Granville-Phillips® Convectron® Series 475 Vacuum Gauge Controller

Advanced Vacuum Measurement Solutions

VACUUM PRODUCTS

Benefits

- High Performance compact vacuum controller for bench top and panel mount applications
- Wide range vacuum pressure measurement from atmosphere to $1x10^{-4}$ Torr ($1x10^{-4}$ mbar, $1x10^{-2}$ Pa)
- Direct replacement for the Series 375 Convectron Gauge Controller
- Highly visible Vacuum Florescent Display (VFD)
- Highly configurable I/O options including analog outputs, setpoint relays, serial communication interface
- Pre-programmed gas curves for N_2, Ar, He, CO_2, and O_2
- Built-in Convectron Gauge simulator
- Intuitive menu control for simplified configuration and parameter setup
- Self diagnostics
- RoHS / CE Compliant

The Granville-Phillips Series 475 Convectron Vacuum Gauge Controller combines the industry standard Convectron gauge technology with high performance controller electronics and an easy to use interface in a compact package design. The Series 475 Convectron Controller and Series 275 Convectron Gauge provide accurate and repeatable vacuum measurements over seven decades from atmosphere to $1x10^{-4}$ Torr ($1x10^{-4}$ mbar; $1 x10^{-2}$ Pa).

The Series 475 Convectron Controller is a third generation Granville-Phillips Convectron Gauge controller that combines the rugged reliability of the Series 375 Convectron Controller with added features for ease of use and system integration. The Series 475 Convectron Controller is easy to use with a larger and brighter, highly visible Vacuum Florescent Display (VFD) and intuitive front panel controls that allow gauge calibration and adjustment of vacuum measurement parameters without the need for special tools. The Series 475 Convectron Controller can be used as a simple readout device for basic vacuum system control or integrated into a more sophisticated control system. The Series 475 Convectron Controller provides a range of control I/O options including analog outputs, setpoint relays and a serial communication interface. The Series 475 is compatible with the Series 375 Convectron Controller with several new features such as self diagnostics, integrated Convectron Gauge simulation, and built-in gas curves, which provide ease of use, better system control, and increased productivity. The compact packaging and innovative electronics make the Series 475 Convectron Controller and Granville-Phillips Convectron technology the ideal solution for today's vacuum measurement systems.

Convectron Gauge Technology

Granville-Phillips Convectron technology has become the industry standard with over 30 years of unmatched performance, repeatability and reliability. To assure the highest level of accuracy and gauge-to-gauge reproducibility, each Convectron Gauge is burned-in for stability and individually calibrated for unmatched accuracy. As the industry standard, Convectron Gauges are in use today on hundreds of thousands of vacuum processes throughout the world, making Convectron technology the best choice for your vacuum measurement applications.

Granville-Phillips Series 475 Convectron Vacuum Gauge Controller

Features and Benefits

Wide Measurement Range: Direct replacement for Series 375 Convectron Controllers and allows vacuum system performance to be monitored continuously from atmosphere to $1x10^{-4}$ Torr ($1x10^{-4}$ mbar, $1x10^{-2}$ Pa)

High Measurement Resolution: Designed to take full advantage of Convectron Gauge technology with 1 Torr (1 mbar, 0.1 Pa) resolution at atmosphere and 0.1 mTorr ($1x10^{-4}$ mbar, $1x10^{-2}$ Pa) resolution at low pressure.

Vacuum Fluorescent Display: The VFD is easier to read from greater distances than other types of displays. The display is configurable to use scientific notation or two ranges (Torr and mTorr, mbar and 10^{-3} mbar, or kPa and Pa) to provide a continuous measurement readout from atmosphere to low pressure.

Process Setpoint Option: Relay contacts allow control of other vacuum equipment, such as valves, pumps, heaters, alarms, and safety interlocking.

Multiple Gas Curves: Selectable N_2, Ar, He, CO_2 and O_2 gas curves are pre-programmed, eliminating the need for individual calibration when changing the process gas.

Push-Button Controls: Calibration and setpoint settings are easy to adjust using intuitive front panel controls. No special tools are required.

Easy-to-use Analog Signals: Provides a one volt per decade logarithmic signal (0-7V or 1-8V) or a selectable non-linear signal (0-9V) that is backwards compatible with older Convectron Gauge controllers.

Serial Communication Interface Option: RS-232 interface allows easy integration with computer controlled systems.

