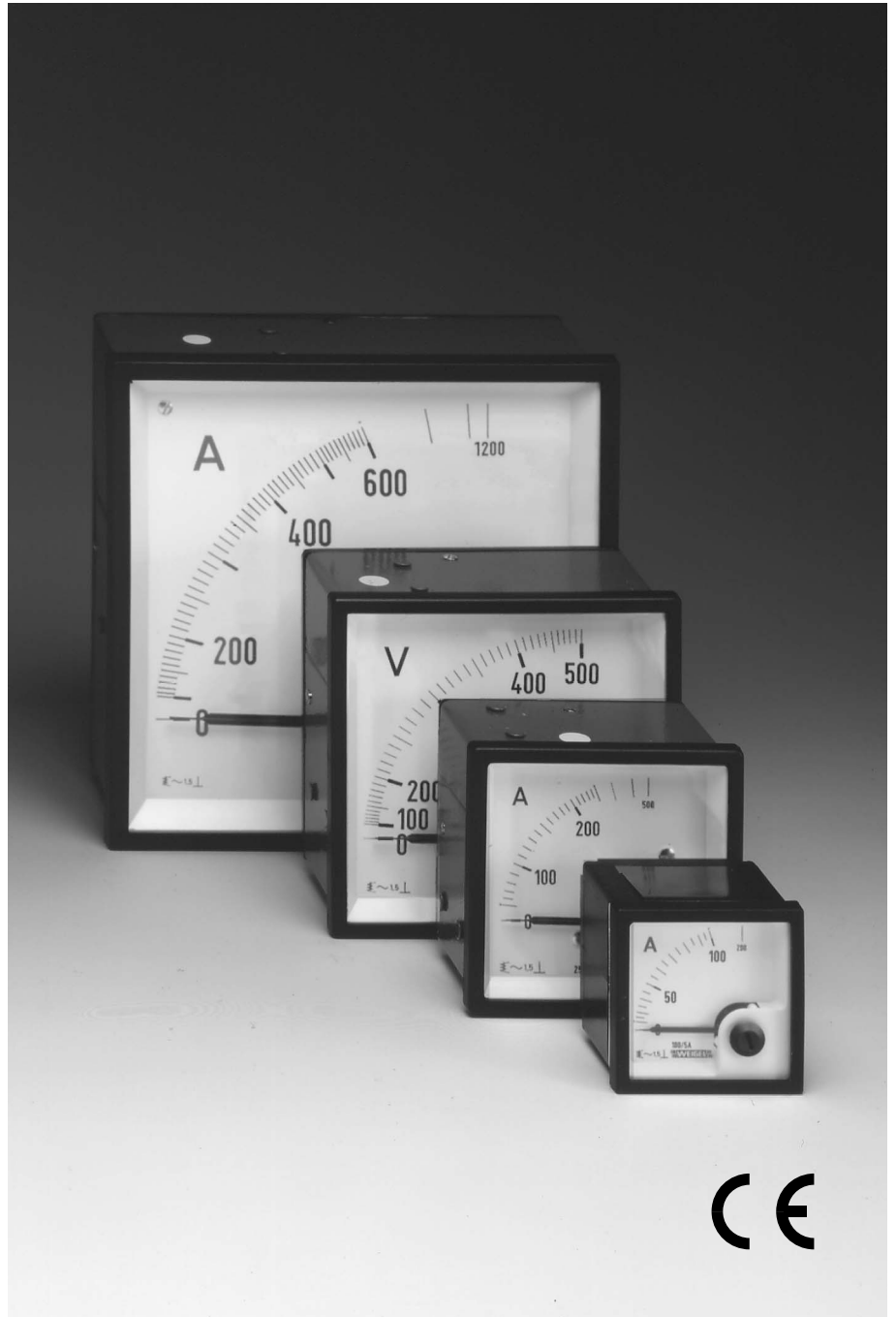


# Data Sheet

M Series  
020.D.101.05

## Analog Meters with Moving-Iron Movement 90° Dial

WSQ 48  
WQ 72 RS  
WQ 96 RS  
WQ 144 RS



**WEIGEL**

## Application

The moving-iron panel meters **WSQ 48** with exchangeable dial and **WQ 72/96/144 RS** (M Series) are mainly used for the measurement of AC currents and voltages in the usual technical frequency range of 16<sup>2</sup>/<sub>3</sub> ... 100 Hz.

