



INSTRUCTIONS FOR USE AND MAINTENANCE

ИДЧЕ_С_МАНТ_02_08

Portable equipment for earthing and short-circuiting

Range of use: indoor and outdoor.
Normal climatic category (N): operating temperature -25°C to + 55°C

Maintenance

To ensure the correct functioning of the device and guarantee it fulfils its essential safety role, it is essential to ensure that it is in good condition at all times:

- Insulating stick or handle
 - store away from light and humidity
 - wipe before and after use with a silicone-treated cloth
 - check that it is free of scratches or traces of impact
- Line clamps and earth connectors:
 - clean and corrosion-free, particularly on the contact studs
 - no seizing up on threaded parts: lubricate them regularly with a neutral grease
 - no seizing up on mobile joints and mechanisms
 - no traces of impact

Cables:

- no cuts or perforations in the cable sheath
- no frayed strands, particularly close to connectors
- free of oxidation
- seals in good condition

Care shall also be taken when handling this equipment:

- avoid knocking or dropping
- do not drag the device along the ground when transporting it
- avoid excessive or rough tightening of the connectors
- make sure that storage conditions are adequate

Repairing the equipment

Never disassemble or reassemble the main components of the device: line clamp(s), cable(s), earth end connector(s). In general, the replacement of all or part of any of these components is **prohibited**. If necessary, or if in any doubt, return the complete device to **FAMECA**, which will check the device and repair it if necessary.

For obvious safety reasons, it is absolutely necessary to discard the **entire** device exposed to short-circuit current, without seeking to repair or retrieve components.



Precautions prior to use

The maximum short circuit current (Icc) admissible by an earthing or short-circuiting device will be determined by the component bearing the lowest current in the chain of the device.

This value is clearly indicated on the device on the short-circuit cable and it is the responsibility of the user to check before use if the device's Icc is appropriate to the use envisaged and the risk of short-circuiting involved.

Installing the equipment

The following steps must be followed, completely and in the correct order:

Checking the absence of voltage

Switch off the line or the installation, and then check the absence of voltage using an appropriate device.

Connecting the equipment to the earth

Always begin by connecting the device's earthing clamp or vice to the installation earth system (earth network, metallic tower, earthing rod, etc...).
For screw-type clamps and vices, tighten them firmly, but not excessively or roughly.
The earthing cable must be completely unwound.

Connecting the line clamps

Using the insulating stick or handle, position and fasten the line clamps onto the conductors. For screw-type clamps, tighten them firmly, but not excessively or roughly.
All the short-circuit cables must be completely unwound and must not be tangled.

Removing the equipment

The following steps must be followed, completely and in the correct order:

Removing the line clamps

Using the insulating stick or handle, unfasten and remove all the line clamps from the conductors.

Removing the earth connection

This operation must always be done last.

Storing the equipment

Clean and visually inspect the equipment.
Store it correctly in its carrying bag or case, and/or in its storage place.

стр. 206

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: **“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“**

Обособена позиция № 1: „Преносими заземители“

ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА

ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“

5. Документи за Преносими заземители за Ср.Н. за шини за ЗРУ Ср.Н. – със заземителен кабел и кабел за свързване на късо (гъвкави медни въжета) – 50 мм²

Приложение № 5.3

Декларация за съответствие, придружена с превод на български език

Участник: “ИНТЕРКОМПЛЕКС” ООД
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg

| | |
|--|--|
| Доставчик: SIBILLE FAMECA ELECTRIC Адрес: 815 В chemin du razas, ZI les plaines 26780 MALATAVERNE Франция | ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ (NF L 00-015C) |
| Клиент: „ИНТЕРКОМПЛЕКС“ ООД Адрес: бул. „Пещерско шосе“ 201 4015 Пловдив България | Декларация №: DEVSFE1500670A Брой стр.: 1/1 |

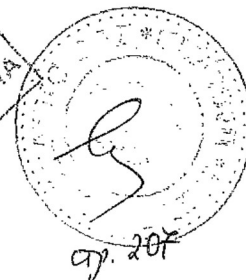
| Договор №: Заземления | | Количество | Стандарт |
|----------------------------------|----------------|------------|----------|
| Обозначение | Референция/тип | | |
| МГВ 35 мм ² | TSC35 | | IEC61138 |
| МГВ 50 мм ² | TSC50 | | IEC61138 |
| МГВ 95 мм ² | TSC95 | | IEC61138 |
| Клема с байонетен накрайник | MT535B | | IEC61230 |
| Заземителна клема NB8 6 до 25 | NB8 | | IEC61230 |
| Клема Ср.Н. | MT535URUB | | IEC61230 |
| PXV 1070 В | PXV | | IEC60855 |
| PXV 1150 В | PXV | | IEC60855 |
| PXV 1250 В | PXV | | IEC60855 |

С настоящата декларация гарантираме, че, освен ако изрично не са посочени изключения, избраното оборудване съответства на изискванията на процедурата/ договора и че, след преминаване на необходимите изпитания, то напълно съответства на всички посочени стандарти, както и останалите приложими стандарти и регулации.

Мениджър – управление на качеството
 Име: Grira Sabri – QSE
 Дата: 20/10/2015
 /подпис нечетлив/




ВЪРНО С
ОРИГИНАЛА



20. 2015

Supplier : SIBILLE FAMECA ELECTRIC

Company : 815 B CHEMIN DU RAZAS
ZI les Plaines
26780 MALATAVERNE
France



STATEMENT OF CONFORMITY
(NF L 00-015C)

Customer : INTERCOMPLEX LTD
Company : 201 PESHTERSKO SHOSSE STR.
4015 PLOVDIV
Bulgaria

Statement no : DEVSFE1500670A
Number of pages : 1 / 1

| Designation | Reference or type | Serial or batch number | Quantity | Complies to |
|--------------------------------------|-------------------|------------------------|----------|-------------|
| Cable section 35 mm ² | TSC35 | | | IEC61138 |
| Cable section 50 mm ² | TSC50 | | | IEC61138 |
| Cable section 95 mm ² | TSC95 | | | IEC61138 |
| Clamp MT535 with bayonet end fitting | MT535B | | | IEC61230 |
| Earthing clamp 6 to 25 type NB8 | NB8 | | | IEC61230 |
| Middle voltage clamp | MT535URUB | | | IEC61230 |
| PXV 1070 B | PXV | | | IEC60855 |
| PXV 1150 B | PXV | | | IEC60855 |
| PXV 1250 B | PXV | | | IEC60855 |

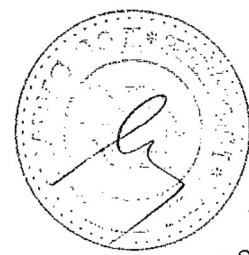
We hereby declare, barring exceptions, reservations, or exemptions listed in this statement of conformity, that the listed supplies comply with the contract requirements and that, after completion of testing and verification, they completely satisfy all specified requirements, and applicable standards and regulations.

Supplier Quality M

Name and title :

На основание чл.36а ал.3 от ЗОП

Date : 20/10/2015



ср. 208

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

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Приложение № 5.4

Приложение № 5.5

Сертификат за изследване на типа, издаден съгласно процедурата за оценяване на съответствието „Изследване на типа“ в съответствие с НСИОСЛПС или еквивалентен нормативен акт на държави-членки на ЕО, на Европейската икономическа зона/Европейската асоциация за свободна търговия (ЕАСТ), с които Република България има подписани и влезли в сила споразумения за взаимно признаване на резултатите от оценяване на съответствието и приемане на промишлените продукти (заверено копие)

Протоколи от проведените проверки и изпитвания на ПЗ в рамките на процедурата за оценяване на съответствието с приложени резултати от изпитванията (заверени копия)



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**LABEIN FOUNDATION – ENERGY UNIT
ELECTRICAL EQUIPMENT LABORATORY**

Test report

No CE35-08-AM-05

Page 1 of 8

Short circuit current test

TEST OBJECT: Portable equipment for earthing and short-circuiting

DESIGNATION: MT535URU
NB8

REQUESTED BY: FAMECA
2 Rue Gutenberg Rixheim (France)

MANUFACTURER: FAMECA

STANDARD: IEC 61230:1993

RECEPTION DATE: February 18th 2008

TESTS DATE: February 19th-21st 2008

The test object has been subjected to the tests required by the applicant, applying the procedures specified in the standard indicated before.

THE PRESENT REPORT CONSISTS OF:

No of pages: 8 (and annex of 16)

Drawings: Annex

Photographs: Annex

Oscillograms: Annex

На основание чл.36а ал.3 от ЗОП

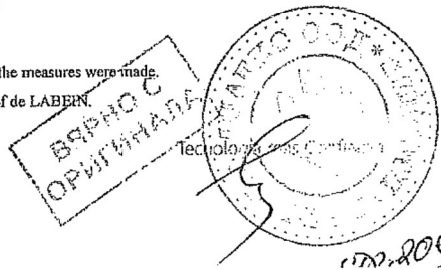


На основание чл.36а ал.3 от ЗОП

Head of Electrical Equipment Laboratory

This document is a copy in pdf of the original Report,
as requested by the client
Barakaldo, June 4th 2008

- * The present report refers only and exclusively to the sample tested and at the moment and conditions in which the measures were made.
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№ 01 Служба Електропреноси • Т.Е. 34827727

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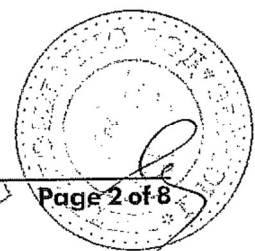
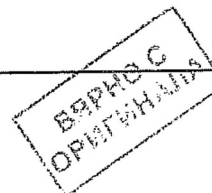
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ANNEX DRAWINGS
 PHOTOGRAPHS
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1. TEST OBJECT DESIGNATION

Portable equipment for earthing and short-circuiting.

Manufacturer: FAMECA

Designation:

Line clamp: MT535URU

Earth clamp: NB8

Short-circuiting cable: TFK950275 (section of 95 mm² and 2.75 m length)

Earthing cable: TFK3510 (section of 35 mm² and 10 m length)

Rated current, I_r: 25 kA, 1 s (phase-to-phase short circuit)

6 kA, 1 s (phase-to-earth short circuit)

Definition dossier reference: diMT535URU01

diNB8

diTFK02

See photographs and drawings of the test object in the annex.

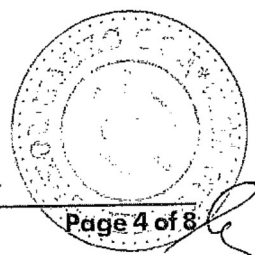
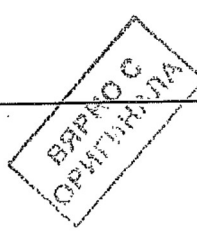
2. TESTS PERFORMED. STANDARD

Short-circuit current tests.

The tests have been performed according to the procedure specified in the following standard:

IEC 61230:1993 and CDV IEC 61230 ed. 2: December 2007 "Live working- Portable equipment for earthing or earthing and short-circuiting"

The calculation of the uncertainties of the measurements is available.

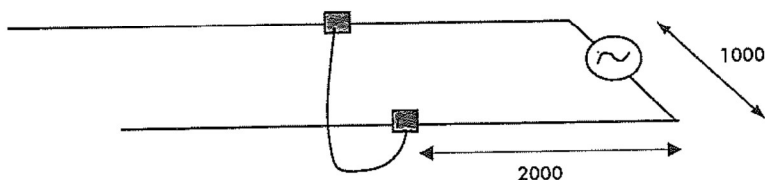


3. PHASE TO PHASE SHORT-CIRCUIT TESTS

3.1. Test description

The test is carried out according to the specifications of the manufacturer and in accordance with subclause 6.6 of the standard IEC 61230.

The scheme of the test is the following, figures in mm:



The test circuit is arranged at 2.6 m height from the ground.

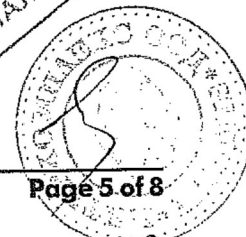
According to the manufacturer, line clamps have been submitted, previously, to a salt fog test of 64 hours following IEC 68-2-11 (see CETIM CERMAT test report n° HD/HD/08E0102-5).

4 Tests with aluminium flexible cable of diameter 31 mm are performed with the following parameters:

I_{test} (r.m.s.): 25 kA
 I_{test} (peak): 62.5 kA
 Time: 1 s
 Torque (line clamp): 20 Nm

See photographs of the test arrangement in the annex.

ВЯРНО С
ОРИГИНАЛА



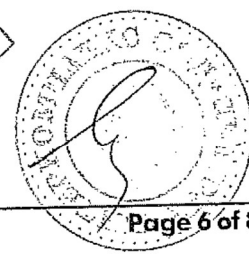
3.2. Results

Registered values are the following:

| Oscillogramm no. | 34 | 35 | 36 | 37 |
|---|-------|-------|-------|-------|
| Short-time r.m.s. current I_{th} (kA) | 25.8 | 25.8 | 25.6 | 25.7 |
| Short-time peak value current, I_{dyn} (kA) | 64.6 | 64.8 | 64.3 | 64.5 |
| Duration (s) | 1.005 | 1.005 | 1.005 | 1.006 |
| Joule integral I^2t (AAs.10 ⁸) | 6.92 | 6.96 | 6.82 | 6.86 |
| Frequency (Hz) | 50 | 50 | 50 | 50 |

Result: The test objects withstand the test current during 1 s. There is neither current interruption nor arcing during the test time.

ВЕРНО С
ОРИГИНАЛА

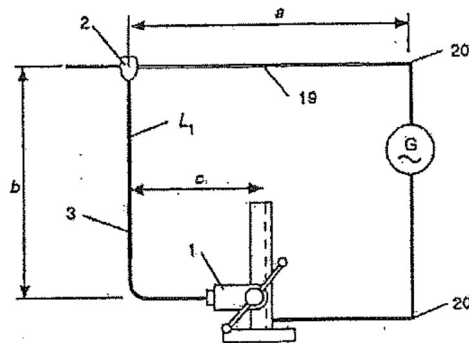


4. PHASE TO EARTH SHORT-CIRCUIT TEST

4.1. Test description

The test is carried out according to the specifications of the manufacturer and in accordance with subclause 6.6 of the standard IEC 61230.

The scheme of the test is the following:



b: 6.5 m

a: 2 m

c: Approximately 1.5 m

19: Line cable

3: Earthing cable

2: Line clamp

1: Earth clamp

According to the manufacturer, line clamps and earth clamps have been submitted, previously, to a salt fog test of 64 hours following IEC 68-2-11 (see CETIM CERMAT test report n° HD/HD/08E0102-5).

Two tests have been performed with the following parameters:

Line conductor: Aluminium flexible cable of diameter 31 mm

Earth conductor: Earth rod 701

Test parameters:

I_{test} (r.m.s.): 6 kA
 I_{test} (peak): 15 kA
 Time: 1 s
 Torque (earth clamp): 20 Nm
 Torque (line clamp): 20 Nm

See photographs of the test arrangement in the annex.

4.2. Results

| | | |
|---|-------|-------|
| Oscillogramm no. | 26 | 27 |
| Short-time r.m.s. current I_{th} (kA) | 6.2 | 6.1 |
| Short-time peak value current, I_{dyn} (kA) | 15.9 | 15.7 |
| Duration (s) | 1.005 | 1.004 |
| Joule integral I^2t (AAs.10 ⁷) | 3.99 | 3.93 |
| Frequency (Hz) | 50 | 50 |

Result: The test objects withstand the test current during 1 s. There is neither current interruption nor arcing during the test time.

See oscillograms in the annex.



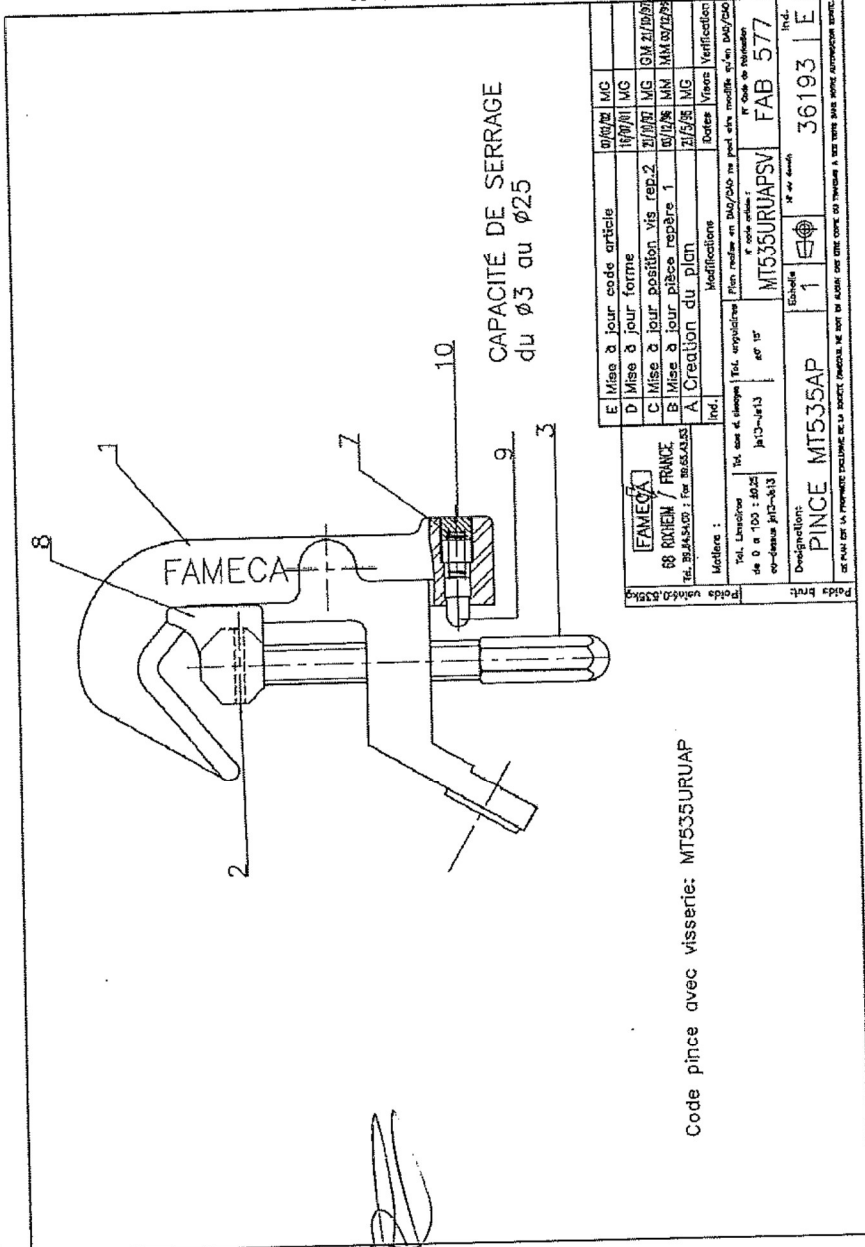
DOSSIER D'IDENTIFICATION

MT535URU

diMT535URU

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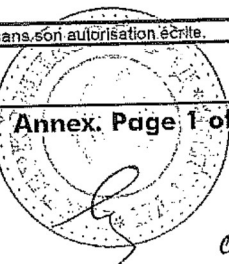
5. PLAN D'ENSEMBLE




Code pince avec visserie: MT535URUAP

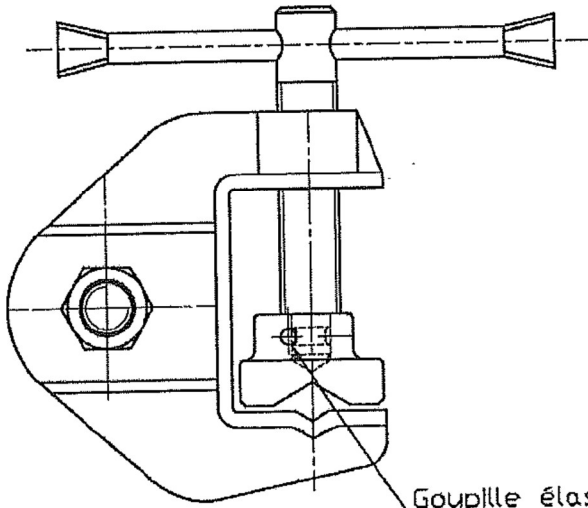
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ВЕРНО
ОРИГИНАЛ



сп. 217

| | | |
|---|---------------------------------|----------|
|  | DOSSIER D'IDENTIFICATION | NB8 |
| | | DINB8 |
| | | Page 6/9 |




Goupille élastique $\varnothing 5.11$

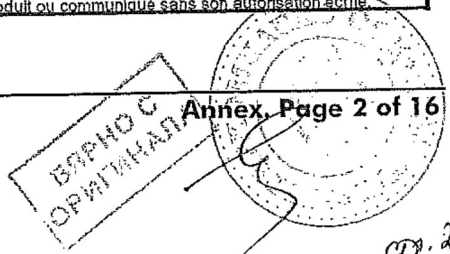
Capacité de serrage:
 $\varnothing 6$ à 25mm
 Barres plates 0 à 25mm

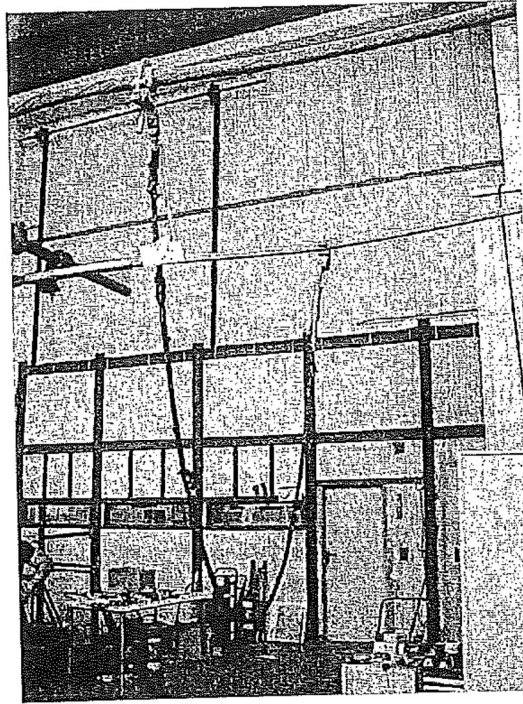
Étau sans visserie référence: NB8SV

Poids brut:
 Poids usiné: 0,365kg

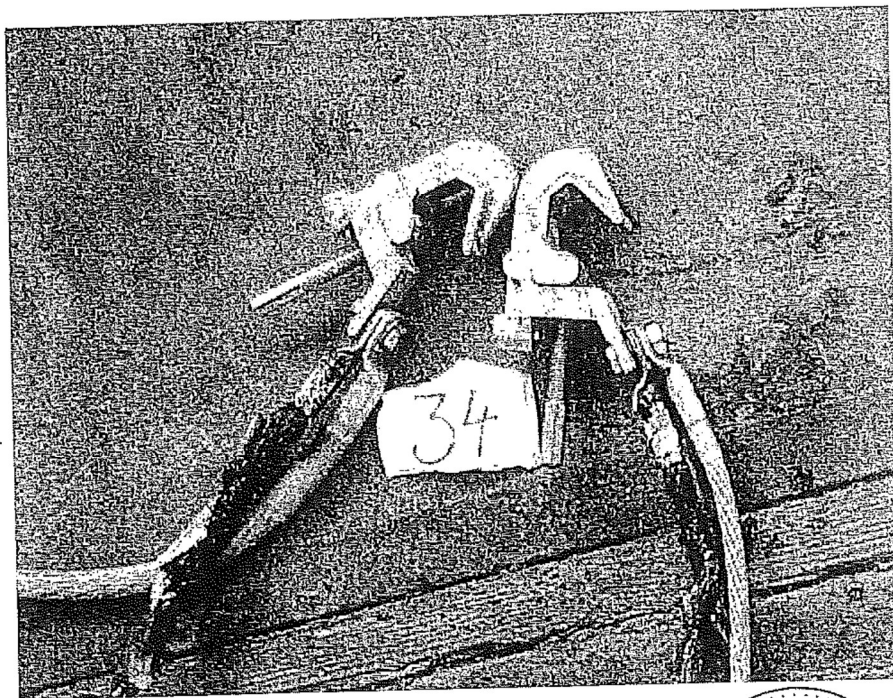
| | | | | | |
|--|--|--|--------------------------|--|-------|
|  68 RIXHEIM / FRANCE Tél. 03.89.64.64.00 ; Fax 03.89.65.43.53 | | | | | |
| Matière : | | Ind. | Modifications | Dates | Visas |
| TOLERANCES GENERALES D'USAGES : SPECIFICATION PREDD3 Dimensions linéaires : de 0,5 à 100 : $\pm 0,25$ de 100 à 400 : $\pm 0,5$ | | Dimensions angulaires pour longueur côté court de l'angle : js13-js13 | | Plan réalisé en DAO/CAO ne peut être modifié qu'en DAO/CAO | |
| Designation: ETAU NB8 | | Echelle 1 | N° code article : NB8 | N° Code de fabrication FAB 404 | |
| | | | N° du dessin 49497 | Ind. A | |
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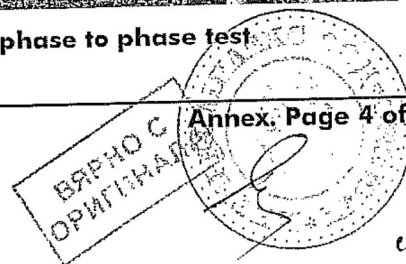


