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

TYPE TEST REPORT

NO. 3096.2081034.859

GSAB Elektrotechnik GmbH Lindenstraße 23 99718 Greußen GERMANY	**CLIENT**
GSAB Elektrotechnik GmbH	**MANUFACTURER**
Low-voltage cable distribution cabinet with NH2 fuse-switch-disconnector in rail design	**TEST OBJECT**
88S1700 K	**TYPE**
Test sample	**SERIAL NO.**

RATED CHARACTERISTICS GIVEN BY THE CLIENT

Rated operational voltage	U_e	400	V
Rated insulation voltage	U_i	690	V
Rated frequency	f	50	Hz
Rated current	I_n	630	A
Rated short-time withstand current	I_{cw}	25	kA, 1 s
Rated peak withstand current	I_{pk}	52.5	kA
Degree of protection		IP 44	

NORMATIVE DOCUMENT

IEC 60439-1: 2004-04
DIN EN 60439-1: 2005-01

RANGE OF TESTS PERFORMED

Verification of

- temperature-rise limits
- dielectric properties
- short-circuit withstand strength
- clearances and creepage distances
- degree of protection
- the resistance of insulating materials to abnormal heat and fire (Glow-wire test)

DATE OF TEST

14 October - 20 October 2008 and 27 February 2009

TEST RESULT

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

RONALD BORCHERT
Senior engineer of low-voltage test laboratory

THOMAS MANTHE
For Test engineer in charge

Berlin, 26 June 2009

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 „Prüffeld für elektrische Hochleistungstechnik" GmbH (IPH Berlin) is a subsidiary of **CESI** S.p.A, Milan.

Deutscher Akkreditierungs Rat
DAT - P - 019/92

Contents Sheet

This test document consists of 42 sheets.

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The test results relate only to the object tested.
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1. Present at the test

Mr.	Rainer Borchert	IPH test engineer in charge
Mr.	Juraschek	IPH test engineer
Mr.	Manthe	IPH test engineer
Mr.	Vonnoe	GSAB Elektrotechnik GmbH

2. Test performed

Verification of

- temperature-rise limits
- dielectric properties
- short-circuit withstand strength
- clearances and creepage distances
- degree of protection
- the resistance of insulating materials to abnormal heat and fire (Glow-wire test)

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:	Low-voltage cable distribution cabinet with NH2 fuse-switch-disconnector in rail design	
Type:	88S1700 K	
Manufacturer:	GSAB Elektrotechnik GmbH	
Serial No.:	Test sample	
Year of manufacture:	2008	
Rated characteristics:	Rated operational voltage	400 V
	Rated insulation voltage	690 V
	Rated frequency	50 Hz
	Rated current	630 A
	Rated short-time withstand current	25 kA, 1 s
	Rated peak withstand current	52.5 kA
	Degree of protection	IP44
	Class of protection	II
Characteristics:	Dimensions (W x D x H)	883 mm x 272 mm x 1345 mm
	Busbars L1/L2/L3	
	Dimensions	1 x 30 mm x 10 mm per pole
	Design	Cu, bare, rounded
	Busbars PEN	
	Dimensions	1 x 30 mm x 10 mm
	Design	Cu, bare, rounded
	Strip-type fuse-switches	
	Number	6 pc
	Type	NH2
	Fuses in the outgoing circuits 1 and 2	
	Size	NH2
	Rated voltage	500 V
	Rated current	250 A
	Utilisation category	gL/gG
	Manufacturer	Jean Müller
	Fuses in the outgoing circuits 3 and 4	
	Size	NH2
	Rated voltage	500 V
	Rated current	250 A
	Utilisation category	gL/gG
	Manufacturer	Ebamat
	Fuses in the outgoing circuits 5 and 6	
	Size	NH2
	Rated voltage	690 V
	Rated current	125 A
	Utilisation category	gL/gG
	Manufacturer	M. Schneider
	Insulating medium	Air
	Type of arrangement	External area
	Material of casing	Insulating material

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 all details. 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
Kabelverteiler mit 6 Stück Sicherungslastschaltleisten Typ 88S1700 K Front- und Seitenansicht	88S1700 Sheet 1	07.01.2008	GSAB Elektrotechnik GmbH	Sheet 41
Kabelverteiler mit 6 Stück Sicherungslastschaltleisten Typ 88S1700 K Stromlaufplan	--	15.07.2008	GSAB Elektrotechnik GmbH	Sheet 42

Entry of test objects at IPH: 10 October 2008

4. Verification of temperature-rise limits

4.1 Test laboratory

Low-voltage test laboratory, test room 10

4.2 Normative document

IEC 60439-1: 2004-04, Sub-clause 8.2.1
DIN EN 60439-1: 2005-01, Sub-clause 8.2.1

4.3 Required test parameters

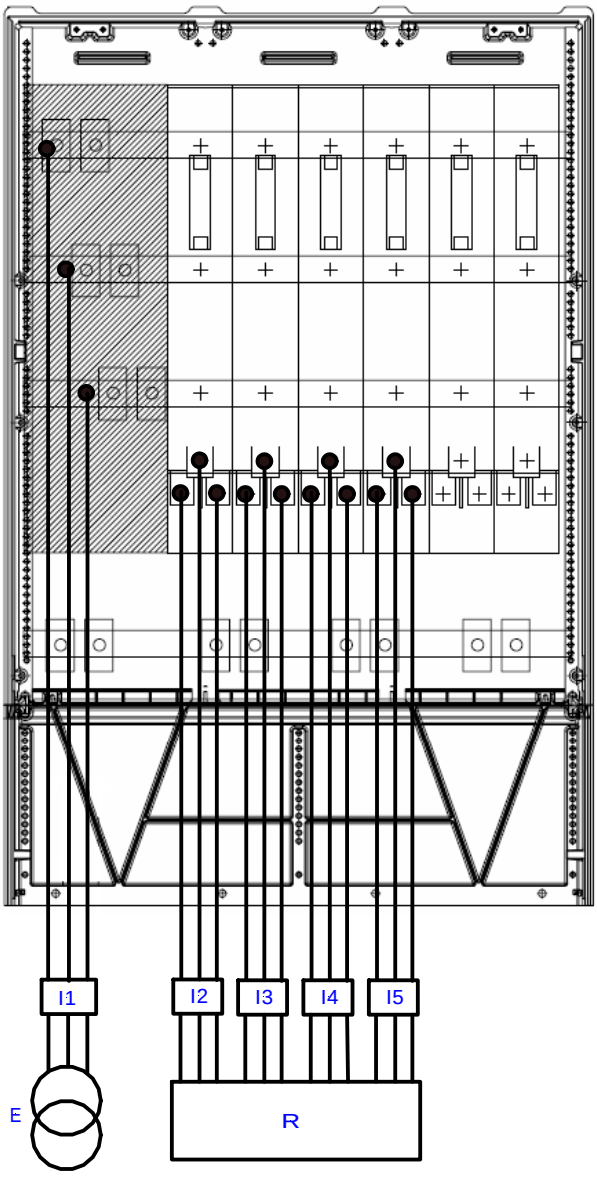
Terminal	Current (three-phase) in A	Frequency in Hz
Supply	630	50
Outgoing circuits 1 to 3	175	
Outgoing circuit 4	105	

4.4 Test arrangement

The power supply was realised by two single-core 185 mm^2 cables per each pole, and the connection of the outgoing circuits by one single-core 120 mm^2 cable per each pole.
The cables for the power supply and for the outgoing circuits were installed from the bottom. To do so, the test sample was put on a wooden frame approximately 5 cm high. The spacing was sealed hermetically.

The rear wall of the test sample was insulated with expanded polystyrene slabs having a thickness of 30 mm.