Moving-iron meters indicate rms-values practically independent of wave form even of high harmonics. Error of indication may occur for extreme wave forms (e.g. phase gating controls) and / or frequencies above 100 Hz.

These meters are **not** suitable for use with shunts or tachogenerators due to their high power consumption.

Moving-iron instruments can also be calibrated to read DC, however, an additional error of approx. 1% will occur.

The instruments are suitable for mounting in generating sets, power control panels, machine tool consoles, switchboards or mosaic panels.

## Movements

Moving-iron movements with pivot suspension. Spring loaded jewel bearings and silicon oil damping for vibration and shock resistance.

## Mechanical Data

case details	square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels, stackable			
material of case	thermoplastics, flame retardant (WSQ 48) pressed steel (WQ 72/96/144 RS)			
material of window	glass			
colour of bezel	black (similar to RAL 9005)			
position of use	vertical ±5°			
panel fixing	spring clamps (WSQ 48) screw clamps (WQ 72/96/144 RS)			
panel thickness	1 ... 15 mm			
mounting	stackable next to each other			
<b>terminals</b>				
voltmeters and ammeters ≤ 30 A (WSQ 48)	hexagon studs, M4 screws and wire clamps			
voltmeters and ammeters ≤ 3 A (WQ 72/96/144 RS)	hexagon studs, M3 screws and wire clamps C6			
ammeters >3 A (WQ 72/96/144 RS)	hexagon studs, M5 screws and wire clamps C10			
ammeters >30 A	hexagon studs, M6 screws and wire clamps C10			
ammeters >60 A	threaded studs M8 with nuts			
ammeters and voltmeters >150 V	connector blades 6.3 x 0.8 for protective wire (WQ 72/96 RS)			
<b>dimensions</b> (in mm)	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
bezel	□ 48	□ 72	□ 96	□ 144
case	□ 45	□ 66.5	□ 90.5	□ 137
depth	48	57	60	60
panel cutout	□45.2+0.3	□68.3+0.4	□92+0.8	□138+1
weight approx.	0.1 kg	0.2 kg	0.3 kg	0.6 kg

◆ for other ratings refer to "Options"

## Electrical Data

measuring unit	AC voltage / current		
frequency range	16 <sup>2</sup> / <sub>3</sub> ... 100 Hz		
overload capacity (acc. to DIN EN 60 051 -1)	1.2 times rated voltage / current		
continuously	5 s max.		
voltmeters	2 times rated voltage		
ammeters	10 times rated current		
power consumption			
voltmeters	approx. 1.5 ... 3 VA		
ammeters	approx. 0.5 ... 1 VA		
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

measuring ranges	operating voltage			
<b>AC current</b> <sup>1)</sup>	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
40; 60; 100; 150; 250; 400; 600 mA				
1; 1.5; 2.5; 4; 5; 6; 10; 15; 25; 40 A	300 V	300 V	600 V	300 V
60; 100 A <sup>3)</sup>	–	300 V	600 V	300 V
<b>AC voltage</b>	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
6; 10; 15; 25; 40; 60; 100; 150 V				
250 V	300 V	300 V	600 V	300 V
400 V, 500 V	300 V	300 V	600 V	600 V
600 V	on request	600 V	600 V	600 V
<b>for use on VT/CT</b>	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
N/1 A, N/5 A <sup>1)</sup>	300 V	300 V	600 V	300 V
N/100 V, N/110 V <sup>2)</sup>	300 V	150 V	150 V	300 V

Please state transformer ratio when ordering.

