

ПАПКА 12

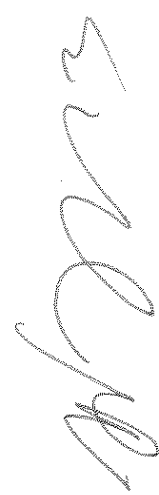
ПРИЛОЖЕНИЕ 10 Други документи за
Позиция 1 и Позиция 2

ПРИЛОЖЕНИЕ 10.3 Автоматични
прекъсвачи

Приложение 4

Приложение 5

Приложение 6



„ПС електрик“ ООД

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Автоматичен прекъсвач Schneider Electric

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Дата: 03.

Състави

На основание чл. 2
от ЗЗЛД



IEC

IECEE
CB
SCHEME

Accréditation
N° 5-0014
Portée
disponible sur
www.cofrac.fr



Ref. Certif. No.

FR 652973A

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST
CERTIFICATES FOR ELECTRICAL EQUIPMENT
(IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE
CERTIFICATS D'ESSAIS DES EQUIPEMENTS
ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE / CERTIFICAT D'ESSAI OC

Product
Produit

Circuit-breakers

Name and address of the applicant
Nom et adresse du demandeur

SCHNEIDER ELECTRIC INDUSTRIES SAS
35, rue Joseph Monier - 92500 RUEIL MALMAISON - France

Name and address of the manufacturer
Nom et adresse du fabricant

SCHNEIDER-ELECTRIC INDUSTRIES ITALIA SPA
Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy

Name and address of the factory
Nom et adresse de l'usine

See annex 1

Note : When more than one factory, please report on page 2
Note : Lorsqu'il y a plus d'une usine, veuillez utiliser la 2ème page

Ratings and principal characteristics
Valeurs nominales et caractéristiques principales

with electronic trip unit
(MICROLOGIC 2.0, 5.0, 6.0, 7.0, types A, P, H)

Trademark (if any)
Marque de fabrique (si elle existe)

SCHNEIDER ELECTRIC

Type of Manufacturer's Testing Laboratories used
Type de programme du laboratoire d'essais constructeur

WMT

Model / Type Ref.
Ref. De type

Series Compact NS, type N
References see annex 1

Additional information (if necessary may also be reported on page 2)
Informations complémentaires (si nécessaire, peuvent être indiquées sur la 2ème page)

See annex 1
Supersedes the certificate FR 60052378A/A1 dated 2007-08-01 due to standard updating.

A sample of the product was tested and found to be in conformity with
Un échantillon de ce produit a été essayé et a été considéré conforme à la

PUBLICATION **EDITION**
IEC 60947-1:2007(ed.5) +A1:2010
IEC 60947-2:2008(ed.4) +A1:2009 + A2:2013

As shown in the Test Report Ref. No. which forms part of this Certificate
Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat

N° 60028009-523214NS/A1, 60052378-553314A, 126228-6 52973

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification



Laboratoire Central des Industries Électriques

33, av du Général Leclerc – BP 8
FR 92266 Fontenay-aux-Roses cedex
www.lcie.fr

На основании чл. 2
от 33ЛД

Date: 2014-11-06

Signature:



Accréditation
N° 5-0014
Portée
disponible sur
www.cofrac.fr



Ref. Certif. No

FR 652973A

Annex 1 : List of Manufacturers and Factories

Circuit-breakers

Factory	Manufacturer
SCHNEIDER SHANGAI POWER DISTRIBUTION ELEC. APP. CO. LTD. 833 Kang Qiao Lu - Pu Dong , 201315 SHANGHAI, China	SCHNEIDER-ELECTRIC INDUSTRIES ITALIA SPA Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy
SCHNEIDER ELECTRIC INDUSTRIES ITALIA SPA Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy	SCHNEIDER-ELECTRIC INDUSTRIES ITALIA SPA Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy

Additional Information (if necessary)
Informations complémentaires (si nécessaire)



Laboratoire Central des Industries Électriques
33,av du Général Leclerc – BP 8
FR 92266 Fontenay-aux-Roses cedex
www.lcie.fr

На основание чл. 2
от ЗЗЛД

Date: 2014-11-06

Signature:

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N° 5-0014
Portée
disponible sur
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Ref. Certif. No.

FR 652973A

Annex 2**REFERENCES, PRINCIPAL CHARACTERISTICS****Low-voltage fixed three- or four-pole circuit-breakers****Models:** Compact NS630b N, NS800 N, NS1000 N, NS1250 N, NS1600 N

Operational current, (Ie)	630 A up to 1600 A
Operational voltage, (Ue)	220 Vac up to 690 Vac
Frequency	50/60 Hz
Insulation voltage, (Ui)	800 V
Impulse withstand voltage, (Uimp)	8 kV
Utilization category	B
Reference temperature	40 °C
Device suitable for isolation	Yes
Duty	uninterrupted

Additional Information (if necessary)
Informations complémentaires (si nécessaire)



Laboratoire Central des Industries Électriques
33,av du Général Leclerc – BP 8
FR 92266 Fontenay-aux-Roses cedex
www.lcie.fr

Date:

2014-11-06

Signature:

На основании чл. 2
от ЗЗЛД



Certificate of Acceptance

To participate
in the IECEE CB Scheme and Factory Surveillance Service –
IEC System of Conformity Assessment Schemes for Electrotechnical
Equipment and Components (IECEE)

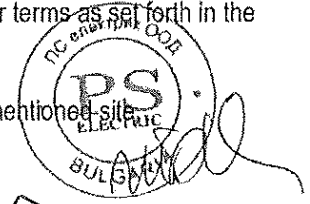
VDE Prüf- und Zertifizierungsinstitut GmbH
Merianstrasse 28
DE-63069 Offenbach / Main
Germany

has been assessed and determined to fully comply with the requirements of ISO/IEC 17065: 2012, The Basic Rules, IECEE 01: 2016-10 and Rules of Procedure IECEE 02: 2017-06, and the relevant IECEE CB-Scheme and specific Factory Surveillance Body (FSB) Operational Documents.

VDE Prüf- und Zertifizierungsinstitut GmbH

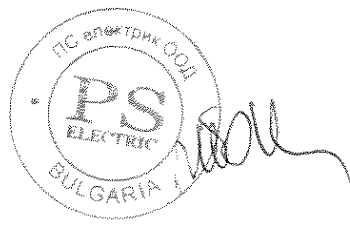
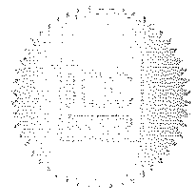
is therefore entitled to operate as an Issuing and Recognising National Certification Body (NCB) and Factory Surveillance Body within the IECEE CB Scheme for the Scope (Product Category(ies) and Standard(s)) as listed in the relevant part of the IECEE Web Site at www.iecee.org, and is subject to all other terms as set forth in the IECEE Basic Rules and Rules of Procedure.

The IECEE membership status of this NCB can be verified on the aforementioned site.



ВЯРНО
ОД
**На основание чл. 2
от ЗЗЛД**

Date of Issue: 2017-12-07
CB007



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CTF Volta Labs Schneider Electric Industries SAS

Home [Standards 0-Stop](#)

Customer Testing Facility

Volta Labs Schneider Electric Industries SAS
37 Quai Paul Louis Merlin
38050 Grenoble
Cedex 09
France

На основании чл. 2 от 33ЛД

Further Information

CTF Stage 2

Reporting National Certification Bodies
VDE Prüf- und Zertifizierungsinstitut GmbH
Germany

ВЕРНО
ОРИГИНАЛ
PS ELECTRIC
ВЕРНО
ОРИГИНАЛ
2017-02-17

Test platform accredited
Under the Nr F01 by :



File nr : 31039

RECORD OF PROVING TEST n° : F01.04.18

Issued to : SCHNEIDER ELECTRIC INDUSTRIES SAS
89, boulevard Franklin Roosevelt
F-92500 RUEIL-MALMAISON FRANCE

Apparatus tested : Low-voltage circuit-breaker

reference : Compact NS 630bN, 1250N, 1600N
with MICROLOGIC 5.0A

manufacturer : SCHNEIDER ELECTRIC SA

Purpose of the test : Verification of the rated short-time withstand current based on IEC 60947-2 (04/2003)
§ 8.3.6 sequence IV

Rated characteristics :

Operational Voltage	220V to 690V
Rated current	630A to 1600A
Rated short circuit withstand current	19.2kA – 1s Three phase
Rated short circuit withstand current	11.52kA – 1s Single phase

Date or period of test : April 23th 2004 to January 16th 2005

This record of proving test comprises : 70 page(s) + 28 appendixe(s)

The results obtained during tests entered in this record of proving test justify the rated characteristics assigned by the Manufacturer as stated above.

Date of issue : 13th july 2005

The technical responsible ,

Name : E. FERNANDEZ

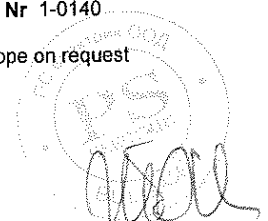
Signature

*This document results from tests carried out on a sample. It does not prejudice the compliance of the whole manufactured products with the tested specimen.
This record of proving test shall only be reproduced in the complete form.
COFRAC accreditation is an attestation of the laboratory technical competence within the field of test covered by the accreditation*

Test performed by : VOLTA LABORATORY - SCHNEIDER ELECTRIC
2 rue Volta 38050 GRENOBLE Cedex 09



Scope on request



Description and characterization of the test object

Characteristics

Type of circuit-breaker: Compact NS 630bN, 1250N, 1600N

Number of poles 4
 Kind of current a.c.
 Number of phases 3
 Rated frequency 50/60 Hz
 Utilization category B
 Reference temperature 40°C
 Suitability for isolation yes

Rated and limiting values: (according to test volume)

Main circuit:

Rated impulse withstand voltage U_{imp} 8 kV
 Rated insulation voltage U_i 800 V
 Conventional thermal current I_{th} / I_{the} 630A to 1600A
 Rated current I_n 630A to 1600A
 Rated current in the neutral pole 630A to 1600A

Short-circuit characteristics:

U_e/V	I_{cm}/kA	I_{cu}/kA	$I_{cs100\%}/kA$	$I_{cs75\%}/kA$	$I_{cw}/kA - 1s$	$I_{cw}/kA - 1s$
			For $I_n=630$ to $1250A$	For $I_n=1600A$	Three phase	Single phase
220/240	105	50	50	37,5	19,2	11,52
380/415	105	50	50	37,5	19,2	11,52
440	105	50	50	37,5	19,2	11,52
500/525	84	40	40	30	19,2	11,52
660/690	63	30	30	22,5	19,2	11,52

Control circuits:

Electrical control circuits:

Kind of current	a.c. or d.c.
Rated frequency	50/60Hz or d.c.
Rated control circuit voltage U_c	MN : 24 to 480Vac , 24 to 250Vdc MX : 24 to 480Vac , 12 to 250Vdc
Rated control supply voltage U_s	./. V
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	690 V

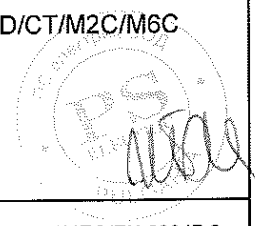
Air-supply control circuits:

Rated supply pressure	./. kPa
Limits of pressure	./. kPa
Required volume for each closing operation	./. m ³
Required volume for each opening operation	./. m ³

Auxiliary circuits:

Rated operational voltage U_e	240 to 690 Vac and 24 to 250Vdc
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	690 V
Rated frequency	50/60 Hz
Rated operational current I_e	according models
Number of circuits	according models
Number and kind of contact elements	OF/SDE/EF/CE/CD/CT/M2C/M6C

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ASEFA	Test report No.: F01.04.18 Page 5 / 70
Type test according to: IEC 60947-2 Test sequence IV	Type: Compact NS 630bN, 1250N, 1600N

TEST SEQUENCE IV

Rated short-time withstand current

Test sequence IV comprises the following tests:

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8.3.6.2	Rated service short-time withstand current	9-10
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	Verification of leakage current (if applicable)	35
8.3.6.6	Verification of overload releases	36

31039.09

E. P. ...
OPW...



ASEFA	Test report No.: F01.04.18 Page 6 / 70																																																												
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8.3.6.5	Verification of dielectric withstand Verification of leakage current (if applicable)	63 64																																																											
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Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM	<p style="text-align: right;">TRF IEC/EN 60947-2 Ed. 2.1 form 39</p> <p style="text-align: center;">Date July 13th 2005</p>																																																												

ASEFATest report No.: F01.04.18
Page 7 / 70Type test according to: IEC 60947-2
Test sequence IV

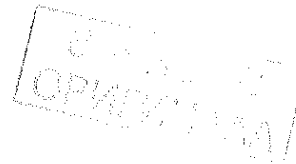
Type: Compact NS 630bN, 1250N, 1600N

Synthesis of tested samples

Sample Nb	Type	Test	I _r	I _{cs} Tested	Supply	pages
31039.09	NS1600N	3 Ph.	1600A	19.2kA/690V	Upper	8-17
31039.10	NS630bN	3 Ph.	630x0.4=252A	19.2kA/690V	Upper	18-26
31039.11B	NS1600N	3 Ph.	1600A	19.2kA/690V	Lower	27-36
31039.12	NS1600N	Single Ph.	1600A	11.52kA/690V/√3	Upper	37-46
31039.13	NS630bN	Single Ph.	630x0.4=252A	11.52kA/690V/√3	Upper	47-55
31039.14	NS1600N	Single Ph.	1600A	11.52kA/690V/√3	Lower	56-65

The MICROLOGIC tripping unit being independent of the temperature, the connections used for testing tripping characteristics differ from those given in the tables of standard (refer to IEC 60947-2 note 2 of 8.3.5.1)

The rated short-time withstand current about circuit-breaker NS 1600 N are the same that circuit-breaker NS 1600 H. Consequently, this test-report covers both types.

