

# EML Precision Products, Model 104

## Instruction Manual

Revision 2, 30 January, 2020

### Description

The Model 104 is a meter designed to measure AC energy. The inputs are AC voltage from the powerline and AC current from current transformers connected to the powerline. The measured energy is indicated via an electrical pulse output.

### Options

The Model 104 may be configured with several options including:

Phase configuration:	Single or Three phase
Power Supply Wiring:	Self Powered or Auxiliary Power Connections
Current Input Type:	Current or voltage input Nominal rating of 100A, 200A or 400A
Wireless Communication:	Available with Wireless Radio Communication

### Nomenclature

The Model 104 model number is created by appending suffix letters to the Model 104 prefix which indicates which options are installed in the meter. All Model numbers begin with '104-' and the suffix letters are added in the form 104-WXYZ. Available option suffixes are listed below.

104-WXYZ	Option	Selection	Suffix
W	Phase configuration	Single Phase	SP
		Three Phase	3P
X	Power Supply Wiring	Self Powered	blank
		Auxiliary Powered	A
Y	Current Input Type	100mA Nominal Input	blank
		333mV Nominal Input	V
Z	Wireless Communication	No Radio	blank
		Wireless Radio Communication	R

Example 1: A single phase, self powered meter uses the Model Number 104-SP (See Figure 1)

Example 2: A three phase, auxiliary powered meter uses the Model Number 104-3PA (See Figure 2)

Nominal current input is not included in the model number but is indicated on the serial number label affixed to the back of the meter.

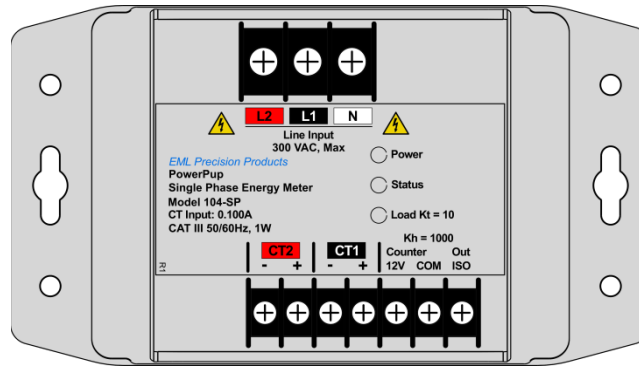


Figure 1

Model 104-SP, Self Powered, Single Phase Meter

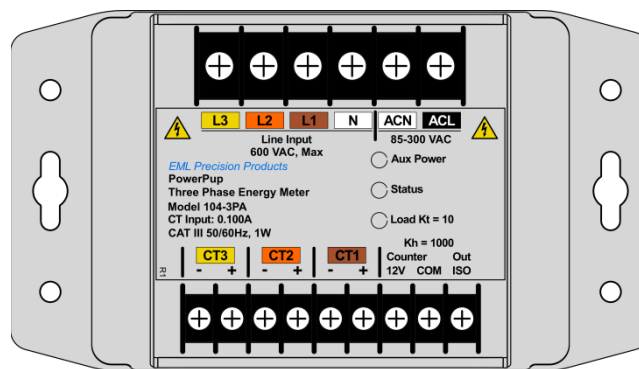


Figure 2

Model 104-3PA, Auxiliary Powered, Three Phase Meter

## Installation

The Model 104 is designed to be installed within an enclosure protecting it from direct contact with people and the weather. The case provides built in mounting ears to allow it to be secured within the enclosure.

Refer to Appendix A for wiring diagrams detailing proper connections of the meter to the line and load.

## Safety

The voltage input terminals of the Model 104 may expose hazardous voltages. Care should be taken when handling the meter when it is energized. The enclosure in which it is mounted should only be opened by trained service personnel.

**Specifications****Inputs**

Voltage: 85-305VAC, 0-600VAC (Optional)

Current: 100mA, 333mV (Optional)

Current Transformer Ratios (100mA output) 100A, (1000:1)  
200A, (2000:1)  
400A, (4000:1)

Current Transformer Ratios (0.333V Out) 100A  
200A  
400A

Auxiliary Power Supply: 85-300VAC, 50-60Hz

**Outputs**

Counter Output: 12V, 80mSec Pulse per 1kWhr  
80mA Maximum

Isolated Output: Dry Contact, 80mSec Closure per 1kWhr  
Off Voltage 60V Maximum  
On Current 100mA Maximum

**Accuracy**

ANSI C12.1, Class 1.0  
ANSI C12.2, Class 0.5 (Optional)

