

Description

The PPM Site-Programmable AC Power Monitor and Display is an ideal choice for continuously monitoring a three-phase power system. It sets up in minutes to handle the majority of low voltage panel measurements typically found in facility, factory automation, and industrial process applications.

Measuring a wide variety of current, voltage and power parameters, the PPM provides three lines of power measurement data on its easy-to-read display. For remote monitoring, the PPM provides two pulse outputs and an optional fieldbus (MODBUS RTU) data communications output.

Front panel push buttons allow you to select from 25 available 3-line display choices. Popular measurements include: Volts, Amps, Watts, Vars, VA, Power Factor, Watt/Hour, Var/Hour, VA/Hour, Peak Demand and Rolling Demand (see Figure 2 on Page 3 for a complete list of display parameter choices).

Current (CT) Transformers

Moore Industries offers a complete line of CTs for use along with the PPM. Ask your Moore Industries Sales Engineer for details.

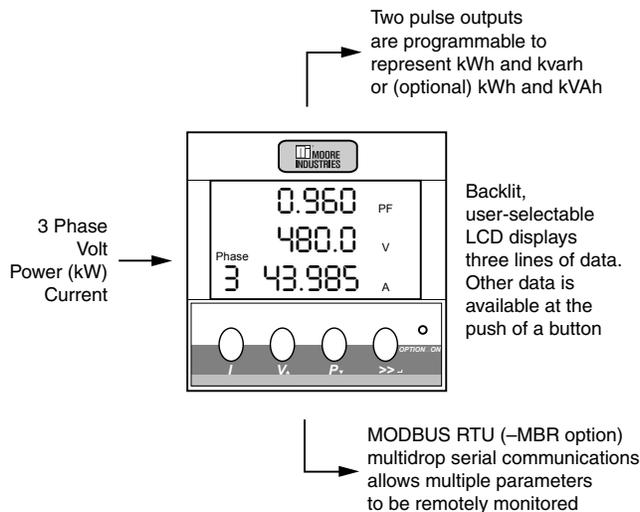


Universal and site-programmable, the compact PPM installs quickly into an instrument panel using convenient panel-mount clips.

Features

- **Bold, crisp and clear display.** High-contrast, backlit display and wide viewing angle make it easy to read your system's power parameters.
- **Continuous 3-phase monitoring.** Instead of sampling each phase in sequence, the PPM simultaneously scans all three phases. This allows it to accurately detect all input cycles, including distorted input waveforms up to the 20th harmonic.
- **Automatically fixes wiring errors.** The PPM uses auto-commissioning to ensure that a reversed CT connection will not cause reading errors. Per-phase kW and power factor (PF) measurement allows a cross-phase connection error to be quickly and easily detected.
- **Dual pulse and fieldbus outputs.** The PPM comes standard with two programmable pulse outputs (kWh and kvarh or kWh and kVAh) that configure to work with an external system such as building management systems. An optional fieldbus output (MODBUS RTU) provides access to all monitored values via a standard RS-485 or RS-422 system connection.

Figure 1. The PPM simultaneously monitors three independent phases and outputs the data in the format you require.



