

SIEMENS

SVEPPI
LABORATORY

ARC FLASH TESTING

CEI EM 622271-200:2005 item 6.106

INFRARED WINDOWS

MODELS: JIT50; JIT75



SIEMENS



LAB N° 0935

SVEPPI

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TEST REPORT

N° RP LS 12/172

MOD. 15-GQLAB REV.7 - 02/12

This Test Report is not a certificate of conformity, the results are referred only to the tested sample.

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N° RP LS 12/172

CUSTOMER:Gimi - Quadros Elétricos
Estrada Portão da Ronda, 3.530
Jd. Revista - Suzano/SP
Brazil**DEVICE UNDER TEST:**

A.C. Metal-enclosed Switchgear

TYPE:

Maggiore Max

PURPOSE OF THE TEST:

Type test

TEST PERFORMED ACCORDING TO:

CEI EN 62271-200: 2005 item 6.106

TEST PERFORMED AT:Power Test Section of SVEPPI Laboratory
Via Alessandro Volta, 34/A – 30030 Salzano (VE)
ITALY**LIST OF TESTS PERFORMED:**

Arcing due to internal fault

RECEIPT'S DATE OF TEST OBJECT:

2012/07/26

PERIOD OF TEST:

2012/09/05 – 2012/09/06

TEST WITNESSED BY:Mr. N. Graziano Gimi – Quadros Elétricos
Mr. J. L. De Aravjo InfraPred**THIS TEST REPORT IS COMPOSED BY:**

Nr. 32 Total pages

Nr. 05 Oscillograms

Nr. 02 Lists (Reported on Page 2)
Nr. 04 Drawings (Reported on Page 2)**Siemens S.p.A.**
Laboratorio SVEPPI

The data necessary to permit repetition of the tests are contained in the document marked
"TEST'S DOCUMENTATION" n. LS 12/172.

Issue	Charged of test	Laboratory's manager
September 2012	<i>Sandro Samartinaro</i> 	<i>Giuseppe Canonico</i>



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MANUFACTURER: Gimi - Quadros Elétricos Ltda
Estrada Portão da Ronda, 3.530
Jd. Revista - Suzano/SP
Brazil

InfraPred - Equipamentos para Manutenção Ltda

SERIAL NUMBER OF DEVICE UNDER TEST: MAG – 01/2012

RATINGS ASSIGNED BY MANUFACTURER OF DEVICE UNDER TEST





<i>Rated voltage</i>	13.8	kV
<i>Number of phases</i>	3	
<i>Rated frequency</i>	50/60	Hz
<i>Rated normal current</i>	1250/2500	A
<i>Rated short-time withstand current (main and earthing circuits)</i>	31.5	kA
<i>Rated peak withstand current (main and earthing circuits)</i>	82	kA
<i>Rated duration of short-circuit</i>	1	s
<i>Rated internal fault</i>	31.5	kA
<i>Rated duration of internal fault</i>	1	s
<i>Test of accessibility</i>	AFLR (Front, Lateral and Rear sides)	

IDENTIFICATION OF DEVICE UNDER TEST

The drawings in the list “MAGGIORE MAX – 31,5kA/1s- 1250/2500A – 13,8kV” and in the list “Infrared Windows model JIT50-ARC and JIT75-ARP – 31,5kA/1s – 1250/2500A – 13,8kV” have been identified by SVEPPI Laboratory. The drawings have been returned to the customer.

The following drawings are included in this Test Report.

Number	Date	Revision	Pages	Title
New Maggiore	2012/06/18	00	1	
M05	2012/06/18	00	1	
MAGGIORE 31,5	2007/06/28	00	8	CUBICULO EXTRAIVEL LSC2-B - MAGGIORE 15kV - NBI-95kV - 31,5kA - 1250/2500A
JIT-75-ALPR	2012/03/21	0	1	JANELA DE INSPEÇÃO JIT-75-ARP

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1. ARCING DUE TO INTERNAL FAULT

1.1. Purpose of the tests

The purpose of the tests was to assess the behaviour of the A.C. Metal-enclosed Switchgear under arcing stress due to internal fault as following described. The test object was tested with the thermographic investigation windows of InfraPred Equipamentos para Manutenção Ltda mounted.

