Test Report

Document No.	B7019962	Copy No.	1	Number of pages	65

Apparatus	Polymer-housed surge arrester section type PA-DM section ST with additional thermal insulation
Designation	---
Serial Number	---
Manufacturer	Joint-Stock Company " Polymer-Apparat"
Client	Joint-Stock Company " Polymer-Apparat" Ak. Kostantinova str.,1 195427 Saint-Petersburg - Russia Federation
Tested for	---
Date(s) of tests	October 3 – 4, 2017
Tested by	CESI S.p.A. Via Rubattino, 54 20134 – Milano - Italy
Test performed	Operating duty test

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this document has been subjected to the series of proving tests in accordance with:

IEC 60099-4 – Edition 3.0 (2014-06)

The results are shown in the record of proving tests and the oscillograms attached hereto. The ratings assigned by the Manufacturer are listed on the ratings page.
The document applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

November 20, 2017

Date	Gregori Marco B7019962 3059 AUT Test Engineer in charge	The Manager - Arcidiaco Lorenzo B7019962 821814 APP Approved By Document Digitally Signed

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
LAB N° 0030

The laboratory meets the requirements of the Standard EN ISO/IEC 17025: 2005 "General Requirements for the Competence of Testing and Calibration Laboratories". The in force status of the accreditation and the list of accredited tests may be checked in the WEB site: www.accredia.it

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Notes

STL-Member

CESI Group members are founder members of the SHORT-CIRCUIT TESTING LIAISON (STL) which has been established in 1969. STL is a forum for voluntary international cooperation of testing organizations.

CESI Group Test Documents description

Type Test Certificate of .....

Issued for type tests of high voltage products (> 1 kV_{ac}; > 1,5 kV_{dc}), which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. The Type Test Certificate consists of documents unequivocally identifying the test object and describes all conditions under which the tests were conducted. It gives evidence of the unobjectionable behavior of the test object during the tests in line with the normative documents applied as well as of the results of successful testing.

Test Certificate of (complete / selected) Type Tests

Issued if type tests of low voltage products (< 1 kV_{ac}; < 1,5 kV_{dc}) requested by the relevant product standard were passed. For these tests the equipment under test must be clearly identified by technical description, drawings, and additional specifications.

Certificate of Design Verification

Issued for passed design verification tests according to IEC 61439. For these tests the equipment under test must be clearly identified by technical description, drawings, and additional specifications.

Type Test Report

Issued for high and low voltage products if parts of selected type tests have been passed; those shall be carried out in full compliance with the relevant standards but (for high voltage products) do not fulfill all STL requirements for issuing a Type Test Certificate. For these tests the equipment under test must be clearly identified by technical description, drawings, and additional specifications.

Test Report

Issued for all other tests on high and low voltage products which have been carried out according to specifications, standards and/or client instructions

On-Site Test Record

Issued as a record of results acquired during the on-site tests / measurements

Test Award

Can be additionally issued for all named types of test documents above if the tests to be referenced were passed

Tests witnessed by:

--- ---

Identification of the object: Requested

The Manufacturer guarantees that the tested object is manufactured according to the submitted drawings.
CESI checked that these drawings adequately represent in shape and dimensions the essential details and the parts of the tested object.
These drawing, identified by CESI and numbered B7024364 No. 1 , is annexed to this document.

Test evaluation
With reference to the Standards/Specifications listed in the first page and the characteristics of the tested sample assigned by manufacturer, the carried out tests passed SUCCESSFULLY.

The reported expanded uncertainties are determined in accordance with the Publication JCGM 100"Evaluation of measurement data - Guide to the expression of uncertainty in measurement" and are based on a standard uncertainty multiplied by a coverage factor k = 2, which for a normal distribution provides a level of confidence of approximately 95 %.

- Voltage a.c. **: ± 3,0%**
- Residual peak voltage (impulse tests) **: ± 3,0%**
- Current a.c. **: ± 3,0%**
- Peak current (impulse tests) **: ± 3,0%**
- Time (impulse tests) **: ± 10,0%**
- Time (a.c. tests) **: ± 1,5%**

Laboratory information

Receipt date of the sample September 2017

Test location CESI – Via Rubattino 54 – Milan

CESI testing team Mr L. Podavitte – Mr I. Guacci

Test laboratory P177

ODV SAP 70006781

Test object characteristics (assigned by the client)

Manufacturer's name	Joint-Stock Company " Polymer-Apparat"
Polymer-housed surge arrester section type	PA-DM section ST
Drawing code	PA-DM.001.ST.02
MO-resistor supplier's	Joint-Stock Company " Polymer-Apparat"
Metal-oxide resistor type	B34/30
Arrester class	Distribution
Designation	DH
Number of MO resistor fitted	1
Nominal discharge current - [kA]	10
Rated voltage - U_r [kV]	1,077 x $U_{ref.}$
Continuous operating voltage - U_c [kV]	0,861 x $U_{ref.}$
Repetitive charge transfer rating – Q_{rs} [C]	0,4
Rated thermal charge transfer rating - Q_{th} [C]	1,1
Reference current - $I_{ref.}$ [mA]	1,0
Rated frequency - [Hz]	48÷62
Year of manufacture	08/2017

geometrical characteristics measured on the MO resistor

Total height [mm]	31,1 mm
Diameter [mm]	36,6 mm

Photographs of the test object

Photo no. 1

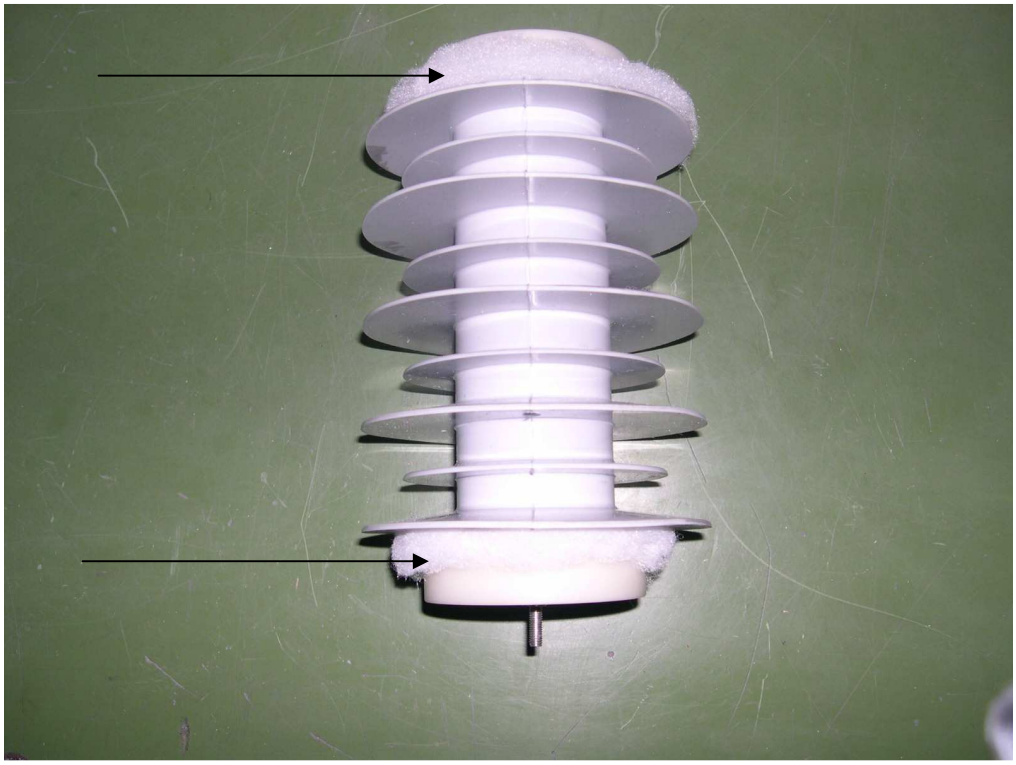


Photo no. 2

Polymer-housed surge arrester section type PA-DM section ST with additional thermal insulation

Reference Standard

IEC 60099-4 (20014/06) – Edition 3.0 - Clause 10.8.7
"Metal-oxide surge arresters without gaps for a.c. system"

Test carried out	Number of sample tested
Operating duty test	3

Test object identification

Test object name	Identification of test sample (given by CESI)	Identification of test sample (given by JSC "Polymer Apparat)
Polymer-housed surge arrester section type PA-DM section ST with additional thermal insulation	OD1	00006
	OD2	00007
	OD3	00008

Test procedure

1. Test performed on Polymer-housed metal-oxide surge arrester section in open air

The test procedure consisted of the following sequence:

Initial test

a) Measurement of the lightning impulse residual voltage at the nominal discharge current
b) Measurement of the power frequency reference voltage at the reference current

Conditioning

c) Application of a high current impulse 4/10 µs at 100 kA

2. Test performed on Polymer-housed metal-oxide surge arrester section assembled in thermal model

Thermal recovery test

d) Calculation of the voltage correction factors
e) The surge arrester sections were kept in an oven at the temperature of 66 °C till thermal equilibrium (not more than twenty hours)
f) Injection of two lightning current impulses 8/20 µs at the rated thermal charge transfer Q_{th}. A time shorter than 100 ms after the application of the second lightning current impulse energization at U_r' for 10 sec. and then at U_c' for 30 min. to verify the thermal stability.
   Note:
   - intervals between lightning duration current impulses: 60 seconds
   - nominal test frequency : 50 Hz

3. Test performed on Polymer-housed metal-oxide surge arrester section in open air

g) Measurement of the lightning impulse residual voltage at nominal discharge current for comparison with initial value
h) After that the sample has cooled to ambient temperature, two current impulses 8/20 at In have been applied for to check the integrity of the internal parts. The interval between impulses was 50-60 seconds.

Test result

The visual inspection of the sample after the test has revealed no sign of physical damage.
The variation of lightning impulse residual voltage before and after the test was less than 5% (maximum allowed variation according to reference standard is 5%). During the two last impulses the oscillograms not reveal any breakdown and the variation of lightning impulse residual voltage between the initial measurement and the last impulse was less than 5% (maximum allowed variation according to reference standard is 5%)
The thermal recovery was achieved.

The acceptance criteria are fulfilled and therefore the test result is positive.

Summary of test results

Variation of lightning impulse residual voltage at I_n

sample	before test		after test		Variation
	discharge current	residual voltage	discharge current	residual voltage	
	kA	kV	kA	kV	%
OD1	10,12	14,24	10,12	14,50	+1,83
OD2	10,12	14,12	10,17	14,34	+1,56
OD3	10,13	14,13	10,18	14,25	+0,85

Variation of lightning impulse residual voltage between residual voltage measurement at In during initial test and residual voltage measurement at In during last impulse

sample	before test		after test (last impulse)		Variation
	discharge current	residual voltage	discharge current	residual voltage	
	kA	kV	kA	kV	%
OD1	10,12	14,24	9,95	14,47	+1,60
OD2	10,12	14,12	10,05	14,36	+1,70
OD3	10,13	14,13	10,13	14,27	+0,99

Visual inspection after the test

The visual external inspection of polymer-housed metal-oxide surge arrester section after the test has revealed no sign of physical damage

Operating duty test.

Lightning impulse residual voltage measurement before the test

Test circuit: A0120

Date: October 3, 2017

Sample	Requested current	Charging voltage	Oscillogram	Current waveshape	Discharge current	Residual Voltage
No.		kV	No.	µs	kA	kV
OD1	I_n	24,6	1	8,5/18,2	10,12	14,24
OD2		24,5	2		10,12	14,12
OD3		24,5	3		10,13	14,13

Notes:

Operating duty test.

Reference voltage test

Test circuit: A0019

Date: October 3, 2017

Sample No. OD1						
oscillogram	voltage	current	current	current	power	3rd harmonic amplitude
No.	kV	+ mA_{cr}	- mA_{cr}	mA_{rms}	W	µA
4	5,48	0,862	1,000	0,561	1,43	--

Sample No. OD2						
oscillogram	voltage	current	current	current	power	3rd harmonic amplitude
No.	kV	+ mA_{cr}	- mA_{cr}	mA_{rms}	W	µA
5	5,42	0,850	1,00	0,556	1,38	--

Sample No. OD3						
oscillogram	voltage	current	current	current	power	3rd harmonic amplitude
No.	kV	+ mA_{cr}	- mA_{cr}	mA_{rms}	W	µA
6	5,40	0,887	1,00	0,561	1,41	--

Operating duty test.

Conditioning: Application of one 100 kA 4/10 μs high current impulses

Test circuit: A0121

Date: October 3, 2017

Sample	Impulse	Charging voltage	Oscillogram	Discharge current	Current waveshape	Opposite polarity
No.	No.	kV	No.	kA	μs	%
OD1	1	85,0 x 2	7	101,3	4,5/9,2	9,0
OD2	1	85,0 x 2	8	101,4		
OD3	1	85,0 x 2	9	101,3		

Notes:

Operating duty test.

Voltage correction factor and thermal energy calculations

Date: October 4, 2017

Sample	U_{ref} [1]	KU_r [2]	KU_C [3]	U_r' [4]	U_c' [5]
No.	kV			kV	kV
OD1	5,48	1,077	0,861	5,902	4,718
OD2	5,42			5,837	4,667
OD3	5,40			5,816	4,649

[1] U_{ref} : measured reference voltage
[2] KU_r : maximum guaranteed factor for calculation of Ur' – $U_r/U_{ref.min.}$ (declared by the Manufacturer)
[3] KU_C : maximum guaranteed factor for calculation of Uc' – $U_c/U_{ref.min.}$ (declared by the Manufacturer)
[4] U_r' : corrected rated voltage [4] = [1] × [2]
[5] U_c' : corrected continuous operating voltage [5] = [1] × [3]

Sample	U_r'	Requested thermal charge transfer, Q_{th}	Requested Q_{th} per impulse
No.	kV	C	C
OD1	5,902	1,1	0,55 (±10%)
OD2	5,837		0,55 (±10%)
OD3	5,816		0,55 (±10%)

Operating duty test.

Application of the lightning current impulses 8/20 µs, corrected rated voltage U_r' and corrected continuous operating U_c' for evaluation of the thermal stability.

Test circuit: A0123-A0020-A0131

Sample No.: OD1

Ambient temperature: 23 °C
Preheating temperature: 66 °C

Date: October 4, 2017

Lightning current impulses 8/20 µs application

Oscillogram	Impulse	Charging voltage	Residual voltage	Discharge current	Q_{th}	Applicable range for Q_{th}
No.	No.	kV	kV	kA	C	C
10	1	61,0 x 2	---	38,70	0,55	0,495÷0,605
11	2	61,0 x 2	---	38,60	0,55	0,495÷0,605

Current impulse waveshape
(µs)
8,7 /18,2

Corrected rated voltage U_r' application

Oscillogram	Time	U_r'	Current	Current
No.	s	kV	+ mA_{cr}	- mA_{cr}
12	0	5,902	66,0	110,0
13	10		26,0	52,0

Corrected continuous operating voltage U_c' application to evaluate the thermal stability

Oscillogram	Time	U_c'	Current	Current	Power	Temperature
No.	min	kV	+ mA_{cr}	- mA_{cr}	W	°C
14	0	4,718	1,08	1,60	2,10	---
	5		0,97	0,97	1,00	---
	10		0,95	0,95	0,88	---
15	15		0,94	0,94	0,82	---
	20		0,94	0,93	0,74	---
	25		0,93	0,92	0,69	---
16	30		0,91	0,91	0,65	---

continued

Note :

Continued

Sample No.: OD2

Ambient temperature: 23 °C
Preheating temperature: 66 °C

Date: October 4, 2017

Lightning current impulses 8/20 µs application

Oscillogram	Impulse	Charging voltage	Residual voltage	Discharge current	Q_{th}	Applicable range for Q_{th}
No.	No.	kV	kV	kA	C	C
17	1	61,0 x 2	---	38,55	0,55	0,495÷0,605
18	2	61,0 x 2	---	38,50	0,55	0,495÷0,605

Current impulse waveshape
µs
8,7/18,2

Corrected rated voltage U_r' application

Oscillogram	Time	U_r'	Current	Current
No.	s	kV	+ mA_{cr}	- mA_{cr}
19	0	5,837	66,0	109,0
20	10		25,0	49,0

Corrected continuous operating voltage U_c' application to evaluate the thermal stability

Oscillogram	Time	U_c'	Current	Current	Power	Temperature
No.	min	kV	+ mA_{cr}	- mA_{cr}	W	°C
21	0	4,667	1,08	1,52	2,02	---
	5		1,07	1,04	1,10	---
	10		0,89	0,98	0,99	---
22	15		0,96	0,96	0,88	---
	20		0,94	0,94	0,77	---
	25		0,93	0,93	0,73	---
23	30		0,92	0,92	0,67	---

Note :

continued

Continued

Sample No.: OD3

Ambient temperature: 23 °C
Preheating temperature: 66 °C

Date: October 4, 2017

Lightning current impulses 8/20 µs application

Oscillogram	Impulse	Charging voltage	Residual voltage	Discharge current	Q_{th}	Applicable range for Q_{th}
No.	No.	kV	kV	kA	C	C
24	1	61,0 x 2	---	38,25	0,55	0,495÷0,605
25	2	61,5 x 2	---	38,50	0,55	0,495÷0,605

Current impulse waveshape
µs
8,7 /18,2

Corrected rated voltage U_r' application

Oscillogram	Time	U_r'	Current	Current
No.	s	kV	+ mA_{cr}	- mA_{cr}
26	0	5,816	67,0	11,0
27	10		30,0	60,0

Corrected continuous operating voltage U_c' application to evaluate the thermal stability

Oscillogram	Time	U_c'	Current	Current	Power	Temperature
No.	min	kV	+ mA_{cr}	- mA_{cr}	W	°C
28	0	4,649	1,08	1,65	2,05	---
	5		0,98	1,00	0,97	---
	10		0,96	0,97	0,86	---
29	15		0,95	0,96	0,80	---
	20		0,94	0,95	0,73	---
	25		0,93	0,94	0,68	---
30	30		0,92	0,91	0,60	---

Note :

Operating duty test.

Lightning impulse residual voltage measurement after the test

Test circuit: A0120

Date: October 4, 2017

Sample	Requested current	Charging voltage	Oscillogram	Current waveshape	Discharge current	Residual Voltage
No.	kA	kV	No.	µs	kA	kV
OD1	10	24,6	31	8,6/18,3	10,12	14,50
OD2	10	24,6	32		10,17	14,34
OD3	10	24,6	33		10,18	14,25

Notes:

Operating duty test.

Additional two lightning impulses residual voltage measurement for check no damage occurred during the test

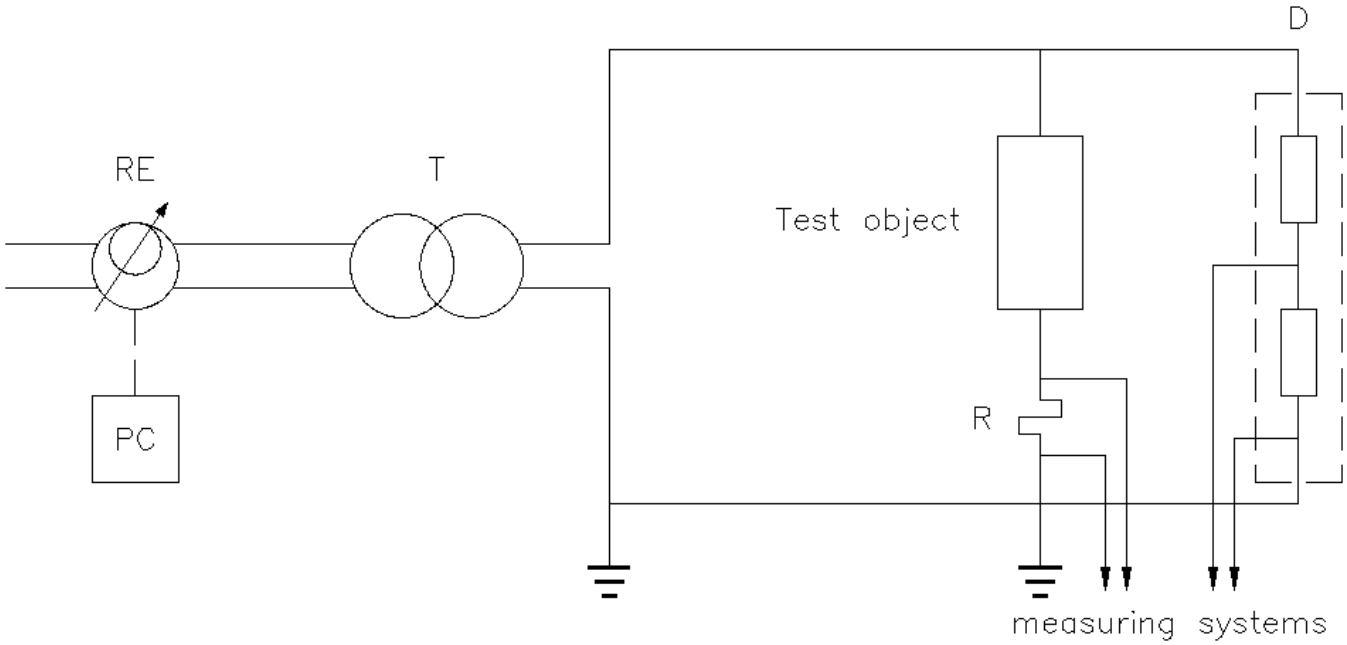
Test circuit: A0120

Date: October 4, 2017

Sample	Requested current	Charging voltage	Oscillogram	Current waveshape	Discharge current	Residual voltage
No.		kV	No.	µs	kA	kV
OD1	I_n	24,5	34	8,6/18,3	9,96	14,46
		24,5	35		9,95	14,47
OD2		24,5	36		10,10	14,31
		24,5	37		10,05	14,36
OD3		24,5	38		10,18	14,25
		24,5	39		10,13	14,27

Notes:

Circuit A0019



Power frequency supply

RE - programmable supply type PACIFIC A.C. Power Source 140 ASX.; CESI no. 0560408
PC - personal computer
T - voltage transformer type SPECIALTRASFO; power 30 kVA; voltage 200 V/15-30 kV

Current measuring system

R - Current shunt CESI No.31120; R= 940,5 Ω
- Electro optical system HBM CESI No. 57986(Rx) – 57987 (Tx)

OSC
- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122;
- CESI No 056227- 0562226 (on channel No.1)

Voltage measuring system

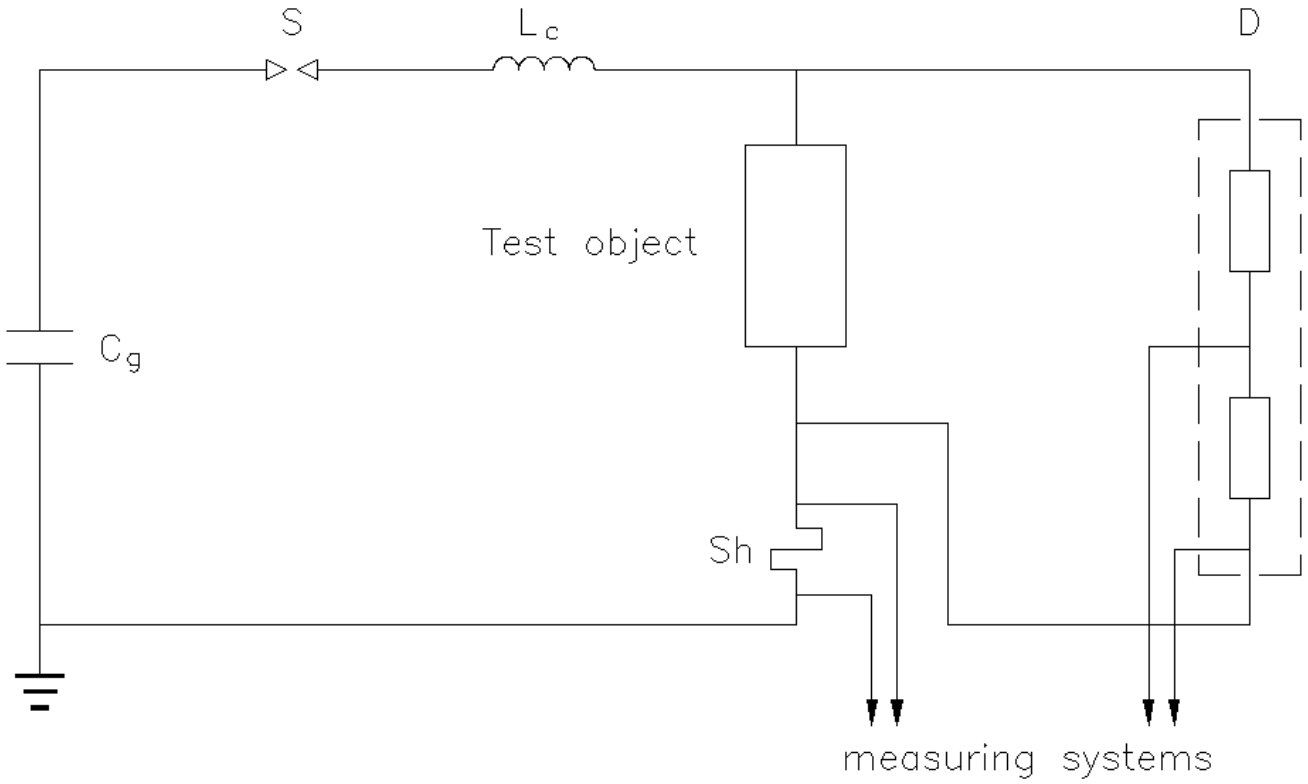
D - Voltage divider SAGI; CESI No.11120
- Electro optical system type HBM CESI No. 57986(Rx) – 57991 (Tx)

OSC
- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122;
- CESI No 056227- 0562226 (on channel No.2)

SOFTWARE SYSTEM:

SW - S.A.D. Surge arrester version 2.0

Circuit A0120



Impulse generator

No. of stages	1
Cg	6,64 µF
Lc	6 µH
S	- Spark-gap

Voltage measuring system.

