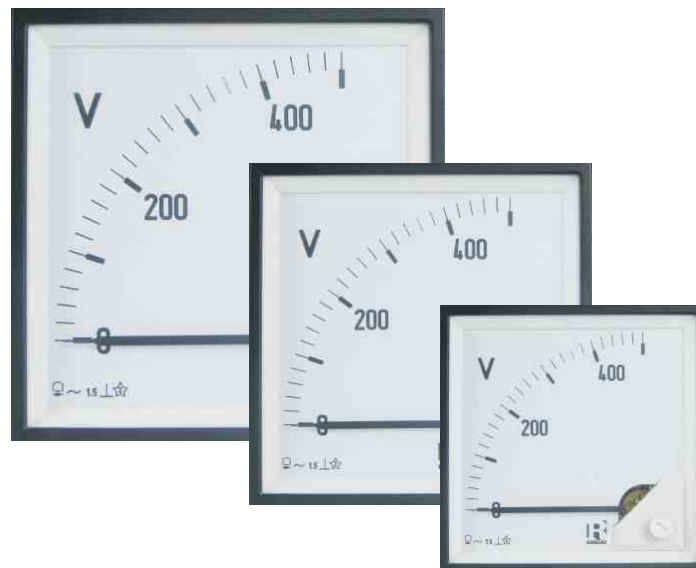


Analogue Meters With Moving - Coil Movement And Rectifier 90° Scale

DG 48
DG 72
DG 96
DG 144

Data Sheet

Analogue Meters with
Moving Coil Movement
And Rectifier 90° Scale



Application

The moving coil, rectifier meters, DG 48/72/96/144 housed in moulded polycarbonate cases are suitable for the measurement of AC currents and voltages.

Moving coil rectifier instruments measure average values & are calibrated to indicate RMS values, assuming a sinusoidal waveform for frequencies from 40 to 10000 Hz (AC current for frequency range of 40 to 1000 Hz and AC voltage for frequency range of 40 to 1000 Hz).

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

Features

- Less VA burden.
- Linear scale.
- Fully range indication.
- Glass filled polycarbonate housing (UL 94-V-0)
- Knife edge pointer.
- Easily replaceable glass and bezel.

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.

Applicable Standards

Nominal case and cutout dimensions for indicating Electrical instruments	IS 2419 DIN IEC 61554
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 VDE 0110 VDE 0410 IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IS 1248 IEC51/DIN EN 60051 DIN 43701
Environmental conditions	IS 1248 IS: 9000 VDE / VDI 3540 DIN 43718
Front frames for indicating measuring instruments principle dimensions	
UL Combustibility Class	UL 94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical strength (Free fall test, vibration test)	IS 1248, IEC 51 IS 9000 VDE 0411 IEC 1010

Scale and Pointer

Pointer	Knife - edge pointer
Pointer deflection	0...90°
Scale characteristics	linear*1
Scale division	Coarse - fine
Scale length	DG48 DG72 DG96 DG144 41 mm 61mm 97mm 146mm
Scale Interchangeability	Interchangeable*

Mechanical Data

Case details	Moulded square case suitable for mounting in Control / Switchgear panels, Machinery consoles.
Case material	Polycarbonate, flame retardant and drip proof as per UL 94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Mounting Clamp
Mounting	Stackable in a single cutout
Panel thickness	≤ 1.5 mm

Terminals

Voltmeters and ammeters < 6A	Hexagon studs, M4 screws and wire clamps E3 (DIN 46282)
Ammeters ≥ 6A	Threaded studs M6 with nuts

Electrical Data

Measured quantity	AC voltage or current
Overload capacity	(acc. to IS: 1248 / IEC 51)
Continuously	1.2 times rated voltage /current
Short duration	2 times rated voltage, 5 sec Max 10 times rated current, 5 sec 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	DG48: 660V DG72/96: 1000V
Proof voltage	DG48: 2kV DG72/96: 3kV
Installation category	600 V CAT III (IEC 1010)
Insulation resistance	> 50 Mohm at 500V d.c
*scale are nonlinear & not interchangeable for ammeters > 750 mA	

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 + 2 °C
Position of use	Nominal position ± 1°
Input	Rated value of measured quantity
Other conditions	IS : 1248 (IEC 51/ DIN EN 60051)

Nominal range of use

Ambient temperature	10...37 °C
Position of use	Vertical + 5°
External magnetic field	At 0.4 kA/m, less than 6% of fiducial value (not as a percentage class index)