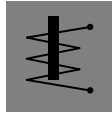
<sup>1)</sup> full scale value = 2 times rated value (overload scaling) ◆

<sup>2)</sup> full scale value = 1.2 times rated value ( – ” – )

<sup>3)</sup> not for WSQ 48

## Scaling

pointer	bar / knife-edge pointer			
colour of pointer	black			
pointer deflection	0 ... 90°			
colour of dial	white			
scale characteristics	scales have divisions down to 20% full-scale value. The initial scale is compressed.			
scale division	coarse-fine			
scale length	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
	44 mm	69 mm	94 mm	146 mm
overload scaling				
ammeters	2 times rated current ◆			
voltmeters for use on voltage transformers	1.2 times rated voltage			



## Analog Meters with Moving-Iron Movement 90° Dial

### Accuracy at Reference Conditions

accuracy class	1.5 according to DIN EN 60 051 - 1 ♦
<b>reference conditions</b>	
ambient temperature	23 °C
position of use	nominal position ± 1 °
input	rated measuring value
frequency	45 ... 65 Hz
wave form	sinusoidal, distortion factor <5%
others	DIN EN 60 051 - 1
<b>influences</b>	
ambient temperature	23 °C ± 2K
position of use	nominal position ± 5 °
frequency	15 ... 100 Hz (voltage) ♦ 15 ... 400 Hz (current)
stray magnetic field	0.5 mT ♦

### Environmental

climatic suitability	climatic class 2 acc. to VDE/VDI 3540, sh. 2 ♦
operating temperature range	-25 ... +40 °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
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)

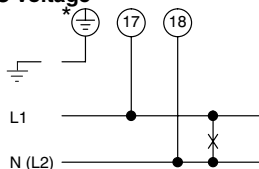
♦ for other ratings refer to "Options"

### Options

<b>measuring range</b>	
special measuring range	deviating from standard
2 <sup>nd</sup> measuring range	with 3 <sup>rd</sup> terminal for voltmeters and ammeters 0.1 ... 25 A in ratios 1 : 2 up to 1 : 5 2 <sup>nd</sup> figuring and 1 or 2 scale divisions
additional measuring ranges	on request
accuracy class	1.0 with fine scale division (as far as possible)
calibration	for a definite frequency between 100...1000 Hz
overload capacity	ammeters to withstand overloads up to 40 times rated current for max. 1 s (except WSQ 48) marked by a red sector at end scale
<b>case</b>	
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 °
<b>performance</b>	
increased mechanical loads	shock 30 g, 11 ms vibration 5 g, 5 ... 55 Hz
climatic suitability	limited use in the tropics climatic class 3 acc. to VDE/VDI 3540, sheet 2 -10 ... +55 °C
with operating temperature range	
marine application	non-certified
enclosure code	IP 54 splash-water protected front
shielding	against stray magnetic fields up to 4 mT
<b>accessories</b>	
terminal protection against accidental contact	full-sized rear cover (except WSQ 48) or protective sleeves
terminals	connector blades 6.3 x 0.8
<b>dial</b>	
blank dial	pencil-marked on initial and end values
scale division and figuring	0 ... 100%, deviating from standard, special calibration from customer's non-linear graph or chart, scaling of voltmeters in ohms; captions on request
2 <sup>nd</sup> scale division	including figuring
coloured dial	black dial with yellow or white pointer, DIN-scale division and figuring
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
zero position	mechanically suppressed zero, without zero adjustment up to 30% of full-scale value
expanded scale	on request
overload scaling	none, ammeters with overload scaling 3, 4 or 5 times rated current (except WSQ 48)
<b>dial illumination</b> by 1 lamp (WQ 72/96 RS) or 2 lamps (WQ 144 RS) 6 V, 12 V or 24 V stickable from rear, dial translucent	

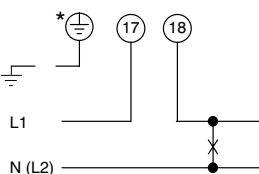
## Connections

### AC voltage

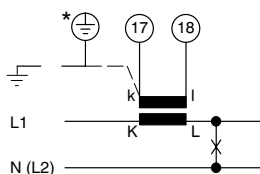
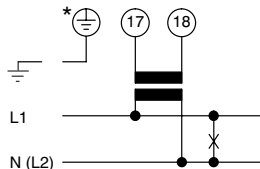


