

Ziegler

Redefine Innovative Metering

Technical Datasheet

MOVING COIL METER PQ/PL

ANALOG PANEL METER

MOVING COIL METER PQ/PL Series

ANALOG PANEL METER

PQ/PL

Moving Coil Meters are designed to measure DC Current and Voltage. These meters indicate average values. Scales are linear and calibrated down to zero. High currents are measured with separate shunts attached on the rear side of the meter. Suppressed zero, centre zero and offset zero models are also available.

Product Features of PQ/PL

- Linear scale.
- Glass filled polycarbonate housing(UL 94-V-0)
- Knife edge pointer.
- Easily replaceable glass and bezel.
- Easy installation with swivel screws.
- Better Resolution.



Specifications:-

Scale & Pointer	
Pointer	Knife - edge Pointer
Pointer Deflection(PQ)	0...90°
Pointer Deflection(PL)	0...240°
Scale characteristics	Linear
Scale division	Coarse - Fine
Scale length(PQ)	PQ48 : 41mm, PQ72 : 61mm, PQ96 : 97mm, PQ144 : 146mm
Scale length(PL)	PL48 :70 mm, PL72 : 106mm, PL96 : 142mm, PL144 : 230mm
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 <5A for PQ and <6A for PL	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Terminals for Ammeters >6 for PL & >5 for PQ	Threaded studs M6 with nuts

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Terminals for Ammeters > 60A(PLPQ)	Threaded studs M8 with nuts
Electrical Data	
Measured quantity	DC Voltage or Current
Overload capacity (acc to IEC 60051)	Continuously 1.2 times rated voltage or current
	Short duration for voltmeters : 2 times for 5sec : 1 overload 2 times for 0.5sec : 9 overloads
	Short duration for Ammeters : 10 times for 5sec : 1 overload 10 times for 0.5sec : 9 overloads
Enclosure code (IEC 60529)	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	PQ/PL48 : 660V, PQ/PL72/96/144 : 1000V
Proof voltage	PQ/PL48 : 2KV, PQ/PL72/96/144 : 3KV
Installation category	PQ/PL48 : 300V CAT III, PQ/PL72/96/144 : 600V(for PQ), 660V(for PL) 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	Rated Value of measured quantity
Other conditions	IEC 60051 / DIN EN 60051
Nominal range of use	
Ambient temperature	0...50 °C
Position of use	Vertical ± 5°
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	-10 ... +55 °C
Storage temperature	-25 ... +65 °C
Relative Humidity	< 75% annual average, non-condensing
Shock resistance	15g, 11ms
Vibration resistance	10-55-10 Hz/0.15mm, 1.5 g at about 50 Hz

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Standard Measuring Ranges For PQ

DC Current		DC Voltage	
Rated Value	Approx Voltage Drop	Rated Value	Sensitivity ($\pm 10\%$)
15 μA *3 *5	140 mV	15 mV *4 *5	0.16 kohm/V
25 μA * *5	240 mV	25 mV *4 *5	0.16 kohm/V
40 μA *3	374 mV	40 mV *4 *5	0.16 kohm/V
50 μA *4	424 mV	50 mV	0.16 kohm/V
60 μA *4	600 mV	60 mV	0.16 kohm/V
100 μA	400 mV	75 mV	0.16 kohm/V
150 μA	600 mV	100 mV	0.16 kohm/V
250 μA	140 mV	150 mV	0.16 kohm/V
400 μA	540 mV	250 mV	0.16 kohm/V
500 μA	540 mV	400 mV	0.16 kohm/V
600 μA	540 mV	600 mV	0.16 kohm/V
1 mA	37 mV	1 V	1 kohm/V
1.5 mA	196 mV	1.5 V	1 kohm/V
2.5 mA	196 mV	2.5 V	1 kohm/V
4 mA	196 mV	4 V	1 kohm/V
5 mA	196 mV	6 V	1 kohm/V
6 mA	196 mV	10 V	1 kohm/V
10 mA	196 mV	15 V	1 kohm/V
15 mA	11 mV	25 V	1 kohm/V
20 mA	60 mV	30 V	1 kohm/V
25 mA	60 mV	40 V	1 kohm/V
40 mA	60 mV	50 V	1 kohm/V
60 mA	60 mV	60 V	1 kohm/V
100 mA	60 mV	100 V	1 kohm/V
150 mA	60 mV	150 V	1 kohm/V
250 mA	60 mV	200 V	1 kohm/V
400 mA	60 mV	250 V	1 kohm/V
600 mA	60 mV	300 V	1 kohm/V
1 A	60 mV	400 V	1 kohm/V
1.5 A	60 mV	500 V	1 kohm/V
2.5 A	60 mV	600 V	1 kohm/V
4 A	60 mV	1000 V	1 kohm/V
5 A	60 mV	1-5 V	1 kohm/V
6 A	72 mV		
10 A	60 mV	For use on external shunt	
15 A	60 mV		
20 A	60 mV	60 mV *6	1 kohm/V
25 A	60 mV	75 mV *6	1 kohm/V
30 A	60 mV	150 mV *6	1 kohm/V
40 A	60 mV		
60 A	72 mV		
100 A *	60 mV		
For use on transducer 4-20 mA		*3 Accuracy Class 5 *4 Accuracy Class 2.5 *5 Not Applicable for PQ 144	*6 Lead Resistance of 0.035ohm for mV *7 Not applicable for PQ48

