

Vacuum

Technology

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Series 947

DIGITAL CONVECTION-ENHANCED PIRANI VACUUM SENSOR SYSTEM

Features and Benefits

- 1.0×10^{-3} to 1.0×10^{-3} Torr measurement range for rough to medium vacuum applications
- Fewer controls for simplified operation and lower cost
- LED digital display for wider angle viewing and visibly clearer, unmistakable readings
- Rapid responsiveness for applications in which speed is important
- Two independent relay set points are standard for process control
- LED set point status indicators
- Available in models that measure in Torr, millibar, Pascal, or microns
- Sensor gives highly reliable and repeatable pressure measurements
- Gas-type sensitivity useful for leak detection
- CE Compliant with EMC Directive 89/336/EEC and Low Voltage Directive 72/23/EEC when used with a shielded sensor

Applications

With a wide measurement range of 10^{-3} to 10^{-3} Torr, the HPS® Series 947 Convection-Enhanced Pirani Controller is ideal for rough to medium vacuum applications. This includes measurement of roughing and foreline pressures, activation of high vacuum sensors, or start-up of a system process with the standard relay set points.

The Series 947 Controller is not only suitable for all vacuum industrial applications such as semiconductor or food processing, but also analytical applications and research. It is useful as either a small system controller or as a module in more sophisticated pressure control environments.

Description

Series 947 Convection-Enhanced Pirani Controller

The Series 947 Convection-Enhanced Pirani Controller offers many standard features at a low price, and is easy to use. An analog output signal proportional to pressure is standard and is accessible from the rear of the controller.



Series 947

Processes are controlled with two independent relay set points that are standard on this single-channel controller. The relays can be set to trip anywhere within the controller's set point range.

All of the operating controls are conveniently accessible from the front panel of the controller, including the power on-off switch.

Adjust set points from the front panel while viewing the large, easy-to-read display. Set point activation is shown with red LED indicators. Set points can be checked at any time with no break in process control.

Atmosphere and zero adjustment potentiometers are also located on the front panel for quick controller calibration when interchanging sensors.

Choose a Series 947 Controller in one of four models that measures either in Torr, millibar, Pascal, or microns. The 947 is ready for benchtop use or can easily be mounted in a standard ¼ DIN panel cutout. Installation is quick and easy with the optional mounting kit.

Included with the Series 947 Controller is a power cord, an accessory connector kit, and an instruction manual. The Convection-Enhanced Pirani Sensor and its cable are ordered separately.

317 Convection-Enhanced Pirani Sensor

The 317 Convection-Enhanced Pirani Sensor provides dependable and stable pressure measurement at a very low cost.

Since the only materials exposed to vacuum are stainless steel, nickel, glass, and platinum, the sensor is compatible with a wide array of process gases and is especially suitable for UHV applications. The platinum filament effectively eliminates any reading variance throughout a convection sensor's higher measuring range.

More accurate than a thermocouple sensor, the 317 Sensor measures over a wider pressure range and responds more rapidly to process pressure changes.

The upper measuring limit of a convection-enhanced Pirani sensor is increased over that of a traditional Pirani sensor from 100 Torr to 1,000 Torr. This higher limit is useful when monitoring the pumpdown of a vacuum system from atmosphere to a base pressure. The sensor compensates for any changes in room temperature ranging from 10° to 50°C.

Like all thermal conductivity sensors, the 317 sensor is innately gas-type sensitive. This feature makes it a simple solution for locating medium to fine leaks in vacuum systems. It complements a mass spectrometer leak detector, which is more efficient in finding smaller leaks.

The sensor, which is shielded against RF noise, meets CE mark requirements and can be baked to 100°C. A version of the sensor that can be baked to 250°C is also available.

Eight mounting options for the 317 Sensor include standard vacuum connections such as KF 16 and 2¼" CF flanges. Other flange types are available if requested.

With cables available in standard lengths up to 50 feet, the 317 Sensor can be installed remotely from the Series 947 Controller. Custom lengths up to 500 feet are also available.



Specifications & Dimensions

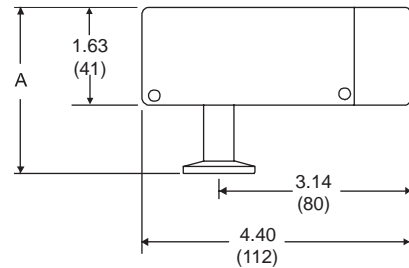
Series 947 Controller

Measuring Range	1.0 x 10 ⁻³ to 1.0 x 10 ⁺³ Torr 1.3 x 10 ⁻³ to 1.3 x 10 ⁺³ mbar 1.3 x 10 ⁻¹ to 1.3 x 10 ⁺⁵ Pascal 1.0 to 1.0 x 10 ⁺⁶ microns
Set Point Range	2.0 x 10 ⁻³ to 9.9 x 10 ⁺² Torr 2.7 x 10 ⁻³ to 1.3 x 10 ⁺³ mbar 2.7 x 10 ⁻¹ to 1.3 x 10 ⁺⁵ Pascal 2.0 to 9.9 x 10 ⁺⁵ microns
Operating Temperature	5° to 40°C (41° to 104°F)
Power Requirements	90 to 130 VAC, 50/60 Hz or 210 to 250 VAC, 50/60 Hz, 9 watts
Resolution	1% of indicated decade
Relays	2 relays, SPDT
Relay Contact Rating	1 A @ 24 VAC/DC resistive
Relay Response	150 msec maximum
Analog Output	0.33 to 5.63 VDC, buffered analog, 1kΩ maximum output impedance
Front Panel Controls	Two set points with LEDs, pushbuttons, and potentiometers; power switch; zero adjust- ment; atmospheric adjustment
Display	Red LED display; 0.6" high readout of 2 digits and 1 exponent; units shown in either Torr, mbar, Pascal or microns
Weight (with KF25 Flange)	2.2 lb (1.0 kg)
CE Certification	89/336/EEC EMC Directive 73/23/EEC Low Voltage Directive

