

Products Covered

VLP1-V-*	VLP1-V-*
PLP1-I-*	PLP1-V-*
ZLP1-*	CLP2-*
WLP2-*	



Caution: Risk of Danger

These instructions contain important safety information : Read before starting installation or servicing of the equipment



Caution: Risk of Electric Shock

Scope

This product range includes multiple functions:

AC Ammeters
AC Voltmeters
DC Ammeters and milliammeters
DC Voltmeters and millivoltmeters
Frequency Meters
P.F meters
Power meters

Marking and ratings

Barrel side labels show function and electrical rating. The terminals are connected directly across the input to be measured. Note that the electrical rating may differ from the dial scale marking, and the unit side label is definitive.

These meters are intended for a rated temperature range of 0-40 deg C and up to 80% relative humidity for temperatures up to 31 deg C, decreasing linearly to 50% relative humidity at 60 deg C, and only for indoor use and at an altitude of less than 2000m.

Installations

The meter should be installed in line with the requirements of the National Electrical Code (NEC) for USA or Canadian Electrical Code (CEC) for Canada. It should be installed in a dry position, not in direct sunlight and where the ambient temperature is stable and will not be outside the range noted above. These units are only for built in use, with terminals inaccessible to users after installation.

It is essential to make proper ANSI cut-out in the panel to make mounting possible, please refer diagram of ANSI panel cut-out as shown over the page.

Do not tighten the mounting nuts beyond the torque necessary to secure the meter to the panel.

please refer connection diagram for wiring guidelines

Note : Proper grounding of panel should be ensured before installation

Commissioning

The units are calibrated at the factory for full accuracy. No further adjustments are required except to check the zero position. With the meter in the intended altitude, adjust the centre slotted adjuster for scale zero without electrical input signal. It is recommended that after installation, test signals are applied to confirm correct indication.

*** For frequency meters & all offset zero meters :**

Give 3 minutes warm up time to meter before use.

Fusing and connections

Terminals are suitable for use with insulated M5 ring type lugs. Ensure a minimum spacing of 0.21 inches (5.5mm) between uninsulated parts of adjacent ring lugs. Fit the supplied lock nut to each terminal after the first nut to ensure that connections cannot come loose in service. Tighten terminal nuts to 1.5Nm (13lb-in) & Mounting nuts to 0.4Nm (4lb-in). Wiring must comply with class 1 requirements. These products do not have internal fuses therefore external fuses must be used for safety protection under fault conditions. voltage input lines where required must be fused with a UL/CSA approved 1A type F with breaking capacity of 35A or greater is recommended, voltage no less than highest circuit voltage connected to the meter. Current metering circuits directly connected in line with the load must be fused at the rated current for the meter, unless the circuit into which they are connected is limited so that it cannot deliver excessive current. Do not fuse CT circuits.

The equipment into which this meter is installed must have definite means of isolating the supply voltage to permit safe access for subsequent maintenance.

Extreme voltage transformers (PTs) and current transformers may be used where appropriate to extend the range, provided that the ratings marked on the side label are not exceeded at point of connection to meter. These products are designed for permanently connected use, normal condition measurement category III, pollution degree 2 (e.g. non ventilated panels or ventilated panels with filters, without condensation occurring), basic insulation, for rated voltage.

Choice of associated components

A table giving guidance of choice of fuses, connection cable and ring lugs is shown over the page.

Choose fuses for a voltage rating equal to or exceeding the rated voltage of the circuit into which the meter is connected and of a type and with a breaking capacity appropriate to the supply to which the fuse is connected. Connection wires and ring lugs should be approved for at least 1A for voltage and auxiliary lines and to at least the rated current for current measuring circuits. Additionally, wires for current meters rated over 50mA must be rated at 75 Deg C or greater. Ensure cables and lugs have a voltage installation rating equal to or greater than the rated voltage of the circuit to which they are connected.

Note that minimum wire current rating for CT circuit ensure that the wire is capable of carrying the current safely. however it may be desirable to use higher gauge wiring particularly for long cable runs to ensure that the CT VT rating is not exceeded and its accuracy impaired.

Maintenance

As required wipe the front face with a damp cloth, ensuring that no moisture enters the unit or penetrates behind the mounting panel. No maintenance is required beyond periodically checking the mechanical zero of the meter as described in "commissioning", if necessary removing any accumulations of dust or other forging matter from the terminal area and ensuring that the connections remain tight.

