

# Granville-Phillips Mini-Convectron® Modules

*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*

## Vacuum Gauge Modules

Modular vacuum gauges are an ideal solution for applications that do not need front panel displays and controls. These compact, convenient, reliable, cost-saving modules have the control electronics mounted directly on the gauge. The all-metal package provides a rugged enclosure and a high level of immunity to electrical noise.

Vacuum pressure measurements over seven decades from atmosphere to  $1 \times 10^{-4}$  Torr ( $1 \times 10^{-4}$  mbar,  $1 \times 10^{-2}$  Pa) are provided by Granville-Phillips Mini-Convectron Modules. Versions are available with analog output, RS-485 interface, or with DeviceNet™ interface (described in a separate brochure).



The basic versions have adjustable setpoint relays which allow you to control other functions of your vacuum process or provide safety interlocking. The digital display version features a bright, 3-digit display that gives instantaneous on-site pressure measurement. A version with a convenient linear analog output signal is also available.

## Convectron Gauge Technology

With over 20 years of successful field installations, the Granville-Phillips 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.

**HELI**

## Features and Benefits



**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.

**Linear Analog Output Version** – Outputs a linear, high-level dc signal of 0 to 10 volts, for 0 to 1 Torr, which can be used to control pressure related processes, or read directly by a digital volt meter (DVM) or data acquisition system.

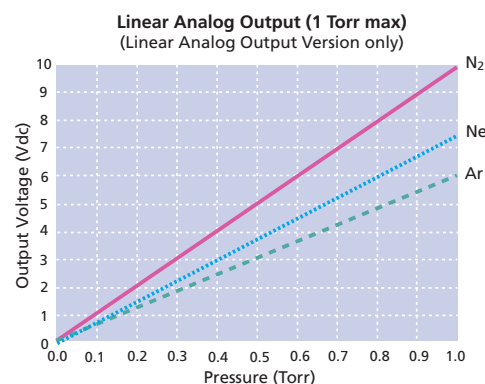
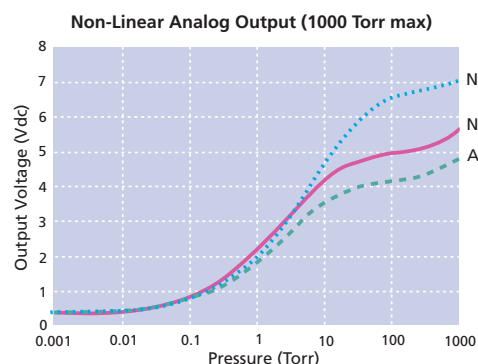
**Digital Display Version** – Provides an easy-to-read, 3-digit green LED display that automatically adjusts between two ranges (Torr and mTorr, or kPa and Pa). It has two setpoint relays that can easily be adjusted using the digital display.

**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.

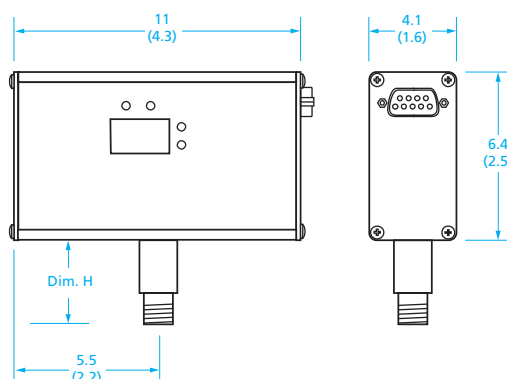
**Low Power Requirements** – System integration is easy using standard low voltage dc power sources.

**Replaceable Gauge** – Gauge can be quickly and easily replaced using only a screwdriver.

## Analog Output



## Dimensions



Dimensions are in cm (inch)

Vacuum Connection	Dim. H
1/8 NPT pipe thread / 1/2" tubulation	2.2 (0.9)
1/4 inch 4VCR®-type female	3.0 (1.2)
1/2 inch 8VCR®-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)