4.5 Test and measuring circuits



E Test current source
R Load resistors
I1 to I5 Current measurement

Figure 1: Diagram of test arrangement

Measuring point	Measured quantity	Measuring sensor/device
I1	Test current Supply	Rogowski coils / integrator / digital display device
I2 to I5	Test current Outgoing circuits 1 to 4	Current probe

Test and measuring circuits (continued)

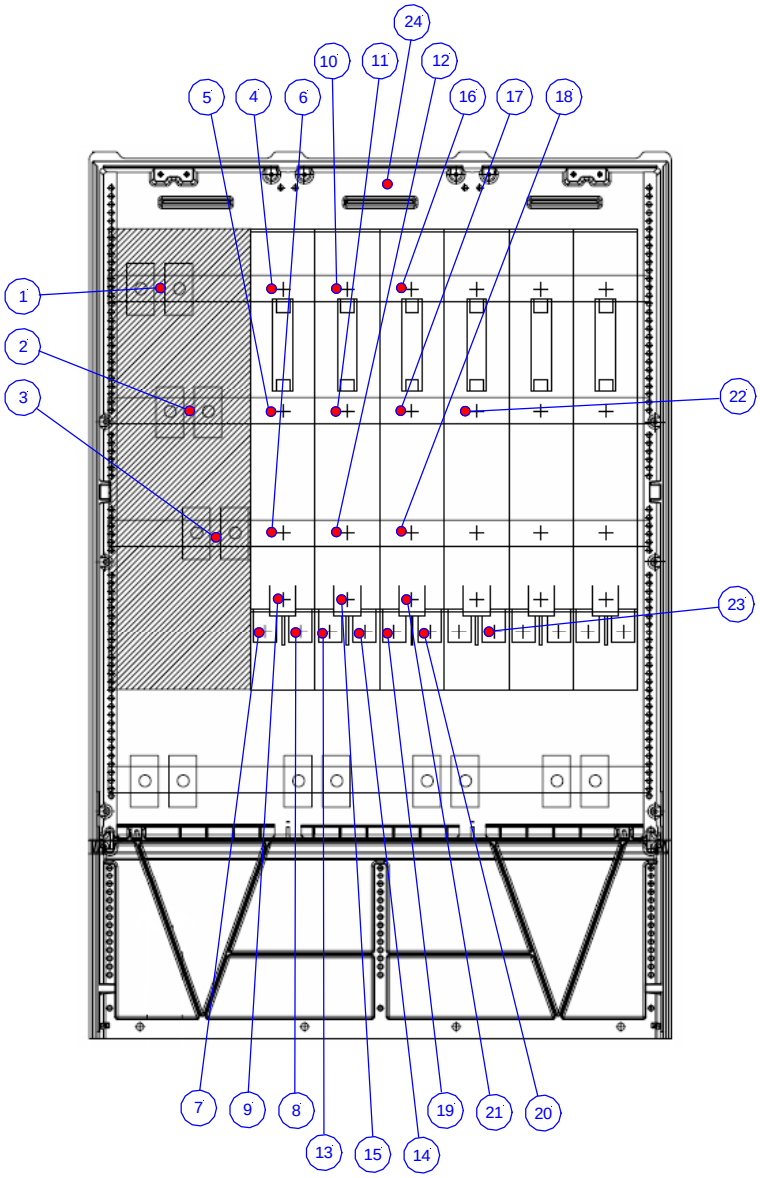


Figure 2: Arrangement of temperature measuring points

Measuring point	Measured quantity	Measuring sensor/device
1 to 24	Temperature	Cu/Constantan thermocouples (type L) Therm 5500-3
25	Temperature: (enclosure)	NiCr/Ni thermal elements (type K) / Almemo 2290-2

4.6 Test results

Test parameters:

Terminal	Current (Phase L1 / L2 / L3) in A	Frequency in Hz
Supply	627 / 635 / 628	50
Outgoing circuit 1	179 / 173 / 175	
Outgoing circuit 2	170 / 175 / 179	
Outgoing circuit 3	169 / 175 / 169	
Outgoing circuit 4	108 / 102 / 107	

Test results:

Measur. point		Classification Designation	Permitted temperature-rise limit in K	Measured final temperature at ΔT ≤1 K/h in °C	Final temperature rise temperature in K	Temperature reserve in K
1	L1	Supply Cable terminal	70	62.5	41.4	28.6
2	L2			58.1	37.0	33.0
3	L3			59.9	38.8	31.2
4	L1	Outgoing circuit 1 Busbar connection	70 [1)]	65.9	44.8	25.2
5	L2			60.5	39.4	30.6
6	L3			59.7	38.6	31.4
7	L1	Outgoing circuit 1 Cable terminal	70	48.3	27.2	42.8
8	L2			51.0	29.9	40.1
9	L3			54.8	33.7	36.3
10	L1	Outgoing circuit 2 Busbar connection	70 [1)]	66.7	45.6	24.4
11	L2			61.8	40.7	29.3
12	L3			57.0	35.9	34.1
13	L1	Outgoing circuit 2 Cable terminal	70	49.7	28.6	41.4
14	L2			49.4	28.3	41.7
15	L3			54.4	33.3	36.7
16	L1	Outgoing circuit 3 Busbar connection	70 [1)]	64.0	42.9	27.1
17	L2			58.1	37.0	33.0
18	L3			54.6	33.5	36.5
19	L1	Outgoing circuit 3 Cable terminal	70	47.5	26.4	43.6
20	L2			48.7	27.6	42.4
21	L3			52.9	31.8	38.2
22	L2	Outgoing circuit 4 Busbar connection	70 [1)]	55.3	34.2	35.8
23	L2	Outgoing circuit 4 Cable terminal	70	38.9	17.8	52.2
24	-	Indoor air above	-	53.7	-	-
-	-	Average ambient temperature	-	21.1	-	-
25	-	Enclosure [2)]	40	34.8	13.7	26.3
-	-	Door handle	25	25.9	4.8	20.2

Note:

1) According to IEC 60947-3

2) Average resulting from three measuring points

4.7 Evaluation of test

The test object reached the final temperatures as shown in the survey on results, see Sheet 10.
The permissible temperature rise to the normative document was not exceeded.

The test object has PASSED the type test.

5. Verification of dielectric properties

5.1 Test laboratory

Low-voltage test laboratory, test room 10

5.2 Normative document

IEC 60439-1: 2004-04, Sub-clause 8.2.2
DIN EN 60439-1: 2005-01, Sub-clause 8.2.2

5.3 Required test parameters

- Test of main circuits:

Power-frequency test voltage	2500	V
Test frequency	50	Hz
Test duration	5 each	s

- Test of enclosure and operating handles made of insulating material:

Power-frequency test voltage	3750	V
Test frequency	50	Hz
Test duration	5 each	s

5.4 Test arrangement

During the tests, all secondary circuits were disconnected.

5.5 Test and measuring circuits

The dielectric test was carried out using a mobile AC voltage test unit of HA2000 type with internal measuring device between

- all active parts and the parts of the switchgear assembly (including PEN) that are connected between each other
- all poles and every other pole to be connected to the parts of the switchgear assembly (including PEN)

Technical data of test installations:

AV test device HA2000 E u_{max} = 5 kV, 50 Hz
i_{max} = 200 mA

5.6 Test results

- Test of main circuits:

Voltage applied to	Earthed	Rated insulation voltage in V	Test voltage in V	Result [1] Disruptive discharges
L1, L2, L3	PEN	690	2500	0
L1	L2, L3, PEN	690	2500	0
L2	L1, L3, PEN	690	2500	0
L3	L1, L2, PEN	690	2500	0

- Test of enclosure and operating handles made of insulating material:

Voltage applied to	Earthed	Rated insulation voltage in V	Test voltage in V	Result [1] Disruptive discharges
L1, L2, L3, PEN	Enclosure	690	3750	0
L1, L2, L3, PEN	Door handle	690	3750	0

Note:

1) IEC 60439-1: 2004 does not permit any disruptive discharge.

5.7 Evaluation of test

To verify the insulation properties of the main circuits, the test sample was tested with an alternating voltage of 2500 V, and to verify the insulation properties of the enclosure and the operating handles made of insulating material it was tested with an alternating voltage of 3750 V. The requirements specified by IEC 60439-1: 2004-04 have been met.

The test object has PASSED the type test.

6. Verification of short-circuit withstand strength

6.1 Test laboratory

Low-voltage test laboratory, test room 1

6.2 Normative document

IEC 60439-1: 2004-04, Sub-clauses 8.2.3 and 8.2.4.2
DIN EN 60439-1: 2005-01, Sub-clauses 8.2.3 and 8.2.4.2

6.3 Required test parameters

	Main conductor	PEN bar
Test voltage	420 V	243 V
Prospective peak short-circuit current	52.5 kA	30 kA
Prospective sustained symmetrical short-circuit current	25 kA	15 kA
Test duration	1 s	1 s

6.4 Test arrangement

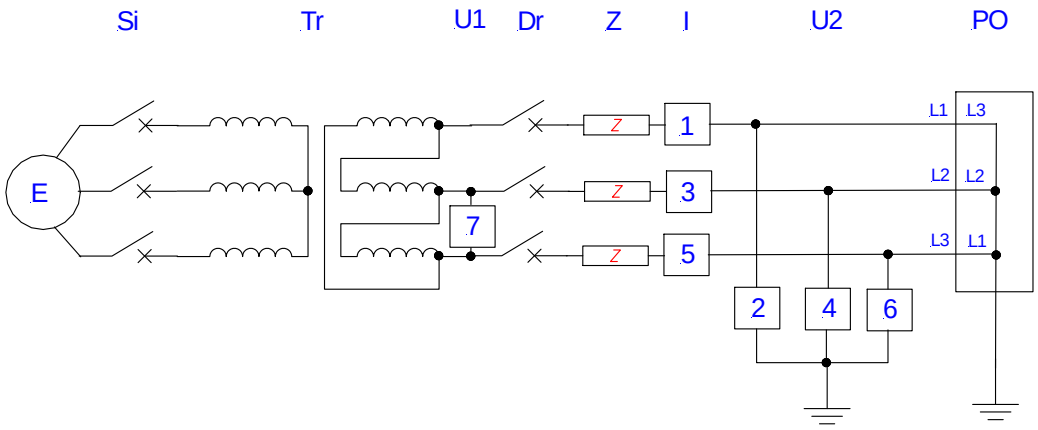
Power was supplied to the main busbar by single-core copper cables of 2 x185 mm^2.

