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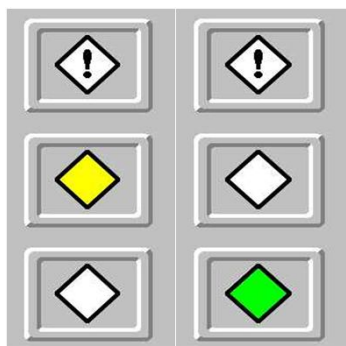
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# NON DESTRUCTIVE ELECTRICAL TESTING

**DLA Italy System**



|                         |                                                            |
|-------------------------|------------------------------------------------------------|
| Test DLA n.             | <b>00000AoE</b>                                            |
| Client                  | <b>???</b>                                                 |
| Address                 | <b>C.LE ??? ( )</b>                                        |
| Machine                 | <b>3 PH SYNCHRONUOS GENERATOR<br/>BRUSHLESS EXCITATION</b> |
| Serial N.               | <b>841215</b>                                              |
| Position                | <b>GROUP 1</b>                                             |
| Date of test execution: | <b>05 December 2013</b>                                    |
| Test made by :          | <b>Eddo Luigi Toscani</b>                                  |
| Report approved by:     | <b>O.M.G.V.</b>                                            |

Mod.

**08R-G-S-3F-EB-FS-13-E-R.E.M.-  
BRV-1-30-IL-COLOR**

PCQ 1226 Rev.03

Discipline -Rotating Electrical Machines



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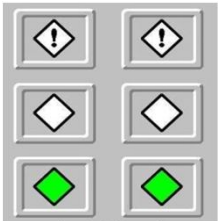
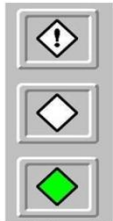
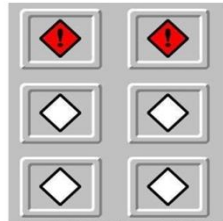
DATE OF TEST 05 December 2013

SERIAL N. 841215

|                                |                       |                      |                               |                                                                                                                                       |
|--------------------------------|-----------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Operator<br>Eddo Luigi Toscani | Preparation<br>O.M.G. | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |
|--------------------------------|-----------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

## INTEGRITY LEVEL

### DIELECTRICAL RELIABILITY OF THE MACHINE

| TEST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | STATOR TOLERANCE LIMITS                                                                                                                                                | K                       | I.L.<br>PHASE -L1-             | I.L.<br>PHASE -L2- | I.L.<br>PHASE -L3-       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------|--------------------|--------------------------|
| POLARIZATION INDEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | from 0 to 2 POOR<br>from 2 to 3 TOLERABLE<br>from 3 to 4 GOOD<br>from 4 to 6 VERY GOOD                                                                                 | 0,1<br>0,7<br>0,98<br>1 | 1,00                           | 1,00               | 1,00                     |
| INSULATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | from 0 to 10 MΩ POOR<br>from 10 to 100 MΩ TOLERABLE<br>from 100 a 1000 MΩ GOOD<br>above 1000 MΩ VERY GOOD                                                              | 0,1<br>0,7<br>0,98<br>1 | 1,00                           | 1,00               | 1,00                     |
| APPLIED VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NON HOMOGENEOUS RAMP<br>HOMOGENEOUS RAMP                                                                                                                               | 0,1<br>1                | 1,00                           | 1,00               | 1,00                     |
| DELTA TANGENT (Tg δ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | above 160 * 10 <sup>-3</sup> POOR<br>from 80 to 160 * 10 <sup>-3</sup> TOLERABLE<br>from 40 to 80 * 10 <sup>-3</sup> GOOD<br>from 0 to 40 * 10 <sup>-3</sup> VERY GOOD | 0,1<br>0,7<br>0,98<br>1 | 1,00                           | 1,00               | 1,00                     |
| DELTA TANGENT DELTA (Δ Tg δ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | from 0 to 10 VERY GOOD<br>from 10 to 20 GOOD<br>from 20 to 30 TOLERABLE<br>above 30 POOR                                                                               | 1<br>0,98<br>0,7<br>0,1 | 1,00                           | 1,00               | 1,00                     |
| CAPACITY (Variation in %)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | above 10 % POOR<br>from 5 to 10 % TOLERABLE<br>from 3 to 5 % GOOD<br>from 0 to 3 % VERY GOOD                                                                           | 0,1<br>0,7<br>0,98<br>1 | 1,00                           | 1,00               | 1,00                     |
| OHMIC RESISTANCE PHASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | UNBALANCED PHASES<br>BALANCED PHASES                                                                                                                                   | 0,1<br>1                | 1,00                           | 1,00               | 1,00                     |
| PHASE IMPEDANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | UNBALANCED PHASES<br>BALANCED PHASES                                                                                                                                   | 0,1<br>1                | 1,00                           | 1,00               | 1,00                     |
| TEST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | POLAR WHEEL TOLERANCE LIMITS                                                                                                                                           | K                       | POLES+DIODES+<br>ROTATING EXC. | POLES              | DIODES+<br>ROTATING EXC. |
| STATIC INSULATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | from 0 to 10 MΩ POOR<br>from 10 to 100 MΩ TOLERABLE<br>from 100 to 1000 MΩ GOOD<br>above 1000 MΩ VERY GOOD                                                             | 0,1<br>0,7<br>0,98<br>1 | 0,98                           | 1,00               | 0,70                     |
| STATIC OHMIC RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NOT REGULAR<br>REGULAR                                                                                                                                                 | 0,1<br>1                |                                | 1,00               |                          |
| STATIC IMPEDANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | UNACCEPTABLE<br>ACCEPTABLE                                                                                                                                             | 0,1<br>1                | 1,00                           | 1,00               | 1,00                     |
| DYNAMIC IMPEDANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | UNACCEPTABLE<br>ACCEPTABLE                                                                                                                                             | 0,1<br>1                | 1,00                           | 1,00               | 1,00                     |
| <b>FINAL RESULTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                        |                         | 0,98000                        | 1,00000            | 0,70000                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                        |                         | GOOD                           | VERY GOOD          | TOLERABLE                |
| SERIAL N.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 841215                                                                                                                                                                 |                         |                                |                    |                          |
| POSITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GROUP 1                                                                                                                                                                |                         |                                |                    |                          |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>da 0,99 a 1<br/><b>VERY GOOD</b></p> </div> <div style="text-align: center;">  <p>da 0,9 a 0,99<br/><b>GOOD</b></p> </div> <div style="text-align: center;">  <p>da 0,167 a 0,9<br/><b>TOLERABLE</b></p> </div> <div style="text-align: center;">  <p>da 0,024 a 0,167<br/><b>POOR</b></p> </div> <div style="text-align: center;">  <p>da 0,00001 a 0,024<br/><b>DANGER</b></p> </div> </div> |                                                                                                                                                                        |                         |                                |                    |                          |

## FINAL CONSIDERATIONS REGARDING STATOR WINDINGS

### DETERMINE POLARIZATION INDEX

L1 PHASE RESULT OTTIMO  
L2 PHASE RESULT OTTIMO  
L3 PHASE RESULT OTTIMO

**The windings are clean and dry, do not have pollution problems and there are no triggers discharges to ground.**

### MEASURE OF INSULATION RESISTANCE

L1 PHASE RESULT VERY GOOD  
L2 PHASE RESULT VERY GOOD  
L3 PHASE RESULT VERY GOOD

**Windings have high ohm mega values.**

### MEASURE OF DELTA LOSS TANGENT FACTOR

L1 PHASE RESULT VERY GOOD  
L2 PHASE RESULT VERY GOOD  
L3 PHASE RESULT VERY GOOD

**Windings present compact and homogeneous insulators.**

### MEASURE OF DELTA LOSS TANGENT DELTA FACTOR

L1 PHASE RESULT VERY GOOD  
L2 PHASE RESULT VERY GOOD  
L3 PHASE RESULT VERY GOOD

**Windings present compact and homogeneous insulators.**

### MEASURE OF FACTOR OF LOSS CAPACOTY

L1 PHASE RESULT VERY GOOD  
L2 PHASE RESULT VERY GOOD  
L3 PHASE RESULT VERY GOOD

**Windings don't have any ionization processes in progress.**

### MEASURE OF OHMIC PHASE RESISTANCE

PHASES RESULT BALANCED PHASES

**Windings don't have turn short circuits and are in line with project data.**

### MEASURE OF PHASE IMPEDANCE

PHASES RESULT BALANCED PHASES

**Windings don't have turn short circuits and are in line with project data.**

## **STATORS WINDINGS ARE IN GOOD DIALECTRICAL CONDITION**

DATE OF TEST 05 December 2013

SERIAL N. 841215

Operator  
Eddo Luigi Toscani

Preparation  
O.M.G.

Check up  
C. Bruni

Identification n.  
00000AoE

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## **FINAL CONSIDERATIONS REGARDING POLAR WHEEL**

MEASURE OF STATIC INSULATION RESISTANCE

RESULT GOOD

POLES + DIODES + ROTATING EXCITER

RESULT VERY GOOD

POLES

RESULT TOLERABLE

DIODES + ROTATING EXCITER

**Windings have high ohm mega values.**

MEASURE OF STATIC OHMIC RESISTANCE

RESULT

POLES + DIODES + ROTATING EXCITER

RESULT REGULAR

POLES

RESULT

DIODES + ROTATING EXCITER

**Windings have normal values in line with project data.**

MEASURE OF STATIC IMPEDANCE

RESULT ACCEPTABLE

**Windings have normal values in line with project data.**

MEASURE OF STATIC IMPEDANCE EACH POLE

RESULT ACCEPTABLE

**Windings have normal values.**

MEASURE OF DYNAMIC IMPEDANCE

RESULT ACCEPTABLE

**Windings have normal values.**

**POLAR WHEEL WINDINGS ARE IN GOOD DIALECTRICAL CONDITION**

DATE OF TEST 05 December 2013

SERIAL N. 841215

Operator  
Eddo Luigi Toscani

Preparation  
O.M.G.

Check up  
C. Bruni

Identification n.  
00000AoE

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## **FINAL CONSIDERATIONS REGARDING EXCITER**

MEASURE OF INSULTATION RESISTANCE

RESULT            GOOD

STATIC WINDING

**Windings have high ohm mega values.**

MEASURE OF OHMIC RESISTANCE

RESULT            REGULAR

STATIC WINDING

**Windings have normal values in line with project data.**

MEASURE OF OHMIC RESISTANCE

RESULT            BALANCED PHASES

3 PHASE ROTATING WINDING

**Windings have normal values in line with project data.**

**STATIC WINDINGS ARE IN GOOD DIALECTRICAL CONDITION**

DATE OF TEST 05 December 2013

SERIAL N. 841215

Operator  
*Eddo Luigi Toscani*

Preparation  
*O.M.G.*

Check up  
*C. Bruni*

Identification n.  
*00000AoE*

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## FINAL CONSIDERATIONS REGARDING ACCESSORIES

MEASURE OF THERMORESISTANCES OHMIC RESISTANCE

RESULT            REGULAR

**Windings of heaters don't have short circuits or interruptions.**

MEASURE OF THERMORESISTANCES' INSULATION

RESULT            GOOD

**Windings of heaters present acceptable ohm mega values.**

MEASURE OF RTD OHMIC RESISTANCE

RESULT            REGULAR

**Windings of probes don't have short circuits or interruptions, all are functioning.**

MEASURE OF RTD INSULATION RESISTANCE

RESULT            GOOD

**Windings of probes present high ohm mega values.**

**TESTS UPON ACCESSORIES SHOW NORMAL VALUES**

|                                |                       |                      |                               |                                                                                                                                          |
|--------------------------------|-----------------------|----------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| DATE OF TEST 05 December 2013  |                       |                      | SERIAL N. 841215              |                                                                                                                                          |
| Operator<br>Eddo Luigi Toscani | Preparation<br>O.M.G. | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced<br>not even partially without R.E.M.'s written consent |

## PLATE DETAILS

### 3 PHASE SYNCHRONOUS GENERATOR

|                       |                                         |                                         |                  |
|-----------------------|-----------------------------------------|-----------------------------------------|------------------|
| PRODUCER              | ALSTOM POWER ITALIA                     | POWER kW                                |                  |
| TIYPE                 | SAV290-180-8                            | POWER kVA                               | 85.000           |
| SERIAL N.             | 841215                                  | POWER HP                                |                  |
| C.LE                  | VENAUS                                  | VOLTAGE kV                              | 15               |
| POSITION              | GROUP 1                                 | CONNECTION                              | STAR             |
| FREQUENCY Hz          | 50                                      | POWER AT                                | 3.272,0          |
| Cos $\phi$            | 0,90                                    | TURN ROUNDS/1'                          | 750              |
| WINDING TYPE          |                                         | N. OF POLES                             | 8                |
| N. OF TERMINALS/CLIPS | 3+3                                     | INSULATION CLASS                        | F                |
| YEAR OF PRODUCTION    | 2009                                    | AIR CIRCUIT                             | OPENED           |
| YEAR OF REVISION      | 2009                                    | SERVICE                                 | S1               |
| REWINDING YEAR        | 2009                                    | THERMORESISTANCES                       | PRESENT          |
| CONSTRUCTION SHAPE    | VERTICAL                                | RTD                                     | PRESENT          |
| IM                    |                                         | TEST CONDITIONS<br>TEMP. cu °C          | 20,00            |
| IC                    |                                         | TEST CONDITIONS<br>TEMP. ENVIRONMENT °C | 20,00            |
| IP                    |                                         | TEST CONDITIONS<br>RELATIVE HUMIDITY %  | 45,00            |
| CERTIFICATE CESI N.   |                                         | VOLTAGE Ecc. V dc                       | 150              |
| WEIGHT OF MACHINE Kg  |                                         | POWER Ecc. A                            | 1.330,0          |
| ROLLING TYPE          | BUSHES                                  | EXCITATION TYPE                         | BRUSHLESS        |
| IP kV dc              | 5                                       | N. DIODES                               | 6                |
| DLA kV ac             | 8,671                                   | TYPE OF DIODES                          |                  |
| TEST PERFORMED BY :   | Eddo Luigi Toscani                      |                                         |                  |
| TEST PERFORMED IN:    | MACHINERY                               |                                         |                  |
| DATE                  | 05 December 2013                        | CALIBRATION EXPIRE                      | 31 December 2014 |
| STATOR                | COMPLETELY OPENED - STAR CENTRE REMOVED |                                         |                  |
| POLAR WHEEL           | OUTSIDE STATOR                          |                                         |                  |

