

ПАПКА 12

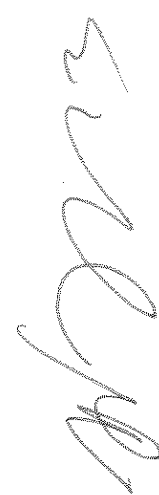
ПРИЛОЖЕНИЕ 10 Други документи за  
Позиция 1 и Позиция 2

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: 03.08.2018 г.

Съставил:

На основание чл. 2  
от ЗЗЛД





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 60947-2:2006(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 основание чл. 2  
от ЗЗЛД

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
<b>SCHNEIDER SHANGAI POWER DISTRIBUTION ELEC. APP. CO. LTD.</b> 833 Kang Qiao Lu - Pu Dong , 201315 SHANGHAI, China	<b>SCHNEIDER-ELECTRIC INDUSTRIES ITALIA SPA</b> Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy
<b>SCHNEIDER ELECTRIC INDUSTRIES ITALIA SPA</b> Corso Italia, 115 - 80020 CASAVATORE (NAPOLI) - Italy	<b>SCHNEIDER-ELECTRIC INDUSTRIES ITALIA SPA</b> 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 основании чл. 2  
от 33ЛД

Date: 2014-11-06

Signature:

Accréditation  
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)



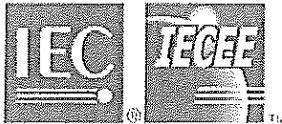
**Laboratoire Central des Industries Électriques**  
33, av du Général Leclerc - BP 8  
FR 92266 Fontenay-aux-Roses cedex  
www.lcie.fr

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)

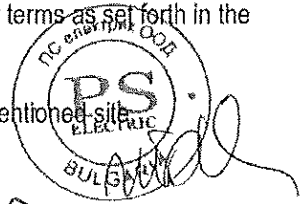
**VDE Prüf- und Zertifizierungsinstitut GmbH**  
Merianstrasse 28  
DE-63069 Offenbach / Main  
Germany

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**

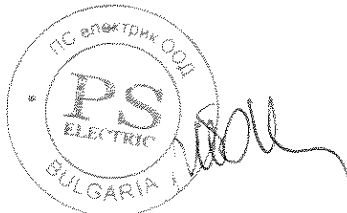
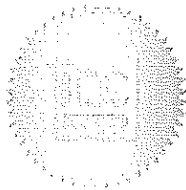
is therefore entitled to operate as an Issuing and Recognising National Certification Body (NCB) and Factory Surveillance Body within the IECEE CB Scheme for the Scope (Product Category(ies) and Standard(s)) as listed in the relevant part of the IECEE Web Site at [www.iecee.org](http://www.iecee.org), 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.



На основание чл. 2  
от ЗЗЛД

Date of Issue: 2017-12-07  
CB007



# CTF Volta Labs Schneider Electric Industries SAS

Home [Share this page](#)

## Customer Testing Facility

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

На основание чл. 2 от ЗЗЛД

## Further Information

**CTF Stage**  
 2

**Reporting National Certification Bodies**  
 VDE Prüf- und Zertifizierungsinstitut  
 Germany

ВЯРНО С  
 ИНИАЛ

ВЯРНО С  
 ОРИГИНАЛ  
 2017-02-17

PS ELECTRIC  
 BULGARIA

ТИ СЕРТОФИКАЦИЯ ООД

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

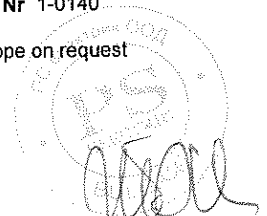
Signature

*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:**

$U_e/V$	$I_{cm}/kA$	$I_{cu}/kA$	$I_{cs100\%}/kA$	$I_{cs75\%}/kA$	$I_{cw}/kA - 1s$	
			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

*Handwritten signature*

**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 <sup>3</sup>
Required volume for each opening operation	./. m <sup>3</sup>

**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

*[Handwritten signature]*

*[Handwritten stamp: EXPLOITATION]*

*[Circular stamp: PS]*

## Releases:

## - Shunt release:

- Rated control circuit voltage  $U_c$
- Kind of current
- Rated frequency if a.c.

MX : 24 to 480Vac , 12 to 250Vdc  
a.c. or d.c.  
50/60 Hz or d.c.

## - Undervoltage or no-voltage release

- Rated control circuit voltage  $U_c$
- Kind of current
- Rated frequency if a.c.

MN : 24 to 480Vac , 24 to 250Vdc  
a.c. or d.c.  
50/60 Hz or d.c.

## - Over-current release:

## - Short-circuit release

- instantaneous release
- definite time-delay release

No  
yes

- Rated current  $I_n$
- Kind of current
- Rated frequency if a.c.
- Current setting (or range of settings)
- Time setting (or range of settings)

630 to 1600 A  
a.c.  
50/60 Hz  
I<sub>sd</sub>:1.5 to 10xI<sub>n</sub>  
I<sub>i</sub>=2 to 15 I<sub>n</sub>  
T<sub>sd</sub> : 0.1 to 0.4s, on, off

## - Overload release (IEC 60947-1; 2.4.30):

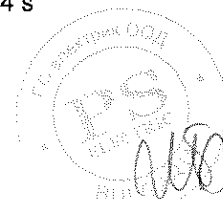
- instantaneous release
- definite time-delay release
- inverse time-delay release
- dependent on ambient air temperature
- independent of ambient air temperature

No  
Yes  
No  
No  
Yes

- Reference temperature
- Rated current  $I_n$
- Kind of current
- Rated frequency if a.c.
- Current setting (or range of settings)
- Time setting (or range of settings)

40°C  
630 to 1600A  
a.c.  
50/60 Hz  
0.4 to 1 I<sub>n</sub>  
tr:0.4 to 24 s

CPKIV  
7/13/05



<b>ASEFA</b>	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

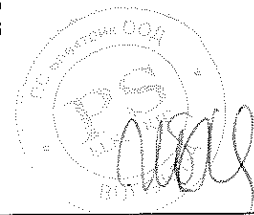
### Rated short-time withstand current


Test sequence IV comprises the following tests:

	<b>Sample 31039.09</b>	page(s)
8.3.6.1	Verification of overload releases	8
8.3.6.2	Rated service short-time withstand current Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	9-10
8.3.6.3	Verification of temperature-rise	11
8.3.6.4	Short-circuit breaking capacity at maximum short-time withstand Current Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)	12-14
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	Verification of leakage current (if applicable)	16
8.3.6.6	Verification of overload releases	17
<b>Sample 31039.10</b>		
8.3.6.1	Verification of overload releases	18
8.3.6.2	Rated service short-time withstand current Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	19-20
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8.3.6.5	Verification of dielectric withstand	24
	Verification of leakage current (if applicable)	25
8.3.6.6	Verification of overload releases	26
<b>Sample 31039.11B</b>		
8.3.6.1	Verification of overload releases	27
8.3.6.2	Rated service short-time withstand current Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	28-29
8.3.6.3	Verification of temperature-rise	30
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8.3.6.5	Verification of dielectric withstand	34
	Verification of leakage current (if applicable)	35
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31039.09

E. P. S. OPTIM



<b>ASEFA</b>	Test report No.: F01.04.18 Page 6 / 70																																																																																	
Type test according to: IEC 60947-2 Test sequence IV	Type: Compact NS 630bN, 1250N, 1600N																																																																																	
<p><b>Sample 31039.12</b></p> <table border="0"> <tr><td>8.3.6.1</td><td>Verification of overload releases</td><td>37</td></tr> <tr><td>8.3.6.2</td><td>Rated service short-time withstand current</td><td></td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)</td><td>38-39</td></tr> <tr><td>8.3.6.3</td><td>Verification of temperature-rise</td><td>40</td></tr> <tr><td>8.3.6.4</td><td>Short-circuit breaking capacity at maximum short-time withstand Current</td><td>41-43</td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)</td><td></td></tr> <tr><td>8.3.6.5</td><td>Verification of dielectric withstand</td><td>44</td></tr> <tr><td></td><td>Verification of leakage current (if applicable)</td><td>45</td></tr> <tr><td>8.3.6.6</td><td>Verification of overload releases</td><td>46</td></tr> </table> <p><b>Sample 31039.13</b></p> <table border="0"> <tr><td>8.3.6.1</td><td>Verification of overload releases</td><td>47</td></tr> <tr><td>8.3.6.2</td><td>Rated service short-time withstand current</td><td></td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)</td><td>48-49</td></tr> <tr><td>8.3.6.3</td><td><i>Verification of temperature-rise</i></td><td></td></tr> <tr><td>8.3.6.4</td><td>Short-circuit breaking capacity at maximum short-time withstand Current</td><td></td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)</td><td>50-52</td></tr> <tr><td>8.3.6.5</td><td>Verification of dielectric withstand</td><td>53</td></tr> <tr><td></td><td>Verification of leakage current (if applicable)</td><td>54</td></tr> <tr><td>8.3.6.6</td><td>Verification of overload releases</td><td>55</td></tr> </table> <p><b>Sample 31039.14</b></p> <table border="0"> <tr><td>8.3.6.1</td><td>Verification of overload releases</td><td>56</td></tr> <tr><td>8.3.6.2</td><td>Rated service short-time withstand current</td><td></td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)</td><td>57-58</td></tr> <tr><td>8.3.6.3</td><td>Verification of temperature-rise</td><td>59</td></tr> <tr><td>8.3.6.4</td><td>Short-circuit breaking capacity at maximum short-time withstand Current</td><td></td></tr> <tr><td></td><td>Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)</td><td>60-62</td></tr> <tr><td>8.3.6.5</td><td>Verification of dielectric withstand</td><td>63</td></tr> <tr><td></td><td>Verification of leakage current (if applicable)</td><td>64</td></tr> <tr><td>8.3.6.6</td><td>Verification of overload releases</td><td>65</td></tr> </table>		8.3.6.1	Verification of overload releases	37	8.3.6.2	Rated service short-time withstand current			Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	38-39	8.3.6.3	Verification of temperature-rise	40	8.3.6.4	Short-circuit breaking capacity at maximum short-time withstand Current	41-43		Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)		8.3.6.5	Verification of dielectric withstand	44		Verification of leakage current (if applicable)	45	8.3.6.6	Verification of overload releases	46	8.3.6.1	Verification of overload releases	47	8.3.6.2	Rated service short-time withstand current			Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	48-49	8.3.6.3	<i>Verification of temperature-rise</i>		8.3.6.4	Short-circuit breaking capacity at maximum short-time withstand Current			Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)	50-52	8.3.6.5	Verification of dielectric withstand	53		Verification of leakage current (if applicable)	54	8.3.6.6	Verification of overload releases	55	8.3.6.1	Verification of overload releases	56	8.3.6.2	Rated service short-time withstand current			Additional test of rated short-time withstand current on four-pole Circuit-breakers ( if applicable)	57-58	8.3.6.3	Verification of temperature-rise	59	8.3.6.4	Short-circuit breaking capacity at maximum short-time withstand Current			Additional test of rated short-time withstand current on four-pole Circuit breakers ( if applicable)	60-62	8.3.6.5	Verification of dielectric withstand	63		Verification of leakage current (if applicable)	64	8.3.6.6	Verification of overload releases	65
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Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM	<div style="text-align: right;">  <p>TRF IEC/EN 60947-2 Ed. 2.1 form 39</p> </div> <p style="text-align: center;">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

