



## Pressure Sensors

## QBE2002-P...

for liquid and gaseous media

- Piezo-resistive measuring system
- DC 0 ...10 V output signal
- Measurement unaffected by changes in temperature
- High temperature stability
- No mechanical aging or creepage
- External thread G $\frac{1}{2}$ "
- Excellent EMC characteristics

### Use

The QBE2002-P... pressure sensors are suitable for the measurement of static and dynamic positive pressure in HVAC plant, particularly in hydraulic and pneumatic systems using liquid or gaseous media (steam applications).

### Technical design

The QBE2002-P... pressure sensors operate on the piezo-resistive measuring principle. The ceramics diaphragm (thick-film hybrid technology) acquires the pressure through direct contact with the medium. The measurement is converted electronically into a linear output signal of DC 0...10 V.

## Type summary

| Type reference     | Pressure range |             |               |
|--------------------|----------------|-------------|---------------|
| <b>QBE2002-P1</b>  | 0...1 bar      | 0...100 kPa | 0...14.5 psi  |
| <b>QBE2002-P2</b>  | 0...2 bar      | 0...200 kPa | 0...29.0 psi  |
| <b>QBE2002-P4</b>  | 0...4 bar      | 0...400 kPa | 0...58.0 psi  |
| <b>QBE2002-P5</b>  | 0...5 bar      | 0...500 kPa | 0...72.5 psi  |
| <b>QBE2002-P10</b> | 0...10 bar     | 0...1.0 MPa | 0...145.0 psi |
| <b>QBE2002-P16</b> | 0...16 bar     | 0...1.6 MPa | 0...232.0 psi |
| <b>QBE2002-P20</b> | 0...20 bar     | 0...2.0 MPa | 0...290.0 psi |
| <b>QBE2002-P25</b> | 0...25 bar     | 0...2.5 MPa | 0...362.6 psi |
| <b>QBE2002-P40</b> | 0...40 bar     | 0...4.0 MPa | 0...580.0 psi |

## Ordering

When ordering, please give name and type reference, e.g.:

Pressure sensor **QBE2002-P1**

Any accessories required must be ordered separately.

## Equipment combinations

The QBE2002-P... pressure sensors can be combined with all devices or systems capable of processing the DC 0 ...10 V output signal from the pressure sensor.

## Mechanical design

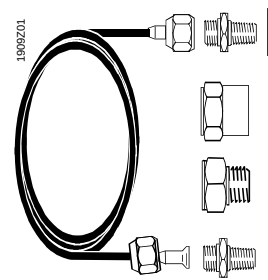
The QBE2002-P... pressure sensors are compact units and cannot be dismantled. No changes or adjustments are possible.

## Accessories

**AQB22.1** Fixing bracket for sensor (for remote mounting). For dimensions, refer to "Dimensions"

**AQB51.1** Mounting kit comprising:

- 2 brass thread adapters, 2 x G<sup>1</sup>/<sub>8</sub>", male
- 2 copper seals, <sup>1</sup>/<sub>8</sub>"
- 1 m copper tube with retaining nuts at each end, G<sup>1</sup>/<sub>8</sub>" female
- 1 thread adapter, G<sup>1</sup>/<sub>8</sub>" female to G<sup>1</sup>/<sub>2</sub>" female, with 1 copper seal, <sup>1</sup>/<sub>2</sub>"
- 1 thread adapter, G<sup>1</sup>/<sub>8</sub>" female to R<sup>1</sup>/<sub>2</sub>" male
- Mounting Instructions (no. 35 757)



The components of the AQB51.1 mounting kit are supplied by SERTO, but the kit must be ordered from Siemens HVAC Products.

Other mounting arrangements can be ordered directly from the SERTO range.

## Mounting notes

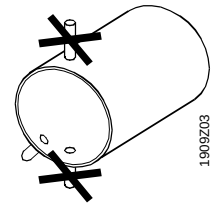
Mounting Instructions are enclosed with the sensor.

