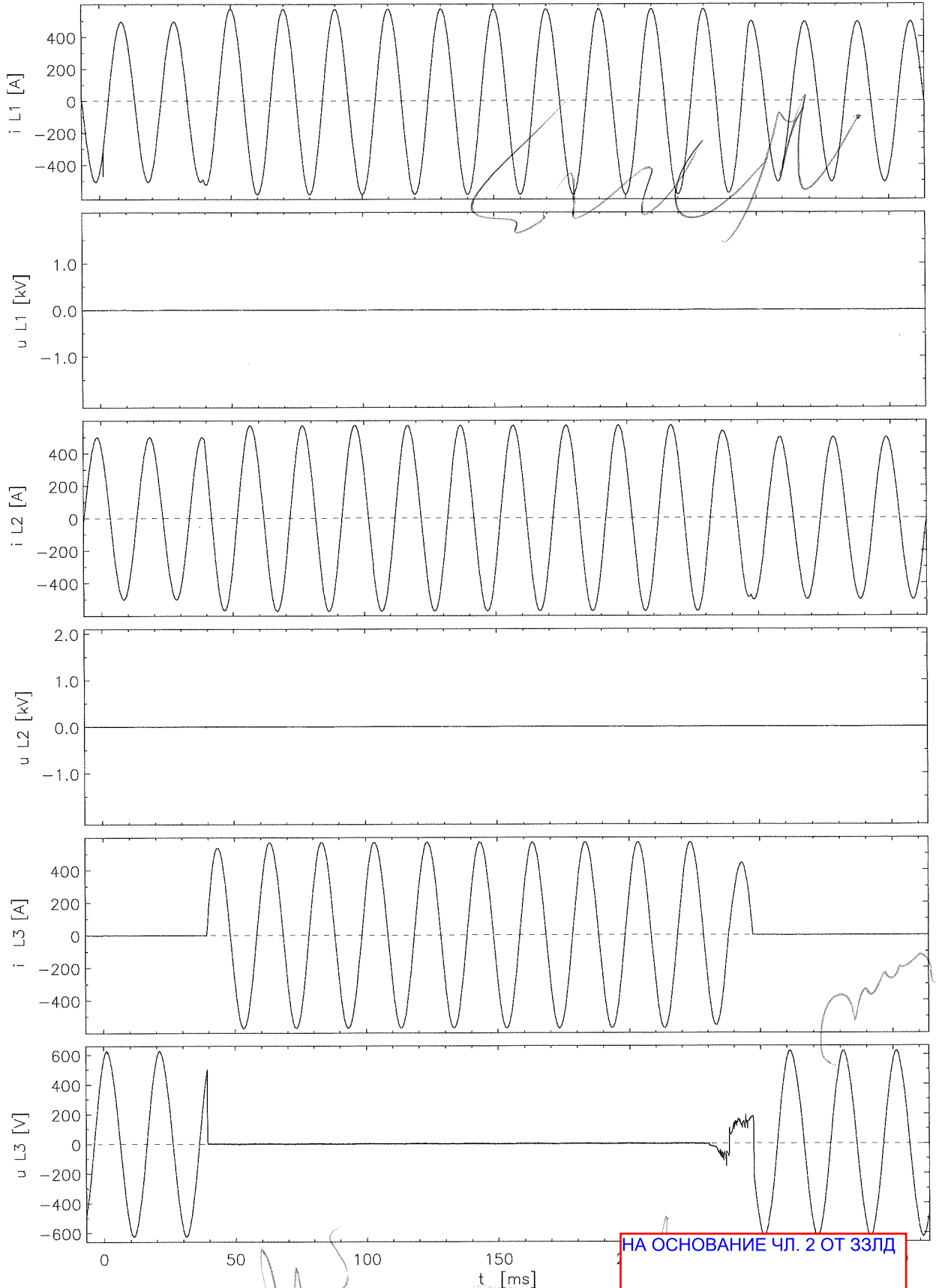


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИ



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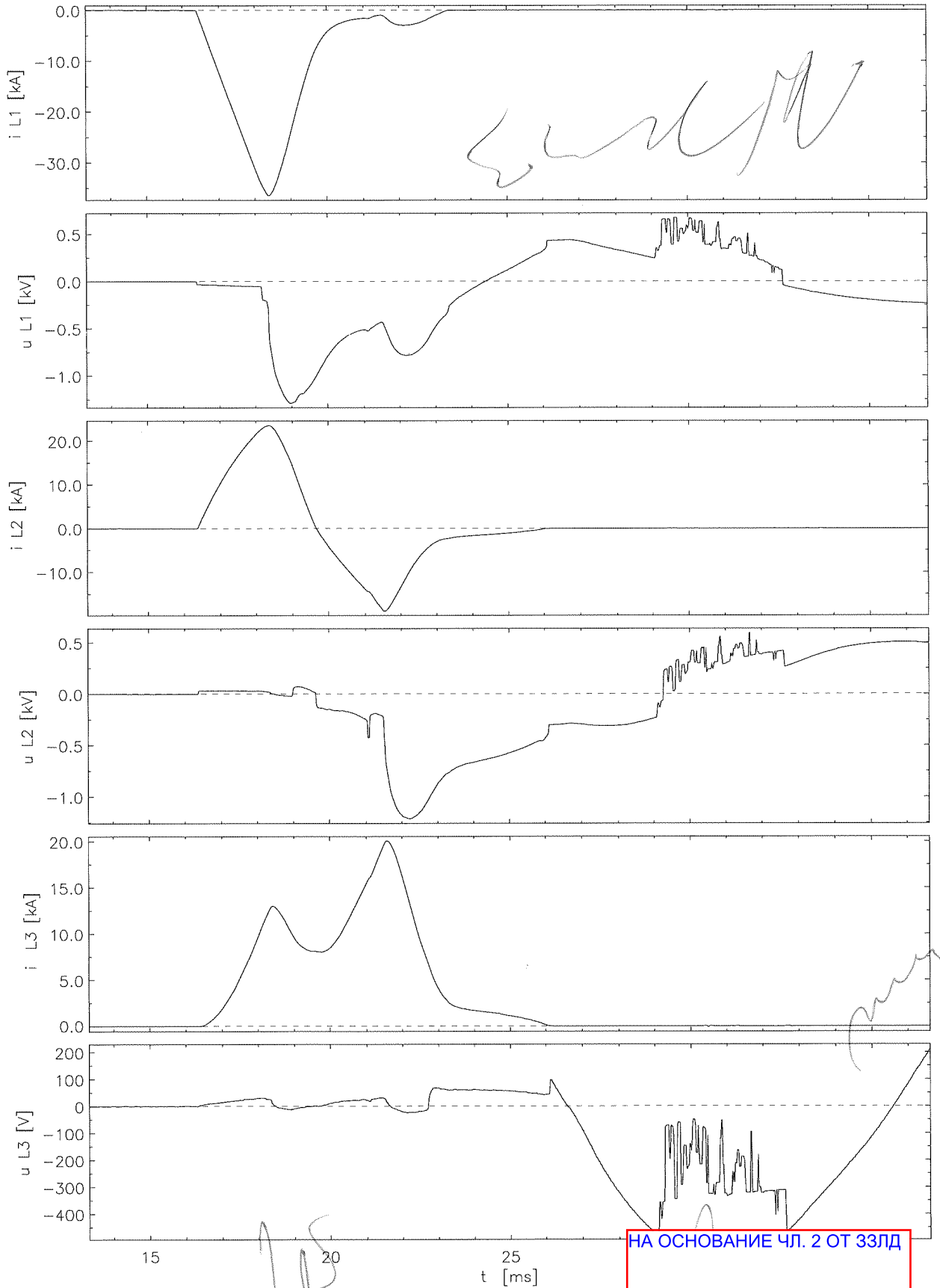


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛА

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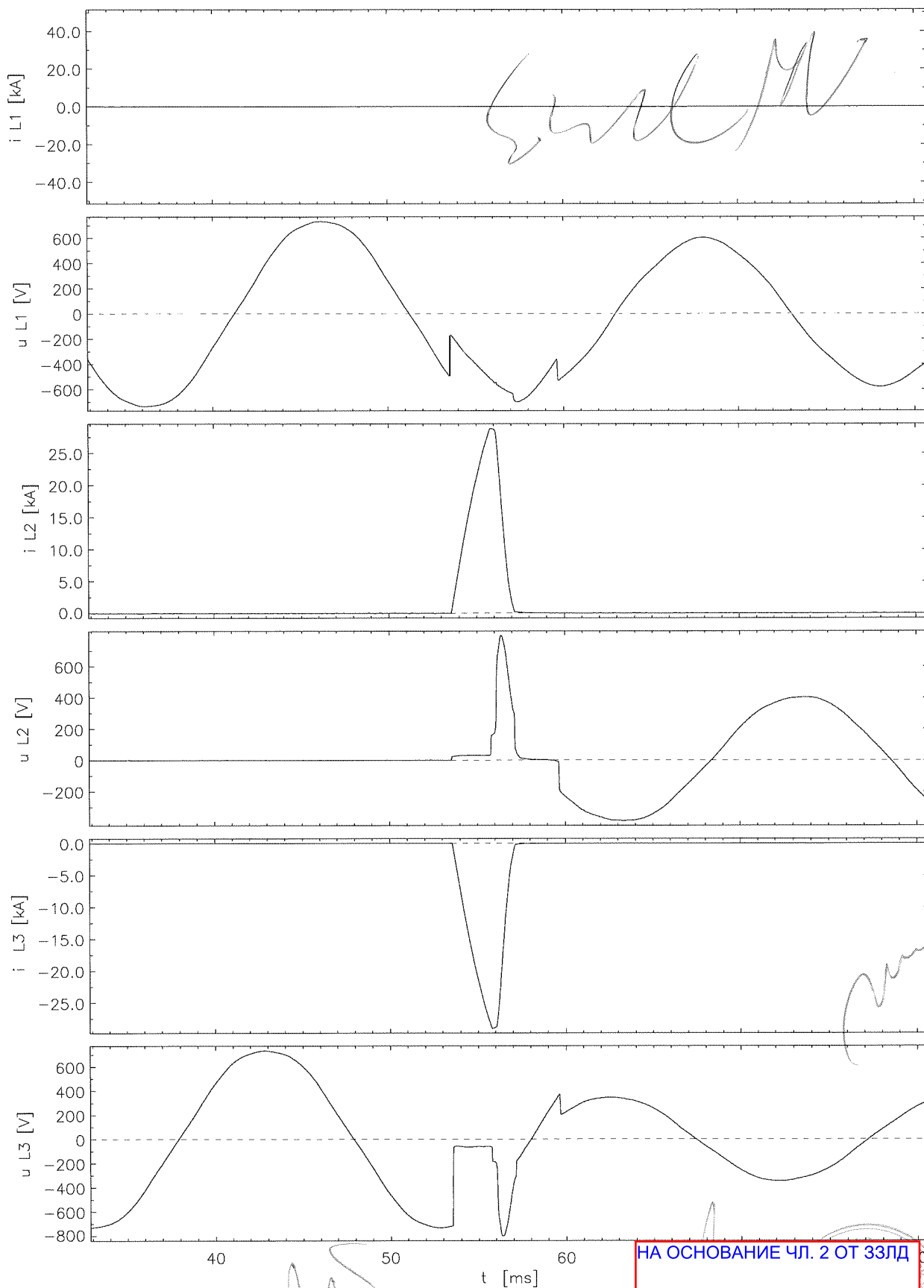
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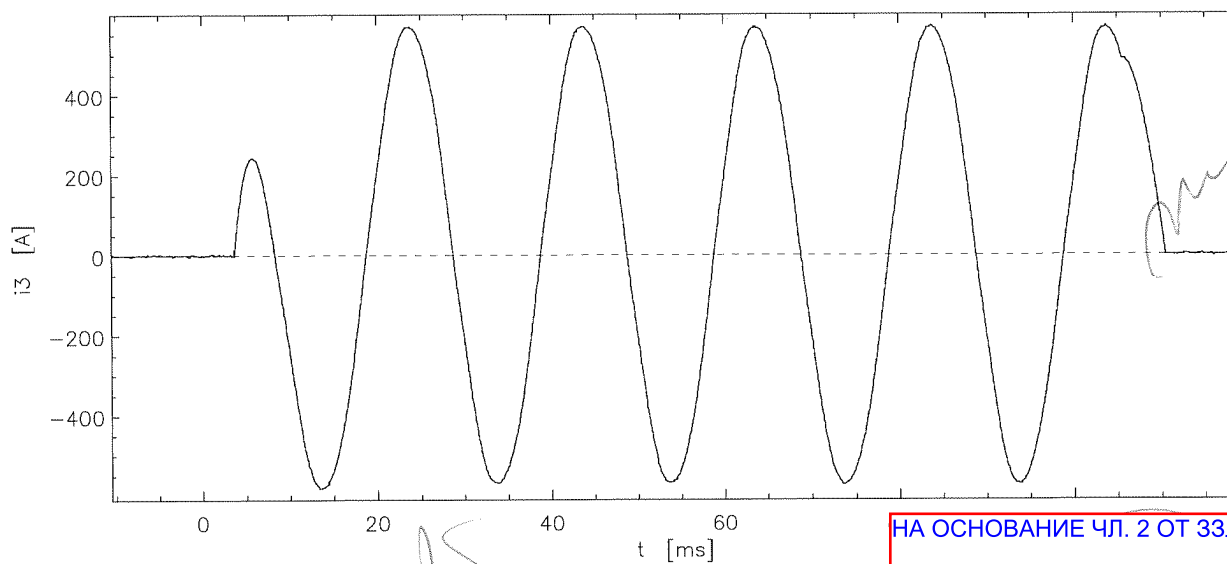
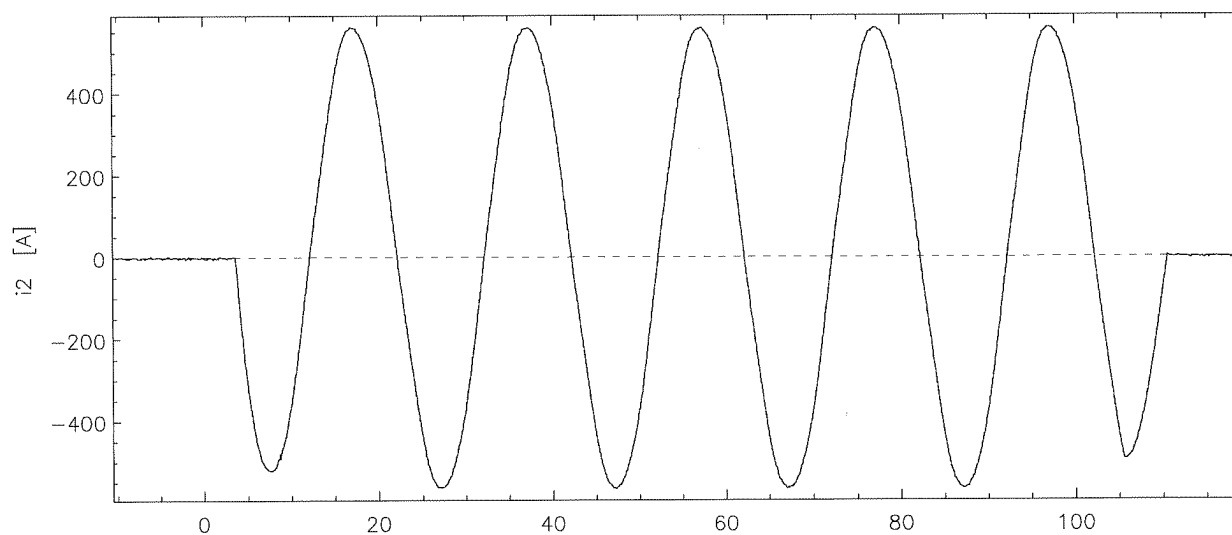
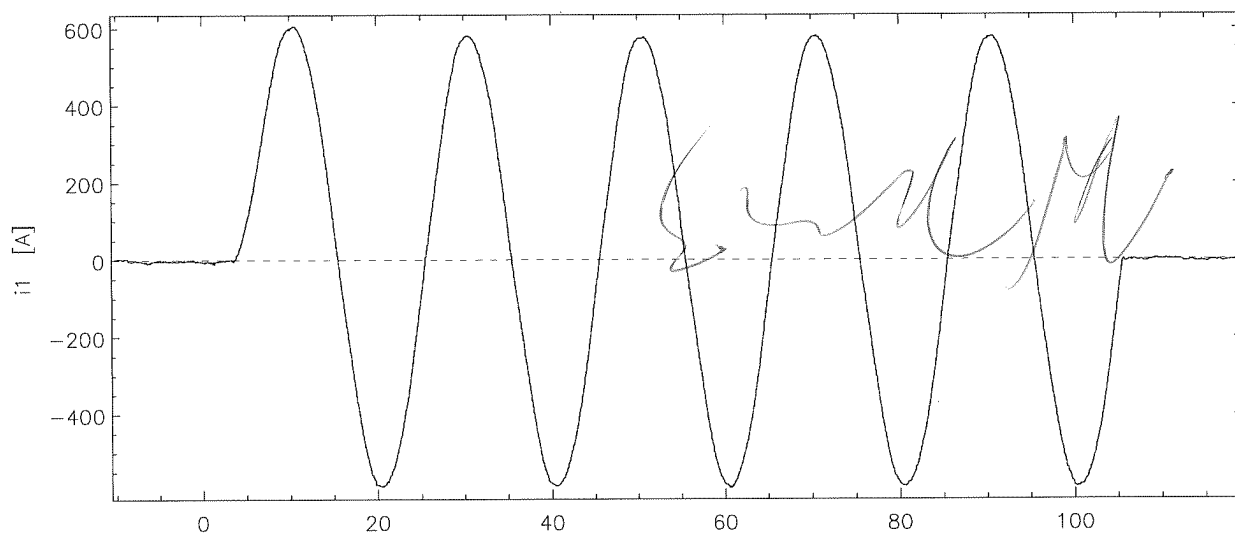
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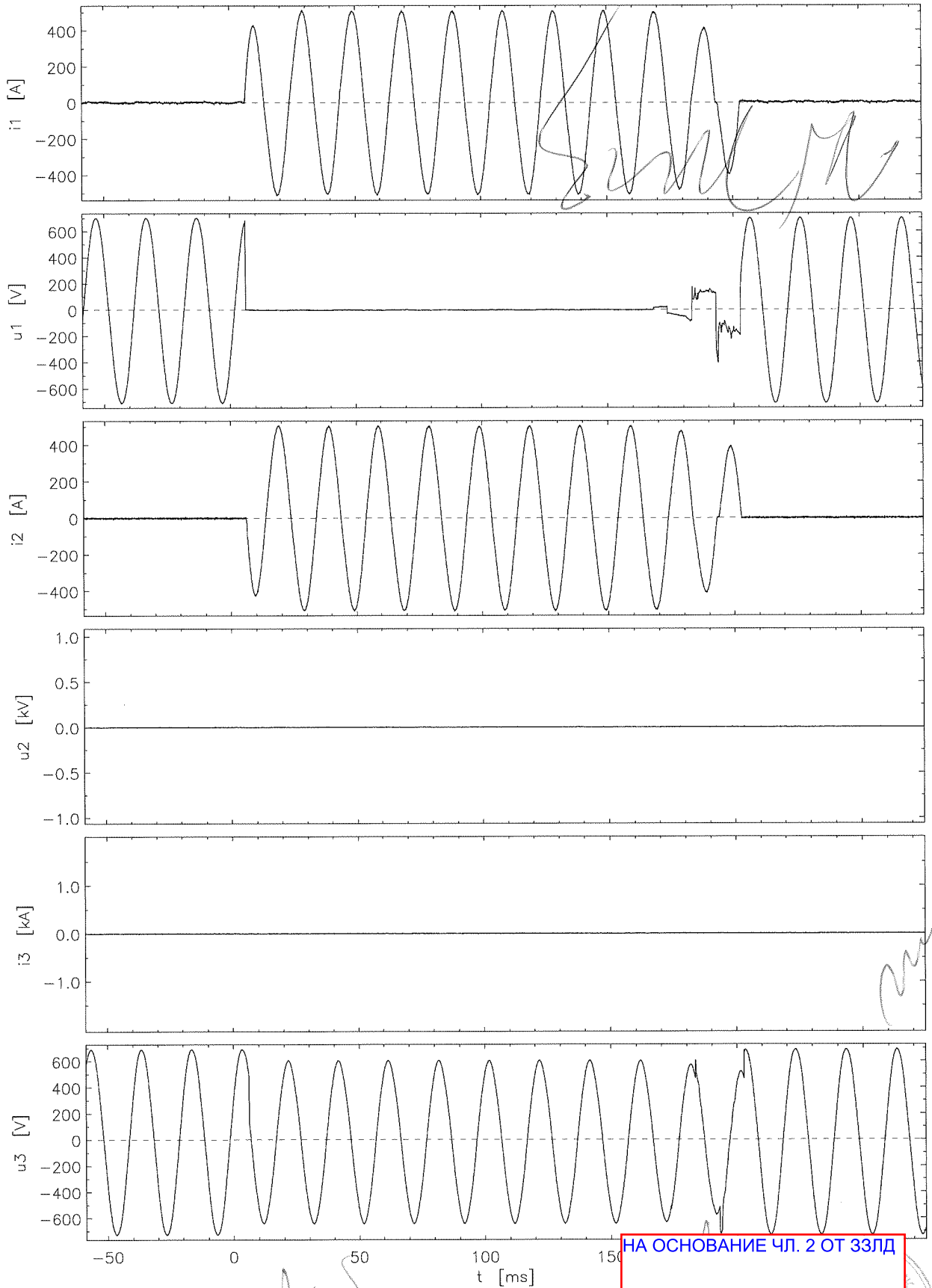
Test-No. 4107786



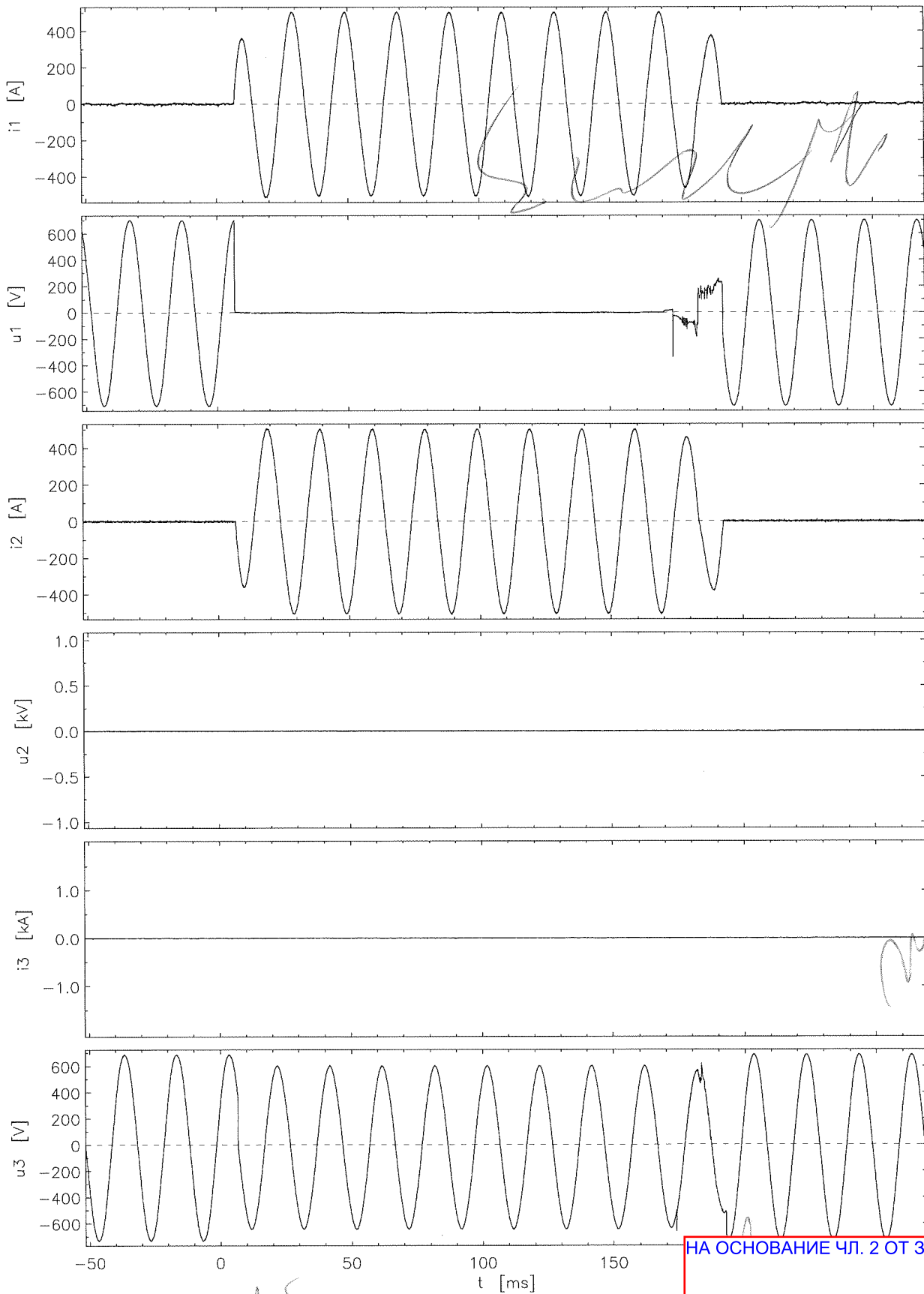
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОПИ

Test-No. 4107787



Test-No. 4107788

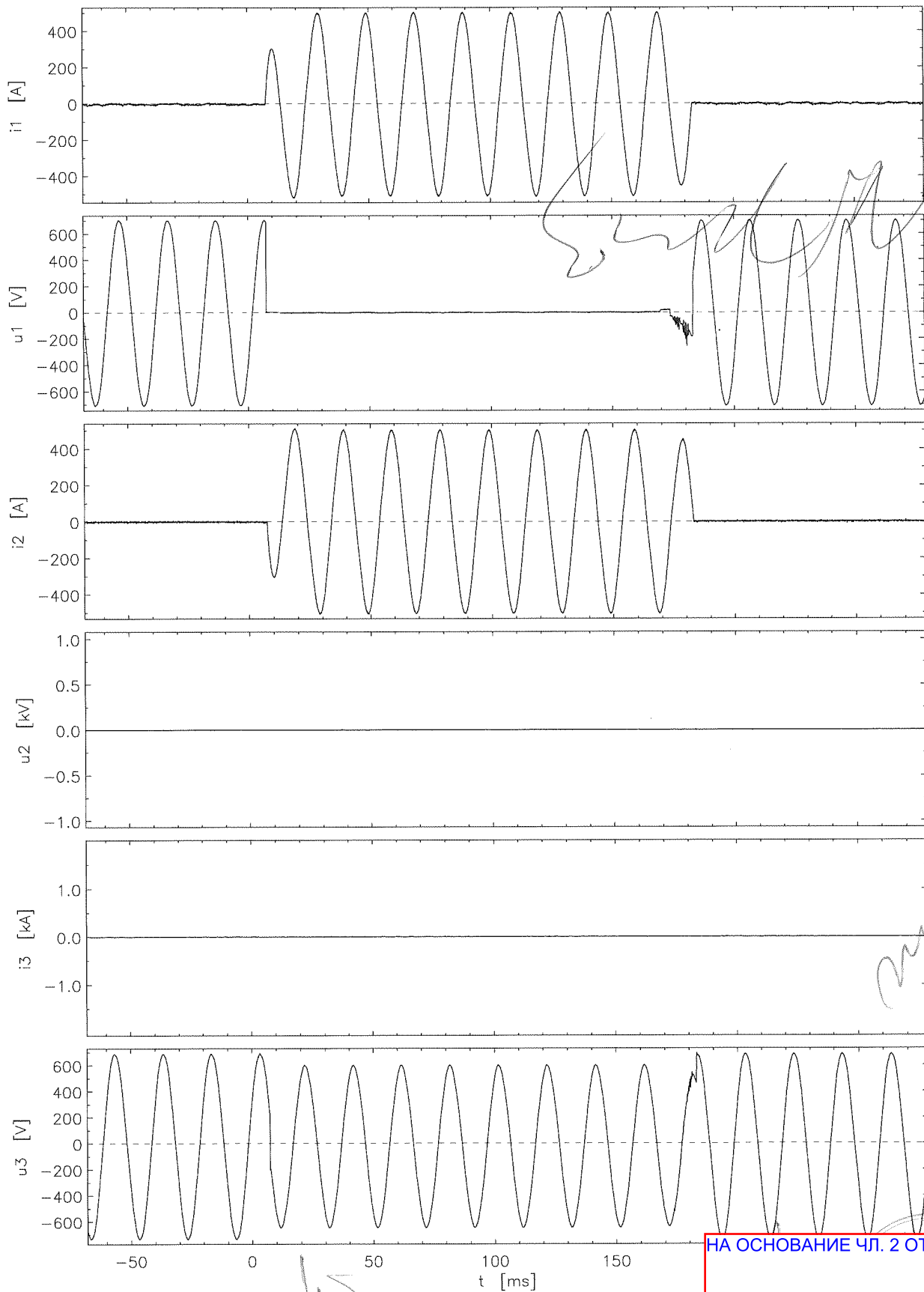


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ВЯРНО С ОРВИ

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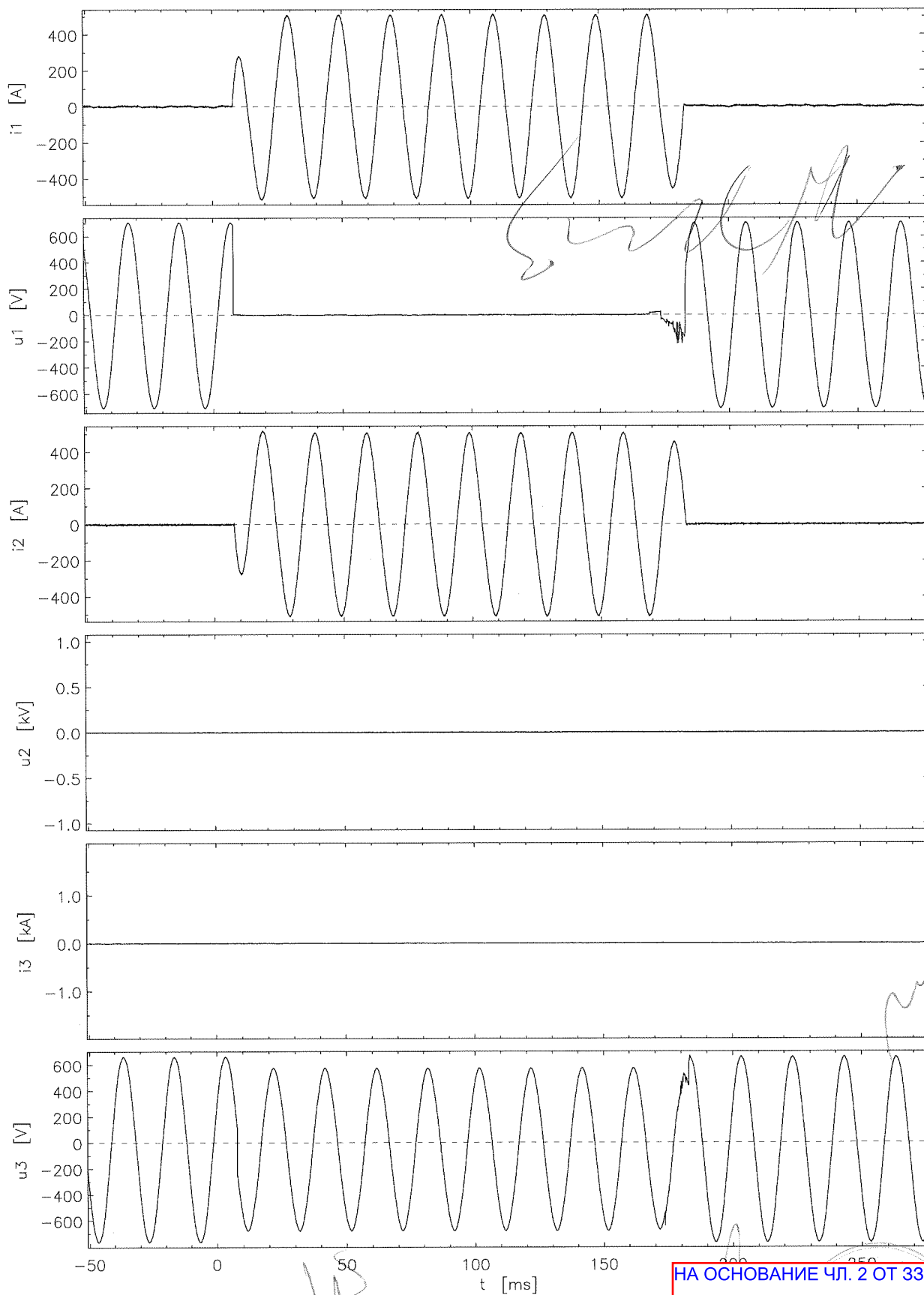
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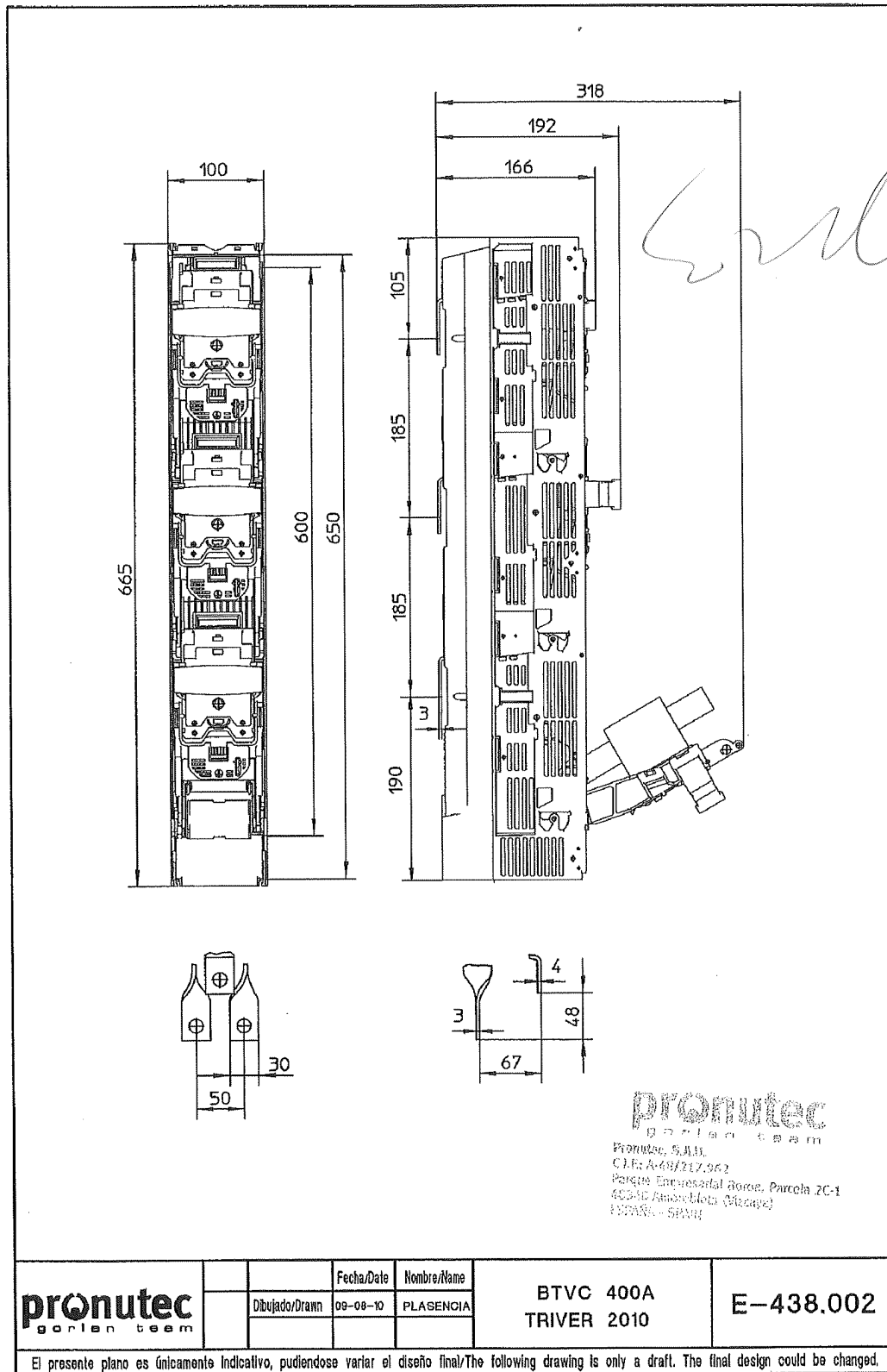
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ВЕРНО С ОРИГ

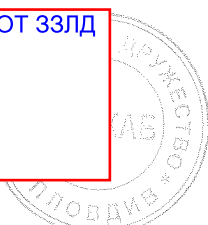
НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

10. Drawing



НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ВЯРНО С ОПИ



СПИСЪК НА ИЗВЪРШЕНИТЕ ИЗПИТВАНИЯ

на вертикален предпазител-разединител НН 400 А, с триполюсно управление
тип ВТВС 400А NH2 DU, произведен от Pronutec, S.A., Испания

Лаборатория, провела изпитванията: IPH Berlin

Издаден изпитвателен протокол за типови изпитвания № 2270.2100870.0579/16-17.09.2010 г.

Проведени изпитвания

Тестова последователност I: Общи експлоатационни характеристики

- Покачване на температурата
- Диелектрични свойства
- Капацитет на отваряне и затваряне
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата
- Якост на задвижващия механизъм

Тестова последователност II: Способност за оперативна ефективност

- Оперативни резултати
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Тестова последователност IV: Условен ток на късо съединение

- Изпитване на издръжливост на късо съединение
- Изпитване на отваряне на късо съединение
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Тестова последователност V: Претоварване

- Изпитване на претоварване
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Дата: 02.02.2018 г.

ПОДПИС И ПЕЧАТ:

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

изпълнителен директор
Филкаб АД

Independent, accredited testing station · Member laboratory of STL and LOVAG

TYPE TEST REPORT

No. 2270.2101164.0705

PRONUTEC, S. A.
Parque Empresarial Boroa
Parcela 2C-1
48340 Amorebieta (Vizcaya)
SPAIN

CLIENT

PRONUTEC, S. A.

MANUFACTURER

Three pole LV HRC fuse-switch-disconnector in vertical design

TEST OBJECT

BTVC 630A NH3 DU
Single-pole operated

TYPE

Samples of series production

SERIAL NO.

Rated operational voltage (AC)	500 V	RATED CHARACTERISTICS GIVEN BY THE CLIENT
Rated insulation voltage (AC)	1000 V	
Rated impulse withstand voltage	8 kV	
Rated operational current	630 A	
Conventional free air thermal current	630 A	
Rated frequency	50 Hz	
Rated conditional short-circuit current	50 kA	
Utilization category	AC-22B	

IEC 60947-3: 2008-08

NORMATIVE DOCUMENT

Test sequence I: General performance characteristics
Test sequence II: Operational performance capability
Test sequence IV: Conditional short-circuit current
Test sequence V: Overload performance

RANGE OF TESTS PERFORMED

13 October to 18 October 2010

DATE OF TEST

The ratings of the test object related to the scope of tests have been proved.
The tests have been PASSED.

TEST RESULT

НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

Senior engineer
Berlin, 15 December 2010



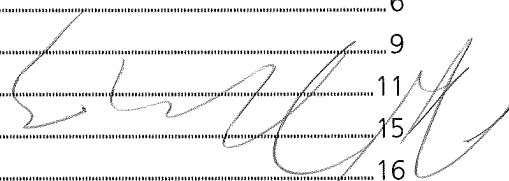
Independent test laboratory, accredited by Deutsche Akkreditierungsstelle Technik (DATech) e.V. in the fields of h.v. apparatus and switchgear, power cables and power cable accessories, l.v. apparatus and switchgear, installation equipment and switching and control equipment.
Institut „Prüfwerk für elektrische Hochleistungstechnik“ GmbH (IPH Berlin) is a subsidiary of CESI S.p.A. Milan.

ВЯРНО С



DAT - P - 019/92

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This test document comprises 69 sheets.

Distribution

Copy No. 1 in English:
Copy No. 2 in German:

ВЯРНО С ОРИГИНАЛ

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Copy No. 1

INUTEC, S. A.
INUTEC, S. A.

The test results relate only to the object tested.

This document is confidential. Its transfer to third parties as well as its reproduction in extracts require the consent of the client.

1. Present at the test

Mr. Rainer Borchert IPH test engineer in charge

Mr. Alberto Andrade Vivas PRONUTEC, S. A.



2. Test performed

Test sequence I: General performance characteristics

- Temperature-rise
- Dielectric properties
- Making and breaking capacities
- Dielectric verification
- Leakage current
- Temperature-rise verification
- Strength of actuator mechanism

Test sequence II: Operational performance capability

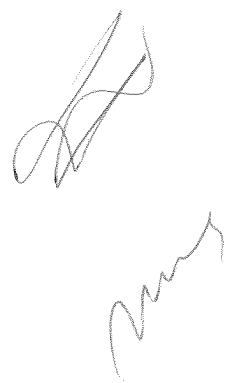
- Operational performance
- Dielectric verification
- Leakage current
- Temperature-rise verification

Test sequence IV: Conditional short-circuit current

- Test of fuse-protected short-circuit withstand
- Test of fuse-protected short-circuit making
- Dielectric verification
- Leakage current
- Temperature-rise verification

Test sequence V: Overload performance

- Overload test
- Dielectric verification
- Leakage current
- Temperature-rise verification




НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ВЯРНО С ОРИГИНАЛ

3. Identity of the test object

3.1 Technical data and characteristics

The technical data and characteristics of the test object are defined by the following parameters and specified by the client

Test object:	Three pole LV HRC fuse-switch-disconnector in vertical design	
Type:	BTVC 630A NH3 DU Single-pole operated	
Size:	NH3	
Manufacturer:	PRONUTEC, S. A.	
Serial No.:	Samples of series production	
Year of manufacture:	2010	
Data:	Rated operational voltage	500 V AC
	Rated insulation voltage	1000 V AC
	Rated impulse withstand voltage	8 kV
	Rated operational current	630 A
	Conventional free air thermal current	630 A
	Rated frequency	50 Hz
	Rated conditional short-circuit current	50 kA
	Rated duty	Uninterrupted
	Utilization category	AC-22B
	Degree of pollution	3
	Material group	III
	Overvoltage class	4
Characteristics:	Fuses used	
	Manufacturer	SIBA
	Type	20 005 13
	Size/char.	NH3-gG
	Rated voltage/current	500V/630A
	Torque	32 Nm
Material:	Material of enclosure	BMC
	Material of cover	PBT
	Material of actuator mechanism	PA
	Material of outgoing bars	Cu tin-coated
	Material of contact	Cu silver-coated
	Material of compression spring	Stainless steel




НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИ

ИЗП. ДИВ.

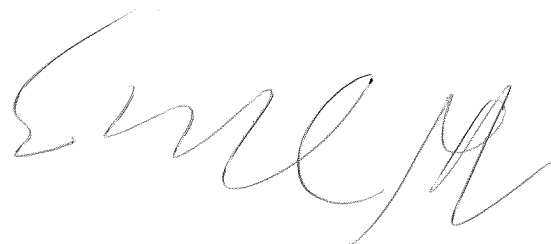
3.2 Identity documents

The manufacturer confirms that the test object has been manufactured in compliance with the drawings given in this document. IPH did not verify this compliance in detail.

The identity of the test object is fixed by the following drawings and data submitted by the client:

Name of drawing	Drawing No.	Date of drawing	Author	Notes
BTVC 630A TRIVER 2010	E-438.003	09-08-10	pronutec gorian team	Sheet 69

Entry of test objects at IPH: 11 October 2010




НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОР

ПЛОВДИВ

4. Test sequence I: General performance characteristics

4.1 Temperature-rise

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08



Required test parameters

Test current: 630 A, three-phase


Test frequency: 50 Hz

Test arrangement

According to IEC 60947-3: 2008-08


The test object was mounted, as specified by the manufacturer, in vertical position of use and in free air to a 1000-mm copper bar system with a cross-section of 2 x 40 mm x 5 mm per phase. The load terminals were connected by a 3-m insulated single-core cable (copper conductor) with a cross-section of 2 x 185 mm² per phase. The neutral point was on the outgoing side.

The torque of the screws at the terminals was 32 Nm.



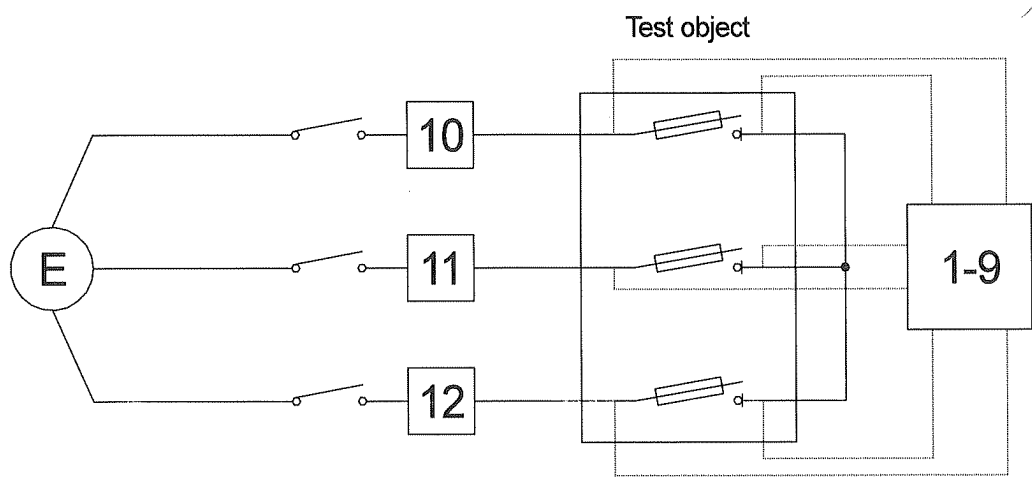

ВЯРНО С

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



Test and measuring circuits

[Handwritten signature]



- E Power supply
- 1 - 9 Points of temperature measurement
- 10 - 12 Points of current measurement

Figure 1: Circuit for the temperature-rise test

Technical data of measuring circuits

Measuring point	Measured quantity	Measuring sensor
1 - 9	Temperature	Cu/constantan thermocouples
10	Test current L1	Current transformer with burden
11	Test current L2	Current transformer with burden
12	Test current L3	Current transformer with burden

Measuring instruments:
 Measuring points 1 - 9: MV-logger Therm 8032-8M
 Measuring points 10 - 12: Digital Display SPE

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НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОПИ



Test results

The temperature-rise test done before the test of making and breaking capacities was carried out using LV HRC fuse-links of size 2.

Technical data of fuses used

Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A gG
 Rated voltage: 500 V

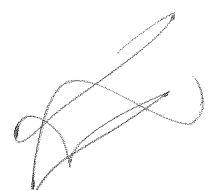


Date of test: 13.10.2010
 Test current: 631 A
 Test frequency: 50 Hz

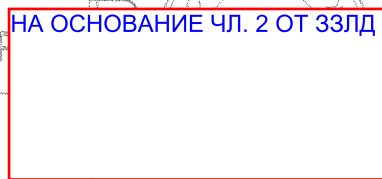
Condition of test object: New

Meas. point/ Phase	Designation	Classification	Material	Temperature-rise limit permitted [K]	Final temperature measured [°C]	Final temperature rise [K]	
1	L1	Busbar terminals	Terminal	65	72.6	47.4	
2	L2				82.2	57.0	
3	L3				77.4	52.2	
4	L1	Cable terminals	Terminal	65	84.1	58.9	
5	L2				82.3	57.1	
6	L3				90.0	64.8	
7	-	Enclosure	Exposed part	Insulating material	50	50.9	25.7
8	-	Actuator	Manual actuator	Insulating material	25	31.9	6.7
9	-	Ambient air	-	-	-	25.2	-

The final temperature-rise values measured did not exceed the temperature-rise limits defined by IEC 60947-1, Tables 2 and 3.



ВЯРНО С ОФ
 НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



4.2 Dielectric properties

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08



Required test parameters

- Verification of impulse withstand voltage

Lightning impulse voltage 1.2/50 μ s:	12.3 kV	Insulation of isolating distances
Lightning impulse voltage 1.2/50 μ s:	9.8 kV	Phase-to-phase insulation and phase-to-earth insulation

- No. of tests: 5 each
- Polarity: Positive und negative to earth

- Power-frequency withstand verification of solid insulation

50 Hz AC test voltage:	2200 V
Duration of test:	5 each s

- Verification of creepage distances

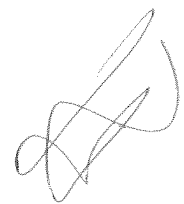
Minimum creepage distance:	12.5 mm	(Degree of pollution 3)
----------------------------	---------	-------------------------

- Leakage current

Test voltage:	550 V (1.1 x 500 V)
Test frequency:	50 Hz

Test arrangement

According to IEC 60947-3: 2008-08



ВЯРНО С

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



Test results

- **Verification of impulse withstand voltage and of power-frequency withstand of solid insulation**

Date of test: 13.10.2010

Atmospheric conditions during test

Air temperature: 19.1 °C
 Air pressure: 1035 mbar
 Air humidity: 37 %



Test arrangement			Applied test voltage 1.2/50 μs	Results	Applied 50-Hz test voltage	Results
Switching state of the test object	Voltage applied to	Earthed				
			kV	No. of impulses/ disruptive discharges	kV	Disruptive discharges
Closed	A,a	B,b,C,c,G	± 9.8	5 each/0	2.2	0
Closed	B,b	A,a,C,c,G	± 9.8	5 each/0	2.2	0
Closed	C,c	A,a,B,b,G	± 9.8	5 each/0	2.2	0
Closed	A,B,C,a,b,c	G	± 9.8	5 each/0	2.2	0
Open	A	a,B,b,C,c,G	± 9.8	5 each/0	2.2	0
Open	B	A,a,b,C,c,G	± 9.8	5 each/0	2.2	0
Open	C	A,a,B,b,c,G	± 9.8	5 each/0	2.2	0
Open	a	A,B,b,C,c,G	± 9.8	5 each/0	2.2	0
Open	b	A,a,B,C,c,G	± 9.8	5 each/0	2.2	0
Open	c	A,a,B,b,C,G	± 9.8	5 each/0	2.2	0
Open	A,B,C	a,b,c	± 12.3	5 each/0	-	-

- **Verification of creepage distances**

The minimum creepage distance measured to Annex G is 17 mm. The required minimum creepage distance limit has been observed.

- **Leakage current**

The leakage current of max. 5 μA measured, was smaller than the permissible value of 0.5 mA.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО



4.3 Making and breaking capacities

Test laboratory

Low-voltage test laboratory, test room 1



Normative document

IEC 60947-3: 2008-08

Required test parameters

	AC-22B
Test voltage:	525 V (1.05 x 500 V)
Test making current:	1890 A
Test breaking current:	1890 A
Power factor:	0.65
Test frequency:	50 Hz

Test arrangement

According to IEC 60947-3: 2008-08

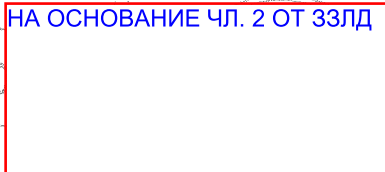
The test object was mounted, as specified by the manufacturer, in vertical position of use and in free air to a 500-mm copper bar system with a cross-section of 1 x 40 mm x 10 mm per phase. This copper bar system was connected to the test current source by a 1.5-m insulated single-core cable (copper conductor) with a cross-section of 240 mm² per phase. On its outgoing side, the test object was connected to the load circuit by a 1.5-m insulated single-core cable (copper conductor) with a cross-section of 185 mm² per phase. The distance to the metallic grid was 50 mm (left/right/top).

The torque of the screws at the terminals was 32 Nm.

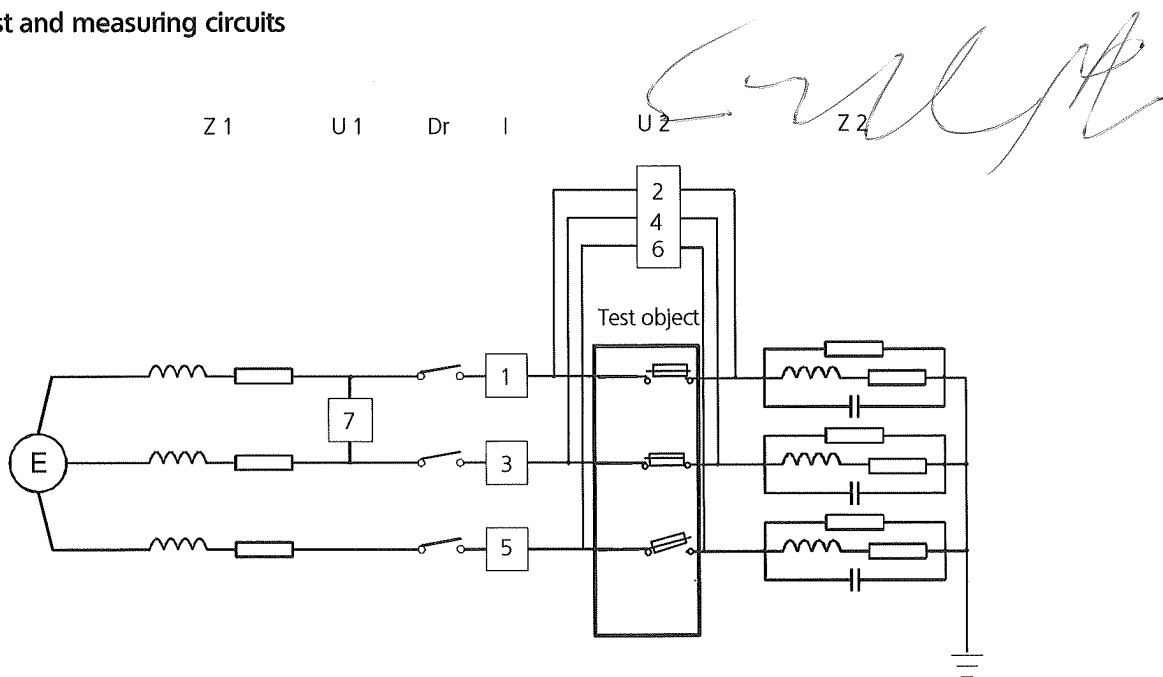


ВЯРНО С С

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



Test and measuring circuits



- | | | | |
|--------|------------------------|-------|-------------------------------|
| E | Power supply | U1 | Test voltage measurement |
| Dr | Making switch | U2 | Switching voltage measurement |
| Z1, Z2 | Test circuit impedance | I | Current measurement |
| | | 1 - 7 | Measuring points |

Figure 2: Circuit for the test of making and breaking capacities AC-22B

Technical data of measuring circuits

Test No.	Measuring point	Measured quantity	Measuring sensor
210 4878 to 210 4887	1	Current L1	Shunt
	3	Current L2	Shunt
	5	Current L3	Shunt
	2	Switching voltage L1	RC divider
	4	Switching voltage L2	RC divider
	6	Switching voltage L3	RC divider
	7	Test voltage	Voltage transformer
Measuring instruments: Measuring points 1 - 6: Transient recorder Measuring point 7: Digital voltmeter (class 0.5)			

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛ



Test results

Date of test: 13.10.2010
 Test circuit type: Direct
 Test requirement: Test of making and breaking capacities AC-22B
 Operating sequence: 5 x CO - t (t - dead time),
 L1 and L2 closed,
 L3 is subjected to the make-break operation cycle
 Connection of test object: - Power supply at busbar terminals
 - Load circuit at cable terminals
 Condition of test object before test: New
 Ambient temperature: 17 °C

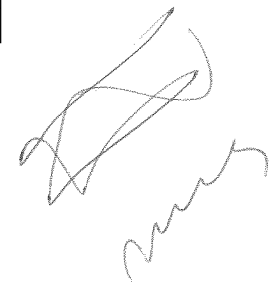
Test parameters:

Test No.		210 4878	210 4879	210 4880	210 4881	210 4882	
Operating sequence		1. CO-t	2. CO-t	3. CO-t	4. CO-t	5. CO	
Dead time	s	30	30	30	30	-	
Applied voltage	V	530	530	530	530	530	
Prospective peak short-circuit current	kA	L1	2.75	2.75	2.75	2.75	2.75
		L2	2.90	2.90	2.90	2.90	2.90
		L3	3.02	3.02	3.02	3.02	3.02
Prospective symmetrical short-circuit current	kA	L1	1.93	1.93	1.93	1.93	1.93
		L2	1.93	1.93	1.93	1.93	1.93
		L3	1.91	1.91	1.91	1.91	1.91
	Average	1.92	1.92	1.92	1.92	1.92	
Power factor cos φ		0.61	0.61	0.61	0.61	0.61	
Breaking current	kA	L1	-	-	-	-	-
		L2	-	-	-	-	-
		L3	1.91	1.90	1.90	1.90	1.90
Recovery voltage	V	L1	-	-	-	-	-
		L2	-	-	-	-	-
		L3	465	465	465	465	465
	Average phase-to-phase	-	-	-	-	-	
Joule Integral	10 ³ kA ² s	L1	1099	1095	1095	1093	1083
		L2	1099	1090	1086	1084	1085
		L3	604	594	613	614	593
Duration of current flow	ms	167	165	176	175	166	
Arcing time	ms	L1	-	-	-	-	-
		L2	-	-	-	-	-
		L3	7.20	6.60	16.3	14.6	5.80
Notes		1)	1)	1)	1)	1)	
Evaluation		OK	OK	OK	OK	OK	

Notes:

OK - The test object was able to make and break properly.

