



Data Sheet

M Series
017.D.101.04

Analog Meters with Dual Moving-Coil Movement

PQ 48 /2



Application

The square moving-coil instruments **PQ 48 /2** (M series) having two meter movements are used for process control measurement of DC currents and/or DC voltages. They are scaled to determine control deviations and regulating link positions in control systems.

The instruments are suitable to be mounted in switchboards, control panels, machine tool consoles or mosaic grid panels.

Movements

Self-shielding moving-coil movements with core-type magnetic systems, pivot suspended. Twin spring loaded jewel bearings for vibration and shock resistance.

Mechanical Data

case details	square case suitable to be mounted in control / switchgear panels or mosaic grid panels, stackable
material of case	thermoplastics, flame retardant
material of window	glass ▶
colour of bezel	black (similar to RAL 9005) ▶
position of use	any position permissible
panel fixing	screw clamps ▶
panel thickness	1 ... 40 mm
mounting	stackable next to each other
terminals	connector blades 6.3 x 0.8

dimensions

bezel	□ 48 mm
case	□ 41 mm
depth	72 mm
panel cutout	□ 45.0 ^{+0.6} mm
weight approx.	0.09 kg

Electrical Data

measuring unit	DC voltages or DC currents
overload capacity (acc. to DIN EN 60 051 - 1)	
continuously	1.2 times rated voltage / current
5 s max.	
voltmeters	2 times rated voltage
ammeters	10 times rated current
measurement category	CAT III
operating voltage	100 V
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

▶ also refer to "Options"

Measuring Ranges

For mains use

Movement I (outer)

control deviation	internal resistance ¹⁾	pointer deflection	scale ▶
-20 ... 0 ... +20 μ A	6 k Ω	$\pm 22.5^\circ$	-10 ... 0 ... +10
-20 ... 0 ... +20 μ A	6 k Ω	$\pm 22.5^\circ$	-20 ... 0 ... +20
-20 ... 0 ... +20 μ A	13 k Ω	$\pm 22.5^\circ$	-10 ... 0 ... +10
-20 ... 0 ... +20 μ A	13 k Ω	$\pm 22.5^\circ$	-20 ... 0 ... +20
-20 ... 0 ... +20 μ A	50 k Ω	$\pm 22.5^\circ$	-10 ... 0 ... +10
-20 ... 0 ... +20 μ A	50 k Ω	$\pm 22.5^\circ$	-20 ... 0 ... +20
-50 ... 0 ... +50 μ A	2 k Ω	$\pm 22.5^\circ$	-10 ... 0 ... +10
-50 ... 0 ... +50 μ A	2 k Ω	$\pm 22.5^\circ$	-20 ... 0 ... +20
-300 ... 0 ... +300 μ A	325 Ω	$\pm 22.5^\circ$	-10 ... 0 ... +10
-300 ... 0 ... +300 μ A	325 Ω	$\pm 22.5^\circ$	-20 ... 0 ... +20

regulating link position

regulating link position	internal resistance ¹⁾	pointer deflection	scale ▶
0 ... 600 μ A	325 Ω	90°	0 ... 100%
0 ... 20 mA ▶	3 Ω	90°	0 ... 100%
0 ... 10 V	100 k Ω	90°	0 ... 100%

Movement II (inner)

regulating link position

regulating link position	internal resistance ¹⁾	pointer deflection	scale ▶
0 ... 600 μ A	325 Ω	90°	0 ... 100%
0 ... 20 mA ▶	3 Ω	90°	0 ... 100%
0 ... 10 V	100 k Ω	90°	0 ... 100%

for use on transducer ("live zero") Movement I, II

4 ... 20 mA mechanically suppressed zero, without zero adjustment, voltage drop approx. 60 mV

Not for mains use

regulating link position

regulating link position	internal resistance ¹⁾	pointer deflection	scale ▶
0 ... 3 V	30 k Ω	90°	0 ... 100%

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

Scaling

pointers	bar / knife-edge pointers		
pointer deflection	control deviation	regulating link position	
	$\pm 22.5^\circ$	0 ... 90°	
scale characteristics	linear		
scale division	coarse-fine		
scale length	control deviation	regulating link position	
	movement I	movement I	movement II
	15.5 mm	31 mm	28 mm

Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051 - 1

reference conditions

ambient temperature	23°C
input	rated measuring value
others	DIN EN 60 051 - 1

influences

ambient temperature 23°C ± 2 K



Analog Meters with Dual Moving-Coil Movement

Environmental

climatic suitability	climatic class 2 ▶ according to VDE/VDI 3540 sheet 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)

Options

measuring range	
special measuring range	deviating from ranges as specified in table
zero position	suppressed for range 4 ... 20 mA mechanically suppressed zero
case	
window	non-glaring glass
colour of bezel	gray (similar to RAL 7037)
panel fixing	plate springs

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 according to VDE/VDI 3540 sheet 2
with operating temperature range	-10 ... +55 °C
marine application	non-certified
enclosure code	IP 54 splash-water protected front

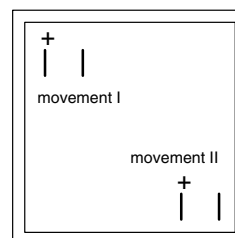
accessories

terminal protection against accidental contact
protective sleeves

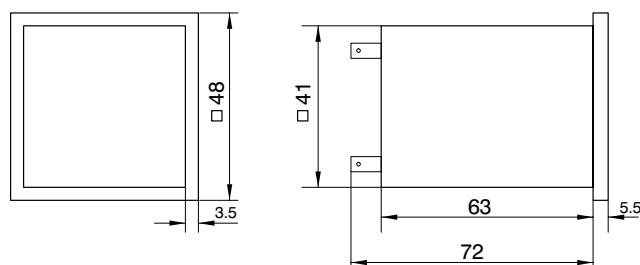
dial

blank dial	pencil marked initial and end values
scale division and figuring	0 ... 100%, linear, full-scale values acc. to standardized series (1 – 1.5 – 2.5 – 4 – 6 and any decimal multiple of these numbers e.g. 150 m ³ /h) or deviating from standard series, captions optional
additional lettering	to be specified e.g. "generator"
additional figuring	to be specified
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 to be specified

Connections



Dimensions



(scaled in mm)

Ordering Information

type PQ	moving-coil instrument for DC voltage and/or DC current
front dimension 48	48 mm x 48 mm
type identification /2	2 movements
measuring ranges	refer to preceding table
"live zero"	movement I, II 4 ... 20 mA mechan. suppressed zero ¹⁾
special measuring range	on special order ²⁾
zero position	movement I, II left hand zero position ¹⁾ centre or off-set zero position ²⁾
window	glass ¹⁾ non-glaring glass
colour of bezel	black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
panel fixing	screw clamps ¹⁾ plate springs
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
terminal safety protection	none ¹⁾ protective sleeves
dial	refer to table inside ¹⁾ blank dial scale division and figuring 0 ... 100% linear acc. to standardized series linear deviating from standard ²⁾ additional lettering to be specified ²⁾ additional figuring to be specified 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

PQ 48 /2, measuring range movement I: -20 ... 0 ... +20 µA,
internal resistance 13 kΩ, scale -20 ... 0 ... +20,
movement II: 4 ... 20 mA, scale 0 ... 100 %,
panel fixing by plate springs, no logo on the dial

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– specifications subject to change without notice; date of issue 04/11 –