Synthesis of tested samples

Sample Nb	Type	Test	Ir	Ics 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/ $\sqrt{3}$	Upper	37-46
31039.13	NS630bN	Single Ph.	630x0.4=252A	11.52kA/690V/ $\sqrt{3}$	Upper	47-55
31039.14	NS1600N	Single Ph.	1600A	11.52kA/690V/ $\sqrt{3}$	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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	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 $22 \text{ }^\circ\text{C}$ Correction factor ( $k = 1$ for releases independent of ambient temperature) $k$ $1$ Current setting value $I_n$ $1600 \text{ A}$  <b>Test current</b>  either $k \times 2.0 \times I_n$ $3200 \text{ A}$ $3200 \text{ A}$  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  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 $\leq 270 \text{ s}$ $242 \text{ s}$ Ph <sub>1</sub> $\leq 270 \text{ s}$ $238 \text{ s}$ Ph <sub>2</sub> $\leq 270 \text{ s}$ $227 \text{ s}$ Ph <sub>3</sub> $\leq 270 \text{ s}$ $234 \text{ s}$	Braid $2000 \text{ mm}^2$ $.l. \times .l. \text{ mm}$ $1 / \text{Ph}$ $700 \text{ mm}$ $50 \text{ Nm}$  $22 \text{ }^\circ\text{C}$ $1$ $1600 \text{ A}$  $3200 \text{ A}$ $3200 \text{ A}$  $.l. \text{ A}$ $.l. \text{ A}$  $242 \text{ s}$ $238 \text{ s}$ $227 \text{ s}$ $234 \text{ s}$
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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	<b>TEST OF RATED SHORT-TIME WITHSTAND CURRENT</b>  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 $.l. mm^2$ Bar 5 x 80 mm Number 2 Length supply side $.l. mm$ load side $.l. mm$  Tightening torque	$.l. mm^2$ 5 x 80 mm 2 $.l. mm$ $.l. mm$ 50 Nm
60947-1 8.3.4.3  Table 11	<b>Alternating current</b>  Oscillogram Test voltage $\geq 80 V$ 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		TRF IEC/EN 60947-2 Ed. 2.1 form 51
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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 8.3.4.3	<b>Alternative test</b>	
	$I_{cw}^2 \times t_{st}$	368.64 (kA) <sup>2</sup> s
	Oscillogram	20040096.0040
	Peak current maximum value	40.88 kA
	Test duration $t_{test}$	1107.9 ms
	Joule-integral $\int I_{test}^2 dt$	Ph <sub>1</sub> 384.45 (kA) <sup>2</sup> s Ph <sub>2</sub> 413.48 (kA) <sup>2</sup> s Ph <sub>3</sub> 412.4 (kA) <sup>2</sup> s Ph <sub>m</sub> 403.44 (kA) <sup>2</sup> s
	Average value	
60947-1 8.3.4.3	<b>Direct current</b>	
	$I_{cw}^2 \times t_{st}$	./. A <sup>2</sup> s
	Oscillogram	Page ./. ./. V
	Test voltage	≥ 80 V
	Maximum of test current $I_{test}$	./. kA
	Test duration $t_{test}$	./. ms
	Joule-integral $\int I_{test}^2 dt$	./. A <sup>2</sup> s

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Type test according to: IEC 60947-2 Test sequence II/III		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
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	<b>VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS</b>	
8.3.2.5	<b>Temperature-rise test</b>	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
	<b>Main circuits</b>	
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	<b>Cabling characteristics</b>	
	Phase poles	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	5 x 80 mm 5 x 80 mm
	Number	2 /Ph 2 /Ph
	Length	2000 mm 2000 mm
	Tightening torque	50 Nm 50 Nm
	Neutral pole (if applicable)	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	./. x ./. mm ./. x ./. mm
	Number	./. ./. ./. ./. ./. Nm
	Length	./. mm ./. mm
	Tightening torque	./. Nm
	Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	
Table 7	<b>Temperature-rise limits</b>	
	Terminals	≤ 80 K 47.3 K



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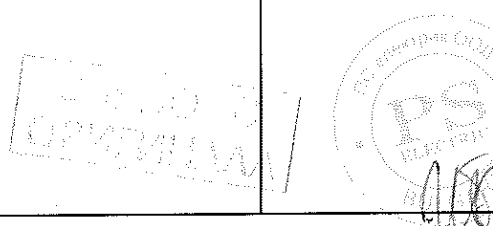
ASEFA		Test report No.: F01.04.18 Page 12 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.4	<b>TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT</b>	
	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	<b>CALIBRATION OF THE TEST CIRCUIT</b>	
	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



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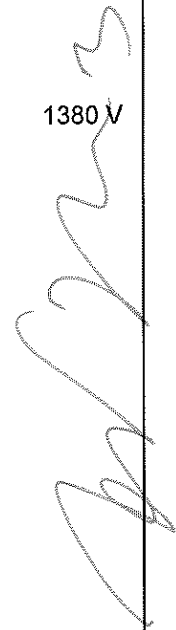


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Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.09
Standard and clause	Kind of tests and requirements	Test values Results
	<p><b>OPERATION "O"</b></p> <p>Oscillogram</p> <p>Peak current value <math>i_1</math> <math>i_2</math> <math>i_3</math></p> <p>Maximum total duration</p> <p>Recovery voltage (phase to phase or phase to neutral) <math>U_{r(1-2)}</math> <math>U_{r(2-3)}</math> <math>U_{r(3-1)}</math> or <math>U_{r(1-N)}</math> <math>U_{r(2-N)}</math> <math>U_{r(3-N)}</math></p> <p>Average value <math>U_{rm}</math></p> <p>Ratio between <math>U_{rm}</math> and <math>U_e</math> <math>U_{rm}/U_e</math></p> <p>Joule integral Ph<sub>1</sub> Ph<sub>2</sub> Ph<sub>3</sub></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><b>OPERATION "CO"</b></p> <p>Oscillogram</p> <p>Applied voltage</p> <p>Peak current value <math>i_1</math> <math>i_2</math> <math>i_3</math></p> <p>Maximum total duration</p> <p>Recovery voltage (phase to phase or phase to neutral) <math>U_{r(1-2)}</math> <math>U_{r(2-3)}</math> <math>U_{r(3-1)}</math> or <math>U_{r(1-N)}</math> <math>U_{r(2-N)}</math> <math>U_{r(3-N)}</math></p> <p>Average value <math>U_{rm}</math></p> <p>Ratio between <math>U_{rm}</math> and <math>U_e</math> <math>U_{rm}/U_e</math></p> <p>Joule integral Ph<sub>1</sub> Ph<sub>2</sub> Ph<sub>3</sub></p>	<p>20040169.0015</p> <p>39.8 kA</p> <p>27.8 kA</p> <p>36.98 kA</p> <p>418.2 ms</p> <p>781.13 V</p> <p>741.03 V</p> <p>698.4 V</p> <p>740.19 V</p> <p>1.07</p> <p>154.91 (kA)<sup>2</sup>s</p> <p>150.01 (kA)<sup>2</sup>s</p> <p>151.12 (kA)<sup>2</sup>s</p> <p>No</p> <p>No</p> <p>No</p> <p>Page ./.</p> <p>3 min</p> <p>20040169.0016</p> <p>742.01 V</p> <p>37.84 kA</p> <p>30.41 kA</p> <p>38.64 kA</p> <p>420.3 ms</p> <p>804.86 V</p> <p>688.98 V</p> <p>711.07 V</p> <p>734.97 V</p> <p>1.06</p> <p>154.64 (kA)<sup>2</sup>s</p> <p>150.88 (kA)<sup>2</sup>s</p> <p>155.28 (kA)<sup>2</sup>s</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>./ ms</p> <p>No</p> <p>No</p> <p>Page ./.</p>
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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
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	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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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
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	<b>For circuit-breakers suitable for isolation having an operational voltage <math>U_e</math> greater than 50 V.</b>	
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	
	<b>Leakage current</b>	
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

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 25

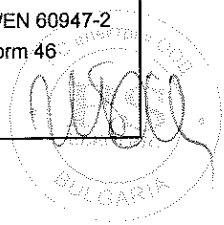
Date July 13th 2005

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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	Cabling characteristics Cable $./. \text{ mm}^2$ Bar 80 x 5 mm Number 2 /Ph Length $./. \text{ mm}$ 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 $I_n$  <b>Test current</b>  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 $k \times 2.5 \times I_n$ $./. \text{ A}$  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 <sub>1</sub> $\leq 270 \text{ s}$ Ph <sub>2</sub> $\leq 270 \text{ s}$ Ph <sub>3</sub> $\leq 270 \text{ s}$	Braid 2000 mm <sup>2</sup> $./. \times ./. \text{ mm}$ 1/Ph 700 mm 50 Nm  29 °C 1 1600 A  3200 A  ./. A  ./. A
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46

Date July 13th 2005



<b>ASEFA</b>		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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	<p>Cabling characteristics</p> <p>Cable 185 mm<sup>2</sup></p> <p>Bar ./. x ./. mm</p> <p>Number 2 /Ph</p> <p>Length ./. mm</p> <p>Tightening torque</p> <p>Reference temperature 40 °C ± 2 °C</p> <p>Ambient temperature 23 °C</p> <p>Correction factor (k = 1 for releases independent of ambient temperature) k 1</p> <p>Current setting value I<sub>n</sub> 630*0.4=252 A</p> <p><b>Test current</b></p> <p>either k x 2.0 x I<sub>n</sub> 504 A</p> <p>8.3.5.1 Test sequence II (I<sub>cs</sub> = I<sub>cu</sub>) before 8.3.4.1</p> <p>8.3.5.1 Test sequence III before 8.3.5.2</p> <p>8.3.6.1 Test sequence IV before 8.3.6.2</p> <p>8.3.6.6 Test sequence IV after 8.3.6.5</p> <p>8.3.7.4 Test sequence V before 8.3.7.5</p> <p>8.3.8.1 Combined test sequence before 8.3.8.2</p> <p>A.5 Verification of discrimination before 8.3.5.2</p> <p>A.6.3 Verification of back-up protection before 8.3.5.2</p> <p>or k x 2.5 x I<sub>n</sub> ./. A</p> <p>8.3.5.4 Test sequence II (I<sub>cs</sub> = I<sub>cu</sub>) after 8.3.4.5</p> <p>8.3.5.4 Test sequence III after 8.3.5.3</p> <p>8.3.7.8 Test sequence V after 8.3.7.7</p> <p>8.3.8.7 Combined test sequence after 8.3.8.6</p> <p>A.5 Verification of discrimination after 8.3.5.3</p> <p>A.6.3 Verification of back-up protection after 8.3.5.3</p> <p>C.4 Individual pole short-circuit test sequence</p> <p>H.4 Test sequence for circuit-breakers for IT-systems</p> <p>Tripping time (for twice the value of current setting on single pole)</p> <p>Neutral ≤ 270 s 220 s</p> <p>Ph<sub>1</sub> ≤ 270 s 214 s</p> <p>Ph<sub>2</sub> ≤ 270 s 214 s</p> <p>Ph<sub>3</sub> ≤ 270 s 233 s</p>	<p>Braid 2000 mm<sup>2</sup></p> <p>./. x ./. mm</p> <p>1 /Ph</p> <p>700 mm</p> <p>50 Nm</p> <p>504 A</p> <p>504 A</p> <p>./. A</p> <p>./. A</p>
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 19 / 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
8.3.6.2 8.3.8.2  Table 4	<b>TEST OF RATED SHORT-TIME WITHSTAND CURRENT</b>  Utilization category <b>B</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 185 mm <sup>2</sup> Bar $./. \times ./. \text{ mm}$ Number 2 Length supply side $./. \text{ mm}$ load side $./. \text{ mm}$  Tightening torque	$./. \text{ mm}^2$ 10 x 100 mm 1 350 mm 350 mm 50 Nm
60947-1 8.3.4.3  Table 11	<b>Alternating current</b>  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 $i_m$	20040096.0041 750 V 0.28 50 Hz  1108.65 ms 19.32 kA 19.86 kA 19.25 kA 19.48 kA

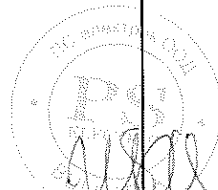
Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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