- 1) Technical data of fuses used:
 Manufacturer/Type: SIBA/20 005 13
 Size/char.: NH3-gG
 Rated voltage/current: 500V/630A

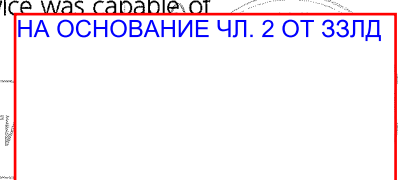



Condition of test object after test:

Immediately after the test of making and breaking capacities, the switching device was capable of properly opening and closing during a no-load operation.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ВЯРНО С ОПИГ





Test results

Date of test: 13.10.2010
 Test circuit type: Direct
 Test requirement: Test of making and breaking capacities AC-22B
 Operating sequence: 5 x CO - t (t - dead time),
 L2 closed and L3 open,
 L1 is subjected to the make-break operation cycle
 Connection of test object: - Power supply at busbar terminals
 - Load circuit at cable terminals
 Condition of test object before test: Prestressed by tests Nos. 210 4878 to 210 4882
 Ambient temperature: 17 °C

Test parameters:

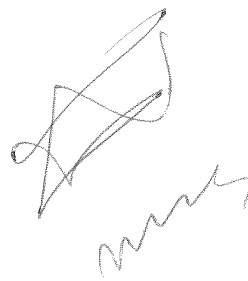
Test No.		210 4883	210 4884	210 4885	210 4886	210 4887
Operating sequence		1. CO-t-	2. CO-t-	3. CO-t-	4. CO-t-	5. CO
Dead time	s	30	30	30	30	-
Applied voltage	V	530	530	530	530	530
Prospective peak short-circuit current	kA	L1	2.75	2.75	2.75	2.75
		L2	2.90	2.90	2.90	2.90
		L3	3.02	3.02	3.02	3.02
Prospective symmetrical short-circuit current	kA	L1	1.93	1.93	1.93	1.93
		L2	1.93	1.93	1.93	1.93
		L3	1.91	1.91	1.91	1.91
	Average	1.92	1.92	1.92	1.92	
Power factor cos φ		0.61	0.61	0.61	0.61	0.61
Breaking current	kA	L1	1.69	1.69	1.68	1.68
		L2	-	-	-	-
		L3	-	-	-	-
Recovery voltage	V	L1	526	526	525	526
		L2	-	-	-	-
		L3	526	526	526	526
	Average phase-to-phase	-	-	-	-	
Joule integral	10 ³ kA ² s	L1	482	480	478	483
		L2	481	479	477	483
		L3	-	-	-	-
Duration of current flow	ms	175	173	173	172	173
Arcing time	ms	L1	11.9	10.7	10.1	9.70
		L2	-	-	-	-
		L3	-	-	-	-
Notes		1)	1)	1)	1)	1)
Evaluation		OK	OK	OK	OK	OK

Notes:

OK - The test object was able to make and break properly.
 1) Technical data of fuses used:
 Manufacturer/Type: SIBA/20 005 13
 Size/char.: NH3-gG
 Rated voltage/current: 500V/630A

Condition of test object after test:

Immediately after the test of making and breaking capacities, the switching device was capable of properly opening and closing during a no-load operation.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОП



4.4 Dielectric verification

Test laboratory

Low-voltage test laboratory, test room 9



Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 1000 V
 Test frequency: 50 Hz

Test arrangement

According to IEC 60947-3: 2008-08

Test results

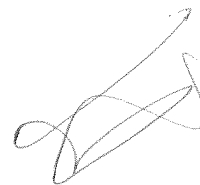
Date of test: 15.10.2010

After the test of making and breaking capacities, an AC voltage withstand test across open contacts and between closed contacts and enclosure was carried out at 1040 V AC.

The test voltage was applied:

- between all closed contacts and the enclosure
- between one pair of closed contacts and the enclosure and the other connected contact gaps
- across all opened contacts and connected gaps and the enclosure
- across all connected terminals of one side and the connected terminals of the other side

During each test period of 5 s, no disruptive discharges occurred.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГ

4.5 Leakage current

Test laboratory

Low-voltage test laboratory, test room 9



Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 550 V (1.1 x 500 V)
 Test frequency: 50 Hz

Test arrangement

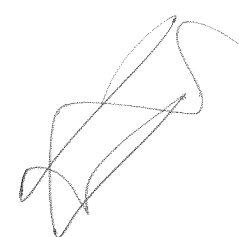
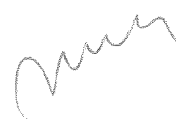
According to IEC 60947-3: 2008-08

Test results

Date of test: 15.10.2010


After the dielectric verification, the leakage current was measured across open contacts and between closed contacts and the enclosure at 110 % rated operational voltage.

The leakage current of max. 23 μ A measured, was smaller than the permissible value of 2 mA.

ВЕРНО

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



4.6 Temperature-rise verification

Test laboratory

Low-voltage test laboratory, test room 7



Normative document

IEC 60947-3: 2008-08

Required test parameters

Test current: 630 A, three-phase
 Test frequency: 50 Hz

Test arrangement

According to IEC 60947-3: 2008-08

The test object was mounted, as specified by the manufacturer, in vertical position of use and in free air to a 1000-mm copper bar system with a cross-section of 2 x 40 mm x 5 mm per phase. The load terminals were connected by a 3-m insulated single-core cable (copper conductor) with a cross-section of 2 x 185 mm² per phase. The neutral point was on the outgoing side.

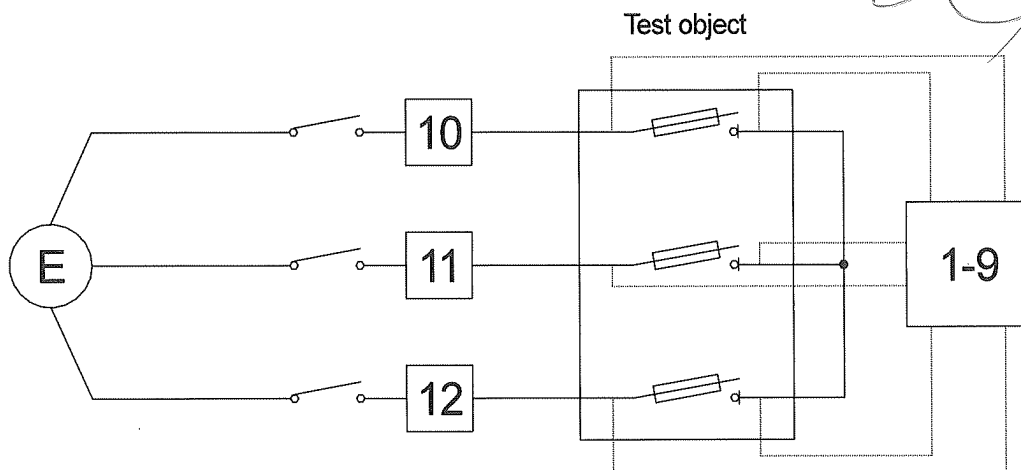
The torque of the screws at the terminals was 32 Nm.




ВЯРНО С ОРИГИ

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Test and measuring circuits



- E Power supply
- 1 - 9 Points of temperature measurement
- 10 - 12 Points of current measurement

Figure 3: Circuit for the temperature-rise verification

Technical data of measuring circuits

Measuring point	Measured quantity	Measuring sensor
1 - 9	Temperature	Cu/constantan thermocouples
10	Test current L1	Current transformer with burden
11	Test current L2	Current transformer with burden
12	Test current L3	Current transformer with burden
Measuring instruments: Measuring points 1 - 9: MV-logger Therm 8032-8M Measuring points 10 - 12: Digital Display SPE		

ВЯРНО С ОРИГИНАЛОМ

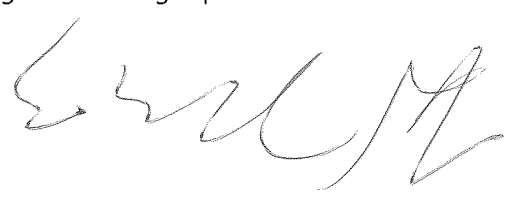
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Test results

The temperature-rise verification done after the test of making and breaking capacities was carried out using LV HRC fuse-links of size 3.

Technical data of fuses used

Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A gG
 Rated voltage: 500 V

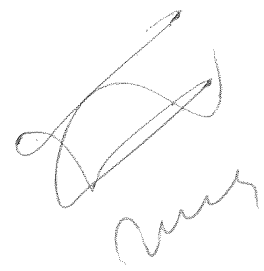


Date of test: 16.10.2010
 Test current: 632 A
 Test frequency: 50 Hz

Condition of test object: Prestressed by tests Nos. 210 4878 to 210 4887

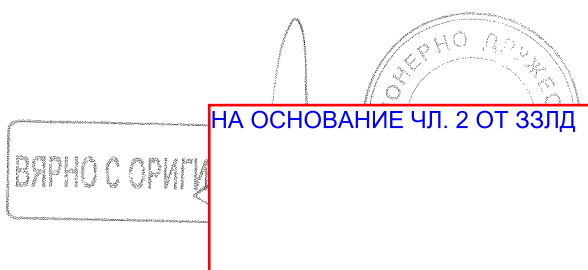
Meas. point/ Phase	Designation	Classification	Temperature-rise limit permitted	Final temperature measured	Final temperature rise	
			[K]	[°C]	[K]	
1	L1	Busbar terminals	80	76.0	53.6	
2	L2			79.6	57.2	
3	L3			76.6	54.2	
4	L1	Cable terminals	80	79.9	57.5	
5	L2			88.6	66.2	
6	L3			96.4	74.0	
7	-	Enclosure	Insulating material	60	49.4	27.0
8	-	Actuator	Insulating material	35	32.2	9.8
9	-	Ambient air	-	-	22.4	-

The final temperature rise measured did not exceed the permissible temperature rise limits.



ВЯРНО С ОРИГИНАЛОМ

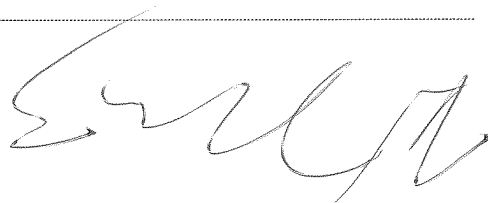
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



4.7 Strength of actuator mechanism

Test laboratory

Low-voltage test laboratory, test room 7



Normative document

IEC 60947-3: 2008-08

Required test parameters

Minimum operating force: 150 N
 Maximum operating force: 400 N

Test performed: One-hand operation (Figure 1e)

Test arrangement

According to IEC 60947-3: 2008-08

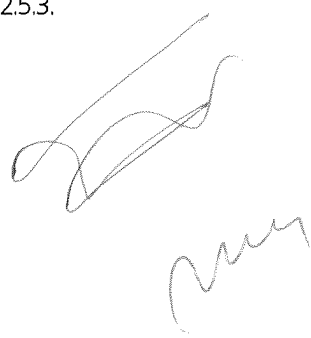
Test results

Date of test: 16.10.2010

Before the strength of the actuator was verified, the force F necessary for opening the test object was measured.
 This force F was 169 N.

To carry out the test, fixed and moving contacts were kept closed by bore and split-pin. The actuator was subjected to a test force of 400 N to IEC 60947-3, Table 8 (one-hand operation). The force was applied without shock to the actuator in a direction to open the contacts for a period of 10 s.

After the test of strength of actuator mechanism no damage was found on the switchgear. The actuator mechanism did not give "OFF" position when the contacts were closed.
 The position indication complies with the requirements defined in IEC 60947-3, Sub-clause 8.2.5.3.



ВЯРНО С ОРИГИНАЛОМ

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

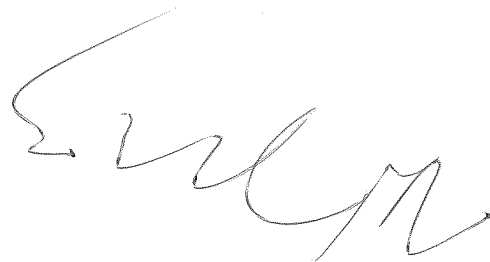
4.8 Evaluation of test sequence I

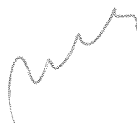
The LV HRC fuse-switch-disconnector in rail design has PASSED

Test sequence I General performance characteristics, consisting of

- Temperature-rise
- Dielectric properties
- Making and breaking capacities
- Dielectric verification
- Leakage current
- Temperature-rise verification
- Strength of actuator mechanism

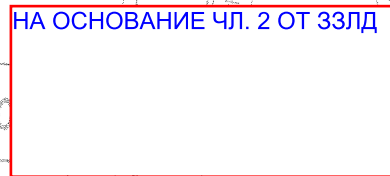
at its rated parameters.





НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С О



5. Test sequence II: Operational performance capability

5.1 Operational performance without current

Test laboratory

Low-voltage test laboratory, test room 5

Normative document

IEC 60947-3: 2008-08



Required test parameters

Number of operating cycles:	800	(Utilization category B)
Operations per hour:	60	

Test arrangement

According to IEC 60947-3: 2008-08

Test results

Date of test: 14.10.2010

The poles L1 and L3 of the test object have undergone the operational performance test without current with the required number of cycles of 800 operations at a rate of 240 operations per hour without mechanical damage or failures.



ВЯРНО С ОРМ

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

5.2 Operational performance with current

Test laboratory

Low-voltage test laboratory, test room 1

Normative document

IEC 60947-3: 2008-08

Required test parameters

	AC-22B
Test voltage:	500 V
Test current:	630 A
Power factor:	0.8
Test frequency:	50 Hz
Number of operating cycles:	200
Operations per hour:	60

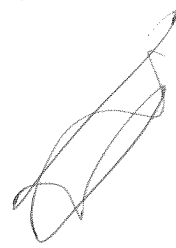
Test arrangement

According to IEC 60947-3: 2008-08

The time interval between the tests of operational performance capability without current and with current was 15 hours.

The test object was mounted, as specified by the manufacturer, in vertical position of use and in free air to a 500-mm copper bar system with a cross-section of 1 x 30 mm x 10 mm per phase. This copper bar system was connected to the test current source by a 1.5-m insulated single-core cable (copper conductor) with a cross-section of 240 mm² per phase. On its outgoing side, the test object was connected to the load circuit by a 1.5-m insulated single-core cable (copper conductor) with a cross-section of 185 mm² per phase. The distance to the metallic grid was 50 mm (left/right/top).

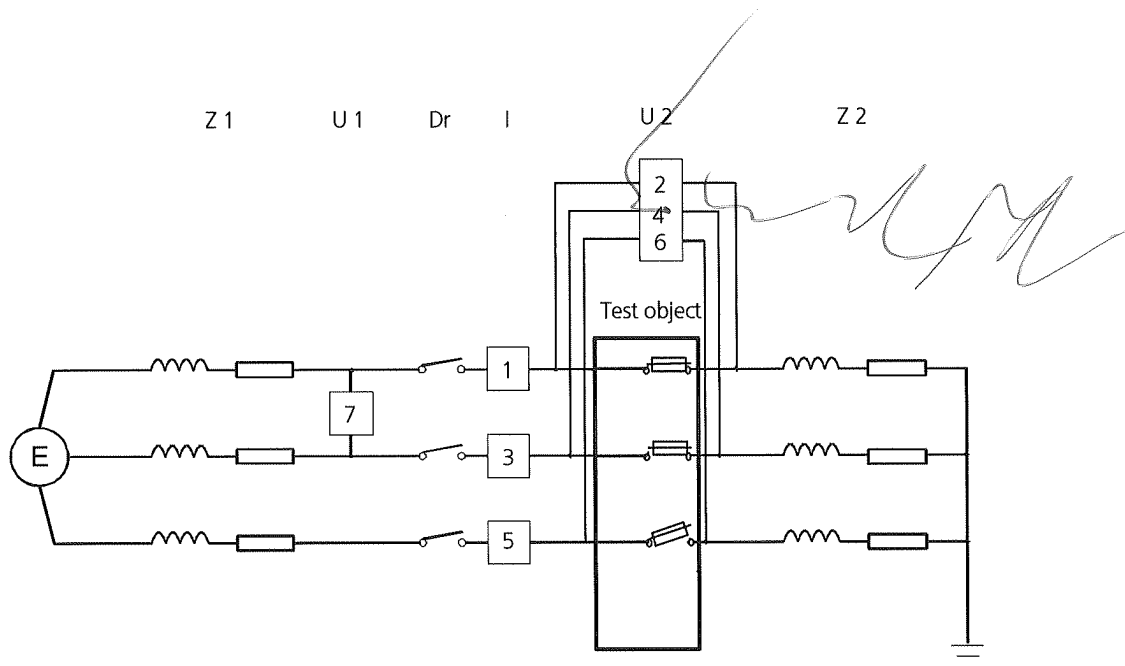
The torque of the screws at the terminals was 32 Nm.


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛА

Test and measuring circuits



- | | | | |
|--------|------------------------|-------|-------------------------------|
| E | Power supply | U1 | Test voltage measurement |
| Dr | Making switch | U2 | Switching voltage measurement |
| Z1, Z2 | Test circuit impedance | I | Current measurement |
| | | 1 - 7 | Measuring points |

Figure 4: Circuit for the operational performance test AC-22B

Technical data of measuring circuits

Test No.	Measuring point	Measured quantity	Measuring sensor
210 4890 to 210 4911	1	Current L1	Voltage transformer
	3	Current L2	Voltage transformer
	5	Current L3	Voltage transformer
	2	Switching voltage L1	RC divider
	4	Switching voltage L2	RC divider
	6	Switching voltage L3	RC divider
	7	Test voltage	Voltage transformer

Measuring instruments:
 Measuring points 1 - 6: Transient recorder
 Measuring point: 7: Digital voltmeter (class 0.5)

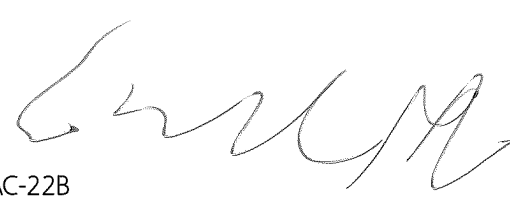
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НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛ

Test results

Date of test: 14.10.2010
 Test circuit type: Direct
 Test requirement: Operational performance AC-22B
 Operating sequence: 200 x CO-t (t - dead time)
 L2 closed and L3 open,
 L1 is subjected to the make-break operation cycle
 Connection of test object: - Power supply at the upper terminals
 - Load circuit at the lower terminals
 Condition of test object before test: New
 Ambient temperature: 18 °C


Test parameters:

Test No.	210 4890		210 4895		210 4900	
Operating sequence	1. CO-t		100. CO-t		200. CO	
Dead time	s	60	60	60	-	-
Applied voltage	V	500	500	500	500	500
Prospective peak short-circuit current	A	L1	917	917	917	917
		L2	922	922	922	922
		L3	939	939	939	939
Prospective symmetrical short-circuit current	A	L1	646	646	646	646
		L2	639	639	639	639
		L3	637	637	637	637
		Average	641	641	641	641
Power factor cos φ		0.77	0.77	0.77	0.77	0.77
Breaking current	A	L1	557	558	558	558
		L2	-	-	-	-
		L3	-	-	-	-
Recovery voltage	V	L1	502	500	500	500
		L2	-	-	-	-
		L3	-	-	-	-
		Average phase-to-phase	-	-	-	-
Joule integral	10 ³ kA ² s	L1	47.7	50.0	50.8	50.8
		L2	47.4	49.7	50.5	50.5
		L3	-	-	-	-
Duration of current flow	ms	-	-	-	-	-
Arcing time	ms	L1	12.0	10.9	11.9	11.9
		L2	-	-	-	-
		L3	-	-	-	-
Notes		1)	1)	1)	1)	1)
Evaluation		OK	OK	OK	OK	OK

Notes:

OK - The test object was able to make and break properly.

1) Technical data of fuses used:

Manufacturer/Type: SIBA/20 005 13

Size/char.: NH3-gG

Rated voltage/current: 500V/630A

Condition of test object after test:

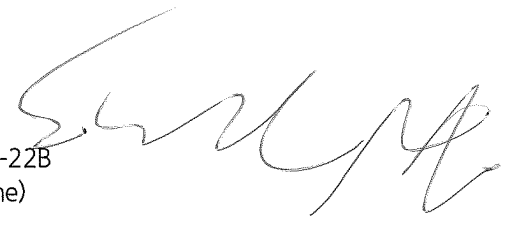
After the test of operational performance, the switching device was capable of properly opening and closing during a no-load operation.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЪРНО С ОПРИГ

Test results (continued)

Date of test: 14.10.2010
 Test circuit type: Direct
 Test requirement: Operational performance AC-22B
 Operating sequence: 200 x CO-t (t - dead time)
 L1 and L2 closed,
 L3 is subjected to the make-break operation cycle
 Connection of test object: - Power supply at the upper terminals
 - Load circuit at the lower terminals
 Condition of test object before test: Prestressed by tests Nos. 210 4890 to 210 4900
 Ambient temperature: 18 °C


Test parameters:

Test No.	210 4901		210 4906		210 4911	
Operating sequence	1. CO-t		100. CO		200. CO	
Dead time	s	60	60	-		
Applied voltage	V	500	500	500		
Prospective peak short-circuit current	A	L1	917	917	917	
		L2	922	922	922	
		L3	939	939	939	
Prospective symmetrical short-circuit current	A	L1	646	646	646	
		L2	639	639	639	
		L3	637	637	637	
	Average	641	641	641		
Power factor cos φ		0.77	0.77	0.77		
Breaking current	A	L1	-	-	-	
		L2	-	-	-	
		L3	637	637	635	
Recovery voltage	V	L1	-	-	-	
		L2	-	-	-	
		L3	434	435	435	
	Average phase-to-phase		-	-	-	
Joule Integral	10 ³ kA ² s	L1	125	126	122	
		L2	124	124	120	
		L3	65.2	70.2	68.4	
Duration of current flow	ms	-	-	-		
Arcing time	ms	L1	-	-	-	
		L2	-	-	-	
		L3	10.5	13.7	9.20	
Notes		1)	1)	1)		
Evaluation		OK	OK	OK		

Notes:

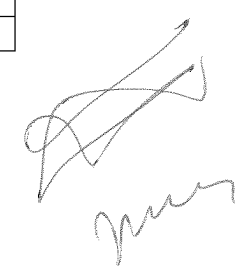
OK - The test object was able to make and break properly.

1) Technical data of fuses used:

Manufacturer/Type: SIBA/20 005 13

Size/char.: NH3-gG

Rated voltage/current: 500V/630A


Condition of test object after test:

After the test of operational performance, the switching device was capable of opening and closing during a no-load operation.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



5.3 Dielectric verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 1000 V
 Test frequency: 50 Hz



Test arrangement

According to IEC 60947-3: 2008-08

Test results

Date of test: 15.10.2010

After the operational performance test, a power-frequency voltage withstand test was carried out at 1050 V AC.

The test voltage was applied:

- between all closed contacts and the enclosure
- between one pair of closed contacts and the enclosure and the other connected contact gaps
- across all opened contacts and connected gaps and the enclosure
- across all connected terminals of one side and the connected terminals of the other side

During each test period of 5 s, no disruptive discharges occurred.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛА

СЛОВЯКИ

5.4 Leakage current

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 550 V (1.1 x 500 V)
 Test frequency: 50 Hz



Test arrangement


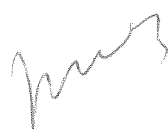
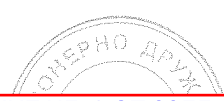

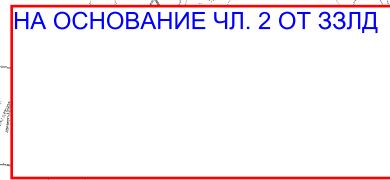
According to IEC 60947-3: 2008-08

Test results

Date of test: 15.10.2010

After the dielectric verification, the leakage current was measured across open contacts and between closed contacts and the enclosure at 110 % rated operational voltage.

The leakage current of max. 21 μ A measured, was smaller than the permissible value of 2 mA.

5.5 Temperature-rise verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test current: 630 A, three-phase

Test frequency: 50 Hz

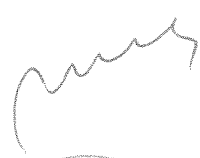
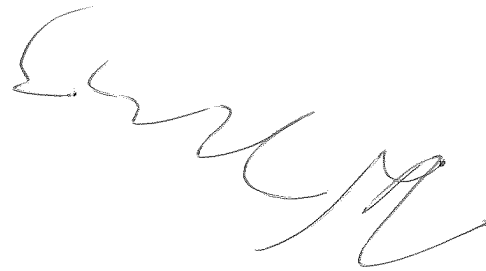
Test arrangement

According to IEC 60947-3: 2008-08

See Sub-clause 4.6, Sheet 17

Test and measuring circuits

See Sub-clause 4.6, Sheet 18



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОИ

Test results

The temperature-rise verification done after the operational performance test was carried out using LV HRC fuse-links of size 3.

Technical data of fuses used

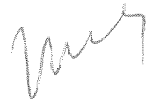
Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A gLgG
 Rated voltage: 500 V
 Date of test: 15.10.2010
 Test current: 630 A
 Test frequency: 50 Hz



Condition of test object: Prestressed by tests Nos. 210 4890 to 210 4911

Meas. point/ Phase	Designation	Classification	Temperature-rise limit permitted [K]	Final temperature measured	Final temperature rise	
				[°C]	[K]	
1	L1	Busbar terminals	80	71.1	49.2	
2	L2			71.3	49.4	
3	L3			62.4	40.5	
4	L1	Cable terminals	80	84.8	62.9	
5	L2			85.1	63.2	
6	L3			98.3	76.4	
7	-	Enclosure	Insulating material	60	48.1	26.2
8	-	Actuator	Insulating material	35	31.5	9.6
9	-	Ambient air	-	-	21.9	-

The final temperature rise measured did not exceed the permissible temperature rise limits.


ВЯРНО С...
 НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

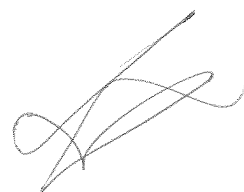
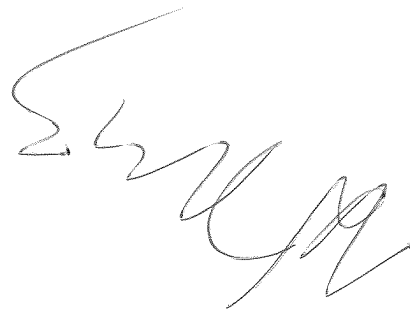
5.6 Evaluation of test sequence II

The LV HRC fuse-switch-disconnector in rail design has PASSED

Test sequence II Operational performance capability, consisting of

- Operational performance
- Dielectric verification
- Leakage current
- Temperature-rise verification

at its rated parameters.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛА

6. Test sequence IV: Conditional short-circuit current

6.1 Fuse-protected short-circuit withstand/making

Test laboratory

Low-voltage test laboratory, test room 1

Normative document

IEC 60947-3: 2008-08



Required test parameters

Test voltage:	525 V (1.05 x 500 V)
Test current:	50 kA
Power factor:	0.25
Test frequency:	50 Hz
Fuses used:	500 V/630 A

Test arrangement

According to IEC 60947-3: 2008-08

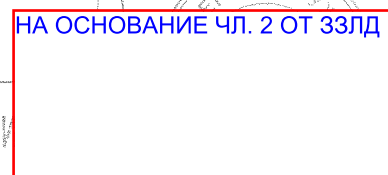
The test object was mounted, as specified by the manufacturer, in vertical position of use and in free air to a 500-mm copper bar system with a cross-section of 1 x 30 mm x 10 mm per phase. This copper bar system was connected to the test current source by a 2-m insulated single-core cable (copper conductor) with a cross-section of 240 mm² per phase. On its outgoing terminals, the test object was connected to the short-circuit by insulated single-core cable (copper conductor) with a cross-section of 185 mm² per phase.

The torque of the screws at the terminals was 32 Nm.




НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОПИ



Test and measuring circuits

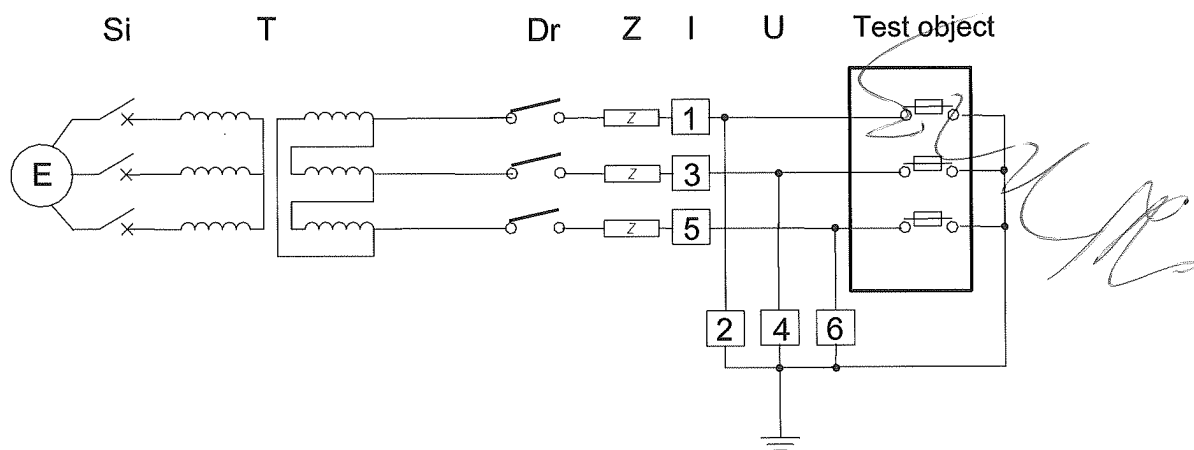


Figure 5: Circuit for the test of fuse-protected short-circuit withstand

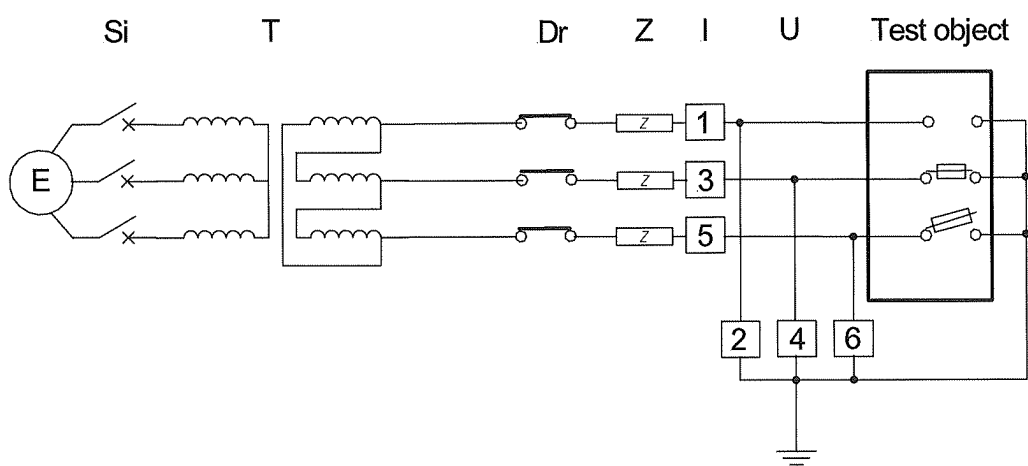


Figure 6: Circuit for the test of fuse-protected short-circuit making

E	Power supply	Si	Main switch
Dr	Making switch	U	Voltage measurement
Z	Test circuit impedance	I	Current measurement
T	Transformer	1 - 6	Measuring points

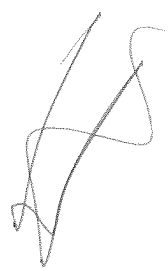
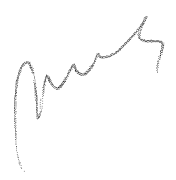
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОПИ

Test and measuring circuits (continued)

Technical data of measuring circuits

Test No.	Measuring point	Measured quantity	Measuring sensor
210 4874 and 210 4875	1	Current L1	Rogowski
	3	Current L2	Rogowski
	5	Current L3	Rogowski
	2	Voltage L1	RC divider
	4	Voltage L2	RC divider
	6	Voltage L3	RC divider
Measuring instruments: Measuring points 1 to 6: Transient recorder			

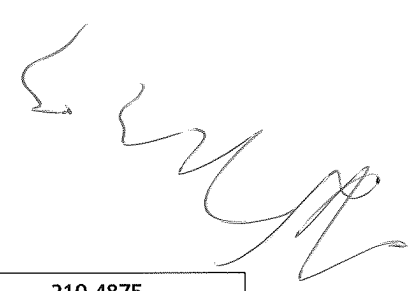
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОФ



Test results

Date of test: 13.10.2010
 Test circuit type: Direct
 Test requirement: Conditional short-circuit
 Connection of test object: - Power supply at busbar terminals
 - Short-circuit at cable terminals
 Condition of test object before test: New
 Ambient temperature: 18 °C


Test parameters:

Test No.		210 4874	210 4875
Operating sequence		O	C
Applied voltage	V	525	525
Prospective peak short-circuit current	kA	L1	96.7
		L2	91.2
		L3	117
Prospective symmetrical short-circuit current	kA	L1	51.4
		L2	50.5
		L3	50.9
	Average	50.9	
Power factor $\cos \varphi$		0.16	0.16
Cut-off current	kA	L1	48.1
		L2	36.6
		L3	36.8
Recovery voltage	V	L1	378
		L2	0
		L3	265
	Average phase-to-phase		-
Joule integral	$10^6 \text{ A}^2\text{s}$	L1	3.99
		L2	3.00
		L3	4.14
Break time	ms	9.74	4.81
Notes		1), 2)	1), 3)
Evaluation		OK	OK

Notes:

OK - The test object was able to make and break properly.

1) Technical parameters of fuse links:

Technical data of fuses used:

Manufacturer/Type: SIBA/20 005 13

Size/char.: NH3-gG

Rated voltage/current: 500V/630A

Breaking capacity: 120 kA

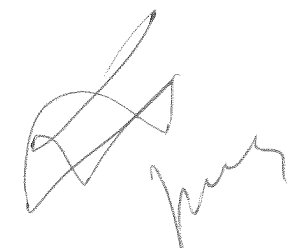
2) The test object is capable of properly carrying its rated conditional short-circuit current.

The fuse is capable of properly breaking the rated conditional short-circuit current.

3) The test object (L3) is capable of properly making its rated conditional short-circuit current. The fuse is capable of properly breaking the rated conditional short-circuit current.

Condition of test object after test:

The test object did not show any visible damage. Immediately after the test it was checked that the switching device did properly open and close during a no-load operation.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОПИ

6.2 Dielectric verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 1000 V

Test frequency: 50 Hz



Test arrangement

According to IEC 60947-3: 2008-08

Test results

Date of test: 15.10.2010

After the tests of fuse-protected short-circuit withstand and fuse-protected short-circuit making, a power-frequency voltage withstand test across the open contacts and between the closed contacts and the enclosure was carried out at 1050 V AC.

The test voltage was applied:

- between all closed contacts and the enclosure
- between one pair of closed contacts and the enclosure and the other connected contact gaps
- across all opened contacts and connected gaps and the enclosure
- across all connected terminals of one side and the connected terminals of the other side

During each test period of 5 s, no disruptive discharges occurred.



ВЯРНО С О

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



6.3 Leakage current

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 550 V (1.1 x 500 V)

Test frequency: 50 Hz



Test arrangement

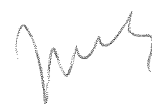
According to IEC 60947-3: 2008-08

Test results

Date of test: 15.10.2010

After the dielectric verification, the leakage current was measured across open contacts and between closed contacts and the enclosure at 110 % rated operational voltage.

The leakage current of max. 25 μ A measured, was smaller than the permissible value of 2 mA.


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОР

6.4 Temperature-rise verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test current: 630 A, three-phase
Test frequency: 50 Hz



Test arrangement

According to IEC 60947-3: 2008-08
See Sub-clause 4.6, Sheet 17


Test and measuring circuits

See Sub-clause 4.6, Sheet 18



ВЯРНО С ОП

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

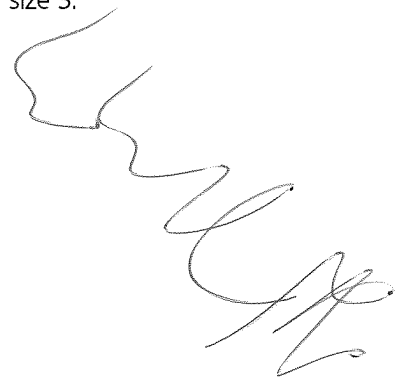


Test results

The temperature-rise verification done after the tests of fuse-protected short-circuit withstand and fuse-protected short-circuit making was carried out using LV HRC fuse-links of size 3.

Technical data of fuses used

Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A gG
 Rated voltage: 500 V
 Date of test: 15.10.2010
 Test current: 633 A
 Test frequency: 50 Hz




Condition of test object: Prestressed by tests Nos. 210 4874 and 210 4875

Meas. point/ Phase	Designation	Classification	Temperature-rise limit permitted [K]	Final temperature measured [°C]	Final temperature rise [K]	
1	L1	Busbar terminals	Terminal	80	81.1	55.8
2	L2				84.0	58.7
3	L3				76.2	50.9
4	L1	Cable terminals	Terminal	80	86.6	61.3
5	L2				88.2	62.9
6	L3				95.8	69.7
7	-	Enclosure	Insulating material	60	53.5	28.2
8	-	Actuator	Insulating material	35	32.9	7.6
9	-	Ambient air	-	-	25.3	-

The final temperature rise measured did not exceed the permissible temperature rise limits.



ВЯРНО С ОП
 НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД


6.5 Evaluation of test sequence IV

The LV HRC fuse-switch-disconnector in rail design has PASSED

Test sequence IV Conditional short-circuit current, consisting of

- Fuse-protected short-circuit withstand
- Fuse-protected short-circuit making
- Dielectric verification
- Leakage current
- Temperature-rise verification

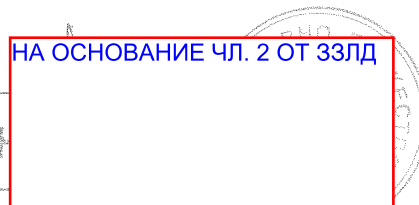
at its rated parameters.





НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛА



7. Test sequence V: Overload performance

7.1 Overload test

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test current: 1008 A, three-phase (1.6 x 630 A)
 Test frequency: 50 Hz
 Test duration: 1 h max.



Test arrangement

According to IEC 60947-3: 2008-08
 See Sub-clause 4.6, Sheet 17


Technical data of fuses used

Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A, gG
 Rated voltage: 500 V

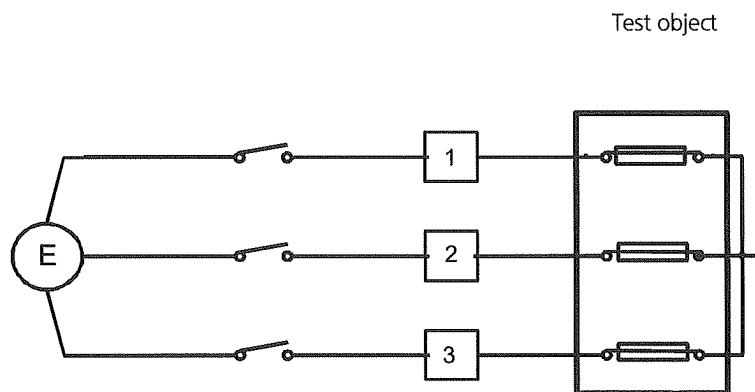



ВЯРНО С О

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



Test and measuring circuits



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- E Power supply
- 1 - 3 Points of current measurement

Figure 7: Circuit for the overload test

Technical data of measuring circuits

Measuring point	Measured quantity	Measuring sensor
1	Test current L1	Current transformer with burden
2	Test current L2	Current transformer with burden
3	Test current L3	Current transformer with burden
Measuring instruments: Measuring points 1 to 3: Digital Display SPE		

Test results

Date of test: 16.10.2010

The test current was 1015 A. It flew for 24 min until the fuse in phase L1 blew. Three minutes after the response of the fuse, the apparatus was opened and closed again. The no-load operations were not impaired.

Force F necessary for opening: 350 N

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НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С



7.2 Dielectric verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 1000 V
 Test frequency: 50 Hz



Test arrangement

According to IEC 60947-3: 2008-08

Test results

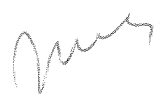
Date of test: 16.10.2010

After the overload test, a power-frequency voltage withstand test across open contacts and between closed contacts and enclosure was carried out at 1050 V AC.

The test voltage was applied:

- between all closed contacts and the enclosure
- between one pair of closed contacts and the enclosure and the other connected contact gaps
- across all opened contacts and connected gaps and the enclosure
- across all connected terminals of one side and the connected terminals of the other side

During each test period of 5 s, no disruptive discharges occurred.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО



7.3 Leakage current

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test voltage: 550 V (1.1 x 500 V)

Test frequency: 50 Hz

Test arrangement

According to IEC 60947-3: 2008-08

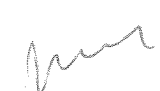
Test results

Date of test: 16.10.2010

After the dielectric verification, the leakage current was measured across open contacts and between closed contacts and the enclosure at 110 % rated operational voltage.


The leakage current of max. 9 μ A measured, was smaller than the permissible value of 2 mA.





ВЕРНО С С

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



7.4 Temperature-rise verification

Test laboratory

Low-voltage test laboratory, test room 7

Normative document

IEC 60947-3: 2008-08

Required test parameters

Test current: 630 A, three-phase

Test frequency: 50 Hz

Test arrangement

According to IEC 60947-3: 2008-08

See Sub-clause 4.6, Sheet 17

Test and measuring circuits

See Sub-clause 4.6, Sheet 18



ВЯРН

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ЭЛЕКТРО-ДРУЖЕСТВО * 08

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Test results

The temperature-rise verification done after the overload test was carried out using LV HRC fuse-links of size 3.

Technical data of fuses used

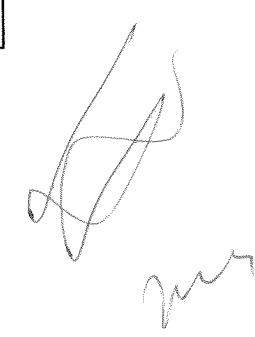
Manufacturer: SIBA
 Type: 20 005 13
 Rated current: 630 A gG
 Rated voltage: 500 V
 Date of test: 18.10.2010
 Test current: 632 A
 Test frequency: 50 Hz



Condition of test object: Prestressed by overload test


Meas. point/ Phase		Designation	Classification	Temperature-rise limit permitted [K]	Final temperature measured [°C]	Final temperature rise [K]
1	L1	Busbar terminals	Terminal	80	66.1	42.0
2	L2				73.9	49.8
3	L3				70.0	45.9
4	L1	Cable terminals	Terminal	80	81.2	57.1
5	L2				84.1	60.0
6	L3				96.0	71.9
7	-	Enclosure	Insulating material	60	50.8	26.7
8	-	Actuator	Insulating material	35	31.0	6.9
9	-	Ambient air	-	-	24.1	-

The final temperature rise measured did not exceed the permissible temperature rise limits.



ВЯРНО С ОР

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



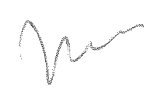
7.5 Evaluation of test sequence V

The LV HRC fuse-switch-disconnector in rail design has PASSED

Test sequence V Overload performance capability, consisting of

- Overload test
- Dielectric verification
- Leakage current
- Temperature-rise verification

at its rated parameters.



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОР

8. Photos

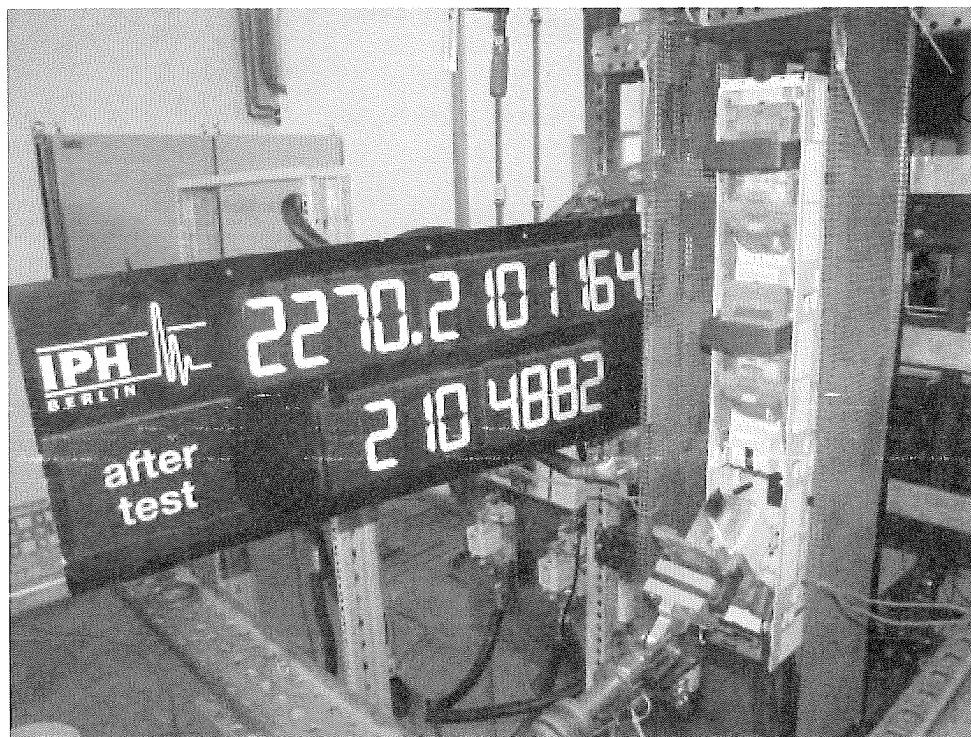


Photo 1: Test object L3 after verification of making and breaking capacities

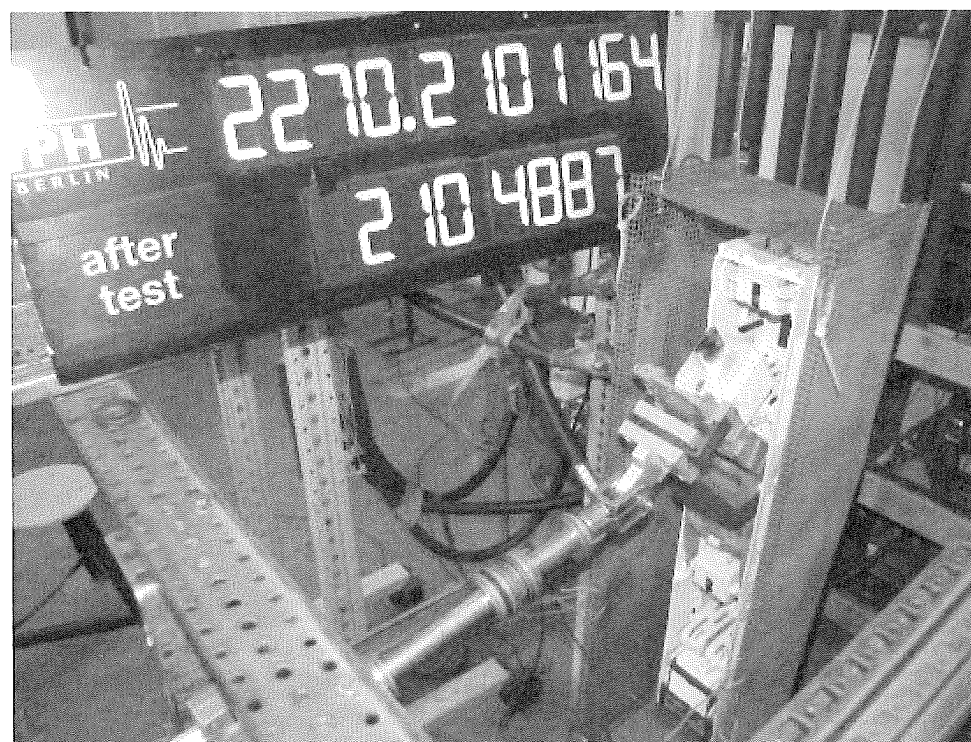
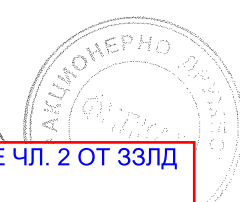


Photo 2: Test object L1 after verification of making and breaking capacities

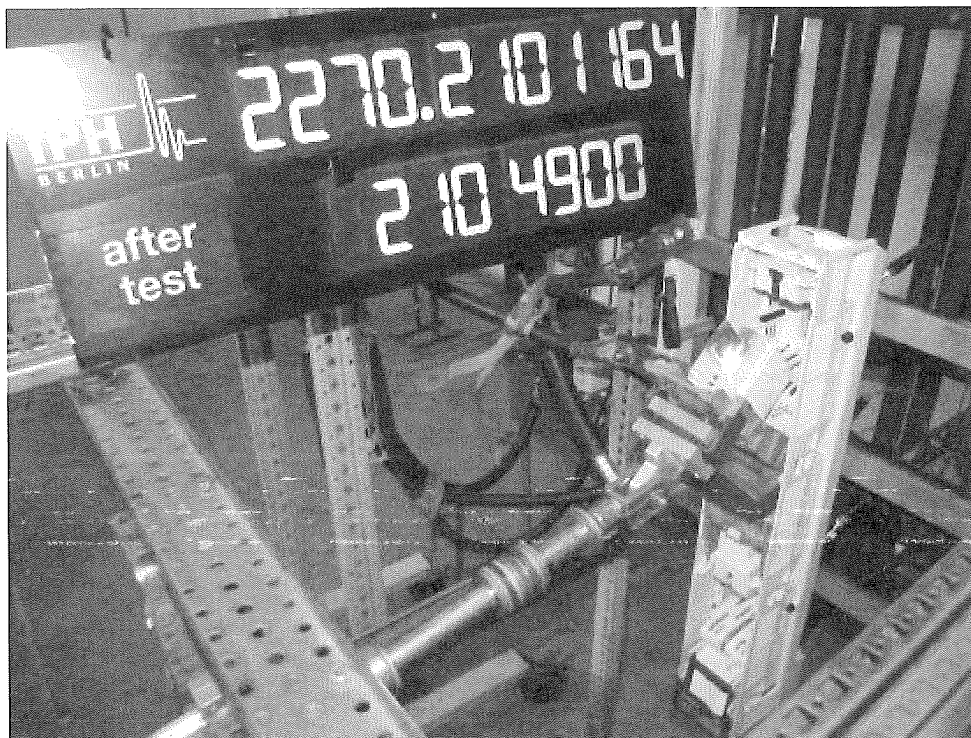
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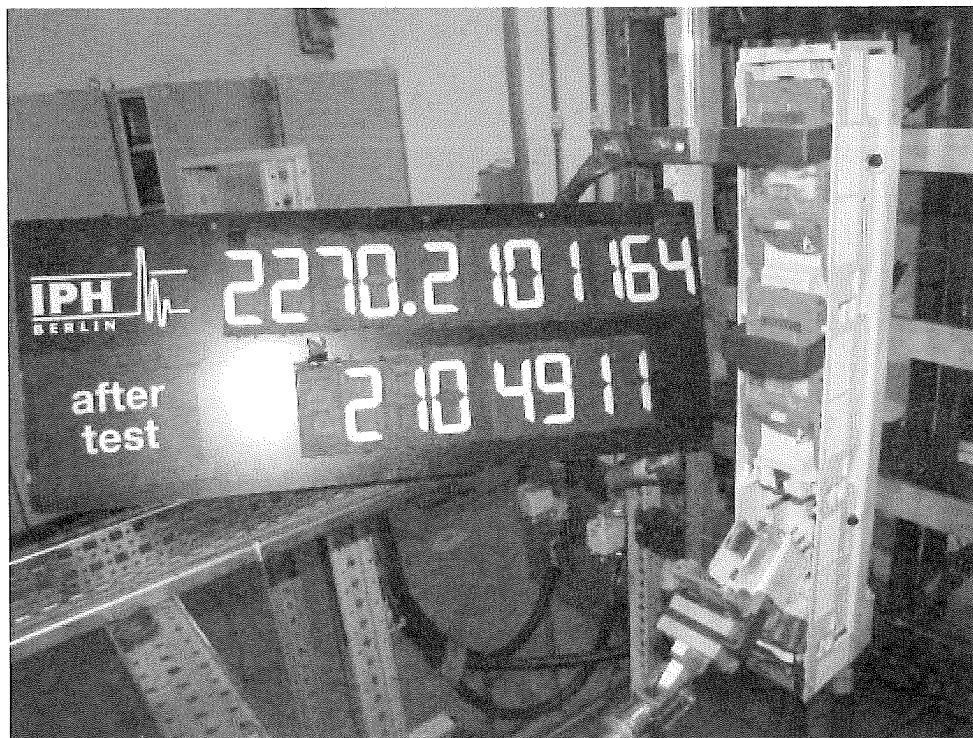
НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ВЯРНО С С



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Photo 3: Test object L1 after operational performance test



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Photo 4: Test object L3 after operational performance test

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НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГ



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Photo 5: Test object L3 after conditional short-circuit current test

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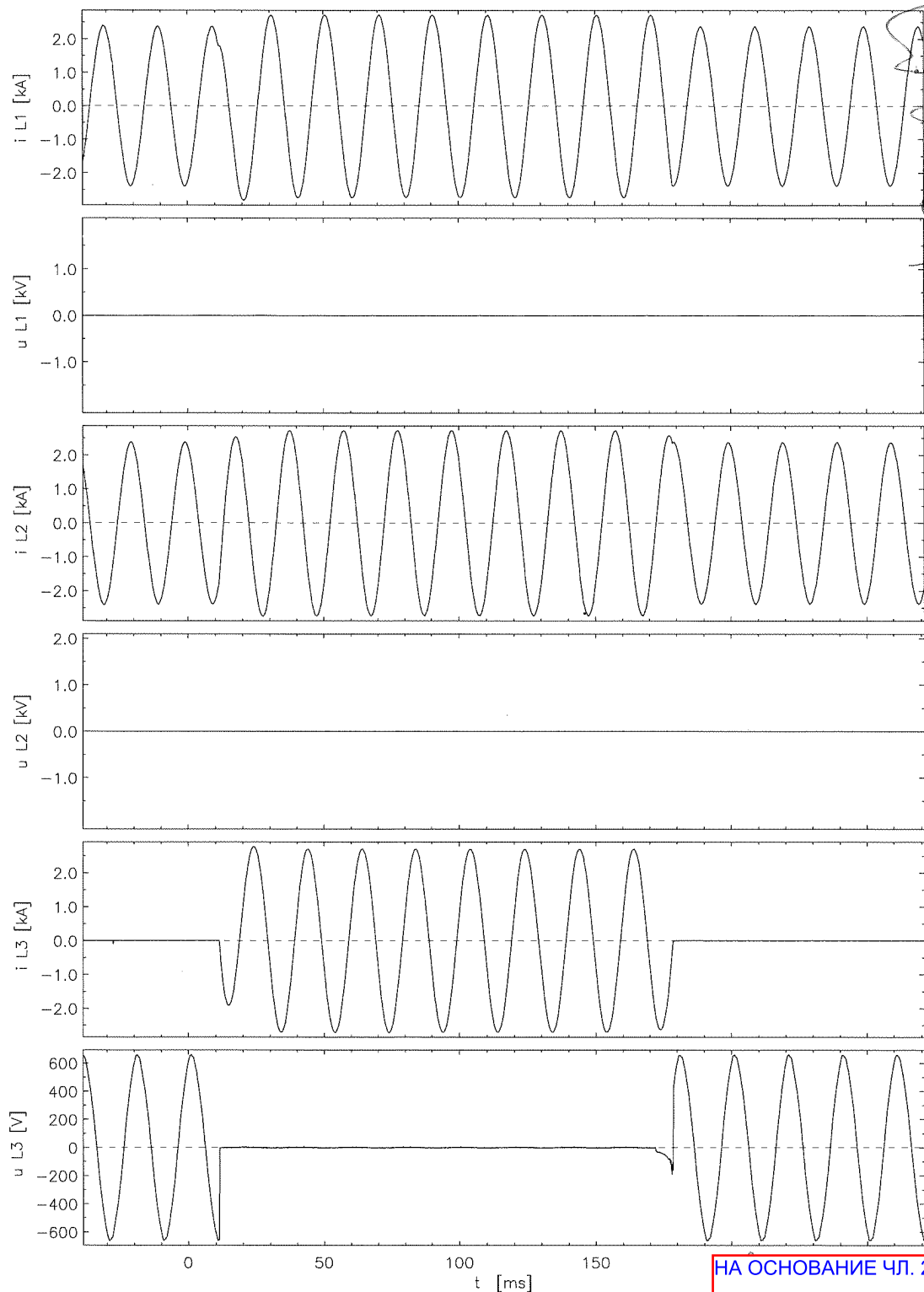
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С



