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Series 925

MicroPirani™ Transducer

The Series 925 MicroPirani™ transducer is a thermal conductivity gauge based on a unique, MEMS-based (Micro-Electro-Mechanical Systems) sensor. The 925 is used for vacuum pressure measurement and offers analog voltage output, digital interface and set point relays for process controlling.

The 925 Transducer offers a wide measurement range from $1x10^{-5}$ Torr to atmosphere that is based on measurement of thermal conductivity. The MicroPirani sensor consists of a silicon chip with a heated resistive element forming one surface of a cavity. A cover on top of the chip forms the other surface of the cavity. Due to the geometry of the sensor, convection cannot take place within the cavity and consequently, the sensor is insensitive to the mounting position. Gas molecules are passed by diffusion only to the heated element where the heat loss of the gas is measured.



Product Features

- Increased pressure measurement range from 10^{-5} Torr to atmosphere, two decades beyond a standard Pirani
- Three set point relays for process control (option)
- Ultra compact design
- High accuracy for improved process control
- Ease of operation via analog output and digital communication (RS232, RS485, and EtherCAT)
- MicroPirani solid state sensor is resistant to damage from air inrush or vibration
- Mountable in any orientation for ease of installation; no loss of measurement accuracy
- Optional integrated touch-screen display available for local pressure indication, etc.
- Alternate analog output and electrical connectors available to match other vendors' gauges and facilitate an easy upgrade

Applications

The 925 can be used in many different vacuum applications within the semiconductor, analytical, and coating industries:

- General vacuum pressure measurement
- Foreline and roughing pressure measurement
- Gas backfilling measurement and control
- Mass spectrometer control
- Activation of UHV gauges
- System process control
- Control system pressure

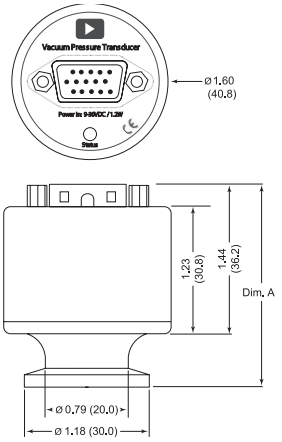
Like all thermal conductivity sensors, the 925 is sensitive to gas type. To compensate for gas dependency, the MicroPirani has a number of common gas calibrations that can be selected via the digital interface. This makes it a simple solution for locating medium to fine leaks in vacuum systems.

The 925 has RS232, RS485, and EtherCAT digital communication interface for setup of transducer parameters and to provide real time pressure measurement.

The 925 also has a analog pressure output of 1 VDC/decade that can be interfaced to external analog equipment for pressure readout or controlling. Other analog outputs and curves can be selected via the digital user interface.

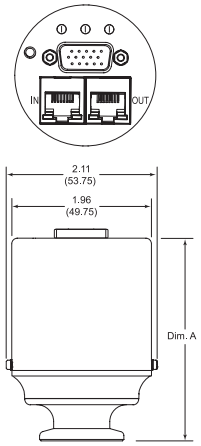
The 925 has up to three mechanical relays which can be used for process control, examples are interlocking valves or pumps. The 925 compact design significantly reduces the amount of space occupied by a vacuum gauge. This is particularly appealling to system designers and allows for a more compact vacuum system.

RS232/RS485/Analog



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

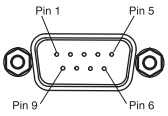
EtherCAT

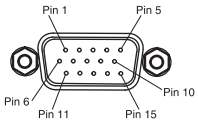


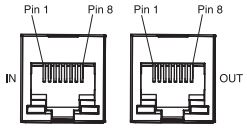
Flange	A
NW 16 KF	2.84 (73.39)
NW 16 KF Ext	3.52 (89.41)
NW 25 KF	3.23 (82.04)
1/8'' NPT-M	4.47 (113.54)
4 VCR®	4.43 (112.52)
8 VCR®	4.47 (113.54)

