



UNIQUE VACUUM
SOLUTIONS

HVP-7AT OnePirani

Pirani Vacuum Transducer

1×10^{-6} to 1333 mbar

MEMS pirani + Diaphragm Peizo transducer With An Atmospheric Switch



Benefits & features :

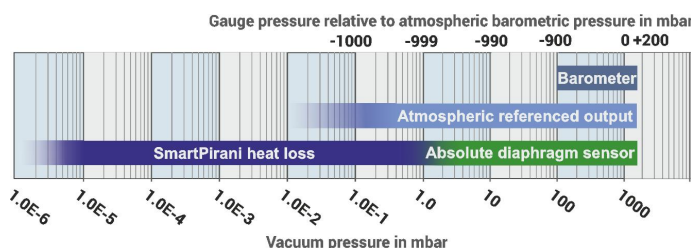
- Ultra-wide measuring range from 1.0E-6 to 1333 mbar
- Precise atmospheric switch function
- Gas independent measurement from 2 to 1333 mbar
- Easy configuration with USB programmer
- 0-10 VDC programmable voltage output
- Digital RS-232 or RS-485 interface
- Optional Ceramic or Parylene sensor protection for corrosive applications
- Optional solid state setpoint relay for external controlling

Applications:

- *Loadlock applications*
- *Mass spectrometers.*
- *PVD applications.*
- *Analytical Vacuum systems.*
- *Freeze drying.*
- *Semiconductor processing.*
- *space simulation.*
- *Vacuum furnaces.*

Best suitable for Load Lock Pressure Control

For applications such as Load-Lock systems in semiconductor industry, where precision measurement of relative atmospheric pressure in combination with vacuum measurement is needed, this HVP-7AT delivers accurate measurement values to control the system process accordingly.



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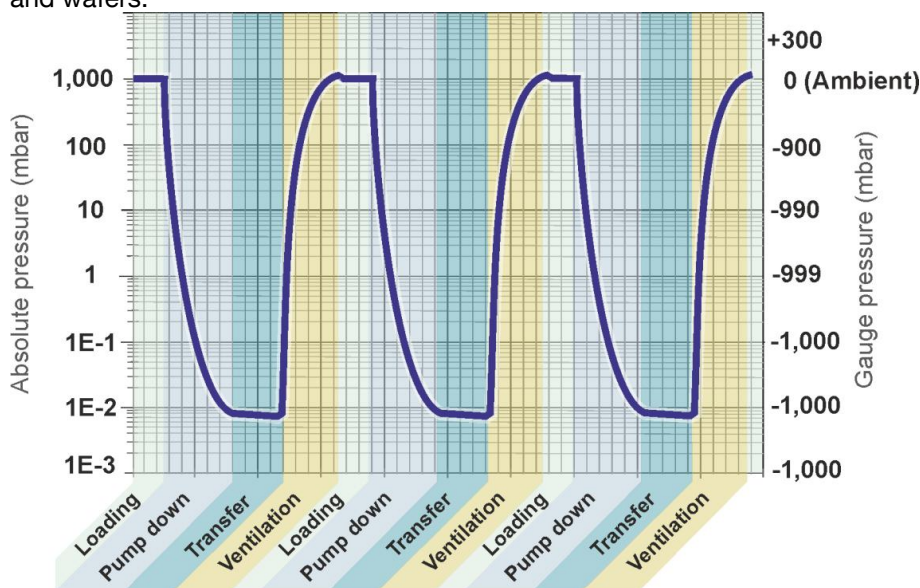
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With the integration of four pressure outputs from a barometric ambient sensor, a wide-ranging heat-loss Pirani, an absolute diaphragm sensor, and a signal relative to atmospheric pressure, This HVP-7AT delivers precise measurements and controls for Load-Lock vacuum systems.

Gas-independent within the absolute pressure range of 2 to 1333 mbar from the diaphragm sensor makes this HVP-7AT more reliable.

A Load-lock is a vacuum chamber used for loading devices like semiconductor wafers from the ambient air pressure to the vacuum processing chamber. The Load-lock is typically cycled between atmospheric barometric ambient pressure and an adequate vacuum pressure required to transfer the wafers to the processing vacuum chamber. Accurate control of pressure in the load-lock vacuum chamber is critically important to prevent ambient air and particulate contamination of the load-lock and wafers.

