



### Safety

**These operating instructions contain important information about the use of the vacuum sensor. Please read them carefully and keep them in a safe place for future reference.**

**Do not attempt to connect and use the vacuum sensor before you have read and understood these operating instructions.**

**Always comply with the following instructions and observe the safety notes and warnings.**

#### Warnings:

- Operation outside the specified performance limits is forbidden, since this could result in malfunction or even destruction of the sensor!
- The sensor may not be used in explosion-risk areas, since this could result in fires or explosions!
- The vacuum sensor may not be opened for any reason, since this could result in damage to the sensor and/or injuries to the person opening it!
- The unit may only be run via power supply units with protected extra-low voltage (PELV) and safe electrical cut-off of the operating voltage, in accordance with EN60204.



#### Caution:

- Do not carry the sensor by its cable or pull the cable in order to remove the sensor from its installation position.
- Ensure that the supply voltage is switched off before installing the sensor.
- Do not use the sensor in locations where it may be subjected to splashwater.
- Do not insert any objects (such as wires, tools, etc.) into the vacuum connector of the sensor.

#### Overview of variants

Each vacuum sensor carries its precise ordering designation on its housing (example: VS-V-SD60-M5).

The abbreviations used in this designation have the following meanings:

Type	Output signal	Switching point for SD *	Connector
VS-V	SA analogue signal	Example: 60 -600mbar	M5 Thread M5
	SD digital (switched) signal	19 -190mbar	M3 Thread M3 D4 Tube Ø4 D6 Tube Ø6

\* Switching point varies according to the version. No switching point is specified for sensors with an analogue output signal

#### Installation

##### Warning:

- The sensor may be installed only by a suitably qualified persons.
- General safety regulations, EN standards and VDE regulations must be observed.

##### Note:

- The maximum permissible length of the cables for the supply voltage and the analog output signal of the sensor is 30m in each case.
- In order to avoid interference, these cable should be kept as short as possible.
- The shield of the cables should be connected to an interference-free ground potential. The shield is not connected inside the sensor.

The vacuum sensors of the VS-V-S... series are connected as follows:

Wire colour	Signal
blue (bu)	Ground (0 V)
brown (bn)	Supply voltage
black (bk)	VS-V-SA... Analog signal
	VS-V-SD... Digital signal

##### Caution:

The following maximum tightening torques may not be exceeded:

VS-V-S...-M3: 0,5 Nm  
VS-V-S...-M5: 1 Nm

The force for screwing in the M3 or M5 adapter may be applied **only** to the flats on the adapter!

Screwing in the sensor by applying force directly to its casing is not permitted, since this may result in leaks and irreversible damage to the sensor.

**Operation**

The vacuum sensors of the VS-V-S... series are designed only for operation with a vacuum (referred to atmospheric pressure).

Pressures of up to 5 bar will not damage the sensor, but may have negative effects on its accuracy and/or operating lifetime.

The pressure resistance specified in the technical data is the maximum pressure at which the sensor will not be destroyed. Nevertheless, such a pressure can affect the accuracy and the lifetime of the sensor!

**Caution:**

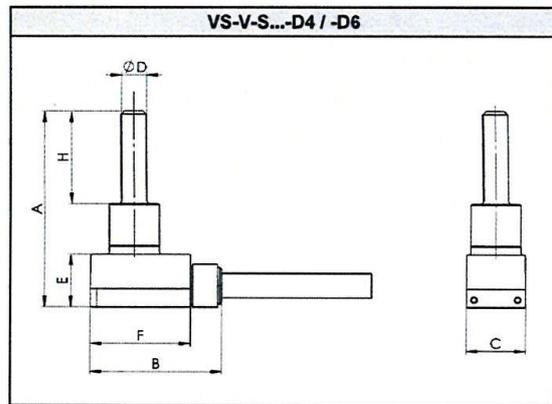
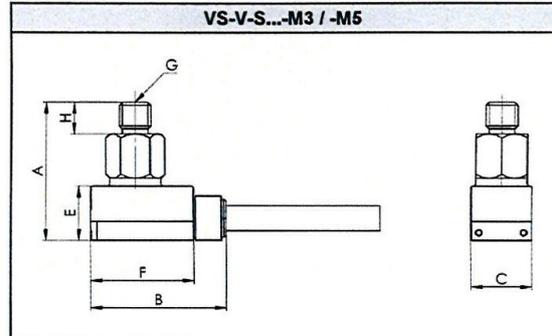
When operated at high ambient temperatures and a low load impedance, the vacuum sensors may reach temperatures of more than 60°C and may thus cause burns if touched!