ASEFA		Test report No.: F01.04.18 Page: 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	<b>Alternative test</b>	
	$I_{cw}^2 \times t_{st}$ 368.64 (kA) <sup>2</sup> s  Oscillogram Peak current maximum value Test duration $t_{test}$ Joule-integral $i_{test}^2 dt$ Ph <sub>1</sub> Average value Ph <sub>m</sub>	20040096.0041 40.51 kA 1108.65 ms 382.58 (kA) <sup>2</sup> s 411.49 (kA) <sup>2</sup> s 410.37 (kA) <sup>2</sup> s 401.48 (kA) <sup>2</sup> s
60947-1 8.3.4.3	<b>Direct current</b>	
	$I_{cw}^2 \times t_{st}$ /. A <sup>2</sup> 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 <sup>2</sup> s

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Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 52

Date July 13th 2005

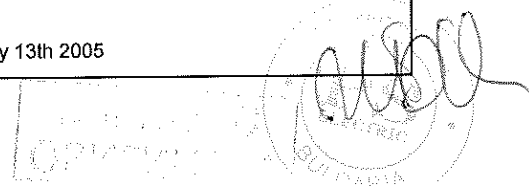
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ASEFA		Test report No.: F01.04.18 Page 21 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
8.3.6.4	<b>TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT</b>	
	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

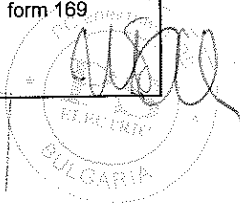
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Date July 13th 2005



<b>ASEFA</b>		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	<b>CALIBRATION OF THE TEST CRUIT</b>  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

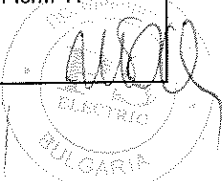
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<b>ASEFA</b>		Test report No.: F01.04.18 Page 23 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
	<b>OPERATION "O"</b>	
	Oscillogram	20040096.0044
	Peak current value	$i_1$ 32.05 kA
		$i_2$ 34.45 kA
		$i_3$ 40.33 kA
	Maximum total duration	412.85 ms
	Recovery voltage (phase to phase or phase to neutral)	$U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 727.9 V
		$U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 727.7 V
		$U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 726.9 V
	Average value	$U_{rm}$ 727.5 V
	Ratio between $U_{rm}$ and $U_e$	$U_{rm}/U_e$ 1.05
	Joule integral	$Ph_1$ 141.31 (kA) <sup>2</sup> s
		$Ph_2$ 151.94 (kA) <sup>2</sup> s
		$Ph_3$ 153.83 (kA) <sup>2</sup> s
	Melting of the fusible element	Yes/No No
	Holes in the PE-sheet (if applicable)	Yes/No No
	Cracks observed if Yes	Yes/No No Page ./.
	Time interval between operations	3 min 3 min
	<b>OPERATION "CO"</b>	
	Oscillogram	20040096.0045
	Applied voltage	750.13 V
	Peak current value	$i_1$ 32.96 kA
		$i_2$ 39.96 kA
		$i_3$ 33.54 kA
	Maximum total duration	412.7 ms
	Recovery voltage (phase to phase or phase to neutral)	$U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 735 V
		$U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 731 V
		$U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 739 V
	Average value	$U_{rm}$ 735 V
	Ratio between $U_{rm}$ and $U_e$	$U_{rm}/U_e$ 1.06
	Joule integral	$Ph_1$ 143.17 (kA) <sup>2</sup> s
		$Ph_2$ 155.64 (kA) <sup>2</sup> s
		$Ph_3$ 152.69 (kA) <sup>2</sup> s
7.2.1.1.3	Closing operation time	./ ms
	Melting of the fusible element	Yes/No No
	Cracks observed if Yes	Yes/No No Page ./.
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 41
		Date July 13th 2005

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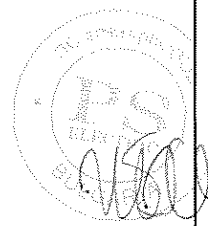


ASEFA		Test report No.: F01.04.18 Page 24 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.10
Standard and clause	Kind of tests and requirements	Test values Results
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	Test voltage	
	2 x $U_n$ , min. 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
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	<b>For circuit-breakers suitable for isolation having an operational voltage <math>U_e</math> greater than 50 V.</b>	
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	
	<b>Leakage current</b>	
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  
Ed. 2.1 form 25

Date July 13th 2005



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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	Cabling characteristics Cable 185 mm <sup>2</sup> 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 <sub>n</sub>  <b>Test current</b> either k x 2.0 x I <sub>n</sub> 504 A  8.3.5.1 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>n</sub> ./. A  8.3.5.4 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>1</sub> ≤ 270 s Ph <sub>2</sub> ≤ 270 s Ph <sub>3</sub> ≤ 270 s	Braid 2000 mm <sup>2</sup> ./. x ./. mm 1 /Ph 700 mm 50 Nm  27 °C 630*0.4=252V  504 A  ./. 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
Date July 13th 2005		

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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	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 $20.3 \text{ }^\circ\text{C}$ Correction factor ( $k = 1$ for releases independent of ambient temperature) $k$ Current setting value $I_n$ 1600 A  <b>Test current</b>  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 $k \times 2.5 \times I_n$ $.I. \text{ A}$ $.I. \text{ A}$ 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 $\leq 270 \text{ s}$ 221 s Ph <sub>1</sub> $\leq 270 \text{ s}$ 221 s Ph <sub>2</sub> $\leq 270 \text{ s}$ 220 s Ph <sub>3</sub> $\leq 270 \text{ s}$ 208 s	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46
Date July 13th 2005		

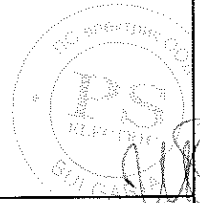
<b>ASEFA</b>		Test report No.: F01.04.18 Page 28 / 70	
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B	
Standard and clause	Kind of tests and requirements	Test values Results	
8.3.6.2 8.3.8.2  Table 4	<b>TEST OF RATED SHORT-TIME WITHSTAND CURRENT</b>  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 ./. mm <sup>2</sup> Bar 100 x 10 mm Number 1 Length supply side ./. mm load side ./. mm  Tightening torque	./. mm <sup>2</sup> 100 x 10 mm 1 500 mm 0 mm 50 Nm	
60947-1 8.3.4.3  Table 11	<b>Alternating current</b>  Oscillogram Test voltage $\geq 80$ 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		TRF IEC/EN 60947-2 Ed. 2.1 form 51	
Date July 13th 2005			

ASEFA		Test report No.: F01.04.18 Page 29 / 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 8.3.4.3	<b>Alternative test</b>	
	$I_{cw}^2 \times t_{st}$	368.64 (kA) <sup>2</sup> s
	Oscillogram	20040283.0169
	Peak current maximum value	39.9 kA
	Test duration $t_{test}$	1024 ms
	Joule-integral $\int I_{test}^2 dt$	Ph <sub>1</sub> 366.16 (kA) <sup>2</sup> s Ph <sub>2</sub> 395.38 (kA) <sup>2</sup> s Ph <sub>3</sub> 387.92 (kA) <sup>2</sup> s Ph <sub>m</sub> 383.15 (kA) <sup>2</sup> s
	Average value	
60947-1 8.3.4.3	<b>Direct current</b>	
	$I_{cw}^2 \times t_{st}$	./. A <sup>2</sup> s
	Oscillogram	Page ./.
	Test voltage	./. V
	Maximum of test current $I_{test}$	./. kA
	Test duration $t_{test}$	./. ms
	Joule-integral $\int I_{test}^2 dt$	./. A <sup>2</sup> s

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
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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	<b>VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS</b>	
8.3.2.5	<b>Temperature-rise test</b>	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
60947-1 8.3.3.3.4	<b>Main circuits</b>	
	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	<b>Cabling characteristics</b>	
	Phase poles	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	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 <sup>2</sup> ./. mm <sup>2</sup>
	Bar	./. x ./. mm ./. x ./. mm
	Number	./. ./.
	Length	./. mm ./. mm
	Tightening torque	./. Nm
	Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	
Table 7	<b>Temperature-rise limits</b>	
	Terminals	≤ 80 K 61.3 K

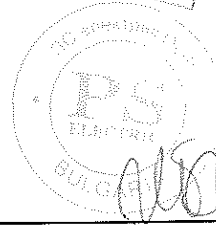
Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 44

Date July 13th 2005

<b>ASEFA</b>		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	<b>TEST OF SHORT-CIRCUIT BREAKING CAPACITY AT THE MAXIMUM SHORT-TIME WITHSTAND CURRENT</b>	
	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 $0.85 \times U_e$ J. V	J. V
7.2.1.1.3	Maximum value of the closing time	J. 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
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 55
Date July 13th 2005		

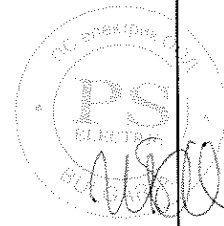
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<b>ASEFA</b>		Test report No.: F01.04.18 Page 32 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	<b>CALIBRATION OF THE TEST CIRCUIT</b>	
	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		

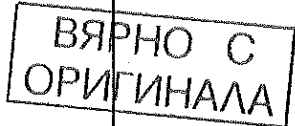

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ASEFA		Test report No.: F01.04.18 Page 33 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
	<b>OPERATION "O"</b>	
	Oscillogram	20040096.0069
	Peak current value	$i_1$ 40.30 kA
		$i_2$ 30.52 kA
		$i_3$ 36.01 kA
	Maximum total duration	428.78 ms
	Recovery voltage	$U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 725 V
	(phase to phase or phase to neutral)	$U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 726 V
		$U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 726 V
	Average value	$U_{rm}$ 725 V
	Ratio between $U_{rm}$ and $U_e$	$U_{rm}/U_e$ 1.05
	Joule integral	$Ph_1$ 155.34 A <sup>2</sup> s
		$Ph_2$ 153.79 A <sup>2</sup> s
		$Ph_3$ 155.41 A <sup>2</sup> s
	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	Page ./.
	Time interval between operations	3 min 5 min
	<b>OPERATION "CO"</b>	
	Oscillogram	20040096.0070
	Applied voltage	765.46 V
	Peak current value	$i_1$ 39.27 kA
		$i_2$ 27.78 kA
		$i_3$ 36.87 kA
	Maximum total duration	427.46 ms
	Recovery voltage	$U_{r(1-2)}$ <input checked="" type="checkbox"/> or $U_{r(1-N)}$ <input type="checkbox"/> 721.66 V
	(phase to phase or phase to neutral)	$U_{r(2-3)}$ <input checked="" type="checkbox"/> or $U_{r(2-N)}$ <input type="checkbox"/> 727.91 V
		$U_{r(3-1)}$ <input checked="" type="checkbox"/> or $U_{r(3-N)}$ <input type="checkbox"/> 747.04 V
	Average value	$U_{rm}$ 732.2 V
	Ratio between $U_{rm}$ and $U_e$	$U_{rm}/U_e$ 1.06
	Joule integral	$Ph_1$ 155.57 (kA) <sup>2</sup> s
		$Ph_2$ 155.34 (kA) <sup>2</sup> s
		$Ph_3$ 154.42 (kA) <sup>2</sup> s
7.2.1.1.3	Closing operation time	./ ms
	Melting of the fusible element	Yes/No No
	Cracks observed	Yes/No No
	if Yes	Page ./.
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 41
		Date July 13th 2005



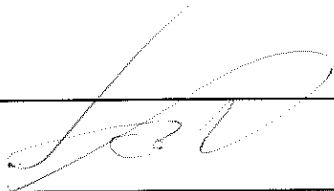
<b>ASEFA</b>		Test report No.: F01.04.18 Page 34 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	Test voltage	
	2 x U <sub>e</sub> , 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
Date July 13th 2005		

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
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	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	769 V
	<b>Leakage current</b>	
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

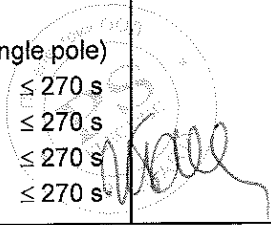
Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

