



## 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

| Type            | Pressure range      |                    |                               |
|-----------------|---------------------|--------------------|-------------------------------|
| <b>QBM81-3</b>  | <b>0,2...3 mbar</b> | <b>20...300 Pa</b> | 0.08...1.2 inH <sub>2</sub> O |
| <b>QBM81-5</b>  | 0,5...5 mbar        | 50...500 Pa        | 0.2...2 inH <sub>2</sub> O    |
| <b>QBM81-10</b> | 1...10 mbar         | 100...1000 Pa      | 0.4...4 inH <sub>2</sub> O    |
| <b>QBM81-20</b> | 5...20 mbar         | 500...2000 Pa      | 2...8 inH <sub>2</sub> O      |
| <b>QBM81-50</b> | 10...50 mbar        | 1000...5000 Pa     | 4...20 inH <sub>2</sub> O     |

## 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

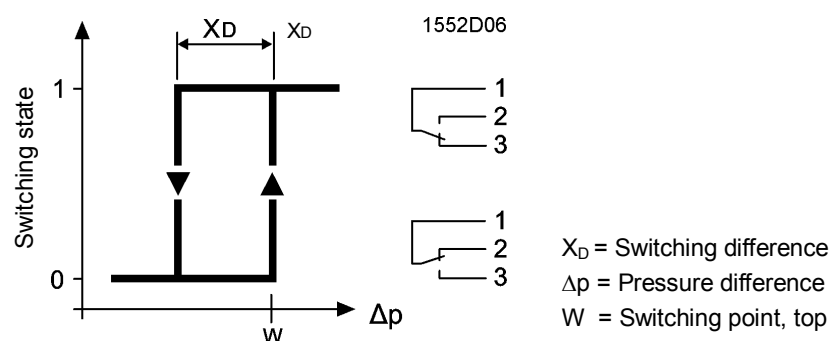
## Technical design

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

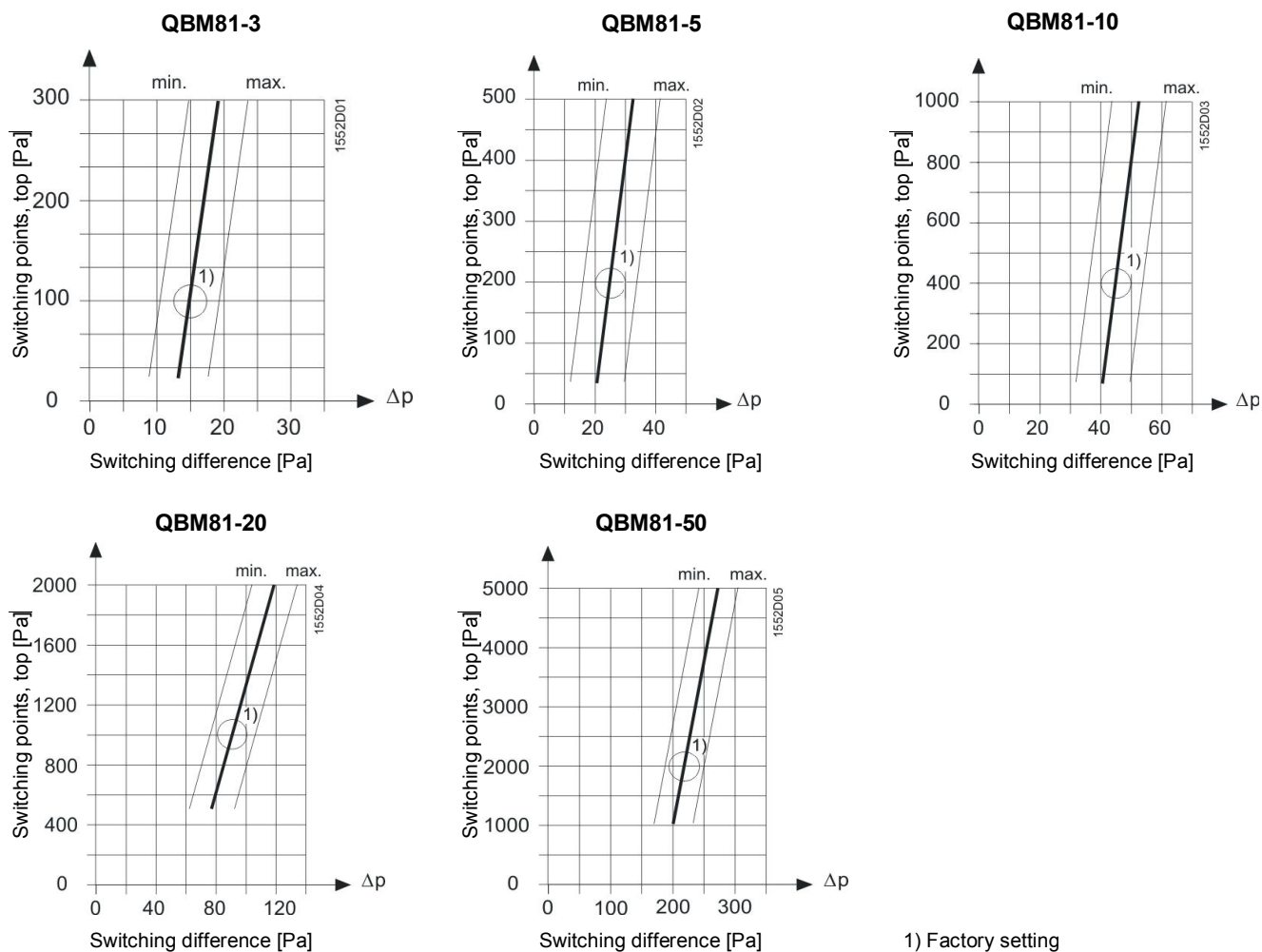
Each type is engraved with individual scales for very precise adjustment. The adjustment options are illustrated in the 5 diagrams in Section "Functions" below.