## POLARIZATION INDEX

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

TEST VOLTAGE V dc      5.000      x 10'      TEMPERATURE cu °C   20,00

### PHASE -L1-

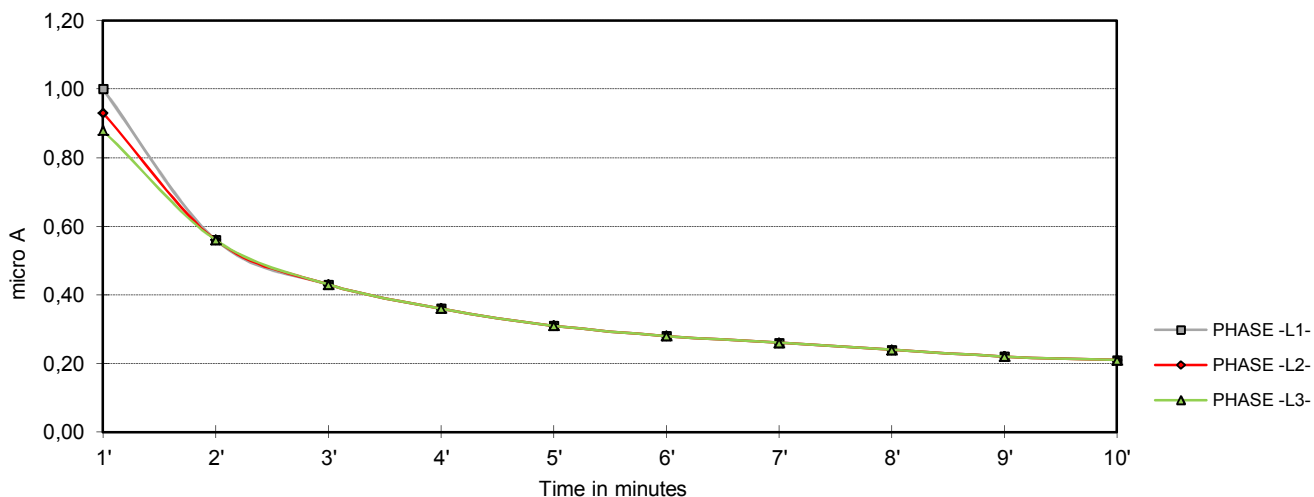
|                   |      |      |      |      |      |      |      |      |      |      |
|-------------------|------|------|------|------|------|------|------|------|------|------|
| Time in minutes ' | 1'   | 2'   | 3'   | 4'   | 5'   | 6'   | 7'   | 8'   | 9'   | 10'  |
| micro A           | 1,00 | 0,56 | 0,43 | 0,36 | 0,31 | 0,28 | 0,26 | 0,24 | 0,22 | 0,21 |

### PHASE -L2-

|                   |      |      |      |      |      |      |      |      |      |      |
|-------------------|------|------|------|------|------|------|------|------|------|------|
| Time in minutes ' | 1'   | 2'   | 3'   | 4'   | 5'   | 6'   | 7'   | 8'   | 9'   | 10'  |
| micro A           | 0,93 | 0,56 | 0,43 | 0,36 | 0,31 | 0,28 | 0,26 | 0,24 | 0,22 | 0,21 |

### PHASE -L3-

|                   |      |      |      |      |      |      |      |      |      |      |
|-------------------|------|------|------|------|------|------|------|------|------|------|
| Time in minutes ' | 1'   | 2'   | 3'   | 4'   | 5'   | 6'   | 7'   | 8'   | 9'   | 10'  |
| micro A           | 0,88 | 0,56 | 0,43 | 0,36 | 0,31 | 0,28 | 0,26 | 0,24 | 0,22 | 0,21 |



|                                             |                                                                                            |                                 |                                                                                                                                                                                       |
|---------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - TRASFORMER DC BAUR PGK50E N.0410339006 - PGK25 N.041159002                           |                                 |                                                                                                                                                                                       |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION | 31 December 2014                                                                           |                                 |                                                                                                                                                                                       |
| TEST LIMITS<br>ACCEPTABILITY                | values from 0 to 2 POOR - from 2 to 3 TOLERABLE - from 3 to 4 GOOD - from 4 to 6 VERY GOOD |                                 |                                                                                                                                                                                       |
| IP TEST RESULTS                             | PHASE -L1-<br>4,76<br>VERY GOOD                                                            | PHASE -L2-<br>4,43<br>VERY GOOD | PHASE -L3-<br>4,19<br>VERY GOOD                                                                                                                                                       |
| RESULTS I.L.                                | 1,00                                                                                       | 1,00                            | 1,00                                                                                                                                                                                  |
| STATOR TEST CONDITIONS                      | COMPLETELY OPENED - STAR CENTRE REMOVED                                                    |                                 |                                                                                                                                                                                       |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 - IEEE std 43 - 2000                 |                                 |                                                                                                                                                                                       |
| DATE OF TEST 05 December 2013               |                                                                                            | SERIAL N. 841215                |                                                                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                      | Check up<br>C. Bruni            | Identification n.<br>00000Aoe<br><small>R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent</small> |

## INSULATION RESISTANCE

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

TEST VOLTAGE V dc      5.000      x 10'      TEMPERATURE cu °C   20,00

### PHASE -L1-

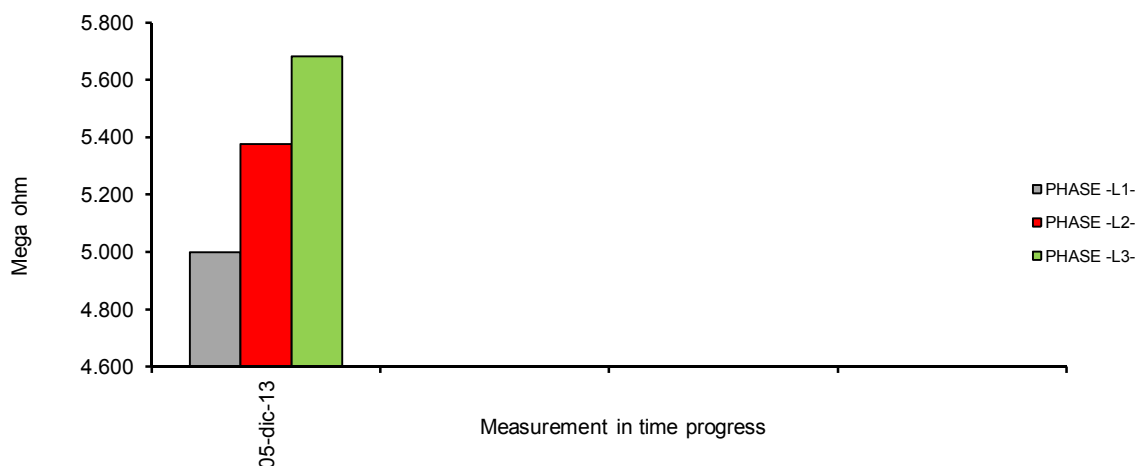
| Time in minutes ' | 1'       | 2'       | 3'        | 4'        | 5'        | 6'        | 7'        | 8'        | 9'        | 10'       |
|-------------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| mega ohm          | 5.000,00 | 8.928,57 | 11.627,91 | 13.888,89 | 16.129,03 | 17.857,14 | 19.230,77 | 20.833,33 | 22.727,27 | 23.809,52 |

### PHASE -L2-

| Time in minutes ' | 1'       | 2'       | 3'        | 4'        | 5'        | 6'        | 7'        | 8'        | 9'        | 10'       |
|-------------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| mega ohm          | 5.376,34 | 8.928,57 | 11.627,91 | 13.888,89 | 16.129,03 | 17.857,14 | 19.230,77 | 20.833,33 | 22.727,27 | 23.809,52 |

### PHASE -L3-

| Time in minutes ' | 1'       | 2'       | 3'        | 4'        | 5'        | 6'        | 7'        | 8'        | 9'        | 10'       |
|-------------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| mega ohm          | 5.681,82 | 8.928,57 | 11.627,91 | 13.888,89 | 16.129,03 | 17.857,14 | 19.230,77 | 20.833,33 | 22.727,27 | 23.809,52 |



|                                             |                                                                                                       |                                     |                                                                                                                                                                                       |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - TRASFORMER DC BAUR PGK50E N.0410339006 - PGK25 N.041159002                                      |                                     |                                                                                                                                                                                       |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION | 31 December 2014                                                                                      |                                     |                                                                                                                                                                                       |
| TEST LIMITS<br>ACCEPTABILITY                | values from 0 to 10 POOR - from 10 to 100 TOLERABLE -<br>from 100 to 1000 GOOD - above 1000 VERY GOOD |                                     |                                                                                                                                                                                       |
| TEST RESULTS VALUES IN<br>MEGA OHM A 1'     | PHASE -L1-<br>5.000,00<br>VERY GOOD                                                                   | PHASE -L2-<br>5.376,34<br>VERY GOOD | PHASE -L3-<br>5.681,82<br>VERY GOOD                                                                                                                                                   |
| I.L. RESULTS                                | 1,00                                                                                                  | 1,00                                | 1,00                                                                                                                                                                                  |
| STATOR TEST CONDITIONS                      | COMPLETELY OPENED - STAR CENTRE REMOVED                                                               |                                     |                                                                                                                                                                                       |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 - IEEE std 43 - 2000                            |                                     |                                                                                                                                                                                       |
| DATE OF TEST 05 December 2013               |                                                                                                       | SERIAL N. 841215                    |                                                                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                                 | Check up<br>C. Bruni                | Identification n.<br>00000Aoe<br><small>R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent</small> |

## APPLIED VOLTAGE

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

### PHASE -L1-

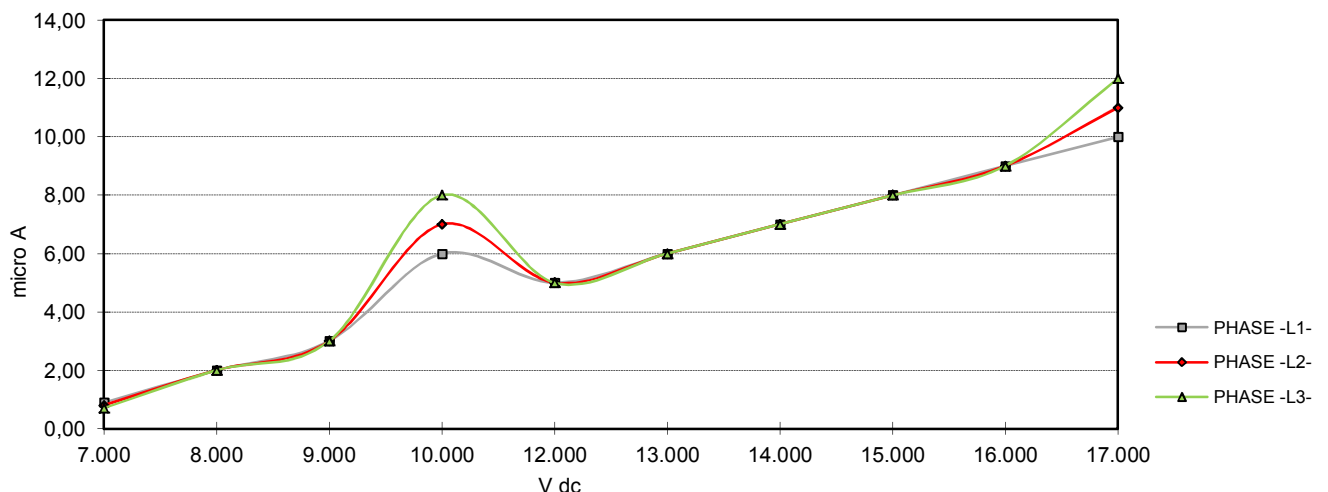
| Time in minutes ' | 1'    | 2'    | 3'    | 4'     | 5'     | 6'     | 7'     | 8'     | 9'     | 10'    |
|-------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| V dc              | 7.000 | 8.000 | 9.000 | 10.000 | 12.000 | 13.000 | 14.000 | 15.000 | 16.000 | 17.000 |
| micro A           | 0,90  | 2,00  | 3,00  | 6,00   | 5,00   | 6,00   | 7,00   | 8,00   | 9,00   | 10,00  |

### PHASE -L2-

| Time in minutes ' | 1'    | 2'    | 3'    | 4'     | 5'     | 6'     | 7'     | 8'     | 9'     | 10'    |
|-------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| V dc              | 7.000 | 8.000 | 9.000 | 10.000 | 12.000 | 13.000 | 14.000 | 15.000 | 16.000 | 17.000 |
| micro A           | 0,80  | 2,00  | 3,00  | 7,00   | 5,00   | 6,00   | 7,00   | 8,00   | 9,00   | 11,00  |