Certifications

CE CE Conformant – EMC Directives 89/336/EEC
EN 61326 and 73/23/EEC EN 61010

PPM

Programmable AC Power Monitor and Display

Specifications

<p>Performance</p> <p>Accuracy: See Table 1 for details</p> <p>Isolation: 2500V isolation from input to digital output</p> <p>Burden: 0.1 VA per phase</p> <p>Surge Withstand Capability: Surge withstand voltage x2 for 2 seconds maximum; Surge withstand current x40 for 0.5 seconds maximum</p> <p>Auxiliary Power Load: 5 VA maximum; With –MBR, 8VA maximum</p> <p>Scaling: Input current and voltage are user scaled for the respective CT and PT ratios</p> <p>CT Primary: 5 - 6,500 Amps</p> <p>PT Primary: 60 - 50,000 Volts</p>	<p>Ambient Conditions</p> <p>Operating & Storage Range: -10°C to +65°C (-14°F to +158°F)</p> <p>Relative Humidity: <75% non-condensing</p> <p>Ambient Temperature Effect: Negligible within specified limits</p> <p>Display Type: LCD; Three rows of 12mm (0.47 in) black digits and 4mm (0.16 in) black legends on a backlit background</p> <p>Format: Two rows of four alphanumeric characters plus legends; Bottom row of six alphanumeric characters plus legends</p> <p>Decimal Point: Auto-adjusting</p> <p>Engineering Units: Auto-adjusting</p>	<p>MODBUS Option</p> <p>Bus Type: RS-422 and RS-485 available</p> <p>Protocol: MODBUS RTU with 16-bit CRC</p> <p>Baud Rate: User programmable to 4800, 9600 or 19200</p> <p>Address: User programmable from 1-247</p> <p>Response Time: 100ms maximum from command end to reply start</p> <p>Command Rate: New command within 5ms of previous one</p> <p>Adjustment</p> <p>Four buttons on the front of the unit provide adjustment for all settings</p> <p>Weight</p> <p>PPM: 403g (14 oz) PPM with –MBR option: 596g (1 lb., 5 oz)</p>
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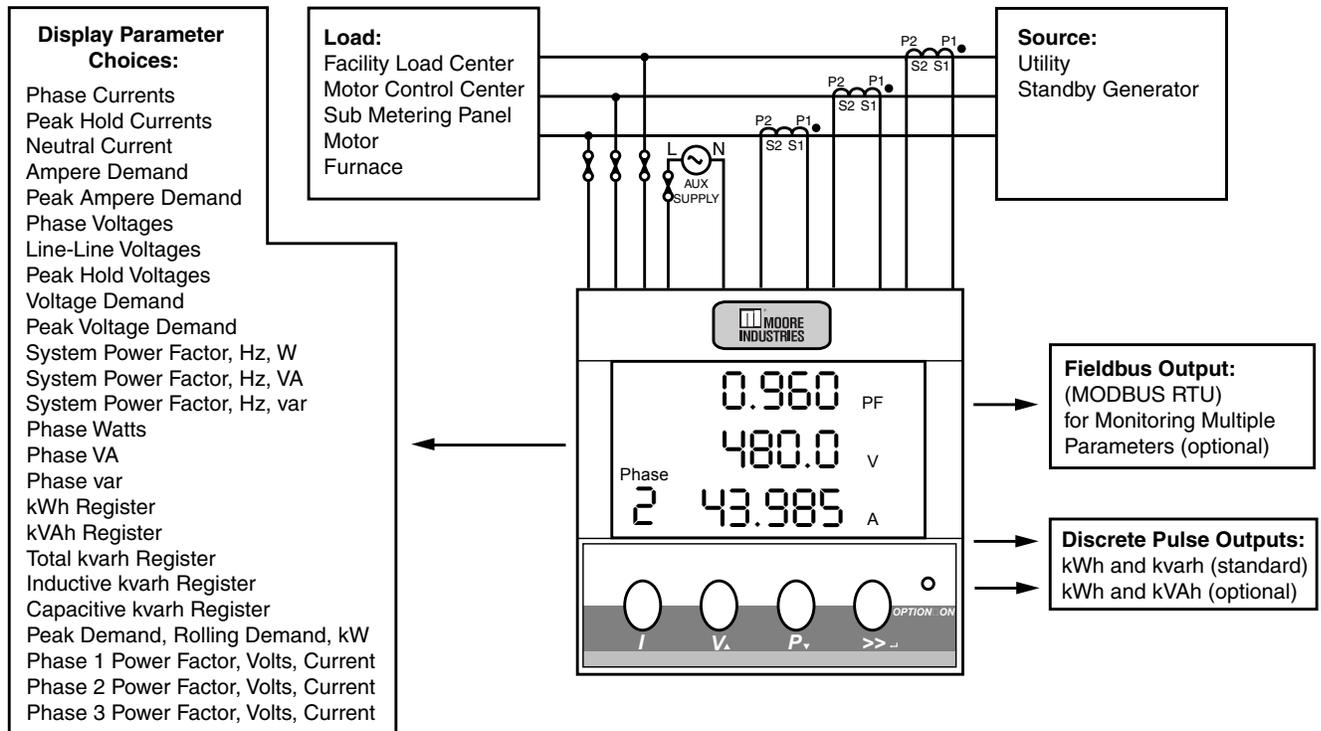
Ordering Information

