

***E-MON D-MON  
Stand Alone KWH/Demand Meter  
Installation Instructions***



Energy MONitoring Products  
for the way you do business today

Langhorne, PA  
(800) 334-3666  
Fax: (215) 752-3094

San Diego, CA  
(800) 810-3666  
Fax: (619) 682-5112

Dear Valued Customer,

We are pleased that you chose to buy one of our products and want you to be just as pleased with it. To be sure that you are 100% satisfied with our products, we provide toll-free technical and sales support Monday through Friday, 8:00 am to 7:30 pm, eastern time. The toll-free numbers are: Langhorne, PA - (800) 334-3666 and San Diego, CA - (800) 810-3666. You may also reach us via email at info@emon.com.

Before installing your new E-MON product, please read the information on the following pages carefully.

We believe that you will find the E-CON Series kilowatt hour meters easy to install and use for monitoring and evaluating your electrical usage.

Be sure to forward this manual to the owner after installation is complete so that they may use it as a reference guide when reading the E-MON meters.

Thank you.

E-MON, L.P.  
Manufacturer of E-MON Energy MONitoring Products

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# Chapter 1

## Pre-Installation Information

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The E-MON D-MON KWH/Demand meter is a single, dual or three element meter that is used to monitor electric power to individual loads after the utility meter. Installation should be performed by qualified personnel and ONLY according to these instructions and local codes. E-MON, L.P. or its representatives assume no responsibility for damage or injury resulting from the improper installation of this meter.

**Check** the rating and configuration on the meter label to ensure it is suitable for the intended service. Meters listed for use on 115/208 volt cannot be used on 277/480 volt services and vice versa.

**Verify** that the meter rating (amperage) is suitable for the intended load. Compare the color of the arrows on the current sensor assembly to the chart below to find the amperage of the current sensors.

SENSOR ARROW COLOR CODE	SENSOR RATING
Brown	100 Amp
Red	200 Amp
Yellow	400 Amp
Black	800 Amp
Blue	1600 Amp
Blue	3200 Amp

**Mount** the meter in the desired location using the mounting flanges located on the top and bottom of the meter enclosure. E-MON meters must be installed indoors where they will not be affected by the elements.

**Assemble** and install current sensors around conductors to be monitored.

NOTE: The modular jacks located on the meter board are to be used only in conjunction with E-MON supplied peripherals. *The jacks contain neutral accessible circuits.*

## Chapter 2

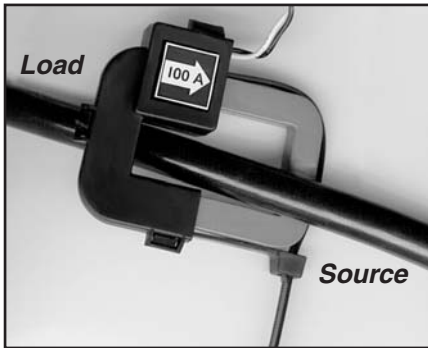
### Current Sensor Assembly

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STEP 1: For each phase being monitored you will need one two-piece current sensor assembly (A three phase meter will require three (3) assemblies.) Open the two-piece current sensor assembly by releasing the nylon clamp using a flathead screwdriver.



STEP 2: Reassemble current sensor assembly around the conductor(s) to be monitored. Be sure that the current sensor halves marked "load" are both facing the load side of the conductor. The colored arrow will be on the source side of the conductor being monitored and **MUST** be pointed in a clockwise direction around the conductor being monitored. Tighten nylon clamp to complete assembly.



#### IMPORTANT

When looking from the source side of the conductor(s) being monitored, you should see the arrow on the current sensor assembly, and the arrow should be pointing clockwise around the conductor(s) being monitored.

If the arrow is not on the source side inaccurate readings will result.

## Chapter 3

### Meter Terminal Block Connections

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#### Current Sensor Connections

STEP 1: Connect the black and white leads from the current sensor assembly to the meter terminal block. The current sensor leads can be extended up to 2,000 feet using #14-22 AWG wire and do not have to be twisted (consult your local electrical codes for proper sizing.) When extending the sensor leads, be sure to note what color lead on the extension is connected to the black lead from the sensor, and what color lead on the extension is connected to the white lead from the sensor. There is no hazardous voltage across the current sensor wires and there will be no damage if the sensor wires are shorted together.