### PHASE -L3-

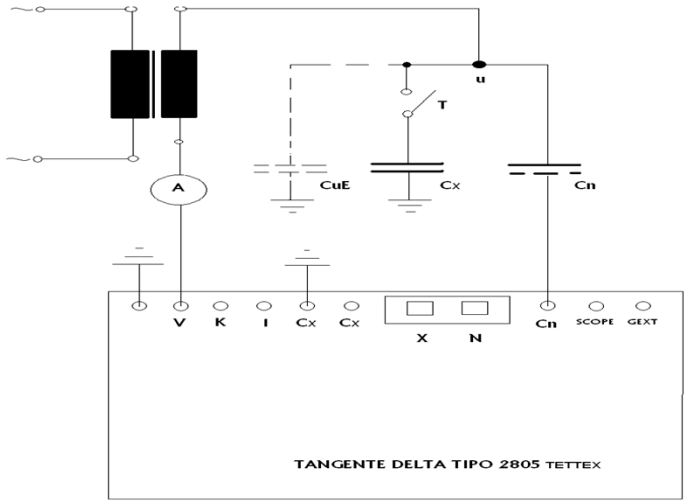
| Time in minutes ' | 1'    | 2'    | 3'    | 4'     | 5'     | 6'     | 7'     | 8'     | 9'     | 10'    |
|-------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| V dc              | 7.000 | 8.000 | 9.000 | 10.000 | 12.000 | 13.000 | 14.000 | 15.000 | 16.000 | 17.000 |
| micro A           | 0,70  | 2,00  | 3,00  | 8,00   | 5,00   | 6,00   | 7,00   | 8,00   | 9,00   | 12,00  |



|                                                                                                                                       |                                                                            |                                           |                                           |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| INSTRUMENTS                                                                                                                           | DLA - TRASFORMATORE C.C. BAUR PGK50E N.0410339006 - PGK25 N.041159002      |                                           |                                           |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION                                                                                           | 31 December 2014                                                           |                                           |                                           |
| TEST LIMITS<br>ACCEPTABILITY                                                                                                          | TEST IS SUCCESSFUL WHEN PHASES SHOW AN ALMOST IDENTICAL POWER CONSUMPTION  |                                           |                                           |
| TEST RESULTS                                                                                                                          | PHASE -L1-<br><b>HOMOGENEOUS<br/>RAMP</b>                                  | PHASE -L2-<br><b>HOMOGENEOUS<br/>RAMP</b> | PHASE -L3-<br><b>HOMOGENEOUS<br/>RAMP</b> |
| I.L. RESULTS                                                                                                                          | 1,00                                                                       | 1,00                                      | 1,00                                      |
| STATOR TEST CONDITIONS                                                                                                                | COMPLETELY OPENED - STAR CENTRE REMOVED                                    |                                           |                                           |
| APPLICABLE NORMS                                                                                                                      | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 - IEEE std 43 - 2000 |                                           |                                           |
| DATE OF TEST 05 December 2013                                                                                                         |                                                                            | SERIAL N. 841215                          |                                           |
| Operator<br><i>Eddo Luigi Toscani</i>                                                                                                 | Preparation<br><i>O.M.G.</i>                                               | Check up<br><i>C. Bruni</i>               | Identification n.<br><i>00000Aoe</i>      |
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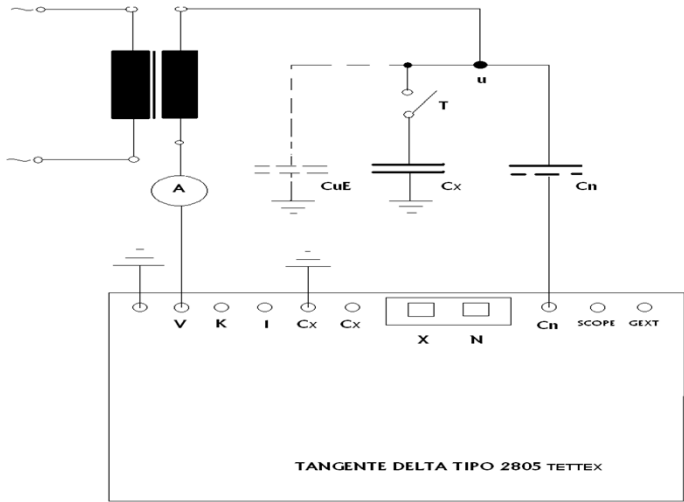
## MEASURES OF LOSS FACTOR

STATOR WINDING -L1- LTHE OTHER 2 ON GROUND

|                                                                                                                                                                                                                     |                       |                      |                               |                                                                                                                                            |         |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| TEST VOLTAGE V ac                                                                                                                                                                                                   |                       | 1.734                | 3.468                         | 5.202                                                                                                                                      | 6.936   | 8.671   |
| Measure of test circuit - Cu E -                                                                                                                                                                                    |                       |                      |                               |                                                                                                                                            |         |         |
| Cu E                                                                                                                                                                                                                | Tg $\delta$ * 10 - 3  | 4,40                 | 4,40                          | 4,60                                                                                                                                       | 4,75    | 4,80    |
|                                                                                                                                                                                                                     | mA                    | 1,00                 | 2,00                          | 4,00                                                                                                                                       | 6,00    | 8,00    |
|                                                                                                                                                                                                                     | Cu E                  | 9,42                 | 9,38                          | 9,37                                                                                                                                       | 9,37    | 9,36    |
| Measure of electrical machine - C1 -                                                                                                                                                                                |                       |                      |                               |                                                                                                                                            |         |         |
| C1                                                                                                                                                                                                                  | Tg $\delta$ * 10 - 3  | 18,20                | 18,80                         | 19,60                                                                                                                                      | 21,50   | 28,60   |
|                                                                                                                                                                                                                     | mA                    | 20,00                | 40,00                         | 60,00                                                                                                                                      | 80,00   | 100,00  |
|                                                                                                                                                                                                                     | C1                    | 113,15               | 113,22                        | 113,33                                                                                                                                     | 113,46  | 113,99  |
| TOTAL MILLIAMPERE                                                                                                                                                                                                   |                       |                      |                               |                                                                                                                                            |         |         |
| mA                                                                                                                                                                                                                  |                       | 19,00                | 38,00                         | 56,00                                                                                                                                      | 74,00   | 92,00   |
| CX CAPACITY                                                                                                                                                                                                         |                       |                      |                               |                                                                                                                                            |         |         |
| CX=C1-Cu E                                                                                                                                                                                                          |                       | 103,73               | 103,84                        | 103,96                                                                                                                                     | 104,09  | 104,63  |
| REAL CAPACITY                                                                                                                                                                                                       |                       |                      |                               |                                                                                                                                            |         |         |
| pF=CX * CN                                                                                                                                                                                                          |                       | 104.352              | 104.463                       | 104.584                                                                                                                                    | 104.715 | 105.258 |
| (CN= sample condensor capacity)                                                                                                                                                                                     |                       |                      |                               |                                                                                                                                            |         |         |
| DELTA TANGENT Tg $\delta$ * 10 - 3                                                                                                                                                                                  |                       |                      |                               |                                                                                                                                            |         |         |
| Tg $\delta$ * 10 - 3                                                                                                                                                                                                |                       | 19,45                | 20,10                         | 20,95                                                                                                                                      | 23,01   | 30,73   |
| <p style="text-align: center;"><b>CIRCUITO DI PROVA</b></p>  <p style="text-align: center;">TANGENTE DELTA TIPO 2805 TETTEX</p> |                       |                      |                               |                                                                                                                                            |         |         |
| DATE OF TEST 05 December 2013                                                                                                                                                                                       |                       |                      |                               | SERIAL N. 841215                                                                                                                           |         |         |
| Operator<br>Eddo Luigi Toscani                                                                                                                                                                                      | Preparation<br>O.M.G. | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that<br>cantt be reproduced not even partially without R.E.M.'s<br>written consent |         |         |

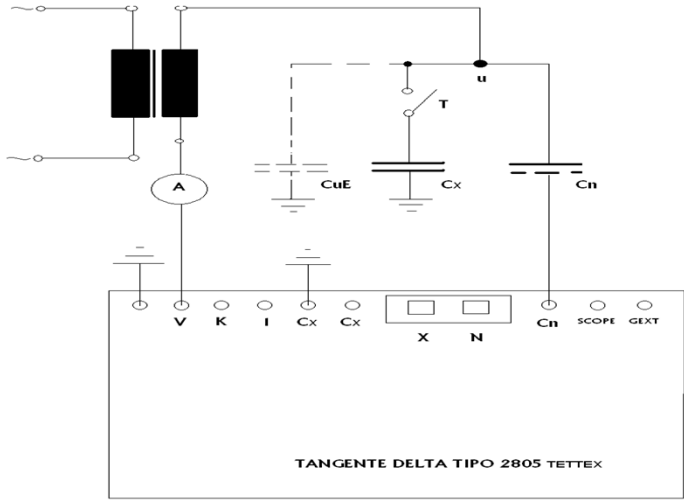
## MEASURES OF LOSS FACTOR

STATOR WINDING -L2- LTHE OTHER 2 ON GROUND

|                                                                                                                                                                                                                     |                       |                      |                               |                                                                                                                                            |         |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| TEST VOLTAGE V ac                                                                                                                                                                                                   |                       | 1.734                | 3.468                         | 5.202                                                                                                                                      | 6.936   | 8.671   |
| Measure of test circuit - Cu E -                                                                                                                                                                                    |                       |                      |                               |                                                                                                                                            |         |         |
| Cu E                                                                                                                                                                                                                | Tg $\delta$ * 10 - 3  | 4,40                 | 4,40                          | 4,60                                                                                                                                       | 4,75    | 4,80    |
|                                                                                                                                                                                                                     | mA                    | 1,00                 | 2,00                          | 4,00                                                                                                                                       | 6,00    | 8,00    |
|                                                                                                                                                                                                                     | Cu E                  | 9,42                 | 9,38                          | 9,37                                                                                                                                       | 9,37    | 9,36    |
| Measure of electrical machine - C1 -                                                                                                                                                                                |                       |                      |                               |                                                                                                                                            |         |         |
| C1                                                                                                                                                                                                                  | Tg $\delta$ * 10 - 3  | 18,20                | 18,80                         | 19,60                                                                                                                                      | 21,50   | 28,60   |
|                                                                                                                                                                                                                     | mA                    | 20,00                | 40,00                         | 60,00                                                                                                                                      | 80,00   | 100,00  |
|                                                                                                                                                                                                                     | C1                    | 113,15               | 113,22                        | 113,33                                                                                                                                     | 113,46  | 113,99  |
| TOTAL MILIAMPERE                                                                                                                                                                                                    |                       |                      |                               |                                                                                                                                            |         |         |
| mA                                                                                                                                                                                                                  |                       | 19,00                | 38,00                         | 56,00                                                                                                                                      | 74,00   | 92,00   |
| CX CAPACITY                                                                                                                                                                                                         |                       |                      |                               |                                                                                                                                            |         |         |
| CX=C1-Cu E                                                                                                                                                                                                          |                       | 103,73               | 103,84                        | 103,96                                                                                                                                     | 104,09  | 104,63  |
| REAL CAPACITY                                                                                                                                                                                                       |                       |                      |                               |                                                                                                                                            |         |         |
| pF=CX * CN                                                                                                                                                                                                          |                       | 104.352              | 104.463                       | 104.584                                                                                                                                    | 104.715 | 105.258 |
| (CN=sample condensor capacity)                                                                                                                                                                                      |                       |                      |                               |                                                                                                                                            |         |         |
| DELTA TANGENT Tg $\delta$ * 10 - 3                                                                                                                                                                                  |                       |                      |                               |                                                                                                                                            |         |         |
| Tg $\delta$ * 10 - 3                                                                                                                                                                                                |                       | 19,45                | 20,10                         | 20,95                                                                                                                                      | 23,01   | 30,73   |
| <p style="text-align: center;"><b>CIRCUITO DI PROVA</b></p>  <p style="text-align: center;">TANGENTE DELTA TIPO 2805 TETTEX</p> |                       |                      |                               |                                                                                                                                            |         |         |
| DATE OF TEST 05 December 2013                                                                                                                                                                                       |                       |                      |                               | SERIAL N. 841215                                                                                                                           |         |         |
| Operator<br>Eddo Luigi Toscani                                                                                                                                                                                      | Preparation<br>O.M.G. | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that<br>cantt be reproduced not even partially without R.E.M.'s<br>written consent |         |         |

## MEASURES OF LOSS FACTOR

STATOR WINDING -L3- LTHE OTHER 2 ON GROUND

|                                                                                                                                                                                                                     |                       |                      |                               |                                                                                                                                            |         |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| TEST VOLTAGE V ac                                                                                                                                                                                                   |                       | 1.734                | 3.468                         | 5.202                                                                                                                                      | 6.936   | 8.671   |
| Measure of test circuit - Cu E -                                                                                                                                                                                    |                       |                      |                               |                                                                                                                                            |         |         |
| Cu E                                                                                                                                                                                                                | Tg $\delta$ * 10 - 3  | 4,40                 | 4,40                          | 4,60                                                                                                                                       | 4,75    | 4,80    |
|                                                                                                                                                                                                                     | mA                    | 1,00                 | 2,00                          | 4,00                                                                                                                                       | 6,00    | 8,00    |
|                                                                                                                                                                                                                     | Cu E                  | 9,42                 | 9,38                          | 9,37                                                                                                                                       | 9,37    | 9,36    |
| Measure of electrical machine - C1 -                                                                                                                                                                                |                       |                      |                               |                                                                                                                                            |         |         |
| C1                                                                                                                                                                                                                  | Tg $\delta$ * 10 - 3  | 18,20                | 18,80                         | 19,60                                                                                                                                      | 21,50   | 28,60   |
|                                                                                                                                                                                                                     | mA                    | 20,00                | 40,00                         | 60,00                                                                                                                                      | 80,00   | 100,00  |
|                                                                                                                                                                                                                     | C1                    | 113,15               | 113,22                        | 113,33                                                                                                                                     | 113,46  | 113,99  |
| TOTAL MILLIAMPERE                                                                                                                                                                                                   |                       |                      |                               |                                                                                                                                            |         |         |
| mA                                                                                                                                                                                                                  |                       | 19,00                | 38,00                         | 56,00                                                                                                                                      | 74,00   | 92,00   |
| CX CAPACITY                                                                                                                                                                                                         |                       |                      |                               |                                                                                                                                            |         |         |
| CX=C1-Cu E                                                                                                                                                                                                          |                       | 103,73               | 103,84                        | 103,96                                                                                                                                     | 104,09  | 104,63  |
| REAL CAPACITY                                                                                                                                                                                                       |                       |                      |                               |                                                                                                                                            |         |         |
| pF=CX * CN                                                                                                                                                                                                          |                       | 104.352              | 104.463                       | 104.584                                                                                                                                    | 104.715 | 105.258 |
| (CN= sample condensor capacity)                                                                                                                                                                                     |                       |                      |                               |                                                                                                                                            |         |         |
| DELTA TANGENT Tg $\delta$ * 10 - 3                                                                                                                                                                                  |                       |                      |                               |                                                                                                                                            |         |         |
| Tg $\delta$ * 10 - 3                                                                                                                                                                                                |                       | 19,45                | 20,10                         | 20,95                                                                                                                                      | 23,01   | 30,73   |
| <p style="text-align: center;"><u>CIRCUITO DI PROVA</u></p>  <p style="text-align: center;">TANGENTE DELTA TIPO 2805 TETTEX</p> |                       |                      |                               |                                                                                                                                            |         |         |
| DATE OF TEST 05 December 2013                                                                                                                                                                                       |                       |                      |                               | SERIAL N. 841215                                                                                                                           |         |         |
| Operator<br>Eddo Luigi Toscani                                                                                                                                                                                      | Preparation<br>O.M.G. | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that<br>cantt be reproduced not even partially without R.E.M.'s<br>written consent |         |         |