See Figures 3 to 6, Sheets 26 to 29.

The feeding to test the PEN bar was done by use of a cable 1 x 185 mm^2 to the connections of the L3 and PEN bar.

See Figure 7, Sheet 30.

6.5 Test and measuring circuits

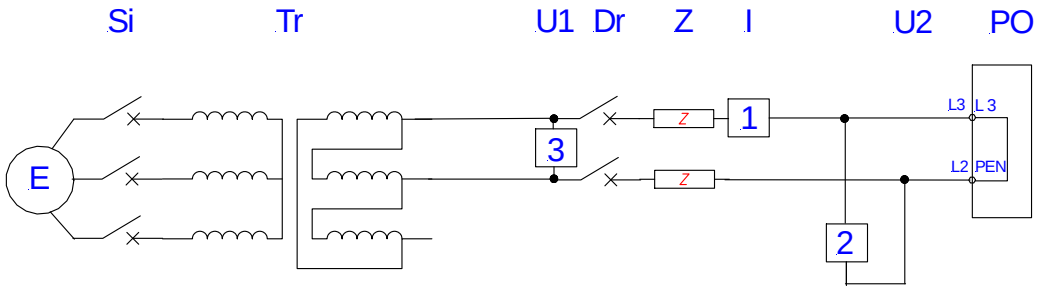


E	Supply	U1	Test voltage measurement
Si	Master breaker	I	Current measurement
Tr	Test transformer	U2	Transient voltage measurement
Dr	Making switch	1 - 7	Measuring points
Z	Test circuit impedance	PO	Test object

Figure 3: Test and measuring circuits for the three-pole tests

Technical data of measuring circuits

Test No.	Measuring point	Measured quantity	Measuring sensor/device
208 3535	1	Current L1	Shunt
to	2	Voltage L1	Voltage divider
208 3539	3	Current L2	Shunt
	4	Voltage L2	Voltage divider
	5	Current L3	Shunt
	6	Voltage L3	Voltage divider
	7	Test voltage	Voltage transformer / Voltmeter
Recording instruments: Measuring points 1 to 6: BAKKER BE 256 transient recorder			



E	Supply	U1	Test voltage measurement
Si	Master breaker	I	Current measurement
Tr	Test transformer	U2	Transient voltage measurement
Dr	Making switch	1 - 3	Measuring points
Z	Test circuit impedance	PO	Test object

Figure 4: Test and measuring circuits for the single-pole tests

Technical data of measuring circuits

Test No.	**Measuring point**	**Measured quantity**	**Measuring sensor/device**
208 3540	1	Current	Shunt
and	2	Voltage	Voltage divider
208 3541	3	Test voltage	Voltage transformer / Voltmeter
Recording instruments: Measuring points 1 and 2 BAKKER BE 256 transient recorder			

6.6 Test results

Condition of test object before test:	Prestressed
Connection of test object:	Main conductor L1/L2/L3
Short-circuit point:	At the end of the main busbar
Ambient temperature:	19 °C

Test parameters:

Test No.			208 3535	208 3536	208 3537
Test voltage	V		450	450	450
Peak short-circuit current	kA	L1	43.7	41.1	40.3
		L2	46.3	45.2	34.1
		L3	55.3	53.1	39.9
Symmetrical short-circuit current	kA	L1	25.8	24.9	24.9
		L2	25.5	24.7	24.5
		L3	25.9	25.0	25.0
	Average		25.7	24.9	24.8
Duration of short-circuit	ms		-	80.3	1075
Joule integral 10^6	A^2s	L1	-	-	666
		L2	-	-	650
		L3	-	-	667
Symmetrical short-circuit current 1 s	kA		-	-	25.7
Notes			1)	2)	3)
Evaluation			-	OK	OK

Notes:

OK The test object is capable of properly carrying its peak current and its short-time current.

1) Setting of the prospective short-circuit current values
2) Peak withstand current test
3) Short-time withstand current test

Condition of test object before test:	Prestressed
Connection of test object:	Main conductor L1/L2/L3
Short-circuit point:	At the cable connections of the respective main busbar
Fuse applied:	NH2, 500 V, 250 A, gL/gG, manufacturer: Jean Müller
Ambient temperature:	19 °C

Test parameters:

Test No.				**208 3538**	**208 3539**
Test voltage		V		**450**	**450**
Peak short-circuit current		kA	L1	**-**	**-**
			L2	**-**	**-**
			L3	**55.3**	**55.3**
Symmetrical short-circuit current		kA	L1	**25.8**	**25.8**
			L2	**25.5**	**25.5**
			L3	**25.9**	**25.9**
		Average		**25.7**	**25.7**
Power factor cos φ				**0.22**	**0.22**
Cut-off current		kA	L1	**19.7**	**19.8**
			L2	**15.2**	**15.0**
			L3	**5.9**	**4.86**
Joule integral	10^6	A^2s	L1	**0.465**	**0.476**
			L2	**0.318**	**0.312**
			L3	**0.058**	**0.034**
Break time		ms		**6.8**	**6.98**
Notes				**1)**	**2)**
Evaluation				**OK**	**OK**

Notes:

OK The test object was able to carry the conditional short-circuit current properly.

1) Test of outgoing circuit 6
2) Test of outgoing circuit 1

Condition of test object before test:	Prestressed Resistance of the PEN bar before test: 54 μΩ
Connection of test object:	Busbar between L3 and PEN
Short-circuit point:	At the end of the busbars L3 - PEN
Ambient temperature:	19 °C

Test parameters:

Test No.			208 3540	208 3541
Test voltage	V		**450**	**450**
Peak short-circuit current	kA	L1	**-**	**-**
		L2	**-**	**-**
		L3	**34.0**	**23.9**
Symmetrical short-circuit current	kA	L1	**-**	**-**
		L2	**-**	**-**
		L3	**16.1**	**16.1**
	Average		**-**	**-**
Duration of short-circuit	ms		**82**	**948**
Joule integral 10^6	A^2s	L1	**-**	**-**
		L2	**-**	**-**
		L3	**-**	**246**
Symmetrical short-circuit current 1 s	kA		**-**	**15.7**
Notes			**1)**	**2)**
Evaluation			**OK**	**OK**

Notes:
OK The test object is capable of properly carrying its peak current and its short-time current.

1) Peak withstand current test
2) Short-time withstand current test

Resistance of the PEN bar after test: 55 μΩ

6.7 Evaluation of test

The test object did not show any visible damage. There was no deformation of busbars. The supporting insulating parts were not deteriorated.

The test object has PASSED the type test.

See Figures 4 to 7, Sheets 27 to 30.

7. Verification of clearances and creepage distances

7.1 Test laboratory

Low-voltage test laboratory, test room 10

7.2 Normative document

IEC 60439-1: 2004-04, Sub-clause 8.2.5
DIN EN 60439-1: 2005-01, Sub-clause 8.2.5

7.3 Required test parameters

Minimum clearances and creepage distances (at ≤ 2000 m above SL; degree of pollution 3 and material group III):

Creepage distances ≥ 12.5 mm
Clearance ≥ 5.5 mm

7.4 Test arrangement

The test was performed without incoming and outgoing circuits connected.

7.5 Test and measuring circuits

The measurement was carried out by means of inspection and testing gauges.

7.6 Test results

All measured values of clearances and creepage distances were above the permissible limit.
The smallest clearance measured was 11 mm and the minimum creepage distance measured was 18 mm.

7.7 Evaluation of test

The clearances and creepage distances were above the permissible limits.

The test object has PASSED the type test.

8. Verification of the degree of protection

8.1 Test laboratory

Low-voltage test laboratory, wet test compartment

8.2 Normative document

IEC 60439-1: 2004-04, Sub-clause 8.2.7
DIN EN 60439-1: 2005-01, Sub-clause 8.2.7

8.3 Required test parameters

Protection against access to hazardous parts and against solid foreign objects

IP 4X

Test probe	Rigid steel rod of 1-mm diameter
Test force	1 N ± 10 %

The rigid steel rod shall not completely penetrate into the test object's enclosure anywhere.