**Radio**

Network Type: Mesh  
Network Protocol: Zigbee 3.0

**Physical**

Dimensions: 6.33 x 3.57 x 2.19", 161 x 91 x 56mm  
Weight: 9.0 oz, 250g  
Power Consumption: 1W Maximum

**Environmental**

Operating : -22 to +158°F, -30 to +70°C,  
Storage: -40 to +185°F, -40 to +85°C

**Standards**

UL: Conforms to UL STD 61010-1  
Conforms to UL STD 61010-2-030  
CSA: Certified to CSA STD C22.2 #61010-1  
Certified to CSA STD C22.2 #61010-2-030

**Operation**

When power is applied to the Model 104 the meter will perform a self-test as it powers up. During this test all three LEDs, green, blue and orange will illuminate for 2- seconds. When the self-test is complete the blue and orange LEDs will turn off leaving only the green 'Power' LED illuminated.

Any deviation from this power on sequence of the LEDs indicates a problem with the meter.

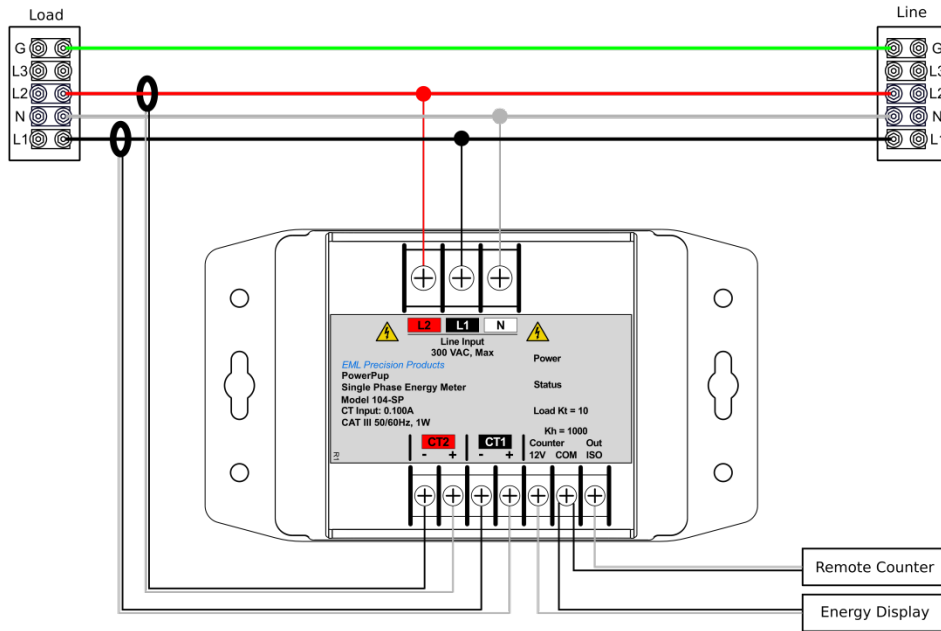
When the meter is measuring energy the orange 'Load' LED will blink at a rate proportional to the amount of energy being measured.

The 12V Output will generate a 12V pulse every time the meter accumulates 1kWhr of energy.

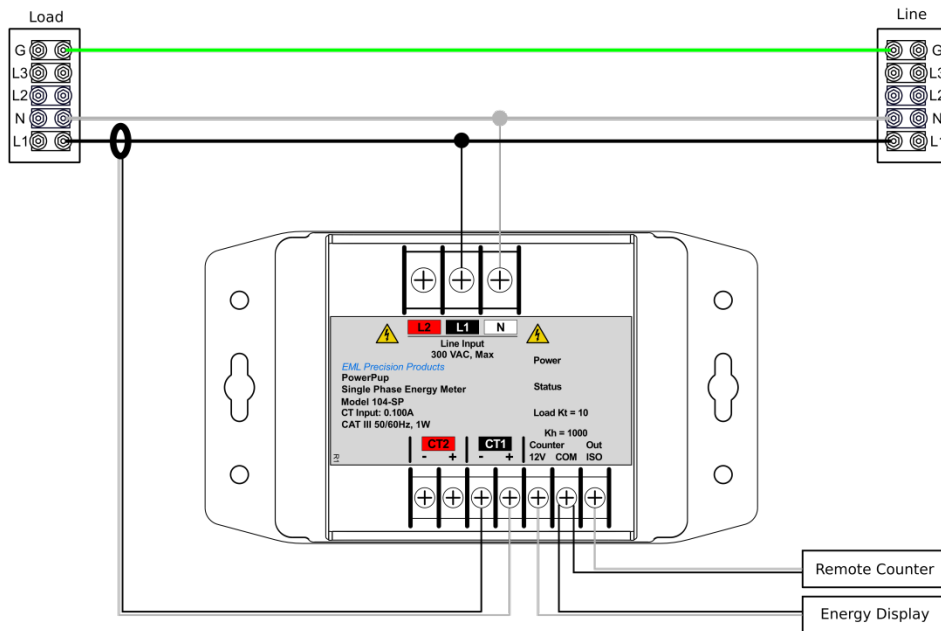
The Isolated Output contact will close every time the meter accumulates 1kWhr of energy.