## DELTA TANGENT( $T_g \delta$ )

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

### PHASE -L1-

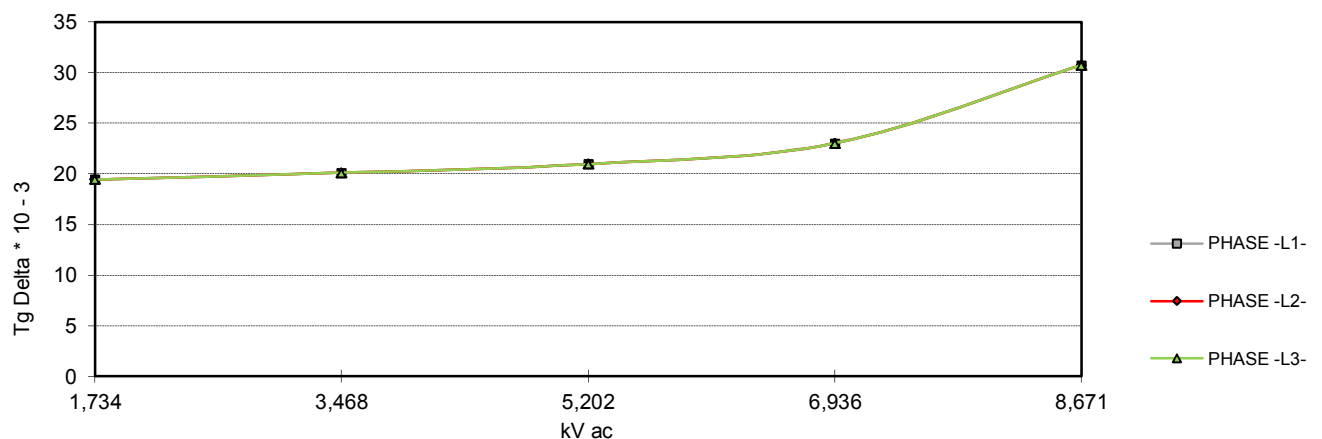
|                    |       |       |       |       |       |
|--------------------|-------|-------|-------|-------|-------|
| TEST VOLTAGE kV ac | 1,734 | 3,468 | 5,202 | 6,936 | 8,671 |
| $T_g \delta * 10$  | 19,45 | 20,10 | 20,95 | 23,01 | 30,73 |

### PHASE -L2-

|                    |       |       |       |       |       |
|--------------------|-------|-------|-------|-------|-------|
| TEST VOLTAGE kV ac | 1,734 | 3,468 | 5,202 | 6,936 | 8,671 |
| $T_g \delta * 10$  | 19,45 | 20,10 | 20,95 | 23,01 | 30,73 |

### PHASE -L3-

|                    |       |       |       |       |       |
|--------------------|-------|-------|-------|-------|-------|
| TEST VOLTAGE kV ac | 1,734 | 3,468 | 5,202 | 6,936 | 8,671 |
| $T_g \delta * 10$  | 19,45 | 20,10 | 20,95 | 23,01 | 30,73 |



|                                             |                                                                                                                                                              |                         |                                                              |                                                                                                                                             |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - MEDIUM VOLTAGE TRANSFORMER MAGLIANO T2 N.634-1 kVA 25 - SCHERING BRIDGE<br>TETTEX 2405 N.132.500 - SAMPLE CONDENSER 3360/1000/30BKN 1.006 pF N.131.031 |                         |                                                              |                                                                                                                                             |
| NEXT EXPIRE DATE INSTRUMENTS<br>CALIBRATION | 31 December 2014                                                                                                                                             |                         |                                                              |                                                                                                                                             |
| TEST LIMITS ACCEPTABILITY                   | from 0 to 40 * 10 - 3 = VERY GOOD<br>from 40 to 80 * 10 - 3 = GOOD                                                                                           |                         | from 80 to 160 * 10-3 = TOLERABLE<br>above 160 * 10-3 = POOR |                                                                                                                                             |
| TEST RESULTS                                | PHASE -L1-<br>VERY GOOD                                                                                                                                      | PHASE -L2-<br>VERY GOOD | PHASE-L3-<br>VERY GOOD                                       |                                                                                                                                             |
|                                             | 1,00                                                                                                                                                         | 1,00                    | 1,00                                                         |                                                                                                                                             |
| I.L. RESULTS                                |                                                                                                                                                              |                         |                                                              |                                                                                                                                             |
| STATOR TEST CONDITIONS                      | COMPLETELY OPENED - STAR CENTRE REMOVED                                                                                                                      |                         |                                                              |                                                                                                                                             |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2                                                                                                        |                         |                                                              |                                                                                                                                             |
| DATE OF TEST                                |                                                                                                                                                              | 05 December 2013        |                                                              | SERIAL N. 841215                                                                                                                            |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                                                                                        | Check up<br>C. Bruni    | Identification n.<br>00000AoE                                | R.E.M. S.r.l. reserves all rights upon present document<br>that cannot be reproduced not even partially without<br>R.E.M.'s written consent |

## DELTA TANGENT DELTA ( $\Delta T_g \delta$ )

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

### PHASE -L1-

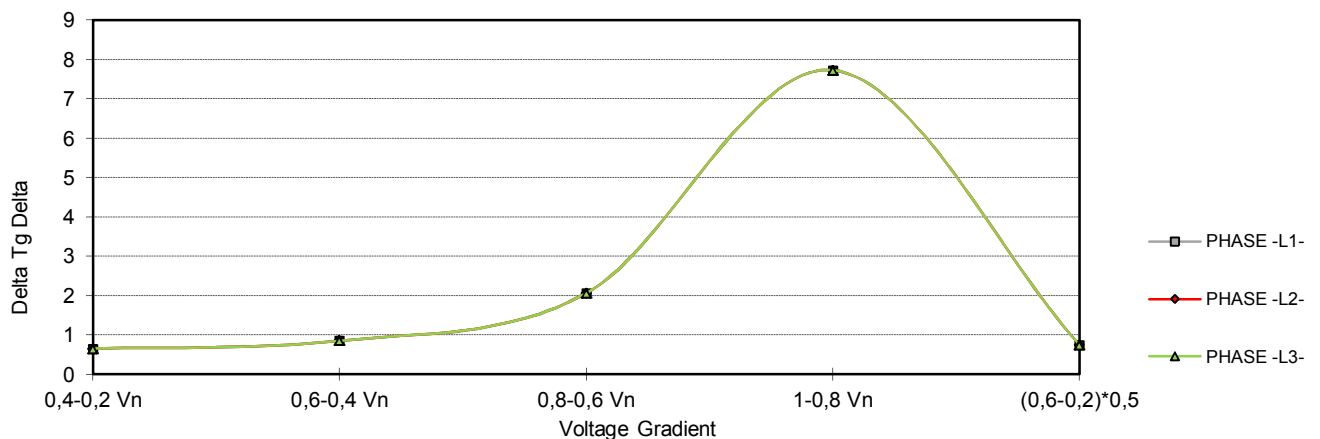
| VOLTAGE GRADIENT    | 0,4-0,2 Vn | 0,6-0,4 Vn | 0,8-0,6 Vn | 1-0,8 Vn | (0,6-0,2)*0,5 |
|---------------------|------------|------------|------------|----------|---------------|
| $\Delta T_g \delta$ | 0,65       | 0,85       | 2,06       | 7,72     | 0,75          |

### PHASE -L2-

| VOLTAGE GRADIENT    | 0,4-0,2 Vn | 0,6-0,4 Vn | 0,8-0,6 Vn | 1-0,8 Vn | (0,6-0,2)*0,5 |
|---------------------|------------|------------|------------|----------|---------------|
| $\Delta T_g \delta$ | 0,65       | 0,85       | 2,06       | 7,72     | 0,75          |

### PHASE -L3-

| VOLTAGE GRADIENT    | 0,4-0,2 Vn | 0,6-0,4 Vn | 0,8-0,6 Vn | 1-0,8 Vn | (0,6-0,2)*0,5 |
|---------------------|------------|------------|------------|----------|---------------|
| $\Delta T_g \delta$ | 0,65       | 0,85       | 2,06       | 7,72     | 0,75          |



|                                             |                                                                                                                                                               |                         |                                              |                                                                                                                                             |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - MEDIUM VOLTAGE TRANSFORMER MAGLIANO T2 N.634-1 kVA 25 - SCHERING BRIDGE<br>TETTEX 2405 N.132.500 - SAMPLES CONDENSER 3360/1000/30BKN 1.006 pF N.131.031 |                         |                                              |                                                                                                                                             |
| NEXT EXPIRE DATE INSTRUMENTS<br>CALIBRATION | 31 December 2014                                                                                                                                              |                         |                                              |                                                                                                                                             |
| TEST LIMITS ACCEPTABILITY                   | from 0 to 10 = VERY GOOD<br>from 10 to 20 = GOOD                                                                                                              |                         | from 20 to 30 = TOLERABLE<br>above 30 = POOR |                                                                                                                                             |
| TEST RESULTS                                | PHASE -L1-<br>VERY GOOD                                                                                                                                       | PHASE -L2-<br>VERY GOOD | PHASE -L3-<br>VERY GOOD                      |                                                                                                                                             |
| I.L. RESULTS                                | 1,00                                                                                                                                                          | 1,00                    | 1,00                                         |                                                                                                                                             |
| STATOR TEST CONDITIONS                      | COMPLETELY OPENED - STAR CENTRE REMOVED                                                                                                                       |                         |                                              |                                                                                                                                             |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2                                                                                                         |                         |                                              |                                                                                                                                             |
| DATE OF TEST                                |                                                                                                                                                               | 05 December 2013        |                                              | SERIAL N. 841215                                                                                                                            |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                                                                                         | Check up<br>C. Bruni    | Identification n.<br>00000AoE                | R.E.M. S.r.l. reserves all rights upon present document<br>that cannot be reproduced not even partially without<br>R.E.M.'s written consent |

## CAPACITY

STATOR WINDING 1 PHASE UNDER TEST, THE OTHER 2 ON GROUND

### PHASE -L1-

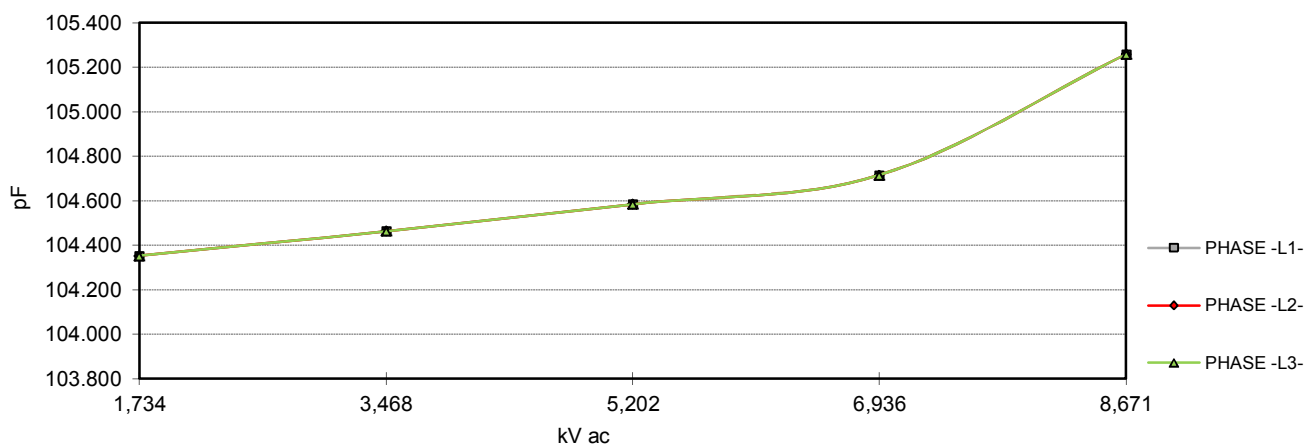
|                    |            |            |            |            |            |
|--------------------|------------|------------|------------|------------|------------|
| TEST VOLTAGE kV ac | 1,734      | 3,468      | 5,202      | 6,936      | 8,671      |
| pF                 | 104.352,38 | 104.463,04 | 104.583,76 | 104.714,54 | 105.257,78 |

### PHASE -L2-

|                    |            |            |            |            |            |
|--------------------|------------|------------|------------|------------|------------|
| TEST VOLTAGE kV ac | 1,734      | 3,468      | 5,202      | 6,936      | 8,671      |
| pF                 | 104.352,38 | 104.463,04 | 104.583,76 | 104.714,54 | 105.257,78 |

### PHASE -L3-

|                    |            |            |            |            |            |
|--------------------|------------|------------|------------|------------|------------|
| TEST VOLTAGE kV ac | 1,734      | 3,468      | 5,202      | 6,936      | 8,671      |
| pF                 | 104.352,38 | 104.463,04 | 104.583,76 | 104.714,54 | 105.257,78 |

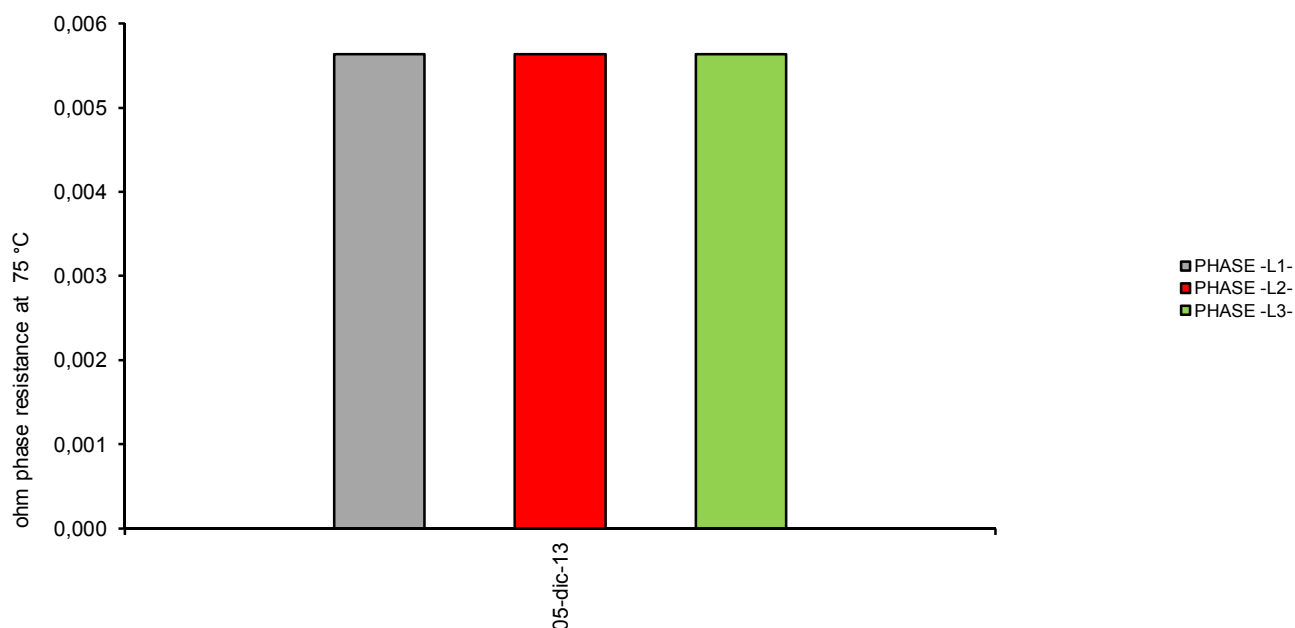


|                                             |                                                                                                                                                               |                                 |                                 |                                                                                                                                             |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - MEDIUM VOLTAGE TRANSFORMER. MAGLIANO T2 N.634-1 kVA 25 - SCHERING BRIDGE<br>TETTEX 2405 N.132.500 - SAMPLE CONDENSER 3360/1000/30BKN 1.006 pF N.131.031 |                                 |                                 |                                                                                                                                             |
| NEXT EXPIRE DATE INSTRUMENTS<br>CALIBRATION | 31 December 2014                                                                                                                                              |                                 |                                 |                                                                                                                                             |
| TEST LIMITS ACCEPTABILITY                   | PERFECT BALANCE OF CAPACITY OF STATOR PHASES                                                                                                                  |                                 |                                 |                                                                                                                                             |
| TEST RESULTS<br>VARIATION % pF              | PHASE -L1-<br>0,87<br>VERY GOOD                                                                                                                               | PHASE -L2-<br>0,87<br>VERY GOOD | PHASE -L3-<br>0,87<br>VERY GOOD |                                                                                                                                             |
| I.L. RESULTS                                | 1,00                                                                                                                                                          | 1,00                            | 1,00                            |                                                                                                                                             |
| STATOR TEST CONDITIONS                      | COMPLETELY OPENED - STAR CENTRE REMOVED                                                                                                                       |                                 |                                 |                                                                                                                                             |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2                                                                                                         |                                 |                                 |                                                                                                                                             |
| DATE OF TEST 05 December 2013               |                                                                                                                                                               | SERIAL N. 841215                |                                 |                                                                                                                                             |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                                                                                         | Check up<br>C. Bruni            | Identification n.<br>00000AoE   | R.E.M. S.r.l. reserves all rights upon present document<br>that cannot be reproduced not even partially without<br>R.E.M.'s written consent |

