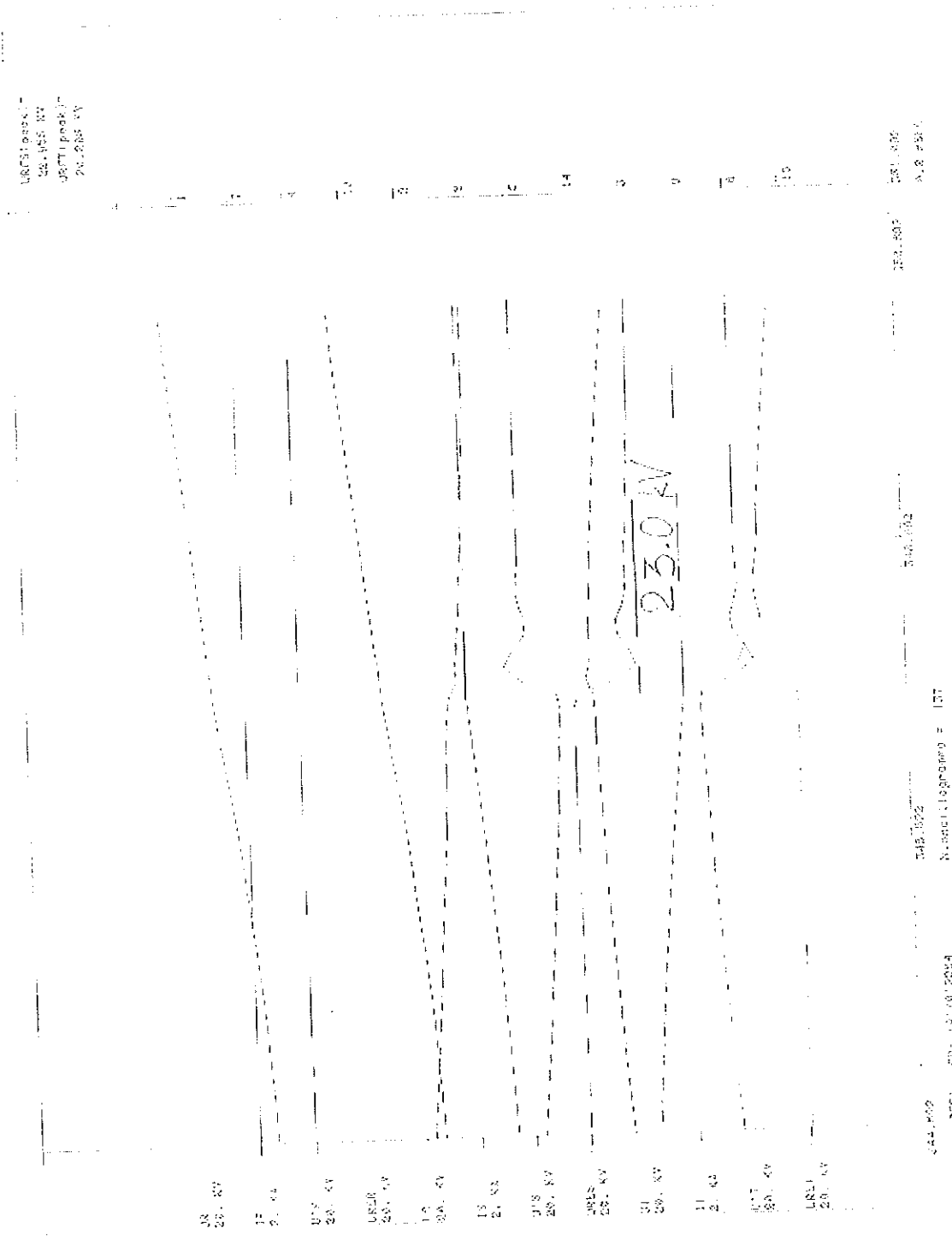


UR51 peak 1
 24.165 eV
 UR51 peak 2
 24.285 eV

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24.165
 24.285

444.000
 444.500
 445.000
 445.500
 446.000
 446.500
 447.000
 447.500
 448.000
 448.500
 449.000
 449.500
 450.000

UR51 - 075 13/01/2004 N. Rossi (loggiato) = ITT
 UR50 peak = 24.165 - 24.285 = 0.120
 UR51 peak = 24.165 - 24.285 = 0.120
 UR52 peak = 24.165 - 24.285 = 0.120

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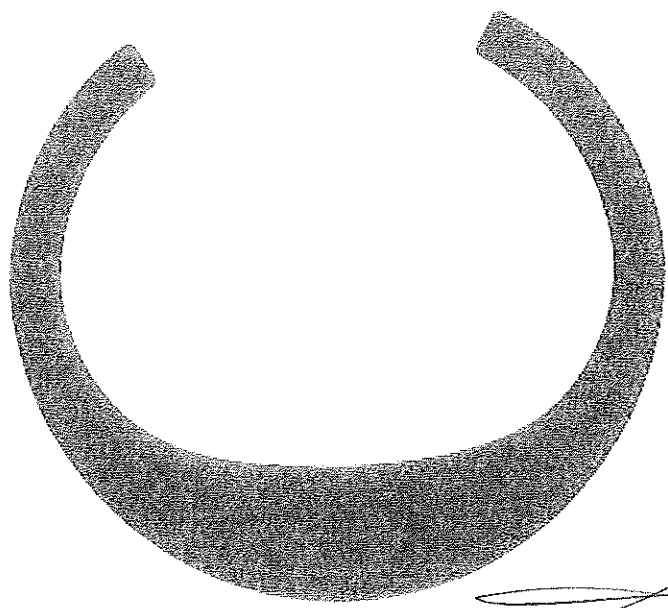
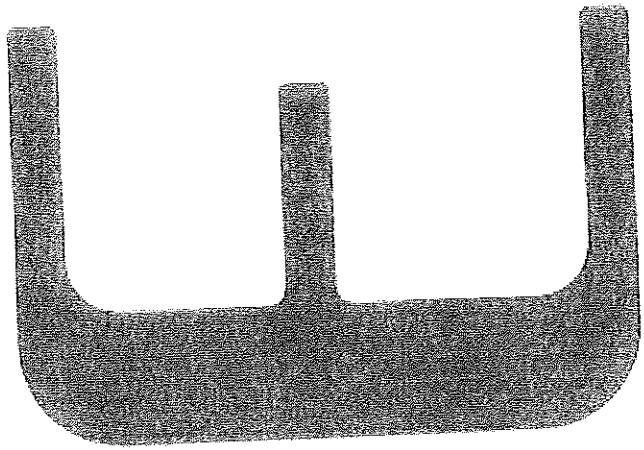
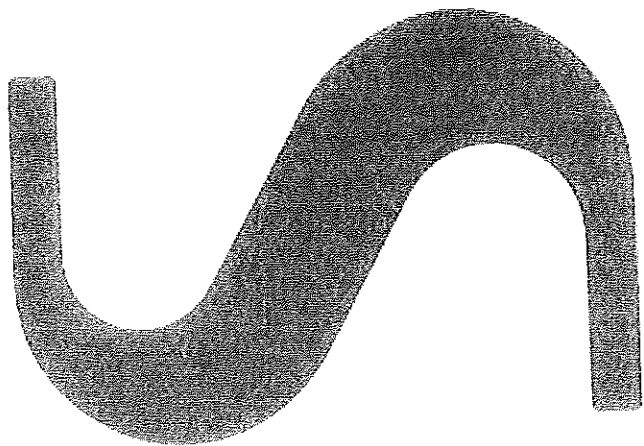
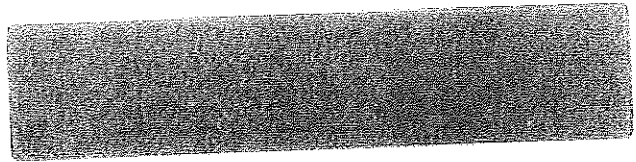
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1914

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51249279XA

GPS91/15222



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1915

client MERLIN GERIN S.A. - Grenoble (France)

object Three pole metal enclosed air insulated switchgear SM6 system type QM.
Fitted with an increased operating frequency SF6 gas insulated switch
type IO SM6.

characteristics of the tested object assigned by the Client

rated voltage 17.5/24 kV rated current 200 A rated frequency 50 Hz
other characteristics listed on page 2

the tests have been made in accordance with client's instructions
based on IEC 420 (1990)

test date June 28th, 1991

the performance of the apparatus tested and the observations made during the
tests have been recorded in the table with the test results and oscillograms

this document is composed by 7 pages, 5 oscillograms

client, August 27th, 1991

test engineer

F. La Monaco

91/012285
keywords : L20100 23430B 36050L 49070T 53001D

table of tests performed

date	Type of test	see page
June 28th 1991	<p>THREE PHASE SHORT CIRCUIT MAKING TESTS WITH FUSES</p> <p>No. 3 tests with a prospective current of 53.5 kA (peak) at 24 kV</p>	5

tests witnessed by

Mr. Laurons - MERLIN GERIN S.A.
Mr. Dubroquis - MERLIN GERIN S.A.

This test report is not a certificate of conformity, nor do the results given necessarily confirm the ratings assigned by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

1998

three phase short circuit making tests with fuses

test duty _____ with 20 kA at 24.0 kV

test circuit conditions _____

circuit diagram see page 6 power factor < 0.15 frequency 50 Hz

U _c	t ₃	t ₀	U ₁	t ₁	U _c	t ₂	t _d
kV	µs	µs	kV	µs	kV	µs	µs
42	89						

transient recovery voltage (TRV)

conditions of the apparatus before the tests: new

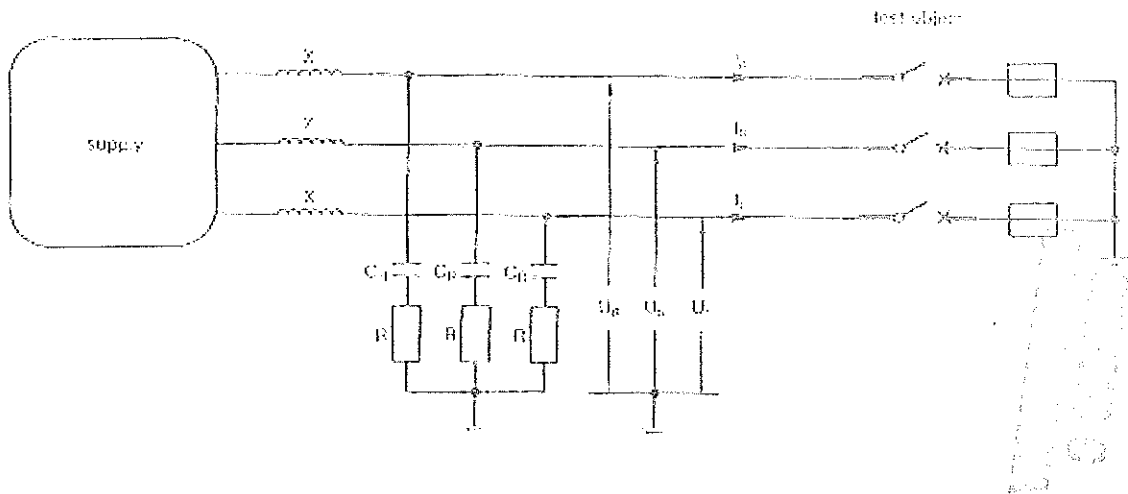
prospective current	symmetrical	kA	20.0	
	peak	kA	53.5	
	oscillogram	no.	503	
test		no.	1	2
oscillogram		no.	250	291
operating duty			0	0
applied voltage (phase value)	kV		13.9	13.9
			13.9	13.9
			13.9	13.9
recovery voltage (phase value)	kV		13.9	13.9
			13.9	13.9
			13.9	13.9
phase-to-phase voltage	kV	24.0	24.0	
maximum overvoltage	kV	44.6	42.0	
breaking current (fuse)	cut-off (max)	kA	12.1	12.2
	phase		T	T
fuse link current rating	A	100	100	
striker operation	yes/no	yes	yes	
duration of interruption	ms	8	8	

conditions of the apparatus after the tests: external parts as before the tests, internal parts not inspected.

note after the tests : the performance of the apparatus is considered satisfactory for the tests performed.

1920

circuit diagram

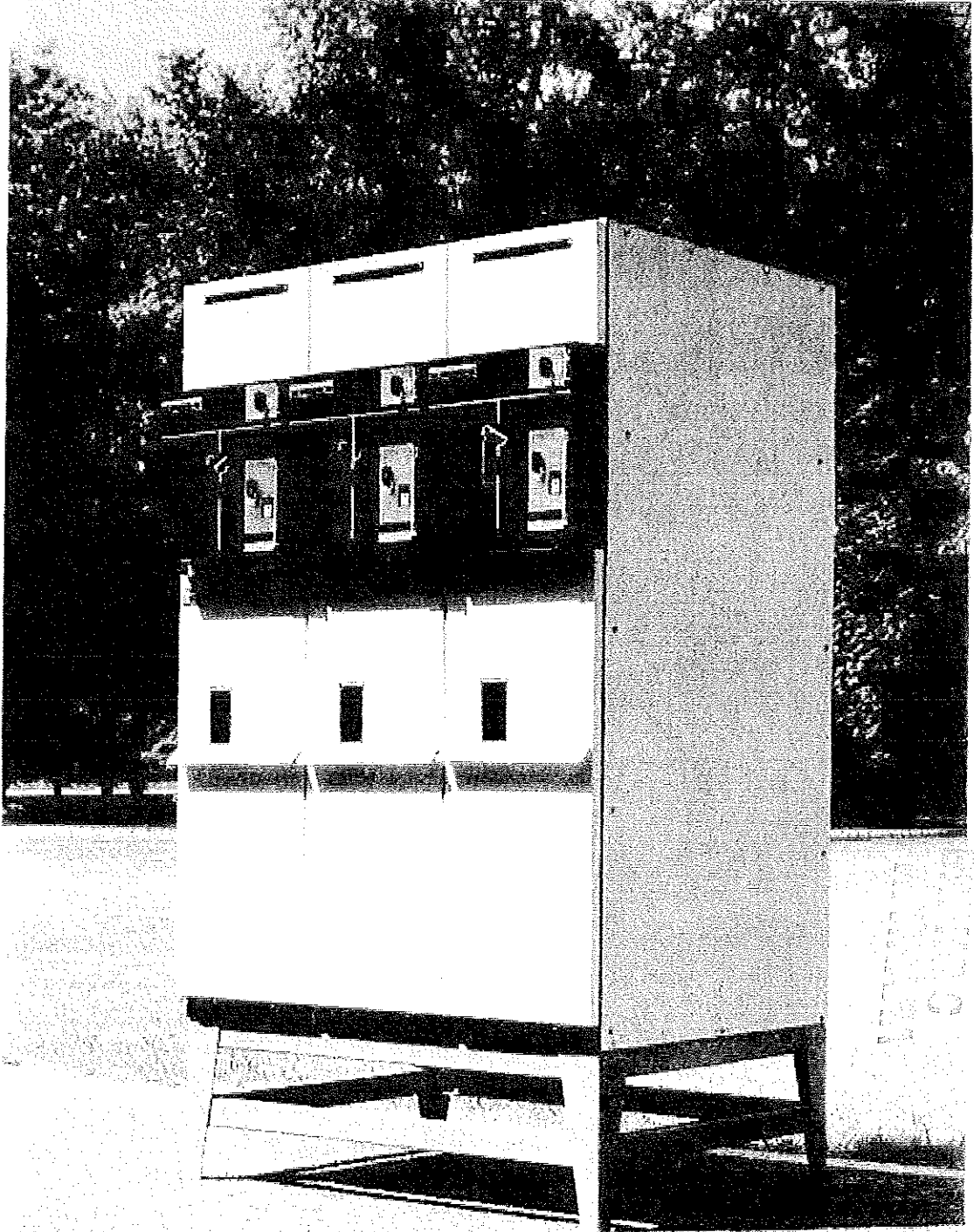


Similar circuit to that depicted and the same test results are given.

The test report is not a certificate of conformity, nor do the results given necessarily confirm the values supplied by the manufacturer. This document may not be reproduced or otherwise used in its entirety without CESI's authorization.

