

App Note: Multiple CT's Per Phase

01/11/1999

The CTs that are used with the WattNode output 333 mV AC at full scale. An internal burden resistor is across the secondary of the CT. This limits the output to less than a volt and is why this class of CTs are often called "safe CTs" in the industry. When installing the CT around a live conductor, the installer is protected from lethal current on the secondary of the CT.

Multiple CTs of this type may be wired in parallel to one input terminal pair. This will measure the average current flow in both CTs. Identical CT models are required on each monitored phase. There must be the same number of CTs on each monitored phase. All CT's must be phased correctly (label or arrow toward the source). The effective size of the CT for computational purposes is the sum of the CT ratings of the CT's in parallel.

For example, take a WattNode model WNA-3Y-208-P. If one were to connect (three) 800 Amp CTs to this model, the WattNode scale factor is 20 Watt-hours per pulse. If one were to alternatively connect two 400 Amp CTs on each phase to this model (ie: six CTs), the WattNode scale factor is the same: 20 Watt-hours per pulse.

In the case of WattNodes used with LonWorks, the sum of the CT current ratings of the CT in parallel should be entered as the nciCtAmps SNVT value. For example, if two 100A CT's are wired in parallel on each phase, the effective CT rated Amps is 200. Thus, the nciCtAmps SNVT should be set to 200.

This technique has a variety of uses. Where there are double-conductors on each phase and the conductors are either too large a diameter or too far apart from one another to fit through a single CT opening, two CTs may be connected in parallel on each phase. Several Continental Control Systems customers have successfully employed this technique.

Another use is the additive measurement of more than one load (of the same voltage) using a single WattNode transducer. CTs from each load are connected in parallel, and a single voltage is connected from one of the loads. One of Continental Control Systems' customers has used this technique to add together the total air conditioning load from four separate package rooftop units with a single WattNode transducer. In this case, the customer used twelve CTs on a single WattNode, four on each phase connected in parallel.

In connecting the CTs in parallel it is recommended that the white wires be tied together and the black wires be tied together. If more than two CTs are being connected in parallel, the terminal block may not be big enough to clamp the wires. In this case, they should be connected together with an additional wire by a wire nut and the single conductor inserted into the terminal block. Since a CT produces at maximum 333mVAC, a good connection among all conductors is extremely important to maintaining accuracy. Soldering the conductors together is the best practice.