## OHMIC PHASE RESISTANCE

### STATOR WINDING

| MEASURED VALUES | PHASE -L1-      | PHASE -L2-      | PHASE -L3-      | TEMPERATURE cu °C   |
|-----------------|-----------------|-----------------|-----------------|---------------------|
|                 | <b>0,004640</b> | <b>0,004640</b> | <b>0,004640</b> | $\Omega$ a °C 20,00 |
|                 | 0,005641        | 0,005641        | 0,005641        | $\Omega$ a °C 75,00 |



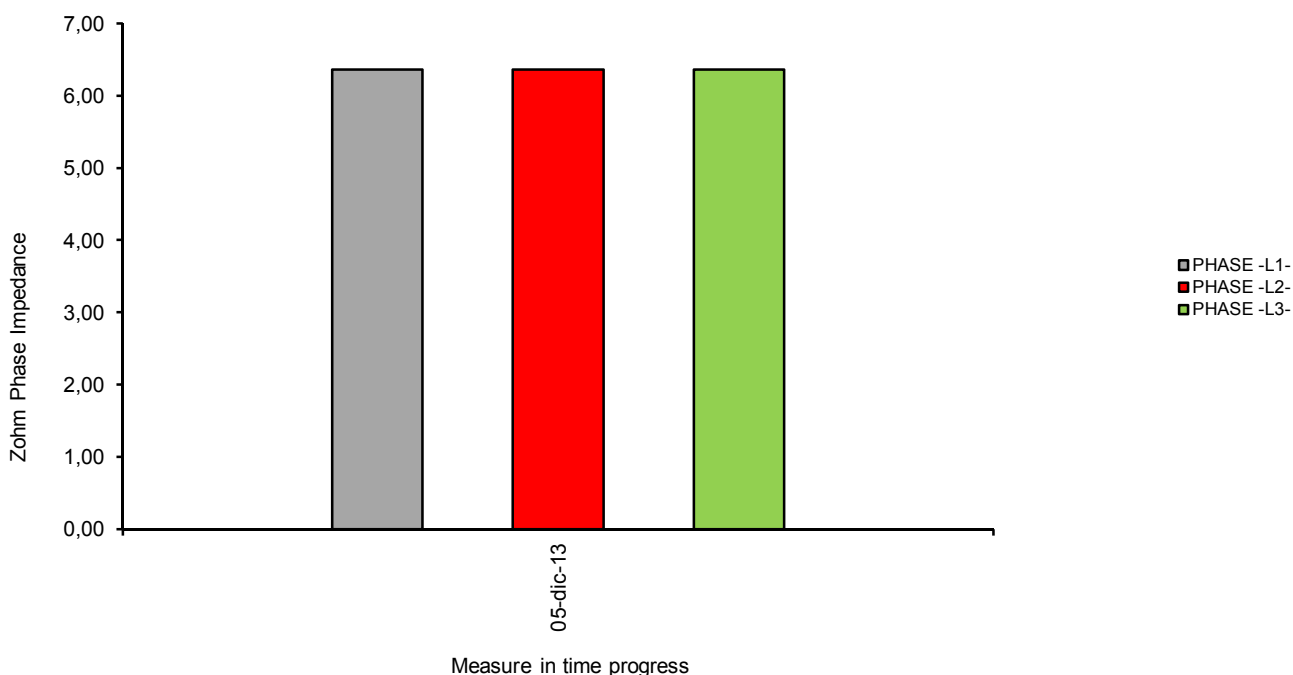
Measurement in time progress

|                                          |                                                                                                                |                      |                               |                                                                                                                                       |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                              | DLA - MIKROOHMMETER BURSTER DIGITAL RESISTOR TYPE 2323 N.062103                                                |                      |                               |                                                                                                                                       |
| NEXT EXPIRE DATE INSTRUMENTS CALIBRATION | 31 December 2014                                                                                               |                      |                               |                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY                | % DEVIATION OF MEASURE MUST BE INFERIOR WITH 10 % RESPECT TO PLATE VALUE                                       |                      |                               |                                                                                                                                       |
| TEST RESULTS                             | <b>BALANCED PHASES</b>                                                                                         |                      |                               |                                                                                                                                       |
| I.L. RESULTS                             | 1,00                                                                                                           |                      |                               |                                                                                                                                       |
| STATOR TEST CONDITIONS                   | COMPLETELY OPENED - STAR CENTRE REMOVED                                                                        |                      |                               |                                                                                                                                       |
| APPLICABLE NORMS                         | NORME INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB U 009 C ; ANSALDO 249W508 ; ALSTOM UQ602012C |                      |                               |                                                                                                                                       |
| DATE OF TEST 05 December 2013            |                                                                                                                | SERIAL N. 841215     |                               |                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani           | Preparation<br>O.M.G.                                                                                          | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |

## PHASE IMPEDANCE

### STATOR WINDING

| MEASURED VALUES | PHASE -L1- | PHASE -L2- | PHASE -L3- |      |
|-----------------|------------|------------|------------|------|
|                 | 7,00       | 7,00       | 7,00       | V ac |
|                 | 1,10       | 1,10       | 1,10       | A    |
|                 | 6,36       | 6,36       | 6,36       | ZΩ   |



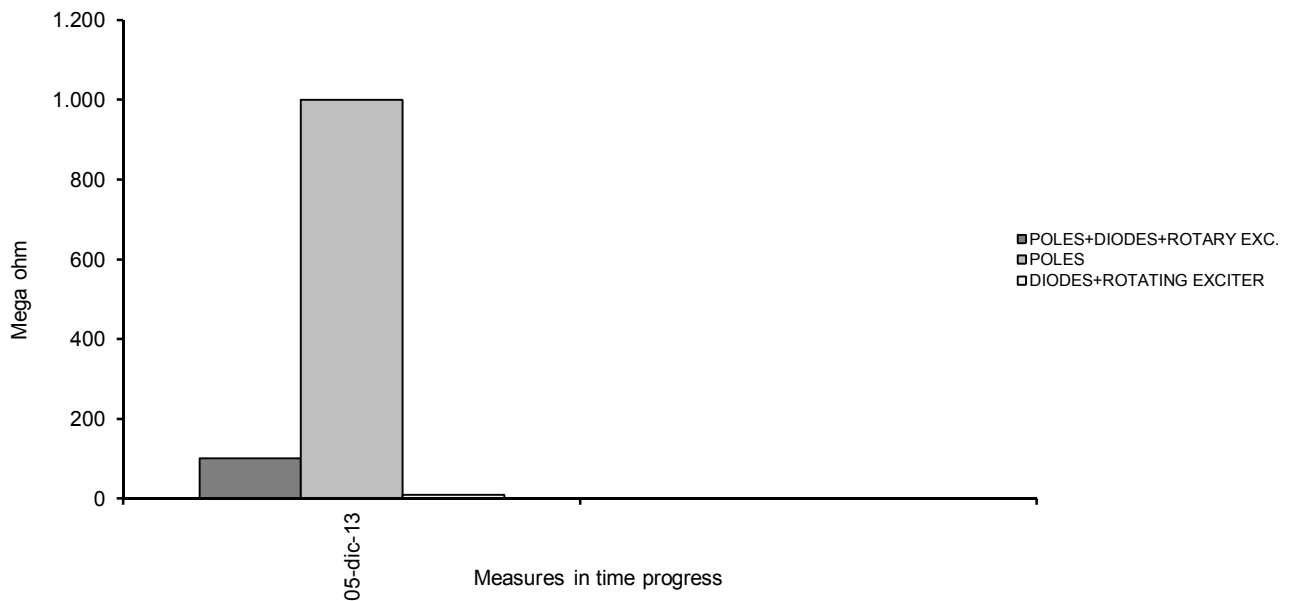
|                                          |                                                                                                                                                   |                      |                               |                                                                                                                                             |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                              | DLA - VARIAC BELOTTI V 220 AC A 113 N.NN - OSCILLOSCOPE<br>FLUKE SCOPEMETER 123 N.DM8620526                                                       |                      |                               |                                                                                                                                             |
| NEXT EXPIRE DATE INSTRUMENTS CALIBRATION | 31 December 2014                                                                                                                                  |                      |                               |                                                                                                                                             |
| TEST LIMITS ACCEPTABILITY                | % DEVIATION OF MEASURE MUST BE INFERIOR WITH 10 %<br>RESPECT TO PLATE VALUE                                                                       |                      |                               |                                                                                                                                             |
| TEST RESULTS                             | <b>BALANCED PHASES</b>                                                                                                                            |                      |                               |                                                                                                                                             |
| I.L. RESULTS                             | 1,00                                                                                                                                              |                      |                               |                                                                                                                                             |
| STATOR TEST CONDITIONS                   | COMPLETELY OPENED - STAR CENTRE REMOVED                                                                                                           |                      |                               |                                                                                                                                             |
| APPLICABLE NORMS                         | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; IEEE Std. 56 - 1977<br>(Guide for insulation maintenance for large AC Rotating Machinery) |                      |                               |                                                                                                                                             |
| DATE OF TEST 05 December 2013            |                                                                                                                                                   | SERIAL N. 841215     |                               |                                                                                                                                             |
| Operator<br>Eddo Luigi Toscani           | Preparation<br>O.M.G.                                                                                                                             | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document<br>that cannot be reproduced not even partially without<br>R.E.M.'s written consent |

# STATIC INSULATION RESISTANCE

## ROTATING WINDING

TEST VOLTAGE V dc      **500**      x 1'      TEMPERATURE cu °C    20,00

| MEASURED VALUES | POLES+DIODES+ROTARY EXC. | POLES              | DIODES+ROTATING EXCITER |
|-----------------|--------------------------|--------------------|-------------------------|
|                 | <b>100,00</b> MΩ         | <b>1.000,00</b> MΩ | <b>10,00</b> MΩ         |

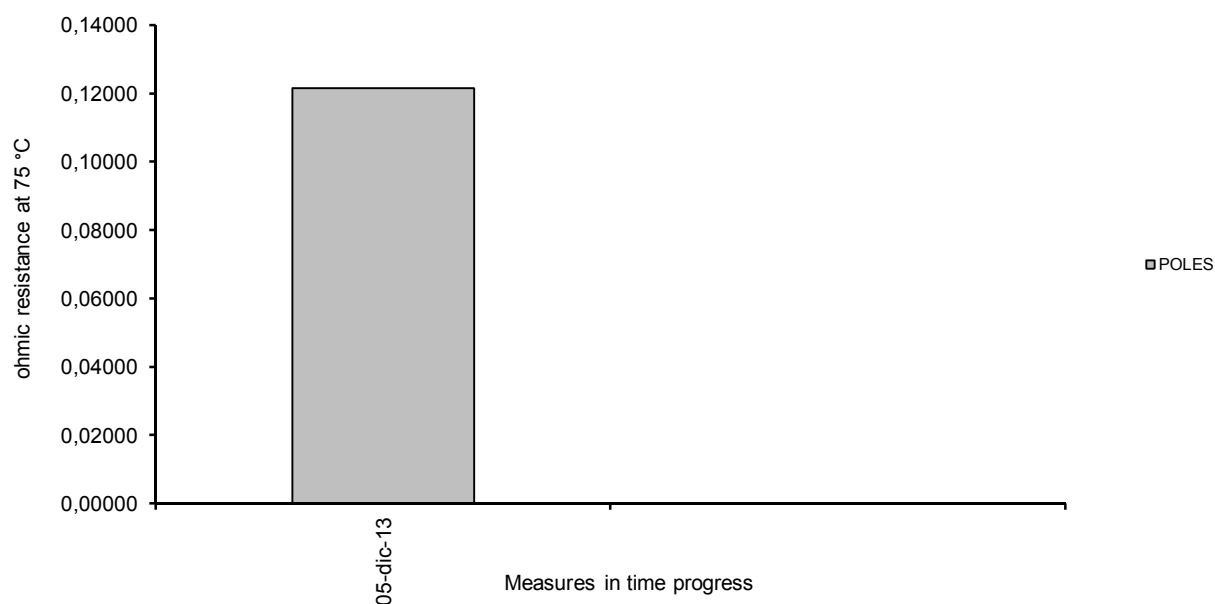


|                                                                                                                                       |                                                                            |                      |                               |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------|-------------------------------|
| INSTRUMENTS                                                                                                                           | DLA - TRASFORMER DC BAUR PGK50E N.0410339006 - PGK25 N.041159002           |                      |                               |
| NEXT EXPIRE DATE                                                                                                                      | 31 December 2014                                                           |                      |                               |
| INSTRUMENTS CALIBRATION                                                                                                               |                                                                            |                      |                               |
| TEST LIMITS                                                                                                                           | R ≥ 10 MΩ (20°C)                                                           |                      |                               |
| ACCEPTABILITY                                                                                                                         |                                                                            |                      |                               |
| TEST RESULTS<br>VALUES IN MEGA OHM AT 1'                                                                                              | POLES+DIODES+ROTARY EXC.                                                   | POLES                | DIODES+ROTATING EXCITER       |
|                                                                                                                                       | 100,00                                                                     | 1.000,00             | 10,00                         |
|                                                                                                                                       | GOOD                                                                       | VERY GOOD            | TOLERABLE                     |
| I.L. RESULTS                                                                                                                          | 0,98                                                                       | 1,00                 | 0,70                          |
| TEST CONDITIONS                                                                                                                       | OUTSIDE STATOR                                                             |                      |                               |
| POLAR WHEEL                                                                                                                           |                                                                            |                      |                               |
| APPLICABLE NORMS                                                                                                                      | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 - IEEE std 43 - 2000 |                      |                               |
| DATE OF TEST 05 December 2013                                                                                                         |                                                                            | SERIAL N. 841215     |                               |
| Operator<br>Eddo Luigi Toscani                                                                                                        | Preparation<br>O.M.G.                                                      | Check up<br>C. Bruni | Identification n.<br>00000AoE |
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# STATIC OHMIC RESISTANCE