Test for the protection against ingress of water

IP X4

Test equipment	Spray nozzle
Water flow rate	10 l/min, ± 180° from the vertical
Test duration	1 min/m^2 at least for 5 min
Distance between test instrument and test object	300 - 500 mm

8.4 Test arrangement

The test sample was tested free standing in the room as floor-mounted distribution board.

8.5 Test and measuring circuits

Test probe	Rigid steel rod of 1.0-mm diameter DIN EN 60529 (VDE 0470 Teil 1): 2000-09, Table 7 integrated spring-tension meter
Spray nozzle	DIN EN 60529 (VDE 0470 Teil 1): 2000-09, Table 8 built-on flow-rate and pressure measuring instrument

8.6 Test results

Using the object probe it was tried to penetrate into the enclosure at appropriate points of the exposed sides.

The test probe could not penetrate in the enclosure anywhere.

Afterwards, the test object were exposed to splashing water for 10 minutes. When the doors of the switchgear cubicle had been opened, no ingress of water near live parts or insulating parts was found.

The subsequently performed lightning impulse voltage test according to Sub-clause 8.2.2 was passed.

8.7 Evaluation of test

The test object has PASSED the type test.

9. Verification of resistance of insulating materials to abnormal heat and fire

9.1 Test laboratory

Low-voltage test laboratory, glow-wire test bay

9.2 Normative document

IEC 60439-1: 2004-04, Sub-clause 8.2.9
DIN EN 60439-1: 2005-01, Sub-clause 8.2.9

9.3 Required test parameters

Designation	Test temperature in °C
Enclosure	650

9.4 Test arrangement

A representative test object for the glow-wire test was selected from the enclosure, near the door.

9.5 Test and measuring circuits

Glow-wire test apparatus to IEC 60695-2-1

9.6 Test results

Test temperature: 650 °C, duration of test: 30 s

During the glow-wire test none of the test objects showed burning tissue paper or scorching of the pinewood board (see Figure 10). Within the maximum permissible time of 30 s, no flames developed (see Figure 11).

9.7 Evaluation of test

The material sample from the enclosure door was subject to a glow-wire test at a temperature of 650 °C. All criteria required to pass the test were met.

The test object has PASSED the type test.

10. Photos

Photo 1: Arrangement for the temperature-rise test

Photo 2: Test object during temperature-rise test (front view)

Photo 3: Arrangement for the short-circuit test of the main busbars
(Condition of test object before short-circuit test)

Photo 4: Arrangement for the short-circuit test of the main busbars
(Condition of test object after short-circuit test)

Photo 5: Arrangement for the short-circuit test of the outgoing circuit no. 6
(Condition of test object after short-circuit test)

Photo 6: Arrangement for the short-circuit test of the outgoing circuit no. 1
(Condition of test object after short-circuit test)

Photo 7: Arrangement for the short-circuit test of the neutral bar
(Condition of test object after short-circuit test)

Photo 8: Arrangement for voltage test

Photo 9: Arrangement for glow-wire test

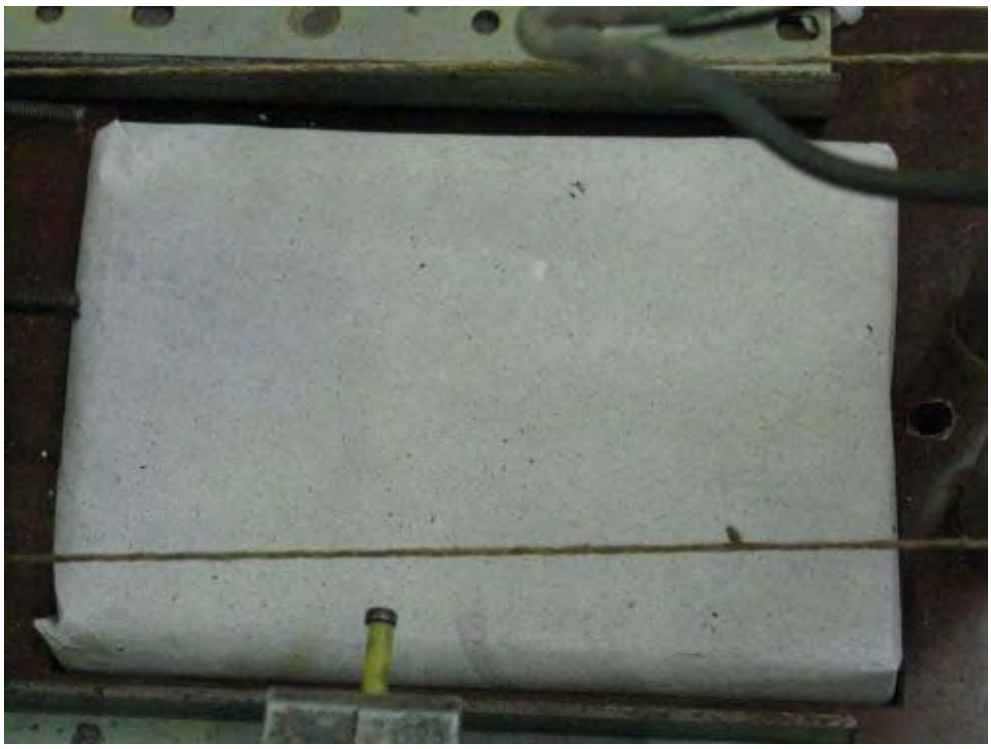
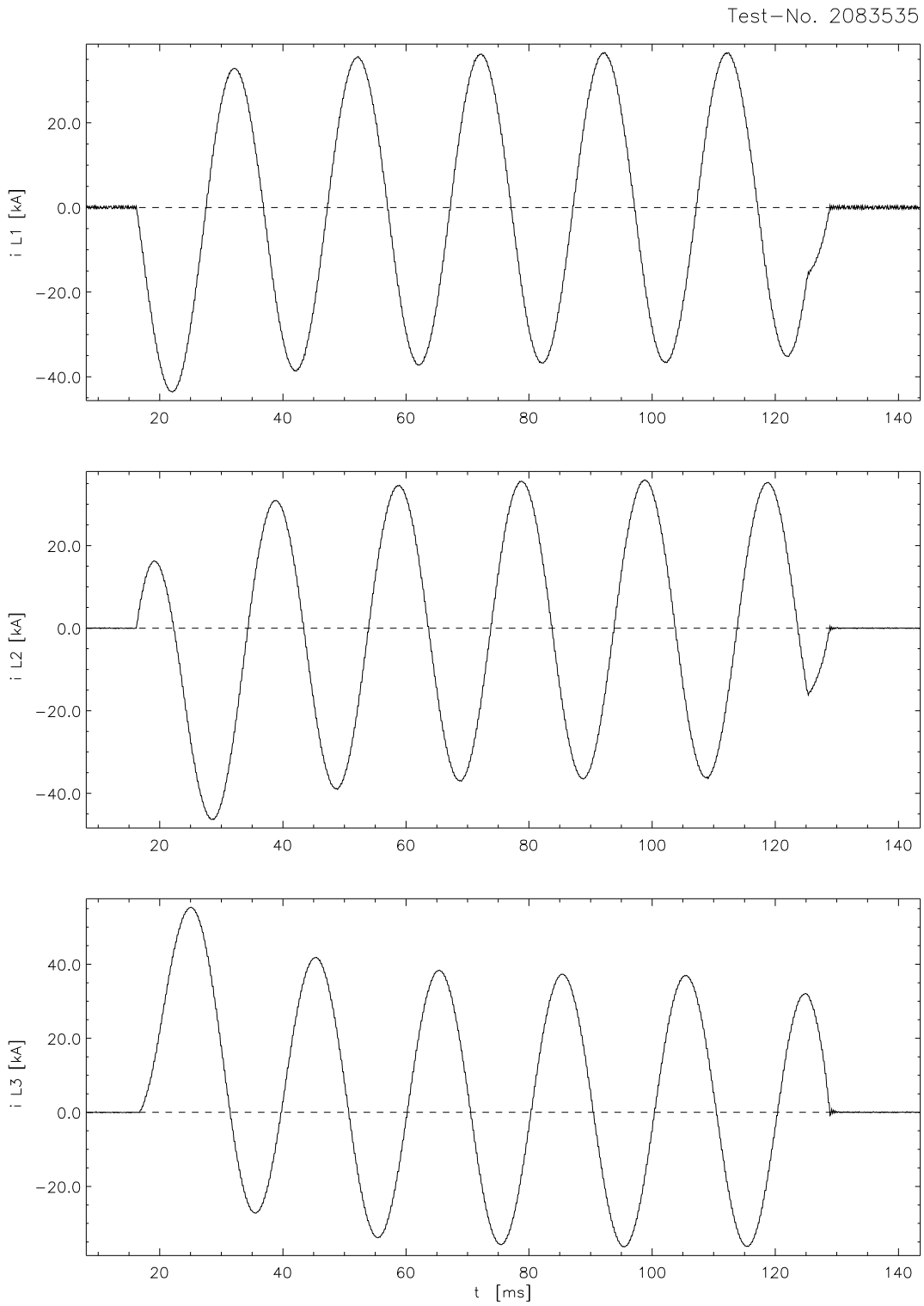
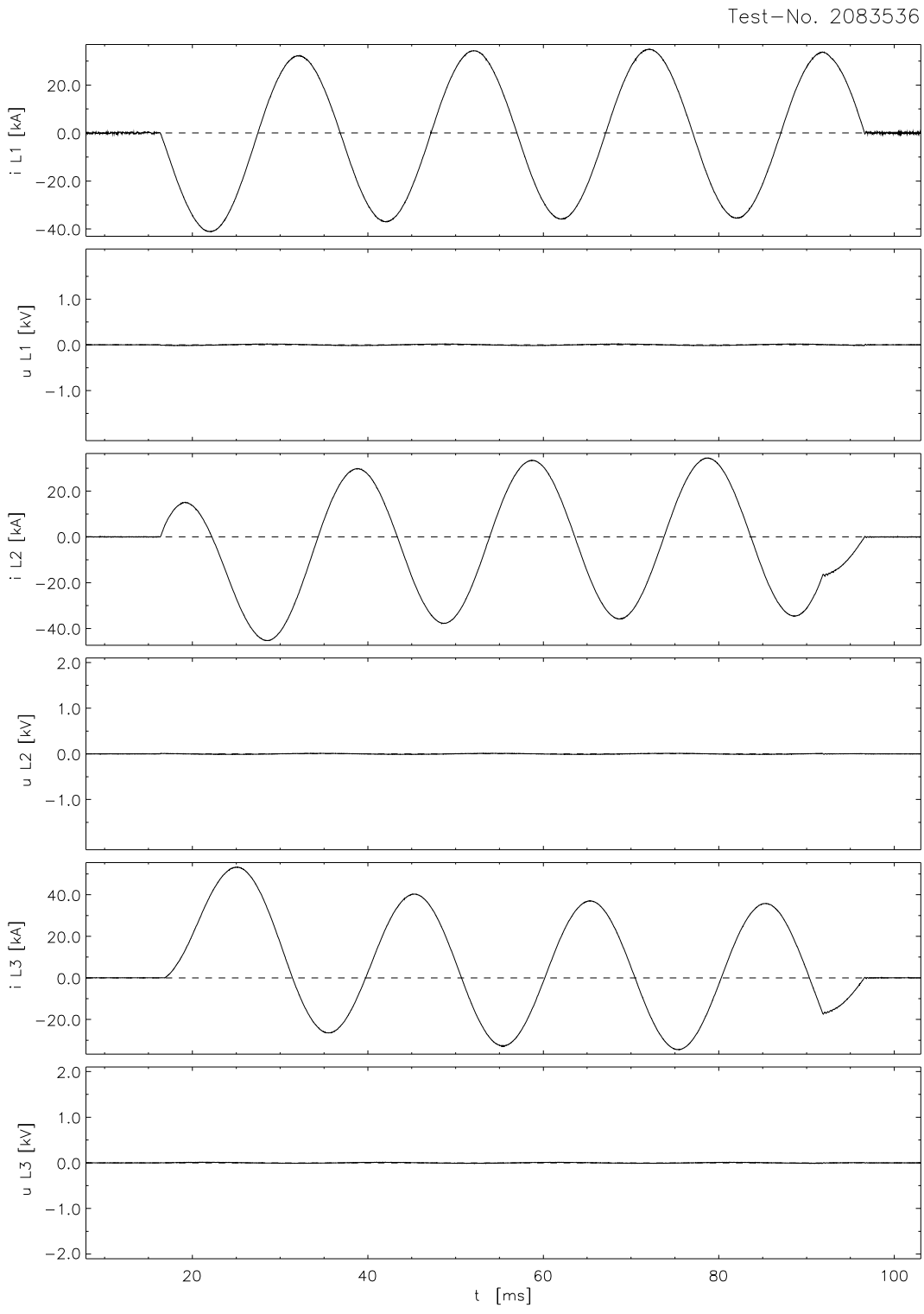


