

## Differential pressure sensors

**QBM63/...**  
**QBM64/...**

for air and non-aggressive gases,  
with a diaphragm sensing element

**With choice of pressure-linear or extracting-the-root characteristic and a d j u s t a b l e pressure measuring range (nominal volumetric flow  $\dot{V}_n$ ).**

**Operating voltage AC 24 V, output signal DC 0...10 V.**

### Use

For very demanding requirements as regards accuracy and quality in the field of ventilating, air conditioning and heating. To acquire the differential pressure of air or non-aggressive gases.

#### *Typical fields of application:*

- chemical industry (laboratories and production)
- in industrial environments (risk of contamination)
- hospitals (e.g. in the operating theatre)

#### *The differential pressure detectors are used:*

- to measure over- or underpressure in air ducts in relation to the ambient pressure
- to measure pressure differentials between different rooms
- to acquire variable air volumes in VAV plants on the supply and extract air side
- to monitor filters and to control fans
- especially on applications that demand:
  - great accuracy
  - very fast response times (monitoring of fans)
  - resistance to contamination

## Type summary

Without indication	Type reference	Standard	Measuring range Limit value (adjustable)	Overload range
	<b>QBM63/100</b>	0... 100 Pa	40... 100 Pa	± 4000 Pa
<b>QBM63/250</b>	0... 250 Pa	100... 250 Pa	± 4000 Pa	
<b>QBM63/500</b>	0... 500 Pa	200... 500 Pa	± 20000 Pa	
<b>QBM63/3000</b>	0...3000 Pa	1200...3000 Pa	± 20000 Pa	

With indication	Type reference	Standard	Measuring range Limit value (adjustable)	Overload range
	<b>QBM64/100</b>	0... 100 Pa	40... 100 Pa	± 4000 Pa
<b>QBM64/250</b>	0... 250 Pa	100... 250 Pa	± 4000 Pa	
<b>QBM64/500</b>	0... 500 Pa	200... 500 Pa	± 20000 Pa	
<b>QBM64/3000</b> <sup>1)</sup>	0...3000 Pa	1200...3000 Pa	± 20000 Pa	

1) Value displayed x 10 = measured value

Accessories (not included in standard delivery)	Name	Type reference/part no.
	Mounting kit (for tubing connection to air duct)	<b>4 669 1975 0</b>
	Connecting tube (4 dia. x 1.5 x 2000 mm)	<b>4 482 2525 0</b>
	Protective casing (IP 55)	<b>ARG62</b>

## Ordering

When ordering, please give name and type reference, for example: differential pressure sensor **QBM63/250**.

Accessories must be ordered separately, with name and type reference or order number.

## Equipment combinations

Any systems or devices that are capable of acquiring and handling the sensor's DC 0...10 V output signal.

## Mode of operation

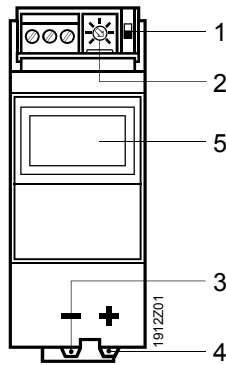
The sensor acquires the differential pressure with the help of a silicon diaphragm. The deflection of the diaphragm is sensed and converted to an electric signal. Potentiometer  $\dot{V}_n$  is used to match the pressure measuring range on an individual basis.

The sensor's electronics generate either a pressure-linear or an extracting-the-root output signal (selectable). The measured value is delivered by the sensor as an analog DC 0...10 V output signal.

## Mechanical design

The sensor consists of a two-sectional plastic casing. The base carries the printed circuit board with the electronic components, sensing element, terminal strip and potentiometer  $\dot{V}_n$ .

The tubing connections of the sensing element, terminal strip, selector for the characteristic and potentiometer  $\dot{V}_n$  are accessible from outside.



**Legend**

- 1 Slide switch, to select the pressure-linear or extracting-the-root characteristic; factory-setting: pressure-linear
- 2 Potentiometer, to set the measuring range (nominal volumetric flow); factory and calibration position: fully clockwise
- 3 Nipple for tubing connection "-"
- 4 Nipple for tubing connection "+"
- 5 Digital display for sensor signal in Pa (only with the QBM64/...)

A mechanism for fitting the sensor to a standard mounting rail and a baseplate for wall mounting are located at the rear. The sensor snaps on the base. The top part carries the type field and the connection diagram. The cover of the sensor snaps on the base. It carries the type plate and the wiring diagram.

**Engineering notes**

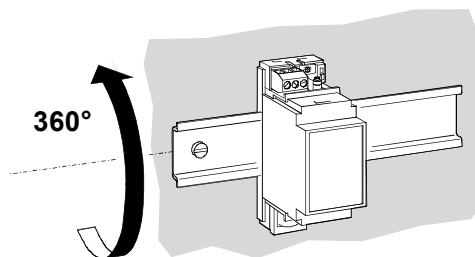
The transformer used must be suitable for safety extra low voltage (SELV). It must have separate windings and be suited for 100 % duty. It must be sized and fused in compliance with local safety regulations. The maximum permissible line lengths should be observed. Where a higher level of protection is required (splash water, terminal cover), the protective casing ARG62 (IP55) should be used.