\* WQ 72/96 RS voltmeters >150 V

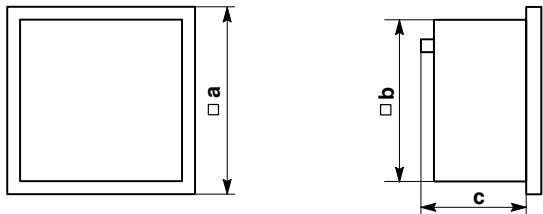
### AC current



\* WQ 72/96 RS ammeters



## Dimensions



dimensions (in mm)	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
a	48	72	96	144
b	45	66	90	137
c	48	57	60	60

## Ordering Information

<b>type (WSQ)WQ</b>	moving-iron panel meter
<b>front dimensions</b>	
48	48 mm x 48 mm
72 RS	72 mm x 72 mm
96 RS	96 mm x 96 mm
144 RS	144 mm x 144 mm
<b>measuring ranges</b>	refer to preceding table
<b>sp. measuring range</b>	on request <sup>2)</sup>
<b>2<sup>nd</sup> measuring range</b>	none <sup>1)</sup> 1 scale division, 2 <sup>nd</sup> figuring 2 scale divisions, 2 figurings <sup>3)</sup>
<b>accuracy class</b>	1.5 <sup>1)</sup> 1.0 with fine scale division
<b>calibration</b>	50 Hz <sup>1)</sup> for a definite frequency 100 ... 1000 Hz <sup>2)</sup>
<b>overload capacity</b>	10 times rated current max. 5s <sup>1)</sup> up to 40 times rated current max. 1s <sup>3)</sup>

<b>window</b>	glass <sup>1)</sup> non-glaring glass
<b>colour of bezel</b>	black (similar to RAL 9005) <sup>1)</sup> gray (similar to RAL 7037)
<b>index marking pointer</b>	none <sup>1)</sup> red, front adjustable
<b>position of use</b>	vertical <sup>1)</sup> on request 15 ... 165° <sup>2)</sup>
<b>mechanical loads</b>	shock 15 g, vibration 2.5 g <sup>1)</sup> shock 30 g, vibration 5 g
<b>climatic suitability</b>	class 2, -25 ... +40°C <sup>1)</sup> class 3, -10 ... +55°C
<b>marine application</b>	none <sup>1)</sup> non-certified
<b>enclosure code</b>	IP 52 <sup>1)</sup> IP 54 splash-water protected front
<b>shielding</b>	against stray magnetic fields up to 0.5 mT <sup>1)</sup> against stray magnetic fields up to 4 mT
<b>terminal protection</b>	none <sup>1)</sup> full-sized rear cover <sup>3)</sup> protective sleeves
<b>terminals</b>	screws and wire clamps <sup>1)</sup> connector blades 6.3 x 0.8
<b>dial</b>	according to measuring range resp. standard series for use on transformers <sup>1)</sup> blank dial scale division and figuring 0 ... 100% deviating from standard <sup>2)</sup> calibration fr. non-linear graph or chart <sup>2)</sup> scaling in ohms for voltmeters <sup>2)</sup> 2 scale divisions <sup>2)</sup> black dial, yellow pointer, division & figuring black dial, white pointer, division & figuring additional lettering on request <sup>2)</sup> additional figuring on request <sup>2)</sup> coloured marks red, green or blue <sup>2)</sup> coloured sector red, green or blue <sup>2)</sup>
<b>logo</b>	WEIGEL <sup>1)</sup> none OEM logo <sup>2)</sup>
<b>zero position</b>	standard zero <sup>1)</sup> suppressed zero (mechanically) <sup>2)</sup>
<b>expanded scale</b>	on request
<b>overload scaling</b>	none <sup>3)</sup> 2 times rated current <sup>1)</sup> 3, 4 or 5 times rated current <sup>3)</sup>
<b>dial illumination</b>	none <sup>1)</sup> with 1 lamp 6 V, 12 V or 24 V (WQ 72/96 RS) with 2 lamps 6 V, 12 V or 24 V (WQ 144 RS)

<sup>1)</sup> Standard

<sup>2)</sup> Please clearly add the desired specifications.

<sup>3)</sup> WQ 72/96/144 RS only

### ordering example

WQ 144 RS, 2 measuring ranges 0 ... 1 A and 0 ... 5 A,  
2 scale divisions, 2 figurings, window non-glaring glass, gray bezel,  
WEIGEL logo

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– specifications subject to change without notice; date of issue 12/10 –