When connecting current sensor leads to the meter terminal block be sure to note which phase you bring into the "A" terminals, and the same for the "B" and "C" phase terminals. Also be sure that the white wire is connected to the "W" terminal, and the black wire is connected to the "B" terminal for each phase.

STEP 2: Proceed to Chapter 4, Various Wiring Diagrams, for further information on current sensor connections.

#### Voltage Connections

STEP 1: Verify that the voltage supplied to the meter is from the same source as the loads being monitored by the current sensors. Connect the line voltage input wires to the meter terminal block (See Various Installation Diagrams, Chapter 4) **NOTE LINE VOLTAGE INPUTS MUST CORRESPOND TO THE SAME CONDUCTOR BEING MONITORED BY THE CURRENT SENSOR INPUTS. THE CONFIGURATION SHOWN MUST BE FOLLOWED OR INACCURATE READINGS WILL RESULT.** These wires are normally #14 AWG (consult your local electrical codes for proper sizing.) Voltage input conductors require protection, It is recommended that inline fuses with a three amp rating be installed to protect all phases. Do not connect the voltage wires to the unit while they are live. Push insulating cover down over meter terminal block. Apply voltage to meter only after installation is complete.

**IMPORTANT:** The line voltage and current sensor inputs must correspond. If the phasing between the voltage and the current sensors does not correspond, inaccurate readings may result.

Refer to Chapter 4, Various Wiring Diagrams for further details.

## **Chapter 3**

### **Meter Terminal Block Connections**

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#### Voltage Connections

STEP 2: The line voltage input may be taken from wherever it is most convenient (lugs, another breaker, another subpanel, etc.) as long as it is the same power source as the items being monitored. Line voltage **cannot** be pulled from a subpanel powered from a different transformer than the item(s) being monitored.

STEP 3: Push the insulating cover down over the terminal block inside the meter. Apply voltage to meter only after installation is complete.

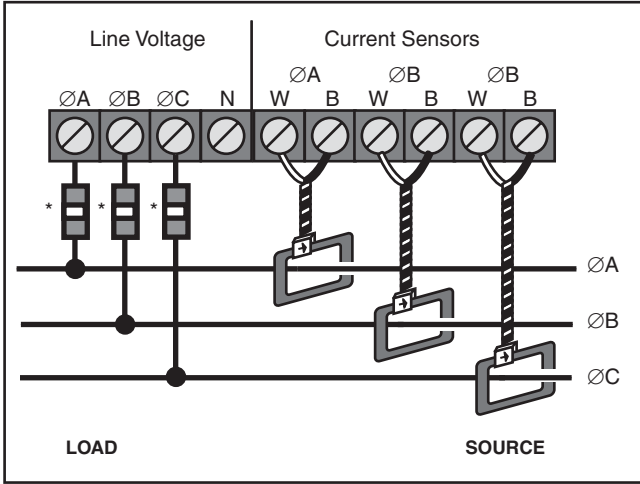
Refer to Chapter 4, Various Wiring Diagrams for further details.

# Chapter 4

## Various Wiring Diagrams-Standard Wiring Diagrams

This chapter provides you with various installation diagrams depending on your monitoring needs. The diagrams below are standard installation diagrams using one (1) set of current sensors. For special monitoring needs see Chapter 5.

