



Data Sheet

Moving Iron Meter AC Ammeters & Voltmeters 90°

EQ



Measure



Control



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Application

The moving iron, panel meters, EQ 48/ 72 / 96/144 housed in moulded polycarbonate cases are suitable for the measurement of AC currents and voltages in the usual frequency range of 15...100Hz.

Moving iron meters indicate rms-values practically independent of waveform even of high harmonic. Error of indication may occur for extreme waveforms (e.g. phase gating controls) & for frequencies above 100Hz.

These meters offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a single Cut out (Mosaic mounting). For CT operated ammeters, dials can be fitted based on CT ratio. Front window glass and bezel can be easily replaced.

Features

- Scale interchangeability.
- Near linear scale.
- Glass filled polycarbonate housing. (UL 94 V-0)
- Easy installation with swivel screws.
- Knife edge pointer.
- Easily replaceable glass and bezel.

Movement

Moving iron movement has pivots of very high hardness. Movement suspended between spring loaded sapphire jewels. Movement is critically damped by use of silicon oil.

Specifications

Scale and Pointer

Pointer	: Knife - edge pointer
pointer deflection	: 0 ... 90°
Scale characteristics	: Near Linear above 10% of nominal full Scale value
Scale division	: Coarse - fine
Scale length	: EQ48 EQ72 EQ96 EQ144 41mm 63mm 97mm 146mm

Over Range :	
Ammeters	: 2 times nominal current
Voltmeters	: 1.2 times nominal voltage
voltage transformer	
scale Interchangeability	: Interchangeable

Mechanical Data

Case details	: Moulded square case suitable for mounting in Control/ Switchgear panels, Machinery consoles.
Case material	: Glass filled polycarbonate, flame retardant and drip proof as per UL 94 V-0.

Front fascia	: Glass
Colour of bezel	: Black
Position of use	: Vertical
Panel fixing	: Swivel screws
Mounting	: Stackable in a single cutout
Panel thickness	: ≤ 25 mm

Terminals	
Voltmeters & ammeters ≤ 30A	: Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Ammeters > 30A	: Threaded studs M6 with Nuts
Ammeters > 60A	: Threaded studs M8 with Nuts

Electrical Data

Measuring quantity	: AC voltage or current
Power consumption	:
Voltmeters	: < 4.5VA
Ammeters < 15A	: < 0.5VA
Ammeters > 15A	: < 0.8 VA
Overload capacity	: (acc. to IS: 1248 / IEC 51)
Continuously	: 1.2 times rated voltage current
Short duration Voltmeters	: 2 times rated voltage max 1000V, upto max 5 seconds.
Ammeters	: EQ 48 EQ72/96/144
5s max.	: 10 times(200 A max). 10 times
1s max	: -- 40 times(250 A max.)
Enclosure code (IEC 529)	: IP 52 case IP 00 for terminals without back cover IP 20 for terminals with back cover
Insulation class	: Group A according to VDE 0110
Rated insulation voltage	: EQ48 : 660V EQ72/96/144: 1000V
Proof voltage	: EQ48: 2kV EQ72/96/144: 3kV
Installation category	: EQ48: 300V CAT III EQ72/96/144: 600V CAT III
Insulation resistance	: > 50 Mohm at 500 V d.c

Reference Conditions

Accuracy class	: 1.5 according to IS: 1248
Reference conditions	: (IEC 51/ DIN EN 60051)
Ambient temperature	: 23°C ± 2
Position of use	: Nominal position ± 1°
Input	: Rated value of measured quantity
Waveform	: sine wave, distortion factor ≤ 5 %
Frequency	: 45...65Hz
Other conditions	: IS : 1248 (IEC 51/ DIN EN 60051)

Nominal Range of Use

Ambient Temperature	: -5...50°C
Position of use	: Vertical ± 5°
Frequency	: 15 ...100Hz (Voltage) 15...400Hz (current)
External magnetic field	: At 0.4 kA/m

Environmental Conditions

Climatic suitability	: Climate category II as per IS : 1248 (climatic class 3 according to VDE/VDI 3540)
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Operating temperature	: -5... + 50°C
Storage temperature	: - 40... + 70°C
Relative humidity	: ≤ 75% annual average, non-condensing
Shock resistance	: 15g _n 11 ms
Vibration resistance	: 10-55-10 Hz/0.15 mm 1.5g _n at about 50 Hz.