## Functions

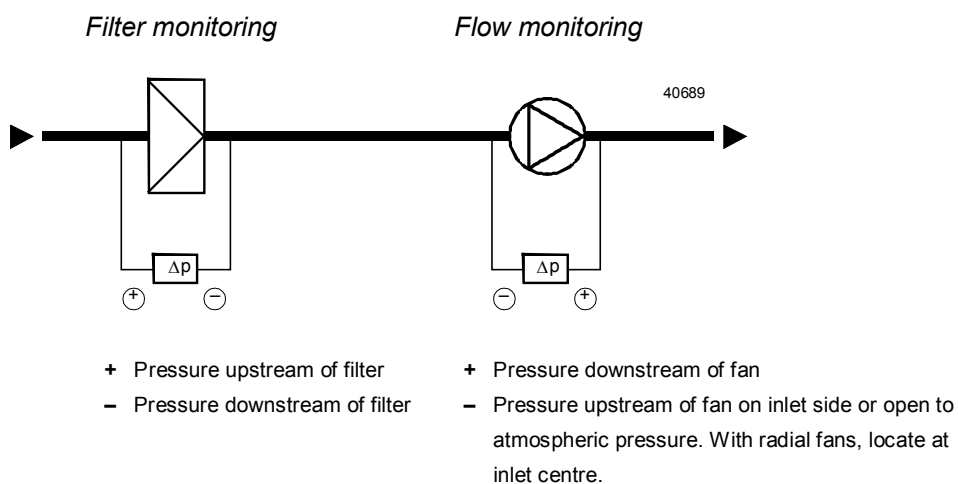
### Function diagram



## Switching points



## Application examples



## 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.

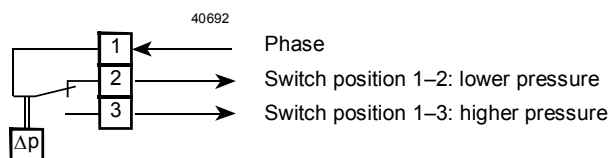
- Dispose of the device via the channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

