

**TEST REPORT****EN 50470-3****Electricity metering equipment (a.c.) – Part 3: Particular requirements – Static meters for active energy (class indexes A, B and C)****Report reference No** .....: 07SP00005

Tested by

(printed name and signature) .....: Alessandro Buzzi

Approved by

(printed name and signature) .....: Agostino Fiorita

Date of issue .....: 2015/02/06

**Testing Laboratory Name** .....: IMQ S.p.A. con socio unico

Address .....: I – 20138 Milano – Via Quintiliano, 43

Testing location .....: See page 2

**Applicant's Name** .....: ENERGY TEAM S.p.A.

Address .....: I-20090 Trezzano sul Naviglio MI - Via Della Repubblica, 9

**Test specification**

Standard .....: EN 50470-1 + EN 50470-3

Test procedure .....: IO-MID-002

**Test Report Form No.** .....: EN 50470-1 + EN 50470-3

TRF originator .....: IMQ

Master TRF .....: dated 2014/10

Ref. No. originator .....: Mod. 987/1

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**Test item description** .....: Alternating current static watt-hour meters for active energy

Trademark .....: EnergyTeam

Manufacturer .....: ENERGY TEAM S.p.A.

Model and/or type reference .....: X-Meter Evo X Meter

Serial number .....: 141104XM123622

Rating(s) .....: 3x100/173...3x230/400 V (poly) 0,05-5(6) A, 50 Hz

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Particulars: test item vs. test requirements</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                        |
| Class index .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | B                                      |
| Meter type .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | static                                 |
| Meter for measurement transformer/s .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | yes                                    |
| Use .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | indoor                                 |
| Measurement of energy .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | bidirectional                          |
| Protective class .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Class II                               |
| Supply .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | inside                                 |
| <b>Testing location</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |
| Testing Laboratory .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | IMQ S.p.A. con socio unico             |
| Testing Location / Address .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I – 20138 Milano – Via Quintiliano, 43 |
| <b>Test case verdicts</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                        |
| Test case does not apply to the test object :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | N/A                                    |
| Test case does not carry out to the test object :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/C                                    |
| Test item does meet the requirement .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | P(ass)                                 |
| Test item does not meet the requirement ...:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | F(ail)                                 |
| <b>Testing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        |
| Date of receipt of test item .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/01/19                             |
| Date(s) of performance of test .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2014/01/22 ÷ 2015/02/11                |
| <p><b>General remarks:</b></p> <p>The test result presented in this report relate only to the item (s) tested.<br/>         This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>“(see Annex #)” refers to an annex appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>Throughout this report the indication "N/C" is used to indicate that the test case applies to the test object but it has not been carried out.</p> |                                        |

**Copy of marking plate:****Summary of test results (information/comments):**

This report is composed of:

- Test Report based on EN 50470-3: 5 pages;
- Annex A – Active energy results: 5 pages;
- Annex B – Graphics: 2 pages;
- Annex C – Photographic documentation: 1 page;
- Annex D – Instruments and accuracy: 1 page.

**General product information:**

|                                                              |                       |            |
|--------------------------------------------------------------|-----------------------|------------|
| Meter type.....                                              | static                |            |
| Reference voltage (Un) .....                                 | 3x100/173...3x230/400 | V          |
| Starting current (Ist) .....                                 | 0,001                 | A          |
| Minimum current (Imin) .....                                 | 0,05                  | A          |
| Transitional current (Itr) .....                             | 0,25                  | A          |
| Reference current (Iref) .....                               | N/A                   |            |
| Rated current (In) .....                                     | 5                     | A          |
| Maximum current (Imax) .....                                 | 6                     | A          |
| Meter for connection through measurement transformer/s ..... | yes                   |            |
| For networks equipped with earth fault neutralizers .....    | N/A                   |            |
| Rated secondary current of the transformer/s :               | 5                     | A          |
| Reference frequency (Hz) .....                               | 50                    | Hz         |
| Constant S0.....                                             | 1000                  | pulses/kWh |
| Class index .....                                            | B                     |            |
| Case material .....                                          | N/A                   |            |
| Use .....                                                    | indoor                |            |
| Measurement of energy .....                                  | bidirectional         |            |
| Protective class .....                                       | Class II              |            |
| Protection code.....                                         | N/A                   |            |
| Temperature ranges .....                                     | N/A                   |            |
| Type of meter according to EN 62053-61 Standard .....        | N/A                   |            |

**Other information:**

References if partial tests ..... : yes

| Model | Test Report | Date |
|-------|-------------|------|
| ---   | ---         | ---  |