9. Oscillograms

Test-No. 2104878

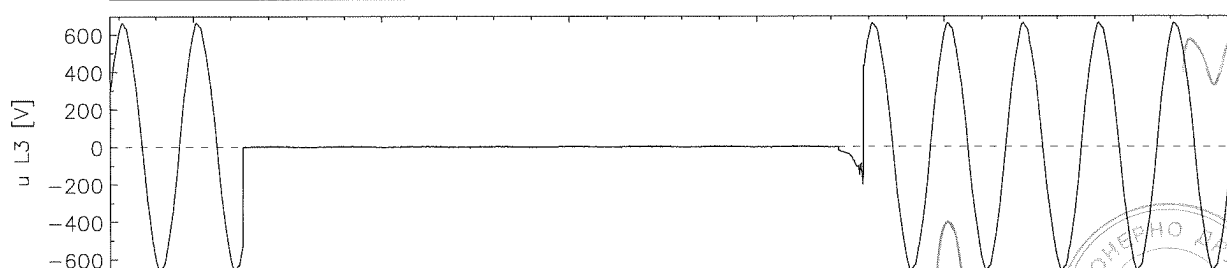
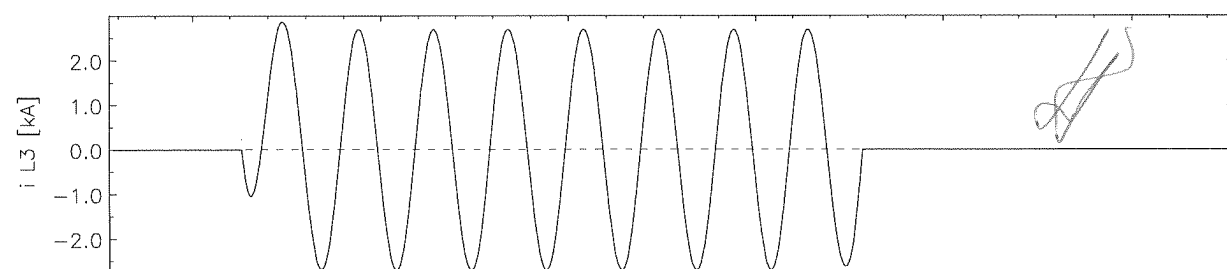
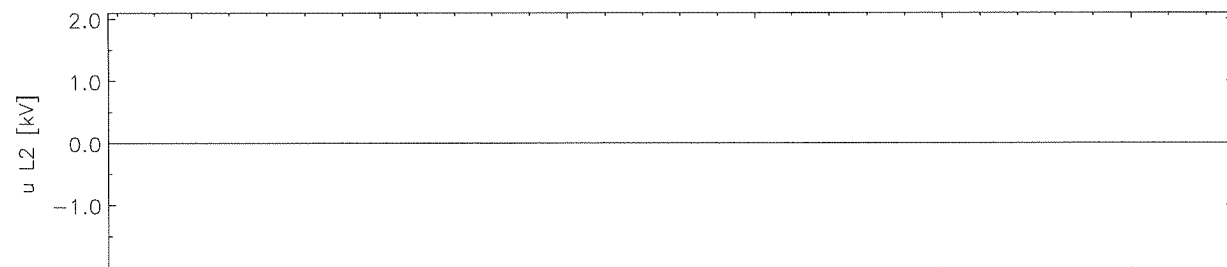
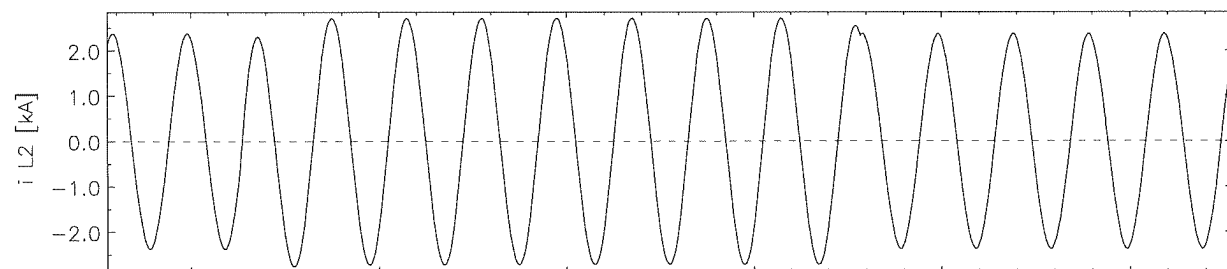
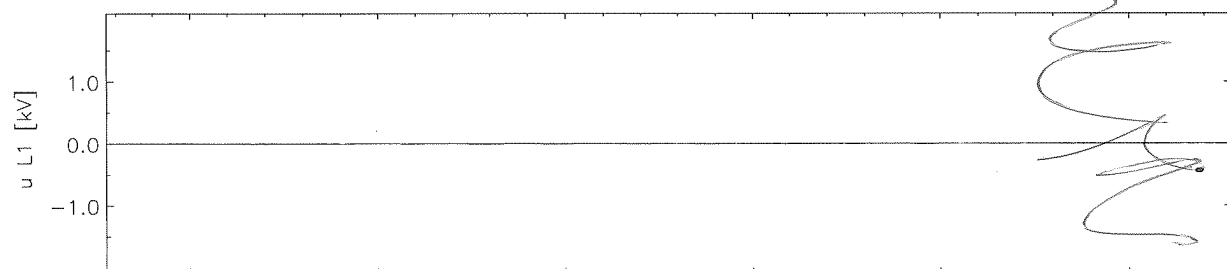
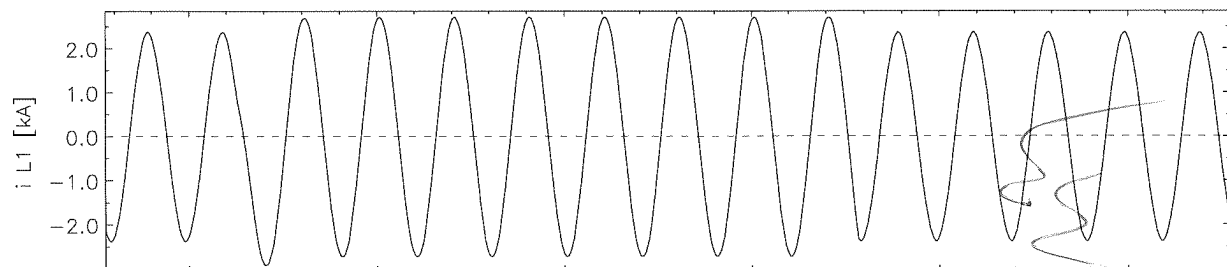


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРИГИНАЛ

ПЛОВДИВ

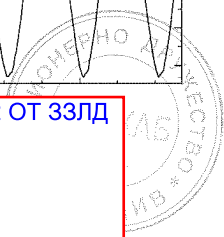
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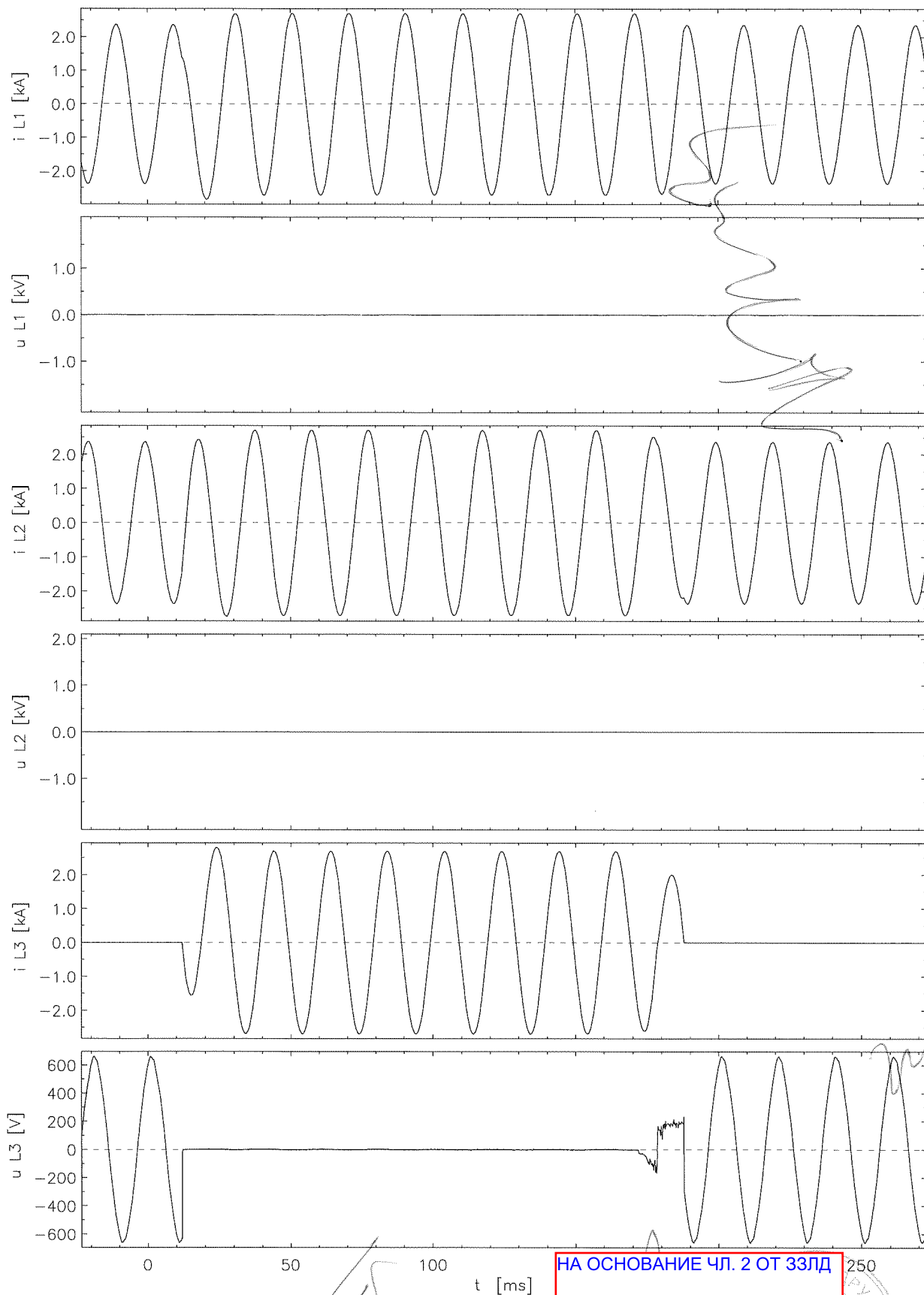
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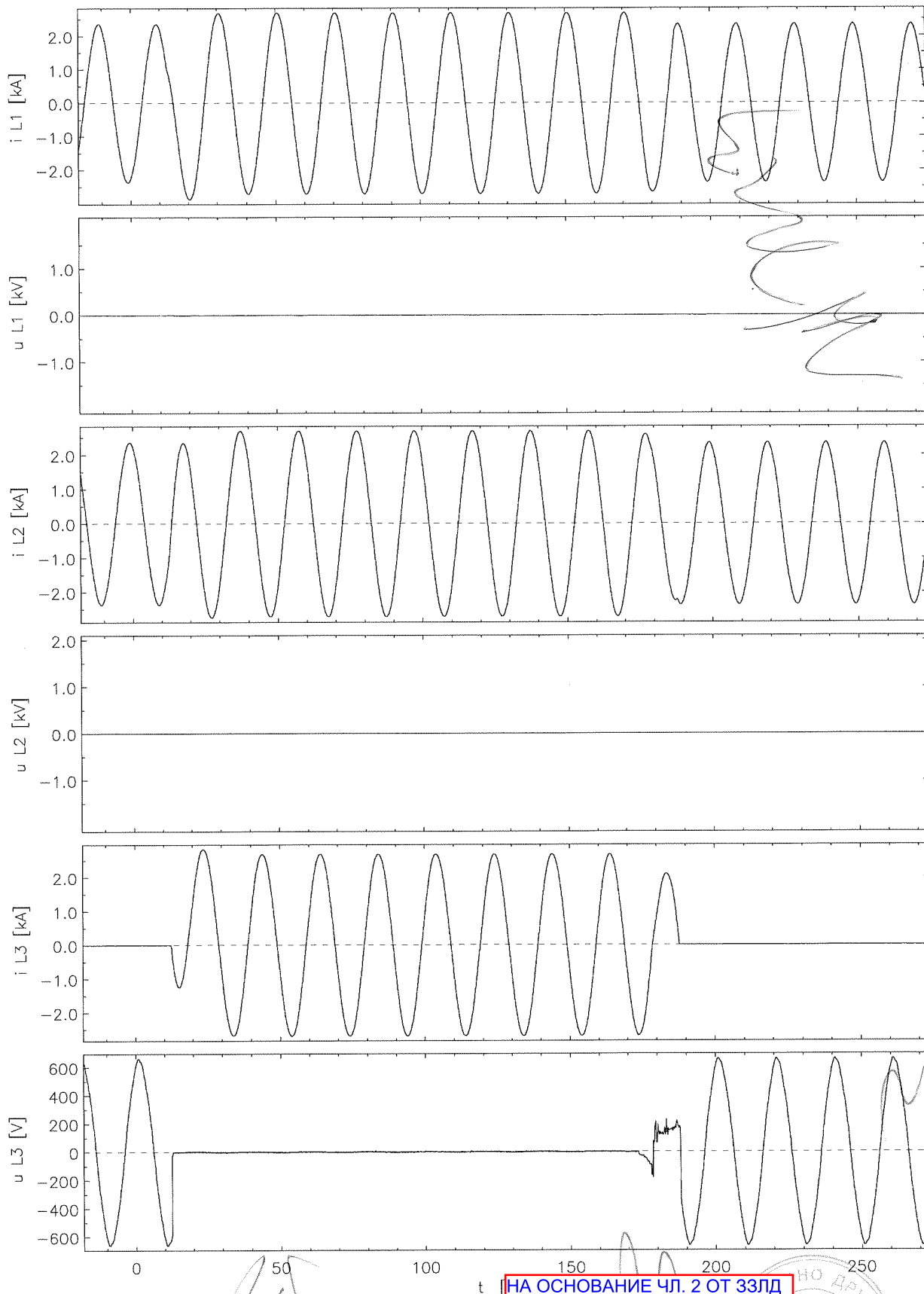
ВЯРНО С



Test-No. 2104880



Test-No. 2104881

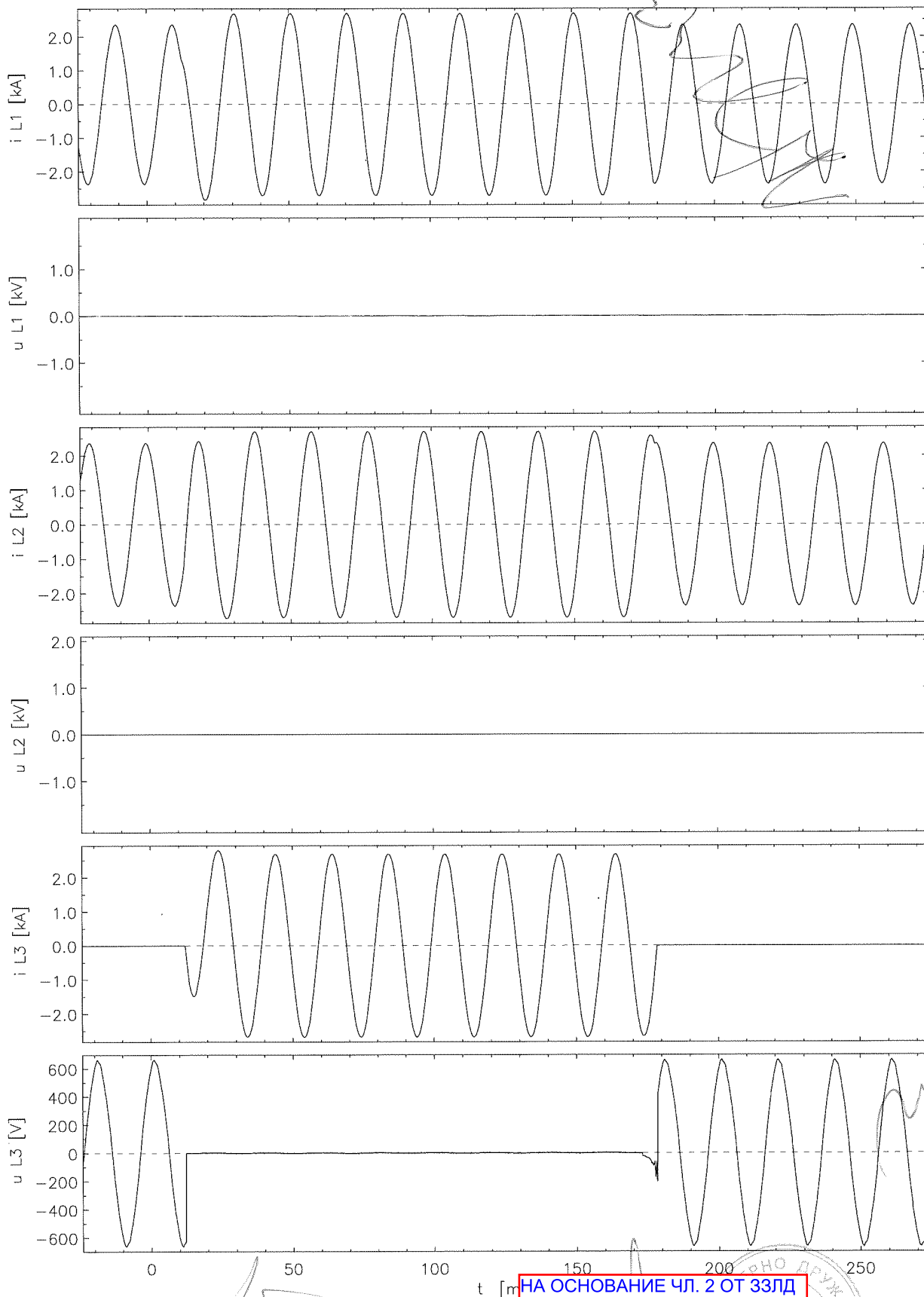


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С



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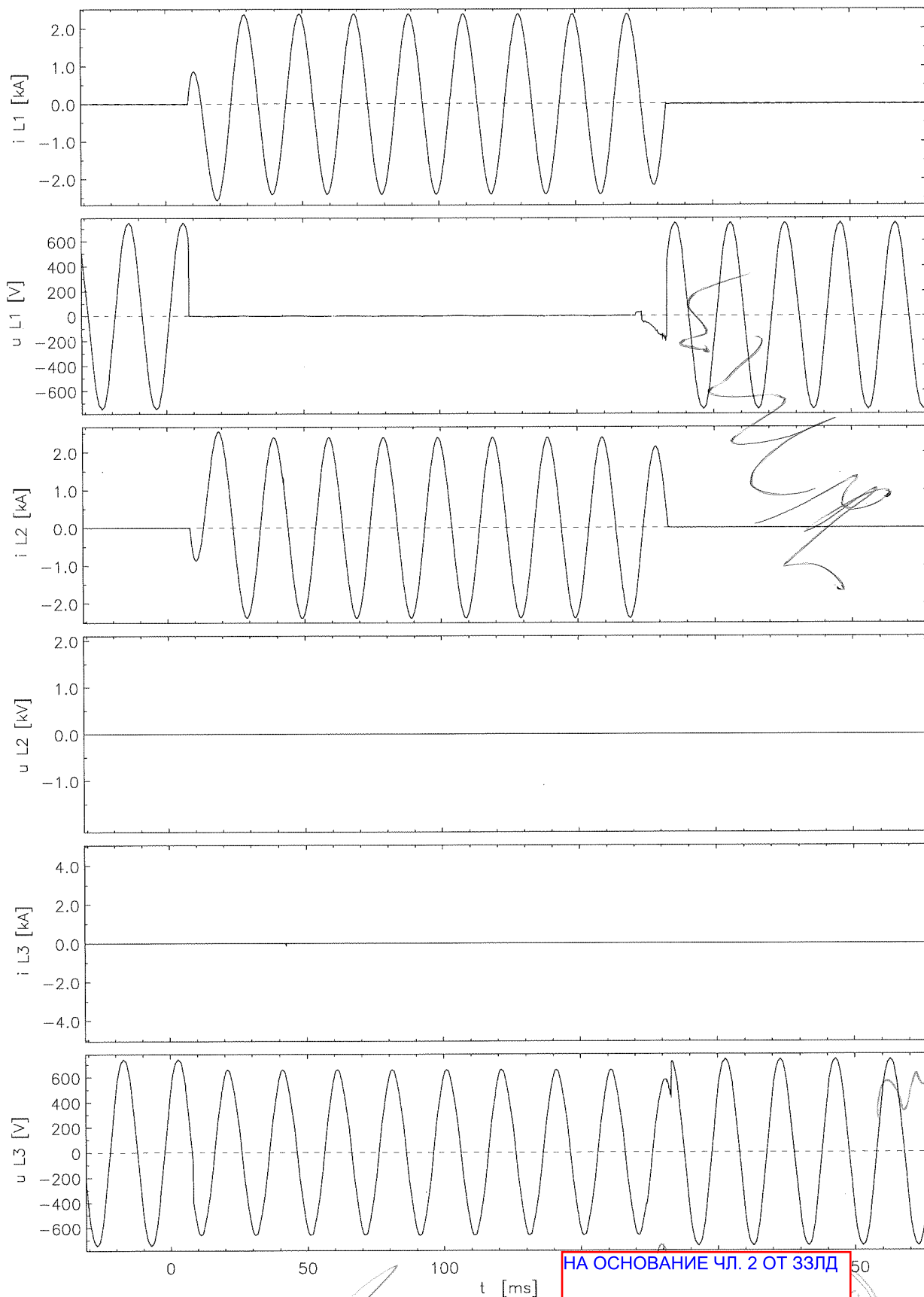


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С О



Test-No. 2104883

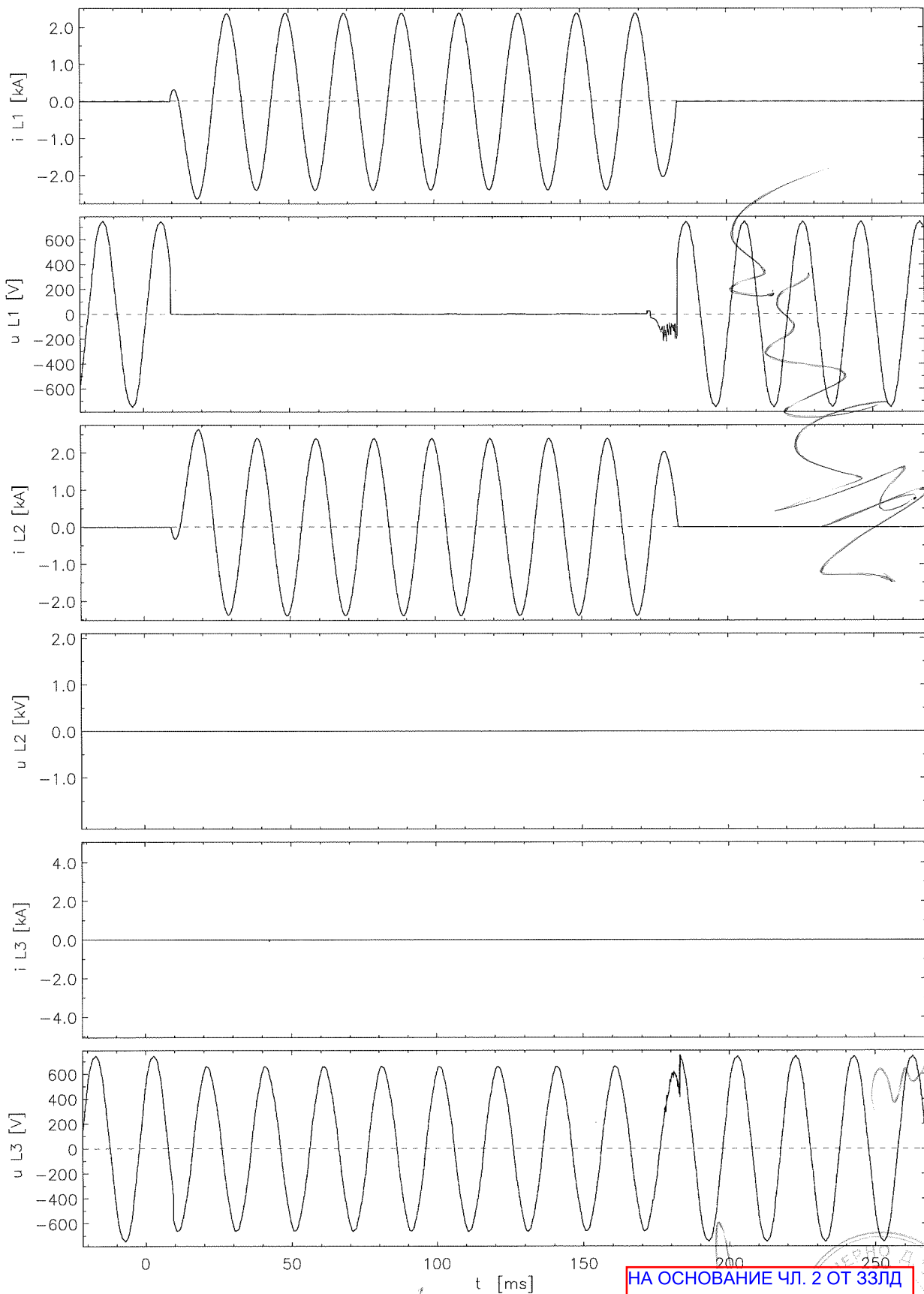


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ИДЯРН

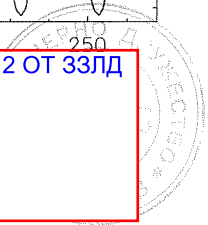
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ВМЕДИ

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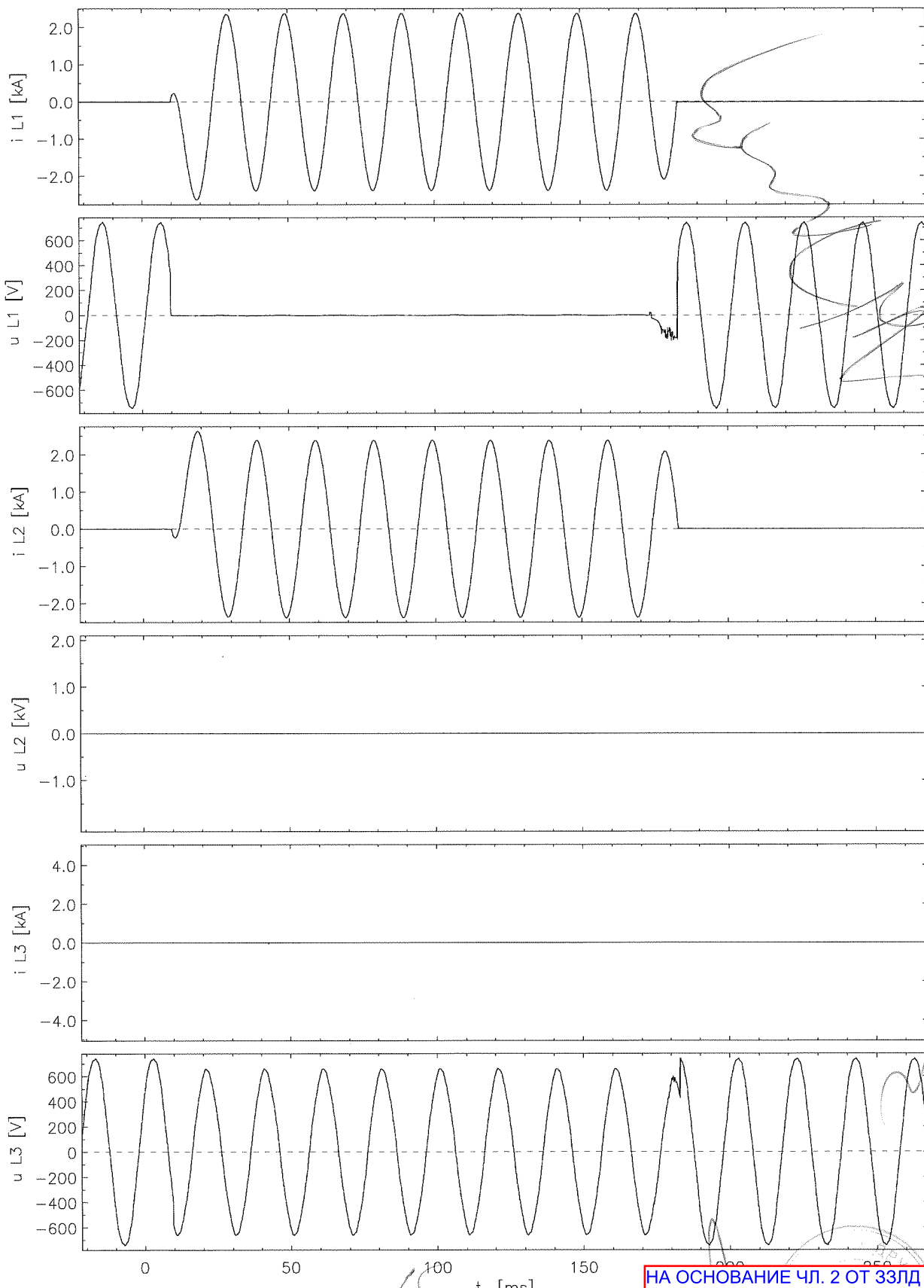