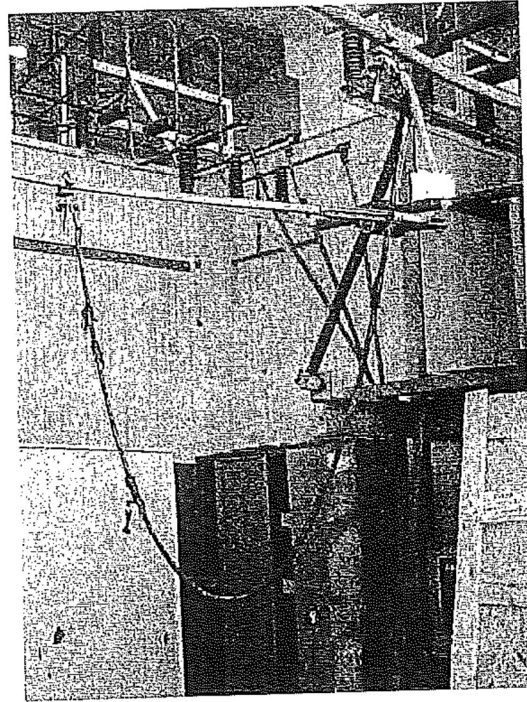


Test object after the first phase to phase test

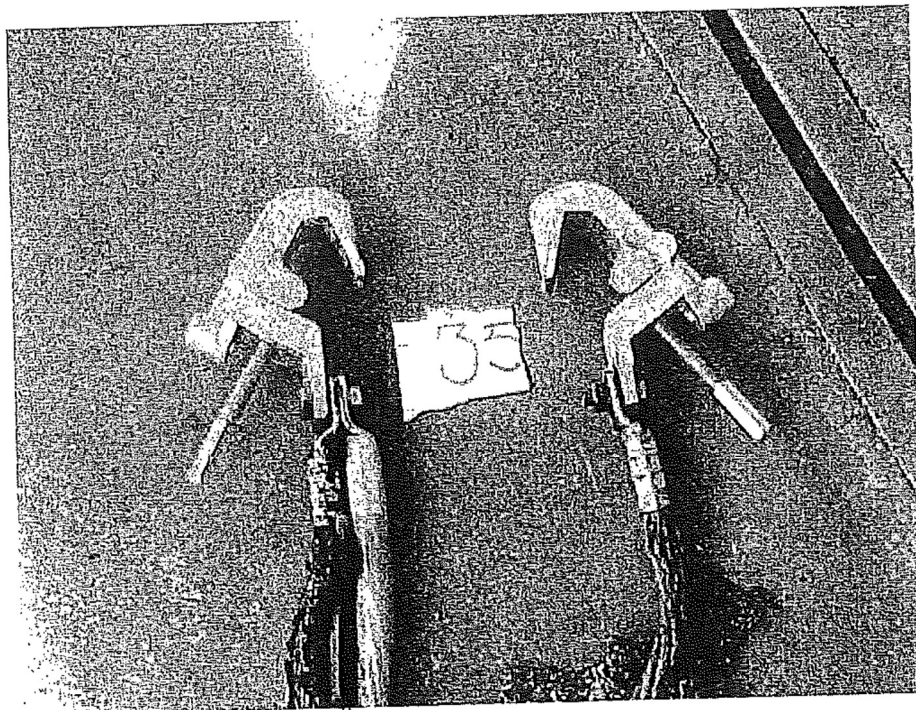


Line clamps after the first phase to phase test

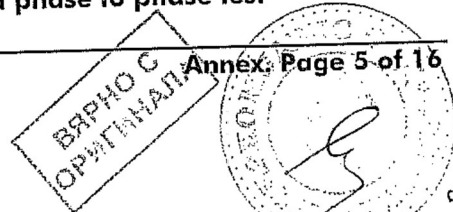


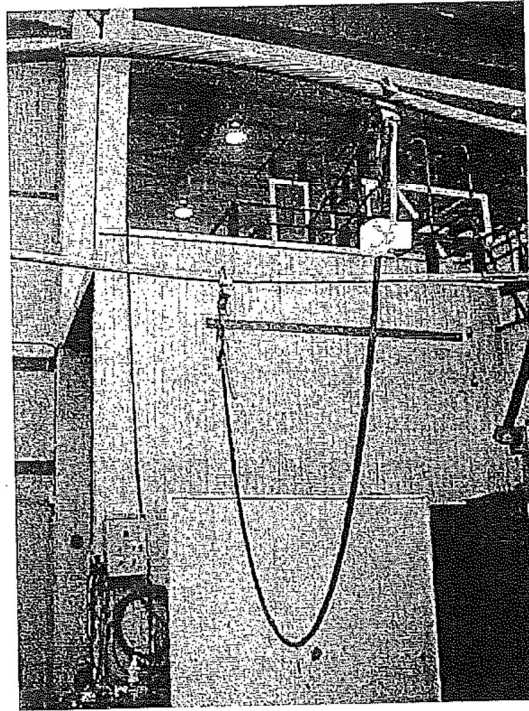


Test object after the second phase to phase test

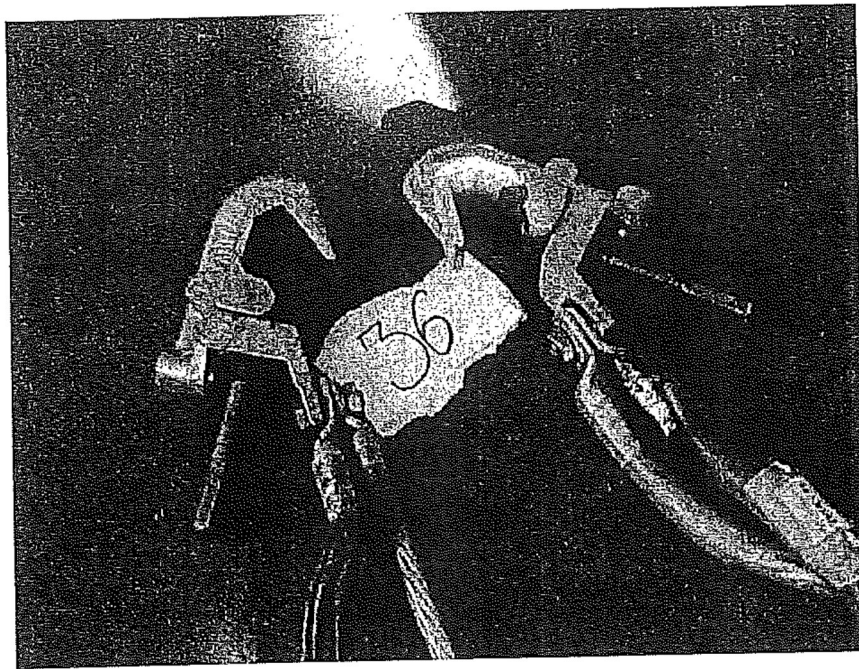


Line clamps after the second phase to phase test

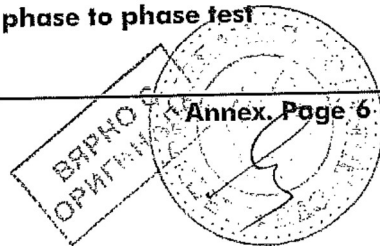


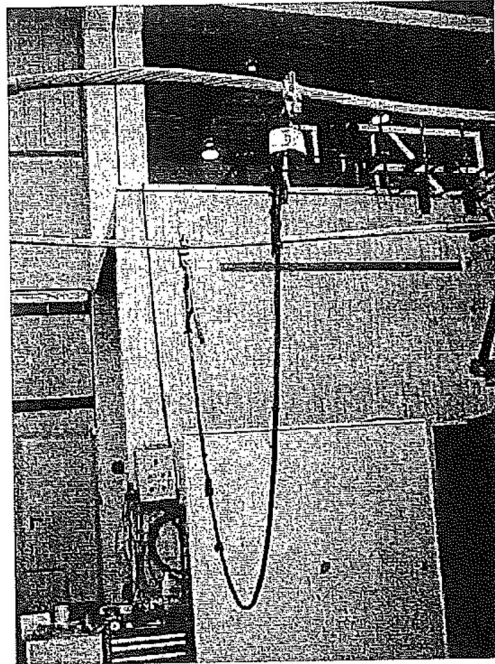


Test object after the third phase to phase test



Line clamps after the third phase to phase test

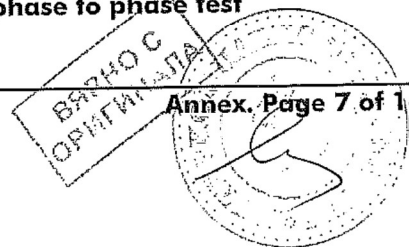




Test object after the fourth phase to phase test

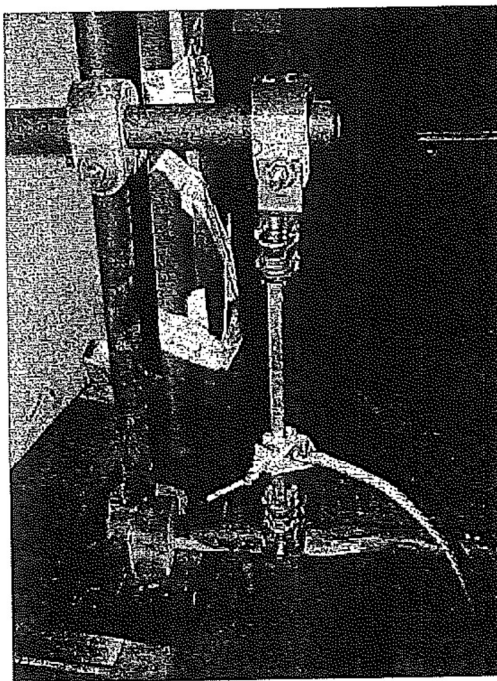


Line clamps after the fourth phase to phase test

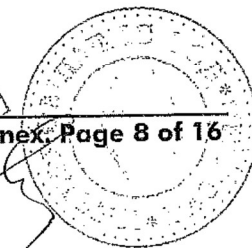


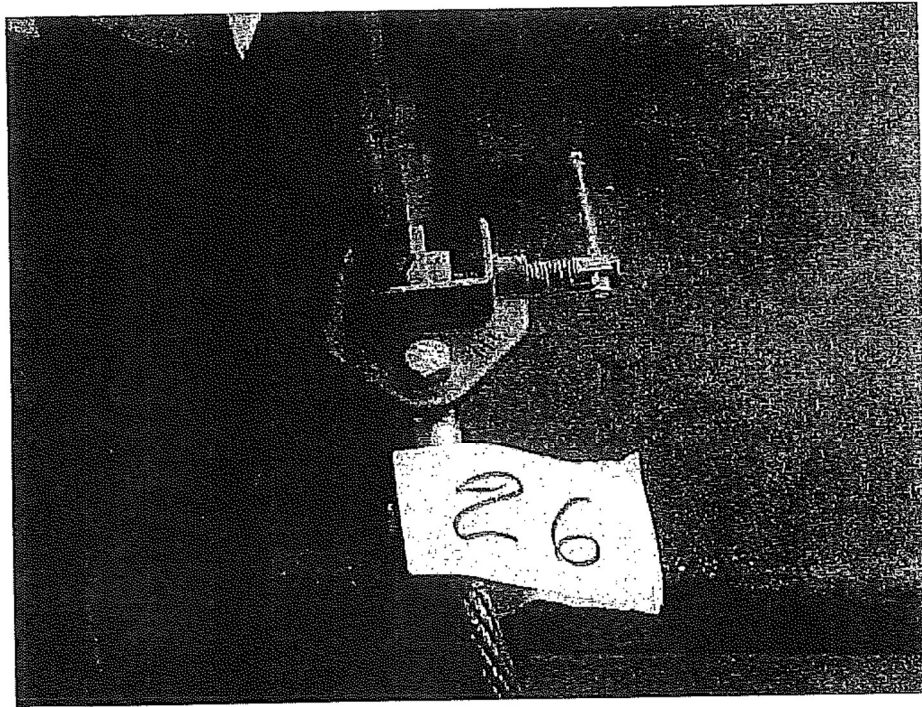


Test arrangement for the phase to earth short-circuit tests



Earth clamp connexion to the earth rod

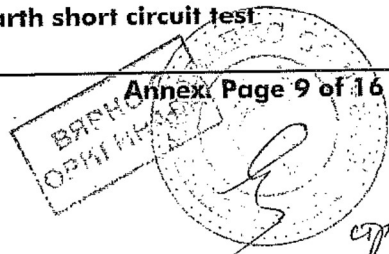


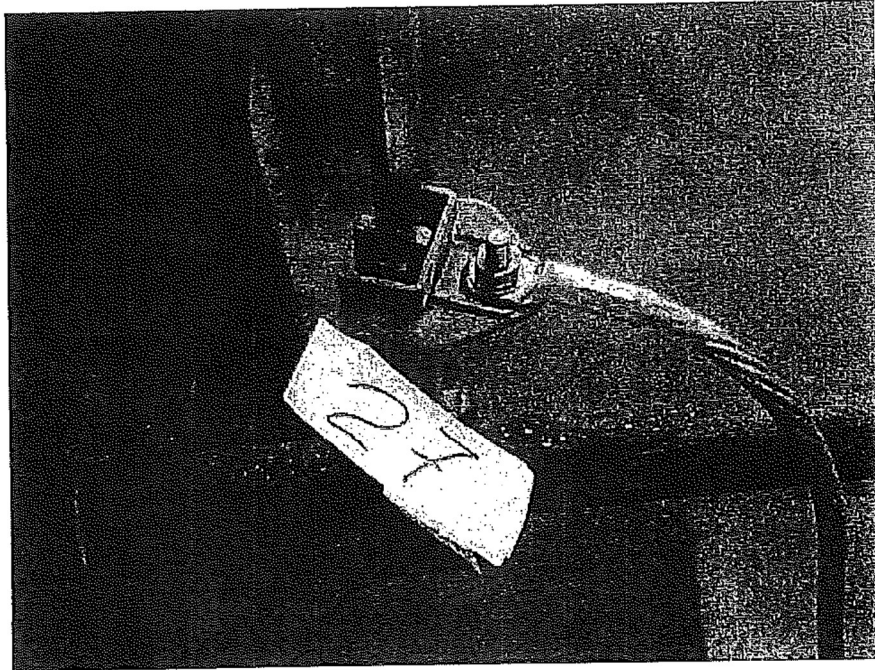


Earth clamp after the first phase to earth short circuit test



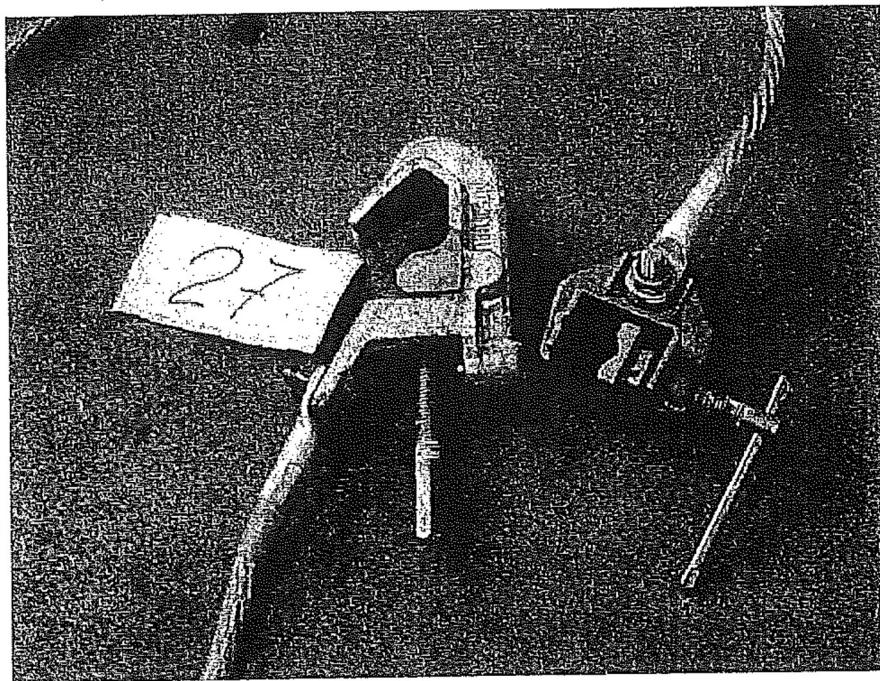
Line clamp after the first phase to earth short circuit test





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Earth clamp after the second phase to earth short circuit test

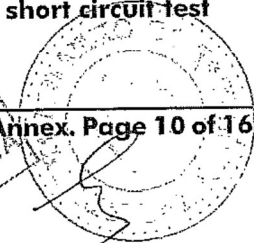


[Handwritten signature]

Earth and line clamps after the second phase to earth short circuit test

[Handwritten signature]

ВЕРНО С Annex. Page 10 of 16
ОРИГИНАЛ

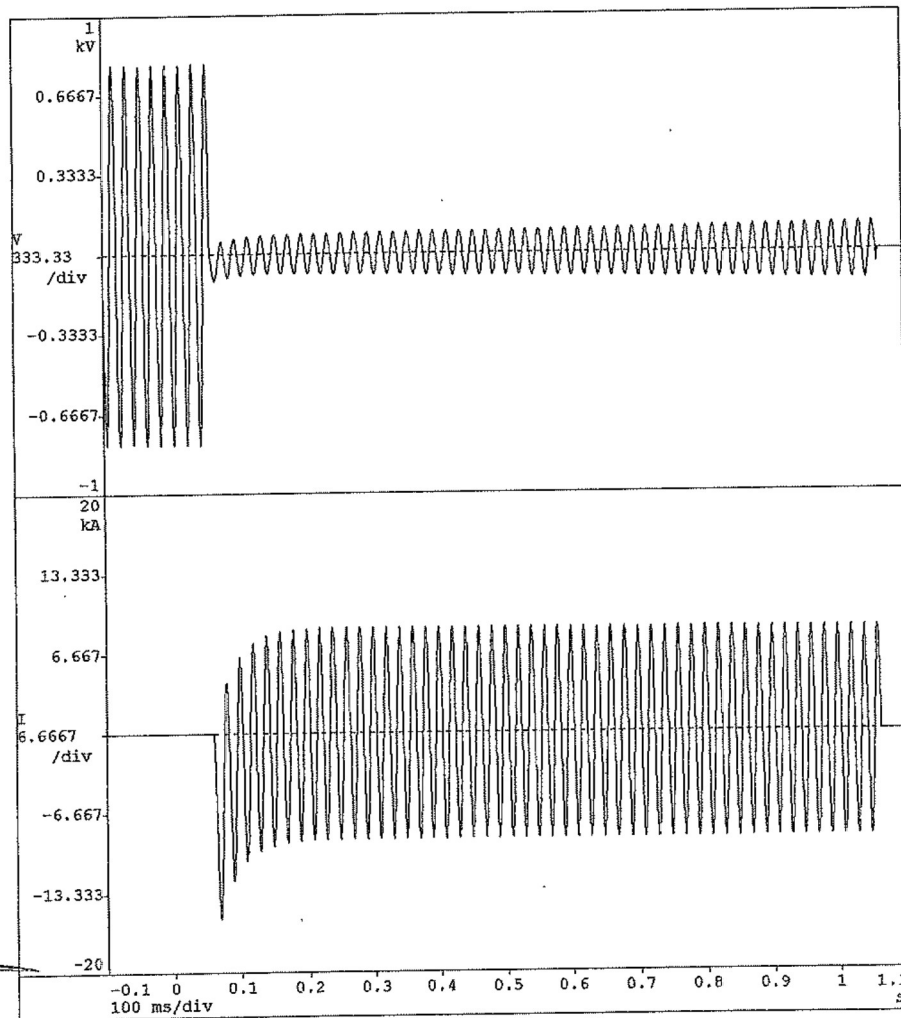


| | |
|--|--------------|
| V (eficaz/RMS) | 549.97 V |
| I (eficaz/RMS) | 6.19 kA |
| I (cresta/peak) | 15.87 kA |
| t ₂ | 3.99E+07 AAs |
| t _i | 0.059 s |
| t _e | 1.084 s |
| t _{total} (t _e -t _i) | 1.005 s |

Fecha / Date: 20/02/08

Nº EXPEDIENTE: CE35-08-AM

Nº OSCIOGRAMA: 26



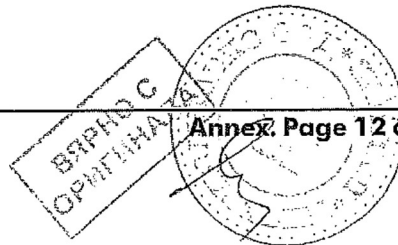
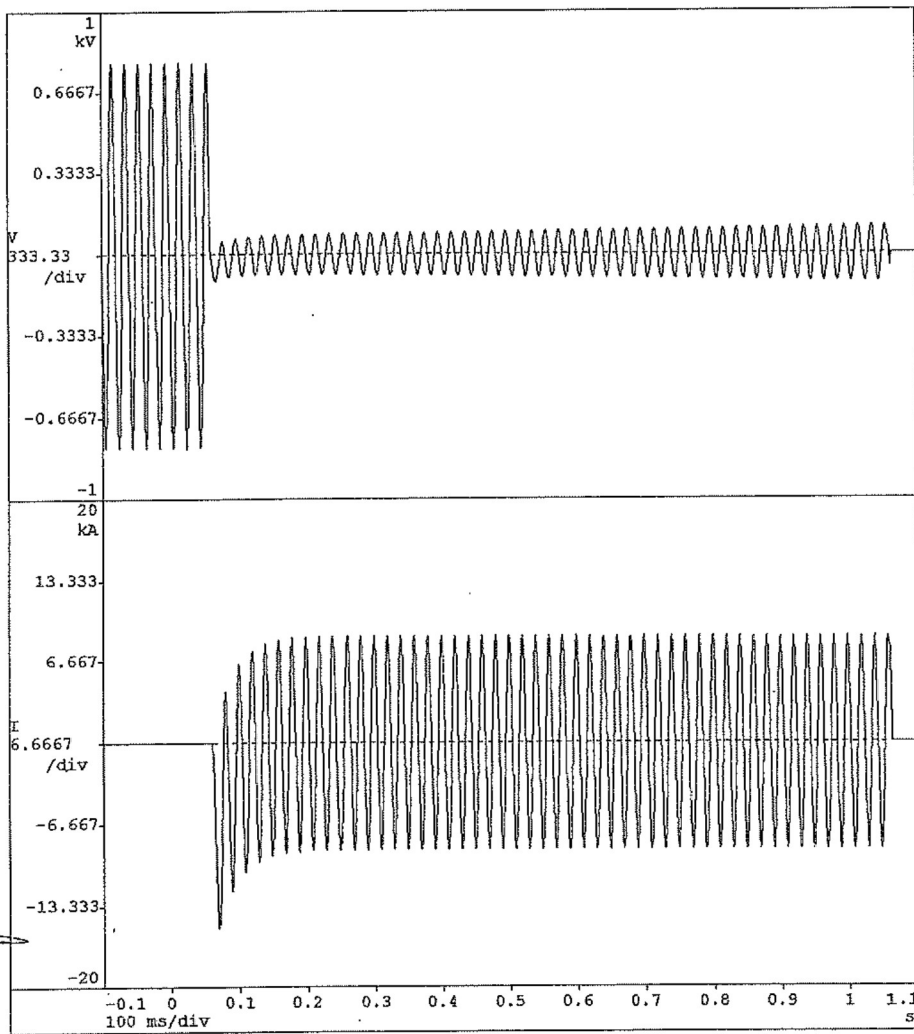
BRPHO C
OP/IF/SHATA

| | |
|---|--------------|
| V (eficaz/RMS) | 547.32 V |
| I (eficaz/RMS) | 6.14 kA |
| I (cresta/peak) | 15.67 kA |
| Z _t | 3.93E+07 AAs |
| t _i | 0.059 s |
| t _e | 1.063 s |
| t total (t _e -t _i) | 1.004 s |

Fecha / Date: 20/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 27

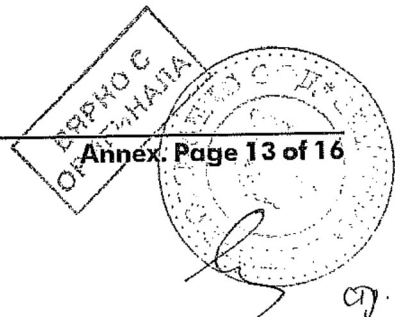
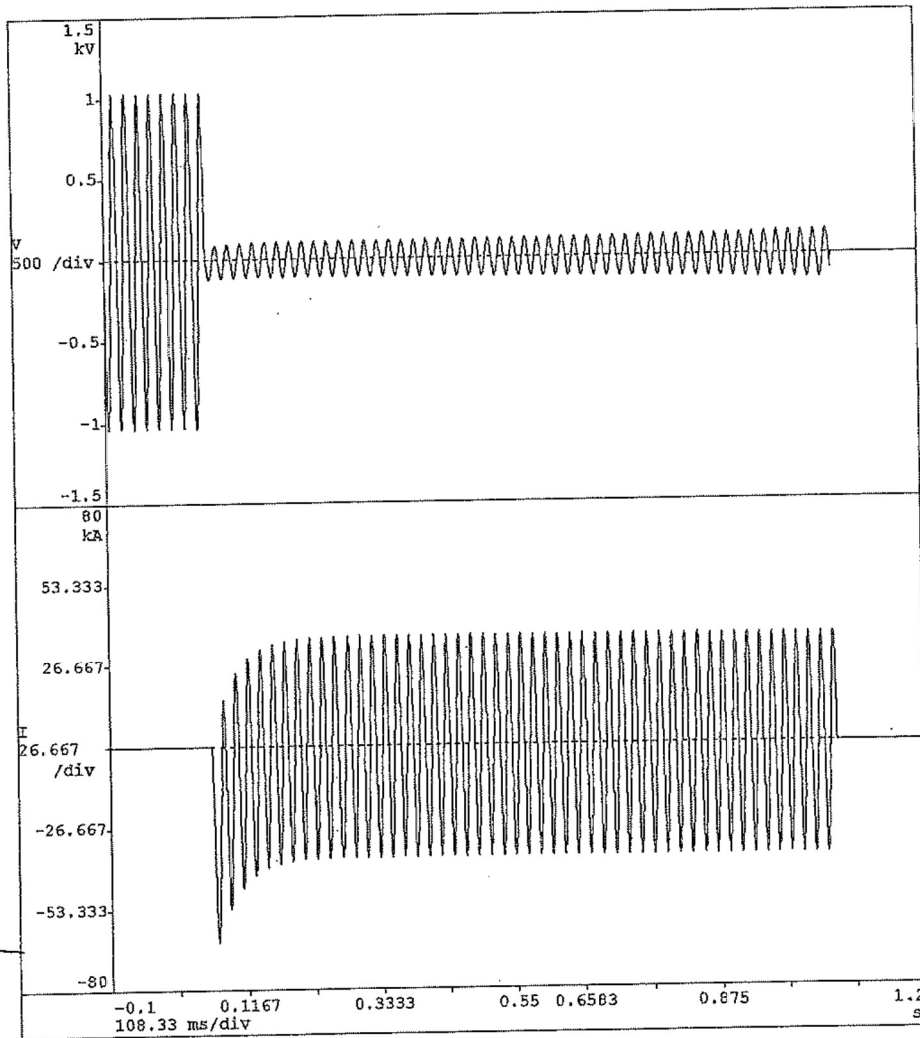


| | |
|--|--------------|
| V (eficaz/RMS) | 739.49 V |
| i (eficaz/RMS) | 25.78 kA |
| I (cresta/peak) | 64.58 kA |
| t _{2-t} | 6.92E+08 AAs |
| t _{ij} | 0.060 s |
| t _{te} | 1.065 s |
| t _{total (t_e-t_i)} | 1.005 s |

