



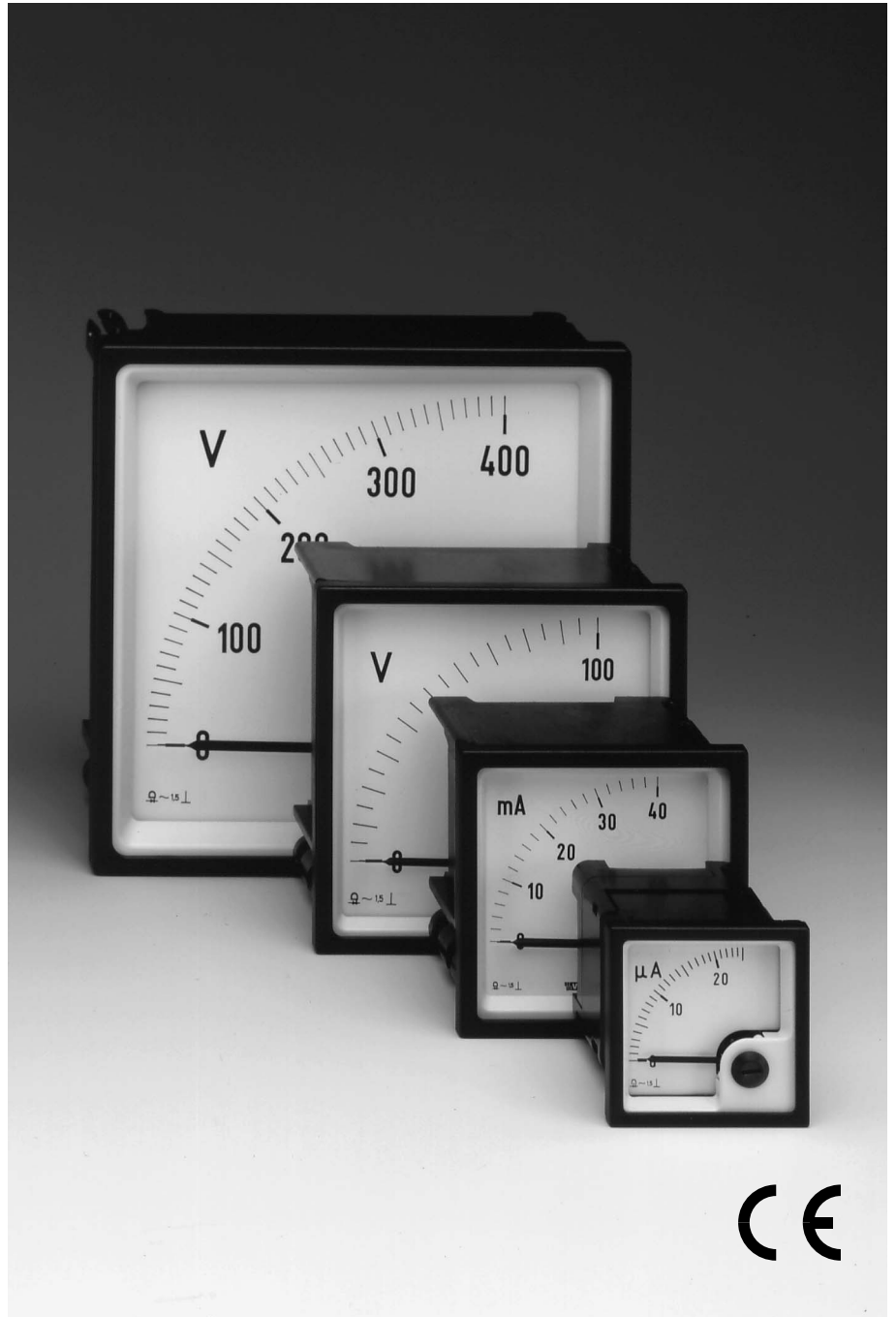
Data Sheet

K Series
415.D.101.09

Analog Meters with Moving-Coil Movement and Rectifier 90° Dial

VQ 48 K
VQ 72 K
VQ 96 K
VQ 144 K

with Slide-In-Dial



WEIGEL

Application

The moving-coil rectifier meters **VQ 48/72/96/144 K** (K series) housed in moulded thermoplastic cases are used for the measurement of sinusoidal AC currents and voltages.

Moving-coil rectifier instruments measure average values and are scaled to indicate r.m.s., assuming a sinusoidal wave form.

The instruments are suitable to be mounted in switchboards, control panels, machine tool consoles and mosaic panels. The bezel, the glass window and the dial can be easily exchanged on-site.

Movements

Self-shielding moving-coil movements with core-type magnet and pivot suspension. Spring loaded jewel bearings for vibration and shock resistance.