1.2. Performed tests

The A.C. Metal-Enclosed Switchgears type Maggiore Max under test was prepared and placed under a room simulated by a structure with the ceiling and two walls perpendicular to each other.

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1.3.1. Arc initiation

The arc was initiated between phases on compartment of functional unit 2 (Figure 1), by means of a 0.5 mm diameter copper wire (see also Photo 2).

1.3.2. Indicators

The indicators for observing the thermal effects of gases were arranged as indicated in Figure 1, according with CEI EN 62271-200: 2005 to verify the type AFLR accessibility on Front, Lateral and Rear sides (see also Photos 3-4, 6-7).

The indicators used during the tests were pieces of black cretonne (150 g/m²), fitted in frames of steel having dimensions of about 150 mm x 150 mm.

During the test the InfraPred JIT75 thermographic investigation window was mounted. The window was not damaged, as can be seen in Photo 5, 9.

The conditions of the circuit breaker box after the test are visible in Photo 8.

2. TESTS RESULT

2.1. Oscillograms table

Oscillogram Nr.	Test current		Duration [s]	Note
	<i>Peak value [kA]</i>	<i>RMS value [kA]</i>		
158953	73.8 (Phase T)	31.7	1.017	Circuit breaker box of functional unit 2
158955	73.7 (Phase T)	32.0	1.017	Omnibus box of functional units 2
158956	73.9 (Phase T)	31.7	1.015	Circuit breaker box of functional unit 1
158958	73.9 (Phase T)	31.7	1.017	Cables box of functional unit 1
158963	73.9 (Phase T)	31.8	1.019	Cables box of functional unit 2

5. PHOTOS



Photo 1 - Test arrangement



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Photo 5 – Before test (InfraPred JIT75)



Photo 6 - After test



Photo 7 – After test



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Photo 8 - After test



Photo 9 - After test (InfraPred JIT75)





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Photo 18 – Before test (InfraPred JIT50)