**Scope:****Accuracy level index class B**

| Test report section: EN 50470-3 |                                                                                                             |                                  |         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------|---------|
| Clause                          | Requirement – Test                                                                                          | Result – Remark                  | Verdict |
| 1                               | SCOPE                                                                                                       |                                  | N/A     |
| 2                               | NORMATIVE REFERENCES                                                                                        |                                  | N/A     |
| 3                               | TERMS AND DEFINITIONS                                                                                       |                                  | N/A     |
| 4                               | STANDARD ELECTRICAL VALUES                                                                                  |                                  | N/A     |
| 5                               | MECHANICAL REQUIREMENTS                                                                                     |                                  | N/A     |
| 6                               | CLIMATIC CONDITIONS                                                                                         |                                  | N/A     |
| 7                               | ELECTRICAL REQUIREMENTS                                                                                     |                                  | N/A     |
| 8                               | ACCURACY REQUIREMENTS AND TESTS                                                                             |                                  |         |
| 8.7.1                           | Accuracy test conditions                                                                                    | according to EN50470-3 Standard  | P       |
| 8.1 - 8.7.2                     | Limits of percentage error due to variation of the load (for the points see table 13 of EN50470-3 Standard) | see annex A tables 1, 2, 3 and 4 | P       |
| 8.7.3                           | Interpretation of test results                                                                              |                                  | P       |
| 8.2                             | Repeatability                                                                                               |                                  | N/A     |
| 8.3                             | Limits of additional percentage error due to influence quantities                                           |                                  | N/A     |
| 8.4                             | Maximum permissible error (MPE)                                                                             |                                  | N/A     |
| 8.5                             | Effect of disturbances of long duration                                                                     |                                  | N/A     |
| 8.6                             | Short-time overcurrents                                                                                     |                                  | N/A     |
| 9                               | DURABILITY                                                                                                  |                                  | N/A     |
| 10                              | RELIABILITY                                                                                                 |                                  | N/A     |
| 11                              | REQUIREMENTS CONCERNING THE SOFTWARE AND PROTECTION AGAINST CORRUPTION                                      |                                  | N/A     |

| Test                                                                                                                                                                                                              |              |                    |                         |            |     | Results        | Verdict |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|-------------------------|------------|-----|----------------|---------|
| Table 1                                                                                                                                                                                                           |              |                    |                         |            |     |                |         |
| Percentage error due to variation of the load - for transformer connection - positive direction (single-phase and polyphase meters with balanced loads)                                                           |              |                    |                         |            |     |                |         |
| Test condition                                                                                                                                                                                                    |              |                    | Percentage error limits |            |     | Meter number   |         |
| Reference voltage                                                                                                                                                                                                 | Power factor | Current            | Index Class             |            |     | 141104XM123622 |         |
|                                                                                                                                                                                                                   |              |                    | A                       | B          | C   | Error results  |         |
| (V)                                                                                                                                                                                                               | (cosφ)       | (I)                | (± %)                   |            |     | (%)            |         |
| 3x230/400                                                                                                                                                                                                         | 1            | I <sub>min</sub>   | 2,5                     | <b>1,5</b> | 1,0 | -0,13          | P       |
|                                                                                                                                                                                                                   |              | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,31           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | 0,63           | P       |
| 3x230/400                                                                                                                                                                                                         | 0,5 ind.     | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,31           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,31           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | 0,63           | P       |
| 3x230/400                                                                                                                                                                                                         | 0,8 cap.     | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,05           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,30           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,66           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | -0,07          | P       |
| Percentage error due to variation of the load - for transformer connection - negative direction (single-phase and polyphase meters with balanced loads)                                                           |              |                    |                         |            |     |                |         |
| Test condition                                                                                                                                                                                                    |              |                    | Percentage error limits |            |     | Meter number   |         |
| Reference voltage                                                                                                                                                                                                 | Power factor | Current            | Index Class             |            |     | 141104XM123622 |         |
|                                                                                                                                                                                                                   |              |                    | A                       | B          | C   | Error results  |         |
| (V)                                                                                                                                                                                                               | (cosφ)       | (I)                | (± %)                   |            |     | (%)            |         |
| 3x230/400                                                                                                                                                                                                         | -1           | I <sub>min</sub>   | 2,5                     | <b>1,5</b> | 1,0 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | 0,62           | P       |
| 3x230/400                                                                                                                                                                                                         | -0,5 ind.    | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,35           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,31           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | 0,61           | P       |
| 3x230/400                                                                                                                                                                                                         | -0,8 cap.    | I <sub>tr</sub>    | 2                       | <b>1</b>   | 0,5 | 0,42           | P       |
|                                                                                                                                                                                                                   |              | 10 I <sub>tr</sub> | 2                       | <b>1</b>   | 0,5 | 0,35           | P       |
|                                                                                                                                                                                                                   |              | I <sub>n</sub>     | 2                       | <b>1</b>   | 0,5 | 0,65           | P       |
|                                                                                                                                                                                                                   |              | I <sub>max</sub>   | 2                       | <b>1</b>   | 0,5 | 0,32           | P       |
| Table 2                                                                                                                                                                                                           |              |                    |                         |            |     |                |         |
| Percentage error due to variation of the load - for transformer connection - positive direction (polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to voltage circuits) |              |                    |                         |            |     |                |         |
| Test condition                                                                                                                                                                                                    |              |                    | Percentage error limits |            |     | Meter number   |         |
| Reference voltage                                                                                                                                                                                                 | Power factor | Current            | Index Class             |            |     | 141104XM123622 |         |
|                                                                                                                                                                                                                   |              |                    | A                       | B          | C   | Error results  |         |
| (V)                                                                                                                                                                                                               | (cosφ)       | (I)                | (± %)                   |            |     | (%)            |         |