Warning:

- During normal operations, voltages hazardous to life may be present at some of the terminals of this unit. Installation and maintenance should be performed only by qualified, properly trained personnel abiding the local regulation. Ensure that all supplies are de-energised before attempting connection or other procedures.
- Never open circuit the secondary winding of an energized current transformer.
- If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.

Electromagnetic Compatibility.

This unit has been designed to provide protection against the interference in line with requirements of FCC and other regulations. Precautions are necessary for proper operation of this meter. Please follow the general guidelines as given below.

- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- The auxiliary supply to the unit should not be subjective to excessive interference. In some cases, a supply line filter may be required.
- To protect the product against incorrect operations or permanent damage, surge and transients must be controlled. It is good EMC practice to suppress the transients and surges at the source.
- Screened small signal leads are recommended and may be required. Connecting the leads may require the fitting of RF suppression components, such as ferrite absorber or line filters.
- It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosure that protect against electrical interference causing a disturbance in function.

INSTALLATION INSTRUCTIONS

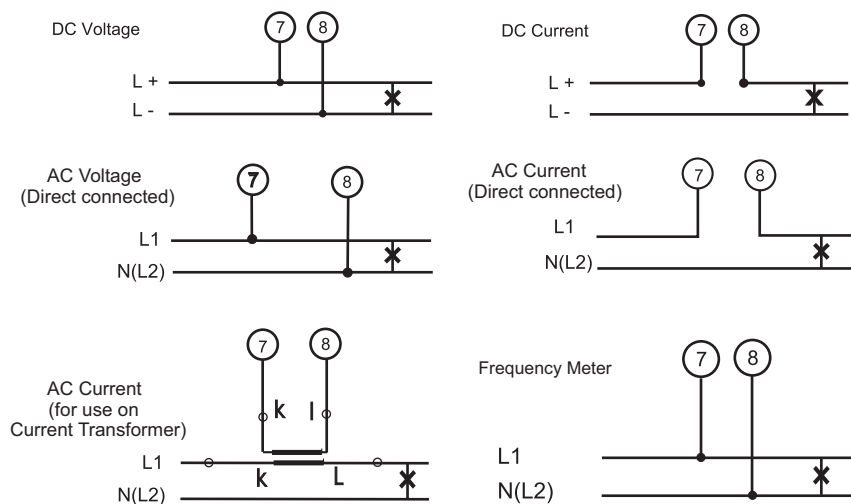
Selection of Fuses, Connection Cable and Ring Lugs

Circuit	Fuse Rating	Connection wire rating	Ring lug rating
Voltage and auxiliary lines	UL/CSA approved 1A type F with breaking capacity of 35A or greater, voltage no less than highest circuit voltage connected to meter.	1A, voltage rating no less than highest circuit voltage connected to meter	1A, voltage rating no less than highest circuit voltage connected to meter.
Current circuit measuring whole current	Current rating as meter rated current. voltage rating no less than voltage of circuit being measured	Current rating as meter rated current, voltage rating no less than voltage of circuit being measured. For DC current circuits rated at greater than 50mA, a wire with a temperature rating of greater than 75 deg C must be used.	Current rating as meter rated current. voltage rating no less than voltage of circuit being measured
CT secondary	CT circuits should not be fused	Current rating* as meter rated current voltage rating no less than voltage of circuit being measured.	Current rating as, meter rated current, voltage rating no less than voltage of circuit being measured

Choose UL approved fuses, connection wires and ring lugs if the installation is to be UL requirements or CSA approved items of the installation is to be to CSA requirements.

*Note that minimum wire current ratings for CT circuits ensure that the wire is capable of carrying the current safely, however it is often desirable to use larger gauge wiring, particularly for long cable runs to ensure that the CT VA rating is not exceeded and it's accuracy impaired.

Connection Diagram



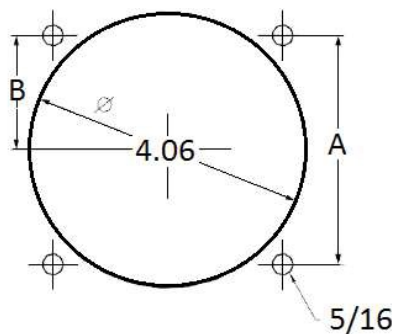
Electrical Ratings Available

PRODUCT	AC AMMETER	AC VOLTMETER	DC AMMETER	DC VOLTMETER	FREQUENCY METER
PANEL RATING	600V	600V	600V	600V	600V
POWER	0.5VA	0.8VA	0.5VA	0.5VA	0.5VA
MEASURING RANGE	1A UPTO 30A	150V UPTO 600V	200uA UPTO 300A	50mV ⁽¹⁾ UPTO 600V	45Hz TO 420Hz / 110V TO 480V

