

# Analogue Panel Instruments

We offer a comprehensive range of analogue and panel instruments for use in control and instrumentation systems. The range includes moving-iron and moving-coil mechanisms in a variety of formats, scales and sizes. All our panel meters are robust, accurate and constructed from high-quality materials to give a long service life. Ammeters, voltmeters and power meters are available with a large range of scales and can be further customised for special applications.



## Application

- HV and LV switchgear panels
- Control and relay panels
- Power control centre (PCC) panels
- Motor control centre (MCC) panels
- Test benches
- Laboratory equipment

## Benefits

- Easy to install, with snap-in mounting
- Well proven instrument designs for high quality and reliability
- Complete product range for a wide range of applications
- Low power consumption
- No need for additional magnetic shielding

## Features

- Range of standard front panel sizes: 48x48, 72x72 and 96x96 mm
- Range of scales: quadrant (90°), circular (240°) and edgewise
- Options for different mounting positions: horizontal, vertical or angled
- Optional protective coatings and materials for use in tropical environments
- Ingress protection rating IP 54 across the range (option for IP 65)
- Wide temperature range: -25 °C to +50 °C
- Adjustable red markers for meters with quadrant scales
- Models available for AC or DC measurement
- Measured parameters:
  - Current
  - Voltage
  - Frequency
  - Power (active or reactive)
  - Power factor
  - Maximum demand (current)
- Synchronisation (pointer synchroscope, twin voltmeter or twin frequency meter)

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## Technical specifications

### Moving Iron Instruments: AC Ammeters and Voltmeters

Scale type	Quadrant (90°)
Front panel size	48x48, 72x72 or 96x96 mm
Linearity	From 20% to 100% of full range
Frequency	50 to 60 Hz (default)
Measuring ranges	13 models cover 250 mA to 60 A (plus 1 A or 5 A via current transformer) 13 models cover 6 V to 800 V (plus 100 V or 110 V via voltage transformer)
Overload capability	1.2x Un continuously, 2x Un for 5 s, 2x In continuously, 10x In for 10 s CT-operated ammeter: 50x In for 1 s

### Moving Coil Instruments: DC Ammeters and Voltmeters

Scale type	Quadrant (90°), circular (240°) or edgewise (70°)
Front panel size	48x48, 72x72 or 96x96 mm (quadrant or circular scale) 48x24, 72x24 or 96x48 mm (edgewise scale)
Linearity	Full range
Frequency	50 to 60 Hz (default)
Measuring ranges	
Quadrant scale	30 models cover 100 µA to 25 A   22 models cover 60 mV to 600 V
Circular scale	26 models cover 600 mA to 25 A   22 models cover 60 mV to 600 V
Edgewise scale	23 models cover 100 µA to 1 A   16 models cover 1 V to 600 V
Overload capability	1.2x Un continuously, 2x Un for 5 s, 2x In continuously, 10x In for 10 s

### Moving Coil Instruments: AC Ammeters and Voltmeters

Scale type	Quadrant (90°), circular (240°) or edgewise (70°)
Front panel size	48x48, 72x72 or 96x96 mm (quadrant or circular scale)
Linearity	Full range
Frequency	50 to 60 Hz (default)
Measuring ranges	
Quadrant scale	18 models cover 400 mA to 1 A (plus 1 A or 5 A via current transformer) 12 models cover 6 V to 600 V (plus 110 V via voltage transformer)
Circular scale	16 models cover 1 mA to 1 A (plus 1 A or 5 A via current transformer) 12 models cover 6 V to 600 V (plus 110 V via voltage transformer)
Overload capability	1.2x Un continuously, 2x Un for 5 s, 2x In continuously, 10 In for 10 s

### Maximum Demand Ammeter with Bimetallic Movements (With or Without Moving-iron Ammeter)

Scale type	Quadrant (90°)
Front panel size	48x48, 72x72 or 96x96 mm
Setting time	15/8 minutes
Frequency	15 to 100 Hz
Measuring range	25 models cover 0-6 A to 0-4.8 kA (via 1 A or 5 A current transformer)

### Power Meters (Active and Reactive) and Power Factor Meters

Scale type	Quadrant (90°) or circular (240°)
Front panel size	96x96 mm
Frequency	40 to 65 Hz
Measuring range	Input current: 1, 2, 5 or 10 A (power meters only) Input voltage: 100, 110, 230, 400 or 500 V

### Frequency Meters

Scale type	Quadrant (90°)
Front panel size	72x72 or 96x96 mm
Voltage	110, 230 or 400 V
Measuring range	46-54 Hz, 56-64 Hz or 375-425 Hz

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