| Phase 1                                                                                                                                                                                                           |              |                  |                         |     |   |                |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|-------------------------|-----|---|----------------|---|
| 3x230/400                                                                                                                                                                                                         | 1            | Itr              | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,44           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,62           | P |
| 3x230/400                                                                                                                                                                                                         | 0,5 ind.     | Itr              | 3                       | 2   | 1 | 0,78           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,70           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,63           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,45           | P |
| Phase 2                                                                                                                                                                                                           |              |                  |                         |     |   |                |   |
| 3x230/400                                                                                                                                                                                                         | 1            | Itr              | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,31           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,42           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,38           | P |
| 3x230/400                                                                                                                                                                                                         | 0,5 ind.     | Itr              | 3                       | 2   | 1 | -0,32          | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,58           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,52           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,62           | P |
| Phase 3                                                                                                                                                                                                           |              |                  |                         |     |   |                |   |
| 3x230/400                                                                                                                                                                                                         | 1            | Itr              | 3                       | 2   | 1 | 0,41           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,42           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,31           | P |
| 3x230/400                                                                                                                                                                                                         | 0,5 ind.     | Itr              | 3                       | 2   | 1 | 0,65           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,56           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,61           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,60           | P |
| difference between the error at 100% In with three-phases and single-phase                                                                                                                                        |              |                  | 2,5                     | 1,5 | 1 | 0,12           | P |
| Percentage error due to variation of the load - for transformer connection - negative direction (polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to voltage circuits) |              |                  |                         |     |   |                |   |
| Test condition                                                                                                                                                                                                    |              |                  | Percentage error limits |     |   | Meter number   |   |
| Reference voltage                                                                                                                                                                                                 | Power factor | Current          | Index Class             |     |   | 141104XM123622 |   |
|                                                                                                                                                                                                                   |              |                  | A                       | B   | C | Error results  |   |
| (V)                                                                                                                                                                                                               | (cosφ)       | (I)              | (± %)                   |     |   | (%)            |   |
| Phase 1                                                                                                                                                                                                           |              |                  |                         |     |   |                |   |
| 3x230/400                                                                                                                                                                                                         | -1           | Itr              | 3                       | 2   | 1 | 0,26           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,31           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,31           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,38           | P |
| 3x230/400                                                                                                                                                                                                         | -0,5 ind.    | Itr              | 3                       | 2   | 1 | -0,08          | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | -0,09          | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,50           | P |
| Phase 2                                                                                                                                                                                                           |              |                  |                         |     |   |                |   |
| 3x230/400                                                                                                                                                                                                         | -1           | Itr              | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | 0,32           | P |
|                                                                                                                                                                                                                   |              | In               | 3                       | 2   | 1 | 0,51           | P |
|                                                                                                                                                                                                                   |              | I <sub>max</sub> | 3                       | 2   | 1 | 0,52           | P |
| 3x230/400                                                                                                                                                                                                         | -0,5 ind.    | Itr              | 3                       | 2   | 1 | 0,81           | P |
|                                                                                                                                                                                                                   |              | 10 Itr           | 3                       | 2   | 1 | -0,04          | P |

