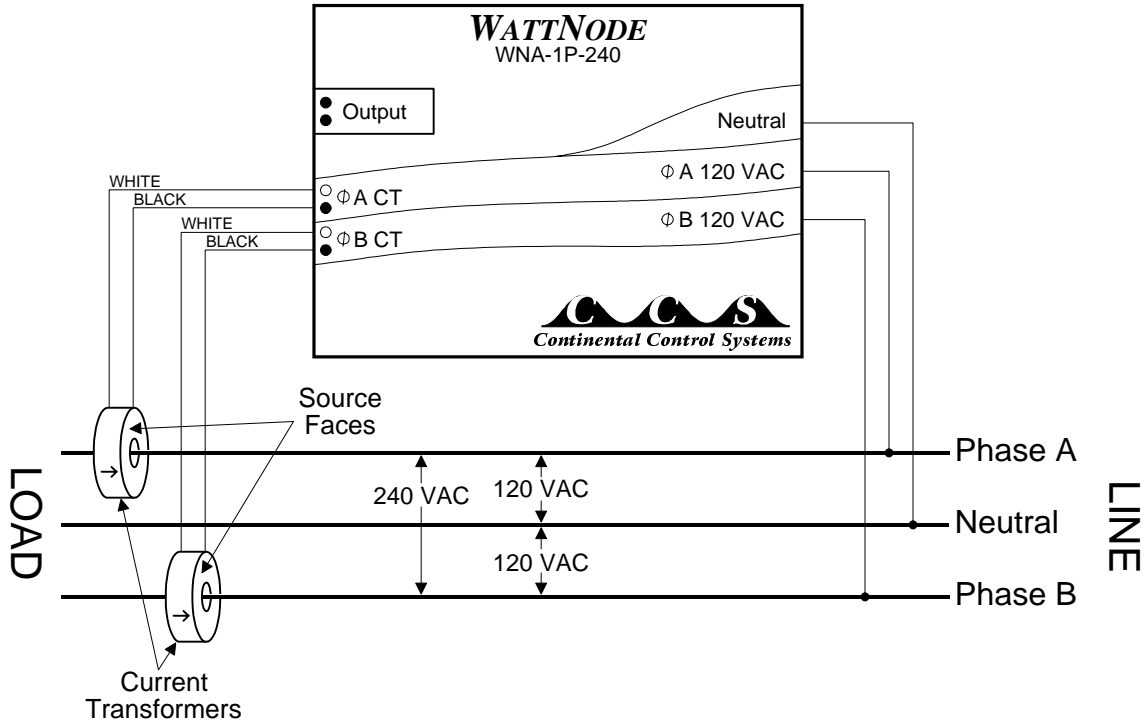


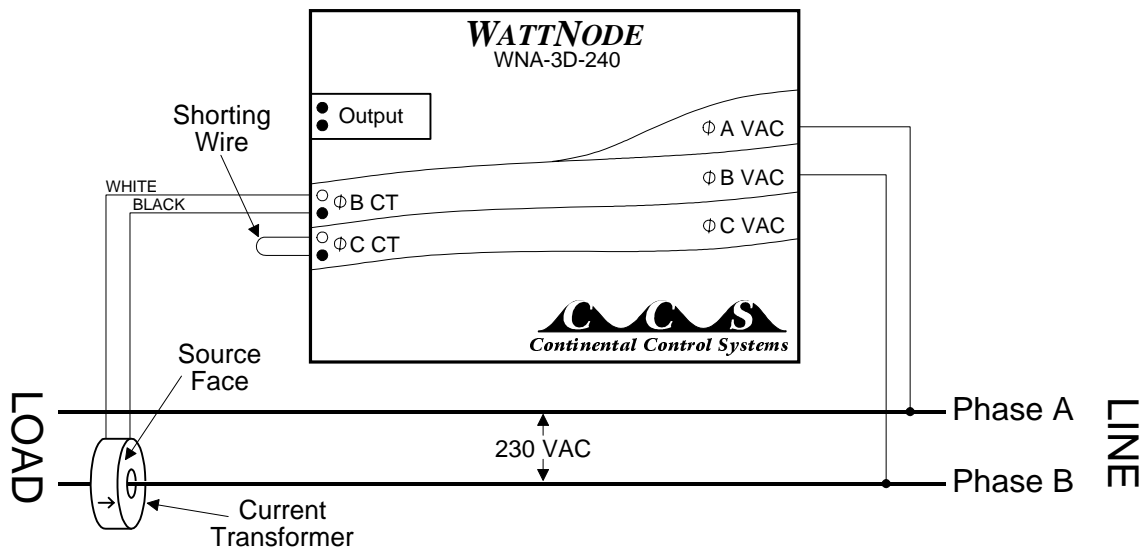
# App Note: Measuring 230 VAC Circuits 2/10/1999