## Technical data

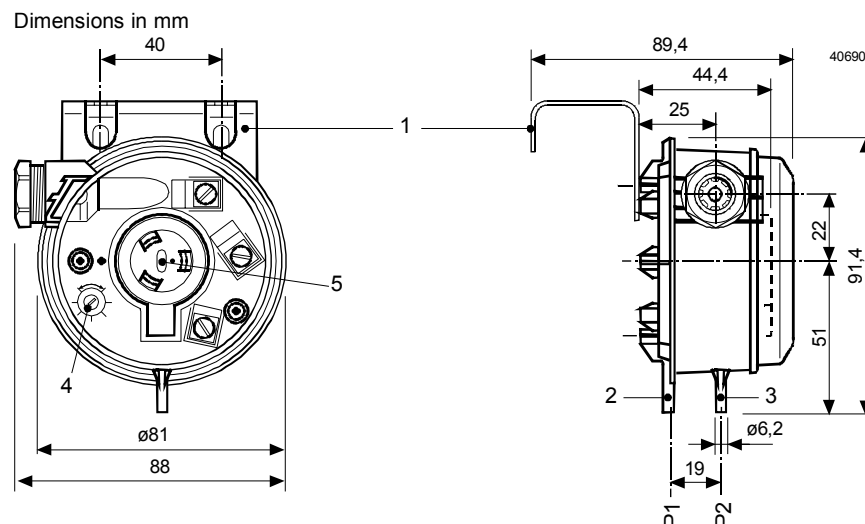
|                                                                                             |                                                       |                                                                                                                                                        |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical interface                                                                        | Type of switch                                        | Single-pole change-over, multi-layer contact                                                                                                           |
|                                                                                             | Contact rating                                        | AC/DC 24 V, $\geq 0.01$ A<br>AC 250 V, max. 5 A res.<br>max. 3 A ind., $\cos \varphi > 0.6$<br>(0.8 A starting current sixfold, $\cos \varphi > 0.6$ ) |
|  Warning | Voltage against earth                                 | Max. AC 250 V                                                                                                                                          |
|                                                                                             | No internal fuse                                      |                                                                                                                                                        |
| Functional data                                                                             | External preliminary protection required in all cases |                                                                                                                                                        |
|                                                                                             | External supply line protection (EU)                  | Fuse slow max. 10 A<br>or<br>Circuit breaker max. 13 A<br>Characteristic B, C, D according to EN 60898                                                 |
|                                                                                             | Switching differential                                | Factory set                                                                                                                                            |
|                                                                                             | Reset                                                 | Automatic                                                                                                                                              |
|                                                                                             | Service life                                          | >1 000 000 switching cycles                                                                                                                            |
|                                                                                             | Measuring range                                       | See "Type summary"                                                                                                                                     |
|                                                                                             | Max. unilateral overload                              |                                                                                                                                                        |
|                                                                                             | -30...75 °C                                           | 7500 Pa                                                                                                                                                |
|                                                                                             | -30...85 °C                                           | 5000 Pa                                                                                                                                                |
|                                                                                             | Permitted media                                       | Air, non-corrosive gases                                                                                                                               |
| Degree of protection                                                                        | Reproducibility for range                             |                                                                                                                                                        |
|                                                                                             | 20...300 Pa                                           | $<\pm 2.5$ Pa                                                                                                                                          |
|                                                                                             | 50...2000 Pa                                          | $<\pm 5$ Pa                                                                                                                                            |
|                                                                                             | 1000...5000 Pa                                        | $<\pm 15$ Pa                                                                                                                                           |
|                                                                                             | Protection class                                      | III according to EN 60730-1                                                                                                                            |
| Materials                                                                                   | Protection degree of housing                          | IP54 according to EN 60529                                                                                                                             |
|                                                                                             | Housing                                               | Fiber-glass reinforced polycarbonate                                                                                                                   |
|                                                                                             | Cover                                                 | Polycarbonate                                                                                                                                          |
|                                                                                             | Diaphragm                                             | Silicone. low-swell rubber, emission-free                                                                                                              |
|                                                                                             | Mounting bracket                                      | Sheet-steel (galvanized)                                                                                                                               |
|                                                                                             | Duct adaptors                                         | ABS                                                                                                                                                    |
| Mounting                                                                                    | Tubing                                                | PVC, soft                                                                                                                                              |
|                                                                                             | Orientation                                           | Any;<br>See "Commissioning notes"                                                                                                                      |
| Connections                                                                                 | Electrical connection                                 | 3 screw terminals                                                                                                                                      |
|                                                                                             | Cable entry                                           | PG11 cable gland                                                                                                                                       |
|                                                                                             | Pressure connections                                  | Male, dia. 6.2 mm                                                                                                                                      |

|                             |                                                                                                                                                                                                                               |                                                                                                                   |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Ambient conditions          | Ambient temperature:                                                                                                                                                                                                          |                                                                                                                   |
|                             | Operation                                                                                                                                                                                                                     | –30... +85 °C                                                                                                     |
|                             | Storage                                                                                                                                                                                                                       | –40... +85 °C                                                                                                     |
| Directives and Standards    | Ambient humidity                                                                                                                                                                                                              | <90 % r.h. (non-condensing)                                                                                       |
|                             | Product standard                                                                                                                                                                                                              | EN 61326-x                                                                                                        |
|                             |                                                                                                                                                                                                                               | Electrical equipment involved in measurement, control, and laboratory use; EMV requirements; general requirements |
|                             | Electromagnetic compatibility (application)                                                                                                                                                                                   | For residential, commercial, and industrial environments.                                                         |
|                             | EU Conformity (CE)                                                                                                                                                                                                            | CA1T1552xx <sup>*)</sup>                                                                                          |
|                             | EAC Conformity                                                                                                                                                                                                                | Eurasia Conformity                                                                                                |
|                             | DVGW approval                                                                                                                                                                                                                 | to DIN 1854                                                                                                       |
| Combustion class            |                                                                                                                                                                                                                               | According to UL94                                                                                                 |
|                             | Pressure casing and housing                                                                                                                                                                                                   | V-0                                                                                                               |
|                             | Cover                                                                                                                                                                                                                         | HB                                                                                                                |
|                             | Plastic tubing                                                                                                                                                                                                                | V-2                                                                                                               |
|                             | Duct adaptors                                                                                                                                                                                                                 | HB                                                                                                                |
| Environmental compatibility | The product environmental declaration CA1E1552 <sup>*)</sup> 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 <a href="http://siemens.com/bt/download">http://siemens.com/bt/download</a> .                                                                                                         |                                                                                                                   |

## Connection terminals



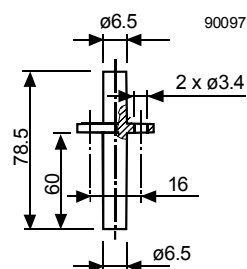
## Dimensions



### 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.