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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar $80 \times 5 \text{ mm}$ Number $2 / \text{Ph}$ Length $.l. \text{ mm}$ Tightening torque Reference temperature $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ Ambient temperature Correction factor ($k = 1$ for releases independent of ambient temperature) k Current setting value I_n Test current either $k \times 2.0 \times I_n$ 3200 A 8.3.5.1 Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or $k \times 2.5 \times I_n$ $.l. \text{ A}$ 8.3.5.4 Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral $\leq 270 \text{ s}$ Ph ₁ $\leq 270 \text{ s}$ Ph ₂ $\leq 270 \text{ s}$ Ph ₃ $\leq 270 \text{ s}$	Braid 2000 mm ² $.l. \times .l. \text{ mm}$ 1 /Ph 700 mm 50 Nm 22 °C 1 1600 A 3200 A 3200 A .l. A .l. A 242 s 238 s 227 s 234 s
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.2 8.3.8.2 Table 4	TEST OF RATED SHORT-TIME WITHSTAND CURRENT Utilization category B Rated operational voltage U_e 690 V Short-time withstand current I_{cw} 19,2 kA Short-time t_{st} 1 s Circuit diagram Calibration of the test circuit Pageform Safety area Pageform Installation of the material tested Pageform	Page 68 Next page Page 67 Page 66
60947-1 Table 9, 10 and 11	Cabling characteristics Cable $./. \text{ mm}^2$ Bar 5 x 80 mm Number 2 Length supply side $./. \text{ mm}$ load side $./. \text{ mm}$ Tightening torque	$./. \text{ mm}^2$ 5 x 80 mm 2 $./. \text{ mm}$ $./. \text{ mm}$ 50 Nm
60947-1 8.3.4.3 Table 11	Alternating current Oscillogram Test voltage $\geq 80 \text{ V}$ Power factor Frequency 50 Hz Test duration t_{st} Test current value i_1 i_2 i_3 Average i_m	20040096.0040 750 V 0.27 50 Hz 1107.9 ms 19.37 kA 19.94 kA 19.3 kA 19.53 kA

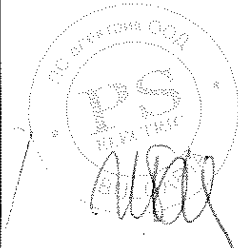
Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 10 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.3	Alternative test	
	$I_{cw}^2 \times t_{st}$ 368.64 (kA) ² s Oscillogram Peak current maximum value Test duration t_{test} Joule-integral $i_{test}^2 dt$ Ph ₁ Average value Ph _m	20040096.0040 40.88 kA 1107.9 ms 384.45 (kA) ² s 413.48 (kA) ² s 412.4 (kA) ² s 403.44 (kA) ² s
60947-1 8.3.4.3	Direct current	
	$I_{cw}^2 \times t_{st}$ /. A ² s Oscillogram Test voltage ≥ 80 V Maximum of test current I_{test} Test duration t_{test} Joule-integral $i_{test}^2 dt$	Page /. /. V /. kA /. ms /. A ² s

EXHIBIT
CERTIFICATE



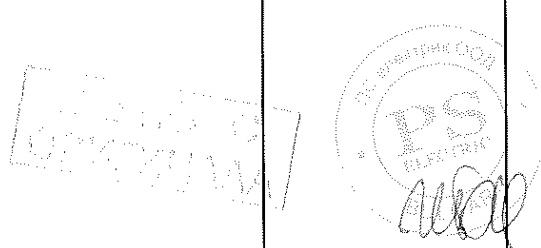
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ASEFA		Test report No.: F01.04.18 Page 12 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.4	TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT	
	Utilization category B	
	Rated operational voltage U_e 690 V	
	Recovery voltage $1.05 \times U_e$	724.5 V(0, +5%)
	Rated short-time withstand current I_{cw}	19.2 kA(0, +5%)
Table 11	Power factor 0.30	0.30(-0.05, 0)
	Frequency 50 Hz	50 Hz
8.3.2.1	Control supply voltage $0.85 \times U_e$./. V	./. V
7.2.1.1.3	Maximum value of the closing time	./. ms
	Sequence of operation O - t - CO	O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit Pageform	Next page
	Safety area Pageform	Page 67
	Installation of the material tested Pageform	Page 66
	Energization direction Top/Bottom	Top
	Cabling characteristics Pageform	Page 66

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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CIRCUIT	
	Oscillogram	20040169-0010 20040169-0012
	Applied voltage	735.6 V
	Frequency	50 Hz
	RMS current value at 20 ms	i_1 20.3 kA i_2 19.7 kA i_3 19.9 kA
	Average RMS. Value	20.0 kA
	Peak current maximum value	40.6 kA
	Power factor	0.27
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
Date July 13th 2005		

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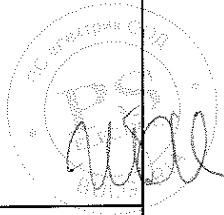
ASEFA		Test report No.: F01.04.18 Page 14 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
	<p>OPERATION "O"</p> <p>Oscillogram</p> <p>Peak current value i_1 39.8 kA i_2 27.8 kA i_3 36.98 kA</p> <p>Maximum total duration 418.2 ms</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 781.13 V (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 741.03 V $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 698.4 V</p> <p>Average value U_m 740.19 V Ratio between U_m and U_e U_m/U_e 1.07</p> <p>Joule integral Ph_1 154.91 (kA)²s Ph_2 150.01 (kA)²s Ph_3 151.12 (kA)²s</p> <p>Melting of the fusible element Yes/No No Holes in the PE-sheet (if applicable) Yes/No No Cracks observed Yes/No No if Yes</p> <p>Time interval between operations 3 min</p> <p>OPERATION "CO"</p> <p>Oscillogram</p> <p>Applied voltage 742.01 V</p> <p>Peak current value i_1 37.84 kA i_2 30.41 kA i_3 38.64 kA</p> <p>Maximum total duration 420.3 ms</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 804.86 V (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 688.98 V $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 711.07 V</p> <p>Average value U_m 734.97 V Ratio between U_m and U_e U_m/U_e 1.06</p> <p>Joule integral Ph_1 154.64 (kA)²s Ph_2 150.88 (kA)²s Ph_3 155.28 (kA)²s</p>	<p>20040169.0015</p> <p>Page ./.</p> <p>3 min</p> <p>20040169.0016</p> <p>Page ./.</p>
7.2.1.1.3	<p>Closing operation time ./ ms</p> <p>Melting of the fusible element Yes/No No</p> <p>Cracks observed Yes/No No if Yes</p>	<p>Page ./.</p>
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 41
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ASEFA		Test report No.: F01.04.18 Page 15 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	1380 V
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	
	Test duration	5 s
		5 s
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32
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1380 V

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ASEFA		Test report No.: F01.04.18 Page 16 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF LEAKAGE CURRENT	
	For circuit-breakers suitable for isolation having an operational voltage U_e greater than 50 V.	
8.3.3.2	- Main circuit of the circuit-breaker - Isolating contacts of a withdrawable unit (if applicable)	
	Test voltage $1.1 \times U_e = 759 \text{ V}$	760 V
60947-1 7.2.7	Application of the test voltage	
	Leakage current	
8.3.3.2	Test sequence I (in new condition)	$\leq 0.5 \text{ mA}$ /. mA
8.3.3.5	Test sequence I (after overload performance)	$\leq 2 \text{ mA}$ /. mA
8.3.4.3	Test sequence II	$\leq 2 \text{ mA}$ /. mA
8.3.5.3	Test sequence III	$\leq 6 \text{ mA}$ /. mA
8.3.6.5	Test sequence IV	$\leq 2 \text{ mA}$ 0 mA
8.3.7.3	Test sequence V, stage 1	$\leq 2 \text{ mA}$ /. mA
8.3.7.7	Test sequence V, stage 2	$\leq 6 \text{ mA}$ /. mA
8.3.8.5	Combined test sequence	$\leq 2 \text{ mA}$ /. mA
C.3	Individual pole short-circuit test sequence I_{su}	$\leq 6 \text{ mA}$ /. mA
H.3	Individual pole short-circuit test sequence I_{IT}	$\leq 6 \text{ mA}$ /. mA

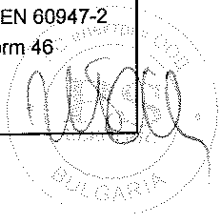
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ASEFA		Test report No.: F01.04.18 Page 17 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable ./. mm ² Bar 80 x 5 mm Number 2 /Ph Length ./. mm Tightening torque Reference temperature 40 °C ± 2 °C Ambient temperature 29 °C Correction factor (k = 1 for releases independent of ambient temperature) k 1 Current setting value I _n 1600 A Test current either k x 2.0 x I _n 3200 A 3200 A 8.3.5.1 Test sequence II (I _{cs} = I _{cu}) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or k x 2.5 x I _n J. A J. A 8.3.5.4 Test sequence II (I _{cs} = I _{cu}) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral ≤ 270 s 260 s Ph ₁ ≤ 270 s 236 s Ph ₂ ≤ 270 s 231 s Ph ₃ ≤ 270 s 234 s	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ASEFA		Test report No.: F01.04.18 Page 18 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable 185 mm ² Bar ./. x ./. mm Number 2 /Ph Length ./. mm Tightening torque 50 Nm Reference temperature 40 °C ± 2 °C Ambient temperature 23 °C Correction factor (k = 1 for releases independent of ambient temperature) k 1 Current setting value I _n 630*0.4=252 A Test current either k x 2.0 x I _n 504 A 8.3.5.1 Test sequence II (I _{cs} = I _{cu}) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or k x 2.5 x I _n ./. A 8.3.5.4 Test sequence II (I _{cs} = I _{cu}) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral ≤ 270 s 220 s Ph ₁ ≤ 270 s 214 s Ph ₂ ≤ 270 s 214 s Ph ₃ ≤ 270 s 233 s	Braid 2000 mm ² ./. x ./. mm 1 /Ph 700 mm 50 Nm 23 °C 1 630*0.4=252 A 504 A 504 A ./. A ./. A
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ASEFA		Test report No.: F01.04.18 Page: 20 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.3	Alternative test	
	$I_{cw}^2 \times t_{st}$ 368.64 (kA) ² s Oscillogram Peak current maximum value Test duration t_{test} Joule-integral $\int I_{test}^2 dt$ Average value	20040096.0041 40.51 kA 1108.65 ms Ph ₁ 382.58 (kA) ² s Ph ₂ 411.49 (kA) ² s Ph ₃ 410.37 (kA) ² s Ph _m 401.48 (kA) ² s
60947-1 8.3.4.3	Direct current	
	$I_{cw}^2 \times t_{st}$ /. A ² s Oscillogram Test voltage ≥ 80 V Maximum of test current I_{test} Test duration t_{test} Joule-integral $\int I_{test}^2 dt$	Page /. /. V /. kA /. ms /. A ² s



Test laboratory: F01- GRENOBLE
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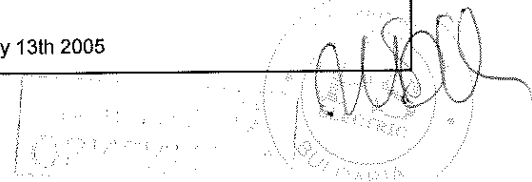
Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 21 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.4	TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT	
	Utilization category B	
	Rated operational voltage U_e 690 V	
	Recovery voltage $1.05 \times U_e$	724.5 V(0, +5%)
	Rated short-time withstand current I_{cw}	19.2 kA(0, +5%)
Table 11	Power factor 0.30	0.30(-0.05, 0)
	Frequency 50 Hz	50 Hz
8.3.2.1	Control supply voltage $0.85 \times U_s$./. V	./. V
7.2.1.1.3	Maximum value of the closing time	./. ms
	Sequence of operation O - t - CO	O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit	Next page
	Safety area	Page 67
	Installation of the material tested	Page 66
	Energization direction Top/Bottom	Top
	Cabling characteristics	Page 66

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

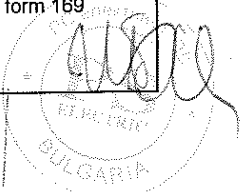
TRF IEC/EN 60947-2
Ed. 2.1 form 55

Date July 13th 2005



ASEFA		Test report No.: F01.04.18 Page 22 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CRUIT Oscillogram Applied voltage Frequency 50 Hz RMS current value at 20 ms i_1 i_2 i_3 Average RMS. Value Peak current maximum value Power factor	20040096-0034 20040096-0035 750.82 V 50 Hz 19.34 kA 19.83 kA 20.52 kA 19.9 kA 40.89 kA 0.27
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
		Date July 13th 2005

