



Legal requirements in the field of electrical energy and power

Market introduction of electricity meters

Measuring equipment, which is used to meter the consumption of electrical energy, is subject to defined legal requirements. These are set down in general in the *Ordinance on Measuring Instruments of 15.02.2006* and specifically in the *Ordinance on Measuring Instruments for Electrical Energy and Power of 19th March 2006*. The latter includes in particular the framework conditions for the conformity assessment, type approval, verification, revision and the technical requirements for measuring instruments and allocates the respective responsibilities.

The ordinances are supplemented by the directives issued by METAS on the verification of measuring instruments for electrical energy and power of 30.10.2006, which regulate the technical and administrative details of the governing ordinances.

1. Market introduction of active-energy electricity meters

Since 30th October 2006, the European Measuring Instrument Directive (MID), which defines the new regulations for the market introduction of active-energy electricity meters used in households, trade and smaller industries, is in effect in Europe. Since the same point in time, the new Swiss Ordinance on Measuring Instruments and a set of ordinances specific to measuring instruments are in effect. They are implementing the bilateral agreement with the European Community on the mutual acceptance of conformity assessments in the field of measuring instruments. The procedure defined for the market introduction of active-energy electricity meters comply with the new European law.

In concrete terms, this means that as of 30th October, the market introduction of these meters in the European Community is subject to new regulations. As a direct consequence, the conformity of the active-energy meters with the legal requirements is no longer confirmed by an approval and initial verification, but by a new modular testing procedure.

2. Conformity assessment for active-energy electricity meters

The new legal ruling enables the manufacturer to choose one of three defined procedures to verify the conformity of his products. The Swiss Ordinance on Measuring Instruments defines these procedures in the form of modules.

The following modules and combinations may be selected for active-energy meters:

- Modules B and D
- Modules B and F
- Module H1

These involve:

Module B: Type approval. At the type approval, the meter is examined on its conformity to the basic legal requirements. This evaluation is conducted by a notified body independent to the manufacturer. In Switzerland, the type approval is conducted solely by METAS.

Module F: Declaration of conformity to the type by means of testing. This procedure corresponds largely to today's initial verification.

Module D: Quality assurance during production. The manufacturer has his quality assurance of production certified by a notified body (METAS is the notified body in Switzerland).

Module H1: Comprehensive quality assurance, supplemented by a design examination. The manufacturer has his entire quality assurance certified by an authorised body (METAS is the notified body in Switzerland).

Type approval by METAS

METAS is the notified body for the conduct of type approvals according to the new legal directives. The procedure of a type approval is briefly outlined as following.

Conditions

The fundamental requirements are defined by the Ordinance on Measuring Instruments for Electrical Energy and Power. Conformity to these requirements is validated if the following corresponding standards are fulfilled:

Standards for active-energy meters for household, trade and small industry

EN 50470-1:2006	AC electricity meters General requirements
EN 50470-2:2006	AC electricity meters Electromechanical meters of class indexes A and B
EN 50470-3:2006	AC electricity meters Static meters of class indexes A, B and C

Type approval procedure

1. Application for type approval in accordance with Module B of active-energy meters is to be submitted in writing to the METAS certification body, using the official application form. Only one application may be submitted to one single notified body.
2. The detailed list of documentation to be submitted is available at the certification body. The application is to be submitted together with the necessary technical documents (detailed list under article II of the Ordinance on Measuring Instruments):
 - Complete technical specifications
 - Instructions for use (if available and where necessary)
 - Detailed description of the additional functions
 - Set of construction drawingsIn addition for electronic meters:
 - Circuit diagrams (electrical schema)
 - Layouts with parts list
 - Short description of the applied software (e.g. documented flow-chart).
3. For the laboratory tests, 6 test samples are to be submitted to METAS. It has to be ensured that the test specimens are series conform and have not been specially selected by the applicant. One to a maximum of three of these test specimens remain after conclusion of the tests at METAS as depot specimens. The remaining instruments are returned to the applicant.
4. The meters must be identified with the conformity symbol in compliance with the Ordinance on Measuring Instruments Annex 4.
5. Following the successful completion of the evaluations, the applicant receives the draft of the conformity certificate for comment.
6. The registration and issuing of the certificate is conducted by the Swiss Certification Service.

