

Replacing a Series 275 *CONVECTRON*® Controller with a Series 375 *CONVECTRON*® Controller



Series 375 *CONVECTRON* Controller with Gauge

Introduction: Effective February 1, 2000, Granville-Phillips' Series 275 *CONVECTRON* 1/4 DIN Controllers are no longer available. The Series 375 *CONVECTRON* Controller can be used in place of the Series 275, although this is not a direct "plug and play" replacement. This application bulletin addresses the differences between the two units.

Comparisons between Series 375 and Series 275 *CONVECTRON* Controllers

Series 375

Wide range pressure measurement from 1000 Torr to 1×10^{-4} Torr.

Rugged all-metal space saving 1/8 DIN package is highly immune to rf interference and is CE compliant.

Field upgradeable: RS-232 or RS-485/422 digital interfaces, 1 or 2 process relays.

Push-button calibration and setpoint controls - no tools needed. Digital setpoints are stored in non-volatile memory and cannot drift.

The *CONVECTRON* Gauge cable connects to the controller using a dedicated 9-pin D connector.

The analog output and process control relays have individual dedicated connectors.

Series 275

Measurement range from 1000 Torr to 1×10^{-3} Torr.

Larger 1/4 DIN plastic enclosure is not CE compliant.

One or two process relays must be ordered at time of order entry. No computer interface available.

Small screwdriver needed for calibration and setpoint adjustments. Analog setpoints are stored via mechanical potentiometers.

The *CONVECTRON* gauge connects to the controller through a shared printed circuit board edge connector.

Analog output and process control connections are only accessible when the cable connector is dismantled.

Comparisons continued

Series 375	Series 275
Analog output is linearized with respect of the logrithum of pressure, which eliminates the need for complicated equations. For backwards compatability, non-linear analog output, identical to the analog output from Series 275, is software selectable.	Analog output is non-linear requiring complicated sets of equations to calculate pressure
Full resolution of the capabilities of the CONVECTRON Gauge (1 Torr resolution at atmosphere and 0.1 mTorr resolution at low pressure).	Readout jumps by 5, 10, or 20 Torr increments as it approaches atmosphere. Readout is 1 mTorr increments as it approaches zero.
Mbar range displays 1333 mbar full scale.	Mbar range limited to 999 mbar full scale.
Operates on 12 to 24 VDC as well as AC voltage mains with external supply.	Can only operate on AC mains.

Differences between the Series 275 CONVECTRON Controller and the Series 375 CONVECTRON Controller

When using a Series 375 CONVECTRON Controller in place of a Series 275 Controller, the major differences to be aware of are:

1. The enclosure of the 1/4 DIN Series 275 is twice as large as the 1/8 DIN of the Series 375 Controller. Inquire about an adapter plate if you need one for an existing 1/4 DIN opening.
2. The process control connections for Series 275 are accessed inside the cable assembly at the edge connector. The process control connections for Series 375 are accessed through a separate 6-pin connector. Relays for both products are rated at 250VAC, 30VDC, 5A resistive load. The Series 375 is CE compliant at these levels, but the Series 275 is not. The following table shows the equivalent wiring connections for both product series.

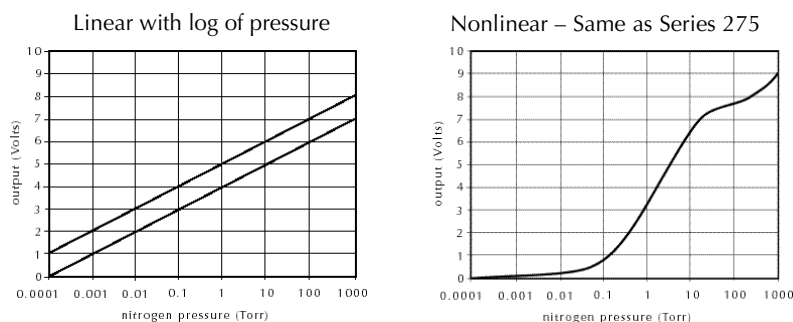
Function	Series 275 edge card connector designation	Series 375 six pin connector designation
Relay #1 - normally closed	6, F	1
Relay #1 - normally open	5, E	2
Relay #1 - common	4, D	3
Relay #2 - normally closed	9, K	4
Relay #2 - normally open	8, J	5
Relay #2 - common	7, H	6

Setpoint pressures are set via the S.P. button on the front of the Series 375 controller. You no longer need a small screwdriver to adjust the setpoints via potentiometers. Detailed instructions are available in the manual that ships with each Series 375 Controller.

