



Data Sheet

018.D.001.04

Analog Meters with Moving-Coil Movement arranged in a Bridge Circuit

PBQ 72
PBQ 96
PBQ 144
PB 72 PrS
PB 96 PrS
PB 144 PrS



WEIGEL

Application

The moving-coil panel meters **PBQ 72/96/144** (M series) in pressed steel cases as well as **PB 72/96/144 PrS** (edgewise series) have two main fields of application. They are used with RTD (resistance thermometers) Pt or Ni to measure and indicate temperature.

If used with resistance sensors they indicate position, e.g. transformer tap position, hoist or valve position, transformer winding temperature and any similar function where the position can be related to the movement of a potentiometer.

The indicators are suitable to be mounted in switchboards, control panels or mosaic grid panels.

Functional Principle

Self-shielding moving-coil movement with a core-type magnet, pivot suspended. Spring loaded jewel bearings for vibration and shock resistance.

The measuring system comprises a stabilized power source, a moving-coil indicator arranged in a bridge circuit and a remotely mounted potentiometer resp. a RTD (resistance thermometer) both to be supplied by customer. (Separate bridge circuit for PB 72 PrS model.)

Mechanical Data

case details	square (PBQ 72/96/144) resp. edgewise (PB 72/96/144 PrS) case suitable to be mounted in switchboards or mosaic grid panels
material of case	pressed steel (PBQ 72/96/144, PB 72/96 PrS) self-extinguishing thermoplastics (PB 144 PrS)
material of window	glass
colour of bezel	black (similar to RAL 9005)
position of use	vertical $\pm 5^\circ$
panel fixing	screw clamps
mounting	stackable next to each other (except PB 144 PrS)
terminals	hexagon studs, M3 screws and wire clamps C6 (PBQ 72/96/144, PB 72/96 PrS), connector blades 6.3 x 0.8 (PB 144 PrS)

dimensions	PBQ 72	PBQ 96	PBQ 144
bezel	□ 72 mm	□ 96 mm	□ 144 mm
case	□ 66 mm	□ 90 mm	□ 137 mm
depth	60 mm	62 mm	60 mm
panel cutout	□68.3 ^{+0.4} mm	□92 ^{+0.8} mm	□138 ⁺¹ mm
panel thickness	1 ... 15 mm	1 ... 15 mm	1 ... 15 mm
weight approx.	0.3 kg	0.4 kg	0.7 kg
dimensions (in mm)	PB 72 PrS	PB 96 PrS	PB 144 PrS
bezel	72 x 36	96 x 48	144 x 72
case	67.5 x 32	90.5 x 42.5	137 x 67
depth	91 mm	100 mm	180 mm
panel cutout	68 ^{+0.7} mm x 33 ^{+0.6} mm	92 ^{+0.8} mm x 45 ^{+0.6} mm	138 ^{+1.0} mm x 68 ^{+0.7} mm
panel thickness	1 ... 25 mm	1 ... 12 mm	≤ 40 mm
weight approx.	0.2 kg	0.45 kg	0.7 kg

Electrical Data

measuring unit	resistance (DC)		
measurement category	CAT III		
operating voltage	PBQ 72/96/144 150 V	PB72/96 PrS 50 V	PB 144 PrS 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

Measuring Ranges

for RTD (resistance thermometer)
measuring range sensor

-220 ... +50 °C	Pt 100	-
-100 ... +50 °C	Pt 100	-
-20 ... +20 °C	Pt 100, Ni 100	
0 ... +40 °C	Pt 100, Ni 100	
-30 ... +60 °C	Pt 100, Ni 100	
0 ... +60 °C	Pt 100, Ni 100	
0 ... +100 °C	Pt 100, Ni 100	
0 ... +150 °C	Pt 100, Ni 100	
+50 ... +150 °C	Pt 100, Ni 100	
0 ... +200 °C	Pt 100, Ni 100	
0 ... +300 °C	Pt 100	-
0 ... +400 °C	Pt 100	-
0 ... +550 °C	Pt 100	-
+200 ... +400 °C	Pt 100	-
+300 ... +550 °C	Pt 100	-

for resistance sensors

please state when ordering:	- measuring range and scaling - auxiliary voltage - total resistance of sensor - variation range of sensor - maximum lead resistance (standard 2x 10 Ω)
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Note

Indication of the meter is influenced by the lead resistance. Consequently, the lead resistance will have to be considered in the calibration of the meter. It should be stated when ordering.

The lead resistance will be calibrated to 10 Ω for RTD (resistance thermometer) in a 2 wire system, to 2x 10 Ω for RTD in a 3 wire system and to 2x 10 Ω for resistance sensors. If possible, varying resistance values may be considered.

The lead resistance calibrated is printed on the dial. The actual resistance will have to be adjusted to this value.