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Standard Measuring Ranges For PL

DC Current		DC Voltage	
Rated Value	Approx Voltage Drop	Rated Value	Sensitivity(±10%)
50 uA *4	540 mV	60 mV *7	200 ohm/V
60 uA *4	540 mV	75 mV *7	200 ohm/V
75 uA	540 mV	100 mV *7	200 ohm/V
100 uA *7	970 mV	150 mV *7	200 ohm/V
150 uA	970 mV	250 mV *7	200 ohm/V
250 uA	810 mV	400 mV *7	1 kohm/V
400 uA	900 mV	600 mV *7	1 kohm/V
600 uA	900 mV	750 mV *7	1 kohm/V
1 mA *7	500 mV	1 V *7	1 kohm/V
1.5 mA	500 mV	1.5 V *7	1 kohm/V
2.5 mA	500 mV	2.5 V *7	1 kohm/V
4 mA	500 mV	4 V *7	1 kohm/V
5 mA *7	40 mV	6 V *7	1 kohm/V
6 mA	40 mV	10 V *7	1 kohm/V
10 mA	75 mV	15 V *7	1 kohm/V
15 mA	60 mV	25 V *7	1 kohm/V
20 mA	60 mV	30 V *7	1 kohm/V
25 mA	60 mV	40 V *7	1 kohm/V
40 mA	60 mV	60 V *7	1 kohm/V
60 mA	60 mV	100 V *7	1 kohm/V
100 mA	60 mV	150 V *7/8	1 kohm/V
150 mA	60 mV	200 V *7/8	1 kohm/V
200 mA	60 mV	250 V *7/8	1 kohm/V
250 mA	60 mV	300 V *7/8	1 kohm/V
300 mA	60 mV	400 V *7/8	1 kohm/V
400 mA	60 mV	500 V *7/8	1 kohm/V
500 mA	60 mV	600 V *7/8	1 kohm/V
600 mA	60 mV		
750 mA	60 mV	For use on external shunt	
1 A *8	60 mV		
1.5 A *8	60 mV		
2.5 A *8	60 mV	50 mV*6	200 ohm/V
4 A*8	60 mV	60 mV*6	200 ohm/V
5A*8	60 mV	75 mV*6	200 ohm/V
6 A *8	60 mV	150 mV*6	200 ohm/V
10 A *8	60 mV		
15 A *8	60 mV		
20 A *8	60 mV		
25 A *8	60 mV		
30 A *8	60 mV		
40 A *5	60 mV		
60 A *5	60 mV		

* 4 Accuracy Class 2.5
 *5 Not Applicable for PQ 144
 *6 Lead Resistance of 0.035ohm for mV

*7 Applicable for PL 48
 *8 Applicable for PL 72 and above

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Applicable Standards (PQ/PL)

