

# CHALLENGER ANALOGUE PANEL METERS



## Features

- Measurement and indication of AC amps, volts, frequency and DC signals
- Surface or window mounting
- Rear zero adjuster on moving coil meters
- High torque pivot and jewel movement
- True RMS measurement meters
- AC and DC inputs
- Up to 40A DC direct connected
- Up to 50A AC direct connected

## Benefits

- AC moving iron and moving coil mechanisms
- Reduced inventory
- 4 ANSI standard case sizes
- Detachable lower fascia plate
- Easy to modify for distributors
- Through holes for back of panel mounting

## IP54 (NEMA 3) protection Applications

- Marine panels
- Switchgear
- Distribution systems
- Control panels
- Embedded generation
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor monitoring

## Compliant with

- ANSI C39.1 1981
- IEC 51
- UL3111-1
- EMC
- LVD
- UL and CUL file no: E236986

The Challenger range of analogue panel meters offers accurate measurement and indication of most electrical and electronic parameters in industry standard 1½", 2½", 3½" and 4½" case sizes. This innovative design features a detachable lower fascia plate, which allows the flexibility of either surface or window mounting. The fascia is simply unclipped to achieve the completely flush panel appearance of rear of panel window mounting.

The range offers AC and DC ammeters, voltmeters and frequency meters utilising a high torque pivot and jewel movement. AC moving coil rectified meters provide 1.5% accuracy of the full scale value and feature a rear zero adjuster screw for tamperproof installation. AC moving iron meters also provide 1.5% high accuracy and true RMS measurement.

## Operation

The Challenger analogue panel meters utilise a traditional pivot and jewel movement, incorporating specially hardened steel pivots and a spring loaded jewel. This robust mechanism is ideally suited for all applications, including the most demanding conditions.

## Moving Coil Meters

These meters offer a centre cored, self-shielding moving coil movement using pivots, hairsprings and sprung jewels. Variations in movement are limited by design. All DC voltmeters are 1000 ohms per Volt, moving coil rectified products run at 900 ohms per Volt. Millivolt meters use a 5 milliamps/50mV movement.

## Moving Iron Meters

This clapper type repulsion design utilises a pivot, hairspring and jewel movement. The bottom jewel is oil filled to provide damping while the top is sprung for resilience. All voltmeters are manufactured with internal voltage dropper resistors.

## Frequency Meters

Frequency meters utilise a 1mA/35 ohm DC moving coil movement driven by an EMC hard frequency conversion circuit.

## Dials, Pointers and Scales

Standard dials are matt white with black printed scales and a tubular knife-edge black matt pointer. The 90° scales are balanced within 1% of scale length and feature a highly repeatable flattened arc scale shape, ensuring consistently accurate measurement readings. Dials are interchangeable between the Challenger meters for inputs within the published specifications of the meter. Options for non standard customised dials are available upon request.

## Current Transformers and Shunts

Crompton Instruments, a Business Unit of TE Connectivity Ltd, offers a comprehensive range of current transformers and shunts, for driving the Challenger panel meters for the safe and simple measurement of AC and DC currents.

Our extensive range of current transformers provides accurate measurement of AC current and ratio matching to a consistent 5 or 1 amp secondary current, proportional to the primary current.

Our range of shunts ensures a DC millivolt signal exactly proportional to the system current for driving ammeters, providing accurate measurement of DC current up to 12000A, with secondary inputs of, 50, 60, 75 or 100mV DC to match the Challenger input.



Model 361 (1 1/2")



Model 362 (2 1/2")



Model 363 (3 1/2")



Model 364 (4 1/2")