1921

2



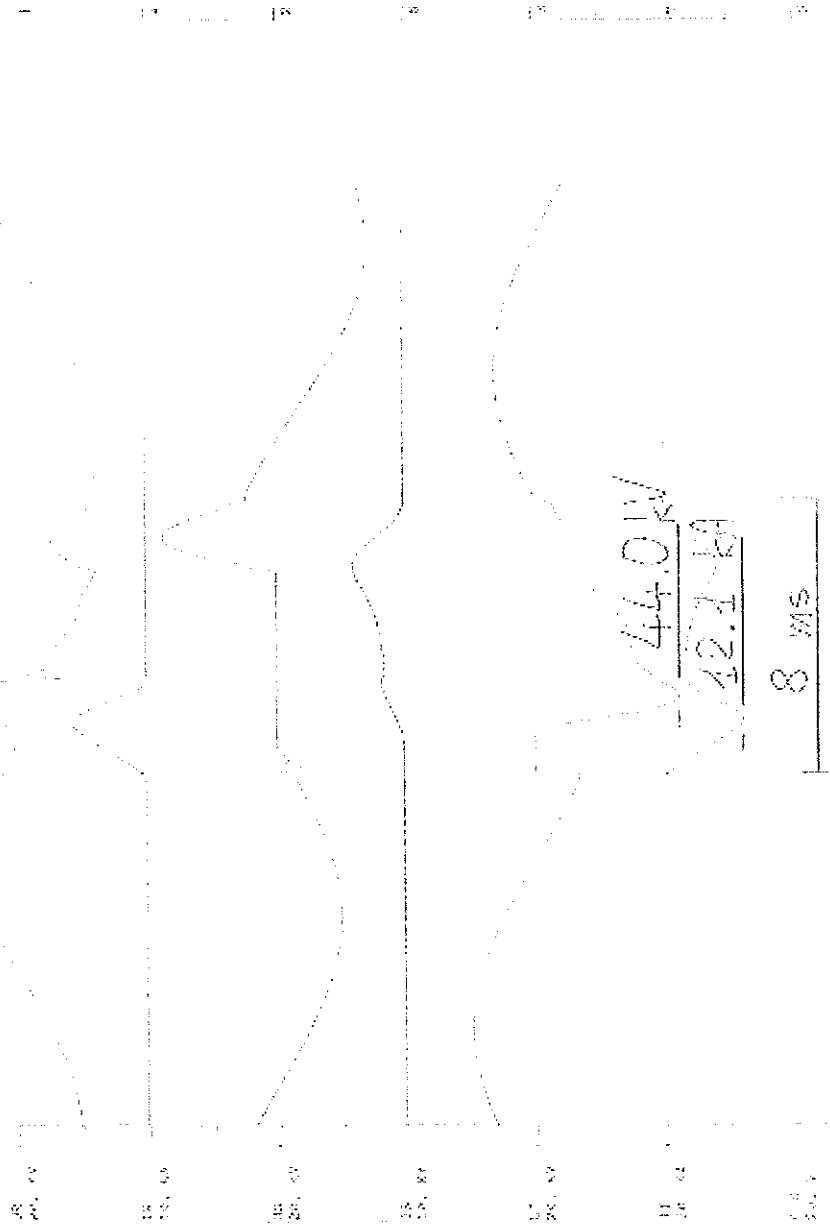
This test report is not a certificate of conformity, nor do the results given necessarily confirm the claims supplied by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

[Handwritten signature]

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401.0002 Hz
 401.418 Hz
 401.836 Hz
 402.254 Hz
 402.672 Hz
 403.090 Hz
 403.508 Hz
 403.926 Hz
 404.344 Hz
 404.762 Hz
 405.180 Hz

g



401.0002 Hz
 401.418 Hz
 401.836 Hz
 402.254 Hz
 402.672 Hz
 403.090 Hz
 403.508 Hz
 403.926 Hz
 404.344 Hz
 404.762 Hz
 405.180 Hz

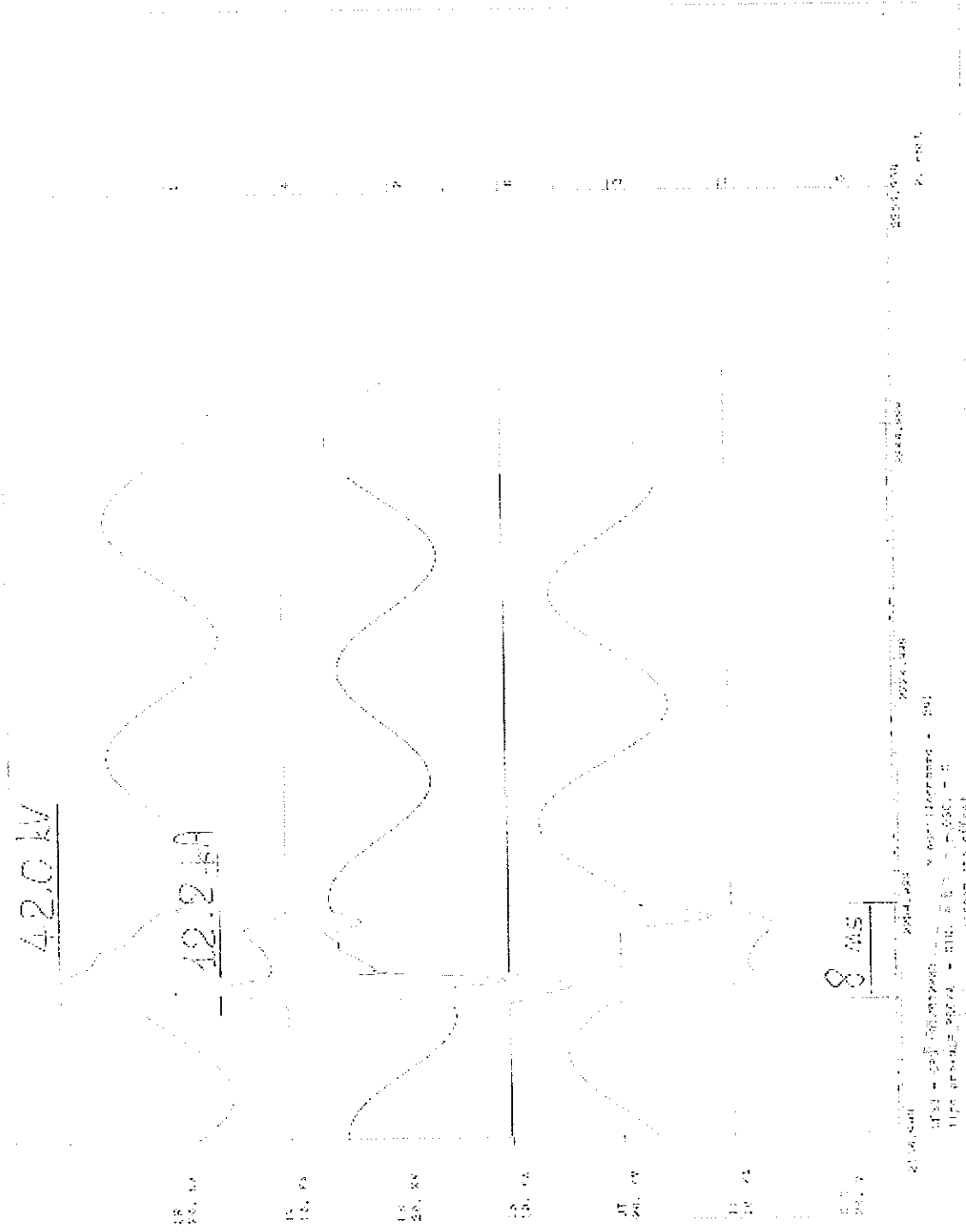
[Signature]

[Signature]

[Signature]

1925

22



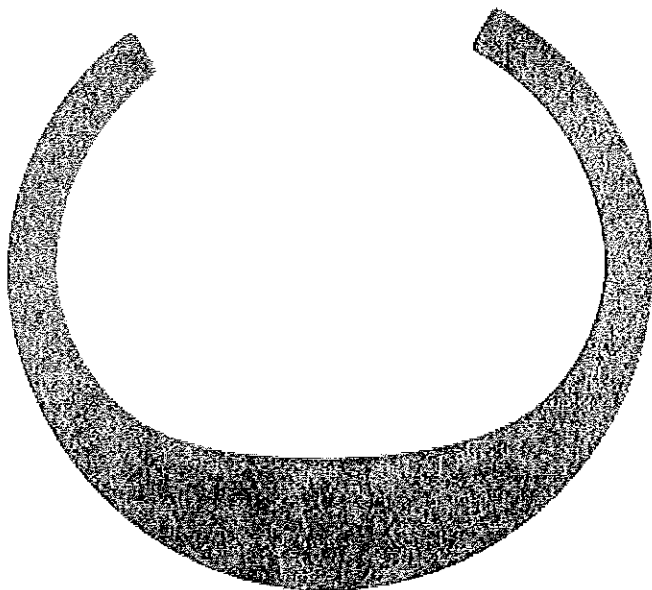
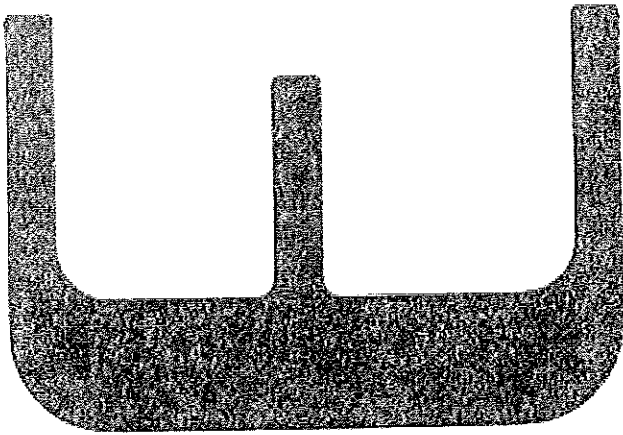
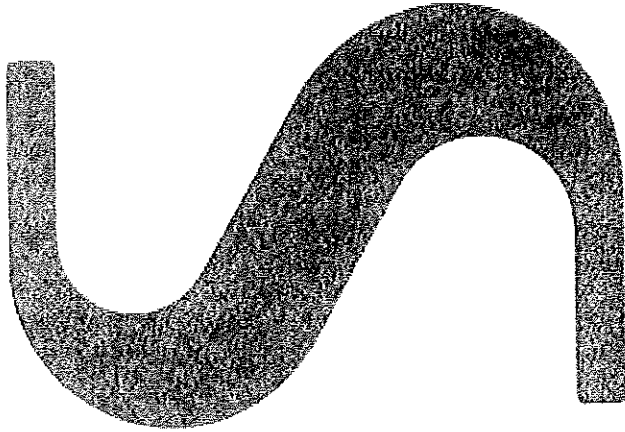
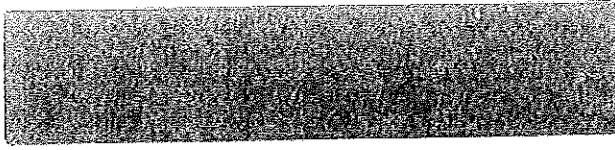
42.0 kW
 42.2 mA
 8 MS
 0V
 10
 20
 30
 Time
 0 2 4 6 8 10 12 14 16 18 20

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51249281XA

GPS91/15223



[Handwritten signatures]

1928

3

client MERLIK GERMIE S.A. - Grenoble (France)

object Three pole metal enclosed air insulated switchgear SM5 system type QM.
Fitted with an increased operating frequency SF6 gas insulated switch,
type IQ SM5.

characteristics of the tested object assigned by the Client

rated voltage 17.5/24 kV rated current 200 A rated frequency 50 Hz
other characteristics listed on page 2

the tests have been made in accordance with client's instructions
based on IEC 420 (1990)

test date June 28th, 1991

the performance of the apparatus tested and the observations made during the
tests have been recorded in the table with the test results and oscillograms

this document is composed by 7 pages, 5 oscillograms

Milan, August 29th, 1991

test engineer

F. Le Monaco

RECEIVED
SEP 11 1991
CPS

9

keywords : 91/015223 220100 234300 260201 450707 530010

This test report is not a certificate of conformity, nor do the results given necessarily confirm the ratings assigned by the manufacturer.
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1929

rated characteristics of the tested object assigned by the client.

voltage	11.5/24	kV
frequency	50	Hz
normal current	230	A
short-circuit making current	50	kA
short-time withstand current	20	kA
short-circuit duration	1	s
gas pressure for interruption	1.4	bar abs

identification of the object effected.

The tested object truly conforms to the drawings of its type supplied by the client. These drawings identified by CESI with embossing press and numbered GPS- 91/015162 1 to 13 are assembled in a folder.

11.5/24 kV
50 Hz
230 A
50 kA
20 kA
1 s
1.4 bar abs

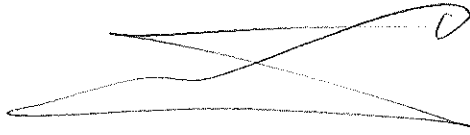


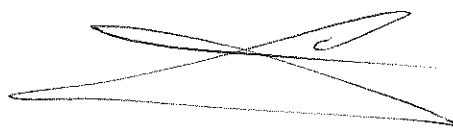
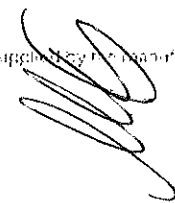
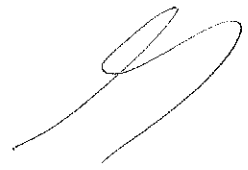

Table of tests performed

date	type of test	n° page
June 28th 1991	<p>THREE PHASE SHORT CIRCUIT MAKING TESTS WITH FUSES</p> <p>No.3 tests with a prospective current of 53.5 kA (peak) at 24 kV</p>	5

C
E
S
I
S
A
S

tests witnessed by

Mr. Laurent - MERLIN GERTE S.A.
 Mr. Dubroqua - MERLIN GERTE S.A.

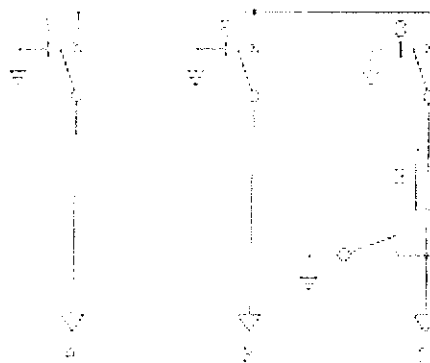
This test report is not a certificate of conformity, nor do the results necessarily confirm the ratings supplied by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

1931

Handwritten scribble

arrangement of the object for the tests

The tested apparatus was assembled with two other apparatus of SMG system (see photo on page 7).
 The figure below shows the electric diagram of the complete setting (single phase diagram of a three phase circuit) :



- 3 : switch-fuse combination under test.
- 1-2 : auxiliary switches
- A-B-C : cables

During the tests the cables B were connected to the supply, the switch 2 was in closed position and the cables C were short-circuited at the bottom. The earthing switch downstream the fuse and the switch 1 were in open position.

The metal enclosure was insulated from earth but connected thereto by a copper wire 0.1 mm in diameter and 30 mm long to indicate any significant leakage current to earth.

015223
 1992
 11/02
 11/92

Handwritten signatures and scribbles

three phase short circuit making tests with fuses

test duty with 20 kA at 24.0 kV

test circuit conditions

circuit diagram see page 6 power factor ≤ 0.15 frequency 50 Hz

Uc	U ₁	U ₂	U ₃	U ₄	U ₅	U ₆	U ₇	U ₈
kV	μ s	μ s	kV	μ s	kV	μ s	μ s	μ s
42	89							

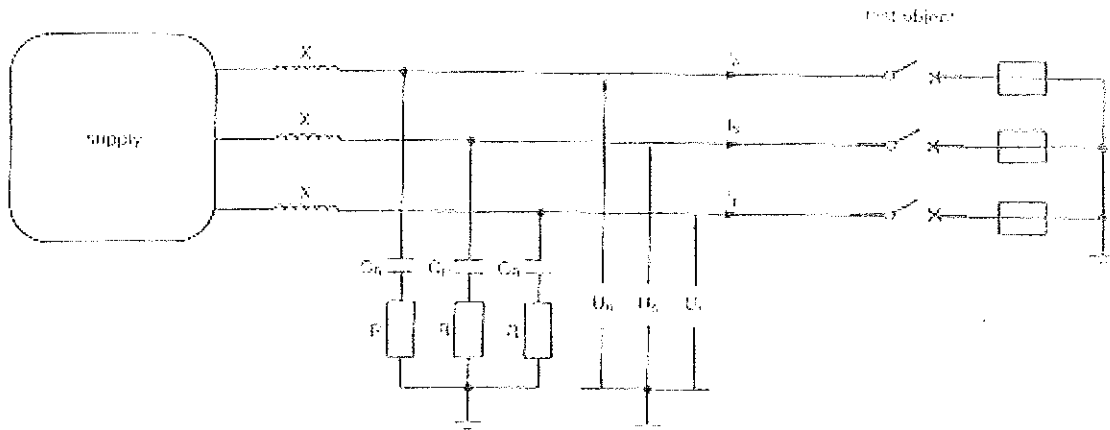
conditions of the apparatus before the tests: new

prospective current	symmetrical	kA	20.0	
	peak	kA	53.5	
	oscillogram	no.	803	
test	no.	1	2	
oscillogram	no.	290	291	
operating duty		C	C	
applied voltage (phase value)	kV	13.9	13.9	
		13.9	13.9	
		13.9	13.9	
recovery voltage (phase value)	kV	13.9	13.9	
		13.9	13.9	
		13.9	13.9	
phase-to-phase voltage	kV	24.0	24.0	
maximum overvoltage	kV	44.0	42.0	
breaking current (fuse)	cut-off (max)	kA	12.1	12.2
	phase		T	T
fuse link current rating	A	100	100	
striker operation	yes/no	yes	yes	
duration of interruption	ms	8	8	

conditions of the apparatus after the tests: external parts as before the tests, internal parts not inspected.

note after the tests : the performance of the apparatus is considered satisfactory for the tests performed.

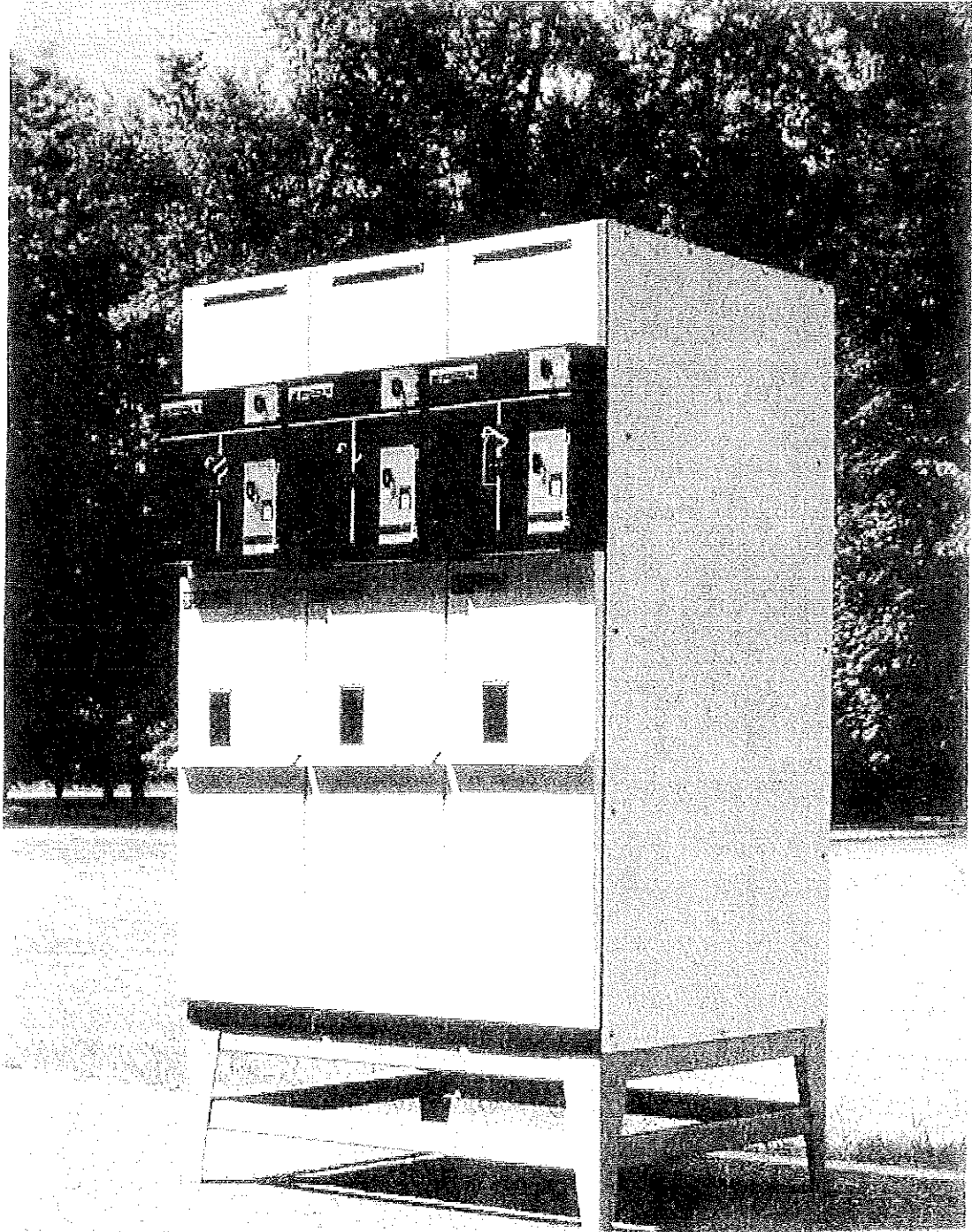
circuit-diagram



the test object and the test object are the same as on the circuit diagram

[Handwritten signatures and stamps]

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Vertical text on the right side of the image, possibly a stamp or label, oriented vertically.