The Typical function of Load-Lock chambers is for loading the semiconductor wafers in the process chamber from ambient air pressure, and in turn transfer the wafers to the processing vacuum chamber. This operational cycling will be continuous and sequential. Hence precision control of pressure in the load-lock vacuum chamber is very important to prevent ambient air and particulate contamination of the load-lock and wafers.



Extended Protection Of Sensor For Harsh Environments.

With the incorporation of either ceramic or Parylene protective barriers (as optional), these sensors can be exposed to corrosive or aggressive gases



Ceramic is highly corrosion resistant and is a well-proven material for vacuum sensor diaphragms in capacitance diaphragm gauges.

Parylene is a unique polymer with highly corrosion resistant and hydrophobic properties. The Parylene barrier is designed for medical applications including lyophilization and sterilization.

In some vacuum processes, where the particulates can damage vacuum gauges and for these applications in combination with the protective coating options the new OnePirani transducers are set for Harsh vacuum environments.

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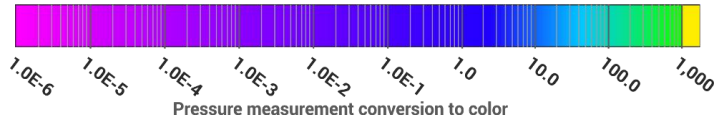


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Analog voltage output

The analog output voltage provides a signal for external readout or controls. The HVP-7AT offers as standard a voltage output signal of 1VDC/decade mbar, Torr, or Pascal. It can also be user configured or ordered preconfigured with a large selection of other analog output options that enables compatibility with other vendors.

RGB LED for pressure indication



With the incorporation of multi color LED on the top of the sensor, this makes the user to follow the color and know the level of vacuum in the sensor, throughout the pressure range.

This cost effective solution is best replacement for expensive onboard vacuum display sensors.

Reliable And Robust Setpoint Relay Control

For use in critical vacuum processes and cycle applications, the HVP-7AT has optional 3 numbers of solid state relay outputs, which setpoint and hysteresis are programmable.

Digital Interface

The HVP-7AT comes with optional RS-232 and RS-485 serial interfaces which transfers of measurement data without being influenced by signal degradation due to long cable lengths or from electrical noise interference.

Applications

The OnePirani has wide range of industries and research applications, such as fore-line measurement, mass spectrometers, scanning electron microscopes and coating processes.

Semiconductor industry

For applications such as Load-Lock vacuum systems, this HVP-7AT is the right choice as this provides accurate atmospheric switching function without the influence of variation in weather conditions and altitude.

Analytical equipment

HVP-5, With an effective wide range of vacuum measurement up to 10e-6 mbar, this OnePirani eliminates of need of expensive high vacuum ionisation gauges in Mass spectrometers and scanning electron microscopes and other analytical vacuum equipment applications.

Physical vapor deposition : In Harsh environment of PVD coatings, the entry of coating particulate in to the vacuum measurement sensor is unavoidable. This results in reducing the life of the sensor and also causing damages to sensing elements exposed to coatings.



The OnePirani HVP-7AT has a user cleanable baffle which avoids the direct entry of coating particulate in to the sensor.