## Specifications

|  |  |
|--|--|
| <b>Accuracy</b>                            |  |
| DC ammeters and voltmeters:                | 1.5% 0-100% of full scale deflection   |
| AC ammeters and voltmeters:                | Moving iron: 1.5% 10-100% of full scale deflection<br>Moving coil: 1.5% 10-100% of full scale deflection |
| Frequency meters:                          | 0.5% of end scale value  |
| <b>Input ratings</b>                       |  |
| DC moving coil ammeters:                   | 50µA - 40A DC. (Model 361: 10A max)  |
| DC moving coil voltmeters:                 | 50mV - 600V DC   |
| DC moving coil centre zero ammeters:       | +/-50mA to +/-40A DC. (Model 361: 10A max)   |
| DC moving coil centre zero voltmeter:      | +/-50mV to +/-600V DC. Standard 1k ohm/volt  |
| DC moving coil suppressed zero ammeters:   | 4/20mA DC  |
| DC moving coil suppressed zero voltmeters: | 1/5, 8/16, 16/32 or 12/24V DC  |
| AC moving coil ammeters:                   | 100µA - 750mA AC   |
| AC moving coil voltmeters:                 | 20 - 600V AC. Standard 900 ohms/volt   |
| AC moving iron ammeters:                   | 1 - 50A AC (Model 361: non applicable)   |
| AC moving iron voltmeters:                 | 3 - 600V AC (Model 361: non applicable)  |
| Frequency:                                 | 100/130V, 200/250V, 360/440V, 50Hz, 60Hz or 400Hz (Model 361: non applicable)                            |
| Burden:                                    | Ammeter: 0.5VA Voltmeter: 4.5VA  |
| Frequency:                                 | 4VA  |
| Overload:                                  | 1.2 continuous x 10 for 0.5 seconds  |
| <b>Enclosure</b>                           |  |
| Movement:                                  | High torque pivot and jewel moving coil and moving iron  |
| Scale balance:                             | Within 1% of scale length  |
| Relative humidity:                         | 25% - 80% nominal range of use   |
| Operating temperature:                     | 0°C to +40°C (-32°F to +104°F)   |
| Storage temperature:                       | -20°C +55°C (-4°F to +131°F)   |
| Case and lower mask:                       | Black matt case UL94V. Polycarbonate cover   |
| Window:                                    | Shatterproof polycarbonate   |
| Surface mounting:                          | 4 corner studs   |
| Rear of panel mounting:                    | 2 through hole mounts (Model 361: facility pending)  |
| <b>Compliant with</b>                      |  |
| UL and CUL:                                | 61010B-1 File no: E236986  |
| Performance:                               | ANSI C39.1 1981 and IEC 51   |
| Scaling:                                   | ANSI C39.1 1981  |
| Safety:                                    | IEC61010-1 (LVD) and BS EN61326:1998 (EMC)   |
| Vibration:                                 | ANSI C39.1 1981 cl. 5.13   |

## Product Codes

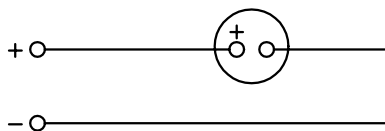
| Input                                | Model 361 cat. no. | Model 362 cat. no. | Model 363 cat. no. | Model 364 cat. no. |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|
| DC moving coil amps                  | 361-01A            | 362-01A            | 363-01A            | 364-01A            |
| DC moving coil volts                 | 361-01V            | 362-01V            | 363-01V            | 364-01V            |
| DC moving coil centre zero amps      | 361-01C            | 362-01C            | 363-01C            | 364-01C            |
| DC moving coil centre zero volts     | 361-01N            | 362-01N            | 363-01N            | 364-01N            |
| DC moving coil suppressed zero amps  | 361-01R            | 362-01R            | 363-01R            | 364-01R            |
| DC moving coil suppressed zero volts | 361-01S            | 362-01S            | 363-01S            | 364-01S            |
| AC moving coil amps                  | 361-01B            | 362-01B            | 363-01B            | 364-01B            |
| AC moving coil volts                 | 361-01W            | 362-01W            | 363-01W            | 364-01W            |
| AC moving iron amps                  | N/A                | 362-02A            | 363-02A            | 364-02A            |
| AC moving iron volts                 | N/A                | 362-02V            | 363-02V            | 364-02V            |
| Frequency                            | N/A                | 362-41S            | 363-41S            | 364-41S            |

Please specify current, voltage, frequency and required options at time of ordering.

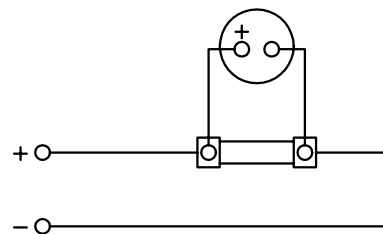


### Connections

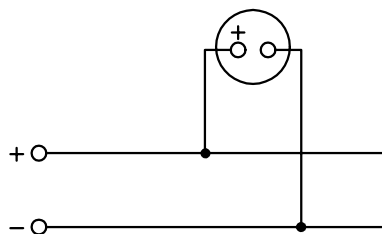
DC Amps - Self contained



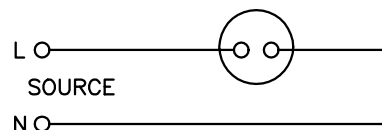
DC Amps - For use with external shunt



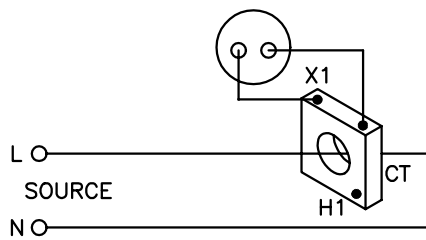
DC Volts



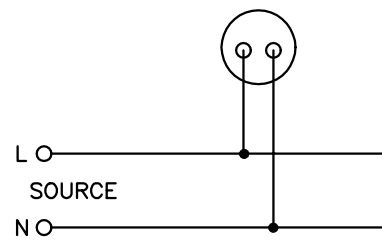
AC Amps - Self contained



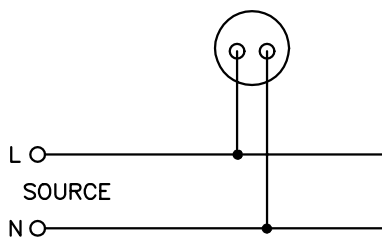
AC Amps - For use with current transformer



