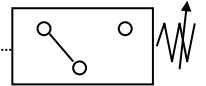


Vacuum switch • Pressure switch

VS-D Series



1x
Now the display switches to the adjustment of the upper margin.
The display is alternating between "b-2" and the preadjusted value.



To adjust the upper margin, push "Up"- or "Down"-key.



Store the settings with the "Mode"-key.



8. Operating modes of the outputs

The outputs can be operated in two different modes.
Each output can be adjusted independent of the other.
The modes are described in the following.

8.1 Hysteresis mode

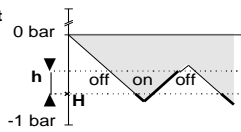
Settings are **switching point H** and **hysteresis h**.

Example: VS-V-D

H = -0.60 bar

h = 0.15 bar

N.O. (Normally Open)



At 0 bar, the digital output is off.

When the vacuum level increases up to the **switching point H**, the digital output switches on. As long as the vacuum is higher than -0.45 bar (= 0.6 bar - 0.15 bar), the digital output stays on. When the vacuum decreases and passes -0.45 bar, the digital output switches off.

For the configuration of N.C. (Normally Closed), the output switches reverse (off > H, on < H-h).

Factory setting: Output 1 & 2 in Hysteresis mode

VS-V-D	mmHg	inHg	kPa	bar
H - 1	345	13.6	-46	0.46
h - 1	50	2.0	-7	0.07
H - 2	595	23.4	-79	0.79
h - 2	50	2.0	-7	0.07

VS-P10-D	psi	kgf/cm ²	MPa	bar
H - 1	67	4.75	0.46	4.6
h - 1	10	0.70	0.07	0.7
H - 2	115	8.2	0.79	7.9
h - 2	10	0.7	0.07	0.7

8.2 Window Comparator mode

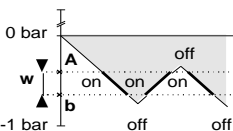
Settings are **lower margin A** and **upper margin b**.

Example: VS-V-D

A = -0.45 bar

b = -0.60 bar

N.O. (Normally Open)



At 0 bar, the digital output is off.

When the vacuum level increases up to the **lower margin A**, the digital output switches on. As long as the vacuum level is in the "window" between the **lower margin A** and the **upper margin b**, the digital output stays on.

When the vacuum level becomes higher than the **upper margin b**, the digital output switches off.

For the configuration of N.C. (Normally Closed), the output switches reverse (A < off < b, A < on > b).

Factory setting: Output 1 & 2 in Window Comparator mode

VS-V-D	mmHg	inHg	kPa	bar
A - 1	195	7.6	-26	0.26
b - 1	400	15.6	-53	0.53
A - 2	495	19.4	-66	0.66
b - 2	645	25.4	-86	0.86

VS-P10-D	psi	kgf/cm ²	MPa	bar
A - 1	38	2.7	0.26	2.6
b - 1	77	5.5	0.53	5.3
A - 2	96	6.85	0.66	6.6
b - 2	125	8.90	0.86	8.6

9. Display of Peak and Bottom values

The built-in memory stores in normal operation the peak value and bottom value since the switch was connected to the power supply.

These will be displayed as follow:

To display the peak value, push the "Up"-key



1x

Peak value

To display the bottom value, push the "Down"-key



1x

bottom value

10. Rotate display

If the mounting position is twisted (rotated on head), the display can be rotated. When connecting the power supply, push and hold the buttons "Up" and "Down".

Note that the decimal point lights up now at the upper margin of the display. The functions keys retain their function, that means that the "Up"-key shows downwards in twisted mounting position!

11. Locking the set values

11.1 Standard versions

Whilst pushing the "Mode"-key, push the "Down"-key. The switch is locked, which means that the set values can't be changed. On the display appears "LoC", the switch is locked.



hold

When doing this once more, the switch gets unlocked and the settings can be changed again.

On the display appears "UnC", the switch is unlocked.



hold

11.2 Version with PIN code (VS-...-C)

The lock prevents unauthorised persons changing the settings. A 3-digit number combination (PIN code) guarantees that only people who know the PIN code (set by the operator) can change the settings.

Activating the lock:

To activate the lock, press and hold the "Mode" button, then press the "Down" button.

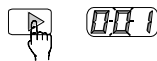


hold

Press the "Up" or "Down" button to change the right digit.



The value for the right digit is saved when you press the "Mode" button. The centre digit flashes.



1x

The centre digit can now be changed. Press the "Mode" button again to change the left digit.

When the "Mode" button is pressed again, the PIN code entered is saved. "LoC" appears on the display and the lock is activated.



1x

Deactivating the lock:

To deactivate the lock, press and hold the "Mode" button, then press the "Down" button.

"000" appears on the display and the right digit flashes.



hold

The saved PIN code must be entered as described above for locking. If the PIN code is correct, "UnC" is displayed and the switch is unlocked.



1x

If the PIN code is incorrect, "LoC" is displayed and the switch remains locked.



1x

If you forget the PIN code saved, the switch can be unlocked in the SCHMALZ factory.