**Notes:**

VS-V-SA... : We recommend that the load impedance at the analog output should be at least 10kΩ.

VS-V-SD... : If used for switching inductive loads, a suitable recovery diode should be provided.

**Dimension drawings**



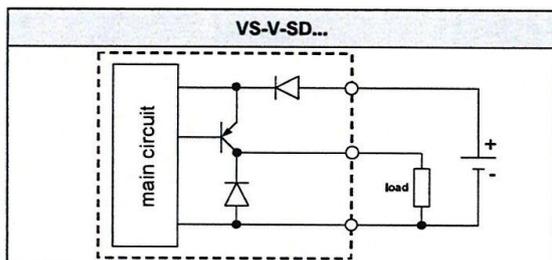
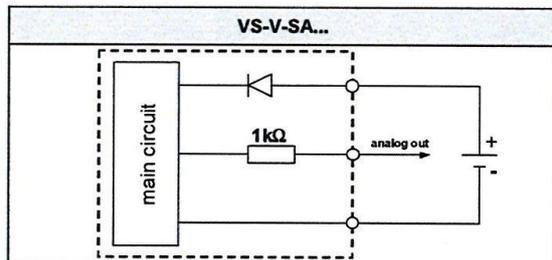
**Technical data**

Measured medium	Non-aggressive gases; dry, oil-free air
Pressure range	-1 ~ 0 bar
Supply voltage	10 ~ 24 VDC, reverse voltage protection, residual ripple (P-P) max. 10%
Analog output [VS-V-SA...]	1 to 5 VDC
Digital output [VS-V-SD...]	N.O., PNP, max. 60 mA, LED indicator Fixed switching point (value depends on version) Hysteresis approx. 20 mbar, fixed
Accuracy	VS-V-SA...: ±3 % of full-scale value at 25°C VS-V-SD...: ±5% of switching value at 25°C
Repeatability	±1 %
Linearity error	±1 %
Offset error	±1 %
Temperature effects	±3 % within operating temperature range
Electrical connection	3-wire cable (shielded), 3m long
Measured-medium connector	VS-V-S...-D4/D6: tube VS-V-S...-M3/M5: thread
Degree of protection	IP 40
Reaction time	< 3 ms
Internal current consumption	< 15 mA
Test voltage	1000 VDC, 1 min
Insulation resistance	> 50 MΩ at 500 VDC
Interference resistance *	tested in accordance with DIN EN 61000-6-2
Interference emission	tested in accordance with DIN EN 61000-6-3
Operating temperature	0°C to 50°C
Storage temperature	-10°C to 60°C
Relative humidity	10% to 90%
Pressure resistance	5 bar
Weight	approx. 75 g (incl. 3 m cable)

\* When exposed to HF fields in accordance with DIN EN 61000-4-3 and high-frequency signals in accordance with DIN EN 61000-4-6, the output signal may change by up to 5%.

Dimensions [mm]							
	A	B	C	D	E	F	H
VS-V-S...-D4	31,9	21	9,5	4	8,6	16	15
VS-V-S...-D6	36,9	21	9,5	6	8,6	16	20
VS-V-S...-M3	19,9	21	9,5	-	8,6	16	3
VS-V-S...-M5	21,9	21	9,5	-	8,6	16	5

**Circuit diagrams**



Technical subject to change!

Applies to the following articles:

**Vacuum sensor, mini-design, analog sensor**

Article No.

Type No.

108422 to 108423

VS 200 to VS 210