

Ziegler

Redefine Innovative Metering

Technical Datasheet

MOVING IRON METER EQ Series

ANALOG PANEL METERS

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EQ | EQ SWT

Moving Iron Meters are designed to measure AC Current and Voltage. These meters indicate RMS values (with 90° deflection) and are substantially independent of system waveform. Scales are calibrated down to 10%, Ammeters can have overload scales of X2, X3, X5 or X6 to sustain Motor Inrush Current.



Product Features

- Wide measurement band of 10% to 100% of full scale
- Near Linear scale
- Scale Interchangeability
- Higher Proof Voltage : 3KV AC for 1 minute
- Moving Iron Meters with in-built selector switch are also available
- Conforms to IP 52 (front face) as per IEC 60529, IP 65 is also available as option
- Compliance to International Safety standards IEC 61010-1- 2001
- EMI / EMC compliance to International standard IEC 61326



Specifications:

Scale & 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 : 41mm, EQ72 : 63mm, EQ96 : 97mm, EQ144 : 146mm
Over range	
Ammeters	2 times nominal current
Voltmeters for use on PT	1.2 times nominal voltage
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 UL94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Swivel screws
Mounting	Stack-able in a single cutout
Panel thickness	25mm
Terminals for Voltmeters & Ammeters ≤ 30A	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Terminals for Ammeters > 30A	Threaded studs M6 with nuts
Terminals for Ammeters > 60A	Threaded studs M8 with nuts

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Electrical Data	
Measured quantity	AC Voltage or Current
Power consumption for Voltmeters	< 4.5VA
Power consumption for Ammeters ≤ 15A	< 0.5VA
Power consumption for Ammeters > 15A	< 0.8 VA
Overload capacity (acc to IEC 60051)	Continuously 1.2 times rated voltage or current
	Short duration for voltmeters : 2 times rated voltage (max 1000V, max up to 5 seconds)
	Short duration for Ammeters : 10 times rated current for 5 sec max (200A max for EQ48) and 40 times (max 250A, max up to 1 second EQ 72/96/144)
Enclosure code (IEC 60529)	IP52 for 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 MΩ at 500V DC

Reference Conditions	
Accuracy Class	1.5 according to IEC 60051
Ambient temperature	23°C ± 2°C
Position of use	Nominal position ± 1°
Input Waveform	Rated value of measured quantity sine wave, distortion factor ≤ 5%
Frequency	45...65 Hz
Other conditions	IEC 60051
Nominal range of use	
Ambient temperature	0...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 IEC 60051 (climatic class 3 acc to VDE/VDI 3540)
Operating temperature	0 ... +50°C
Storage temperature	-25 ... +65°C
Relative Humidity	< 75% annual average, non-condensing
Shock resistance	15gn, 11ms
Vibration resistance	10-55-10 Hz/0.15mm, 1.5 gn at about 50 Hz

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Standard Measuring Ranges for EQ	
AC Voltage	AC Current
6V	100mA
10V	150mA
15V	250mA
25V	400mA
40V	600mA
60V	1A
100V	1.5A
120V	2.5A
132V	3A
150V	4A
200V	5A
250V	6A
300V	10A
400V	15A
500V	20A
600V	25A
750V (except EQ48)	30A
1000V (except EQ48)	40A
For use on voltage transformer	50A
.../100V secondary	60A
Or	100A (except for EQ48)
.../110V secondary	For use on current transformer .../1A secondary
	Or .../5A secondary

Standard Measuring Ranges for EQ SWT	
AC Voltage	AC Current
100V	
120V	
132V	
150V	
200V	1A
250V	5A
300V	(Option : 2 times and 6 times suppression)
400V	
500V	
600V	

Note for EQ SWT meter :-

- 1) Non standard ranges available on request.
- 2) For single phase system there will be 4 switch positions as OFF L1 L2 L3
- 3) For 3 Phase 3 wire system, 4 switch positions are as L1-L2, L2-L3, L3-L1
- 4) For 3 Phase 4 wire system, 6 switch positions are as L1-L3, L2-L3, L1-L2, L1-N, L2-N, L3-N (Option : 3 Ph 4W in 7 switch positions)

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Applicable standards	
Nominal case & cutout dimensions for indicating electrical instruments	DIN 43700
Scale & Pointer for electrical measuring instruments	IEC 60051, DIN 43802
Connections and terminal markings for panel meters	IEC 60051, DIN 43807
Terminal bolts / leads	DIN 46200/46282
Safety requirements and protective measures for Electrical indicating instruments and their accessories	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 60529, IEC 61010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories Environmental conditions	IEC 60051 / DIN EN 60051, DIN 43701, VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions	DIN 43718
UL Combustibility class	UL94 V-0
Compliance with European directives	89/336/EEC (EMC Directive), 73/23/EEC (low voltage directive) & amendment 93/68/EEC for CE marking

Options	
Front facia	Anti-glare glass
Colour of bezel	Red, Yellow, Blue, White
Red Index pointer	Front adjustable on site
Position of use	On request 15°...165°
Blank dial	With initial and end values marked
Special markings	Numbering / Lettering
Division dials	Basic divisions without numbering
Colour marking / band	Red or green
Over range (ammeters)	No over range or 6 times over range over nominal current

Accessories

Safety Terminal Protection

Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc to 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.

