

# 3 1/2" PANEL METERS

## INSTALLATION AND WIRING INSTRUCTIONS

These instructions apply to the the following 3 1/2" NEWMAR panel meters:

<u>Model</u>	<u>Part Number</u>	<u>Model</u>	<u>Part Number</u>
8-16 DC VOLTMETER	023-9161-5	0-150 AC VOLTMETER	023-1500-5
16-32 DC VOLTMETER	023-1632-5	0-300 AC VOLTMETER	023-3002-5
0-50 DC AMMETER	023-0502-5	0-50 AC AMMETER	023-0301-5
0-100 DC AMMETER	023-1001-5	0-100 AC AMMETER	023-1001-7
FREQUENCY METER (60 Hz)	023-1600-5		

Meters are designed for front panel mounting. Use the diagrams below to determine the proper dimensions for the panel cut-out. Use the threaded studs with nut and washer which protrude from the rear of the meter for securing the meter to the panel. Quick connect spade lugs are provided for attaching wiring to the meter.

Some meters require the installation of an external shunt, current transformer or dropping resistor (listed below). Ensure that the meter is properly installed with the necessary accessory as noted below and illustrated on the reverse of this page. Failure to do so will result in damage to the meter. *Note: External accessories listed here are provided with the meter. Contact the factory if any is missing from the packaging.*

**DC AMMETERS** - Require an external shunt.

**AC AMMETERS** - Require an external current transformer.

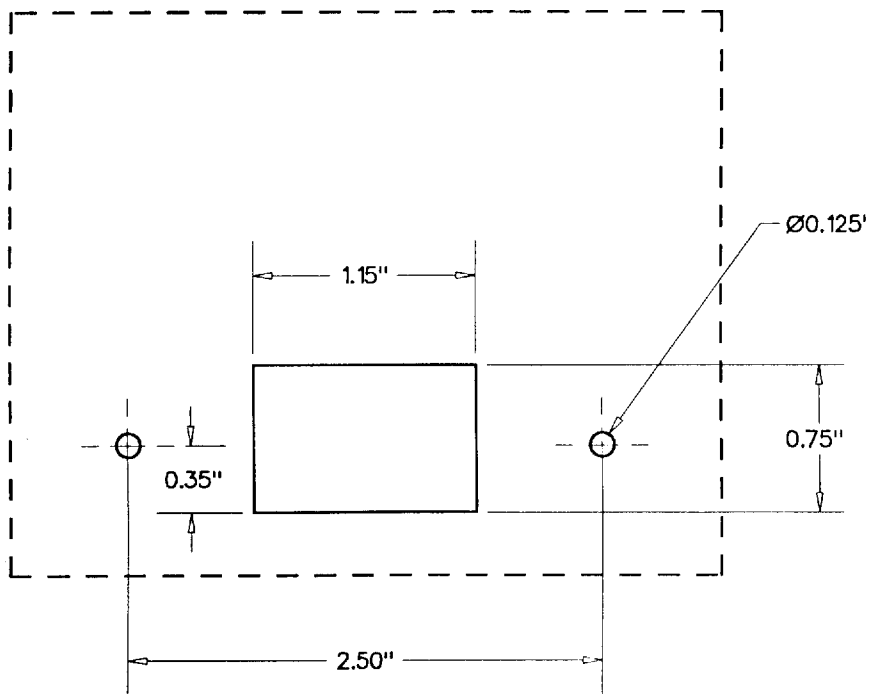
**0-300 AC VOLTMETER** - Requires a resistor installed in-line with hot lead.

**DC VOLTMETERS, 0-150 AC VOLTMETER, FREQUENCY METER** - No external device required.

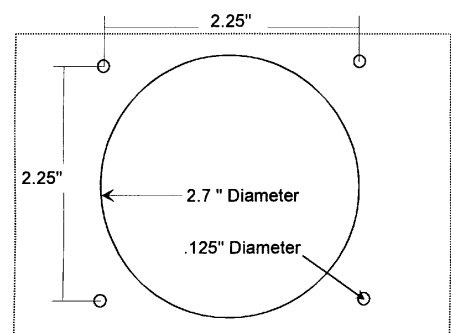
### MOUNTING HOLE PATTERNS

*Note: The Ammeter/Voltmeter illustration is actual size and may be used as a template when cutting and drilling the mounting surface.*

**Ammeters and Voltmeters**



**Frequency Meter**



(Wiring Diagrams on Reverse)



