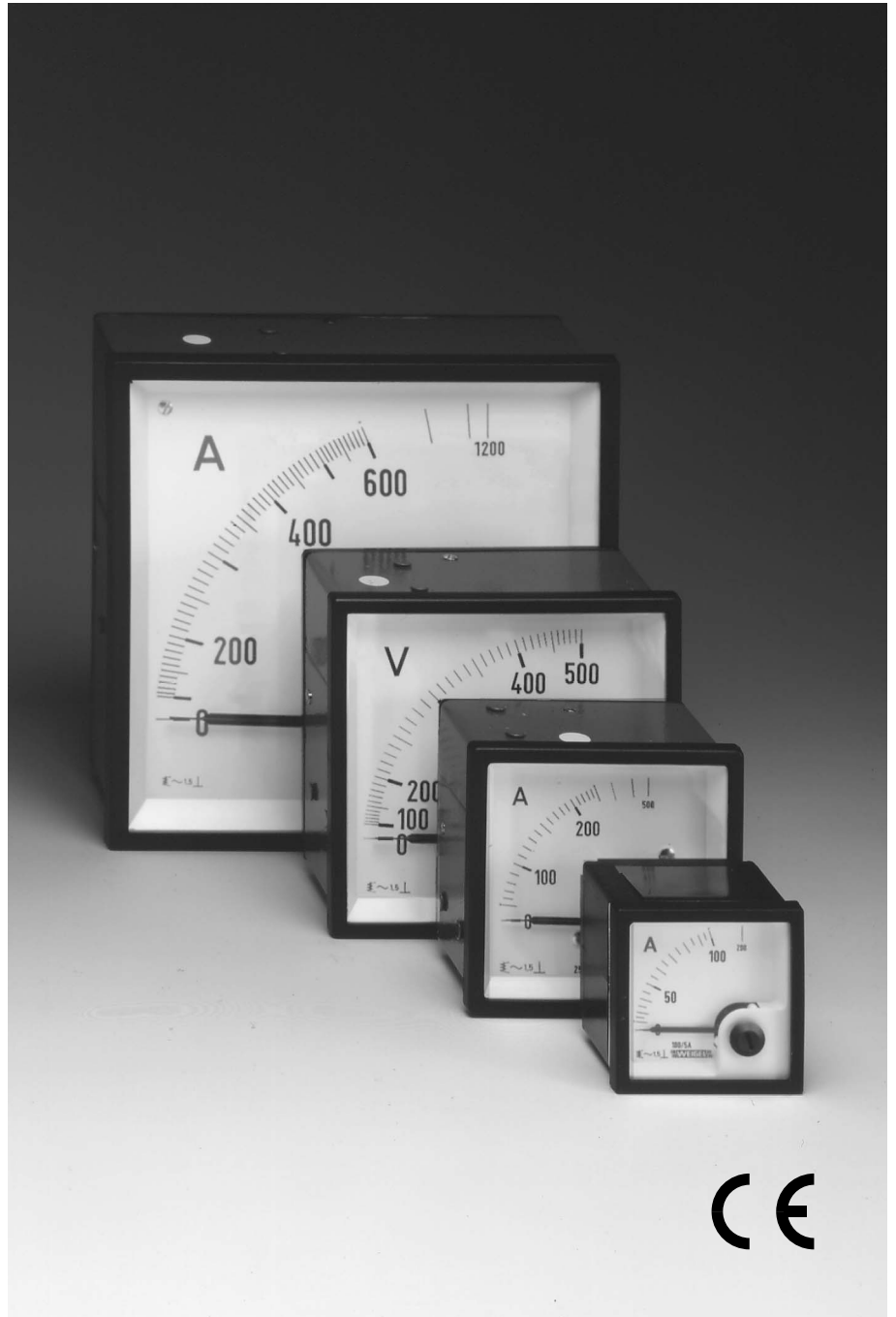


Data Sheet

M Series
020.D.101.06

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 16²/₃ ... 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			
terminals				
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)			
dimensions (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 ² / ₃ ... 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			
AC current ¹⁾	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 ³⁾	–	300 V	600 V	300 V
AC voltage	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
for use on VT/CT	WSQ 48	WQ 72 RS	WQ 96 RS	WQ 144 RS
N/1 A, N/5 A ¹⁾	300 V	300 V	600 V	300 V
N/100 V, N/110 V ²⁾	300 V	150 V	150 V	300 V

Please state transformer ratio when ordering.

