



VDM-5 DiCAP™

Dual sensor vacuum transducer

5×10^{-3} to 1333 mbar / 3.75×10^{-3} to 1000 Torr

Wide range capacitance / piezo transducer

Advantages

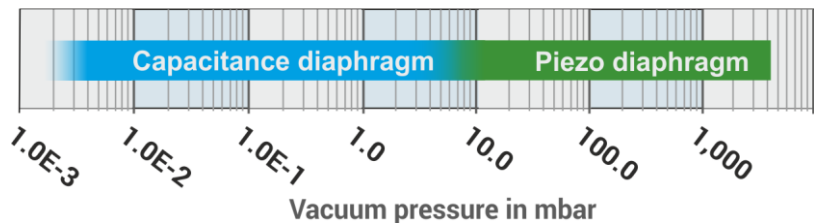
- Wide measuring range of 6 decades
- Gas independent measurement
- Automatic zeroing of piezo sensor
- Reliable solid-state relays for control
- 0-10 VDC programmable voltage output
- Digital interface
- Vacuum temperature sensor for diagnostics
- RGB LED color pressure indicator

Applications

- PVD coating
- Plasma sterilization
- Freeze-drying
- Load-lock control
- Furnace heat treatment

RoHS
 0-10 VDC
 ON/OFF
 PATENT PENDING IP
 RS-232
 RS-485
 S4-Connect

The VDM-5 DiCAP™ transducer establishes new standards with an all-in-one measurement solution for a wide selection of vacuum applications. It differentiates from any other vacuum gauge by offering an overall cost-effective gas independent measurement from 5.0E-3 to 1333 mbar.

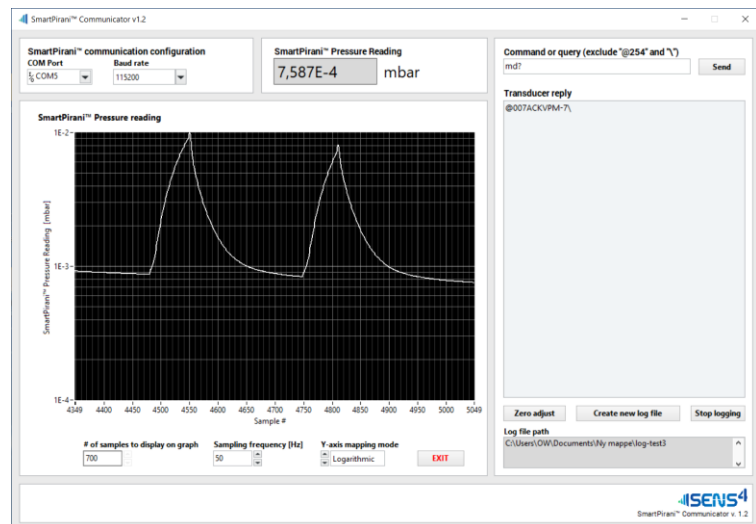


In vacuum applications where the gas composition or type can change, traditional gas dependent Pirani gauges will result in measurement deviation from the actual pressure. The VDM-5 transducer uses a precision capacitance diaphragm gauge (CDG) sensor that eliminates the gas dependency and provides accurate measurements also when the gas properties change.

Programmable settings and parameters

The transducer settings and parameters can be user-programmed to control vacuum system and application process parameters. The digital RS-232 or RS-485 serial interface can be used for diagnostics, predictive maintenance, service, calibration, setpoint configuration, analog output scaling and acquisition of real-time vacuum pressure measurements for on-screen visualization.

The serial USB programmer in combination with the free, intuitive configuration software is a plug-and-play solution for transducer programming, real-time measurements and diagnostics.



Analog voltage output

A wide selection of analog output scaling options to emulate other vendors' vacuum gauges and transducers is available. An optional secondary analog output enables external monitoring of both the full-range vacuum pressure and the pressure signal relative to atmospheric pressure.

Reliable and robust pressure control

Several vacuum pressure parameters need to be accurately and reliably controlled in many vacuum applications. The VDM-5 transducer has three independent solid-state switch relays that can be configured to control venting and the transfer chamber gate-valve. Compared to traditional electro-mechanical relays, the solid-state relays offer superior reliability and faster switching time while providing arc free contacts and generates no EMI (electromagnetic interference) when switching contacts. The VDM-5 control relays are designed to last and are UL listed, CSA recognized, and EN/IEC 60950-1 certified for maximum confidence when used to control critical vacuum processes and high-cycle applications.