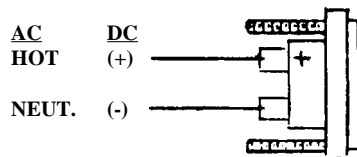
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E-Mail: sales@newmarpower.com

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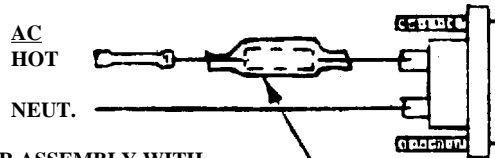
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E-Mail: newmareuro@newmarpower.com

# WIRING DIAGRAMS:

## DC VOLTMETERS, 0-150 AC VOLTMETER & FREQUENCY METER

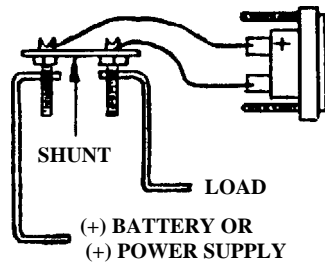


## 0-300 AC VOLTMETER

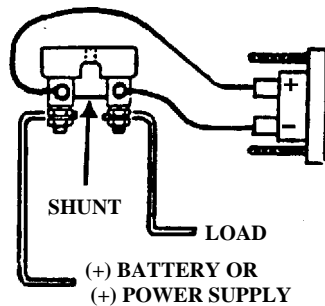


RESISTOR ASSEMBLY WITH INSULATING TUBING, LUG AND CRIMP SPLICE (MUST BE INSTALLED -- EITHER TERMINAL OK)

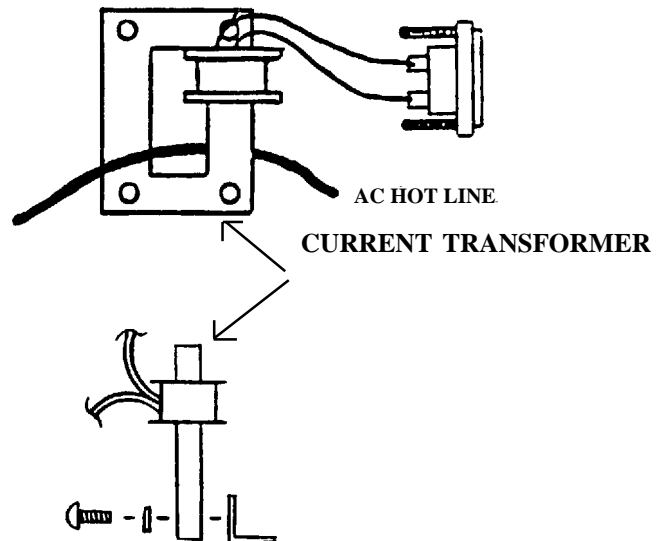
## 0-50 DC AMMETER



## 0-100 DC AMMETER



## AC AMMETERS



SECURE TRANSFORMER WITH MOUNTING BRACKETS PROVIDED. MUST BE AT LEAST 4" AWAY FROM METER OR FALSE READINGS WILL OCCUR

Wiring to all meters should be 14 or 16 AWG (except sense leads on current transformer for AC ammeters). The provided 1/4" quick-connect lugs will accommodate wires of either gauge. For maximum accuracy, wire length should not exceed 10'.

M-MTR312-E



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## 2 1/2" PANEL METERS

### INSTALLATION AND WIRING INSTRUCTIONS

These instructions apply to the the following 2 1/2" NEWMAR panel meters:

<u>Model</u>	<u>Part Number</u>	<u>Model</u>	<u>Part Number</u>
8-16 DC VOLTMETER	023-9161-0	0-150 AC VOLTMETER	023-1500-0
16-32 DC VOLTMETER	023-1632-0	0-300 AC VOLTMETER	023-3002-0
0-50 DC AMMETER	023-0502-0	0-50 AC AMMETER	023-0301-0
0-100 DC AMMETER	023-1001-0	0-100 AC AMMETER	023-1001-2

Meters are designed for front panel mounting. Use the diagrams below to determine the proper dimensions for the panel cut-out. Use the threaded studs with nut and washer which protrude from the rear of the meter for securing the meter to the panel. Quick connect spade lugs are provided for attaching wiring to the meter.

