Appendices

Burden Determination

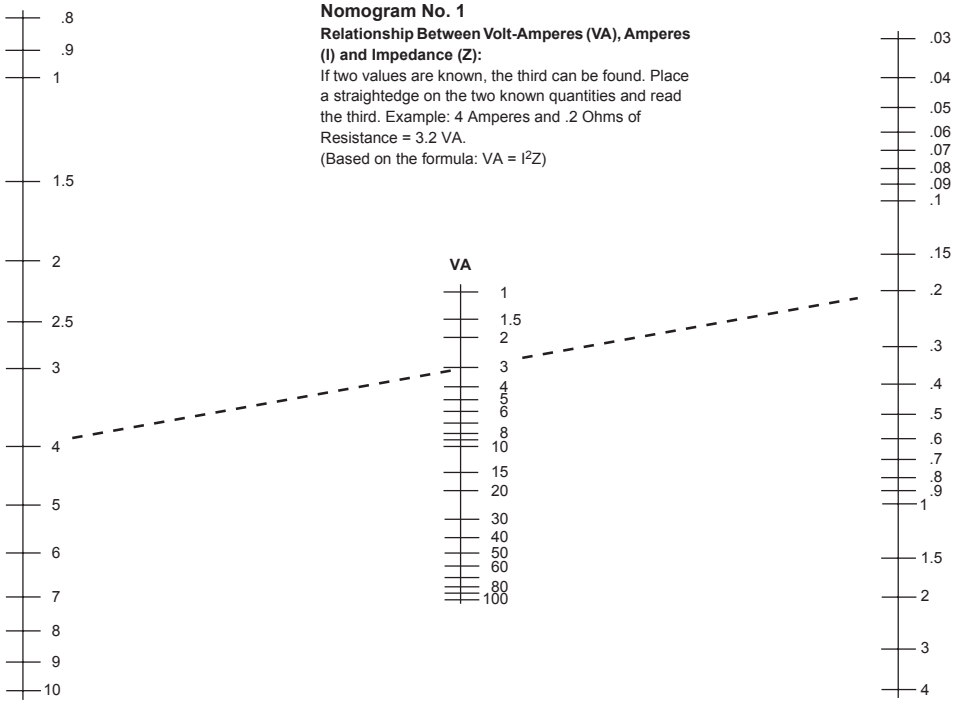
The Burden consists of the sum total of the wiring and all connected devices. Determine the burden of the connected devices by referring to the nameplate or catalog data. If the burden is expressed in volt-amperes, add this directly for the Voltage Transformer, or convert to ohms impedance for the Current Transformer, using Nomogram No. 1.

Nomogram No. 1

Relationship Between Volt-Amperes (VA), Amperes (I) and Impedance (Z):

If two values are known, the third can be found. Place a straightedge on the two known quantities and read the third. Example: 4 Amperes and .2 Ohms of Resistance = 3.2 VA.

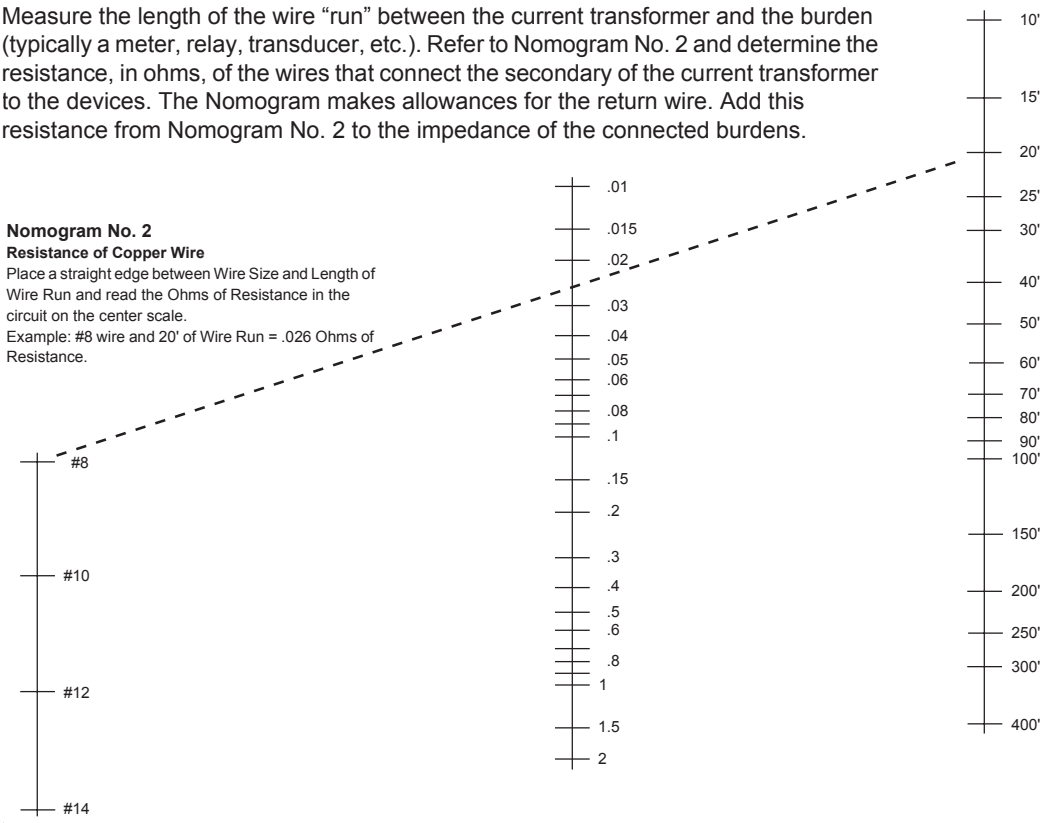
(Based on the formula: $VA = I^2Z$)



Determining Burden

Measure the length of the wire "run" between the current transformer and the burden (typically a meter, relay, transducer, etc.). Refer to Nomogram No. 2 and determine the resistance, in ohms, of the wires that connect the secondary of the current transformer to the devices. The Nomogram makes allowances for the return wire. Add this resistance from Nomogram No. 2 to the impedance of the connected burdens.

Nomogram No. 2
Resistance of Copper Wire
Place a straight edge between Wire Size and Length of Wire Run and read the Ohms of Resistance in the circuit on the center scale.
Example: #8 wire and 20' of Wire Run = .026 Ohms of Resistance.



Excitation Data

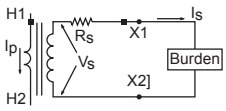
Calculating CT Metering Accuracy from Excitation Curves

The accuracies shown in the Data Sheets for each CT are for standardized burdens and provide a quick approximation of the accuracy for most purposes. However, if a more precise value of accuracy is needed to refer to the Excitation Curves where the exciting current, I_e, is plotted against secondary voltage, V_S. The transformer ratio error expressed as a percentage becomes:

$$\%\ (RE)\quad \frac{I_e \times 100}{I_S}$$

Where: I_S = Secondary Current

To use the curves to determine I_e, first calculate V_S.



Typical CT Circuit Diagram

By referring to a typical CT circuit as shown at left, it shows that the voltage V_S must force the secondary current I_S through the entire circuit consisting of the secondary winding and the burden, including the interconnecting leads.

The resistance of the secondary winding R_S is listed in this catalog for a given CT under the heading of "DC R – ohms". "Z" is commonly referred to as "Burden" and must be obtained from the catalog information of the connected devices added to the resistance of the interconnection leads and R_S. Ohm's Law gives us $V_S = I_S Z$. We may now refer to the Excitation Curve for the CT in question and determine I_e, the exciting current.