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HPS® Products

Vacuum Technology

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Series 910

DUALTRANS™ MICROPIRANI/ABSOLUTE PIEZO TRANSDUCER

Benefits & Features

- Integrated electronics and two sensors in one unit for space savings
- Single continuous reading of 10^{-5} to 1,500 Torr
- Low cost gauging alternative
- Reduced process cycle time due to sensor's fast, accurate and repeatable pressure measurements
- Ease of operation with both analog output and digital communication
- Mountable in any position for ease of installation
- Clean design and construction compatible with semiconductor loadlock application
- Solid state sensor is resistant to damage from air inrush or vibration
- Accurate atmospheric reading from absolute Piezo, independent of gas type
- Three setpoints with fast response time for reliable process control
- CE marked, compliant with EMC Directive 89/336/EEC

Construction

The HPS® Series 910 is a dual sensor transducer, combining the pressure measurement technology of Pirani and Piezo with an integrated electronic control circuit. The transducer measurement range is 10^{-5} to 1,500 Torr.

The Piezo is a direct-reading absolute pressure sensor, allowing the measurement to be gas independent. The sensor includes a unique temperature compensation, allowing for high accuracy over a wide measurement range. The Piezo will measure from 10^{-1} to 1,500 Torr.The MicroPirani performs an autozero function to the Piezo when pressure is below 10^{-2} Torr.

Unlike traditional Pirani gauges, the element in the MicroPirani™ is made of a one millimeter square silicon chip, allowing the measurements to be made in a very small volume. A traditional Pirani sensor has a measuring range from 10^{-3} to about 100 Torr, rapidly losing sensitivity above 10 Torr. Because the size of the sensing portion of the MicroPirani™ is so small, it has a range down to 10^{-5} Torr. The design minimizes the effects of convection, so operation is possible in any position without compromising accuracy, for simplified installation.The transducer includes a push button zero control than can be used when pressure is below 10^{-5} Torr.

Communications

The digital communication allows for all adjustments and monitoring to be delivered real-time, via a host computer. The 910 includes RS485 or RS232 communication as a standard feature.

The Series 910 provides a 1 to 9 volt DC analog output signal at the male 15 pin high density D-sub connector. The transducer output is smoothed between the two sensors and reads from both sensors in the 5 to 15 Torr range.

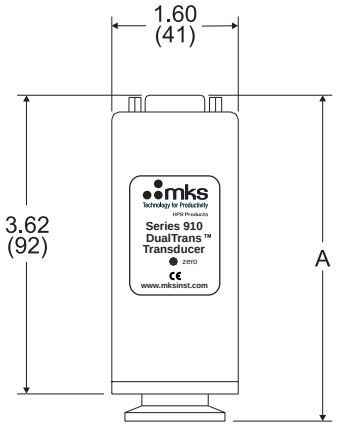
For process control, the 910 has three independent relay setpoints. Features of the setpoints can be set, adjusted and monitored through the digital port.

Leak Detection

Like all thermal conductivity sensors, the MicroPirani™ is gas-type sensitive. The Piezo measures independent of gas type. The 910 provides a digital leak detection output that measures differential reading between the Piezo and MicroPirani™. This makes it a simple solution for locating medium to fine leaks in vacuum systems.

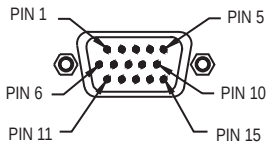
Specifications and Ordering Information

Dimensions



Flange	A
NW 16 KF	3.92 (100)
8 (1/2") VCR®-F [1]	5.14 (131)
4 (1/4") VCR®-F [1]	5.37 (136)
1/8" NPT-F	5.20 (132)

Pinout



1 - RS485 (-) / RS232 transmit	9 - Relay #1 NC
2 - RS485 (+) / RS232 receive	10 - Relay #2 NC
3 - Power (+)	11 - Relay #2 Common
4 - Power (-)	12 - Relay #2 NO
5 - Analog Output (+)	13 - Relay #3 NC
6 - Analog Output (-)	14 - Relay #3 Common
7 - Relay #1 NO	15 - Relay #3 NO
8 - Relay #1 Common	

Specifications

Measuring Range	1.0 X 10^{-5} to 1,500 Torr *
Set Point Range	1.0 X 10^{-4} to 1,500 Torr
Calibration Gas	Air, Argon, Helium, Nitrogen, H_2, H_2O. Gas independent above 10 Torr
Operating Temperature Range	0° to 40°C (32° to 104°F)
Maximum Bakeout Temperature	85°C (185°F), non-operating
Digital Communications	RS485 or RS232
Controls	Zero adjust, span adjust, pressure units, baud rate, address, factory default, setpoint functions: value, hysteresis, direction, enable
Status	Pressure reading and units, setpoint, operating time, transducer temperature, user tag, model, device type, serial number, firmware and hardware versions
Analog Output	1 to 9.2 VDC, 1 K maximum output impedance
Relays	3 relays SPDT
Relay Contact Rating	1 A @ 30VAC/DC, resistive
Relay Response	Piezo: 25 msec maximum MicroPirani: 300 msec maximum
Power Requirements	10 to 30 VDC, 150 ma, < 1.5 W max
Accuracy (typical)	5 X 10^{-4} to 10^{-3} Torr ±10% of reading 10^{-3} to 50 Torr ±5% of reading 50 to 1,000 Torr ±1% of reading
Repeatability (typical)	5 X 10^{-4} to 10^{-3} Torr ±8% of reading 10^{-3} to 50 Torr ± 2% of reading 50 to 1,000 Torr ± 0.5% of reading
Overpressure Limit	1500 Torr
Installation Orientation	Any
Internal Volume	0.04 $in.^3$ (0.65 cm^3) maximum
Materials Exposed to Vacuum	Silicon, SiO_2, SiN_4, gold, epoxy resin, stainless steel, Viton®, Ultem® 1000, aluminum
Electronic Casing	304 stainless steel
Weight (with KF 16 Flange)	.46 lbs (209 g)
CE Certification	EMC Directive 89/336/EEC

* To achieve both accurate and repeatable measurement below 5 x 10^{-4} Torr, it is necessary to perform zero calibration of the transducer.

Ordering Information:

Part Number	Description	Price
910-11	Series 910 Transducer, NW 16 KF, RS232	
910-12	Series 910 Transducer, NW 16 KF, RS485	
910-21	Series 910 Transducer, NW 25 KF, RS232	
910-22	Series 910 Transducer, NW 25 KF, RS485	
910-41	Series 910 Transducer, 4 VCR®-F [1], RS232	
910-42	Series 910 Transducer, 4 VCR®-F [1], RS485	
910-51	Series 910 Transducer, 8 VCR®-F [1], RS232	
910-52	Series 910 Transducer, 8 VCR®-F [1], RS485	
910-81	Series 910 Transducer, Long NW 16 KF, RS232	
910-82	Series 910 Transducer, Long NW 16 KF, RS485	

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[1] VCR®-compatible parts may be used. Specifications and prices are subject to change without notice. HPS® is a registered trademark and MicroPirani™ is a trademark of MKS Instruments, Inc. VCR® is a registered trademark of Swagelok® Company. Viton® is a registered trademark of EI DuPont de Nemours & Co., Inc. Ultem® is a registered trademark of GE Polymers. Kovar is a trademark of Carpenter Technologies.

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