**Three Phase, 3 Wire Connection  
[Delta System (on 4 Wire Delta, Neutral is not used)]**

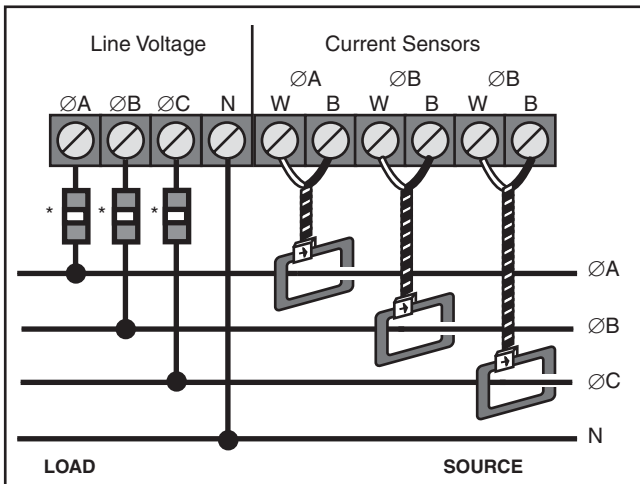


Line voltage connection: #14 AWG

Sensor Connection:  
B=Black  
W=White

\* Three-amp inline fuses recommended

**Three Phase, 4 Wire Connection  
[Wye System]**



Line voltage connection: #14 AWG

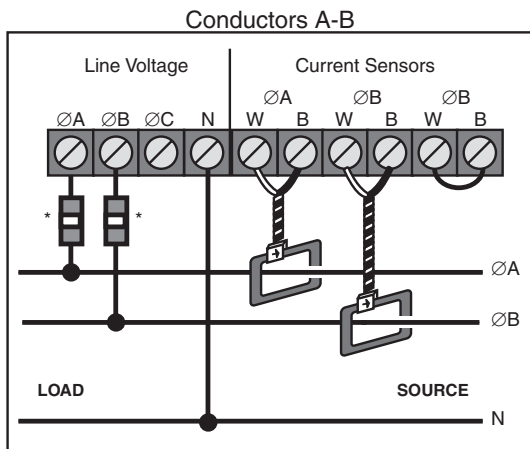
Sensor Connection:  
B=Black  
W=White

\* Three-amp inline fuses recommended

# Chapter 4

## Various Wiring Diagrams-Standard Wiring Diagrams

### Single Phase, Three Wire Connection (Monitoring conductors A-B, B-C, A-C)



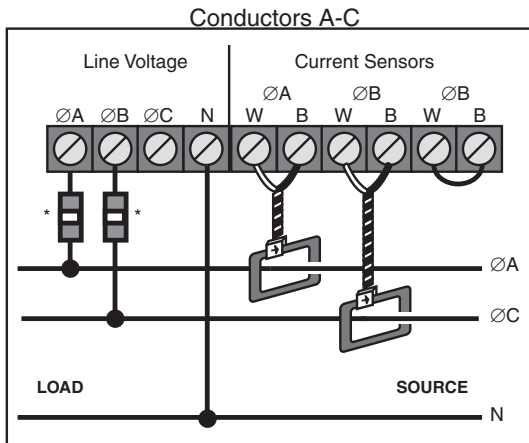
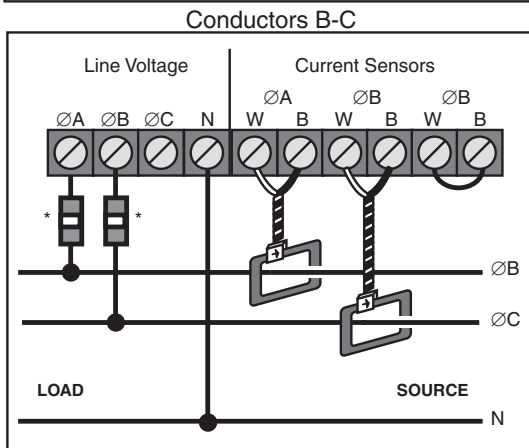
Line Voltage Connections: #14 AWG

Sensor Connections: B=Black lead  
W=White lead

\* 3-amp inline fuses recommended

**IMPORTANT:** Line voltage **MUST** be present at the A & B phase voltage terminals (e.g. you cannot bring power into A & C phase terminals only, or B & C phase terminals only).

**Shorting link MUST** be installed on C phase current sensor terminals.



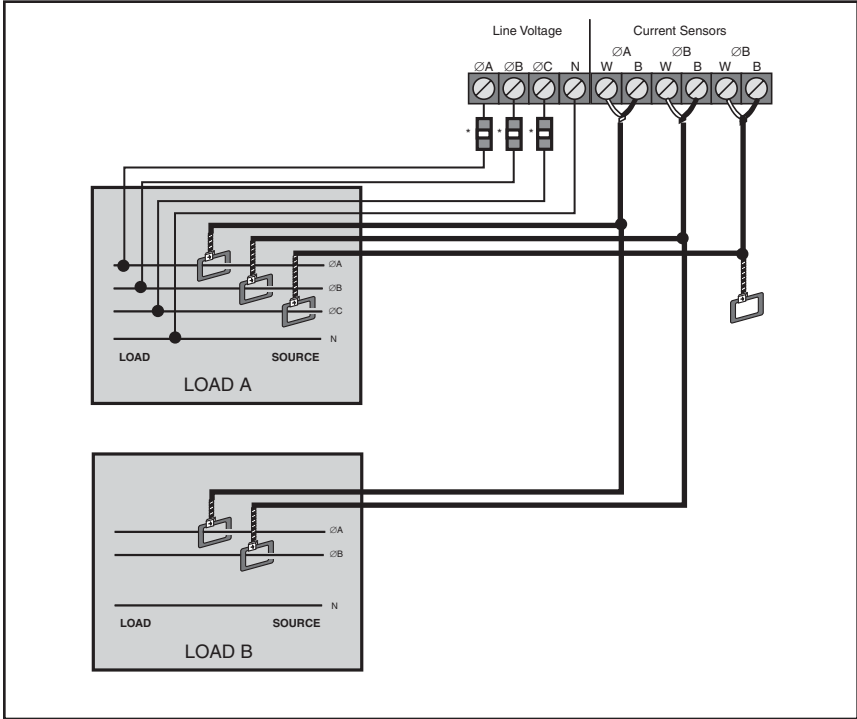
For other applications (120 V, 1-phase, 2 wire, High voltage, etc.) contact E-MON at: Langhorne, PA (800) 334-3666 or San Diego, CA (800) 810-3666.

