



## Differential Pressure Sensor

## QBM3460-3

for air and non-aggressive gases

- Linear pressure curve
- Compact design
- Zero-point adjustment
- Connection terminals for VAV<sup>1)</sup> box and volume flow controller

1) VAV = Variable air volume

### Use

The differential pressure sensor is suitable for volume flow measurements on round and angular VAV boxes. The VAV box and volume flow controller can be directly connected to the connection terminals of the sensor and wired there.

### Type summary

| Product No.      | Stock number | Pressure range |            |                            |
|------------------|--------------|----------------|------------|----------------------------|
|                  |              | 0...3 mbar     | 0...300 Pa | 0...1.2 inH <sub>2</sub> O |
| <b>QBM3460-3</b> | S55720-S118  |                |            |                            |

## Ordering

The quantity, name and type designation must be indicated when ordering.

| Type             | Name                         |
|------------------|------------------------------|
| <b>QBM3460-3</b> | Differential pressure sensor |

## Accessories

Three different air duct connection pieces are available for connecting the differential pressure sensor directly to air ducts (without a VAV box). Refer also to the data sheet CA1N1589E:

| Type          | Name  | Description  |
|---------------|---|--|
| <b>FK-PZ1</b> | Connection pieces, with adjustable submersion depth                   | Set of two sensor tubes made from stainless steel with rubber grommets |
| <b>FK-PZ2</b> | Connection pieces, with adjustable submersion depth and orifice plate | Set of two sensor tubes with aluminum mounting rosettes                |
| <b>FK-PZ3</b> | Connection pieces, with fixed submersion depth                        | Set of two plastic sensor tubes with 2 m connecting hose               |

## Equipment combinations

The differential pressure sensor can be combined with devices and systems that can process a sensor output signal measuring DC 0...10 V.

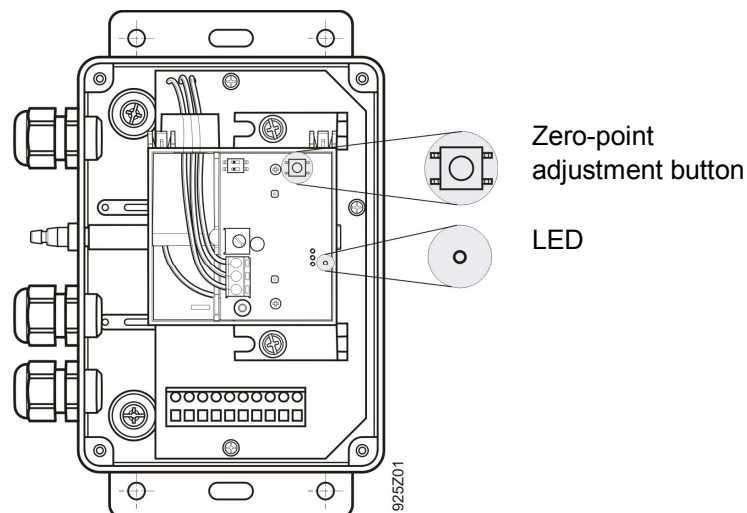
## Technical design

The sensor measures the difference in pressure across a silicon diaphragm and a ceramic cantilever. The sensor generates a linear, temperature-compensated output signal of DC 0...10 V according to the detected deviation.

## Mechanical design

The sensor comprises the following:

- Sensor housing with mounting plate and cable inlets
- Pressure measurement housing with silicon diaphragm and ceramic cantilever
- Printed circuit board with sensor element and connection terminals
- Zero-point adjustment button and LED (see "Commissioning notes")



## Engineering notes

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A transformer with a separate coil is to be used for safety extra-low voltage (SELV) and for 100 % on-time. The mandatory security requirements apply to the measurement and protection of the transformer. The permissible line lengths should be observed. Shielded cables must be used for cables exceeding 50 m in length in parallel to power lines.

## Mounting notes

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The differential pressure sensor is suitable for direct installation on round and angular VAV boxes. The VAV box and volume flow controller can be directly connected and wired in the sensor housing to the connection terminals. An appropriate power supply is required for all connected devices.

To achieve the housing protection class specified under "Technical data", the pressure connector pieces must face downwards. The pieces should also be positioned higher than the sensor probes in the air duct.

 Caution

If the pressure connector pieces face upwards or are lower than the sensor probes in the air duct, condensation can collect in the sensor, eventually destroying it.

Note

The pressure hoses of the sensor probes must be connected to the differential pressure sensor as follows:

| <i>Air duct side</i>                             | <i>Pressure sensor side</i>              |
|--|--|
| Hose on the higher pressure side (lesser vacuum) | On pressure connection piece "P1" or "+" |
| Hose on the lower pressure side (greater vacuum) | On pressure connection piece "P2" or "-" |

## Commissioning notes

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 Caution

Sensor calibration

The values specified under "Technical data" only apply when the differential pressure sensor is installed vertically (pressure connection pieces at the bottom). Deviations in measured values are possible if the sensor is installed horizontally (housing cover is on top or at the bottom). These deviations can be compensated by a zero-point adjustment by pressing the corresponding button on the installed sensor until the LED lights up briefly (see the figure shown under "Mechanical design").

