

# VSM

The digital combination transducer VSM (Pirani/cold cathode) measures absolute pressure from atmospheric pressure to ultrahigh vacuum.

Microcontroller intelligence automatically manages the optional interplay of both vacuum sensors.

Smartline represents cutting edge technology providing safe, precise and cost effective process control.

## Typical Applications

- Analysis technology
- Coating plants and vapor deposition
- Vacuum furnaces
- Process engineering
- Measuring and controlling in fine and ultrahigh vacuum
- Sputtering plants

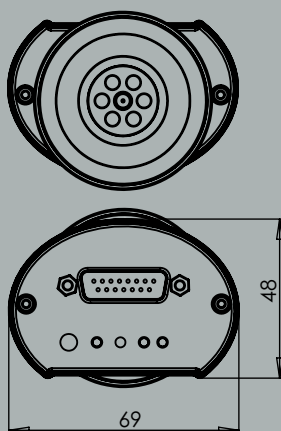
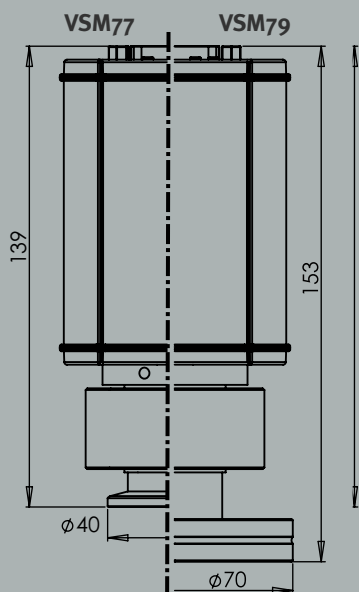
## Smartline Vacuum Transducer Absolute Pressure 1000 to $5 \times 10^{-9}$ mbar



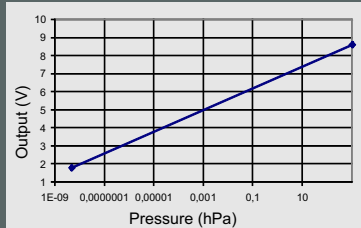
*Smartline*

## Benefits

- Wide range sensor Pirani / cold cathode
- The cold cathode sensor is automatically controlled by the Pirani
- Pirani with extended range allows operation of cold cathode at lower pressure and increases lifetime
- Robust sensor design
- Small volume of the measuring cell e. g. 9 cm<sup>3</sup> for VSM77D
- Excellent ignition behavior
- Insensitive against inrush of air
- Two independent, potential-free relay switch points
- LEDs for device status and switch points
- Easily replaceable sensor heads with stored calibration data
- Correct pressure readings by means of separate gas type correction factors for Pirani and cold cathode
- Suitable for Thyracont 2 and 4 channel display and control units VD12 / VD10
- Digital RS485 interface and additional analog output signal 1.819-8.6 V or EtherCAT
- Digital adjustment of zero and atmospheric pressure via pushbutton or interface
- Large, integrated LCD display with background illumination (VSM77DL, VSM79DL)
- Display flashes in bright red color in case of error, compared to green lighting in the normal mode (VSM77DL, VSM79DL)
- Easy connection with PLCs
- The digital output signal can be transmitted error-free over long distances (up to 500 m)
- Baud rate 9.6 kBd to 115 kBd
- Rugged, EMI-proof metal housing
- Vacuum connection by stainless steel small flange DN 25 ISO-KF or conflat flange DN 40 CF-F



Dimensions in mm



$$V_{out} / V = 0,6 \log (p / \text{mbar}) + 6,8$$

$$p / \text{mbar} = 10^{(V_{out} / V - 6,8) / 0,6}$$

## Technical Data

Measuring Principle	Pirani / inverted magnetron, both depending on gas type
Material In Contact With Vacuum	Stainl. steel 1.4307, nickel, tungsten, molybdenum, glass, ceramic
Measurement Range	1000 - 5 x 10 <sup>-9</sup> mbar (750 - 5 x 10 <sup>-9</sup> Torr), max. overpressure 4 bar abs.
Accuracy	1000 - 10 mbar: < 30 % from reading 10 - 2 x 10 <sup>-3</sup> mbar: < 10 % from reading 2 x 10 <sup>-3</sup> mbar - 1 x 10 <sup>-8</sup> mbar: < 25% from reading
Repeatability	10 - 1 x 10 <sup>-2</sup> mbar: Approx. ±2% from reading 1 x 10 <sup>-2</sup> - 1 x 10 <sup>-8</sup> mbar: Approx. ±7% from reading
Response Time	200 ms (1s for activating the cold cathode)
Cathode Voltage	Max. 2.5 kV
Voltage Supply	20 - 30 VDC
Electrical Connection	VSM77D/DL, VSM79D/DL: SubD, 15pol., male, lockable VSM77E, VSM79E: M12 circular connector, female, lockable, 1x A standard, 5pol., 2x D coded, 4pol.
Power Consumption	Max. 3 W, additionally 0.8 W f. EtherCAT / relays / LCD
Operating Temperature	+5...+60°C
Storage Temperature	-40...+65°C
Maximum Bake Out Temperature	160°C at flange (electronic detached)
Output Signal	0 - 10 VDC, measuring range 1.819 - 8.6 VDC, log., 0.6 V/decade load resistor > 10k Ω (VSM77D/DL, VSM79D/DL)
Serial Interface	RS485: 9.6 kBd to 115 kBd, address switch 1 - 16
Switch Points	2 switch-over relays, 50 VAC / 2 A, 30 VDC / 2 A, max. 60 VA
Vacuum Connection	DN 25 ISO-KF (VSM77), DN 40 CF-F (VSM79)
Protection Class	IP54 (VSM77E, VSM79E), IP40 (VSM77D/DL, VSM79D/DL)
Weight	Approx. 555 g

## Product Codes

• **VSM77D**  
Combi transducer Pirani/inverted magnetron, 1000 - 5 x 10<sup>-9</sup> mbar, DN 25 ISO-KF connection output 0 - 10 V and RS485

• **VSM77DL**  
As VSM77D, with LCD display

• **VSM77E**  
As VSM77D, output RS485 and EtherCAT

• **VSM79D**  
Combi transducer Pirani/inverted Magnetron, 1000 - 5 x 10<sup>-9</sup> mbar, DN 40 CF-F connection output 0 - 10 V and RS485

• **VSM79DL**  
As VSM79D, with LCD display

• **VSM79E**  
As VSM79D, output RS485 and EtherCAT

## Accessories:

• **SLN4**  
Plug-in power supply 24 V

• **SLKUSB**  
Interface converter RS485-USB

• **VGR**  
VacuGraph™ software for Windows

• **W1515002**  
Measuring cable for VD12 and VD10, shielded 2 m

• **W1515006**  
As W1515002, 6 m

• **W1515020**  
As W1515002, 20 m

• **Replacement sensor heads**  
B\_VSM77, B\_VSM79

Alterations reserved (VSMAo2)