AC Volts

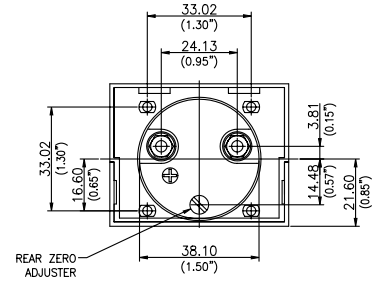
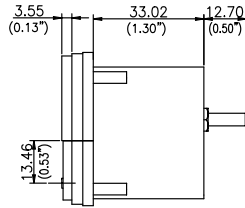
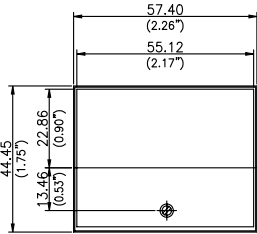


Frequency Meter

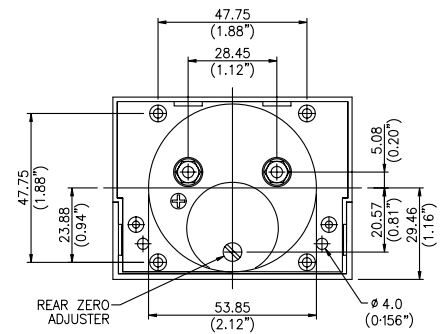
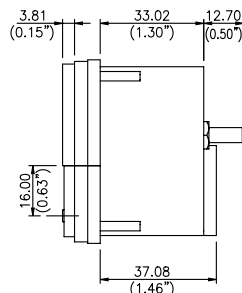
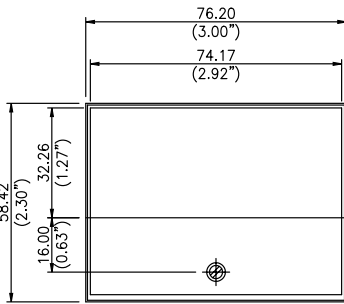


## Dimensions - Surface Mount

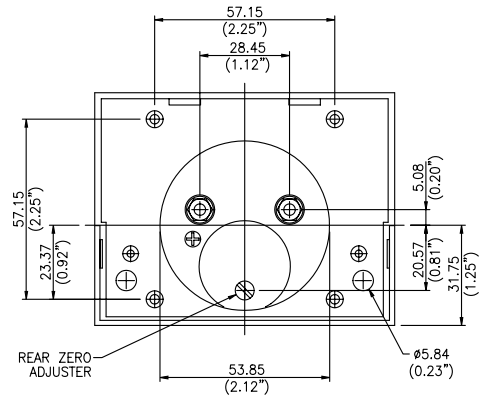
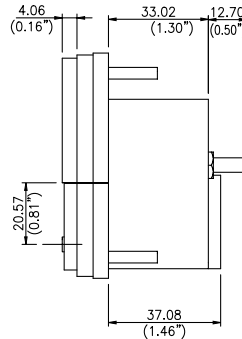
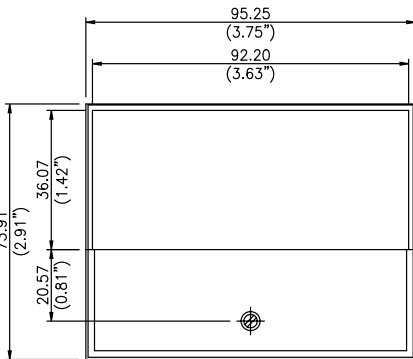
### Model 361



