Installation and Operating Instructions

Analogue Instruments

Panel Indicators - Challenger Series

Products Covered

361-**, 362-**, 363-** 364-** (* = additional characters)

Scope

This product range includes multiple functions:
AC Ammeters and AC Voltmeters
DC Ammeters
DC Voltmeters
Frequency meters

Markings 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.
INDOOR USE
These meters are intended for a rated temperature range of 0 to +40°C and at an altitude not exceeding 2000m.
Maximum Relative Humidity 80% for temperatures up to 31°C decreasing linearly to 50% Relative Humidity at 40°C
Pollution Degree 1 or 2
Measurement Category III

Installation

The product should be panel mounted using the mounting kit provided. Consideration should be given to the space required behind the unit to allow for bends in the connecting cables. Additional protection to the panel may be obtained by the use of an optional panel gasket. The terminals at the rear of the case should be protected from liquids. Units should be mounted in a reasonably stable ambient temperature.

The unit should not be mounted where it can be subjected to excessive direct sunlight and vibration should be kept to a minimum. Connection wires should be sized to comply with local regulations and should be terminated on to tags suitable for screw connection. The products do not have internal fuses, therefore; external fuses **must** be used for safety protection under fault conditions.

Fusing and Connections

Connection diagrams should be carefully followed to ensure correct polarity. Terminals are suitable for use with insulated ring lugs.
Voltage input lines where required should be fused with a quick blow fuse 1A maximum. Current metering circuits directly connected in line with the load must be fused at the rated current for the meter. Do not fuse CT circuits.
The equipment into which this meter is installed must have an adjacent means of isolating the supply voltage to permit safe access for subsequent maintenance.
External 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.

Safety

Caution
Risk of Electric Shock

Warnings

- **During normal operation, voltages hazardous to life may be present at some of the terminals of this unit.**
- **At voltages below that specified in the Range of Use the meter may shut down. However, voltages hazardous to life may still be present at some of the terminals of this unit.**
- **Installation and servicing should be performed only by qualified, properly trained personnel abiding by local regulations.**
- **Ensure all supplies are de-energised before attempting connection or other procedures.**
- **Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.**
- **This unit is not intended to function as part of a system providing the sole means of fault protection - good engineering practice dictates that any critical function be protected by at least two independent and diverse means.**
- **The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.**
- **Never open-circuit the secondary winding of an energized current transformer.**
- **This product should only be operated with the CT secondary connections earthed.**
- **If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.**

It is essential that the primary current is isolated BEFORE connecting or disconnecting the secondary current connections.

The unit is designed in accordance with BS EN 61010-1:2010 (IEC 61010-1:2010) – Permanently connected use, Normal condition. Installation category III, pollution degree 1 or 2, basic insulation for rated voltage. Measurement Category III.

EMC Installation Requirements

- Whilst this unit complies with all relevant FCC and other (electro-magnetic compatibility) regulations, any additional precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:
- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- The supply to the unit should not be subject to excessive interference. In some cases, a supply line filter may be required.
- To protect the product against incorrect operation or permanent damage, surge transients must be controlled. It is good EMC practice to suppress transients and surges at the source. The unit has been designed to automatically recover from typical transients; however, in extreme circumstances it may be necessary to temporarily disconnect the supply for a period of greater than 10 seconds to restore correct operation.
- Screened communication leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.
- It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

Symbols

Caution
Risk of Electric Shock

Refer to Manual

Do NOT Discard

Maintenance

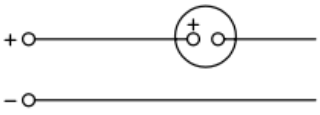
As required, wipe the front face with a damp cloth, ensuring that no moisture enters the unit or penetrates behind the mounting panel. No maintenance is required beyond periodically checking the mechanical zero of the meter as described overleaf in “commissioning”, if necessary removing any accumulations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

Commissioning

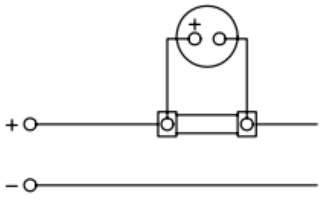
The units are calibrated at the factory for full accuracy. No further adjustments are required except to check the zero position. With the meter in the intended attitude, adjust the centre slotted adjuster for scale zero without electrical input signal. It is recommended that after installation, test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

Connections

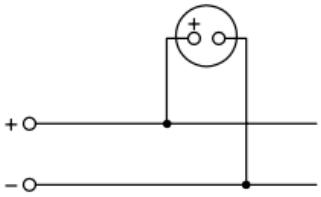
DC amps - self contained



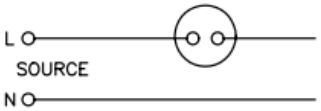
DC amps - for use with external shunt



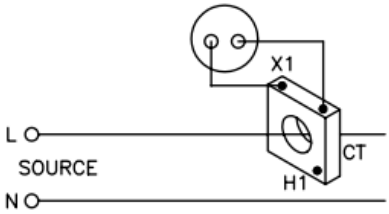
DC volts



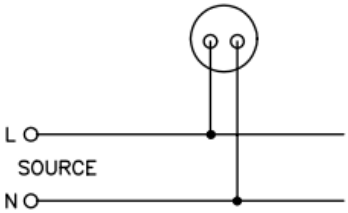
AC amps - self contained



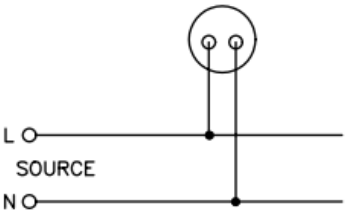
AC amps - For use with current transformer



AC volts

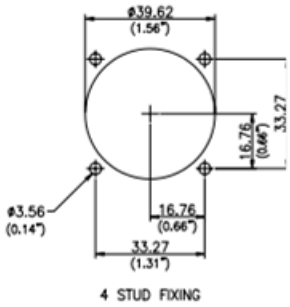


Frequency meter

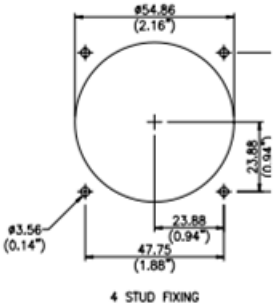


Panel Requirements

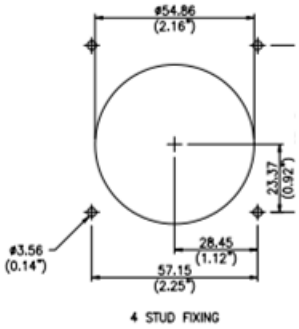
Model 361
surface mount cut-out



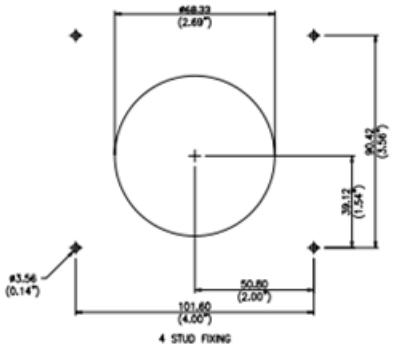
Model 362
surface mount cut-out



Model 363
surface mount cut-out



Model 364
surface mount cut-out



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