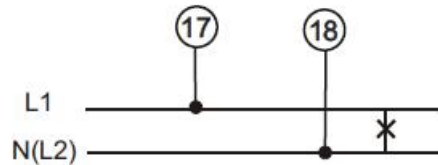
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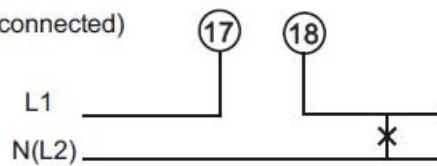
- 3) The back cover must be snapped into place after connection wires have been clamped for protection against accidental contact.
- 4) Scales may only be replaced under voltage-free conditions.
- 5) Bezels and window glasses may only be replaced under voltage-free conditions.

Connection Diagram :

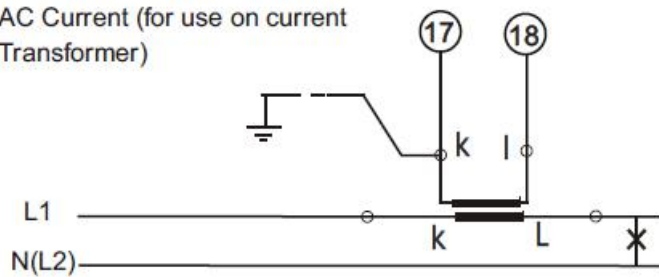
AC Voltage (Direct connected)



AC Current (Direct connected)

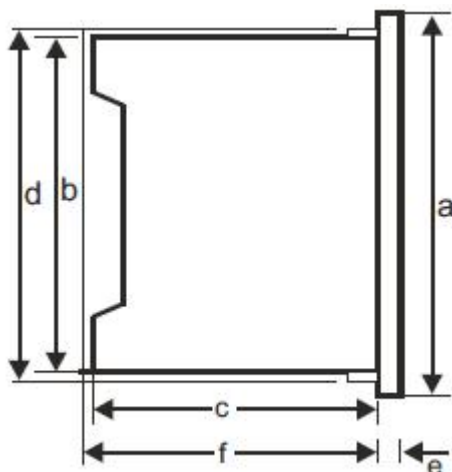


AC Current (for use on current Transformer)

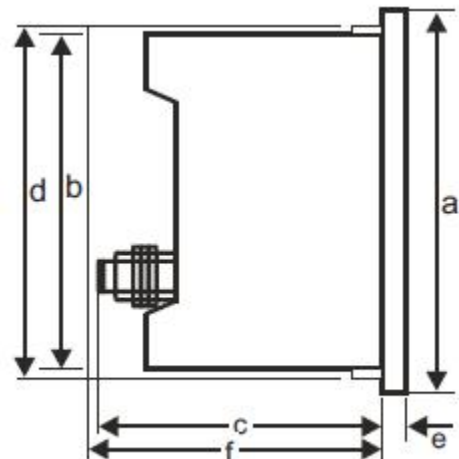


Dimensions:

For Voltmeters and Ammeters below 30A



For Ammeters 30A and above



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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 ^x	53	53	53	53
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5 ⁺¹
	Cotout Size	45 ^{+0.6}	68 ^{+0.7}	92 ^{+0.8}	138 ⁺¹
Depth with Back cover	f ^{xx}	64	64	64	64

^x c=62mm, for I > 30A & up to 60A
^x c = 67 mm, for I > 60 A
^{xx} f = 69.5mm, for I > 60 A
^{xx} f = 75mm, for EQ 48 I > 30 A

Weight (approx.) **0.1 kg.** **0.16 kg.** **0.2 kg.** **0.4 kg**

Ordering information

EQ	
Front dimension	48X48mm, 72X72mm, 96X96mm, 144X144mm
Over range (ammeters)	No over range *3 2 times nominal current *1 6 times nominal current *3
Measuring ranges	Refer to table inside on page no. 3
Terminal Protection	Full sized polycarbonate back cover
Panel fixing	Swivel screw
Red Index Pointer	None *1
Front facia	Normal glass *1, PC glass *3, Anti-glare glass
Colour of bezel	Black *1 Red, Blue, Yellow, White *3
Position of use	Vertical *1 On request 15°...165°
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	Ziegler*1, Others*3

*1 Standard

*3 Please clearly add the desired specifications while ordering

Example – EQ72, Measuring range 0-150V, Dial 0-100%

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