There are four situations where this arises:

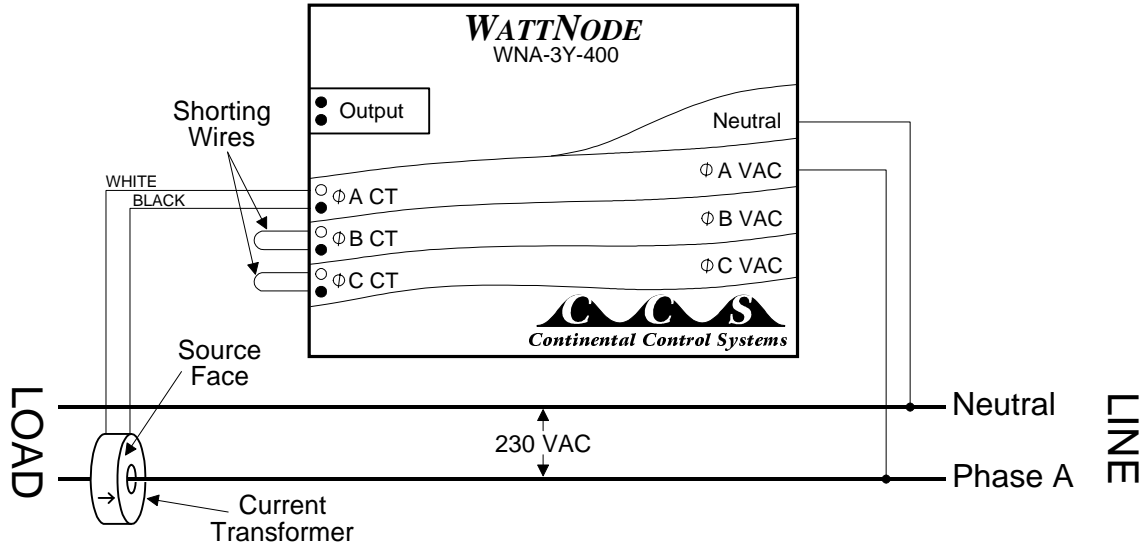
- 1) Home wiring in the United States where neutral is present. There are two line wires and one neutral wire (ground may or may not be present). The voltage between the line wires and neutral will range from 110 - 120 VAC, while the voltage between the two line wires will be 220 - 240 VAC. This configuration can be measured with either the WNA-1P-240 or the WNA-3Y-208 models.



- 2) Home wiring in the United States where neutral is not present. There are two line wires with 230 VAC between them. This configuration **cannot** be measured with the WNA-1P-240. It can be measured with the WNA-3D-240 models.



- 3) Non U.S. 220 - 240 VAC wiring. This typically has a neutral and a line wire with 230 VAC between them. This can be measured with the WNA-3Y-400 models.



- 4) Three phase delta circuits with 208 - 240 VAC between phases. This can be measured with the WNA-3D-240 models. The diagram for this configuration is the same as the diagram for case 2), but with the addition of the Phase C voltage and current transformer.

We are sometimes asked if it is possible to use the WNA-1P-240 to measure cases 2) and 3) above. Unfortunately, this is not possible. The WNA-1P-240 models use a 120 VAC power supply that can operate over the range from 90 to 144 VAC. Connecting 230 VAC between the Neutral and the Phase A terminals will overheat and destroy the power supply. If you connect the 230 VAC between the Phase A and Phase B terminals without connecting neutral, then the WattNode will not operate, because the power supply and the measurement circuitry need the neutral connection.

We are also asked if the WNA-3D-240 and the WNA-3Y-400 are interchangeable for single phase 230 VAC circuits. Either one can accurately measure power for such a circuit, but the WNA-3Y-400 should be used whenever neutral is present (one of the screw terminals is labeled 'Neutral') and the WNA-3D-240 should be used when neutral is not present (there is no 'Neutral' screw terminal). This helps ensure a safe and correct installation.



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