

# Ziegler

Redefine Innovative Metering

# Technical Datasheet

MOVING COIL WITH RECTIFIER TYPE VQ/VL

---

ANALOG PANEL METER

# MOVING COIL VQ/VL Series

## ANALOG PANEL METER

### VQ/VL

Moving Coil with Rectifier Meters VQ/VL are designed to measure AC Current and AC Voltage, these meters indicate average values of sinusoidal waveform and are scaled in RMS values. The high quality silicon bridge rectifier gives a linear scale down to near zero.

### Product 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.



### Specifications:

Scale & Pointer	
Pointer	Knife - edge Pointer
Pointer Deflection(VQ)	0...90°
Pointer Deflection(VL)	0...240°
Scale characteristics	Linear *1
Scale division	Coarse – Fine
Scale length(VQ)	VQ48 : 41mm, VQ72 : 61mm, VQ96 : 97mm, VQ144 : 146mm
Scale length(VL)	VL72 : 106mm, VL96 : 142mm, VL144 : 230mm
Scale Interchangeability	Interchangeable*
Mechanical Data	
Case details	Molded 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(VQ)	≤25mm
Panel thickness(VL)	≤25mm
Terminals for Voltmeters & Ammeters < 6A(VQ)	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Terminals for Ammeters ≤ 6A(VQ)	Threaded studs M6 with nuts
Terminals for Voltmeters & Ammeters < 10A(VL)	Hexagon studs, M4 screws & wire clamps E3 (DIN 46282)
Electrical Data	
Measured quantity	DC Voltage or Current
Overload capacity ( IEC 60051)	Continuously 1.2 times rated voltage or current
	Short duration for voltmeters : 2 times for 5 sec : 1 overload 2 times for 0.5 sec : 9 overloads

# MOVING COIL VQ/VL Series

## ANALOG PANEL METER

	Short duration for Ammeters : 10 times for 5 sec : 1 overload 10 times for 0.5 sec : 9 overloads
Enclosure code (IEC 60529)	IP52 for case IP 20 for terminals with back cover
Insulation class	Group A according to VDE 0110
Rated Insulation Voltage	VQ48 : 660V, VQ72/96/144 : 1000V
Proof voltage	VQ48 : 2KV, VQ72/96/144 : 2KV
Installation category	VQ48 : 300V CAT III, VQ72/96/144 : 300V CAT III
Insulation resistance	>50 MΩ at 500V DC
*Scale are nonlinear & not interchangeable after ammeters >750mA for VQ meters	
<b>Reference Conditions</b>	
Accuracy Class	1.5 according to IEC 60051 / DIN EN 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 0.4kA/m
<b>Environmental conditions</b>	
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	15g, 11ms
Vibration resistance	10-55-10 Hz/0.15mm, 1.5 g at about 50 Hz

## STANDARD MEASURING RANGES FOR VQ

A. C. Current		A. C. Voltage	
Rated Value	Approx Voltage drop	Rated value	Sensitivity (10%)
1 mA	2.4 V	40 V <sup>*3</sup>	900 ohm/ V
1.5 mA	1.4 V	60 V <sup>*4</sup>	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
40mA	1.7 V		
60mA	1.7 V		
100 mA	1.7 V		
150 mA	1.33 V		
250 mA	0.80 V		
400 mA	0.50 V		
600 mA	0.33 V		
750 mA	0.27 V		
1A <sup>*1</sup>	0.20 V		
1.5A <sup>*1</sup>	0.14V		

# MOVING COIL VQ/VL Series

## ANALOG PANEL METER

2.5A *1	0.80V		
4A *1	0.50V		
5A *1	0.40V		
6A *2	0.03V		
10A *2	0.02V		

### Note for VQ :-

- 1) Scales are non linear and non interchangeable for ammeters > 750mA.
- 2) \*1 possible in 72 and above size.
- 3) \*2 possible in 96 and above size.
- 4) \*3 Accuracy class 5.
- 5) \*4 Accuracy class 2.5

## STANDARD MEASURING RANGES FOR VL

A. C. Current		A. C. Voltage	
Rated Value	Approx Voltage drop	Rated Value	Sensitivity (+ 10%)
100 mA	1.8 V	40 A *A*2	900 ohm/ V
1 A *A	75 mV	60 A *A*1	900 ohm/ V
5A *A	75 mV	100 A *A	900 ohm/ V
10A *A	75 mV	150 A *A	900 ohm/ V
		250 A *A	900 ohm/ V
		300 A *A	900 ohm/ V
		400 A *A	900 ohm/ V
		500 A *A	900 ohm/ V
		600 A *A	900 ohm/ V
			900 ohm/ V
			900 ohm/ V

Note for Suppression scale possible upto X 6 meter

\*A for 72, 96, 144 sizes \*1- Accuracy Class 2.5 2\* Accuracy Class 5.

