Data Sheet

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


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 /C0039
colour of bezel black (similar to RAL 9005) /C0039
position of use vertical /C0177
5/C0176/C0039
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 PBQ72 PBQ96 PBQ144 PB 144 PrS
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*10.4 mm □ 92*10.9 mm □ 138*11 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

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 sensor type 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 Pt 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 – –

PBQ72/96/144 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 PBQ72 PBQ96 PBQ144 PB 144 PrS
69 mm 94 mm 146 mm 92 mm

Auxiliary Supply

auxiliary voltage DC 24 V ±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**: within the limits specified
- **auxiliary voltage**: 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 DIN EN 60 051-1
- **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
- **DIN EN 60 529**: Enclosure codes by housings (IP-code)
- **DIN EN 61 010-1**: Safety requirements for electrical measuring, control and laboratory equipment
- **DIN EN 61 326-1**: Electrical equipment for measurement, control and laboratory use – EMC 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) (non-condensing)

* also refer to "Options"

Options

- **auxiliary voltage**: AC 230 V
  - (PBQ 96/144, PB 144 PrS only) ±15%, +10%, 48 ... 62 Hz (PBQ 96/144)
  - ±10%, 45 ... 65 Hz (PBQ 144 PrS) electrically insulated

**case**:
- 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 DIN IEC 60 051-6

**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: 0 ... 100%,
- and figuring: 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)**
- **Resistance Sensor**: 2 wire system

**PBQ 72/96/144**:
- 4 auxiliary voltage +/-
- 5 auxiliary voltage +/-

**PB 144 PrS**:
- auxiliary voltage
- 2 wire system
## Dimensions

**PBQ 72/96/144 RS**

<table>
<thead>
<tr>
<th>Dimensions (in mm)</th>
<th>PBQ 72</th>
<th>PBQ 96</th>
<th>PBQ 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>72</td>
<td>96</td>
<td>144</td>
</tr>
<tr>
<td>b</td>
<td>66</td>
<td>90</td>
<td>137</td>
</tr>
<tr>
<td>c</td>
<td>60</td>
<td>62</td>
<td>60</td>
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</table>

**PB 144 PrS**

<table>
<thead>
<tr>
<th>Dimensions (in mm)</th>
<th>PB 144 PrS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>144</td>
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<tr>
<td>b</td>
<td>72</td>
</tr>
<tr>
<td>c</td>
<td>180</td>
</tr>
<tr>
<td>d</td>
<td>67</td>
</tr>
<tr>
<td>e</td>
<td>137</td>
</tr>
</tbody>
</table>

**Scales and position of use (PB 144 PrS)**

- Vertical mounting
- Inclined mounting
- Horizontal mounting
- Vertical scale
- Horizontal scale

## Ordering Information

### Type
- **PBQ**
  - Square moving-coil panel meter
  - Arranged in a bridge circuit
- **PB 144 PrS**
  - Profile moving-coil panel meter
  - Arranged in a bridge circuit

### Measuring Ranges
- Refer to preceding table

### Wiring
- RTD in 2 wire system
- RTD in 3 wire system
- Resistance sensor

### Auxiliary Voltage
- DC 24 V
- AC 230 V

### Window
- Glass
- Non-glaring glass

### Colour of Bezel
- Black (similar to RAL 9005)
- Gray (similar to RAL 7037)

### Position of Use
- Vertical
- Horizontal
- To special order

### Performance 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

### Terminal Safety Protection
- None
- Full-sized rear cover
- Protective sleeves

### Terminals
- Screws and wire clamps
- Connector blades 6.3 x 0.8 (PB 144 PrS)

### Dial Position
- Horizontal dial
- Vertical dial

### Dial
- Scale division and measuring range alike
- Scale division and figuring
  - Linear to standardized series
  - 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

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**Ordering Example**

PB 144 PrS, measuring range –30 ... –6°C on Pt 100, 3 wire system, auxiliary voltage DC 24 V, horizontal scale –30 ... +6°C, vertical mounting, window non-glaring glass, WEIGEL logo

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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 –*