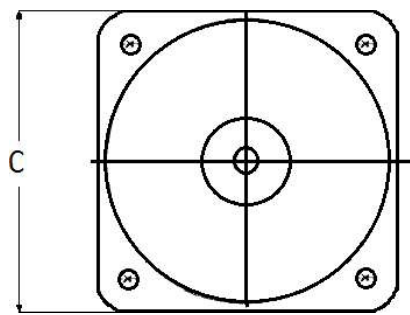
(1) Total lead resistance of 0.035 Ohm is considered for mV ranges while calibration.

Dimensions

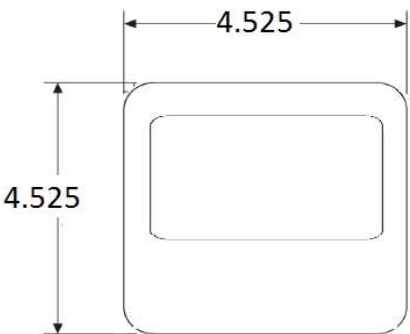
Short & Long Case



Panel Cutout



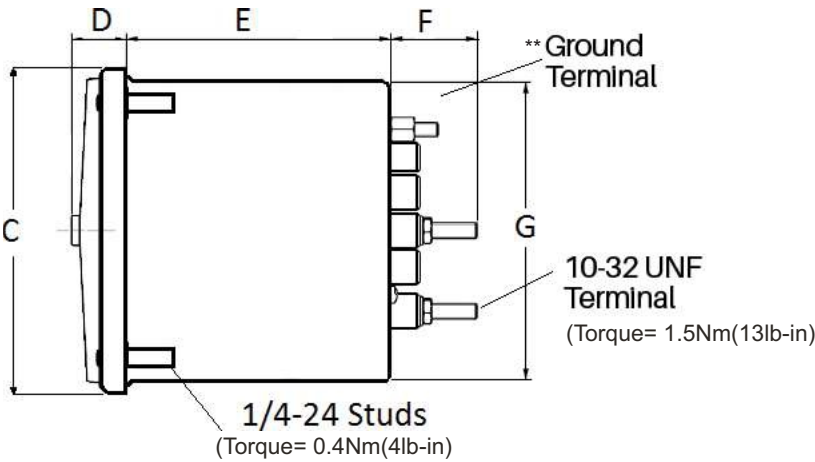
Front



Front Digital Synchroscope

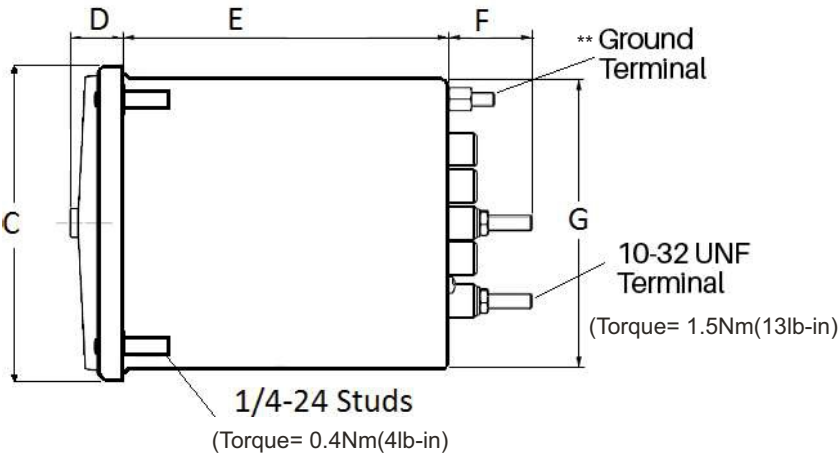
Short Case - AC V / A, DC V / A, Hz, and Tach.

	MCS
	INCHES
A	3.37"
B	1.69"
C	4.30"
D	0.65"
E	2.25"
F	0.98"
G	3.95"



Long Case - Watt, Var, Power Factor, Synchroscope

	MCS	
	Wattmeter, Varmeter, PF	Synchroscope Digital
A	3.37"	3.37"
B	1.69"	1.69"
C	4.30"	4.525"
D	0.65"	0.77"
E	3.35"	3.35"
F	1.12"	1.12"
G	3.95"	3.95"



(All dimensions are in inches)

**** Note:** The case shall be bonded to ground by Earthing Terminal provided at the base of meter.