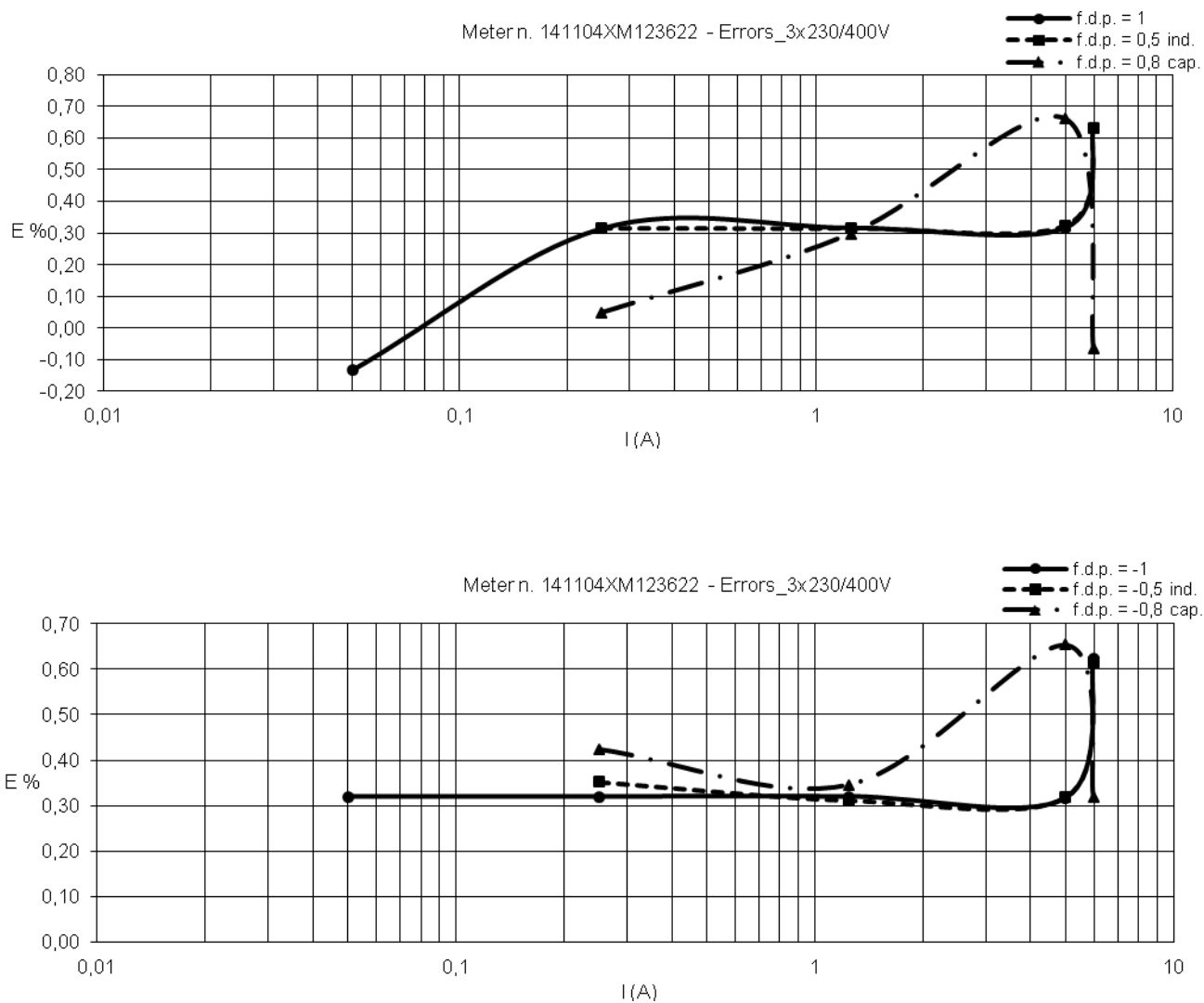
|                                                                            |           |                    |     |     |   |       |   |
|----------------------------------------------------------------------------|-----------|--------------------|-----|-----|---|-------|---|
|                                                                            |           | In                 | 3   | 2   | 1 | 0,41  | P |
|                                                                            |           | I <sub>max</sub>   | 3   | 2   | 1 | 0,43  | P |
| Phase 3                                                                    |           |                    |     |     |   |       |   |
| 3x230/400                                                                  | -1        | I <sub>tr</sub>    | 3   | 2   | 1 | 0,41  | P |
|                                                                            |           | 10 I <sub>tr</sub> | 3   | 2   | 1 | 0,32  | P |
|                                                                            |           | In                 | 3   | 2   | 1 | 0,52  | P |
|                                                                            |           | I <sub>max</sub>   | 3   | 2   | 1 | 0,52  | P |
| 3x230/400                                                                  | -0,5 ind. | I <sub>tr</sub>    | 3   | 2   | 1 | 0,19  | P |
|                                                                            |           | 10 I <sub>tr</sub> | 3   | 2   | 1 | -0,07 | P |
|                                                                            |           | In                 | 3   | 2   | 1 | 0,35  | P |
|                                                                            |           | I <sub>max</sub>   | 3   | 2   | 1 | 0,52  | P |
| difference between the error at 100% In with three-phases and single-phase |           |                    | 2,5 | 1,5 | 1 | 0,20  | P |