## ROTARY WINDING

| MEASURED VALUES   |  |                |   |
|-------------------|--|----------------|---|
| TEMPERATURE cu °C |  | POLES          |   |
| 20,00             |  | <b>0,10000</b> | Ω |
| 75,00             |  | 0,12157        | Ω |



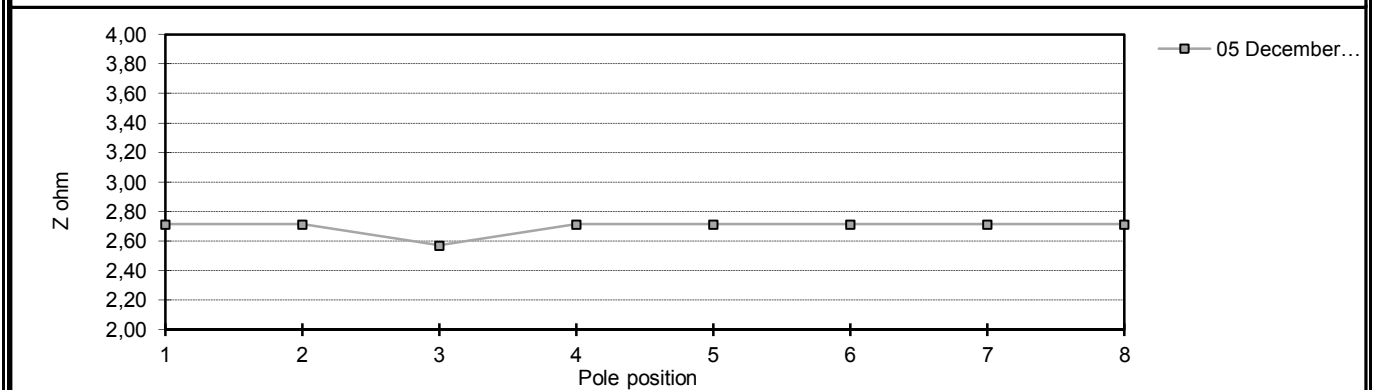
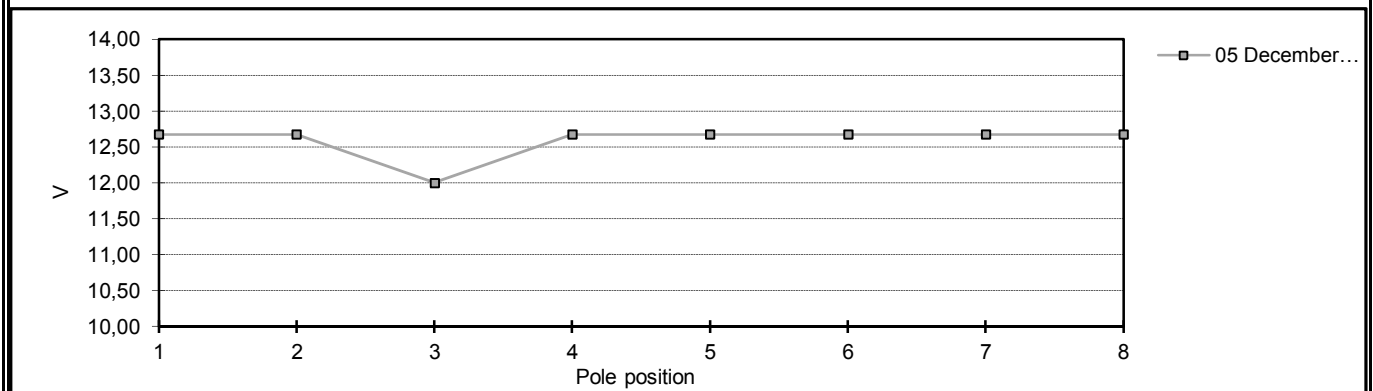
|                                                                                                                                       |                                                                                                          |                                    |                               |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------|
| INSTRUMENTS                                                                                                                           | DLA - MIKROOHMMETER BURSTER DIGITAL RESISTOR TYPE 2323 N.062103                                          |                                    |                               |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION                                                                                           | 31 December 2014                                                                                         |                                    |                               |
| TEST LIMITS<br>ACCEPTABILITY                                                                                                          | % DEVIATION OF MEASURE MUST BE INFERIOR WITH 10 % RESPECT TO PLATE VALUE                                 |                                    |                               |
| TEST RESULTS                                                                                                                          |                                                                                                          | POLES<br>0,12157<br><b>REGULAR</b> |                               |
| I.L. RESULTS                                                                                                                          |                                                                                                          | 1,00                               |                               |
| TEST CONDITIONS<br>POLAR WHEEL                                                                                                        | OUTSIDE STATOR                                                                                           |                                    |                               |
| APPLICABLE NORMS                                                                                                                      | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB U 009 C ; ANSALDO 249W508 ; ALSTOM UQ602012C |                                    |                               |
| DATE OF TEST 05 December 2013                                                                                                         |                                                                                                          | SERIAL N. 841215                   |                               |
| Operator<br>Eddo Luigi Toscani                                                                                                        | Preparation<br>O.M.G.                                                                                    | Check up<br>C. Bruni               | Identification n.<br>00000AoE |
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# STATIC IMPEDANCE

## ROTARY WINDING

| MEASURED VALUES | V ac   | A    | ZΩ    |
|-----------------|--------|------|-------|
|                 | 101,40 | 4,67 | 21,71 |

| POLES NUMBERING IMPRINTED ON THE POLAR BODY COLLECTOR SIDE |       |       |       |       |       |       |       |  |  |  |  |  |  | POS. POLE |
|------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|-----------|
| 1                                                          | 2     | 3     | 4     | 5     | 6     | 7     | 8     |  |  |  |  |  |  | V ac      |
| 12,68                                                      | 12,68 | 12,00 | 12,68 | 12,68 | 12,68 | 12,68 | 12,68 |  |  |  |  |  |  | ZΩ        |
| 2,71                                                       | 2,71  | 2,57  | 2,71  | 2,71  | 2,71  | 2,71  | 2,71  |  |  |  |  |  |  |           |



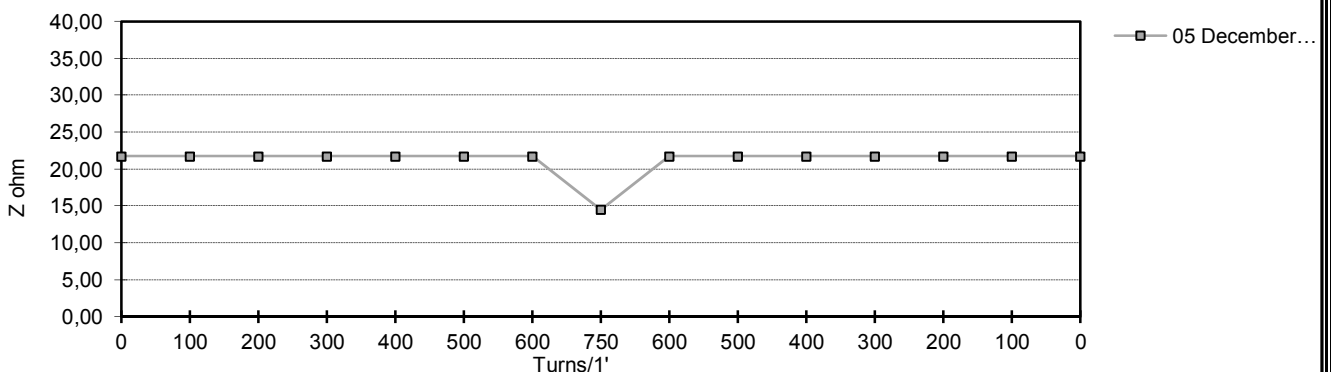
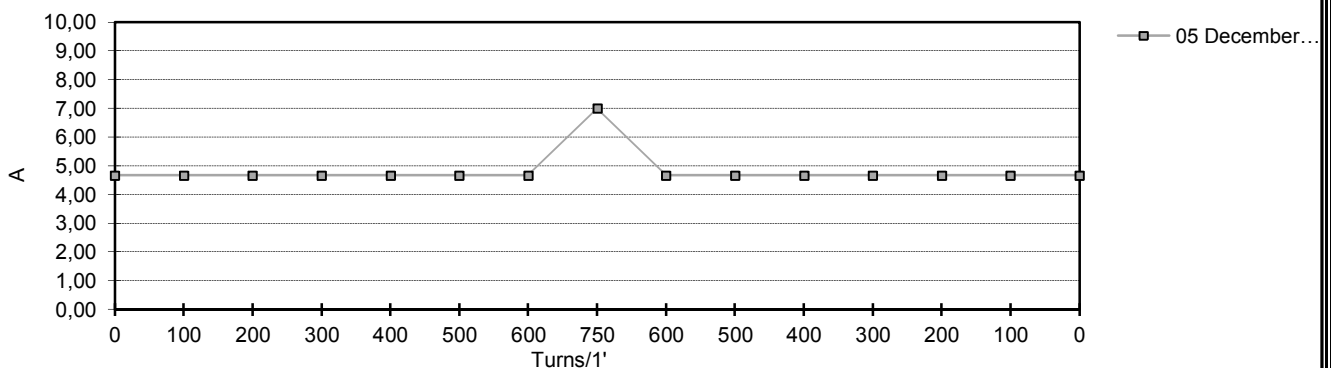
|                                |                                                                                                                                                                        |                      |                               |                                                                                                                                       |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                    | DLA - VARIAC BELOTTI V 220 AC A 113 N.NN - OSCILLOSCOPIO FLUKE SCOPEMETER 123 N.DM8620526                                                                              |                      |                               |                                                                                                                                       |
| NEXT EXPIRE DATE               | 31 December 2014                                                                                                                                                       |                      |                               |                                                                                                                                       |
| INSTRUMENTS CALIBRATION        |                                                                                                                                                                        |                      |                               |                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY      | THE DIFFERENTIAL BETWEEN THE VALUES IN RELATION TO THE EXTREME MEDIA MUST NOT BE MORE THAN 5 %                                                                         |                      |                               |                                                                                                                                       |
| TEST RESULTS %                 | 0,14 ACCEPTABILITY                                                                                                                                                     |                      |                               |                                                                                                                                       |
| I.L. RESULT                    | 1,00                                                                                                                                                                   |                      |                               |                                                                                                                                       |
| TEST CONDITIONS POLAR WHEEL    | OUTSIDE STATOR                                                                                                                                                         |                      |                               |                                                                                                                                       |
| APPLICABLE NORMS               | NORME INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; IEEE Std. 56 - 1977 (Guide for insulation maintenance for large AC Rotating Machinery) ; ANSALDO 249W508 |                      |                               |                                                                                                                                       |
| DATE OF TEST 05 December 2013  |                                                                                                                                                                        | SERIAL N. 841215     |                               |                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani | Preparation<br>O.M.G.                                                                                                                                                  | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |

# DYNAMIC IMPEDANCE

## ROTARY WINDING

| MEASURED VALUES | V ac   | A    | ZΩ    | Turns/1' |
|-----------------|--------|------|-------|----------|
|                 | 101,40 | 4,67 | 21,71 | 0        |

| 0     | 100   | 200   | 300   | 400   | 500   | 600   | 750   | 600   | 500   | 400   | 300   | 200   | 100   | 0     | Turns/1' |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | 7,00  | 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | 4,67  | A        |
| 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | 14,49 | 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | 21,71 | ZΩ       |



|                                |                                                                                                                                                                  |                      |                               |                                                                                                                                       |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                    | DLA - VARIAC BELOTTI V 220 AC A 113 N.NN - OSCILLOSCOPE FLUKE SCOPEMETER 123 N.DM8620526                                                                         |                      |                               |                                                                                                                                       |
| NEXT EXPIRE DATE               | 31 December 2014                                                                                                                                                 |                      |                               |                                                                                                                                       |
| INSTRUMENTS CALIBRATION        |                                                                                                                                                                  |                      |                               |                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY      | AVERAGE OF IMPEDANCE VALUES RESPECT TO TURNS (0) MUST NOT BE HIGHER THAN 3 %                                                                                     |                      |                               |                                                                                                                                       |
| ESITO DELLA PROVA              | 2,27% ACCEPTABLE                                                                                                                                                 |                      |                               |                                                                                                                                       |
| I.L. RESULT                    | 1,00                                                                                                                                                             |                      |                               |                                                                                                                                       |
| TEST CONDITIONS POLAR WHEEL    | POLAR WHEEL WITH EXCITER CONNECTION REMOVED                                                                                                                      |                      |                               |                                                                                                                                       |
| APPLICABLE NORMS               | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; IEEE Std. 56 - 1977 (Guide for insulation maintenance for large AC Rotating Machinery) ; ANSALDO 249W508 |                      |                               |                                                                                                                                       |
| DATE OF TEST 05 December 2013  |                                                                                                                                                                  | SERIAL N. 841215     |                               |                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani | Preparation<br>O.M.G.                                                                                                                                            | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |

# STATIC EXCITER'S INSULATION RESISTANCE

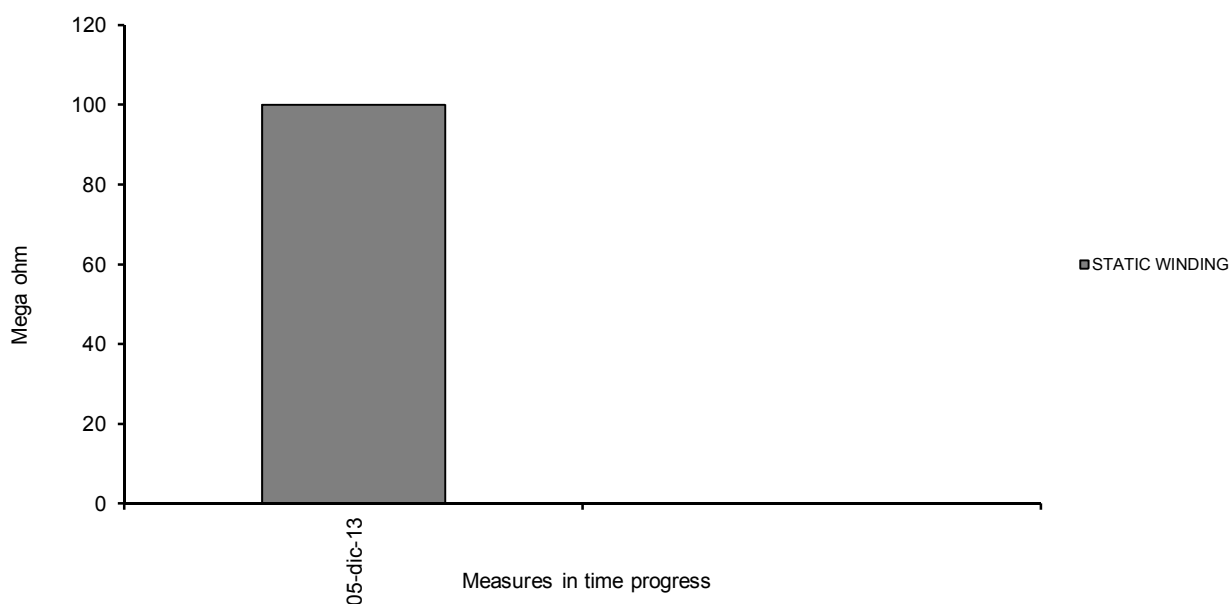
## STATOR WINDING

TEST VOLTAGE V dc      **500**      x 1'      TEMPERATURE cu °C    20,00

MEASURED VALUES

STATIC WINDING

**100,00** MΩ

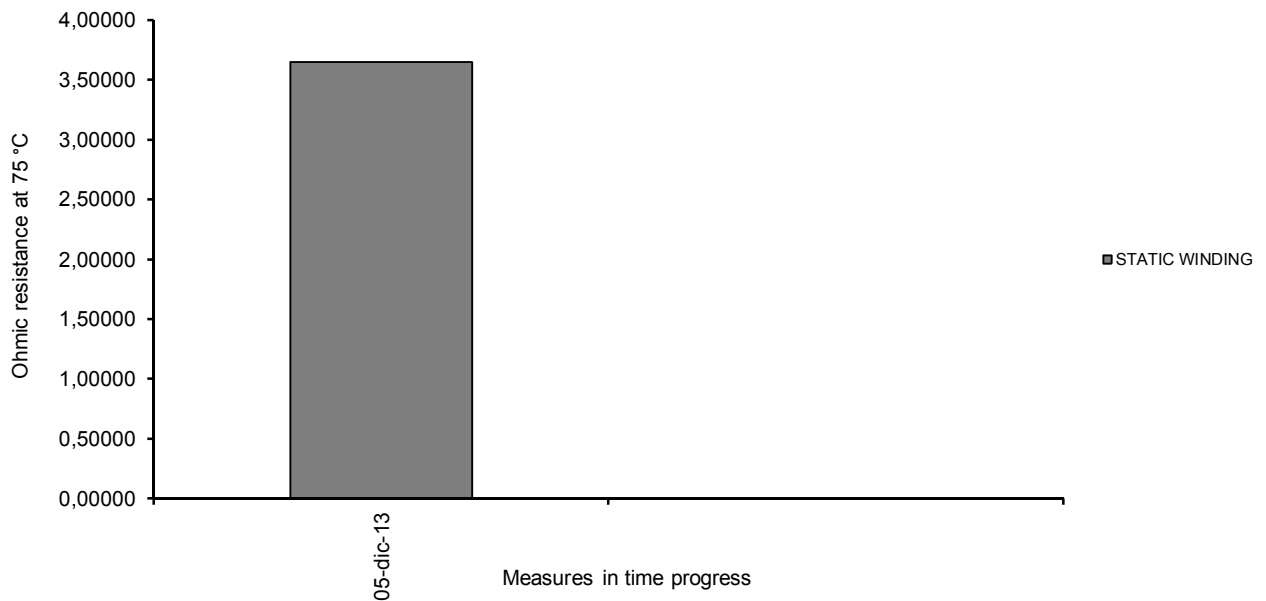


|                                             |                                                                            |                      |                               |                                                                                                                                             |
|---------------------------------------------|----------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - TRASFORMER DC BAUR PGK50E N.0410339006 - PGK25 N.041159002           |                      |                               |                                                                                                                                             |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION | 31 December 2014                                                           |                      |                               |                                                                                                                                             |
| TEST LIMITS<br>ACCEPTABILITY                | R ≥ 10 MΩ (20°C)                                                           |                      |                               |                                                                                                                                             |
| TEST RESULTS VALUES IN<br>MEGA OHM AT 1'    | STATOR WINDING                                                             |                      |                               |                                                                                                                                             |
|                                             | 100,00                                                                     |                      |                               |                                                                                                                                             |
|                                             | GOOD                                                                       |                      |                               |                                                                                                                                             |
|                                             | 0,98                                                                       |                      |                               |                                                                                                                                             |
| I.L. RESULT                                 |                                                                            |                      |                               |                                                                                                                                             |
| TEST CONDITIONS<br>STATIC WINDING           | IN POSITION WITH CLOSED MACHINE                                            |                      |                               |                                                                                                                                             |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 - IEEE std 43 - 2000 |                      |                               |                                                                                                                                             |
| DATE OF TEST                                |                                                                            | 05 December 2013     |                               | SERIAL N. 841215                                                                                                                            |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                      | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that<br>cannot be reproduced not even partially without R.E.M.'s written<br>consent |

# OHMIC RESISTANCE STATIC EXCITER

## STATOR WINDING

| MEASURED VALUES   |                  |  |  |
|-------------------|------------------|--|--|
| TEMPERATURE cu °C | STATIC WINDING   |  |  |
| 20,00             | <b>3,00000</b> Ω |  |  |
| 75,00             | 3,64706 Ω        |  |  |

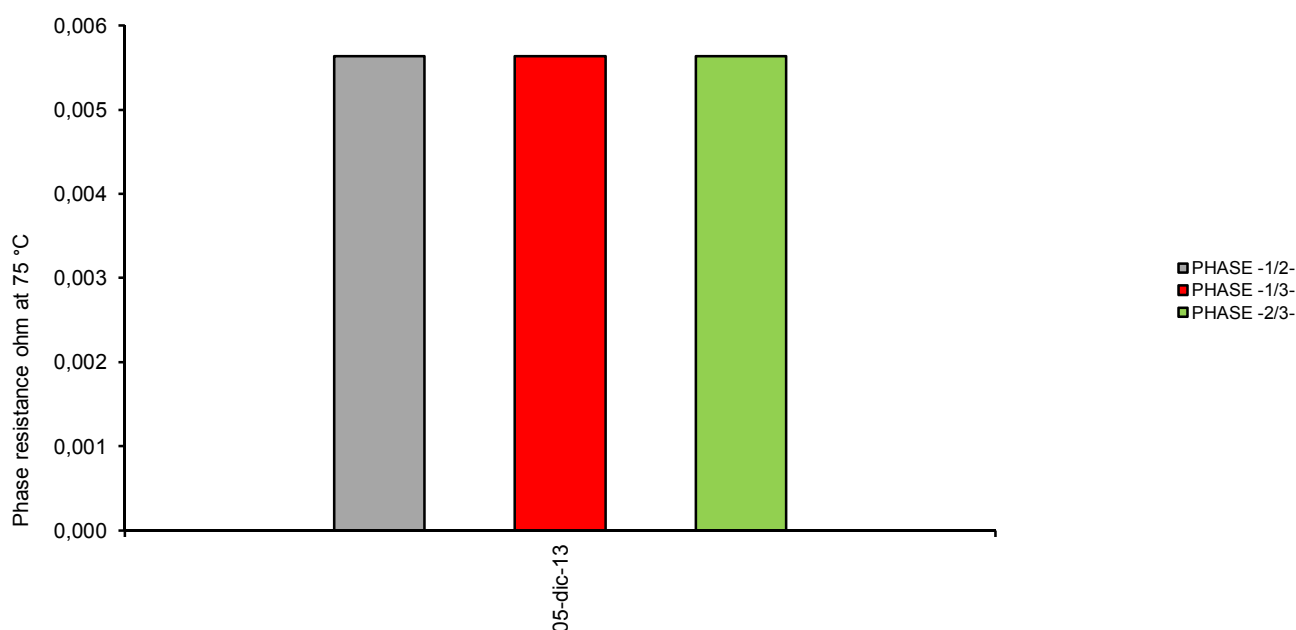


|                                             |                                                                                                             |                      |                               |                                                                                                                                             |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - MIKROOHMMETER BURSTER DIGITAL RESISTER TYPE 2323<br>N.062103                                          |                      |                               |                                                                                                                                             |
| NEXT EXPIRE DATE<br>INSTRUMENTS CALIBRATION | 31 December 2014                                                                                            |                      |                               |                                                                                                                                             |
| TEST LIMITS<br>ACCEPTABILITY                | % DEVIATION OF MEASURE MUST BE INFERIOR WITH 10 % RESPECT TO<br>PLATE VALUE                                 |                      |                               |                                                                                                                                             |
| TEST RESULTS                                | STATOR WINDING                                                                                              |                      |                               |                                                                                                                                             |
|                                             | 3,64706                                                                                                     |                      |                               |                                                                                                                                             |
|                                             | REGULAR                                                                                                     |                      |                               |                                                                                                                                             |
| I.L. RESULT                                 | 1,00                                                                                                        |                      |                               |                                                                                                                                             |
| TEST CONDITIONS<br>STATIC WINDING           | IN POSITION WITH MACHINE CLOSED                                                                             |                      |                               |                                                                                                                                             |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB U 009 C ; ANSALDO 249W508<br>; ALSTOM UQ602012C |                      |                               |                                                                                                                                             |
| DATE OF TEST                                |                                                                                                             | 05 December 2013     |                               | SERIAL N. 841215                                                                                                                            |
| Operator<br>Eddo Luigi Toscani              | Preparation<br>O.M.G.                                                                                       | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that<br>cannot be reproduced not even partially without R.E.M.'s written<br>consent |

# PHASE OHMIC RESISTANCE STATIC EXCITER

## ROTARY WINDING 3 PHASE ROTATING

| MEASURED VALUES | PHASE -1/2-     | PHASE -1/3-     | PHASE -2/3-     | TEMPERATURE cu °C   |
|-----------------|-----------------|-----------------|-----------------|---------------------|
|                 | <b>0,004640</b> | <b>0,004640</b> | <b>0,004640</b> | $\Omega$ a °C 20,00 |
|                 | 0,005641        | 0,005641        | 0,005641        | $\Omega$ a °C 75,00 |



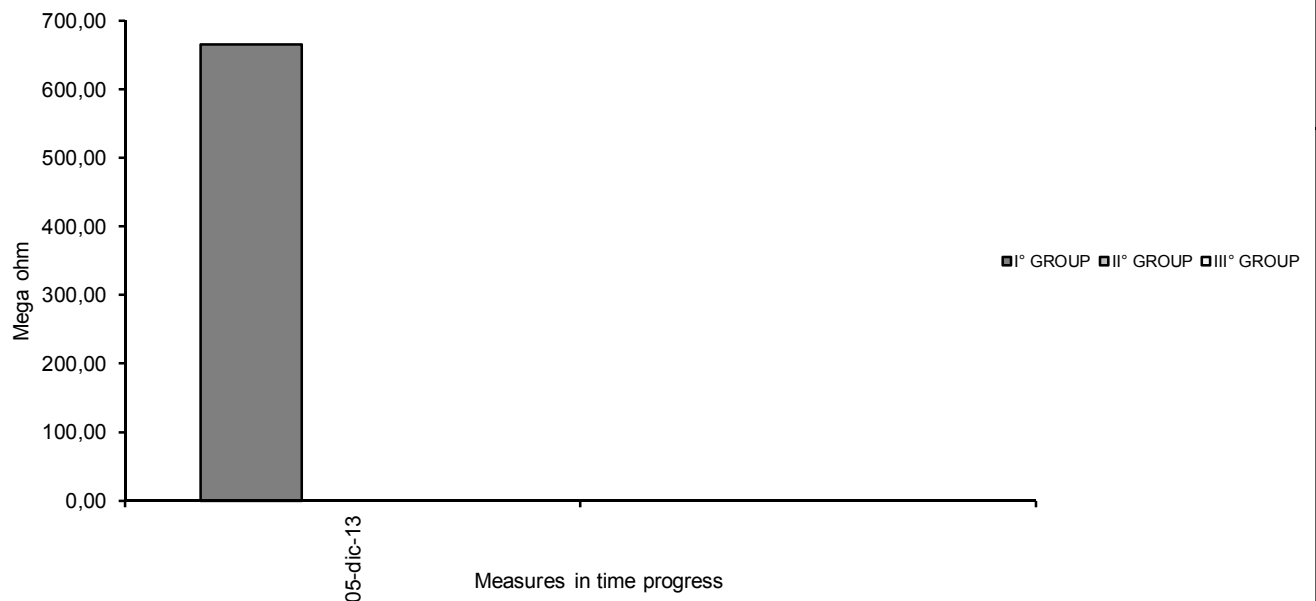
|                                          |                                                                                                          |                      |                               |                                                                                                                                       |
|------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                              | DLA - MIKROOHMMETER BURSTER DIGITAL RESISTER TYPE 2323 N.062103                                          |                      |                               |                                                                                                                                       |
| NEXT EXPIRE DATE INSTRUMENTS CALIBRATION | 31 December 2014                                                                                         |                      |                               |                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY                | % DEVIATION OF MEASURE MUST BE INFERIOR WITH 10 % RESPECT TO PLATE VALUE                                 |                      |                               |                                                                                                                                       |
| TEST RESULTS                             | <b>BALANCED PHASES</b>                                                                                   |                      |                               |                                                                                                                                       |
| TEST CONDITIONS ROTOR                    | UNCONNECTED TO DIODES' PLATE                                                                             |                      |                               |                                                                                                                                       |
| APPLICABLE NORMS                         | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB U 009 C ; ANSALDO 249W508 ; ALSTOM UQ602012C |                      |                               |                                                                                                                                       |
| DATE OF TEST 05 December 2013            |                                                                                                          | SERIAL N. 841215     |                               |                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani           | Preparation<br>O.M.G.                                                                                    | Check up<br>C. Bruni | Identification n.<br>00000Aoe | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |

# INSULATION RESISTANCE

## THERMORESISTANCES

TEST VOLTAGE V dc      **500**      x 1'

|                 | I° GROUP         | II° GROUP | III° GROUP |
|-----------------|------------------|-----------|------------|
| MEASURED VALUES | <b>666,00</b> MΩ | MΩ        | MΩ         |



|                                                                                                                                       |                                                                                 |                      |                               |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------|-------------------------------|
| INSTRUMENTS                                                                                                                           | DLA - MEGGER DIGITAL ELECTRONICAL MEGABRAS TYPE 5060X N.SN1                     |                      |                               |
| NEXT EXPIRE DATE                                                                                                                      | 31 December 2014                                                                |                      |                               |
| INSTRUMENTS CALIBRATION                                                                                                               |                                                                                 |                      |                               |
| TEST LIMITS                                                                                                                           | R ≥ 10 MΩ (20°C)                                                                |                      |                               |
| ACCEPTABILITY                                                                                                                         |                                                                                 |                      |                               |
| TEST RESULTS                                                                                                                          | I° GROUP                                                                        | II° GROUP            | III° GROUP                    |
|                                                                                                                                       | GOOD                                                                            |                      |                               |
|                                                                                                                                       |                                                                                 |                      |                               |
| TEST CONDITIONS                                                                                                                       | MACHINE STOPPED - AUXILIARIES IN SAFETY -THERMORESISTANCES' CONNECTIONS REMOVED |                      |                               |
| APPLICABLE NORMS                                                                                                                      | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2                           |                      |                               |
| DATE OF TEST 05 December 2013                                                                                                         |                                                                                 | SERIAL N. 841215     |                               |
| Operator<br>Eddo Luigi Toscani                                                                                                        | Preparation<br>O.M.G.                                                           | Check up<br>C. Bruni | Identification n.<br>00000AoE |
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# OHMIC RESISTANCE

## THERMORESISTANCES

TEMPERATURE cu °C

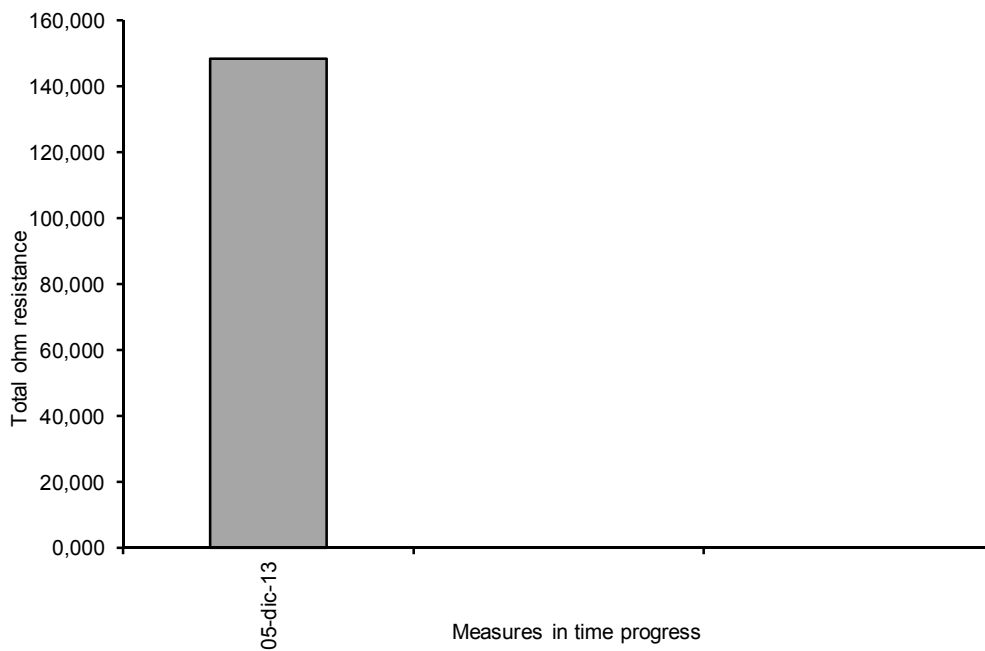
MEASURED VALUES

**122,00000**

Ω a °C 20,00

148,31373

Ω a °C 75,00



INSTRUMENTS

DLA - OSCILLOSCOPE FLUKE SCOPEMETER 123 N.DM86209526

NEXT EXPIRE DATE INSTRUMENTS  
CALIBRATION

31 December 2014

TEST LIMITS ACCEPTABILITY

HEATERS MUST WORK PROPERLY

TEST RESULTS

**REGULAR**

TEST CONDITIONS

MACHINE STOPPED - AUXILIARIES IN SAFETY -  
THERMORESISTANCES' CONNECTIONS REMOVED

APPLICABLE NORMS

INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2

DATE OF TEST 05 December 2013

SERIAL N. 841215

Operator  
Edo Luigi Toscani

Preparation  
O.M.G.

Check up  
C. Bruni

Identification n.  
00000AoE

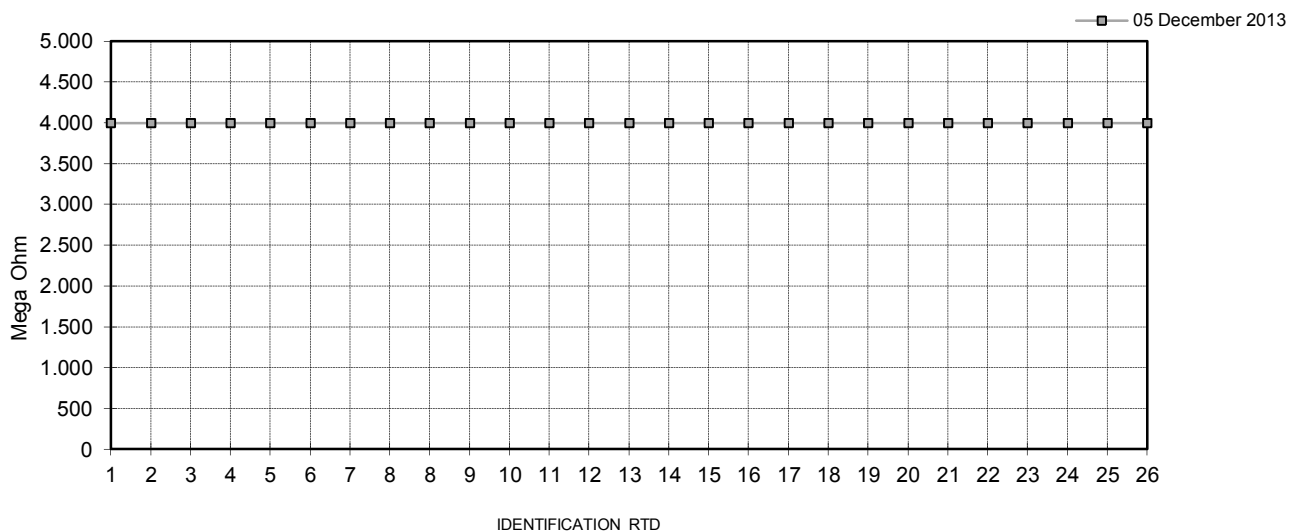
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# INSULATION RESITANCE

## RTD THERMOELEMENTS Pt 100 ohm at 0°C

TEST VOLTAGE TO GROUND = V dc **500**

|           |           |           |           |           |           |           |           |           |                |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|
| <b>1</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>  | <b>5</b>  | <b>6</b>  | <b>7</b>  | <b>8</b>  | <b>9</b>  | IDENTIFICATION |
| 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | MΩ             |
| <b>10</b> | <b>11</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | IDENTIFICATION |
| 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | MΩ             |
| <b>19</b> | <b>20</b> | <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> | <b>26</b> | <b>27</b> | IDENTIFICATION |
| 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | 4.000     | MΩ             |

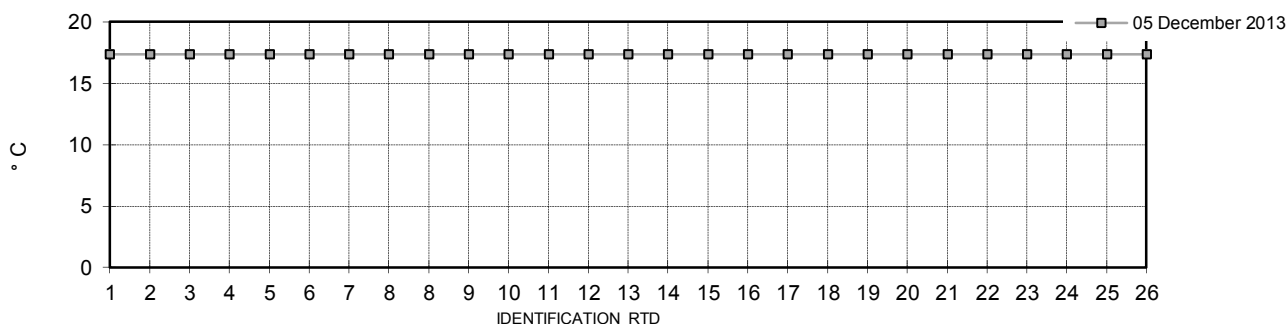
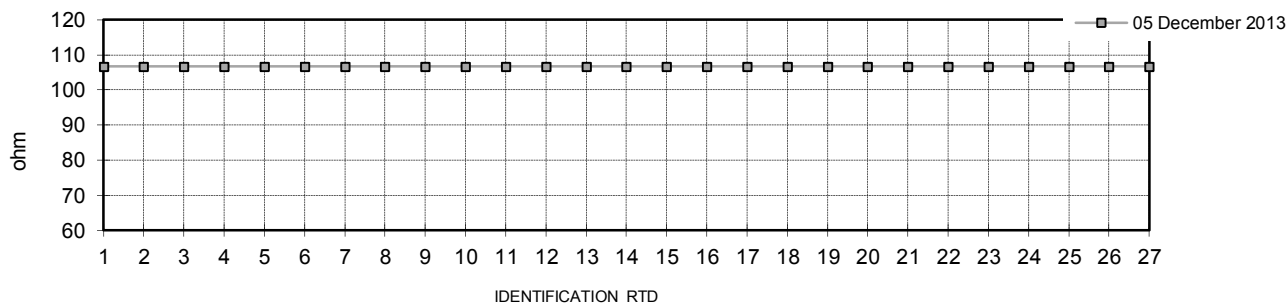


|                                             |                                                                          |                      |                                                                                                                                                                                       |
|---------------------------------------------|--------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                                 | DLA - MEGGER DIGITAL ELECTRONICAL MEGABRAS TYPE 5060X<br>N.SN1           |                      |                                                                                                                                                                                       |
| NEXT EXPIRE DATE INSTRUMENTS<br>CALIBRATION | 31 December 2014                                                         |                      |                                                                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY                   | R ≥ 100 MΩ (20°C)                                                        |                      |                                                                                                                                                                                       |
| TEST RESULTS                                | <b>GOOD</b>                                                              |                      |                                                                                                                                                                                       |
| I.L. RESULT                                 |                                                                          |                      |                                                                                                                                                                                       |
| TEST CONDITIONS                             | MACHINE STOPPED - AUXILIARIES IN SAFETY - RTD<br>CONNECTIONS REMOVED     |                      |                                                                                                                                                                                       |
| APPLICABLE NORMS                            | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB ISV-U 602010 |                      |                                                                                                                                                                                       |
| DATE OF TEST 05 December 2013               |                                                                          | SERIAL N. 841215     |                                                                                                                                                                                       |
| Operator<br>Edo Luigi Toscani               | Preparation<br>O.M.G.                                                    | Check up<br>C. Bruni | Identification n.<br>00000AoE<br><small>R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent</small> |

# OHMIC RESISTANCE

## RTD THERMOELEMENTS Pt 100 ohm at 0°C

| 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | IDENTIFICATION |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------|
| 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | Ω              |
| 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | °C             |
| 10     | 11     | 12     | 13     | 14     | 15     | 16     | 17     | 18     | IDENTIFICATION |
| 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | Ω              |
| 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | °C             |
| 19     | 20     | 21     | 22     | 23     | 24     | 25     | 26     | 27     | IDENTIFICATION |
| 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | 106,70 | Ω              |
| 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | 17,36  | °C             |



|                                          |                                                                          |                      |                               |                                                                                                                                       |
|------------------------------------------|--------------------------------------------------------------------------|----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUMENTS                              | DLA - OSCILLOSCOPE FLUKE SCOPEMETER 123 N.DM8620526                      |                      |                               |                                                                                                                                       |
| NEXT EXPIRE DATE INSTRUMENTS CALIBRATION | 31 December 2014                                                         |                      |                               |                                                                                                                                       |
| TEST LIMITS ACCEPTABILITY                | TEST MUST REVEAL TO BE FUNCTIONING FOR ALL PT 100                        |                      |                               |                                                                                                                                       |
| TEST RESULTS                             | <b>REGULAR</b>                                                           |                      |                               |                                                                                                                                       |
| I.L. RESULT                              |                                                                          |                      |                               |                                                                                                                                       |
| TEST CONDITIONS                          | MACHINE STOPPED - AUXILIARIES IN SAFETY - RTD CONNECTIONS REMOVED        |                      |                               |                                                                                                                                       |
| APPLICABLE NORMS                         | INTERNATIONAL STANDARD CEI - IEC 60034-1 EDITION 10.2 ; ABB ISV-U 602010 |                      |                               |                                                                                                                                       |
| DATE OF TEST 05 December 2013            |                                                                          |                      | SERIAL N. 841215              |                                                                                                                                       |
| Operator<br>Eddo Luigi Toscani           | Preparation<br>O.M.G.                                                    | Check up<br>C. Bruni | Identification n.<br>00000AoE | R.E.M. S.r.l. reserves all rights upon present document that cannot be reproduced not even partially without R.E.M.'s written consent |