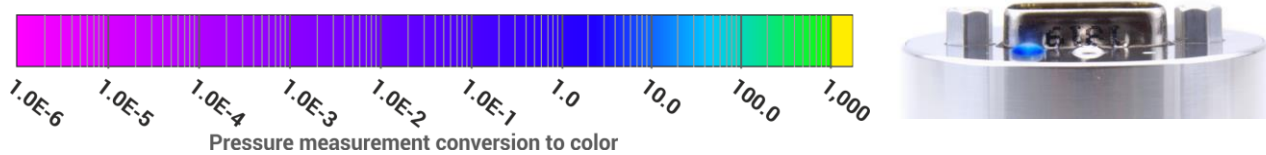
Contamination containment

Particulate contamination can occur in applications like vacuum furnaces and physical vapor deposition systems. The optional baffle accessory can prevent such particles from reaching the sensor element and thereby extend the time between maintenance and overall lifetime of the product.



RGB LED for pressure indication

The VDM-5 transducer introduces a new approach for visually determining the measured pressure by a multi-color LED that smoothly changes color throughout the pressure range. This selectable visual function is a low-cost alternative to integrated displays and provides a rough indication of the measured pressure. It also provides a clear visual warning if the vacuum system is pressurized above ambient pressure.



Customized settings

The transducer can be delivered with a custom configuration to match specific application requirements. Examples of pre-configured options include measurement range, vacuum pressure unit, setpoint configuration and output signal scaling. Customized products will be assigned a unique part number for easy and simple future reordering.

Technical data

Specifications

Measuring range	5×10 ⁻³ to 1333 mbar (3.75×10 ⁻³ to 1000 Torr)
Measuring principle 5×10 ⁻³ to 3.99 mbar	Capacitance diaphragm gauge (CDG)
Measuring principle 4 mbar to 5 mbar	Blended CDG / Piezo reading
Measuring principle 5 to 1333 mbar	MEMS piezo resistive diaphragm
Accuracy 1E-2 to 800 mbar	0.5% of reading
Accuracy 800 to 1099 mbar	0.25% of reading
Accuracy 1100 to 1200 mbar	0.5% of reading
Hysteresis 1×10 ⁻² to 10 mbar (ISO 19685:2017)	1%
Hysteresis 10 to 1200 mbar (ISO 19685:2017)	0.1%
Vacuum temperature sensor range	-20 to + 85°C
Vacuum temperature sensor accuracy	+/- 1.5 °C
Transducer temperature sensor range	-20 to + 85°C
Transducer temperature sensor accuracy	+/- 1.5 °C
Analog output resolution	16 bit (150 µV)
Analog output update rate	124 Hz
Response time	<20 ms
Temperature compensation	+10 to +50 °C
Solid state relay set point range (absolute)	1×10 ⁻² to 1333 mbar (7.5×10 ⁻³ to 1000 Torr)
Solid state relay contact rating	50 V, 100 mA _{rms} / mA _{DC}
Solid state relay contact endurance	Unlimited (no mechanical wear)
Solid state relay approvals	UL Recognized: File E76270 CSA Certified: Certificate 1175739 EN/IEC 60950-1 Certified

Environment conditions

Operating ambient temperature	-20 to +50 °C
Media temperature	-20 to +50 °C
Storage ambient temperature	-20 to +80 °C
Bake-out temperature (non-operating)	+80 °C
Maximum media pressure	4 bar absolute
Mounting position	Arbitrary
Protection rating, EN 60529/A2:2013	IP40
Humidity, IEC 68-2-38	98%, non-condensing

Power supply

Supply voltage	12-30 VDC
Power consumption	350 mW (max)
Reverse polarity protection	Yes
Overvoltage protection	Yes
Internal fuse	100 mA (thermal recoverable)

Specifications are subject to change without further notice

Technical data

Materials

Enclosure	SS 1.4307 / AISI 304L / Aluminum 6061
Vacuum Process flange (media wetted)	SS 1.4307 / AISI 304L
Vacuum exposed materials (media wetted)	304 Stainless steel, Kovar, glass, silicon, Al ₂ O ₃ , gold, Viton®, vitreous silica, solder, RO4305
Process leak tightness (ISO 27895:2009)	<1·10 ⁻⁹ mbar-l/s

Approvals

CE	EMC directive 2014/30/EU
RoHS compliance	Directive EU 2015/863

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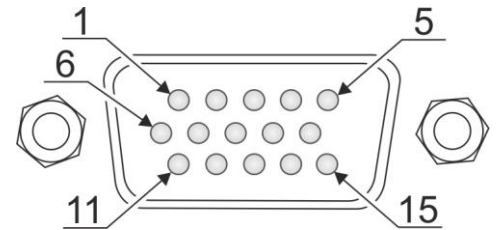
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Connector Pin outs

