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PRECISION INSTRUMENTATION

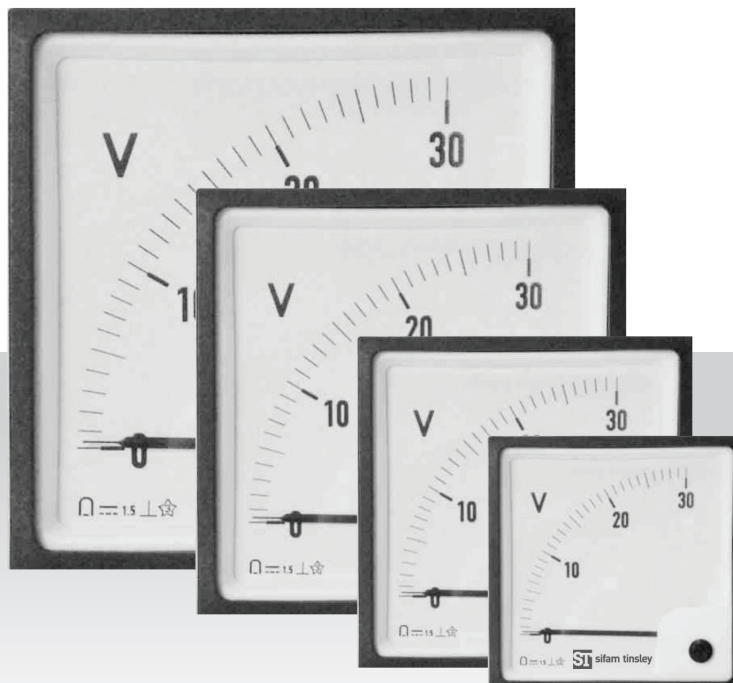
ANALOGUE PANEL METERS
www.sifamtinsley.co.uk



DATASHEET

Issue 1

**NEW
PRODUCT**



Multifunction Meters

Transducers & Isolators

Temperature Controllers

Converters & Recorders

Digital Panel Meters

Current Transformers

kWh Energy Meters

Analogue Panel Meters

Shunts

Digital Bargraphs

Digital Multimeters

Protection Relays

Synchroscope Series

Rotary Switches

Power Supplies

Test & Measurement



PQ 48/72/96/144 MOVING COIL ANALOGUE PANEL METERS For the measurement of DC currents and voltages

SUBJECT TO CHANGE WITHOUT NOTICE

This datasheet superseded all previous versions – please keep for future reference

Product Features:

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

PQ 48/72/96/144 MOVING COIL ANALOGUE PANEL METERS for the measurement of DC currents and voltages



Application

The PQ 48/72/96/144 moving coil analogue panel meters for the measurement of DC currents and voltages.

These instruments offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a single Cut out (Mosaic mounting). Front glass, Bezel & Dial can be easily replaced.

Movement

Moving coil movement has pivots of very high hardness. Movement is suspended between spring loaded sapphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.



Specifications

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 facia	Glass
Colour of bazel	Black
Position of use	Vertical
Panel fixing	Swivel screws
Mounting	Stackable in a single cutout
Panel thickness	<25 mm
Terminals	
Voltmeters and ammeters <5A	Hexagon studs, M4 screws and wire clamps E3 (DIN 46282)
Ammeters ³ 5A	Threaded studs M6 with nuts
Ammeters >60A	Threaded studs M8 with nuts
Electrical Data	
Measured quantity Overload capacity	DC voltage or current (acc. to IS: 1248 / IEC 51)
Continuously	1.2 times rated voltage /current
Short duration :	
Voltmeters	2 times for 5 sec : 1 overload 2 times for 0.5 sec : 9 overloads
Ammeters	10 times for 5 sec : 1 overload 10 times for 0.5 sec : 9 overloads
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 PQ 48 PQ 72/96/144
Rated insulation voltage	660 V 1000V
Proof voltage	2kV 3kV
Installation catagory	300V CAT III 600V CAT III
Insulation resistance	> 50 Mohm at 500 V d.c.

*³ Accuracy class 5

*⁴ Accuracy class 2.5

*⁵ Not applicable for PQ 144

*⁶ Total lead resistance of 0.035 ohm is considered for mV ranges while calibration.

*⁷ Not applicable for PQ 48



Standard Measuring Ranges

D. C. Current		D. C. Voltage	
Rated Value	Approx Voltage drop	Rated Value	Sensitivity (+/-10%)
15uA ^{*3 *5}	140 mV	15 mV ^{*4 *5}	0.16kohm/V 0.16kohm/V
25uA ^{*3 *5}	240 mV	25 mV ^{*4 *5}	0.16kohm/V
40 uA ^{*3}	374 mV	40 mV ^{*4 *5}	0.16kohm/V
50 uA ^{*4}	424 mV	50 mV	0.16kohm/V
60 uA ^{*4}	600 mV	60 mV	0.16kohm/V
100 uA	400 mV	75 mV	0.16kohm/V
150 uA	600 mV	100 mV	0.16kohm/V
250 uA	140 mV	150 mV	0.16kohm/V
400 uA	540 mV	250 mV	0.16kohm/V
500 uA	540 mV	400 mV	0.16kohm/V
600 uA	540 mV	600 mV	1 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	
6 A	72 mV	For use on external shunt	
10 A	60 mV	60 mV ^{*6}	
15 A	60 mV	75 mV ^{*6}	1 kohm/V
20 A	60 mV	150 mV ^{*6}	1 kohm/V
25 A	60 mV		1 kohm/V
30 A	60 mV		
40 A	60 mV		
60 A	72 mV		
100 A ^{*7}	60 mV		
For use on transducer			
4-20 mA	60 mV		