D	- Voltage divider SAGI; CESI No.11120
	- Electro optical system type HBM CESI No. 57986(Rx) – 57991 (Tx)
OSC	- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122 - CESI No 056227- 0562226 (on channel No.2)

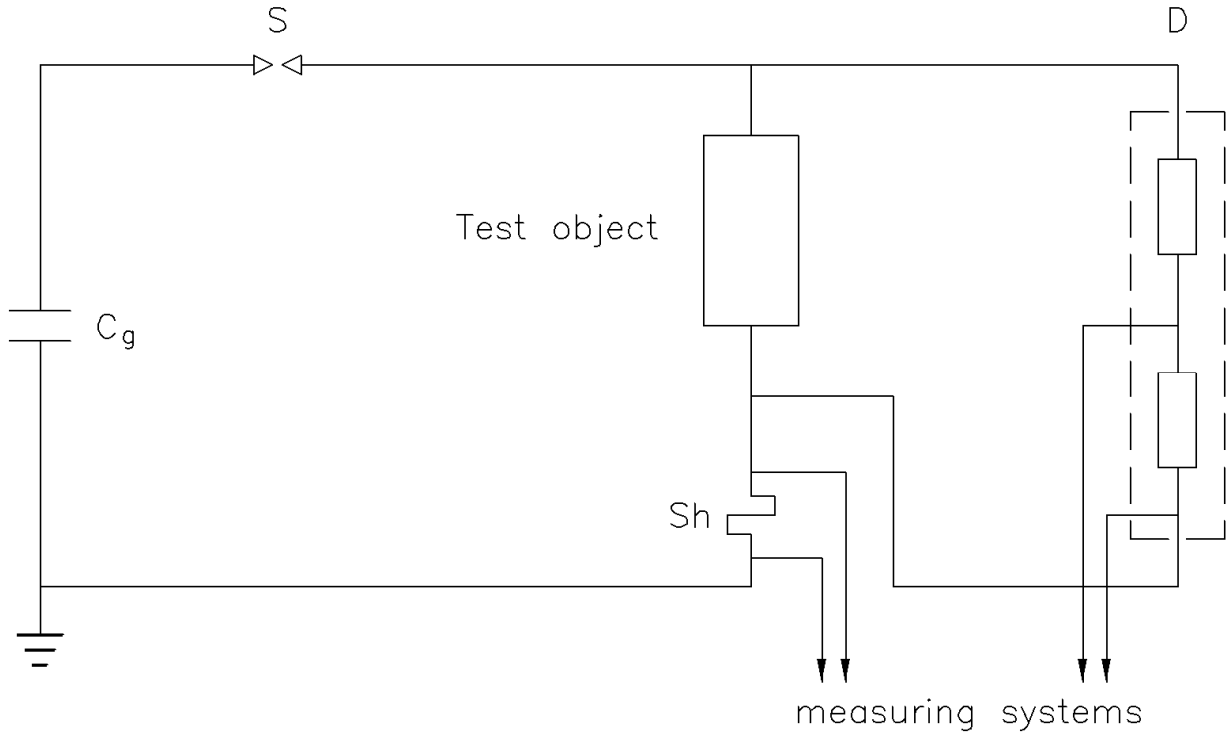
Current measuring system

Sh	- Current shunt CESI No.6042; R= 2 mΩ; peak current= 250 kA
	- Electro optical system HBM CESI No. 57986(Rx) – 57987 (Tx)
OSC	- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5152; - CESI No 056227- 0562226 (on channel No.1)

SOFTWARE SYSTEM:

SW - S.A.D. Surge arrester version 2.0

Circuit A0121



Impulse generator

No. of stages 2
Cg 2,91 µF

S - Spark-gap

Two blocks in series have been added

Voltage measuring system.(not used)

D - Voltage divider SAGI; CESI No.11120
- Electro optical system HBM CESI No. 57986(Rx) – 57991 (Tx)

OSC
- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122;
- CESI No 056227- 0562226 (on channel No.2)

Current measuring system

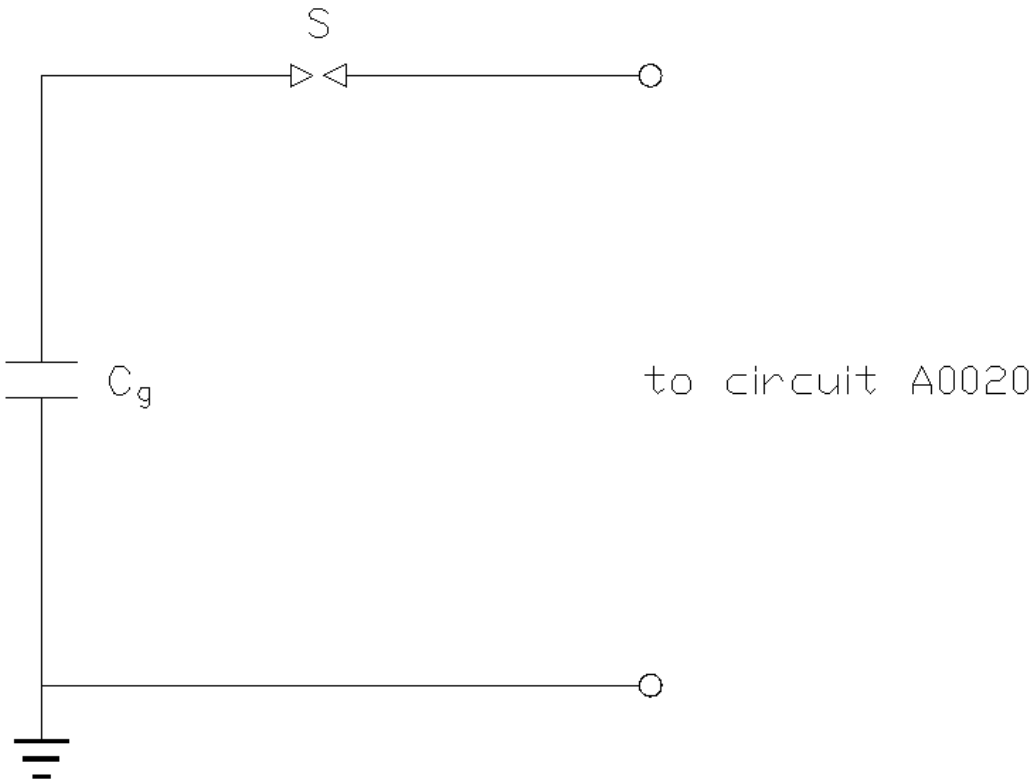
Sh - Current shunt CESI No.6042; R= 2 mΩ; peak current= 250 kA
- Electro optical system HBM CESI No. 57986(Rx) – 57987 (Tx)

OSC
- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122;
- CESI No 056227- 0562226 (on channel No.1)

SOFTWARE SYSTEM:

SW - S.A.D. Surge arrester version 2.0

Circuit A0123

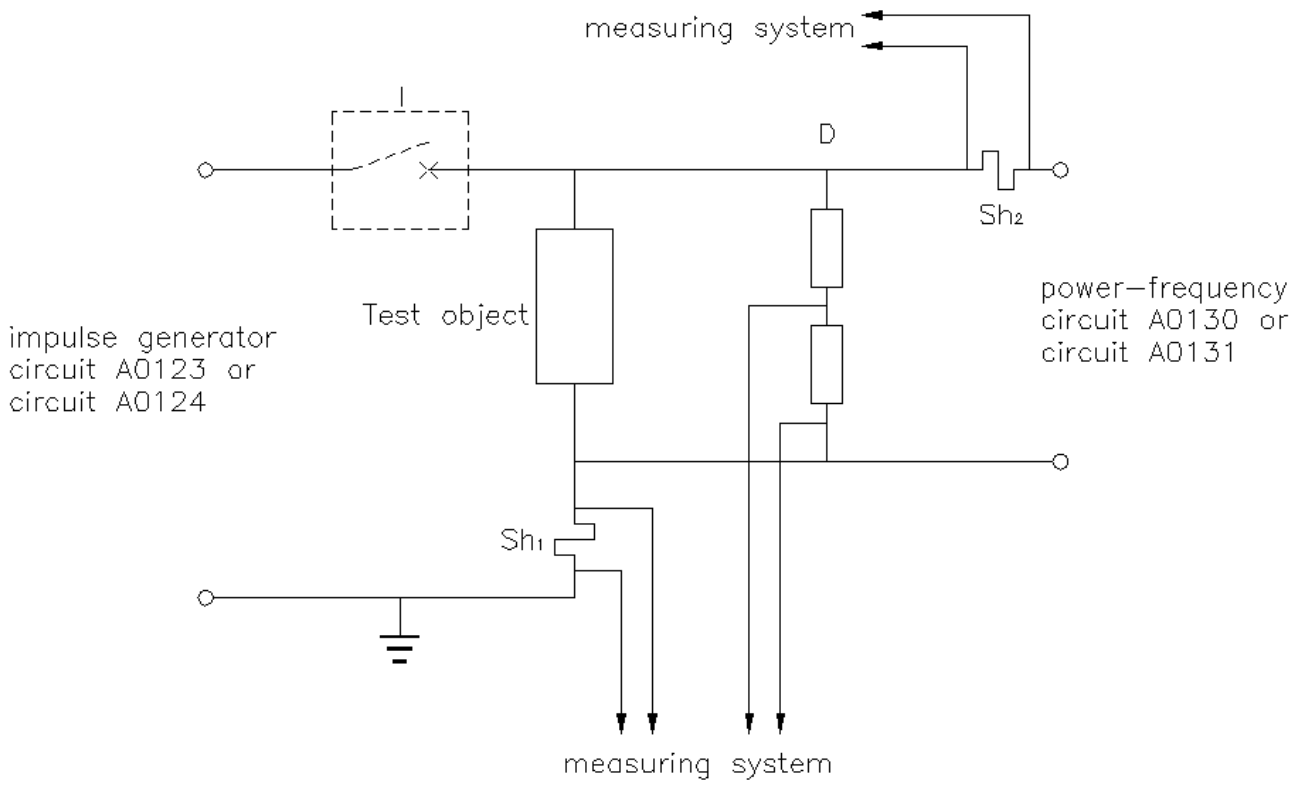


Impulse generator circuit for injection of Q_{th}

No. of stages 2
Cg 2,91 µF
Lc 12 µH

S - spark-gap

Circuit A0020



Impulse generator circuit A0123

Impulsive current measuring system

Sh_1	- Current shunt CESI No.6042; R= 2 m Ω
	- Electro optical system HBM CESI No. 57986(Rx) – 57987 (Tx)
$OSC_{2,3}$	- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122 - CESI No 056227- 0562226 (on channel No.2)
I	- Circuit-breaker

Power frequency circuit A0131

Voltage measuring system.

D	- Voltage divider SAGI; CESI No.11120
	- Electro optical system HBM CESI No. 57986(Rx) – 57991 (Tx)
$OSC_{2,3}$	- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122 - CESI No 056227- 0562226 (on channel No.2)

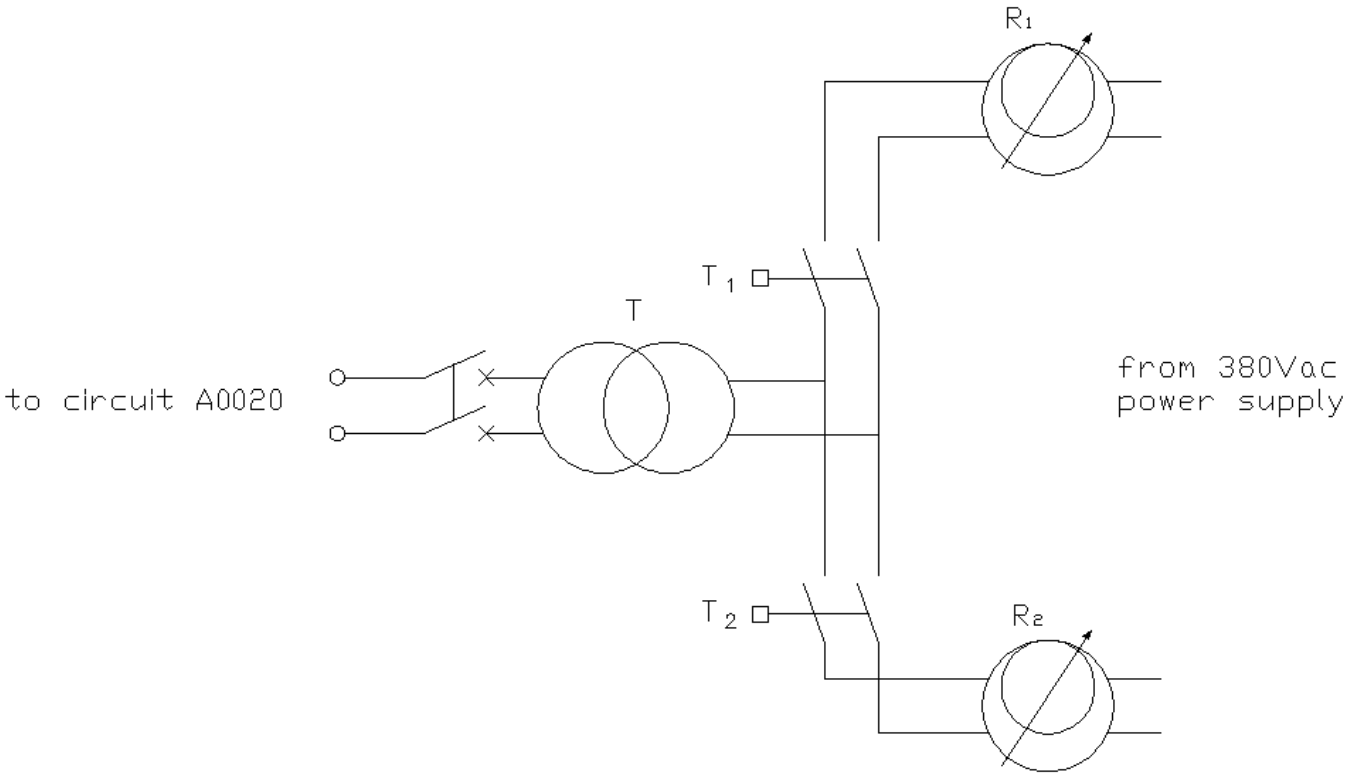
Current measuring system

Sh_2 (TOV - MCOV)	- Current shunt type CESI n. 058315 R= 500 Ω - Electro optical system CESI No. 57986(Rx) – 58294 (Tx)
$OSC_{2,3}$	- Oscilloscope type NATIONAL INSTRUMENT NI PXI-1031/NI-PXI 8108/NI-PXI 5122; - CESI No 056227- 0562226 (on channel No.1)

SOFTWARE SYSTEM:

SW - S.A.D. Surge arrester version 2.0

Circuit A0131

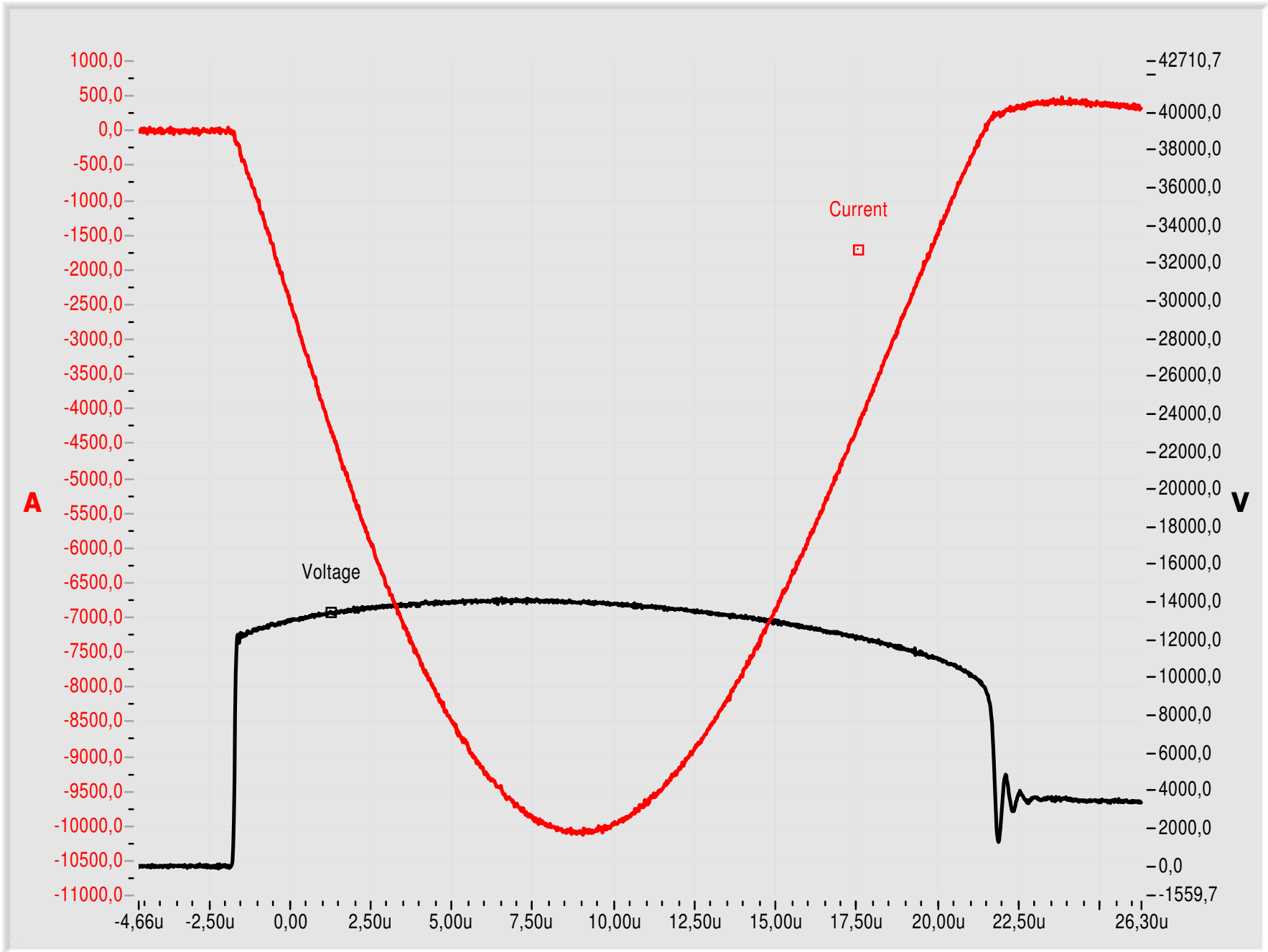


Power-frequancy circuit

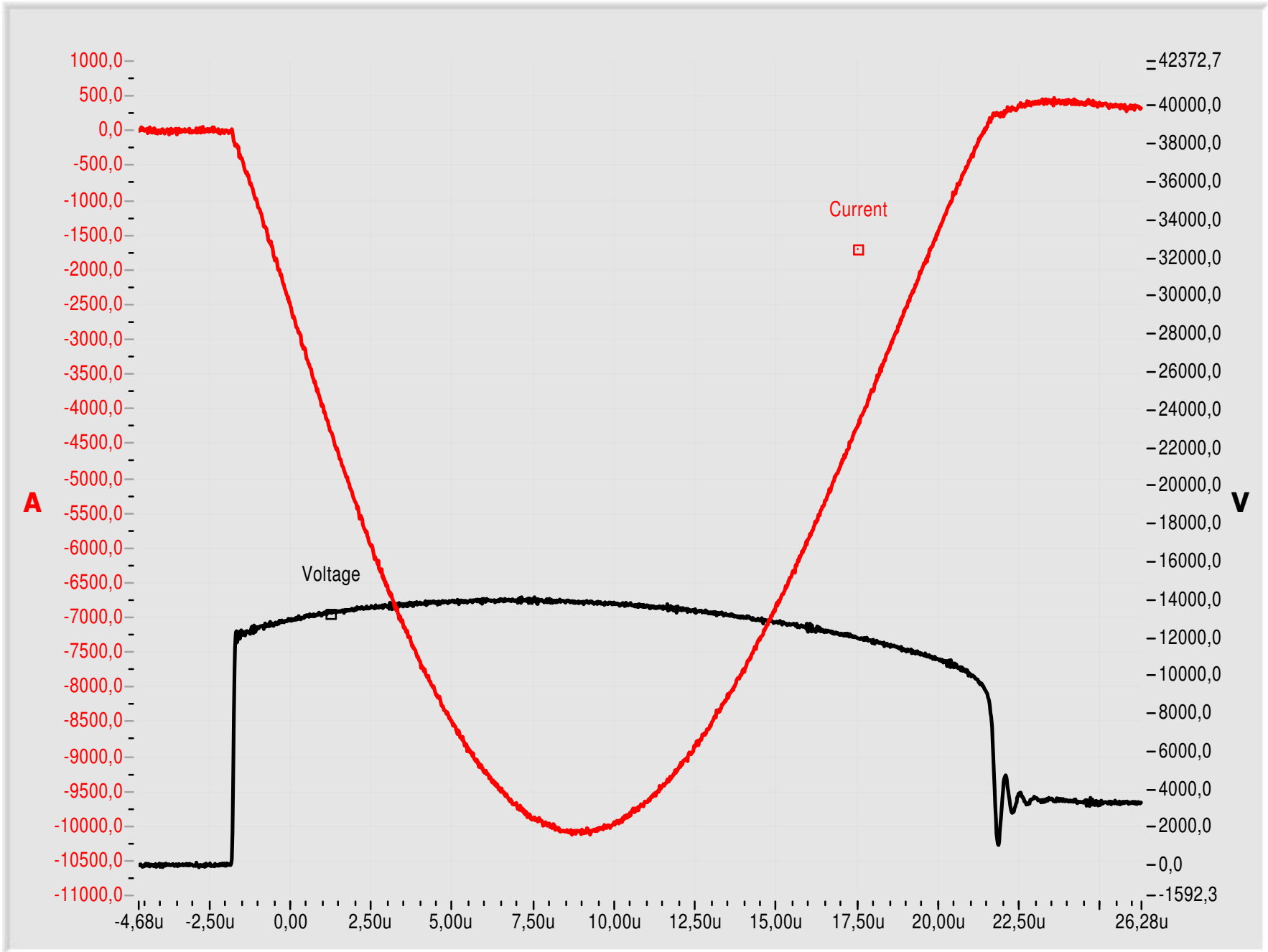
from 380Vac power supply

R_1 single-phase voltage regulator CORMES; power 20 kVA; voltage 380/04220 Vac
R_2 single-phase voltage regulator CORMES; power 10 kVA; voltage 380/04220 Vac
T_1 voltage transformer type SPECIALTRASFO; power 30 kVA; voltage 200-400 V/15-30 kV