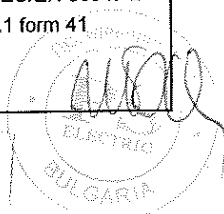
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ASEFA		Test report No.: F01.04.18 Page 23 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
	<p>OPERATION "O"</p> <p>Oscillogram</p> <p>Peak current value i_1 i_2 i_3</p> <p>Maximum total duration</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/></p> <p>Average value U_{rm}</p> <p>Ratio between U_{rm} and U_e U_{rm}/U_e</p> <p>Joule integral Ph_1 Ph_2 Ph_3</p> <p>Melting of the fusible element Yes/No</p> <p>Holes in the PE-sheet (if applicable) Yes/No</p> <p>Cracks observed Yes/No if Yes</p> <p>Time interval between operations 3 min</p> <p>OPERATION "CO"</p> <p>Oscillogram</p> <p>Applied voltage</p> <p>Peak current value i_1 i_2 i_3</p> <p>Maximum total duration</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/></p> <p>Average value U_{rm}</p> <p>Ratio between U_{rm} and U_e U_{rm}/U_e</p> <p>Joule integral Ph_1 Ph_2 Ph_3</p>	<p>20040096.0044</p> <p>32.05 kA</p> <p>34.45 kA</p> <p>40.33 kA</p> <p>412.85 ms</p> <p>727.9 V</p> <p>727.7 V</p> <p>726.9 V</p> <p>727.5 V</p> <p>1.05</p> <p>141.31 (kA)²s</p> <p>151.94 (kA)²s</p> <p>153.83 (kA)²s</p> <p>No</p> <p>No</p> <p>No</p> <p>Page ./.</p> <p>3 min</p> <p>3 min</p> <p>20040096.0045</p> <p>750.13 V</p> <p>32.96 kA</p> <p>39.96 kA</p> <p>33.54 kA</p> <p>412.7 ms</p> <p>735 V</p> <p>731 V</p> <p>739 V</p> <p>735 V</p> <p>1.06</p> <p>143.17 (kA)²s</p> <p>155.64 (kA)²s</p> <p>152.69 (kA)²s</p>
7.2.1.1.3	<p>Closing operation time</p> <p>Melting of the fusible element Yes/No</p> <p>Cracks observed Yes/No if Yes</p>	<p>./.</p> <p>No</p> <p>No</p> <p>Page ./.</p>
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 41
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ELCOTIC
OP/AV/DA



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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	1380 V
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	
	Test duration	5 s 5 s

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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ASEFA		Test report No.: F01.04.18 Page 25 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF LEAKAGE CURRENT	
	For circuit-breakers suitable for isolation having an operational voltage U_e greater than 50 V.	
8.3.3.2	- Main circuit of the circuit-breaker - Isolating contacts of a withdrawable unit (if applicable)	
	Test voltage	$1.1 \times U_e = 760 \text{ V}$ 759 V
60947-1 7.2.7	Application of the test voltage	
	Leakage current	
8.3.3.2	Test sequence I (in new condition)	$\leq 0.5 \text{ mA}$./ mA
8.3.3.5	Test sequence I (after overload performance)	$\leq 2 \text{ mA}$./ mA
8.3.4.3	Test sequence II	$\leq 2 \text{ mA}$./ mA
8.3.5.3	Test sequence III	$\leq 6 \text{ mA}$./ mA
8.3.6.5	Test sequence IV	$\leq 2 \text{ mA}$ 1 mA
8.3.7.3	Test sequence V, stage 1	$\leq 2 \text{ mA}$./ mA
8.3.7.7	Test sequence V, stage 2	$\leq 6 \text{ mA}$./ mA
8.3.8.5	Combined test sequence	$\leq 2 \text{ mA}$./ mA
C.3	Individual pole short-circuit test sequence I_{su}	$\leq 6 \text{ mA}$./ mA
H.3	Individual pole short-circuit test sequence I_{IT}	$\leq 6 \text{ mA}$./ mA

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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ASEFA		Test report No.: F01.04.18 Page 26 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable 185 mm ² Bar ./ x ./ mm Number 2 /Ph Length ./ mm Tightening torque Reference temperature 40 °C ± 2 °C Ambient temperature Correction factor (k = 1 for releases independent of ambient temperature) k Current setting value I _n Test current either k x 2.0 x I _n 504 A 8.3.5.1 Test sequence II (I _{cs} = I _{cu}) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or k x 2.5 x I _n ./ A 8.3.5.4 Test sequence II (I _{cs} = I _{cu}) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral ≤ 270 s Ph ₁ ≤ 270 s Ph ₂ ≤ 270 s Ph ₃ ≤ 270 s	Braid 2000 mm ² ./ x ./ mm 1 /Ph 700 mm 50 Nm 27 °C 630*0.4=252V 504 A ./ A 225 s 192 s 195 s 183 s
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ASEFA		Test report No.: F01.04.18 Page 27 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable $.I. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.I. \text{ mm}$ Tightening torque Reference temperature $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ Ambient temperature Correction factor ($k = 1$ for releases independent of ambient temperature) k Current setting value I_n Test current either $k \times 2.0 \times I_n$ 3200 A 8.3.5.1 Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or $k \times 2.5 \times I_n$ $.I. \text{ A}$ 8.3.5.4 Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral $\leq 270 \text{ s}$ Ph ₁ $\leq 270 \text{ s}$ Ph ₂ $\leq 270 \text{ s}$ Ph ₃ $\leq 270 \text{ s}$	$.I. \text{ mm}^2$ 100 x 5 mm 2 /Ph 500 mm 50 Nm $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 20.3 $^\circ\text{C}$ 1 1600 A 3200 A 3200 A $.I. \text{ A}$ $.I. \text{ A}$ 221 s 221 s 220 s 208 s
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ASEFA		Test report No.: F01.04.18 Page 28 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.2 8.3.8.2 Table 4	TEST OF RATED SHORT-TIME WITHSTAND CURRENT Utilization category B Rated operational voltage U_e 690 V Short-time withstand current I_{cw} 19.2 kA Short-time t_{st} 1 s Circuit diagram Calibration of the test circuit Pageform Safety area Pageform Installation of the material tested Pageform	Page 68 Next page Page 67 Page 66
60947-1 Table 9, 10 and 11	Cabling characteristics Cable ./ mm² Bar 100 x 10 mm Number 1 Length supply side ./ mm load side ./ mm Tightening torque	./ mm ² 100 x 10 mm 1 500 mm 0 mm 50 Nm
60947-1 8.3.4.3 Table 11	Alternating current Oscillogram Test voltage ≥ 80 V Power factor Frequency 50 Hz Test duration t_{st} Test current value i_1 i_2 i_3 Average i_m	20040283.0169 736 V 0.24 50 Hz 1024 ms 18.74 kA 19.53 kA 19.4 kA 19.22 kA

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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ASEFA		Test report No.: F01.04.18 Page 30 / 70
Type test according to: IEC 60947-2 Test sequence II/III		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
8.3.4.4 8.3.6.3 8.3.7.2 8.3.8.6	VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS	
8.3.2.5	Temperature-rise test	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
60947-1 8.3.3.3.4	Main circuits Conventional thermal current I_{th} Conventional thermal current for enclosure I_{the} Conventional thermal current for the neutral pole	1600 A . / . A . / . A 1600 A . / . A . / . A
60947-1 Table 9, 10 and 11	Cabling characteristics Phase poles Cable Bar Number Length Tightening torque Neutral pole (if applicable) Cable Bar Number Length Tightening torque Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	. / . mm ² 100 x 5 mm 2 / Ph 3000 mm 50 Nm . / . mm ² . / . x . / . mm . / . . / . mm . / . Nm . / . mm ² 100 x 5 mm 2 / Ph 3000 mm 50 Nm . / . mm ² . / . x . / . mm . / . . / . mm . / . Nm
Table 7	Temperature-rise limits Terminals	≤ 80 K 61.3 K

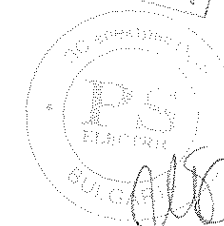
Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 31 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.4	TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT	
	Utilization category B	
	Rated operational voltage U_e 690 V	
	Recovery voltage $1.05 \times U_e$	724.5 V(0, +5%)
	Rated short-time withstand current I_{cw}	19.2 kA(0, +5%)
Table 11	Power factor 0.30	0.30(-0.05, 0)
	Frequency 50 Hz	50 Hz
8.3.2.1	Control supply voltage $0.85 \times U_s$./. V	./. V
7.2.1.1.3	Maximum value of the closing time	./. ms
	Sequence of operation O - t - CO	O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit	Next page
	Safety area	Page 67
	Installation of the material tested	Page 66
	Energization direction	Bottom
	Cabling characteristics	Pageform 9

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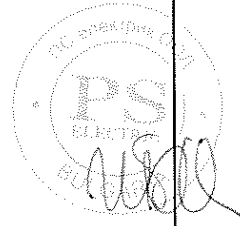
Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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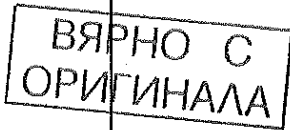

ASEFA		Test report No.: F01.04.18 Page 32 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CIRCUIT	
	Oscillogram	20040096-0013 20040096-0067
	Applied voltage	744 V
	Frequency	50 Hz
	RMS current value at 20 ms	i_1 20.05 kA i_2 19.53 kA i_3 19.86 kA
	Average RMS. Value	19.75 kA
	Peak current maximum value	40.42 kA
	Power factor	0.26
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
Date July 13th 2005		

OPTECH



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ASEFA		Test report No.: F01.04.18 Page 33 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
	<p>OPERATION "O"</p> <p>Oscillogram</p> <p>Peak current value i_1 i_2 i_3</p> <p>Maximum total duration</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/></p> <p>Average value U_{rm}</p> <p>Ratio between U_{rm} and U_e U_{rm}/U_e</p> <p>Joule integral Ph_1 Ph_2 Ph_3</p> <p>Melting of the fusible element Yes/No</p> <p>Holes in the PE-sheet (if applicable) Yes/No</p> <p>Cracks observed Yes/No if Yes</p> <p>Time interval between operations 3 min</p> <p>OPERATION "CO"</p> <p>Oscillogram</p> <p>Applied voltage</p> <p>Peak current value i_1 i_2 i_3</p> <p>Maximum total duration</p> <p>Recovery voltage $U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> (phase to phase or phase to neutral) $U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> $U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/></p> <p>Average value U_{rm}</p> <p>Ratio between U_{rm} and U_e U_{rm}/U_e</p> <p>Joule integral Ph_1 Ph_2 Ph_3</p>	<p>20040096.0069</p> <p>40.30 kA 30.52 kA 36.01 kA</p> <p>428.78 ms</p> <p>725 V 726 V 726 V</p> <p>725 V</p> <p>1.05</p> <p>155.34 A²s 153.79 A²s 155.41 A²s</p> <p>No No No</p> <p>Page ./.</p> <p>5 min</p> <p>20040096.0070</p> <p>765.46 V</p> <p>39.27 kA 27.78 kA 36.87 kA</p> <p>427.46 ms</p> <p>721.66 V 727.91 V 747.04 V</p> <p>732.2 V</p> <p>1.06</p> <p>155,57 (kA)²s 155.34 (kA)²s 154.42 (kA)²s</p>
7.2.1.1.3	<p>Closing operation time</p> <p>Melting of the fusible element Yes/No</p> <p>Cracks observed Yes/No if Yes</p>	<p>./.</p> <p>No No</p> <p>Page ./.</p>
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		<p>TRF IEC/EN 60947-2 Ed. 2.1 form 41</p> <p>Date July 13th 2005</p>

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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	1380 V
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	
	Test duration	5 s 60 s
		 
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32
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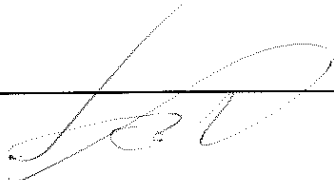
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ASEFA		Test report No.: F01.04.18 Page 35 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF LEAKAGE CURRENT	
	For circuit-breakers suitable for isolation having an operational voltage U_e greater than 50 V.	
8.3.3.2	- Main circuit of the circuit-breaker - Isolating contacts of a withdrawable unit (if applicable)	
	Test voltage	$1.1 \times U_e = 760 \text{ V}$
60947-1 7.2.7	Application of the test voltage	759 V
	Leakage current	
8.3.3.2	Test sequence I (in new condition)	$\leq 0.5 \text{ mA}$ /. mA
8.3.3.5	Test sequence I (after overload performance)	$\leq 2 \text{ mA}$ /. mA
8.3.4.3	Test sequence II	$\leq 2 \text{ mA}$ /. mA
8.3.5.3	Test sequence III	$\leq 6 \text{ mA}$ /. mA
8.3.6.5	Test sequence IV	$\leq 2 \text{ mA}$ 1 mA
8.3.7.3	Test sequence V, stage 1	$\leq 2 \text{ mA}$ /. mA
8.3.7.7	Test sequence V, stage 2	$\leq 6 \text{ mA}$ /. mA
8.3.8.5	Combined test sequence	$\leq 2 \text{ mA}$ /. mA
C.3	Individual pole short-circuit test sequence I_{su}	$\leq 6 \text{ mA}$ /. mA
H.3	Individual pole short-circuit test sequence I_{IT}	$\leq 6 \text{ mA}$ /. mA

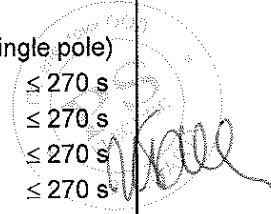
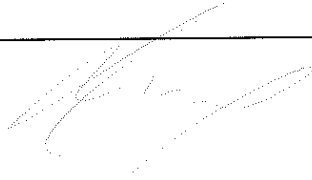
Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
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Date July 13th 2005