Environmental Conditions

Climatic suitability	Climate category II as per IS : 1248 (climatic class 3 according to VDE/VDI 3540)
Operating temperature	- 10... + 55 C
Storage temperature	- 25... + 65 C
Relative humidity	≤ 75% annual average, non-condensing
Shock resistance	15g _n for pulse duration 11 ms
Vibration resistance	10-50-10Hz for ampli. 0.15mm (1.5 g at 50Hz)

Standard Measuring Ranges

A. C. current		A. C. Voltage	
Rated Value	Approx Voltage drop	Rated value	Sensitivity (+10%)
100 μ A	1.3 V	6 V	900 ohm/ V
150 μ A	2.4 V	10 V	900 ohm/ V
250 μ A	2.4 V	15 V	900 ohm/ V
400 μ A	2.4 V	25 V	900 ohm/ V
600 μ A	2.4 V	40 V	900 ohm/ V
1 mA	2.4 V	60 V	900 ohm/ V
1.5 mA	1.4 V	100 V	900 ohm/ V
2.5 mA	1.4 V	150 V	900 ohm/ V
4 mA	1.4 V	250 V	900 ohm/ V
6 mA	1.4 V	400 V	900 ohm/ V
10 mA	1.4 V	500 V	900 ohm/ V
15 mA	1.7 V	600 V	900 ohm/ V
25 mA	1.7 V		
40 mA	1.7 V		
60 mA	1.7 V		
100 mA	1.7 V		
150 mA	1.33V		
250 mA	0.80V		
400 mA	0.50V		
600 mA	0.33V		
750 mA	0.27V		
1A *	0.20V		
1.5A *	0.14V		
2.5A *	0.80V		
4A *	0.50V		
6A *	0.03V		
10A *	0.02V		

*1 Scales are non-linear & not interchangeable for ammeters > 750mA

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 15°C ... 165°C

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

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

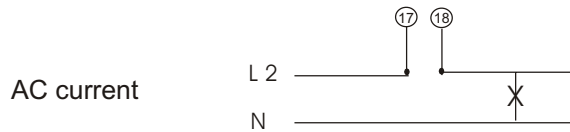
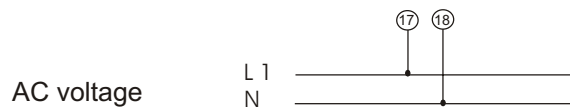
- 1) Instruments with damaged bezel or glasses must be disconnected from the mains.
- 2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
- 3) The back cover must be snapped into place after connector wires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

Others

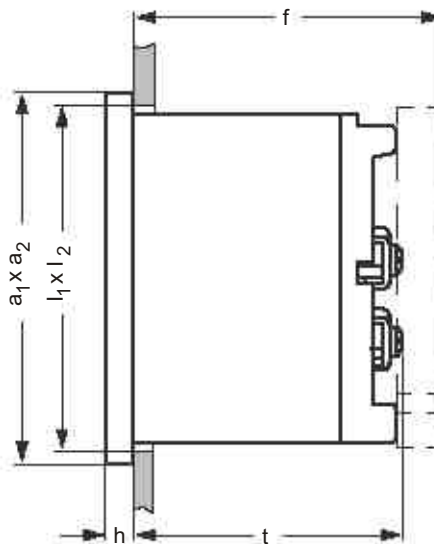
Increased sensitivity
Adjustment of Resistance
(Sensitivity)

4 k ohm/V for voltmeters 1...600V
Within $\pm 1\%$ at 23 °C

Connections



Dimensions



Front in mm	Nominal Dimensions, mm		Cutout, mm $l_1 \times l_2$	Installation Depth Including Terminal (t), mm	Installation Depth Incl. Full Cover (f), mm
	$a_1 \times a_2$	h			
48 x 48	48 x 48	5.5	$45^{+0.6} \times 45^{+0.6}$	54	62.5
72 x 72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62.5
96 x 96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62.5
144 x 144	144 x 144	5.5	$138^{+1} \times 138^{+1}$	54	62.5

Ordering Information

Type DG	Moving-coil with rectifier panel meter
Front Dimension	48 --- 48mm x 48mm 72 --- 72mm x 72mm 96 --- 96mm x 96mm 144 --- 144mm x 144mm
Measuring Ranges	Refer to table inside
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 0...180 ⁰³
Terminal Protection	Full sized polycarbonate back cover
zero position	Centre ¹ , Off-set zero ³
Increased sensitivity	4 kohm/V for voltmeters 1...600 V ³
Adjustment Resistance (Sensitivity)	Within $\pm 1\%$ at 23 °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	RISHABH ¹

¹Standard

³Please clearly add the desired specifications while ordering

Ordering example

DG 72 measuring range 0 ... 100mA, dial with 0...100 degree C, red mark at 37 degree C.

Specifications are subject to change without notice (07/09)



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Measure, Control & Record with a Difference

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