Unit	Input	Output	Power	Options	Housing	
PPM Programmable AC Power Monitor	Specify a Voltage and a Current value. (e.g., 208AC, 5A)		2DO Standard two pulse discrete outputs represent KWh and kvarh	110AC (±15%) Auxiliary power, 45-65Hz (required for 480AC and 110AC input)	–MBR MODBUS RTU (RS-485 or RS-422) communication for reading multiple power measurement parameters	PM Panel-mount housing
	<p><u>Voltage:</u> 400AC (400Y230) 400Vac L-L, 3 phase, 3-Wire; 230Vac L-N, 3 phase, 4-Wire 208AC (208Y120) 208Vac L-L, 3 phase, 3-Wire; 120Vac L-N, 3 phase, 4-Wire 480AC* (480Y277) 480Vac L-L, 3 phase, 3-Wire; 277Vac L-N, 3 phase, 4-Wire 110AC* (110Y63) 110Vac L-L, 3 phase, 3-Wire; 63Vac L-N, 3 phase, 4-Wire</p> <p><i>Programmable</i> Use the front panel keypad to program the PPM to accommodate users' CT and/or PT primaries</p> <p>*110AC auxiliary power only</p>	<p><u>Current:</u> 5A</p> <p>NOTE: For two pulse outputs representing kWh and kVAh, see the -KVAH option</p> <p>(Contacts are rated for 100V, 100mA, maximum, AC/DC)</p>				

When ordering, specify: Unit / Input / Output / Power / Options [Housing]

Model number example: PPM / 400AC, 5A / 2DO / 110AC / –MBR [PM]

Figure 2. The versatile PPM is the ideal solution for a vast array of power monitoring needs.



Applications

The PPM is perfectly suited for power measurement, control and protection, switchgear metering, load monitoring and shedding, cogeneration and submetering and energy and cost management. Common installations vary from chemical plants and saw mills to commercial buildings, shopping centers, and telephone exchanges.

Gather data for a plant automation system. Use the PPM to gather data for systems that integrate process, instrument and electrical requirements. Accurately display and monitor a wide array of parameters.

Provide Preventative Maintenance. Changing electrical needs are often the first sign of a faulty instrument. Use the PPM to track electrical usage, then repair or replace a failing instrument before it causes an unnecessary and costly shutdown.

Meter distribution feeders, transformers, motors, generators, switchgears and capacitor banks. The versatility of the PPM allows you to monitor a large variety of power parameters from just about any power source.

Monitor Power for Revenue Billing Calculations. The PPM is ideal for use in energy management, cost accounting, cogeneration or submetering applications.

Table 1. Input Accuracy.

Input	Per Phase Accuracy	3-Phase Accuracy
Current 5% to 120% FS	±0.2% FS ±1% Reading	N/A
Voltage LN 20% to 120% FS	±0.2% FS ±1% Reading	N/A
Voltage LL 20% to 120% FS	±0.3% FS ±1% Reading	N/A
Watts 5% to 120% FS	±0.4% FS ±1% Reading	±0.6% FS ±1% Reading
VA 5% to 120% FS	±0.6% FS ±1.5% Reading	±1% FS ±1.5% Reading
var 5% to 120% FS	±0.8% FS ±2% Reading	±1.5% FS ±2% Reading
PF Frequency (45-65Hz range)	±0.2°	±0.2° ±0.05Hz
Neutral Current 5% to 120% FS	N/A	±0.6% FS ±2% Reading
Wh Register VAh Register varh Register	N/A N/A N/A	Class 1 EN 61036 Class 2 Class 2 IEC 1268

Note: All accuracies specified are ±1 digit

PPM

Programmable AC Power
Monitor and Display

Connections

Figure 3. Electrical Connections for 3-Phase, 3-Wire Power Circuits using Two Current Transformers (Not suitable for neutral current measurements)

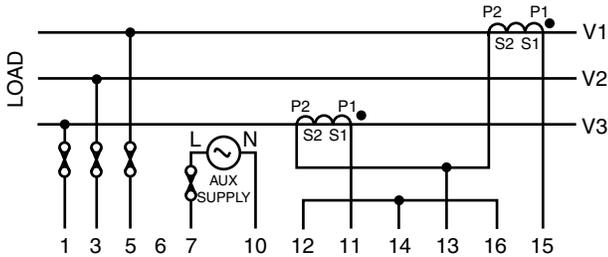


Figure 4. Electrical Connections for 3-Phase, 3-Wire Power Circuits using Three Current Transformers

