

# Absolute-pressure sensors

## Micromechanical hybrid design

Input quantity: P

Output quantity: U

- High level of accuracy
- EMC protection better than 100 V m<sup>-1</sup>.
- With temperature compensation.
- Version with additional integrated temperature sensor.



### Application

This sensor is used to measure the absolute intake-manifold pressure. The version with integrated temperature sensor additionally measures the temperature of the intake-air flow.

### Design and operation

The piezo-resistive pressure-sensor element and appropriate signal amplification and temperature compensation electronics are integrated on a silicon chip.

The measured pressure acts from above on the active side of the silicon diaphragm. A reference vacuum is enclosed between the rear side and a glass base. The temperature-sensor element is an NTC thermistor. Thanks to an appropriate coating method, the pressure and temperature sensor are resistant to the gases and liquids occurring in the intake manifold.

### Installation instructions

The sensor is designed for attachment to a flat surface at the intake manifold of motor vehicles. The pressure connection and the temperature sensor jointly project into the intake manifold and are sealed off from the atmosphere by an O-ring. The sensor should be installed in the vehicle such that condensate cannot accumulate in the pressure cell (pressure sampling point at top of intake manifold, pressure connection angled downwards etc.).

### Explanation of characteristic quantities

$U_A$  Output voltage  $U_V$  Supply voltage  $k$  Tolerance multiplier  $D$  After endurance test  $NA$  new condition

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## Part number

**0 281 002 487**

### Technical data

Parameter	min	type	max		
Pressure range kPa ( $p_1 \dots p_2$ )			20	250	
Operating temperature	$\vartheta_B$	°C	-40	+130	
Supply voltage (1 min)	$U_V$	V	4,5	5	5,5
Current input at $U_V = 5$ V	$I_V$	mA	6	9	12,5
Load current at output	$I_L$	mA	-1	0,5	
Load resistance to $U_V$ or ground	$R_{\text{pull-up}}$	k $\Omega$	5	680	
Load resistance to $U_V$ or ground	$R_{\text{pull-down}}$	k $\Omega$	10	100	
Response time	$\tau_{10/90}$	ms	1		
Voltage limitation at $U_V = 5$ V - lower limit		V	0,25	0,3	0,35
Voltage limitation at $U_V = 5$ V - upper limit		V	4,75	4,8	4,85

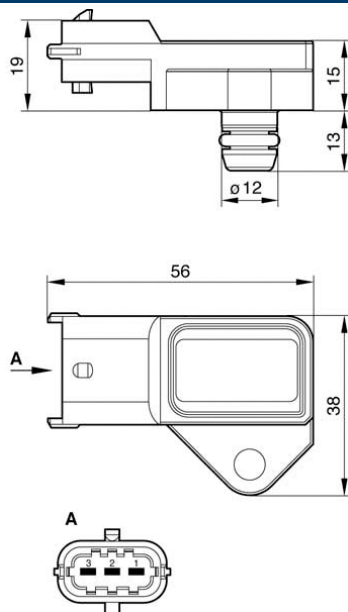
### Limit data

Supply voltage	$U_{V\text{max}}$	V	16		
Storage temperature		°C	-40	+130	

### Temperature sensors

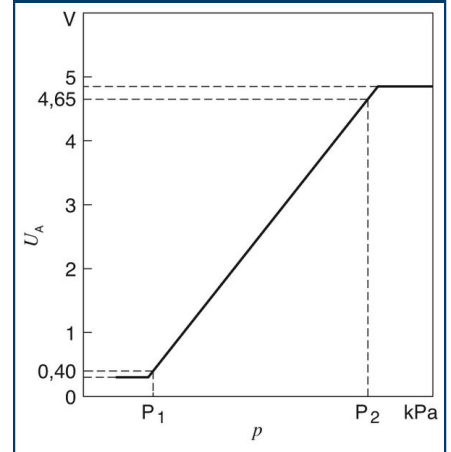
Accessories are not included in the scope of delivery of the sensor and are therefore to be ordered separately as required.

### Dimensional drawing



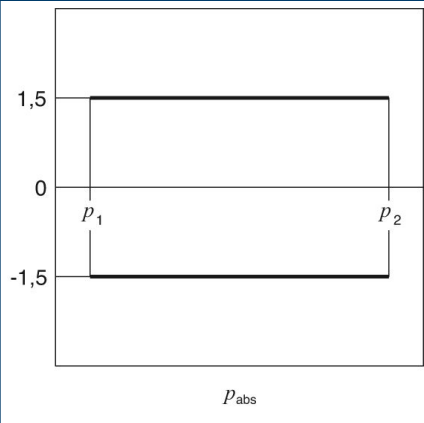
Pin 1 +5 V Pin 2 Ground Pin 3 Output signal

### Characteristic curve

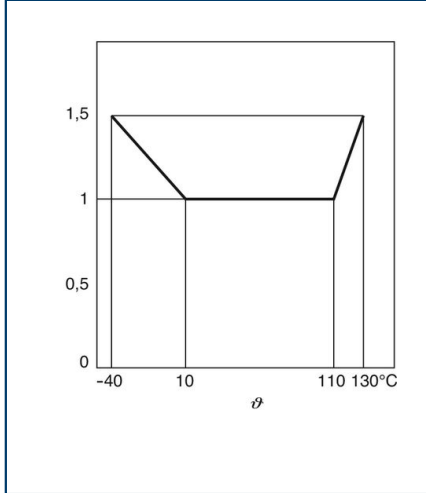




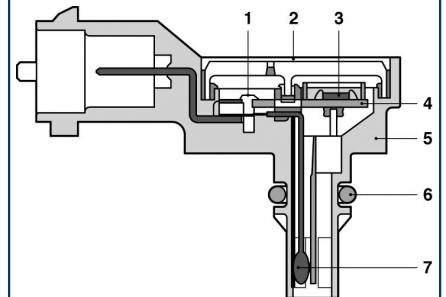
**Characteristic-curve tolerance**



**Tolerance extension factor**

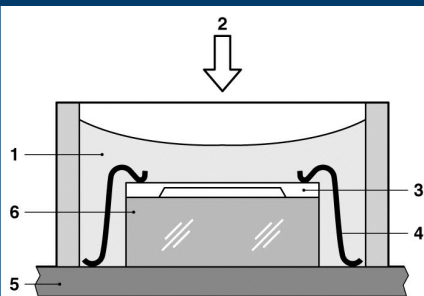


**Section through pressure sensor**



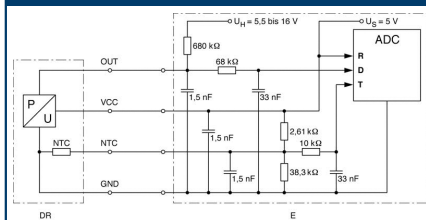
- 1 Bond
- 2 Cover
- 3 Sensor chip
- 4 Ceramic substrate
- 5 Housing with pressure-sensor connection
- 6 Seal 7NTC element.

**Section through sensor cell**



- 1 Protective gel
- 2 Pressure
- 3 Sensor chip
- 4 Bond
- 5 Ceramic substrate
- 6 Glass base.

**Recommendation for signal evaluation.**



- R Reference
- D Pressure signal
- T Temperature signal
- Dr Pressure sensor
- E Electronic control unit

**Accessories**

**Part number**

- Connector housing
- Contact pins
- Individual seals

	Quantity required: 1 x	1 928 403 966
	Quantity required: 3 x; Contents: 100 x	1 928 498 060
	Quantity required: 3 x; Contents: 10 x	1 928 300 599

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