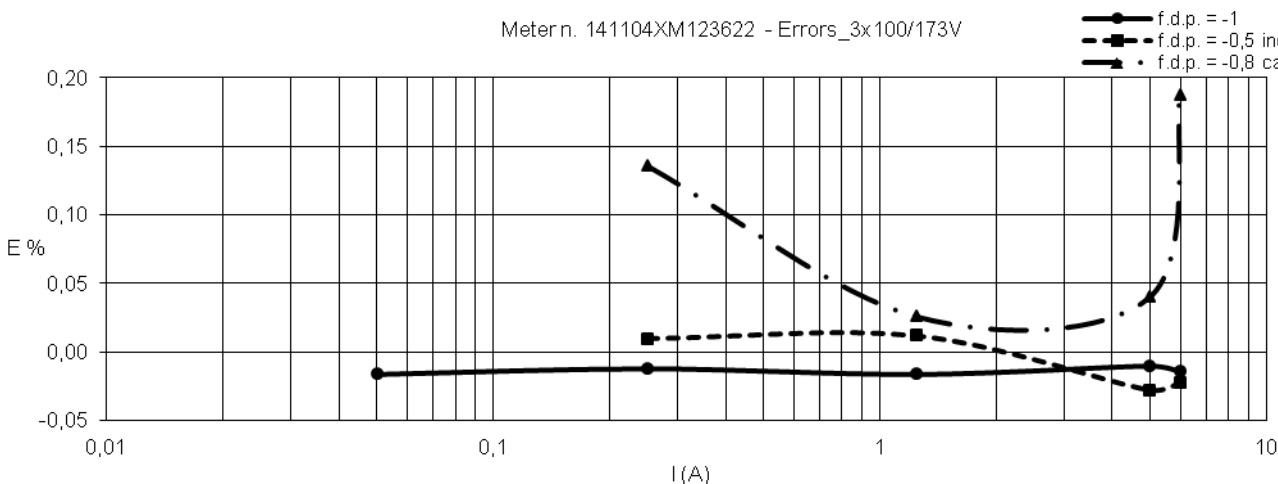
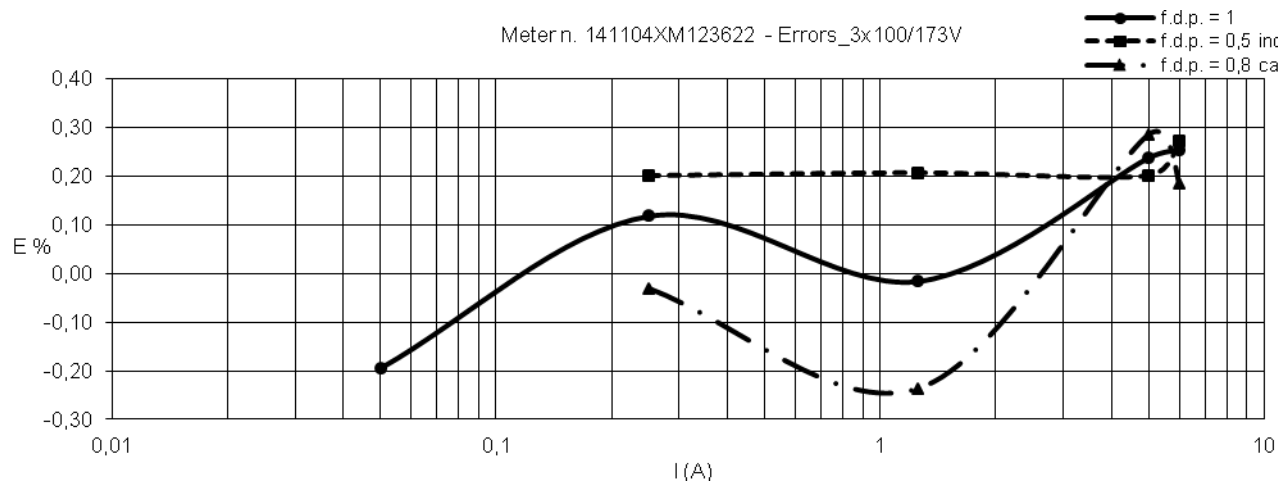
| Test                                                                                                                                                    |              |                    |                         |     |     | Results        | Verdict |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|-------------------------|-----|-----|----------------|---------|
| Table 3                                                                                                                                                 |              |                    |                         |     |     |                |         |
| Percentage error due to variation of the load - for transformer connection - positive direction (single-phase and polyphase meters with balanced loads) |              |                    |                         |     |     |                |         |
| Test condition                                                                                                                                          |              |                    | Percentage error limits |     |     | Meter number   |         |
| Reference voltage                                                                                                                                       | Power factor | Current            | Index Class             |     |     | 141104XM123622 |         |
|                                                                                                                                                         |              |                    | A                       | B   | C   | Error results  |         |
| (V)                                                                                                                                                     | (cosφ)       | (I)                | (± %)                   |     |     | (%)            |         |
| 3x100/173                                                                                                                                               | 1            | I <sub>min</sub>   | 2,5                     | 1,5 | 1,0 | -0,19          | P       |
|                                                                                                                                                         |              | I <sub>tr</sub>    | 2                       | 1   | 0,5 | 0,12           | P       |
|                                                                                                                                                         |              | 10 I <sub>tr</sub> | 2                       | 1   | 0,5 | -0,02          | P       |
|                                                                                                                                                         |              | In                 | 2                       | 1   | 0,5 | 0,24           | P       |
|                                                                                                                                                         |              | I <sub>max</sub>   | 2                       | 1   | 0,5 | 0,25           | P       |
| 3x100/173                                                                                                                                               | 0,5 ind.     | I <sub>tr</sub>    | 2                       | 1   | 0,5 | 0,20           | P       |
|                                                                                                                                                         |              | 10 I <sub>tr</sub> | 2                       | 1   | 0,5 | 0,21           | P       |
|                                                                                                                                                         |              | In                 | 2                       | 1   | 0,5 | 0,20           | P       |
|                                                                                                                                                         |              | I <sub>max</sub>   | 2                       | 1   | 0,5 | 0,27           | P       |
| 3x100/173                                                                                                                                               | 0,8 cap.     | I <sub>tr</sub>    | 2                       | 1   | 0,5 | -0,03          | P       |
|                                                                                                                                                         |              | 10 I <sub>tr</sub> | 2                       | 1   | 0,5 | -0,24          | P       |
|                                                                                                                                                         |              | In                 | 2                       | 1   | 0,5 | 0,28           | P       |
|                                                                                                                                                         |              | I <sub>max</sub>   | 2                       | 1   | 0,5 | 0,18           | P       |
| Percentage error due to variation of the load - for transformer connection - negative direction (single-phase and polyphase meters with balanced loads) |              |                    |                         |     |     |                |         |
| Test condition                                                                                                                                          |              |                    | Percentage error limits |     |     | Meter number   |         |
| Reference voltage                                                                                                                                       | Power factor | Current            | Index Class             |     |     | 141104XM123622 |         |
|                                                                                                                                                         |              |                    | A                       | B   | C   | Error results  |         |
| (V)                                                                                                                                                     | (cosφ)       | (I)                | (± %)                   |     |     | (%)            |         |
| 3x100/173                                                                                                                                               | -1           | I <sub>min</sub>   | 2,5                     | 1,5 | 1,0 | -0,02          | P       |
|                                                                                                                                                         |              | I <sub>tr</sub>    | 2                       | 1   | 0,5 | -0,01          | P       |
|                                                                                                                                                         |              | 10 I <sub>tr</sub> | 2                       | 1   | 0,5 | -0,02          | P       |
|                                                                                                                                                         |              | In                 | 2                       | 1   | 0,5 | -0,01          | P       |
|                                                                                                                                                         |              | I <sub>max</sub>   | 2                       | 1   | 0,5 | -0,01          | P       |
| 3x100/173                                                                                                                                               | -0,5 ind.    | I <sub>tr</sub>    | 2                       | 1   | 0,5 | 0,01           | P       |
|                                                                                                                                                         |              | 10 I <sub>tr</sub> | 2                       | 1   | 0,5 | 0,01           | P       |
|                                                                                                                                                         |              | In                 | 2                       | 1   | 0,5 | -0,03          | P       |
|                                                                                                                                                         |              | I <sub>max</sub>   | 2                       | 1   | 0,5 | -0,02          | P       |
| 3x100/173                                                                                                                                               | -0,8 cap.    | I <sub>tr</sub>    | 2                       | 1   | 0,5 | 0,14           | P       |