ASEFA 		Test report No.: F01.04.18 Page 36 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.l. \text{ mm}$ Tightening torque 50 Nm Reference temperature $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ Ambient temperature $20.3 \text{ }^\circ\text{C}$ Correction factor ($k = 1$ for releases independent of ambient temperature) k Current setting value I_n 1600 A Test current either $k \times 2.0 \times I_n$ 3200 A 3200 A 8.3.5.1 Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or $k \times 2.5 \times I_n$ $.l. \text{ A}$ $.l. \text{ A}$ 8.3.5.4 Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral $\leq 270 \text{ s}$ 236 s Ph ₁ $\leq 270 \text{ s}$ 236 s Ph ₂ $\leq 270 \text{ s}$ 231 s Ph ₃ $\leq 270 \text{ s}$ 217 s	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ВЯРНО С
ОРИГИНАЛА

ASEFA		Test report No.: F01.04.18 Page 37 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.l. \text{ mm}$ Tightening torque Reference temperature $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ Ambient temperature Correction factor ($k = 1$ for releases independent of ambient temperature) k Current setting value I_n	$.l. \text{ mm}^2$ 100 x 5 mm 2 /Ph 500 mm 50 Nm 21.8 $^\circ\text{C}$ 1 1600 A
	Test current	
	either $k \times 2.0 \times I_n$ 3200 A	3200 A
8.3.5.1	Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1	
8.3.5.1	Test sequence III before 8.3.5.2	
8.3.6.1	Test sequence IV before 8.3.6.2	
8.3.6.6	Test sequence IV after 8.3.6.5	
8.3.7.4	Test sequence V before 8.3.7.5	
8.3.8.1	Combined test sequence before 8.3.8.2	
A.5	Verification of discrimination before 8.3.5.2	
A.6.3	Verification of back-up protection before 8.3.5.2	
	or $k \times 2.5 \times I_n$ $.l. \text{ A}$	$.l. \text{ A}$
8.3.5.4	Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5	
8.3.5.4	Test sequence III after 8.3.5.3	
8.3.7.8	Test sequence V after 8.3.7.7	
8.3.8.7	Combined test sequence after 8.3.8.6	
A.5	Verification of discrimination after 8.3.5.3	
A.6.3	Verification of back-up protection after 8.3.5.3	
C.4	Individual pole short-circuit test sequence	
H.4	Test sequence for circuit-breakers for IT-systems	
	Tripping time (for twice the value of current setting on single pole)	
	Neutral $\leq 270 \text{ s}$	220 s
	Ph ₁ $\leq 270 \text{ s}$	228 s
	Ph ₂ $\leq .l. \text{ s}$	$.l. \text{ s}$
	Ph ₃ $\leq .l. \text{ s}$	$.l. \text{ s}$

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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ASEFA		Test report No.: F01.04.18 Page 38 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.2	ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS	
	Test made on the same sample as for the three-pole short-time withstand or on a new sample	same/new new
Table 4	Utilization category	B
60947-1	Rated operational voltage U_e	690 $V\sqrt{3}=398V$
8.3.4.3	Short-time withstand current of the fourth pole I_{cw} (not less than 60 % of I_{cw})	11.52 kA
	Short-time t_{st}	1 s
	Circuit diagram	Page 68
	Calibration of the test circuit	Pageform Next page
	Safety area	Pageform Page 67
	Installation of the material tested	Pageform Page 66
60947-1	Cabling characteristics	
Table 9, 10 and 11	Cable	./. mm ² ./. mm ²
	Bar	100 x 5 mm 100 x 5 mm
	Number	2 2
	Length	supply side ./. mm 500 mm
		load side ./. mm 0 mm
	Tightening torque	50 Nm
60947-1	Alternating current	
8.3.4.3	Oscillogram	20040283.0134
	Test voltage	≥ 80 V 780 V
Table 11	Power factor	0.29
	Frequency	50 Hz 50 Hz
	Test duration t_{st}	1112.7 ms
	Test current value I_1	12.02 kA

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 39 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.3	Alternative test $I_{cw}^2 \times t_{st}$ 132.71 (kA) ² s Oscillogram Peak current maximum value Test duration t_{test} Joule-integral $I_{test}^2 dt$ Ph ₁	20040283,0134 23.22 kA 1112.7 ms 139.55 (kA) ² s
60947-1 8.3.4.3	Direct current $I_{cw}^2 \times t_{st}$./ A ² s Oscillogram Test voltage ≥ 80 V Maximum of test current I_{test} Test duration t_{test} Joule-integral $I_{test}^2 dt$	Page ./ ./ V ./ kA ./ ms ./ A ² s

TEST REPORT
SIGNATURE



Test laboratory: F01- GRENOBLE
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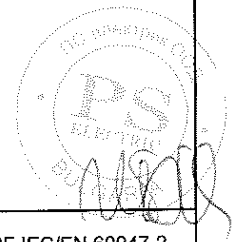
ASEFA		Test report No.: F01.04.18 Page 40 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
8.3.4.4 8.3.6.3 8.3.7.2 8.3.8.6	VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS	
8.3.2.5	Temperature-rise test	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
	Main circuits	
60947-1 8.3.3.3.4	Conventional thermal current I_{th}	1600 A 1600 A
	Conventional thermal current for enclosure I_{the}	./. A ./. A
	Conventional thermal current for the neutral pole	./. A ./. A
60947-1 Table 9, 10 and 11	Cabling characteristics	
	Phase poles	
	Cable	./. mm ² ./. mm ²
	Bar	100 x 5 mm 100 x 5 mm
	Number	2 /Ph 2 /Ph
	Length	./. mm 3000 mm
	Tightening torque	50 Nm
	Neutral pole (if applicable)	
	Cable	./. mm ² ./. mm ²
	Bar	./. x ./. mm ./. x ./. mm
	Number	./. ./. ./. ./. ./. Nm
	Length	./. mm
	Tightening torque	./. Nm
	Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	
Table 7	Temperature-rise limits	
	Terminals	≤ 80 K 56.3 K

Test laboratory: F01- GRENOBLE
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ASEFA		Test report No.: F01.04.18 Page 42 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CIRCUIT Oscillogram Applied voltage Frequency 50 Hz RMS current value at 20 ms i_1 i_2 i_3 Average RMS. Value Peak current maximum value Power factor	20040299-0003 20040299-0008 425.55 V 50 Hz 11.77 kA ./. kA ./. kA 11.77 kA 23.24 kA 0.28
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
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ASEFA		Test report No.: F01.04.18 Page 43 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
7.2.1.1.3	OPERATION "O" Oscillogram Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Melting of the fusible element Yes/No Holes in the PE-sheet (if applicable) Yes/No Cracks observed Yes/No if Yes Time interval between operations 3 min	20040299-0011 23.29 kA 415.75 ms 419.02 V 1.05 53.87 (kA) ² s No No No Page ./. 3 min
	OPERATION "CO" Oscillogram Applied voltage Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Closing operation time Melting of the fusible element Yes/No Cracks observed Yes/No if Yes	20040299.0012 435 V 19.38 kA 420.45 ms 418.57 V 1.05 52.85 (kA) ² s ms No No Page ./. 3 min

ВЯРНО С
ОРИГИНАЛА



Test laboratory: F01- GRENOBLE
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ASEFA		Test report No.: F01.04.18 Page 44 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	1380 V
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	
	Test duration	5 s
		5 s

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 46 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.l. \text{ mm}$ Tightening torque Reference temperature 40 °C ± 2 °C Ambient temperature 18.2 °C Correction factor ($k = 1$ for releases independent of ambient temperature) k 1 Current setting value I_n 1600 A Test current either $k \times 2.0 \times I_n$ 3200 A 8.3.5.1 Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or $k \times 2.5 \times I_n$ $.l. \text{ A}$ $.l. \text{ A}$ 8.3.5.4 Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral $\leq 270 \text{ s}$ 215 s Ph ₁ $\leq 270 \text{ s}$ 226 s Ph ₂ $\leq .l. \text{ s}$ $.l. \text{ s}$ Ph ₃ $\leq .l. \text{ s}$ $.l. \text{ s}$	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
Date July 13th 2005		

ASEFA		Test report No.: F01.04.18 Page 47 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable 185 mm ² 185 mm ² Bar ./. x ./. mm ./. x ./. mm Number 1 /Ph 1 /Ph Length ./. mm 2000 mm Tightening torque 50 Nm Reference temperature 40 °C ± 2 °C Ambient temperature 21.7 °C Correction factor (k = 1 for releases independent of ambient temperature) k 1 Current setting value I _n 630x0.4=252 A Test current either k x 2.0 x I _n 504 A 504 A 8.3.5.1 Test sequence II (I _{cs} = I _{cu}) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or k x 2.5 x I _n ./. A ./. A 8.3.5.4 Test sequence II (I _{cs} = I _{cu}) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral ≤ 270 s 236 s Ph ₁ ≤ 270 s 212 s Ph ₂ ≤ ./. s ./. s Ph ₃ ≤ ./. s ./. s	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
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ASEFA		Test report No.: F01.04.18 Page 48 / 70	
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13	
Standard and clause	Kind of tests and requirements	Test values Results	
8.3.6.2	ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS		
	Test made on the same sample as for the three-pole short-time withstand or on a new sample	same/new	new
Table 4	Utilization category	B	
60947-1	Rated operational voltage U_e	$690\sqrt{3}=398$ V	
8.3.4.3	Short-time withstand current of the fourth pole I_{cw} (not less than 60 % of I_{cw})	11.52 kA	
	Short-time t_{st}	1 s	
	Circuit diagram		Page 68
	Calibration of the test circuit	Pageform	Next page
	Safety area	Pageform	Page 67
	Installation of the material tested	Pageform	Page 66
60947-1	Cabling characteristics		
Table 9, 10 and 11	Cable	./. mm ²	./. mm ²
	Bar	100 x 10 mm	100 x 10 mm
	Number	1	1
	Length	supply side ./. mm load side ./. mm	400 mm ./.
	Tightening torque		50 Nm
60947-1	Alternating current		
8.3.4.3	Oscillogram		20040283.0135
	Test voltage	≥ 80 V	780 V
Table 11	Power factor		0.29
	Frequency	50 Hz	50 Hz
	Test duration t_{st}		1112.95 ms
	Test current value i_t		11.97 kA
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 53	
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ASEFA		Test report No.: F01.04.18 Page 49 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.3	Alternative test $I_{cw}^2 \times t_{st}$ 132.71 (kA) ² s Oscillogram Peak current maximum value Test duration t_{test} Joule-integral $\int I_{test}^2 dt$ Ph ₁	20040283/0135 23.12 kA 1112.96 ms 139.86 (kA) ² s
60947-1 8.3.4.3	Direct current $I_{cw}^2 \times t_{st}$./. A ² s Oscillogram Test voltage ≥ 80 V Maximum of test current I_{test} Test duration t_{test} Joule-integral $\int I_{test}^2 dt$	Page ./. ./. V ./. kA ./. ms ./. A ² s

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08/07/2005



Test laboratory: F01- GRENOBLE
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Date July 13th 2005

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ASEFA		Test report No.: F01.04.18 Page 50 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
8.3.5.2 8.3.6.4 8.3.7.6	ADDITIONAL SEQUENCE OF SHORT-CIRCUIT OPERATIONS ON FOUR POLE CIRCUIT-BREAKERS Test made on the same sample as for the three-pole short-circuit or on a new sample	same/new new
	Rated operational voltage U_e	690 V
	Test voltage	$U_e/\sqrt{3}$ 398 V
	Recovery voltage	$1.05 \times U_e/\sqrt{3}$ 418 V
	Rated ultimate short-circuit breaking capacity I_{cu}	50 kA
	Rated short-time withstand current I_{cw}	11.52 kA
	Short-circuit breaking capacity of the fourth pole (by arrangement) (not less than 60 % of I_{cu} or I_{cw} as applicable)	11.52 kA
Table 11	Power factor	0.30 0.29
	Frequency	50 Hz 50 Hz
8.3.2.1 7.2.1.1.3	Control supply voltage	$0.85 \times U_s$./. V ./. V
	Maximum value of the closing time	./. ms ./. ms
	Sequence of operation	O - t - CO O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit	Pageform Next page
	Safety area	Pageform Page 67
	Installation of the material tested	Pageform Page 66
	Energization direction	Top/Bottom Top
60947-1 Table 9, 10 and 11	Cabling characteristics	
	Cable	./. mm ² ./. mm ²
	Bar	100 x 10 mm 100 x 10 mm
	Number	2 2
	Length	supply side ./. mm 400 mm load side ./. mm 0 mm
	Tightening torque	50 Nm

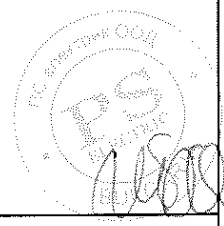
Test laboratory: F01- GRENOBLE
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TRF IEC/EN 60947-2
Ed. 2.1 form 48

Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 51 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CIRCUIT Oscillogram Applied voltage Frequency 50 Hz RMS current value at 20 ms i_1 i_2 i_3 Average RMS. Value Peak current maximum value Power factor	20040299-0003 20040299-0008 430 V 50 Hz 11.77 kA / kA / kA 11.77 kA 23.24 kA 0.28
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
Date July 13th 2005		

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ASEFA		Test report No.: F01.04.18 Page 52 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
	OPERATION „O“ Oscillogram Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Melting of the fusible element Yes/No Holes in the PE-sheet (if applicable) Yes/No Cracks observed Yes/No if Yes Time interval between operations 3 min	20040299.0013 23.14 kA 414.75 ms 419 V 1.05 53.55 (kA) ² s No No No Page ./. 3 min
7.2.1.1.3	OPERATION „CO“ Oscillogram Applied voltage Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Closing operation time Melting of the fusible element Yes/No Cracks observed Yes/No if Yes	20040299.0014 426.54 V 22.91 kA 414.25 ms 420 V 1.05 52.9 (kA) ² s ./ ms No No Page ./