Fecha / Date: 21/02/08

Nº EXPEDIENTE: CE35-08-AM

Nº OSCILOGRAMA: 34



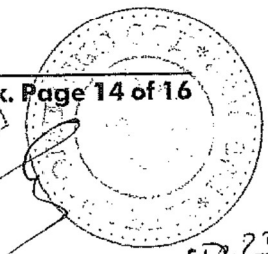
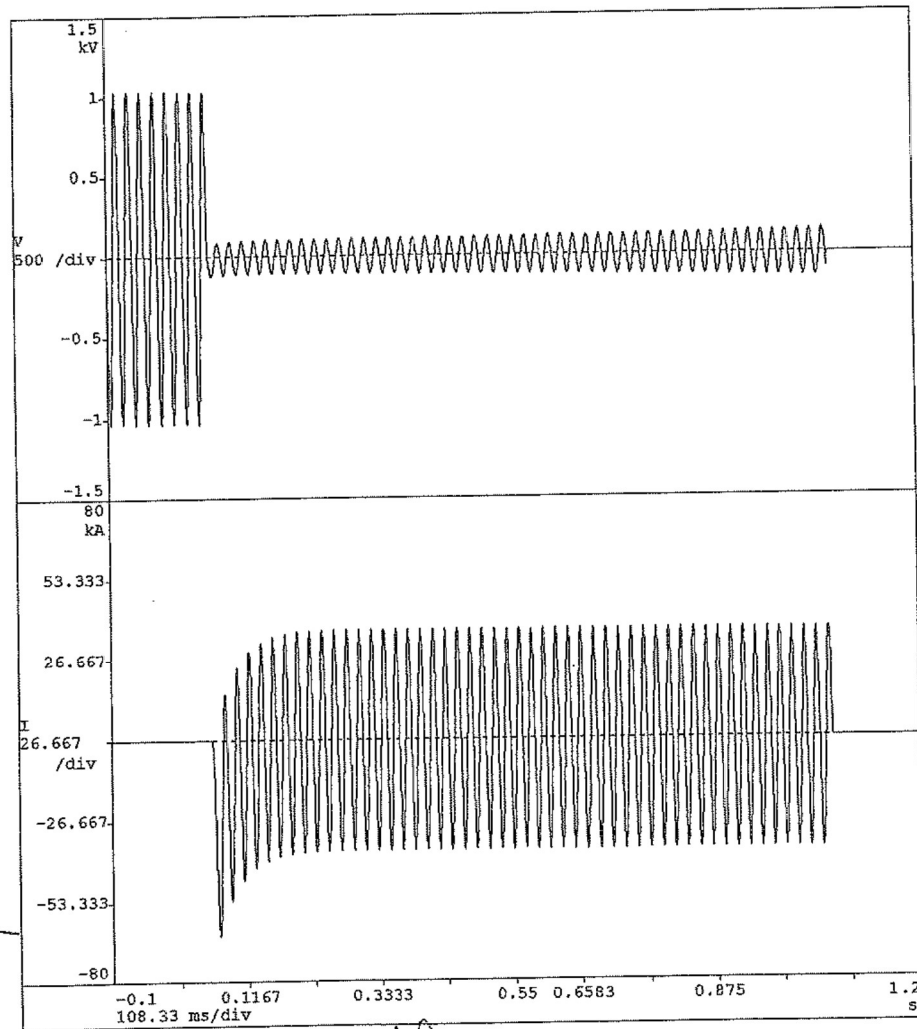
527.6

| | |
|--|--------------|
| V (eficaz/RMS) | 740.07 V |
| I (eficaz/RMS) | 25.84 kA |
| I (cresta/peak) | 64.83 kA |
| $\int I^2 dt$ | 6.96E+08 AAs |
| t _i | 0.060 s |
| t _e | 1.065 s |
| t _{total} (t _e -t _i) | 1.005 s |

Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 35

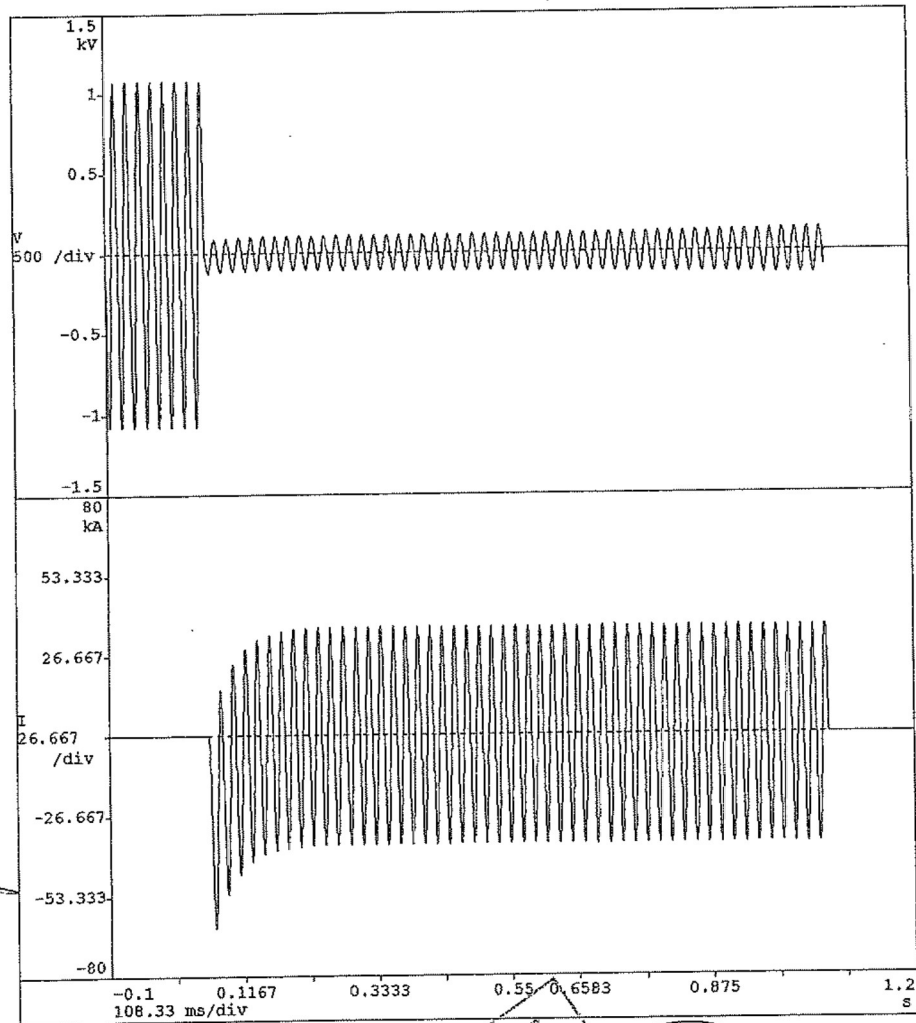


| | |
|-----------------------|--------------|
| V (eficaz/RMS) | 771.12 V |
| I (eficaz/RMS) | 25.57 kA |
| V (crestal/peak) | 64.26 kA |
| $I_{2,t}$ | 6.82E+08 AAs |
| t_f | 0.060 s |
| t_e | 1.065 s |
| $t_{total} (t_e-t_f)$ | 1.005 s |

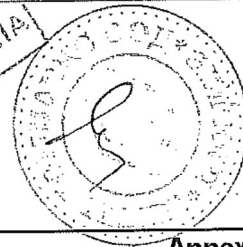
Fecha / Date: 21/02/08

Nº EXPEDIENTE: CE35-08-AM

Nº OSCILOGRAMA: 36



ВЕРНО С
ОРИГИНАЛА

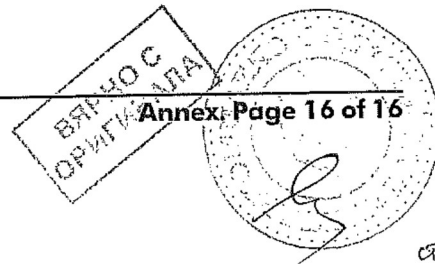
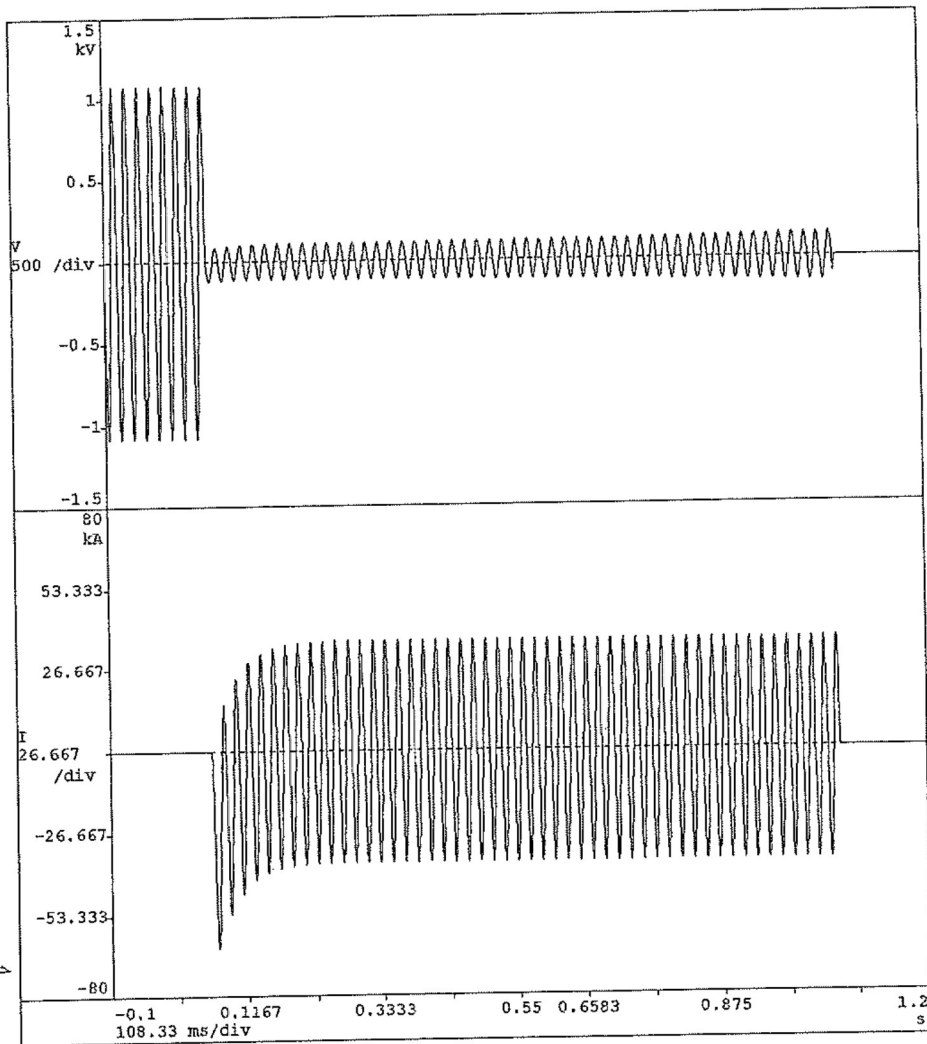


| | |
|--|--------------|
| V (eficaz/RMS) | 774.52 V |
| i (eficaz/RMS) | 25.86 kA |
| I _{crestal/peak} | 64.48 kA |
| t _{2-t} | 6.86E+08 AAs |
| t _i | 0.060 s |
| t _e | 1.066 s |
| t _{total (t_e-t_i)} | 1.006 s |

Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 37





TEST REPORT

N° 135086 – 671357 B-Cr17/02/10

English version – Original in French

ISSUE TO : FAMECA
2, rue Gutenberg
BP 13
68173 RIXHEIM CEDEX

OBJET : TESTS ACCORDING TO THE STANDARD IEC 60855-1 (10:2009)
INSULATING FOAM-FILLED TUBES FOR LIVE WORKING.

Model tested : Tubes ø28mm red and ø32mm yellow

Test date : May 2015

Composition of this document: 19 pages

Document initially released on: July 10, 2015
Corrected on: February 10, 2017

Test supervised by:
The test technician,

D. TELLIER

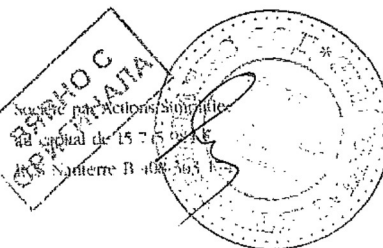
На основании чл.36а ал.3 от ЗОП

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стр. 233



БЪЛГАРСКИ СЪЮЗ НА ТЕХНИЧЕСКИТЕ ЕКСПЕРТИ

1 – TESTED PRODUCT

Two diameter tubes red 28mm and yellow 32mm.

| Designation | | Marking | |
|-------------|--------|-------------------------------|--|
| Tube ø28mm | Red | FAMECA ø28 037/15 CEI 60855-1 | |
| Tube ø32mm | Yellow | FAMECA ø32 048/15 CEI 60855-1 | |

2 – TEST PROGRAM

The test program, established with the customer, was to realize in the local society FAMECA, under supervision of LCIE, type tests of the IEC 60855-1 of October 2009. Crushing test on tube has been made at CETIM and validated by LCIE.

3 – EXECUTION MODALITIES

The execution modalities have been those of the corresponding paragraph of the specification above.

Chronological order of type tests:

| Tests | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 | Group 6 | Group 7 |
|---|--|---------|---------|---------|---------|---------|---------|
| Dimensional check | <u>Note:</u> Control has not been performed on each before cutting lengths; control was performed on the control sample Group 8. | | | | | | |
| Durability of marking | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Visual check | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Dielectric test after water exposition | 3 | | | | | | |
| Wet test | | 3 | | | | | |
| Bending test | | | 3 | | | | |
| Torsion test | | | | 3 | | | |
| Crushing test on tube | | | | | 3 | | |
| Bending ageing test | | | | | | 3 | |
| Dielectric test after mechanical ageing | | | | | | 4 | |
| Dye penetration test | | | | | | | 3 |

Group and samples :

| Group | Number of test pieces |
|-------|--|
| 1 | 3 x 0.3m |
| 2 | 3 x 1.2m (cut at 0.1) |
| 3 | 3 x 2.5m |
| 4 | 3 x 1.2m |
| 5 | 3 x (3 x \varnothing ext. at $\pm 5\%$)mm |
| 6 | 3 x 2.5m |
| 7 | 3 x (100 ± 5)mm (cut at least to 0.1m from the end of initial length of cube) |
| 8 | 1 x 2m (specimen) |

4 - RESULTS

The following results have been obtained:

4.1 - Dimensional check (article 5.3.3 table B.1)

| Tube | Tolerance | Prescribed | | Measures 1 | Measures 2 | Measures 3 |
|---------------------|--|------------|---------|------------|------------|------------|
| | | Min. | Max. | | | |
| $\varnothing 28$ mm | $\varnothing < 30$ mm (± 0.5 mm) | 27.5mm | 28.5mm | 27.87mm | 27.85mm | 27.84mm |
| $\varnothing 32$ mm | $30 \leq \varnothing \leq 40$ mm (± 0.55 mm) | 31.45mm | 32.55mm | 32.03mm | 32.02mm | 32.17mm |

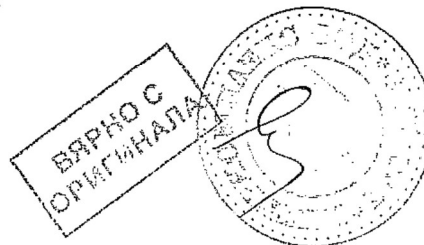
Satisfactory results

4.2 - Durability of marking (article 5.5.6 table B.1)

The markings shall be rubbed for 1min, with a clean soaked in water then with a clean cloth soaked in isopropanol.

| Sample test | Prescribed | Observation |
|--------------------------|---|-------------------|
| Tube $\varnothing 28$ mm | The markings must still legible and the characters do not run or smear. | Nothing to report |
| Tube $\varnothing 32$ mm | | Nothing to report |

Satisfactory results



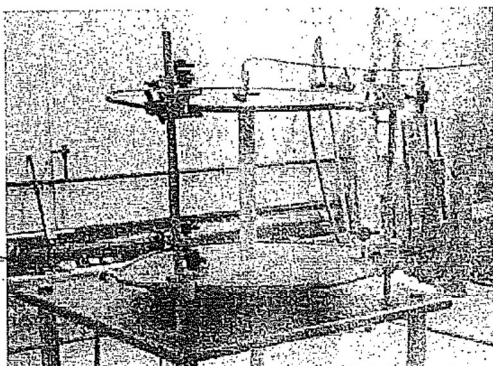


4.3 – Visual check (article 5.3.2 table B.1)

| Group | Prescribed | Observation | |
|-------|--|-------------------|-------------------|
| | | Ø28 | Ø32 |
| 1 | Each test, each group must not have: - Before cutting, defects in type of air bubble surface, bumps, dirt, strange body ... - After cutting, the internal defects at the apparent section detachment of the foam (open - cracks) | Nothing to report | Nothing to report |
| 2 | | Nothing to report | Nothing to report |
| 3 | | Nothing to report | Nothing to report |
| 4 | | Nothing to report | Nothing to report |
| 5 | | Nothing to report | Nothing to report |
| 6 | | Nothing to report | Nothing to report |
| 7 | | Nothing to report | Nothing to report |
| 8 | | Nothing to report | Nothing to report |

Satisfactory results

4.4 – Dielectric test after exposure to water (article 5.4.2 table B.1)



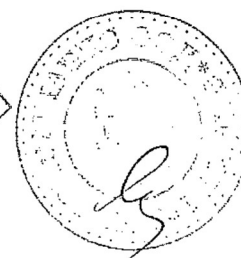
AC voltage applied: 100kV (f=50Hz)
 Distance between electrode: 30cm
 Duration of application: 1min

4.4.1 – With a conditioning by humidity

Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air.
 Test conditioning: 24h in water at 20 ° C.

| Ø28 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 48 | 0.8 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.7 | | | Nothing to report |
| Sample.3 | | 0.89 | | | Nothing to report |

Satisfactory results



стр. 23С



| Ø32 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 49.2 | 0.78 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.84 | | | Nothing to report |
| Sample.3 | | 0.81 | | | Nothing to report |

Satisfactory results

4.4.2 – With a conditioning by immersion

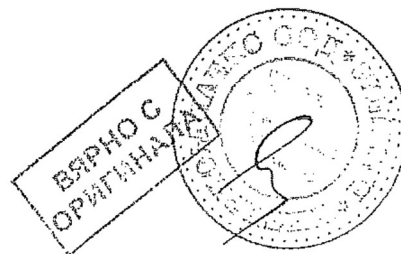
Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air.
 Test conditioning: 24h in water at 20 ° C.

| Ø28 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 48 | 0.77 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.67 | | | Nothing to report |
| Sample.3 | | 0.73 | | | Nothing to report |

Satisfactory results

| Ø32 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 49.2 | 0.81 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.81 | | | Nothing to report |
| Sample.3 | | 0.78 | | | Nothing to report |

Satisfactory results



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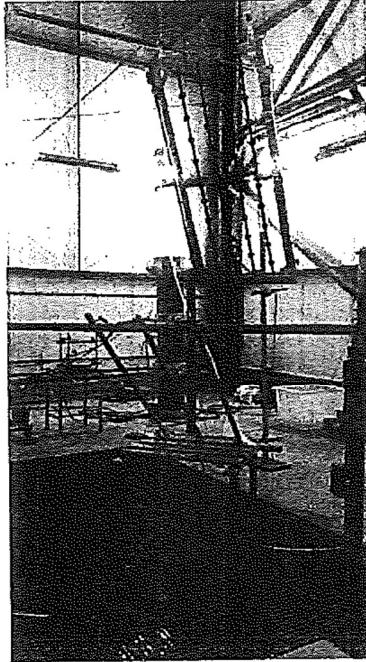
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4.5 – Wet test (article 5.4.3 table B.1)

Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air..



AC voltage applied: 100kV
 Duration of application: 1h
 Average precipitation rate: 1,5mm/min
 Ambient temperature: 19.4°C
 Water temperature: 19.0°C
 Humidity « H% » : 49.1%
 Water resistivity : 100Ω.m
 Inclination samples : 45°

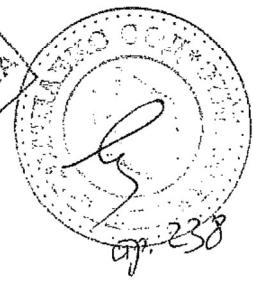
| Ø28 | Elevated temperature (°C) | | Visual check | |
|----------|---------------------------|----------|---|-------------------|
| | Prescribed | Recorded | Prescribed | Observation |
| Sample.1 | < 20 | < 1 | No flashover during the test. No sparkover or puncture. No visual sign of tracking. No erosion on the surface. | Nothing to report |
| Sample.2 | | < 1 | | Nothing to report |
| Sample.3 | | < 1 | | Nothing to report |

Satisfactory results

| Ø32 | Elevated temperature (°C) | | Visual check | |
|----------|---------------------------|----------|---|-------------------|
| | Prescribed | Recorded | Prescribed | Observation |
| Sample.1 | < 20 | < 1 | No flashover during the test. No sparkover or puncture. No visual sign of tracking. No erosion on the surface. | Nothing to report |
| Sample.2 | | < 1 | | Nothing to report |
| Sample.3 | | < 1 | | Nothing to report |

Satisfactory results

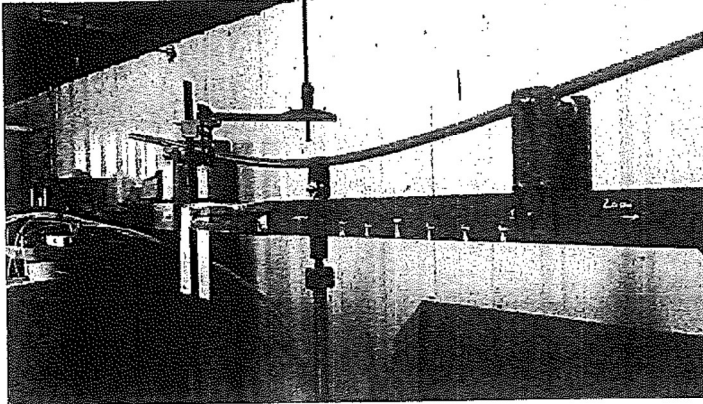
BUREAU VERITAS
 OPTIMIZATA





L C I E

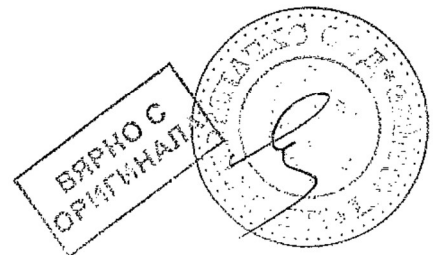
4.6 - Bending test (article 5.5.1 table B.1)



Rate of the applied force: 200 N/s
 Fd « ø28mm »: 890N (pages 7 - 9)
 Fd « ø32mm »: 1100N (pages 10 - 12)

| Ø28 | Initial orientation at 0° | | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| Sample | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 22.44 | 44.23 | 70.05 | ≤ 35 | 21.8 | 25.82 |
| Sample.2 | 23.05 | 49.01 | 75.85 | | 26.0 | 26.8 |
| Sample.3 | 24.52 | 46.50 | 71.87 | | 22.0 | 25.4 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.25 | ≤ 6 | | 0.4 | | |
| Sample.2 | 0.48 | | | 0.6 | | |
| Sample.3 | 0.27 | | | 0.4 | | |

Satisfactory results



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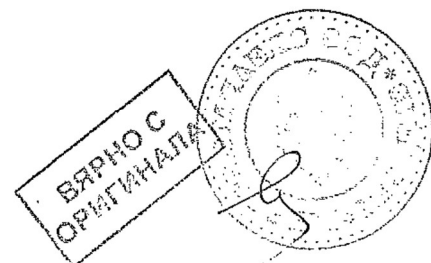
L C I E

| Ø28 | Initial orientation at 90° | | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 21.03 | 43.62 | 69.44 | ≤ 35 | 22.6 | 25.8 |
| Sample.2 | 24.40 | 49.79 | 76.87 | | 25.4 | 27.1 |
| Sample.3 | 23.54 | 46.88 | 71.64 | | 23.3 | 24.8 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.49 | ≤ 6 | | 0.7 | | |
| Sample.2 | 0.29 | | | 0.4 | | |
| Sample.3 | 0.43 | | | 0.6 | | |

Satisfactory results

| Ø28 | Initial orientation at 180° | | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 23.11 | 46.63 | 73.48 | ≤ 35 | 23.5 | 26.9 |
| Sample.2 | 25.62 | 48.92 | 69.0 | | 23.3 | 20.1 |
| Sample.3 | 25.13 | 47.96 | 73.18 | | 22.8 | 25.2 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.46 | ≤ 6 | | 0.6 | | |
| Sample.2 | 0.53 | | | 0.8 | | |
| Sample.3 | 0.47 | | | 0.6 | | |

Satisfactory results



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| Ø28 | | Initial orientation at 270° | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 22.16 | 44.86 | 72.40 | ≤ 35 | 22.7 | 27.5 |
| Sample.2 | 23.52 | 47.57 | 75.92 | | 24.1 | 28.4 |
| Sample.3 | 24.70 | 48.42 | 73.96 | | 23.7 | 25.5 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.59 | ≤ 6 | | 0.8 | | |
| Sample.2 | 0.55 | | | 0.7 | | |
| Sample.3 | 0.45 | | | 0.6 | | |

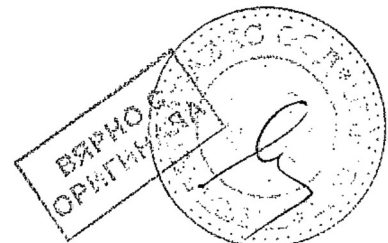
Satisfactory results

| Ø28 | | Variation of the deflection (%) | | | | | | | | |
|------------|----------|---------------------------------|-------|------|------------|-------|-------|-------------|-------|------|
| Prescribed | | 0° → 90° | | | 90° → 180° | | | 180° → 270° | | |
| | | 1/3Fd | 2/3Fd | Fd | 1/3Fd | 2/3Fd | Fd | 1/3Fd | 2/3Fd | Fd |
| ≤ 15 | Sample.1 | -6.3 | -1.4 | -0.9 | 9.9 | 6.9 | 5.8 | -4.1 | -1.8 | -1.5 |
| | Sample.2 | 5.9 | 1.6 | 1.3 | 5.1 | -1.7 | -10.2 | -8.2 | -2.8 | 10.0 |
| | Sample.3 | -4.0 | 0.8 | -0.3 | 6.7 | 2.3 | 2.1 | -1.7 | 1.0 | 1.1 |

Satisfactory results

| Ø28 | F= 1740 N / t= 30sec | | Breaking load (N) |
|----------|----------------------|-------------------|-------------------|
| | Prescribed | Observations | |
| Sample.1 | No sign of failure | Nothing to report | 2500 |
| Sample.2 | | Nothing to report | 2400 |
| Sample.3 | | Nothing to report | 2500 |

Satisfactory results



exp. 241



L C I E

| Ø32 | | Initial orientation at 0° | | | | |
|----------|---|---|---------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 367N (1/3Fd) | At 733N (2/3Fd) | At 1100N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 19.77 | 41.23 | 64.72 | ≤ 35 | 21.5 | 23.5 |
| Sample.2 | 19.94 | 41.31 | 65.73 | | 21.4 | 24.4 |
| Sample.3 | 19.58 | 41.69 | 65.70 | | 22.1 | 24.0 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | | Results | |
| Sample.1 | 1.01 | ≤ 6 | | | 1.6 | |
| Sample.2 | 0.39 | | | | 0.6 | |
| Sample.3 | 0.41 | | | | 0.6 | |

Satisfactory results

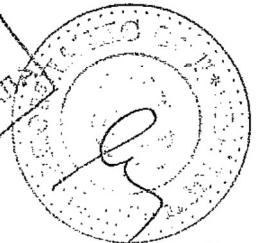
| Ø32 | | Initial orientation at 90° | | | | |
|----------|---|---|---------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 367N (1/3Fd) | At 733N (2/3Fd) | At 1100N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 20.55 | 42.42 | 64.39 | ≤ 35 | 21.9 | 22.0 |
| Sample.2 | 19.75 | 41.17 | 65.79 | | 21.4 | 24.6 |
| Sample.3 | 20.05 | 42.30 | 65.86 | | 22.3 | 23.6 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | | Results | |
| Sample.1 | 0.49 | ≤ 6 | | | 0.8 | |
| Sample.2 | 0.37 | | | | 0.6 | |
| Sample.3 | 0.50 | | | | 0.8 | |

Satisfactory results

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ВЕРНО С
ОРИГИНАЛУ



срп. 242



L C I E

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| Ø32 | | Initial orientation at 180° | | | | |
|----------|---|---|---------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 367N (1/3Fd) | At 733N (2/3Fd) | At 1100N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 19.13 | 43.52 | 65.85 | ≤ 35 | 24.4 | 22.3 |
| Sample.2 | 19.40 | 41.00 | 62.12 | | 21.6 | 21.1 |
| Sample.3 | 19.53 | 41.76 | 64.38 | | 22.2 | 22.6 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.35 | ≤ 6 | | 0.5 | | |
| Sample.2 | 0.43 | | | 0.7 | | |
| Sample.3 | 0.46 | | | 0.7 | | |

