



## 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.

#### Features & Benefits

- 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 or RS485)
- 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
- CE marked, compliant with EMC Directive 2004/108/EEC

#### 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



## Description

The 925 Transducer offers a wide measurement range from  $1 \times 10^{-5}$  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.

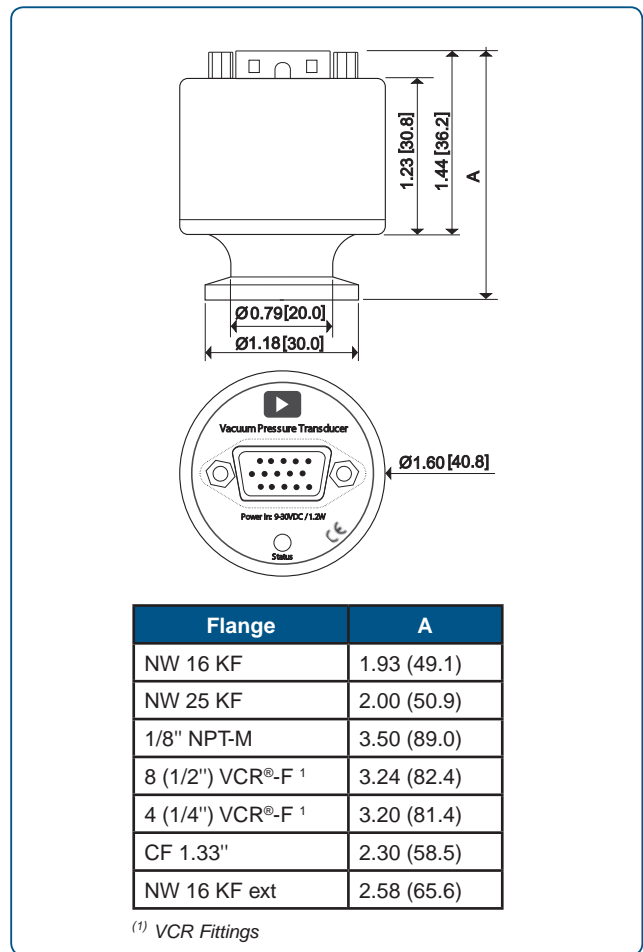
Like all thermal conductivity sensors, the 925 is sensitive to gas type. To compensate for gas dependency, the MicroPirani has a number of common gas calibrations that can be selected via the digital interface. This makes it a simple solution for locating medium to fine leaks in vacuum systems.

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

The 925 also has an analog pressure output of 1VDC/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.

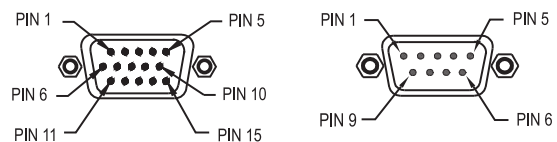
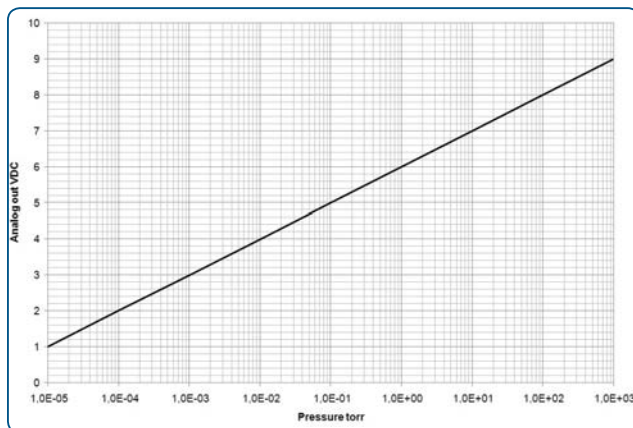
The 925 has up to three mechanical relays which can be used for process control, examples are interlocking valves or pumps.

The 925 compact design significantly reduces the amount of space occupied by a vacuum gauge. This is particularly appealing to system designers and allows for a more compact vacuum system.



