



Data Sheet

Moving Coil Meter AC Ammeters & Voltmeters With Rectifier 90°

VQ



Measure



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Application

The moving coil, rectifier meters, VQ48/72/96/144 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 40 to 1000 Hz and for AC voltage 40 to 10000 Hz)

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.

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.
- Easy installation with swivel screws.

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

Scale and Pointer

Pointer	: Knife - edge pointer
Pointer deflection	: 0 ... 90°
Scale characteristics	: Linear *1
Scale division	: Coarse - fine
Scale length	: VQ 48 VQ 72 VQ 96 VQ 144
	: 41 mm 61 mm 97 mm 146 mm
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 facia	: Glass
Colour of bezel	: Black
Position of use	: Vertical
Panel fixing	: Swivel Screws

Mounting	: Stackable in single cut out
Panel thickness	: ≤ 25 mm
Terminals	:
Voltmeters and ammeters ≤ 10A	: Hexagon studs, M4 screws And wire clamps E3(DIN 46282)

Electrical Data

Measured quantity	: DC voltage or current
Overload capacity	: (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
Enclosures code (IEC 529)	: IP 52 case IP 00 for terminals without back - cover IP 20 for terminals with backcover
Insulation class	: Group A according to VDE 0110 VQ48 VQ 72/96/144
Rated insulation voltage	: 660V 1000 V
Proof voltage	: 2 kV 2kV
installation category	: 300 V CAT III 300 V CAT III
Insulation resistance	: > 50 Mohm at 500 V 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)
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	: 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 IS : 1248(climatic class 3 according to VDE/VDI 3540)
Operating temperature	: 0... + 50°C
Storage temperature	: -25... + 65°C
Relative humidity	: ≤75% annual average, non condensing
Shock resistance	: 15g _n 11 ms
Vibration resistance	: 10-55-10Hz / 0.15mm 1.5 g _n at about 50 Hz.



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Standard Measuring Ranges

A. C. Current		A. C. Voltage	
Rated Value	Approx Voltage drop	Rated Value	Sensitivity (?10%)
1 mA	2.4 V	40 V ^{*3}	900 ohm/ V
1.5 mA	1.4 V	60 V ^{*4}	900 ohm/ V
2.5 mA	1.4 V	100 V	900 ohm/ V
4 mA	1.4 V	150 V	900 ohm/ V
6 mA	1.4 V	250 V	900 ohm/ V
10 mA	1.4 V	400 V	900 ohm/ V
15 mA	1.7 V	500 V	900 ohm/ V
25 mA	1.7 V	600 V	900 ohm/ 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 ^{*1}	0.20V		
1.5A ^{*1}	0.14V		
2.5A ^{*1}	0.80V		
4A ^{*1}	0.50V		
5A ^{*1}	0.40V		
6A ^{*2}	0.03V		
10A ^{*2}	0.02V		

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

*1 Possible in 72 and above size

*2 Possible in 96 and above size

*3 Accuracy class 5

*4 Accuracy class 2.5

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°.....180°
Accuracy class	:	1

Dial

Blank dial	:	With initial & end values marked.
Special markings	:	Numbering /Lettering.
Division dials	:	Basic divisions without numbering.
Colour markings/bands	:	Red or green.

Others

Increased sensitivity	:	4kohm/V for voltmeters 1...600V
Adjustment of	:	
Resistance (Sensitivity)	:	Within 1% at 23°C

Applicable Standards

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

Scale and pointer for electrical measuring instruments : IS 1248, IEC 51
DIN 43802

Connections and Terminal markings for panel meters	:	IS 1248, IEC 51 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 IEC 51/DIN EN 60051DIN 43701
Environmental conditions	:	IS 1248, IEC 51 IS: 9000, Part 5, 7, 8,VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions.	:	DIN 43718
UL Combustibility class.	:	UL 94 V-O
Technical conditions of delivery for electrical instruments.	:	DIN 43701
Mechanical strength (Free fall test, vibration test)	:	IS 1248, IEC 51 IS 9000 VDE 0411, part I, Sec.43/44, IEC 1010

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.



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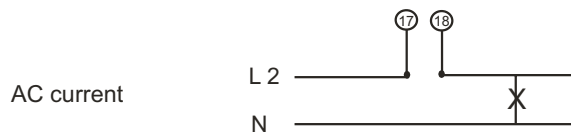
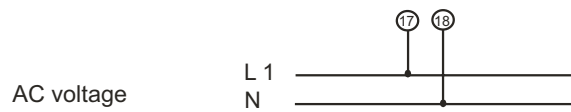


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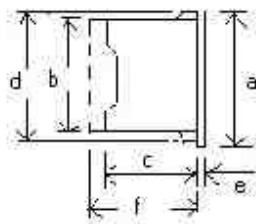
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Connections



Dimensions

For Voltmeters & ammeters upto 10 A



Dimensions (in mm)			VQ 48	VQ 72	VQ 96	VQ 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	
Cotout Size		45+0.6	68 +0.7	92+0.8	138 ⁺¹	
Depth with Back cover	f ^{xx}	64	64	64	64	
Weight (approx.)	0.2 kg.		0.25 kg.	0.3 kg.	0.58 kg.	



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Ordering Information

Type : VQ	Moving-coil with rectifier 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
Measuring ranges	refer to table inside
Front fascia	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
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} , Others ^{*3}

^{*1} standard

^{*3} Please clearly add the desired specifications while ordering

Ordering example

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

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



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Specifications may change without prior notice



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