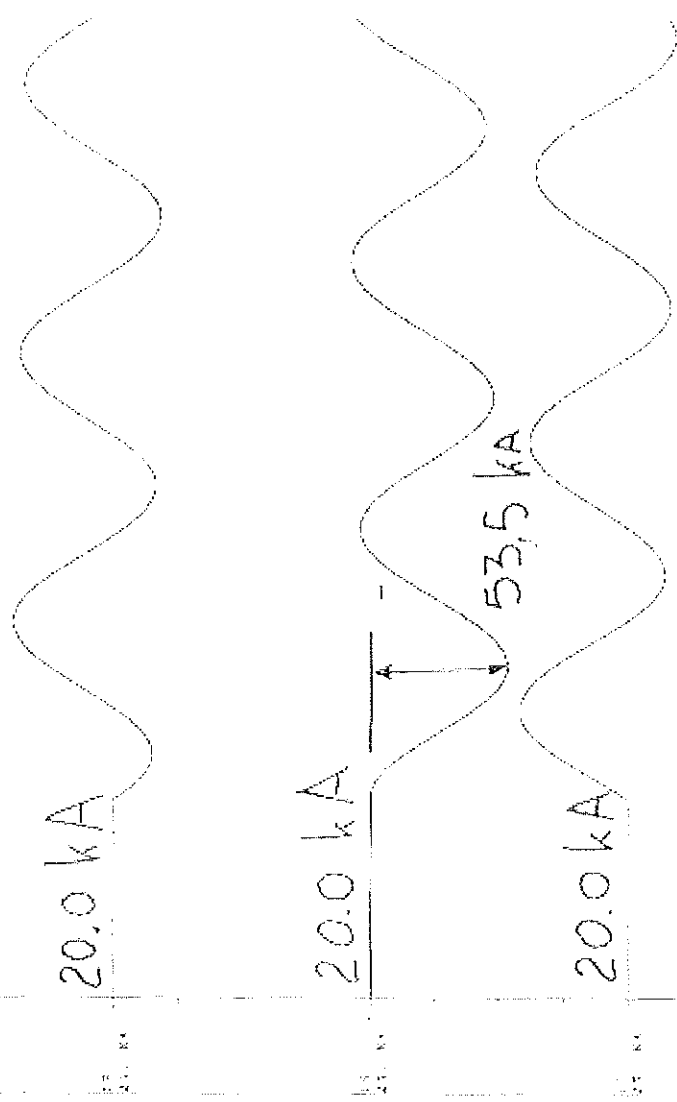
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This test report is not a certificate of conformity, nor do the results given necessarily confirm the ratings claimed by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

1935

ESURKAT
ES-001 KA



ESURKAT ES-001 KA
 20.0 kA
 53,5 kA
 20.0 kA

2/2

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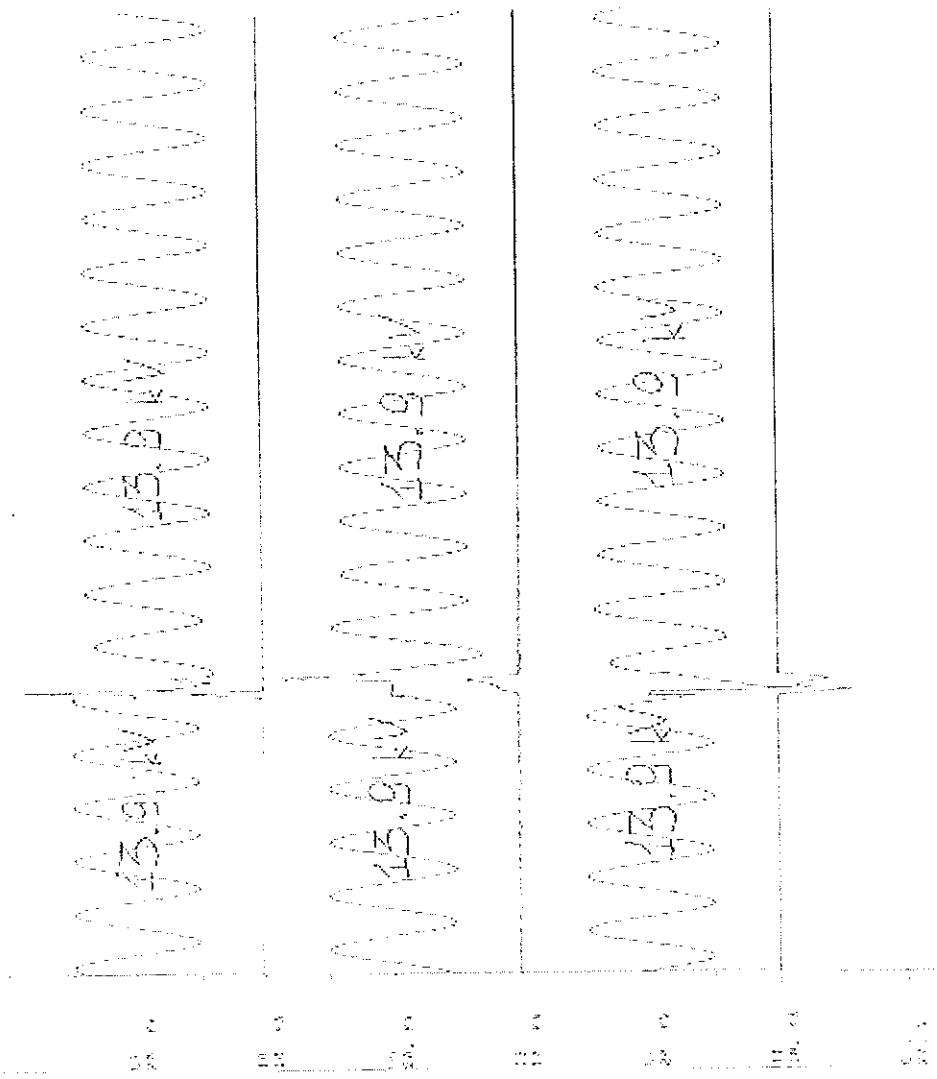
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ESURKAT
ES-001 KA

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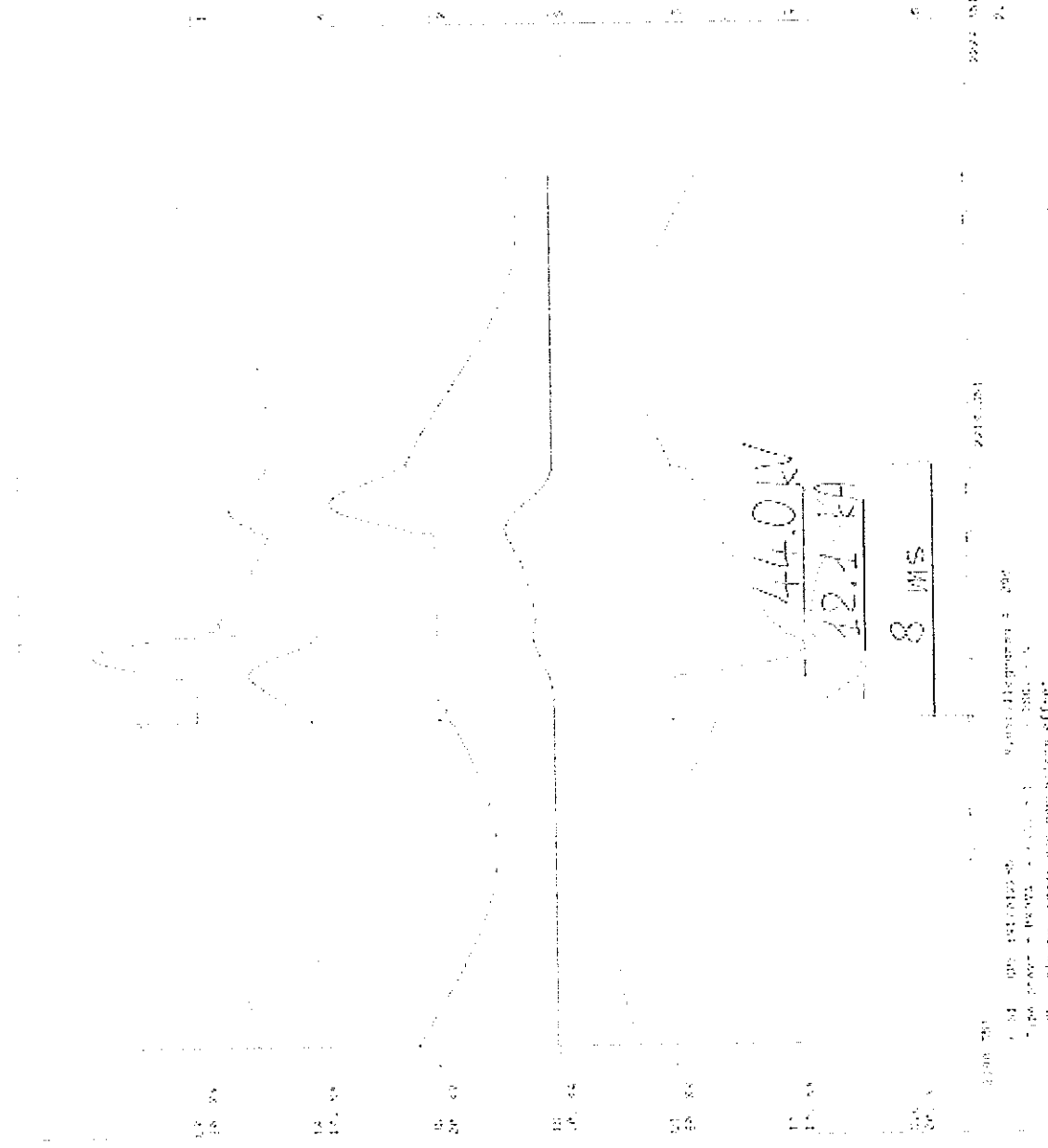
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 15.9
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 15.9
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0.000000
33.420000
USP 406.74
33.420000
0.000000
44.820000
11.000000
12.112000
0.000000



2004 01
24 0004

8 MS
8 AU

M.O. 777
A.R. 28

0.000000
0.000000

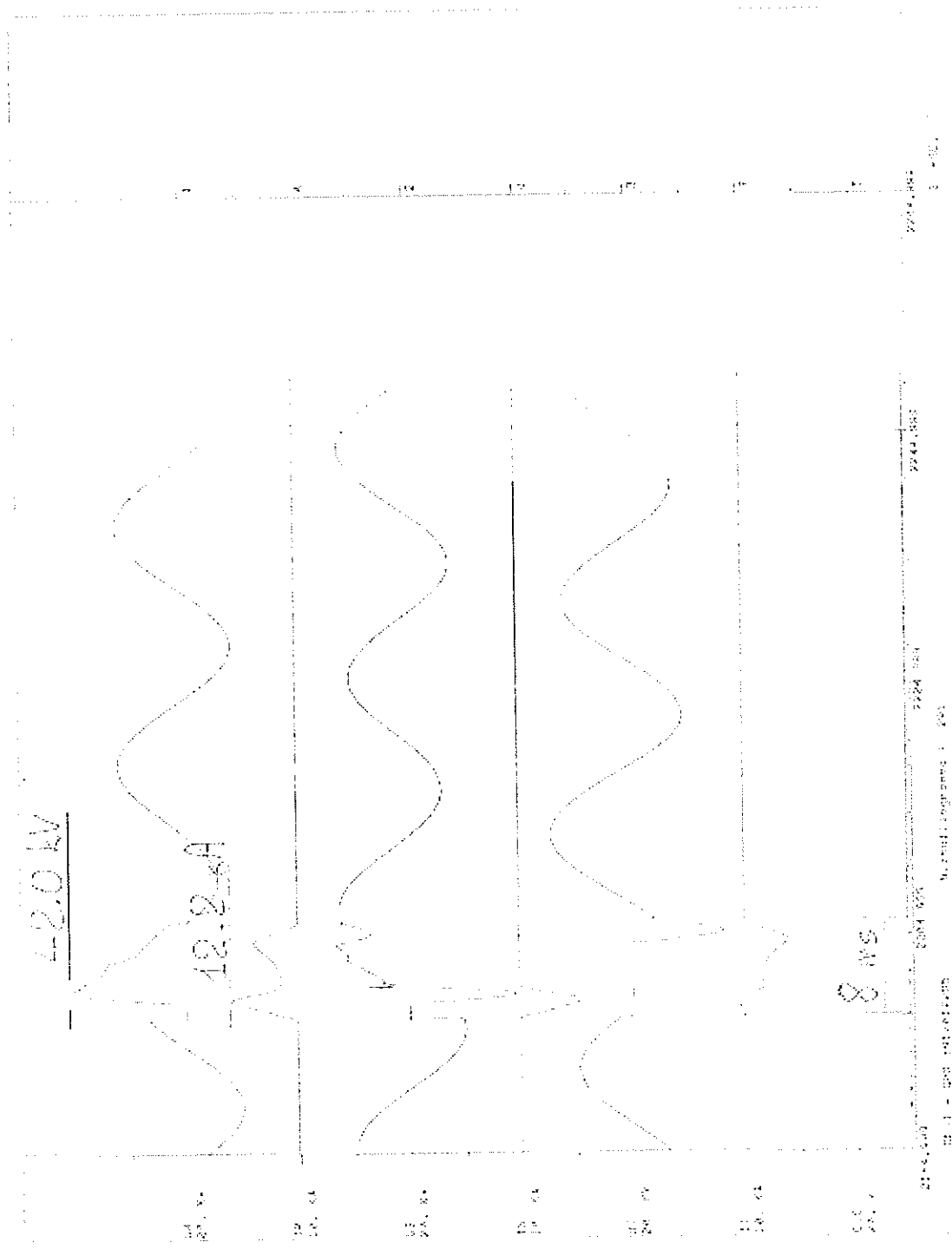
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1938

g



21-45-500
 22-44-1000
 23-44-1000
 24-44-1000
 25-44-1000
 26-44-1000
 27-44-1000
 28-44-1000
 29-44-1000
 30-44-1000

Model - 500
 Type - 500
 Serial - 500
 Date - 500

1000
 2000
 3000
 4000
 5000
 6000
 7000
 8000
 9000
 10000

[Signature]

[Signature]

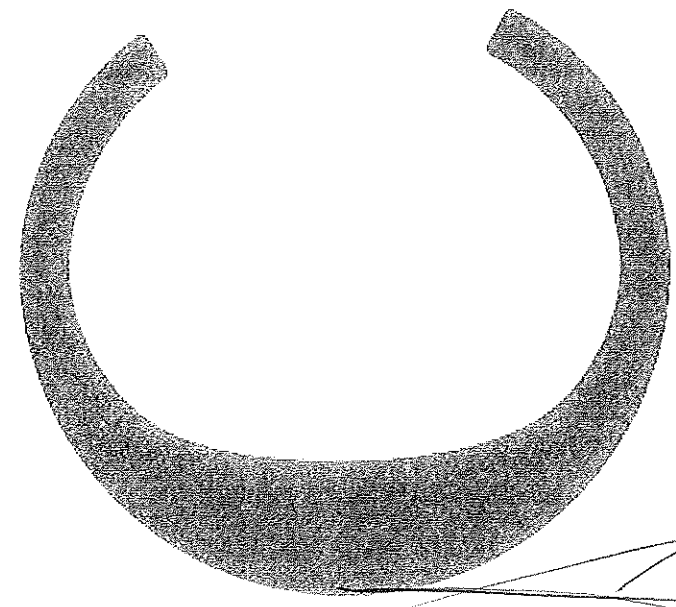
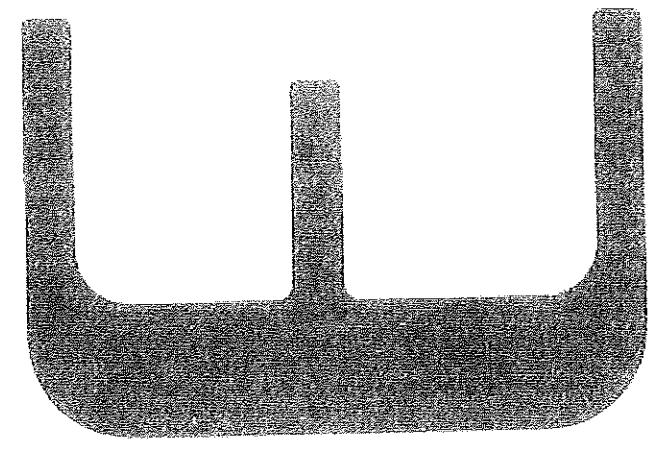
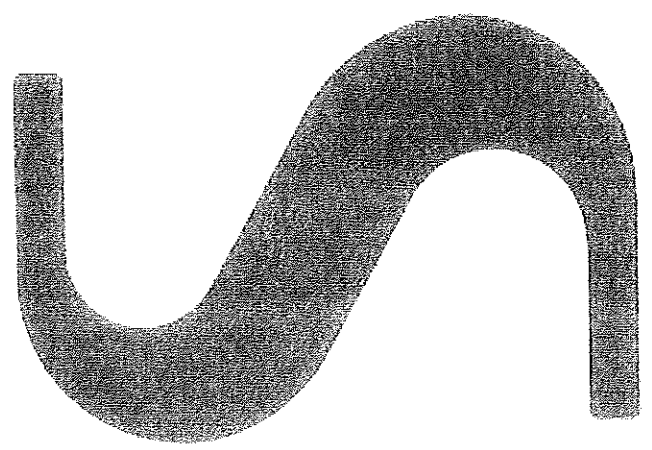
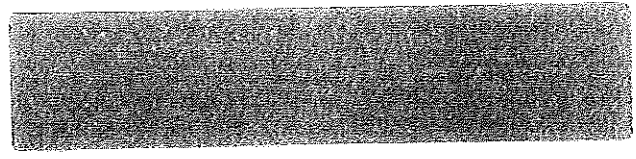
[Signature]

10/40

9/2

51249283XA

GPS91/15224



9/2

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1991

rated characteristics of the tested object assigned by the client.

voltage	12 kV
frequency	50 Hz
normal current	200 A
short-circuit making current	50 kA
short-time withstand current	20 kA
short-circuit duration	1 s
gas pressure for interruption	1.4 bar abs

Identification of the object affected.

