What class should I choose for the sensors associated with my measuring system?

For connections to high-power networks, or to connect to other circuits without opening the wiring, the measuring instruments are connected to current sensors; their presence in the measurement loop affects the accuracy of the measurement.

In the context of the association of a measuring instrument with sensors, the IEC 61557-12 standard indicates recommended CTs and gives the resulting classes:

Performance class of the power or energy metering and monitoring device without external sensors	Class of the recommended associated sensor	Total combined uncertainty
0,2	0.2 or more	0.5%
0,5	0.5 or more	1%
1	1 or more	2%

For example:

- With a Ulys TT meter (class 1), we can choose a TCR (classes 0.5, 1, or 3 depending on the power in use)
- Similarly, with an Enerium 100 power meter in class 0.5, the same TCR can be used if the power in use is limited to the rated power corresponding to class 0.5
- With an Enerium 300 power meter in class 0.2, it will be preferable to use a class 0.2S CT of the JVS line

This total uncertainty concerns such items as the energy, the power, and the current.

Beyond this, as the standard indicates:

*The association of an electrical network metering and monitoring device with external current and/or voltage sensors constitutes a complete system. **The performance class of the system depends on the classes of the sensor and of the metering and monitoring device.***

However, the performance class of a system is applicable only if the intrinsic uncertainty of the sensor is within the limits of its performance class. Again, the latter is not equivalent to the unique performance class of the metering and monitoring device.

Special attention must be paid to power and energy measurements, because the measurements are very sensitive to the phase error of the sensor when the power factor is different from unity: a phase error of 20 minutes adds 1% error to the measurement of the active power with a power factor of 0.5.

For this reason, if a better performance class is required, we strongly recommend using class 0.2S or class 0.5S sensors to measure power or energy.

This is because the class of class "S" sensors is defined over a much larger range (from 20% to 120% rather than the 100% to 120% of the ordinary classes); the minimum current of class "S" sensors is 1% of In.