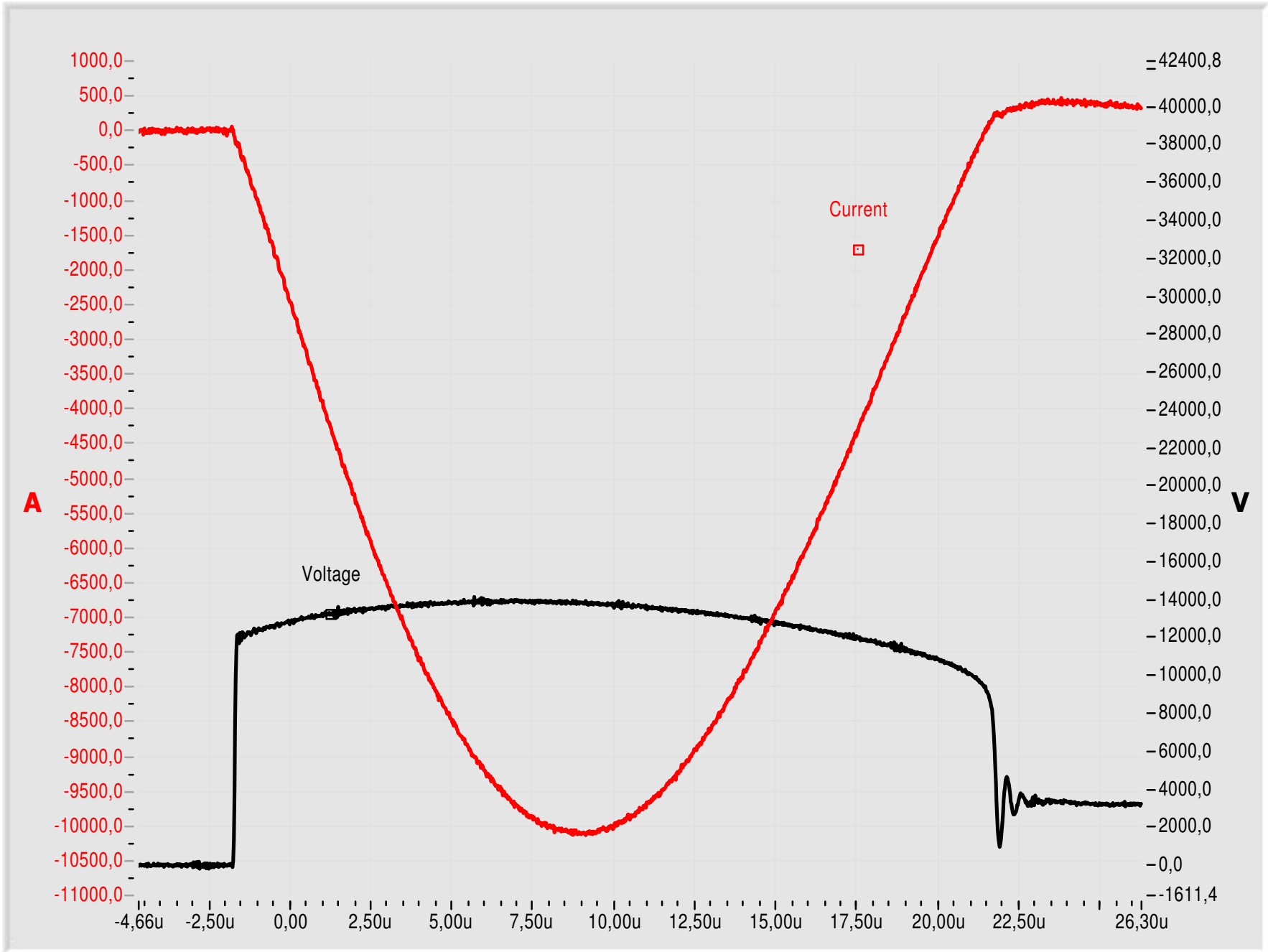
CESI B7019962 Oscillogram n. 1



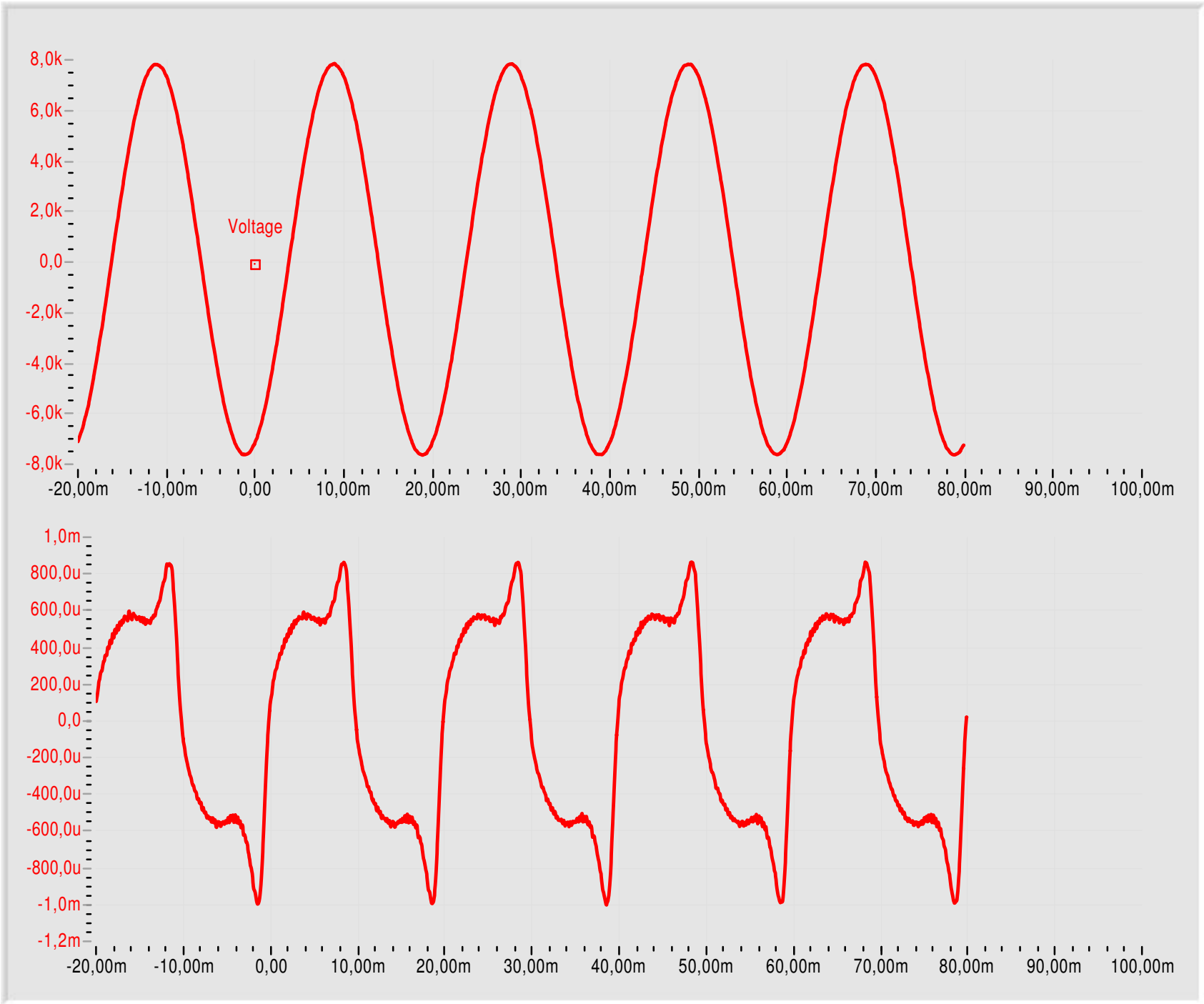
CESI B7019962 Oscillogram n. 2



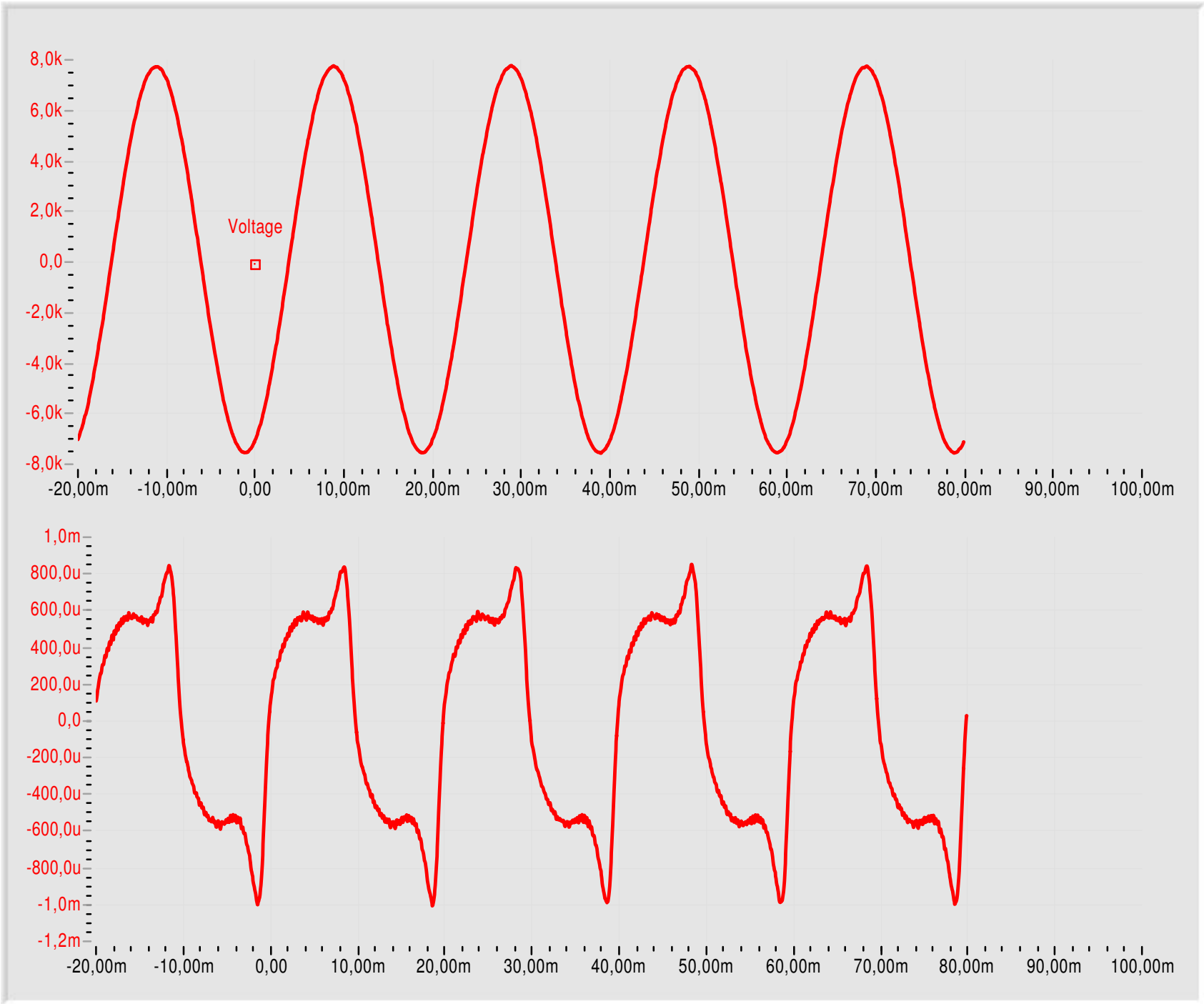
CESI B7019962 Oscillogram n. 3



CESI B7019962 Oscillogram n. 4



CESI B7019962 Oscillogram n. 5



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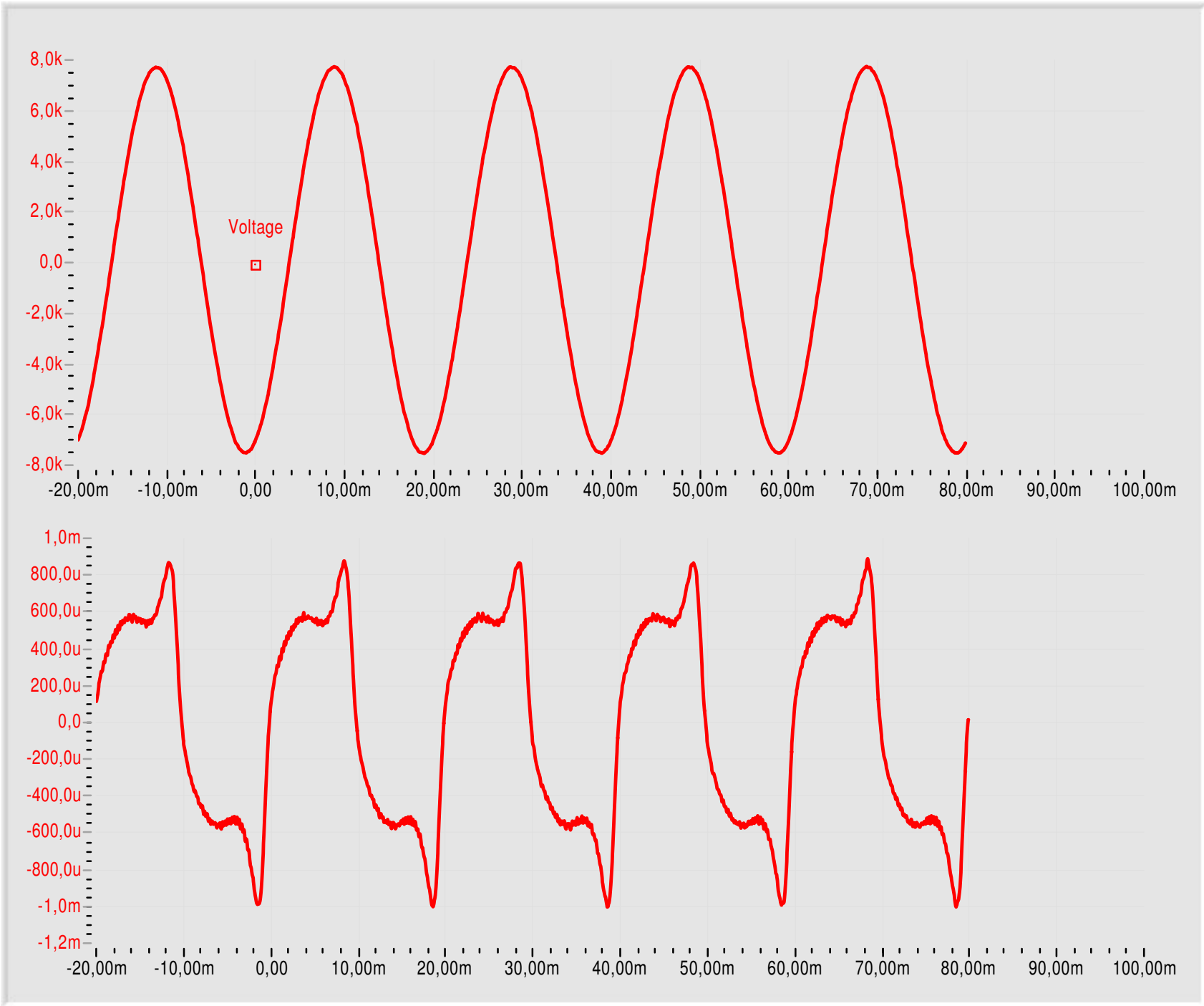
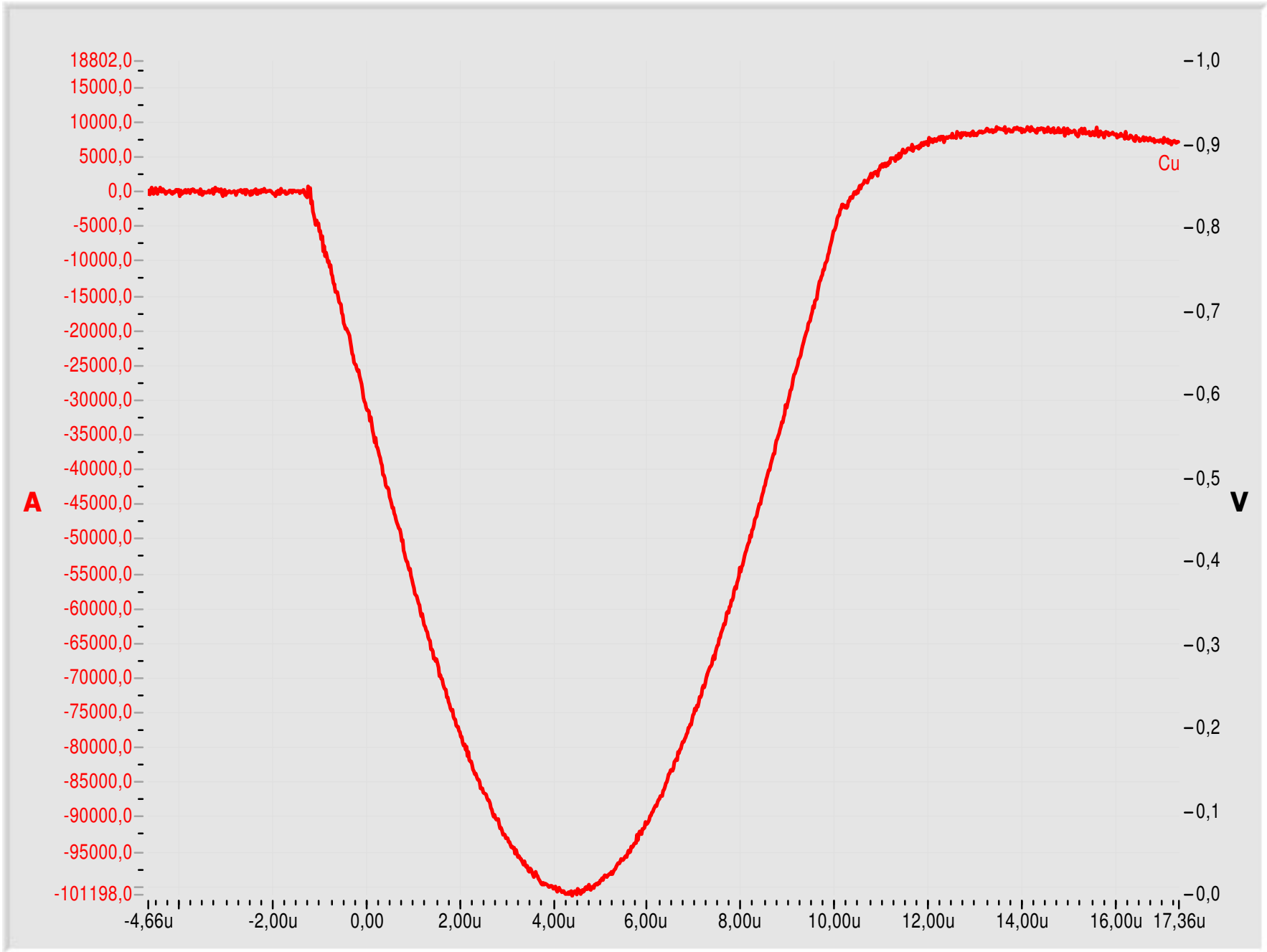
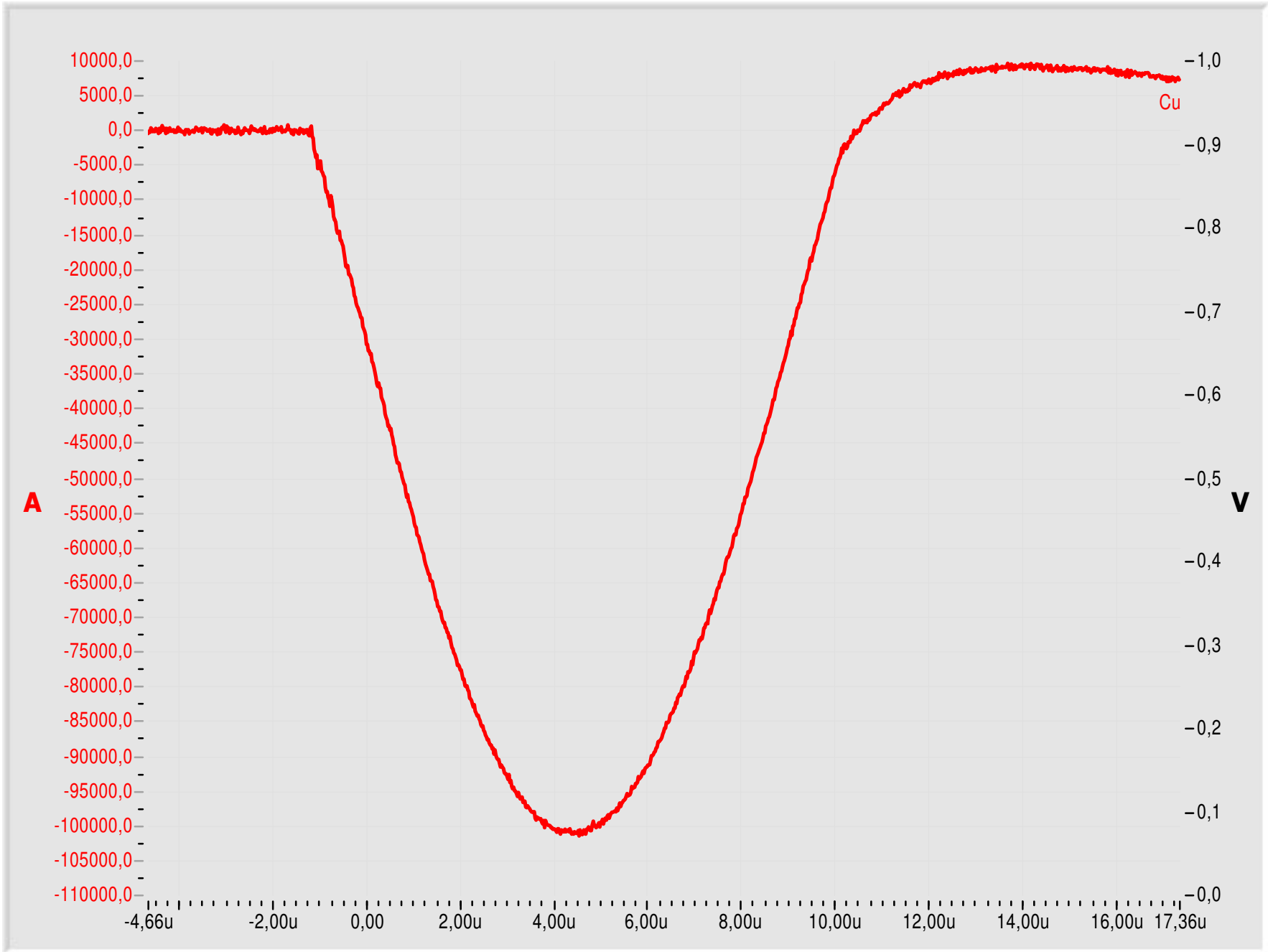


