HOW TO CHOOSE A CURRENT TRANSFORMER (CT) FOR THE FRONIUS SMART METER

/ There are a few decisions to be made when selecting current transformers:

- / Type
- / Accuracy
- / Size
- / Rated Amps
- / Primary and secondary side ratings
- / Wiring
- / Technical specifications

/ Type

In most cases, opening or split-core CT's are the preferred choice because installation is much easier. Note: some split core CT's are not designed for outdoor use or harsh climate conditions where contact with moisture can cause rust development. In humid environments spraying a rust inhibitor such as WD40 on the exposed laminations can help to prevent rusting. For monitoring power on metal buss bars, either a buss bar or flexible rope style CT can be used.

/ Accuracy

CT accuracy ratings should be based on your specific application needs. For monitoring basic consumption or loads, accuracy is typically not as critical. Revenue grade CT's provide a higher level of accuracy at lower amperages and will improve system performance in zero feed-in applications.

/ Size

It is critical that the opening in the CT is large enough to fit around the conductor that is being monitored (see chart on page 3). Generally, if a CT is rated for high enough amperage for the conductor then it should fit. Consider measuring the required wire and CT size before placing the order. It is tempting to order the largest possible CT to ensure it will fit, but we recommend against this as larger CT's may be difficult to fit in the panel or in tight wiring situations. For best accuracy, the diameter of the conductor being monitored should be more than half the opening size of the CT.

/ Rated Amps

The primary side full-scale current rating of the CT's should be chosen somewhat above the maximum current of the circuit being measured. The easiest approach is to select a CT with the same rated amps as the rating of the circuit which generally is the rating of the breaker being monitored. In some cases, you might select CT's with a lower rated current to optimize accuracy at lower current readings. Some CT's are rated for oversizing, so you could use a 50A CT on a 100A service panel. Please keep in mind that the actual load on one 120V leg of a typical 240V AC panel will typically be less than the panel rating.

/ Wiring

You may want to shorten the original CT wires to avoid creating large loops or gaps between the white and black wires at the junction point as this can increase electrical interference.
There are occasions where longer CT lead wires are needed. If the standard 8 foot leads are not long enough, they can be extended to 100 feet or more, especially if you keep the wires away from electrically noisy equipment. It is common practice to extend the leads in the field by using commonly available insulated 18 AWG twisted pair wire and rated butt connectors.

/ Technical Specifications

The Fronius Smart Meter has technical requirements that need to be followed when choosing CT's. **The Smart Meter is designed for measuring AC circuits only.**

CT's have what is commonly referred to as a primary and secondary side. The primary side is the circuit being measured. The secondary side is the output from the windings on the CT and is measured in amps or volts. For the Fronius Smart Meter, only CT's with a voltage output of **0.333V** on the secondary side may be used.

ATTENTION: CT's with current output such as 1 Amp, 2 Amps and 5 Amps will destroy the meter and must not be used.

Although any brand of CT that meet the technical requirements may be used, CT's available from Continental Control Systems have been specifically designed to work with the Fronius Smart Meter:
https://ctlsys.com/current_transformers

/ CT wire sizing chart

Wire Gauge	Typical Amps	Typical Insulated Wire Diameter	Recommended CT Opening Sizes (I.D.)
10 AWG	30A	0.17″	0.30″ – 0.75″
8 AWG	40-50A	0.24″	0.30″ – 0.75″
6 AWG	50-70A	0.27″	0.30″ – 0.75″
4 AWG	80-100A	0.32″	0.35″ – 0.75″
3 AWG	90-110A	0.35″	0.50″ – 0.75″
2 AWG	100-130A	0.38″	0.50″ – 1.00″
1 AWG	110-150A	0.44″	0.75″ – 1.00″
1/0 AWG	125-170A	0.48″	0.75″ – 1.00″
2/0 AWG	145-200A	0.53″	0.75″ – 1.00″

If you have any questions about this or if you want to learn more about our solar solutions, do not hesitate to contact us at **(219)734-5500** or PV-Support-USA@Fronius.com. We are happy to help you!