



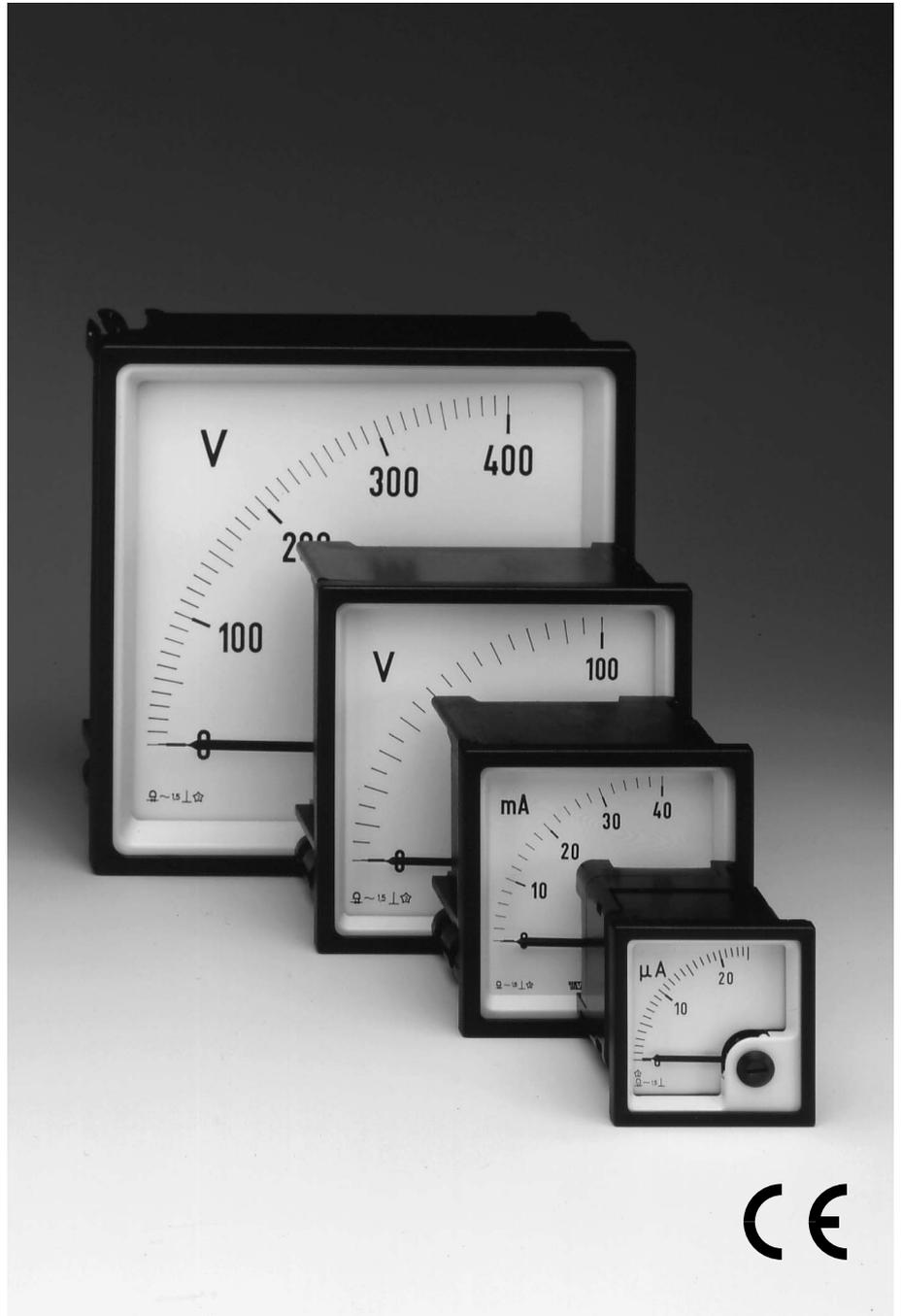
# Data Sheet

K Series  
415.D.101.05

## 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** (Kseries) 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	$\leq 40$ mm			
terminals	hexagon studs, M4 screws and wire clamps E3			
<b>dimensions</b> (in mm)	<b>VQ 48 K</b>	<b>VQ 72 K</b>	<b>VQ 96 K</b>	<b>VQ 144 K</b>
bezel	□ 48	□ 72	□ 96	□ 144
case	□ 42.5	□ 66	□ 90	□ 136
depth	53	53	53	53
panel cutout	□ 45 <sup>+0.6</sup>	□ 68 <sup>+0.7</sup>	□ 92 <sup>+0.8</sup>	□ 138 <sup>+1</sup>
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 ... 50 Hz ... 10 kHz current 50 Hz (others on request)
overload capacity (acc. to DIN EN 60 051)	
continuously	1.2 times rated voltage / current
5 s max.	2 times rated voltage, 10 times rated current
pollution level	2
operating voltage	600 V ▶
excess voltage category	CAT II ▶
enclosure code	IP 52 case 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*
10 mA	1.7 V	6 V	900 $\Omega/V$
15 mA	1.7 V	10 V	900 $\Omega/V$
25 mA	1.7 V	15 V	900 $\Omega/V$
40 mA	1.9 V	25 V	900 $\Omega/V$
60 mA	1.9 V	40 V	900 $\Omega/V$
100 mA	2.0 V	60 V	900 $\Omega/V$
		100 V	900 $\Omega/V$
		150 V	900 $\Omega/V$
		250 V	900 $\Omega/V$
		400 V	900 $\Omega/V$
		500 V	900 $\Omega/V$
		600 V	900 $\Omega/V$

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

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

### influences

ambient temperature	-10°C ... +23°C ... +55°C
position of use	nominal position $\pm 5^\circ$
frequency	40 ... 50 ... 100 Hz
stray magnetic field	0.5 mT

## 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	$\leq 75\%$ annual average, non-condensing
shock resistance	15 g, 11 ms
vibration resistance	2.5 g, 5 ... 55 Hz

▶ also refer to "Options"



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

### Rules and Standards

DIN 43 700	measuring and control instruments for panel mounting; nominal case and cutout dimensions