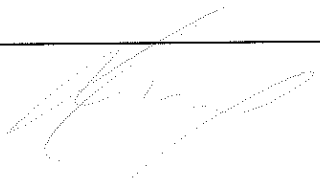
TRF IEC/EN 60947-2  
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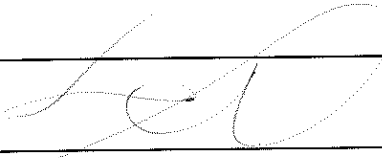
ASEFA 		Test report No.: F01.04.18 Page 36 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.11B
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	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 $^\circ\text{C}$ Correction factor ( $k = 1$ for releases independent of ambient temperature) $k$ Current setting value $I_n$ 1600 A  <b>Test current</b>  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 <sub>1</sub> $\leq 270 \text{ s}$ 236 s Ph <sub>2</sub> $\leq 270 \text{ s}$ 231 s Ph <sub>3</sub> $\leq 270 \text{ s}$ 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

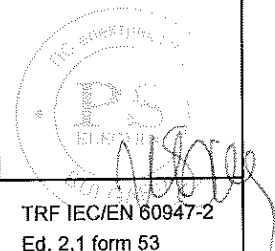




ASEFA		Test report No.: F01.04.18 Page 37 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 Table 9, 10 and 11	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	Cabling characteristics Cable $./. \text{ mm}^2$ Bar 100 x 5 mm Number 2 /Ph Length $./. \text{ mm}$ 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 $I_n$  <b>Test current</b>  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 $k \times 2.5 \times I_n$ $./. \text{ A}$ 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 <sub>1</sub> $\leq 270 \text{ s}$ Ph <sub>2</sub> $\leq ./. \text{ s}$ Ph <sub>3</sub> $\leq ./. \text{ s}$	$./. \text{ mm}^2$ 100 x 5 mm 2 /Ph 500 mm 50 Nm  $40 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 21.8 $^\circ\text{C}$ 1 1600 A  3200 A  3200 A  $./. \text{ A}$ $./. \text{ A}$  220 s 228 s $./. \text{ s}$ $./. \text{ s}$
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 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	<b>ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS</b>	
	Test made on the same sample as for the three-pole short-time withstand or on a new sample	same/new <b>new</b>
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 <sup>2</sup> <b>./. mm<sup>2</sup></b>
	Bar	100 x 5 mm <b>100 x 5 mm</b>
	Number	2 <b>2</b>
	Length	supply side ./. mm <b>500 mm</b> load side ./. mm <b>0 mm</b>
	Tightening torque	<b>50 Nm</b>
60947-1	<b>Alternating current</b>	
8.3.4.3	Oscillogram	20040283.0134
	Test voltage	≥ 80 V <b>780 V</b>
	Power factor	<b>0.29</b>
Table 11	Frequency	50 Hz <b>50 Hz</b>
	Test duration $t_{st}$	<b>1112.7 ms</b>
	Test current value $I_1$	<b>12.02 kA</b>
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 53

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	<b>Alternative test</b>  $I_{cw}^2 \times t_{st}$ 132.71 (kA) <sup>2</sup> s  Oscillogram Peak current maximum value Test duration $t_{test}$ Joule-integral $I_{test}^2 dt$ Ph <sub>1</sub>	20040283.0134 23.22 kA 1112.7 ms 139.55 (kA) <sup>2</sup> s
60947-1 8.3.4.3	<b>Direct current</b>  $I_{cw}^2 \times t_{st}$ ./. A <sup>2</sup> 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 <sup>2</sup> s

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Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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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	<b>VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS</b>	
8.3.2.5	<b>Temperature-rise test</b>	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
	<b>Main circuits</b>	
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	<b>Cabling characteristics</b>	
	<b>Phase poles</b>	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	100 x 5 mm 100 x 5 mm
	Number	2 /Ph 2 /Ph
	Length	./. mm 3000 mm
	Tightening torque	50 Nm
	<b>Neutral pole (if applicable)</b>	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	./. x ./. mm ./. x ./. mm
	Number	./. ./.
	Length	./. mm ./. mm
	Tightening torque	./. Nm
	Arrangement: 3 phase <input checked="" type="checkbox"/> or poles in series <input type="checkbox"/>	
Table 7	<b>Temperature-rise limits</b>	
	Terminals	≤ 80 K 56.3 K

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
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ASEFA		Test report No.: F01.04.18 Page 41 / 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
8.3.5.2 8.3.6.4 8.3.7.6	<b>ADDITIONAL SEQUENCE OF SHORT-CIRCUIT OPERATIONS ON FOUR POLE CIRCUIT-BREAKERS</b>  Test made on the same sample as for the three-pole short-circuit or on a new sample	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	0.30(-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	Pageform
	Safety area	Pageform
	Installation of the material tested	Pageform
	Energization direction	Top/Bottom
60947-1	Cabling characteristics	
Table 9, 10 and 11	Cable ./. mm <sup>2</sup>	./. mm <sup>2</sup>
	Bar 100 x 10 mm	100 x 10 mm
	Number 1	1
	Length supply side ./. mm	400 mm
	load side ./. mm	0 mm
	Tightening torque	50 Nm

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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Date July 13th 2005

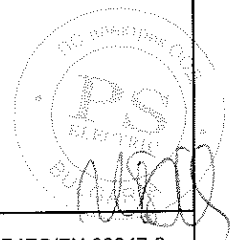


ASEFA		Test report No.: F01.04.18 Page 42 / 70
Type test according to: IEC 60947-2		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
60947-1 8.3.4.1.5	<b>CALIBRATION OF THE TEST CIRCUIT</b>	
	Oscillogram	20040299-0003 20040299-0008
	Applied voltage	425.55 V
	Frequency	50 Hz
	RMS current value at 20 ms	$i_1$ 11.77 kA $i_2$ ./. kA $i_3$ ./. kA
	Average RMS. Value	11.77 kA
	Peak current maximum value	23.24 kA
	Power factor	0.28

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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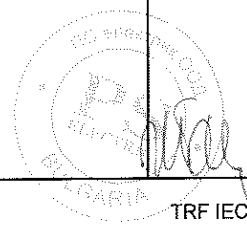
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<b>ASEFA</b>		Test report No.: F01.04.18 Page 43 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
	<b>OPERATION "O"</b>	
	Oscillogram	20040299-0011
	Peak current value $i_t$	23.29 kA
	Total duration	415.75 ms
	Recovery voltage (phase to neutral) $U_{r(1-N)}$	419.02 V
	Ratio between $U_r$ and $U_e$ $U_r/U_e$	1.05
	Joule integral $Ph_1$	53.87 (kA) <sup>2</sup> s
	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	Page ./.
	Time interval between operations	3 min 3 min
	<b>OPERATION "CO"</b>	
	Oscillogram	20040299.0012
	Applied voltage	435 V
	Peak current value $i_t$	19.38 kA
	Total duration	420.45 ms
	Recovery voltage (phase to neutral) $U_{r(1-N)}$	418.57 V
	Ratio between $U_r$ and $U_e$ $U_r/U_e$	1.05
	Joule integral $Ph_1$	52.85 (kA) <sup>2</sup> s
7.2.1.1.3	Closing operation time	./-ms
	Melting of the fusible element	Yes/No No
	Cracks observed	Yes/No No
	if Yes	Page ./.
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 49
Date July 13th 2005		

ВЯРНО С  
ОРИГИНАЛА



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<b>ASEFA</b>		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
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	Test voltage	
	2 x U <sub>e</sub> , 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/VOLTA
		Date July 13th 2005

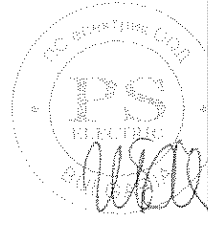
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ASEFA		Test report No.: F01.04.18 Page 45 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.12
Standard and clause	Kind of tests and requirements	Test values Results
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	<b>For circuit-breakers suitable for isolation having an operational voltage <math>U_e</math> greater than 50 V.</b>	
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
	<b>Leakage current</b>	
8.3.3.2	Test sequence I (in new condition)	≤ 0.5 mA
8.3.3.5	Test sequence I (after overload performance)	≤ 2 mA
8.3.4.3	Test sequence II	≤ 2 mA
8.3.5.3	Test sequence III	≤ 6 mA
8.3.6.5	Test sequence IV	≤ 2 mA
8.3.7.3	Test sequence V, stage 1	≤ 2 mA
8.3.7.7	Test sequence V, stage 2	≤ 6 mA
8.3.8.5	Combined test sequence	≤ 2 mA
C.3	Individual pole short-circuit test sequence $I_{su}$	≤ 6 mA
H.3	Individual pole short-circuit test sequence $I_{IT}$	≤ 6 mA

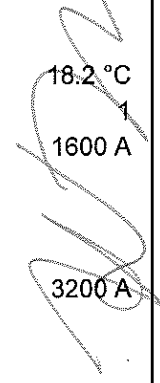
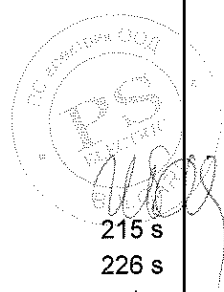

759 V  
759 V



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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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>		
	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  <b>Test current</b>  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 <sub>1</sub> $\leq 270 \text{ s}$ 226 s Ph <sub>2</sub> $\leq .l. \text{ s}$ $.l. \text{ s}$ Ph <sub>3</sub> $\leq .l. \text{ s}$ $.l. \text{ s}$	  	
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	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
	Cabling characteristics Cable 185 mm <sup>2</sup> Bar ./. x ./. mm Number 1 /Ph Length ./. 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 <sub>n</sub> 630x0.4=252 A  <b>Test current</b>  either k x 2.0 x I <sub>n</sub> 504 A 504 A  8.3.5.1 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>n</sub> ./. A ./. A  8.3.5.4 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>1</sub> ≤ 270 s 212 s Ph <sub>2</sub> ≤ ./. s ./. s Ph <sub>3</sub> ≤ ./. 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	<b>ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS</b>	
	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 <sup>2</sup> ./. mm <sup>2</sup>
	Bar	100 x 10 mm 100 x 10 mm
	Number	1 1
	Length	supply side ./. mm 400 mm load side ./. mm ./. mm
	Tightening torque	50 Nm
60947-1	<b>Alternating current</b>	
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 $i_1$	11.97 kA

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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	<b>Alternative test</b>  $I_{CW}^2 \times t_{st}$ 132.71 (kA) <sup>2</sup> s  Oscillogram Peak current maximum value Test duration $t_{test}$ Joule-integral $\int I_{test}^2 dt$ Ph <sub>1</sub>	20040283 0135 23.12 kA 1112.95 ms 139.86 (kA) <sup>2</sup> s
60947-1 8.3.4.3	<b>Direct current</b>  $I_{CW}^2 \times t_{st}$ ./. A <sup>2</sup> 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 <sup>2</sup> s

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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	<b>ADDITIONAL SEQUENCE OF SHORT-CIRCUIT OPERATIONS ON FOUR POLE CIRCUIT-BREAKERS</b>  Test made on the same sample as for the three-pole short-circuit or on a new sample	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
	Sequence of operation O - t - CO	O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit	Pageform
	Safety area	Pageform
	Installation of the material tested	Pageform
	Energization direction	Top/Bottom
60947-1 Table 9, 10 and 11	Cabling characteristics	
	Cable ./. mm <sup>2</sup>	./ . mm <sup>2</sup>
	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  
ASEFA recognised PLATFORM

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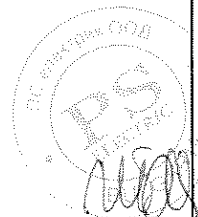
Date July 13th 2005