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TECHNICAL DATA

MODEL	HVP-7AT
SPECIFICATIONS	<p>Measuring range in mbar : 1×10^{-6} to 1333 mbar (7.5×10^{-7} to 1000 Torr)</p> <p>Measuring principle 1×10^{-6} to 1.5 mbar : MEMS Pirani thermal conductivity</p> <p>Measuring principle 1.5 to 2 mbar : Blended MEMS Pirani / piezo reading</p> <p>Measuring principle 2 to 1333 mbar : MEMS piezo resistive diaphragm</p> <p>Accuracy 1×10^{-5} to 9.99×10^{-5} : 25% of reading</p> <p>Accuracy 1×10^{-4} to 7.99 mbar : 5% of reading</p> <p>Accuracy 8.00 to 99.9 mbar : 1% of reading</p> <p>Accuracy 100 to 800 mbar : 0.5% of reading</p> <p>Accuracy 800 to 1099 mbar : 0.25% of reading</p> <p>Accuracy 1100 to 1333 mbar : 0.5% reading</p> <p>Hysteresis 1×10^{-3} to 10 mbar (ISO19685:2017) : 1%</p> <p>Hysteresis 10 to 1333 mbar (ISO19685:2017) : 0.1%</p> <p>Barometric measurement range : 300 to 1200 mbar</p> <p>Barometric accuracy : ± 0.5 mbar</p> <p>Atmospheric referenced pressure output range : -1333 to + 1333 mbar</p> <p>Vacuum temperature sensor range : -20 to + 85°C</p> <p>Vacuum temperature sensor accuracy : ± 1.5 °C</p> <p>Transducer temperature sensor range : -20 to + 85°C</p> <p>Transducer temperature sensor accuracy : ± 1.5 °C</p> <p>Analog output resolution : 16 bit (150 μV)</p> <p>Analog output update rate : 124 Hz</p> <p>Response time (ISO 19685:2017) : <20 ms</p> <p>Temperature compensation : +10 to +50 °C</p> <p>Solid state relay set point range : 5×10^{-6} to 1333 mbar (3.75×10^{-6} to 1000 Torr)</p> <p>Solid state relay contact rating : 50 V, 100 mArms / mADC</p> <p>Solid state relay contact endurance : Unlimited (no mechanical wear)</p> <p>Solid state relay approvals : UL Recognized: File E76270</p> <p>CSA Certified: Certificate 1175739</p> <p>EN/IEC 60950-1 Certified</p>
Environmental conditions for operation	<p>Operating ambient temperature : -20 to +50 °C</p> <p>Media temperature : -20 to +50 °C</p> <p>Storage ambient temperature : -40 to +120 °C</p> <p>Bake-out temperature (non-operating) : +120 °C</p> <p>Maximum media pressure : 10 bar absolute</p> <p>Mounting position : Arbitrary</p> <p>Protection rating, EN 60529/A2:2013 : IP40</p> <p>Humidity, IEC 68-2-38 : 98%, non-condensing</p>
Power supply	<p>Supply voltage : 12-30 VDC</p> <p>Power consumption : 240 mW (max)</p> <p>Reverse polarity protection : Yes</p> <p>Overvoltage protection : Yes</p> <p>Internal fuse : 100 mA (thermal recoverable)</p>
Materials	<p>Enclosure : SS 1.4307 / AISI 304L / Aluminum 6061</p> <p>Vacuum Process flange (media wetted) : SS 1.4307 / AISI 304L</p> <p>Parylene protected version : 316 Stainless steel, Viton®, Parylene</p> <p>Vacuum exposed materials-Standard Version (media wetted) : 316 Stainless steel, Kovar, glass, silicon, nickel, aluminum, SiO₂, Si₃N₄, gold, Viton®, low out-gassing epoxy resin, solder, RO4305</p> <p>Vacuum exposed materials (media wetted) Ceramic protected version : 316 Stainless steel, Viton®, Aluminum oxide ceramic (Al₂O₃)</p> <p>Process leak tightness (ISO 27895:2009) : $<1 \cdot 10^{-9}$ mbar-l/sec.</p>
Reliability	<p>MTBF (Mean Time Between Failure) : 13,092,170 hours / 1494 years</p> <p>Failure rate FIT (Failure In Time, where time=10E+9 hours) : 76,38</p>

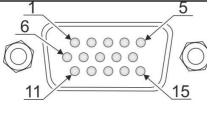
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Connector Pin outs

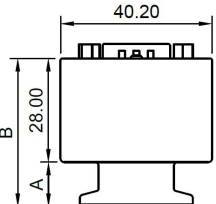
PIN	DESCRIPTION	15 Pin HD D-sub RS-232 / RS-485
1	RS-232 Transmit / RS-485 (-)	
2	RS-232 Receive / RS-485 (+)	
3	Supply voltage 12-30 VDC	
4	Supply voltage - (return)	
5	Analog voltage signal +	
6	Analog voltage signal - (return)	
7	Relay 1 NO (normally open contact) (4)	
8	Relay 1 Common (1)	
9	Relay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

(4) Optional solid-state relay

(5) Optional secondary analog voltage output

Dimensions (in mm)

Flange Type	A(mm)	B(mm)
DN16KF (P/N: HVP-7AT-1...)	12.00	40.00
DN25KF (P/N: HVP-7AT-2...)	12.00	40.00
VCR41 (P/N: HVP-7AT-4...)	33.70	61.70
VCR81 (P/N: HVP-7AT-5...)	29.43	57.43
1/8" NPT (P/N: HVP-7AT-3...)	37.0	65.0
DN16CF (P/N: HVP-7AT-6...)	21.83	49.83