DIN 43 701	electrical switchboard instruments
DIN 43 718	bezels and front panels
DIN 43 802	scales and pointers for electrical measuring instruments
DIN 16 257	nominal position of use and position symbols applicable for measuring instruments
DIN 40 050	enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water
DIN EN 60 051	direct acting indicating electrical measuring instruments and their accessories
DIN EN 61 010	safety requirements for electrically operated measuring, control and laboratory equipment
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)

#### electrical data

operating voltage	up to 1000 V
excess voltage category	up to CAT III

#### 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
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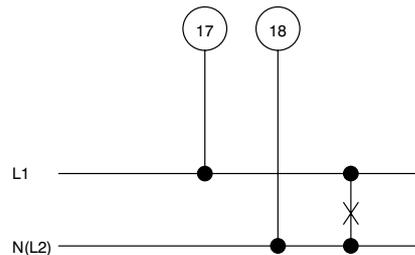
adjustment of resistance	to ±1% at 23°C
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#### terminal protection against accidental contact

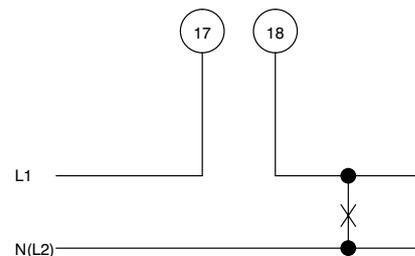
full-sized rear cover (except direct-connected ammeters > 25 A), protective sleeves to go on hexagon studs and M4 screws with wire clamps E3  
protection against accidental contact (hand and fingers)  
acc. to VBG 4 / DIN 57 106, sec. 100

### Connections

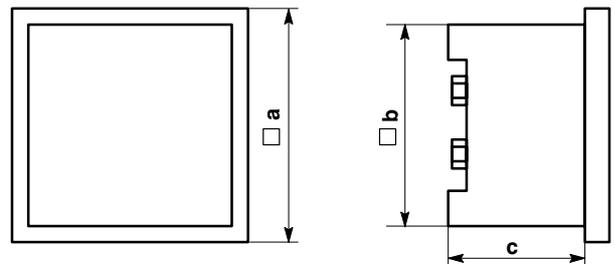
#### AC voltage



#### 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

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

\*) standard

\*\*) 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

– specifications subject to change without notice; date of issue 03/05 –

## WEIGEL – MESSGERÄTE GmbH

P.O.B. 720 154 • D-90241 Nürnberg • Telephone: 0911 / 423 47-0  
Erlenstraße 14 • D-90441 Nürnberg • Fax: 0911 / 423 47-39  
Internet: <http://www.weigel-messgeraete.de>  
e-mail: [vertrieb@weigel-messgeraete.de](mailto:vertrieb@weigel-messgeraete.de)