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ВЯРНО



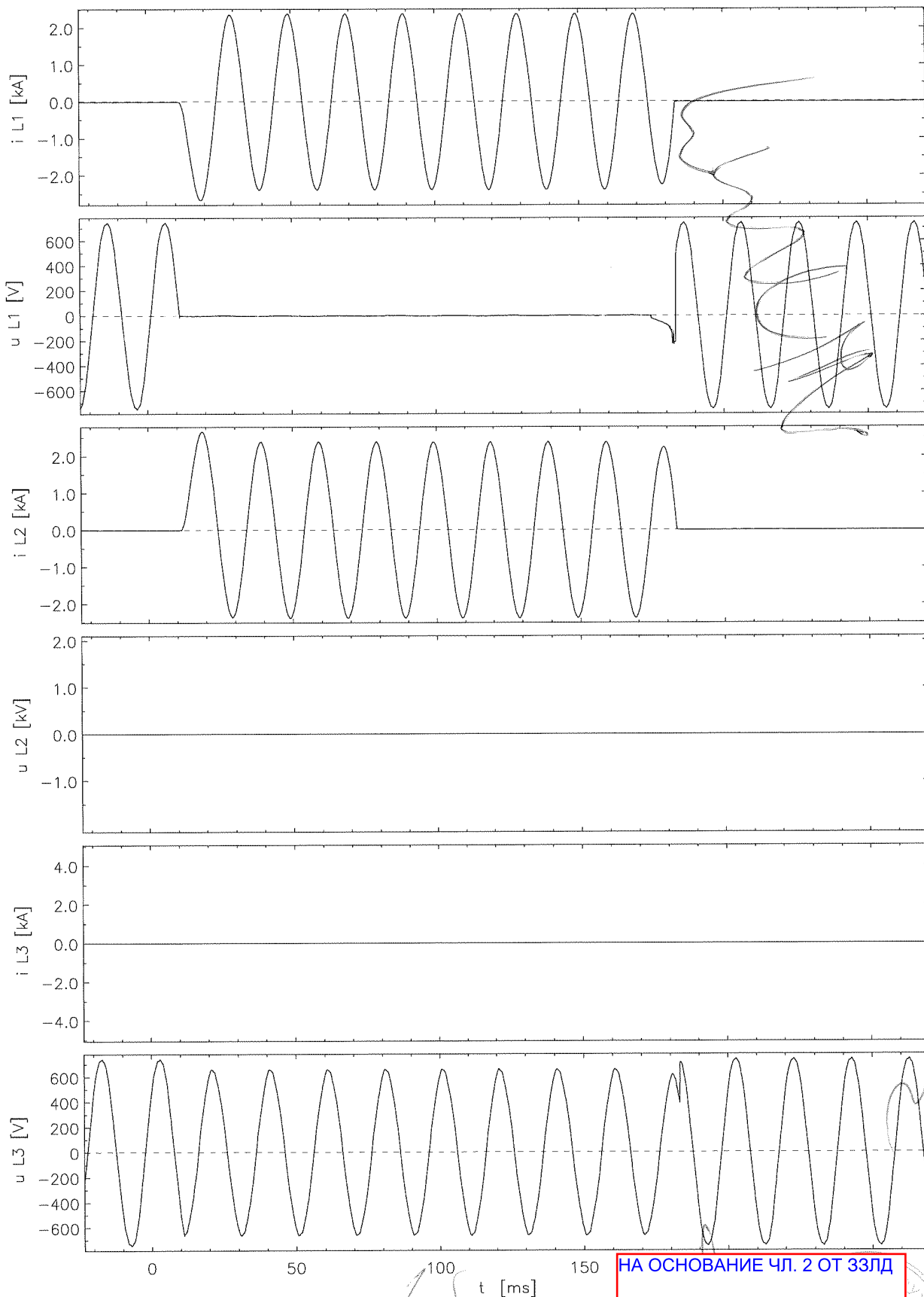
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НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОРН

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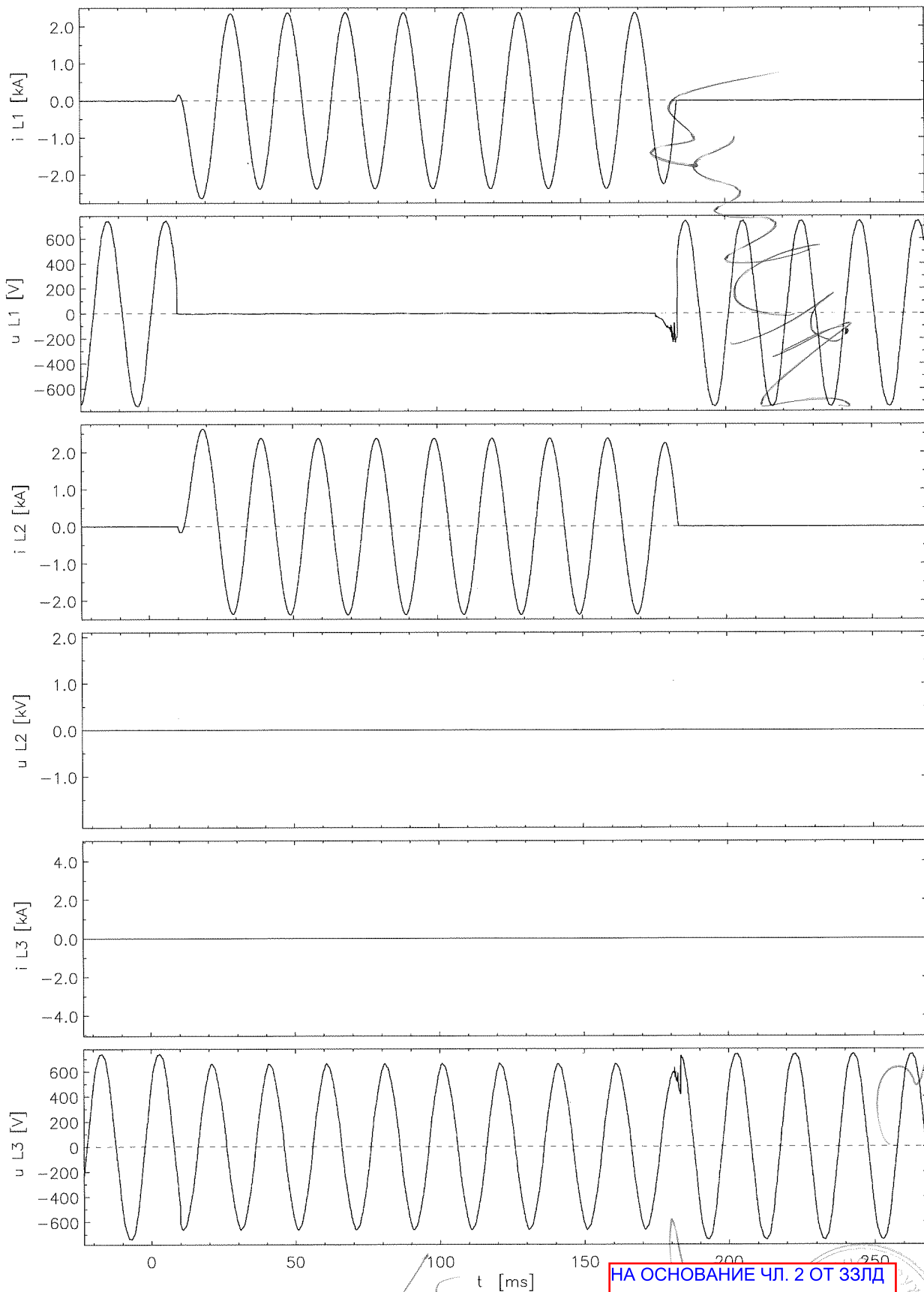


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОИ



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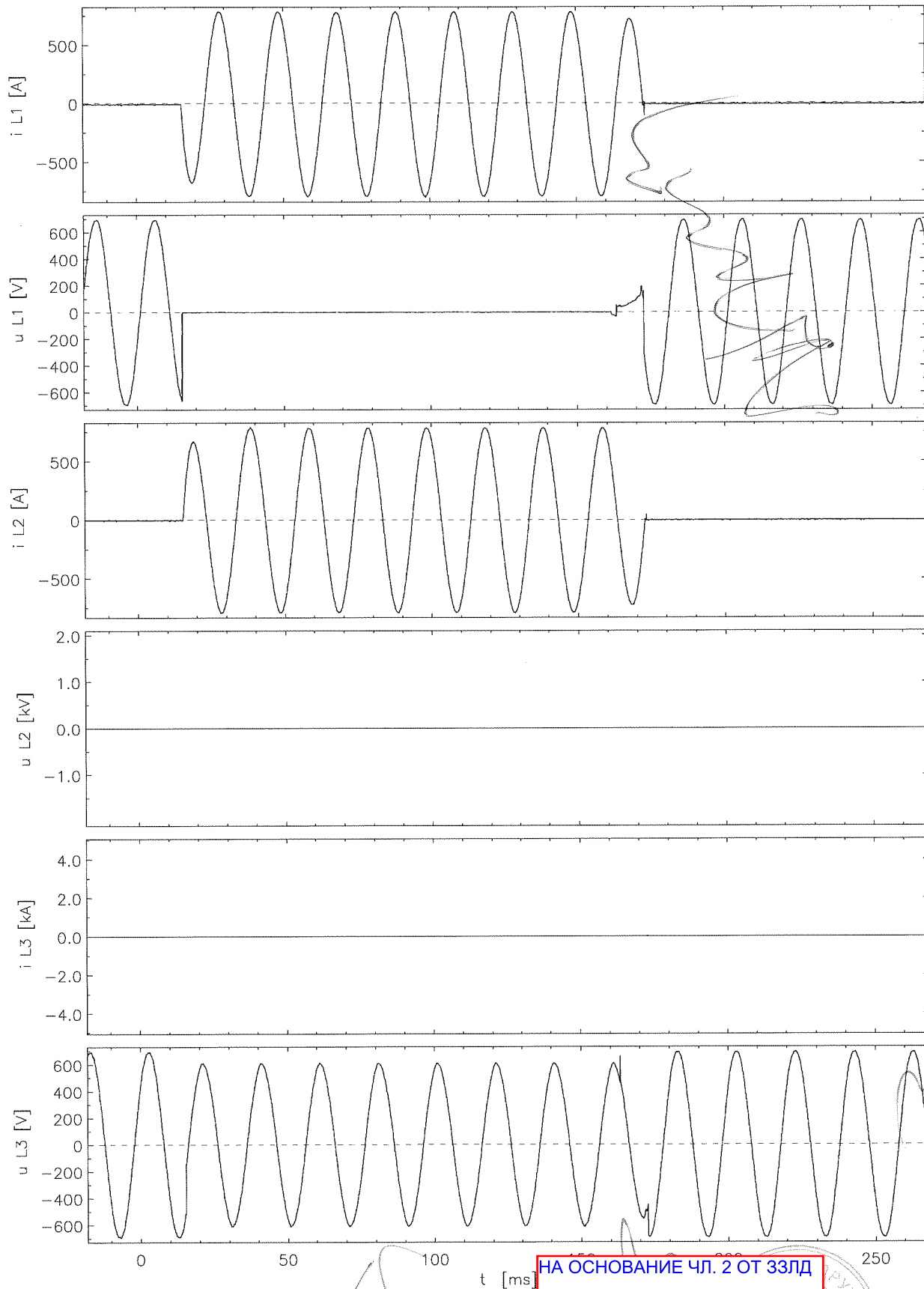


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С ОР

ИМЕТСЯ

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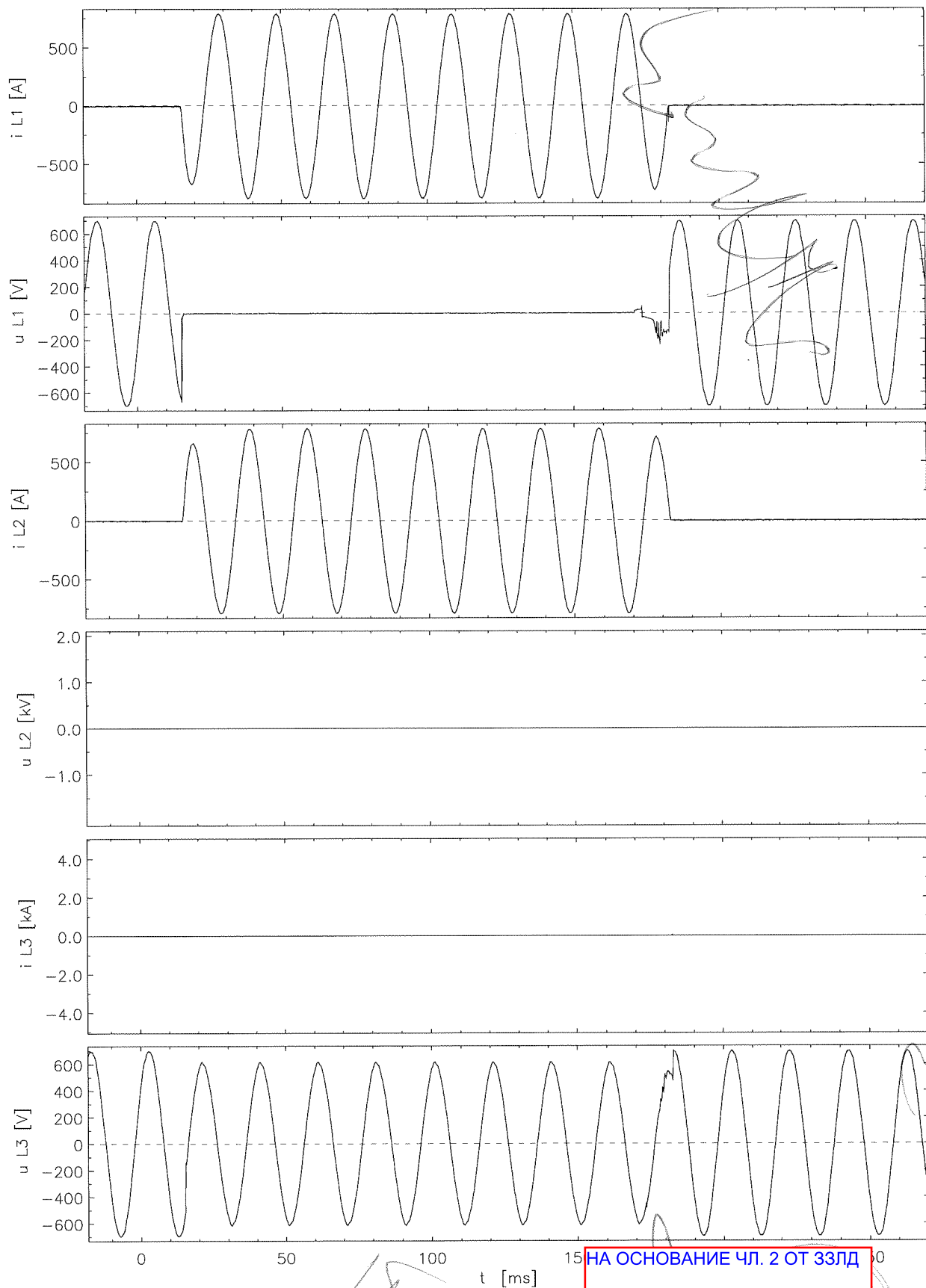


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С О



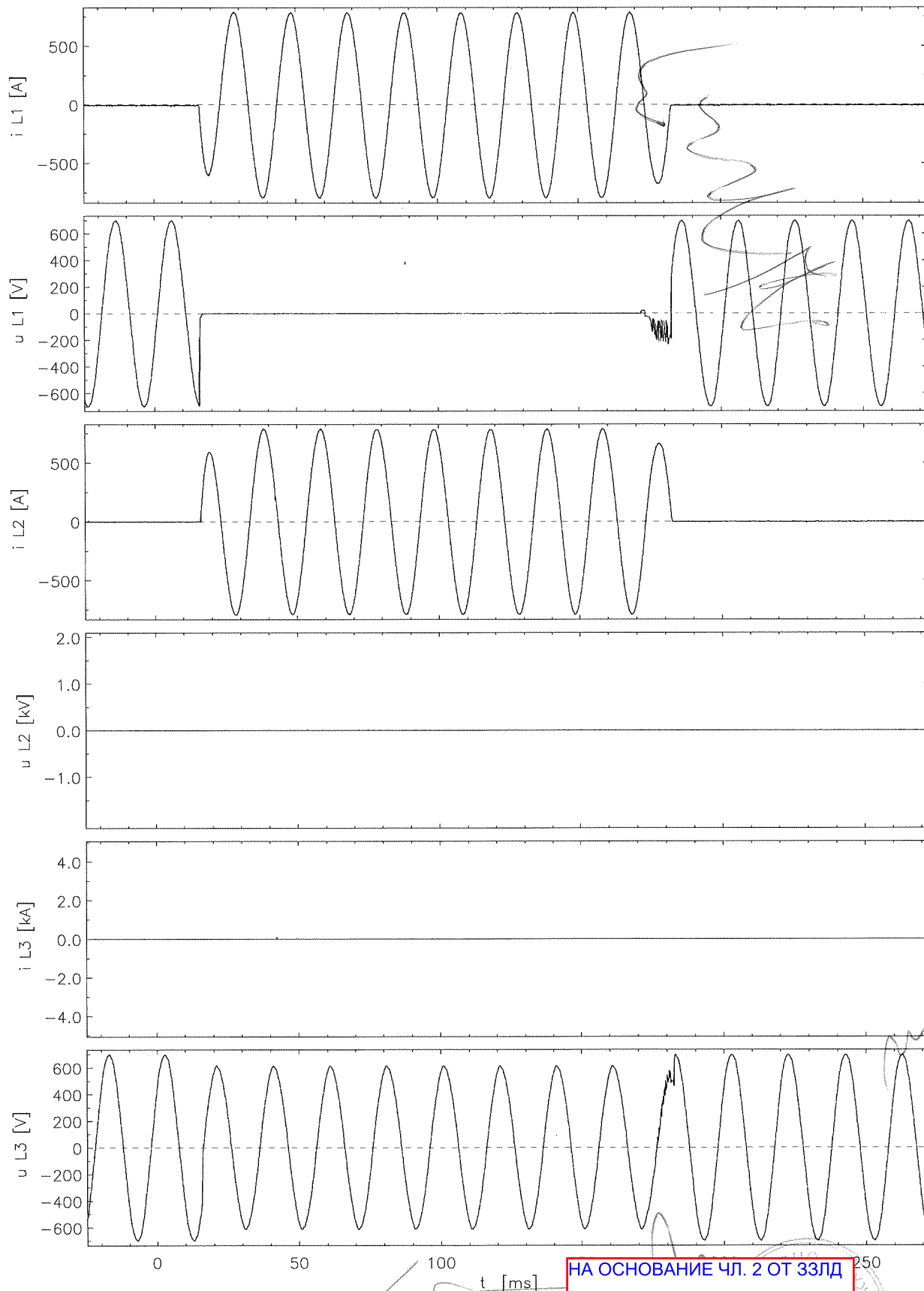
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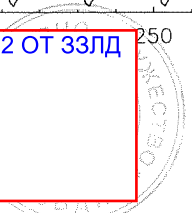
ВЕРНО СО

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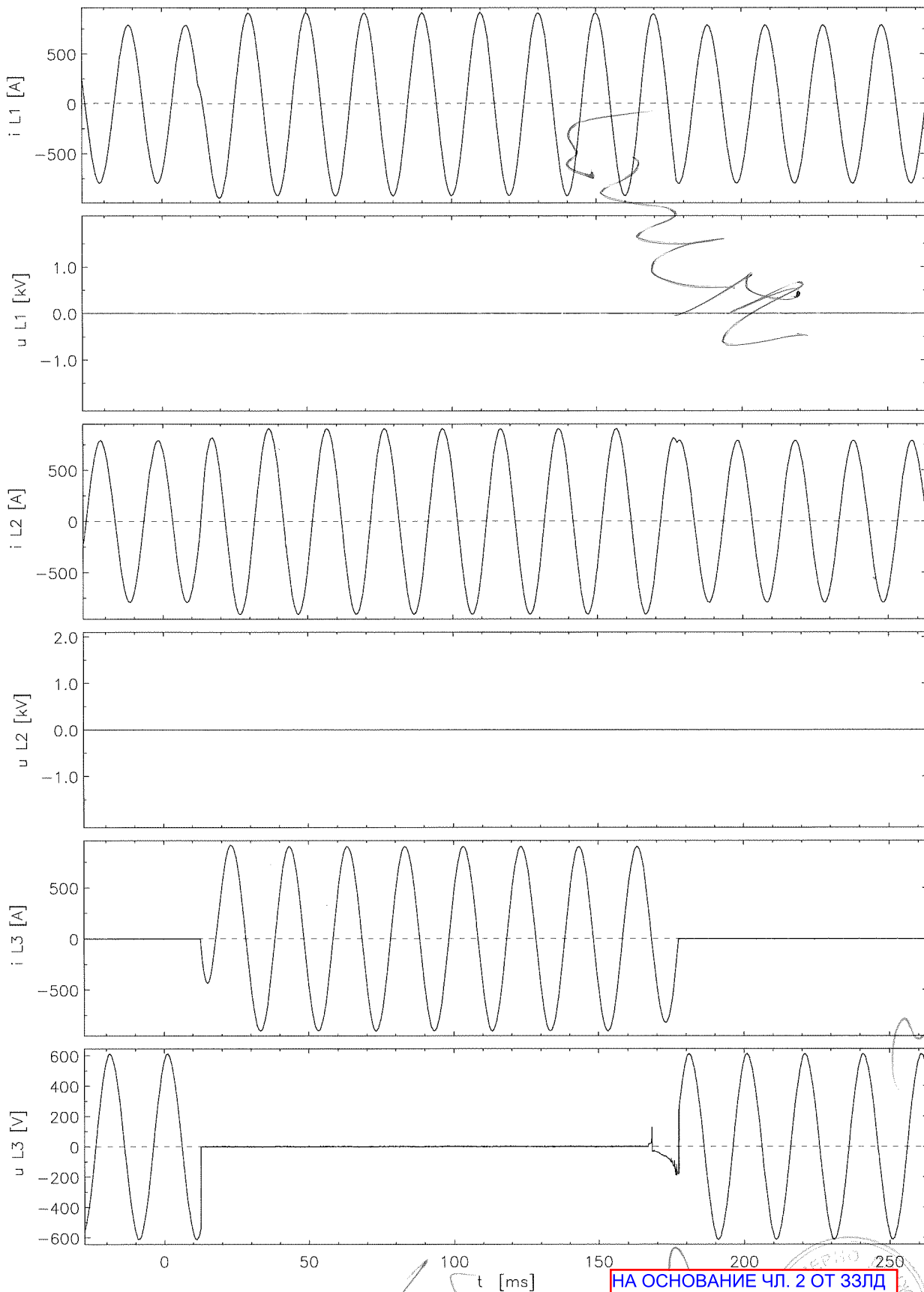


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД 250

ВЯРНО С



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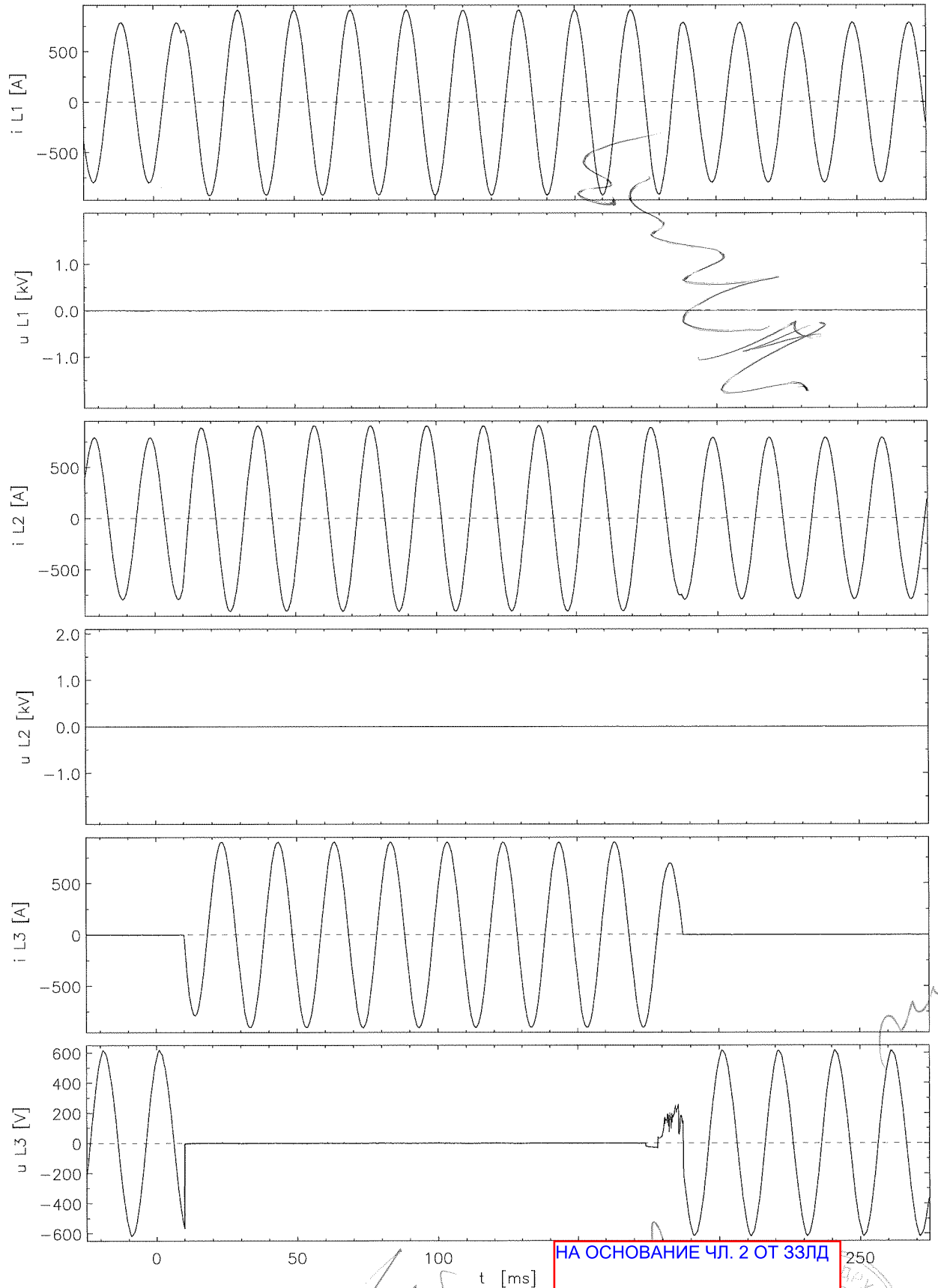