# Chapter 5

## Monitor Multiple Loads with One E-MON Meter

This chapter provides you with various installation diagrams depending on your monitoring needs. The diagrams below are standard installation diagrams using one (1) set of current sensors. For special monitoring needs see Chapter 5.

### Monitor (1) three phase load and (1) single phase load



**NOTE:** Three phase line voltage **MUST** be provided to the E-MON meter. When reading the E-MON meter, be sure to multiply the meter reading by the number of sets of sensors in parallel.

### IMPORTANT!

Current sensors **MUST** be installed in complete sets of three (3), bring the third sensor into the terminal block at the meter but do not clamp the actual sensor assembly around any conductors or the neutral.

For other applications contact E-MON's technical department at:  
Langhorne, PA - (800) 334-3666 or San Diego, CA - (800) 810-3666

## **Chapter 5**

### **Monitor Multiple Loads with One E-MON Meter**

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The E-MON D-MON KWH/Demand meter provides extreme flexibility by allowing additional sets of current sensors to be used in parallel so multiple locations can be monitored by one meter. This feature allows a totalized display from two or more loads.

You may use parallel sensors to monitor specific breakers from one panel, specific breakers from more than one panel, two or more complete panels, etc. You may also monitor three phase loads and single phase loads for a totalized reading, provided they are from the same power source.

When paralleling current sensors, the following rules must be followed for accurate readings.

- RULE 1:** Current sensors must be installed in complete sets of three. This is necessary even when paralleling poly phase with single phase loads.
- RULE 2:** All sensors used in parallel must be of the same amperage rating (i.e. all 100 amp, or all 400 amp, etc.) The rating will be determined by the current rating (amperage) of the meter. A 200 amp meter, for example, must use extra sets of 200 amp current sensors.
- RULE 3:** All locations being monitored must have the same power source. A 480 volt meter, for example cannot monitor a 208 volt load, nor can a meter monitor two 480 volt loads if they are from a different originating power source (or from different transformers.)
- RULE 4:** The meter reading shown on the display must be multiplied by the number of sets of current sensors installed. i.e. A meter using 2 sets of current sensors, with a display reading of 20...  
 $2 \times 20=40$ ....the actual usage is 40.

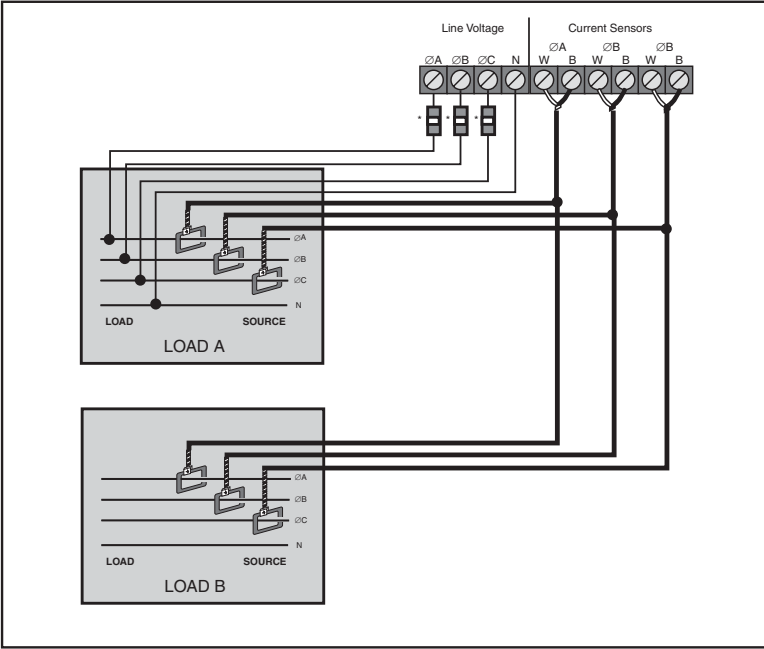
**NOTE: Sets of current sensors consist of three sensors, one per phase. The multiplier only applies when extra sets of sensors are installed on one meter. If you are only using one set of three sensors, this multiplier DOES NOT apply.**

