Vacuum Technology

WWW.MKSINST.COM

mks
Technology for Productivity
HPS® Products

Series 925 & 925C

MICROPIRANI™ TRANSDUCERS

The HPS® Series 925 and 925 Compact (925C) MicroPirani™ transducers are thermal conductivity gauges based on a unique, MEMS-based sensor. The 925 and 925C are commonly used for vacuum pressure measurement applications in semiconductor and analytical environments, as well as general vacuum applications.

Features and Benefits

- Increased pressure measurement range from 10^{-5} Torr to atmosphere, two decades beyond a standard Pirani
- Set point relays have a fast response time for reliable process control
  - 925C has one set point relay
  - 925 has three set point relays
- Compact dimensional design
- High accuracy and reduced process cycle time
- Ease of operation via analog output and digital communication
- 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
- CE marked, compliant with EMC Directive 89/336/EEC

Description

The Series 925 and 925C sensors offer a wide measurement range from 1 x 10^{-5} Torr to atmosphere and are based on measurement of thermal conductivity in a small cavity where gas enters by diffusion only, instead of flow.

While traditional Pirani gauges often have problems with temperature drift, low accuracy, calibration and sensitivity to mounting position, these issues are significantly reduced with the Series 925 and 925C MicroPirani™ sensors.

The sensor element in the 925/925C is made of a one millimeter square silicon chip, allowing the measurements to be made in a very small volume. Due to the small size and repeatable geometry of the sensing portion of the MicroPirani™, it has a range from ATM down to 10^{-5} Torr. The design minimizes the effects of convection, so operation is possible in any position without compromising accuracy, simplifying installation.

The sensor's solid state design is highly resistant to vibrations and mechanical force, resulting in less system downtime due to broken filaments.

Description (cont.)

Digital communication allows for all adjustments and monitoring to be delivered real-time, via a host computer. The 925/925C includes RS485 or RS232 communication as a standard feature.

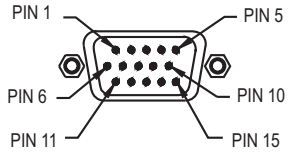
The 925 has a 15 pin connector, while the 925C has a 9 pin connector. The 925 and 925C are also equipped with 1-9 VDC analog output. For process control, the 925 has three setpoints, and the 925C has one setpoint relay, which can be set, adjusted and monitored through the digital port.

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

Series 900 Ethernet Gateway

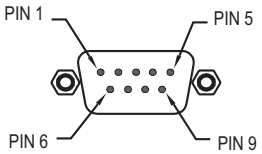
The 925 and 925C are compatible with the Series 900 Ethernet Gateway. The Ethernet Gateway is designed exclusively for operation with the entire range of HPS Series 900 vacuum transducers. Converting the digital output to Ethernet, the Gateway enables any of the Series 900 transducers to operate via Ethernet communications. By connecting multiple RS485 transducers to one Gateway, the Ethernet Gateway offers a cost effective solution to system integrators looking to use multiple vacuum transducers on a single system.

Pinout 925



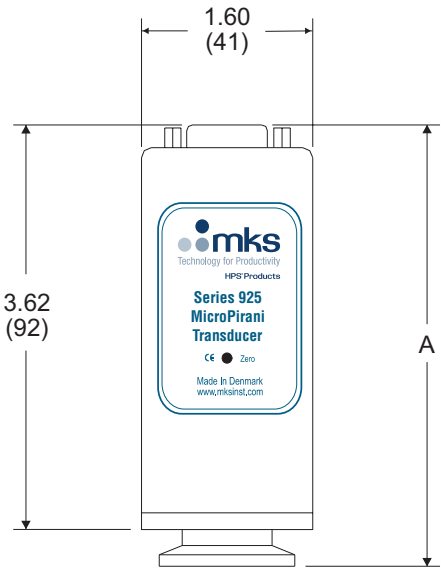
1 - RS485 (-) / RS232 transmit
2 - RS485 (+) / RS232 receive
3 - Power (+)
4 - Power (-)
5 - Analog Output (+)
6 - Analog Output (-)
7 - Relay #1 NO
8 - Relay #1 Common
9 - Relay #1 NC
10 - Relay #2 NC
11 - Relay #2 Common
12 - Relay #2 NO
13 - Relay #3 NC
14 - Relay #3 Common
15 - Relay #3 NO

Pinout 925C

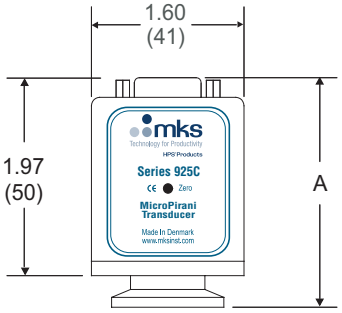


1 - Relay NO
2 - Relay NC
3 - Power (+)
4 - Power (-)
5 - Analog Output (+)
6 - Relay Common
7 - RS485(-) / RS232 transmit
8 - Analog Output (-)
9 - RS485(+) / RS232 receive