**Appendix A**  
**Wiring Diagrams**

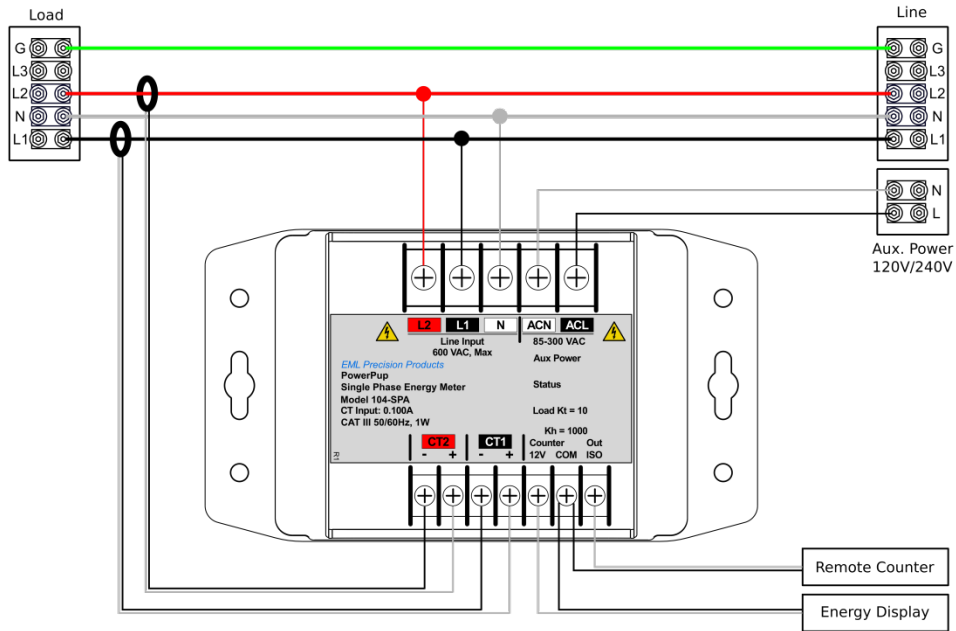
Model 104-SP  
Single Phase, 3 Wire, 120V, Split Phase  
Self Powered



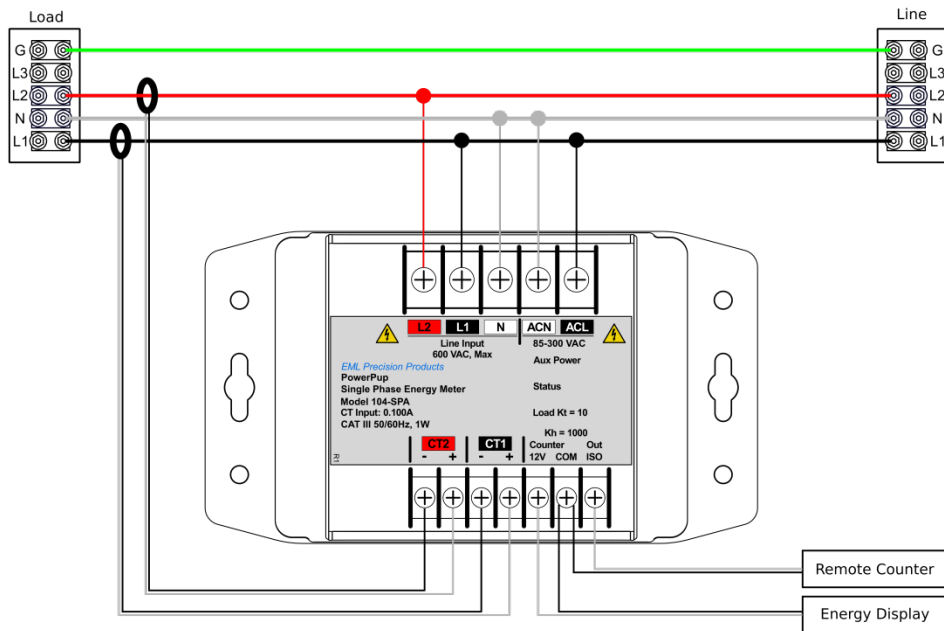
Model 104-SP  
Single Phase, 2 Wire  
Self Powered