# Chapter 5

## Monitor Multiple Loads with One E-MON Meter

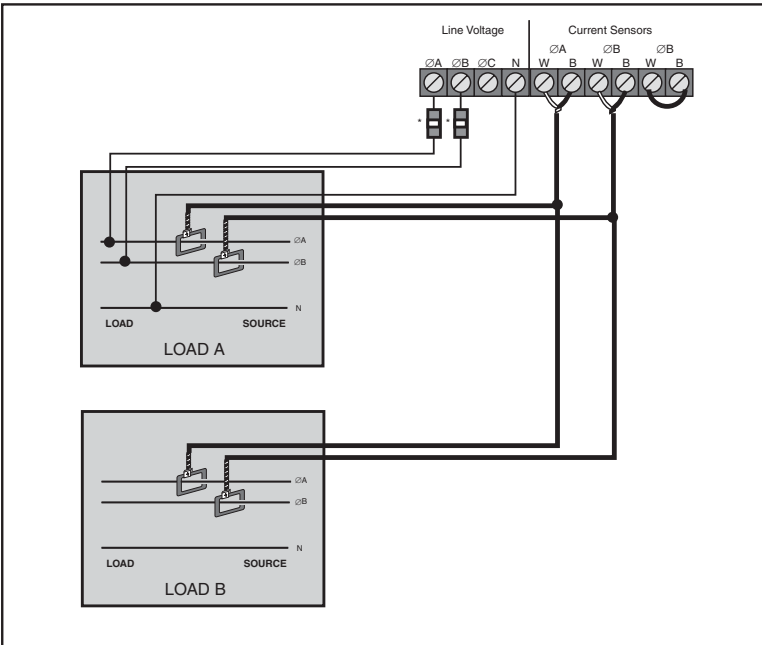
### Parallel Current Sensor Installation Diagrams

#### Monitor (2) three phase loads



When reading the E-MON meter, be sure to multiply the meter reading by the number of sets of sensors in parallel.

#### Monitor (2) Single phase loads



#### IMPORTANT!

Line voltage MUST be provided to the A & B line voltage terminals in the E-MON meter (e.g. you cannot bring power to only the B & C phase, or the A & C phase)

Shorting link must be installed on the C phase current sensor terminals.

When reading the E-MON meter, be sure to multiply the meter reading by the number of sets of sensors in parallel.

## Chapter 6

### Demand Meter Display Functions

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The demand meter has a single display window that cycles through the energy data screens. The meter can be configured to cycle either four (4) or six (6) separate screens. The screens are described below.

00004723 kwh

The KWH display shows the amount of energy consumed in kilowatt hours (KWH).

000059.3 kw

The KW display shows the electrical Demand in kilowatts (KW). Demand is either 15 minutes or 30 minutes. (default is 15 minutes)

04-22-02

The date display shows the date of the Demand (KW) peak.

12-30

The Time display shows the time of the day that the Demand peak occurred.

P1-05829

The P1 display shows the count received from an external meter, such as gas or water, into the P1 input.

P2-37046

The P2 display shows the count received from an external meter, such as gas or water, into the P2 input.

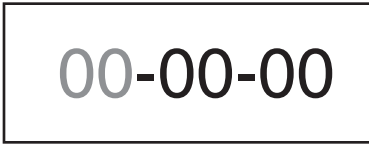
The P1 and P2 display screens are usually selected as an option when the meter is initially set-up and can be programmed as part of the display cycle. They can be easily added or subtracted from the display cycle anytime required.