### Dimensional Drawing — 925 (KF16)

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



Pin	Description	Pin	Description
1	RS485 - / RS232 Transmit	1	Relay Normally Open
2	RS485 + / RS232 Receive	2	Relay Normally Closed
3	Power + (9-30 VDC)	3	Power + (9-30 VDC)
4	Power Return -	4	Power Return -
5	Analog Output +	5	Analog Output +
6	Analog Output -	6	Relay Common
7	Relay 1 Normally Open	7	RS485 - / RS232 Transmit
8	Relay 1 Common	8	Analog Output
9	Relay 1 Normally Closed	9	RS485 + / RS232 Receive
10	Relay 2 Normally Closed		
11	Relay 2 Common		
12	Relay 2 Normally Open		
13	Relay 3 Normally Closed or		
	Analog Output 2 +		
14	Relay 3 Common		
15	Relay 3 Normally Open		



# Specifications

<b>Sensor Type</b>	MicroPirani (MEMS Thermal Conductivity)
<b>Measuring Range</b>	1.0 x 10 <sup>-4</sup> Torr to Atmosphere
<b>Set Point Range</b>	5.0 x 10 <sup>-4</sup> Torr to 500 Torr
<b>Calibration Gas</b>	Air, Argon, Helium, Nitrogen, Hydrogen, H <sub>2</sub> O vapor, CO <sub>2</sub> , Xenon, Neon
<b>Operating Temperature Range</b>	0° to 40°C (32° to 104°F)
<b>Maximum Bakeout Temperature</b>	85°C (185°F), non-operating
<b>Communication</b>	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
<b>Analog Output</b>	1 to 9 VDC, 100Ω maximum output impedance, 1 volt/decade
<b>Analog Output Resolution</b>	16 bit
<b>Relays (Optional)</b>	925 - 3 relays SPDT
Relay Contact Rating	1 A @ 30VAC/DC, resistive
Relay Response	<100 msec maximum
<b>Power Requirements</b>	9 to 30 VDC, < 1.5 watts max
<b>Accuracy (Typical)<sup>2</sup></b>	5 x 10 <sup>-4</sup> to 10 <sup>-3</sup> Torr ±10% of reading 10 <sup>-3</sup> to 100 Torr ±5% of reading 100 Torr to atm ±25% of reading
<b>Repeatability (Typical)<sup>2</sup></b>	10 <sup>-3</sup> to 100 Torr ± 2% of reading
<b>Overpressure Limit</b>	3000 Torr absolute
<b>Installation Orientation</b>	Any
<b>Internal Volume (KF16)</b>	2.80 cm <sup>3</sup>
<b>Materials Exposed to Vacuum</b>	304 stainless steel, Silicon, SiO <sub>2</sub> , Si <sub>3</sub> N <sub>4</sub> , Gold, Viton®, Low out gassing epoxy resin
<b>Electronic Casing and Flange</b>	304 stainless steel
<b>Weight (KF 16)</b>	170 g
<b>CE Certification</b>	EMC Directive 2004/108/EEC

<sup>2</sup> Accuracy and repeatability are typical values measured with Nitrogen gas at ambient temperature after zero adjustment.



# Ordering Information

	Code
<b>Transducer Model</b>	
925 MicroPirani™	925-
<b>Flange</b>	
KF16	1
KF25	2
1/8" NPT-M	3
VCR4	4
VCR8	5
CF1.33	6
KF16 extended	8
<b>Interface</b>	
RS232 / Analog	1
RS485 / Analog	2
<b>Analog Out</b>	
Standard MKS	0
MKS Moducell (limited measuring range)	8
<b>Connector Relays</b>	
SUBD 9pin male / 1 relay set point (925C compatible)	1
SUBD 15pinHD male / no relay	2
SUBD 15pinHD male / 3 relays	3
SUBD 15pinHD male / 3 relays / Dual Aout	5
<b>Enclosure Sealing</b>	
Standard / Viton sealing	0
Standard / UHV sealing	1
Standard / Viton sealing/display	4

**Ordering Code Example:** 925-11030 = KF16, RS232, standard MKS analog output, sub D 15 pin HD male connector, 3 set point relays, Viton seals

### Analog Output

The 925 has a standard analog output voltage pressure signal of 1VDC/decade, but 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 customer service for details.

The standard 925 uses a 15 pin HD sub D connector, but it is also available with connectors offered by other vendors.

## 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.

## 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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