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	<p><b>CALIBRATION OF THE TEST CIRCUIT</b></p> <p>Oscillogram</p> <p>Applied voltage</p> <p>Frequency 50 Hz</p> <p>RMS current value at 20 ms <math>i_1</math> <math>i_2</math> <math>i_3</math></p> <p>Average RMS. Value</p> <p>Peak current maximum value</p> <p>Power factor</p>	<p>20040299-0003 20040299-0008</p> <p>430 V</p> <p>50 Hz</p> <p>11.77 kA / kA / kA</p> <p>11.77 kA</p> <p>23.24 kA</p> <p>0.28</p>




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
7.2.1.1.3	<b>OPERATION „O“</b>  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) <sup>2</sup> s  No No No Page ./.  3 min
	<b>OPERATION „CO“</b>  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) <sup>2</sup> s  ./ ms No No Page ./



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<b>ASEFA</b>		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
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	Test voltage	
	2 x U <sub>e</sub> , 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)	
	Test duration	5 s
		1 min
		
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32
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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
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	<b>For circuit-breakers suitable for isolation having an operational voltage <math>U_e</math> greater than 50 V.</b>	
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
	<b>Leakage current</b>	
8.3.3.2	Test sequence I (in new condition)	≤ 0.5 mA
8.3.3.5	Test sequence I (after overload performance)	≤ 2 mA
8.3.4.3	Test sequence II	≤ 2 mA
8.3.5.3	Test sequence III	≤ 6 mA
8.3.6.5	Test sequence IV	≤ 2 mA
8.3.7.3	Test sequence V, stage 1	≤ 2 mA
8.3.7.7	Test sequence V, stage 2	≤ 6 mA
8.3.8.5	Combined test sequence	≤ 2 mA
C.3	Individual pole short-circuit test sequence $I_{su}$	≤ 6 mA
H.3	Individual pole short-circuit test sequence $I_{IT}$	≤ 6 mA

Test laboratory: F01- GRENOBLE  
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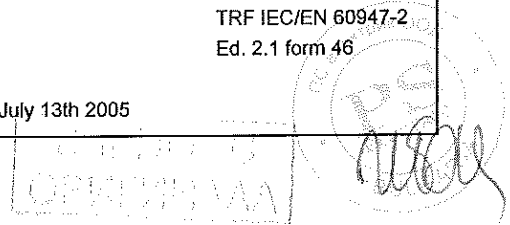
Date July 13th 2005

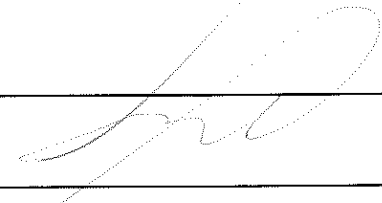
ASEFA		Test report No.: F01.04.18 Page 55 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.13
Standard and clause	Kind of tests and requirements	Test values Results
	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
60947-1 Table 9, 10 and 11	Cabling characteristics Cable 185 mm <sup>2</sup> Bar ./. x ./. mm Number 1 /Ph Length ./. mm 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 <sub>n</sub> 0.4x630=252 A  <b>Test current</b>  either k x 2.0 x I <sub>n</sub> 504 A 504 A	185 mm <sup>2</sup> ./. x ./. mm 1 /Ph 2000 mm 50 Nm  17.8 °C 1 0.4x630=252 A  504 A 504 A
8.3.5.1	Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>n</sub> ./. A ./. A	
8.3.5.4	Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>1</sub> ≤ 270 s 225 s	
	Ph <sub>2</sub> ≤ ./. s ./. s	
	Ph <sub>3</sub> ≤ ./. s ./. s	

Test laboratory: F01- GRENOBLE  
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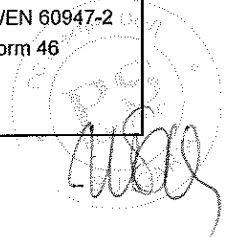
ASEFA 		Test report No.: F01.04.18 Page 56 / 70
Type test according to: IEC 60947-2 Test sequence IV		Type: Compact NS 630bN, 1250N, 1600N Sample 31039.14
Standard and clause	Kind of tests and requirements	Test values Results
	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
60947-1 Table 9, 10 and 11	<b>Cabling characteristics</b> Cable <span style="float: right;">./ mm<sup>2</sup></span> Bar <span style="float: right;">100 x 5 mm</span> Number <span style="float: right;">2 /Ph</span> Length <span style="float: right;">./ mm</span> Tightening torque  Reference temperature <span style="float: right;">40 °C ± 2 °C</span> Ambient temperature Correction factor (k = 1 for releases independent of ambient temperature) k Current setting value <span style="float: right;">I<sub>n</sub></span>	./ mm <sup>2</sup> 100 x 5 mm 2 /Ph 500 mm 50 Nm  18.2 °C 1 1600 A
	<b>Test current</b>	
	either k x 2.0 x I <sub>n</sub> <span style="float: right;">3200 A</span>	3200 A
8.3.5.1	Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>n</sub> <span style="float: right;">./ A</span>	./ A
8.3.5.4	Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <span style="float: right;">≤ 270 s</span>	218 s
	Ph <sub>1</sub> <span style="float: right;">≤ 270 s</span>	215 s
	Ph <sub>2</sub> <span style="float: right;">≤ ./ s</span>	./ s
	Ph <sub>3</sub> <span style="float: right;">≤ ./ s</span>	./ s

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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

Date July 13th 2005

  
GRADINA

  
1600

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	<b>ADDITIONAL TEST OF RATED SHORT-TIME WITHSTAND CURRENT ON FOUR POLE CIRCUIT-BREAKERS</b>	
	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 <sup>2</sup> ./. mm <sup>2</sup>
	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	<b>Alternating current</b>	
8.3.4.3	Oscillogram	20040283.0136
	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 $I_t$	12.04 kA

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 53

Date July 13th 2005



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	<b>Alternative test</b>  $I_{cw}^2 \times t_{st}$ 132.7 (kA) <sup>2</sup> s  Oscillogram Peak current maximum value Test duration $t_{test}$ Joule-integral $I_{test}^2 dt$ Ph <sub>1</sub>	20040283.0136 23.25 kA 1112.95 ms 139.04 (kA) <sup>2</sup> s
	<b>Direct current</b>  $I_{cw}^2 \times t_{st}$ ./. A <sup>2</sup> 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 <sup>2</sup> s
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 54
Date July 13th 2005		

Stamp: 01.07.05  
GPK/04/14



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	<b>VERIFICATION OF TEMPERATURE-RISE ONLY FOR TERMINALS</b>	
8.3.2.5	<b>Temperature-rise test</b>	
60947-1 8.3.3.3.1	Ambient temperature	10...40 °C 22 °C
	<b>Main circuits</b>	
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	<b>Cabling characteristics</b>	
	<b>Phase poles</b>	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	100 x 5 mm 100 x 5 mm
	Number	2 /Ph 2 /Ph
	Length	./. mm 500 mm
	Tightening torque	50 Nm
	<b>Neutral pole (if applicable)</b>	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	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	<b>Temperature-rise limits</b>	
	Terminals	≤ 80 K 53.6 K

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 44

Date July 13th 2005

ASEFA		Test report No.: F01.04.18
Type test according to: IEC 60947-2 Test sequence IV		Page 60 / 70
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	<b>ADDITIONAL SEQUENCE OF SHORT-CIRCUIT OPERATIONS ON FOUR POLE CIRCUIT-BREAKERS</b>  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 $I_{cu}$	11.52 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	cos 0.30 0.28
	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
	Sequence of operation	O - t - CO O - t - CO
	Circuit diagram	Page 68
	Calibration of the test circuit	Pageform Page ./.
	Safety area	Pageform Page 67
	Installation of the material tested	Pageform Page 66
	Energization direction	Top/Bottom Bottom
60947-1 Table 9, 10 and 11	Cabling characteristics	
	Cable	./. mm <sup>2</sup> ./. mm <sup>2</sup>
	Bar	100 x 10 mm 100 x 10 mm
	Number	1 1
	Length	supply side ./. mm 400 mm load side ./. mm 0 mm
	Tightening torque	50 Nm

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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

Date July 13th 2005

<b>ASEFA</b>		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	<b>CALIBRATION OF THE TEST CIRCUIT</b>  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 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	<b>OPERATION "O"</b>		
	Oscillogram	20040299.0015	
	Peak current value $i_1$	23.08 kA	
	Total duration	415.7 ms	
	Recovery voltage (phase to neutral) $U_{r(1-N)}$	419 V	
	Ratio between $U_r$ and $U_e$ $U_r/U_e$	1.05	
	Joule integral $Ph_1$	53.77 (kA) <sup>2</sup> s	
	Melting of the fusible element	Yes/No	No
	Holes in the PE-sheet (if applicable)	Yes/No	No
	Cracks observed if Yes	Yes/No	No Page ./.
	Time interval between operations	3 min	4 min
	<b>OPERATION "CO"</b>		
	Oscillogram	20040299.0016	
	Applied voltage	426.6 V	
	Peak current value $i_1$	22.9 kA	
	Total duration	415.65 ms	
	Recovery voltage (phase to neutral) $U_{r(1-N)}$	419 V	
	Ratio between $U_r$ and $U_e$ $U_r/U_e$	1.05	
	Joule integral $Ph_1$	53.2 (kA) <sup>2</sup> s	
	Closing operation time		./ ms
Melting of the fusible element	Yes/No	No	
Cracks observed if Yes	Yes/No	No Page ./.	

Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

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

Date July 13th 2005

<b>ASEFA</b>		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
	<b>VERIFICATION OF DIELECTRIC WITHSTAND</b>	
	Test voltage	
	2 x U <sub>e</sub> , 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                      1 min
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 32/VOLTA
Date July 13th 2005		

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ASEFA		Test report No.: F01.04.18 Page 64 / 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
	<b>VERIFICATION OF LEAKAGE CURRENT</b>	
	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      759 V
60947-1 7.2.7	Application of the test voltage	
	<b>Leakage current</b>	
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 $I_T$	≤ 6 mA      ./ mA

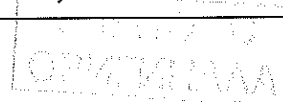
Test laboratory: F01- GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed. 2.1 form 25

Date July 13th 2005

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
	<b>VERIFICATION OF OVERLOAD RELEASES ON EACH POLE SEPARATELY</b>	
60947-1 Table 9, 10 and 11	<b>Cabling characteristics</b> Cable ./. mm <sup>2</sup> Bar 100 x 5 mm Number 2 /Ph Length ./. mm Tightening torque 50 Nm  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 <sub>n</sub> 1600 A  <b>Test current</b>  either k x 2.0 x I <sub>n</sub> 3200 A 3200 A  8.3.5.1 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 <sub>n</sub> ./. A ./. A 8.3.5.4 Test sequence II (I <sub>cs</sub> = I <sub>cu</sub> ) 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 218 s Ph <sub>1</sub> ≤ 270 s 215 s Ph <sub>2</sub> ≤ ./. s ./. s Ph <sub>3</sub> ≤ ./. s ./. s	
Test laboratory: F01- GRENOBLE ASEFA recognised PLATFORM		TRF IEC/EN 60947-2 Ed. 2.1 form 46

Date July 13th 2005



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**ASEFA**

Test report No.: F01.04.18  
Page 66 / 70

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

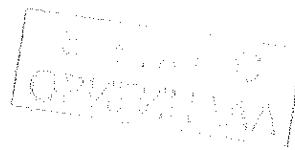
Type: Compact NS 630bN, 1250N, 1600N

### INSTALLATION

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.

The apparatus are operated with an air actuator for test of rated service short-circuit breaking capacity.