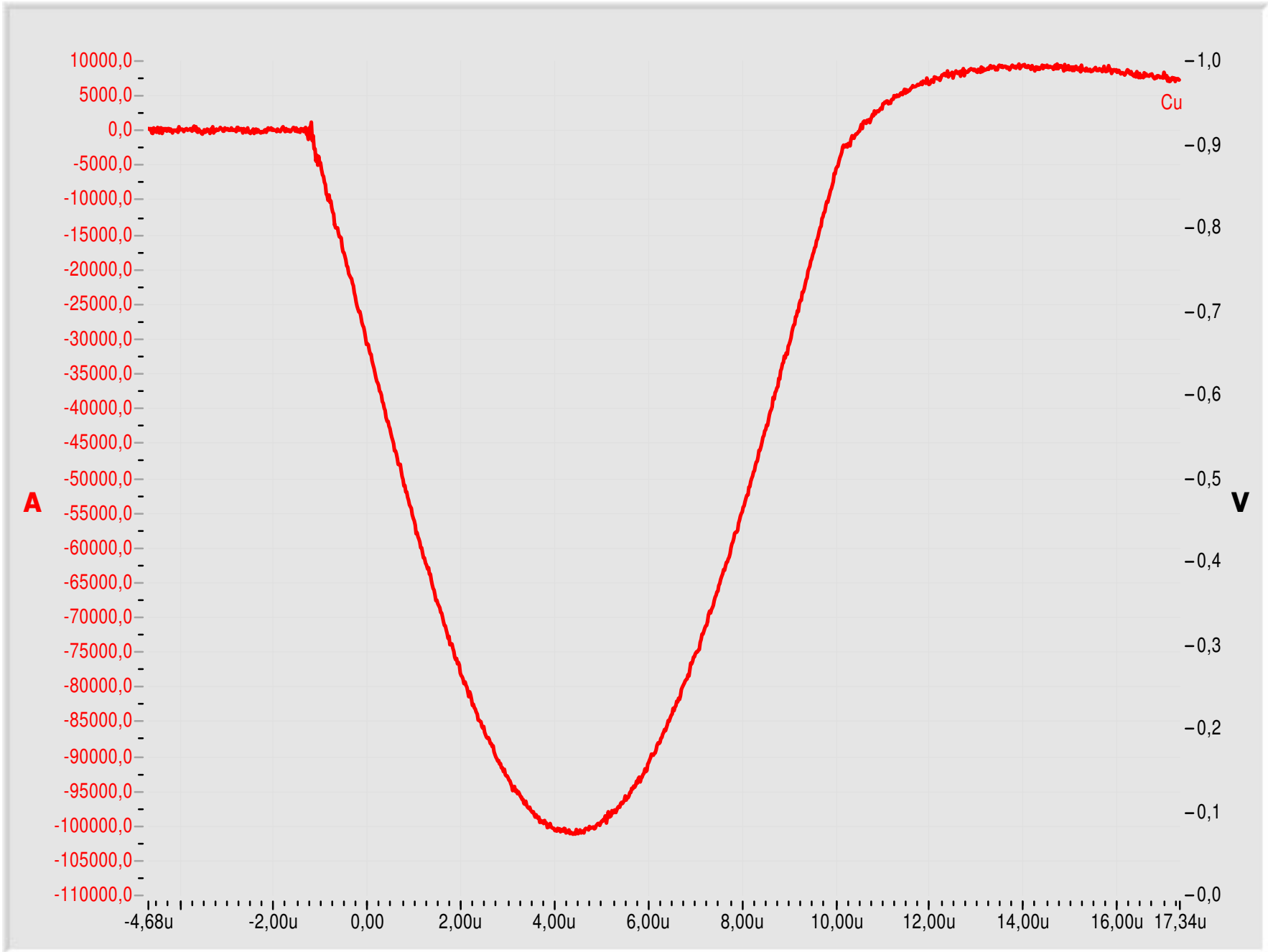
CESI B7019962 Oscillogram n. 7



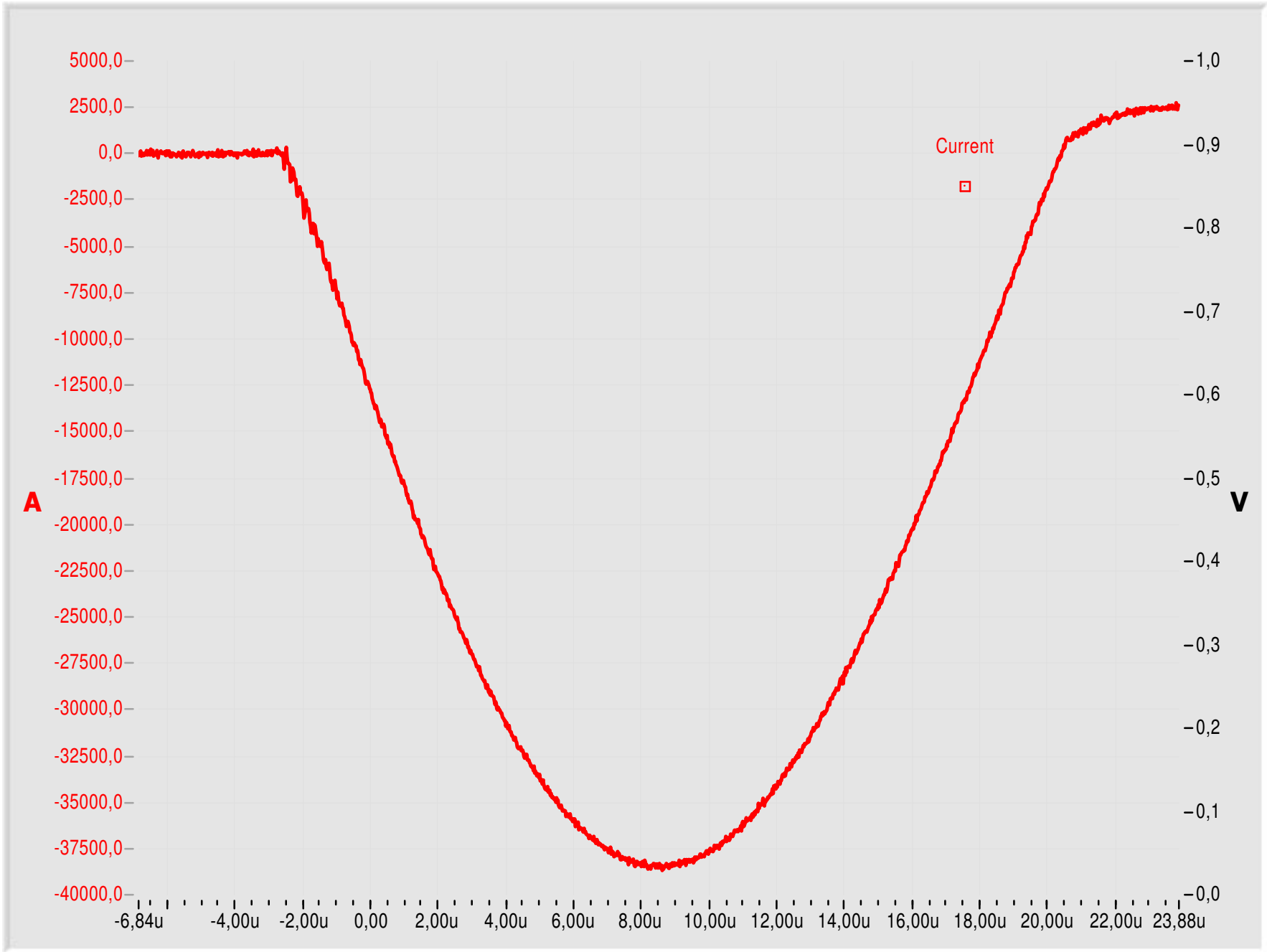
CESI B7019962 Oscillogram n. 8



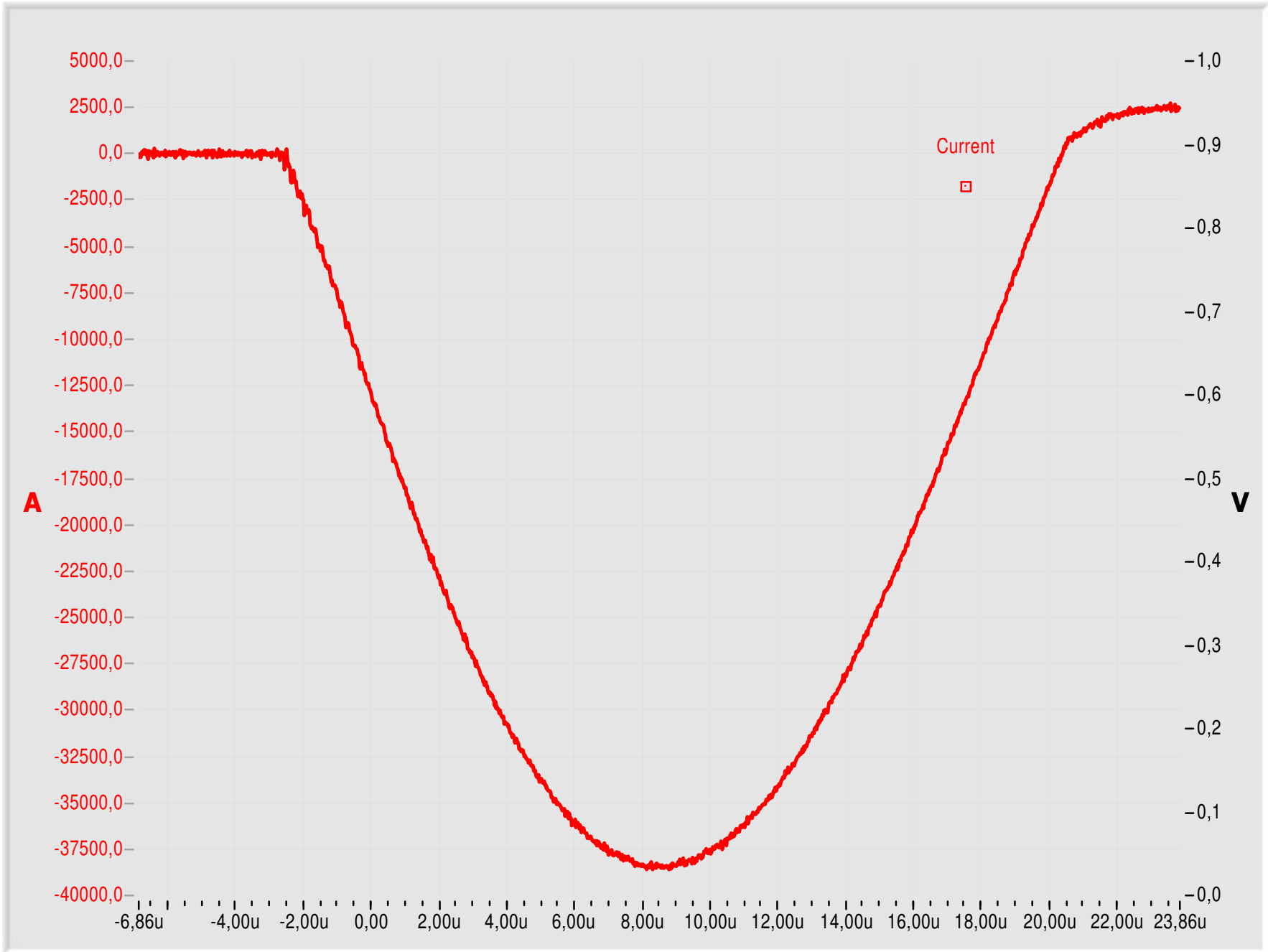
CESI B7019962 Oscillogram n. 9



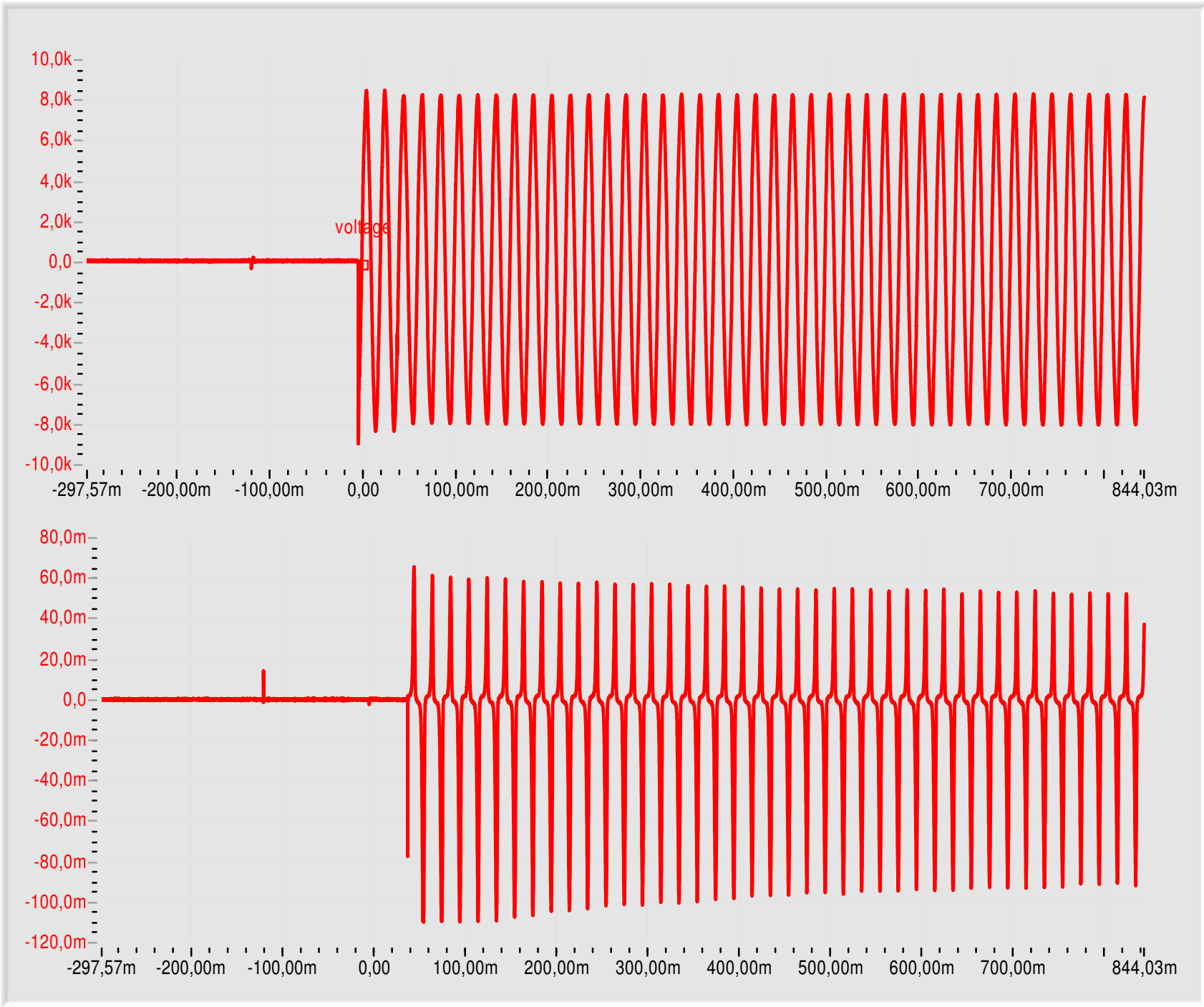
CESI B7019962 Oscillogram n. 10



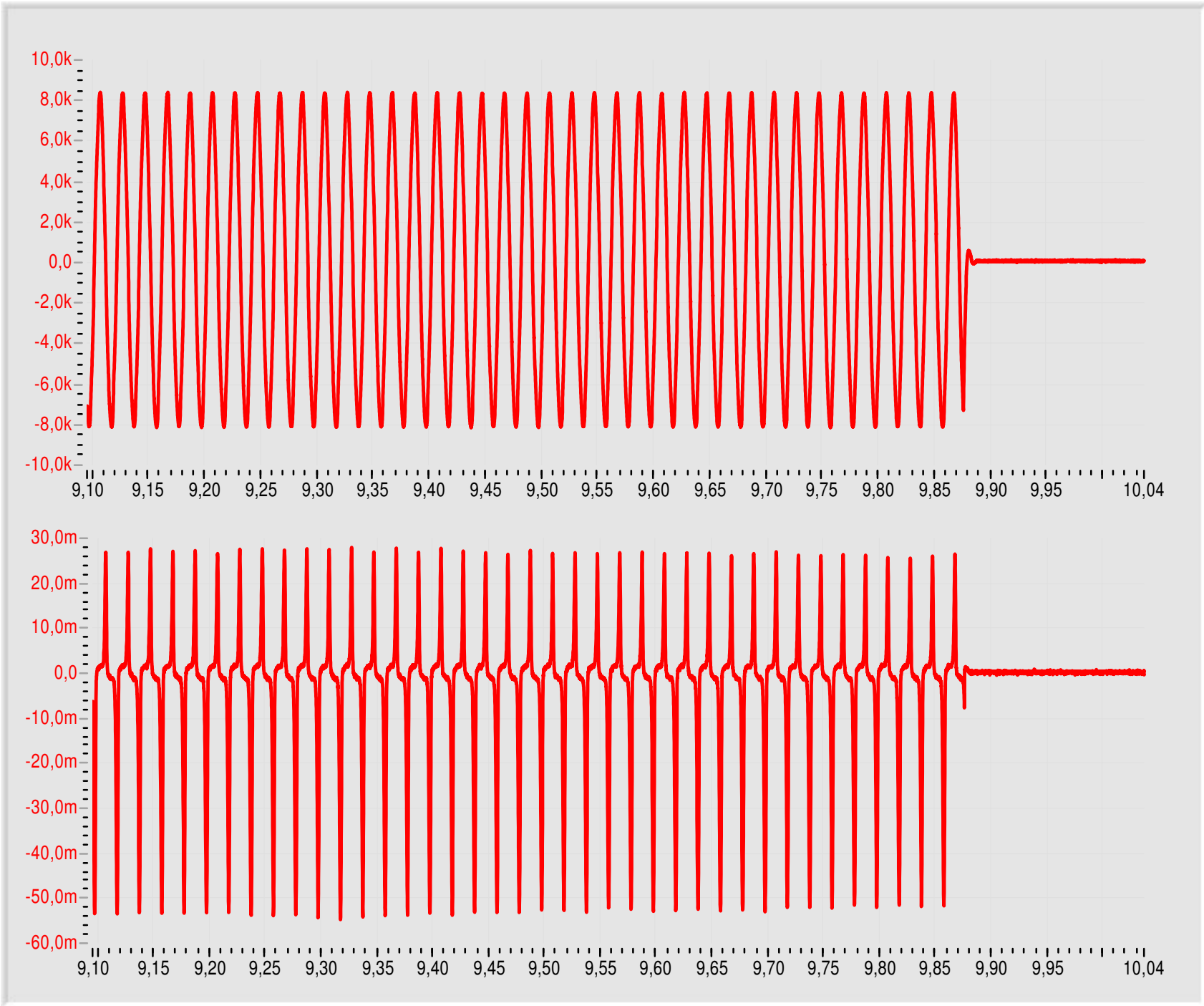
CESI B7019962 Oscillogram n. 11



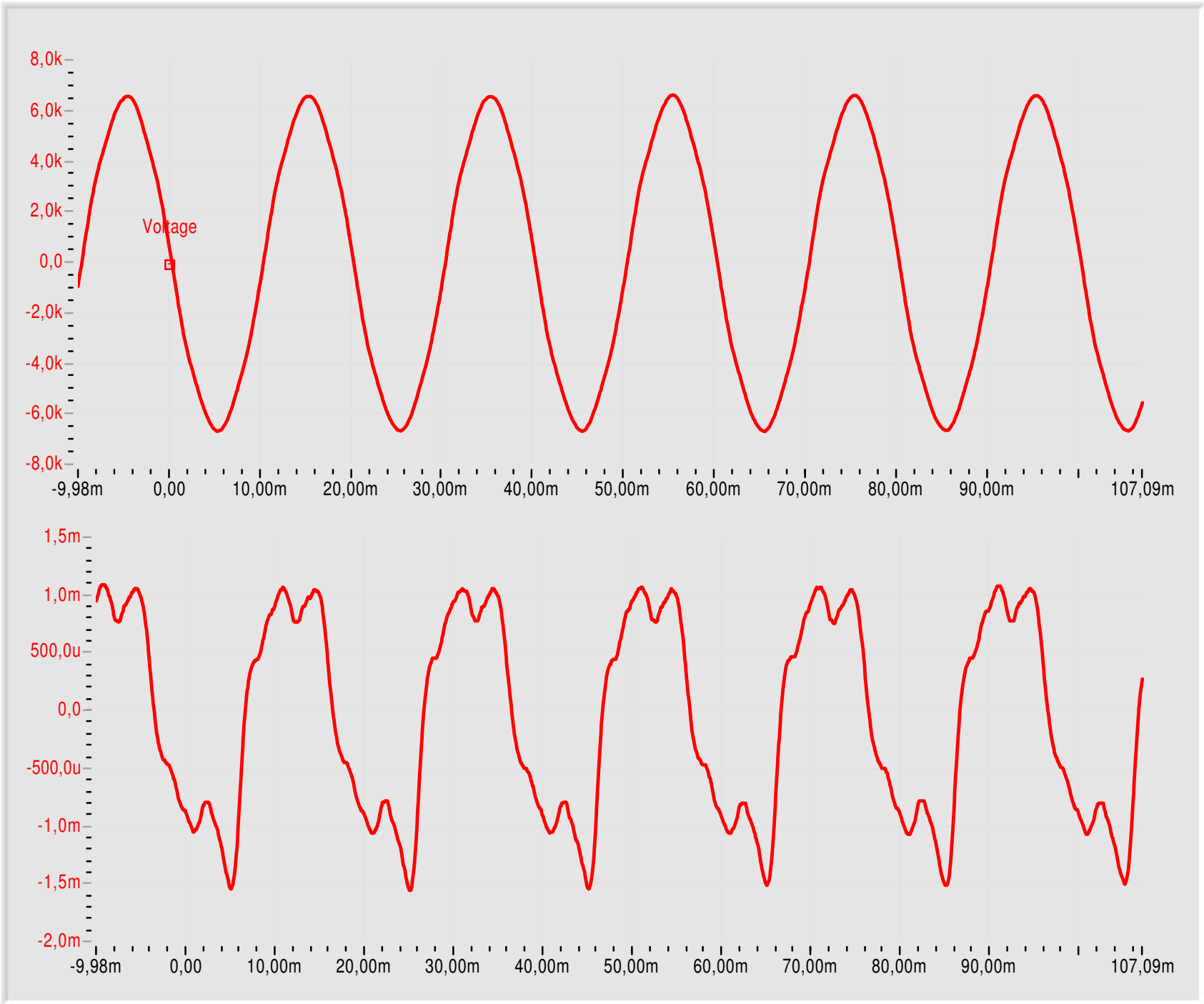
CESI B7019962 Oscillogram n. 12



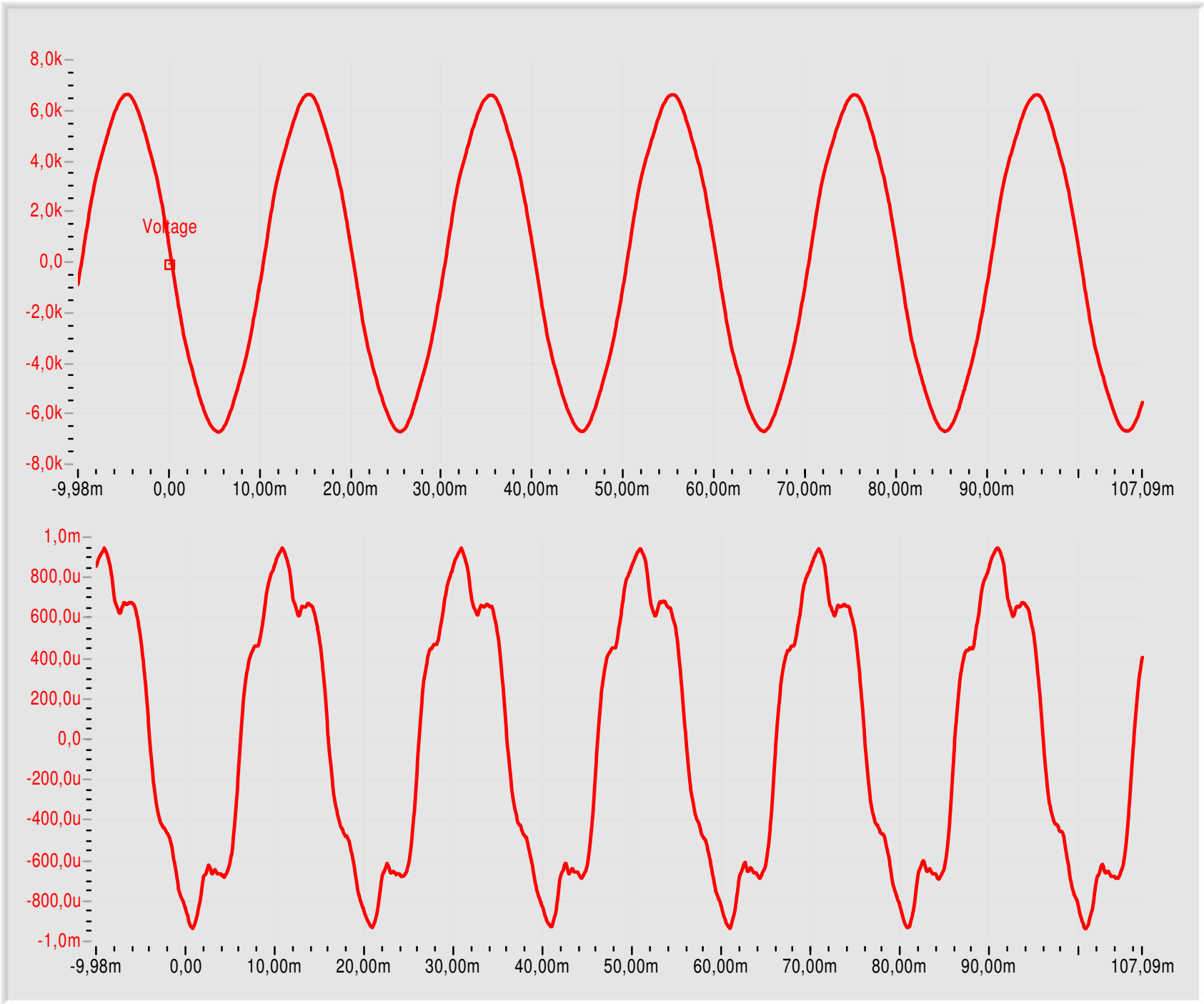
CESI B7019962 Oscillogram n. 13



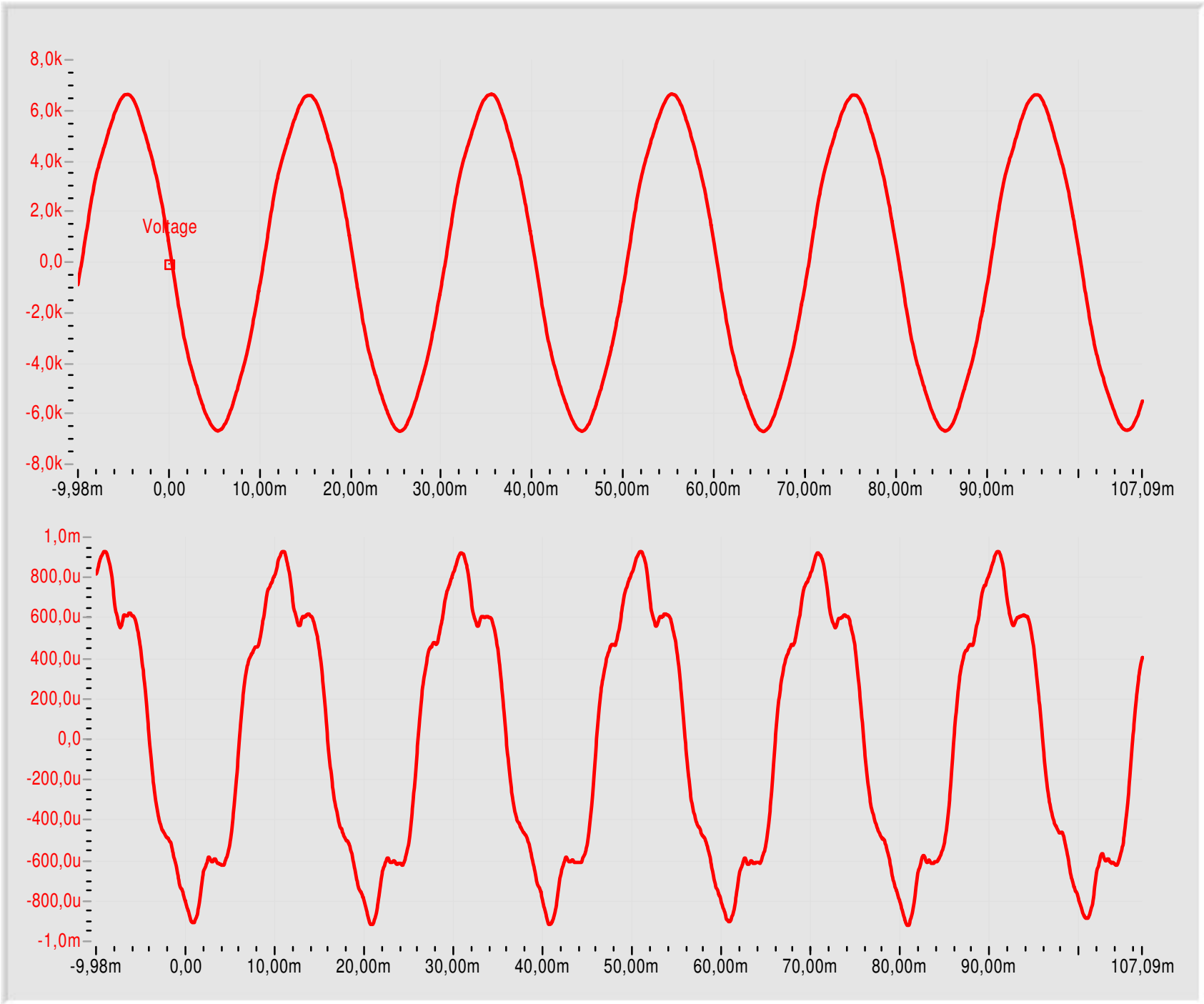