ВЯРНО С С

НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

ДИРЕКТОР

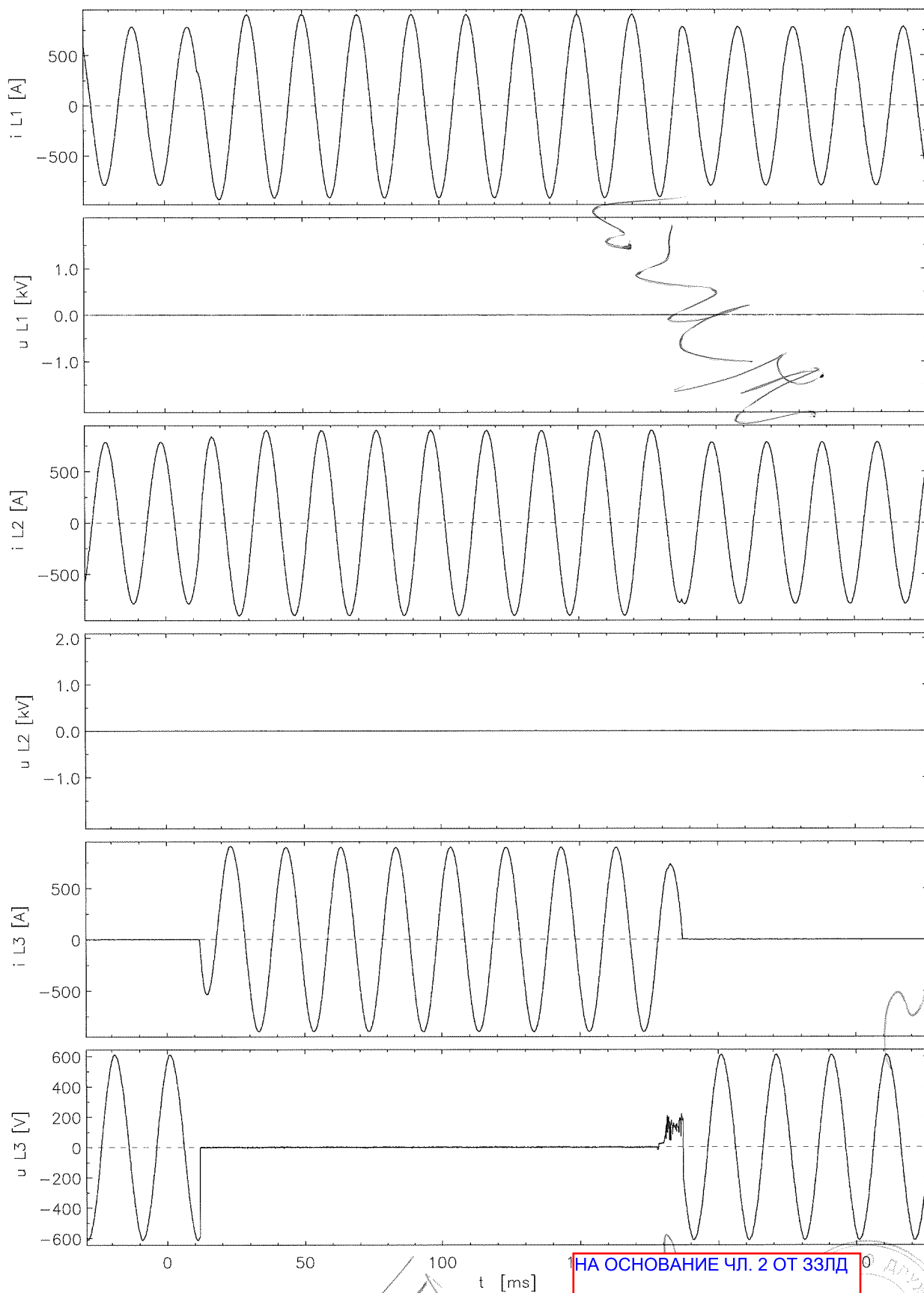
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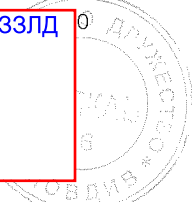
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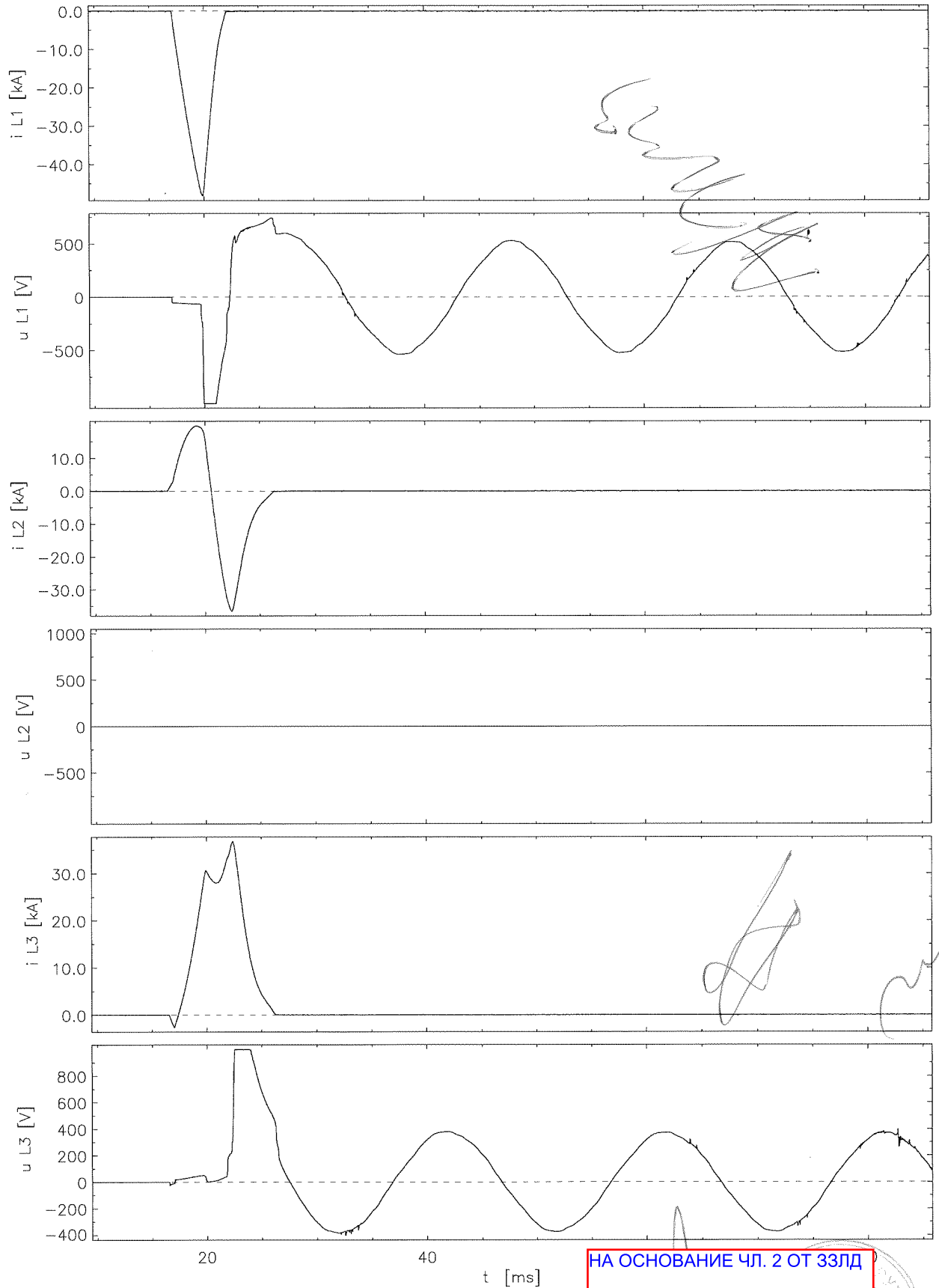


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ВЯРНО

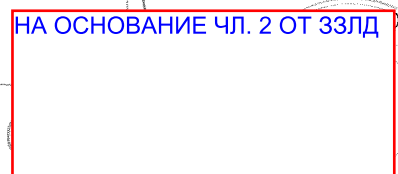


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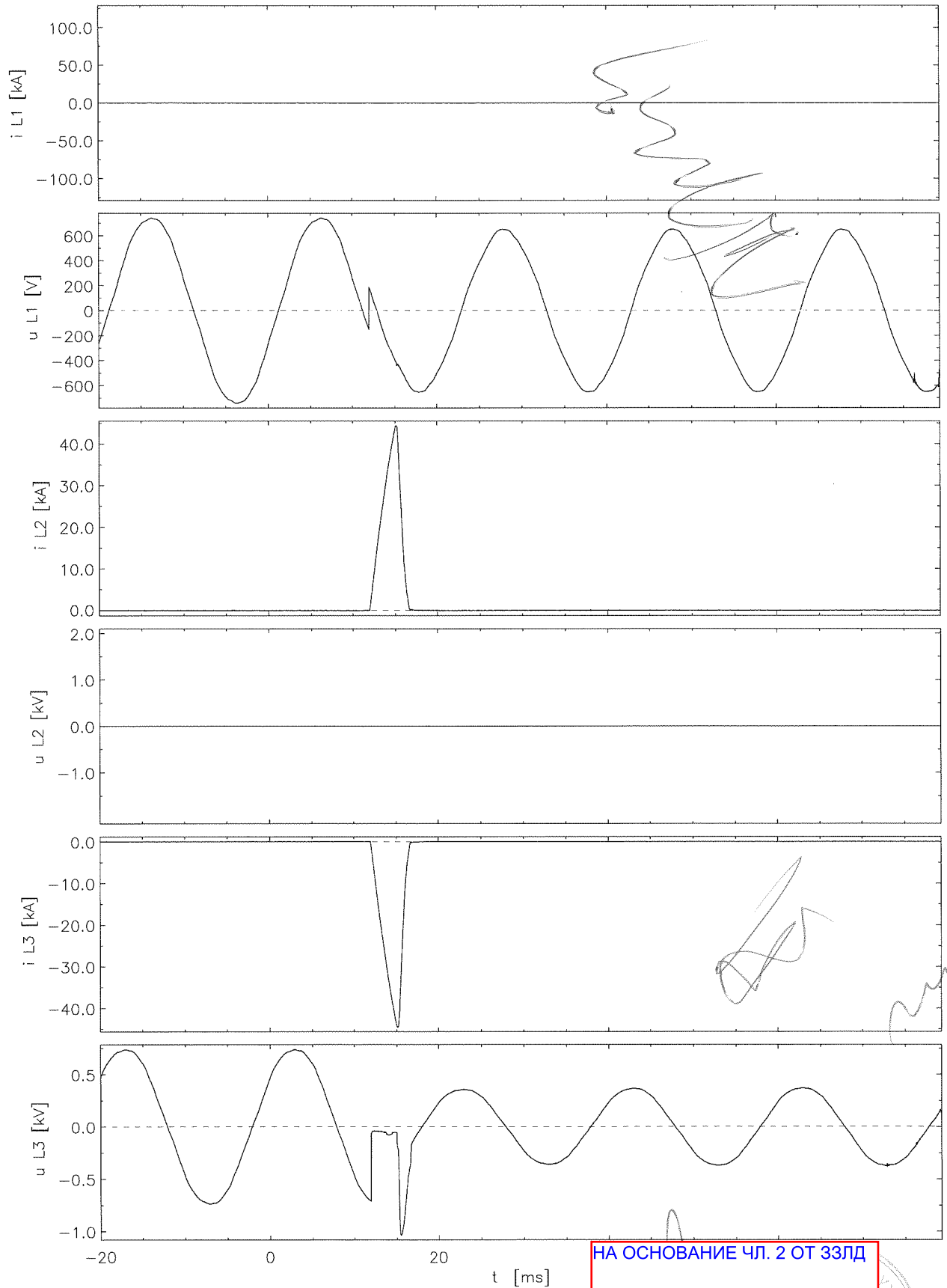


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО



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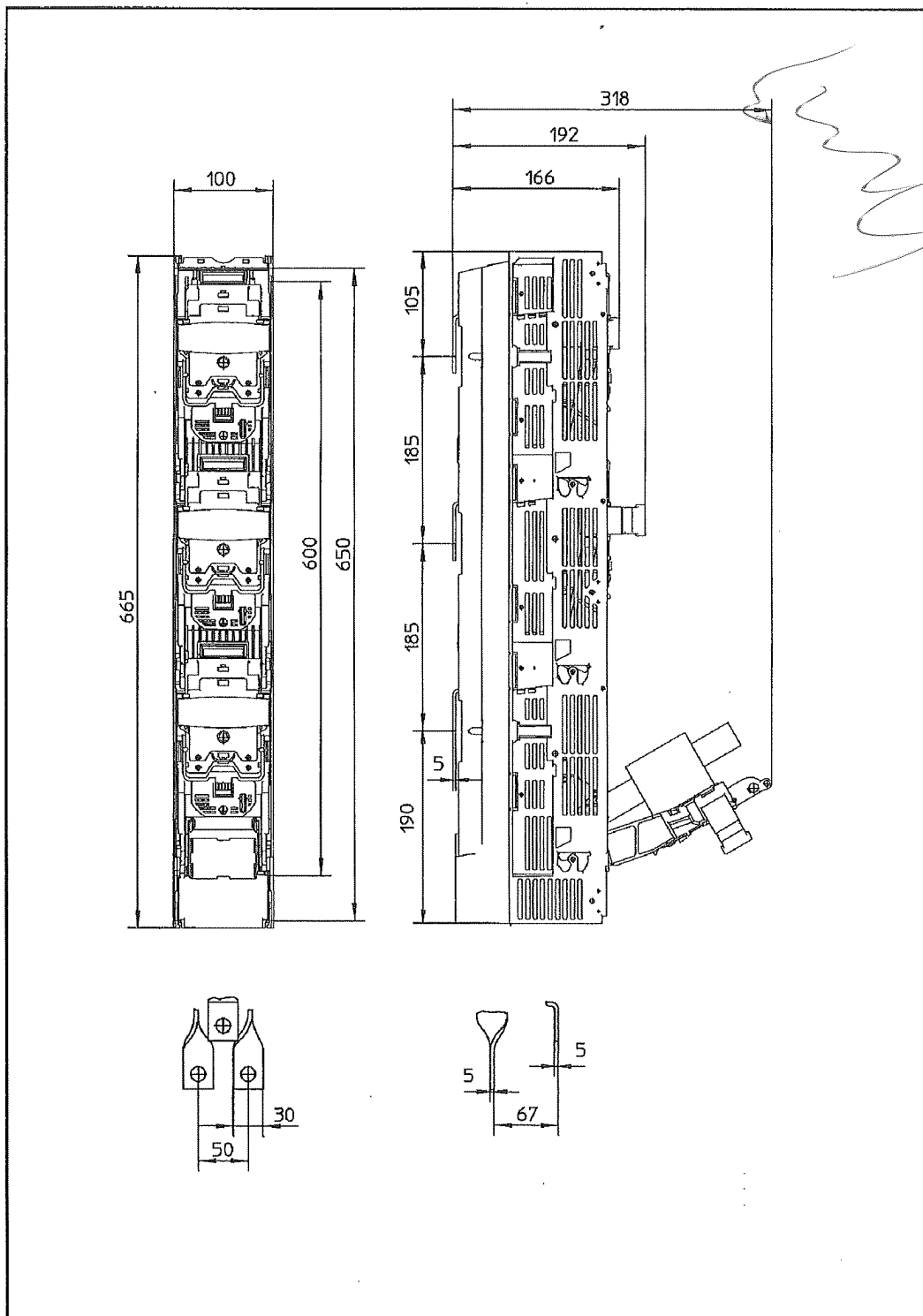


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО С С



10. Drawing

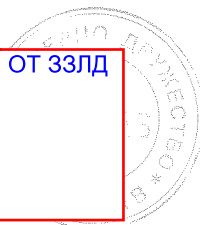


		Fecha/Date	Nombre/Name	BTVC 630A TRIVER 2010	E-438.003
	Dibujado/Drawn	09-08-10	PLASENCIA		

El presente plano es únicamente indicativo, pudiéndose variar el diseño final/The following drawing is only a draft. The drawing is based on the basis of clause 2 of the contract.

ВЯРНО

[Handwritten signature]



СПИСЪК НА ИЗВЪРШЕНИТЕ ИЗПИТВАНИЯ

на вертикален предпазител-разединител НН 630 А, с триполюсно управление
тип ВТВС 630А НН3 DU, произведен от Pronutec, S.A., Испания

Лаборатория, провела изпитванията: IPH Berlin

Издаден изпитвателен протокол за типови изпитвания № 2270.2101164.0705/13-18.10.2010 г.

Проведени изпитвания

Тестова последователност I: Общи експлоатационни характеристики

- Покачване на температурата
- Диелектрични свойства
- Капацитет на отваряне и затваряне
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата
- Якост на задвижващия механизъм

Тестова последователност II: Способност за оперативна ефективност

- Оперативни резултати
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Тестова последователност IV: Условен ток на късо съединение

- Изпитване на издръжливост на късо съединение
- Изпитване на отваряне на късо съединение
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Тестова последователност V: Претоварване

- Изпитване на претоварване
- Диелектрична проверка
- Ток на утечка
- Проверка на покачването на температурата

Дата: 02.02.2018 г.

ПОДПИС И ПЕЧАТ:

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Изпълнителен директор
Филкаб АД



Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

- High-voltage equipment and components
- Low-voltage equipment and components
- Installation, switching, control and protective equipment
- High-voltage, medium-voltage and low-voltage cables and their accessories

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-11-11 with the accreditation number D-PL-12107-01 and is valid until 2020-11-10. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 42 pages.

Registration number of the certificate: **D-PL-12107-01-00**



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Frankfurt, 2015-11-11

Dipl.-Ing.
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

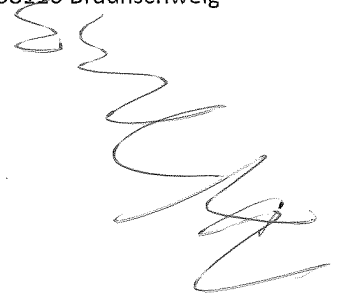
See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig



The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

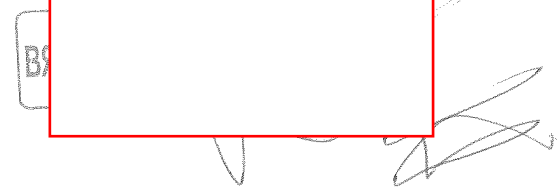
The up-to-date state of membership can be retrieved from the following websites:

EA: www.european-accreditation.org

ILAC: www.ilac.org

IAF: www.iaf.nu

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД



Превод от английски език

DAkkS

Deutsche
Akkreditierungsstelle

Поверено съгласно раздел 8, подраздел 1 AkkStelleG, във връзка с раздел 1, подраздел 1 AkkStelleGBV

Страна, подписала многостранните споразумения на EA, ILAC и IAF за взаимно признаване

Акредитация



The Deutsche Akkreditierungsstelle GmbH удостоверява, че лаборатория за изпитвания

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

е компетентна според условията на DIN EN ISO/IEC 17025:2005 да извършва изпитвания в следните области:

- Оборудване и компоненти за високо напрежение
- Оборудване и компоненти за ниско напрежение
- Инсталационно, комутационно, контролно и защитно оборудване
- Кабели и аксесоари за високо, средно и ниско напрежение

Сертификатът за акредитация се прилага само във връзка с обявлението за акредитация от 2015-11-11 г. с акредитационен номер D-PL-12107-01 и важи до 2020-11-10. Той се състои от придружителна страница, обратната страна на придружителната страница и анекс общо 42 страници.

Регистрационен номер на сертификата: **D-PL-12107-01-00**

Франкфурт, 2015-11-11

Дипл. Инж. Ралф Егнер
Началник отдел

Този документ е превод. Оригиналната версия е сертификат за акредитация на немски език.

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРН



Офис Берлин
Spittelmarkt 10
10117 Берлин

Офис Франкфурт
Gartenstraße 6
60594 Франкфурт на Майн

Офис Брауншвайг
Bundesallee 100
38116 Брауншвайг



Публикуването на откъси от сертификата за акредитация подлежи на предварително писмено одобрение от Deutsche Akkreditierungsstelle GmbH (DAkKS). Изключения се правят за непроменената форма на отделно разпространение на придружителната страница от органа за оценка на съответствието, посочен на обратната страна на листа.

Не трябва да се създава впечатление, че акредитацията обхваща и области, извън обхвата на акредитацията, удостоверен от DAkKS.

Акредитацията е дадена съгласно Закона за акредитационния орган (AkkStelleG) от 31 юли 2009 г. (Държавен вестник I стр. 2625) и Регламент (ЕО) № 765/2008 на Европейския парламент и на Съвета от 9 юли 2008 г. за определяне на изискванията за акредитация и надзор на пазара във връзка с предлагането на пазара на продукти (Официален журнал на Европейския съюз L 218 от 9 юли 2008 г., стр. 30). DAkKS е страна по многостранните споразумения за взаимно признаване на европейското сътрудничество за акредитация (EA), Международния форум за акредитация (IAF) и Международното сътрудничество по акредитация на лабораториите (ILAC). Подписалите тези споразумения признават взаимно своите акредитации.

Актуалното състояние на членството може да бъде видяно на следните уебсайтове:

EA: www.european-accreditation.org ILAC: www.ilac.org IAF: www.iaf.nu



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРНО



PRONUTEC, S.A.u.
Parque Empresarial Boroa Parc. 2c-1
48340 Amorebieta – VIZCAYA (SPAIN)
NIF.: ES-A-48/217.962

Declara bajo su responsabilidad que el producto:
Declare under our sole responsibility that the product:
Eigenverantwortliche Erklärung zu unserem Produkt:

Bases tripolares verticales cerradas (BTVC) tamaños 1/2/3, desconexión unipolar y tripolar.
Three poles fuse rails (BTVC) size 1/2/3, one and three pole Switching.
Dreipolige Sicherungslastschaltleisten (BTVC) Größe 1/2/3, ein und dreipolig schaltbar.

Referencias 438xxxxxx fabricados según la Especificación Técnica de Pronutec ET-438.
References 438xxxxxx manufactured according Pronutec's ET-438 Technical Specification.
Die Referenznummern 438xxxxxx sind alle gefertigt gemäß den technischen Spezifikationen der Pronutec ET-438.

Son conformes con las exigencias de la Directiva de Seguridad del material eléctrico destinado a ser utilizado bajo determinados límites de tensión 2014/35/EU.
Are in accordance with the requirements of the Low Voltage Directive 2014/35/EU.
Diese sind in Übereinstimmung mit den Anforderungen der Niederspannungsanweisung 2014/35/EU.

Y de la Directiva de Compatibilidad Electromagnética 2014/30/EU
And with the Electromagnetic Compatibility Directive 2014/30/EU.
Und mit der Elektromagnetischen Verträglichkeitsanweisung 2014/30/EU.

De acuerdo a la siguiente norma armonizada:
According to the following harmonised standard:
Gemäß der folgenden Norm:

UNE - EN 60947-3: 2009/ A1 :2013

Cualquier montaje, ya sea inicial o posterior que no respete las instrucciones generales de puesta en servicio y uso dadas por Pronutec, anula este documento.
Any initial or subsequent installation that will not observe the general instructions given by Pronutec will cancel this document.
Jegliche Änderungs oder Nachinstallationen, die nicht den generellen Anweisungen der Firma Pronutec entspricht, widerruft diese Erklärung.

En Amorebieta / In Amorebieta

Fdo. Diego Martín Imbert
Director Técnico
Technical Director / Technischer Direktor



Pronutec, S.A.U.
C.I.F.: A-48/217.962
Parque Empresarial Boroa, Parcela 2C-1
48340 Amorebieta (Vizcaya)
ESPAÑA - SPAIN

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Превод от английски език
ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

PRONUTEC, S.A.U.
Parque Empresarial Boroa Parc. 2c-1
48340 Amorebieta - VIZCAYA (SPAN)
N/F.: ES-A-48/217.962

Declara bajo su responsabilidad que el producto:

Декларираме на своя собствена отговорност, че продукт:
Eigenverantwortliche Erklärung zu unserem Produkt:

Bases tripolares verticales cerradas (BTVC) tamanos 1/2/3, desconexión unipolar y tripolar.
Триполюсни вертикални разединители за стопяеми предпазители (BTVC) размер 1/2/3, превключване на един и три полюса.
Dreipolige Sicherungslastschaltleisten (BTVC) Größe 1/2/3, ein und dreipolig schaltbar.

Referencias 438xxxxxx fabricados según la Especificación Técnica de Pronutec ET-438.
Референции 438xxxxxx, произведени според техническа спецификация на Pronutec ET-438.
Die Referenznummern 438xxxxxx sind alle gefertigt gemäß den technischen Spezifikationen der Pronutec ET-438.

Son conformes con las exigencias de la Directiva de Seguridad del material eléctrico destinado a ser utilizado bajo determinados límites de tensión 2014/35/EU.
Са в съответствие с изискванията на Директивата за ниско напрежение 2014/35/EU.
Diese sind in Übereinstimmung mit den Anforderungen der Niederspannungsanweisung 2014/35/EU.

Y de la Directiva de Compatibilidad Electromagnética 2014/30/EU
и с Директивата за електромагнитна съвместимост 2014/30/EU.
Und mit der Elektromagnetischen Verträglichkeitsanweisung 2014/30/EU.

De acuerdo a la siguiente norma armonizada:
Според следния хармонизиран стандарт:
Gemäß der folgenden Norm:

UNE - EN 60947-3:2009/A1:2013

Cualquier montaje, ya sea inicial o posterior que no respete las instrucciones generales de puesta en servicio y uso dadas por Pronutec, anula este documento.
Всеки първоначален или последващ монтаж с неспазване на общите указания на Pronutec прави този документ невалиден.
Jegliche Änderungen oder Nachinstallationen, die nicht den generellen Anweisungen der Firma Pronutec entspricht, widerruft diese Erklärung.

En Amorebieta / In Amorebieta

Fdo. Diego M
Dire

Подпис – не се чете Технически директор/

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Печат на Pronutec

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

pronutec
g o r i a n t e a m
PWflutec, SAU.
Cf.f: A-4Я/217.9И2
f'atr'i,ie Empresanel Boroa,
Parrola 2C>J
43340 Amorebieta (Vizcaya)
ESPAÑA ■ SPAIN

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

ВЯРН

ПРИЛОЖЕНИЕ 7

ДЕКЛАРАЦИЯ

за съответствие при изпълнение на поръчката от участник в обществена поръчка с предмет: "Доставка на линейни защитно-комутационни апарати НН за вертикален закрит монтаж", Реф. № PPD17-162

Долуподписаният Атанас Иванов Танчев, с ЕГН 8411144523, притежаващ лична карта № 645380765, издадена на 10.09.2014 г. от МВР, гр. Пловдив, адрес: ул. „Любен Каравелов“ № 11, ет. 7, ап. 55, представляващ „Филкаб“ АД в качеството си на Изпълнителен директор на „Филкаб“ АД със седалище гр. Пловдив, ул. „Коматевско шосе“ № 92 и адрес на управление: гр. Пловдив, ул. „Коматевско шосе“ № 92, тел.: 032 277 171, факс: 032 671 133, вписано в търговския регистър при Пловдивски окръжен съд съд по ф.д. № 2189/1999 г., ЕИК115328801 и ИН по ЗДДС BG115328801

ДЕКЛАРИРАМ, ЧЕ:

Предлаганите от нас

- Вертикален предпазител-разединител НН 400 А, с триполюсно управление тип 438.62.24.58.00
- Вертикален предпазител-разединител НН 630 А, с триполюсно управление тип 438.63.24.58.00

предмет на горепосочената обществена поръчка, съответстват на изискванията на техническата спецификация на стандарта за материал, вкл. на параграфи „Характеристика на материала“ и „Съответствие на предложеното изпълнение с нормативно-техническите документи“, посочен в Част III. Технически изисквания и спецификации от Документацията за участие в процедурата.

Известна ми е отговорността по чл. 313 от Наказателния кодекс за посочване на неверни данни.

Дата: 02.02.2018 г.

Декларатор:

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Изпълнителен директор
Филкаб АД



(Handwritten signatures)

ПРИЛОЖЕНИЕ 8

Инструкция за правилно съхранение, транспорт, монтаж и експлоатация

Изделията следва да се съхраняват и транспортират в собствените им индивидуални опаковки без да се нарушава тяхната цялост. Не се допуска при стифиране за съхранение и транспорт да се поставят други товари върху кашоните с изделия или изпускането им от по-голяма височина при товаро-разтоварните дейности.

При съхранение на склад опаковките се стифират на дървени палети или друг вид, но не директно на пода. При допускане на намокряне би следвало да се прибегне до подсушаване и препаковане.

Мястото на съхранение трябва да е на закрито и сухо, далеч от източници на влага, като допустимите температурни граници са $-40^{\circ}\text{C} \div +80^{\circ}\text{C}$.

Инструкции за монтаж на производителя – дадени в приложение.

Експлоатацията да се извършва при стриктно спазване на изискванията за безопасност съгласно местното законодателство. Температурните граници за експлоатация са $-25^{\circ}\text{C} \div +55^{\circ}\text{C}$.

Дата: 02.02.2018 г.