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ASEFA		Test report No.: F01.04.18 Page 53 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	1380 V
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	
	Test duration	5 s
		1 min
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32
Date July 13th 2005		

Stamp: GRENOBLE

Stamp: TRF IEC/EN 60947-2
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Signature

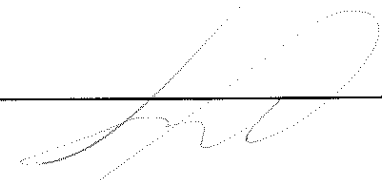
ASEFA		Test report No.: F01.04.18 Page 54 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF LEAKAGE CURRENT	
	For circuit-breakers suitable for isolation having an operational voltage U_e greater than 50 V.	
8.3.3.2	- Main circuit of the circuit-breaker - Isolating contacts of a withdrawable unit (if applicable)	
	Test voltage	1.1 x U_e = 759 V
60947-1 7.2.7	Application of the test voltage	759 V
	Leakage current	
8.3.3.2	Test sequence I (in new condition)	≤ 0.5 mA /. mA
8.3.3.5	Test sequence I (after overload performance)	≤ 2 mA /. mA
8.3.4.3	Test sequence II	≤ 2 mA /. mA
8.3.5.3	Test sequence III	≤ 6 mA /. mA
8.3.6.5	Test sequence IV	≤ 2 mA 0 mA
8.3.7.3	Test sequence V, stage 1	≤ 2 mA /. mA
8.3.7.7	Test sequence V, stage 2	≤ 6 mA /. mA
8.3.8.5	Combined test sequence	≤ 2 mA /. mA
C.3	Individual pole short-circuit test sequence I_{su}	≤ 6 mA /. mA
H.3	Individual pole short-circuit test sequence I_{IT}	≤ 6 mA /. mA

Test laboratory: F01- GRENOBLE
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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 55 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
	Cabling characteristics Cable 185 mm ² Bar <i>.l. x .l. mm</i> Number 1 /Ph Length <i>.l. mm</i> Tightening torque 50 Nm Reference temperature 40 °C ± 2 °C Ambient temperature 17.8 °C Correction factor (k = 1 for releases independent of ambient temperature) k 1 Current setting value <i>I_n</i> 0.4x630=252 A Test current either k x 2.0 x <i>I_n</i> 504 A 504 A 8.3.5.1 Test sequence II (<i>I_{cs}</i> = <i>I_{cu}</i>) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or k x 2.5 x <i>I_n</i> <i>.l. A</i> <i>.l. A</i> 8.3.5.4 Test sequence II (<i>I_{cs}</i> = <i>I_{cu}</i>) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral ≤ 270 s 235 s Ph ₁ ≤ 270 s 225 s Ph ₂ ≤ <i>.l. s</i> <i>.l. s</i> Ph ₃ ≤ <i>.l. s</i> <i>.l. s</i>	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
Date July 13th 2005		

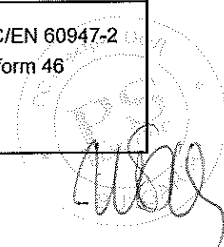

ASEFA 		Test report No.: F01.04.18 Page 56 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY	
60947-1 Table 9, 10 and 11	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.l. \text{ mm}$ Tightening torque Reference temperature 40 °C ± 2 °C Ambient temperature Correction factor (k = 1 for releases independent of ambient temperature) k Current setting value I_n Test current either $k \times 2.0 \times I_n$ 3200 A or $k \times 2.5 \times I_n$ $.l. \text{ A}$	$.l. \text{ mm}^2$ 100 x 5 mm 2 /Ph 500 mm 50 Nm 18.2 °C 1 1600 A 3200 A $.l. \text{ A}$
8.3.5.1	Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1	
8.3.5.1	Test sequence III before 8.3.5.2	
8.3.6.1	Test sequence IV before 8.3.6.2	
8.3.6.6	Test sequence IV after 8.3.6.5	
8.3.7.4	Test sequence V before 8.3.7.5	
8.3.8.1	Combined test sequence before 8.3.8.2	
A.5	Verification of discrimination before 8.3.5.2	
A.6.3	Verification of back-up protection before 8.3.5.2	
8.3.5.4	Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5	
8.3.5.4	Test sequence III after 8.3.5.3	
8.3.7.8	Test sequence V after 8.3.7.7	
8.3.8.7	Combined test sequence after 8.3.8.6	
A.5	Verification of discrimination after 8.3.5.3	
A.6.3	Verification of back-up protection after 8.3.5.3	
C.4	Individual pole short-circuit test sequence	
H.4	Test sequence for circuit-breakers for IT-systems	
	Tripping time (for twice the value of current setting on single pole)	
	Neutral $\leq 270 \text{ s}$	218 s
	Ph ₁ $\leq 270 \text{ s}$	215 s
	Ph ₂ $\leq .l. \text{ s}$.l. s
	Ph ₃ $\leq .l. \text{ s}$.l. s

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
Ed. 2.1 form 46

Date July 13th 2005


OPERATIONAL

ASEFA		Test report No.: F01.04.18 Page 57 / 70	
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14	
Standard and clause	Kind of tests and requirements	Test values Results	
8.3.6.2	ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS		
	Test made on the same sample as for the three-pole short-time withstand or on a new sample	same/new	new
Table 4	Utilization category	B	
60947-1	Rated operational voltage U_e	690/ $\sqrt{3}$ =398 V	
8.3.4.3	Short-time withstand current of the fourth pole I_{cw} (not less than 60 % of I_{cw})	11.52 kA	
	Short-time t_{st}	1 s	
	Circuit diagram		Page 68
	Calibration of the test circuit	Pageform	Next page
	Safety area	Pageform	Page 67
	Installation of the material tested	Pageform	Page 66
60947-1	Cabling characteristics		
Table 9, 10 and 11	Cable	./. mm ²	./. mm ²
	Bar	100 x 5 mm	100 x 5 mm
	Number	2	2
	Length	supply side ./. mm load side ./. mm	500 mm 0 mm
	Tightening torque		50 Nm
60947-1	Alternating current		
8.3.4.3	Oscillogram		20040283.0136
	Test voltage	≥ 80 V	780 V
	Power factor		0.29
Table 11	Frequency	50 Hz	50 Hz
	Test duration t_{st}		1112.95 ms
	Test current value i_t		12.04 kA

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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ASEFA		Test report No.: F01.04.18 Page 58 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.3	Alternative test	
	$I_{cw}^2 \times t_{st}$ 132.7 (kA) ² s Oscillogram Peak current maximum value Test duration t_{test} Joule-integral $i_{test}^2 dt$ Ph ₁	20040283.0136 23.25 kA 1112.95 ms 139.04 (kA) ² s
60947-1 8.3.4.3	Direct current	
	$I_{cw}^2 \times t_{st}$./. A ² s Oscillogram Test voltage ≥ 80 V Maximum of test current I_{test} Test duration t_{test} Joule-integral $i_{test}^2 dt$	Page ./. ./. V ./. kA ./. ms ./. A ² s

ГРЕНОБЛЕ
СЕРТИФИКАЦИЯ



Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 59 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
8.3.4.4 8.3.6.3 8.3.7.2 8.3.8.6	VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS	
8.3.2.5	Temperature-rise test	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22°C
	Main circuits	
60947-1 8.3.3.3.4	Conventional thermal current I_{th}	1600 A 1600 A
	Conventional thermal current for enclosure I_{the}	./. A ./. A
	Conventional thermal current for the neutral pole	./. A ./. A
60947-1 Table 9, 10 and 11	Cabling characteristics	
	Phase poles	
	Cable	./. mm ² ./. mm ²
	Bar	100 x 5 mm 100 x 5 mm
	Number	2 /Ph 2 /Ph
	Length	./. mm 500 mm
	Tightening torque	50 Nm
	Neutral pole (if applicable)	
	Cable	./. mm ² ./. mm ²
	Bar	./. x ./. mm ./. x ./. mm
	Number	./. ./. ./. ./. Nm
	Length	./. mm
	Tightening torque	./. Nm
	Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	
Table 7	Temperature-rise limits	
	Terminals	≤ 80 K 53.6 K

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
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Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 60 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
8.3.5.2 8.3.6.4 8.3.7.6	ADDITIONAL SEQUENCE OF SHORT-CIRCUIT OPERATIONS ON FOUR POLE CIRCUIT-BREAKERS Test made on the same sample as for the three-pole short-circuit or on a new sample Rated operational voltage U_e Test voltage Recovery voltage Rated ultimate short-circuit breaking capacity I_{cu} Rated short-time withstand current I_{cw} Short-circuit breaking capacity of the fourth pole (by arrangement) (not less than 60 % of I_{cu} or I_{cw} as applicable)	same/new 690 V $U_e/\sqrt{3}$ 398 V $1.05 \times U_e/\sqrt{3}$ 418 V 11.52 kA 11.52 kA 11.52 kA
Table 11	Power factor Frequency	cos 0.30 0.28 50 Hz 50 Hz
8.3.2.1 7.2.1.1.3	Control supply voltage Maximum value of the closing time	$0.85 \times U_s$./. V ./. V /. ms
	Sequence of operation Circuit diagram Calibration of the test circuit	O - t - CO O - t - CO Page 68 Pageform Pageform ./. Pageform Pageform ./. Page 67 Page 66 Bottom
60947-1 Table 9, 10 and 11	Cabling characteristics Cable Bar Number Length Tightening torque	/. mm ² ./. mm ² 100 x 10 mm 100 x 10 mm 1 1 supply side ./. mm 400 mm load side ./. mm 0 mm 50 Nm

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
Ed. 2.1 form 48

Date July 13th 2005

ASEFA		Test report No.: F01.04.18 Page 61 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	CALIBRATION OF THE TEST CIRCUIT Oscillogram Applied voltage Frequency 50 Hz RMS current value at 20 ms i_1 i_2 i_3 Average RMS. Value Peak current maximum value Power factor	20040299-0003 20040299-0008 430 V 50 Hz 11.77 kA ./. kA ./. kA 11.77 kA 23.24 kA 0.28
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 169
Date July 13th 2005		

ASEFA		Test report No.: F01.04.18 Page 62 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
7.2.1.1.3	OPERATION "O" Oscillogram Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Melting of the fusible element Yes/No Holes in the PE-sheet (if applicable) Yes/No Cracks observed Yes/No if Yes Time interval between operations 3 min	20040299.0015 23.08 kA 415.7 ms 419 V 1.05 53.77 (kA) ² s No No No Page ./. 4 min
	OPERATION "CO" Oscillogram Applied voltage Peak current value i_t Total duration Recovery voltage (phase to neutral) $U_{r(1-N)}$ Ratio between U_r and U_e U_r/U_e Joule integral Ph_1 Closing operation time Melting of the fusible element Yes/No Cracks observed Yes/No if Yes	20040299.0016 426.6 V 22.9 kA 415.65 ms 419 V 1.05 53.2 (kA) ² s ./ ms No No Page ./

Test laboratory: F01- GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
Ed. 2.1 form 49

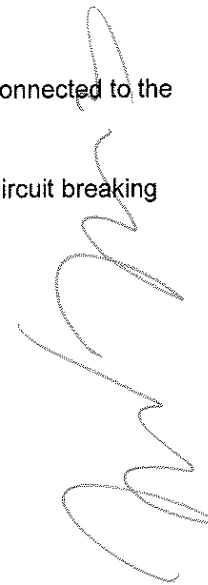

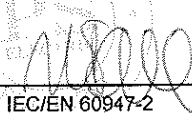
Date July 13th 2005

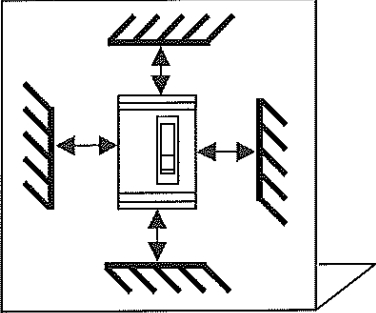
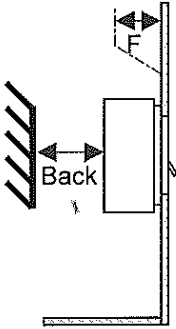
ASEFA		Test report No.: F01.04.18 Page 63 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
	VERIFICATION OF DIELECTRIC WITHSTAND	
	Test voltage	
	2 x U _e , min. 1000 V	1380 V
8.3.3.5	Test sequence I	
8.3.4.3	Test sequence II	
8.3.5.3	Test sequence III	
8.3.6.5	Test sequence IV	
8.3.7.3	Test sequence V, stage 1	
8.3.7.7	Test sequence V, stage 2	
8.3.8.5	Combined test sequence	
B.10.3.1	Test sequence B.II	
A.5	Verification of discrimination	
A.6.3	Verification of back-up protection	
C.3	Individual pole short-circuit test sequence	
H.3	Test sequence for circuit-breakers for IT-systems	
8.3.3.2.2 a)	Application of the test voltage -Main circuit of the circuit-breaker -Isolating contacts of the withdrawable unit (if applicable)	1380 V
	Test duration	5 s 1 min
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32/VOLTA
Date July 13th 2005		