Photo 10: Condition of the tissue paper after the glow-wire test

Photo 11: Condition of test object after test after the glow-wire test

11. Oscillograms

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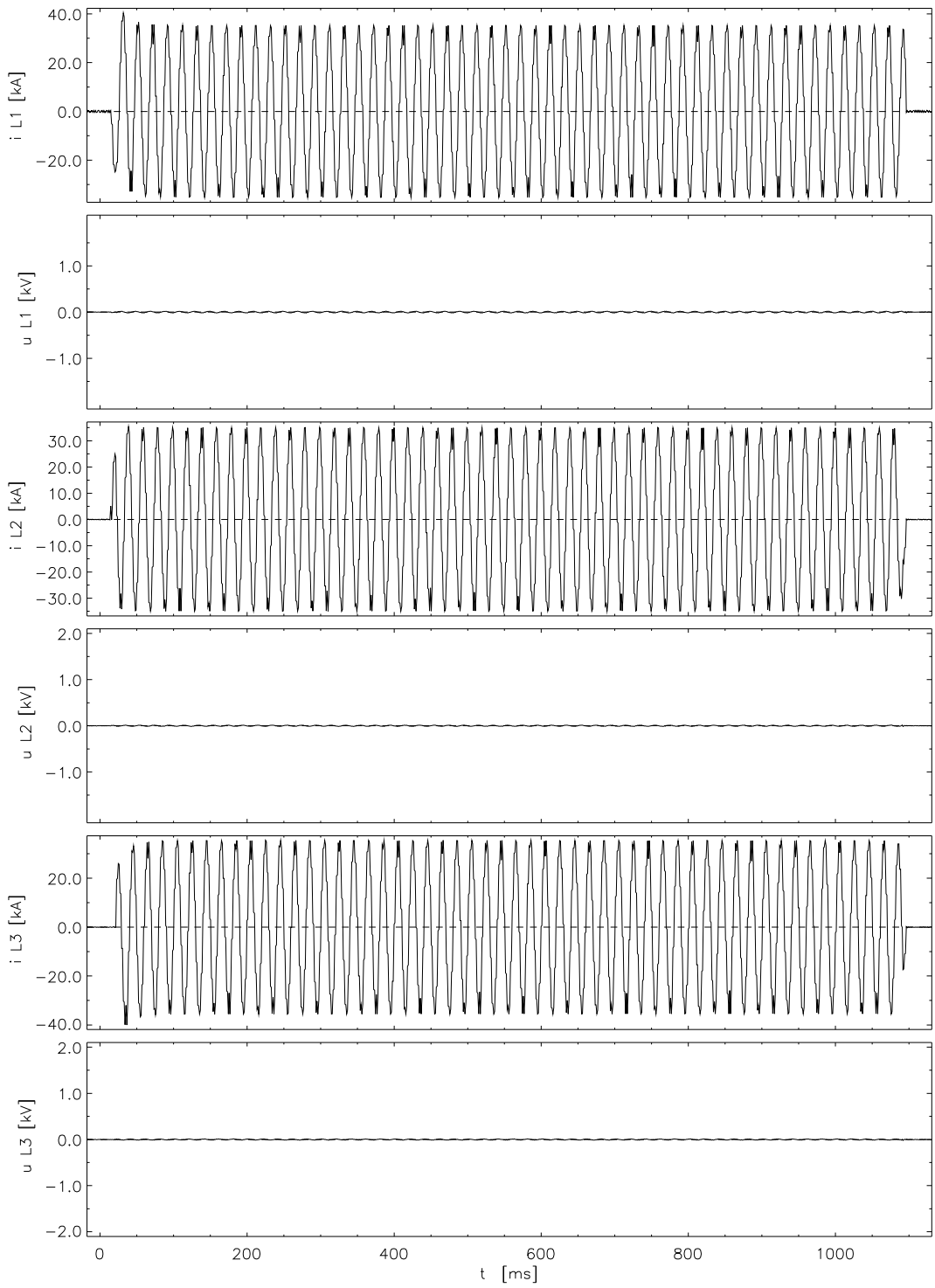
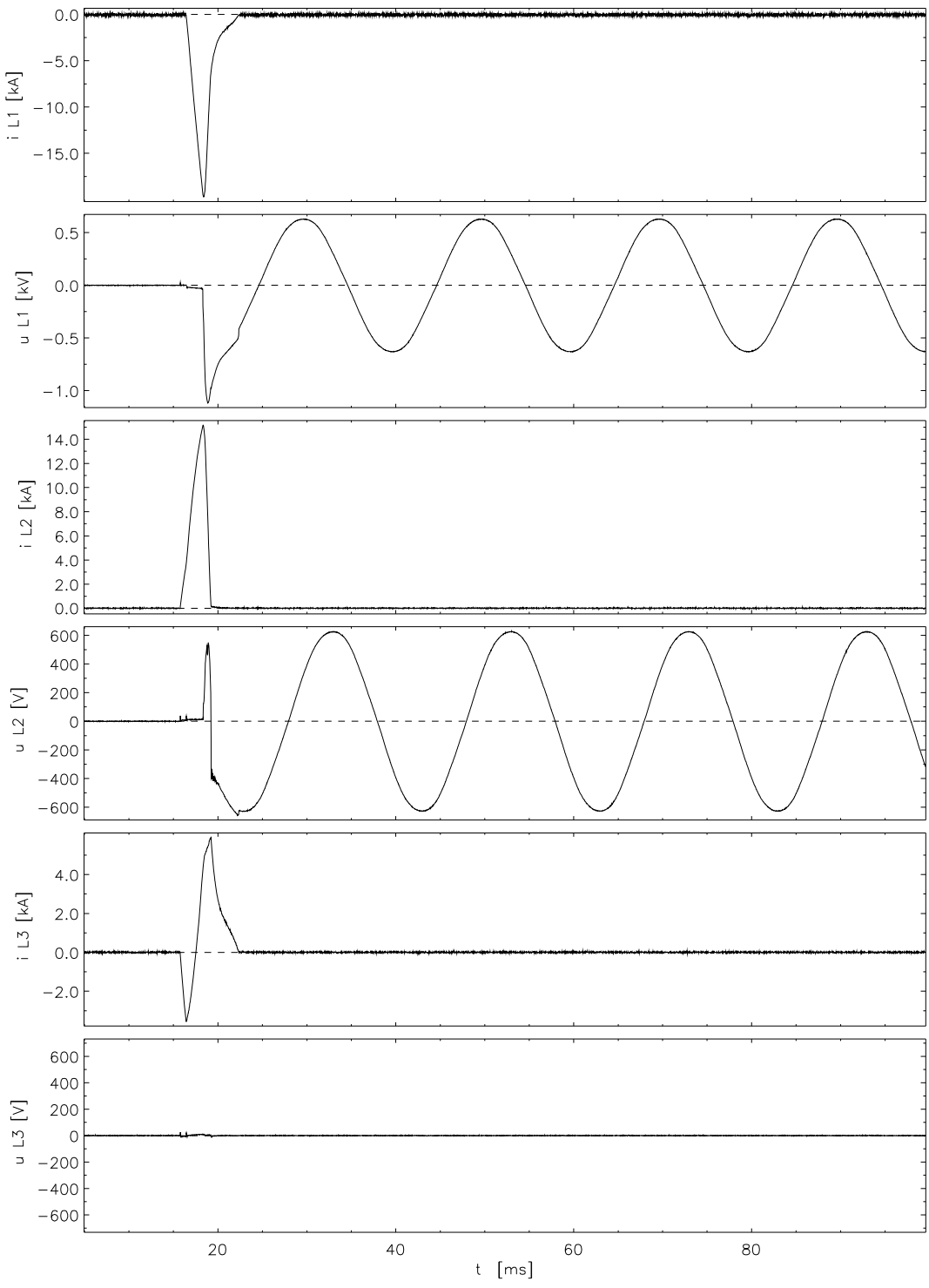
i L1 [kA]
20.0
0.0
-20.0
-40.0
u L1 [kV]
1.0
0.0
-1.0
i L2 [kA]
20.0
0.0
-20.0
-40.0
u L2 [kV]
2.0
1.0
0.0
-1.0
i L3 [kA]
40.0
20.0
0.0
-20.0
u L3 [kV]
2.0
1.0
0.0
-1.0
-2.0
20
40
60
80
100
t [ms]