The tested object truly conforms to the drawings of its type supplied by the Client. These drawings identified by CESI with embossing press and numbered GPS- 91/015162 1 to 13 are assembled in a folder.

1993
 10/10/93
 10/10/93

Table of tests performed

date	type of test	non page
June 28th 1991	THREE PHASE SHORT CIRCUIT MAKING TESTS WITH FUSES No.3 tests with a prospective current of 65 kA (peak) at 12 kV	5

Vertical stamp or text on the right side of the table area.

tests witnessed by

Mr. Laurens - MERLIN GERIN S.A.
Mr. Dubroqua - MERLIN GERIN S.A.

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10/44

three phase short circuit making tests with fuses

test duty _____ with 25 kA at 12.0 kV

test circuit conditions _____

circuit diagram see page 6 power factor < 0.15 frequency 50 Hz

transient recovery voltage (TRV)	U _c kV	t ₃ μs	t _d μs	U ₁ kV	t ₁ μs	U _c kV	t ₂ μs	t _d μs
	21	50						

condition of the apparatus before the tests: new

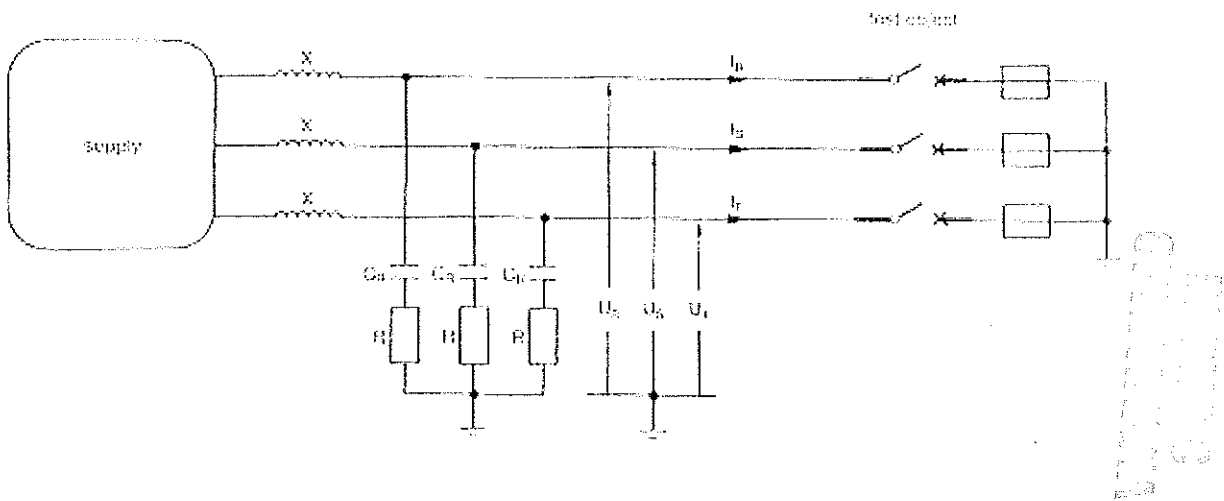
prospective current	symmetrical	kA	25.0	
	peak	kA	65.0	
	oscillogram	no.	502	
test		no.	1	2
oscillograms		no.	288	289
operating duty			C	C
applied voltage (phase value)		kV	5.90	6.90
			5.90	6.90
			5.90	6.90
recovery voltage (phase value)		kV	5.90	6.90
			5.90	6.90
			5.90	6.90
phase-to-phase voltage		kV	12.0	12.0
maximum overvoltage		kV	23.0	21.0
breaking current (fuse)	cut-off (max)	kA	19.8	18.8
	phase		T	T
fuse link current rating		A	200	200
striker operation		yes/no	yes	yes
duration of interruption		ms	6	7

conditions of the apparatus after the tests: external parts as before the tests, internal parts not inspected.

note after the tests : the performance of the apparatus is considered satisfactory for the tests performed.

1946

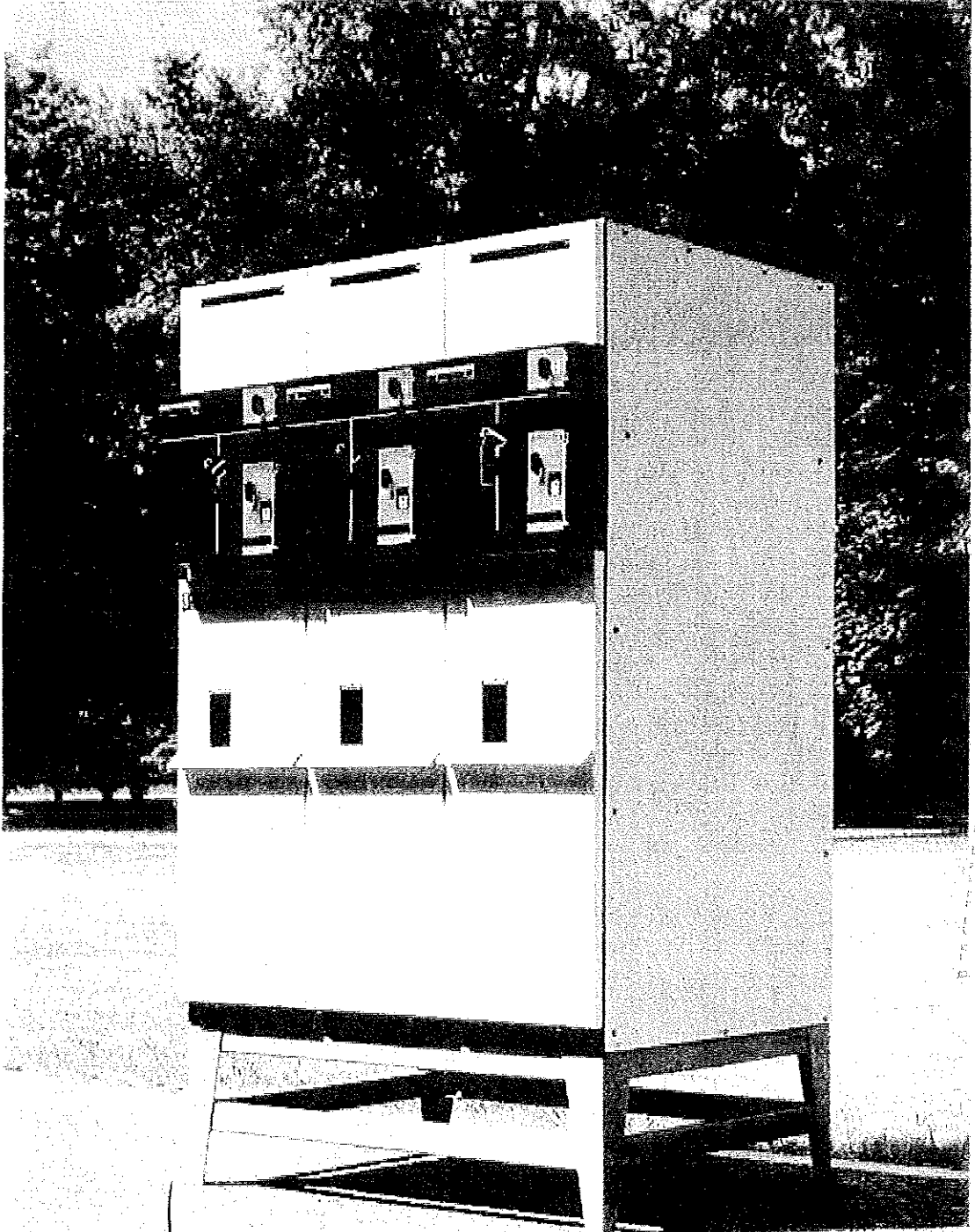
circuit-diagram



Values used in this diagram are the same as on the test program.

This test report is not a certificate of conformity, nor do the test results necessarily confirm the ratings supplied by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

1977



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This test report is not a certificate of conformity, nor do the results given necessarily confirm the ratings supplied by the manufacturer. This document may not be reproduced otherwise than in its entirety without CESI's authorization.

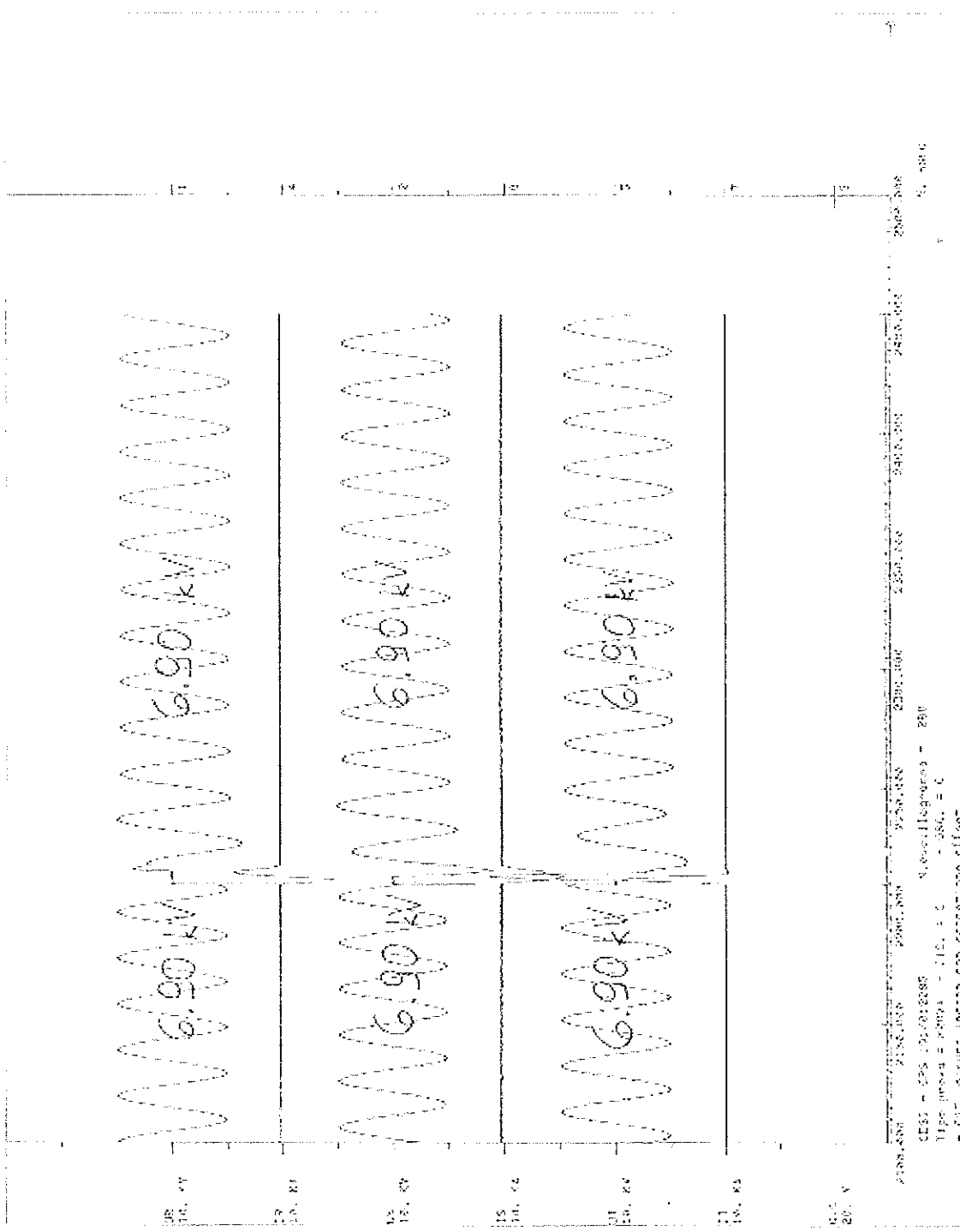
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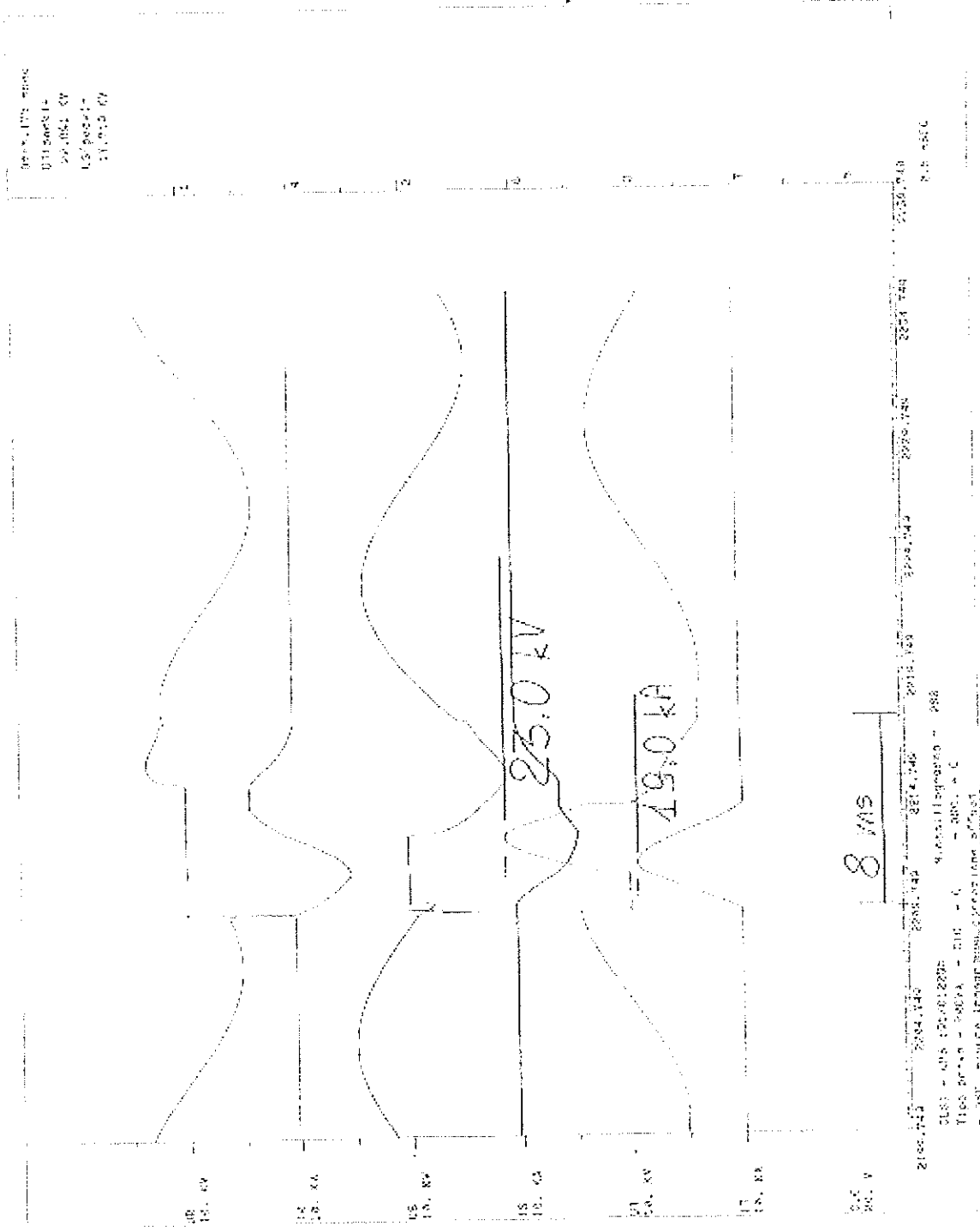
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Handwritten number '1950' at the bottom right corner.



