Reliability prediction of kWh-meters

Information-sheet about KEMA services for review and certification

There are several ways to evaluate the reliability of an energy meter. You might know that IEC provides a series of standards related to reliability / dependability testing or evaluation. These standards are:

IEC 62059-11	-general concepts
IEC 62059-21	-collection of meter dependability data from the field
IEC 62059-31-1	-accelerated reliability testing
IEC 62059-41	-reliability prediction

This sheet will give you some information of IEC 62059-41.

IEC 62059-41

The method described in IEC 62059-41 is a white box method. The calculation of the failure rate this way is done with a theoretical approach. KEMA offers to review and certify the evaluation performed by the manufacturer. The manufacturer calculates the failure rate according to this method, as he is the only party able to do this. KEMA will review the calculation and method. Calculations that meet the requirements will be awarded a certificate.

In the review we go through the following steps.

- The manufacturer will evaluate the meter according to the method described in IEC62059-41.
- The manufacturer provides us the report and all relevant documents such as electrical diagrams and a sample of the meter.
- KEMA will review the report and the provided documents to IEC 62059-41.
- If the requirements of IEC 62059-41 are met we provide you a KEMA certificate which will state the information mentioned in clause 6.6 of IEC62059-41. This is also indicated below for your information.

The method for reporting and calculating the failure rate is up to the manufacturer. Most important is that it meets the requirements of IEC62059-41. KEMA must be allowed to review the calculation.

When reporting reliability predictions according to this standard, at least the following information shall be provided (see also clause 6.6 of IEC62059-41):

- purpose of the prediction, like business decisions, system architecture decisions, equipment design decisions;
- object of prediction (EUP);
- EUP functions covered and any functions that are excluded from the prediction shall be listed together with the reasons for their exclusion.
- a statement that the prediction is based on the reliability model and method presented in IEC 61709 and IEC 62059-41 (this standard);
- a statement that the prediction applies for the constant failure rate interval;
- failure definitions: relevant failures according to IEC 62059-21;
- environmental and operating conditions for which the prediction is made;
- ratings and π factors assumed;
- component failure rate data source, (see Bibliography, Siemens Norm 29500). If data sources other than handbooks are used, the sources and the justification of using them shall be presented;
- prediction result: failure rate in %/year.

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