Mechanical Data

case details	moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels, stackable			
material of case	polycarbonate thermoplastics, flame retardant with UL rating of 94 V – 0			
material of window	glass ▶			
colour of bezel	black (similar to RAL 9005) ▶			
position of use	vertical $\pm 5^\circ$ ▶			
panel fixing	screw clamps or spring clamps (except VQ 144 K)			
mounting	stackable next to each other			
panel thickness	≤ 40 mm			
terminals	hexagon studs, M4 screws and wire clamps E3			
dimensions (in mm)	VQ 48 K	VQ 72 K	VQ 96 K	VQ 144 K
bezel	□ 48	□ 72	□ 96	□ 144
case	□ 42.5	□ 66	□ 90	□ 136
depth	53	53	53	53
panel cutout	□ 45 ^{+0.6}	□ 68 ^{+0.7}	□ 92 ^{+0.8}	□ 138 ⁺¹
weight approx.	0.11 kg	0.15 kg	0.2 kg	0.25 kg

Electrical Data

measuring unit	AC voltage or current			
frequency range	voltage	40 Hz ... <u>50 Hz</u> ... 10 kHz		
	current	50 Hz (others on request)		
overload capacity (acc. to DIN EN 60 051-1)	continuously			
5 s max.	1.2 times rated voltage / current 2 times rated voltage, 10 times rated current			
measurement category	CAT III			
operating voltage	refer to Measuring Ranges			
pollution level	2			
enclosure code	IP 52 case front side IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact ▶			

Measuring Ranges

AC current	voltage drop approx.	AC voltage	sensitivity ¹⁾
10 mA	1.7 V	6 V	900 Ω/V
15 mA	1.7 V	10 V	900 Ω/V
25 mA	1.7 V	15 V	900 Ω/V
40 mA	1.9 V	25 V	900 Ω/V
60 mA	1.9 V	40 V	900 Ω/V
100 mA	2.0 V	60 V	900 Ω/V
		100 V	900 Ω/V
		150 V	900 Ω/V
		250 V	900 Ω/V
		400 V	900 Ω/V
		500 V	900 Ω/V
		600 V ²⁾	900 Ω/V

measuring ranges operating voltage

AC current	VQ 48 K	VQ 72 K	VQ 96 K	VQ 144 K
10; 15; 20; 25; 40; 60; 100 mA	150 V	150 V	150 V	150 V
AC voltage	VQ 48 K	VQ 72 K	VQ 96 K	VQ 144 K
6; 10; 15; 25; 40; 60; 100; 150 V	150 V	150 V	150 V	150 V
250 V	300 V	300 V	300 V	600 V
400; 500 V	300 V	300 V	300 V	600 V
600 V ²⁾	–	–	600 V	600 V

¹⁾ the resistance values are limited to a tolerance of $\pm 20\%$

²⁾ not for VQ 48/72 K

Scaling

pointer	bar / knife-edge pointer			
pointer deflection	0 ... 90°			
scale characteristics	linear			
scale division	coarse-fine			
scale length	VQ 48 K	VQ 72 K	VQ 96 K	VQ 144 K
	41 mm	61 mm	97 mm	146 mm

Accuracy at Reference Conditions

accuracy class	1.5 according to DIN EN 60 051 - 1
reference conditions	
ambient temperature	23°C
position of use	nominal position $\pm 1^\circ$ ▶
input	rated measuring value
frequency	45 ... <u>50</u> ... 65 Hz
wave form	sinusoidal, distortion factor <5%
others	DIN EN 60 051 - 1

influences

ambient temperature	23°C ± 2 K
position of use	nominal position $\pm 5^\circ$
frequency	40 ... <u>45...60</u> ... 100 Hz
stray magnetic field	0.5 mT

▶ also refer to "Options"



Analog Meters with Moving-Coil Movement and Rectifier 90° Dial

Environmental

climatic suitability	climatic class 3 acc. to VDE/VDI 3540 sheet 2
operating temperature range	-10 ... +55 °C
storage temperature range	-25 ... +65 °C
relative humidity	≤ 75% annual average, non-condensing
shock resistance	15 g, 11 ms
vibration resistance	2.5 g, 5 ... 55 Hz