Dimensional Drawing

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







Pin	RS232/485 9 pin Sub-D	RS232/485 15 pin Sub-D	EtherCAT 15 pin Sub-D	RJ45 EtherCAT IN/OUT
1	Relay Normally Open	RS485 (-)/RS232 transmit	NC	TX+
2	Relay Normally Closed	RS485 (+)/RS232 receive	NC	TX-
3	Power (+) (9-30 VDC)	Power (+)	Input Power (+) 9 to 24 VDC	RX+
4	Power Return (-)	Power (-)	Power Return -	NC
5	Analog Output (+)	Analog Output (+) abs.	Signal Output +	NC
6	Relay Common	Analog Output (-)	Signal Common	RX-
7	RS485 (-)/RS232 Transmit	Relay #1 NO	NC	NC
8	Analog Output	Relay #1 Common	NC	NC
9	RS485 (+)/RS232 Receive	Relay #1 NC	NC	
10		Relay #2 NC	NC	
11		Relay #2 Common	NC	
12		Relay #2 NO	NC	
13		Relay #3 NC (or analog output diff)	NC	
14		Relay #3 Common	NC	
15		Relay #3 NO	Chassis Ground	

PinOuts

Three (3) set point relays and dual Aout, 15 pin D Subminiature and RJ45 EtherCAT IN/OUT Connectors

Specifications

Sensor Type	MicroPirani (MEMS Thermal Conductivity)
Measuring Range	1.0 x 10^{-5} Torr to Atmosphere
Set Point Range	5.0 x 10^{-4} Torr to 500 Torr
Calibration Gas	Air, Argon, Helium, Nitrogen, Hydrogen, H_2O vapor, CO_2, Xenon, Neon
Operating Temperature Range	0° to 40°C (32° to 104°F)
Maximum Bakeout Temperature	80°C (176°F), non-operating
Communication	RS485 / RS232 (4800 to 230400 Baud)
Controls	Zero adjust, atmosphere adjust, pressure units, baud rate, address, factory default, gas type; set point functions: value, hysteresis, direction, enable analog output transducer status, switch, LED test
Status	Pressure reading and units, set point, operating time, transducer temperature, user tag, model, device type, serial number, firmware and hardware versions part number, manufacturer
Analog Output	1 to 9 VDC, 100Ω maximum output impedance, 1 volt/decade
Analog Output Resolution	16 bit
Relays (Optional)	925 - 3 relays SPDT
Relay Contact Rating	1 A @ 30VAC/DC, resistive
Relay Response	<100 msec maximum
Power Requirements	9 to 30 VDC, < 1.5 watts max
Accuracy (Typical)[1]	5 x 10^{-4} to 10^{-3} Torr ±10% of Reading 10^{-3} to 100 Torr ±5% of Reading 100 Torr to atm ±25% of Reading
Repeatability (Typical)[1]	10^{-3} to 100 Torr ±2% of Reading
Overpressure Limit	3000 Torr absolute
Installation Orientation	Any
Internal Volume (KF16)	2.80 cm^3
Materials Exposed to Vacuum	304 stainless steel, Silicon, SiO_2, Si_3N_4, Gold, Viton®, Low out gassing epoxy resin
Electronic Casing and Flange	304 stainless steel
Weight (KF 16)	170 g
Compliance	CE, ETG.5003.2080 Vacuum Pressure Gauge

[1] Accuracy and repeatability are typical values measured with Nitrogen gas at ambient temperature after zero adjustment.

Ordering Information

Ordering Code Example: 925-11030	Code	Configuration
925 MicroPirani	925-	925
Flange		
KF16	1	1
KF25	2	
1/8'' NPT-M	3	
VCR4	4	
VCR8	5	
CF1.33	6	
KF16 Extended	8	
Interface		
RS232/Analog	1	1
RS485/Analog	2	
EtherCAT/Analog	7	
Analog Out		
Standard MKS	0	0
Connector Relays		
D-Sub 9 pin male/One relay set point	1 (not available wth EtherCAT)	3
D-Sub 15 pin HD male/No Relay	2	
D-Sub 15 pin HD male/Three Relays	3 (not available wth EtherCAT)	
D-Sub 15 pin HD male/Three Relays/Dual Aout	5 (not available wth EtherCAT)	
Enclosure		
Standard/Viton Sealing	0	0
Standard/Viton Sealing/Display	4 (not available wth EtherCAT)	



PDR900 Power Supply and 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.



925 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 reading can be seen from >5 meters away on the high contrast display.

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