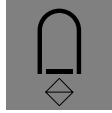
Scaling

pointer	bar / knife-edge pointer		
dial position	horizontal dial (PB 72/96/144 PrS)		
scale characteristics	linear		
scale division	coarse-fine		
scale length	PBQ 72 69 mm	PBQ 96 94 mm	PBQ 144 146 mm
	PB 72 PrS 46 mm	PB 96 PrS 67 mm	PB 144 PrS 92 mm

Auxiliary Supply

auxiliary voltage	DC 24 V $\pm 10\%$
current consumption	approx. 40 mA
residual ripple	<3%
Measuring input and auxiliary supply are not electrically insulated.	

also refer to "Options"



Analog Meters with Moving-Coil Movement arranged in a Bridge Circuit

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
auxiliary voltage	within the limits specified
others	DIN EN 60 051 - 1
influences	
ambient temperature	23 °C ±2K
position of use	nominal position ±5°
stray magnetic field	0.5 mT

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
-6	Part 6: Special requirements for ohmmeters (impedance meters) and conductance meters
-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 (IEC 61 000 -4 -3 evaluation criterion B)
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) (non - condensing)

♦ also refer to "Options"

Options

auxiliary voltage AC 230 V -15% ... +10%, 48 ... 62 Hz electrically insulated applying to PBQ 96/144, PB 144 PrS only

case

window non-glaring glass
colour of bezel gray (similar to RAL 7037)
position of use horizontal or to be specified 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 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 full-sized rear cover (PBQ 72/96/144 only) or protective sleeves
terminals connector blades 6.3 x 0.8

dial

dial position vertical dial (PB 72/96/144 PrS)
blank dial pencil marked initial and end values
scale division 0 ... 100%,
linear, full-scale values acc. to standardized series (1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 7.5 and their decimal multiples e.g. 150 m³/h) or deviating from standard;
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

Attachment

Power Supply please refer to accessories data sheets

Lead Adjustment Resistor 10 Ω coil-type with soldering tags

Test Resistor for RTD (resistance thermometer) to adjust the measuring circuit.

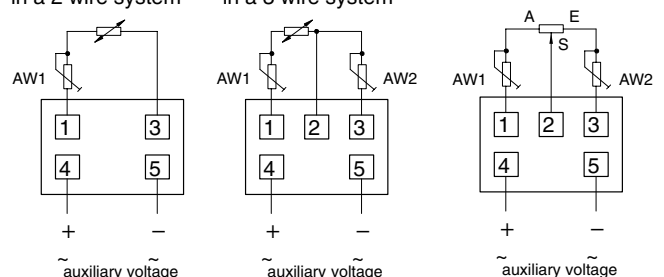
Connections

RTD (resistance thermometer)

in a 2 wire system

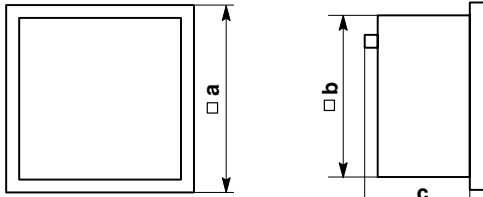
in a 3 wire system

Resistance Sensor



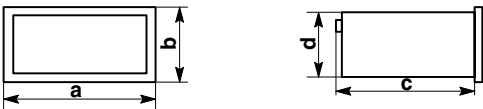
Dimensions

PBQ 72/96/144 RS

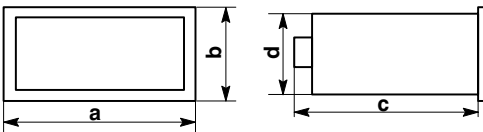


dimensions (in mm)	PBQ 72	PBQ 96	PBQ 144
a	72	96	144
b	66	90	137
c	60	62	60

PB 72/96 PrS

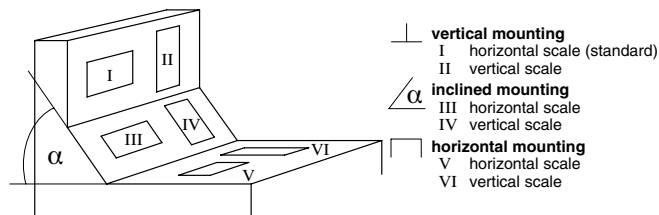


PB 144 PrS



dimensions (in mm)	PB 72 PrS	PB 96 PrS	PB 144 PrS
a	72	96	144
b	36	48	72
c	91	100	180
d	32	43	67
e	67.5	90.5	137

scales and position of use (PB 72/96/144 PrS)



Ordering Information

type	PBQ	square moving-coil panel meter arranged in a bridge circuit
front dimensions		
72		72 mm x 72 mm
96		96 mm x 96 mm
144		144 mm x 144 mm

type	PB	profile moving-coil panel meter arranged in a bridge circuit
front dimensions	72 PrS 96 PrS 144 PrS	72 mm x 36 mm 96 mm x 48 mm 144 mm x 72 mm
measuring ranges		refer to preceding table
wiring		RTD in 2 wire system RTD in 3 wire system resistance sensor
auxiliary voltage		DC 24 V ¹⁾ AC 230 V
window		glass ¹⁾ non-glaring glass
colour of bezel		black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
position of use		vertical ¹⁾ horizontal to special order 15 ... 165° ²⁾
performance 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⁾ full-sized rear cover ³⁾ protective sleeves
terminals		screws and wire clamps ¹⁾ connector blades 6.3 x 0.8 (PB 144 PrS ¹⁾)
dial position		horizontal dial ¹⁾ vertical dial
dial		scale division and measuring range alike ¹⁾ blank dial scale division and figuring 0 ... 100% linear to standardized series ²⁾ 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.

³⁾ PBQ 72/96/144 only

ordering example

PB 72 PrS, measuring range -30 ... 60°C on Pt 100, 3 wire system, auxiliary voltage DC 24 V, horizontal scale -30 ... 60°C, vertical mounting, window non-glaring glass, WEIGEL logo

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

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