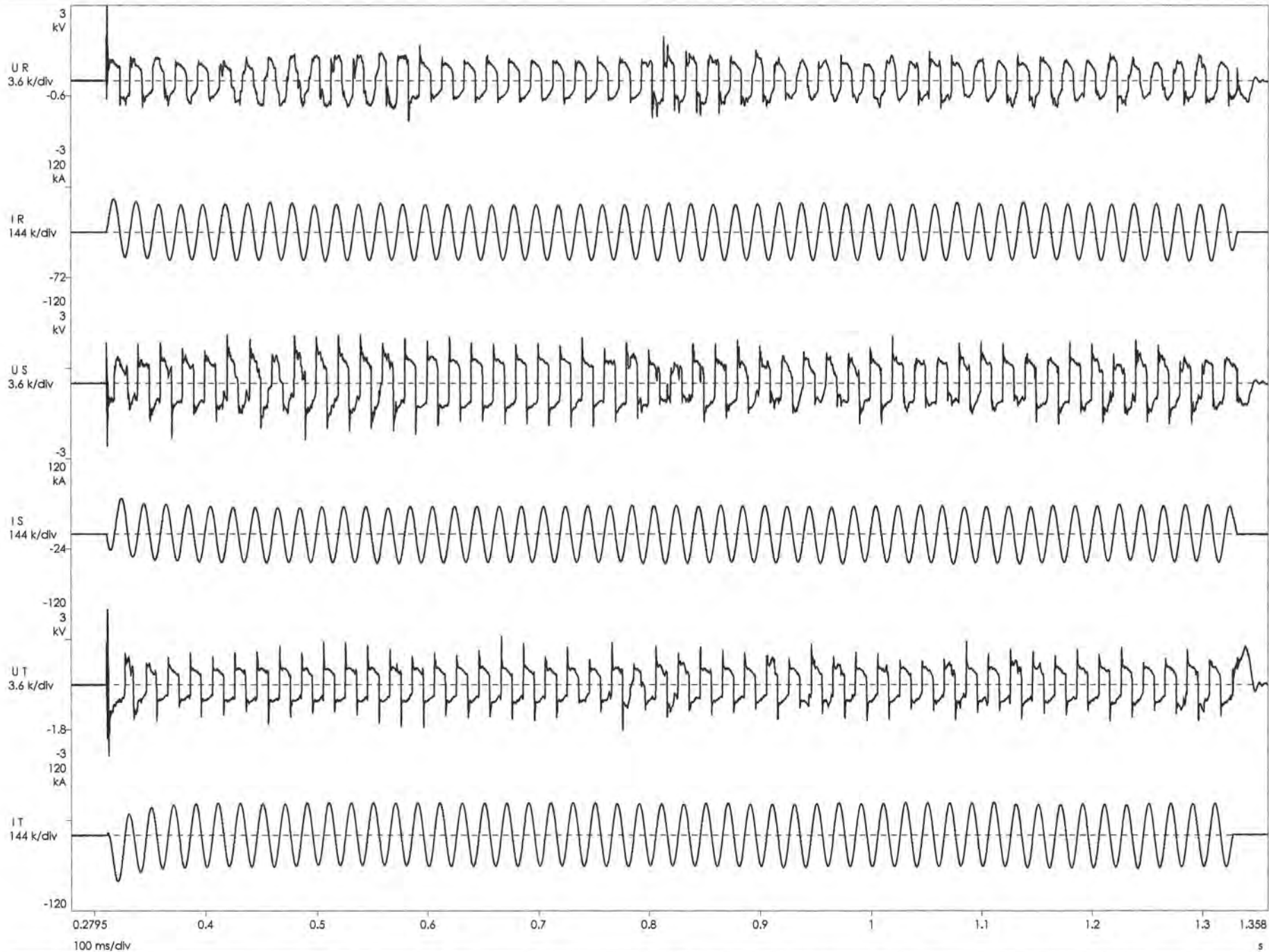
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