ПОДПИС И ПЕЧАТ:

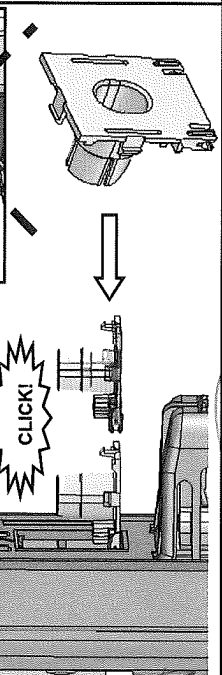
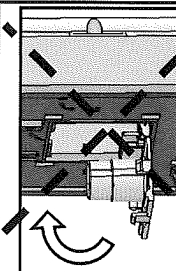
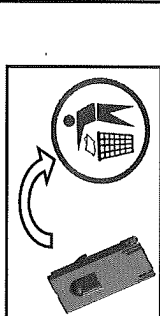
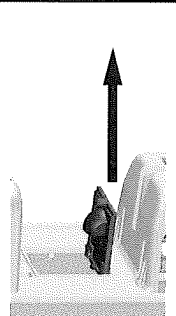
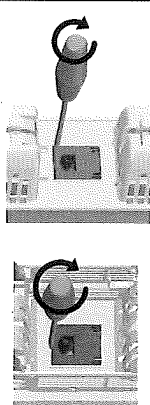
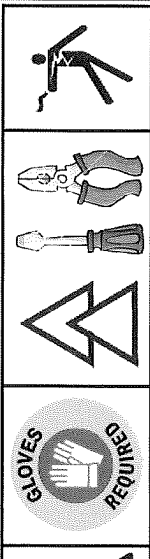
НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Атанас Танчев
Изпълнителен директор
Филкаб АД



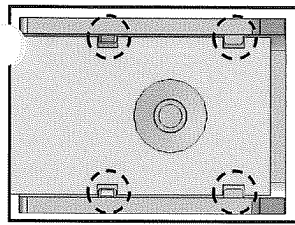
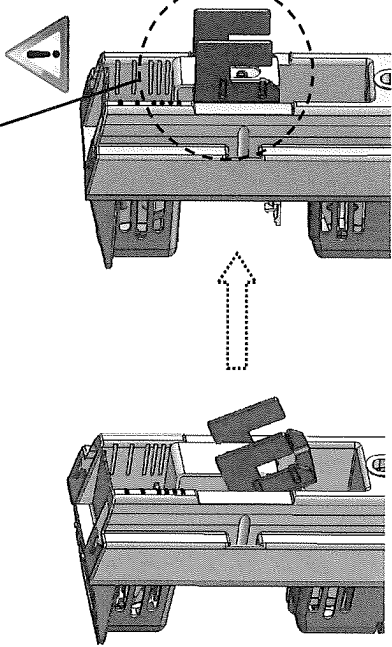
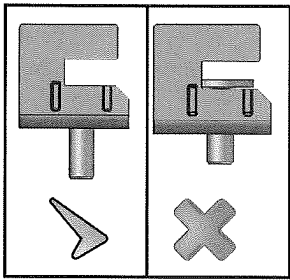
INSTRUCCIONES DE MONTAJE
ONLY INSTRUCTIONS / MONTAGEANLEITUNG

APA DE CONEXIÓN PARA BASES PORTAFUSIBLES
 HOOK ON CLAMP FOR FUSE RAILS
 FRALLENKLEMMEN FÜR SICHERUNGSLEISTEN
 NH1/2/3

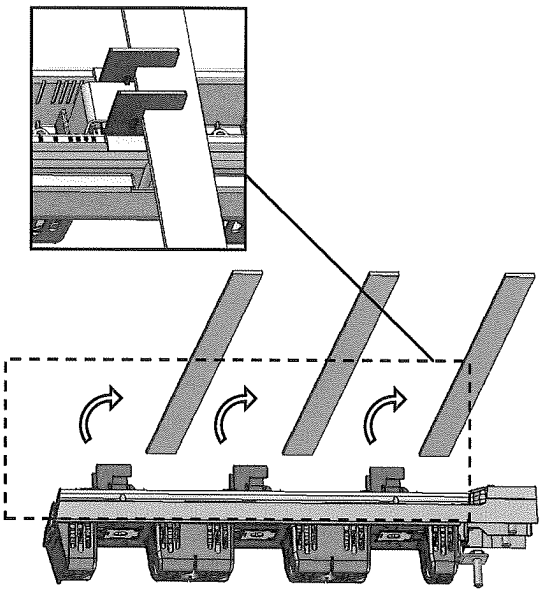


НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЛД

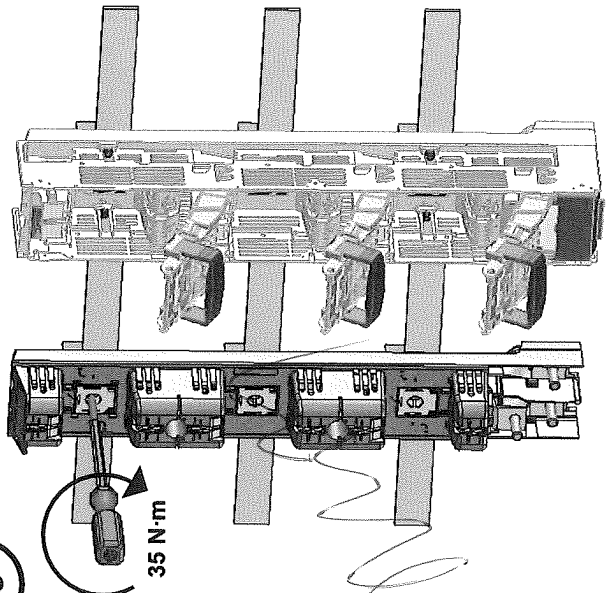
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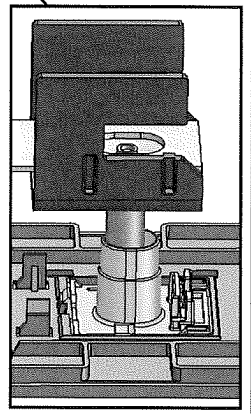
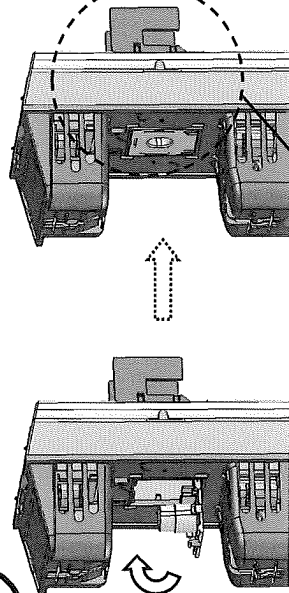
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6



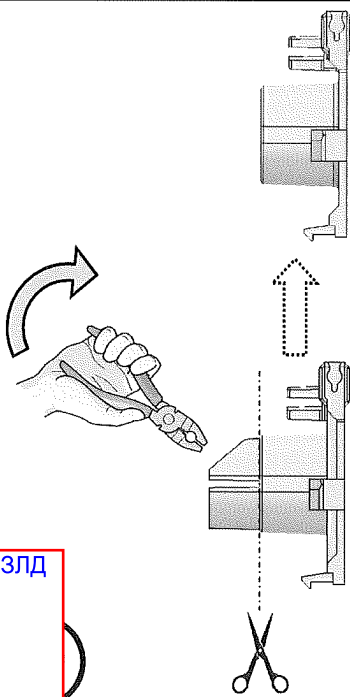
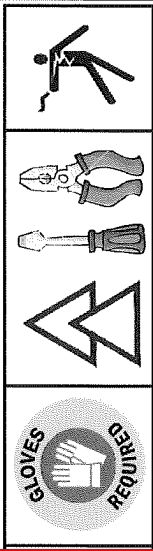
4



E Pronutec no se hace responsable de cualquier daño causado por un uso incorrecto de este producto. / GB Pronutec is not responsible for any damage caused by a wrong use of this product. / D Pronutec übernimmt keinerlei Haftung oder Verantwortung bei unsachgemäßer Bölenung oder Anwendung der Produkte.

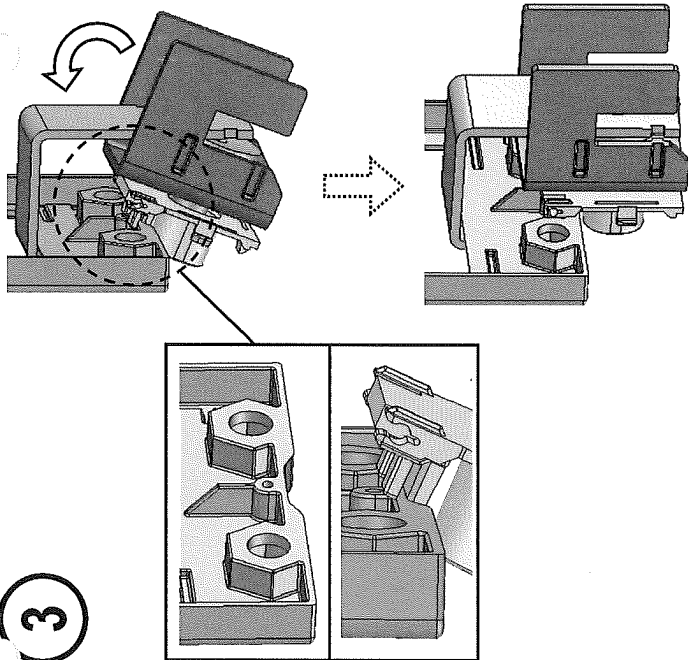
**INSTRUCCIONES DE MONTAJE
Y MONTAGEANLEITUNG**

CLAMP FOR DOUBLE ADAPTER DOBLE
KRALLEKLEMMEN FÜR DOPPELADAPTER

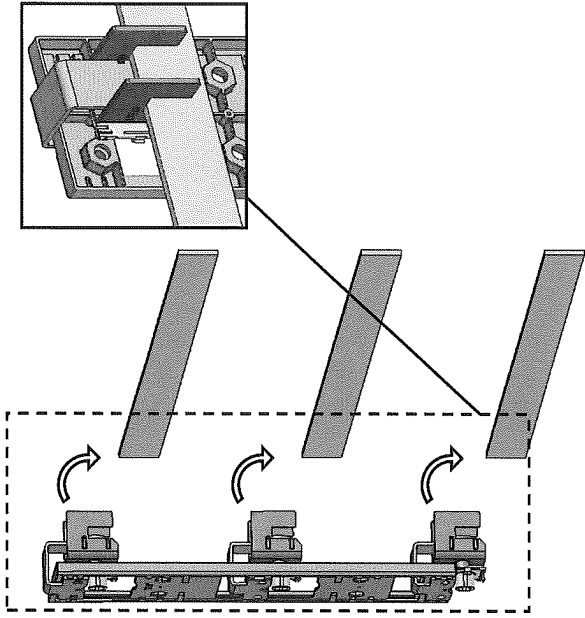


НА ОСНОВАНИЕ ЧЛ. 2 ОТ 33ЗД

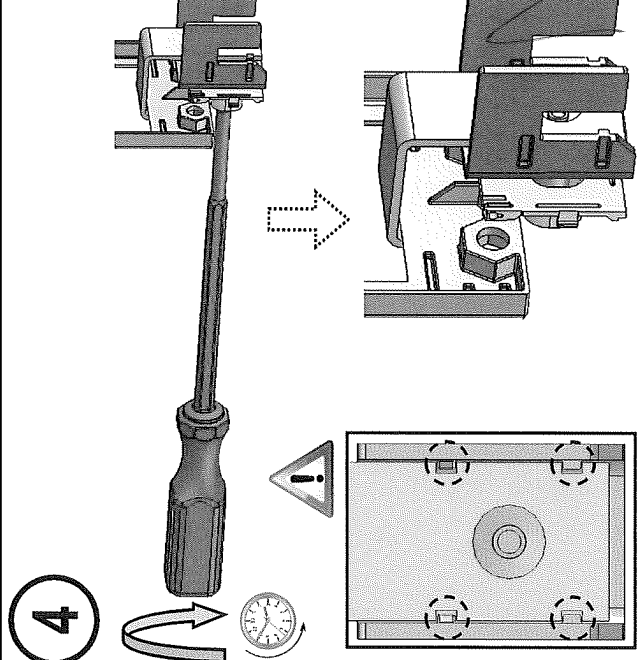
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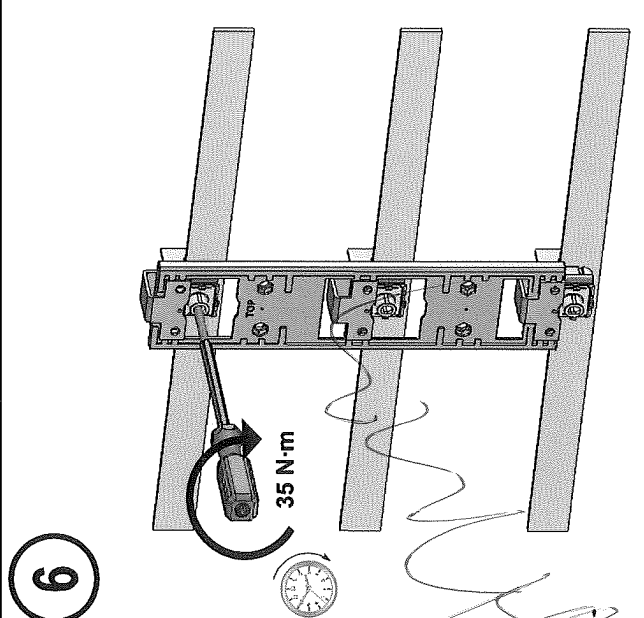
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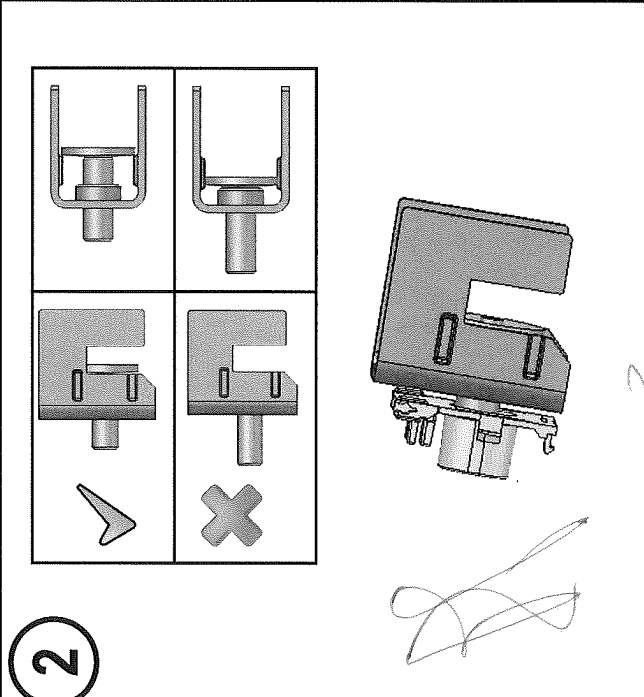
4



6



2



E Pronutec no se hace responsable de cualquier daño causado por un uso incorrecto de este producto. / GB Pronutec is not responsible for any damage caused by a wrong use of this product. / D Pronutec übernimmt keinerlei Haftung oder Verantwortung bei unsachgemäßer Bedienung oder Anwendung der Produkte.

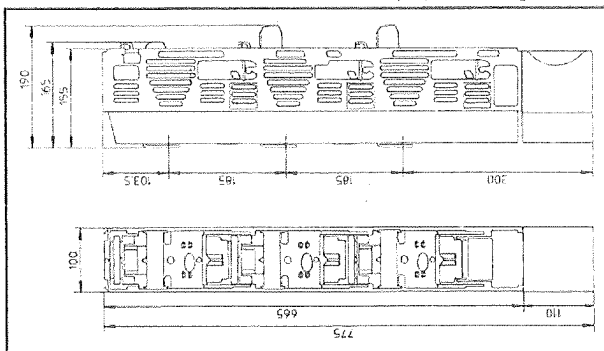
TRIVER +

INSTRUCCIONES DE MONTAJE

ASSEMBLY INSTRUCTIONS / Инструкция за монтаж

BTVC / BTVC-DT / BTVC-DTU MH 1-2-3

DESCONEXION UNIPOLAR / ONE POLE SWITCHING / Превключаване еднополюсен
DESCONEXION TRIPOLAR / THREE POLE SWITCHING / Превключаване трепета-полюсен

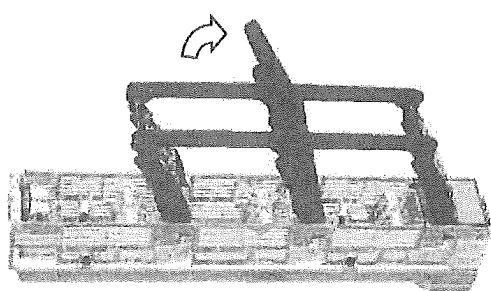


1.

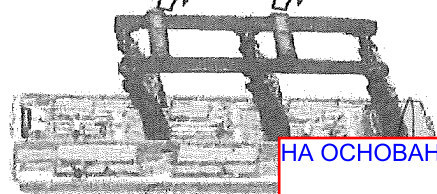
E EXTRAER LA TAPA DE CONEXIONES
GB REMOVE CONNECTION COVER
В Отстранете предпазния капак на клемите

2.

E TIRAR DE LAS ASAS
GB PULL THE HANDLES
В Издърпайте ръкохватките

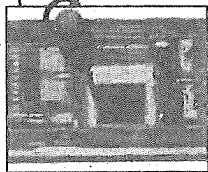


E TIRAR DE LAS 2 ASAS AL MISMO TIEMPO
GB PULL BOTH HANDLES AT THE SAME TIME
В Издърпайте едновременно но двете ръкохватки



НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

3a)
CONEXIÓN A EMBARRADO EN TENSION
INSTALLING ON LIVE BUSBARS
Монтаж при шинна система под напрежение

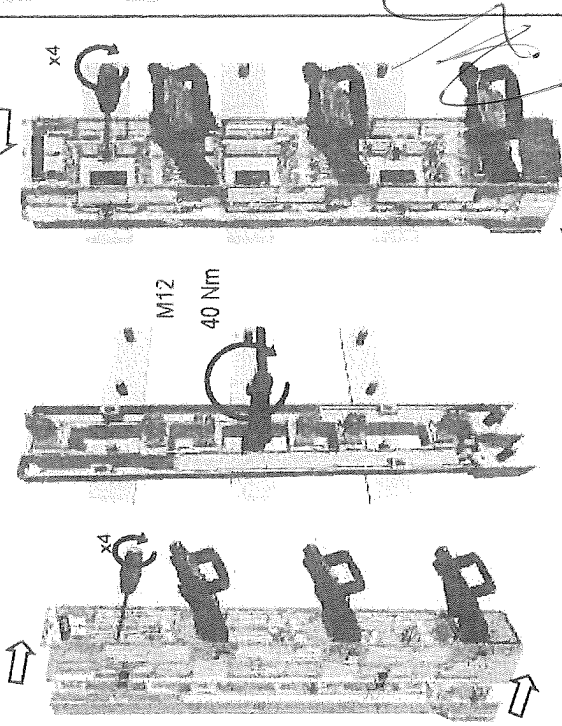


185 mm

185 mm



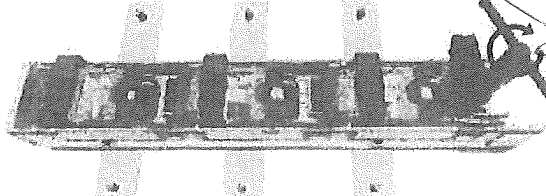
3b)
CONEXIÓN A EMBARRADO SIN TENSION
INSTALLING ON CURRENT FREE BUSBARS
Монтаж при шинна система без напрежение



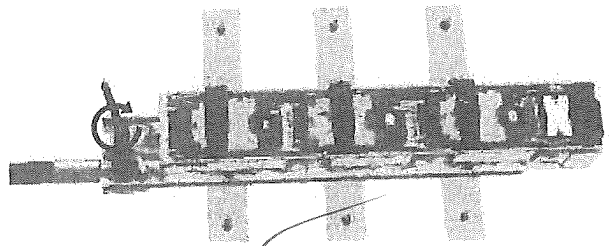
TENER EN CUENTA EL MARCADO DE LAS FASES EN LA ZONA DE CONEXIONES DEL ZOCALO, AL HACER LAS UNIONES ELÉCTRICAS.
CONSIDER THE PHASES MARKING IN THE TERMINAL ZONE OF THE FUSE RAIL HOLDER, WHEN DOING ELECTRIC UNIONS.
Вземете под внимание маркировката на фазите при осъществяване на електрически контакт.



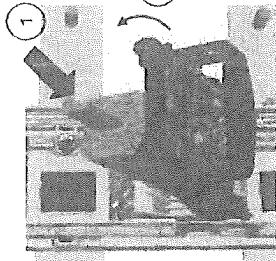
4
E CONECTAR LOS CABLES UTILIZANDO HERRAMIENTA AISLADA
GB FASTEN THE CABLE LUGS BY USING AN ISOLATED TOOL.
В При монтажа кабелите и при останалите монтажни операции използвайте изолирани инструменти и защитни средства



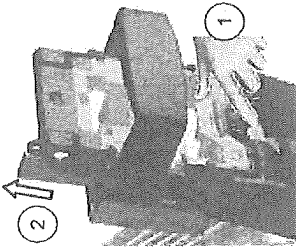
M10 - 32 Nm
M12 - 40 Nm



INTRODUCCION / EXTRACCION DEL FUSIBLE
INSTALLING / REMOVAL OF FUSE
Инсталиране и смяна на предпазител

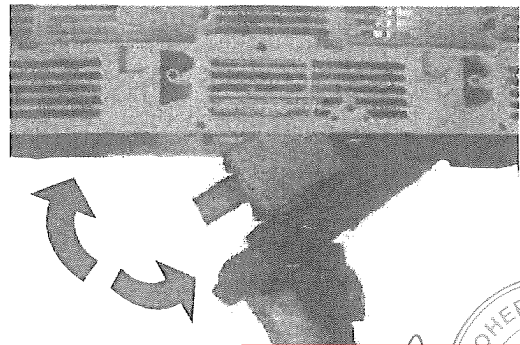
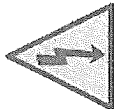


E INSERTAR LOS FUSIBLES Y CERRAR LA TAPA
OR INSERT THE FUSES AND CLOSE THE COVERS
В Поставете предпазителите и затворете капачице



E EXTRACCION DEL FUSIBLE
OR REMOVAL OF FUSE
В Смяна на предпазител

ON / OFF. MANIOBRAR RAPIDAMENTE!
ON / OFF: MOVE LEVER QUICKLY!
Да се включва и изключва бързо!

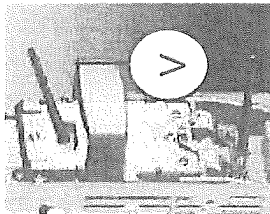


НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

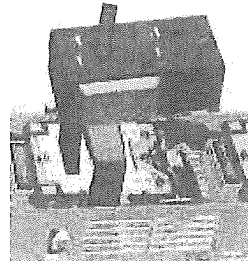
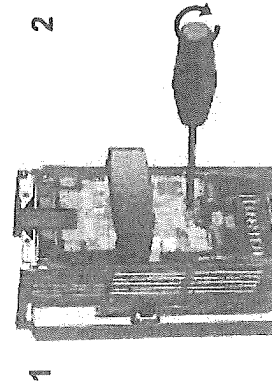
ВЯРНО С ОРИГИНАЛА



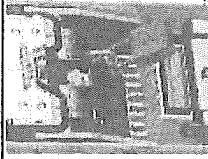
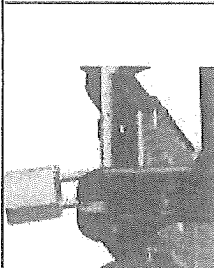
PRESENCIA DE TENSION
VOLTAGE MEASUREMENT
Измерване на напрежение



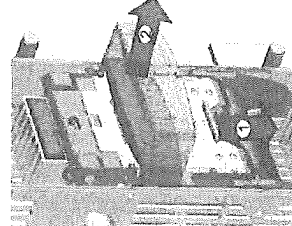
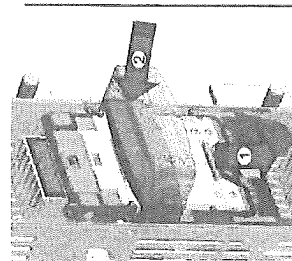
INSTALACION DE SALIDA AUXILIAR PROTEGIDA POR FUSIBLE
INSTALLING A PROTECTED AUXILIAR OUTPUT
Монтаж на спомогателен изолиран изход



BLOQUEO DE CANDADO LOCKING DEVICE **Заключващо устройство**



ASA ESCAMOTEABLE BTVC-E / RETRACTABLE HANDLE BTVC-E /
Прибираща се ръкохватка за BTVC-E



TRIVER+	
CARACTERÍSTICAS ELÉCTRICAS/MECÁNICAS ELECTRICAL/MECHANICAL CHARACTERISTICS Технически данни и характеристики	
INTENSIDAD NOMINAL Is (A) RATED OPERATIONAL CURRENT Ie (A) / Номинален ток Ie (A)	250 A 400 A 630 A
TENSION NOMINAL Ue (V) RATED OPERATIONAL VOLTAGE Ue (V) / Номинално напрежение Ue (V)	250 400 630 690 1000
TENSION DE AISLAMIENTO Ui (V) RATED INSULATION VOLTAGE Ui (V) / Изолиращо напрежение Ui (V)	10 10 10 20 20
TENSION DE FRECUENCIA INDUSTRIAL TEST VOLTAGE 50 Hz (kV) / Испитателно напрежение 50 Hz (kV) Entre partes activas y masa - 1 min. Between phase and earth - 1 min. Между фаза и Земята - 1 минута Entre partes activas - 1 min. Between phases - 1 min. / Между фази - 1 минута	3.5 3.5 3.5
TENSION ONDA DE CHOQUE Uimp (kV) RAISED IMPULSE WITHSTAND VOLTAGE Uimp (kV) / Изпитателно импулсно напрежение Uimp (kV)	70 70
RESISTENCIA CORTOCIRCUITO Icm (kA) RAISED SHORT-CIRCUIT MAKING CAPACITY Icm (kA) with fuse Ток на токовична устойчивост Icm (kA)	>50 >50 >50
RESISTENCIA AL AISLAMIENTO (MΩmm) INSULATION RESISTANCE / Съпротивление на изолацията	>5 >5
RESISTENCIA MECÁNICA MECHANICAL OPERATING CYCLES / Механична износостойчивост	800 800 800
ENDURANCIA ELÉCTRICA ELECTRICAL OPERATING CYCLES Електроенергетическа износостойчивост	200 200 200
CATEGORIA DE EMPLEO UTILIZATION CATEGORY / Категория на използване Ue = 400 V Ue = 500 V Ue = 630 V	AC238 AC238 AC238 AC228 AC228 AC228 AC228 AC228 AC228
GRADO DE PROTECCION PROTECTION DEGREE / Степен на защита	IP-30 IP-30 IP-30

IP43801-BLG-B0

Приложение 3 към Техническо предложение

СРОК ЗА ИЗПЪЛНЕНИЕ НА НАСТОЯЩАТА ОБЩЕСТВЕНА ПОРЪЧКА:

СРОКОВЕ ЗА ДОСТАВКА

№	Наименование	Мярка	Количество със срок на доставка до 7 кал. дни	Количество със срок на доставка до 30 кал. дни
1	2	3	4	5
1	ВПР НН, 400 А, 3-полюсно управление	бр.	6	25
2	ВПР НН, 630 А, 3-полюсно управление	бр.	1	2

Забележки:

- 1/ Срокът на доставките започва да тече от датата на изпращане на поръчката.
- 2/ Количествата в колона 4, със срок на доставка до 7 /седем/ календарни дни, се доставят след SAP поръчка до посочените в обявлението складове на Възложителя за покриване на спешни нужди на Възложителя.
Възложителят може да поръчва посоченото спешно количество веднъж месечно.
- 3/ В случай, че крайният срок на доставката съвпада с празничен или неработен ден, то доставката се извършва не по-късно от първия работен ден след изтичането на срока.
- 4/ При поръчки на Възложителя на количества в рамките на потвърдените от Изпълнителя и недоставени в посочените срокове, ще бъдат налагани неустойки, съгласно условията на договора.
- 5/ Възложителят може да поръчва количества по-малки от посочените в колони 4 и 5.
- 6/ Възложителят може да поръчва количества по-високи от посочените в колони 4 и 5, като това обстоятелство ще бъде посочено текстово в съответната поръчка изпратена към Изпълнителя. С потвърждението на поръчката, Изпълнителят вписва в същата очаквана дата за доставка на количествата надвишаващи посочените в колони 4 и 5.
- 7/ Количествата за доставка в колони 4 и 5 са отделни и независими едно от друго.
- 8/ Количествата за доставка в колона 5 не включват в себе си количествата за доставка в колона 4.
- 9/ Възложителят има право да направи едновременно поръчки за доставка на количества от колони 4 и 5.

Дата: 02.02.2018 г.

ПОДПИС И ПЕЧАТ:

НА ОСНОВАНИЕ ЧЛ. 2 ОТ ЗЗЛД

Атанас Танчев
Изпълнителен директор
Филкаб АД