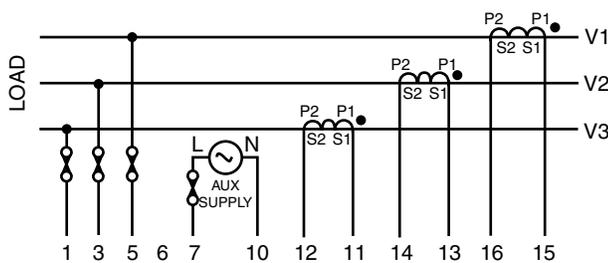


Figure 5. Electrical Connections for 3-Phase, 4-Wire Power Circuits

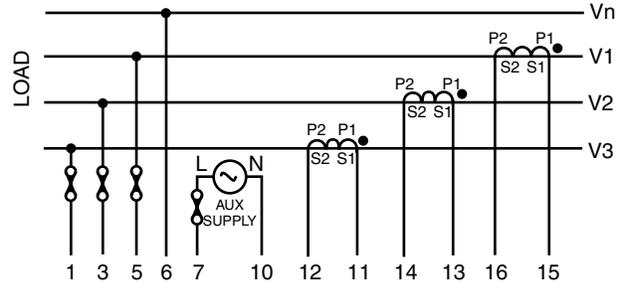


Figure 6. Electrical Connections for 3-Phase, 3-Wire Power Circuits using Potential Transformers

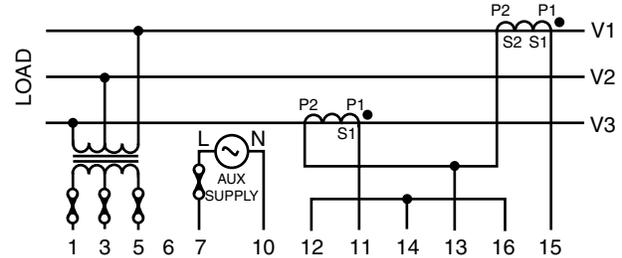


Figure 7. Electrical Connections for Single-Phase Power Circuits

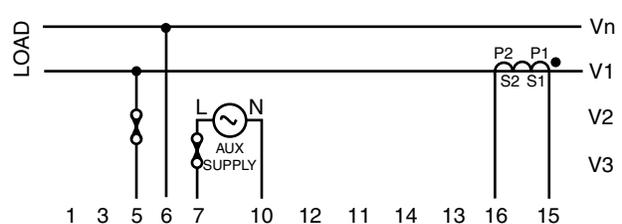
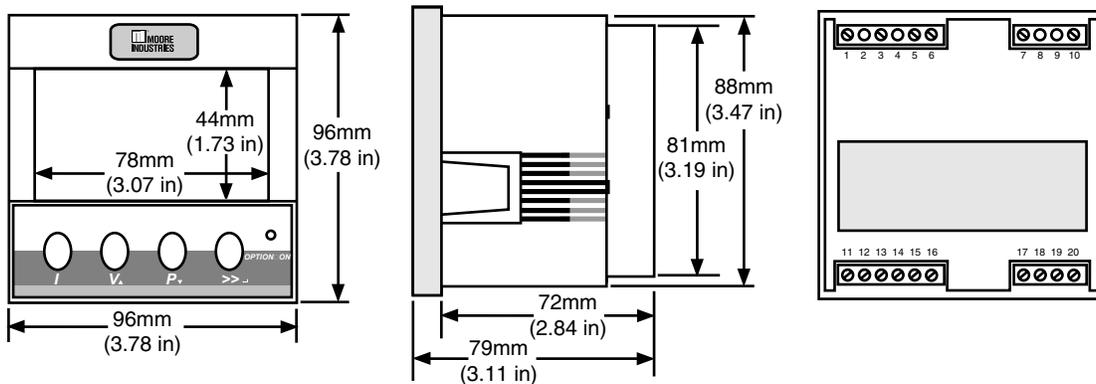


Figure 8. PPM Dimensions— Panel should be 1mm (.04 in) to 4mm (.16 in) thick with a square cutout of 92mm (3.62 in)



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