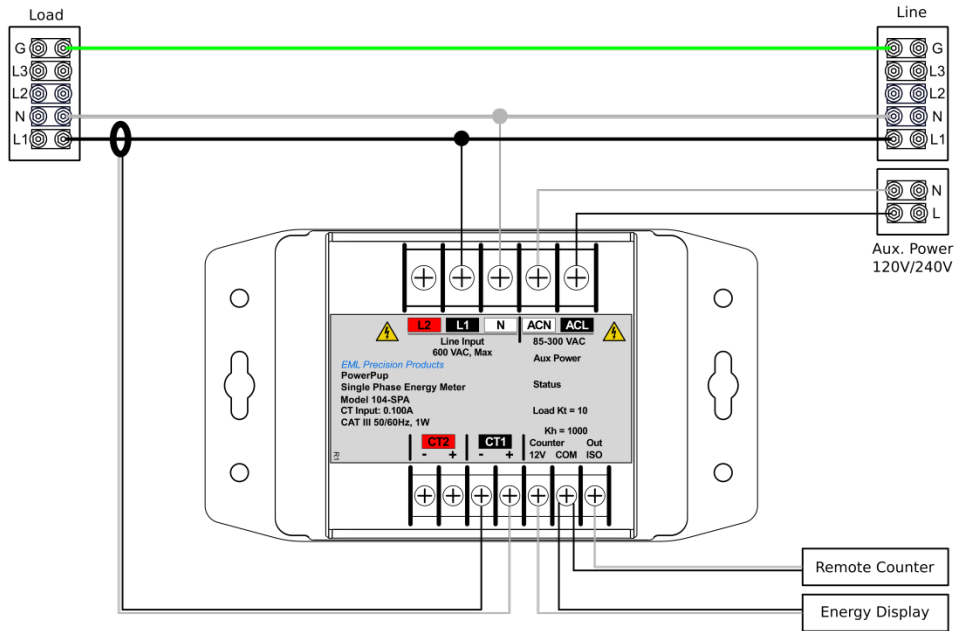
Model 104-SPA  
Single Phase, 3 Wire, 120V, Split Phase  
Auxiliary Powered



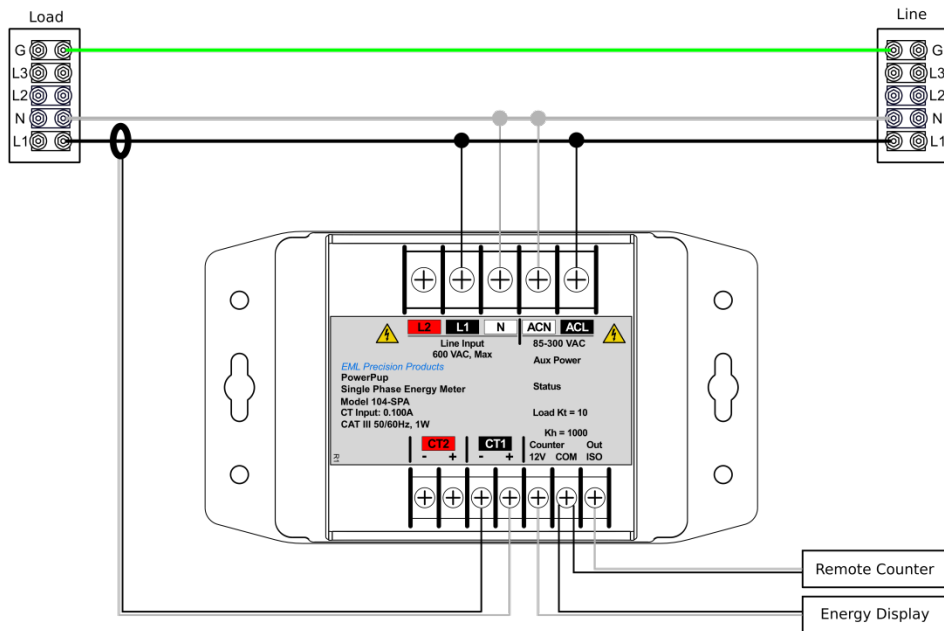
Model 104-SPA  
Single Phase, 3 Wire, 120V, Split Phase  
Auxiliary Powered - Line