## Technical Specifications

Measuring range for air and N <sub>2</sub> (see notes 1 and 2, below)	
Torr	1x10 <sup>-4</sup> to 1000
mbar	1x10 <sup>-4</sup> to 1300
Pa	1x10 <sup>-2</sup> Pa to 130 kPa
Resolution	1x10 <sup>-4</sup> Torr, 1x10 <sup>-4</sup> mbar, 1x10 <sup>-2</sup> 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 89/336/EEC, EN 50081-2, EN 50082-2
Basic version	1 or 2 setpoint relays
Analog output	0.375 to 5.659 Vdc for 0 to 1000 Torr of N <sub>2</sub> , 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	9-pin subminiature-D male
Connector for 2 relays	15-pin subminiature-D male, high density
Linear analog output version	2 analog outputs, no setpoints
Analog output 1	0.0 to 10.0 Vdc for 0 to 1 Torr of N <sub>2</sub> , linear
Analog output 2	0.375 to 5.659 Vdc for 0 to 1000 Torr of N <sub>2</sub> , non-linear
Power required	12.5 to 26.5 Vdc, 0.1 A at 12.5 Vdc, 1.6 W max
Connector	9-pin subminiature-D male
Digital display version	0 or 2 setpoint relays
Units	Torr or Pa
Display	3-digit green LED, automatic ranging
Analog output	0.375 to 5.659 Vdc for 0 to 1000 Torr of N <sub>2</sub> , non-linear
Power required	11.5 to 26.5 Vdc, 0.15 A at 11.5 Vdc, 3.5 W max
Connector	15-pin subminiature-D male, high density
Digital interface version	RS-485, 2 setpoint relays
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
Setpoint relay configuration	Single-pole, double-throw (SPDT)
Contact rating	1 A at 30 Vdc resistive, AC non-inductive
Range	1x10 <sup>-3</sup> to 1000 Torr, 1 x 10 <sup>-3</sup> to 1300 mbar, 1 x10 <sup>-1</sup> Pa to 130 kPa
Resolution	2 significant digits
Convectron Gauge	
Sensor material	Gold-plated tungsten
Other materials exposed to gas	304 stainless steel, borosilicate glass, Kovar, alumina, NiFe alloy, polyimide
Internal volume	35 cm <sup>3</sup> (2.14 inch <sup>3</sup> )
Gauge bakeout temperature	150 °C maximum, non-operating with electronics removed

## Application Notes

1. Measurements will change with different gases and mixtures. Correction curves for common gases are provided in the instruction manual.
2. Convectron Gauges are not intended for use with flammable or explosive gases.

## Ordering Information

Vacuum Connection:	Basic Version with one setpoint relay, non-linear analog output, without display	Basic Version with two setpoint relays, non-linear analog output, without display	Linear Analog Output Version with both linear and non-linear analog output, without setpoint relays or display	Digital Display Version with non-linear analog output, two setpoint relays, display in Torr	Digital Display Version with non-linear analog output, two setpoint relays, display in Pa	Digital Interface Version with RS-485 interface, two setpoint relays, without display
Catalog No.	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

Wall transformer to convert 120 Vac to 12 Vdc, with 15-pin subminiature-D connector for use with Digital Display modules only (UL Listed): Catalog #275933

Replacement Convectron Gauges for Mini-Convectron Modules are listed in the current Granville-Phillips Products Price List.

## Backed by GUTS®

All Granville-Phillips products are backed by the GUTS (Guaranteed Uptime Support) rapid response network, our comprehensive customer support program. When you call the GUTS service center, you are guaranteed an immediate, competent response and action by a vacuum expert from our world-wide technical support staff. We're at work for you 24 hours a day, 365 days a year. 1-800-FOR-GUTS (800-367-4887).

# HELIX

Helix Technology Corporation  
Colorado Operations

6450 Dry Creek Pkwy • Longmont, Colorado 80503-9501 USA

Telephone: (303) 652-4400 • Toll free in USA: (800) 776-6543 • Fax: (303) 652-2844

email: [salesupport@helixtechnology.com](mailto:salesupport@helixtechnology.com) Visit us online at: [www.helixtechnology.com](http://www.helixtechnology.com)

Copyright © 2002 Helix Technology Corporation. All Rights Reserved.  
Granville-Phillips, Convectron and GUTS are registered trademarks of Helix Technology Corporation.  
VCR and VCO are registered trademarks of Cajon Co.  
ConFlat is a registered trademark of Varian Associates.  
DeviceNet is a trademark of the Open DeviceNet Vendor Association, Inc.