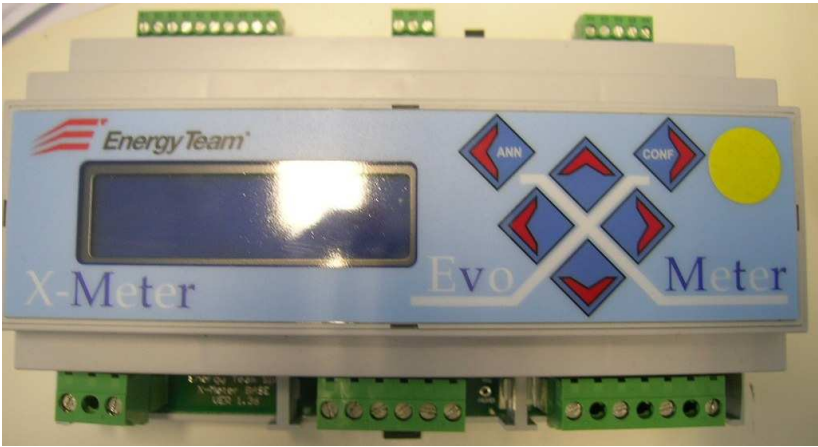
|                                                                                                                                                                                                                         |                 |                  |                         |            |     |                |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-------------------------|------------|-----|----------------|---|
|                                                                                                                                                                                                                         |                 | 10 ltr           | 2                       | <b>1</b>   | 0,5 | 0,03           | P |
|                                                                                                                                                                                                                         |                 | In               | 2                       | <b>1</b>   | 0,5 | 0,04           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 2                       | <b>1</b>   | 0,5 | 0,19           | P |
|                                                                                                                                                                                                                         |                 |                  |                         |            |     |                |   |
| Table 4                                                                                                                                                                                                                 |                 |                  |                         |            |     |                |   |
| Percentage error due to variation of the load - for transformer connection - positive direction<br>(polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to<br>voltage circuits) |                 |                  |                         |            |     |                |   |
| Test condition                                                                                                                                                                                                          |                 |                  | Percentage error limits |            |     | Meter number   |   |
| Reference voltage                                                                                                                                                                                                       | Power<br>factor | Current          | Index Class             |            |     | 141104XM123622 |   |
|                                                                                                                                                                                                                         |                 |                  | A                       | <b>B</b>   | C   | Error results  |   |
| (V)                                                                                                                                                                                                                     | (cosφ)          | (I)              | (± %)                   |            |     | (%)            |   |
| Phase 1                                                                                                                                                                                                                 |                 |                  |                         |            |     |                |   |
| 3x100/173                                                                                                                                                                                                               | 1               | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | 0,03           | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | 0,20           | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,23           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | 0,26           | P |
| 3x100/173                                                                                                                                                                                                               | 0,5 ind.        | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | 0,56           | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | 0,42           | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,20           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | 0,08           | P |
| Phase 2                                                                                                                                                                                                                 |                 |                  |                         |            |     |                |   |
| 3x100/173                                                                                                                                                                                                               | 1               | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | -0,01          | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | -0,02          | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,21           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | 0,24           | P |
| 3x100/173                                                                                                                                                                                                               | 0,5 ind.        | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | -0,38          | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | -0,01          | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,20           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | -0,01          | P |
| Phase 3                                                                                                                                                                                                                 |                 |                  |                         |            |     |                |   |
| 3x100/173                                                                                                                                                                                                               | 1               | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | -0,02          | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | -0,02          | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,17           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | 0,25           | P |
| 3x100/173                                                                                                                                                                                                               | 0,5 ind.        | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | 0,41           | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | 0,16           | P |
|                                                                                                                                                                                                                         |                 | In               | 3                       | <b>2</b>   | 1   | 0,15           | P |
|                                                                                                                                                                                                                         |                 | I <sub>max</sub> | 3                       | <b>2</b>   | 1   | 0,13           | P |
| difference between the error at 100% In with<br>three-phases and single-phase                                                                                                                                           |                 |                  | 2,5                     | <b>1,5</b> | 1   | 0,07           | P |
| Percentage error due to variation of the load - for transformer connection - negative direction<br>(polyphase meters carrying a single-phase load, but with balanced polyphase voltages applied to<br>voltage circuits) |                 |                  |                         |            |     |                |   |
| Test condition                                                                                                                                                                                                          |                 |                  | Percentage error limits |            |     | Meter number   |   |
| Reference voltage                                                                                                                                                                                                       | Power<br>factor | Current          | Index Class             |            |     | 141104XM123622 |   |
|                                                                                                                                                                                                                         |                 |                  | A                       | <b>B</b>   | C   | Error results  |   |
| (V)                                                                                                                                                                                                                     | (cosφ)          | (I)              | (± %)                   |            |     | (%)            |   |
| Phase 1                                                                                                                                                                                                                 |                 |                  |                         |            |     |                |   |
| 3x100/173                                                                                                                                                                                                               | -1              | I <sub>tr</sub>  | 3                       | <b>2</b>   | 1   | 0,10           | P |
|                                                                                                                                                                                                                         |                 | 10 ltr           | 3                       | <b>2</b>   | 1   | -0,01          | P |