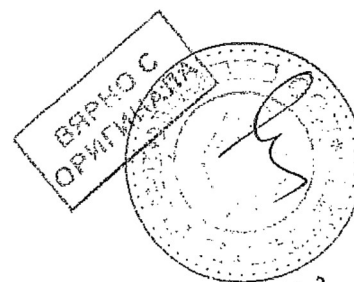
Satisfactory results

| Ø32 | | Initial orientation at 270° | | | | |
|----------|---|---|---------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 367N (1/3Fd) | At 733N (2/3Fd) | At 1100N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 21.07 | 42.03 | 64.83 | ≤ 35 | 21.0 | 22.8 |
| Sample.2 | 19.52 | 42.09 | 65.78 | | 22.6 | 23.7 |
| Sample.3 | 20.52 | 42.00 | 65.60 | | 21.5 | 23.6 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.04 | ≤ 6 | | < 0.1 | | |
| Sample.2 | 0.57 | | | 0.9 | | |
| Sample.3 | 0.53 | | | 0.8 | | |

Satisfactory results

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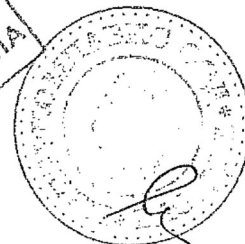
| Ø32 | Variation of the deflection (%) | | | | | | | | | |
|----------|---------------------------------|----------|-------|------|------------|-------|------|-------------|-------|------|
| | Prescribed | 0° → 90° | | | 90° → 180° | | | 180° → 270° | | |
| | | 1/3Fd | 2/3Fd | Fd | 1/3Fd | 2/3Fd | Fd | 1/3Fd | 2/3Fd | Fd |
| Sample.1 | ≤ 15 | 3.9 | 2.9 | -0.5 | -6.9 | 2.6 | 2.3 | 10.1 | -3.4 | -1.5 |
| Sample.2 | | -0.9 | -0.3 | 1.6 | -1.8 | -0.4 | -5.6 | 0.6 | 2.7 | 5.9 |
| Sample.3 | | 2.4 | 1.5 | 0.2 | -2.6 | -1.3 | -2.2 | 5.1 | 0.6 | 1.9 |

Satisfactory results

| Ø32 | F= 1740 N / t= 30sec | | Breaking load (N) |
|----------|----------------------|-------------------|-------------------|
| | Prescribed | Observations | |
| Sample.1 | No sign of failure | Nothing to report | 3390 |
| Sample.2 | | Nothing to report | 3330 |
| Sample.3 | | Nothing to report | 3250 |

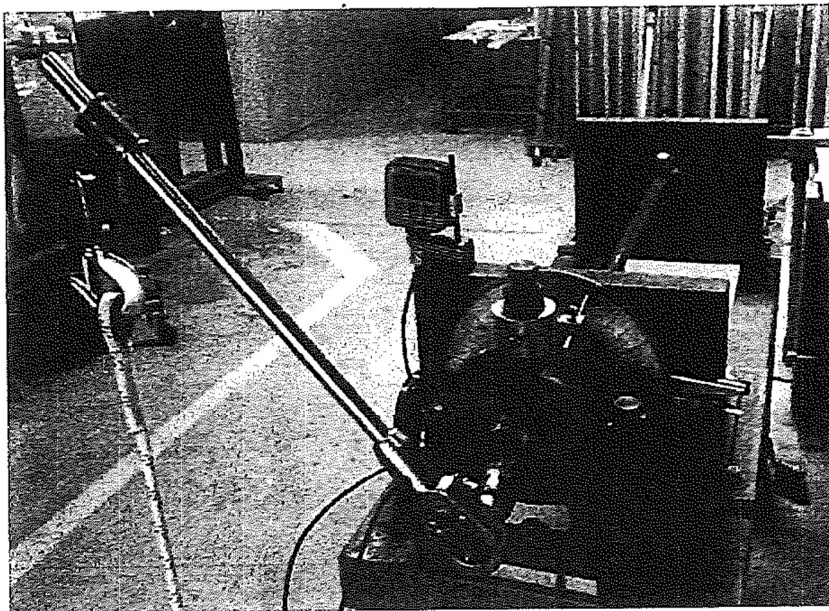
Satisfactory results

БВРНО С
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4.7 – Torsion test (article 5.5.2 table B.1)



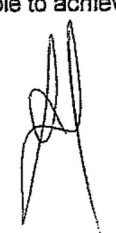

| Ø28 | Angle of deflection after 30s at Cd = 35N.m (°) | | | Residual angle of deflection after 1min at Cd = 0Nm (°) | |
|----------|---|----------|-------------------|---|----------|
| | Prescribed | Recorded | Observations | Prescription | Recorded |
| Sample.1 | < 35 | 8.5 | Nothing to report | < 1 | < 0.1 |
| Sample.2 | | 9.5 | Nothing to report | | 0.5 |
| Sample.3 | | 10.0 | Nothing to report | | 0.1 |

Satisfactory results

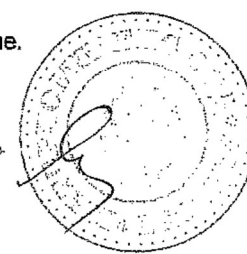
| Ø28 | after 30s at Cr = 70N.m | | Rise to failure (N.m) |
|----------|----------------------------|-------------------|--------------------------|
| | Prescribed | Observations | |
| Sample.1 | No cracks | Nothing to report | > 95 * |
| Sample.2 | | Nothing to report | > 92 * |
| Sample.3 | | Nothing to report | > 93 * |

Satisfactory results

* Samples were slipped into their mountings, impossible to achieve the value of the breaking torque.



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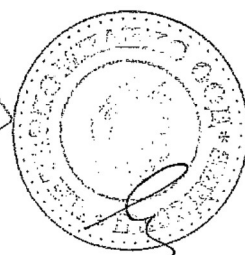
| Ø32 | Angle of deflection after 30s at Cd = 40N.m (°) | | | Residual angle of deflection after 1min at Cd = 0 N.m (°) | |
|----------|---|----------|-------------------|---|----------|
| | Prescribed | Recorded | Observations | Prescribed | Recorded |
| Sample.1 | < 35 | 8.0 | Nothing to report | < 1 | 0.4 |
| Sample.2 | | 9.0 | Nothing to report | | 0.5 |
| Sample.3 | | 10.0 | Nothing to report | | 0.5 |

Satisfactory results

| Ø32 | after 30s at Cr = 80N.m | | Rise to failure (N.m) |
|----------|----------------------------|-------------------|--------------------------|
| | Prescription | Observations | |
| Sample.1 | No cracks | Nothing to report | 130 |
| Sample.2 | | Nothing to report | 129 |
| Sample.3 | | Nothing to report | 113 |

Satisfactory results

ВЯРНО С
ОРИГИНАЛА



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4.8 – **Crushing test** (article 5.5.3 table B.1)

Length of test pieces: 150mm
Speed: 2mm/min
Temperature: 23±2°C
Humidity : 50±10%

F_d : Minimum value of F where first linearity is lost related to a loss of $\Delta F \geq 0,01 F_d$
F_r : Maximum value of F recorded during the 3 first minutes of test (displacement ≤ 6 mm)

| Ø28 | <i>F_d</i> (N) | | <i>F_r</i> (N) | |
|----------|-----------------------------|----------|-----------------------------|----------|
| | Prescribed | Recorded | Prescribed | Recorded |
| Sample.1 | > 700 | 4884 | > 1400 | 3376 |
| Sample.2 | | 5119 | | 3318 |
| Sample.3 | | 4878 | | 4338 |

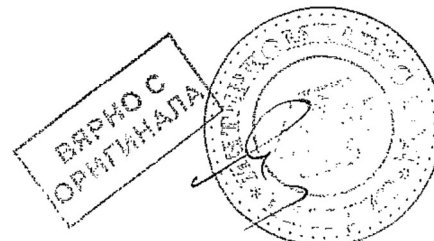
Satisfactory results

| Ø32 | <i>F_d</i> (N) | | <i>F_r</i> (N) | |
|----------|-----------------------------|----------|-----------------------------|----------|
| | Prescribed | Recorded | Prescribed | Recorded |
| Sample.1 | > 700 | 3407 | > 1400 | 3117 |
| Sample.2 | | 1256 | | 2318 |
| Sample.3 | | 2448 | | 4338 |

Satisfactory results

Test reports issued by CETIM CERMA numbers MAT0005232 and MAT0005272 dated of June 15, 2015.

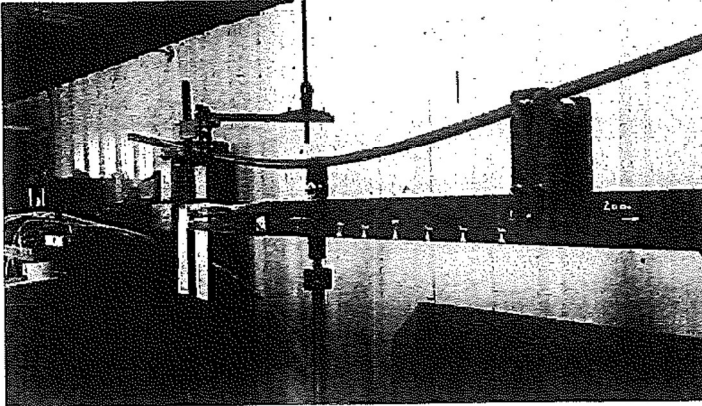
Used machine: Wolpert TT1220 checked in June 2015 regulated provider.
Cell type: 25kN



07.247



4.9 – Bending ageing test (article 5.5.4.1 table B.1)



Applied force $\varnothing 28\text{mm}$: 1100N
 Applied force $\varnothing 32\text{mm}$: 1100N
 Frequency : 2 cycles/min
 Number of cycles : 1000 for each orientation
 Number of directions : 4
 (0° ; 90° ; 180° ; 270°)

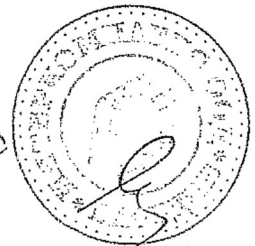
| $\varnothing 28$ | Prescribed | Observation after 1000 cycles | | | |
|------------------|--|-------------------------------|-------------------|-------------------|-------------------|
| | | 0° | 90° | 180° | 270° |
| Sample.1 | No signs of deterioration, or have any permanent set | Nothing to report | Nothing to report | Nothing to report | Nothing to report |
| Sample.2 | | Nothing to report | Nothing to report | Nothing to report | Nothing to report |
| Sample.3 | | Nothing to report | Nothing to report | Nothing to report | Nothing to report |

Satisfactory results

| $\varnothing 32$ | Prescribed | Observation after 1000 cycles | | | |
|------------------|--|-------------------------------|-------------------|-------------------|-------------------|
| | | 0° | 90° | 180° | 270° |
| Sample.1 | No signs of deterioration, or have any permanent set | Nothing to report | Nothing to report | Nothing to report | Nothing to report |
| Sample.2 | | Nothing to report | Nothing to report | Nothing to report | Nothing to report |
| Sample.3 | | Nothing to report | Nothing to report | Nothing to report | Nothing to report |

Satisfactory results

ВЯРНО С
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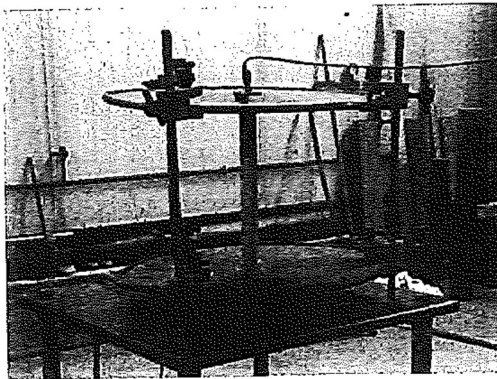
L C I E

4.10 – Dielectric test after mechanical ageing (article 5.5.4.1 table B.1)

Cutting of 2 test pieces of 0.3m from each half of the samples having undergone the 4000 cycles bending test.

Conditioning : 168h at 23°C and 93% HR

At the end of the conditioning period, dielectric test at the ambient conditions of the test area after the test pieces have been wiped with a clean dry lint free cloth and after the ends of the test pieces have been covered with conducting adhesive tape.



AC voltage test : 100kV (f=50Hz)
Distance of electrode : 30cm
Duration of application : 1min

| Ø28 | | Current I (µA) | | Phase angle | | Contournement |
|----------|----|----------------|----------|-------------|----------|-------------------|
| | | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | .1 | ≤ 48 | 0.73 | ≥ 50° | 90° | Nothing to report |
| | .2 | | 0.79 | | | Nothing to report |
| Sample.2 | .1 | | 0.80 | | | Nothing to report |
| | .2 | | 0.84 | | | Nothing to report |
| Sample.3 | .1 | | 0.79 | | | Nothing to report |
| | .2 | | 0.80 | | | Nothing to report |

Satisfactory results

| Ø32 | | Current I (µA) | | Phase angle | | Contournement |
|----------|----|----------------|----------|-------------|----------|-------------------|
| | | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | .1 | ≤ 48 | 0.82 | ≥ 50° | 90° | Nothing to report |
| | .2 | | 0.72 | | | Nothing to report |
| Sample.2 | .1 | | 0.74 | | | Nothing to report |
| | .2 | | 0.79 | | | Nothing to report |
| Sample.3 | .1 | | 0.81 | | | Nothing to report |
| | .2 | | 0.71 | | | Nothing to report |

Satisfactory results

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02.215

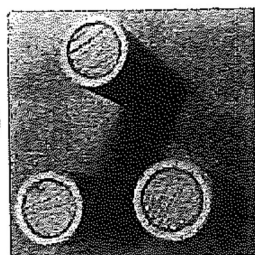
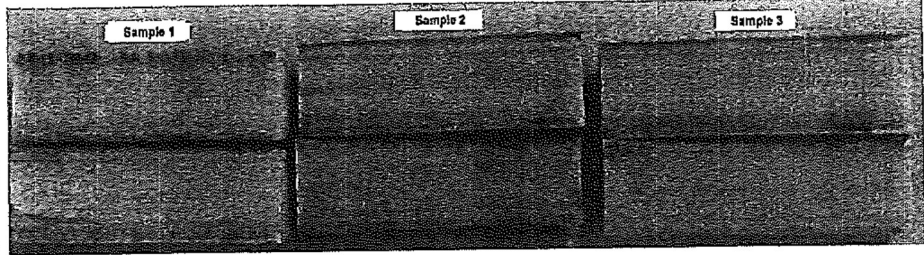


4.11 – Dye penetration test (article 5.5.5 table B.1)

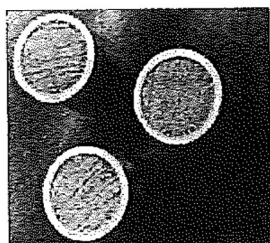
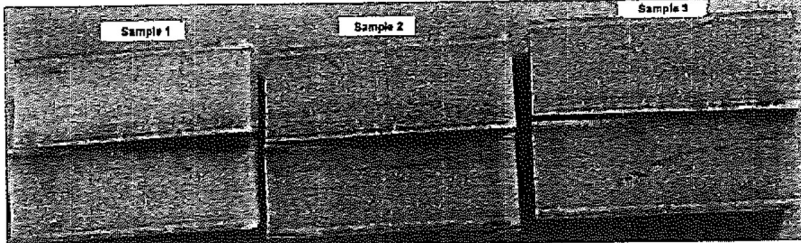
Conditioning : Immersing the specimens in a container containing a coloring solution in water, under vacuum (pressure less than 6500Pa) for one hour.

The test pieces after removed from the solution are dried for 24 hours at a temperature of 35 ° C.

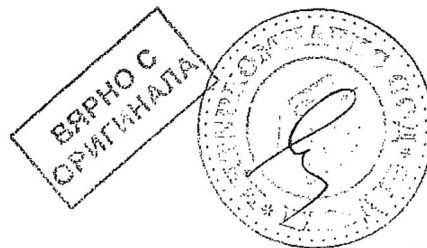
After drying the test pieces are cut to 5 mm from each end, and then cut longitudinally.

| Ø28 | Pictures | |
|---|---|--------------------|
|  |  | |
| | Prescribed | Observation |
| Sample.1 | No sign of solution dye penetration in either the foam, at the junction of the foam and the tube, or in the tube. | Nothing to report |
| Sample.2 | | Nothing to report |
| Sample.3 | | Nothing to report |

Satisfactory results

| Ø32 | Pictures | |
|---|---|--------------------|
|  |  | |
| | Prescribed | Observation |
| Sample.1 | No sign of solution dye penetration in either the foam, at the junction of the foam and the tube, or in the tube. | Nothing to report |
| Sample.2 | | Nothing to report |
| Sample.3 | | Nothing to report |

Satisfactory results



срн 200

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

Обособена позиция № 1: „Преносими заземители“

ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА

ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“

5. Документи за Преносими заземители за Ср.Н. за шини за ЗРУ Ср.Н. – със заземителен кабел и кабел за свързване на късо (гъвкави медни въжета) – 50 мм²

Приложение № 5.6

Инструкция за употреба на български език съгласно НСИОСЛПС, включително изисквания за правилно поддържане и използване и изисквания за периодичност на необходимите контролни изпитвания по време на експлоатация

Участник: **“ИНТЕРКОМПЛЕКС”** ООД
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg



ИНСТРУКЦИИ ЗА УПОТРЕБА И ПОДДРЪЖКА

Преносимо оборудване за заземяване и късо съединение

При необходимост, или при възникване на някакви съмнения, върнете цялото устройство на FAMECA, където ще го проверят и, ако е необходимо, ремонтният.

По очевидни причини, свързани с безопасността, е абсолютно необходимо да извършите цялото устройство, което е било изложено на ток на късо съединение, без да се опитвате да ремонтирате или подмените негови компоненти.

Поддръжка

За да сте сигурни, че оборудването ще функционира правилно и ще изпълни съществената си роля по отношение на безопасността, е необходимо да гарантирате, че във всеки един момент то е в добро състояние.

Изолационна щанга или ръкохватка

- Съхранявайте далеч от пряка светлина и влага;
 - Преди и след употреба почистете с кърпа със силикон;
 - Проверете дали няма драскотини или следи от удар.
- Фазови клеми и заземителни накрайници
- чисти и без корозия, особено на контактните болтове;
 - без полепване на груби частици върху резбованите части, редовно ги омаслявайте с неутрална грес;
 - без разхлабване на мобилните връзки и механизми;
 - без следи от удар.

Кабели

- без пропуски или отвори в изолацията на кабела;
- без пречупване на проводниците, особено в близост до връзките;
- без окисляване;
- добро състояние на оплетката.

Необходимо е с оборудването да се работи внимателно:

- Избягвайте ударяне или изпускане
- Не влачете оборудването по земята при местене
- Избягвайте прекомерно или грубо затягане на свързващите елементи
- Уверете се, че условията за съхранение са подходящи

Ремонт на оборудването

Никога не разглобявайте или сглобявайте повторно основните компоненти на устройството: клеми (и), кабел(ите), заземителния(ите) накрайник(ици). Най-общо, замяната на всички или някои от тези компоненти е забранена.

Предпазни мерки преди употреба

Максималният ток на късо съединение (I_{sc}), приемлив за дадено устройство за заземяване или късо съединение, се определя от компонента, издържаш на най-нисък ток във веригата на устройството.

Тази стойност за съответното устройство е ясно посочена върху кабела за свързване на късо съединение и е отговорност на потребителя, преди да пристъпи към употреба, да провери дали I_{sc} на устройството е подходящ за предвидената употреба и съществуващия риск от късо съединение.

Монтаж на оборудването:

Необходимо е изцяло и в съответната последователност да извършите следните стъпки: Проверка за отсъствие на напрежение. Изключете захранващата линия или инсталацията, след което проверете отсъствието на напрежение чрез подходящо устройство.

Свързване на оборудването към земя
Винти започвайте чрез свързване на заземителната клема на устройството или заземителната пета на заземителна система на инсталацията (заземителна мрежа, метална кула, заземителен кол и пр.).

При винтови клеми или заземителни пети, ги затягайте здраво, но не прекалено или грубо. Заземителният кабел трябва да бъде изцяло развита.

Свързване на клемите
Като използвате изолационната щанга или ръкохватка, поставете и закопчайте клемите на проводниците. При винтови клеми, ги затягайте здраво, но не прекалено или грубо. Всички кабели за късо съединение трябва да бъдат напълно развити и да не се оплитат.

Демонтаж на оборудването:

Необходимо е изцяло и в съответната последователност да извършите следните стъпки:

Демонтаж на клемите

Като използвате изолационната щанга или ръкохватка, разкопчайте и свалете клемите от проводниците.

Демонтаж на заземителния накрайник

Тази операция трябва винаги да се извършва последна.

Съхранение на оборудването

Почистете и прегледайте оборудването. Съхранявайте го правилно в съответния капъф или куфар и/или на съответното място за съхранение.



FAMECA

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МЕТОДИКА И СРОКОВЕ ЗА ПЕРИОДИЧНИ ИЗПИТАНИЯ В ПЕРИОДА НА ЕКСПЛОАТАЦИЯ НА ПРЕНОСИМИ ЗАЗЕМИТЕЛИ

Съгласно Наредба № 22 от 8 май 2006 г. за изпитване на електрозащитни средства в експлоатация, Раздел II - Изпитване, проверки и оценяване на резултатите, преносимите заземители не се подлагат на периодични изпитвания в лаборатория.

Когато преносимите заземители са комплектовани с щанги, е необходимо изолационните щанги да бъдат изпитвани на всеки 12 месеца в оторизирана лаборатория съгласно изискванията на приложимите стандарти и регулации, както следва:

БДС EN 62193:2004 Работа под напрежение.

Телескопични пръти и телескопични измервателни пръти/ **IEC 62193**

БДС EN 60855:2001 Изолиращи пенонапълнени тръби и
масивни щанги за работа под напрежение/ **IEC 60855-1**

ASTM F 1826

ASTM F711.

Преди всяко използване на заземителя се извършва оглед и проверка за:

1. наличието и състоянието на всички елементи на заземителя - проводници (въжета) и предпазна обвивка (шлаух), присъединителни клеми;
2. видимо изменение на цвета на проводниците и/или следи от преминал през заземителя ток на късо съединение;
3. състоянието на изолиращата щанга за поставяне на заземителите.

Преносим заземител с установени при огледа дефекти се маркира за несъответствие и не се допуска за употреба. От употреба се изважда и заземител, който е бил подложен на еднократно въздействие от ток на късо съединение.

При необходимост, или при възникване на някакви съмнения, върнете изделието на производителя или на негов оторизиран представител, където ще го проверят и, ако е необходимо, ремонтират.

Оторизиран представител на SFE International за българския пазар е фирма „Интеркомплекс“ ООД, гр. Пловдив.

гр. Пловдив
29.05.2020 г.



Упр

На основание чл.36а ал.3 от ЗОП



стр. 2/2

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

Обособена позиция № 1: „Преносими заземители“

ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА

ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“

6. Документи за Преносими заземители за ВН за шини за уредби 110 kV – със заземителен кабел и кабел за свързване на късо (гъвкави медни възсета) – 95 мм²

Приложение № 6.1

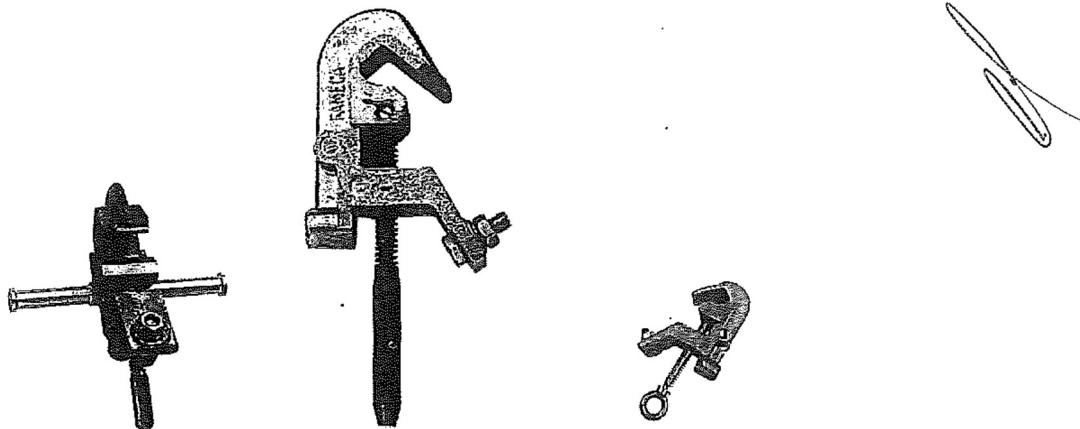
Последно издание на каталога на производителя

Участник: “ИНТЕРКОМПЛЕКС” ООД
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg



■ MT535URU

➔ Screw clamp for bare MV overhead lines



▶ STANDARD(S)

IEC 61230

▶ USE

For short-circuiting and earthing bare overhead lines from the post.

▶ SPECIFICATIONS

Clamping range on line conductor 3 to 32 mm.

Max Isc : 25 kA/1s.

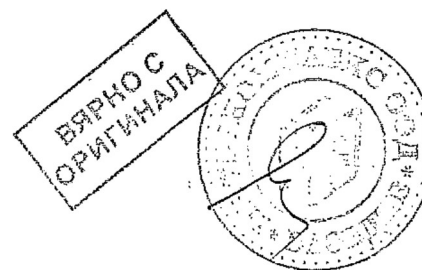
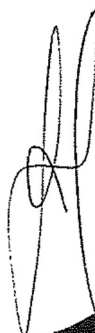
Material : Aluminium.

The central clamp can be fitted with one or two attachment rods for one or two extra phase clamps.

DMT535URU : Made to measure earthing and short-circuiting device please contact us.

▶ ADVANTAGES

Lightweight, very compact clamp.



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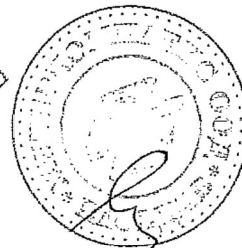
TECHNICAL SHEET

| Reference | Description | Dimensions (mm) | Weight (g) |
|-------------|---|-----------------|------------|
| MT535URUAP | Clamp with AP end fitting (hexagonal 12 mm) | 44 x 100 x 180 | 620 |
| MT535URUB | Clamp with B end fitting (VDE-type bayonet) | 44 x 100 x 180 | 620 |
| MT535URUCR | Clamp with CR end fitting (ring for hooked stick) | 44 x 100 x 180 | 620 |
| MT535URUCR1 | Clamp with CR end fitting and 1 attachment rod | 97 x 100 x 180 | 720 |
| MT535URUCR2 | Clamp with CR end fitting and 2 attachment rods | 150 x 100 x 180 | 850 |
| MT535URUAP2 | Clamp with CR end fitting and 2 attachment rods | 150 x 100 x 180 | 850 |
| MT535URUB2 | Clamp with B end fitting and 2 attachment rods | 150 x 100 x 180 | 850 |

TABLE LEGEND

Other end fittings available on request.

ВЕРНО С
ОРИГИНАЛА



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сш. 254



■ NB8

→ Earthing clamp



▶ STANDARD(S)

IEC 61230

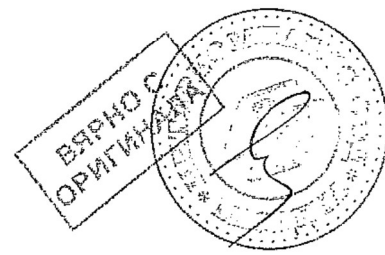
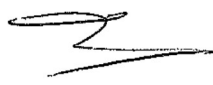
▶ USE

For connection to the earthing conductor. Can be positioned on the earth rod (type 701 or PTT130).