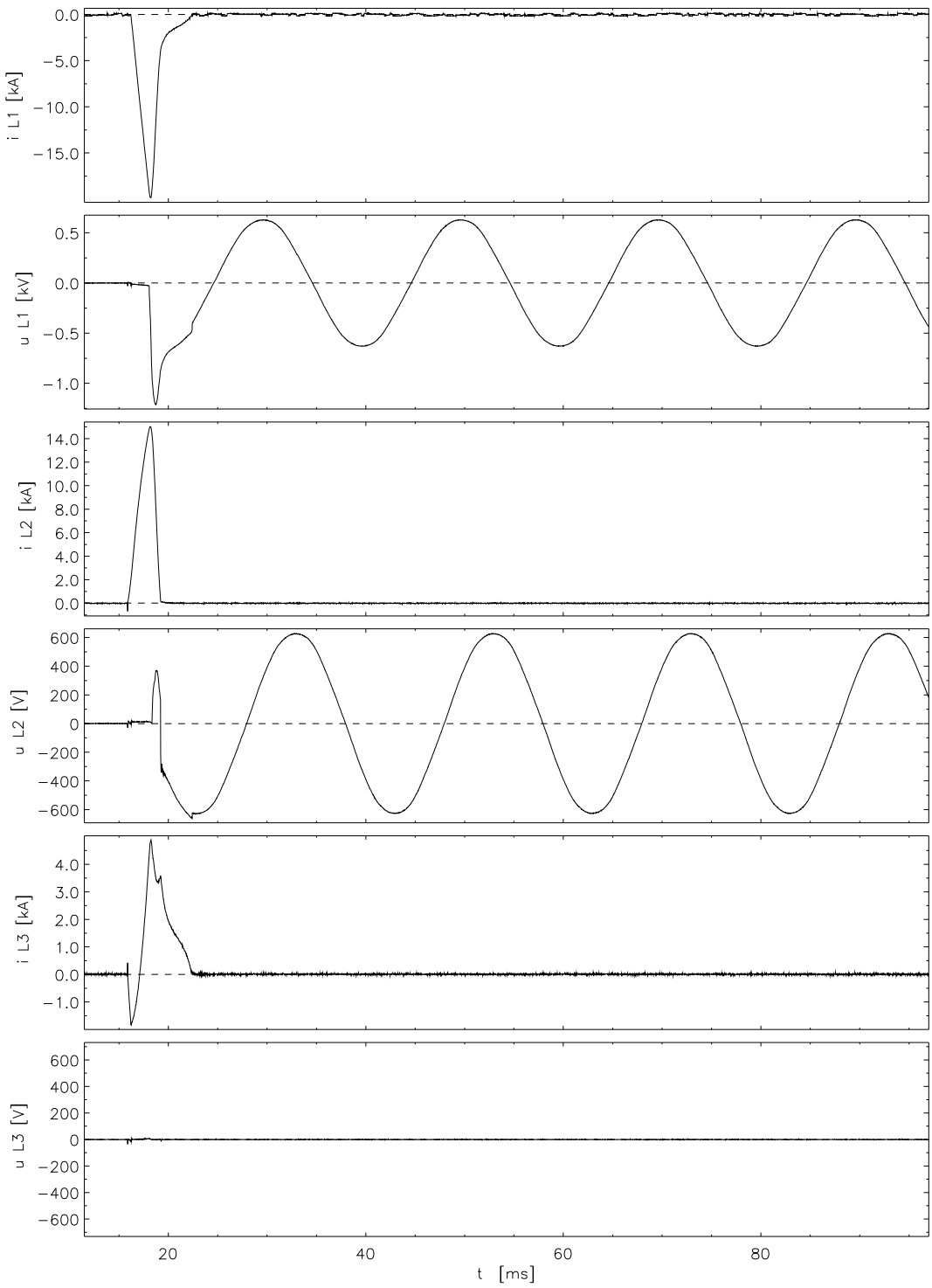
Test-No. 2083537

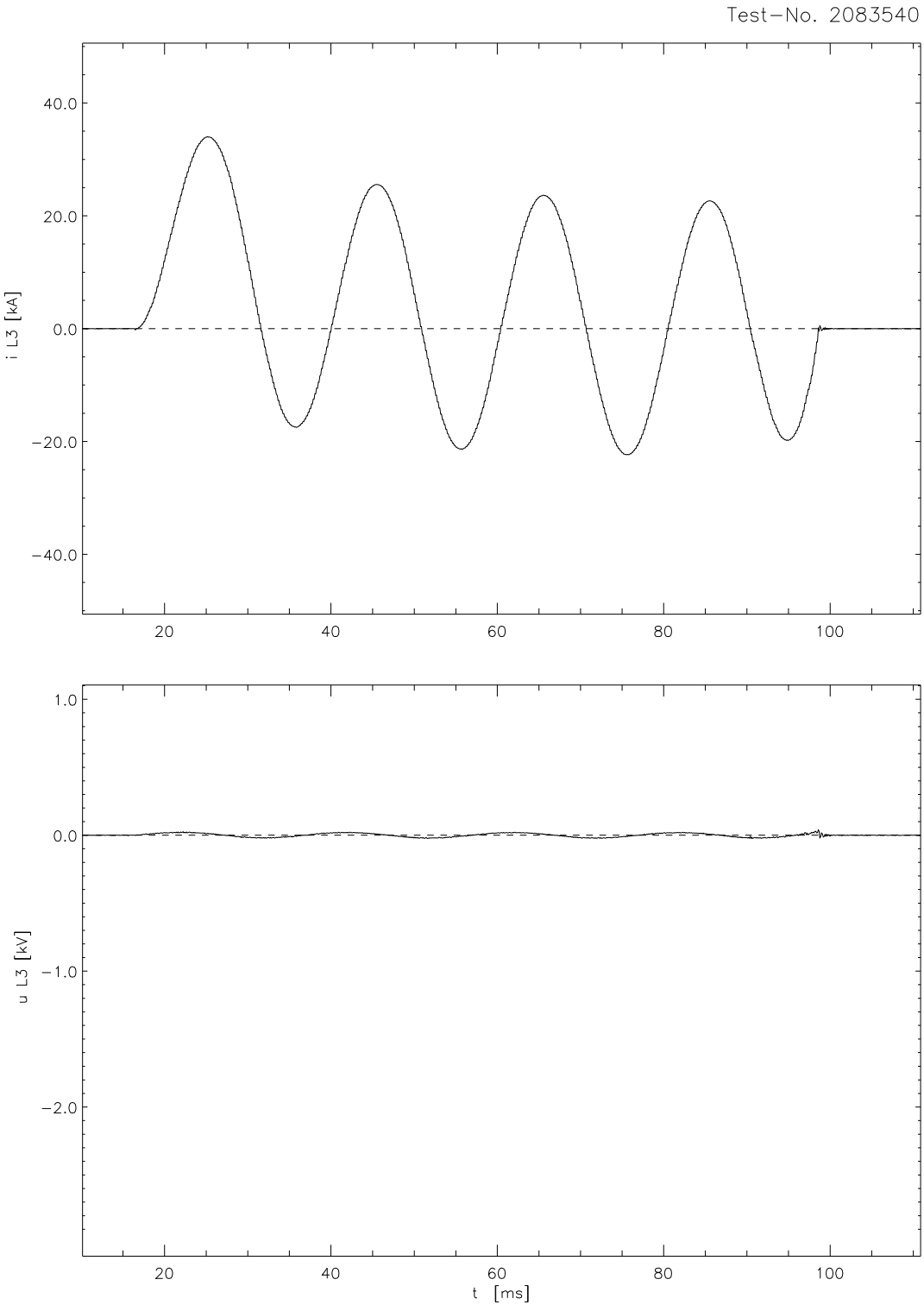


Test-No. 2083538

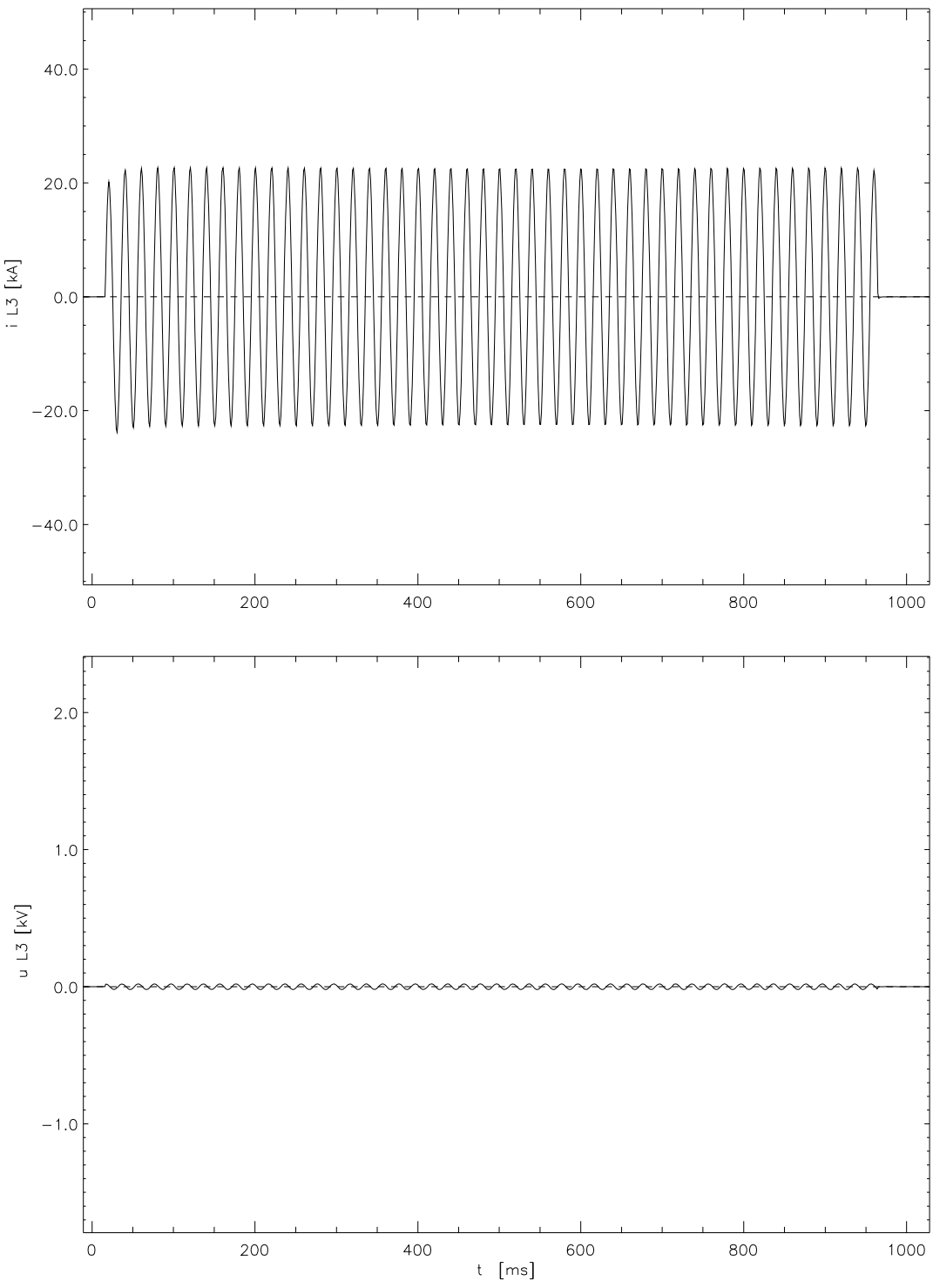


Test-No. 2083539

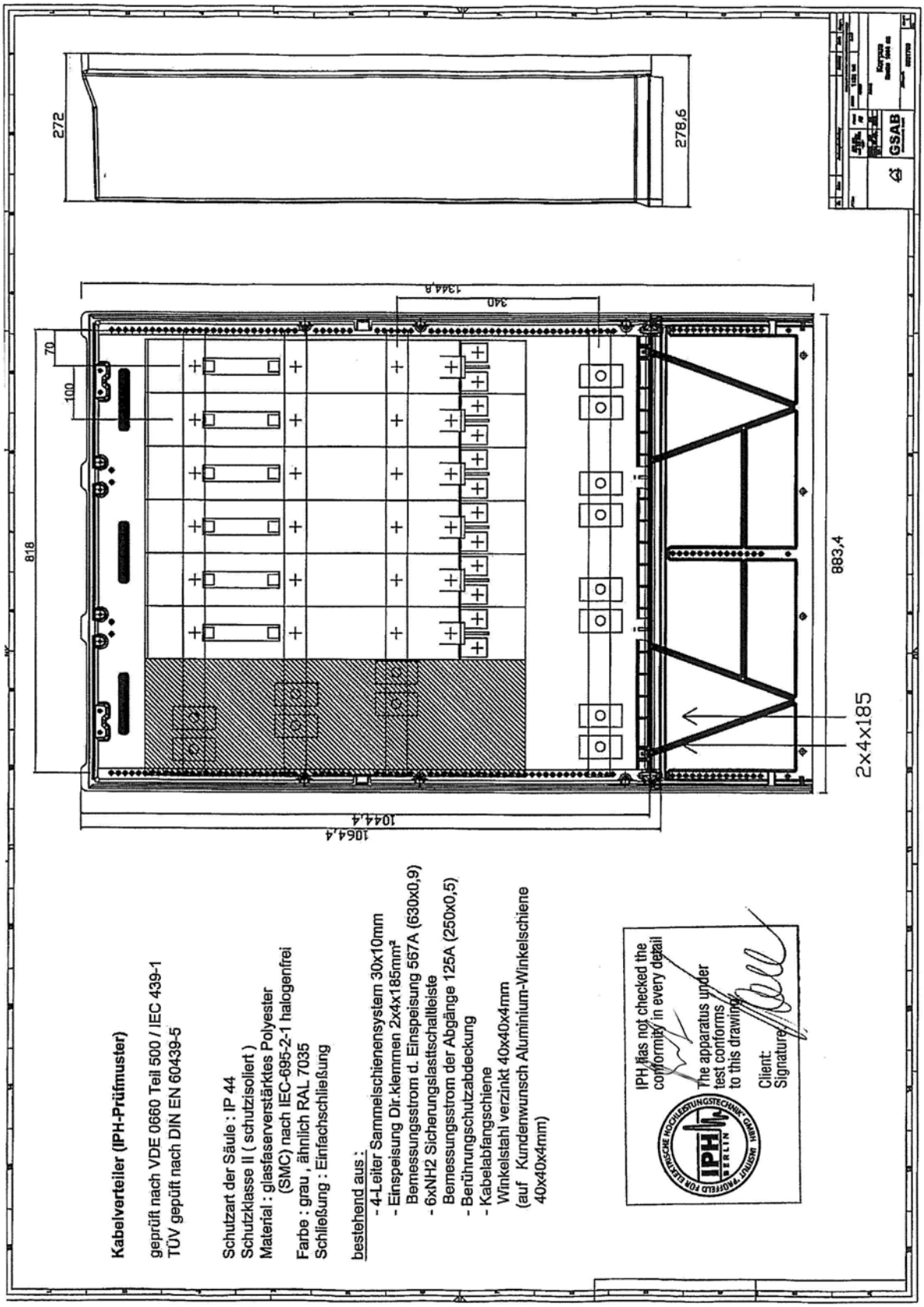


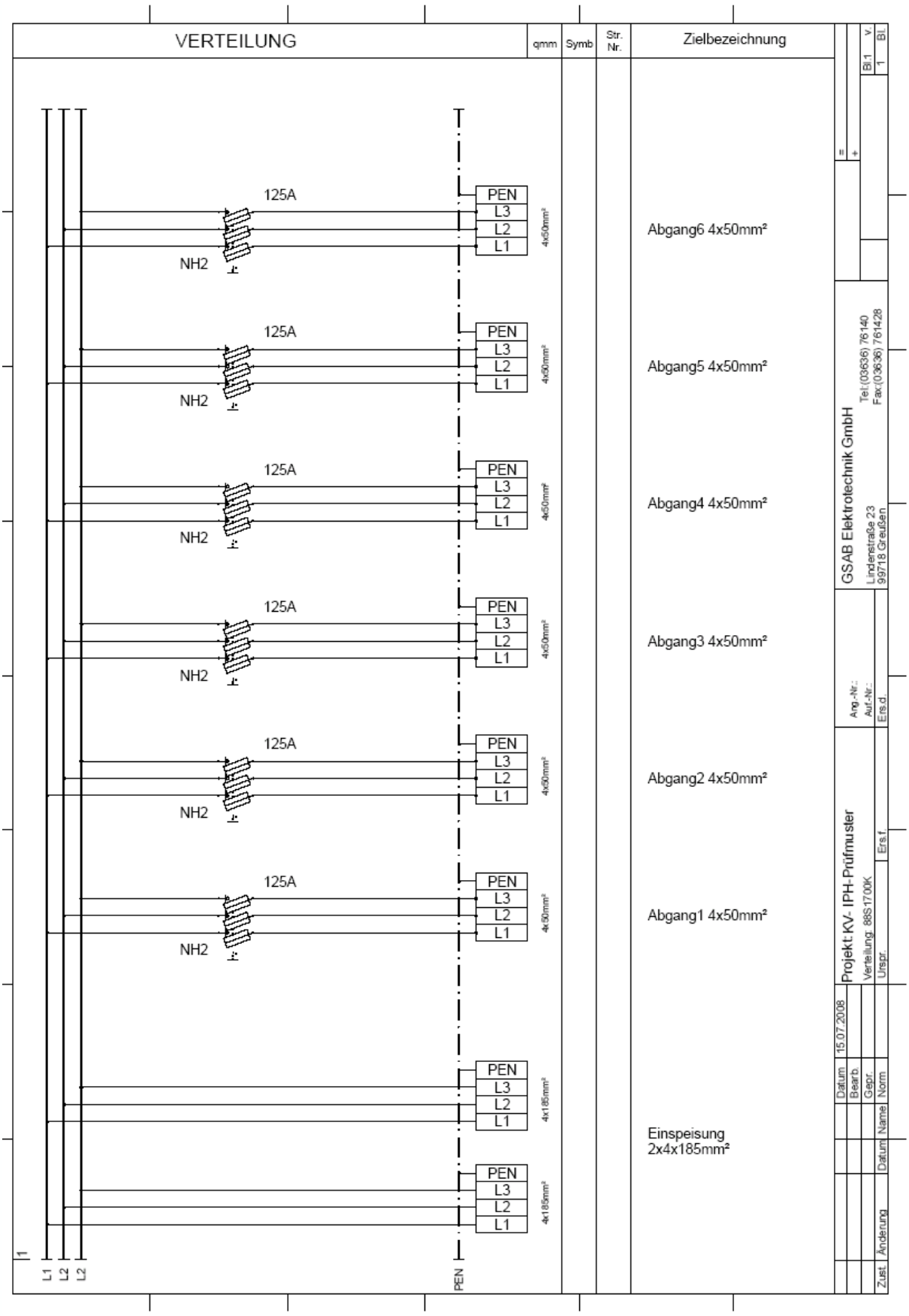

Test-No. 2083540
40.0
20.0
0.0
-20.0
-40.0
i L3 [kA]
20
40
60
80
100
1.0
0.0
-1.0
-2.0
u L3 [kV]
20
40
60
80
100
t [ms]

Test-No. 2083541



12. Drawings


272
278,6
1344,8
340
70
100
818
883,4
2x4x185
1044,4
1064,4
Kabelverteiler (IPH-Prüfmuster)
geprüft nach VDE 0660 Teil 500 / IEC 439-1
TÜV geprüft nach DIN EN 60439-5