02-11-57
 07:20:00
 43 1981 45
 13-10-57
 21:00:00



21:00:00

1.8 MS

21:00:00 2004.140 2205.142 2314.146 2415.153 2516.160 2617.167 2718.174 2819.181 2920.188 3021.195 3122.202 3223.209 3324.216 3425.223 3526.230 3627.237 3728.244 3829.251 3930.258 4031.265 4132.272 4233.279 4334.286 4435.293 4536.300 4637.307 4738.314 4839.321 4940.328 5041.335 5142.342 5243.349 5344.356 5445.363 5546.370 5647.377 5748.384 5849.391 5950.398 6051.405 6152.412 6253.419 6354.426 6455.433 6556.440 6657.447 6758.454 6859.461 6960.468 7061.475 7162.482 7263.489 7364.496 7465.503 7566.510 7667.517 7768.524 7869.531 7970.538 8071.545 8172.552 8273.559 8374.566 8475.573 8576.580 8677.587 8778.594 8879.601 8980.608 9081.615 9182.622 9283.629 9384.636 9485.643 9586.650 9687.657 9788.664 9889.671 9990.678 10091.685 10192.692 10293.699 10394.706 10495.713 10596.720 10697.727 10798.734 10899.741 109100.748 110101.755 111102.762 112103.769 113104.776 114105.783 115106.790 116107.797 117108.804 118109.811 119110.818 120111.825 121112.832 122113.839 123114.846 124115.853 125116.860 126117.867 127118.874 128119.881 129120.888 130121.895 131122.902 132123.909 133124.916 134125.923 135126.930 136127.937 137128.944 138129.951 139130.958 140131.965 141132.972 142133.979 143134.986 144135.993 145136.000

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1957

Handwritten mark

W 6.90 W 6.90 W 6.90 W 6.90

W 6.90 W 6.90 W 6.90 W 6.90

W 6.90 W 6.90 W 6.90 W 6.90

2100.000 2150.000 2200.000 2250.000 2300.000 2350.000 2400.000 2450.000 2500.000 2550.000 2600.000 2650.000 2700.000 2750.000 2800.000 2850.000 2900.000 2950.000 3000.000

1591 - 096 191012250 4.0000 1.000000000 - 214
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- 092 - 11.1.10 - 0000.000.000.01100

09/08/52

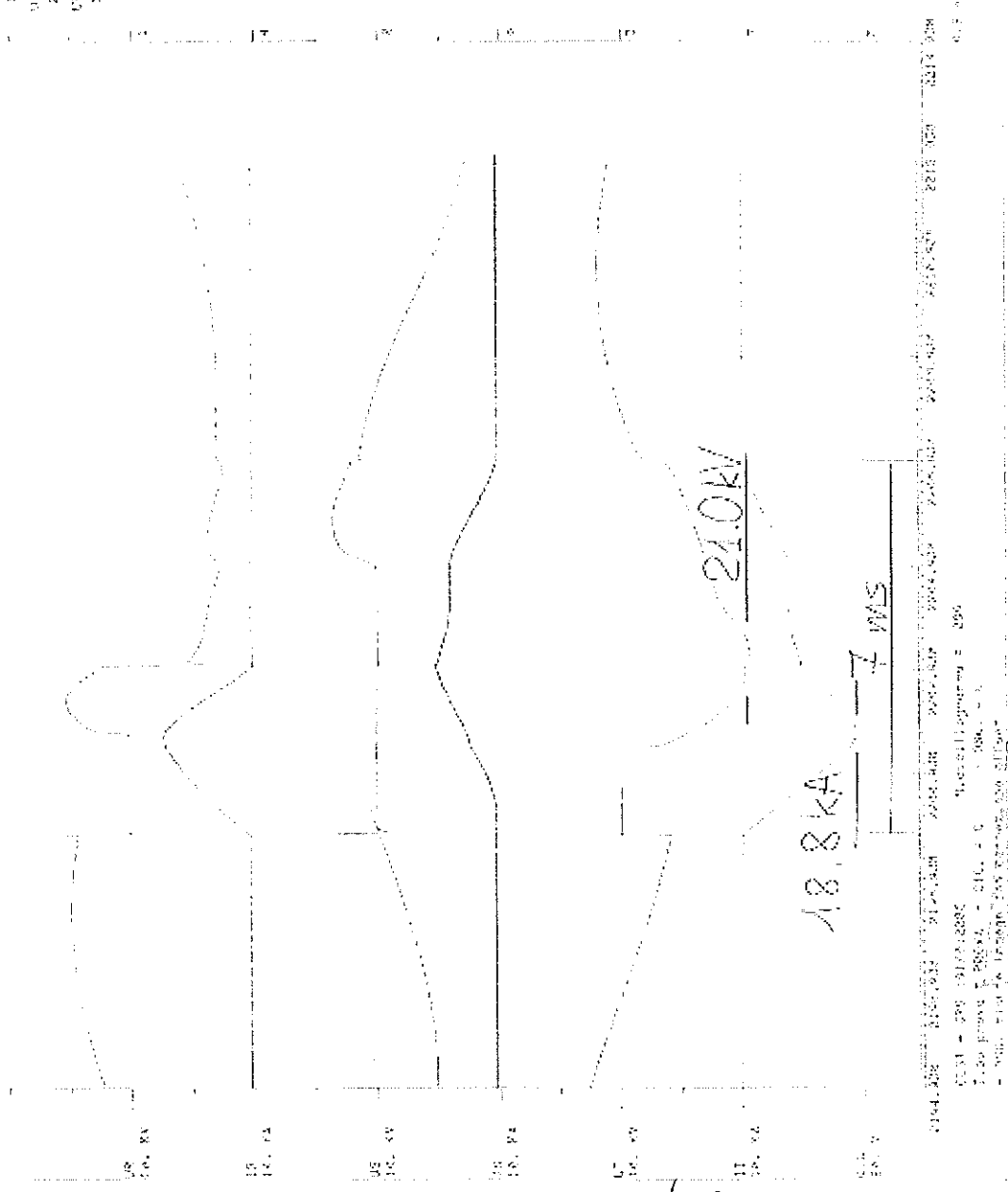
A

110

1952

0144, 300, 5000
 1117, 800 -
 18, 350 KA
 011, 000 -
 20, 000 KV
 021, 000 -
 13, 000 KA

Handwritten scribble



0144, 300, 5000
 1117, 800 -
 18, 350 KA
 011, 000 -
 20, 000 KV
 021, 000 -
 13, 000 KA

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Handwritten signature

1953

LE.M.T.

11, rue de la République, 73000 Le Grand-Bourg
73000 Le Grand-Bourg
11, rue de la République, 73000 Le Grand-Bourg
73000 Le Grand-Bourg
Tél. : 04 78 39 44 66
Fax : 04 78 39 13 00



TEST REPORT n°51249432EA

Apparatus : A.C. metal-enclosed switchgear and controlgear
Designation : MERLIN GERIN SM6 type IMC
Rated voltage : 24 kV Rated current : 630 A
Manufacturer : Schneider Electric Industries SA - Rueil-Malmaison - FRANCE

Object : Dielectric tests
- Lightning impulse voltage tests
- Power-frequency voltage tests

Tested for : Schneider Electric Industries SA

Date(s) of tests : 6, 8, 9 March 2000

These tests were carried out in accordance with : Customer request based on IEC 60298 (1990)
IEC 60694 (1996)

*The performance of the apparatus tested and the results obtained are shown in the tables, oscillograms and photographs enclosed.
This document relate only to the items presented for testing.*

The documents forming part of this test report are :

Apparatus ratings	page(s) 2
Test records	page(s) 3
Test conditions	page(s) 4 and 5
Test results	page(s) 6 and 7
Photographs / Drawings	page(s) 8
The test report comprises :	8 pages

*This test report can only be copied as a photographic facsimile in its entirety.
COFRAC Testing Section accreditation is only to certify that the laboratory complies with the technical competence required to carry out test on the product types covered by the accreditation.*

Varces, 4 April 2000

Technical manager

Testing laboratory manager

L. MANNONE

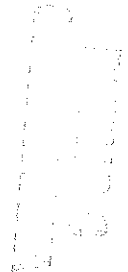
R. ANTOINE

APPARATUS RATINGS

Manufacturer	: Schneider Electric Industries SA	
Designation	: MERLIN GERIN SM6 type IMC 2 CT	
Number of poles	: 3	
Voltage	kV	: 24
Lightning impulse withstand voltage	kV	: 125
Power frequency withstand voltage	kV	: 50
Frequency	Hz	: 50 / 60
Normal current	A	: 630
Short time withstand current	kA	: 16
Peak withstand current	kA	: 40
Short circuit breaking current	kA	: 16
Short circuit making current	kA	: 40
Interrupting medium	: SF ₆	
Relative pressure at 20°C	bar(s)	: 0.4
Degree of protection	: IP2XC	
Drawing n°	: 3731372 ind. R	

The metal-enclosed switchgear and controlgear is fitted out with :

- 2 CT ARM 2 / N2F Nuova Magrini Gallileo
- ph 1 (n° 9843510)
- ph 3 (n° 9843513)



1955

TEST RECORDS

Test type	Page
Lightning impulse voltage tests	6
Power-frequency voltage tests (50Hz)	7

Manufacturer's representative : J. GUADAGNINO DI-PMT / 38V

Test manager : J. GALAN L.E.M.T / 38V



1956

TEST CONDITIONSCondition before tests

- Relative test pressure at 20 °C : 0.4 bar
- The power supply is carried out with 1 cable 240 mm² Alu per phase

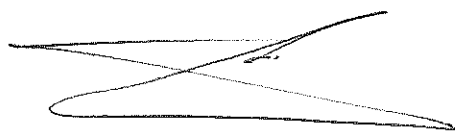
Ambient air conditions during the tests

Date		03/06/00	03/08/00	03/09/00
Pressure	MmHg	750	753	748
Dry temperature	°C	20.0	18.0	20.0
Correction factor	K	0.9868	0.9976	0.9842

For a test, the test voltage is equal to the specified voltage multiplied by K.

Measuring uncertainty

Measuring uncertainty	Date					
	03/06/00		03/08/00		03/09/00	
$U_0 = k \times U_{\text{arbit}}$	AU ₀ (kV)	%	AU ₀ (kV)	%	AU ₀ (kV)	%
Lightning impulse	2.1	1.7	2.1	1.7	2.1	1.7
Power-frequency	1.1	2.1	1.1	2.1	1.1	2.1




TEST CONDITIONSTests and measurements facilities

- Lightning impulse :

	Platform B
Haefely generateur 400kV, coupling 200kV 4kJ	DGE4
Haefely damped capacitive divider 400kV 2nF	DDC2
Haefely peak voltmeter 64M	DVO5
Oscilloscope Tektronix 2235	DOS2
390 AD programmable digitizer Tektronix	DAN1

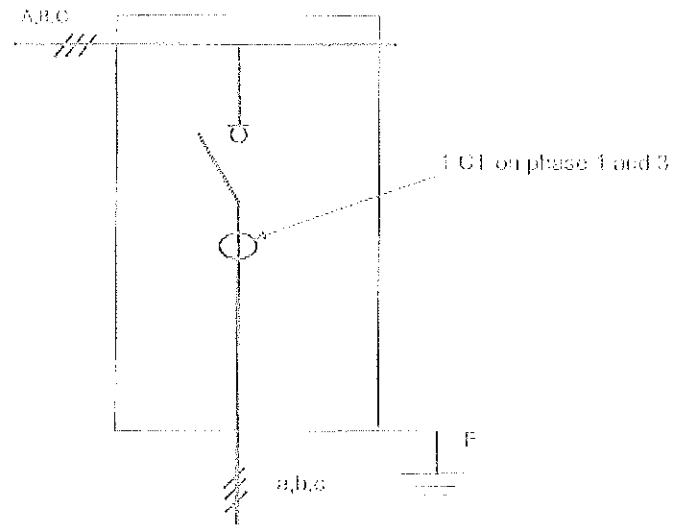
- Power frequency :

Transformer American Test System 150kV - 0.4A	DGE5
Resistive divider American Test System 10 MΩ - 2,4kΩ	DGE5
Voltmeter American Test System 600	DPU2

1958



RESULTS OF THE LIGHTNING IMPULSE VOLTAGE TESTS

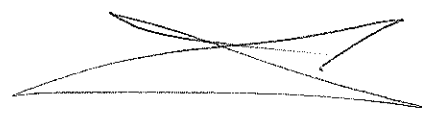


Test voltage (kV) : 125 x K

Wave shape (µs) : 1.2 / 50 µs

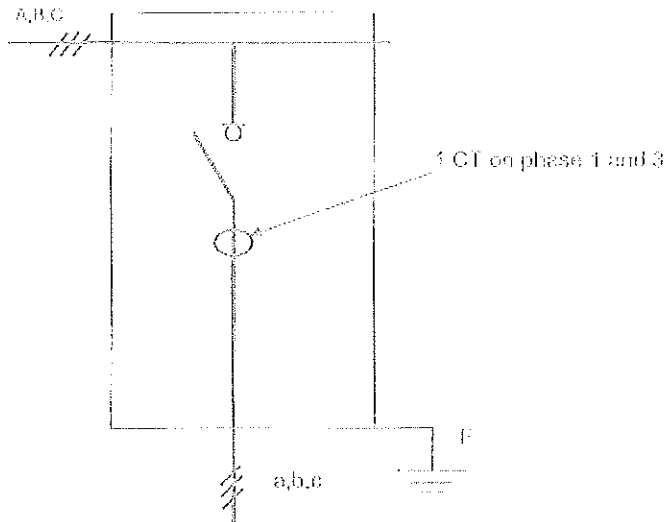
Fifteen consecutive lightning impulses at the rated withstand voltage are applied for each test condition and each polarity, preceded of 2 conditioning shocks to 80 % and 100 % of the test voltage.

Test n°	Switching device	Voltage applied to	Earth connected to	Disruptive discharge	
				polarity +	polarity -
1	Closed	aA	bcBCF	0	0
2	Closed	bB	acACF	0	0
3	Closed	cC	abABF	0	0
4	Open	A	BCabcF	0	0
5	Open	B	ACabcF	0	0
6	Open	C	ABabcF	0	0
7	Open	a	bcABCf	0	0
8	Open	b	acABCf	0	0
9	Open	c	abABCf	0	0



1959

RESULTS OF THE POWER FREQUENCY VOLTAGE TESTS



Test voltage (kV) : 50 x K

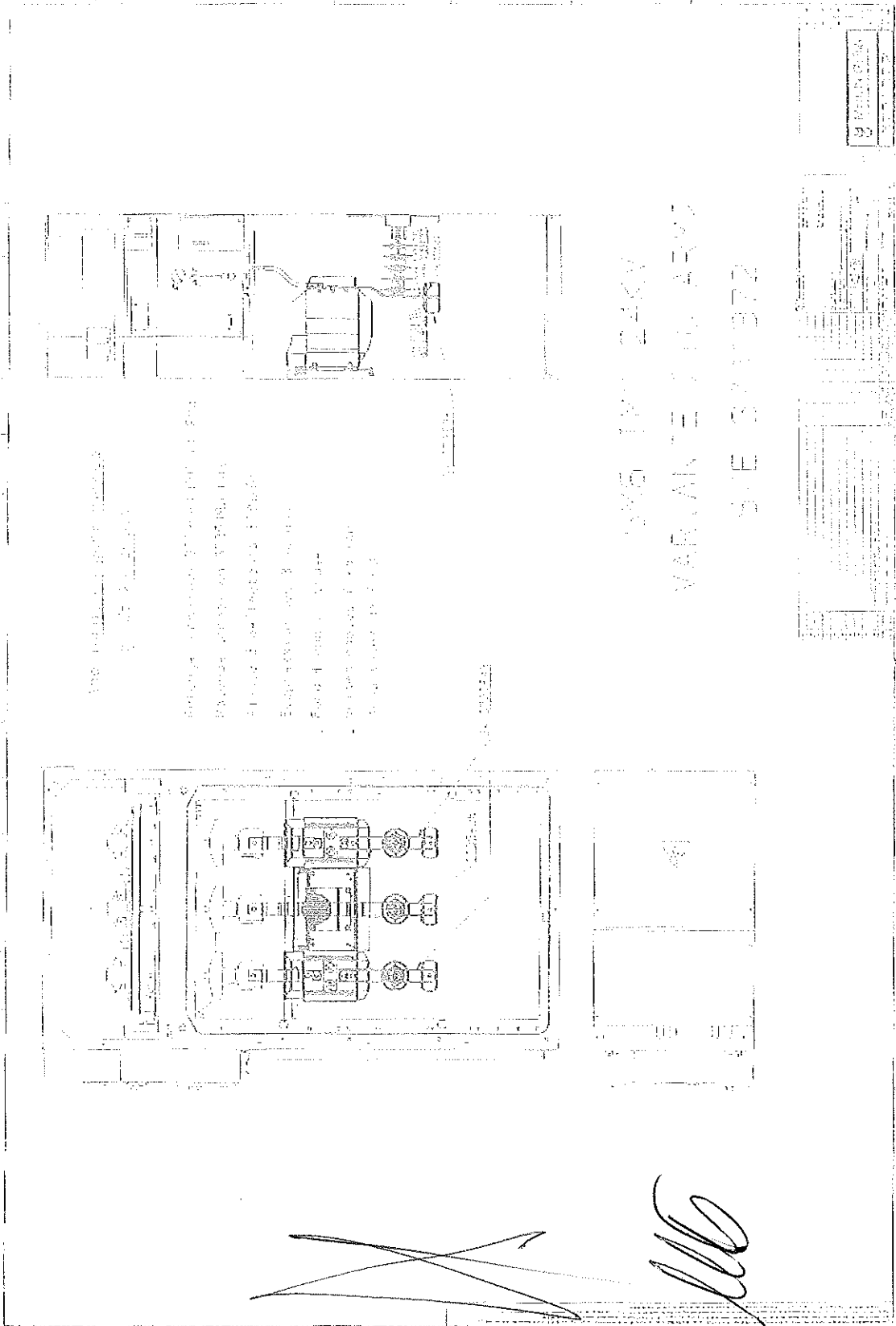
The test voltage is raised for each test condition to the rated withstand voltage and is maintained for one minute.

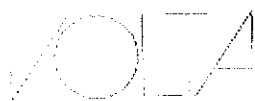
Test n°	Switching device	Voltage applied to	Earth connected to	Disruptive discharge
1	Closed	eA	bcBCF	0
2	Closed	bB	acACF	0
3	Closed	cC	abADF	0
4	Open	A	BCabcF	0
5	Open	B	ACabcF	0
6	Open	C	ABabcF	0
7	Open	a	bcABCF	0
8	Open	b	acABCF	0
9	Open	c	abABCF	0

1960

2

DRAWING





centre d'essais
 station d'essais à grande puissance
 48550 - Grenoble - Cedex 9 - France



51249695XB

TEST REPORT No. AC 2499 b

Apparatus : *Metal-enclosed switchgear*
 Designation : *MERLIN GERIN SM6 type IM*
Rated voltage 12 kV - Rated normal current 630 A - Rated frequency 50/60 Hz
 Manufacturer : *SCHNEIDER ELECTRIC - Bâtiment Billancourt - FRANCE*
 Object : *Tests at the short-circuit making capacity of switch and earthing switch rated at 25 kA - 62.5 kA peak - 12 kV*

Tested for : SCHNEIDER ELECTRIC
 Date(s) of tests : 15/09/1998

These tests were carried out in accordance with : On standards IEC 60298 (1996) and CEI 129 (1984) § 6.101

The performance of the apparatus tested and the results obtained are shown in the tables, oscillograms and photographs enclosed

The responsibility for conformity of any apparatus having the same designation with that tested rests with the Manufacturer

The documents forming part of this report are

Rating of the apparatus	3 page(s)
Record of proving tests	1 page(s)
Conditions of proving tests	2 page(s)
Test result tables	4 page(s)
Photographs	0 page(s)
Oscillograms	10 page(s)
Drawings of the apparatus	1 page(s)

The test report covers 22 pages

This record of proving test shall only be reproduced in the form of a complete photographic fac simile.

The accreditation by the COFRAC Testing section attests only of the laboratory technical competence in tests covered by the accreditation. The french version is legally acceptable.