3. Market introduction of reactive energy and combination meters

Reactive energy and combination meters are exempt from the new EC regulations. These meters still require Swiss approval by METAS and an initial verification to be conducted by a Swiss verification body. The procedure for a Swiss approval is briefly outlined as following.

Conditions

The basic requirements are defined in article 8 of the Ordinance on Measuring Instruments for Electrical Energy and Power. Conformity to these requirements is validated if the following corresponding standards are fulfilled:

Reactive-energy meters and reactive-energy section of combination meters

IEC 62053-23:2003 Electricity metering equipment (AC) – Particular requirements.
Part 23: Static meters for reactive energy (classes 2 and 3).

In addition to the classes of reactive-energy meters covered by the standards, reactive-energy meters of class 1 may also be tested and approved for Swiss approvals. The basic requirements for these meters are to be found in the *Ordinance on Measuring Instruments for Electrical Energy and Power of 19th March 2006, Annex 2*.

Standards for the active-energy section of combination meters

IEC 62052-11:2003 Electricity metering equipment (AC) – General requirements, tests and test conditions. Part 11: Metering equipment;

IEC 62053-11:2003 Electricity metering equipment (AC) – Particular requirements.
Part 11: Electromechanical meters for active energy (classes 0.5, 1, 2);

IEC 62053-21:2003 Electricity metering equipment (AC) – Particular requirements.
Part 21: Static meters for active energy (classes 1 and 2);

IEC 62053-22:2003 Electricity metering equipment (AC) – Particular requirements.
Part 22: Static meters for active energy (classes 0.2 S and 0.5 S)

Pattern evaluation and type approval procedure

1. The procedure is divided into an administrative and a technical phase. During the administrative phase, the submitted documentation is examined on its comprehensiveness and conformity to the above-listed IEC standards.
2. The application for approval of reactive energy or combination meters is to be submitted in writing to the METAS certification service, using the official application form. The application is to be submitted together with the technical documents necessary for the evaluation:
 - Comprehensive technical specifications
 - Instructions for use (if available and where necessary)
 - Detailed description of the additional functions
 - Set of construction drawings

In addition for electronic meters:

- Circuit diagrams (electrical schema)
 - Layouts with parts list
 - Short description of the applied software (e.g. documented flow-chart).
3. If the meter has already undergone a type approval in a member state of the European Community, the relevant documents may be submitted to METAS. METAS examines the documents regarding the conformity to the tests required by the stan-

dards. Tests previously absolved and passed by European metrology institutes and by accredited laboratories are recognised by METAS.

4. Should there be no approval or documented tests available, the tests are conducted or commissioned by METAS. In addition, 6 test specimens are to be submitted. It has to be ensured that the test specimens are series conform and have not been specially selected by the applicant. The test specimens are to be returned to the applicant after completion of the evaluation.
5. The meters are to be identified on the nameplate with the Swiss approval symbol and the product code and registration number (Ordinance on Measuring Instruments, Annex 6). The approval symbol shall be administered by METAS and assigned to a new measuring instrument following application for approval. This symbol is to be of a reasonably legible size and wipe-proof, and positioned on the transformer's nameplate.
6. Following the successful completion of the tests, the applicant receives a manuscript of the approval document for comment before the approval certificate is issued. The approval is publicised via the METAS information channels.



The Federal Office of Metrology (METAS) maintains the national calibration standards of Switzerland, ensures their international recognition and disseminates them with sufficient accuracy to Switzerland's research, economy and society. METAS takes the necessary steps to ensure that the measurements required for the protection and safety of the population and the environment are made correctly and in compliance with the applicable laws and regulations.

Contact

Rudolf Kämpfer
Head of Laboratory
Federal Office of Metrology METAS
Lindenweg 50, CH-3003 Bern-Wabern
Tel. +41 31 32 33 306
rudolf.kaempfer@metas.ch
www.metas.ch

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