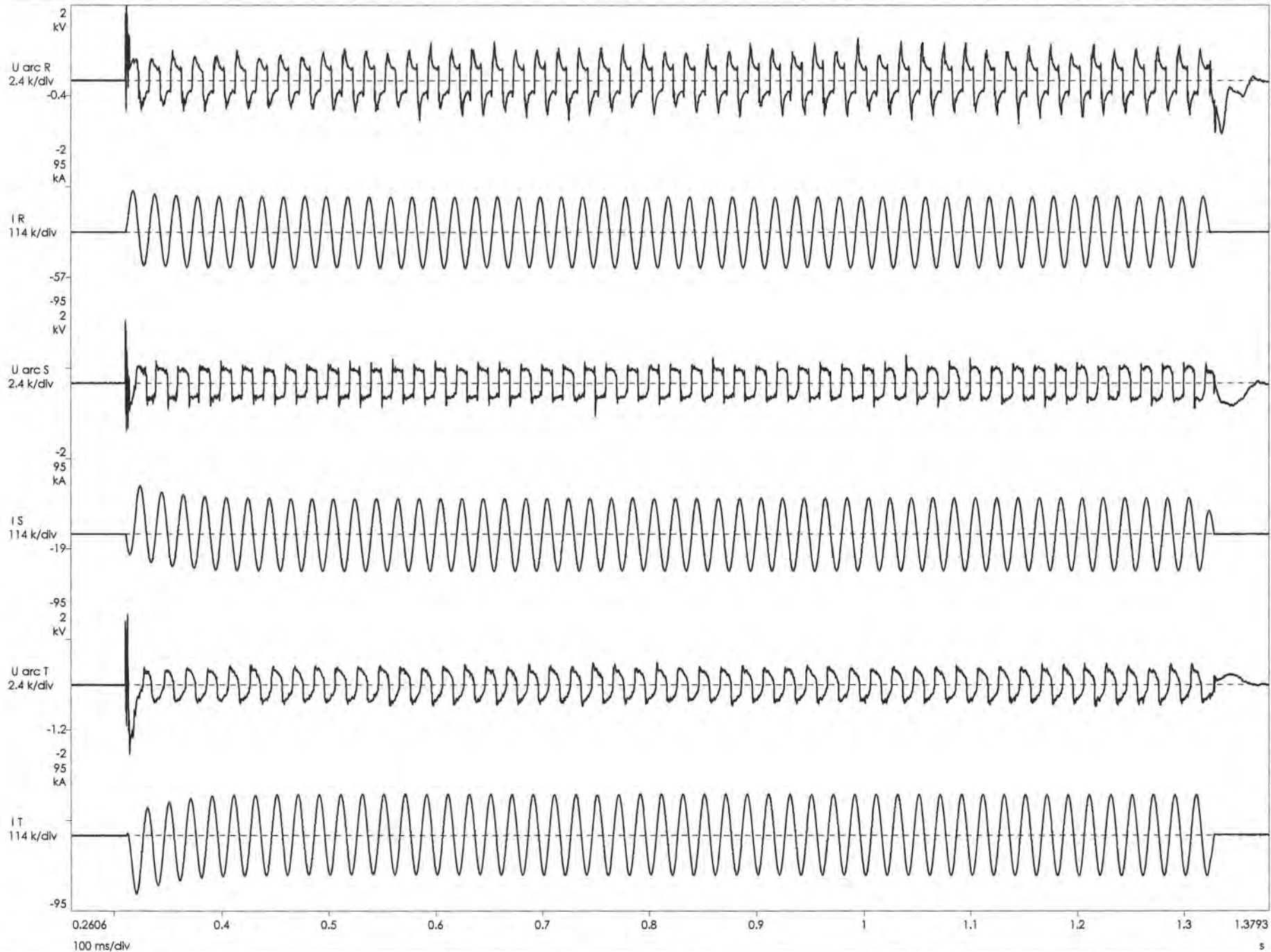
Photo 21 – After test (InfraPred JIT50)



