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# HVP-5 OnePirani

## Pirani Vacuum Transducer

## $1\times10^{-6}$ to 1333 mbar

## MEMS pirani + Diaphram Peizo transducer

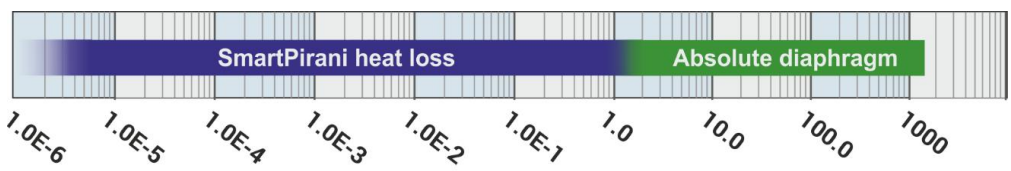
### Benefits & features

- Ultra-wide measuring range from 1.0E-6 to 1333 mbar
- 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
- Pin and outputs Compatibility with other Brand gauges

### Applications:

- ***PVD coating***
- ***Mass spectrometers.***
- ***Analytical Vacuum systems.***
- ***Freeze drying.***
- ***Semiconductor processing.***
- ***Sterilisation process.***
- ***Load lock systems.***
- ***Vacuum furnaces.***

This OnePirani HVP-5 uses the thermal conductivity sensing technology and has extended measurement range from 1333 to 1E-6 mbar.
This OnePirani MEMS (Microelectromechanical Systems) sensor technology, combined with a novel precision digital signal processing architecture and advanced algorithms gives the possibility for wide applications and precision vacuum measurement.




**With the high accurancy and tested repeatability standards of this HVP-5 sensor, this is the best cost effective replacement solution for conventional hot cathod and cold cathod ionisation gauges.**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# 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.

**Analog Output Voltage**
The analog output voltage provides a signal for external readout or controls. The HVP-5 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.

**Reliable and robust setpoint relay control**
For use in critical vacuum processes and cycle applications, the HVP-5 has optional 3 numbers of solid state relay outputs, which setpoint and hysteresis are programmable.

## Applications

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

**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-5 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-5 |
|---|---|
| **SPECFICATIONS** | Measuring range in mbar : $1\times10^{-6}$ to 1333 mbar ($7.5\times10^{-7}$ to 1000 Torr)<br>Measuring principle $1\times10^{-6}$ to 1.5 mbar : MEMS Pirani thermal conductivity<br>Measuring principle 1.5 to 2 mbar : Blended MEMS Pirani / piezo reading<br>Measuring principle 2 to 1333 mbar : MEMS piezo resistive diaphragm<br>Accuracy $1\times10^{-5}$ to $9.99\times10^{-5}$ : 25% of reading<br>Accuracy $1\times10^{-4}$ to 7.99 mbar : 5% of reading<br>Accuracy 8.00 to 99.9 mbar : 1% of reading<br>Accuracy 100 to 800 mbar : 0.5% of reading<br>Accuracy 800 to 1099 mbar : 0.25% of reading<br>Accuracy 1100 to 1333 mbar : 0.5% reading<br>Hysteresis $1\times10^{-3}$ to 10 mbar (ISO19685:2017) : 1%<br>Hysteresis 10 to 1333 mbar (ISO19685:2017) :0.1%<br>Analog output resolution : 16 bit (150 µV)<br>Analog output update rate :124 Hz<br>Response time (ISO 19685:2017) : <20 ms<br>Temperature compensation : +10 to +50 °C<br>Solid state relay set point range : $5\times10^{-6}$ to 1333 mbar ($3.75\times10^{-6}$ to 1000 Torr)<br>Solid state relay contact rating : 50 V, 100 mArms / mADC<br>Solid state relay approvals : UL Recognized: File E76270<br>CSA Certified: Certificate 1175739<br>EN/IEC 60950-1 Certified |
| **Environmental conditions for operation** | Operating ambient temperature : -20 to +50 °C<br>Media temperature : -20 to +50 °C<br>Storage ambient temperature : -40 to +120 °C<br>Bake-out temperature (non-operating) : +120 °C<br>Maximum media pressure : 10 bar absolute<br>Mounting position : Arbitrary<br>Protection rating, EN 60529/A2:2013 : IP40<br>Humidity, IEC 68-2-38 : 98%, non-condensing |
| **Power supply** | Supply voltage :12-30 VDC<br>Power consumption : 240 mW (max)<br>Reverse polarity protection : Yes<br>Overvoltage protection : Yes<br>Internal fuse :100 mA (thermal recoverable) |
| **Materials** | Enclosure : SS 1.4307 / AISI 304L / Aluminum 6061<br>Vacuum Process flange (media wetted) :SS 1.4307 / AISI 304L<br>Vacuum exposed materials (media wetted)<br>Parylene protected version : 316 Stainless steel, Viton®, Parylene<br>Vacuum exposed materials (media wetted) : Ceramic protected version<br>316 Stainless steel, Viton®, Aluminum oxide ceramic : (AI2O3)<br>Process leak tightness (ISO 27895:2009) : <1·10e-9 mbar·l/sec. |


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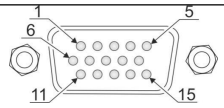
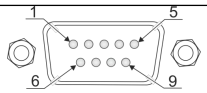
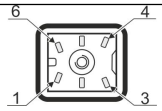
# Connector Pin outs

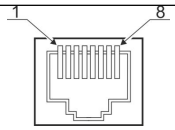
| PIN | DESCRIPTION | 15 Pin HD D-sub RS-232 / RS-485 |
|---|---|---|
| 1 | RS-232 Transmit / RS-485 (-) |  |
| 2 | | |
| 3 | RS-232 Receive / RS-485 (+) | |
| 4 | Supply voltage 12-30 VDC | |
| 5 | Supply voltage – (return) | |
| 6 | Analog voltage signal + | |
| 7 | Analog voltage signal – (return)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