Test Manager

P. JACQUEI

Grenoble 01/05/1998

Technical Manager

D. FERNANDEZ

1998



Centre d'essais
Station d'essais à grande puissance
28000 Grenchen, Suisse

9

N° AC 2480 B

Page 2

RATINGS OF THE METAL-ENCLOSED SWITCHGEAR ACCORDING TO IEC 298

Manufacturer	SCHNEIDER ELECTRIC	
Designation	MERLIN GERIN SM6 type IIA	
Number of phases	3	
Voltage	kV : 12	
Power frequency withstand voltage (1 min)	kV : 25	
- to earth and between poles	kV : 32	
- across the isolating distance		
Lightning impulse withstand voltage	kV peak : 75	
- to earth and between poles	kV peak : 85	
- across the isolating distance		
Frequency	Hz : 50/60	
Normal current	A : 630	
Peak withstand current	kA : 62.5	
Short-time withstand current (duration)		
- main circuit	kA : 25 (1 s)	
- earthing switch	kA : 25 (1 s)	
- earth bar	kA : 25 (1 s)	
Arcing withstand due to an internal fault	kA : 7	
- duration	s : 1	
- type of accessibility (A or B)	A	
Degree of protection	IP2XC	
Dimensions (H x W x D)	mm : 7	
Weight	kg : 7	
Drawing(s) No	3 730 457 - 0 page 1/17	
Metal-enclosed switchgear equipped with	- 1 switch - earthing switch	

1963

1963



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1, rue de Grande Croix 8

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No. AC 2439 D

page 3

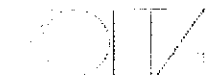
RATINGS OF THE HV SWITCH ACCORDING TO IEC 265

Manufacturer	SCHNEIDER ELECTRIC		
Designation	MERLIN GERIN SM6		
Increased operating frequency switch		■ ■	
Installation	other		
	indoor	■ ■	
Interrupting medium	gas SF6	■ ■	
	other		
Absolute pressure at 20 °C	bar	0.4	
Number of poles		3	
Voltage	kV	12	
Power frequency withstand voltage (1 min)	kV	28	
Lightning impulse withstand voltage	kV peak	75	
Frequency	Hz	50/60	
Normal current	A	630	
Peak withstand current	kA	62.5	
Short-circuit withstand current - duration	kA	25	
	s	1	
Breaking capacity	A	620	
	- mainly active load	A	15
	- no-load transformer	A	630
	- closed loop	A	31.5
	- cable-charging	A	7
	- line-charging	A	95
	- earth-fault	A	55
Short-circuit making current	kA peak	62.5	
Number of operations with mainly active load		120	
Mechanical endurance	operating cycles	1000	
Operating temperature	minimum °C	-15	
	maximum °C	+55	
Degree of protection	IP2XC		
Drawing(s) No	3 730 457 - D page 1/17		

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1964



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- 36000 Courcouronnes cedex 9



No. AC 2498 b

Page 4

RATINGS OF THE EARTHING SWITCH ACCORDING TO IEC 129

Manufacturer Des fabricant	SCHNEIDER ELECTRIC MERLIN GERIN SAE		
Installation	indoor	室外	
	outdoor		
Method of closing	manual	手动	
	electrical		
Method of opening	manual	手动	
	electrical		
Number of poles	3		
Voltage	kV	12	
Power frequency withstand voltage			
- to earth and between poles	.1 min	kV : 28	
	.1 min wet	kV : 7	
Lightning impulse withstand voltage			
- to earth and between poles	kV peak	75	
Switching impulse withstand voltage			
- class for U > 300 kV (A or B)		7	
- to earth	kV peak	7	
Frequency	Hz	50/60	
Peak withstand current	kA	62.5	
Short-circuit withstand current	kA	35	
- duration	s	1	
Short-circuit making current	kA peak	62.5	
Supply voltage			
- control motor	Vac	7	
- closing mechanism	Vac	7	
- opening mechanism	Vac	7	
Operating mechanism supply pressure	bar gauge	7	
Contact zone	m	U = 7, S = 7, U = 7	
Mechanical terminal load	N	7	
- cross-load	N	7	
Control mechanism type		CI2	
Drawing(s) No.		7	



1965

g

RECORD OF PROVING TESTS

Apparatus No: 1

Test type and test-duty	Page
- 5 short-circuit making tests of earthing switch at: 25 2/28.0 kA - 66.4/62.3 kA peak - 12.1/12.2 kV	8-9
- 5 short-circuit making tests of switch at: 25 2/25.5 kA - 65.0/57.1 kA peak - 12.1/12.2 kV	10-11

g

Manufacturer
 (Representatives)

M. MESTRALLET

SCHNEIDER ELECTRIC

[Signature]

[Signature]

g
 1966



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F-33501 Gennevilliers cedex 3

No. AG 2493 B

page 7

UNCERTAINTIES OF MEASURING CHAINS

Type of measurement	Range	Type of calculation	1 st order uncertainty (%)	2 nd order
Current from probe	0 - 1 A	RMS value	1.7	
Current from probe	0 - 5 A	Peak value	3.7	
Current from probe	> 5 A	RMS value	1.6	
Current from probe	> 5 A	Peak value	4.1	
Current from probe (current transformer)	0 - 65 A	RMS value	1.4	
Current from probe	> 100 A	RMS value	1.92	
Current from probe	> 100 A	True value (peak to peak / √2)	1.67	III
Current from probe	> 100 A	Peak value	1.6	III
Current from probe	> 100 A	Area integral	1.5%	
Current from probe	> 100 A	Quasi-peak average (peak to peak / √2)	1.34	
Power factor	< 100 A	Peak ratio	0.87	
Voltage from CD or MCD	< 1000 V	RMS value	1.75	
Voltage from CD or MCD	< 1000 V	True value (peak to peak / √2)	1.42	
Voltage from CD or MCD	< 1000 V	Peak value	1.6%	
Voltage from CD or MCD	> 1000 V and < 10 kV	RMS value	< 20 kHz: 1.6 > 20 kHz: 1.64	
Voltage from CD or MCD	> 1000 V and < 10 kV	True value (peak to peak / √2)	< 20 kHz: 1.34 > 20 kHz: 1.79	
Voltage from CD or MCD	> 1000 V and < 10 kV	Peak value	< 20 kHz: 1.35 > 20 kHz: 1.35	
Voltage from CD or MCD	> 10 kV	RMS value	< 20 kHz: 1.6 > 20 kHz: 1.66	
Voltage from CD or MCD	> 10 kV	True value (peak to peak / √2)	< 20 kHz: 1.33 > 20 kHz: 1.77	III
Voltage from CD or MCD	> 10 kV	Peak value	< 20 kHz: 1.35 > 20 kHz: 1.35	
Voltage from CD or MCD	> 1000 V	Peak value	1.63	
Voltage measured from CD or MCD	U < 10 kV I measured with GRE > 100 A	RMS value	1.33	
Pressure	0.5 to 1 bar 1 to 2 bars 2 to 5 bars 5 to 10 bars	Peak value	1.7 1.75 1.6 1.75	
Time	10 to 200 ns		1.3	III
Time	200 ns to 1 s		1.3	

CD: capacitive divider MCD: inductive capacitive divider

1968



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1, rue de la République, 92130 Issy-les-Moulineaux

No. AC 2489 a

page 3

RESULTS OF THE SHORT-CIRCUIT MAKING TESTS

Apparatus under test : Earthing switch of the outside type (M)

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 and 7

Apparatus condition before tests : new having performed the previous tests

Time (s)		*10 ³	C 2489 98 29,10			
			0,45	1	0,05	0,02
Operating voltage (kV)			2	3 min	2	0,5 min
Applied voltage		kV	12,2		12,1	12,1
Break current	1 st	VA	54,8		60,8	60,4
	12	VA	55,3		41,4	51,7
	13	VA	47,3		60,9	55,5
Making current	1 st	VA	25,7		25,7	26,2
	12	VA	25,5		25,5	26,1
	13	VA	25,5		25,5	25,7
Average		VA	25,8		25,9	25,9
Time	pre-opening	ms	7		7	7
	closing	ms	7		7	7
	current	ms	20		1,5	1,9
Remarks						

Apparatus condition after tests : No deterioration was noted.

1969



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17050 Cléon Cedex 9

No. AC 2439 E

page 5

RESULTS OF THE SHORT-CIRCUIT MAKING TESTS

Apparatus under test

Earthing switch of the circuit breaker type IM

Operating conditions
of the apparatus

See page 6

Test conditions

See pages 6 and 7

Apparatus condition before tests

1

new

having performed the previous tests

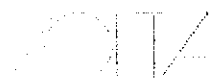
Tap position		No.	C 3439 38.09.13			
			03a	4 end	03	03b
Rated frequency			50	4 end	50	50
Applied voltage		kV	12.1		12	
Phase	I	kA	51.3		51.4	
Current	II	kA	44.3		44.7	
	III	kA	49.0		51.9	
	average	kA	44.8		49.0	
Voltage	II	kV	13.3		13.3	
	III	kV	13.1		13.4	
	average	kV	13.2		13.3	
Time	opening	ms	7		7	
	closing	ms	7		7	
	current	ms	120		121	
Test						
Remarks						

RECEIVED
1970

Apparatus condition after tests

No deterioration was noted

1970



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RESULTS OF THE SHORT-CIRCUIT MAKING TESTS

Apparatus under test : Switch of the cubicle 3B15 type (M)

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 and 7

Apparatus condition before tests : new having performed the previous tests

Measurement		Unit	C 2-59-72 CS, 10		
			0%	50%	100%
Average 1 voltage		kV	10.1	12.2	10.2
Phase	II	kA	44.6	51.1	51.4
	I	kA	45.4	44.7	44.1
	IV	kA	46.7	50.6	49.1
Voltage	1	kV	26.0	26.0	25.9
	2	kV	25.7	26	26.7
	average	kV	25.7	25.7	26.2
Time	average	ms	7	7	7
	1	ms	7	7	7
	2	ms	7.2	7.1	7.1
Time					
Remarks					

Apparatus condition after tests : No deterioration was noted

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1971



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100000 Grenoble Cedex 9

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No. AC 2499 b

page 11

RESULTS OF THE SHORT-CIRCUIT MAKING TESTS

Apparatus under test : Switch of the cubicle SM6 type M

Operating conditions of the apparatus : See page 6

Test conditions : See pages 6 and 7

Apparatus condition before tests : - new
- having performed the previous tests

Condition		No.	C 2499 06 09 10	
			053	054
Operating equipment			0	0
Applied voltage		kV	12.7	12.7
Phase	II	1A	52.7	69.0
	I	1A	64.9	63.9
	1B	1A	52.3	46.6
Phase	II	2A	25.6	16.0
	I	2A	26.0	21.7
	1B	2A	25.7	18.6
Energy		kWh	21.6	20.8
Time	pre-arc	ms	7	7
	clearing	ms	-	7
	arcing	ms	132	149
Date				
Remarks				

Apparatus condition after tests : No deterioration was noted.

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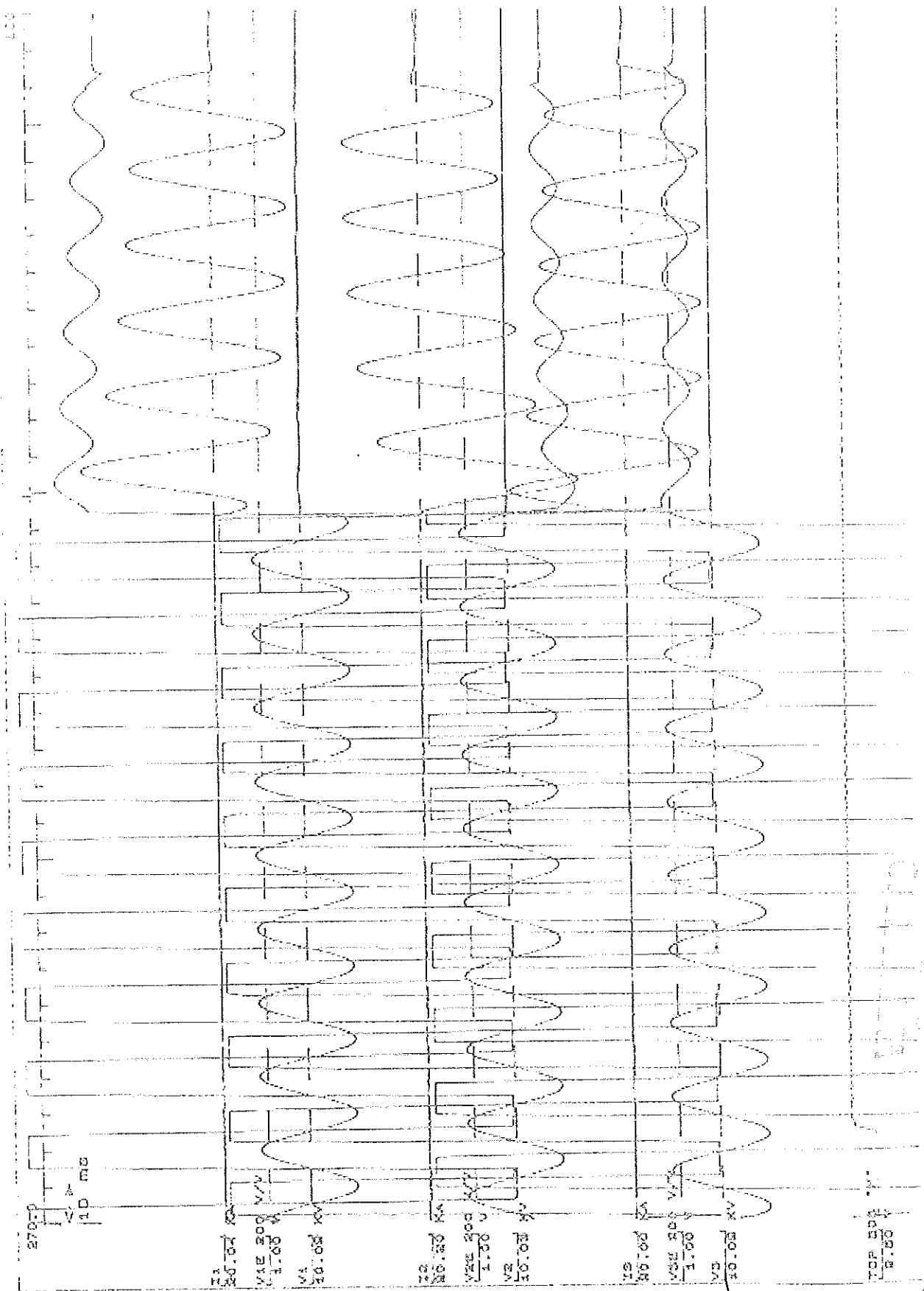
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1972

VOLTA

C2499 98/09/15/048

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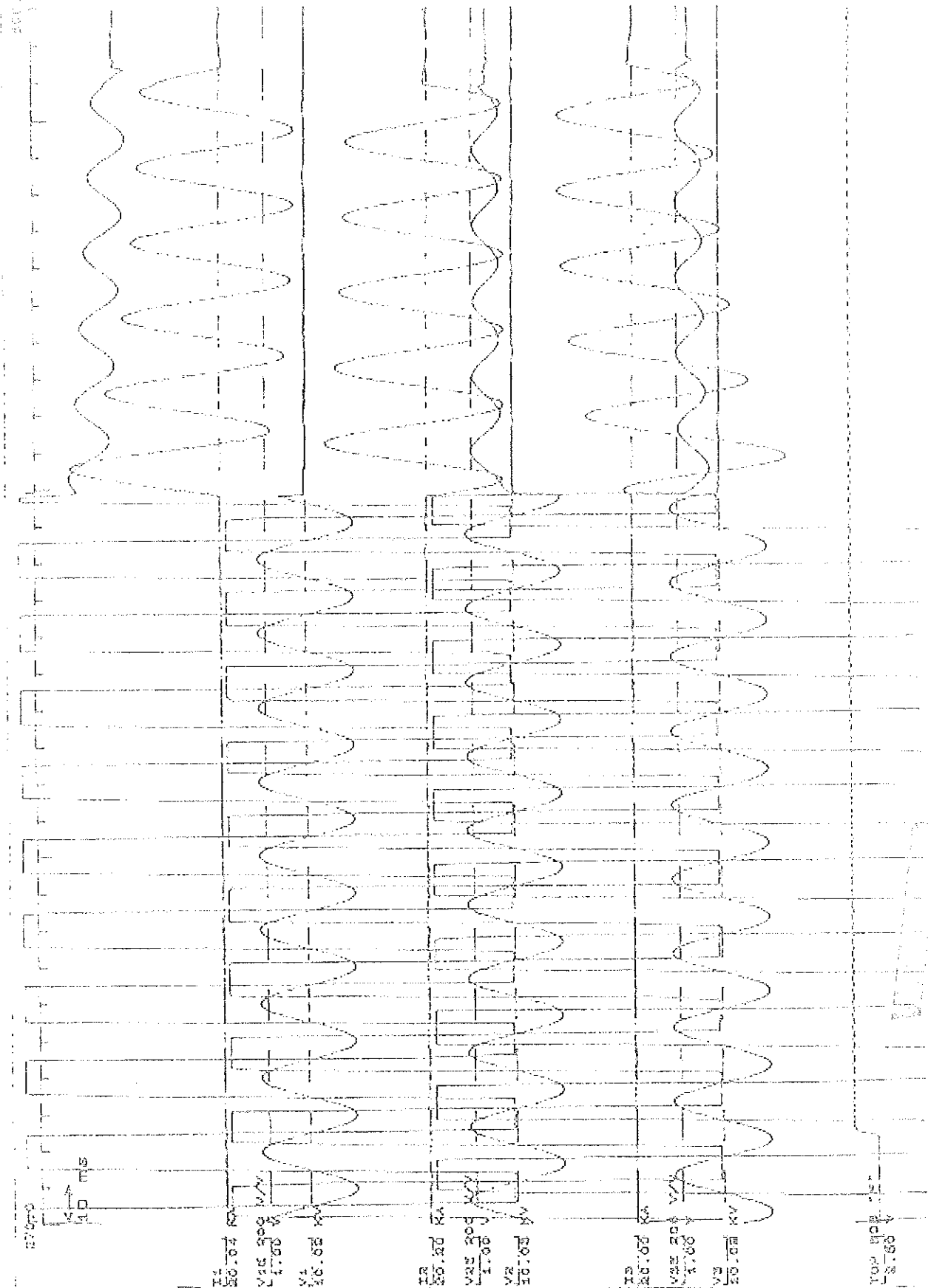
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1973