## Chapter 7

### Demand Display Set-up

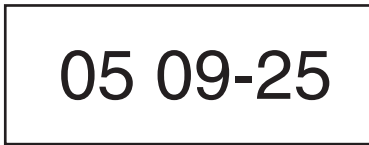
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#### STEP 1: Date Setting



Press the Mode Select button and the display screen to the left will appear. The date is entered MM-DD-YY. A zero will proceed a single digit entry. using the Up and Down buttons, enter the correct numbers. After entering the correct number in the first set of digits, press the Mode Select button to move to the next set of digits. When completed, pressing the Mode Select button will advance the display to the next screen.

#### STEP 2: Day of Week and Time Setting

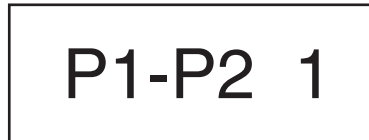


The first section of the next screen calls for the entry of the recent day of the week. Using the Up and Down buttons, enter "1" for Sunday, "2" for Monday, "3" for Tuesday, "4" for Wednesday, "5" for Thursday, "6" for

Friday, or "7" for Saturday. This is important so the meter can automatically keep track of daylight savings time. Using the Mode Select button, move to the next field where the hour is entered through the Up and Down buttons. As the meter uses a 24 hour clock, this number will be from 1 to 24. e.g. 2:00 PM=14. The final field will be the minute display which is also entered by pressing the Up and Down buttons. Again, press the Mode Select button to move to the final display screen.

#### STEP 3: P1 and P2 Inputs

The E-MON demand meter will support up to two (2) outside pulse contacts from water and/or gas meters. These contacts can be physical (such as a reed switch) or a solid state device. When using solid state contacts, polarity must be observed. The number "1" indicates the (+) connection on the P1 and P2 input connections which are located on the bottom of the display board. The pulse count can be shown on the meter display if these inputs are utilized.



Use the Up and Down button to set the right digit on this screen to either 0 or 1. Entering "1" activates the P1 and P2 display, entering "0" turns off the P1 and P2 display

function. When completed with this screen, press the *Mode Select* button to return to normal meter reading.

## Chapter 8

### ***Demand Meter Hardware Function Description***

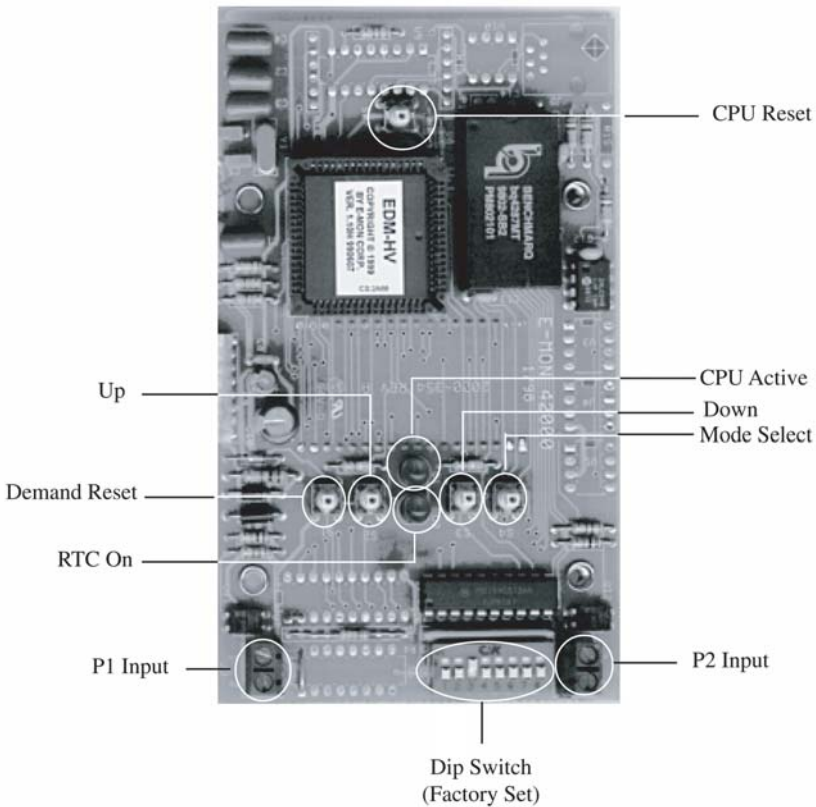
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CPU Active	LED (D1) blinks indicating the CPU is active and operating.
Mode Select	Button used to select adjustment mode when setting up the meter (clock adjust, date adjust, input select.)
Down Button	Used when adjusting time and date for meter display.
P2 Input	Input terminal for counting pulses from external metering device such as gas or water meters.
Dip Switch	Set by factory to match meter with supplied current sensors. <b>Mut not be changed by installer or user.</b>
P1 Input	Input terminal for counting pulses from external metering device such as gas or water meters.
RTC On	LED (D2) indicates Real Time Clock is functioning when lit.
Demand Reset	Button to reset demand portion of display.
Up Button	Used when adjusting time and date for meter display.
CPU Reset	Resets the CPU; <b>to be used by field service personnel.</b>