Series 317 Convection Pirani Sensor (Shielded)

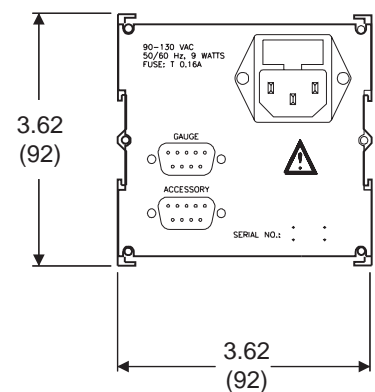
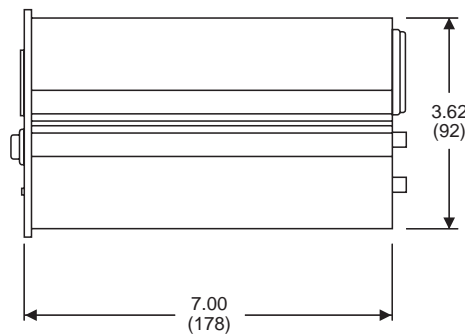
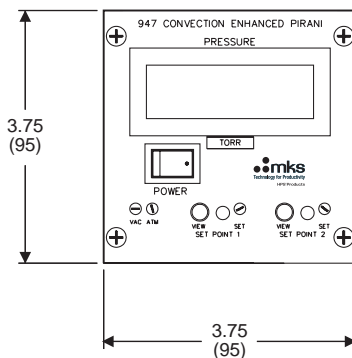
Sensor Construction (materials exposed to vacuum)	Stainless steel, nickel, glass, platinum
Reproducibility	5% of indicated pressure
Cables & Connectors	Maximum length is 500 ft 9 pin D-sub connectors, multiconductor shielded cable
Operating Temperature	0° to 50°C (32° to 122°F)
Bakeout Temperature	100°C (212°F) shielded version *Special order version available to 250°C
Gas Calibration	Air/nitrogen
Installation	Horizontal
Weight	0.5 lb (0.2 kg)

317 Convection Pirani



Size	A
NW 16 KF	2.76 (70)
NW 25 KF	2.76 (70)
1 1/8" CF	3.06 (78)
2 3/4" CF	2.73 (69)
8 VCR [®] -F ¹	2.83 (72)
4 VCR [®] -F ¹	2.51 (64)
1/8" NPT-M	2.93 (74)
15 & 18 mm	3.19 (81)

Series 947 Controller



Ordering Information

Series 947 Convection-Enhanced Pirani Controller *

Part Number	Description	Price
947-A-120-TR	Series 947 Controller, 120 volts, Torr readout	
947-A-220-TR	Series 947 Controller, 220 volts, Torr readout	
947-A-120-MC	Series 947 Controller, 120 volts, micron readout	
947-A-220-MC	Series 947 Controller, 220 volts, micron readout	
947-A-120-PA	Series 947 Controller, 120 volts, Pascal readout	
947-A-220-PA	Series 947 Controller, 220 volts, Pascal readout	
947-A-120-MB	Series 947 Controller, 120 volts, mbar readout	
947-A-220-MB	Series 947 Controller, 220 volts, mbar readout	

317 Shielded Convection-Enhanced Pirani Sensor

Part Number	Description	Price
103170010SH	Series 317 Sensor, Shielded, NW 16 KF	
103170011SH	Series 317 Sensor, Shielded, 1/8" NPT-M	
103170012SH	Series 317 Sensor, Shielded, 8 VCR®-F ¹	
103170013SH	Series 317 Sensor, Shielded, Mini 1 1/8" CF	
103170014SH	Series 317 Sensor, Shielded, 2 3/4" CF	
103170016SH	Series 317 Sensor, Shielded, 15 mm. tube	
103170018SH	Series 317 Sensor, Shielded, 18 mm. tube	
103170027SH	Series 317 Sensor, Shielded, NW 25 KF	
103170029SH	Series 317 Sensor, Shielded, 4 VCR®-F ¹	

Cables

Part Number	Description	Price
103170006SH	10 ft (3.0 m)	
103170007SH	25 ft (7.6 m)	
103170008SH	50 ft (15.2 m)	
103170009SH	Custom Cable (maximum length 500 ft.)	

Accessories

Part Number	Description	Price
103150001	Power cord, 115 VAC	
100005021	Mounting hardware	
109470020	Series 947 User's Manual	
100005456	Rack panel, 19", 3U, 1/4 DIN, blank	
100005457	Rack panel, 19", 3U, 1/4 DIN, 1 cutout	
100005458	Rack panel, 19", 3U, 1/4 DIN, 2 cutouts	
100005459	Rack panel, 19", 3U, 1/4 DIN, 3 cutouts	
100005460	Rack panel, 19", 3U, 1/4 DIN, 4 cutouts	

* Includes controller, power cord, manual and output connector.

¹ VCR®-compatible parts may be used.



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