VOLTA

C2499 98/09/15/049



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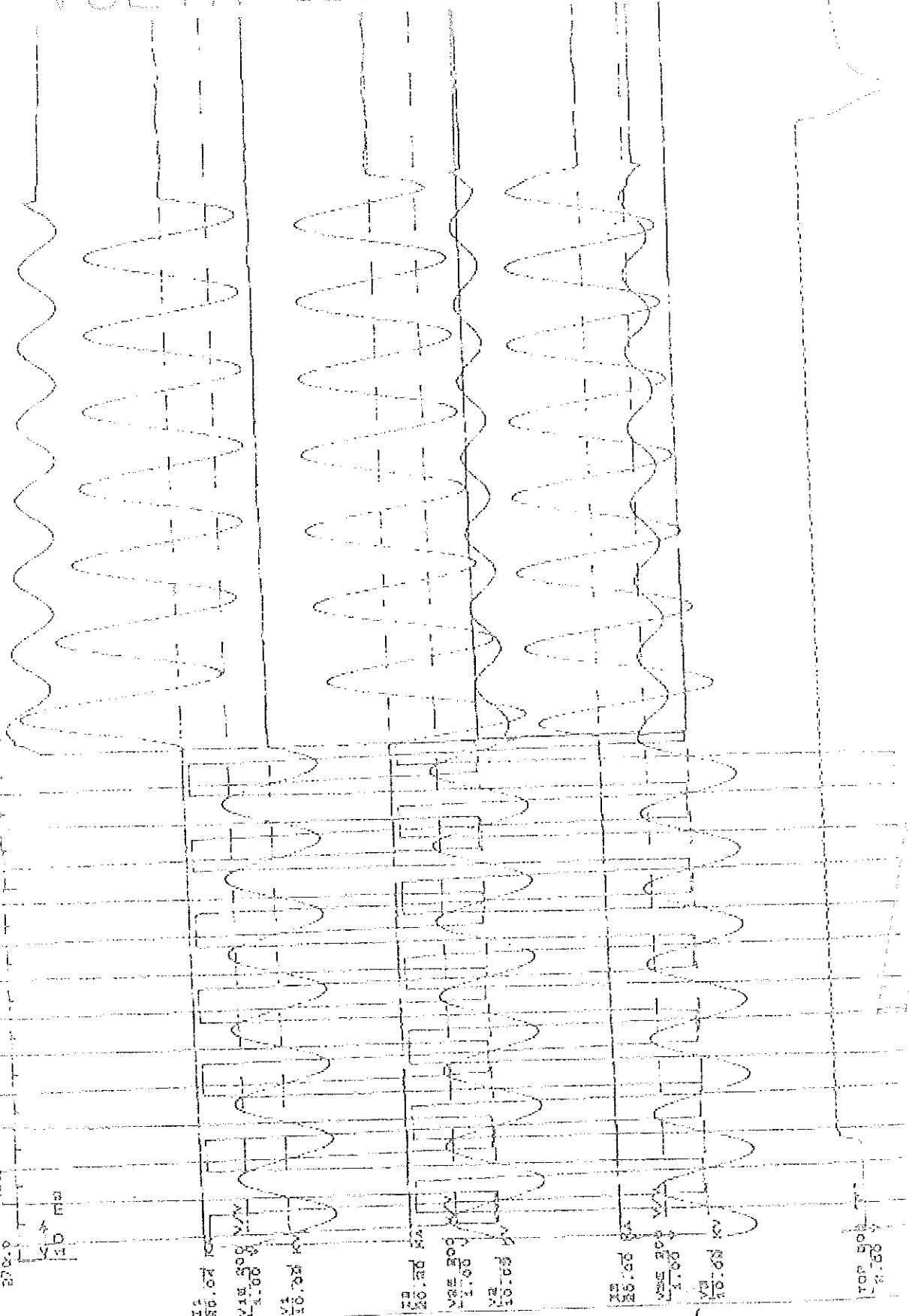
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1974

HTBI
1974

VOLTA

C2499 98/09/15/050

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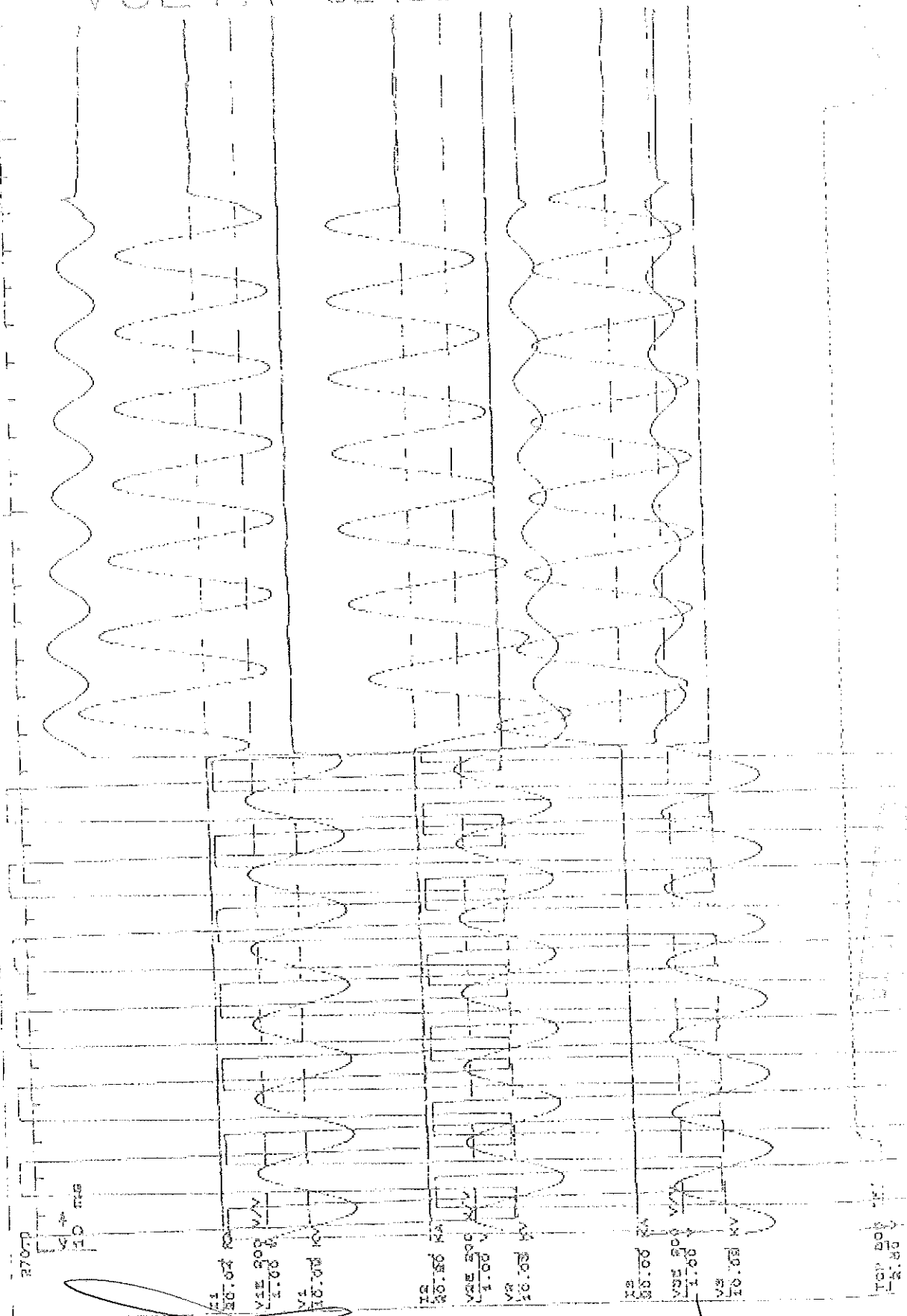
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1975

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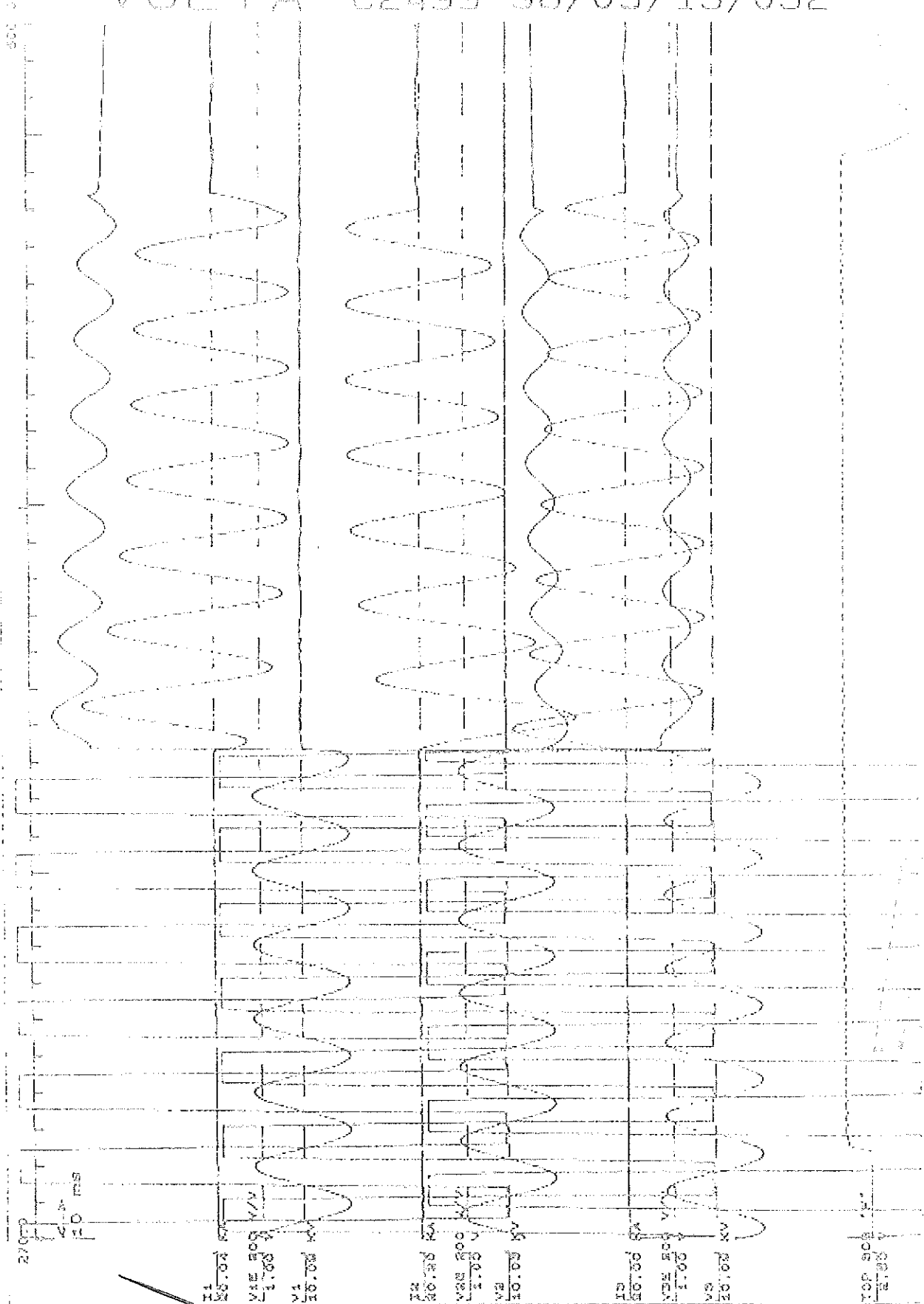


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1976

VOLTA C2499 98/09/15/052



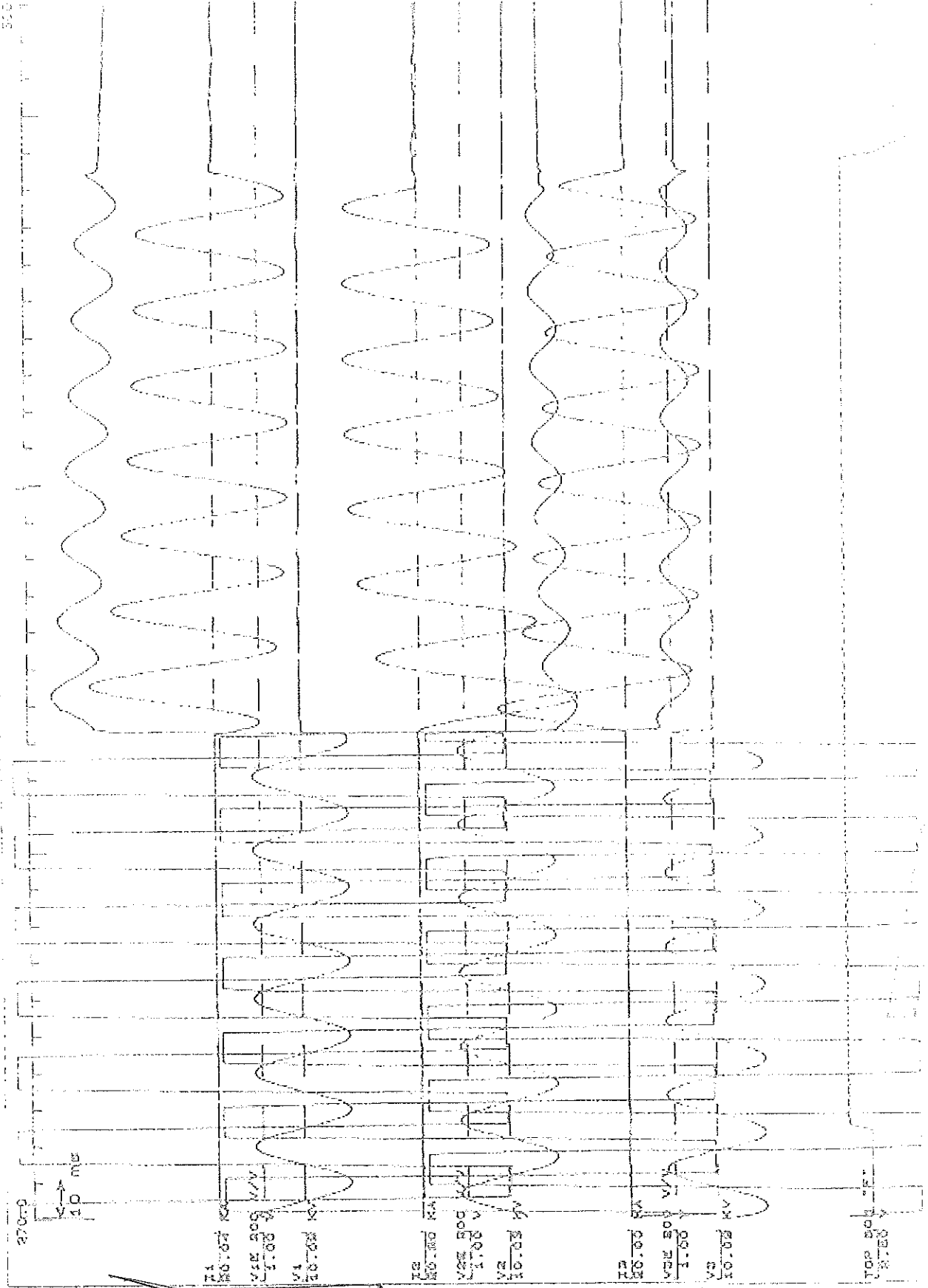
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1977

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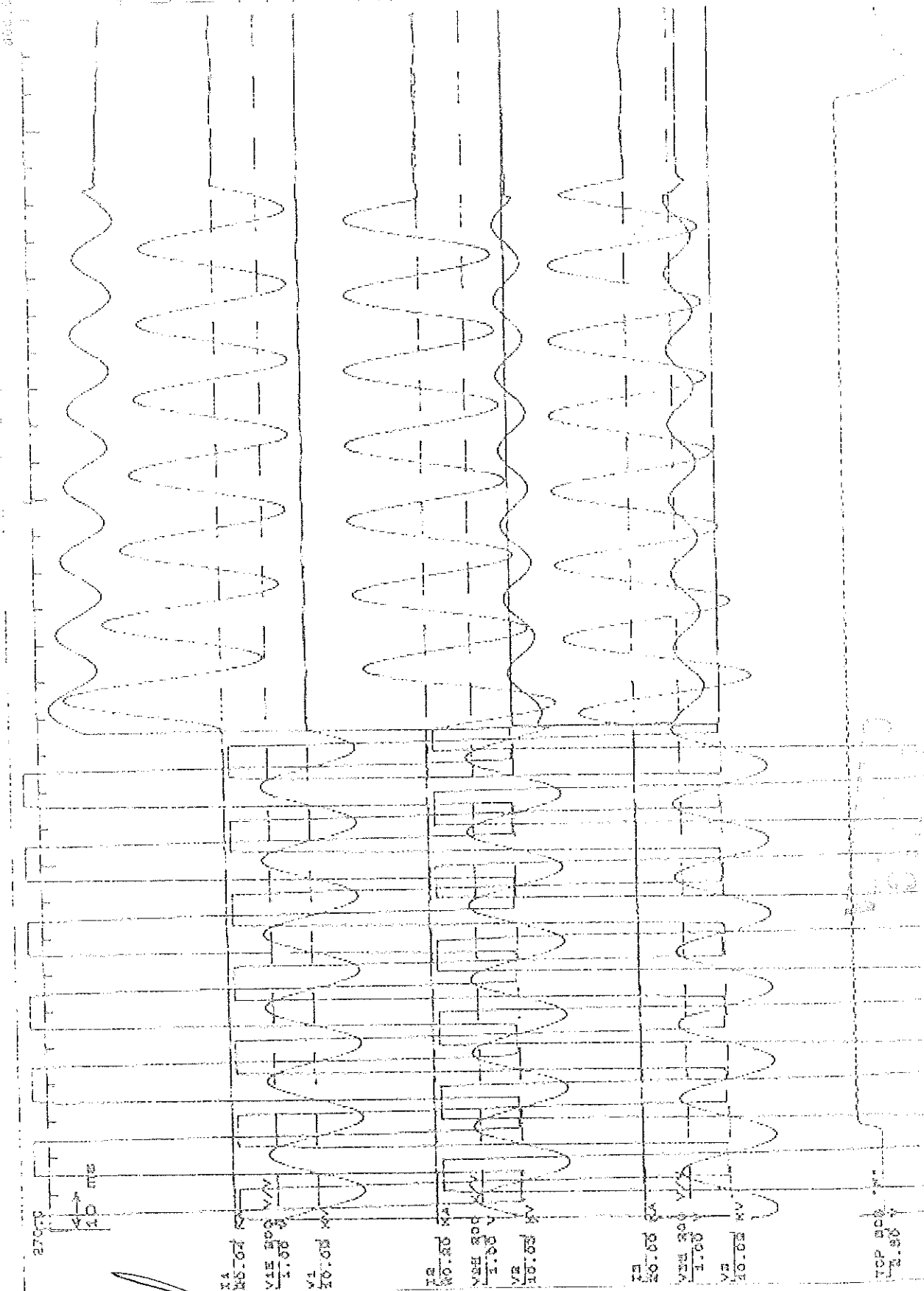
VOLTA C2499 98/09/15/053