15 Pin HD D-sub RS-232 / RS-485

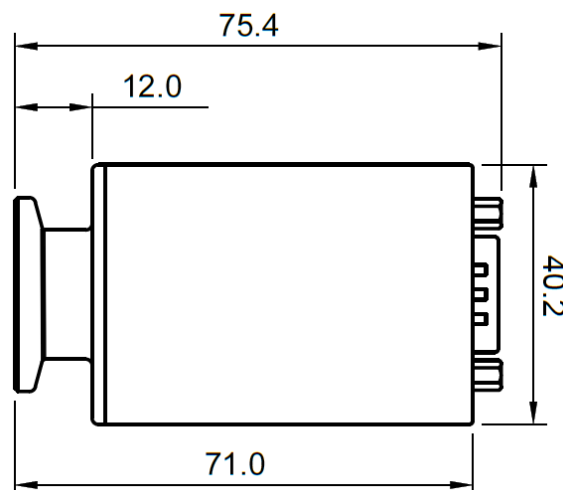
Pin	Description
1	RS-232 Transmit / RS-485 (-)
2	RS-232 Receive / RS-485 (+)
3	Supply voltage 12-30 VDC
4	Supply voltage - (return)
5	Analog voltage signal +
6	Analog voltage signal - (return)
7	Relay 1 NO (normally open contact) ⁽¹⁾
8	Relay 1 Common ⁽¹⁾
9	Relay 1 NC (normally closed contact) ⁽¹⁾
10	Relay 2 NC (normally closed contact) ⁽¹⁾
11	Relay 2 Common ⁽¹⁾
12	Relay 2 NO (normally open contact) ⁽¹⁾
13	Relay 3 NC (normally closed contact) ⁽¹⁾
14	Relay 3 Common ⁽¹⁾
15	Relay 3 NO (normally open contact) ⁽¹⁾

(1) Optional relay



Dimensions (DN16KF flange)

All dimensions in mm.



Order guide

	VDM-5-	1	0	1	0	1	2	3	2	
Vacuum flange										Connection
DN16KF		1	0							1 9 Pin D-sub male
DN25KF		2	0							2 15 pin HD D-sub male
NPT 1/8"		3	0							3 15 pin HD D-Sub male / dual analog out
VCR4		4	0							4 6 pin Hirschmann, ID res 3K
DN16KF Extended		8	0							5 6 pin Hirschmann, ID res 5.1K
DN16KF with light baffle		1	1							6 6 pin Hirschmann, ID res 9.1K/11.1K
DN16KF with heavy duty baffle		1	2							7 8 pin RJ45 / FCC68, ID Res 27K
DN25KF with light baffle		2	1							8 8 pin RJ45 / FCC68, ID Res 36K
DN25KF with heavy duty baffle		2	2							9 8 pin RJ45 / FCC68, ID Res 43K
										Setpoints
Digital interface										0 None
RS-232 / S4-Connect™				1						1 1x Solid State Relay
RS-485 / S4-Connect™				2						2 2x Solid State Relays
										3 3x Solid State Relays
										Unit
Analog Output										1 torr
0.5 - 9.5 (1 V/dec)				0	1					2 mbar
1.0-9 VDC 1 VDC/Dec (MKS 901P/925/910)				0	2		1			3 Pascal
0.375 to 5.659 VDC (MKS GP275)				0	3		2			
0.5V DC (MKS 523)				0	4		3			
1.9-10 VDC (Inficon PSG55x, Leybold TTR91)				0	5					
1.5-8.5 VDC (Pfeiffer TPR260/27x/28x)				0	6					
1.9-9.1VDC Edwards APG100XLC				0	7					
1.9-9.1VDC (Edwards APG100XM)				0	8					
0-10 VDC 0.1Torr FS Capacitance manometer		1	0							
0-10 VDC 1 Torr FS Capacitance manometer		1	1							
0-10 VDC 10 Torr FS Capacitance manometer		1	2							
0-10 VDC 100 Torr Capacitance manometer		1	3							
0-10 VDC 1000 Torr Capacitance manometer		1	4							

Other analog outputs are available on request

Accessories

Programming device	
RS-232 to USB, 15 pin HD D-sub, Power supply (90-230VAC)	PRG-WPRS2-15DS-01
RS-485 to USB, 15 pin HD D-sub, Power supply (90-230VAC)	PRG-WPRS4-15DS-01
RS-232 USB programmer, 1.5 m cable	PRG-RS232-DS15 RS-232
RS-485 USB programmer, 1.5 m cable	PRG-RS485-DS15 RS-485
Calibration certificate	
Accredited calibration certificate from DAKKS lab.	CAL-VDM-5-DAKSS
Cables	
15 pin HD D-sub female to 15 pin D-sub male with 3 m cable	CAB-F15DSM15DS-003
15 pin HD D-sub female to 15 pin D-sub male with 5 m cable	CAB-F15DSM15DS-005
15 pin HD D-sub female to 15 pin D-sub male with 10 m cable	CAB-F15DSM15DS-0105

About

Sens4 develops, manufactures, markets and distributes vacuum, pressure and temperature measuring equipment for industrial applications worldwide. Our products are designed, engineered and manufactured in Denmark to the highest quality standards. Our mission is to continuously endeavor to provide customer centric state of the art measurement solutions.

Our passion | Your value™