test current

phase R	
R.M.S. value	31.5 kA
peak value	52.4 kA
phase S	
R.M.S. value	31.6 kA
peak value	57.0 kA
phase T	
R.M.S. value	31.9 kA
peak value	73.8 kA
mean value	31.7 kA
duration	1.017 s
I^2t	1019 (kA) ² s

Note

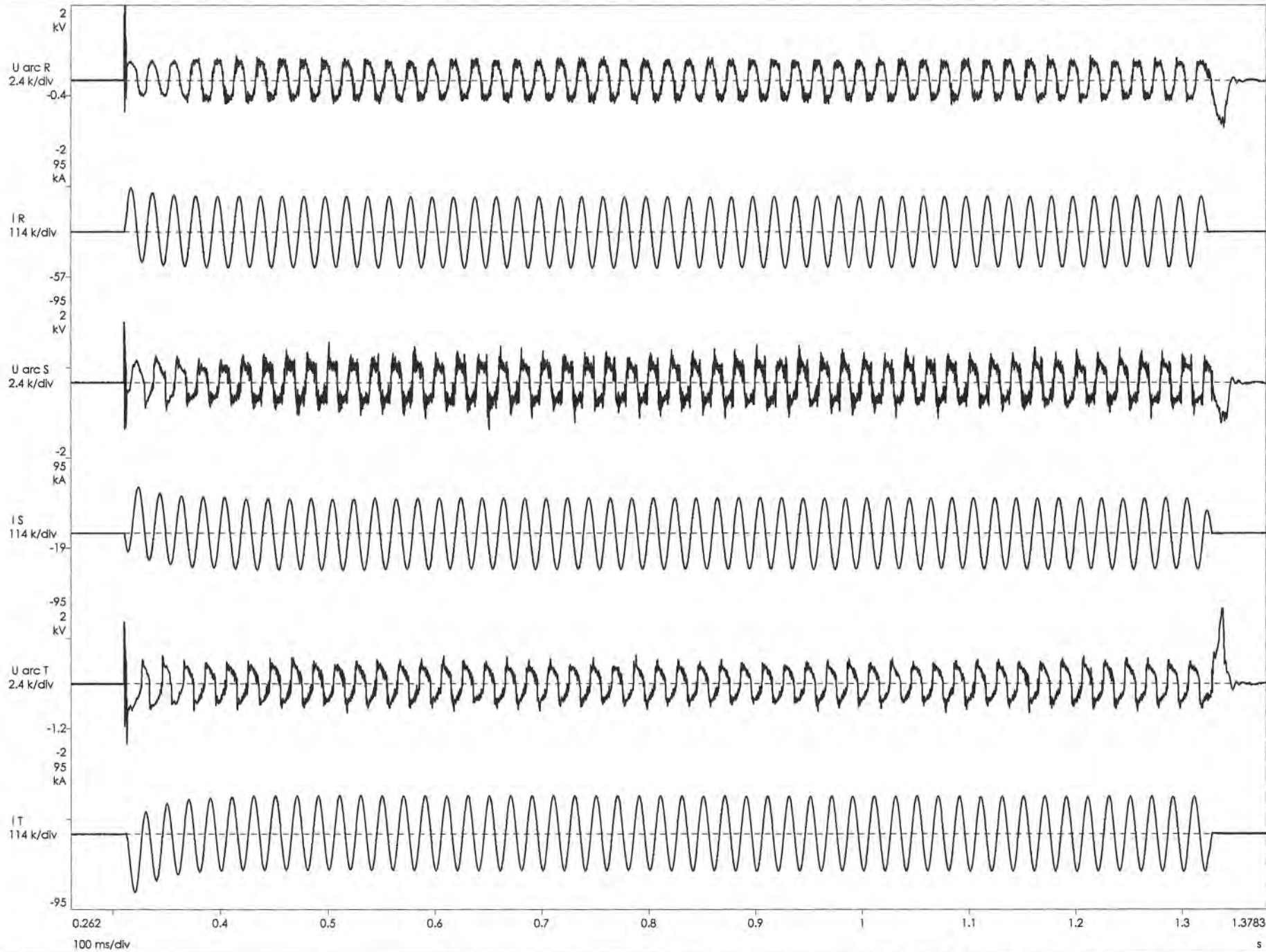


test current

phase R	
R.M.S. value	31.5 kA
peak value	51.8 kA
Arc energy	12.89 MJ
phase S	
R.M.S. value	32.4 kA
peak value	60.6 kA
Arc energy	10.98 MJ
phase T	
R.M.S. value	31.9 kA
peak value	73.7 kA
Arc energy	11.26 MJ
mean value	32.0 kA
duration	1.017 s

Note

Press1 =
Press2 =
DV1 =
DV2 =
DV3 =
DV4 =



test current

phase R	
R.M.S. value	31.6 kA
peak value	54.9 kA
Arc energy	12.09 MJ
phase S	
R.M.S. value	31.8 kA
peak value	58.5 kA
Arc energy	12.88 MJ
phase T	
R.M.S. value	31.9 kA
peak value	73.9 kA
Arc energy	11.21 MJ
mean value	31.7 kA
duration	1.015 s