Stamp: 31039.14



ASEFA		Test report No.: F01.04.18 Page 65 / 70	
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14	
Standard and clause	Kind of tests and requirements	Test values Results	
60947-1 Table 9, 10 and 11	VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY		
	Cabling characteristics Cable $.l. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $.l. \text{ mm}$ Tightening torque Reference temperature $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ Ambient temperature $18.2 \text{ }^\circ\text{C}$ Correction factor ($k = 1$ for releases independent of ambient temperature) k 1 Current setting value I_n 1600 A Test current either $k \times 2.0 \times I_n$ 3200 A 3200 A 8.3.5.1 Test sequence II ($I_{cs} = I_{cu}$) before 8.3.4.1 8.3.5.1 Test sequence III before 8.3.5.2 8.3.6.1 Test sequence IV before 8.3.6.2 8.3.6.6 Test sequence IV after 8.3.6.5 8.3.7.4 Test sequence V before 8.3.7.5 8.3.8.1 Combined test sequence before 8.3.8.2 A.5 Verification of discrimination before 8.3.5.2 A.6.3 Verification of back-up protection before 8.3.5.2 or $k \times 2.5 \times I_n$ $.l. \text{ A}$ $.l. \text{ A}$ 8.3.5.4 Test sequence II ($I_{cs} = I_{cu}$) after 8.3.4.5 8.3.5.4 Test sequence III after 8.3.5.3 8.3.7.8 Test sequence V after 8.3.7.7 8.3.8.7 Combined test sequence after 8.3.8.6 A.5 Verification of discrimination after 8.3.5.3 A.6.3 Verification of back-up protection after 8.3.5.3 C.4 Individual pole short-circuit test sequence H.4 Test sequence for circuit-breakers for IT-systems Tripping time (for twice the value of current setting on single pole) Neutral $\leq 270 \text{ s}$ 218 s Ph ₁ $\leq 270 \text{ s}$ 215 s Ph ₂ $\leq .l. \text{ s}$ $.l. \text{ s}$ Ph ₃ $\leq .l. \text{ s}$ $.l. \text{ s}$		
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46	
		Date July 13th 2005	

ASEFA	Test report No.: F01.04.18 Page 66 / 70
Type test according to: IEC 60947-2 Test sequence IV	Type: Compact NS 630bN, 1250N, 1600N
<p><u>INSTALLATION</u></p> <p>The apparatus is set up on a metallic structure, fixed on insulated bars. The safety perimeter is materialised by a metallic enclosure (see next page) connected to the neutral by a fuse.</p> <p>The apparatus are operated with an air actuator for test of rated service short-circuit breaking capacity.</p> <div style="text-align: right; margin-right: 50px;"></div>	
Test laboratory: F01 GRENOBLE ASEFA recognized PLATFORM	 TRF IEC/EN 60947-2 Ed 2.1 form 170  Date July 13th 2005

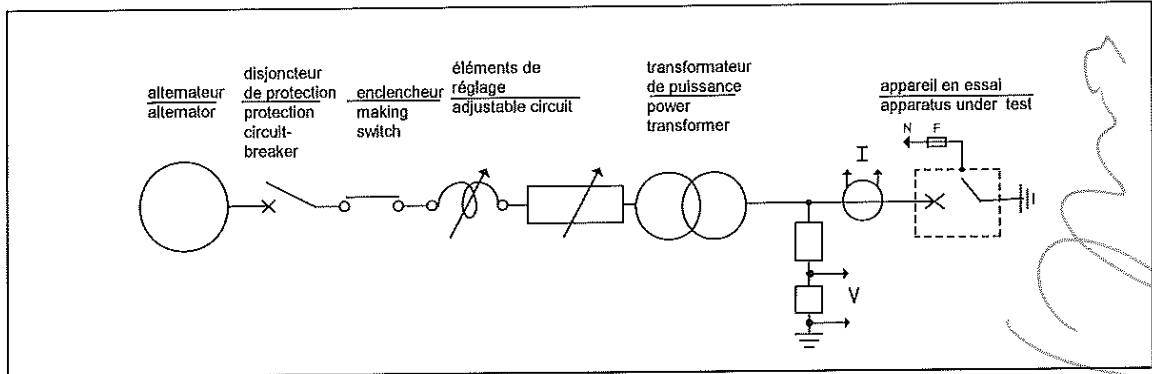
ASEFA		Test report No.: F01.04.18 Page : 67 / 70
Type test according to: IEC 60947-2		Type : Compact NS 630bN, 1250N, 1600N
Standard and clause	Kind of tests and requirements	Test values Results
60947-2	<p>SAFETY AREA AND DETECTION OF THE FAULT CURRENT</p> <p>Characteristics of the metallic screen</p> <ul style="list-style-type: none"> - structure <ul style="list-style-type: none"> woven wire mesh ./. perforated metal ./. expanded metal Yes - ratio hole area / total area 0,45 - 0,65 ./. - size of hole $\leq 30 \text{ mm}^2$./. mm^2 - coating <ul style="list-style-type: none"> bare ./. conductive plating yes <div style="display: flex; justify-content: space-around;">   </div> <p>Detection of the fault current</p> <ul style="list-style-type: none"> - prospective fault current in the fusible element circuit 50 A - fusible element <ul style="list-style-type: none"> . diameter of copper wire 0.1 mm . length 100 mm or . equivalent fusible element / 	<p>Top : 120 mm</p> <p>Left : 10 mm</p> <p>Right : 10 mm</p> <p>Bottom : 120 mm</p> <p>Front : 0 mm</p> <p>Back : 0 mm</p>
Test laboratory: F01 GRENOBLE ASEFA recognized PLATFORM		TRF IEC/EN 60947-2 Ed 2.1 form 170 Date July 13th 2005

Type test according to: IEC 60947-2

Type: Compact NS 630bN, 1250N, 1600N

DIAGRAM OF THE TEST CIRCUIT

TEST OF RATED SERVICE SHORT-CIRCUIT BREAKING CAPACITY



Équipement
OPÉRATIONNEL



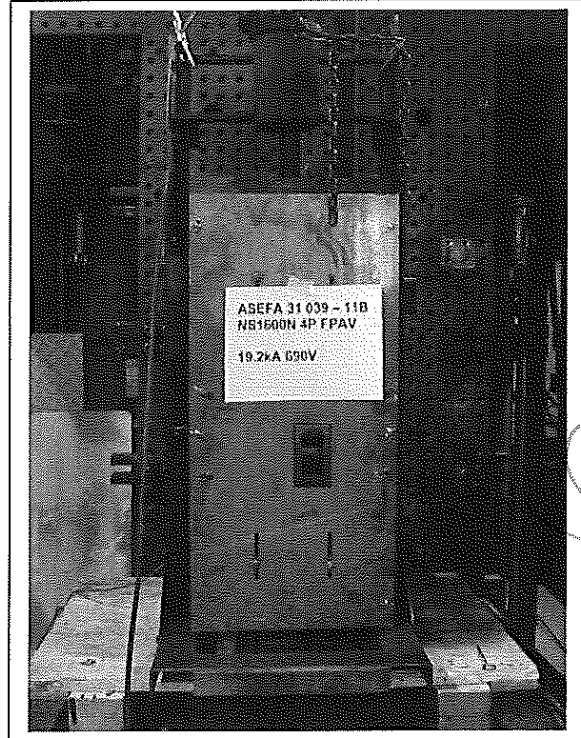
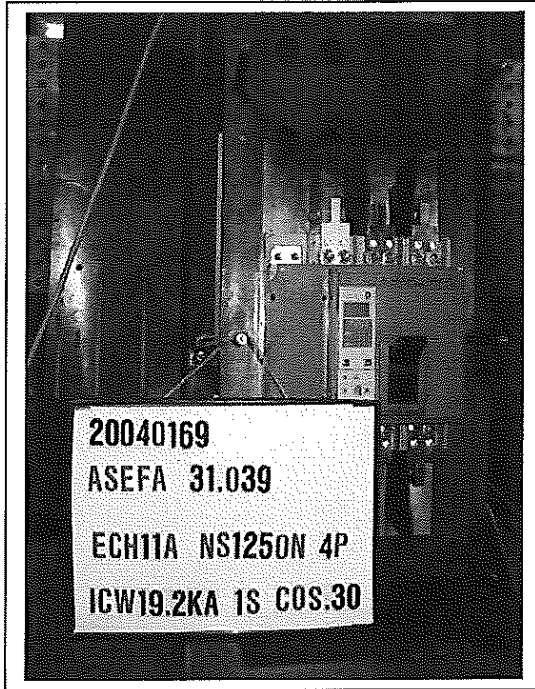
ASEFA

Test report No.: F01.04.18
Page 69 / 70

Type test according to: IEC 60947-2
Test sequence IV

Type: Compact NS 630bN, 1250N, 1600N

PHOTOGRAPHIE OF THE ASSEMBLY



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Test laboratory: F01 - GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
Ed 2.1 form 170

Date July 13th 2005

ASEFA

Test report No.: F01.04.18
Page : 70 / 70

Type test according to: IEC 60947-2
Test sequence IV

Type: Compact NS 630bN, 1250N, 1600N

APPENDIXES

APPARATUS CHARACTERISTICS

General view circuit-breaker
Tripping curve Micrologic 5.0A

GHD1189100 ind.B
51156274AA 01 1/1

OSCILLOGRAMS

ASEFA 31 039.09 ICW
Calibration voltage
Calibration current
ASEFA 31 039.09 Opening
ASEFA 31 039.09 Closing/Opening 1

20040096 - 0040
20040169 - 0010
20040169 - 0012
20040169 - 0015
20040169 - 0016

ASEFA 31 039.10 ICW
Calibration voltage
Calibration current
ASEFA 31 039.10 Opening
ASEFA 31 039.10 Closing/Opening 1

20040096 - 0041
20040096 - 0034
20040096 - 0035
20040096 - 0044
20040096 - 0045

ASEFA 31 039.11B ICW
Calibration voltage
Calibration current
ASEFA 31 039.11B Opening
ASEFA 31 039.11B Closing/Opening 1

20040283 - 0169
20040096 - 0013
20040096 - 0067
20040096 - 0069
20040096 - 0070

ASEFA 31 039.12 ICW
Calibration voltage
Calibration current
ASEFA 31 039.12 Opening
ASEFA 31 039.12 Closing/Opening 1

20040283 - 0134
20040299 - 0003
20040299 - 0008
20040299 - 0011
20040299 - 0012

ASEFA 31 039.13 ICW
ASEFA 31 039.13 Opening
ASEFA 31 039.13 Closing/Opening 1

20040283 - 0135
20040299 - 0013
20040299 - 0014

ASEFA 31 039.14 ICW
ASEFA 31 039.14 Opening
ASEFA 31 039.14 Closing/Opening 1

20040283 - 0136
20040299 - 0015
20040299 - 0016

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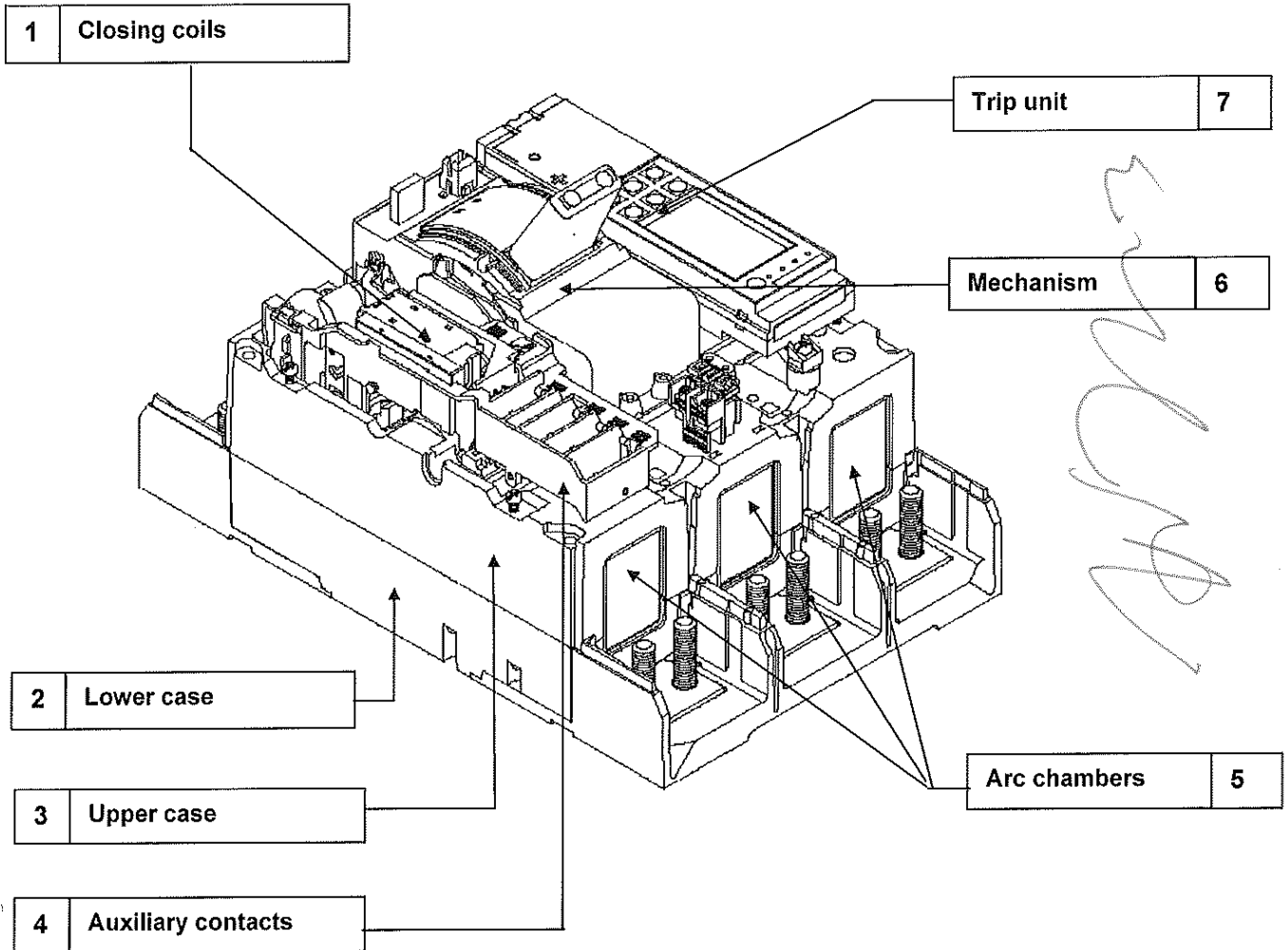
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Test laboratory: F01 - GRENOBLE
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2
Ed 2.1 form 170