|                                                                            |           |        |     |     |   |       |   |
|----------------------------------------------------------------------------|-----------|--------|-----|-----|---|-------|---|
|                                                                            |           | In     | 3   | 2   | 1 | 0,03  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | -0,01 | P |
| 3x100/173                                                                  | -0,5 ind. | Itr    | 3   | 2   | 1 | -0,40 | P |
|                                                                            |           | 10 Itr | 3   | 2   | 1 | -0,27 | P |
|                                                                            |           | In     | 3   | 2   | 1 | 0,21  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | 0,39  | P |
| Phase 2                                                                    |           |        |     |     |   |       |   |
| 3x100/173                                                                  | -1        | Itr    | 3   | 2   | 1 | 0,05  | P |
|                                                                            |           | 10 Itr | 3   | 2   | 1 | -0,01 | P |
|                                                                            |           | In     | 3   | 2   | 1 | 0,31  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | 0,23  | P |
| 3x100/173                                                                  | -0,5 ind. | Itr    | 3   | 2   | 1 | 0,50  | P |
|                                                                            |           | 10 Itr | 3   | 2   | 1 | -0,23 | P |
|                                                                            |           | In     | 3   | 2   | 1 | 0,14  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | 0,14  | P |
| Phase 3                                                                    |           |        |     |     |   |       |   |
| 3x100/173                                                                  | -1        | Itr    | 3   | 2   | 1 | 0,16  | P |
|                                                                            |           | 10 Itr | 3   | 2   | 1 | -0,02 | P |
|                                                                            |           | In     | 3   | 2   | 1 | 0,42  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | 0,25  | P |
| 3x100/173                                                                  | -0,5 ind. | Itr    | 3   | 2   | 1 | -0,20 | P |
|                                                                            |           | 10 Itr | 3   | 2   | 1 | -0,22 | P |
|                                                                            |           | In     | 3   | 2   | 1 | 0,31  | P |
|                                                                            |           | Imax   | 3   | 2   | 1 | 0,25  | P |
| difference between the error at 100% In with three-phases and single-phase |           |        | 2,5 | 1,5 | 1 | 0,43  | P |