▶ SPECIFICATIONS

Made of aluminium bronze
Contact pad for cable lug for TFK type cable.
M10 stainless steel screws included.

| Reference | Description | Capacity | Max. Isc | Material | Dimensions (mm) | Weight (kg) |
|-----------|----------------|--|-----------|-----------|-----------------|-------------|
| NB8 | Earthing clamp | Ø 6 to 27 mm / flat 0 to 25 mm / hexagonal 19 mm | 20 kA/1 s | cupro-alu | 100 x 100 x 40 | 0,5 |



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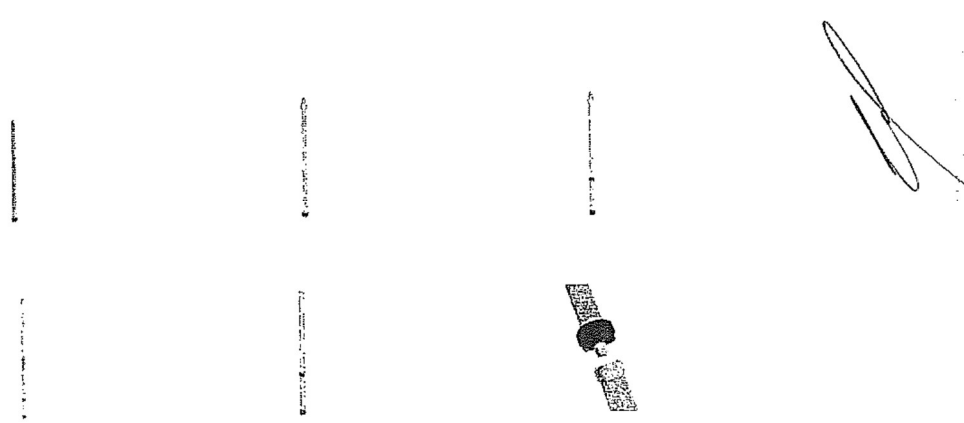
ESP
ELECTRICAL SAFETY PRODUCTS

0971. 255



■ PXV

➔ Connectable insulating sticks made of \varnothing 32 mm tube



▣ STANDARD(S)

IEC 60855-1 / EN 50508

▣ USE

- All weather use.
- No-voltage testing.
 - Earthing on MV/LV lines and substations.
 - Disconnecter operation.
 - All work involving medium mechanical loads.

▣ SPECIFICATIONS

Made up of 1, 2, 3 or 4 sections with :

- Fibreglass composite tube, \varnothing 32 mm, polyurethane foam-filled, compliant with IEC 60855 (series tested against penetration of humidity).

Longitudinal dielectric strength 100 kV/30 cm guaranteed in humid atmosphere.

- Screw connectors ref. S37, light alloy.
- Elastomer hand guard marks the gripping zone.

PXV sticks are supplied off the shelf with these end fittings:

- U : notched universal
- APV : multi-purpose, 12 mm 6-sided with automatic locking
- B : bayonet.
- others : on request.

Please specify when ordering.



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TECHNICAL SHEET

ADVANTAGES

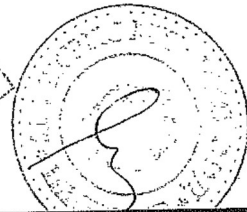
Ribbed non-slip shaft.

| Reference | Description | Overall length (m) | Insulating length (mm) | Weight (kg) | Number of elements | Max voltage EN 50508 | Cover |
|-----------|---|--------------------|------------------------|-------------|--------------------|----------------------|---------|
| PXVH100 | Stick shaft PXVH for insulating stick PXV | 1,00 | 300 | 0,70 | | | |
| PXVH150 | Stick shaft PXVH for insulating stick PXV | 1,50 | 500 | 0,95 | | | |
| PXVH188 | Stick shaft PXVH for insulating stick PXV | 1,88 | 680 | 1,10 | | | |
| PXVH200 | Stick shaft PXVH for insulating stick PXV | 2,00 | 800 | 1,20 | | | |
| PXVH250 | Stick shaft PXVH for insulating stick PXV | 2,50 | 1100 | 1,50 | | | |
| PXVH300 | Stick shaft PXVH for insulating stick PXV | 3,00 | 1600 | 1,75 | | | |
| PSM100 | Stick extension PSM (intermediary element) for insulating stick PXV | 1,00 | 850 | 0,80 | | | |
| PSM150 | Stick extension PSM (intermediary element) for insulating stick PXV | 1,50 | 1385 | 1,00 | | | |
| PSM188 | Stick extension PSM (intermediary element) for insulating stick PXV | 1,88 | 1730 | 1,20 | | | |
| PSM200 | Stick extension PSM (intermediary element) for insulating stick PXV | 2,00 | 1850 | 1,30 | | | |
| PSM250 | Stick extension PSM (intermediary element) for insulating stick PXV | 2,50 | 2350 | 1,50 | | | |
| PSM300 | Stick extension PSM (intermediary element) for insulating stick PXV | 3,00 | 2850 | 1,80 | | | |
| PSM100* | Upper element PSM for insulating stick PXV | 1,00 | 850 | | | | |
| PSM150* | Upper element PSM for insulating stick PXV | 1,50 | 1385 | | | | |
| PSM188* | Upper element PSM for insulating stick PXV | 1,88 | 1730 | | | | |
| PSM200* | Upper element PSM for insulating stick PXV | 2,00 | 1850 | | | | |
| PSM250* | Upper element PSM for insulating stick PXV | 2,50 | 2350 | | | | |
| PSM300* | Upper element PSM for insulating stick PXV | 3,00 | 2850 | | | | |
| PXV1080* | Connectable insulating stick PXV | 0,80 | 550 | 0,50 | 1 | 15 kV | HTR1950 |
| PXV1125* | Connectable insulating stick PXV | 1,25 | 1000 | 0,90 | 1 | 45 kV | H10 |

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ВЕРНО С
ОРИГИНАЛА



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оп. 257



TECHNICAL SHEET

| Reference | Description | Overall length (m) | Insulating length (mm) | Weight (kg) | Number of elements | Max voltage EN 50508 | Cover |
|-----------|----------------------------------|--------------------|------------------------|-------------|--------------------|----------------------|----------|
| PXV1150* | Connectable insulating stick PXV | 1,50 | 1100 | 1,00 | 1 | 45 kV | H10 |
| PXV1200* | Connectable insulating stick PXV | 2,00 | 1300 | 1,40 | 1 | 66 kV | H11 |
| PXV1250* | Connectable insulating stick PXV | 2,50 | 1800 | 1,60 | 1 | 132 kV | HTR12750 |
| PXV1300* | Connectable insulating stick PXV | 3,00 | 2000 | 2,00 | 1 | 150 kV | H12 |
| PXV2200* | Connectable insulating stick PXV | 2,00 | 1300 | 1,50 | 2 | 66 kV | H30 |
| PXV2300* | Connectable insulating stick PXV | 3,00 | 2000 | 2,10 | 2 | 150 kV | H31 |
| PXV2400* | Connectable insulating stick PXV | 4,00 | 2800 | 2,60 | 2 | 220 kV | H32 |
| PXV2500* | Connectable insulating stick PXV | 5,00 | 3600 | 3,30 | 2 | 220 kV | H20 |
| PXV2600* | Connectable insulating stick PXV | 6,00 | 4600 | 4,10 | 2 | 480 kV | H21 |
| PXV3300* | Connectable insulating stick PXV | 3,00 | 2300 | 2,15 | 3 | 150 kV | H30 |
| PXV3450* | Connectable insulating stick PXV | 4,50 | 3500 | 2,90 | 3 | 220 kV | H31 |
| PXV3600* | Connectable insulating stick PXV | 6,00 | 4800 | 4,30 | 3 | 480 kV | H32 |
| PXV4400* | Connectable insulating stick PXV | 4,00 | 3300 | 3,20 | 4 | 220 kV | H30 |
| PXV4600* | Connectable insulating stick PXV | 6,00 | 5000 | 4,50 | 4 | 480 kV | H31 |
| PXV4750* | Connectable insulating stick PXV | 7,50 | 6300 | 5,20 | 4 | 480 kV | H31 |
| PXV4800* | Connectable insulating stick PXV | 8,00 | 6800 | 5,40 | 4 | 480 kV | H32 |

TABLE LEGEND

* Add the end fitting code at the the end of the reference (ex : PSM250U / PXV3450APV).

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Division

ESP

ELECTRICAL SAFETY PRODUCTS

258



■ Flexible copper cables

➔ Flexible copper earthing and short-circuiting cables

📁 STANDARD(S)

IEC / EN 61138

📁 USE

Cable for portable earthing and short-circuiting devices according to IEC 61230 (EN 61230).

📁 SPECIFICATIONS

TSC type : extra flexible PVC sheathed copper cable (ST11) for use from -25°C to +55°C.
SX type : silicone sheathed copper cable for use from -40°C to + 70°C.

ВЕРНО С
ОРИГИНАЛА

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ESP 259

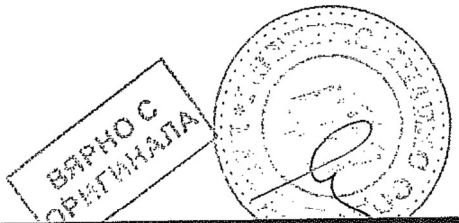


TECHNICAL SHEET

| Reference | Description | Cable cross-section | Ø over copper core | Cable heats up to 350°C at end of s/c | Cable heats up to 700°C at end of s/c | Item n° with silicone sheath | Weight (g) |
|-----------|--|---------------------|--------------------|---------------------------------------|---------------------------------------|------------------------------|------------|
| TSC16 | Flexible copper earthing and short-circuiting cables | 16 mm ² | 5 mm | 4 kA/0,5s - 3 kA/1s | 6 kA/0,5s - 4 kA/1s | SX016 | 160 |
| TSC25 | Flexible copper earthing and short-circuiting cables | 25 mm ² | 6,4 mm | 6,5 kA/0,5s - 4,5 kA/1s | 9,5 kA/0,5s - 6,5 kA/1s | SX025 | 300 |
| TSC35 | Flexible copper earthing and short-circuiting cables | 35 mm ² | 8,2 mm | 9,5 kA/0,5s - 6,5 kA/1s | 13 kA/0,5s - 10,5 kA/1s | SX035 | 350 |
| TSC40 | Flexible copper earthing and short-circuiting cables | 40 mm ² | 8,2 mm | 10,5 kA/0,5s - 7,5 kA/1s | 15 kA/0,5s - 9 kA/1s | / | 350 |
| TSC50 | Flexible copper earthing and short-circuiting cables | 50 mm ² | 9,2 mm | 13 kA/0,5s - 9,5 kA/1s | 18,5 kA/0,5s - 13 kA/1s | SX050 | 550 |
| TSC70 | Flexible copper earthing and short-circuiting cables | 70 mm ² | 12 mm | 18,5 kA/0,5s - 13 kA/1s | 26 kA/0,5s - 18,5 kA/1s | SX070 | 750 |
| TSC75 | Flexible copper earthing and short-circuiting cables | 75 mm ² | 12,2 mm | 20 kA/0,5s - 14 kA/1s | 28 kA/0,5s - 20 kA/1s | / | 800 |
| TSC95 | Flexible copper earthing and short-circuiting cables | 95 mm ² | 13 mm | 25 kA/0,5s - 18 kA/1s | 35,5 kA/0,5s - 25 kA/1s | SX095 | 960 |
| TSC120 | Flexible copper earthing and short-circuiting cables | 120 mm ² | 14,8 mm | 31,5 kA/0,5s - 22,5 kA/1s | 45 kA/0,5s - 31,5 kA/1s | SX120 | 1305 |
| TSC150 | Flexible copper earthing and short-circuiting cables | 150 mm ² | 18 mm | 40 kA/0,5s - 28 kA/1s | 56 kA/0,5s - 40 kA/1s | SX150 | 1620 |
| TSC10 | Flexible copper earthing and short-circuiting cables | 10 mm ² | 4 mm | 2,6 kA/0,5s - 1,9 kA/1s | 3,7 kA/0,5s - 2,6 kA/1s | / | 100 |

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ex-260

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

Обособена позиция № 1: „Преносими заземители“

**ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА
ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“**

6. Документи за Преносими заземители за ВН за шини за уредби 110 kV – със заземителен кабел и кабел за свързване на късо (гъвкави медни въжета) – 95 мм²

Приложение № 6.2


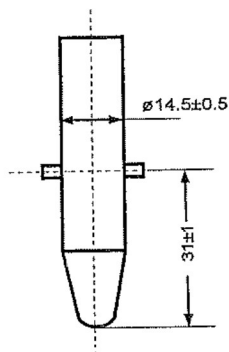
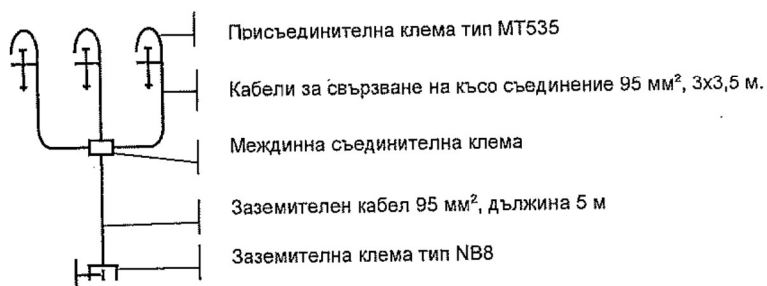
Чертежи с размери и инструкция за експлоатация на български език съгласно т. 4.10 от БДС EN 61230:2008



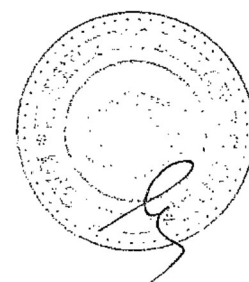
Участник: **“ИНТЕРКОМПЛЕКС”** ООД
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg

ЧЕРТЕЖ

Продукт: Преносим заземител за шини в електрически уредби 110 kV
Съкратено наименование на материала: Заземители за шини В.Н.
Изпълнение: ПЗ ЕУ 110kV 3x3,5 м. + 5 м.



**Устройство за затягане на фазовата съединителна клема
(съгласно DIN 48087)**





ИНСТРУКЦИИ ЗА УПОТРЕБА И ПОДДРЪЖКА

Преносимо оборудване за заземяване и късо съединение

Обхват на употреба: на закрито и на открито.

Нормална климатична категория (N): работна температура -25°C to +55°C.

Поддръжка

За да сте сигурни, че оборудването ще функционира правилно и ще изпълни съществената си роля по отношение на безопасността, е необходимо да гарантирате, че във всеки един момент то е в добро състояние:

Изолационна щанга или ръкохватка

- Съхранявайте далеч от пряка светлина и влага;
 - Преди и след употреба почистете с кърпа със силикон;
 - Проверете дали няма дракотини или следи от удар.
- #### Фазови клеми и заземителни накрайници
- чисти и без корозия, особено на контактните болтове;
 - без полупане на груби частици върху резбованите части, редовно ги омазнявайте с неутрална грес;
 - без разхлабване на мобилните връзки и механизми;
 - без следи от удар.

Кабели:

- без прорези или отвори в изолацията на кабела;
- без пречуване на проводниците, особено в близост до връзките;
- без окисляване;
- добро състояние на оплетката.

Необходимо е с оборудването да се работи внимателно:

- Избягвайте удяряне или изпускане
- Не влачете оборудването по земята при местене
- Избягвайте прекомерно или грубо затягане на свързващите елементи
- Уверете се, че условията за съхранение са подходящи

Ремонт на оборудването

Никога не разглобявайте или сглобявайте повторно основните компоненти на устройството: клема (M), кабел(ите)-заземителник(ите), накрайник(ици). Най-общо, замяната на всички или някои от тези компоненти е забранена.

При необходимост, или при възникване на някакви съмнения, върнете цялото устройство на FAMECA, където ще го проверят и, ако е необходимо, ремонтният.

По очевидни причини, свързани с безопасността, е абсолютно необходимо да извършите цялото устройство, което е било изложено на ток на късо съединение, без да се опитвате да ремонтирате или подмените негови компоненти.

Предпазни мерки преди употреба

Максималният ток на късо съединение (I_{cc}), приемлив за дадено устройство за заземяване или късо съединение, се определя от компонента, издържащ на най-нисък ток във веригата на устройството.

Тази стойност за съответното устройство е ясно посочена върху кабела за свързване на късо съединение и е отговорност на потребителя, преди да пристъпи към употреба, да провери дали I_{cc} на устройството е подходящ за предвидената употреба и съществуващия риск от късо съединение.

Монтаж на оборудването:

Необходимо е изцяло и в съответната последователност да извършите следните стъпки:

Проверка за отсъствие на напрежение
Изключете захранващата линия или инсталацията, след което проверете отсъствието на напрежение чрез подходящо устройство.

Свързване на оборудването към земя
Винаги започвайте чрез свързване на заземителната клема на устройството или заземителната пета на заземителна система на инсталацията (заземителна мрежа, метална кула, заземителен кол и пр.).

При винтови клеми или заземителни пети, ги затягайте здраво, но не прекалено или грубо. Заземителният кабел трябва да бъде изцяло развита.

Свързване на клемите

Като използвате изолационната щанга или ръкохватка, поставете и закопчайте клемите на проводниците. При винтови клеми, ги затягайте здраво, но не прекалено или грубо.

Всички кабели за късо съединение трябва да бъдат напълно развити и да не се оплитат.

Демонтаж на оборудването:

Необходимо е изцяло и в съответната последователност да извършите следните стъпки:

Демонтаж на клемите

Като използвате изолационната щанга или ръкохватка, разкопчайте и свалете клемите от проводниците.

Демонтаж на заземителния накрайник

Така операция трябва винаги да се извършва последна.

Съхранение на оборудването

Почистете и прегледайте оборудването.

Съхранявайте го правилно в съответния калъф или куфар и/или на съответното място за съхранение.

FAMECA

France – Tel.: +33-(0)-3-89-64-54-00 / Fax: +33-(0)-3-89-65-43-33

e-mail: adv@fameca.com

ВАЖНО СЪДЪРЖАНА

INSTRUCTIONS FOR USE AND MAINTENANCE

WPE_CS_MALI_02_GB

Portable equipment for earthing and short-circuiting

Range of use: indoor and outdoor.
Normal climatic category (N): operating temperature -25°C to + 55°C

Maintenance

To ensure the correct functioning of the device and guarantee it fulfils its essential safety role, it is essential to ensure that it is in good condition at all times:

- Insulating stick or handle
- store away from light and humidity
 - wipe before and after use with a silicone-treated cloth
 - check that it is free of scratches or traces of impact

Line clamps and earth connectors:

- clean and corrosion-free, particularly on the contact studs
- no seizing up on threaded parts: lubricate them regularly with a neutral grease
- no seizing up on mobile joints and mechanisms
- no traces of impact

Cables:

- no cuts or perforations in the cable sheath
- no cut strands, particularly close to connections
- free of oxidation
- seals in good condition

Care shall also be taken when handling this equipment:

- avoid knocking or dropping
- do not drag the device along the ground when transporting it
- avoid excessive or rough tightening of the connectors
- make sure that storage conditions are adequate

Repairing the equipment

Never disassemble or reassemble the main components of the device: line clamp(s), cable(s), earth end connector(s). In general, the replacement of all or part of any of these components is **prohibited**. If necessary, or if in any doubt, return the complete device to **FAIMECA**, which will check the device and repair it if necessary.

For obvious safety reasons, it is absolutely necessary to discard the entire device exposed to short-circuit current, without seeking to repair or retrieve components.

Precautions prior to use

The maximum short circuit current (Icc) admissible by an earthing or short-circuiting device will be determined by the component bearing the lowest current in the chain of the device.

This value is clearly indicated on the device on the short-circuit cable and it is the responsibility of the user to check before use if the device's Icc is appropriate to the use envisaged and the risk of short-circuiting involved.

Installing the equipment

The following steps must be followed completely and in the correct order:

Checking the absence of voltage

Switch off the line or the installation, and then check the absence of voltage using an appropriate device.

Connecting the equipment to the earth

Always begin by connecting the device's earthing clamp or vice to the installation earth system (earth network, metallic tower, earthing rod, etc...).

For screw-type clamps and vices, tighten them firmly, but not excessively or roughly. The earthing cable must be completely unwound.

Connecting the line clamps

Using the insulating stick or handle, position and fasten the line clamps onto the conductors. For screw-type clamps, tighten them firmly, but not excessively or roughly.

All the short-circuit cables must be completely unwound and must not be tangled.

Removing the equipment

The following steps must be followed completely and in the correct order:

Removing the line clamps

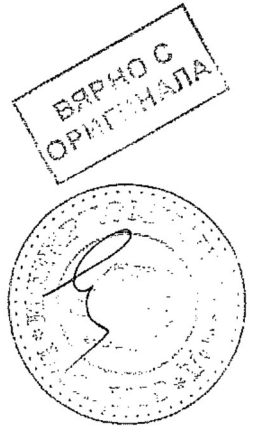
Using the insulating stick or handle, unfasten and remove all the line clamps from the conductors.

Removing the earth connection

This operation must always be done last.

Storing the equipment

Clean and visually inspect the equipment. Store it correctly in its carrying bag or case, and/or in its storage place.



стр. 263

ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

Обособена позиция № 1: „Преносими заземители“



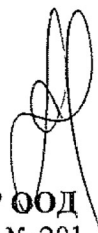
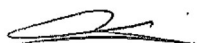
ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА

ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“

6. Документи за Преносими заземители за ВН за шини за уредби 110 kV – със заземителен кабел и кабел за свързване на късо (гъвкави медни въжета) – 95 мм²

Приложение № 6.3

Декларация за съответствие, придружена с превод на български език



Участник: **“ИНТЕРКОМПЛЕКС” ООД**
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg

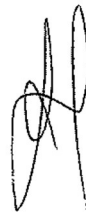
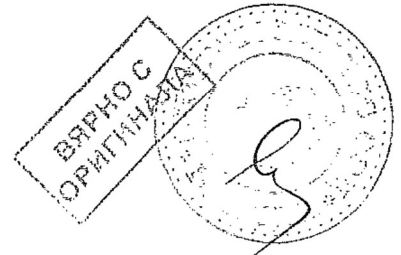
| | |
|--|--|
| Доставчик: SIBILLE FAMECA ELECTRIC Адрес: 815 В chemin du razas, ZI les plaines 26780 MALATAVERNE Франция | ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ (NF L 00-015C) |
| Клиент: „ИНТЕРКОМПЛЕКС“ ООД Адрес: бул. „Пещерско шосе“ 201 4015 Пловдив България | Декларация №: DEVSFE1500670A Брой стр.: 1/1 |

Договор №: Заземления

| Обозначение | Референция/тип | Количество | Стандарт |
|----------------------------------|----------------|------------|----------|
| МГВ 35 мм ² | TSC35 | | IEC61138 |
| МГВ 50 мм ² | TSC50 | | IEC61138 |
| МГВ 95 мм ² | TSC95 | | IEC61138 |
| Клема с байонетен накрайник | MT535B | | IEC61230 |
| Заземителна клема NB8 6 до 25 | NB8 | | IEC61230 |
| Клема Ср.Н. | MT535URUB | | IEC61230 |
| PXV 1070 В | PXV | | IEC60855 |
| PXV 1150 В | PXV | | IEC60855 |
| PXV 1250 В | PXV | | IEC60855 |

С настоящата декларация гарантираме, че, освен ако изрично не са посочени изключения, изброеното оборудване съответства на изискванията на процедурата/ договора и че, след преминаване на необходимите изпитания, то напълно съответства на всички посочени стандарти, както и останалите приложими стандарти и регулации.

Мениджър – управление на качеството
 Име: Grira Sabri – QSE
 Дата: 20/10/2015
 /подпис нечетлив/

Supplier : SIBILLE FAMECA ELECTRIC

Company : 815 B CHEMIN DU RAZAS
ZI les Plaines
26780 MALATAVERNE
France



STATEMENT OF CONFORMITY
(NF L 00-015C)

Customer : INTERCOMPLEX LTD
Company : 201 PESHTERSKO SHOSSE STR.
4015 PLOVDIV
Bulgaria

Statement no : DEVSFE1500670A
Number of pages : 1 / 1

| Designation | Reference or type | Serial or batch number | Quantity | Complies to |
|--------------------------------------|-------------------|------------------------|----------|-------------|
| Cable section 35 mm ² | TSC35 | | | IEC61138 |
| Cable section 50 mm ² | TSC50 | | | IEC61138 |
| Cable section 95 mm ² | TSC95 | | | IEC61138 |
| Clamp MT535 with bayonet end fitting | MT535B | | | IEC61230 |
| Earthing clamp 6 to 25 type NB8 | NB8 | | | IEC61230 |
| Middle voltage clamp | MT535URUB | | | IEC61230 |
| PXV 1070 B | PXV | | | IEC60855 |
| PXV 1150 B | PXV | | | IEC60855 |
| PXV 1250 B | PXV | | | IEC60855 |

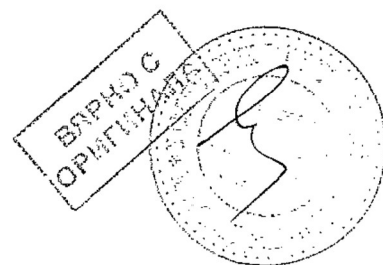
We hereby declare, barring exceptions, reservations, or exemptions listed in this statement of conformity, that the listed supplies comply with the contract requirements and that, after completion of testing and verification, they completely satisfy all specified requirements, and applicable standards and regulations.

Supplier Quality Manager

Name and title : Grira Sabri - QSE

Signature :

Date : 20/10/2015



ОТКРИТА ПРОЦЕДУРА ЗА СКЛЮЧВАНЕ НА РАМКОВО СПОРАЗУМЕНИЕ

Реф. № PPD 20-028

с предмет: *“Доставка на преносими заземители, детектори за напрежение, оперативни щанги и указатели за сфазирание“*

Обособена позиция № 1: „Преносими заземители“

ПРИЛОЖЕНИЯ КЪМ ПРЕДЛОЖЕНИЕ ЗА ИЗПЪЛНЕНИЕ НА ПОРЪЧКАТА

ОБОСОБЕНА ПОЗИЦИЯ № 1: „ПРЕНОСИМИ ЗАЗЕМИТЕЛИ“

б. Документи за Преносими заземители за ВН за шини за уредби 110 kV – със заземителен кабел и кабел за свързване на късо (гъвкави медни въжета) – 95 мм²

Приложение № 6.4

Приложение № 6.5

Сертификат за изследване на типа, издаден съгласно процедурата за оценяване на съответствието „Изследване на типа“ в съответствие с НСИОСЛПС или еквивалентен нормативен акт на държави-членки на ЕО, на Европейската икономическа зона/Европейската асоциация за свободна търговия (ЕАСТ), с които Република България има подписани и влезли в сила споразумения за взаимно признаване на резултатите от оценяване на съответствието и приемане на промишлените продукти (заверено копие)

Протоколи от проведените проверки и изпитвания на ПЗ в рамките на процедурата за оценяване на съответствието с приложени резултати от изпитванията (заверени копия)

Участник: “ИНТЕРКОМПЛЕКС” ООД
гр. Пловдив, бул. “Пещерско шосе” № 201
тел./факс: (032) 24 14 14; 24 14 15
e-mail: sales@intercomplex.bg

LABEIN-Tecnalia

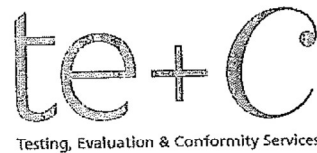
• Parque Tecnológico de Bizkaia
C/ Geldo - Edificio 700
48160 - Derio (Bizkaia)
Tel. +34 94 404 14 41
Fax +34 94 404 14 45

• Vega de Tapia, s/n
48903 - Burtzena (Bizkaia)
Tel. +34 94 607 34 90
Fax +34 94 607 34 95

• Parque Tecnológico de Bizkaia
Edificio 101
48170 - Zamudio (Bizkaia)

• Pol. Industrial Basabe
Pabellon E-3
20500 - Aretxabaleta (Gipuzkoa)

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**LABEIN FOUNDATION – ENERGY UNIT
ELECTRICAL EQUIPMENT LABORATORY**

Test report

No CE35-08-AM-05

Page 1 of 8

Short circuit current test

| | |
|------------------------|--|
| TEST OBJECT: | Portable equipment for earthing and short-circuiting |
| DESIGNATION: | MT535URU NB8 |
| REQUESTED BY: | FAMECA 2 Rue Gutenberg Rixheim (France) |
| MANUFACTURER: | FAMECA |
| STANDARD: | IEC 61230:1993 |
| RECEPTION DATE: | February 18th 2008 |
| TESTS DATE: | February 19th-21st 2008 |

The test object has been subjected to the tests required by the applicant, applying the procedures specified in the standard indicated before.