CESI B7019962 Oscillogram n. 14



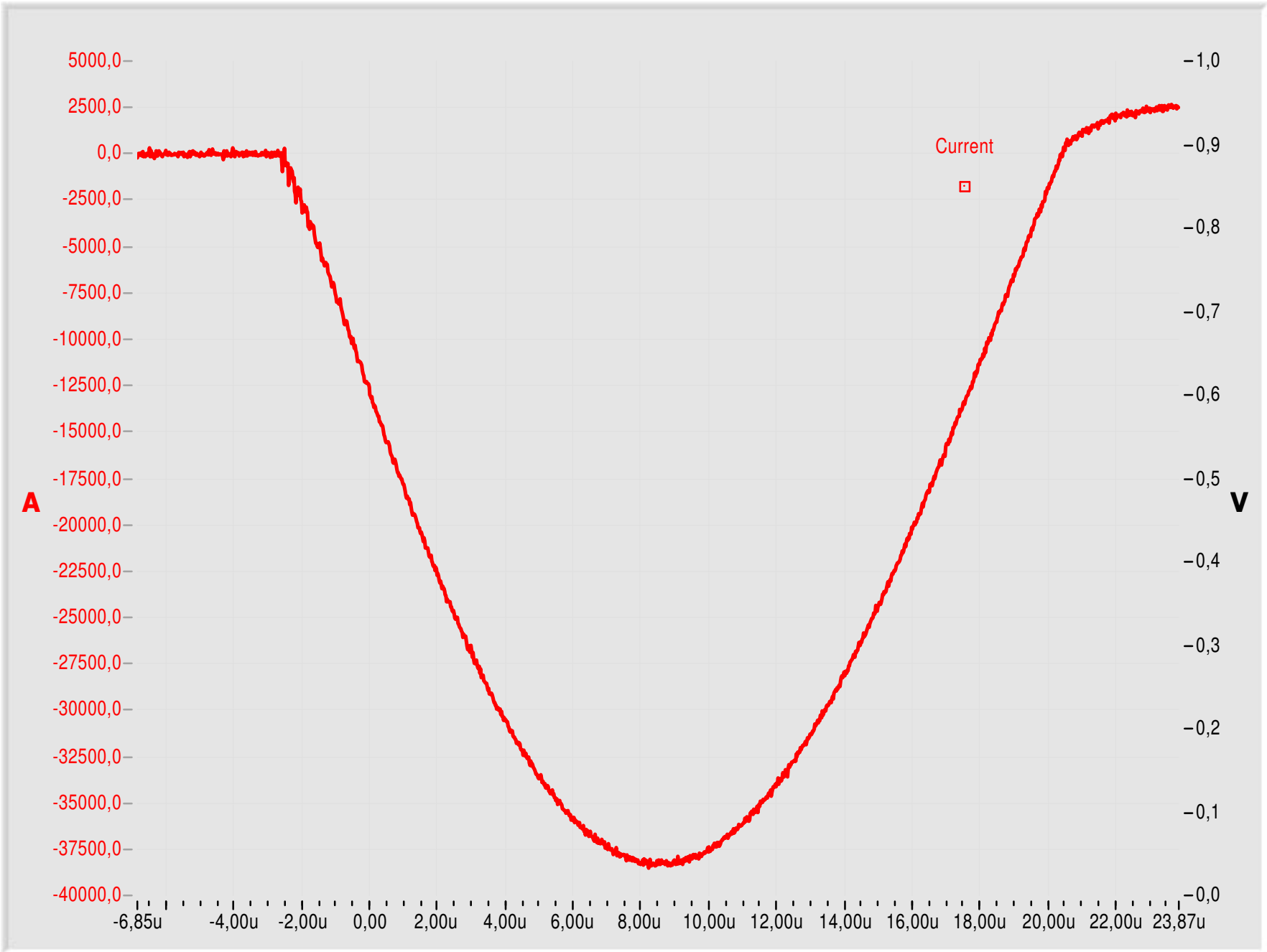
CESI B7019962 Oscillogram n. 15



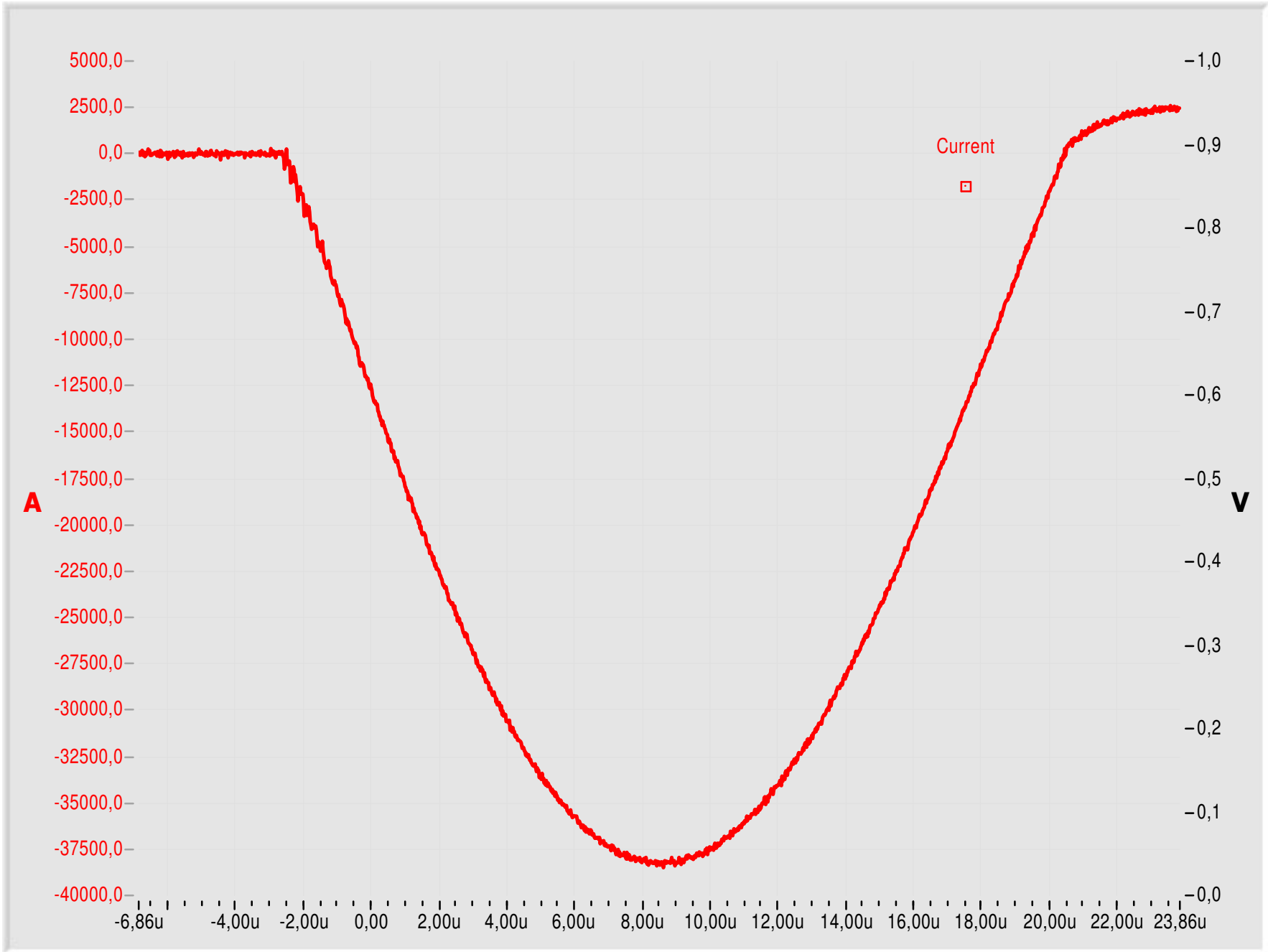
CESI B7019962 Oscillogram n. 16



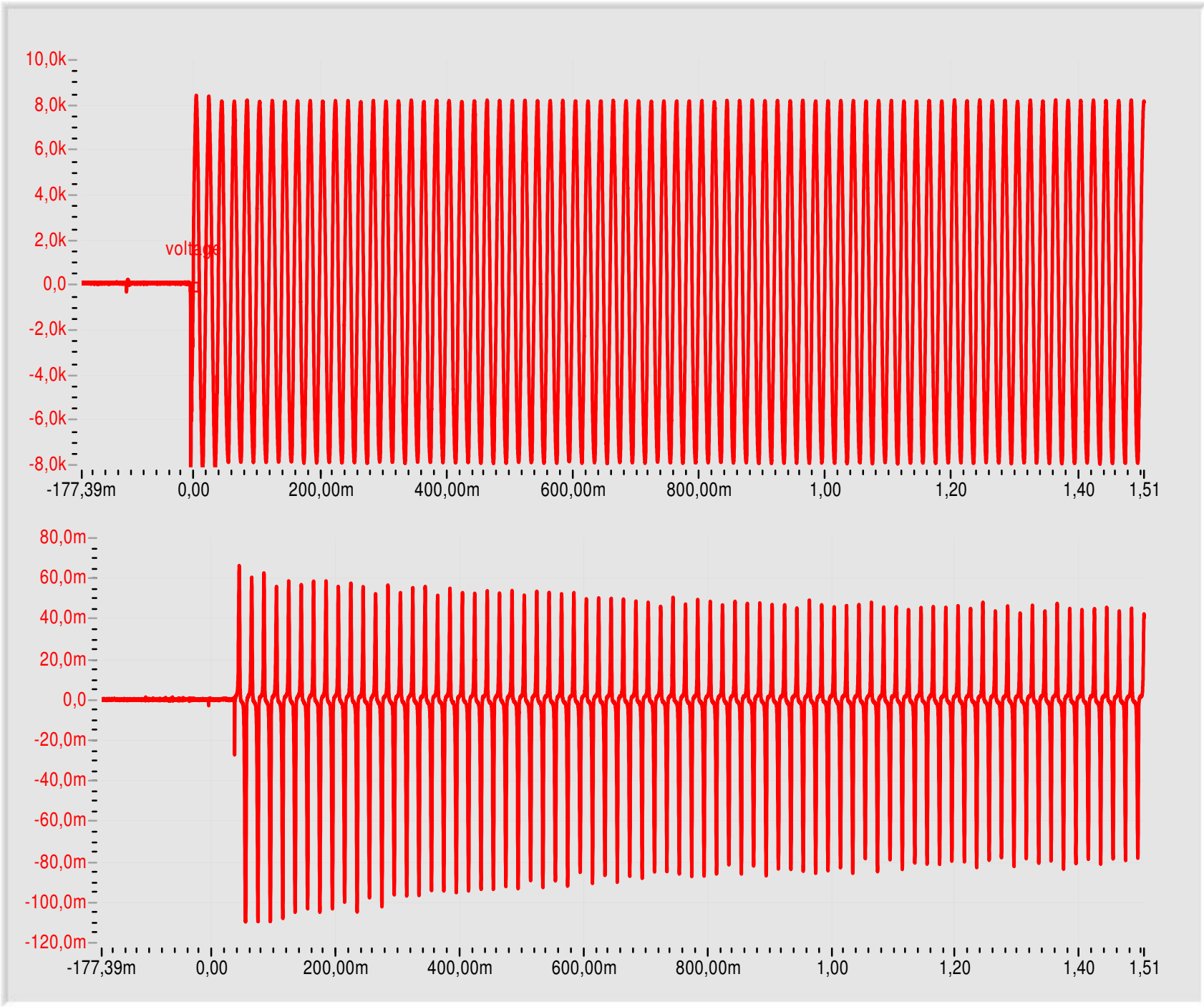
CESI B7019962 Oscillogram n. 17



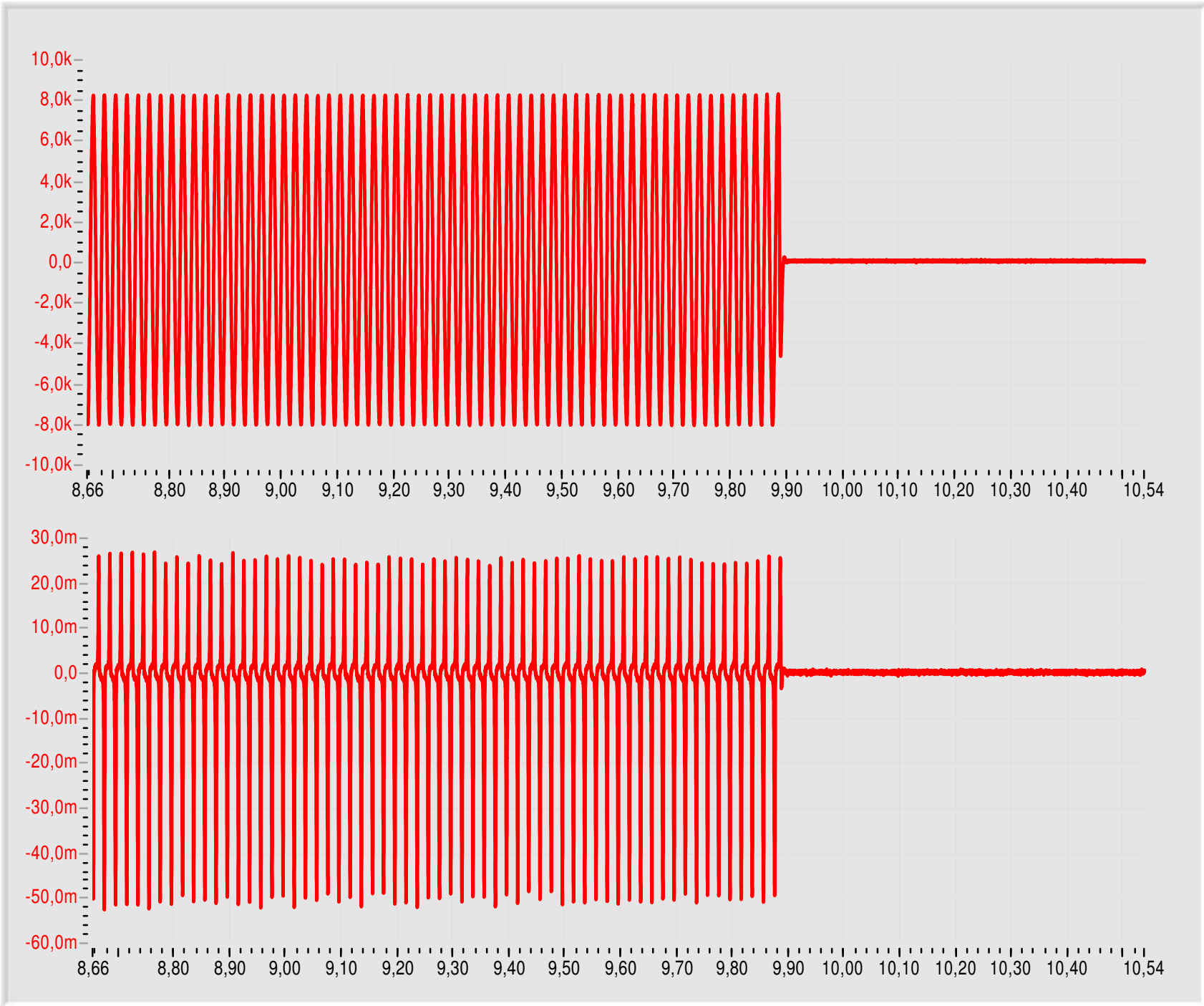
CESI B7019962 Oscillogram n. 18



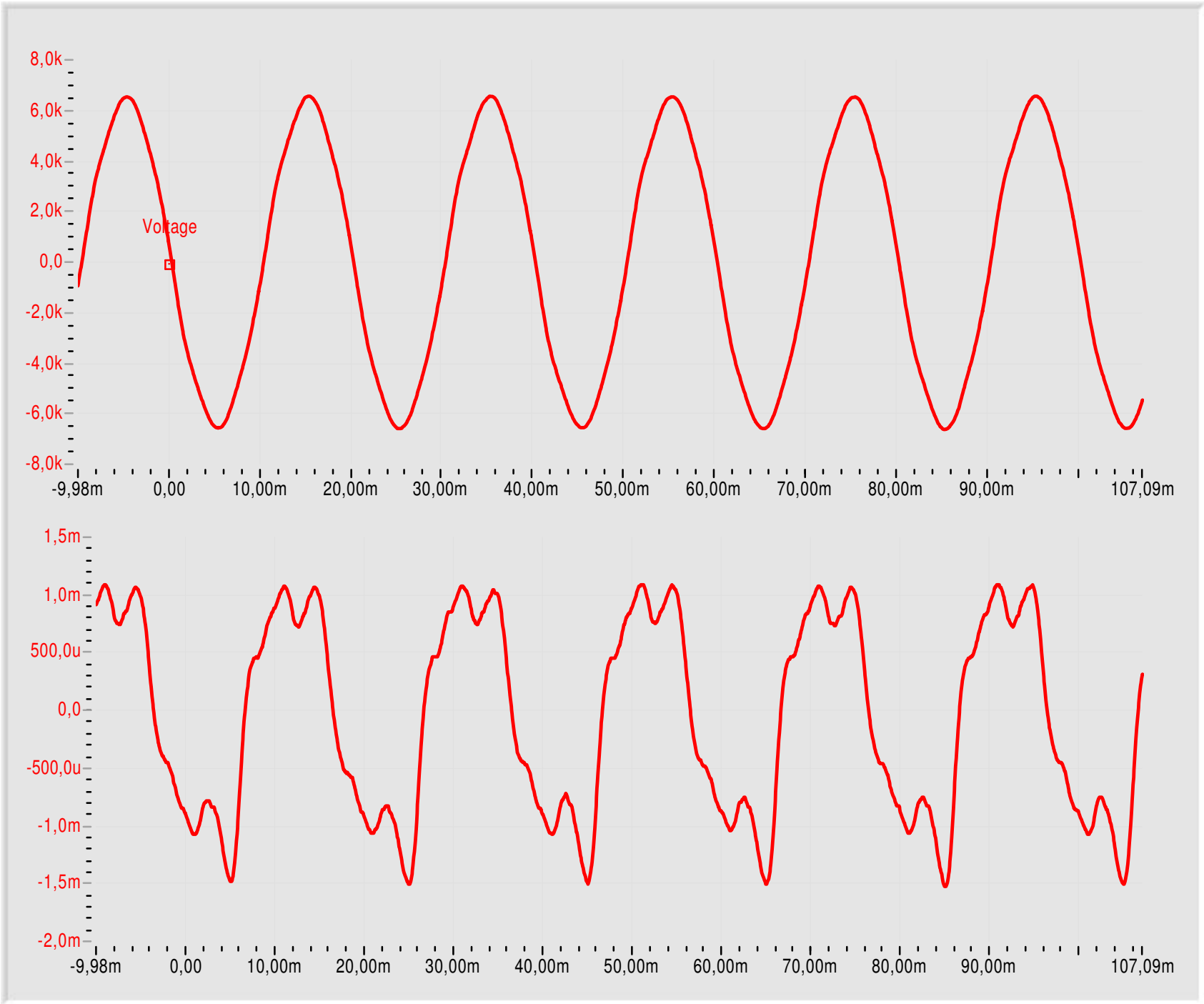
CESI B7019962 Oscillogram n. 19



CESI B7019962 Oscillogram n. 20



CESI B7019962 Oscillogram n. 21



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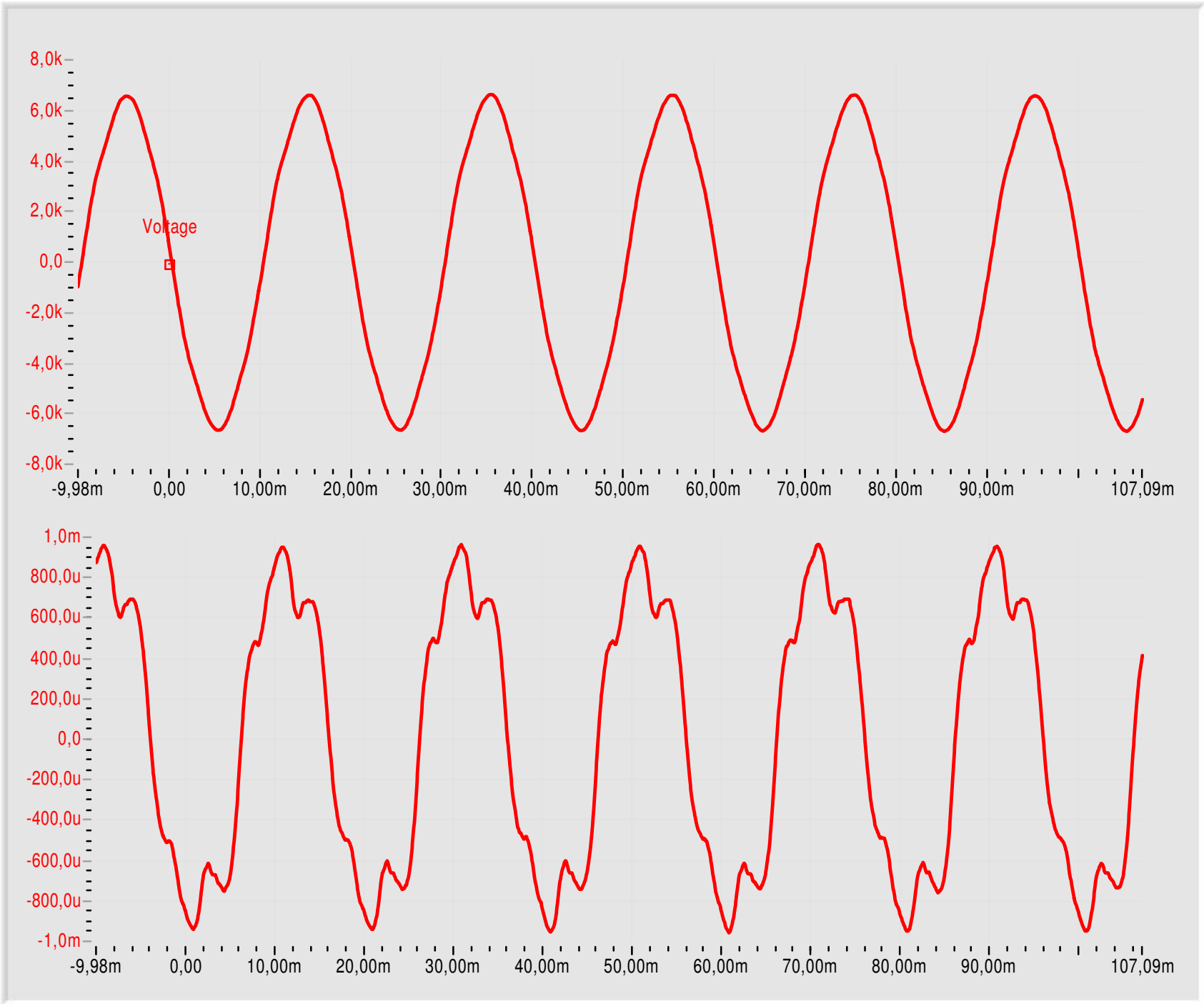