Rules and Standards

DIN 43 718	Measurement and control; front-frames and frontpanels of measurement and control equipment; principal dimensions
DIN 43 802	Line scales and pointers for indicating electrical measuring instruments; general requirements
DIN 16 257	Nominal positions and position symbols used for measuring instruments
DIN EN 60 051	Direct acting indicating analogue electrical measuring instruments and their accessories
-1	Part 1: Definitions and general requirements common to all parts
-2	Part 2: Special requirements for ammeters and voltmeters
-9	Part 9: Recommended test methods
DIN EN 60 529	Enclosure codes by housings (IP-code)
DIN EN 61 010-1	Safety requirements for electrical measuring, control and laboratory equipment Part 1: General requirements
DIN EN 61 326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements Part 1: General requirements (IEC 61 000-4-3 evaluation criterion B)
DIN IEC 61 554	Panel mounted equipment – Electrical measuring instruments – Dimensions for panel mounting
VDE/VDI 3540 sheet 2	reliability of measuring and control equipment (classification of climates)

Options

case	
window	non-glaring glass
colour of bezel	gray (similar to RAL 7037)
index marking pointer	red, front adjustable
position of use	on request 15...165°
marine application	non-certified or with approbation by "Germanischer Lloyd" (except VQ 48 K)
dial	
non-calibrated	with dial symbols
blank dial	pencil-marked on initial and end values
scale division and figuring	0 ... 100%
linear scale division	non-standard captions on request
additional lettering	on request e.g. "generator"
additional figuring	on request

coloured marks	red, green or blue for important scale values
coloured sector	red, green or blue within scale division
logo on the dial	none or on request

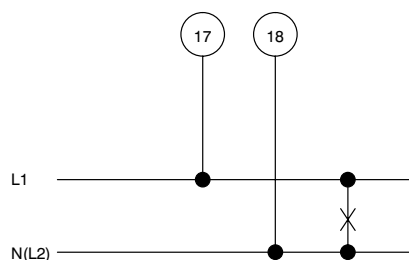
others	
increased sensitivity	4 kΩ/V for voltmeters 6 ... 600 V 10 kΩ/V for voltmeters 6 ... 150 V
adjustment of resistance	to ±1% at 23 °C

terminal protection against accidental contact

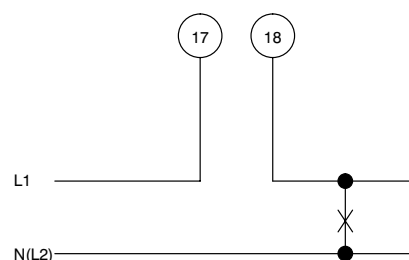
full-sized rear cover (except direct-connected ammeters > 25 A), protective sleeves to go on hexagon studs and M4 screws with wire clamps E3

Connections

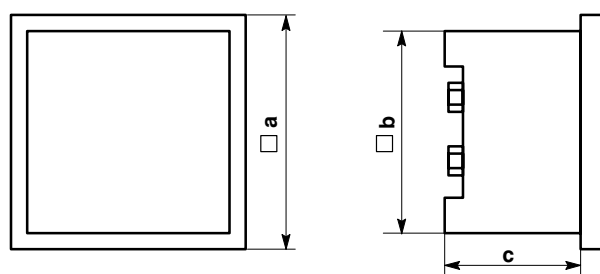
AC voltage



AC current



Dimensions



dimensions (in mm)	VQ 48 K	VQ 72 K	VQ 96 K	VQ 144 K
a	48	72	96	144
b	42.5	66	90	136
c	53	53	53	53

Ordering Information

type VQ	moving-coil rectifier panel meter
front dimensions 48 K 72 K 96 K 144 K	48 mm x 48 mm 72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
measuring ranges	refer to preceding table
window	glass ¹⁾ non-glaring glass
colour of bezel	black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
position of use	vertical ¹⁾ on request 15 ... 165° ²⁾
panel fixing	screw clamps ¹⁾ spring clamps (except VQ 144 K)
marine application	none ¹⁾ non-certified with approbation by "Germanischer Lloyd" (except VQ 48 K)
terminal protection	none ¹⁾ full-sized rear cover protective sleeves
index marking pointer	none ¹⁾ red, front adjustable
increased sensitivity	900 Ω/V for voltmeters ¹⁾ 4 kΩ/V for voltmeters 6 ... 600 V 10 kΩ/V for voltmeters 6 ... 150 V
adjustment of resistance	none ¹⁾ to ±1% at 23°C
dial	scale division & measuring range alike ¹⁾ no dial non-calibrated, with dial symbols blank dial scale division and figuring 0 ... 100% linear scale division ²⁾ additional lettering on request ²⁾ additional figuring on request ²⁾ coloured marks red, green or blue ²⁾ coloured sector red, green or blue ²⁾
logo	WEIGEL ¹⁾ none OEM logo ²⁾

¹⁾ Standard

²⁾ Please clearly add the desired specifications.

ordering example

VQ 72 K, measuring range 0 ... 100 mA, window non-glaring glass, dial 0 ... 100%, red mark at 90%, no logo

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– specifications subject to change without notice; date of issue 02/11 –