Nominal case & cutout dimensions for indicating electrical instruments	DIN 43700
Scale & Pointer for electrical measuring instruments	DIN 43802
Connections and terminal markings for panel meters	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 61529, 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
Clamp straps	DIN 46282
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical Strength (Free fall test, vibration test)	VDE 0411, part I, Sec.43/44. IEC 61010
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 0°...180°
Blank dial	With initial and end values marked
Special markings	Numbering / Lettering
Division dials	Basic divisions without numbering
Colour marking / band	Red or green
Zero position	Centre zero or off-set zero
Increased Sensitivity	4kohm/V for voltmeters 1....600V 10kohm/V for voltmeters 15....150V
Adjustment of Resistance (Sensitivity)	Within ±1% at 23°

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Accessories

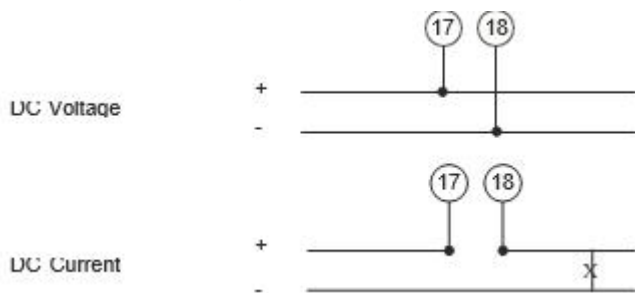
Safety Terminal Protection

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

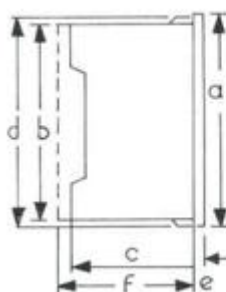
Safety Precautions

- 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.
- 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 should be replaced under voltage-free conditions.

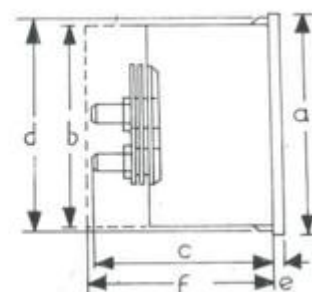
Connection Diagram And Dimension:



For Voltmeter & Ammeter < 5A



For Ammeter 5 - 100 A



Dimensions (in mm)	PQ 48	PQ 72	PQ 96	PQ 144
Bezel a	48	72	96	144
Case b	43.5	66	90	136
Depth	c*	53	53	53
	d	44.5	67.5	91.5
	e	5.5	5.5	5.5
Cutout size	45 ^{+0.6}	68 ^{+0.7}	92 ^{+0.8}	138 ⁺¹
weight(Approx)	0.13kg	0.18kg	0.22kg	0.43kg
Depth with back cover f**	64	64	64	64

- * c = 68mm, for I= 6 to 60 A
- * c = 78mm, for I> 60 A
- **f = 70mm, for I= 6 to 60 A
- **f = 75mm, for PQ 48, I >6A

FOR PL

Dimensions (in mm)	PL48	PL72	PL96	PL144
Bezel a	48	72	96	144
Case b	43.5	66	90	136
Depth	c*	53	53	53
	d	44.5	67.5	91.5
	e	5.5	5.5	5.5
Cutout Size	45 ^{+0.6}	68 ^{+0.7}	92 ^{+0.8}	138 ⁺¹
Weight (approx.)	0.13 kg.	0.25 kg.	0.30 kg.	0.43 kg.
Depth with Back cover f**	64	64	64	64

- * c = 68mm, for I= 6 to 60 A
- * c = 78mm, for I> 60 A
- ** f = 70mm, for I= 6 to 60 A

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Ordering Information

PQ/PL	
Front dimension	48X48mm, 72X72mm, 96X96mm, 144X144mm
Zero position	Centre *1, Off-set *3, Supp.zero *3
Measuring ranges	Refer to table inside on page no. 3
Terminal Protection	Full sized polycarbonate back cover
Increased Sensitivity	4kohm/V for voltmeters 1....600V 10kohm/V for voltmeters 15....150V
Adjustment of Resistance (Sensitivity)	Within $\pm 1\%$ at 23°
Front facia	Normal glass *1, PC glass *3, Anti glare glass *3
Colour of bezel	Black *1 Red, Blue, Yellow, White *3
Position of use	Vertical *1 On request 0°...180°*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	Ziegler*1, Others*3

*1 Standard

*3 Please clearly add the desired specifications while ordering

Example – PQ72, Measuring range 0-20mA, Dial 0-100°C, red mark at 37°C.

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