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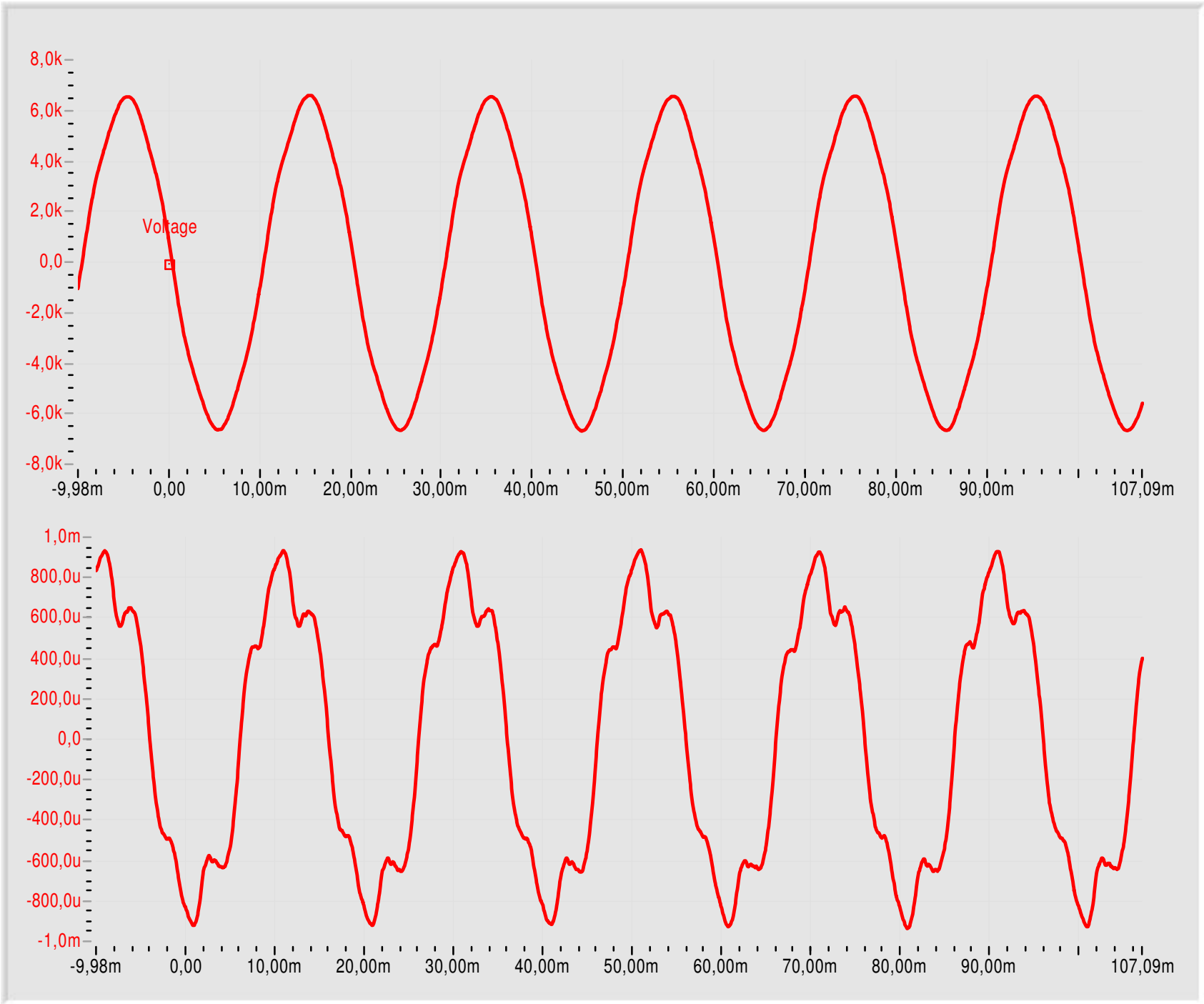
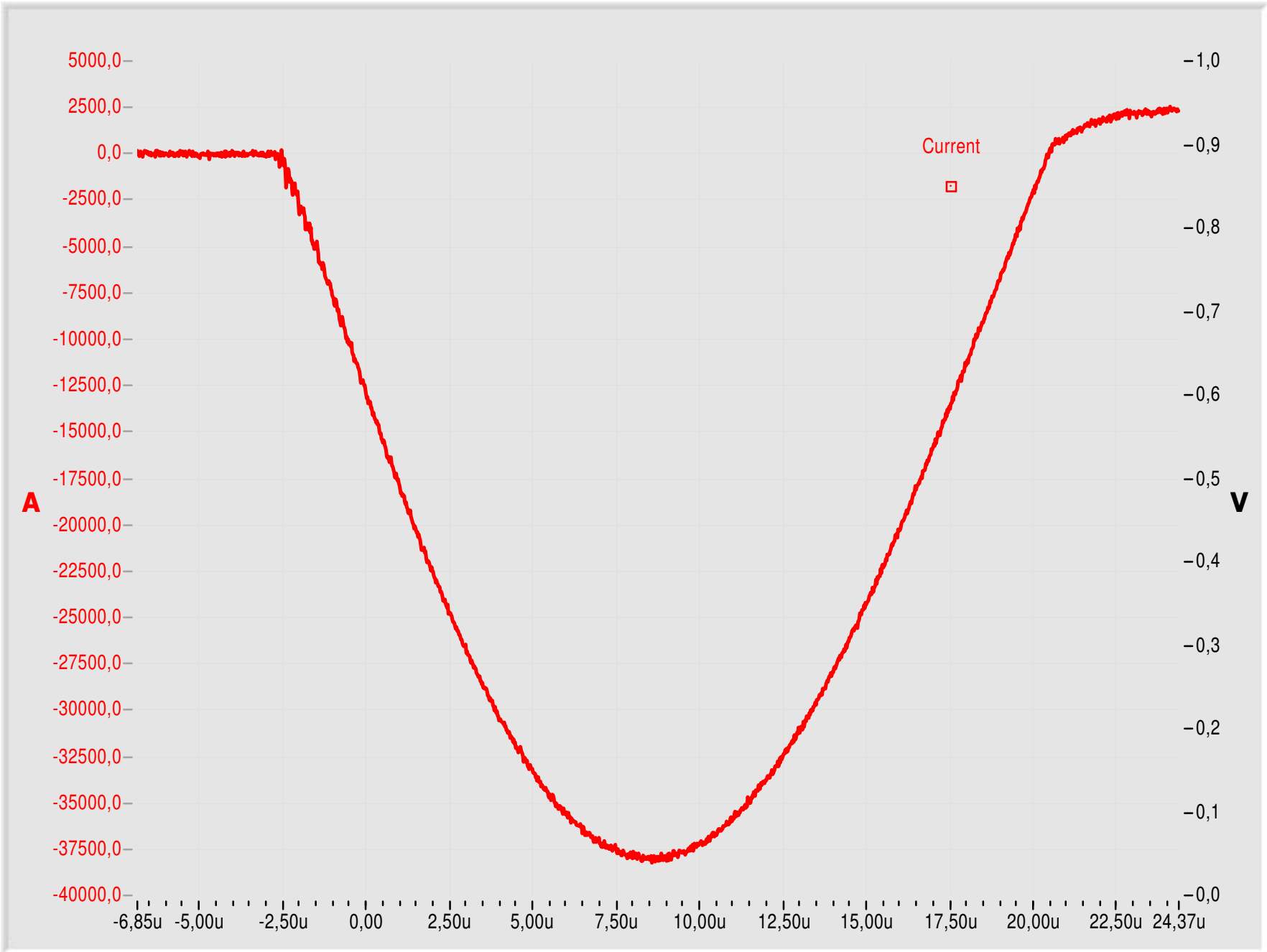
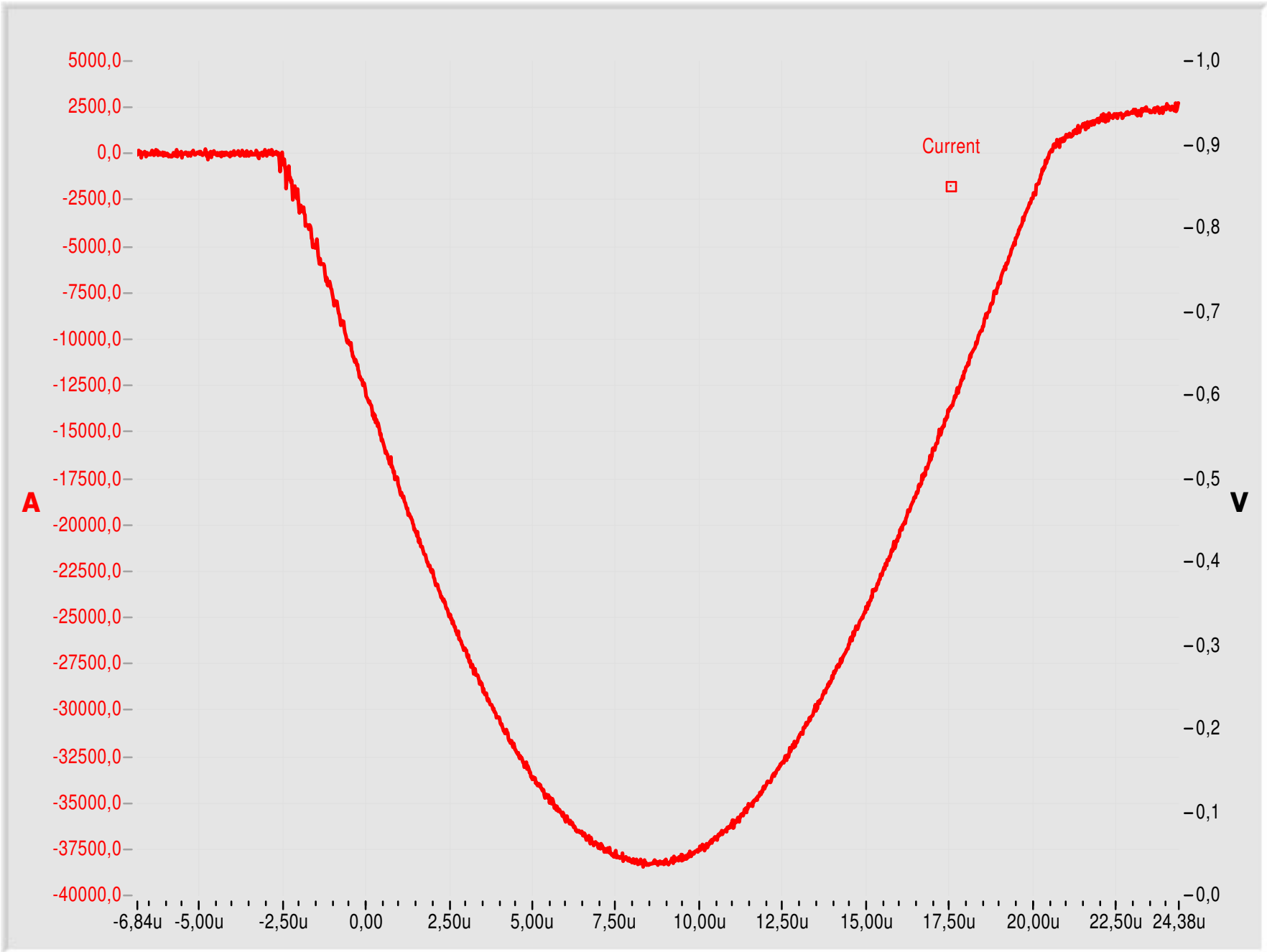


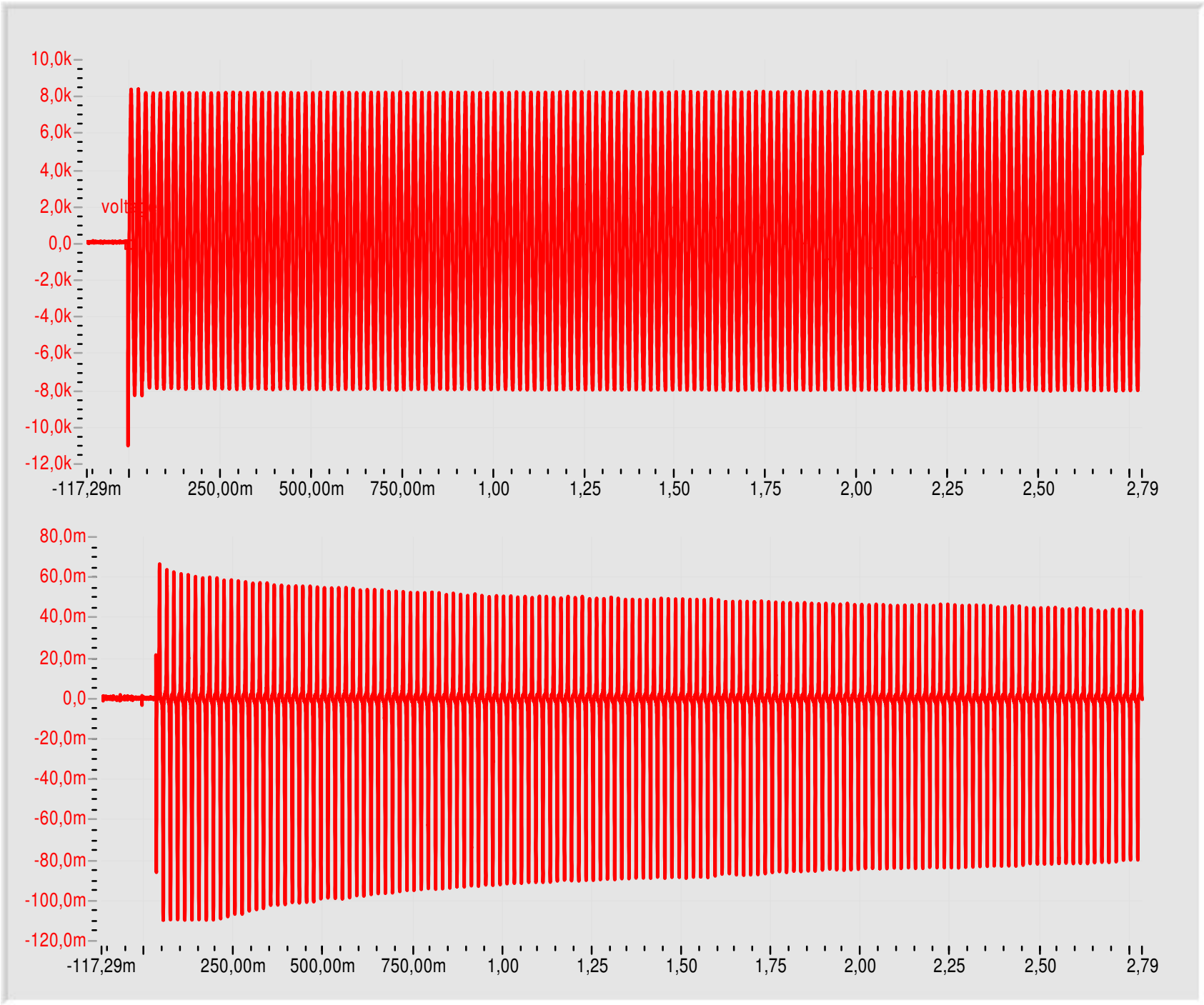
CESI B7019962 Oscillogram n. 24



CESI B7019962 Oscillogram n. 25



CESI B7019962 Oscillogram n. 26



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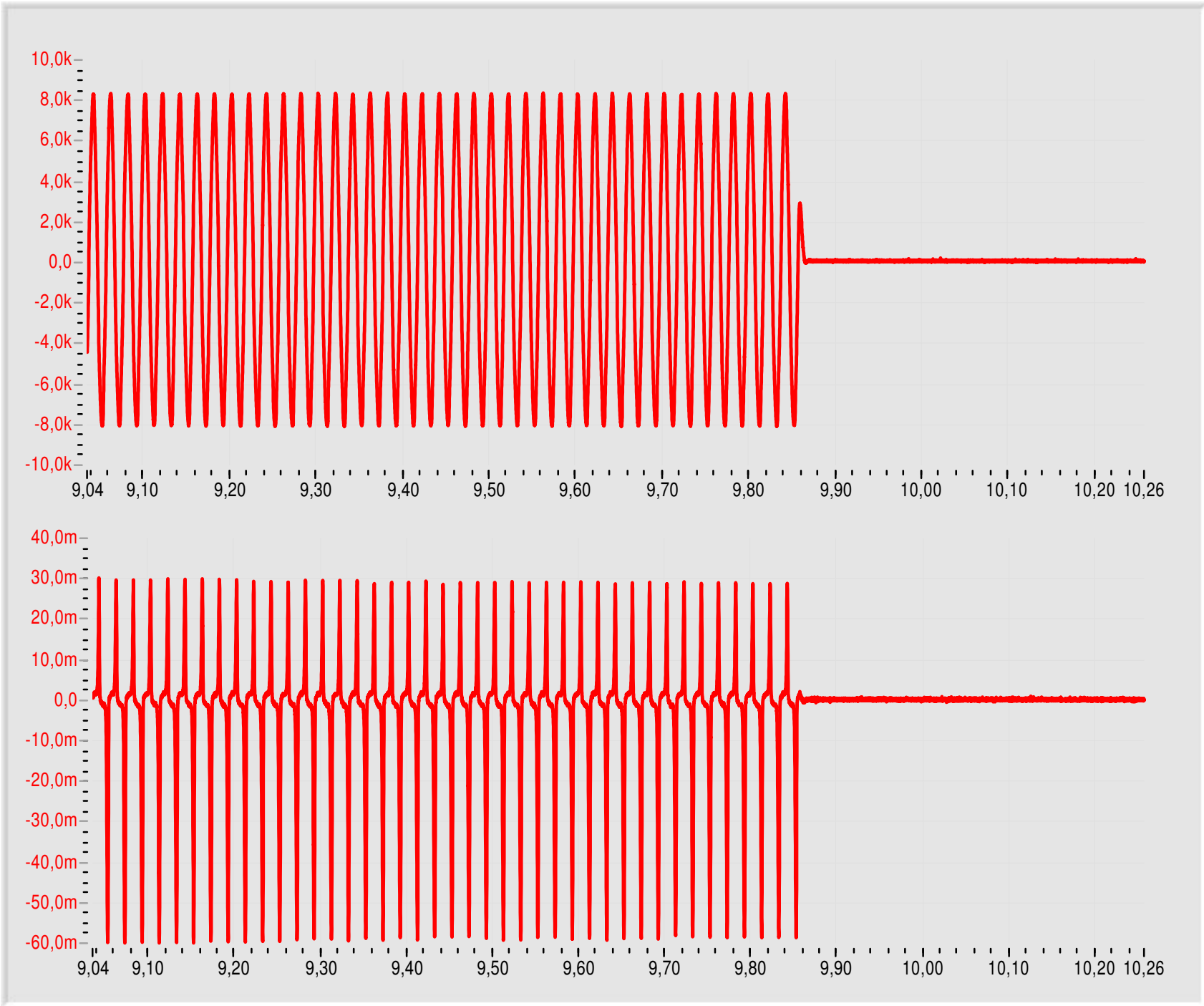

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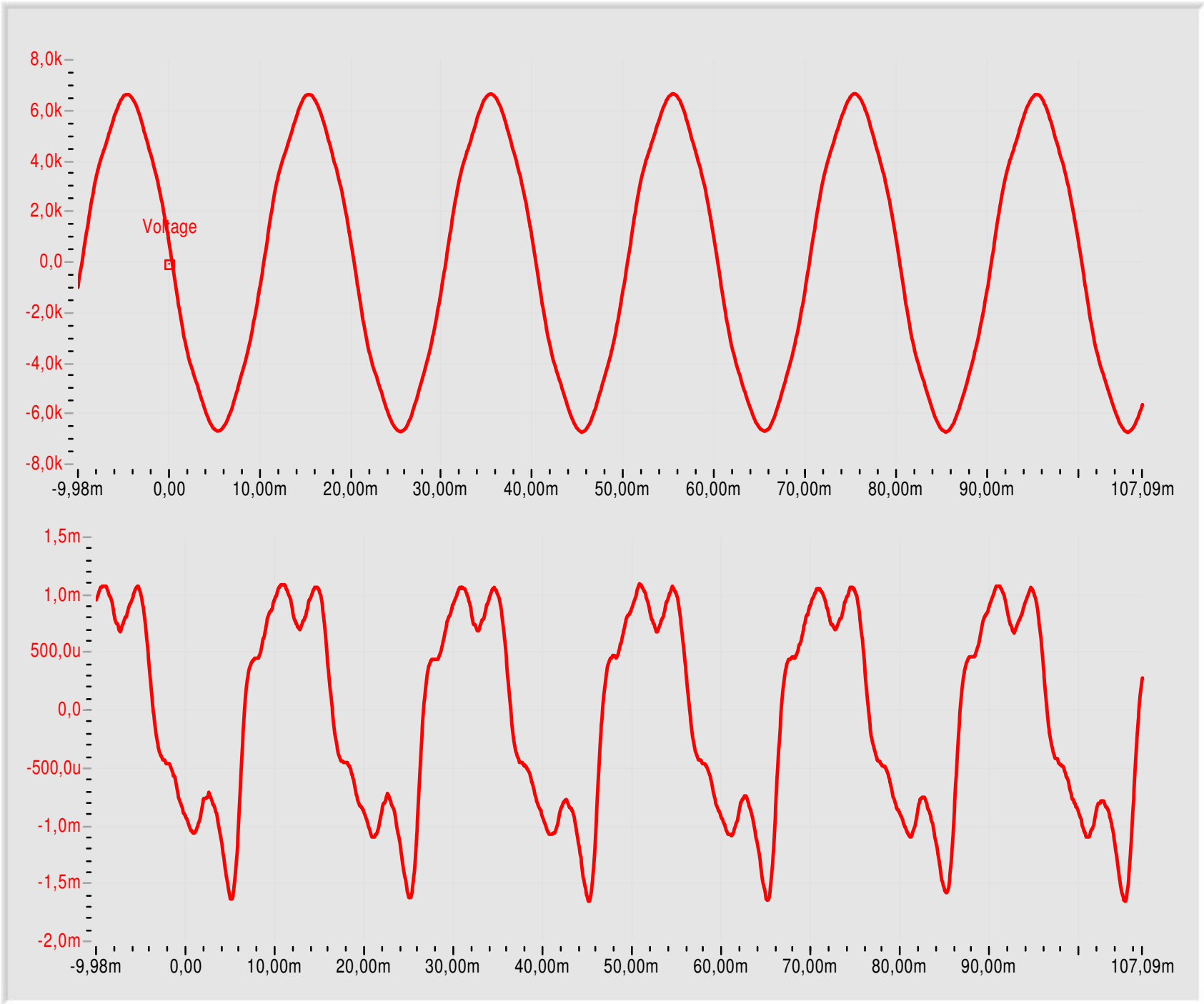