Built-in Convectron Gauge Simulator: Simulates a Convectron Gauge, which allows system diagnostics without the need of a vacuum system.

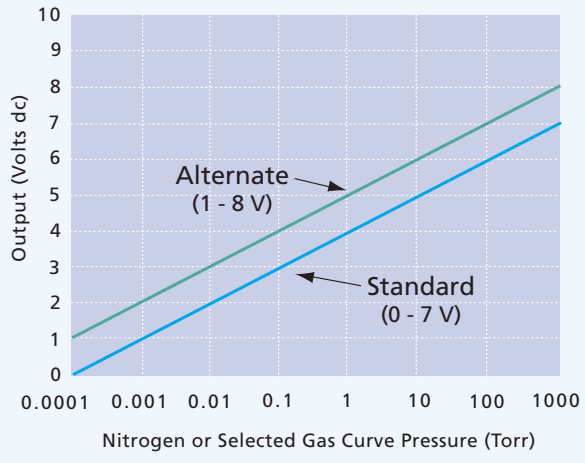
Self Diagnostics: The A/D (Convectron Gauge bridge voltage) and analog outputs are continuously monitored for erroneous readings.

Compact 1/8 DIN Controller: Easy to install in space restricted locations.

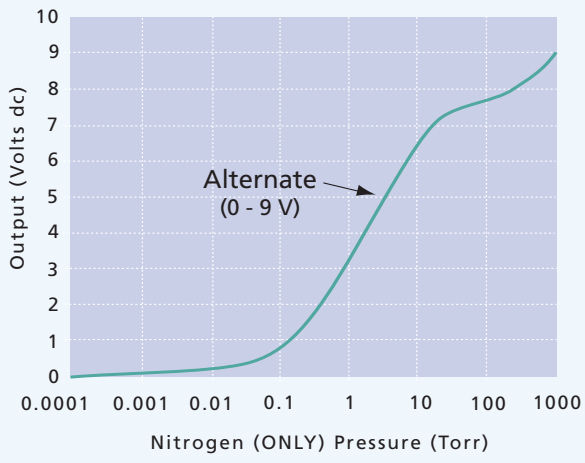
Rugged All-Metal Package: Provides a high level of immunity to RF noise and is RoHS / CE Compliant.

Analog Outputs

Linear with Logarithmic Signal of Pressure



Nonlinear Signal (S-Curve)



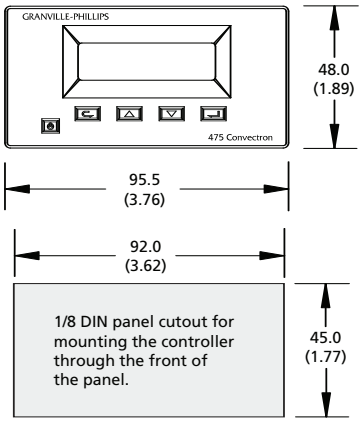
Standard analog output is 0 to 7 Volts that is linear in voltage with the log of pressure. Two alternate analog outputs can be selected using the front panel buttons: either 1 to 8 Volts that is linear in voltage with the log of pressure or 0 to 9 Volts that is non-linear with the log of pressure and mimics the output of older Granville-Phillips Vacuum Gauge Controllers.