Schutzart der Säule : IP 44
Schutzklasse II (schutzisoliert)
Material : glasfaserverstärktes Polyester
(SMC) nach IEC-695-2-1 halogenfrei
Farbe : grau , ähnlich RAL 7035
Schließung : Einfachschließung
bestehend aus :
- 4-Leiter Sammelschienensystem 30x10mm
- Einspeisung Dir.klemmen 2x4x185mm²
Bemessungsstrom d. Einspeisung 567A (630x0,9)
- 6xNH2 Sicherungslasttschaltleiste
Bemessungsstrom der Abgänge 125A (250x0,5)
- Berührungschutzabdeckung
- Kabelabfangschiene
Winkelstahl verzinkt 40x40x4mm
(auf Kundenwunsch Aluminium-Winkelschiene
40x40x4mm)
IPH has not checked the conformity in every detail
The apparatus under test conforms to this drawing
Client:
Signature
GSAB


VERTEILUNG
qmm
Symb
Str. Nr.
Zielbezeichnung
125A
NH2
PEN
L3
L2
L1
4x50mm²
Abgang6 4x50mm²
Abgang5 4x50mm²
Abgang4 4x50mm²
Abgang3 4x50mm²
Abgang2 4x50mm²
Abgang1 4x50mm²
4x185mm²
Einspeisung
2x4x185mm²
L1
L2
L2
PEN
GSAB Elektrotechnik GmbH
Lindenstraße 23
99718 Greußen
Tel:(03636) 76140
Fax:(03636) 761428
Projekt: KV- IPH-Prüfmuster
Verteilung: 88S1700K
Ursp.
Ers.f
Ang.-Nr.:
Auf.-Nr.:
Ers.d
Datum
15.07.2008
Bearb.
Gepr.
Norm
Name
Datum
Änderung
Zust.
Bl.
Bl 1
1