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7978

VOLTA C2499 98/09/15/054



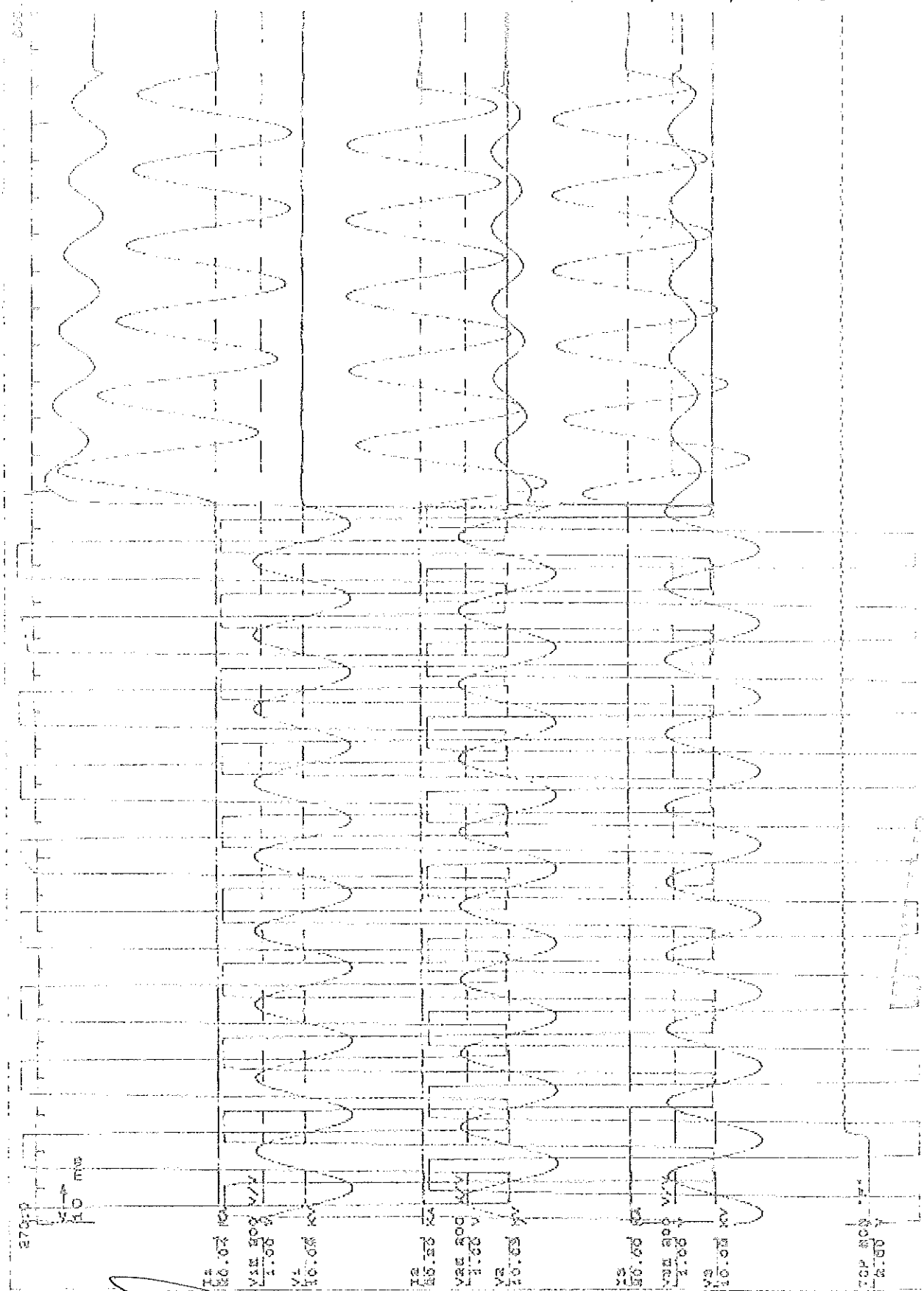
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1979

3/2

VOLTA C2499 98/09/15/055



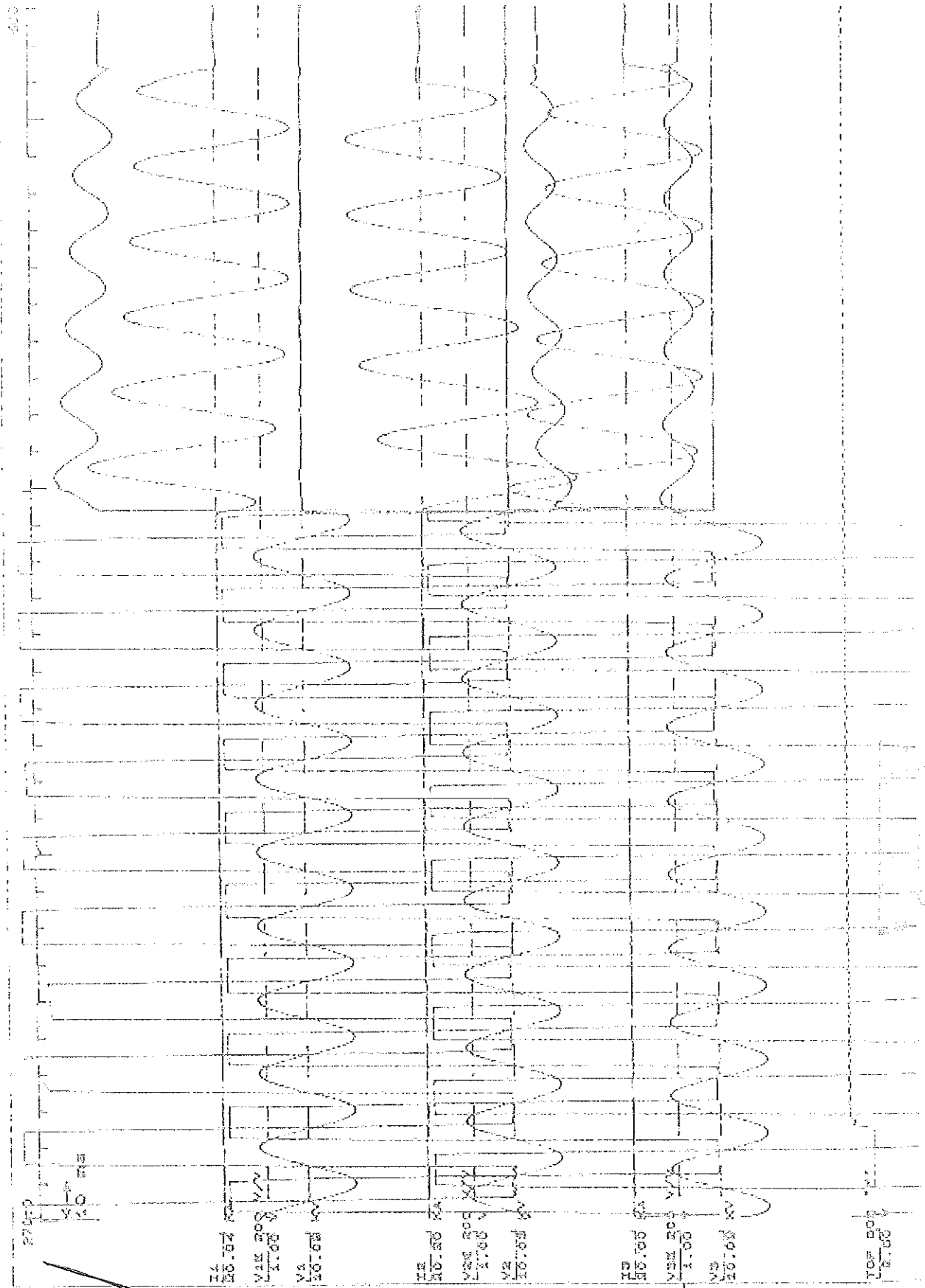
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1980

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VOLTA C2499 98/09/15/056



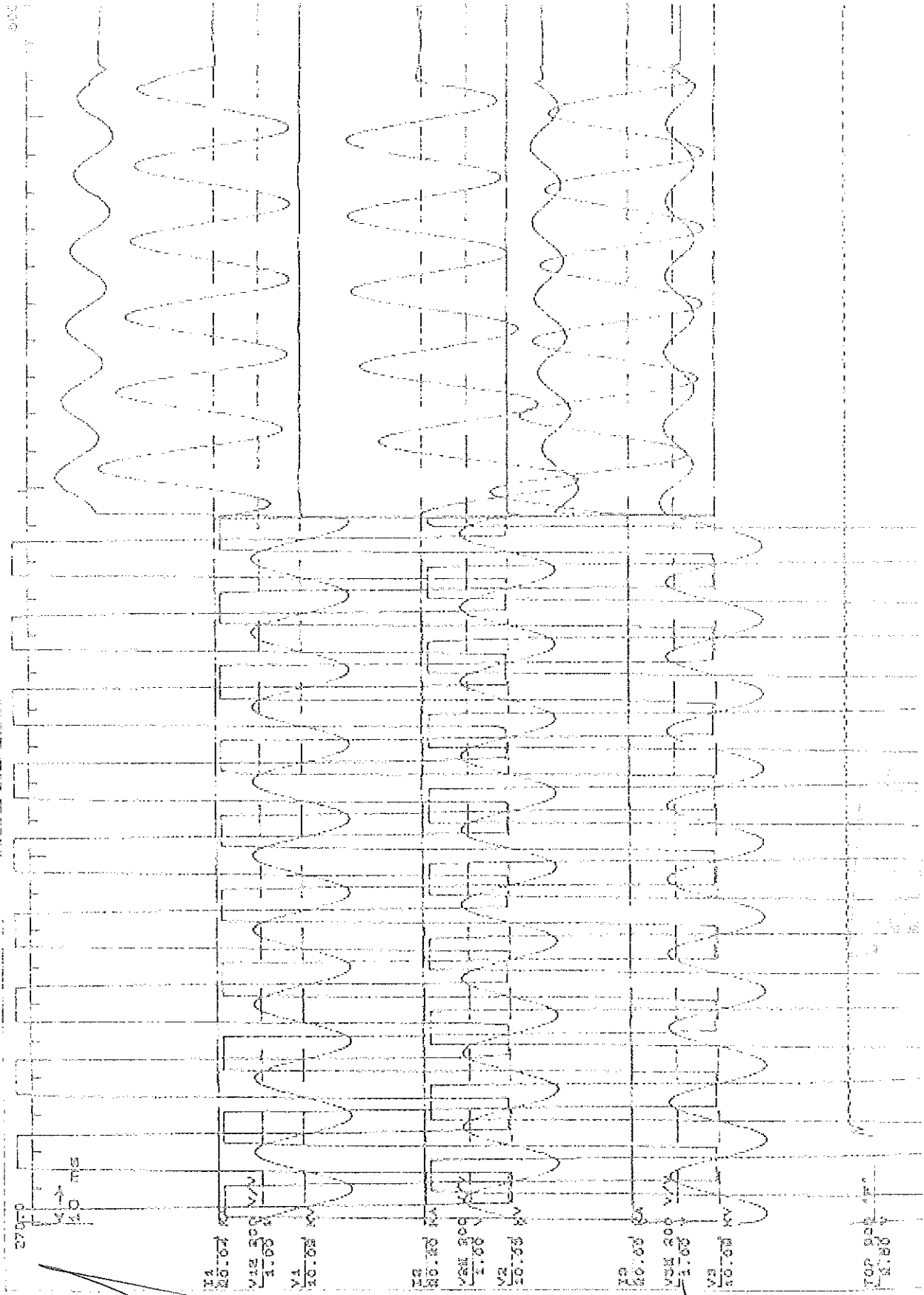
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1981

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VOLTA C2499 98/09/15/057

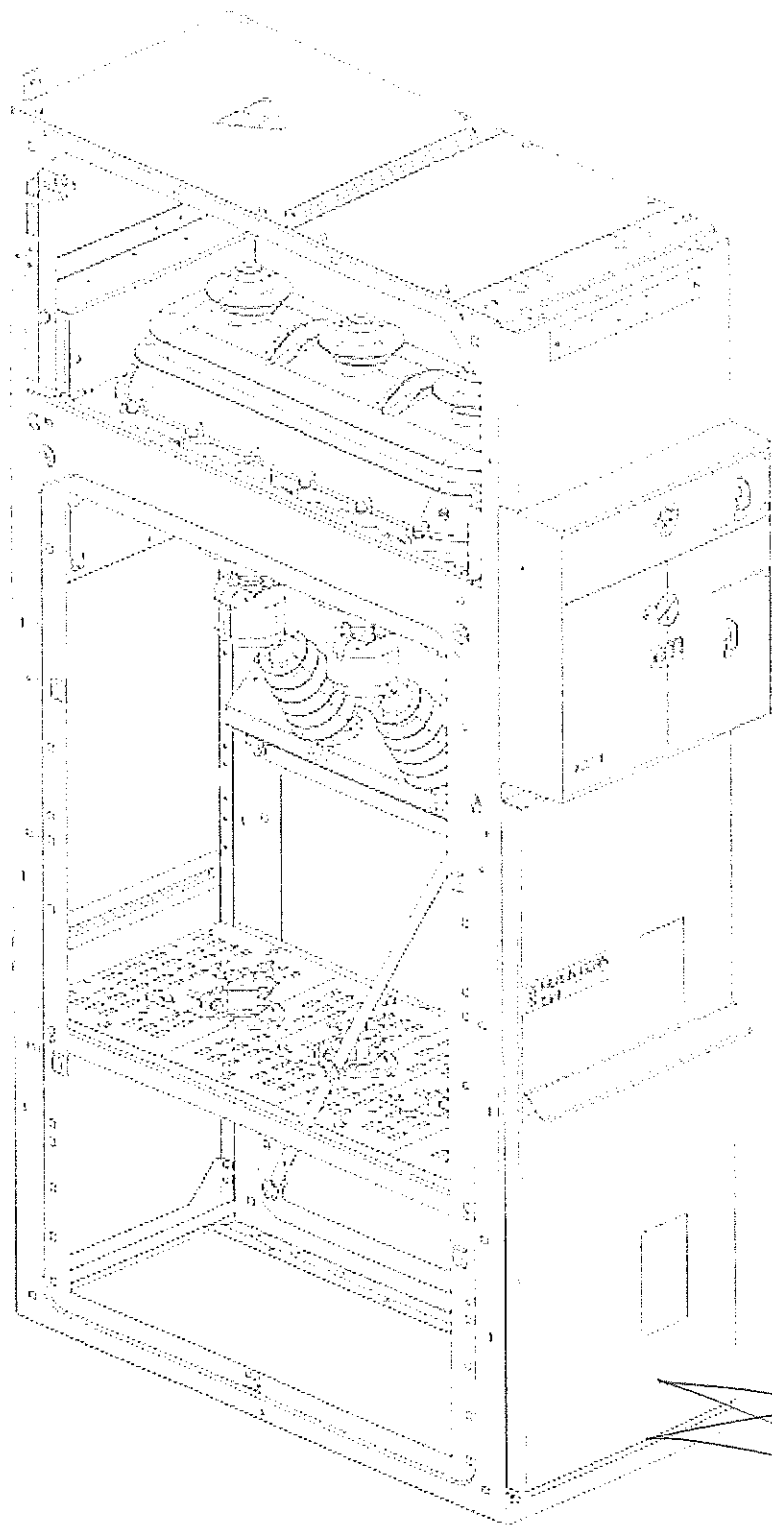


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100%


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1962

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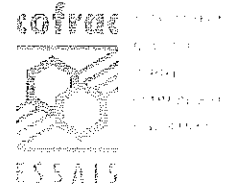
Tipo de base 821AECTA	Aparato fabricado en el momento 5M6	 MERLIN GERIN	
Tipo de base con 5T-DMT	Estado de accesorio CHILLUE TM		
Tipo de distribución RELLUCE EMS	3730457		Page 136 001/0 17

[Handwritten signature]

1983

L.E.M.T.

Laboratoire d'essais moyenne tension
Usine 38V
Z.A.C Champ saint-ange
38760 Varcès
tél. : 04 76 39 62.01
fax : 04 76 39 13 01



TEST REPORT n°51252688EA

Apparatus : Metal-enclosed switchgear and controlgear
Designation : MERLIN GERIN SM6 type IM 500
Rated voltage : 24 kV Rated current : 630 A
Manufacturer : Schneider Electric Industries SAS - Rueil-Malmaison - FRANCE

Object : Temperature-rise tests at rated current 630 A

Tested for : Schneider Electric Industries SAS

Date(s) of tests : 01 April 2004

These tests were carried out in accordance with : Customer request based on IEC 62271-200(2003)

*The performance of the apparatus tested and the results obtained are shown in the tables, oscillograms and photographs enclosed.
This document relate only to the items presented for testing.*

The documents forming part of this test report are :

Apparatus ratings	page(s) 2
Test records	page(s) 3
Test conditions	page(s) 4 and 5
Test results	page(s) 6 and 7
Oscillograms	page(s) 8 to 10
Drawings	page(s) 11
The test report comprises :	11 pages

*This test report can only be copied as a photographic facsimile in its entirety.
COFRAC Testing Section accreditation is only to certify that the laboratory complies with the technical competence required to carry out test on the product types covered by the accreditation.*

Varcès, 08 April 2004

Technical manager

Testing laboratory manager

B. VANDENBERGUE

JM ANSELMETTI

APPARATUS RATINGS

Manufacturer Designation	:	Schneider Electric Industries SAS	
	:	MERLIN GERIN SM6 type IM 500	
Number of poles	:	3	
Voltage	kV	: 24	
Lightning impulse withstand voltage	kV	: 125	
Power frequency withstand voltage	kV	: 50	
Frequency	Hz	: 50 / 60	
Normal current	A	: 630	
Short time withstand current	kA	: 20	s : 1
Peak withstand current	kÂ	: 50	
Short circuit breaking current	kA	: 20	
Short circuit making current	kÂ	: 50	
Interrupting medium	Disconnecter	:	SF ₆
Relative pressure at 20°C	bar(s)	:	0.4
Control mechanism type		:	CIT
Degree of protection		:	IP2XC
Drawing n°		:	3730457 ind. H

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