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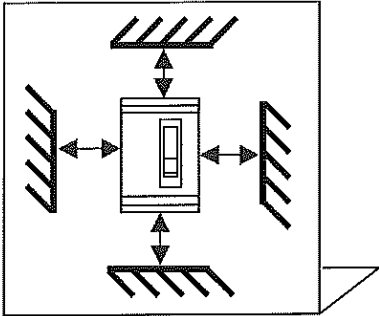
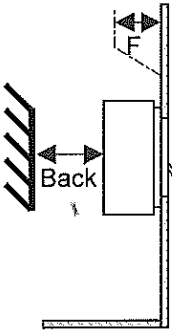


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Test laboratory: F01 GRENOBLE  
ASEFA recognized PLATFORM

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Date July 13th 2005

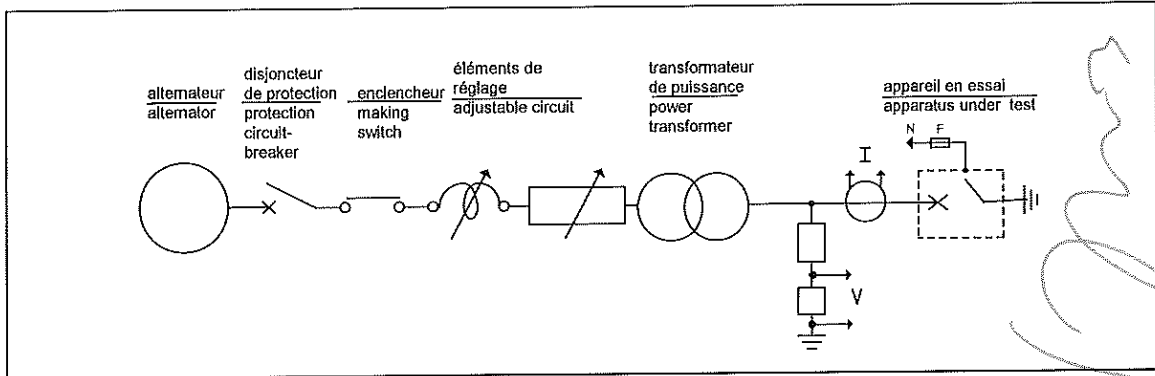
<b>ASEFA</b>	Test report No.: F01.04.18 Page : 67 / 70	
Type test according to: IEC 60947-2	Type : Compact NS 630bN, 1250N, 1600N	
Standard and clause	Kind of tests and requirements	Test values Results
60947-2	<p><b>SAFETY AREA AND DETECTION OF THE FAULT CURRENT</b></p> <p>Characteristics of the metallic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



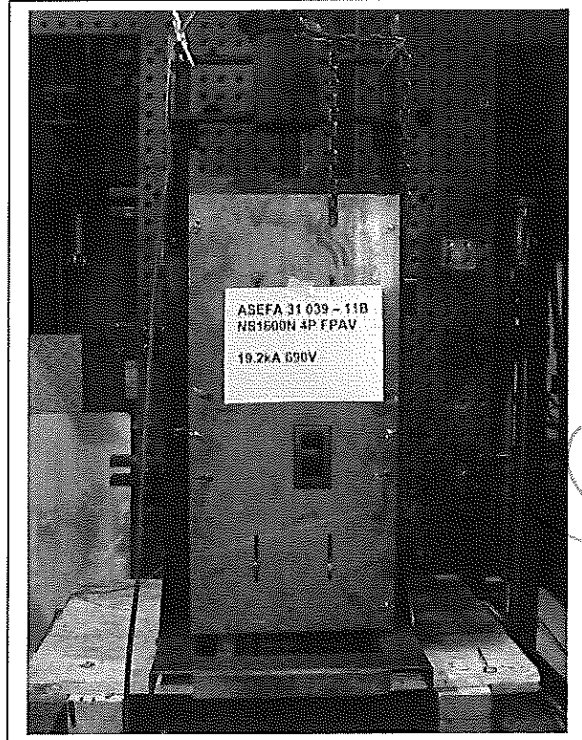
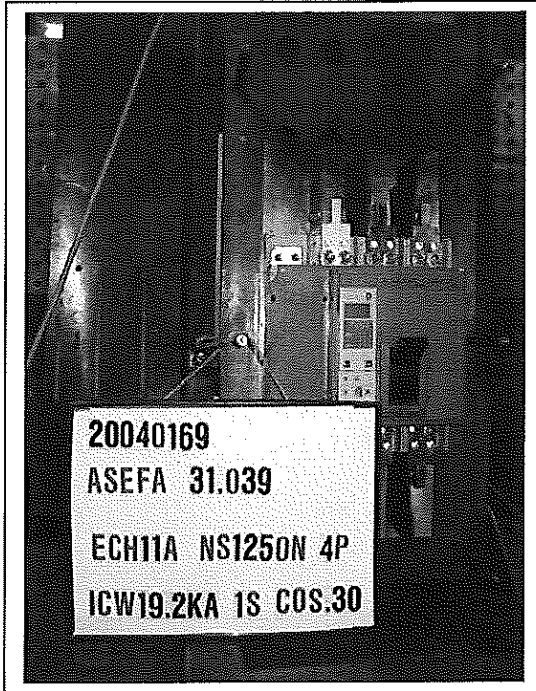
**ASEFA**

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

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

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

**APPENDIXES**

**APPARATUS CHARACTERISTICS**

General view circuit-breaker GHD1189100 ind.B  
Tripping curve Micrologic 5.0A 51156274AA 01 1/1

**OSCILLOGRAMS**

ASEFA 31 039.09 ICW 20040096 - 0040  
Calibration voltage 20040169 - 0010  
Calibration current 20040169 - 0012  
ASEFA 31 039.09 Opening 20040169 - 0015  
ASEFA 31 039.09 Closing/Opening 1 20040169 - 0016

ASEFA 31 039.10 ICW 20040096 - 0041  
Calibration voltage 20040096 - 0034  
Calibration current 20040096 - 0035  
ASEFA 31 039.10 Opening 20040096 - 0044  
ASEFA 31 039.10 Closing/Opening 1 20040096 - 0045

ASEFA 31 039.11B ICW 20040283 - 0169  
Calibration voltage 20040096 - 0013  
Calibration current 20040096 - 0067  
ASEFA 31 039.11B Opening 20040096 - 0069  
ASEFA 31 039.11B Closing/Opening 1 20040096 - 0070

ASEFA 31 039.12 ICW 20040283 - 0134  
Calibration voltage 20040299 - 0003  
Calibration current 20040299 - 0008  
ASEFA 31 039.12 Opening 20040299 - 0011  
ASEFA 31 039.12 Closing/Opening 1 20040299 - 0012

ASEFA 31 039.13 ICW 20040283 - 0135  
ASEFA 31 039.13 Opening 20040299 - 0013  
ASEFA 31 039.13 Closing/Opening 1 20040299 - 0014

ASEFA 31 039.14 ICW 20040283 - 0136  
ASEFA 31 039.14 Opening 20040299 - 0015  
ASEFA 31 039.14 Closing/Opening 1 20040299 - 0016

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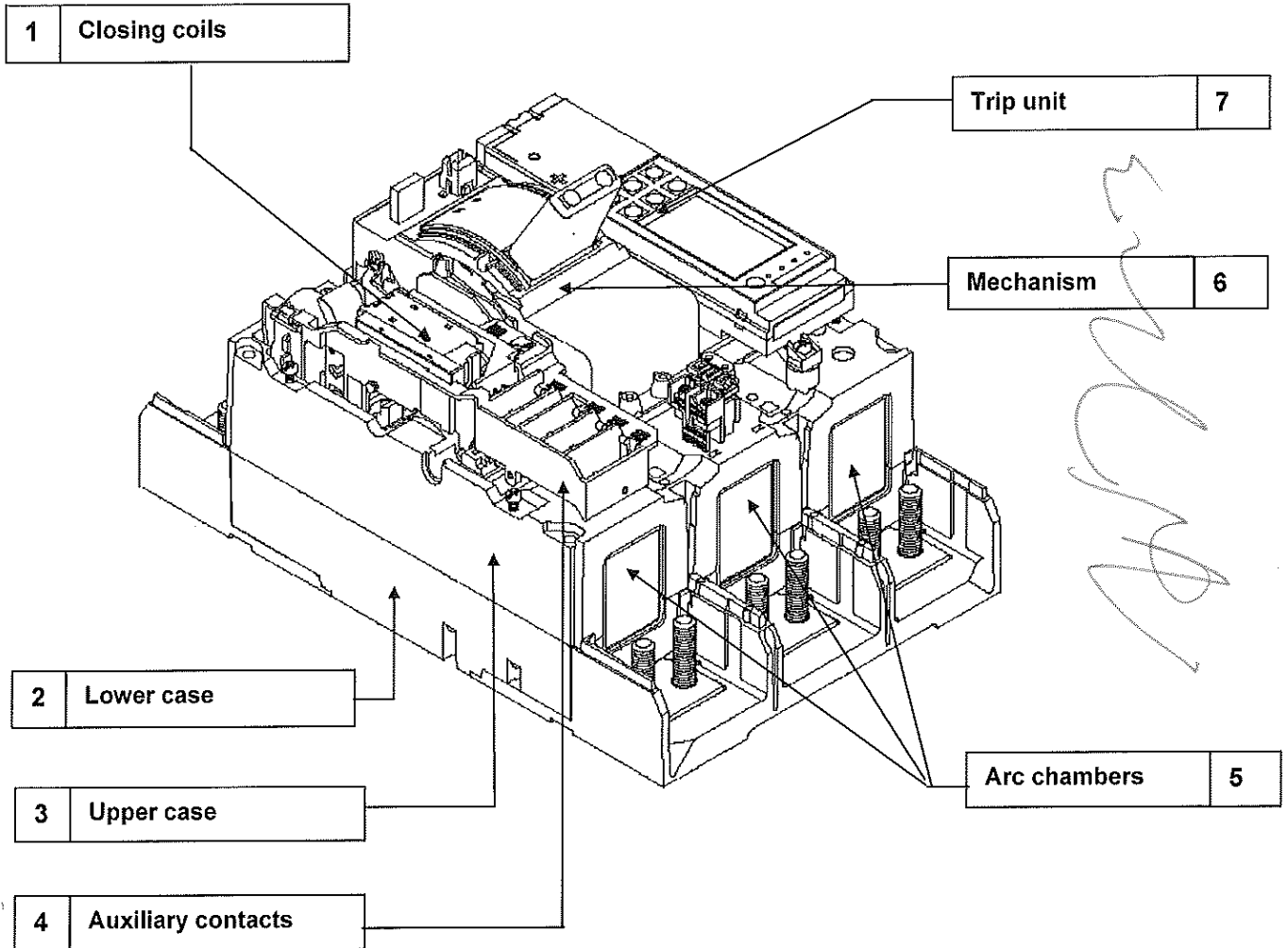
TRF IEC/EN 60947-2  
Ed 2.1 form 170