Technical Specifications

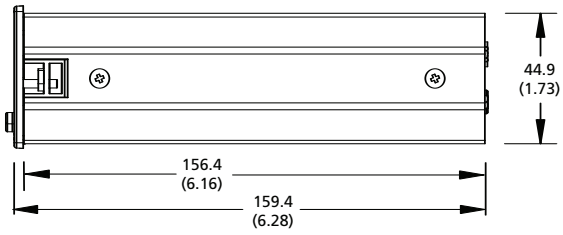
Measurement range for and N_2 (see Notes 1 & 2, below)	
Torr	$1x10^{-4}$ to atmosphere
mbar	$1x10^{-4}$ to atmosphere
Pa	$1x10^{-2}$ to atmosphere
Resolution	1 x 10^{-4} Torr, 1 x 10^{-4} mbar, 1 x 10^{-2} Pa
Display	Vacuum Fluourescent
Update rate	Every 0.5 sec
Input power	12 to 24 Vdc, 6 W continuous
Weight	720 gm (25 oz)
Operating temperature	0 °C to 40 °C ambient, non-condensing
Non-operating temperature	-40 °C to 70 °C
CE compliance	
Safety	Low Voltage Directive 2006/95/EC, EN61010-1
EMC	EMC Directive 2004/104/EC, EN61326-1:2006
Environmental	RoHS compliant
Setpoint relays (optional)	(2) single pole, double-throw (SPDT)
Contact rating	5 A @ 250 Vac resistive load
Range	1 x 10^{-3} to 1000 Torr, 1 x 10^{-3} to 1333 mbar, 1 x 10^{-1} Pa to 133 kPa
Resolution	2 significant digits
Communicative Interface (optional)	
RS-232	
Data format	ASCII, 8 data bits, one stop-bit, no parity, no handshake
Baud rate	1200, 2400, 4800, 9600, 19200, 38400 (19200 Default)
Convectron Gauge	
Sensor material	Gold-plated tungsten, platinum
Other materials exposed to gas	304 stainless steel, borosilicate glass, Kovar, alumina, NiFe alloy, polyimide
Internal volume	40 cm^3 (2.5 $in.^3$)
Weight	85 grams (3 ounces)
Gauge operating temperature	0 °C to 50 °C ambient, non-condensing
Gauge bakeout temperature	150 °C maximum, non-operating, cable disconnected
Mounting orientation	Horizontal preferred
Cable bakeout temperature	105 °C maximum

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

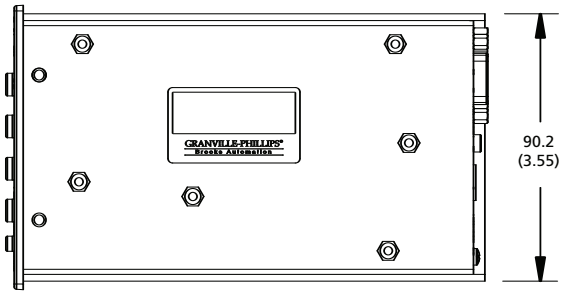
Dimensions



NOTE: All dimensions are shown in mm (inch)



NOTE: Allow 64 mm (2.5 in) clearance for the connectors on the back of the controller.



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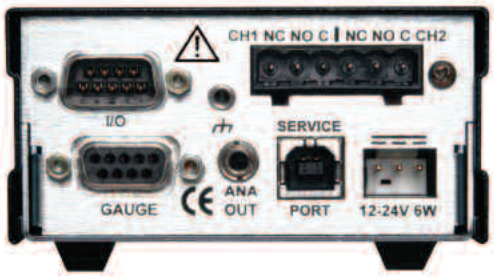
Ordering Information



Base 475 Convectron Vacuum Gauge Controller		Model Number
1/8 DIN, panel mount with digital display		475001 - # - #
Interface / Setpoint Options:		
None	0	
RS-232 with 2 setpoints	A	
Preconfigured Measurement units:*		
Torr	T	
mbar	M	
Pa	P	

* User configurable via front panel.

Power Supplies		Model Number
Universal power supply		475008 - #
Power cord plug type:		
North America 115 Vac	1	
North America 240 Vac	2	
Universal Europe 220 Vac	3	
United Kingdom 240 Vac	4	

Convectron Gauge Cables	
10 feet (3 meters)	475012-10
25 feet (7.6 meters)	475012-25
50 feet (15.2 meters)	475012-50
100 feet (30.5 meters)	475012-100
200 feet (61 meters)	475012-200
500 feet (152.4 meters)	475012-500

Convectron Gauges (gold-plated tungsten)*	
1/8 NPT / 1/2 inch tubulation	275071
1/4 inch VCR® type female fittings	275185
1/2 inch VCR® type female fittings	275282
3/8 inch VCO® type male fitting	275233
1.33 inch (NW16CF) rotatable Conflat® type flange	275256
2.75 inch (NW35CF) rotatable Conflat® type flange	275238
NW16KF flange (welded)	275203
NW25KF flange (welded)	275196
NW40KF flange (welded)	275316

* Platinum sensor Gauges are available; contact Brooks Sales Support.

Backed by GUTS®

All Granville-Phillips products are backed by the GUTS (Guaranteed Uptime Support) rapid response network, our unique, comprehensive global customer support program. When you call a GUTS service center, you are guaranteed 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).

For more information, please contact your local Brooks Automation sales representative or visit www.brooks.com.

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