## Chapter 8

### Demand Meter Display Board Hardware Functions

The picture below shows the various hardware points on the demand meter display board that are utilized in setting up the meter for operation. The board is located on the inside of the door of the demand meter, and is accessed by opening the meter. A padlocking hasp is provided on the meter to prevent unauthorized access. The functions of these hardware points are described on the following page.



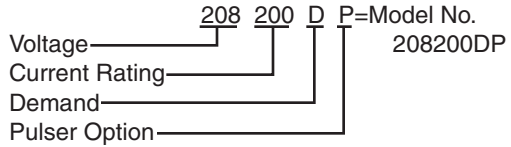
# Meter Technical Specifications

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Ordering Information:

Simply state voltage, current rating and any options required:

EXAMPLE:



Voltage Input Configuration:

2-wire, 3-wire and 4-wire  
This covers all secondary voltage supplies: single-phase, split secondary and three-phase, both grounded and ungrounded

Voltage Input:

Up to 600 volts rms A.C. available

Current Input:

Up to 3200 amps rms A.C. available

Power Factor:

0.5 leading or lagging

Frequency:

50 Hz to 400 Hz

Accuracy:

Certified to ANSI C12.1 (+/-1% from 1%-100% of rated load.)

Voltage Operating Range:

+/- 25% of rated load

Temperature Range:

-20 degrees C to +50 degrees C

Voltage Overload:

+25% continuously; +100% for 20 cycles

Current Overload:

Can be overloaded 100% without damaging meter

Display:

Fully electronic, 8-digit display. Manual reset to zero (Demand only)

Standard Ranges:

120/240 volts; 100, 200, 400, 800, 1600, or 3200 amps  
115/208 volts; 100, 200, 400, 800, 1600, or 3200 amps  
277/480 volts; 100, 200, 400, 800, 1600, or 3200 amps  
Other voltages available as options

High Voltage Metering:

Call E-MON's technical department for 2300V, 4160 V and higher voltage applications.  
Langhorne, PA - (800) 334-3666  
San Diego, CA - (800) 810-3666

## ***Important Information*** ***About your New E-MON Product***

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E-MON, L.P. is committed to producing and delivering quality products in appearance and performance. That is why our meters are covered with a *Five Year Limited Warranty* against defects in workmanship and material (see below for details.)

If you have questions, we can handle them quickly and effectively with a telephone call. Please let us try to help you by phone, **BEFORE** you remove your E-MON product. Call our technical department at: Langhorne, PA (800) 334-3666 or San Diego, CA (800) 810-3666 between the hours of 8:00 am and 7:30 pm, eastern time. To help us help you, please have all relevant information on hand when you call (model or part numbers, nature of difficulty, etc.)

### **E-MON, L.P.** **Five Year Limited Warranty**

Subject to the exclusions listed below, E-MON, L.P. will either repair or replace (at it's option) any product that it manufactures and which contains a defect in material or workmanship. The following exclusions apply:

1. This Limited Warranty is effective for a period of five (5) years following the date of manufacture (as indicated on the Limited Warranty.)
2. E-MON must be notified of the defect within ninety (90) days after the defect becomes apparent.
3. All freight costs are the responsibility of the product owner.
4. This Limited Warranty does not cover installation, removal, reinstallation or labor costs, and excludes the battery and normal wear and tear.
5. This Limited Warranty does not cover any product which has been altered from its original manufactured condition, improperly installed, abused or misused, or used in connection with equipment or materials not supplied or recommended by E-MON, L.P.
6. This Warranty is limited to the obligation to repair and/or replace the manufactured product. This is the exclusive remedy afforded by this Limited Warranty. **IN NO EVENT SHALL E-MON, L.P. BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, such as property damage or economic losses caused by a product.**
7. **THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, AS TO QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