THE PRESENT REPORT CONSISTS OF:

| | |
|---------------|---------------------|
| No of pages: | 8 (and annex of 16) |
| Drawings: | Annex |
| Photographs: | Annex |
| Oscillograms: | Annex |

На основании чл.36а ал.3 от ЗОП



На основании чл.36а ал.3 от ЗОП

Head of Electrical Equipment Laboratory

This document is a copy in pdf of the original Report,
as requested by the client

Barakaldo, June 4th 2008

- The present report refers only and exclusively to the sample tested and at the moment and conditions in which the measures were made.
- The partial reproduction of the present document is categorically forbidden without the permission of LABEIN.

Tecnología más Confianza

стр. 266

• C.I.F. : G48975767

Razón Social: Fundación

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3. PHASE TO PHASE SHORT-CIRCUIT TESTS5

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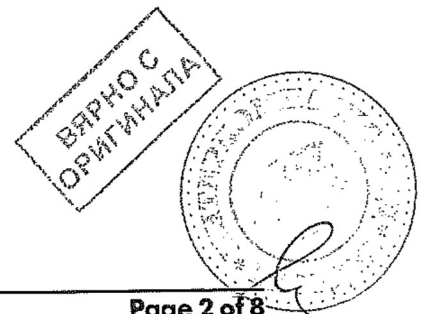
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 4.1. Test description7

 4.2. Results8

ANNEX DRAWINGS
 PHOTOGRAPHS
 OSCILLOGRAMS



1. TEST OBJECT DESIGNATION

Portable equipment for earthing and short-circuiting.

Manufacturer: FAMECA
Designation:
Line clamp: MT535URU
Earth clamp: NB8
Short-circuiting cable: TFK950275 (section of 95 mm² and 2.75 m length)
Earthing cable: TFK3510 (section of 35 mm² and 10 m length)

Rated current, I_r: 25 kA, 1 s (phase-to-phase short circuit)
6 kA, 1 s (phase-to-earth short circuit)

Definition dossier reference: diMT535URU01
diNB8
diTFK02

See photographs and drawings of the test object in the annex.

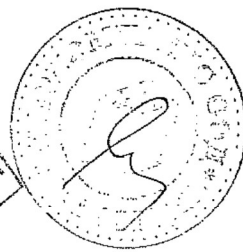
2. TESTS PERFORMED. STANDARD

Short-circuit current tests.

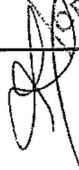
The tests have been performed according to the procedure specified in the following standard:

IEC 61230:1993 and CDV IEC 61230 ed. 2: December 2007 "Live working- Portable equipment for earthing or earthing and short-circuiting"

The calculation of the uncertainties of the measurements is available.



ВЯРНО С
ОРИГИНАЛА

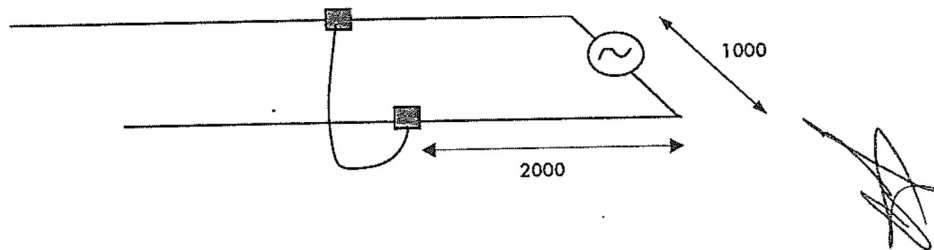


3. PHASE TO PHASE SHORT-CIRCUIT TESTS

3.1. Test description

The test is carried out according to the specifications of the manufacturer and in accordance with subclause 6.6 of the standard IEC 61230.

The scheme of the test is the following, figures in mm:



The test circuit is arranged at 2.6 m height from the ground.

According to the manufacturer, line clamps have been submitted, previously, to a salt fog test of 64 hours following IEC 68-2-11 (see CETIM CERMAT test report n° HD/HD/08E0102-5).

4 Tests with aluminium flexible cable of diameter 31 mm are performed with the following parameters:

[Signature]

I_{test} (r.m.s.): 25 kA
 I_{test} (peak): 62.5 kA
 Time: 1 s
 Torque (line clamp): 20 Nm

See photographs of the test arrangement in the annex.

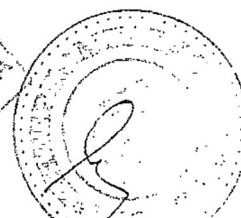
3.2. Results

Registered values are the following:

| Oscillogramm no. | 34 | 35 | 36 | 37 |
|--|-------|-------|-------|-------|
| Short-time r.m.s. current I _{th} (kA) | 25.8 | 25.8 | 25.6 | 25.7 |
| Short-time peak value current, I _{dyn} (kA) | 64.6 | 64.8 | 64.3 | 64.5 |
| Duration (s) | 1.005 | 1.005 | 1.005 | 1.006 |
| Joule integral I ² t (AAs.10 ⁸) | 6.92 | 6.96 | 6.82 | 6.86 |
| Frequency (Hz) | 50 | 50 | 50 | 50 |

Result: The test objects withstand the test current during 1 s. There is neither current interruption nor arcing during the test time.

ВЯРНО С
 ОРБИТНАТА



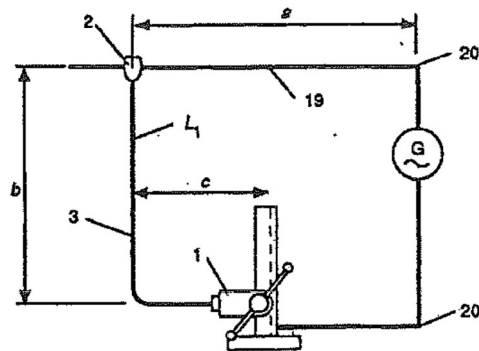
271

4. PHASE TO EARTH SHORT-CIRCUIT TEST

4.1. Test description

The test is carried out according to the specifications of the manufacturer and in accordance with subclause 6.6 of the standard IEC 61230.

The scheme of the test is the following:



b: 6.5 m

a: 2 m

c: Approximately 1.5 m

19: Line cable

3: Earthing cable

2: Line clamp

1: Earth clamp

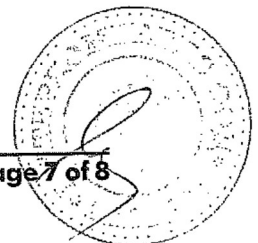
According to the manufacturer, line clamps and earth clamps have been submitted, previously, to a salt fog test of 64 hours following IEC 68-2-11 (see CETIM CERMAT test report n° HD/HD/08E0102-5).

Two tests have been performed with the following parameters:

Line conductor: Aluminium flexible cable of diameter 31 mm

Earth conductor: Earth rod 701

ВЪРНО С
ОРИГИНАЛА



Test parameters:

I_{test} (r.m.s.): 6 kA
 I_{test} (peak): 15 kA
 Time: 1 s
 Torque (earth clamp): 20 Nm
 Torque (line clamp): 20 Nm

See photographs of the test arrangement in the annex.

4.2. Results

| | | |
|---|-------|-------|
| Oscillogramm no. | 26 | 27 |
| Short-time r.m.s. current I_{th} (kA) | 6.2 | 6.1 |
| Short-time peak value current, I_{dyn} (kA) | 15.9 | 15.7 |
| Duration (s) | 1.005 | 1.004 |
| Joule integral I^2t (AAs.10 ⁷) | 3.99 | 3.93 |
| Frequency (Hz) | 50 | 50 |

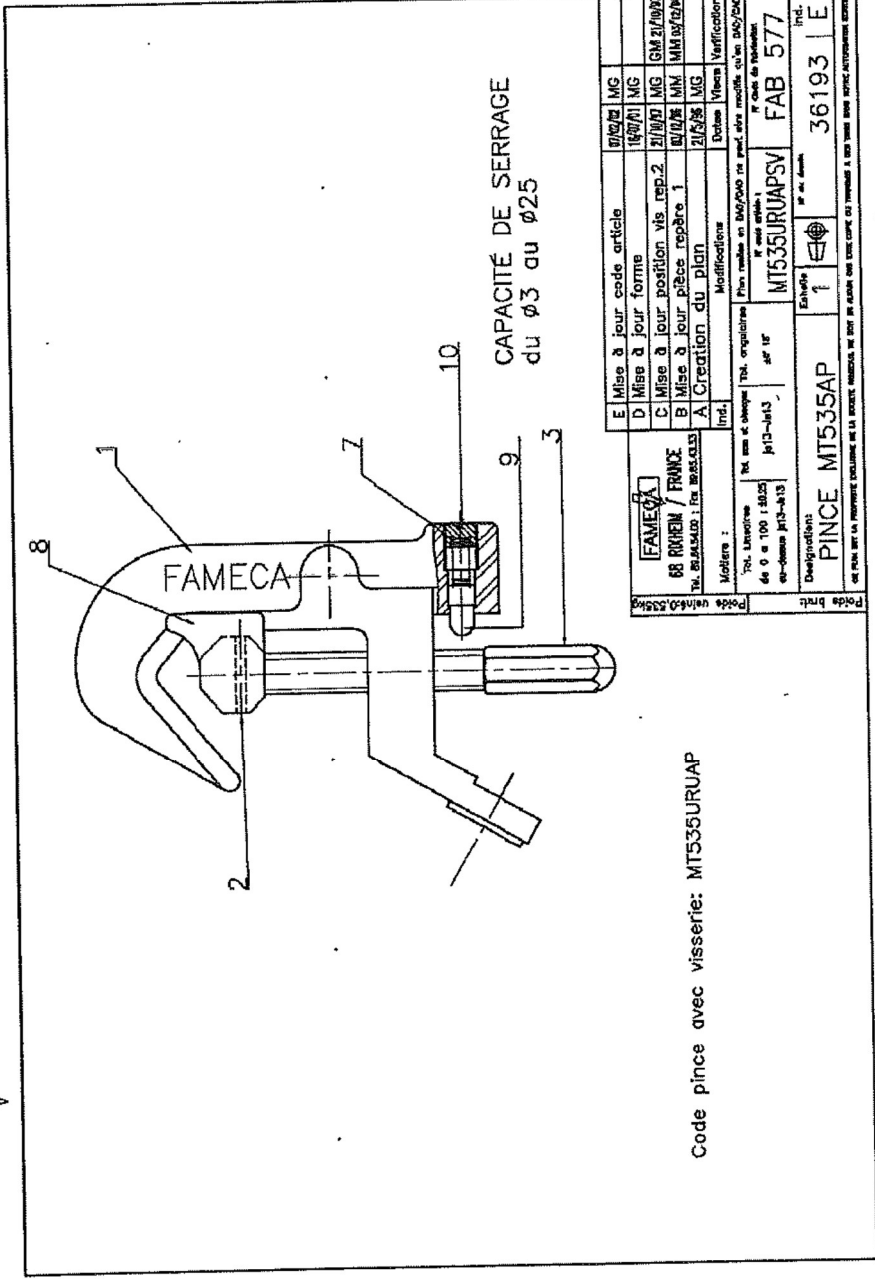
Result: The test objects withstand the test current during 1 s. There is neither current interruption nor arcing during the test time.

See oscillograms in the annex.

ВРНО С
ОРИГИНАЛ

ср. 273


5. PLAN D'ENSEMBLE

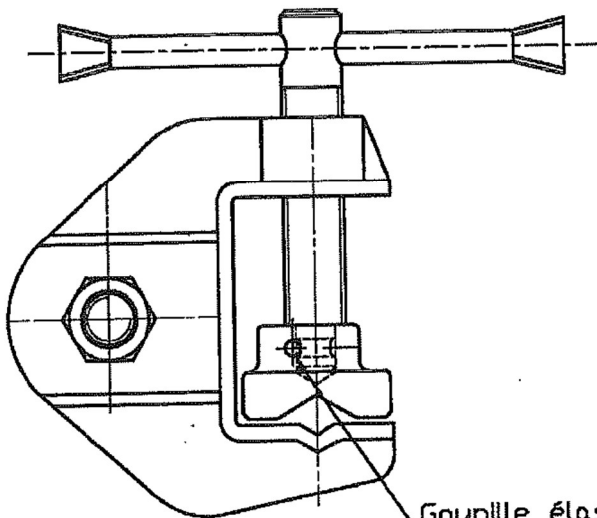


| | | | |
|---|--------------------------------|----------------------|----|
| E | Mise à jour code article | 01/02/12 | MG |
| D | Mise à jour forme | 14/01/11 | MG |
| C | Mise à jour position vis rep.2 | 21/01/12 | MG |
| B | Mise à jour pièce repère 1 | 01/02/12 | MM |
| A | Creation du plan | 21/02/08 | MG |
| Modifications | | Date | |
| Fin réalisé en 04/02/08 par [nom] [nom] | | 04/02/08 | |
| Titre: Livret de | | 14/12-14/13 | |
| 44 0 a 100 1 8105 | | 14/12-14/13 | |
| ex-00000 14/12-14/13 | | 14/12-14/13 | |
| Designation: | | MT535URUAPSV FAB 577 | |
| Poids bruts: | | 36193 E | |
| Poids nets: | | 36193 E | |

Code pince avec visserie: MT535URUAP

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| | | | |
|---|--------------------------|--|----------|
|  | DOSSIER D'IDENTIFICATION | | NB8 |
| | | | DiNB8 |
| | | | Page 6/9 |




Goupille élastique ø5.11

Capacité de serrage:
ø6 à 25mm
Barres plates 0 à 25mm

Étau sans visserie référence: NB8SV

| | |
|----------------------|--|
| Poide brut: | |
| Poide usiné: 0,365kg | |

| | | | | | |
|--|------|--|----------------------------|-----------------------|----------------|
|  68 RIXHEIM / FRANCE Tél. 03.88.84.54.00 ; Fax 03.88.85.43.53 | | | | | |
| Matière : | Ind. | Modifications | Dates | Visas | Verification |
| TOLERANCES GENERALES D'USINAGES : SPECIFICATION PRECIS Dimensions linéaires de 0,5 à 100 : ±0,25 Dimensions circulaires de 100 à 400 : ±0,5 Dimensions circulaires : Je13-Je13 Dimensions angulaires pour longueur coté court de l'angle de 80 à 120 mm : ±0,20° | | Plan réalisé en DAO/CAO ne peut être modifié qu'en DAO/CAO | | N° code article : NB8 | |
| Designation: ETAU NB8 | | Echelle: 1 | N° du dessin: 49497 | | Ind.: A |
| CE PLAN EST LA PROPRIÉTÉ EXCLUSIVE DE LA SOCIÉTÉ FAMECA. IL NE PEUT ÊTRE REPRODUIT OU TRANSMIS À DES TIERS SANS NOTRE AUTORISATION ÉCRITE. | | | | | |

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DOSSIER D'IDENTIFICATION

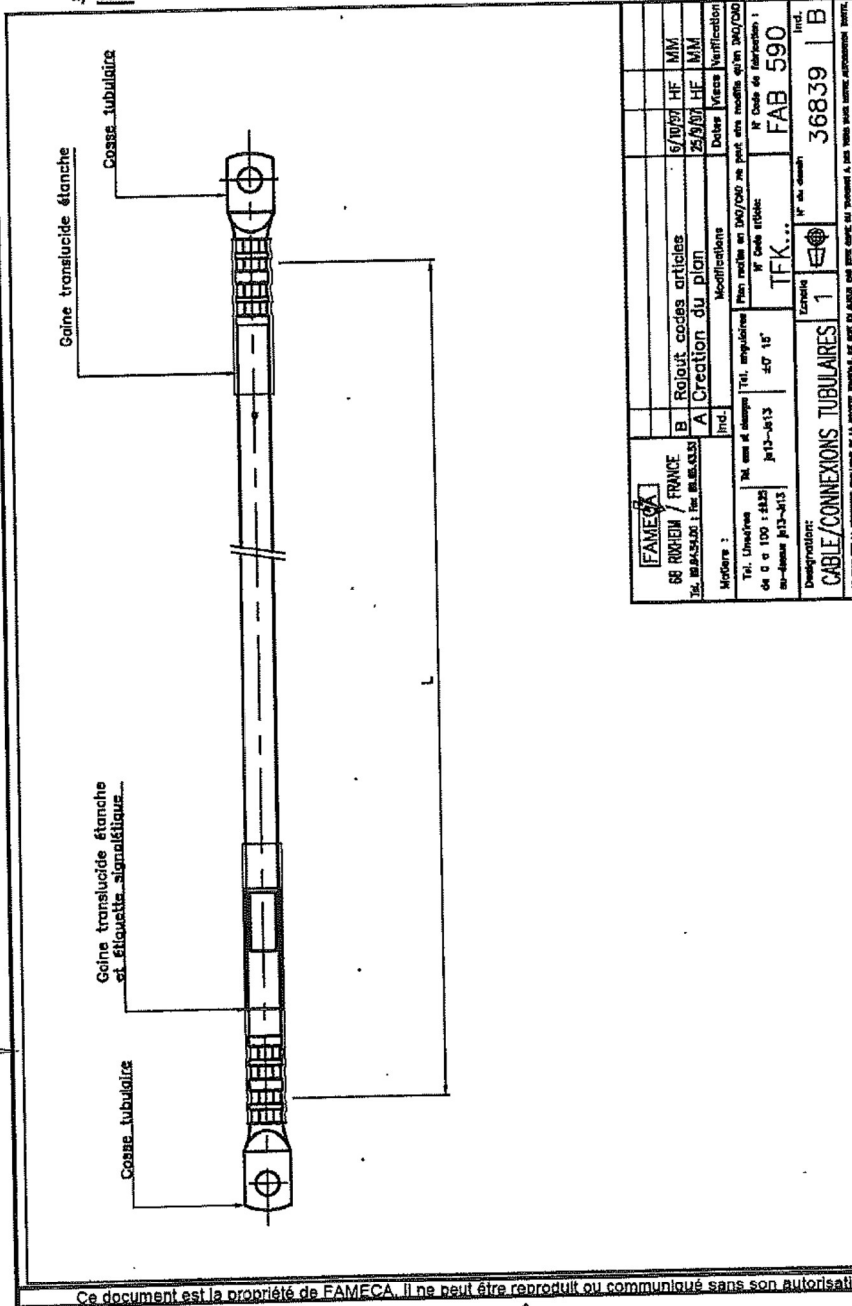
CABLE MALT

dITFK

Page 6/13

5. PLAN D'ENSEMBLE

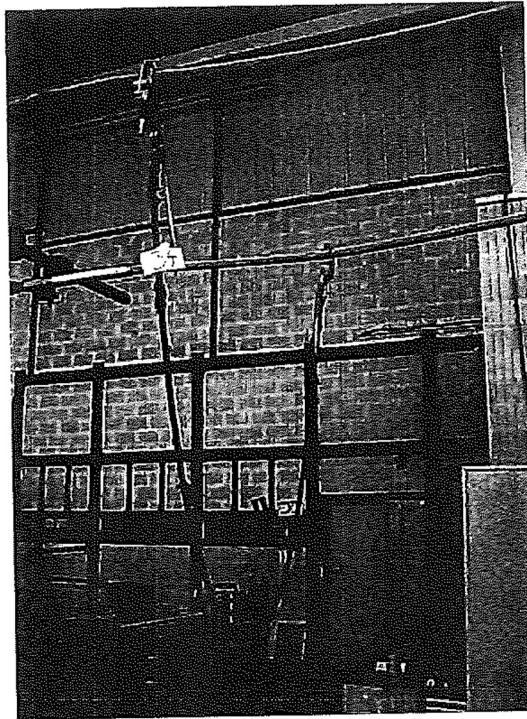
a) TFK



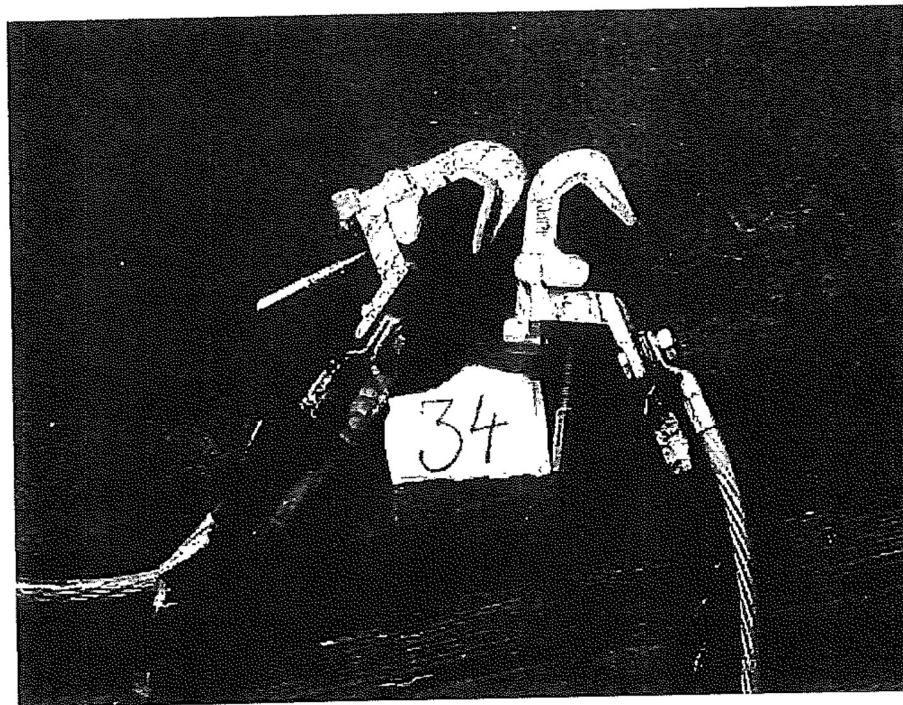
| | | | | | | | | |
|--|--|-----------------------------|--|-----------------------|--|------------------------|----|----|
| FAMECA | | B | | Relaut codes articles | | 5/10/21 | HF | MM |
| 68 RUEIM / FRANCE | | A | | Creation du plan | | 25/01 | HF | MM |
| Tel. BULGARIA : 01 818.63.32 | | Ind. | | Modifications | | | | |
| Modèle : | | Tel. France | | N° de série | | N° Date de fabrication | | |
| de 0 à 100 : 0432 | | Tel. Belgique | | TFK | | FAB 590 | | |
| de 101 à 200 : 0432 | | Tel. Espagne | | ±0° 15' | | | | |
| de 201 à 300 : 0432 | | Tel. Italie | | | | | | |
| de 301 à 400 : 0432 | | Tel. Pays-Bas | | | | | | |
| de 401 à 500 : 0432 | | Tel. Portugal | | | | | | |
| de 501 à 600 : 0432 | | Tel. Royaume-Uni | | | | | | |
| de 601 à 700 : 0432 | | Tel. Suède | | | | | | |
| de 701 à 800 : 0432 | | Tel. Suisse | | | | | | |
| de 801 à 900 : 0432 | | Tel. Turquie | | | | | | |
| de 901 à 1000 : 0432 | | Tel. USA | | | | | | |
| Description : | | CABLE/CONNEXIONS TUBULAIRES | | 1 | | 36839 | | B |
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ВЕРНО С
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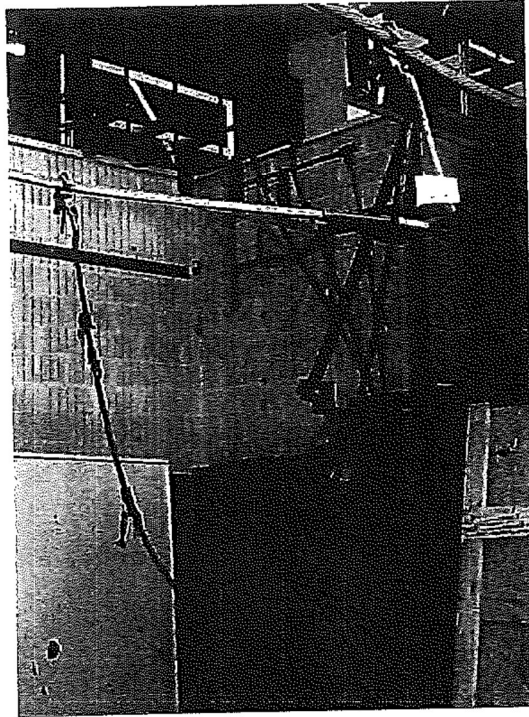
op. 276



Test object after the first phase to phase test

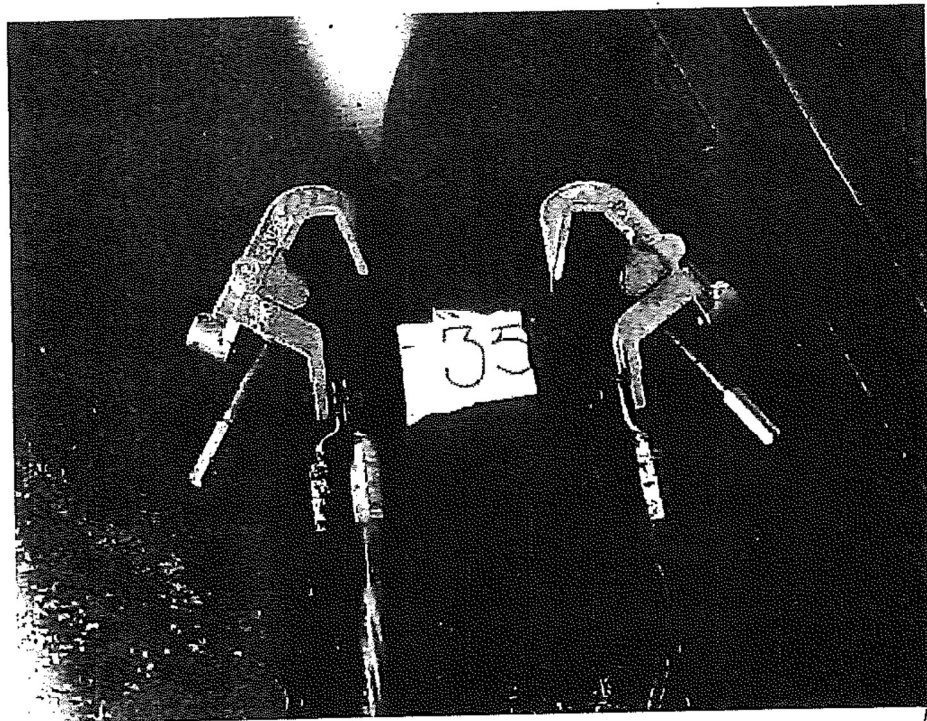


Line clamps after the first phase to phase test



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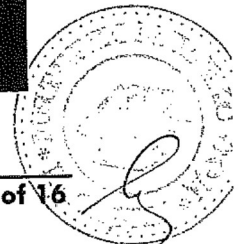
Test object after the second phase to phase test