Note
Press1 =
Press2 =
DV1 =
DV2 =
DV3 =
DV4 =

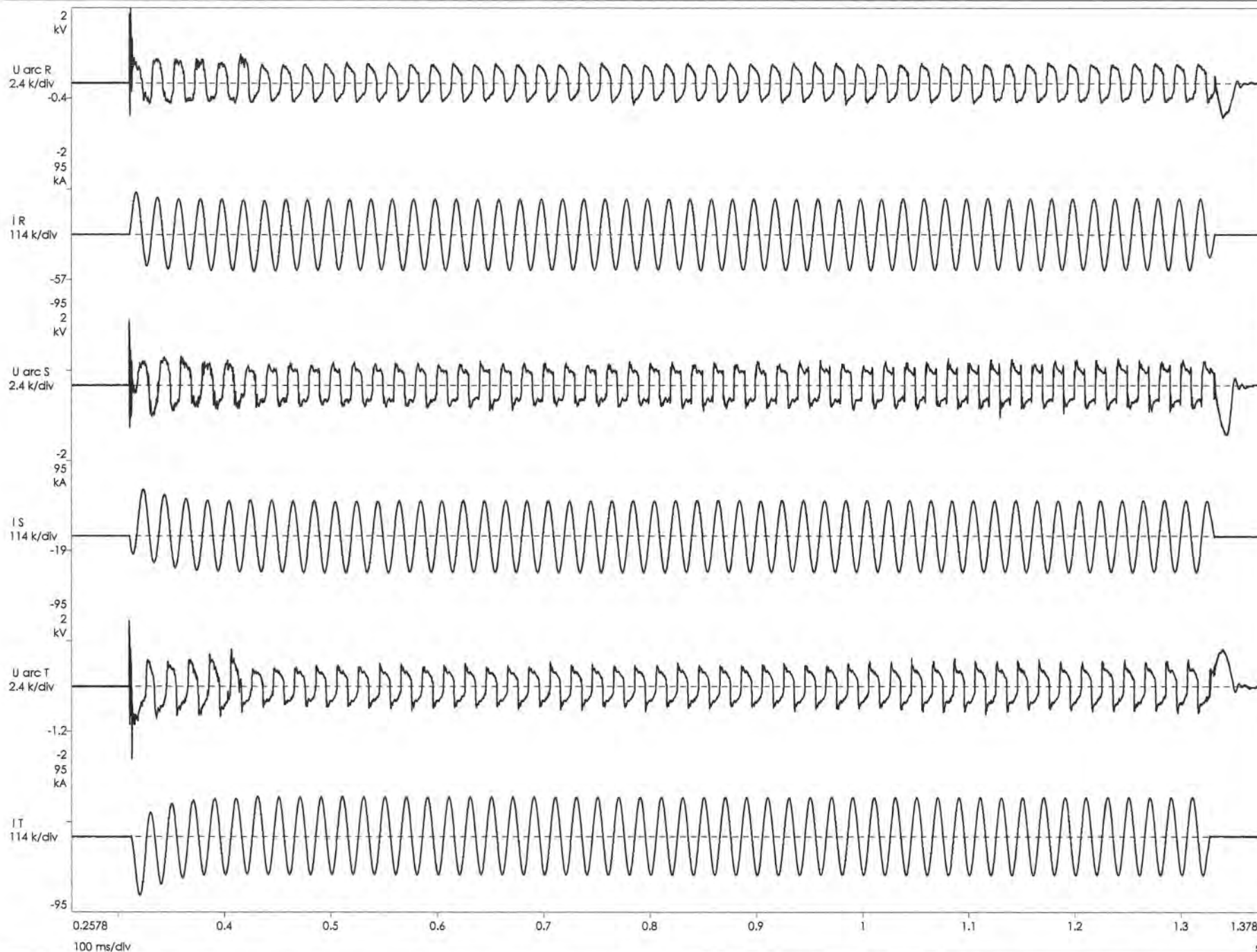


test current

phase R	
R.M.S. value	31.5 kA
peak value	54.0 kA
Arc energy	11.15 MJ
phase S	
R.M.S. value	31.8 kA
peak value	59.1 kA
Arc energy	11.60 MJ
phase T	
R.M.S. value	31.7 kA
peak value	73.9 kA
Arc energy	10.92 MJ
mean value	31.7 kA
duration	1.017 s

Note

Press1 =
Press2 =
DV1 =
DV2 =
DV3 =
DV4 =



test current

phase R	
R.M.S. value	31.6 kA
peak value	52.7 kA
Arc energy	11.63 MJ
phase S	
R.M.S. value	32.0 kA
peak value	59.1 kA
Arc energy	12.62 MJ
phase T	
R.M.S. value	32.0 kA
peak value	73.9 kA
Arc energy	12.39 MJ
mean value	31.8 kA
duration	1.019 s

Note

Press1 =
Press2 =
DV1 =
DV2 =
DV3 =
DV4 =