



Pressure &

Vacuum Measurement Solutions

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Series 275

MODULES WITH ANALOG OUTPUT OR RS-485 INTERFACE

The MKS Mini-Convection Module combines the high precision convection enhanced Pirani gauge with electronics to provide a compact, convenient, reliable, and cost-saving solution for vacuum measurement from atmosphere to 10^{-4} Torr. With over 35 years of successful field installations, the Convection gauge has become an industry standard. It is a unique variation of thermal conductivity gauges where pressure measurement is based on the rate of heat loss from a sensor wire. Unlike traditional thermocouple and Pirani gauges that use only conductive heat loss, Convection gauges take advantage of heat loss due to convection at higher pressures. This extends the range of accurate, repeatable measurement to atmosphere. Convection gauges are in use today on hundreds of thousands of vacuum processes throughout the world, making them a wise choice for many vacuum applications. Modules are available with analog output, RS-485 interface, and DeviceNet™ interface.

Features & Benefits

- Wide range pressure measurement from atmosphere to 10^{-4} Torr (10^{-4} mbar, 10^{-2} Pa)
- Individually calibrated gauges assure highest measurement performance
- Compact, rugged, RF and noise-immune module is CE compliant
- Easy installation in space restricted locations
- Available with setpoint relays for safety interlocking
- Optional local display aids setup and diagnostics
- Digital interface versions for use with computer controlled systems



Convectron Gauge Technology

With over 35 years of successful field installations, the Convectron® gauge has become an industry standard. It is a unique variation of thermal conductivity gauges where pressure measurement is based on the rate of heat loss from a sensor wire. Unlike traditional thermocouple and Pirani gauges, Convectron gauges take advantage of heat loss due to convection cooling at higher pressures. This extends the range of accurate, repeatable vacuum measurements to atmosphere. To assure the highest level of accuracy and gauge-to-gauge repeatability, each Convectron gauge is individually calibrated at our factory.

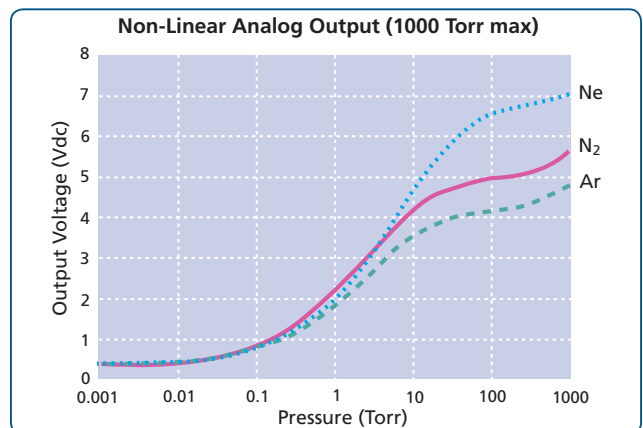
Convectron gauges are in use today on hundreds of thousands of vacuum processes throughout the world, making them a wise choice for many vacuum applications.

Description

- **Wide Measurement Range:** Allows vacuum system performance to be monitored continuously from atmosphere to 10^{-4} Torr (10^{-4} mbar, 10^{-2} Pa).
- **Individual Calibration:** Assures the highest level of accuracy and gauge-to-gauge reproducibility.
- **All-Metal Package:** Provides a high level of immunity to RF noise and is CE compliant.
- **Process Setpoints:** Relay contacts are available on most versions to control other vacuum equipment and provide safety interlocking.
- **Digital Display Version:** Provides an easy-to-read, 3-digit green LED display that automatically adjusts between two ranges (Torr and mTorr or kPa and Pa). It has two setpoint relays that can easily be adjusted using the digital display.
- **Digital Interface Version:** Provides an RS-485 interface for easy compatibility with computer controlled processes. It has two setpoint relays that are adjusted through the RS-485 interface.
- **Low Power Requirements:** System integration is easy using standard low voltage DC power sources.
- **Replaceable Gauge:** Gauge can be quickly and easily replaced using only a screwdriver.