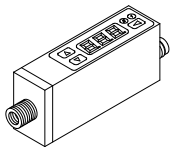
12. Error messages

Error	Message	Solution
Err	Pressure during Zero-point adjustment was higher than ±3% F.S.	Make Zero-point adjustment again at environment pressure.
CE1	Overcurrent at Output 1	Loaded current exceeds rated power of 180mA max. Check output.
CE2	Overcurrent at Output 2	
FFF	Applied pressure exceeds measuring range.	Apply pressure within the measuring range.
-FF*		
Er1	EEPROM defective, calibration storage could not be read anymore	Switch defective, replace it

* A display change from 0.00 to -FF or e.g. 0.01 at a atmospheric pressure is not an error, but caused by fluctuations in the air pressure.

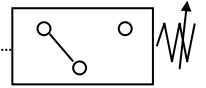
This can be rectified by setting the zero point.

The zero point must also be set after performing a "Clear all" (CLA).

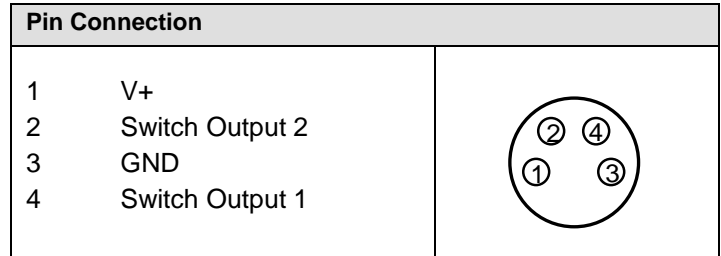
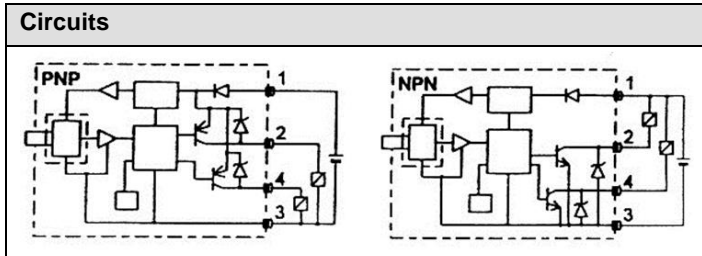


Vacuum switch • Pressure switch

VS-D Series



	VS-V-D-PNP	VS-V-D-PNP-C	VS-V-D-NPN	VS-P10-D-PNP	VS-P10-D-NPN
Art.- #	10.06.02.00049	10.06.02.00270	10.06.02.00055	10.06.02.00056	10.06.02.00125
Pressure range	0 ~ -1 bar (0 ~ -29.5 inHg)	0 ~ -1 bar (0 ~ -29.5 inHg)	0 ~ -1 bar (0 ~ -29.5 inHg)	0 ~ 10 bar (0 ~ 145 psi)	0 ~ 10 bar (0 ~ 145 psi)
Overpressure	5 bar (72.5 psi)	5 bar (72.5 psi)	5 bar (72.5 psi)	16 bar (232 psi)	16 bar (232 psi)



Dimension / Colour Codes of Schmalz cables

1 Vacuum connection
2 Reference connection
3 M8 electrical connection

If the switch is used in a moist environment, the reference connection (for ambient or reference pressure) must be connected to a deaeration hose (∅ 3 mm) which leads to a dry environment.

bn = ①
wh = ②
bu = ③
bk = ④

Technical Data	
Media	Non corrosive gases and non lubricated air
Power supply	10.8 ~ 30 VDC (Protected extra-low voltage PELV), Max. 10% ripple (P-P) , Reverse voltage protection
2 Switch Output	N.O. or N.C. separate selective, max. 180 mA, LED-indication on display, short circuit-proof, PNP or NPN version
Output resistance NPN	780 KΩ in open state
Display	3-digit 7- segment LED
Pressure units	VS-V-D: bar, mmHg, inHg, kPa VS-P10-D: bar, psi, kgf/cm ² , Mpa
Display resolution	VS-V-D: 0.01 bar, 5 mmHg, 0.2 inHg, 1 kPa VS-P10-D: 0.1 bar, 1 psi, 0.05 kgf/cm ² , 0.01 MPa
Hysteresis	Hysteresis mode (0-100%) or Windows Comparator mode separate selective
Electrical connection	Connector M8, 4-pin
Air connection	M5F and G1/8" M
Protection	IP 65 (without venting tube IP40)
Operation accuracy	± 1% F.S.
Thermal error	± 3% F.S. in range 0 ~ 50 °C (32 ~ 122 °F)
Response time	< 5 ms
Current consumption	< 55 mA
Dielectric strength	1,000 VDC 1 min
Insulation resistance	> 100 MΩ at 500 VDC
Interference emission	As per DIN EN 50081-1
Immunity to interference	As per DIN EN 50082-2
Operating temperature range	0 ~ 50 °C (32 ~ 122 °F)
Storage temperature range	-10 ~ 60 °C (14 ~ 140 °F)
Operating humidity range	10 ~ 90 % RH
Vibration resistance	10-55 Hz 1.5 mm (0.06"), XYZ, 2hrs
Shock resistance	10 G XYZ
Mass	25 g (0.88 oz)
Immunity to interference: The following minimum operating quality is guaranteed when there is interference from electromagnetic HF-Fields as per ENV 50140 and ENV 50141: The switch point can be modified by max. 10 %.	