Date July 13th 2005

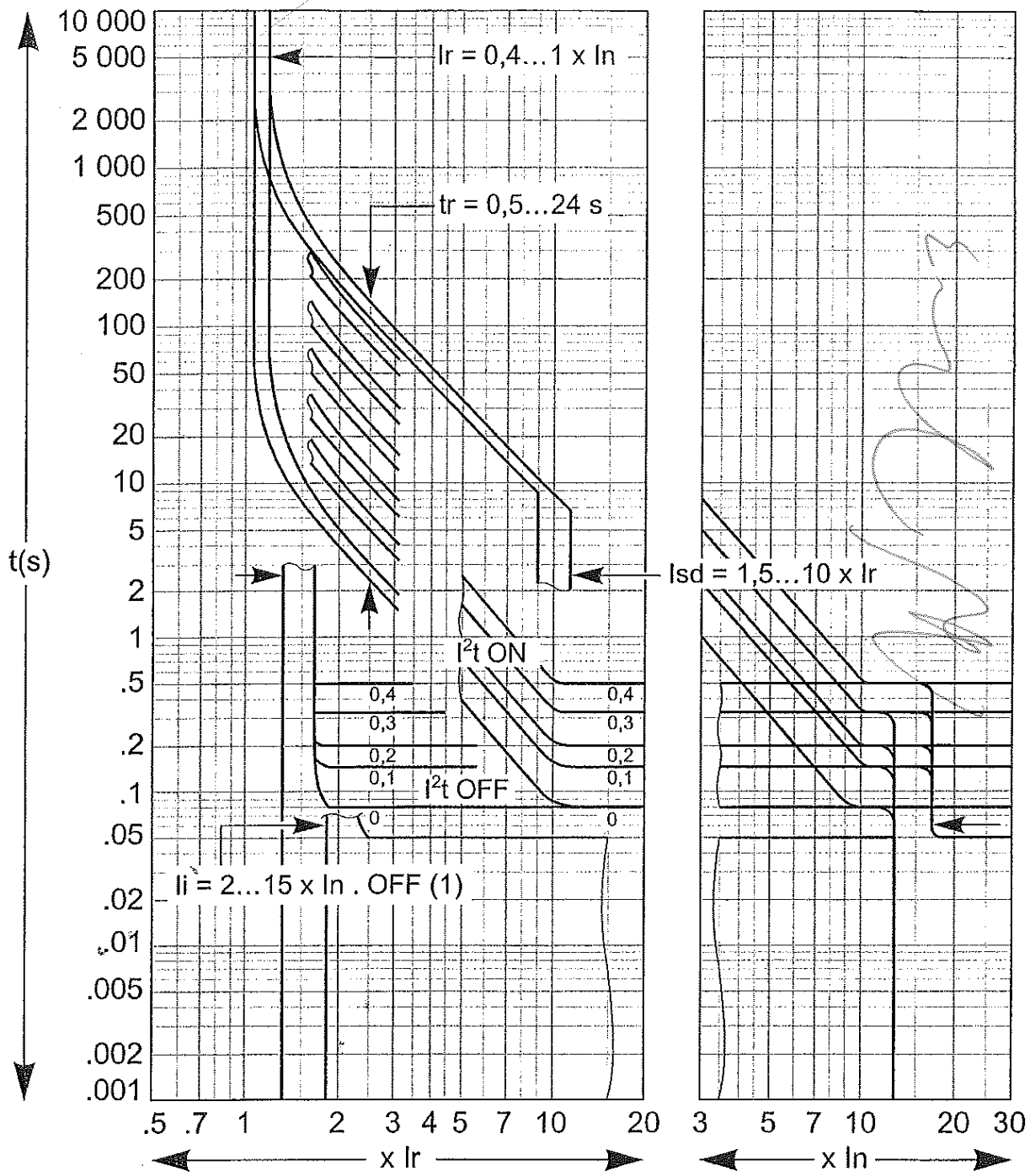
GENERAL VIEW - FIGURE 1



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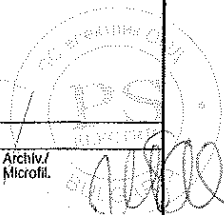


OFF (1)

In (A)	,800	,2000	,4000	,5000	,6300
N1	42 kA				
H1	65 kA			100 kA	
H2	82 kA			120 kA	
H3			65 kA		
L1	37 kA				

02	09/06/99	Rajout des crans 0 à 0,4
Ind / Rev	Date / Date	Modification / Modification

JOUBERT	GRELIER
Nom/Name	Nom/Name
Visa	Visa
Préparé/Issued by	Préparé/Issued by



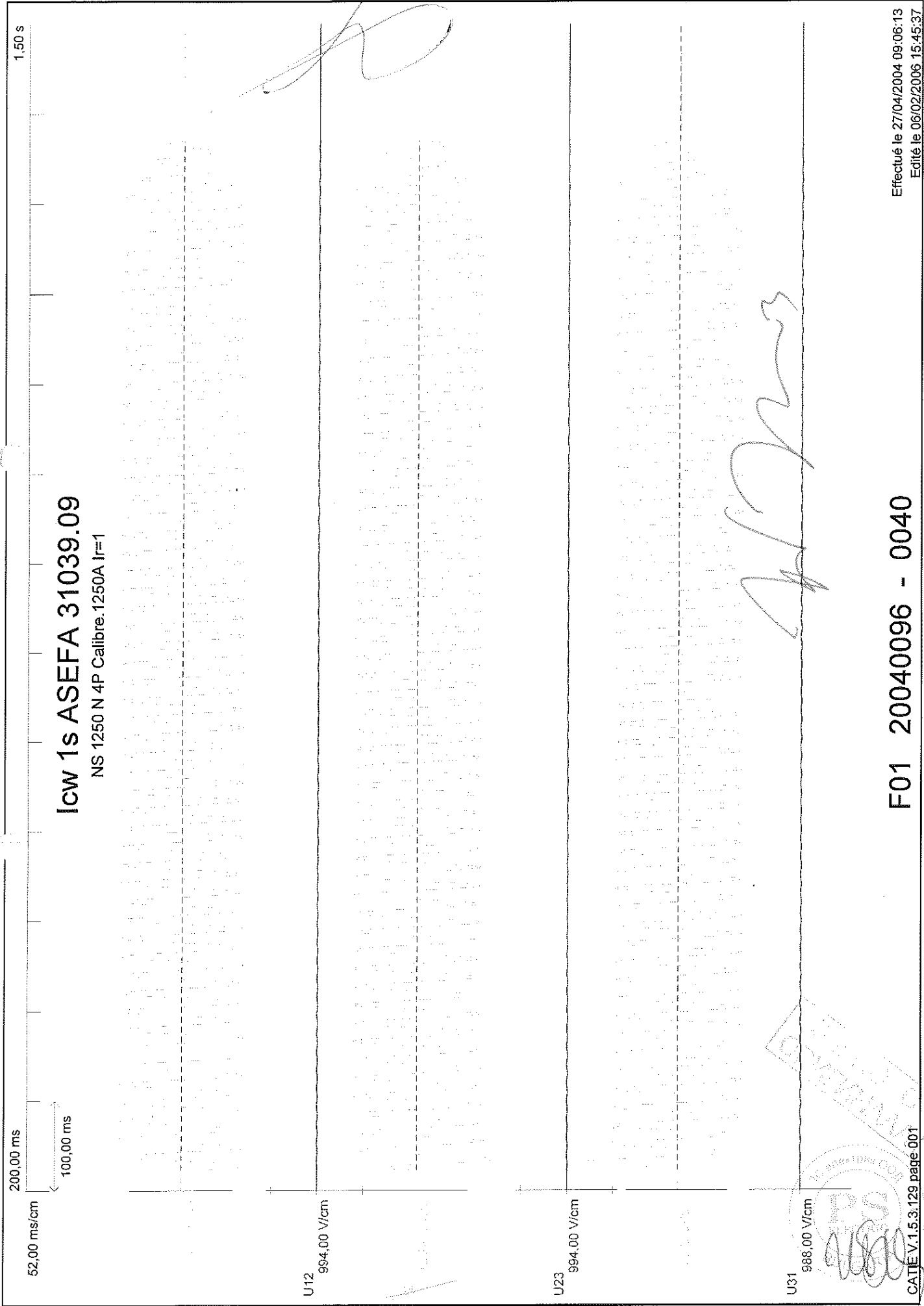
Projet / Projet: Compact NS630b à NS1600
 Dossier / Folder:

DISJONCTEUR FIXE ET DEBROCHABLE
 Courbe de déclenchement pour déclencheurs
 Micrologic 5.0, 6.0, 7.0



Code diff. / Distrib. code
 Unité / Département
 DBTP

5 1 1 5 6 2 7 4 A A Ind/Rev 0 1 Folio/Sheet 1/1



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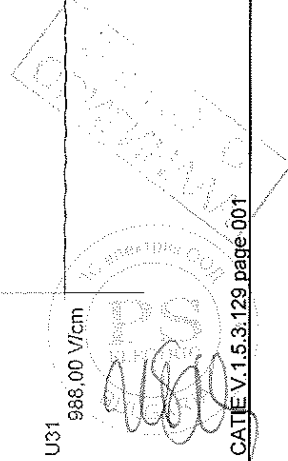
Icw 1s ASEFA 31039.09
NS 1250 N 4P Calibre.1250A I=1