### 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
Clamp straps for connections	DIN 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 1010

# MOVING COIL VQ/VL Series

## ANALOG PANEL METER

Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories Environmental conditions	IEC 60051 / DIN EN 60051, DIN 43701, IEC 60051, VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions	DIN 43718
UL Combustibility class	UL94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical strength (Free fall test , vibration test )	IEC 60051, VDE 0411,part 1, Sec. 43/44, IEC 61010
Electromagnetic Compatibility(EMC) Compliance as per following standards	EN 50081-2,EN 50082-2, EN 55011/CISPR 11, EN 60555 -2,IEC 555-2, EN 61000-4-4 / IEC 1000-4-4, EN 61000-4-2 / IEC 1000-4-2, EN 61000-4-5 / IEC 1000-4-5, ENV 50140
Comply with following 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°
Accuracy class	1
Blank dial	With initial and end values marked
Special markings	Numbering / Lettering
Division dials	Basic divisions without numbering
Colour marking / band	Red or green
Increased sensitivity(VQ)	4kohm/V for voltmeters 1....600V
Increased sensitivity(VL)	4kohm/V for voltmeters 1....600V 10ohm/V for voltmeters 15....150V
Adjustments of Resistance (Sensitivity)	Within 1 % at 23°C

# MOVING COIL VQ/VL Series

## ANALOG PANEL METER

### Accessories

#### Safety Terminal Protection

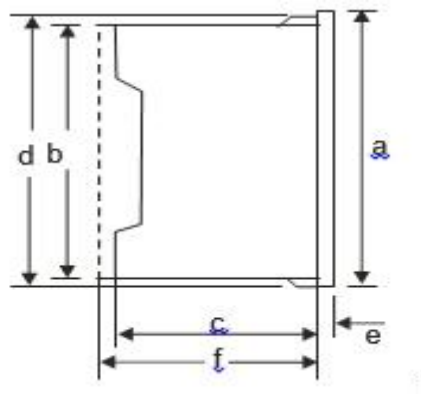
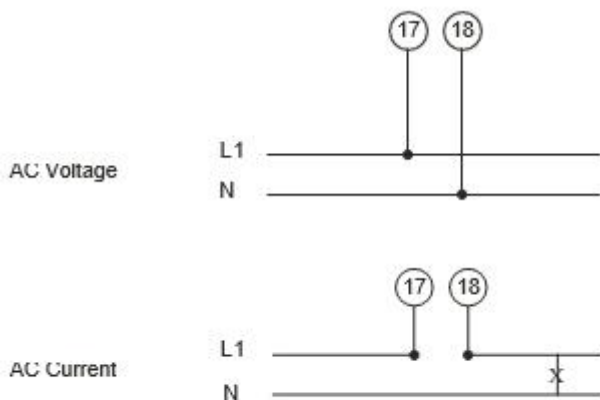
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc to VDE 0410.

#### 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 should be replaced under voltage-free conditions.
- 5) Bezels and window glasses may only be replaced under voltage-free conditions.

#### Connection Diagram :

#### Dimensions:



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 <sup>x</sup> 53	53	53	53
	d 44.5	67.5	91.5	137.5
	e 5.5	5.5	5.5	5.5 <sup>+1</sup>
	Cutout Size 45 <sup>+0.6</sup>	68 <sup>+0.7</sup>	92 <sup>+0.8</sup>	138 <sup>+1</sup>
Depth with Back cover	f <sup>**</sup> 64	64	64	64
Weight (approx.)	0.2 kg.	0.25 kg.	0.3 kg.	0.58 kg.

Dimensions (in mm)	VL72	VL96	VL144
Bezel	a <input type="checkbox"/> 72	<input type="checkbox"/> 96	<input type="checkbox"/> 144
Case	b <input type="checkbox"/> 66	<input type="checkbox"/> 90	<input type="checkbox"/> 136
Depth	c <sup>*</sup> <input type="checkbox"/> 53 or 72 <sup>#</sup>	<input type="checkbox"/> 53	<input type="checkbox"/> 53
	d <input type="checkbox"/> 67.5	<input type="checkbox"/> 91.5	<input type="checkbox"/> 137.5
e	5.5	5.5	5.5
Cutout Size	<input type="checkbox"/> 68 <sup>+0.7</sup>	<input type="checkbox"/> 92 <sup>+0.8</sup>	<input type="checkbox"/> 138 <sup>+1</sup>
Weight (approx.)	0.25 kg.	0.30 kg.	0.43 kg.
Depth with Back cover	f <sup>**</sup> 64	64	64

# MOVING COIL VQ/VL Series

ANALOG PANEL METER

## Ordering information

VQ/VL	
Front dimension(VQ)	48X48mm, 72X72mm, 96X96mm, 144X144mm
Front dimension(VL)	72X72mm, 96X96mm, 144X144mm
Measuring ranges	Refer to table inside
Terminal Protection	Full sized polycarbonate back cover
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
Increased sensitivity(VQ)	4kohm/V for voltmeters 1....600 V *3
Increased sensitivity(VL)	4kohm/V for voltmeters 1....600 V *3 10kohm/V for voltmeters 15....150 V
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	Ziegler*1, Others*3

\*1 Standard

\*3 Please clearly add the desired specifications while ordering

**Example** – VQ/VL72, Measuring range 0.....100mA, Dial with 0.....100°C Red Mark at 37°C

Specification are subjects to change without notice

# Ziegler

Redefine Innovative Metering

**Ziegler Instrumentation UK Ltd.**

Central Buildings, Woodland close old woods Trading Estate, Torquay Devon, TQ2 7BB, United Kingdom  
+441803 616 800 | [info@ziegler-instrument.com](mailto:info@ziegler-instrument.com) | [ziegler-instrument.com](http://ziegler-instrument.com)