



Pressure &

Vacuum Measurement Solutions

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Series 275

ANALOG, RS485 AND DEVICENET™ MODULES

The MKS Mini-Convector® 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 Convector® 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, Convector gauges take advantage of heat loss due to convection at higher pressures. This extends the range of accurate, repeatable measurement to atmosphere. Modules are available with analog output, RS485 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
- Available with set point relays for safety interlocking
- Optional local display aids setup and diagnostics
- Digital interface versions for use with computer controlled systems
- DeviceNet digital interface facilitates easy system integration
- All functions programmable through RS485 or DeviceNet interfaces



Description

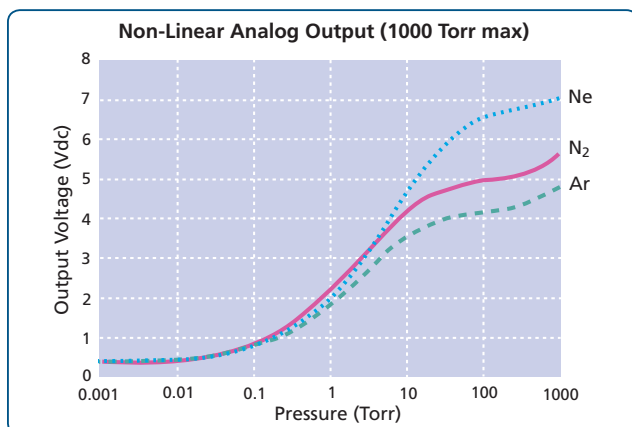
- **Wide Measurement Range:** Allows vacuum system performance to be monitored continuously from atmosphere to 10^{-4} Torr (10^{-4} mbar, 10^{-2} Pa).
- **Individual Calibration:** Assures the highest level of accuracy and gauge-to-gauge reproducibility.
- **All-Metal Package:** Provides a high level of immunity to RF and noise and is CE compliant.
- **Programmable Process Set Points:** 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).
- **Digital Interface Version:** Provides RS485 or DeviceNet interface for easy compatibility with computer controlled processes.
- **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.



Display Side (Analog shown)



Parameter Adjustment Side (DeviceNet shown)



Analog Output



Parameter Adjustment Side (RS485 shown)



Specifications

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

Torr	1x10 ⁻⁴ to 1000
mbar	1x10 ⁻⁴ to 1300 <small>See Note (2)</small>
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

Power Required

DeviceNet	11 to 26 VDC, 0.5 A at 11 VDC, 2.5 W max
Analog	11.5 to 26.5 VDC, 0.1 A at 11.5 VDC, 1.6 W max, 1.8 max (with display)
RS485	11.5 to 26.5 VDC, 0.12 A at 11.5 VDC, 2 W max

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

Compliance

EN61326-1
EN61010-1
2011/65/EU

Enclosure

Aluminum
IP20 rating

Display (optional)

Resolution 3-digit green LED, automatic ranging See Note (3)

Least significant digit on each range

Set Point Relays

0, 1 or 2

Configuration Single-pole, double-throw (SPDT)

Contact Rating 1 A at 30 VDC resistive, AC non-inductive

Adjustments Value, direction, and hysteresis through software

Range 1x10⁻³ to 1000 Torr, 1x10⁻³ to 1300 mbar, 1x10⁻¹ Pa to 130 kPa

Resolution 2 significant digits

Analog Output

0.375 to 5.659 VDC for 0 to 1000 Torr of N₂, non-linear

RS485 Digital Interface

RS485, 2 set point relays

Parameters Adjustable Vacuum and atmosphere calibration, set points (value, direction and hysteresis)

Baud Rates 300-115.2K, 19200 Baud (default value)

Data Format ASCII, 8 data bits, one stop bit, no parity, no handshake (default values)

Resolution Least significant digit on each range

DeviceNet Interface

Parameters Adjustable Vacuum and atmosphere calibrations, set points

Device Type Vacuum/pressure gauge device

Messaging Polled I/O and explicit

Address 0 to 63, selected by using the Low and High address switches

Baud Rates 125K, 250K, or 500K, switch selectable

Connector 5-pin Micro

Connectors

9 or 15-pin subminiature-D male, high density

5-pin Micro DeviceNet

Convectron Gauge

Sensor Materials Gold-plated tungsten or Platinum

Other Materials Exposed to Gas 304 stainless steel, borosilicate glass, Kovar®, alumina, NiFe alloy, polyimide

Internal Volume 40 cc (2.5 cu. in)

Gauge Bakeout Temperature 150°C maximum, non-operating, with electronics removed

Notes:

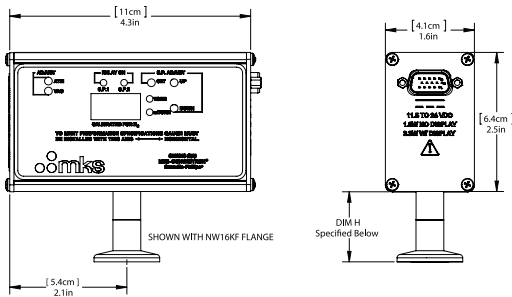
⁽¹⁾ Measurements will change with different gases and mixtures. Correction curves for common gases are provided in the instruction manual.

⁽²⁾ For units calibrated in mbar, the output signal continues up to the Full Scale of 1300 mbar, but the digital display does not display past 999 mbar.

⁽³⁾ Convectron Gauges are not intended for use with flammable or explosive gases.



Ordering Information



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 — all versions

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

Ordering Code Example: 275600-0-GD-T	Code	Configuration
Model Type		
Series 275 Module	275	275
Display		
Without display	4	6
With display	6	
Interface		
Analog	00	00
RS485	10	
DeviceNet	20	
Relay Set Points		
No Relay Set Points (analog w/o display)	0	0
1 Relay Set Point (analog only)	1	
2 Relay Set Points	2	
Filaments		
Gold-Plated Tungsten	G	G
Platinum	P	
Flange/Fitting		
NW16KF	D	D
NW25KF	E	
1.33 inch (NW16CF) ConFlat-type	F	
2.75 inch (NW35CF) ConFlat-type	G	
NW40KF	K	
1/8 inch NPT / 1/2 inch tubulation	P	
1/4 inch VCR-type female	Q	
1/2 inch VCR-type female	R	
Measurement Units		
Torr	T	T
mbar	M	
Pa	P	



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