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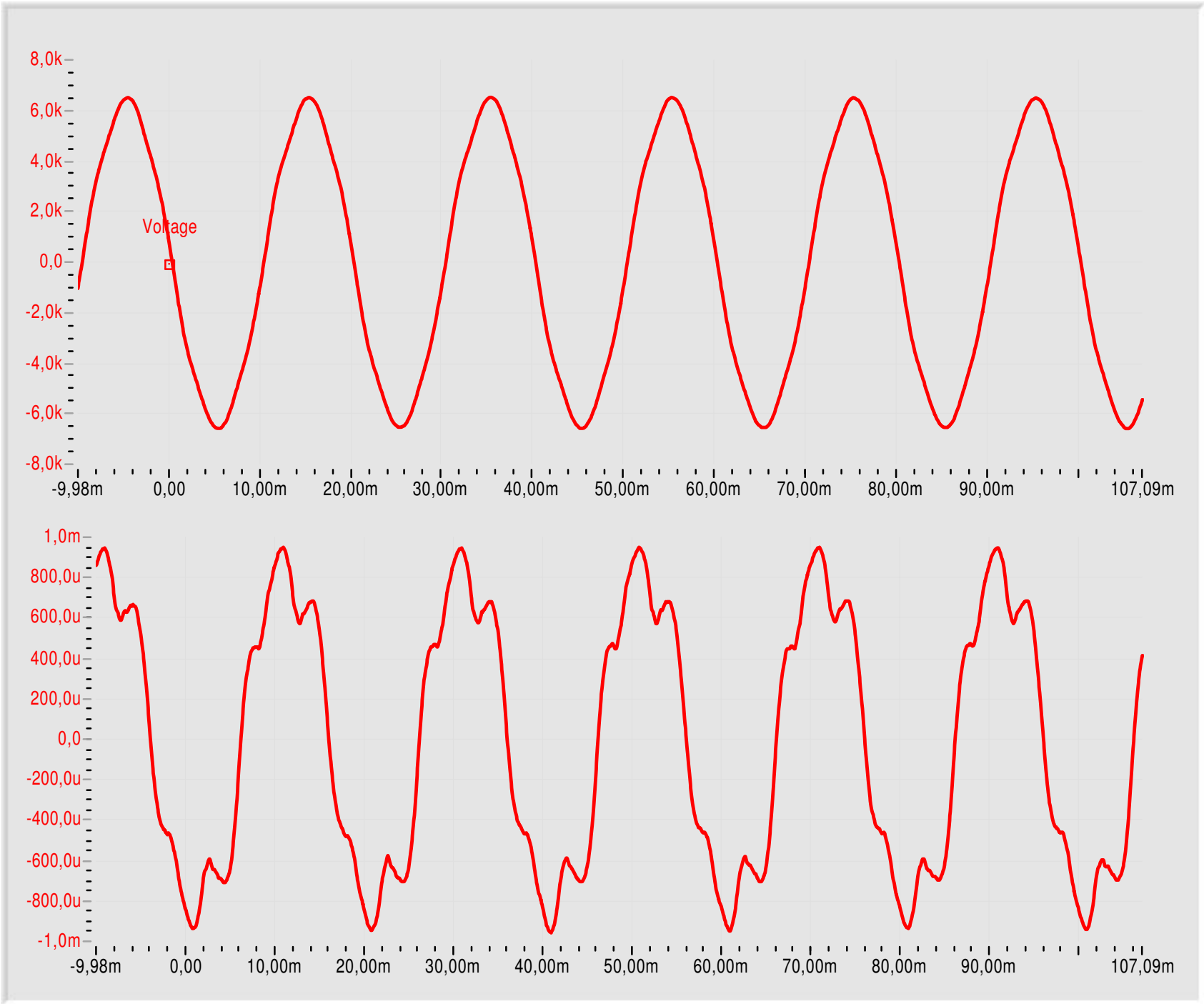
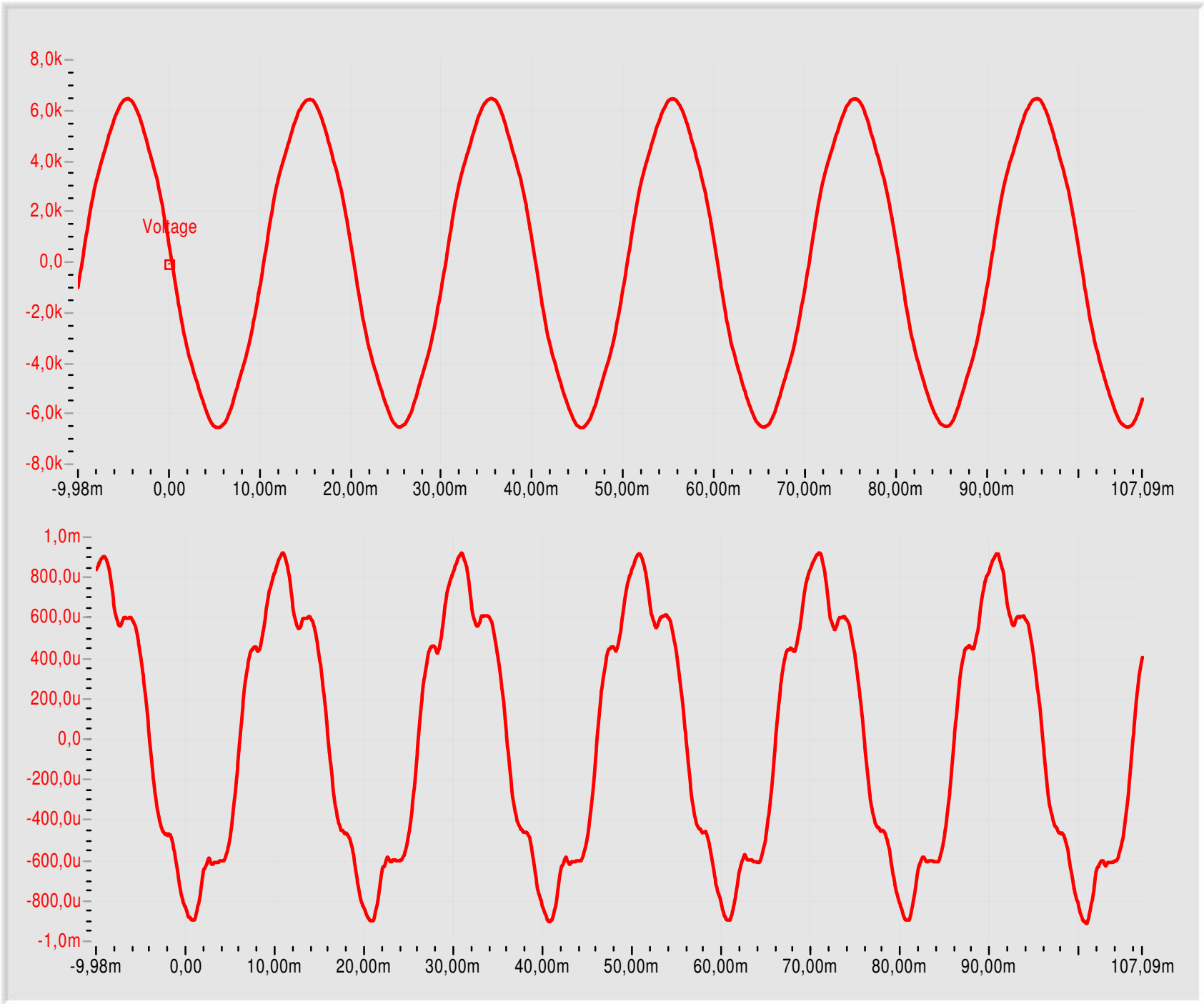
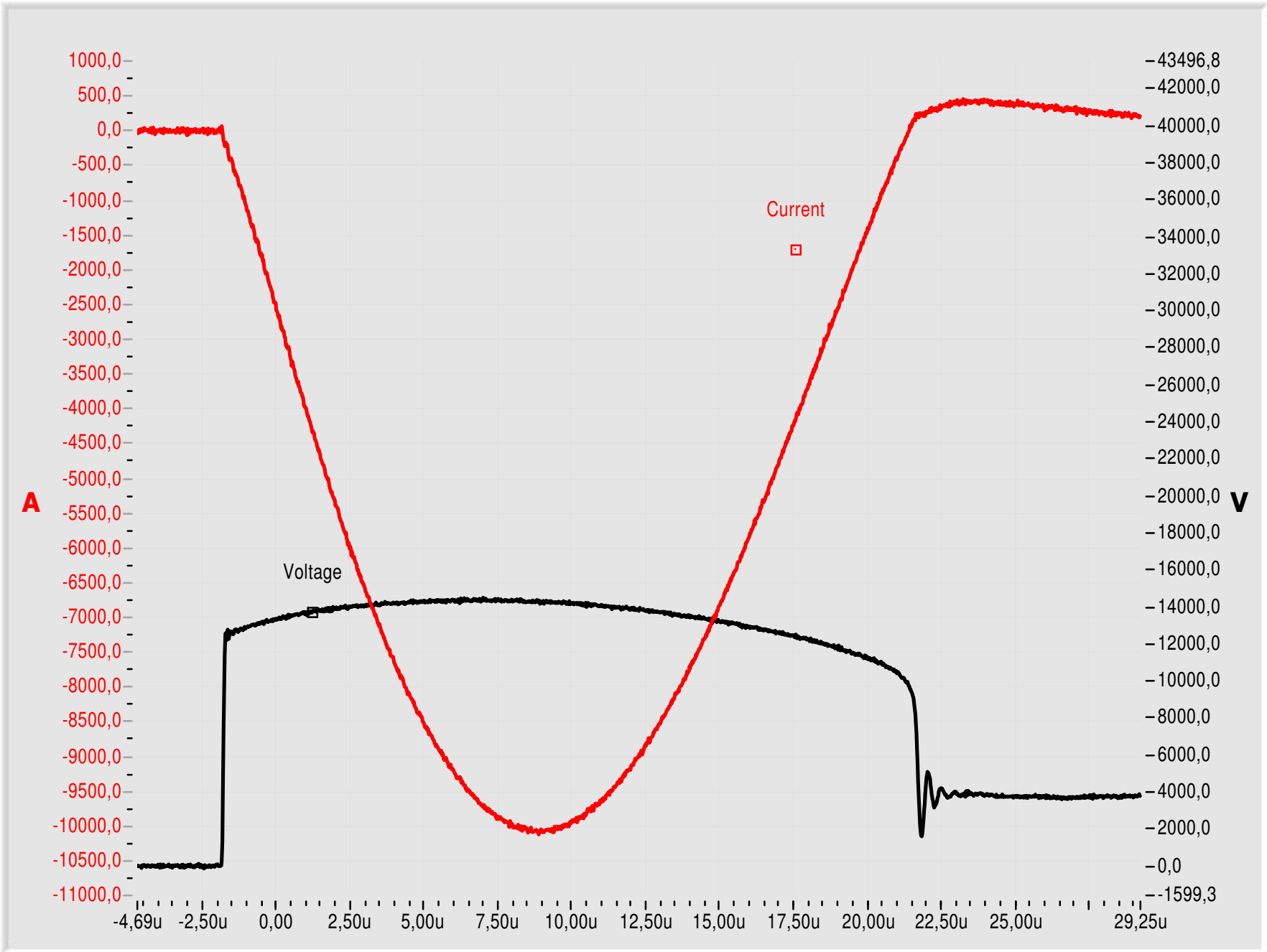


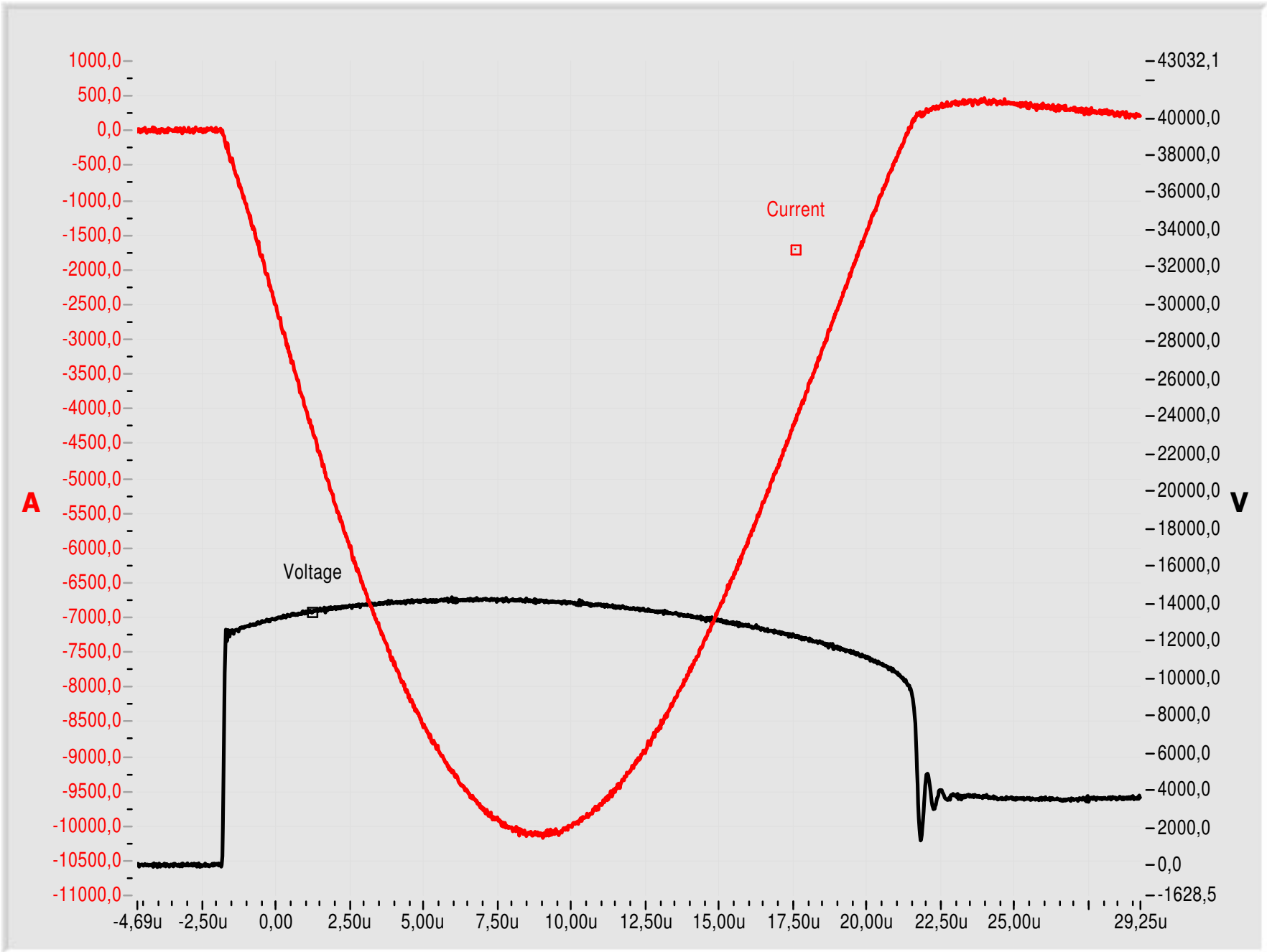
CESI B7019962 Oscillogram n. 30



CESI B7019962 Oscillogram n. 31



CESI B7019962 Oscillogram n. 32



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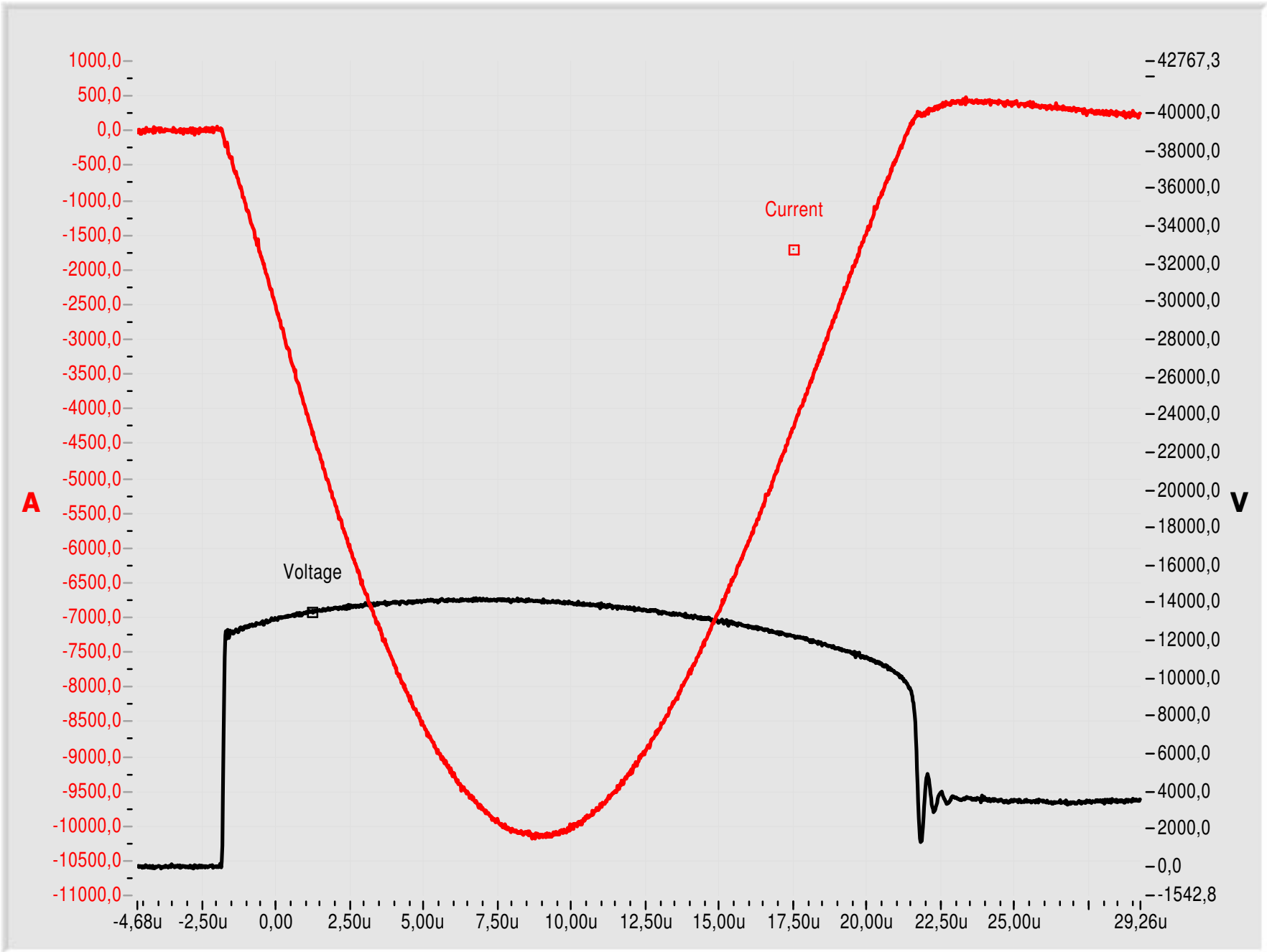
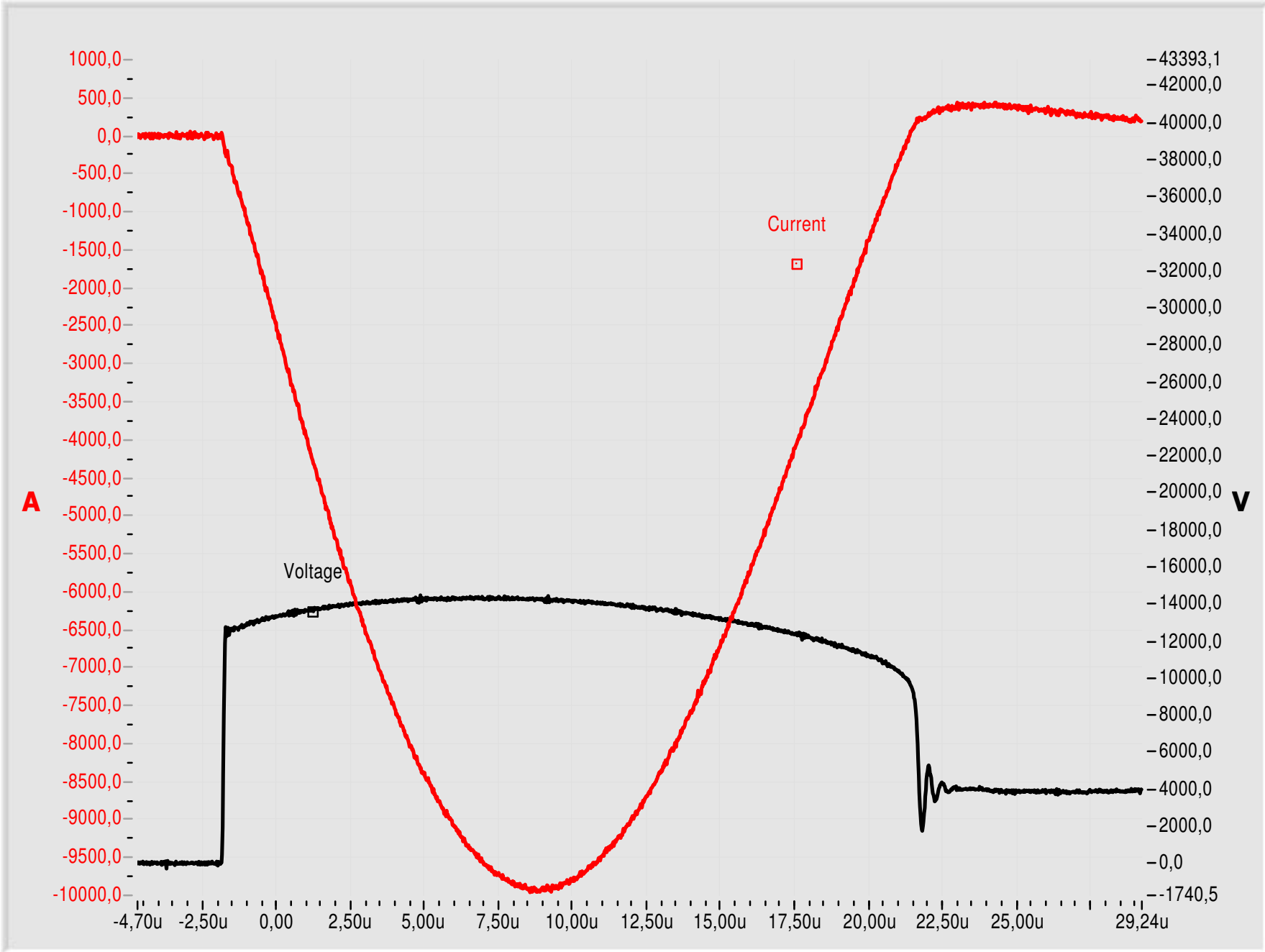
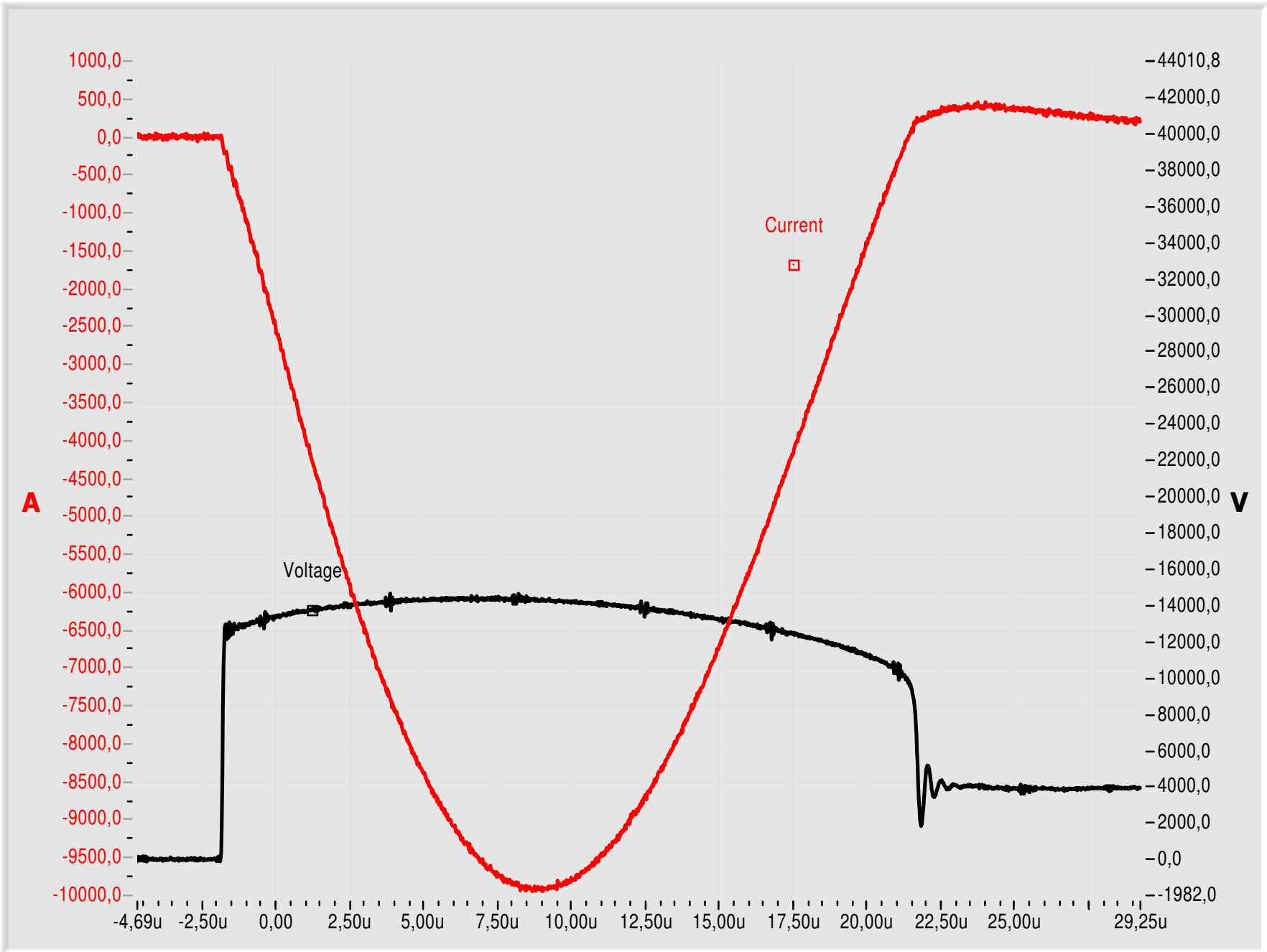