Mini-Convectron® Module



Analog Output



Specifications

Measuring Range for Air and N₂ See Notes (1), (2)

Torr	1x10 ⁻⁴ to 1000
mbar	1x10 ⁻⁴ to 1300
Pa	1x10 ⁻² Pa to 130 kPa

Step Size at Minimum Pressure 1x10⁻⁴ Torr, 1x10⁻⁴ mbar, 1x10⁻² Pa

Mounting Position Horizontal preferred

Weight 340 gm (12oz) with 1/8 NPT fitting

Operating Temperature 0°C to 40°C ambient, non-condensing

Non-Operating Temperature -40°C to 70°C

Case Material Aluminum extrusion

CE Compliance

EMC Directive	2004/108/EC; EN61326-1
Low Voltage Directive	2006/95/EC; EN61010-1

Basic Analog Version

	1 or 2 setpoint relays
Analog Output	0.375 to 5.659 VDC for 0 to 1000 Torr of N ₂ , non-linear
Power Required	11.5 to 26.5 VDC, 0.1 A at 11.5 VDC, 1.6 W max
Connector for 1 Relay	11.5 to 26.5 VDC, 0.1 A at 11.5 VDC, 1.6 W max
Connector for 2 Relays	11.5 to 26.5 VDC, 0.1 A at 11.5 VDC, 1.6 W max

Digital Interface Version

Parameters Adjustable	Vacuum and atmosphere calibration, setpoints (value, direction and hysteresis)
Baud Rates	19200 Baud (default value)
Data Format	ASCII, 8 data bits, one stop bit, no parity, no handshake (default values)
Power Required	11.5 to 26.5 VDC, 0.12 A at 11.5 VDC, 2 W max
Connector	15-pin subminiature-D male, high density
Resolution	Least significant digit on each range

Setpoint Relay Configuration

	Single-pole, double-throw (SPDT)
Contact Rating	1 A at 30 VDC resistive, AC non-inductive
Range	1x10 ⁻³ to 1000 Torr, 1x10 ⁻³ to 1300 mbar, 1x10 ⁻¹ Pa to 130 kPa
Resolution	2 significant digits

Convector Gauge

Sensor Materials	Gold-plated tungsten
Other Materials Exposed to Gas	304 stainless steel, borosilicate glass, Kovar®, alumina, NiFe alloy, polyimide
Internal Volume	35 cm ³ (2.14 inch ³)
Gauge Bakeout Temperature	150°C maximum, non-operating, with electronics removed

Notes:

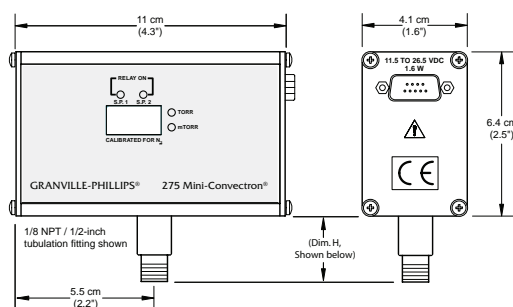
⁽¹⁾ Measurements will change with different gases and mixtures. Correction curves for common gases are provided in the instruction manual.

⁽²⁾ Convector Gauges are not intended for use with flammable or explosive gases.



Ordering Information

Vacuum Connection	Basic	Basic	Linear Analog Output	Digital Display	Digital Display	Digital Display
	one set point relay, non-linear analog output, without display	two set point relays, non-linear analog output, without display	both linear and non-linear analog output, without set point relays or display	two set point relays, non-linear analog output, display in Torr	two set point relays, non-linear analog output, display in pa	two set point relays, RS-485 interface, without display
Type	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.
1/8 NPT / 1/2 inch tubulation	275800-EU	275870-EU	275850-EU	275904-EU	275904-EU-P	275527-EU
1/4 inch VCR®-type female fitting	275801-EU	275871-EU	275851-EU	275905-EU	275905-EU-P	275528-EU
1/2 inch VCR®-type female fitting	275863-EU	275867-EU	275862-EU	275906-EU	275906-EU-P	275529-EU
3/8 inch VCO®-type male fitting	275802-EU	275872-EU	275852-EU	275907-EU	275907-EU-P	275530-EU
1.33 inch (NW16CF) ConFlat®-type	275803-EU	275873-EU	275853-EU	275908-EU	275908-EU-P	275531-EU
2.75 inch (NW35CF) ConFlat®-type	275804-EU	275874-EU	275854-EU	275909-EU	275909-EU-P	275532-EU
NW16KF	275806-EU	275876-EU	275856-EU	275911-EU	275911-EU-P	275546-EU
NW25KF	275807-EU	275877-EU	275857-EU	275912-EU	275912-EU-P	275534-EU
NW40KF	275808-EU	275878-EU	275858-EU	275913-EU	275913-EU-P	275535-EU



Vacuum Connection	Dim. H
1/8 NPT pipe thread/ 1/2 inch tubulation	2.2 (0.9)
1/4 inch 4 VCR®-type female	3.0 (1.2)
1/2 inch 8 VCR®-type female	3.9 (1.5)
1.33 inch (NW16CF) ConFlat®-type	3.8 (1.5)
2.75 inch (NW35CF) ConFlat®-type	3.8 (1.5)
NW16KF	3.1 (1.2)
NW25KF	3.1 (1.2)
NW40KF	3.7 (1.5)

Dimensional Drawing —

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



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