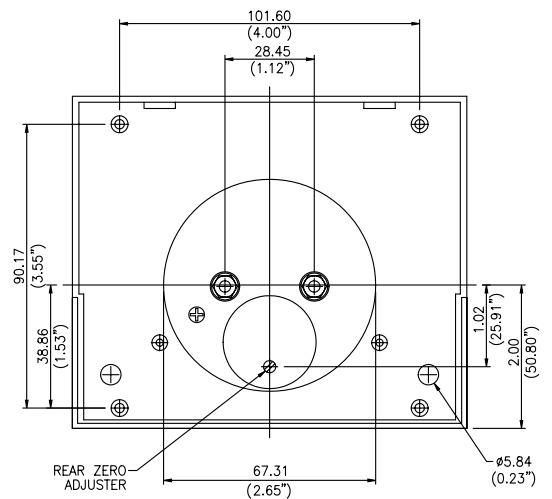
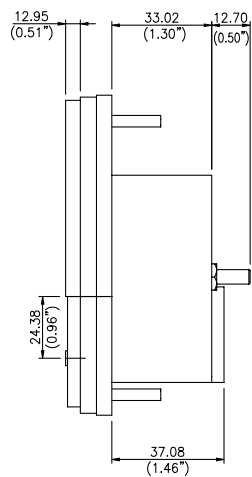
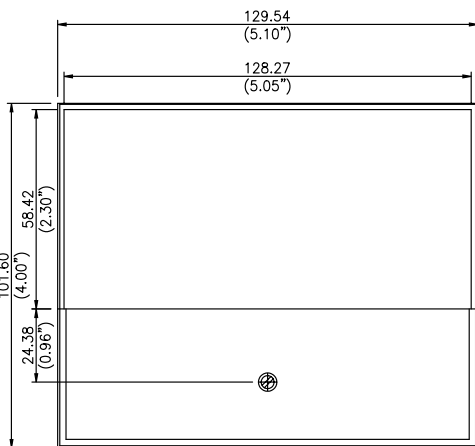
### Model 362



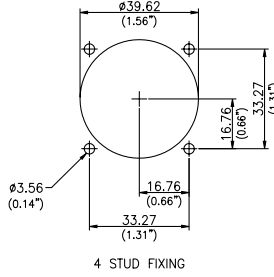
### Model 363



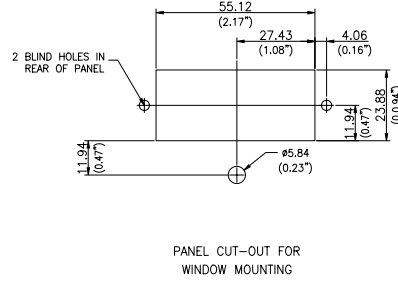
### Model 364



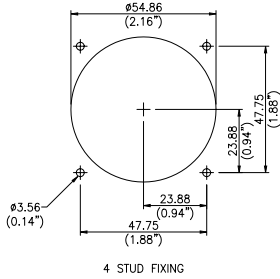
**Model 361**  
Surface Mount Cut-out



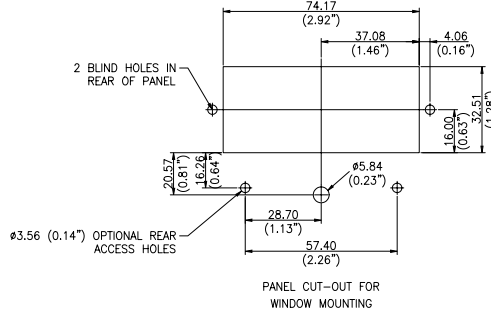
**Window Mount Cut-out**



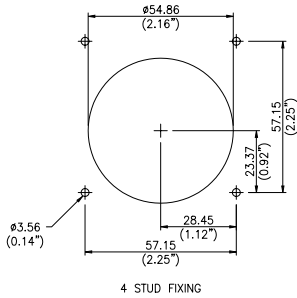
**Model 362**  
Surface Mount Cut-out



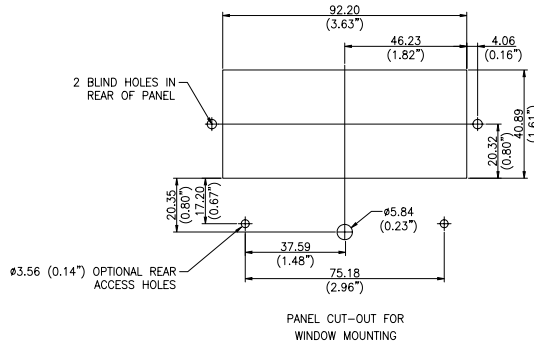
**Window Mount Cut-out**



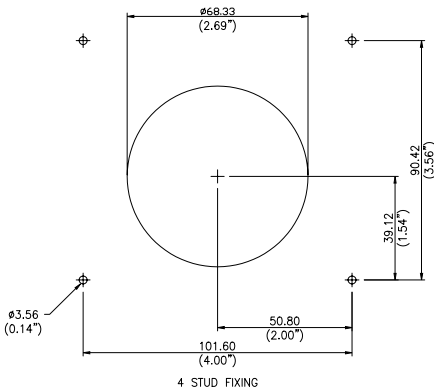
**Model 363**  
Surface Mount Cut-out



**Window Mount Cut-out**



**Model 364**  
Surface Mount Cut-out



**Window Mount Cut-out**