Model 104-SPA  
Single Phase, 2 Wire  
Auxiliary Powered

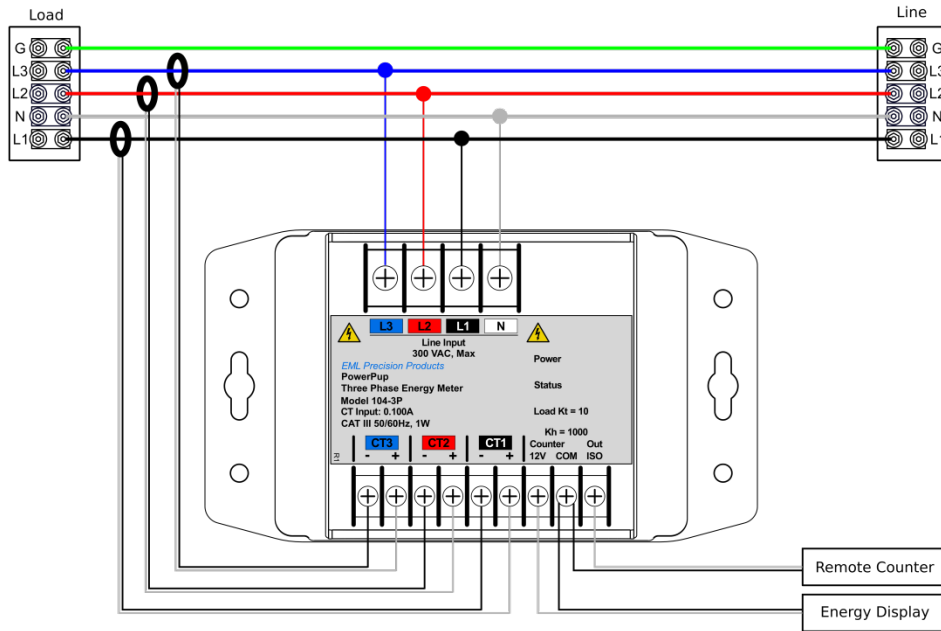


Model 104-SPA  
Single Phase, 2 Wire  
Auxiliary Powered - Line

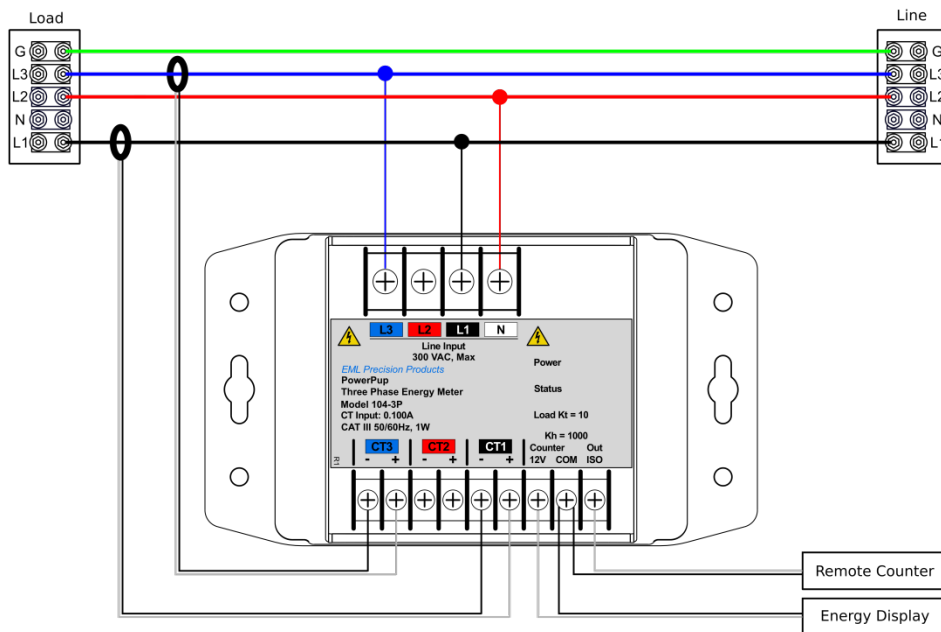




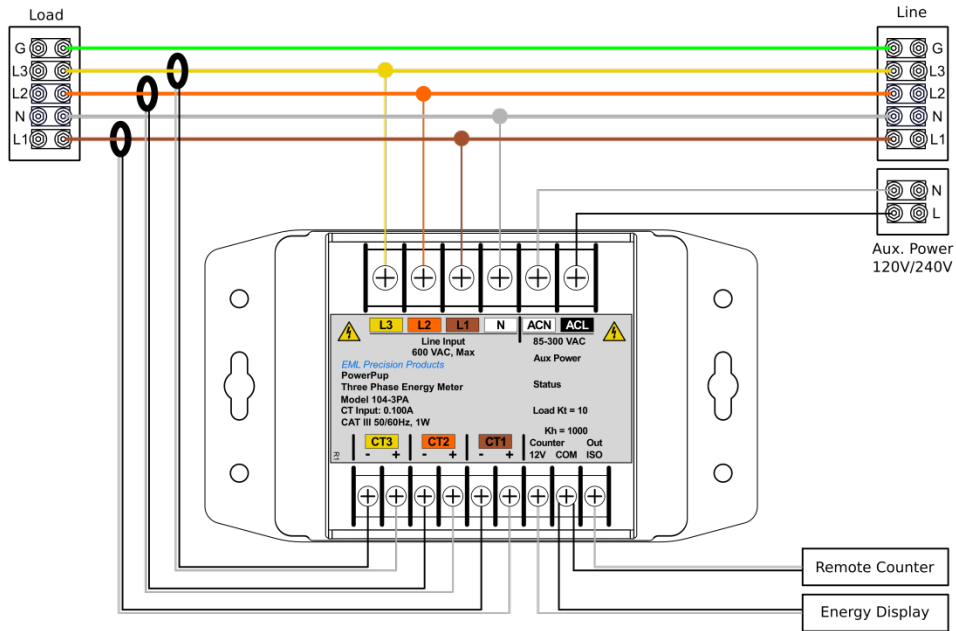
Model 104-3P  
Three Phase, 4 Wire, 120V/208V, Wye  
Self Powered