The QBE2002-P... sensors are designed for direct connection to screwed fittings with G<sup>1</sup>/<sub>2</sub>" threads. Appropriate measures must be taken to ensure a leak-proof fitting.

To provide for test measurements without leakage of the medium, it is strongly recommended that an appropriate test adapter and shutoff device be fitted.

**Pressure measurement  
with liquids**

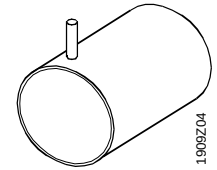
The tapping point should be at the side, near the bottom of the pipe. Do not measure the pressure from the top of the pipe (where it may be affected by airlocks) or the bottom (where it may be affected by dirt).  
Always evacuate the system.



1909Z03

**Pressure measurement  
with condensing gases**

The tapping point should be at the top so that no condensate reaches the sensor.

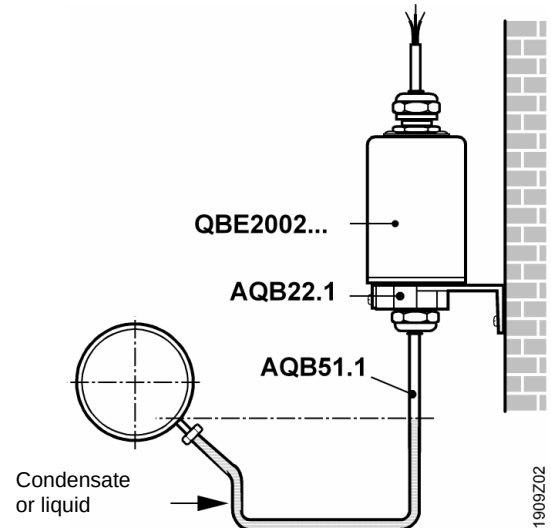


1909Z04

**Remote mounting**

If the temperature of medium is lower than  $-40\text{ }^{\circ}\text{C}$  or higher than  $+80\text{ }^{\circ}\text{C}$ , the sensor should be fitted remotely, taking care that no condensate can reach the sensor.

For remote mounting, a fixing bracket AQB22.1 and mounting kit AQB51.1 can be delivered (refer to "Accessories").



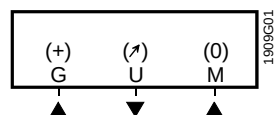
1909Z02

**Technical data**

|                      |                                                    |                                                                                                                                                                     |
|----------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical interface | Power supply                                       | with extra-low voltage only (SELV, PELV)                                                                                                                            |
|                      | Supply voltage                                     | AC 24 V, 50...60 Hz or DC 18...33 V                                                                                                                                 |
|                      | Max. voltage tolerance                             | $\pm 15\%$ at AC 24 V                                                                                                                                               |
|                      | Current consumption                                | $< 4\text{ mA}$                                                                                                                                                     |
|                      | Output signal                                      | DC 0 ...10 V, $R_{\text{Load}} > 10\text{ k}\Omega$<br>(not galvanically separated, 3-wire connection, short-circuit proof and protected against polarity reversal) |
|                      | Application range                                  | 0...40 bar, refer to "Type summary"                                                                                                                                 |
| Functional data      | Accuracy:                                          | (FS = Full Scale)                                                                                                                                                   |
|                      | Total of linearity, hysteresis and reproducibility | $< \pm 0.4\%$ FS                                                                                                                                                    |
|                      | Zero point offset voltage                          | $< 60\text{ mV}$                                                                                                                                                    |
|                      | Temperature drift:                                 | balancing in bar                                                                                                                                                    |
|                      | TC zero point                                      | $< \pm 0.04\%$ FS/K (typically)                                                                                                                                     |
|                      | TC sensitivity                                     | $< \pm 0.015\%$ FS/K (typically)                                                                                                                                    |
|                      | Response time                                      | $< 5\text{ ms}$                                                                                                                                                     |
|                      | Nominal pressure                                   | relative pressure as in "Type summary"<br>(measurement of difference from ambient pressure)                                                                         |
|                      | Max. admissible pressure                           | 2 x scale end value of measuring range (FS)                                                                                                                         |
|                      | Rupture pressure                                   | 3 x scale end value of measuring range (FS)                                                                                                                         |
|                      | Media                                              | neutral and slightly corrosive liquids and gases<br>(suited for use with oil-contacting media)                                                                      |
|                      | Admissible temperature of medium                   | $-40...+80\text{ }^{\circ}\text{C}$                                                                                                                                 |
|                      | Maintenance                                        | maintenance-free                                                                                                                                                    |
|                      | Mounting position                                  | Optional                                                                                                                                                            |
| Protection           | Protection standard                                | IP 65 to EN 60 529                                                                                                                                                  |
| Connections          | Connecting cable                                   | PVC, length 1.5 m, 3 x 0.25 mm <sup>2</sup> stranded wires                                                                                                          |
|                      | Screwed fitting                                    | external thread G $\frac{1}{2}$ "                                                                                                                                   |