Test laboratory: F01 - GRENOBLE  
ASEFA recognised PLATFORM

TRF IEC/EN 60947-2  
Ed 2.1 form 170

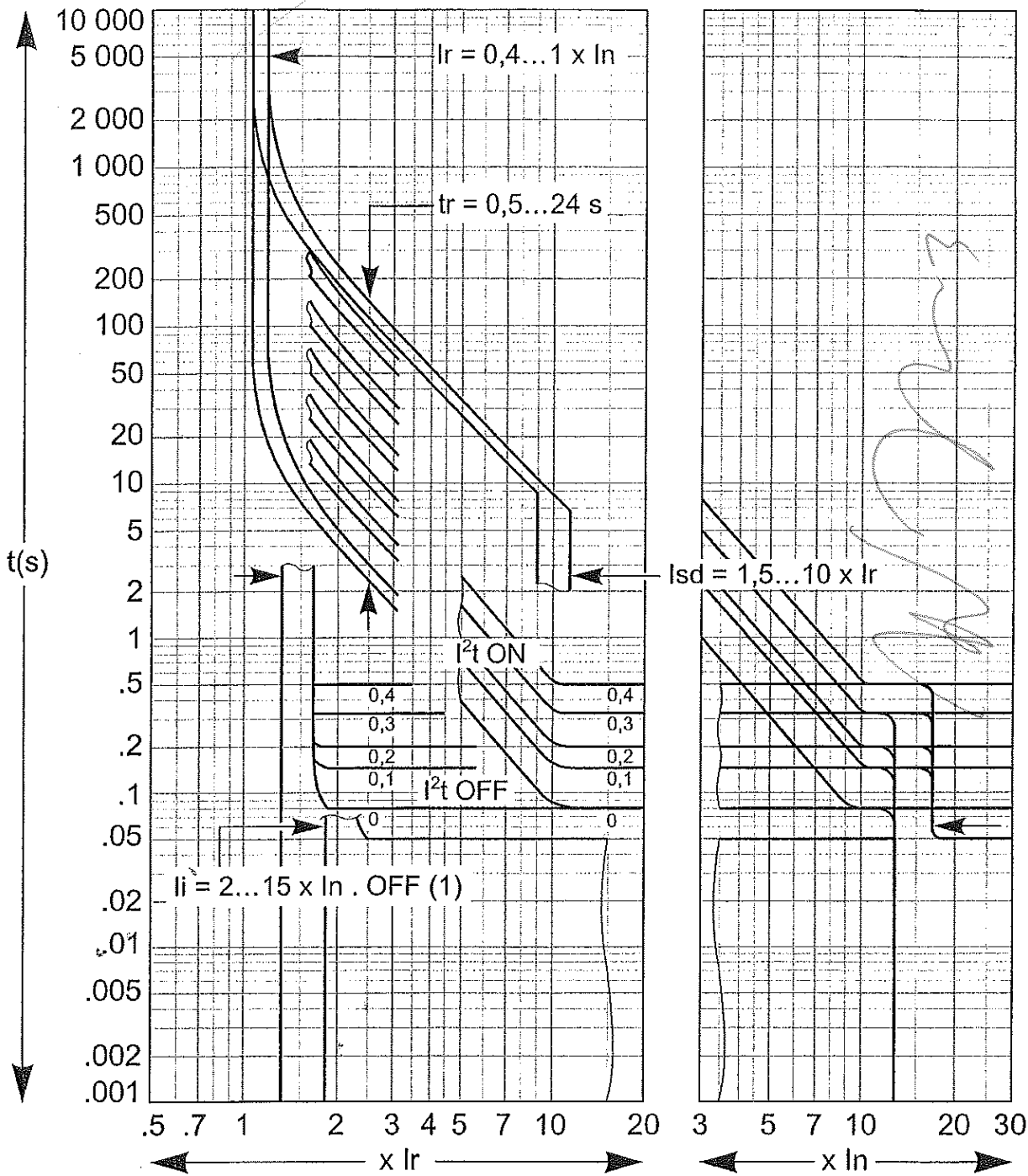
Date July 13th 2005

**GENERAL VIEW - FIGURE 1**



ORIGINAL

PS  
Signature



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	JOUBERT	GRELIER		
Ind / Rev	Date / Date	Modification / Modification	Nom/Name	Visa	Non/Name	Visa
			Préparer/Issued by	Préparer/Issued by	Archiv./ Microfil.	
Projet / Projet: Compact NS630b à NS1600			DISJONCTEUR FIXE ET DEBROCHABLE			
Dossier / Folder:			Courbe de déclenchement pour déclencheurs Micrologic 5.0, 6.0, 7.0			
 <b>GROUPE SCHNEIDER</b>			Code diff. / Distrib. code		Ind/Rev	
			Unité / Département DBTP		Folio/Sheet	
			5 1 1 5 6 2 7 4, A A		0 1 / 1	

1,50 s

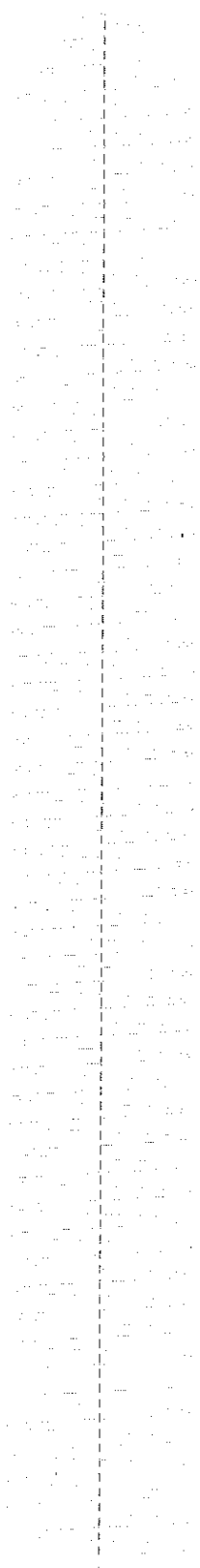
200,00 ms

52,00 ms/cm

100,00 ms

# Icw 1s ASEFA 31039.09

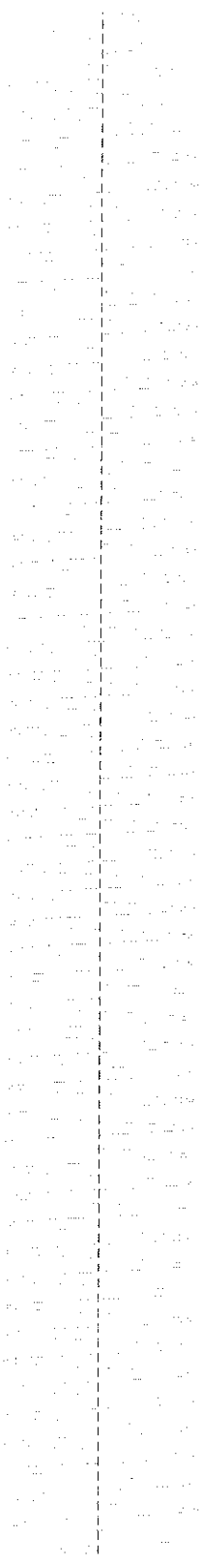
NS 1250 N 4P Calibre.1250A I#1



U12

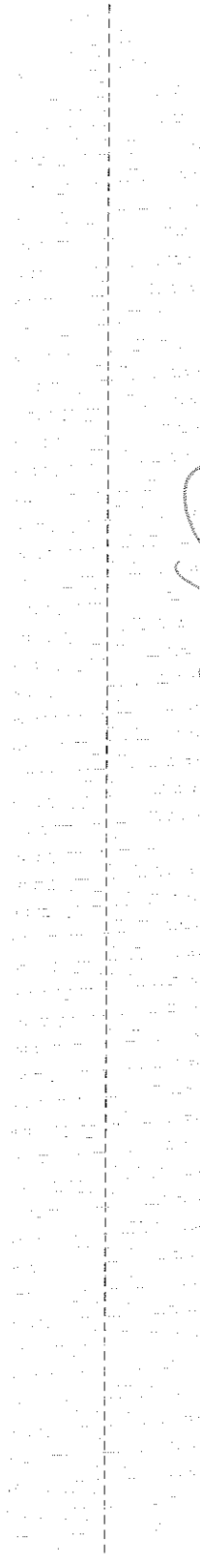
994,00 V/cm

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U23

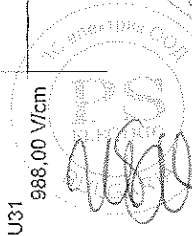
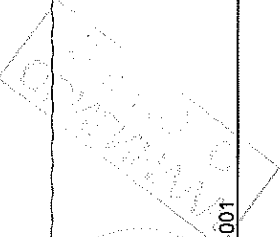
994,00 V/cm