200,00 ms
52,00 ms/cm
100,00 ms

U12
994,00 V/cm

U23
994,00 V/cm

U31
988,00 V/cm



F01 20040096 - 0040

500,00 ms

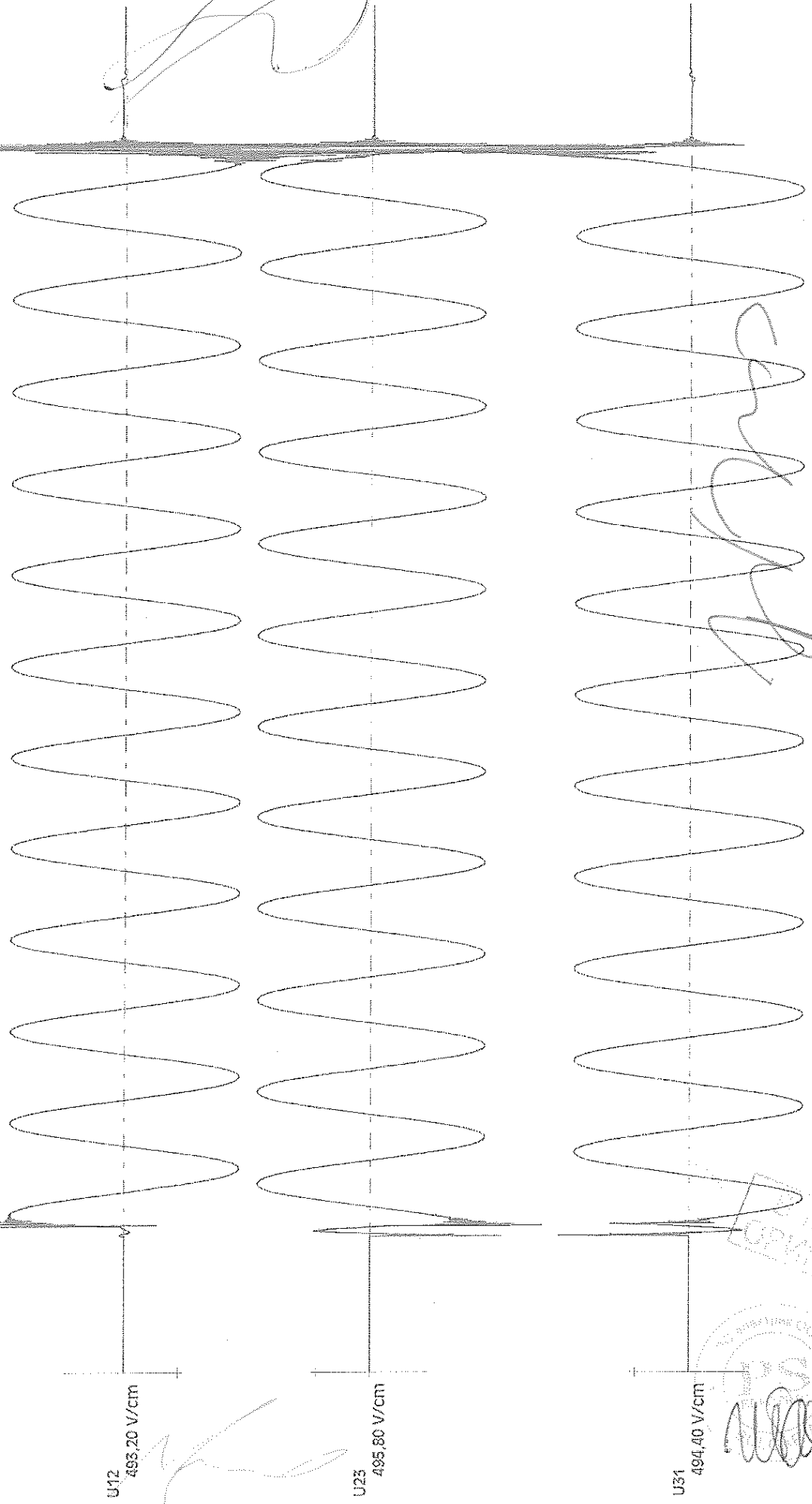
Calibr. test circuit U

Cir tri : 19.2kA-690V+5%-Cos=0.25/0.30

200,00 ms

12,00 ms/cm

10,00 ms



U12

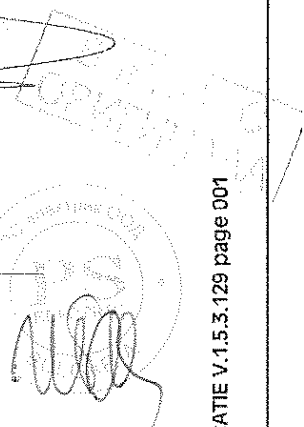
493.20 V/cm

U23

495.80 V/cm

U31

494.40 V/cm



F01 20040169 - 0010

Effectué le 28/07/2004 08:25:57
Edité le 12/07/2005 11:34:09

200.00 ms

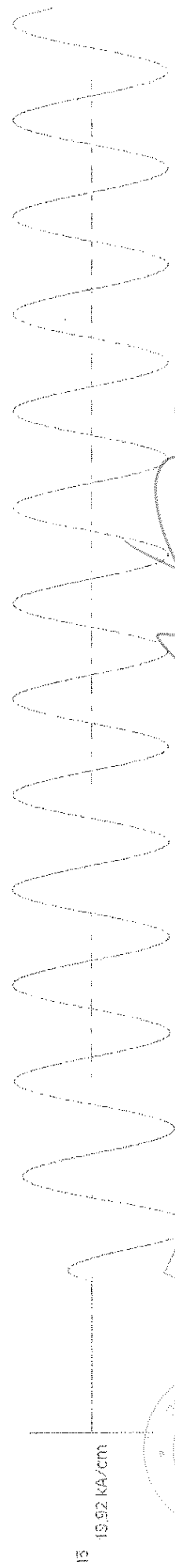
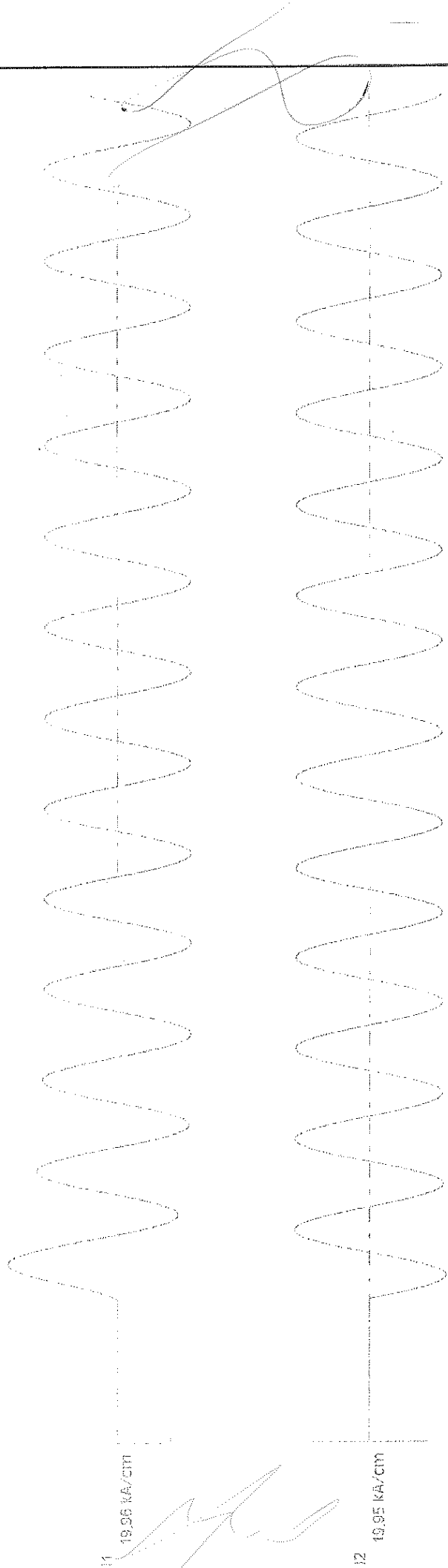
12.00 ms/cm

10.00 ms

500.00 ms

Calibr. test circuit I

Cir tri : 19.2kA-690V+5%-Cos=0.25/0.30



[Handwritten signature]

F01 20040169 - 0012

Effectué le 28/07/2004 08:35:22
Edité le 12/07/2005 11:54:44

800,00 ms

100,00 ms

28,00 ms/cm

10,00 ms

CO ASEFA: 31.039.09

cir tri: 19,2kA-690V+5% · Cos=0,25/0,30

I1 19,95 kA/cm

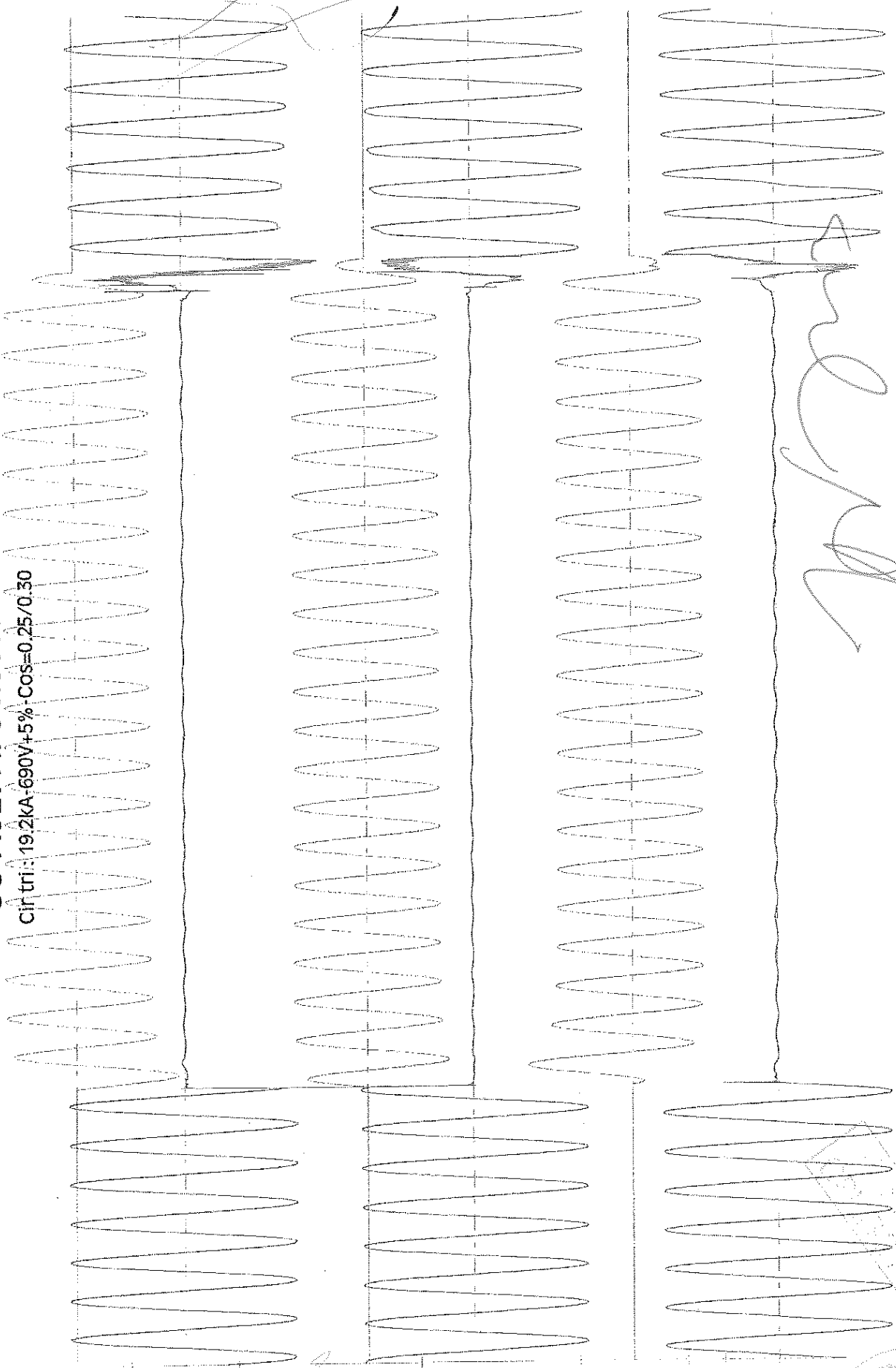
U12 493,20 V/cm

I2 19,95 kA/cm

U23 495,80 V/cm

I3 19,92 kA/cm

U31 494,40 V/cm



F01 20040169 - 0016

Effectué le 28/07/2004 08:58:28
Edité le 21/07/2005 11:41:25

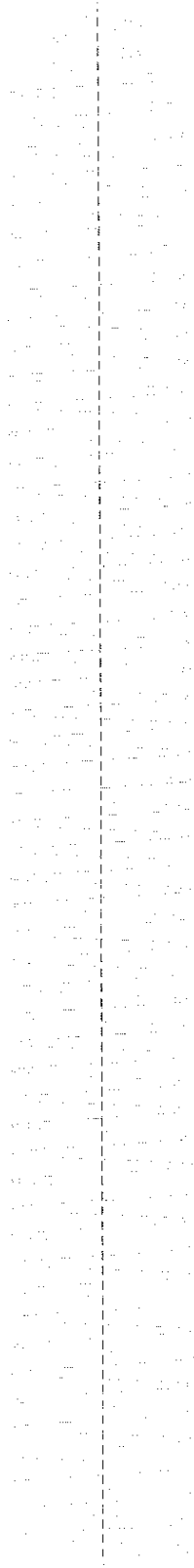
1.50 s

200.00 ms

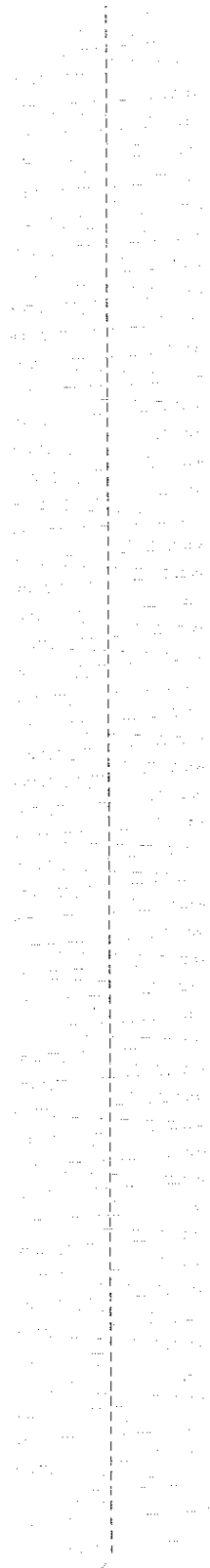
100.00 ms

Icw 1s ASEFA 31039.10

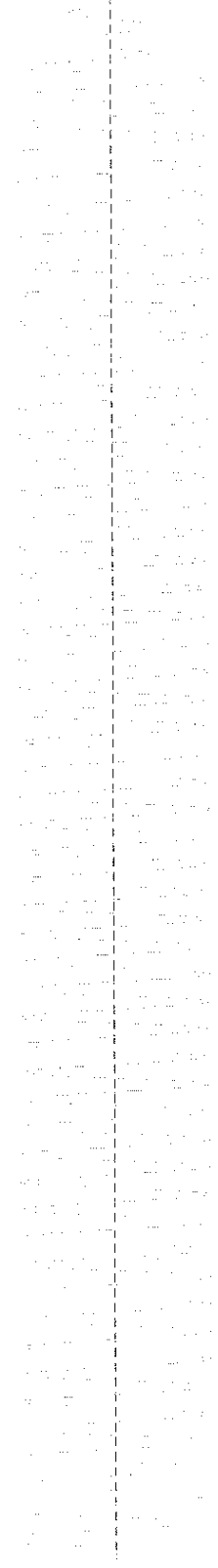
NS 630b 4P Calibre 630A Ir=0.4



U12 994.00 V/cm

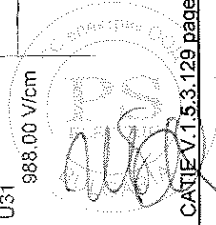
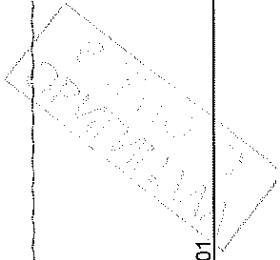


U23 994.00 V/cm



U31 988.00 V/cm

Handwritten signature



F01 20040096 - 0041