Dimensions: 925



Dimensions: 925C



Flange	925 A	925C A
NW 16 KF	3.92 (100)	2.32 (59)
NW 25 KF	4.27 (108)	2.67 (68)
8 (½") VCR®-F [1]	5.14 (131)	3.40 (86)
4 (¼") VCR®-F [1]	5.37 (136)	3.06 (78)
NW 16 KF ext	4.89 (124)	3.09 (78)

Dimensions: inch (mm)

Specifications

Sensor Type	MicroPirani
Measuring Range	1.0 X 10^{-5} Torr to Atmosphere
Set Point Range	1.0 X 10^{-4} Torr to Atmosphere
Calibration Gas	Air, argon, helium, nitrogen, H_2, H_2O vapor
Operating Temperature Range	0° to 40°C (32° to 104°F)
Maximum Bakeout Temperature	85°C (185°F), non-operating
Communication	RS485 / RS232
Controls	Zero adjust, atmosphere adjust, pressure units, baud rate, address, factory default, gas type; 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 VDC, 1 K maximum output impedance, 1 volt/decade
Relays **Relay Contact Rating** **Relay Response**	925 - 3 relays SPDT 925C - 1 relay SPDT 1 A @ 30VAC/DC, resistive 50 msec maximum
Power Requirements	10 to 30 VDC, < 1.5 watts max
Accuracy	10^{-4} to 10^{-3} Torr ±10% of reading 10^{-3} to 100 Torr ±5% of reading 100 to atm ±25% of reading
Repeatability	10^{-4} to 10^{-3} Torr ±8% of reading 10^{-3} to 100 Torr ± 2% of reading 100 to atm ±10% of reading
Overpressure Limit	1500 Torr
Installation Orientation	Any
Internal Volume	0.04 $in.^3$ (.65 cm^3) maximum
Materials Exposed to Vacuum	Silicon, SiO_2, SiN_4, gold, epoxy resin, 304 stainless steel, Kovar™, Viton®
Electronic Casing	304 stainless steel
Weight (KF flange)	925 - .46 lbs (209 g) 925C - .36 lbs (165 g)
CE Certification	EMC Directive 89/336/EEC

Note: Accuracy and repeatability are typical values measured with Nitrogen gas

Ordering Information

Series 925

Part Number	Description	Price
925-11	Series 925 Transducer, NW 16 KF, RS232, 3 set point relays	
925-12	Series 925 Transducer, NW 16 KF, RS485, 3 set point relays	
925-21	Series 925 Transducer, NW 25 KF, RS232, 3 set point relays	
925-22	Series 925 Transducer, NW 25 KF, RS485, 3 set point relays	
925-41	Series 925 Transducer, 4 VCR®-F[1], RS232, 3 set point relays	
925-42	Series 925 Transducer, 4 VCR®-F[1], RS485, 3 set point relays	
925-51	Series 925 Transducer, 8 VCR®-F[1], RS232, 3 set point relays	
925-52	Series 925 Transducer, 8 VCR®-F[1], RS485, 3 set point relays	
925-81	Series 925 Transducer, Long NW 16 KF, RS232, 3 set point relays	
925-82	Series 925 Transducer, Long NW 16 KF, RS485, 3 set point relays	

Series 925C

Part Number	Description	Price
925C-11	Series 925C Transducer, NW 16 KF, RS232, 1 set point relay	
925C-12	Series 925C Transducer, NW 16 KF, RS485, 1 set point relay	
925C-21	Series 925C Transducer, NW 25 KF, RS232, 1 set point relay	
925C-22	Series 925C Transducer, NW 25 KF, RS485, 1 set point relay	
925C-41	Series 925C Transducer, 4 VCR®-F[1], RS232, 1 set point relay	
925C-42	Series 925C Transducer, 4 VCR®-F[1], RS485, 1 set point relay	
925C-51	Series 925C Transducer, 8 VCR®-F[1], RS232, 1 set point relay	
925C-52	Series 925C Transducer, 8 VCR®-F[1], RS485, 1 set point relay	
925C-81	Series 925C Transducer, Long NW 16 KF, RS232, 1 set point relay	
925C-82	Series 925C Transducer, Long NW 16 KF, RS485, 1 set point relay	

Series 900 Ethernet Gateway

Part Number	Description	Price
100014129	Series 900 Ethernet Gateway	

Accessories

Part Number	Description	Price
100012641	Power supply w/ cable, RS232, 120VAC, USA	
100012664	Power supply w/ cable, RS232, 90-230VAC, Universal (UK, Continental Europe & Australia)	
100012621	D-type converter, for 902 and 925C	
100013527	Adapter, USB to 485	
100012604	Setup and demonstration software	

mks
Technology for Productivity
HPS® Products

MKS Global Headquarters
90 Industrial Way
Wilmington, MA 01887
Tel: (978) 284.4000
Tel: (800) 227.8766 (in USA)
Web: www.mksinst.com
Email: mks@mksinst.com

MKS Vacuum Technology
HPS® Products
5330 Sterling Drive
Boulder, CO 80301
Tel: (303) 449.9861
Tel: (800) 345.1967 (in USA)

MKS Denmark ApS
Ndr. Strandvej 119G
DK-3150 Hellebaek
Denmark
Tel: +45 4492 9299
Email: mksdenmark@mksinst.com

Bulletin 07/05 - Series 925/925C