Data Sheet

M – Series
017.D.101.01

Analog Meters with Dual Moving–Coil Movement

PQ 48 /2

CE

WEIGEL

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)	
continuously	1.2 times rated voltage / current
5 s max.	
voltmeters	2 times rated voltage
ammeters	10 times rated current
protection class	I
enclosure code	IP 52 case ◗ IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact
insulation class	group A according to VDE 0110
rated insulation voltage	660 V ◗
dielectric test	2 kV ◗ based on 50 Hz, 1 min acc. to DIN 57 410

Measuring Ranges

Movement I (outer)

control deviation	internal resistance*)	pointer deflection	scale ◗
−20 ... 0 ... +20 μA	6 kΩ	±22.5°	−10 ... 0 ... +10
−20 ... 0 ... +20 μA	6 kΩ	±22.5°	−20 ... 0 ... +20
−20 ... 0 ... +20 μA	13 kΩ	±22.5°	−10 ... 0 ... +10
−20 ... 0 ... +20 μA	13 kΩ	±22.5°	−20 ... 0 ... +20
−20 ... 0 ... +20 μA	50 kΩ	±22.5°	−10 ... 0 ... +10
−20 ... 0 ... +20 μA	50 kΩ	±22.5°	−20 ... 0 ... +20
−50 ... 0 ... +50 μA	2 kΩ	±22.5°	−10 ... 0 ... +10
−50 ... 0 ... +50 μA	2 kΩ	±22.5°	−20 ... 0 ... +20
−300 ... 0 ... +300 μA	325 Ω	±22.5°	−10 ... 0 ... +10
−300 ... 0 ... +300 μA	325 Ω	±22.5°	−20 ... 0 ... +20

regulating link position	internal resistance*)	pointer deflection	scale ◗
0 ... 600 μA	325 Ω	90°	0 ... 100%
0 ... 20 mA ◗	3 Ω	90°	0 ... 100%
0 ... 3 V	30 kΩ	90°	0 ... 100%
0 ... 10 V	100 kΩ	90°	0 ... 100%

Movement II (inner)

regulating link position	internal resistance*)	pointer deflection	scale ◗
0 ... 600 μA	325 Ω	90°	0 ... 100%
0 ... 20 mA ◗	3 Ω	90°	0 ... 100%
0 ... 3 V	30 kΩ	90°	0 ... 100%
0 ... 10 V	100 kΩ	90°	0 ... 100%

*) the resistance values are limited to a tolerance of ±20%

Scaling

pointers	bar / knife–edge pointers		
pointer deflection	control deviation ±22.5°	regulating link position 0 ... 90°	
scale characteristics	linear		
scale division	coarse–fine		
scale length	control deviation movement I	regulating link position 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

reference conditions

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

influences

ambient temperature	−25°C ... +23°C ... +40°C

◗ also refer to "Options"

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Environmental

climatic suitability	climatic class 2 according to VDE/VDI 3540
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 43 700	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 57 410 / VDE 0410	safety requirements for electrically operated measuring, control and laboratory equipment
DIN EN 60 051	direct acting indicating electrical measuring instruments and their accessories
DIN VDE 0110	dimensioning of clearances and creepage distances
DIN VDE 0411	protective measures for electronically operated measuring equipment
DIN 40 050	enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water
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, no zero adjustment

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
with operating temperature range	–10 ... +55˚C
marine application	non–certified
enclosure code	IP 54 splash–water protected front
dielectric test	3 kV based on 50 Hz, 1 min acc. to DIN 57 410

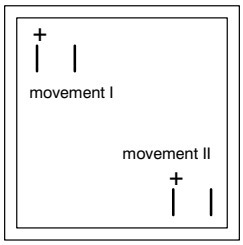
accessories

terminal protection against accidental contact
protective sleeves

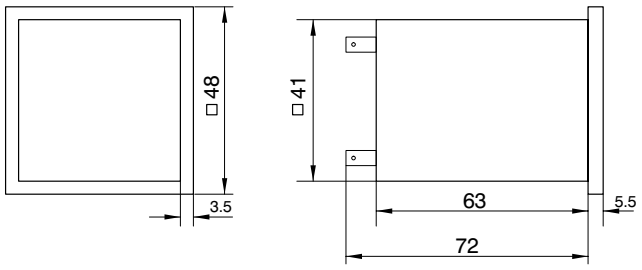
dial

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
special measuring range	on special order **)
zero position	electrical zero = mechanical zero *) mechanically suppressed zero for range 4 ... 20 mA
window	glass *) non−glaring glass
colour of bezel	black (similar to RAL 9005) *) gray (similar to RAL 7037)
panel fixing	screw clamps *) plate springs
mechanical loads	shock 15 g, vibration 2.5 g *) shock 30 g, vibration 5 g
climatic suitability	class 2, −25 ... +40°C *) class 3, −10 ... +55°C
marine application	none *) non−certified
enclosure code	IP 52 *) IP 54 splash−water protected front
dielectric test	2 kV *) 3 kV
terminal safety protection	none *) protective sleeves
dial	refer to table inside *) blank dial scale division and figuring 0 ... 100% linear acc. to standardized series linear deviating from standard **) additional lettering to be specified **) additional figuring to be specified **) coloured marks red, green or blue **) coloured sector red, green or blue **)
logo	WEIGEL *) none OEM logo **)

*) standard
**) 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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