**Fitting notes**

Normally, the sensor is fitted directly on the air duct, where it can be secured to a DIN mounting rail, or directly to a vertical or horizontal surface.

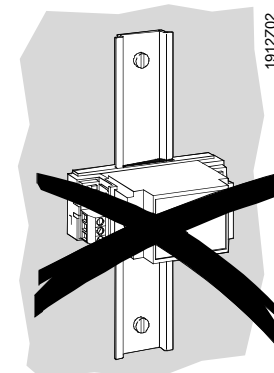
*Permitted mounting positions*

(any position where the diaphragm is vertical)



*Unpermitted mounting positions*

(any position where the diaphragm is horizontal)



The higher pressure must be connected to "+" and the lower to "-".

The sensor is supplied with installation instructions.

## Technical data

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Operating voltage (SELV)	AC 24 V $\pm$ 20 %
Frequency	50 or 60 Hz
Power consumption	1 VA
Output signal	DC 0...10 V, $\pm$ 1 mA
Lowest voltage level	DC 0 V
Perm. line lengths	
Copper cable 0.5 mm dia.	15 m
Copper cable 1.0 mm <sup>2</sup>	60 m
Copper cable 1,5 mm <sup>2</sup>	90 m
Copper cable 2.5 mm <sup>2</sup>	150 m
Connection terminals for	2 x 1.5 mm <sup>2</sup> or 1 x 2.5 mm <sup>2</sup>
Pressure ranges	refer to "Type summary"
Accuracy at 25 °C and in mandatory mounting positions	
With linear characteristic (0...100 % of pressure range)	$\pm$ 1 % of standard pressure measuring range
With extracting-the-root characteristic (2...100 % of pressure range)	$\pm$ 2 % of standard pressure measuring range)
Display (only with QBM64/...)	
Range of display in Pa	standard pressure measuring range
Accuracy	< $\pm$ 2 digits
Hysteresis and repetition	$\pm$ 0.5 %
Temperature dependancy	< $\pm$ 0.1 %/K
Position dependancy in unpermitted mounting position	$\pm$ 15 Pa
Time constant	<1 s
Warming-up time	10 s
Pressure amplification	1...2.5
(Volumetric flow amplification	1...1.6)
Ambient conditions	
Operation to IEC 721-3-3	class 3K5
Temperature (ambient and medium)	
QBM63/...	-10...+50 °C
QBM64/...	0...50 °C
Humidity	5...95 % r.h.
Transportation to IEC 721-3-2	class 2K3
Temperature	-25...+70 °C
Humidity	<95 % r.h.
Mechanical ambient conditions	class 2M2
Electromagnetic compatibility	
Emissions	EN 50 081-1
Immunity	EN 50 082-1
<b>CE</b> conformance to EMC directive	89/336/EWG
Degree of protection of casing	IP 20 to EN 60 529
With the ARG62	IP 55 to EN 60 529
Insulation class	III to EN 60 730
Weight	approx. 0.1 kg

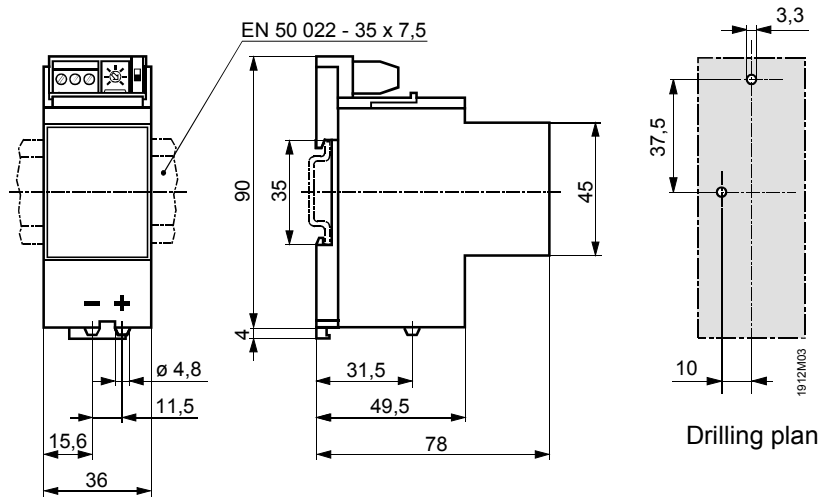
## Connection terminals

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- G, M Operating voltage AC 24 V (SELV)
- G System potential
- M System neutral, measuring neutral
- B1 Measuring signal DC 0...10 V

QBM63/..., QBM64...



ARG62

