Differential Pressure Switch QBM81-…

for air and nonaggressive gases

- For ventilation and air conditioning plants
- To monitor air filters, air flow, fan belts
- To monitor pressure in clean rooms, kitchens etc.
- Easy to mount
- >1 mio switching cycles
- Highly precise setting
- Long-term stability

Use

In ventilation and air conditioning plants to:
- Monitor differential pressure, underpressure and overpressure
- Monitor air filters and air flows
- Recognize torn fan belts

Differential pressure switches can be used in clean rooms, kitchens, etc.

Type summary

<table>
<thead>
<tr>
<th>Type</th>
<th>Pressure range</th>
<th>Pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>QBM81-3</td>
<td>0.2…3 mbar</td>
<td>20…300 Pa</td>
</tr>
<tr>
<td>QBM81-5</td>
<td>0.5…5 mbar</td>
<td>50…500 Pa</td>
</tr>
<tr>
<td>QBM81-10</td>
<td>1…10 mbar</td>
<td>100…1000 Pa</td>
</tr>
<tr>
<td>QBM81-20</td>
<td>5…20 mbar</td>
<td>500…2000 Pa</td>
</tr>
<tr>
<td>QBM81-50</td>
<td>10…50 mbar</td>
<td>1000…5000 Pa</td>
</tr>
</tbody>
</table>
Ordering

When ordering, please indicate quantity, name and product number. **Example:**

1 differential pressure switch QBM81-5

The accessory duct probe FK-PZ3 are included in the delivery. Additional accessories must be ordered separately.

Mechanical design

The differential pressure switch QBM81-... consists of:
- Housing and cover
- Diaphragm
- 1 sheet-steel mounting bracket

Accessory duct probe connection kit (FK-PZ3):
- 2 duct adaptors
- 4 fixing screws
- 2 m tubing, 5/8 mm dia.

Accessories

For precise measurements, two additional duct probe sets must be delivered; see also data sheet CA1N1589E:

- **FK-PZ1** Set containing two stainless steel duct adaptors with rubber grommet
- **FK-PZ2** Set containing two duct adaptors with aluminum fixing rosettes, 4 screws

Technical design

The differential pressure between the two pressure connections deflects a spring-loaded diaphragm. This special diaphragm ensures the long-term stability of switching points.

Each type is engraved with individual scales for very precise adjustment. The adjustment options are illustrated in the 5 diagrams in Section "Functions" below.

Functions

**Function diagram**

![Function diagram](image)

- XD = Switching difference
- ∆p = Pressure difference
- W = Switching point, top

XD

1552D06
Switching points

Switching difference [Pa]

1) Factory setting

Application examples

Filter monitoring
Flow monitoring

Mounting notes

Mounting instructions are enclosed with the differential pressure switch. The pressure switch is suitable for mounting on air ducts or walls. Vertical orientation is recommended, but any orientation is acceptable in principle. Mounting positions other than vertical affects the switching point of the differential pressure switch; see “Commissioning notes” below.
The pressure connection tubes can be any length, but the response time increases if longer than 2 meters. Mount the pressure switch above the pressure connection points. To prevent accumulation of condensation, route the tubing to ensure gradual incline from the pressure connection points to the differential pressure switch (no looping).

**Commissioning notes**

Select the required setpoint using the setpoint knob [5] located under the cover (see "Dimensions"). The differential pressure switch is factory-calibrated in vertical position. Horizontal installation affects the switching point as follows:
- With cover facing upward: Switching point is 11 Pa higher than scale
- With cover facing downward: Switching point is 11 Pa lower than scale.

**Disposal**

The devices are considered electronics devices for disposal in term 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**

<table>
<thead>
<tr>
<th>Electrical interface</th>
<th>Type of switch</th>
<th>Single-pole change-over, multi-layer contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact rating</td>
<td>AC/DC 24 V, ≥ 0.01 A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC 250 V, max. 5 A res.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>max. 3 A ind., cos ϕ &gt; 0.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.8 A starting current sixfold, cos ϕ &gt; 0.6)</td>
<td></td>
</tr>
<tr>
<td>Voltage against earth</td>
<td>Max. AC 250 V</td>
<td></td>
</tr>
</tbody>
</table>

**Warning**

No internal fuse
External preliminary protection required in all cases
External supply line protection (EU)     
- Fuse slow max. 10 A  
- or Circuit breaker max. 13 A  
- Characteristic B, C, D according to EN 60898  

<table>
<thead>
<tr>
<th>Functional data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching differential</td>
<td>Factory set</td>
<td></td>
</tr>
<tr>
<td>Reset</td>
<td>Automatic</td>
<td></td>
</tr>
<tr>
<td>Service life</td>
<td>&gt;1 000 000 switching cycles</td>
<td></td>
</tr>
<tr>
<td>Measuring range</td>
<td>See “Type summary”</td>
<td></td>
</tr>
<tr>
<td>Max. unilateral overload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30…75 °C</td>
<td>7500 Pa</td>
<td></td>
</tr>
<tr>
<td>-30…85 °C</td>
<td>5000 Pa</td>
<td></td>
</tr>
<tr>
<td>Permitted media</td>
<td>Air, non-corrosive gases</td>
<td></td>
</tr>
</tbody>
</table>

**Reproducibility for range**
- 20…300 Pa  
- 50…2000 Pa  
- 1000…5000 Pa
- ≤2.5 Pa
- ≤5 Pa
- ≤15 Pa

**Degree of protection**
- Protection class: III according to EN 60730-1
- Protection degree of housing: IP54 according to EN 60529

**Materials**
- Housing: Fiber-glass reinforced polycarbonate
- Cover: Polycarbonate
- Diaphragm: Silicone, low-swell rubber, emission-free
- Mounting bracket: Sheet-steel (galvanized)
- Duct adaptors: ABS
- Tubing: PVC, soft

**Mounting**
- Orientation: Any; See “Commissioning notes”

**Connections**
- Electrical connection: 3 screw terminals
- Cable entry: PG11 cable gland
- Pressure connections: Male, dia. 6.2 mm

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Siemens Building Technologies  
Differential pressure switch QBM81-…  
CA1N1552E  
2014-07-30
General ambient conditions

Ambient temperature:
- Operation: –30...+85 °C
- Storage: –40...+85 °C
Ambient humidity: <90 % r.h. (non-condensing)

Directives and Standards

Product standard: EN 60730-1
Automatic electrical controls for household and similar use
EU Conformity (CE): CA1T1552xx
DVGW approval: to DIN 1854

Combustion class
- Pressure casing and housing: According to UL94 V-0
- Cover: HB V-2
- Plastic tubing: HB V-2
- Duct adaptors: HB

Environmental compatibility
The product environmental declaration CA1E1552*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Weight
- Weight (including packaging): 0.19 kg with mounting bracket
*) The documents can be downloaded from http://siemens.com/bt/download.

Connection terminals

Phase
Switch position 1–2: lower pressure
Switch position 1–3: higher pressure
Dimensions

Dimensions in mm

Key:
1 Mounting bracket
2 P1 connection, higher pressure
3 P2 connection, lower pressure
4 Pressure differential scale (factory-sealed with paint)
5 Setpoint knob

Duct adaptor

2 duct adaptors and 2 m tubing are supplied with the pressure switch.