Pressure & Vacuum Measurement Solutions

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Series 910

DUALTRANS™ MICROPIRANI/ABSOLUTE PIEZO TRANSDUCER

Designed specifically for wide-range pressure measurement applications, the Series 910 Transducer combines Piezo and MicroPirani™ sensor technologies. The combined output provides significantly higher accuracy, stability, repeatability and a faster response time than conventional thermal conductivity gauges.

Features & Benefits

- Two sensors in a single transducer for space savings and wide measurement range
- Ultra compact design
- Absolute pressure measurement from 1500 to 10^{-5} Torr
- Gas independent absolute pressure measurement from 11 to 1500 Torr
- Fast, accurate and repeatable pressure measurements reduces process cycle time
- Mountable in any orientation for ease of installation; no loss of measurement accuracy
- Optional integrated touch-screen display available for local pressure indication etc.
- MicroPirani and Piezo solid state sensor is resistant to damage from air inrush or vibration
- Three set points with fast response time for reliable process control (optional)
- Ease of operation via analog output and digital communication
- Setup, diagnostic and operation software available
- Alternate analog output and electrical connectors available to match other vendors' gauges and facilitate an easy upgrade

Applications

The 910 Transducer allows the user to combine multiple gauges into a single, compact package. This not only saves cost, but can simplify the operation and design of their system. The wide range measurement capability and available on-board relays allow for a high level of functionality in an extremely small footprint. The 910 can be used on any vacuum chamber requiring absolute pressure measurement and switching capabilities.

Description

The 910 combines two pressure measurement technologies to provide superior performance and functionality. The 910 provides gas independent absolute pressure measurement from 11 to 1500 Torr with increased accuracy over thermal conductivity sensors.

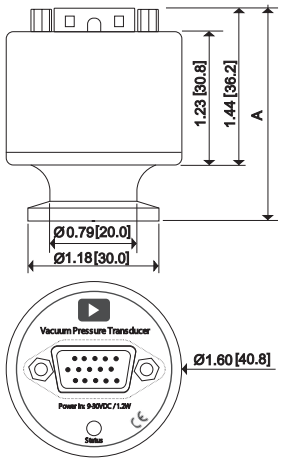
Unlike traditional Pirani gauges, the sensor element in the MicroPirani is made of a one millimeter square silicon chip, allowing the measurements to be made in a very small volume. As a result of the MicroPirani technology, the 910 can read pressures down to 10^{-5} Torr, two decades below a standard Pirani sensor. The sensor design minimizes the effects of convection, subsequently the 910 can be mounted in any orientation without compromising accuracy.

The Piezo is an absolute pressure sensor, providing a direct pressure reading, allowing the measurement to be gas independent. The Piezo sensor measures from less than 1 Torr to 1500 Torr.

The 910 has RS232 or RS485 digital communication interface for setup of transducer parameters and to provide real time pressure measurement.

The 910 also has an analog pressure output of 1VDC/ decade that can be interfaced to external analog equipment for pressure readout or control. Other analog outputs and curves can be selected via the digital user interface.

The 910 has up to three mechanical relays which can be used for process control, for example interlocking isolation valves and vacuum pumps. Each set point can be assigned either to the piezo measurement or the combined absolute MicroPirani/Piezo measurement. The 910 compact design significantly reduces the amount of space occupied by a vacuum gauge. This is particularly appealing to system designers and allows for a more compact vacuum system.

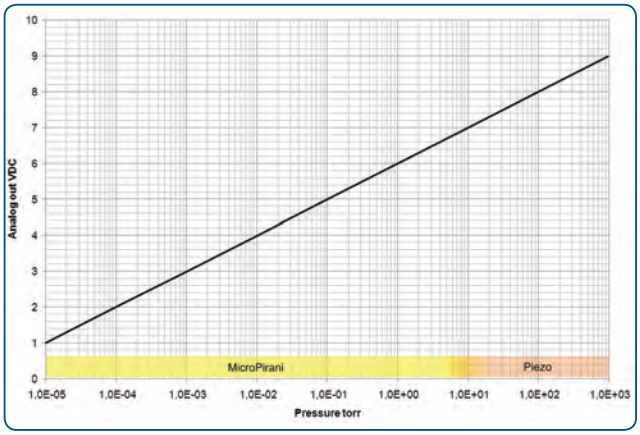


Flange	A
NW 16 KF	1.93 (49.1)
NW 25 KF	2.00 (50.9)
1/8" NPT-M	3.50 (89.0)
8 (1/2") VCR®-F [1]	3.24 (82.4)
4 (1/4") VCR®-F [1]	3.20 (81.4)
CF 1.33"	2.30 (58.5)
NW 16 KF ext	2.58 (65.6)

(1) VCR Fittings

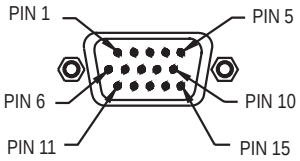
Dimensional Drawing —

Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).