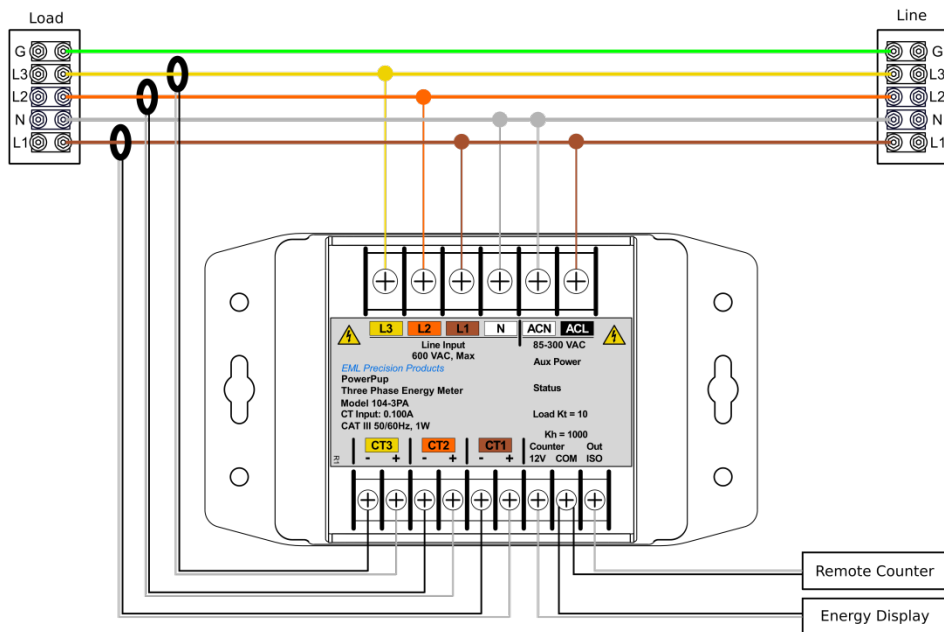
Model 104-3P  
Three Phase, 3 Wire, 120V/208V, Delta  
Self Powered



Model 104-3PA  
Three Phase, 4 Wire, 480V/277V, Wye  
Auxiliary Powered



Model 104-3PA  
Three Phase, 4 Wire, 208V/120V, Wye  
Auxiliary Powered - Line



Model 104-3PA  
 Three Phase, 3 Wire, 480V, Delta  
 Auxiliary Powered