(4)Optional solid-state relay
(5) Optional secondary analog voltage output

| PIN | DESCRIPTION | 9 Pin D-sub RS-232 / RS-485 |
|---|---|---|
| 1 | Relay 1 NO (normally open contact)(1) |  |
| 2 | Relay 1 NC (normally closed contact)(1) | |
| 3 | Supply voltage 12-30 VDC | |
| 4 | Supply voltage – (return) | |
| 5 | Analog voltage signal + | |
| 6 | Relay 1 Common (6) | |
| 7 | | |
| 8 | RS-232 Transmit / RS-485 (-) | |
| 9 | Analog voltage signal – (return) | |
| | RS-232 Receive / RS-485 (+) | |

(6) Optional solid-state relay

| PIN | DESCRIPTION | 6 Pin Hirschmann connector |
|---|---|---|
| 1 | Identification resistor (3K) |  |
| 2 | Analog voltage signal + | |
| 3 | Analog voltage signal – (return) | |
| 4 | Supply voltage 12-30 VDC | |
| 5 | Supply voltage – (return) | |
| 6 | Chassis | |

| PIN | DESCRIPTION | 8 Pin RJ45 / 8P8C |
|---|---|---|
| 1 | Supply voltage 12-30 VDC |  |
| 2 | Supply voltage – (return) | |
| 3 | Analog pressure voltage signal + | |
| 4 | Identification resistor | |
| 5 | Analog pressure voltage signal – (return) | |
| 6 | Relay 2 NO (normally open contact)(7) | |
| 7 | Relay 1 NO (normally open contact)(7) | |
| 8 | Relay COMMON(7) | |

(7) Optional relay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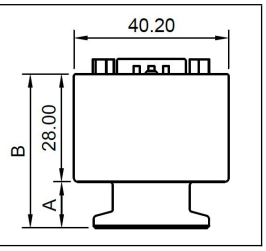
## Dimensions (in mm)

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




## Ordering Information:

| HVP-5 | 1 | 0 | 1 | 0 | 1 | 2 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|

**Vacuum flange / sensor protection**

| | | |
|---|---|---|
| DN16KF | 1 | 0 |
| DN25KF | 2 | 0 |
| NPT 1/8" | 3 | 0 |
| VCR4 female | 4 | 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 rotateble, 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 rotateble Parylene protected sensors | 6 | 6 |
| DN16KF Extended, Parylene protected sensors | 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) | 1 |
| RS-485 / S4-Connect™ (9 and 15 pin D-sub) | 2 |
| S4-Connect™ (RJ45/FCC68 and Hirschmann) | 3 |

**Analog Output**

| | | |
|---|---|---|
| 0.5 - 9.5 (1 V/dec) | 0 | 1 |
| 1.0-9 VDC 1 VDC/Dec (MKS 901P/925/910) | 0 | 2 |
| 0.375 to 5.659 VDC (MKS GP275) | 0 | 3 |
| 0.5V DC (MKS 523) | 0 | 4 |
| 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 |
| 2-10VDC (Edwards APG-L) | 0 | 9 |
| 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 |
| 2.0-8.6 VDC (MPG400/Pfeiffer PKR251, PKR261) | 1 | 5 |
| 0.61-10.2 VDC (Leybold TTR101N) | 3 | 5 |
| 1.8-8.6 VDC (Pfeiffer PKR251) | 3 | 6 |
| 0-10VDC 0.1 mbar FS Capacitance manometer | 5 | 0 |
| 0-10VDC 1 mbar FS Capacitance manometer | 5 | 1 |
| 0-10VDC 2 mbar FS Capacitance manometer | 5 | 2 |
| 0-10VDC 5 mbar FS Capacitance manometer | 5 | 3 |
| 0-10VDC 10 mbar FS Capacitance manometer | 5 | 4 |
| 0-10VDC 20 mbar FS Capacitance manometer | 5 | 5 |
| 0-10VDC 50 mbar FS Capacitance manometer | 5 | 6 |
| 0-10VDC 100 mbar FS Capacitance manometer | 5 | 7 |
| 0-10VDC 200 mbar FS Capacitance manometer | 5 | 8 |
| 0-10VDC 500 mbar FS Capacitance manometer | 6 | 9 |
| 0-10VDC 1100 mbar Capacitance manometer | 6 | 0 |
| 0-10VDC 1000 mbar Capacitance manometer | 6 | 1 |

**Unit**

| | |
|---|---|
| 1 | torr |
| 2 | mbar |
| 3 | Pascal |

**Setpoints**

| | |
|---|---|
| 0 | None |
| 1 | 1x Solid-State Relay (Only 9 pin D-sub) |
| 2 | 2x Solid State Relays (Only RJ45/FCC68) |
| 3 | 3x Solid State Relays (Only 15 pin HD D-sub) |

**Connection**

| | |
|---|---|
| 1 | 9 Pin D-sub male |
| 2 | 15 pin HD D-sub male |
| 3 | 15 pin HD D-Sub male / dual analog out |
| 4 | 6 pin Hirschmann, ID res 3K |
| 5 | 6 pin Hirschmann, ID res 5.1K |
| 6 | 6 pin Hirschmann, ID res 9.1K/11.1K |
| 7 | 8 pin RJ45 / FCC68, ID Res 27K |
| 8 | 8 pin RJ45 / FCC68, ID Res 36K |
| 9 | 8 pin RJ45 / FCC68, ID Res 43K |
| A | 8 pin RJ45 / FCC68, ID Res 71K5 |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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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