Current Transducer (CT) Selection Guide

April 2008

This brief guide is intended to help you select the right quantity and type of current transducers needed for an eGauge™ installation. A typical eGauge™ installation measures two quantities: the power produced by a solar system and the power delivered to the site from the electric utility. Two measure these two quantities, one CT *per source* (grid and solar) and *per phase* is needed. Examples:

- Typical 2-phase residence w/solar: 4 CTs
- Single-phase residence w/solar: 2 CTs
- 3-phase site w/solar: 6 CTs

Picking the type of CT involves selecting the *mechanical dimension* and the *current rating* (in Amps).

Selecting the mechanical dimension of the CT

CTs are available in three difference sizes, as shown in Figure 1. The inner diameter (ID) of the CT is shown as dimension E in the Figure and is usually the critical one: it needs to be big enough that the CT can fit over the wire that is carrying the current to be measured. An ID of 0.75" is usually the right choice, but wires with high maximum currents may need an ID size of 1.25" or even 2.00". The larger the ID, the larger the overall size of the CT, so be sure that the CT can still fit inside the panel in which it is to be installed.

Selecting the current rating of the CT

For the CTs that measure the power produced by the **solar** system, use the following formula to determine the current rating:

Isolar = Psolar / Nphases / 120

where:

Psolar: Peak power of the solar system (in Watts).

Isolar: Maximum current per phase produced by the solar system (in Amps).

Nphases: Number of phases (2 for typical 2-phase residence, 3 for 3-phase, 1 for single-phase).

Select the CT by rounding up Isolar to the next available current rating.

Note: The peak power of a solar system is usually significantly bigger than the rated power, because on cold, sunny days, the panels may work more efficiently than rated. For example, if a 10kW system may produce 12,000W on the coldest days, Psolar=12,000 should be used in the above formula.

For the CTs that measure the power supplied from the electric utility (**grid**), there is two ways to pick the current rating: The quick and easy, but less accurate way is select CTs with the same current rating as the rating of the distribution panel. That is, for a 200 Amp distribution panel, you'd pick one 200A CT per phase.

The second, more accurate way to pick the current rating is to use the following formula:

Igrid = 0.0096 * Eannual / Nphases

where:

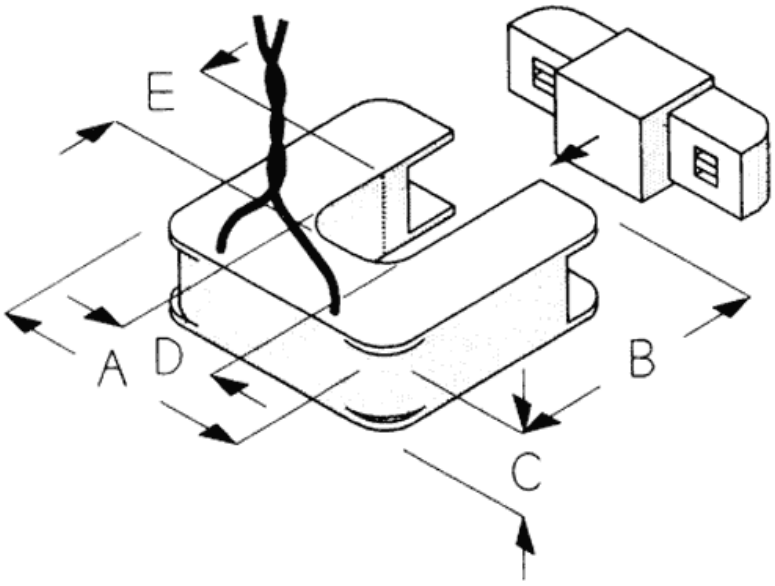
Eannual: Annual electricity used by the site (in kWh).

Nphases: Number of phases (2 for typical 2-phase residence, 3 for 3-phase, 1 for single-phase).

Example: For a 2-phase residence with a solar system with peak production of 4100W and an annual consumption of 20,000 kWh, we would get:

Isolar = 4100/2/120 = 17A Igrid = 0.0096*20000/2 = 96A

so we would select 30A CTs for the solar wires and 100A CTs for the grid wires.



Part number:	A	B	C	D	E
CTS-0.75-*xxxx*	2.00”	2.10”	0.67”	0.75”	0.75”
CTS-1.25-*xxxx*	3.25”	3.35”	1.06”	1.25”	1.25”
CTS-2.00-*xxxx*	4.75”	5.00”	1.20”	2.00”	2.00”

Figure 1

Part numbers of available CTs:

Current rating:	**0.75” ID**	**1.25” ID**	**2.00” ID**
30A	CTS-0.75-30A		
50A	CTS-0.75-50A		
100A	CTS-0.75-100A	CTS-1.25-100A	
200A		CTS-1.25-200A	
400A		CTS-1.25-400A	
800A			CTS-2.0-800A
1000A			CTS-2.0-1000A
1500A			CTS-2.0-1500A