U31

988,00 V/cm

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F01 20040096 - 0040

Effectué le 27/04/2004 09:06:13  
Edité le 06/02/2006 15:45:37

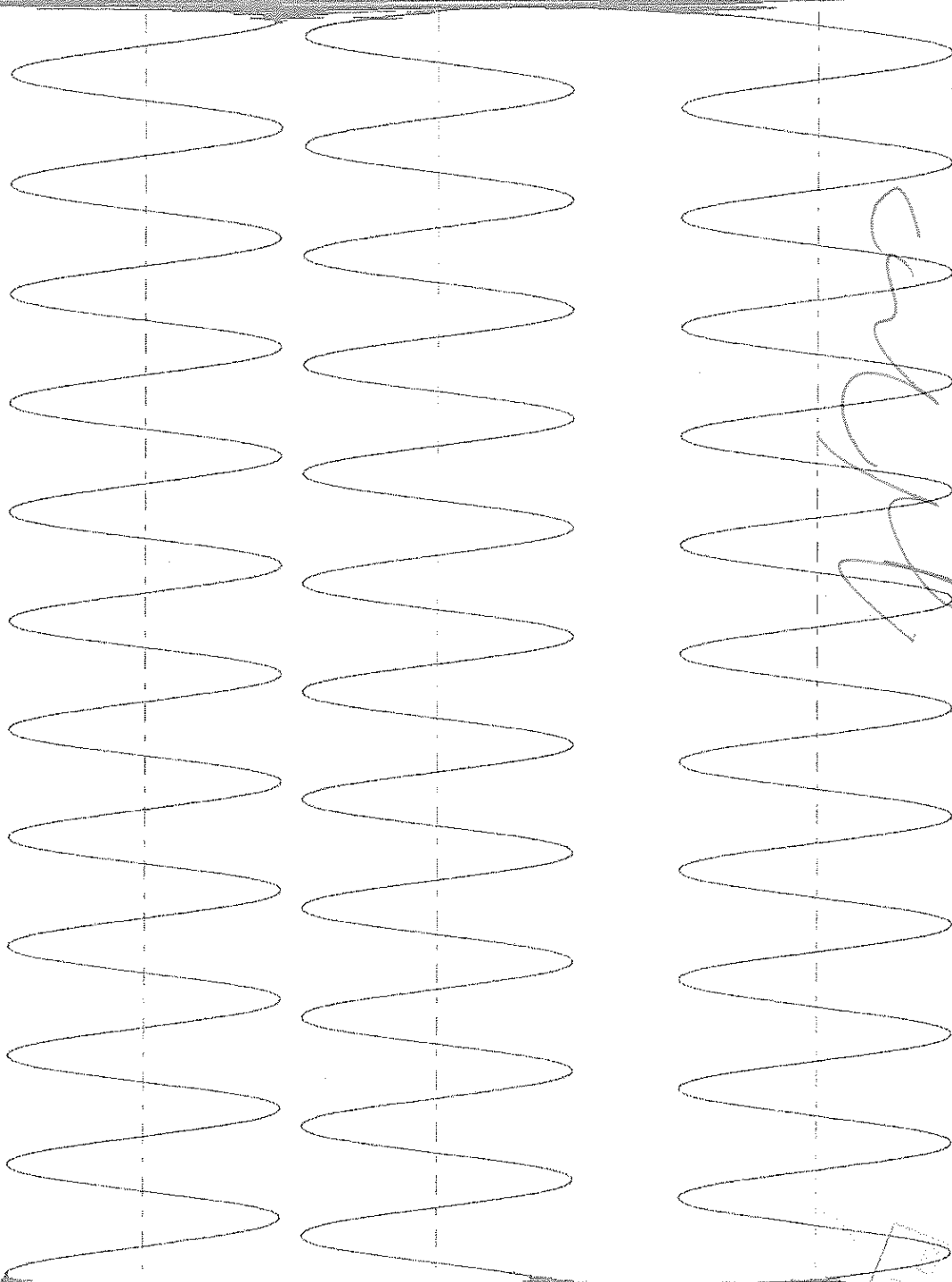


12,00 ms/cm  
200,00 ms  
10,00 ms

# Calibr. test circuit U

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

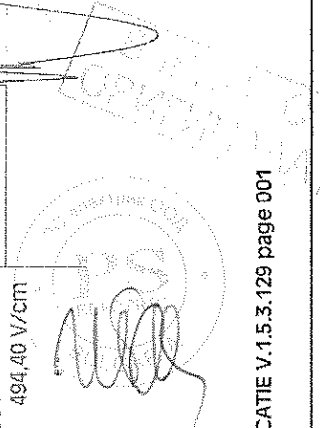
500,00 ms



U12  
495.20 V/cm

U23  
495.80 V/cm

U31  
494.40 V/cm



F01 20040169 - 0010

500.00 ms

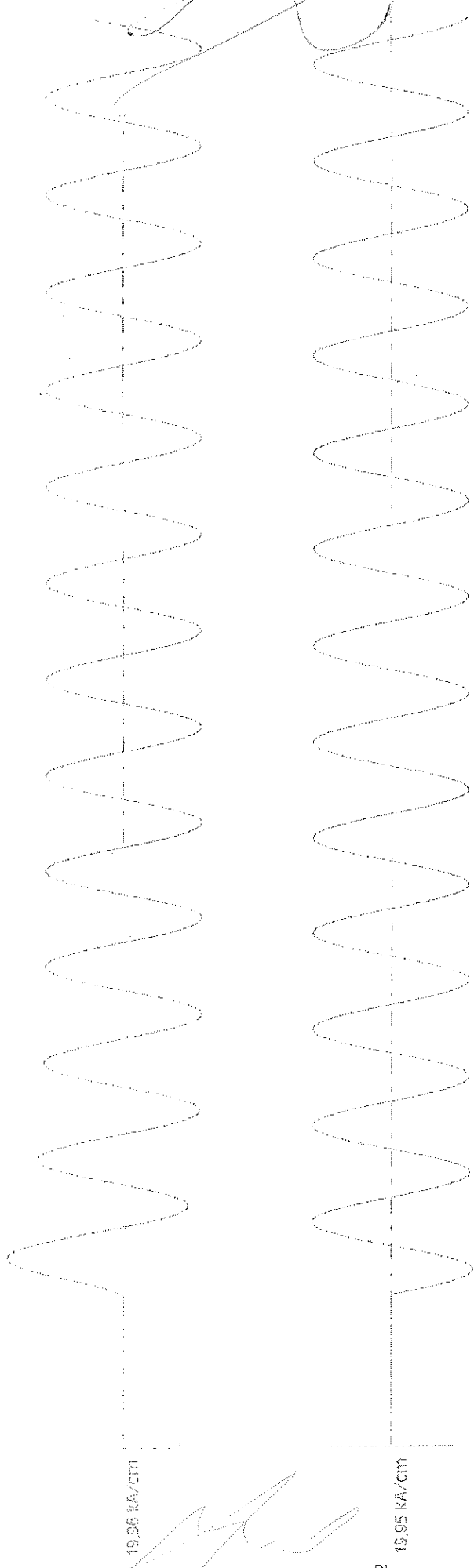
200.00 ms

12.00 ms/cm

10.00 ms

# Calibr. test circuit I

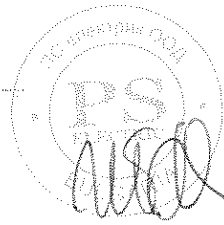
Cir tri : 19.2kA-690V+5%-Cos=0.25/0.30



19.96 kA/CT1

19.95 kA/CT1

19.92 kA/CT1



F01 20040169 - 0012

Effectué le 28/07/2004 08:55:22  
Edité le 12/07/2005 11:54:44

1,00 s

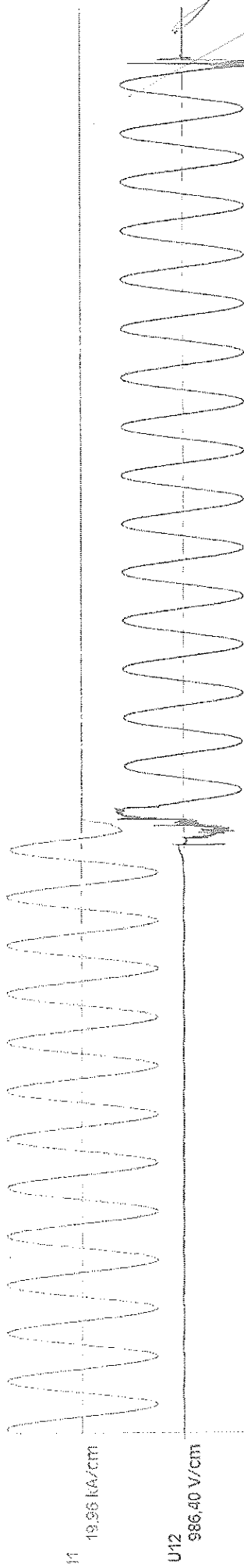
400,00 ms

24,00 ms/cm

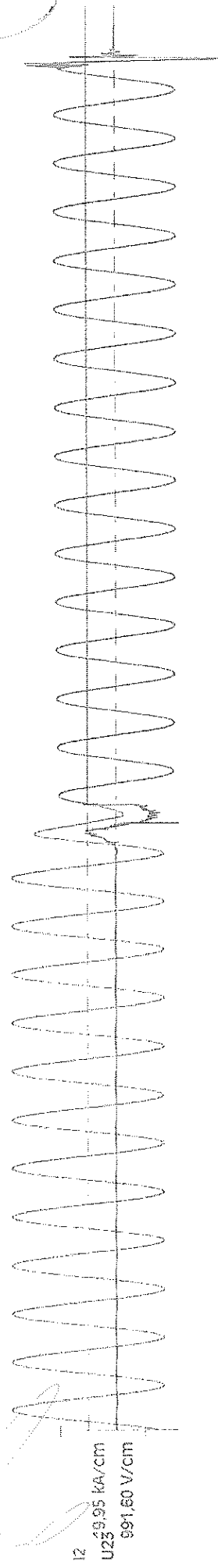
10,00 ms

# O ASEFA: 31.039.09 NS 1250NS O

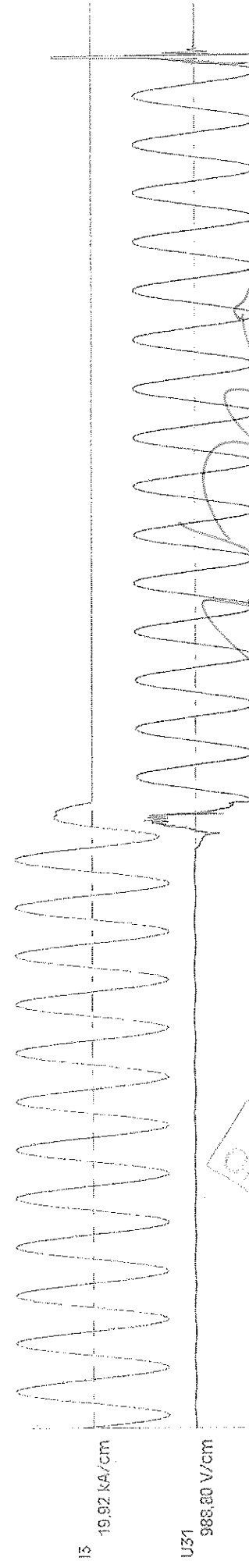
Cir tri : 19.2kA-690V+5%-COS=0.25/0.30



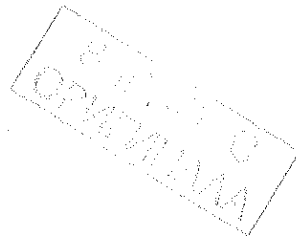
U12  
986,40 V/cm



U23  
991,60 V/cm



U31  
986,60 V/cm



F01 20040169 - 0015

Effectué le 28/07/2004 08:55:26  
Edité le 12/07/2005 11:36:14

800,00 ms

100,00 ms

28,00 ms/cm

10,00 ms

CO ASEFA: 31.039.09

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



I1  
19,96 kA/cm

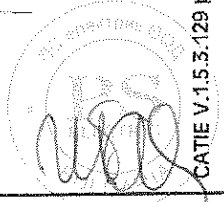
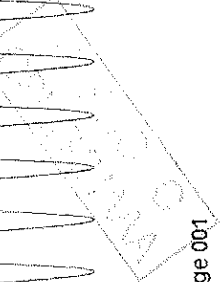
U12  
493,20 V/cm

I2  
19,95 kA/cm

U25  
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

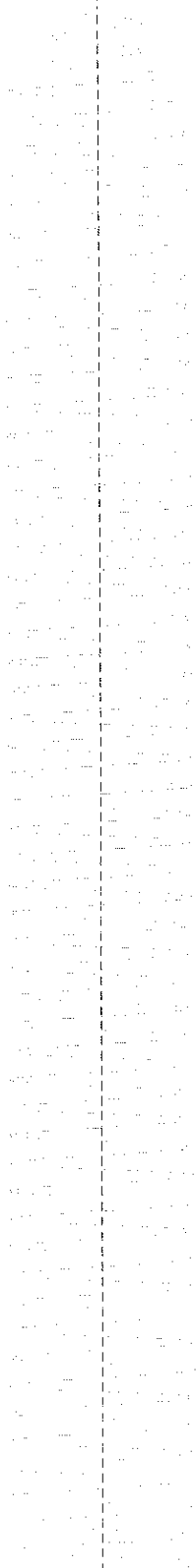
200.00 ms

52.00 ms/cm

100.00 ms

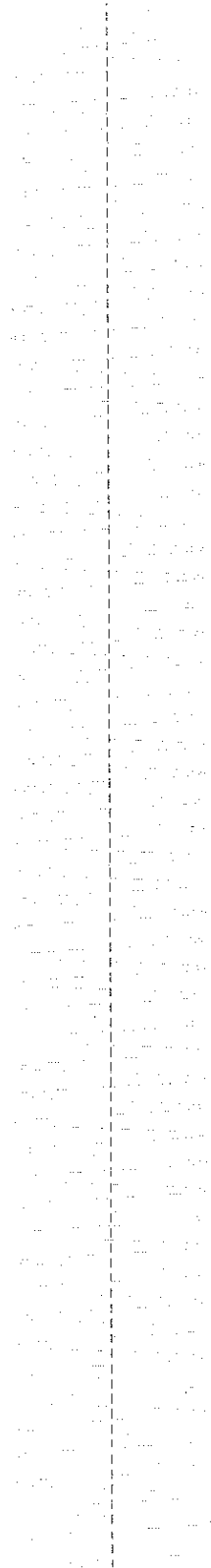
# Icw 1s ASEFA 31039.10

NS 630b 4P Calibre.630A Ir=0.4

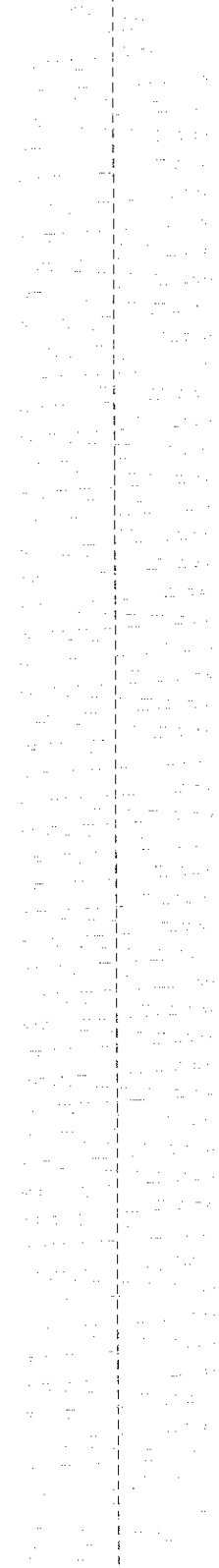


U12 994.00 V/cm

*[Handwritten signature]*

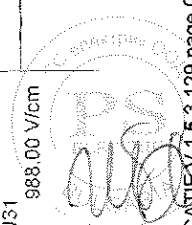
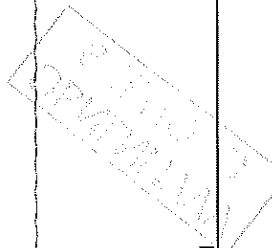


U23 994.00 V/cm



U31 988.00 V/cm

*[Handwritten signature]*



## F01 20040096 - 0041

Effectué le 27/04/2004 09:35:12  
Edité le 06/02/2006 15:47:31