|                          |                                                                               |                                          |
|--------------------------|-------------------------------------------------------------------------------|------------------------------------------|
| Environmental conditions | Operation to                                                                  | IEC 721-3-3                              |
|                          | Climatic conditions                                                           | class 3K7                                |
|                          | Temperature                                                                   | –40...+80 °C                             |
|                          | Humidity                                                                      | <100 % r.h.                              |
|                          | Storage/transport                                                             |                                          |
|                          | Climatic conditions                                                           |                                          |
|                          | Temperature                                                                   | –25...+70 °C                             |
|                          | Humidity                                                                      | <95 % r.h.                               |
| Standards                | Electromagnetic compatibility                                                 |                                          |
|                          | Immunity to                                                                   | EN 61 000-6-2, EN 61 326-1               |
|                          | Emissions to                                                                  | EN 61 000-6-3, EN 55 022, EN 61 326-1    |
|                          | CE conformity to EMC directive                                                | 89/336/EEC                               |
| Materials                | C conformity to Australian EMC Framework Radio Interference Emission Standard | Radio Communication Act 1992 AS/NZS 3548 |
|                          | Base                                                                          | stainless steel (1.4305)                 |
|                          | Measuring element                                                             | ceramics diaphragm                       |
|                          | Cover                                                                         | stainless steel (1.4305)                 |
| Weight                   | Sealant                                                                       | FPM fluor-caoutchouk spec.               |
|                          | Fixing bracket AQB22.1                                                        | die-cast aluminium                       |
|                          | Mounting kit AQB51.1                                                          | see "Accessories"                        |
|                          | Including packaging                                                           | 0.265 kg                                 |

## Internal diagram

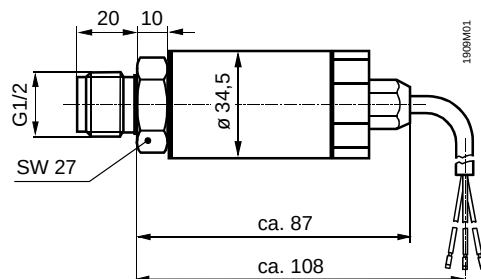


## Legend

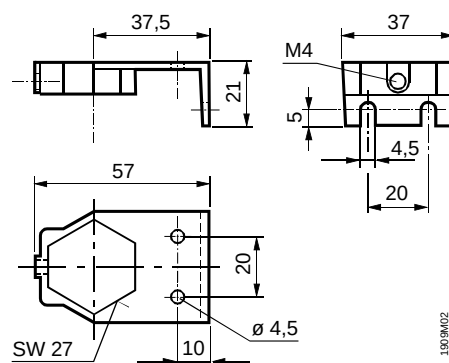
| SBT terminal marking | Color of core | Meaning                                       |
|----------------------|---------------|-----------------------------------------------|
| G (+)                | Brown         | Supply voltage AC 24 V or DC 18 ... 33 V      |
| U (↗)                | Green         | Output signal DC 0...10 V (signal ground GND) |
| M (0)                | White         | GND                                           |

## Dimensions

### QBE2002-P...



### AQB22.1



Dimensions in mm