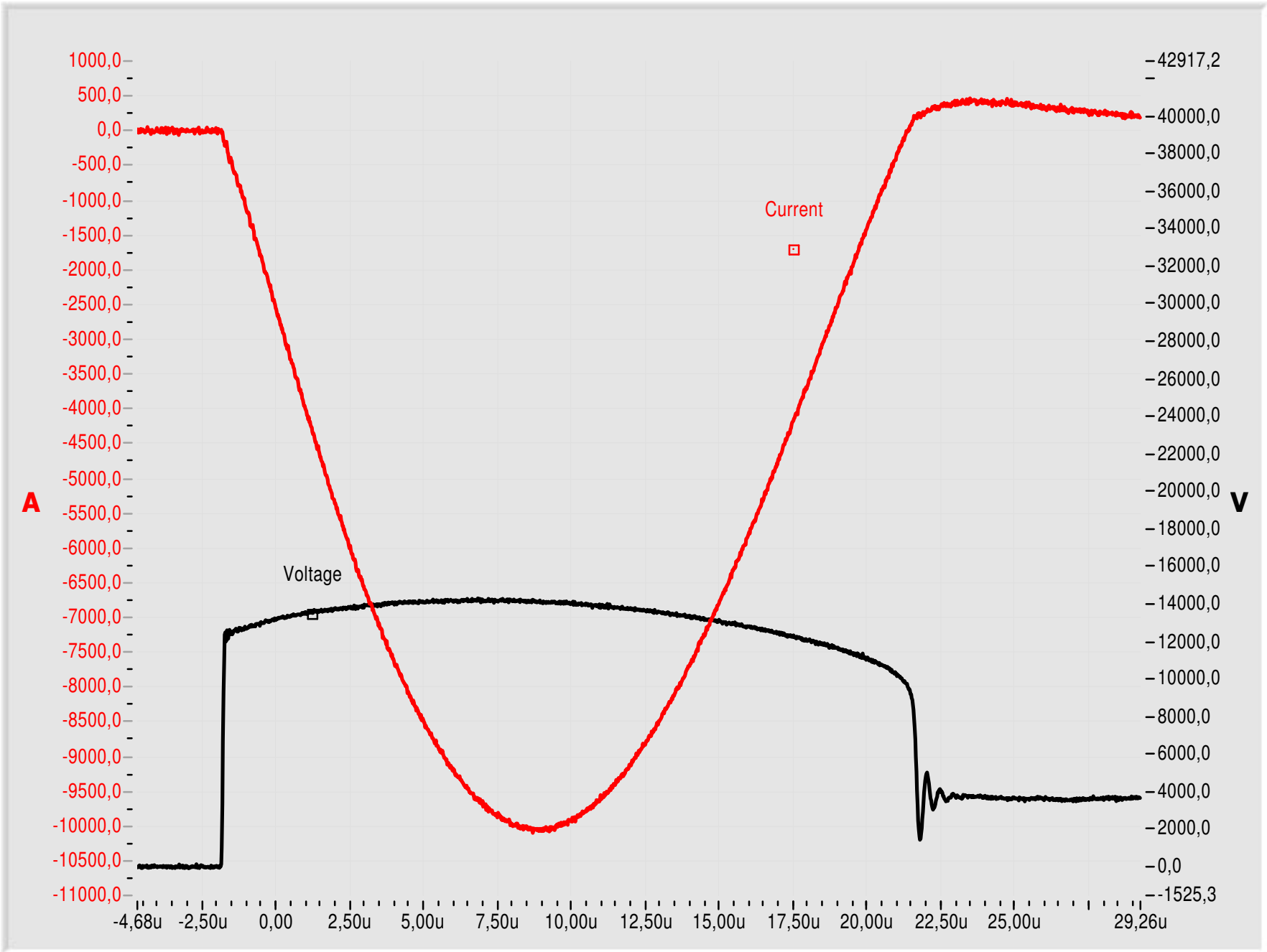
CESI B7019962 Oscillogram n. 34



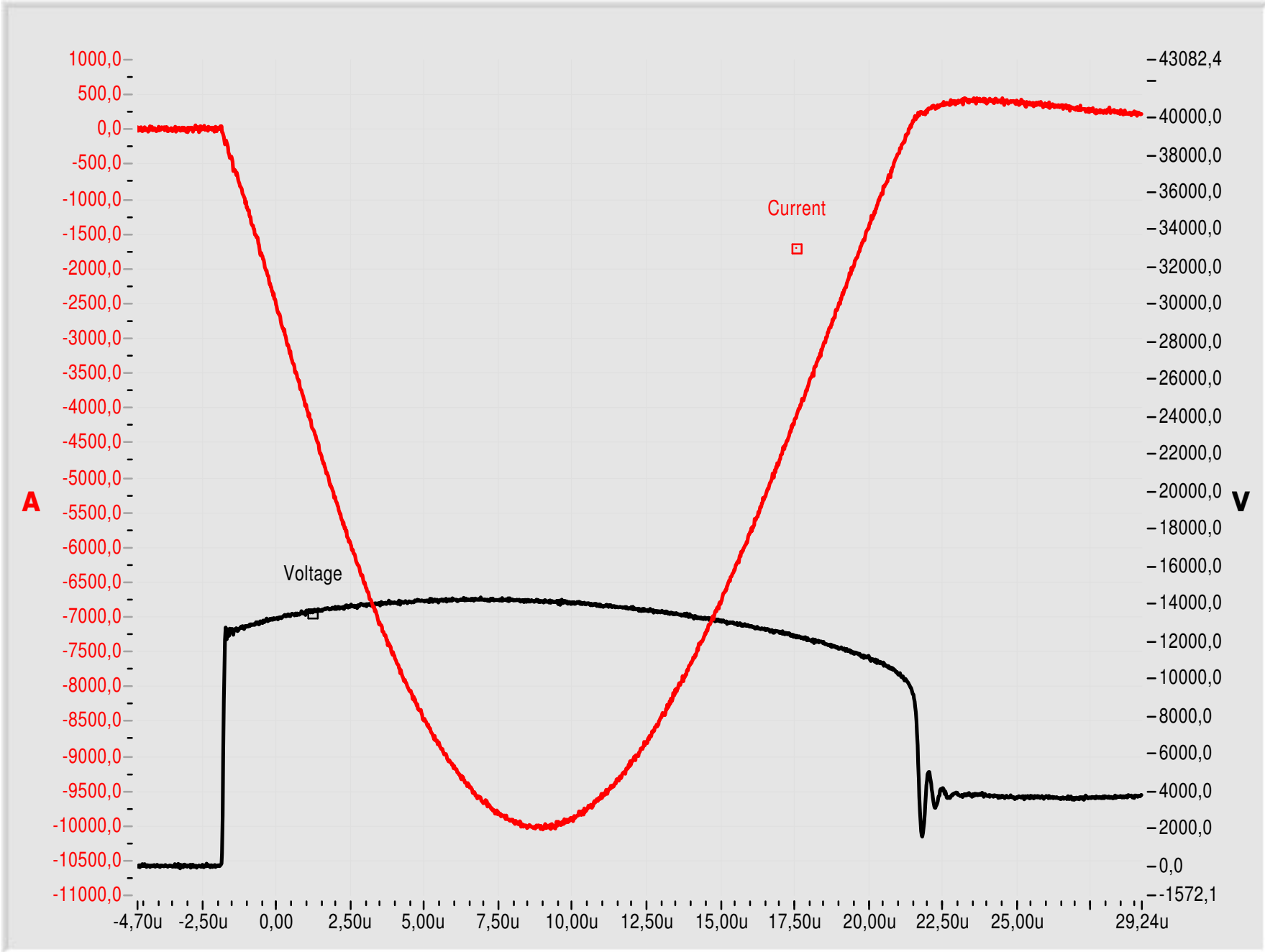
CESI B7019962 Oscillogram n. 35



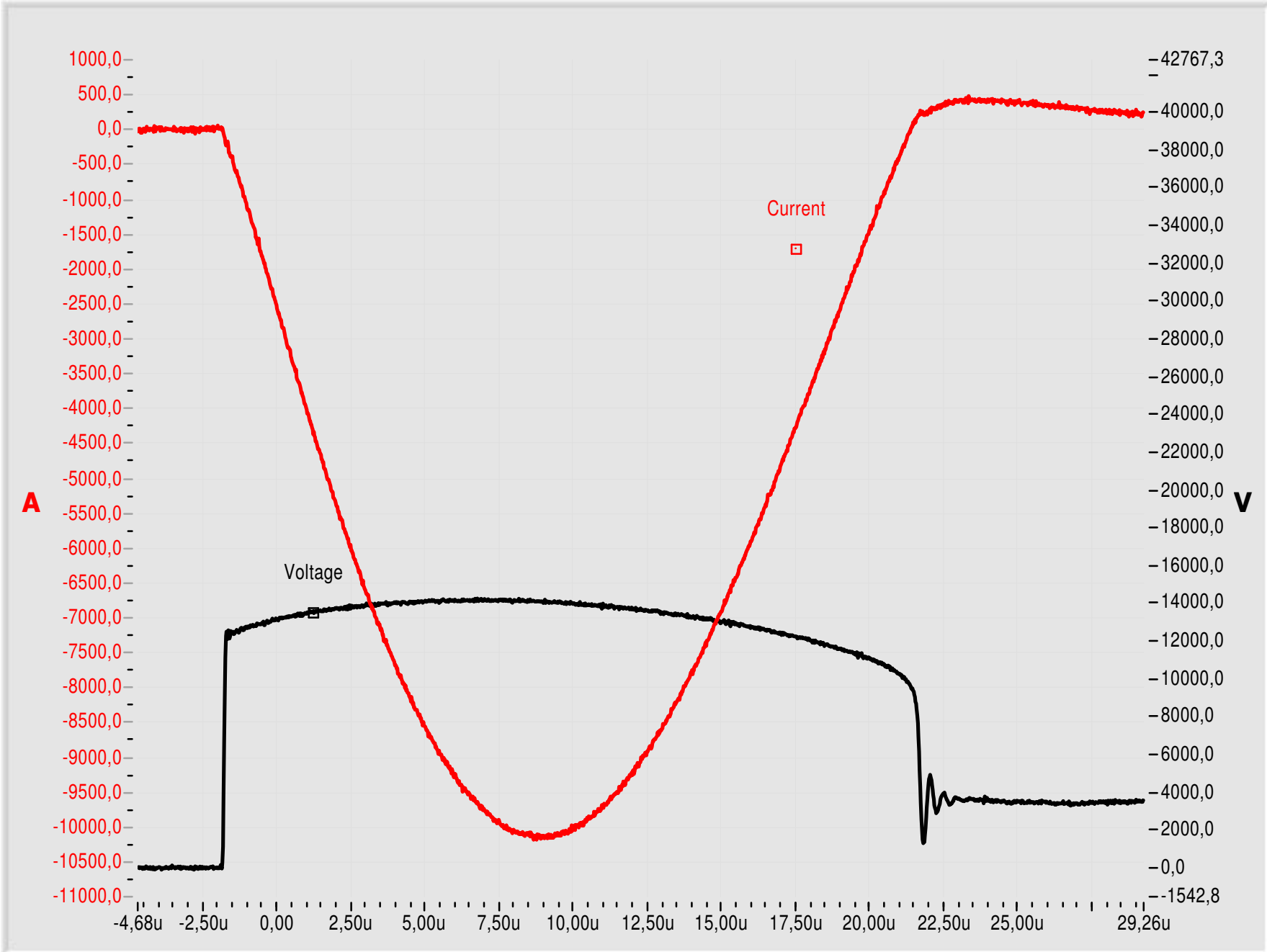
CESI B7019962 Oscillogram n. 36



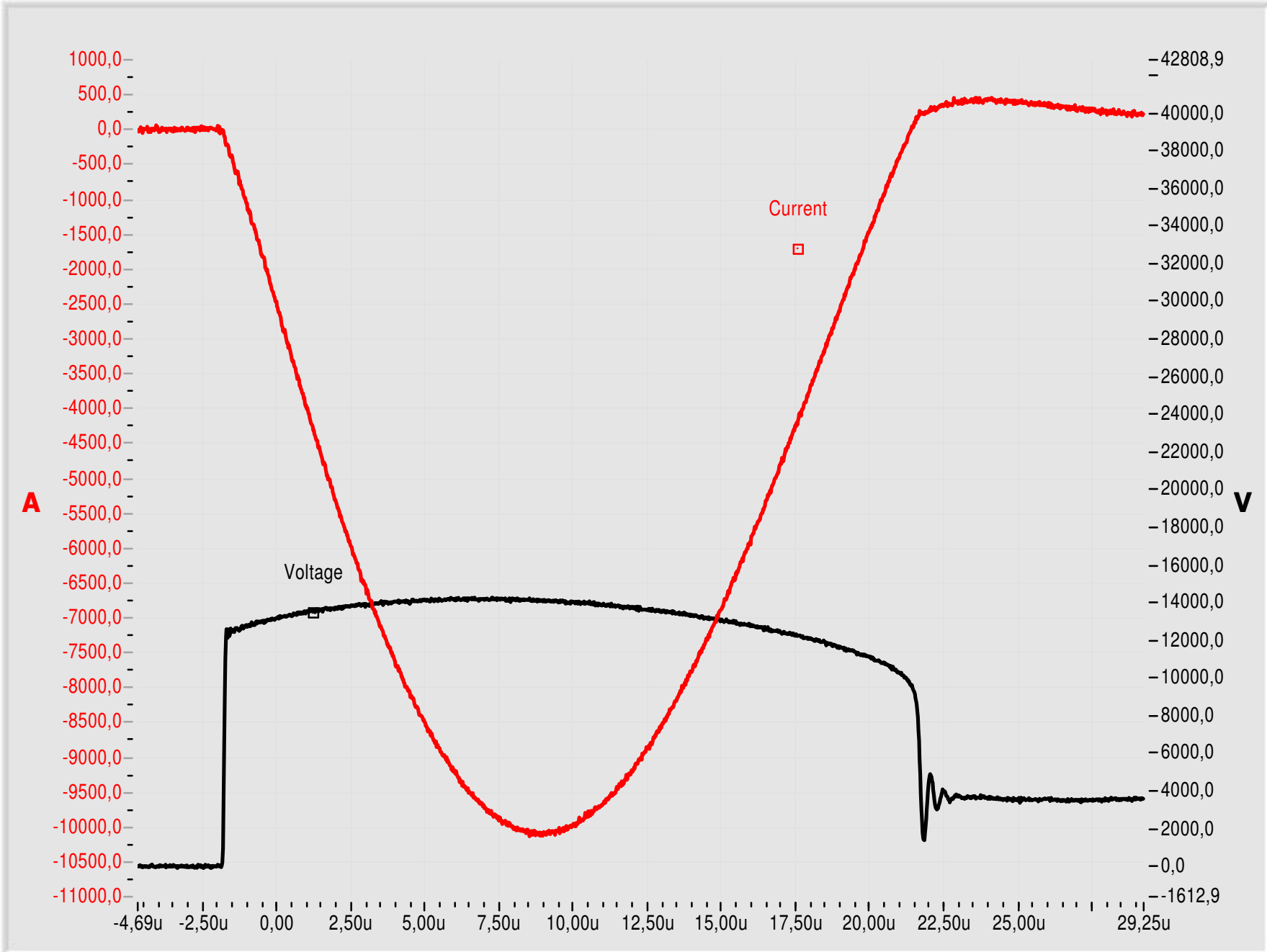
CESI B7019962 Oscillogram n. 37



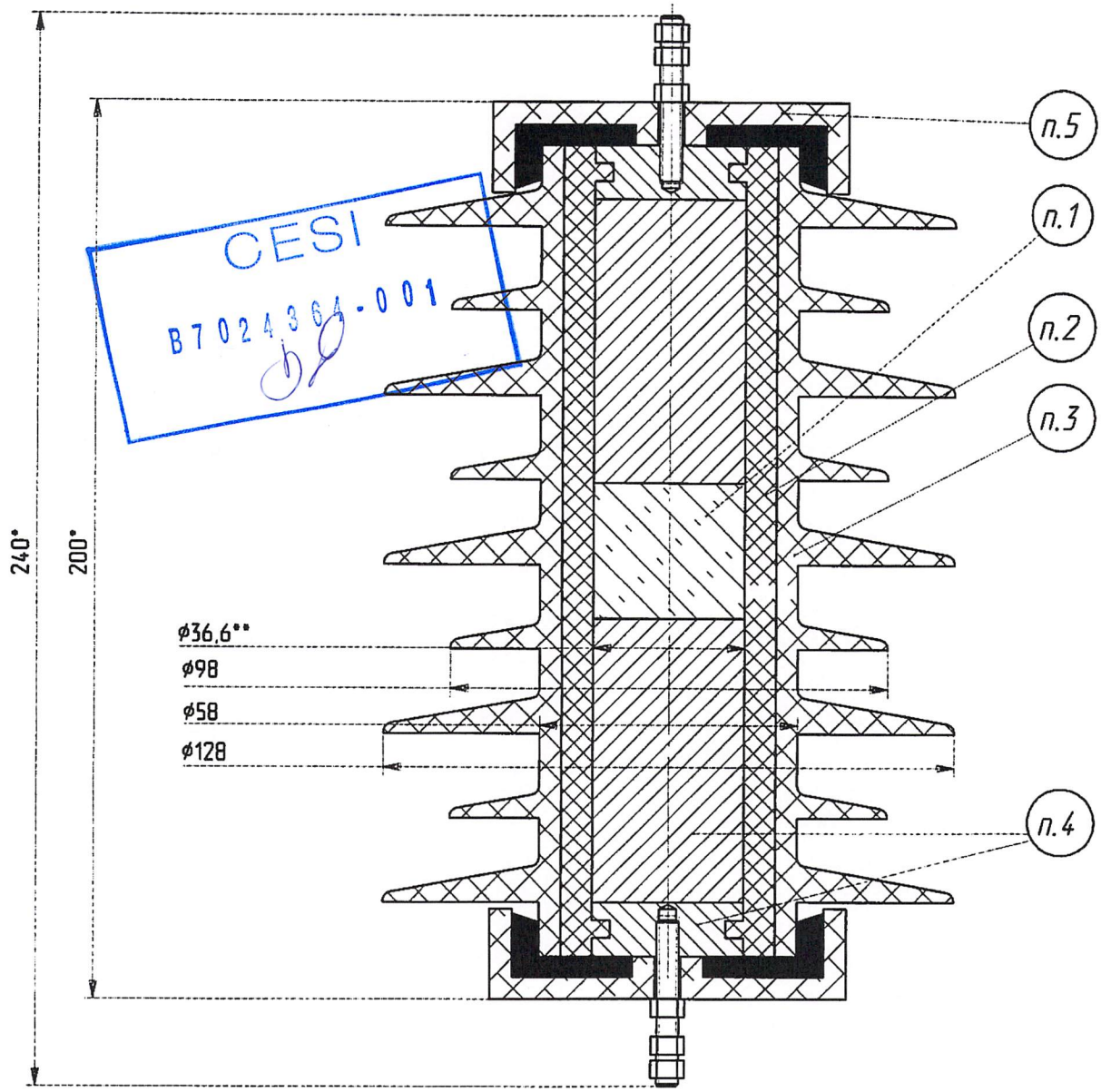
CESI B7019962 Oscillogram n. 38



CESI B7019962 Oscillogram n. 39



PA-DM.001.ST.02



№ п.п.	name	note
n.1	varistor B34/30	000
n.2	Housing	000
n.3	External insulation	000
n.4	Metal flanges and spacers	000
n.5	Additional thermal insulation	000

1. * - Dimensions for reference
2. ** - Typical diameter B34 / 30

Изм.	Лист	№докум.	Подп.	Дата
Разраб.		Потапов В.В.		
Пров.		Потапов А.В.		
Т.контр.				
Н.контр.				
Утв.		Шевцов И.В.		

PA-DM.001.ST.02

section in thermal model.
Surge Arrester PA-DM

Лит.	Масса	Масшт.
		1:1

Лист 1 | Листов 1

ЗАО "Полимер-Аппарат"

Копировал

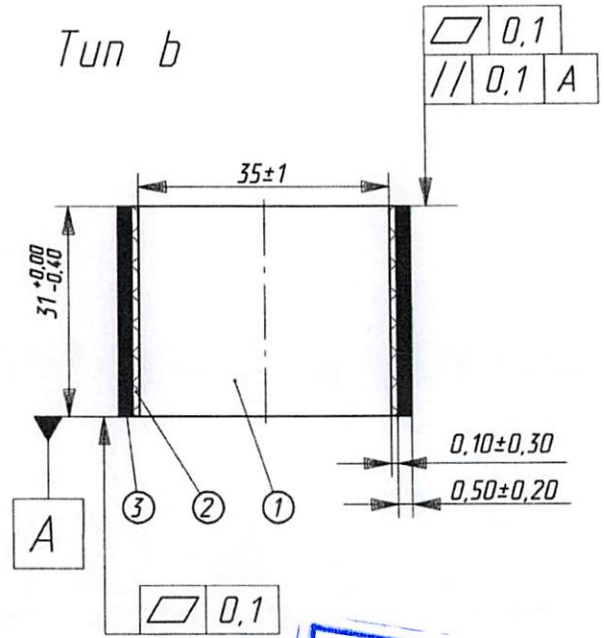
Формат А3

Перв. применение | Справ. №

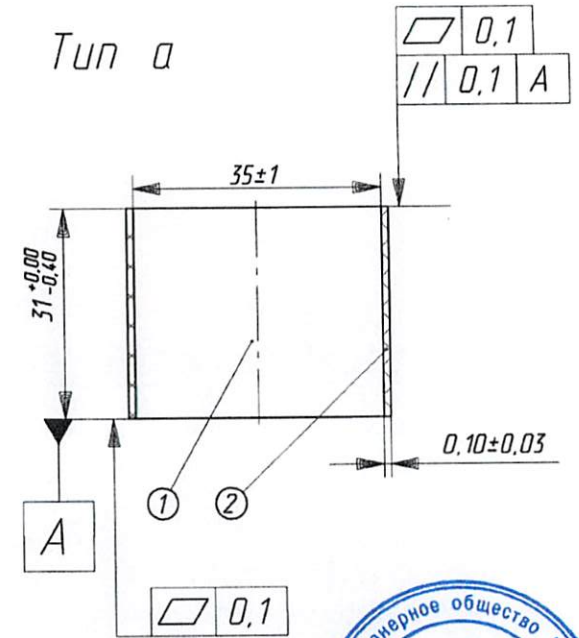
Инв. № подл. | Подп. и дата | Взам. инв. № | Инв. № дубл. | Подп. и дата

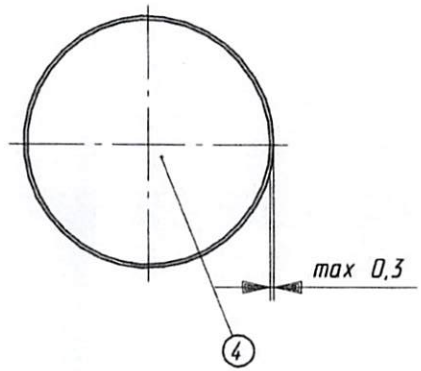
PA.VAR.0400.30

Тип b



Тип a





1. Металлооксидный варистор (MOV disk)
2. Изоляционное покрытие стекло (Glass insulating collar)
3. Изоляционное покрытие полиуретан (PU insulating collar)
4. Алюминиевый электрод (Al – electrode)

CESI
B7020387-001

Закрытое акционерное общество "Полимер-Аппарат" Санкт-Петербург

Изм.	Лист	№докум.	Подп.	Дата
Разраб.		Потапов А.В.		09.17
Пров.		Петухов А.П.		09.17
Т.контр.				
Н.контр.				
Утв.		Шевцов И.В.		09.17

PA.VAR.0400.30

Varistor B34/30

Оксид цинка

Лит.	Масса	Масшт.
	0.177	1:1
Лист 1	Листов 1	

ЗАО "Полимер-Аппарат"

Подп. и дата | Инв. № дубл. | Взам. инв. № | Подп. и дата | Инв. № подл.

Копировал

Формат А4