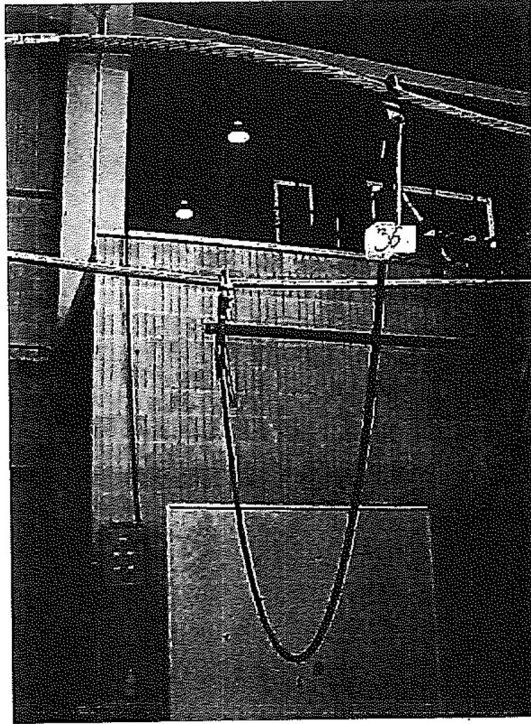
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Line clamps after the second phase to phase test

БРИФО
ОРИГИНАЛ

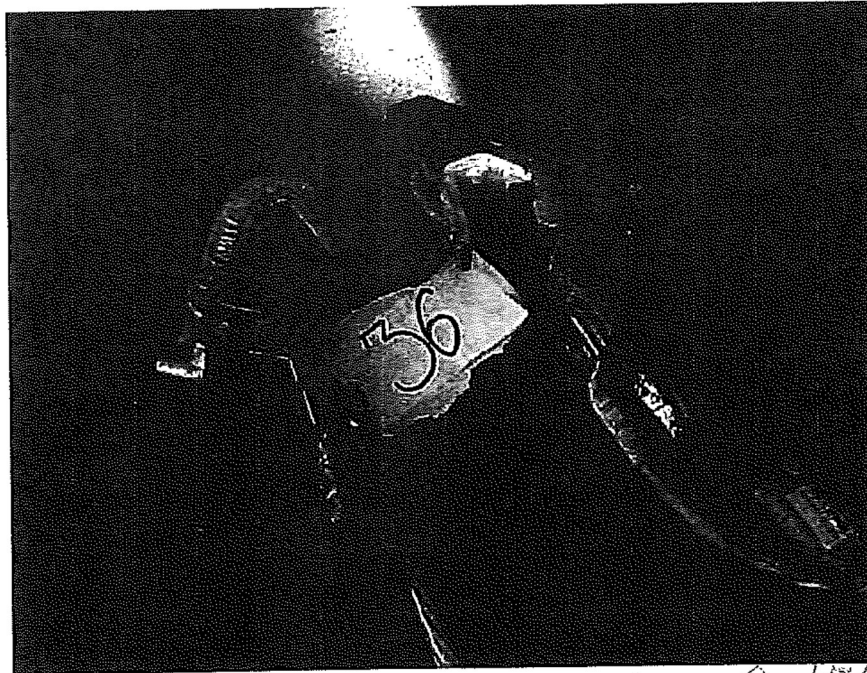


278



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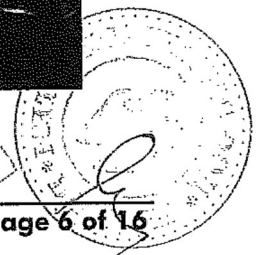
Test object after the third phase to phase test



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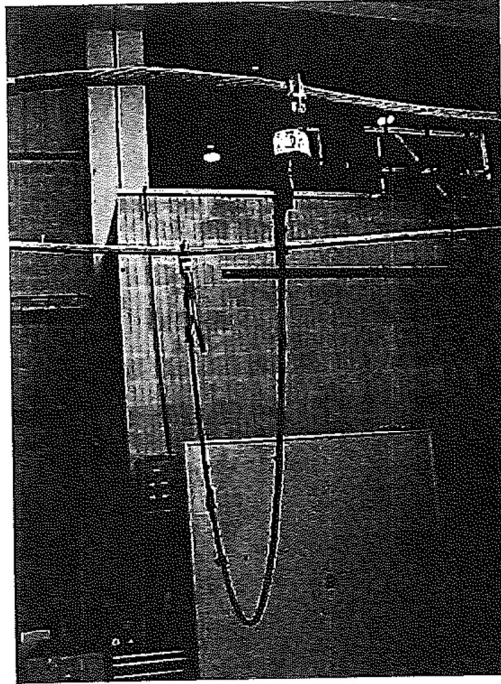
Line clamps after the third phase to phase test

ΕΡΓΟ ΔΙΑΧΕΙΡΙΣΗ
ΟΡΓΑΝΙΣΜΟΣ

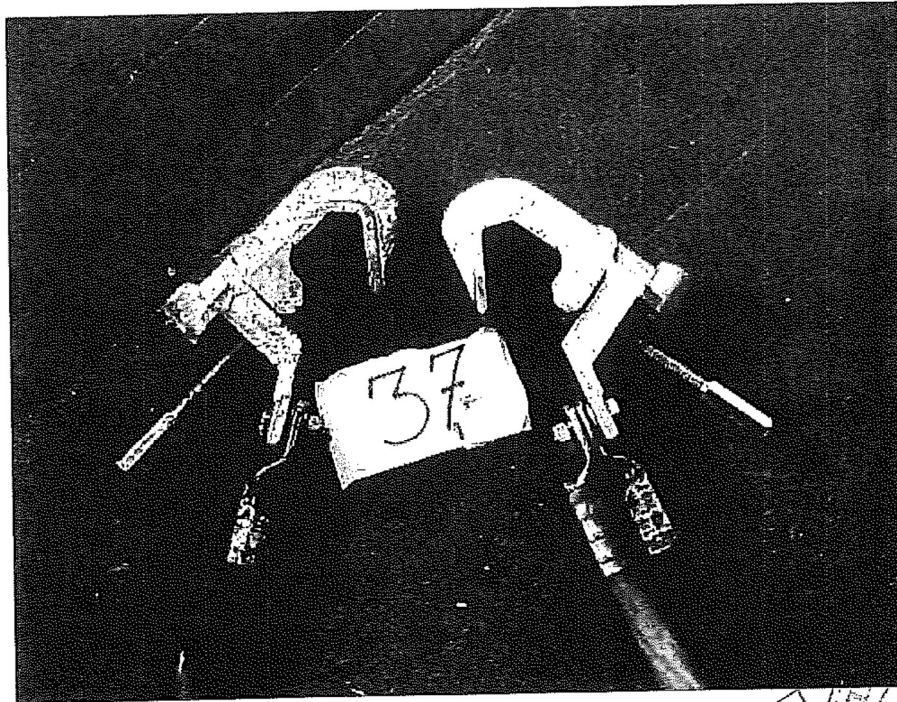


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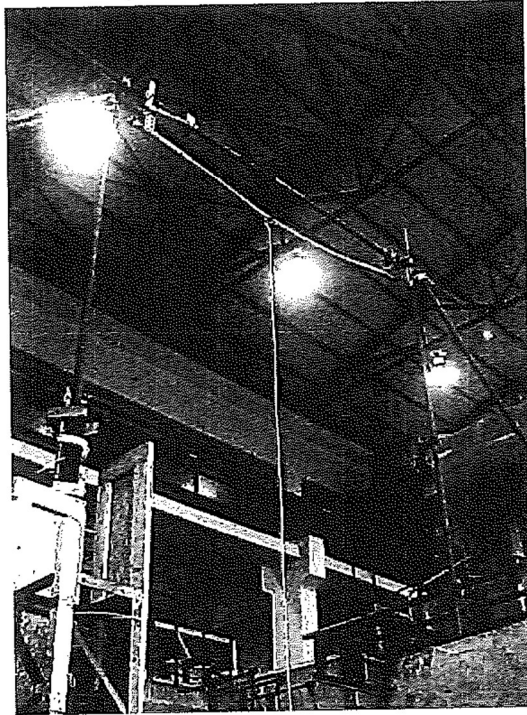
275



Test object after the fourth phase to phase test

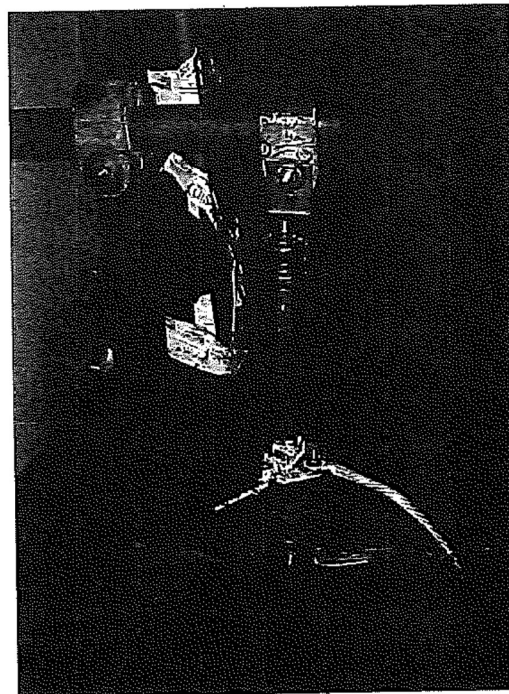


Line clamps after the fourth phase to phase test



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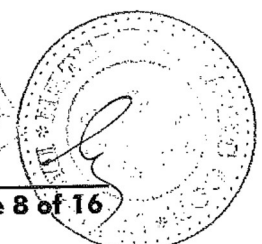
Test arrangement for the phase to earth short-circuit tests



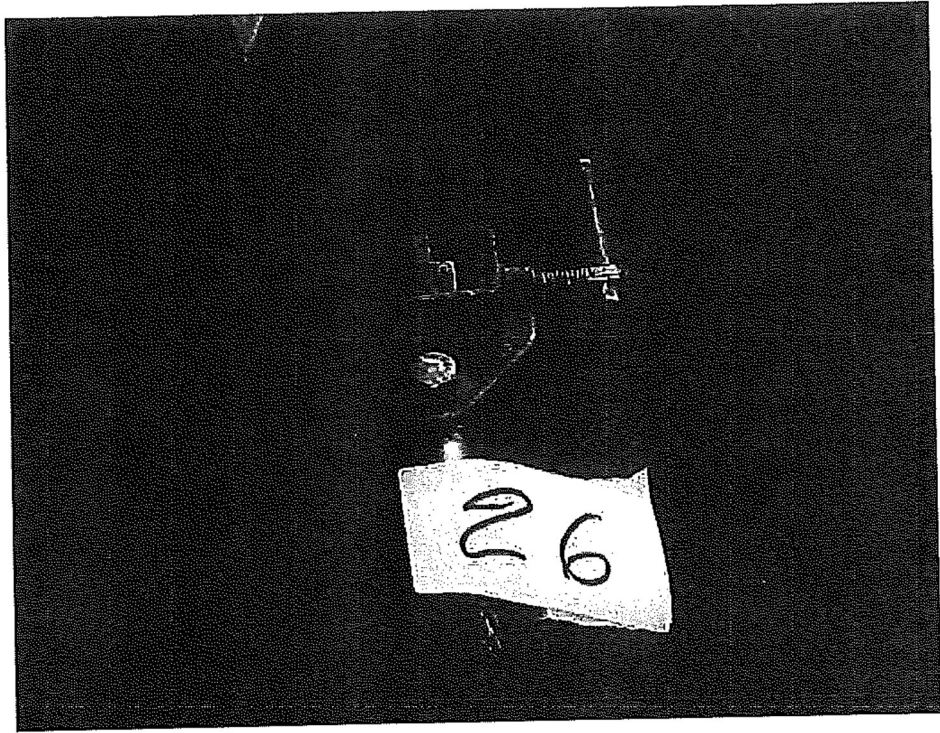
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Earth clamp connexion to the earth rod

БЯРНО С
ОРИГИНАЛ



ср. 281



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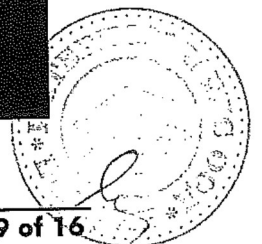
Earth clamp after the first phase to earth short circuit test



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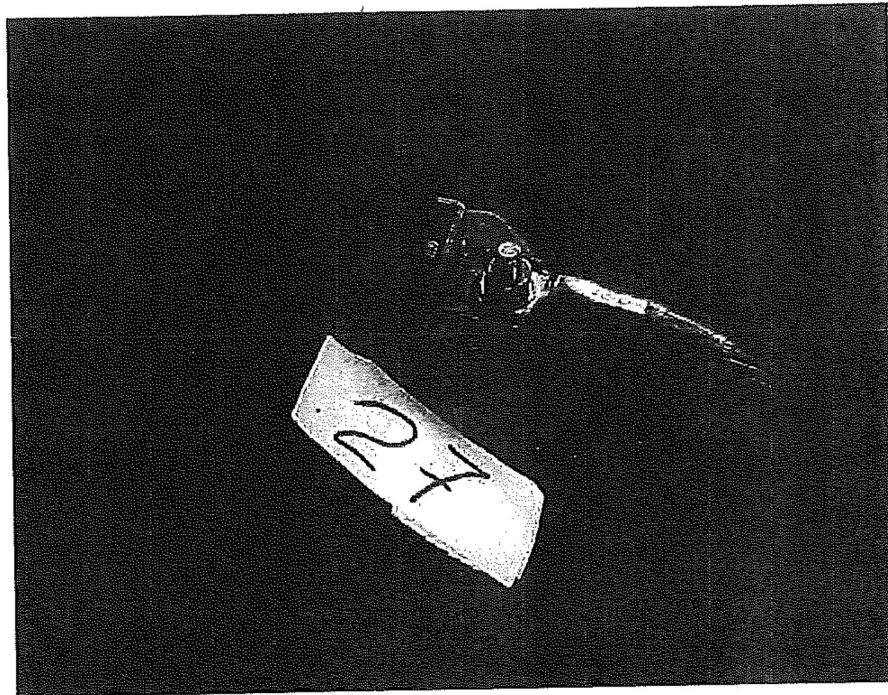
Line clamp after the first phase to earth short circuit test

ВЯРНО С
ОРИГИНАЛА

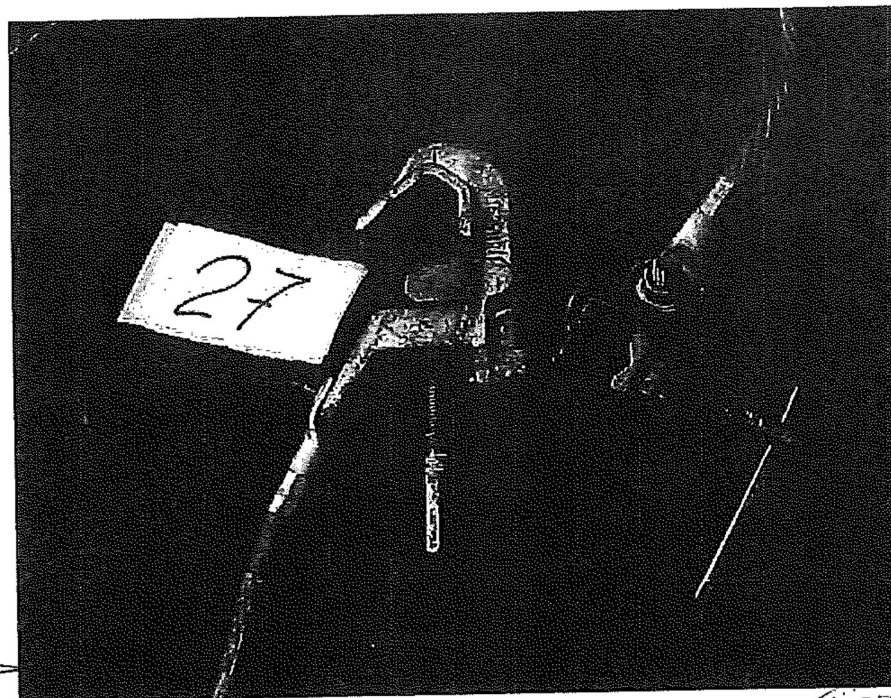


стр. 282

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Earth clamp after the second phase to earth short circuit test



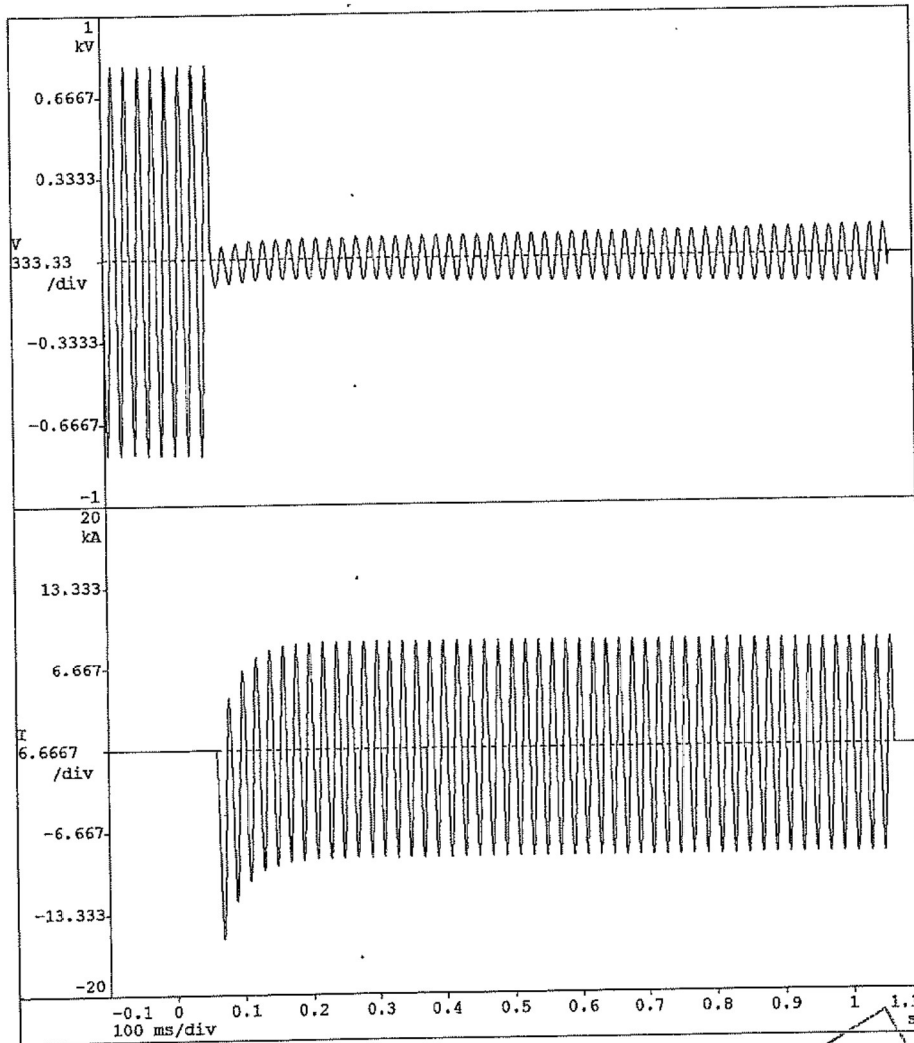
Earth and line clamps after the second phase to earth short circuit test

| | |
|--|--------------|
| V (eficaz/RMS) | 549.97 V |
| I (eficaz/RMS) | 6.19 kA |
| I (cresta/peak) | 15.87 kA |
| t _{r-t} | 3.99E+07 AAs |
| t _f | 0.059 s |
| t _e | 1.064 s |
| t _{total} (t _e -t _f) | 1.005 s |

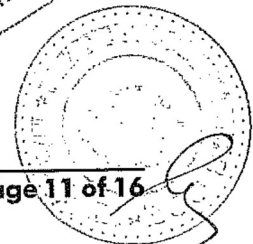
Fecha / Date: 20/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 26



ВЯРНО С
ОРИГИНАЛА

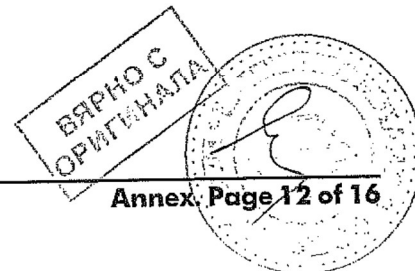
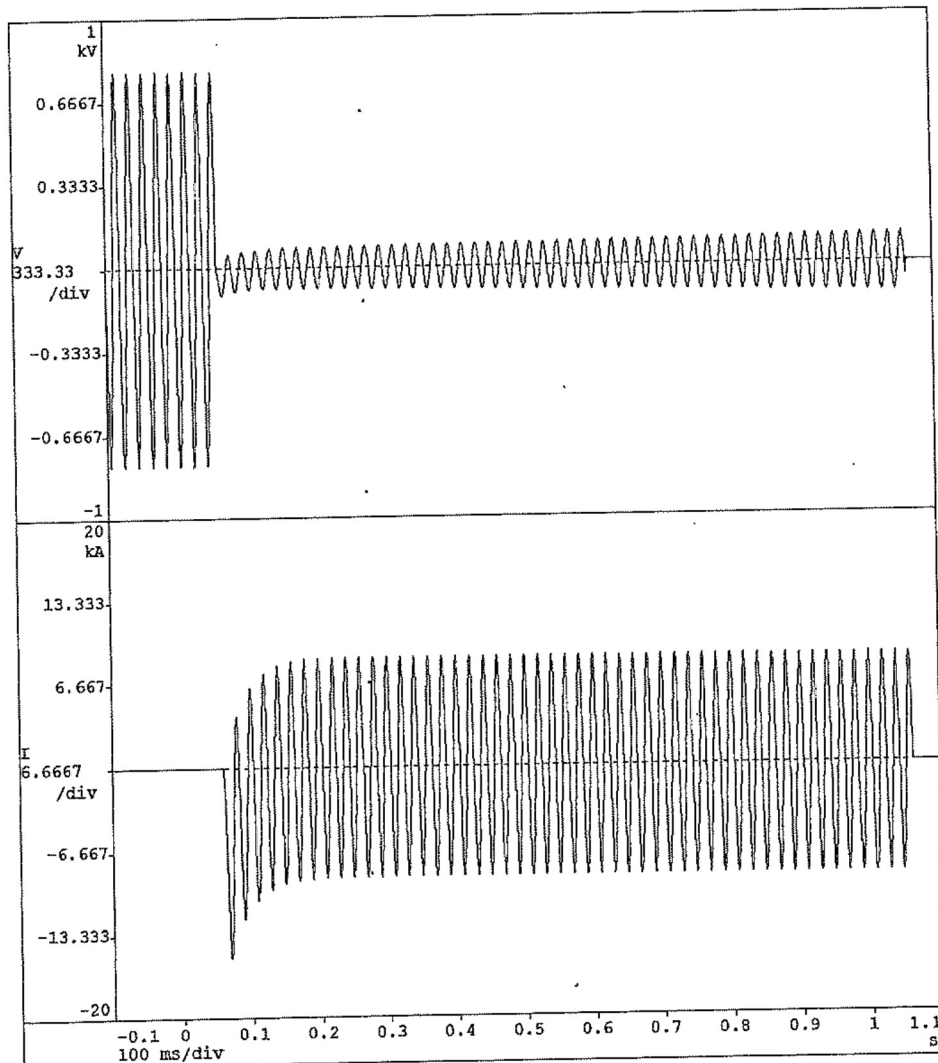


| | |
|--|--------------|
| V (eficaz/RMS) | 547.32 V |
| I (eficaz/RMS) | 6.14 kA |
| I (cresta/peak) | 15.67 kA |
| Z _t | 3.93E+07 AAs |
| t _i | 0.059 s |
| t _e | 1.063 s |
| t _{total} (t _e -t _i) | 1.004 s |

Fecha / Date: 20/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 27

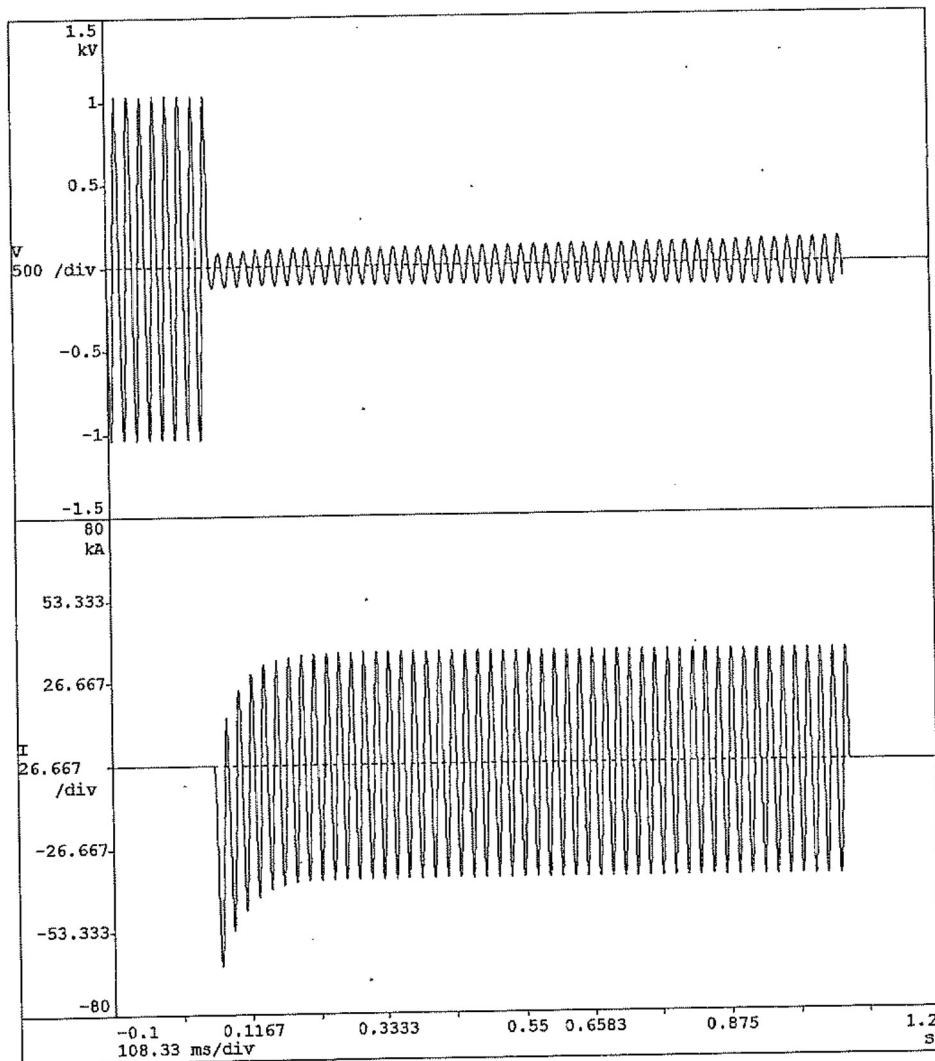


| | |
|--|--------------|
| V (eficaz/RMS) | 739.49 V |
| I (eficaz/RMS) | 25.78 kA |
| I (cresta/peak) | 64.58 kA |
| Z_{t} | 6.92E+08 AAs |
| t _i | 0.080 s |
| t _e | 1.065 s |
| t _{total} (t _e -t _i) | 1.005 s |