Standard Analog Output —

Pressure vs. Voltage



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

PinOuts —

Three (3) set point relays and dual Aout

Specifications

Sensor	
Type 1	MicroPirani (MEMS Thermal Conductivity)
Type 2	Piezo absolute (MEMS diaphragm)
Measuring Range	
Absolute	1.0 x 10^{-5} Torr to 1500 Torr
Set Point Range	
Absolute	5.0 x 10^{-4} Torr to 1500 Torr
Calibration Gas	Air, Argon, Helium, Nitrogen, H_2, H_2O vapor, CO_2, Xenon, Neon Gas independent above 11 Torr
Operating Temperature Range	0° to 40°C (32° to 104°F)
Maximum Bakeout Temperature	85°C (185°F), non-operating
Digital Communication	RS485/RS232 (4800 to 230400 Baud)
Controls	Zero adjust, span adjust, analog output, pressure units, baud rate, address, factory default, set point functions: value, hysteresis, direction, enable, transducer status, switch, LED test
Status	Pressure reading, units, set point, operating time, transducer temperature, user tag, model, device type, serial number, firmware and hardware versions, part number, manufacturer
Analog Output (Absolute Pressure)	1 to 9.2 VDC, 1 VDC/decade, 100Ω maximum output impedance
Analog Output Resolution	16 bit
Relays (Optional)	910 - 3 relays SPDT
Relay Contact Rating	1 A @ 30VAC/DC, resistive
Relay Response	100 msec maximum
Power Requirements	9 to 30 VDC, < 1.2 watts max
Accuracy[(2)]	5 x 10^{-4} to 1 x 10^{-3} Torr ±10% of reading
	1 x 10^{-3} to 11 Torr ±5% of reading
	11 to 1000 Torr ±0.75% of reading
Repeatability[(2)]	5 x 10^{-4} to 10^{-3} Torr ±8% of reading
	10^{-3} Torr to 11 Torr ±2% of reading
	11 to 1000 Torr ±0.2% of reading
Overpressure Limit	2250 Torr (Absolute)
Installation Orientation	Any
Internal Volume (KF16)	2.8 cm^3
Materials Exposed to Vacuum	Silicon, SiO_2, Si_3N_4, gold, low outgassing epoxy resin, 304 stainless steel, Viton®
Electronic Casing and Flange	304 stainless steel
Weight (with KF 16 Flange)	170 g
Compliance	CE

Note:

(2) *Accuracy and repeatability are typical values measured with Nitrogen gas at ambient temperature after zero adjustment.*

Ordering Information

Transducer Model	Code
910 DualTrans	910-
Flange	
KF16	1
KF25	2
1/8" NPT-M	3
VCR4	4
VCR8	5
CF1.33	6
KF16 extended	8
Interface	
RS232/Analog	1
RS485/Analog	2
Analog Out	
Standard MKS	0
Connector Relays	
SUBD 15pinHD male/no relay	2
SUBD 15pinHD male/3 relays	3
SUBD 15pinHD male/3 relays/Dual Aout	5
Enclosure	
Standard/Viton sealing	0
IP54/Viton sealing	2
Standard/Viton sealing/display	4
Standard/Viton sealing/display SI	6

Ordering Code Example: 910-11030 = KF16, RS232, standard analog output, Sub D 15 pin HD male, 3 relays, Viton.

Analog Output
The 910 has a standard 15 pin HD SUBD connector and an analog output voltage pressure signal of 1VDC/decade. It can also emulate analog voltage outputs from a variety of other vacuum transducers. The emulation feature can be used to upgrade and replace other vendors' gauges in OEM applications without changing system software. Contact MKS technical support for details.

PDR900 Power Supply & Display

The PDR900 power supply and readout unit is a stand alone, single channel controller for use with the Series 900 digital vacuum transducers. It can be used as a stand-alone power supply readout unit or as a tool for configuration, calibration and diagnostics of system integrated transducers in OEM applications.

910 with Display

The optional integrated touch-screen display is user configurable; the user can change pressure units, orientation and has access to set point parameters as well as gas type. The display also indicates the status of the available set point relays. Displayed pressure reading from individual sensors or combined reading can be seen from >5 meters away on the high contrast display.

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