



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

PBQ 72
PBQ 96
PBQ 144
PB 144 PrS



Application

The moving-coil panel meters **PBQ 72/96/144** (M series) as well as **PB 144 PrS** (edgewise series) in pressed steel cases 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.

A moving-coil indicator is arranged in a bridge circuit.

Mechanical Data

case details	square (PBQ 72/96/144) resp. edgewise (PB 144 PrS) case suitable to be mounted in switchboards or mosaic grid panels		
material of case	pressed steel		
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), 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	PB 144 PrS		
bezel	144 mm x 72 mm		
case	137 mm x 67 mm		
depth	180 mm		
panel cutout	138 ^{+1.0} mm x 68 ^{+0.7} mm		
panel thickness	≤ 40 mm		
weight approx.	0.7 kg		

also refer to "Options"

Electrical Data

measuring unit	resistance (DC)
measurement category	CAT III
operating voltage	150 V
pollution level	2
enclosure code	IP 52 case front side (except PB 144 PrS) IP 50 case front side (PB 144 PrS)
	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	PBQ 72/96/144 sensor type	PB 144 PrS sensor type
-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	Pt 100
0 ... +100 °C	Pt 100, Ni 100	Pt 100
0 ... +150 °C	Pt 100, Ni 100 –	–
+50 ... +150 °C	Pt 100, Ni 100 –	–
0 ... +200 °C	Pt 100, Ni 100	Pt 100
0 ... +300 °C	Pt 100 –	Pt 100
0 ... +400 °C	Pt 100 –	Pt 100
0 ... +550 °C	Pt 100 –	–
+200 ... +400 °C	Pt 100 –	–
+300 ... +550 °C	Pt 100 –	–

PBQ 72/96/144 for resistance sensors

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

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 144 PrS)			
scale characteristics	linear			
scale division	coarse-fine			
scale length	PBQ 72	PBQ 96	PBQ 144	PB 144 PrS
	69 mm	94 mm	146 mm	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.	



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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 $\pm 1^\circ$ ♦
input	rated measuring value
auxiliary voltage	within the limits specified
others	DIN EN 60 051 - 1

influences

ambient temperature	23 °C ± 2 K
position of use	nominal position $\pm 5^\circ$
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	$\leq 75\%$ 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 (PBQ 96/144, PB 144 PrS only)	AC 230 V -15% ... +10%, 48 ... 62 Hz (PBQ 96/144) $\pm 10\%$, 45 ... 65 Hz (PB 144 PrS) electrically insulated
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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 144 PrS)
blank dial	pencil marked initial and end values
scale division and figuring	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 m ³ /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

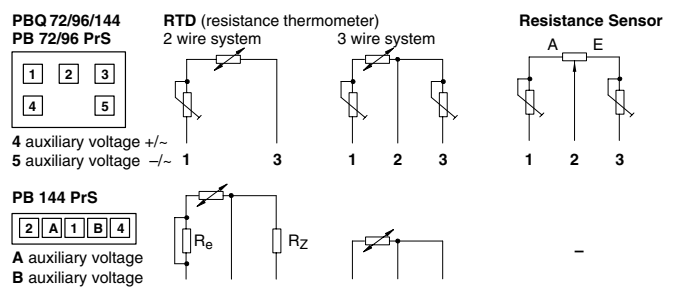
Attachment

Power Supply please refer to accessories data sheets

Lead Adjustment Resistor 10 Ω coil-type with soldering tags

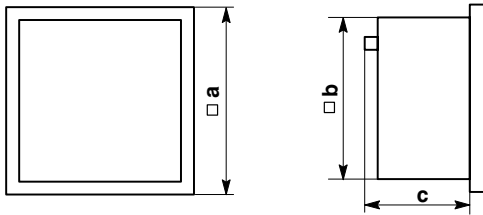
Test Resistor for RTD (resistance thermometer) to adjust the measuring circuit.

Connections



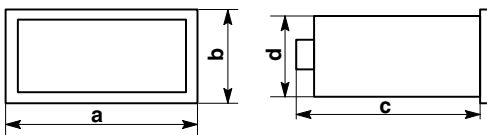
Dimensions

PBQ 72/96/144 RS



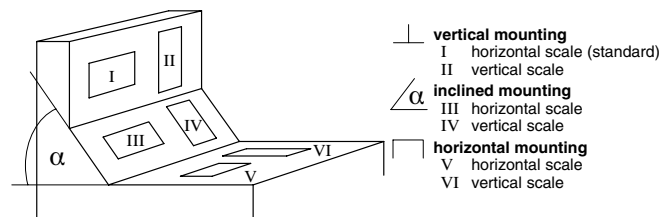
dimensions (in mm)	PBQ 72	PBQ 96	PBQ 144
a	72	96	144
b	66	90	137
c	60	62	60

PB 144 PrS



dimensions (in mm)	PB 144 PrS
a	144
b	72
c	180
d	67
e	137

scales and position of use (PB 144 PrS)



ordering example

PB 144 PrS, measuring range $-30 \dots 60^\circ\text{C}$ on Pt 100, 3 wire system, auxiliary voltage DC 24 V, horizontal scale $-30 \dots 60^\circ\text{C}$, vertical mounting, window non-glaring glass, WEIGEL logo

Ordering Information

type PBQ	square moving-coil panel meter arranged in a bridge circuit
72	72 mm x 72 mm
96	96 mm x 96 mm
144	144 mm x 144 mm
type PB 144 PrS	profile moving-coil panel meter arranged in a bridge circuit 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, $-25 \dots +40^\circ\text{C}$ ¹⁾ class 3, $-10 \dots +55^\circ\text{C}$
marine application	none ¹⁾ non-certified
enclosure code	IP 52 ¹⁾⁴⁾ / IP 50 ¹⁾⁵⁾ 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 (PB 144 PrS)	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

⁴⁾ except PB 144 PrS

⁵⁾ PB144 PrS only

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– specifications subject to change without notice; date of issue 06/16 –

