

Electrical measuring equipment has become increasingly sophisticated: a basic electrical energy meter now often proposes real-time display of the electrical grid's behavior (voltage, current, power) as well as the energy.

The accuracy of an electrical measurement, which historically only concerned the energy – the main item which is linked to the energy bill – now involves all the electrical parameters of a grid.

There are three standard reference frameworks for characterizing the accuracy of an electrical measurement:

Reference standard	Instruments concerned	Accuracy classes	Scope involved
EN50470-1 EN50470-3	Electrical energy meters	A, B, C or D	Measuring product alone (concerns the accuracy of the energy values)
IEC62053-21 IEC62053-22	MID electrical energy meters (for rebilling)	0.2S, 0.5S, 1, 2	Measuring product alone (concerns the accuracy of the energy values)
IEC61557-12	Power monitors	For active energy: 0.2, 0.5, 1, 2 For active power: 0.1, 0.2, 0.5, 1, 2, 2.5	Measuring product alone and the entire measuring system (concerns the accuracy of any electrical quantity)

Details:

The EN50470-X reference framework and the IEC62053-X reference framework show differences in the class designations; however, by analogy, Class A and Class 2, Class 1 and Class B, Class 0.5S and Class C, and Class 0.2S and Class D can be considered equivalent.

The accuracy class indicates a maximum measurement uncertainty, i.e. a maximum error percentage over a precise current variation range and in specific environmental conditions. Typically, an active energy meter for a maximum current of 45 A, such as the Ulys MD45, has an accuracy class of 1: it will have a given accuracy of 1% at worst over the range from 5% I_n to I_{max} , i.e. 0.25 A to 45 A ($I_n = 5$ A, $I_{max} = 45$ A).

The accuracy class given in this way will concern the accuracy of the measuring product alone, such as a meter with direct reading; in the event where other elements are involved in the measurement chain (such as current or voltage sensors when measuring equipment with indirect reading), please see the FAQ on « How to find out the accuracy class of my measuring system ».