Standard Measuring Ranges

A. C. Voltage

6V
10V
15V
25V
40V
60V
100V
120V
132V
150V
200V
250V
300V
400V
500V
600V
750V (except EQ 48)
1000A (except EQ 48)
For use on voltage transformer
.../100V secondary
.../110V secondary

A. C. Current

100mA
150mA
250mA
400mA
600mA
1A
1.5A
2.5A
3 A
4 A
5 A
6 A
10 A
15 A
20 A
25 A
30 A
40A
5 0 A
60A
100A (except EQ 48)
for use on current transformer
.../1A secondary
or .../5Asecondary

Applicable Standards

Nominal case and cutout dimensions for indicating Electrical instruments : IS 2419 DIN 43700

Scale & pointer for electrical measuring instruments : IS 1248 DIN 43802

Connections and Terminal markings for panel meters : IS 1248 DIN 43807

Terminal bolts / leads. : DIN 46200/46282

Safety requirements & protective measures for Electrical indications instruments and their accessories. : IS 9249-1979 DIN 40050/8-70, : VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529, IEC 1010

Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories Environmental conditions : IS 1248 EC51/DINEN60051 DIN 43701 : IS 1248 IS: 9000, Part 5, 7, 8, VDE / VDI 3540

Front frames for indicating measuring : DIN 43718

instruments Principle dimensions UL	
Combustibility Class	: UL 94 V-0
Comply with following European directives	: 89 / 336 / EEC (EMC Directive), 73/23/EEC (low voltage directive) & ammendment 93/68/eec, for CE Marking

Options

Front facia	: Antiglare glass
Colour of bezel	: Red, Yellow, Blue, White
Red index pointer	: Front adjustable on site
Position of use	: on request 15°...165°
Dial	
Blank dial	: With initial and end values marked.
Special markings	: Numbering/ Lettering.
Division dials	: Basic divisions without numbering.
Colour markings/bands	: Red or green
Over range (ammeters)	: No over range or 6 times over range over nominal current
Enclosure code	: IP 65 case

Accessories

Safety Terminal Protection

Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc.to IS 9249, VDE 0410.

Safety Precautions

- 1) Instruments with damaged bezels or window glasses must be disconnected from the mains.
- 2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
- 3) The back cover must be snapped into place after connector wires have been clamped for protection against accidental contact.
- 4) Scales may only be replaced under voltage - free conditions.
- 5) Bezels and window glasses may only be replaced under voltage - free Conditions.



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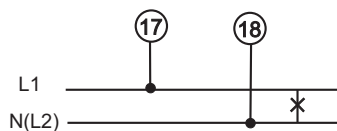
Analyze



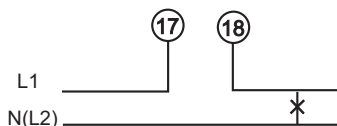
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Connections

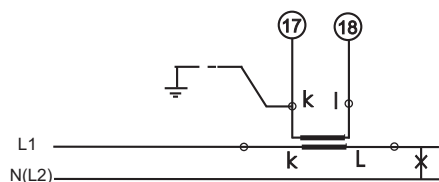
AC Voltage (Direct connected)



AC Current (Direct connected)

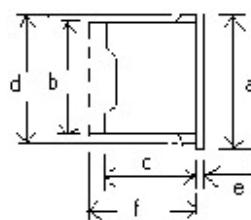


AC Current (for use on current Transformer)

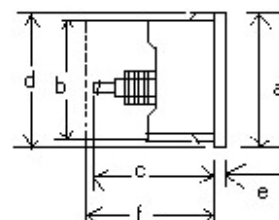


Dimensions

For Voltmeters &
Ammeters upto 30A



For Ammeters > 30A



Dimensions (in mm)	EQ 48	EQ 72	EQ 96	EQ 144
Bezel	a 48	72	96	144
Case	b 43.5	66	90	136
Depth	c* 53	53	53	53
	d 44.5	67.5	91.5	137.5
	e 5.5	5.5	5.5	5.5
Cotout Size	45 ^{+0.6}	68 ^{+0.7}	92 ^{+0.8}	138 ⁺¹
Depth with Back cover	f** 64	64	64	64
	* c=62mm, for I > 30A & up to 60A			
	* c = 67 mm, for I > 60 A			
	** f = 69.5mm, for I > 60 A			
	** f = 75mm, for EQ 48 I > 30 A			
Weight (approx.)	0.1 kg.	0.16 kg.	0.2 kg.	0.4 kg.



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Ordering Information

Type EQ	Moving-iron panel meter
Front dimension 48, 72, 96, 144	48 mm x 48 mm 72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
Over range(Ammeters)	no over range ^{*3} 2 times nominal current ^{*1} 6 times nominal current ^{*3}
Measuring ranges	Refer to table inside
Terminal protection	full sized polycarbonate backcover
Panel Fixing	Swivel Screw
Red Index Pointer	None ^{*1}
Front Facia	Normal glass ^{*1} Antiglare glass ^{*3}
Colour of Bezel	Black ^{*1} Red,Blue,Yellow,White ^{*3}
Position of use	Vertical ^{*1} On request 15° 165° ^{*3}
Dial	Standard scale same as measuring range ^{*1} Blank dial with division ^{*3} Additional lettering on request ^{*3} Additional numbering on request ^{*3} Coloured marking red or green ^{*3} Coloured sector red or green ^{*3}
Logo	RISHABH ^{*1} , for Indian sales Others ^{*3}

*1 Standard

*3 Please clearly add the desired specifications while ordering

Ordering Example

EQ 72 Measuring range 150 V, dial 0 - 100%

Specifications are subject to change without notice (11/11)



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RISHABH

Specifications may change without prior notice



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