Scale and Pointer

Pointer	Knife - edge pointer			
Pointer deflection	0...900			
Scale characteristics	linear			
Scale division	Coarse - fine			
Scale length	PQ 48 41 mm	PQ 72 61 mm	PQ 96 97 mm	PQ 144 146 mm
Scale Interchangeability	Interchangeable			

Accuracy at Reference Conditions

Accuracy class	1.5 according to IS: 1248 (IEC 51/ DIN EN 60051)
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Reference conditions

Ambient temperature	23 C $\pm$ 2 C 0
Position of use	Nominal position $\pm$ 1
Input	Rated value of measured quantity
Other conditions	IS : 1248 (IEC 51/ DIN EN 60051)

Nominal range of use

Ambient temperature	-5...500C
Position of use	Vertical $\pm$ 5
External magnetic field	At 0.4 kA/m

Environmental Conditions

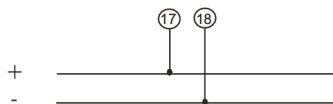
Climatic suitability	Climate category II as per IS : 1248 (climatic class 3 according to VDE/VDI 3540)
Operating temperature	- 5... + 500 C
Storage temperature	- 40... + 700C
Relative humidity	< 75% annual average, non-condensing
Shock resistor	15g, 11ms
Vibration resistor	10-55-10 Hz / 0.15mm 1.5 g at about 50 Hz.

Applicable Standards

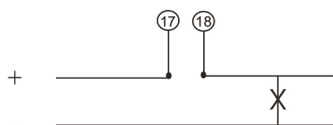
Nominal case and cutout dimensions for indicating Electrical instruments :	IS 2419 DIN 43700
Scale and pointer for electrical measuring instruments :	IS 1248 DIN 43802
Connections and Terminal markings for panel meters :	IS 1248 DIN 43807
Terminal bolts / leads :	DIN 46200/46282
Clamp straps for connections :	DIN 46282
Safety requirements and protective measures for Electrical indicating. instruments and their accessories :	IS 9249 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 & their accessories	IS 1248 IEC 51/DIN EN 60051 DIN 43701
Environmental condition :	IS 1248 IS: 9000, Part 5, 7, 8, VDE / VDI 3540
Front frames for indicating : measuring instruments	DIN 43718
Principle dimensions	
UL Combustibility Class :	UL 94 V-0
Technical conditions of delivery : for electrical instruments	DIN 43701

Connections

DC voltage



DC current



Mechanical strength :

(Free fall test, vibration test)

IS 1248

IS 9000

VDE 0411, part 1, Sec. 43/44, IEC 1010

Comply with following European directives:

89 / 336/ EEC (EMC directive), 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for marking.

Options

Case

Front facia

Antiglare glass

Colour of bezel

Red, Yellow, Blue, White

Red index pointer

Front adjustable on site

Position of use

on request 0.0...180 °

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

Others

Zero position

Centre zero or off-set zero

Increased sensitivity

4kohm/V for voltmeters 1...600V

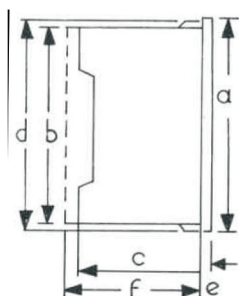
10 kohm/V for Voltmeters 15..150V

Adjustment of Resistance
(Sensitivity)

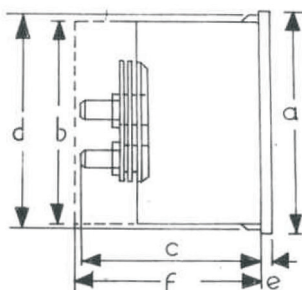
Within $\pm 1\%$ at 230 °C

Dimensions

For Voltmeter & Ammeter < 5A



For Ammeter 5 - 100 A



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

- Instruments with damaged bezels or window glasses must be disconnected from mains.
- Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing, if non-insulated connector wires are used.
- The back cover must be snapped into place after the connector wires have been clamped for protection against accidental contact.
- Scales should be replaced under Voltage- free conditions
- Bezels and window glasses should be replaced under Voltage - free conditions.

Dimensions

(in mm)	PQ 48	PQ 72	PQ 96	PQ 144
Bezel a	48	72	96	144
Case b	43.5	66	90	136.6
Depth c*	53	53	53	53
d	44.5	67.5	91.5	137.5
e	5.5	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



Ordering Information

Type PQ	Moving-coil panel meter
Front dimension 48 72 96 144	48mm x 48 mm 72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
Measuring ranges	refer to table inside
Front facia	Normal glass ^{*1} , PC glass ^{*3} Antiglare glass ^{*3}
Colour of bezel	Black ^{*1} Red,Blue,Yellow,White ^{*3}
Position of use	Vertical ^{*1} on request 0...180 0 ^{*3}
Terminal protection	Full sized polycarbonate back cover
Zero position	Centre ^{*1} , Off-set zero ^{*3} , Supp. zero ^{*3}
Increased sensitivity	4 kohm/V for voltmeters 1...600 V ^{*3} 10 kohm /V for voltmeters 15 ...150 V ^{*3}
Adjustment Resistance (Sensitivity)	Within + 1 % at 23 0 C ^{*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	Sifam Tinsley ^{*1} , Others ^{*3}

*1 standard

*3 Please clearly add the desired specifications while ordering

Ordering example

PQ 72 measuring range 0 ... 20 mA, dial with 0...100 C, red mark at 37°C.

Specifications are subject to change without notice (03/18)



Contact



Sifam Tinsley Instrumentation Ltd

1 Warner Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2YW

Tel: 01376 335271
Email: sales@sifamtinsley.com

www.sifamtinsley.co.uk