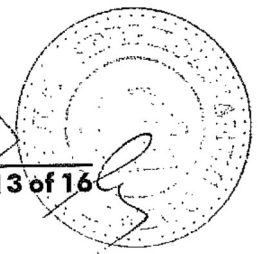
Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 34



ПРОС
ОРИГИНАЛ



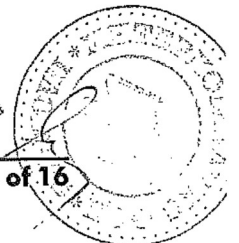
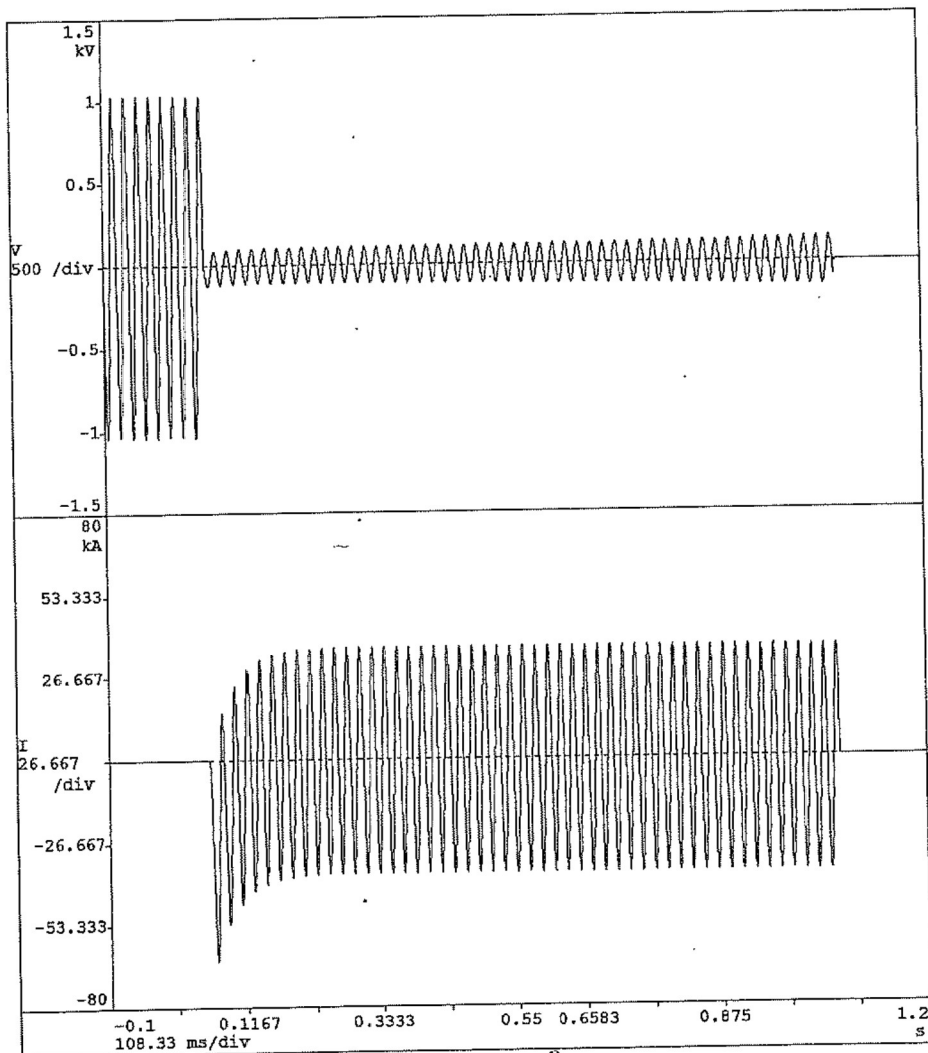
стр. 286

| | |
|---|--------------|
| V (eficaz/RMS) | 740.07 V |
| I (eficaz/RMS) | 25.84 kA |
| I (cresta/peak) | 64.83 kA |
| t _{-t} | 6.96E+08 AAs |
| t _i | 0.060 s |
| t _e | 1.065 s |
| t total (t _e -t _i) | 1.005 s |

Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 35

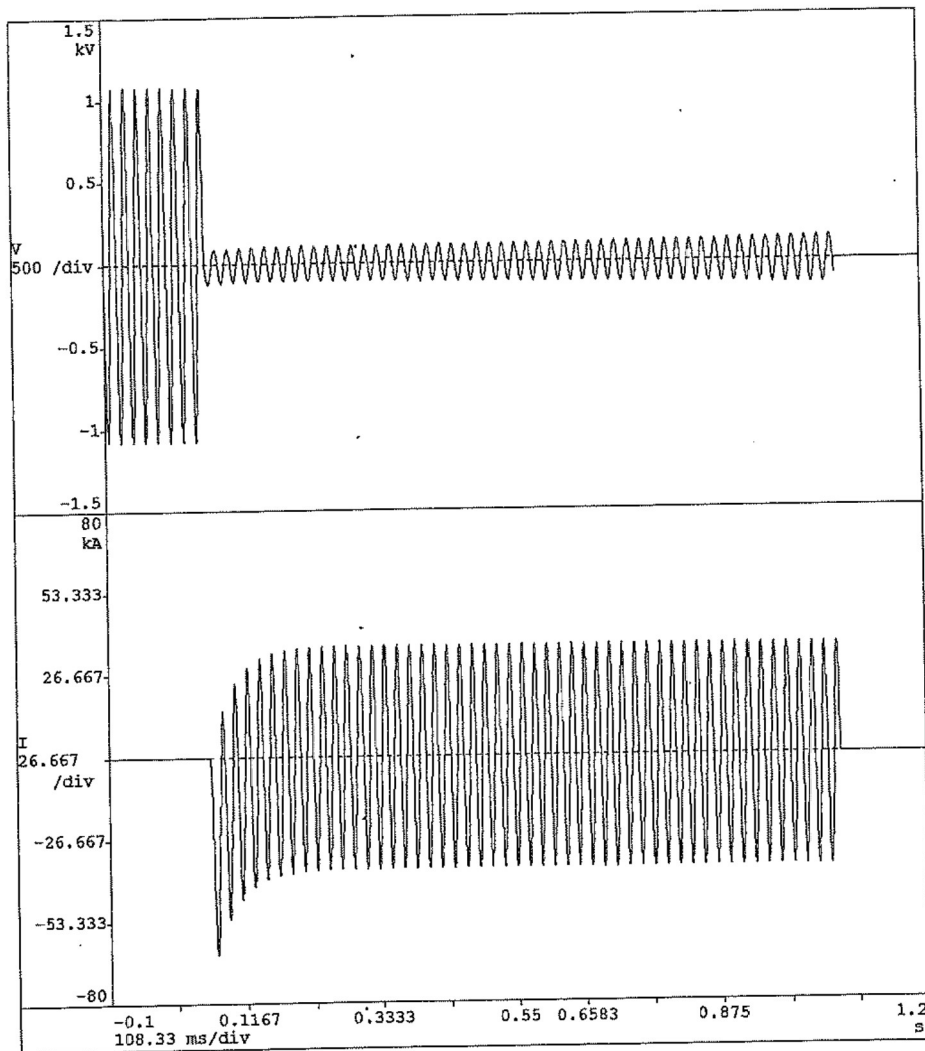


| | |
|--|--------------|
| V (eficaz/RMS) | 771.12 V |
| I (eficaz/RMS) | 25.57 kA |
| I (cresta/peak) | 64.26 kA |
| t _{2-t} | 6.82E+08 AAs |
| t _i | 0.060 s |
| t _e | 1.065 s |
| t _{total (t_e-t_i)} | 1.005 s |

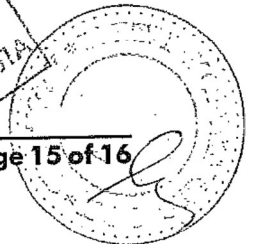
Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCILOGRAMA: 36



БЯРНО С
ОРИГИНАЛА

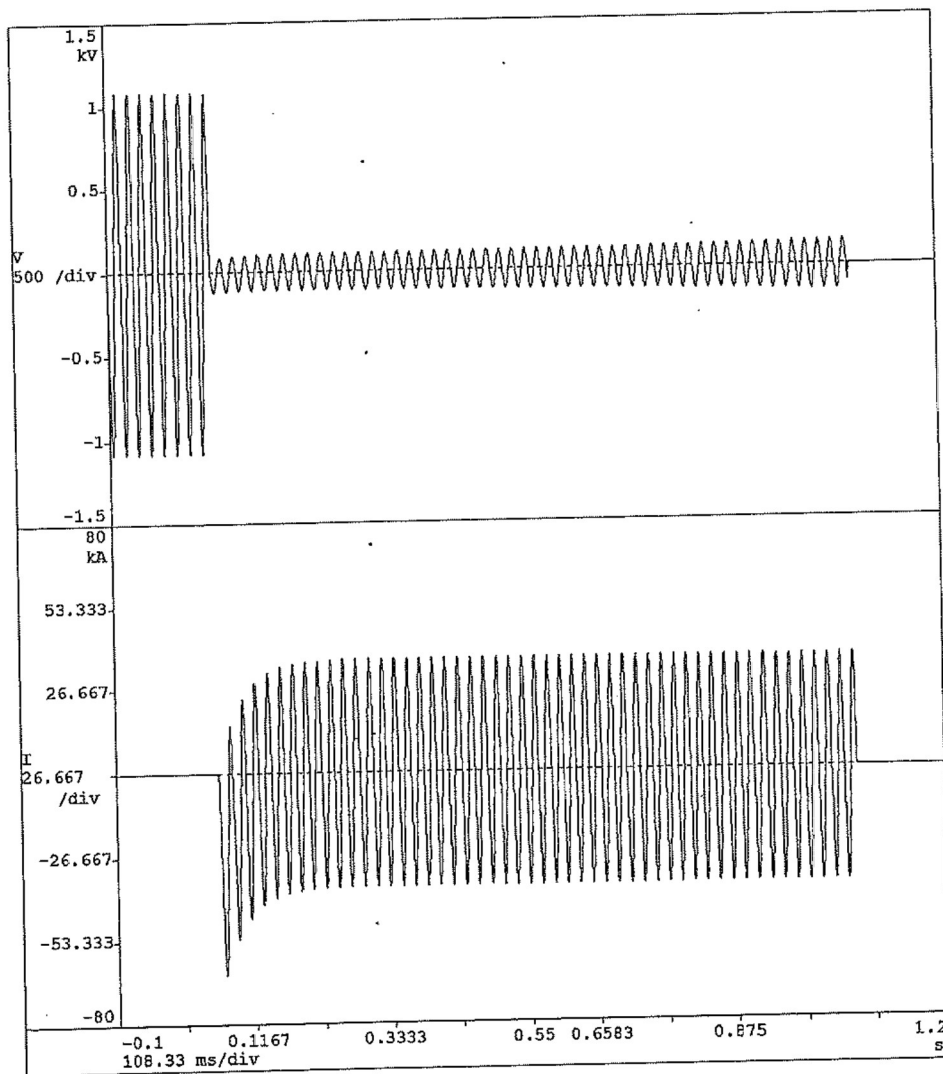


| | |
|---|--------------|
| V (eficaz/RMS) | 774.52 V |
| I (eficaz/RMS) | 25.86 kA |
| I (cresta/peak) | 64.48 kA |
| Z-t | 6.86E+08 AAs |
| t _i | 0.060 s |
| t _e | 1.066 s |
| t total (t _e -t _i) | 1.006 s |

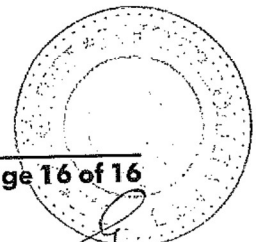
Fecha / Date: 21/02/08

N° EXPEDIENTE: CE35-08-AM

N° OSCIOGRAMA: 37



ВЕРНО С
ПРИГЛАНА





TEST REPORT

N° 135086 – 671357 B-Cr17/02/10

English version – Original in French

ISSUE TO : FAMECA
2, rue Gutenberg
BP 13
68173 RIXHEIM CEDEX

OBJET : TESTS ACCORDING TO THE STANDARD IEC 60855-1 (10:2009)
INSULATING FOAM-FILLED TUBES FOR LIVE WORKING.

Model tested : Tubes ø28mm red and ø32mm yellow

Test date : May 2015

Composition of this document: 19 pages

Document initially released on: July 10, 2015
Corrected on: February 10, 2017

Test supervised by:
The test technician,

D. TELLIER

На основании чл.36а ал.3 от ЗОП

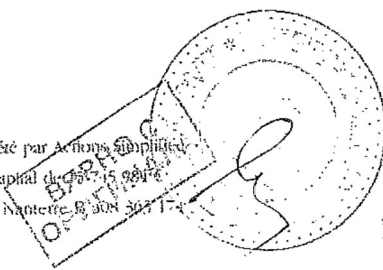
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LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas

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France

Tel : +33 (0) 1 47 95 60 60
Fax : +33 (0) 1 47 95 86 56
contact@lcie.fr
www.lcie.fr

Société par Actions simplifiée
au capital de 15 000 000 €
RCS Nanterre B 308 307 174

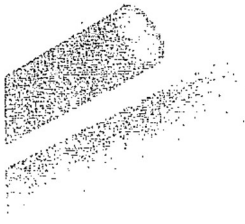


стр. 2/0



1 – TESTED PRODUCT

Two diameter tubes red 28mm and yellow 32mm.

| Designation | | Marking |  |
|-------------|--------|-------------------------------|---|
| Tube ø28mm | Red | FAMECA ø28 037/15 CEI 60855-1 | |
| Tube ø32mm | Yellow | FAMECA ø32 048/15 CEI 60855-1 | |

2 – TEST PROGRAM

The test program, established with the customer, was to realize in the local society FAMECA, under supervision of LCIE, type tests of the IEC 60855-1 of October 2009. Crushing test on tube has been made at CETIM and validated by LCIE.

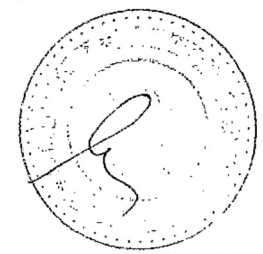
3 – EXECUTION MODALITIES

The execution modalities have been those of the corresponding paragraph of the specification above.

Chronological order of type tests:

| Tests | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 | Group 6 | Group 7 |
|---|--|---------|---------|---------|---------|---------|---------|
| Dimensional check | <u>Note:</u> Control has not been performed on each before cutting lengths; control was performed on the control sample Group 8. | | | | | | |
| Durability of marking | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Visual check | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Dielectric test after water exposition | 3 | | | | | | |
| Wet test | | 3 | | | | | |
| Bending test | | | 3 | | | | |
| Torsion test | | | | 3 | | | |
| Crushing test on tube | | | | | 3 | | |
| Bending ageing test | | | | | | 3 | |
| Dielectric test after mechanical ageing | | | | | | 4 | |
| Dye penetration test | | | | | | | 3 |

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OPWI HATA





TEST REPORT N° 135086-671357B-Cr17/02/10

Group and samples :

| Group | Number of test pieces |
|-------|---|
| 1 | 3 x 0.3m |
| 2 | 3 x 1.2m (cut at 0.1) |
| 3 | 3 x 2.5m |
| 4 | 3 x 1.2m |
| 5 | 3 x (3 x ϕ ext. at $\pm 5\%$)mm |
| 6 | 3 x 2.5m |
| 7 | 3 x (100 \pm 5)mm (cut at least to 0.1m from the end of initial length of cube) |
| 8 | 1 x 2m (specimen) |

4 - RESULTS

The following results have been obtained:

4.1 - Dimensional check (article 5.3.3 table B.1)

| Tube | Tolerance | Prescribed | | Measures 1 | Measures 2 | Measures 3 |
|--------------|---|------------|---------|------------|------------|------------|
| | | Min. | Max. | | | |
| $\phi 28$ mm | $\phi < 30$ mm (± 0.5 mm) | 27.5mm | 28.5mm | 27.87mm | 27.85mm | 27.84mm |
| $\phi 32$ mm | $30 \leq \phi \leq 40$ mm (± 0.55 mm) | 31.45mm | 32.55mm | 32.03mm | 32.02mm | 32.17mm |

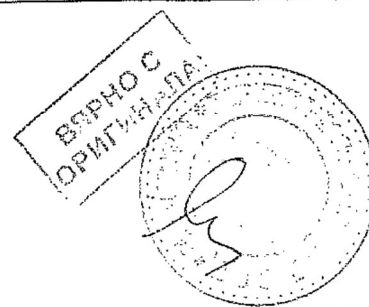
Satisfactory results

4.2 - Durability of marking (article 5.5.6 table B.1)

The markings shall be rubbed for 1min, with a clean soaked in water then with a clean cloth soaked in isopropanol.

| Sample test | Prescribed | Observation |
|-------------------|---|-------------------|
| Tube $\phi 28$ mm | The markings must still legible and the characters do not run or smear. | Nothing to report |
| Tube $\phi 32$ mm | | Nothing to report |

Satisfactory results



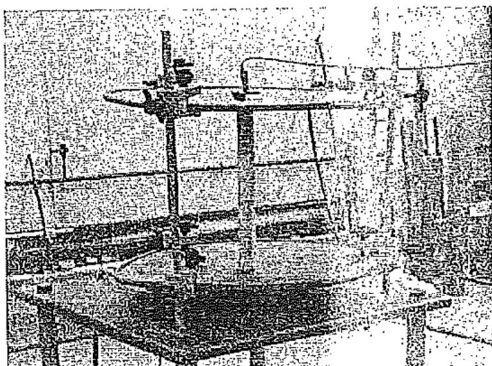


4.3 – Visual check (article 5.3.2 table B.1)

| Group | Prescribed | Observation | |
|-------|--|-------------------|-------------------|
| | | Ø28 | Ø32 |
| 1 | Each test, each group must not have: - Before cutting, defects in type of air bubble surface, bumps, dirt, strange body ... - After cutting, the internal defects at the apparent section detachment of the foam (open - cracks) | Nothing to report | Nothing to report |
| 2 | | Nothing to report | Nothing to report |
| 3 | | Nothing to report | Nothing to report |
| 4 | | Nothing to report | Nothing to report |
| 5 | | Nothing to report | Nothing to report |
| 6 | | Nothing to report | Nothing to report |
| 7 | | Nothing to report | Nothing to report |
| 8 | | Nothing to report | Nothing to report |

Satisfactory results

4.4 – Dielectric test after exposure to water (article 5.4.2 table B.1)



AC voltage applied: 100kV (f=50Hz)
 Distance between electrode: 30cm
 Duration of application: 1min

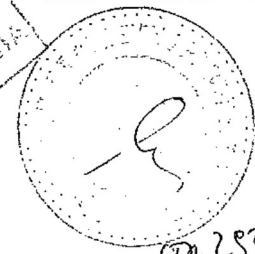
4.4.1 – With a conditioning by humidity

Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air.
 Test conditioning: 24h in water at 20 ° C.

| Ø28 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 48 | 0.8 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.7 | | | Nothing to report |
| Sample.3 | | 0.89 | | | Nothing to report |

Satisfactory results

БЮРО С
ОРИЕНТАЦИЈА



cr. 253



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| Ø32 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 49.2 | 0.78 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.84 | | | Nothing to report |
| Sample.3 | | 0.81 | | | Nothing to report |

Satisfactory results

4.4.2 – With a conditioning by immersion

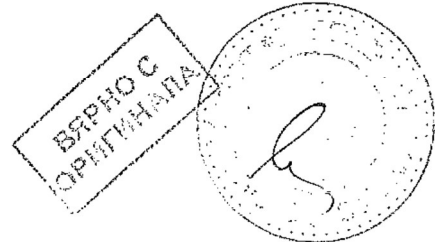
Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air.
Test conditioning: 24h in water at 20 ° C.

| Ø28 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 48 | 0.77 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.67 | | | Nothing to report |
| Sample.3 | | 0.73 | | | Nothing to report |

Satisfactory results

| Ø32 | Current I (µA) | | Phase angle | | Observation |
|----------|----------------|----------|-------------|----------|-------------------|
| | Prescribed | Recorded | Prescribed | Recorded | |
| Sample.1 | ≤ 49.2 | 0.81 | ≥ 50° | 90° | Nothing to report |
| Sample.2 | | 0.81 | | | Nothing to report |
| Sample.3 | | 0.78 | | | Nothing to report |

Satisfactory results



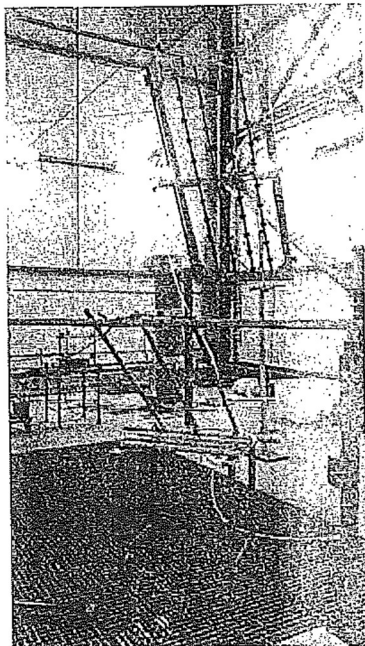
ep. 284



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4.5 – Wet test (article 5.4.3 table B.1)

Before the test: Each test should be cleaned with isopropanol and dry for 15 minutes at ambient air..



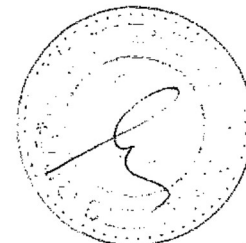
AC voltage applied: 100kV
 Duration of application: 1h
 Average precipitation rate: 1,5mm/min
 Ambient temperature: 19.4°C
 Water temperature: 19.0°C
 Humidity « H% » : 49.1%
 Water resistivity : 100Ω.m
 Inclination samples : 45°

| Ø28 | Elevated temperature (°C) | | Visual check | |
|----------|---------------------------|----------|---|-------------------|
| | Prescribed | Recorded | Prescribed | Observation |
| Sample.1 | < 20 | < 1 | No flashover during the test. No sparkover or puncture. No visual sign of tracking. No erosion on the surface. | Nothing to report |
| Sample.2 | | < 1 | | Nothing to report |
| Sample.3 | | < 1 | | Nothing to report |

Satisfactory results

| Ø32 | Elevated temperature (°C) | | Visual check | |
|----------|---------------------------|----------|---|-------------------|
| | Prescribed | Recorded | Prescribed | Observation |
| Sample.1 | < 20 | < 1 | No flashover during the test. No sparkover or puncture. No visual sign of tracking. No erosion on the surface. | Nothing to report |
| Sample.2 | | < 1 | | Nothing to report |
| Sample.3 | | < 1 | | Nothing to report |

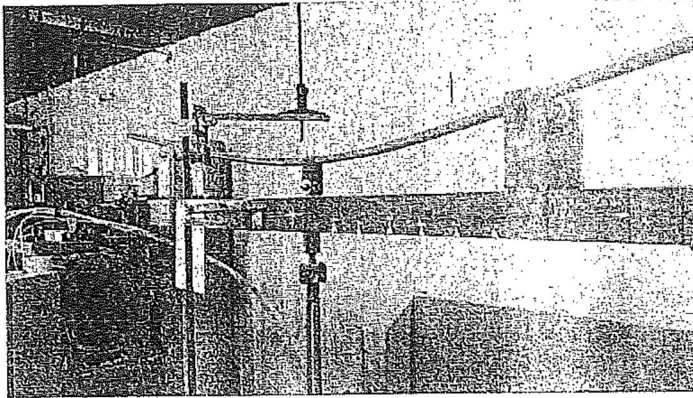
Satisfactory results



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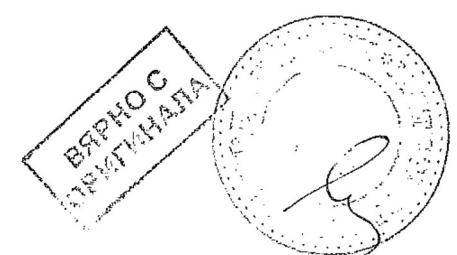
4.6 – Bending test (article 5.5.1 table B.1)



Rate of the applied force: 200 N/s
 Fd « ø28mm »: 890N (pages 7 - 9)
 Fd « ø32mm »: 1100N (pages 10 - 12)

| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 22.44 | 44.23 | 70.05 | ≤ 35 | 21.8 | 25.82 |
| Sample.2 | 23.05 | 49.01 | 75.85 | | 26.0 | 26.8 |
| Sample.3 | 24.52 | 46.50 | 71.87 | | 22.0 | 25.4 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | Results | | | |
| Sample.1 | 0.25 | ≤ 6 | 0.4 | | | |
| Sample.2 | 0.48 | | 0.6 | | | |
| Sample.3 | 0.27 | | 0.4 | | | |

Satisfactory results



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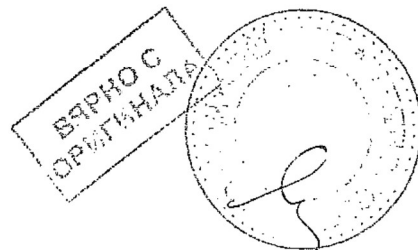
БСЦ

| Ø28 | Initial orientation at 90° | | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 21.03 | 43.62 | 69.44 | ≤ 35 | 22.6 | 25.8 |
| Sample.2 | 24.40 | 49.79 | 76.87 | | 25.4 | 27.1 |
| Sample.3 | 23.54 | 46.88 | 71.64 | | 23.3 | 24.8 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.49 | ≤ 6 | | 0.7 | | |
| Sample.2 | 0.29 | | | 0.4 | | |
| Sample.3 | 0.43 | | | 0.6 | | |

Satisfactory results

| Ø28 | Initial orientation at 180° | | | | | |
|----------|---|---|--------------|---|-------------------------|----------------------|
| Sample | Recorded deflection after 30sec (mm) | | | Difference between recorded deflection after 30sec (mm) | | |
| | At 300N (1/3Fd) | At 600N (2/3Fd) | At 890N (Fd) | Prescribed | Between 2/3Fd and 1/3Fd | Between Fd and 2/3Fd |
| Sample.1 | 23.11 | 46.63 | 73.48 | ≤ 35 | 23.5 | 26.9 |
| Sample.2 | 25.62 | 48.92 | 69.0 | | 23.3 | 20.1 |
| Sample.3 | 25.13 | 47.96 | 73.18 | | 22.8 | 25.2 |
| Sample | Residual deflection after 1min at 0N (mm) | Variation of the residual deflection / deflection at Fd (%) | | | | |
| | | Prescribed | | Results | | |
| Sample.1 | 0.46 | ≤ 6 | | 0.6 | | |
| Sample.2 | 0.53 | | | 0.8 | | |
| Sample.3 | 0.47 | | | 0.6 | | |

Satisfactory results



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