Ordering Information:

VPM-7-	1	0	1	0	1	2	3	2	Connection
Vacuum flange / sensor protection	1	0							15 pin HD D-sub male
DN16KF	1	0							15 pin HD D-sub male / dual analog out
DN25KF	2	0							
NPT 1/8"	3	0							
VCR4 female	4	0							
VCR8 female	5	0							
DN16KF Extended	8	0							
DN16KF with light baffle	1	1							
DN16KF with heavy duty baffle	1	2							
DN25KF with light baffle	2	1							
DN25KF with heavy duty baffle	2	2							
DN16KF, Ceramic protected sensors	1	3							
DN25KF, Ceramic protected sensors	2	3							
NPT 1/8", Ceramic protected sensors	3	3							
VCR4 female, Ceramic protected sensors	4	3							
VCR8 female, Ceramic protected sensors	5	3							
DN16CF rotatable, Ceramic	6	3							
DN16KF Extended, Ceramic	8	3							
DN16KF with light baffle, Ceramic	1	4							
DN16KF with heavy duty baffle, Ceramic	1	5							
DN25KF with light baffle, Ceramic	1	4							
DN16KF, Parylene protected sensors	1	6							
DN25KF, Parylene protected sensors	2	6							
NPT 1/8", Parylene protected sensors	3	6							
VCR4 female, Parylene protected sensors	4	6							
VCR8 female, Parylene protected sensors	5	6							
DN16CF rotatable Parylene protected sensor	6	6							
DN16KF Extended, Parylene protected sensor	8	6							
DN16KF with light baffle, Parylene	1	7							
DN16KF with heavy duty baffle, Parylene	1	8							
DN25KF with light baffle, Parylene	2	7							
DN25KF with heavy duty baffle, Parylene	2	8							
Digital interface									
RS-232 / S4-Connect* (9 and 15 pin D-sub)									
RS-485 / S4-Connect* (9 and 15 pin D-sub)									
S4-Connect* (RJ45/FCC58 and Hirschmann)									
Analog Output									
0.5 - 9.5 (1 V/dec)									
1.0-9 VDC 1 VDC/Dec (MKS 901P/925/910)									
0.375 to 5.659 VDC (MKS GP27S)									
0.5V DC (MKS S23)									
1.9-10 VDC (Inficon PSG55x, Leybold TTR91)									
1.5-8.5 VDC (Pfeiffer TPR260/27x/28x)									
1.9-9.1 VDC (Edwards AP0100XLC)									
1.9-9.1 VDC (Edwards AP0100M)									
2-10VDC (Edwards APG-L)									
0-10 VDC 0.1 Torr FS Capacitance manometer									
0-10 VDC 1 Torr FS Capacitance manometer									
0-10 VDC 10 Torr FS Capacitance manometer									
0-10 VDC 100 Torr FS Capacitance manometer									
0-10 VDC 1000 Torr FS Capacitance manometer									
2-9.8 VDC (MPS4000/Pfeiffer PKR251, PKR261)									
0.61-10.2 VDC (Leybold TTR101N)									
1.8-8.6 VDC (Pfeiffer PKR251)									
0-10VDC 0.1 mbar FS Capacitance manometer									
0-10VDC 1 mbar FS Capacitance manometer									
0-10VDC 2 mbar FS Capacitance manometer									
0-10VDC 5 mbar FS Capacitance manometer									
0-10VDC 10 mbar FS Capacitance manometer									
0-10VDC 20 mbar FS Capacitance manometer									
0-10VDC 50 mbar FS Capacitance manometer									
0-10VDC 100 mbar FS Capacitance manometer									
0-10VDC 200 mbar FS Capacitance manometer									
0-10VDC 500 mbar FS Capacitance manometer									
0-10VDC 1100 mbar FS Capacitance manometer									
0-10VDC 1000 mbar FS Capacitance manometer									

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Our Products In Vacuum Measurements Are :

DPRG
FLEXA
Hybrid
DVG
OnePirani
Mercury McLeod

Our Expertise Is In :

Helium Leak test Systems
Vacuum Measuring Gauges
High Vacuum Systems
Vacuum filtration solutions
High vacuum components
Vacuum Gauges & Helium
Std leak Calibration Services
Helium Leak testing services

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