Some meters require the installation of an external shunt, current transformer or dropping resistor (listed below). Ensure that the meter is properly installed with the necessary accessory as noted below and illustrated on the reverse of this page. Failure to do so will result in damage to the meter. *Note: External accessories listed here are provided with the meter. Contact the factory if any is missing from the packaging.*

**DC AMMETERS** - Require an external shunt.

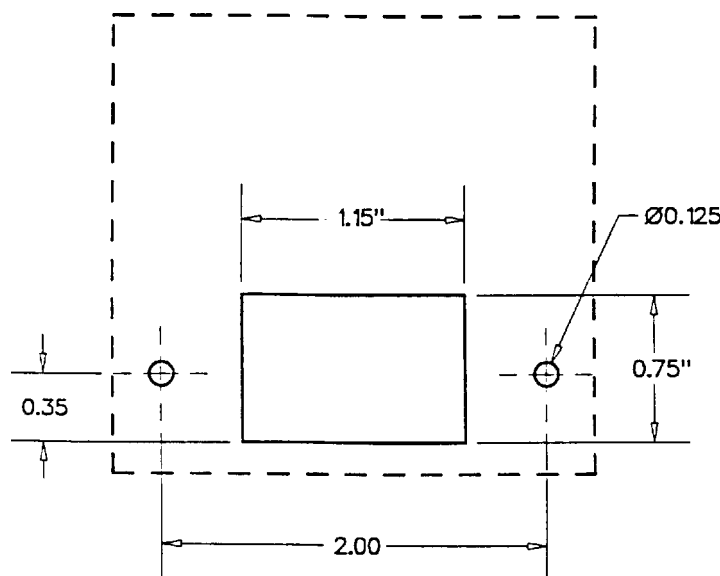
**AC AMMETERS** - Require an external current transformer.

**AC VOLTMETERS** - Require a resistor installed in-line with hot lead.

**DC VOLTMETERS** - No external device required.

#### MOUNTING HOLE PATTERNS

*Note: The Ammeter/Voltmeter illustration is actual size and may be used as a template when cutting and drilling the mounting surface.*



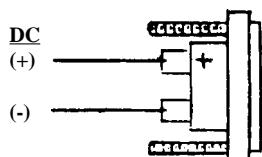
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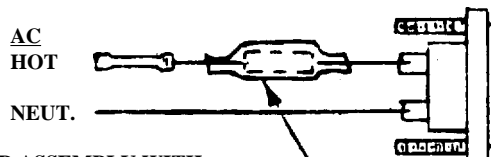
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## WIRING DIAGRAMS:

### DC VOLTMETERS

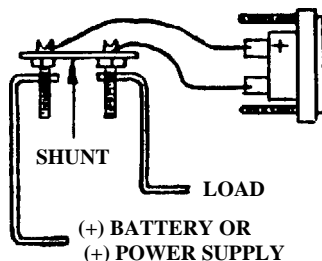


### AC VOLTMETERS



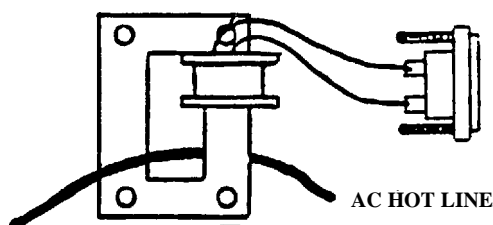
RESISTOR ASSEMBLY WITH INSULATING TUBING, LUG AND CRIMP SPLICE (MUST BE INSTALLED -- EITHER TERMINAL OK)

### 0-50 DC AMMETER

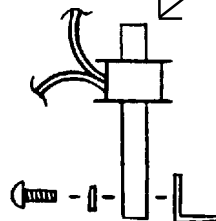


(+) BATTERY OR  
(+) POWER SUPPLY

### AC AMMETERS

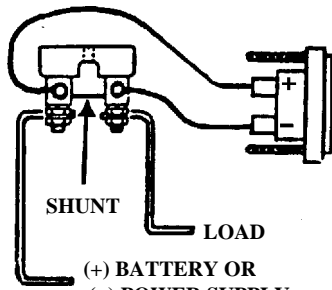


CURRENT TRANSFORMER



SECURE TRANSFORMER WITH MOUNTING BRACKETS PROVIDED. MUST BE AT LEAST 4" AWAY FROM METER OR FALSE READINGS WILL OCCUR

### 0-100 DC AMMETER



(+) BATTERY OR  
(+) POWER SUPPLY

Wiring to all meters should be 14 or 16 AWG (except sense leads on current transformer for AC ammeters). The provided 1/4" quick-connect lugs will accommodate wires of either gauge. For maximum accuracy, wire length should not exceed 10'.

M-MTR212-E



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