|                                                   |                   |
|---------------------------------------------------|-------------------|
| B                                                 | ANNEX B, GRAPHICS |
| Graphic 1 – Error due to variation of the current |                   |





|                                                                                     |                                     |
|-------------------------------------------------------------------------------------|-------------------------------------|
| C                                                                                   | ANNEX C, PHOTOGRAPHIC DOCUMENTATION |
| Photo 1 – Frontal view                                                              |                                     |
|   |                                     |
| Photo 2 – Rear view                                                                 |                                     |
|  |                                     |

| D                      | ANNEX D, INSTRUMENTS AND ACCURACY |            |                |             |
|------------------------|-----------------------------------|------------|----------------|-------------|
| Type test              |                                   |            | Accuracy       |             |
| Name of test           | Instruments                       | IMQ number | Instrument (±) | Request (±) |
| Accuracy test          | Meters test bench                 | P-02301    | (a)            | (b)         |
|                        | Meters test bench                 | P-03010    | (a)            | (b)         |
| Enviromental condition |                                   |            |                |             |
| Ambient temperature    | Enviromental data acquisition     | S-03285    | 1 °C           | 2 °C        |
| Relative umidity       | Enviromental data acquisition     | S-03294    | 3%Ur           | 6%Ur        |

(a) 0,2% for voltage measurement;  
 0,2% for current measurement;  
 0,1% for frequency measurement;  
 0,03%/cosφ for active energy measurement.

(b) 1,5% for voltage measurement;  
 1,5% for current measurement;  
 0,5% for frequency measurement;  
 0,2% for active energy measurement cosφ 1;  
 0,3% for active energy measurement cosφ 0,5 ind;  
 0,3% for active energy measurement cosφ 0,8 ind.