## Disposal

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The devices are considered electronics devices for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic waste.

- Dispose of the device via the channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

## Technical data

|                               |   |   |
|-------------------------------|---|---|
| <b>Electrical connections</b> | Power supply<br>Operating voltage <sup>1)</sup><br>Power consumption  | Safety extra-low voltage (SELV, PELV)<br>AC 24 V ± 15 %, 50/60 Hz or DC 13.5...33 V<br>< 10 mA  |
|                               | External supply line protection   | Fuse slow max. 10 A<br>or<br>Circuit breaker max. 13 A<br>Characteristic B, C, D according to EN 60898<br>or<br>Power source with current limitation of max. 10 A |
|                               | Output signal   | DC 0...10 V, R <sub>Load</sub> > 10 kΩ<br>(not galvanically isolated, three-conductor technology, short-circuit and reverse polarity protection)                  |
|                               | Looped signals<br>Operating voltage <sup>1)</sup>   | 2 signal lines<br>VAV actuator  |
| <b>Functional data</b>        | Pressure range  | 0...300 Pa, see "Type summary"  |
|                               | Measurement precision<br>Total of linearity, hysteresis<br>and reproducibility  | (FS = Full Scale)<br><± 1.0 % FS  |
|                               | Zero-point offset   | <± 0.7 % FS   |
|                               | Long-term stability according to IEC 60770  | <± 1.0 % FS   |
|                               | Temperature drift<br>TK zero point  | <± 0.05 % FS/K, typical <± 0.02 % FS/K  |
|                               | TK sensitivity  | <± 0.05 % FS/K, typical <± 0.02 % FS/K  |
|                               | Response time   | < 20 ms   |
|                               | Nominal pressure  | Relative pressure according to "Type summary"<br>table (differential measurement for ambient<br>pressure)   |
|                               | Max. permissible overload<br>in overpressure range<br>in underpressure range  | 10 kPa on P1, 400 Pa P2<br>-400 Pa on P1, -10 kPa on P2   |
|                               | Bursting pressure   | 2 x overload at room temperature  |
|                               | Media   | Air and neutral gases   |
|                               | Temperature<br>Medium and environment<br>Storage  | Without condensing<br>0...+70 °C<br>-10...+70 °C  |
|                               | Maintenance   | Maintenance-free  |
| Mounting positions            | Vertical (pressure connection pieces facing<br>down) or horizontal (housing cover facing up or<br>down), zero-point adjustment possible |   |
| <b>Line connections</b>       | Electrical connections<br>Spring terminals<br>Cable inlet   | 10 × 1.5 mm <sup>2</sup><br>PG cable threaded joint or conduit threaded joint   |
|                               | Pressure connectors   | Hose connector piece Ø 6.2 mm   |

|  |   |  |
|--|---|--|
| <b>Degree of protection</b>                | Protection degree of housing  | IP54 according to EN 60529   |
|  | Protection class  | III according to EN 60730-1  |
| <b>Standards, directives and approvals</b> | Product standard  | EN 61326-x<br>Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements |
|  | Electromagnetic compatibility   | For residential, commercial, and industrial environments.  |
|  | EU Conformity (CE)  | CE1T1925xx <sup>2)</sup>   |
|  | RCM Conformity  | CE1T1910en_C1 <sup>2)</sup>  |
|  | EAC Conformity  | Eurasia conformity   |
| <b>Environmental compatibility</b>         | The product environmental declaration CM1E1925 <sup>2)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). |  |
| <b>Materials</b>                           | Measuring element   | Ceramic (96%) / glass  |
|  | Diaphragm   | Silicon  |
|  | Housing   | Polycarbonate  |
|  | Mounting plate  |  |
| <b>Dimensions</b>                          | See chapter "Dimensions"  |  |
| <b>Weight</b>                              | including packaging   | 0.61 kg  |

<sup>1)</sup> The operating voltage should be chosen to correspond to the requirements of the differential pressure sensor and any connected VAV actuator.

<sup>2)</sup> The documents can be downloaded from <http://siemens.com/bt/download>.

## Connection terminals

|                             |    |                 |   |   |    |          |    |   |    |
|-----------------------------|----|-----------------|---|---|----|----------|----|---|----|
|                             |    |                 |   |   |    |          |    |   |    |
| ○                           | ○  | ○               | ○ | ○ | ○  | ○        | ○  | ○ | ○  |
| 1                           | 2  | 3               | 4 | 5 | 6  | 7        | 8  | 9 | 10 |
| G                           | G0 | U               | X | Y | G0 | G        | G0 | Y | X  |
| 24VAC/DC<br>POWER<br>SUPPLY |    | CONTROL-SIGNALS |   |   |    | ACTUATOR |    |   |    |

Key:

| Terminal number | Terminal designation | Connection   |
|-----------------|----------------------|--|
| 1, 7            | G                    | Operating voltage AC 24 V or DC 18 ... 33 V <sup>1)</sup>    |
| 2, 6, 8         | G0                   | GND  |
| 3               | U                    | Differential pressure signal DC 0...10 V                     |
| 4, 10           | X                    | Position indicator signal, signal type depending on actuator |
| 5, 9            | Y                    | Position control signal, signal type depending on controller |

## Dimensions