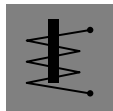
¹⁾ full scale value = 2 times rated value (overload scaling) ◆

²⁾ full scale value = 1.2 times rated value (– ” –)

³⁾ 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 ♦

reference conditions

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

influences

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

measuring range

special measuring range deviating from standard
2nd measuring range with 3rd terminal for voltmeters and ammeters 0.1 ... 25 A in ratios 1 : 2 up to 1 : 5
2nd figuring and 1 or 2 scale divisions on request

additional measuring ranges

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

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 °

performance

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

accessories

terminal protection against accidental contact full-sized rear cover (except WSQ 48) or protective sleeves
terminals connector blades 6.3 x 0.8

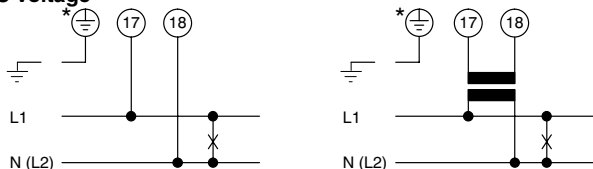
dial

blank dial pencil-marked on initial and end values
scale division 0 ... 100%,
and figuring deviating from standard,
special calibration from customer's non-linear graph or chart,
scaling of voltmeters in ohms; captions on request
2nd scale division including figuring
coloured dial black dial with yellow or white pointer, DIN-scale division and figuring on request e.g. "generator"
additional lettering on request
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 on request
expanded scale on request
overload scaling none, ammeters with overload scaling 3, 4 or 5 times rated current (except WSQ 48)
dial illumination pluggable, dial translucent
for WQ 72/96 RS 1 lamp 6V, 12V or 24V
for WQ 72/96 RS 1 LED 24V DC / 0.4W

special dial illumination with light-carrier dial and dial mask, dial plate black, scale divisions black on a yellow or white arc; pointer and figures yellow or white, illumination white or red, supply voltage 6V, 12V or 24V

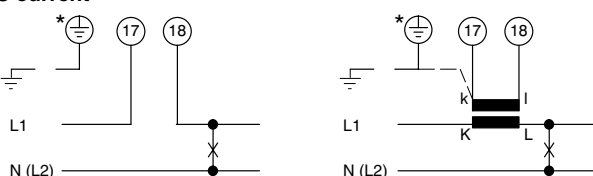
Connections

AC voltage



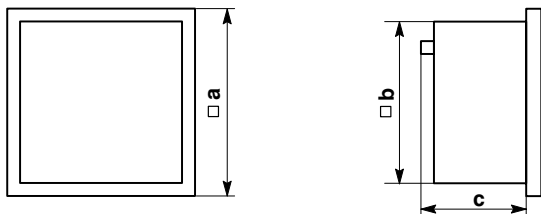
* WQ 72/96 RS voltmeters >150 V

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

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

window	glass ¹⁾ non-glaring glass
colour of bezel	black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
index marking pointer	none ¹⁾ red, front adjustable
position of use	vertical ¹⁾ on request 15 ... 165° ²⁾
mechanical loads	shock 15 g, vibration 2.5 g ¹⁾ shock 30 g, vibration 5 g
climatic suitability	class 2, -25 ... +40°C ¹⁾ class 3, -10 ... +55°C
marine application	none ¹⁾ non-certified
enclosure code	IP 52 ¹⁾ IP 54 splash-water protected front
shielding	against stray magnetic fields up to 0.5 mT ¹⁾ against stray magnetic fields up to 4 mT
terminal protection	none ¹⁾ full-sized rear cover ³⁾ protective sleeves
terminals	screws and wire clamps ¹⁾ connector blades 6.3 x 0.8
dial	according to measuring range resp. standard series for use on transformers ¹⁾ blank dial scale division and figuring 0 ... 100% deviating from standard ²⁾ calibration fr. non-linear graph or chart ²⁾ scaling in ohms for voltmeters ²⁾ 2 scale divisions ²⁾ black dial, yellow pointer, division & figuring black dial, white pointer, division & figuring 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⁾
zero position	standard zero ¹⁾ suppressed zero (mechanically) ²⁾
expanded scale	on request
overload scaling	none ³⁾ 2 times rated current ¹⁾ 3, 4 or 5 times rated current ³⁾
dial illumination	none ¹⁾ 1 lamp 6V, 12V or 24V ⁴⁾ 1 pluggable LED 24V DC / 0.4W ⁴⁾
sp. dial illumination	with light-carrier dial 6, 12 or 24 V

¹⁾ Standard

²⁾ Please clearly add the desired specifications.

³⁾ WQ 72/96/144 RS only ⁴⁾ WQ 72/96 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

– specifications subject to change without notice; date of issue 02/13 –

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