3. The analog output voltages for Series 275 Controllers are also accessed inside the cable assembly at the edge connector. The analog output voltage on a Series 375 controller is more conveniently accessed through a 1/8 inch mini-phone jack which will be shipped with the unit. The following table shows the equivalent wiring connections for Series 275 and Series 375.

Function	Series 275 edge card connector designation	Series 375 1/8 inch mini-phone jack
Recorder output	M	Tip of jack (center conductor of shielded 1-conductor)
Recorder return	N	Ring of jack (shield of shielded 1-conductor)

Three different analog output signals (illustrated below) are software selectable in the Series 375 Controller.



Analog output choices, menu selectable.

The factory default analog output voltage for Series 375 is 0 - 7 volts. This voltage output signal is linear with respect to the log of pressure. The analog output is 1 volt per decade of pressure with 0 volts at 1.0×10^{-4} Torr. The output equation for this setting is:

Pressure = 10^{V-4} Torr/mbar (where V = output voltage).

An alternate analog output voltage is 1 - 8 volts so that 0 V output can be used to indicate that the Controller is off. The lowest reading is 1 volt at 1.0×10^{-4} Torr and the output equation is Pressure = 10^{V-5} Torr/mbar. To change to this output voltage, enter the setup mode by holding the up and down buttons down during power up. Then press the up or down buttons until the display reads 1.02 and press the CAL button to store the value. Return to operational mode by turning the Controller off and then on again.

A third output option is 0 - 9 V non-linear analog output signal identical to the Series 275 Controller. This is available by entering the setup mode and using the up and down buttons until the display reads 1.03. Then press the CAL button to store the value. Return to operational mode by turning the Controller off and then on again.

4. The power requirements for a Series 375 *CONVECTRON* Controller is 12-24 VDC, 6W. An input cable is shipped with each controller to hook up to an existing DC power source.

If you do not have 12-24 VDC power available in your system, there are two different power supplies available from Granville-Phillips.

P/N 375006 provides a wall mount transformer to convert 115VAC into 24 VDC and has a North American style plug.

P/N 375007-X is CE compliant, has an external power cord, and operates on any voltage from 90 VAC through 250 VAC. The "X" designates the type of power cord connector.

Power Cord Connectors

North American 115 V
Japan 100 V
p/n 375007-1



United Kingdom 240 V
p/n 375007-4



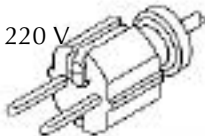
North American 240 V
p/n 375007-2



Switzerland 220 V
p/n 375007-5



Universal European 220 V
p/n 375007-3



Australian 240 V
p/n 375007-6



If you have any questions or need further assistance while converting from Series 275 to Series 375, please contact Customer Support at 1-800-776-6543 (US or Canada) or your nearest Helix Sales Office.

The information, recommendations, descriptions and safety notations in this Applications Bulletin are based on Granville-Phillips' experience and judgement with respect to the subject application. If additional information is required, please consult our Application Engineer for this product line. THIS APPLICATION BULLETIN SHOULD NOT BE CONSIDERED TO BE ALL-INCLUSIVE, OR TO COVER ALL CONTINGENCIES. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OF FITNESS, ARE MADE REGARDING THE SAME. In no event will Granville-Phillips be responsible for any incidental or consequential damages or loss resulting from use of the information, recommendations, descriptions and safety notations herein.

GRANVILLE-PHILLIPS
HELIIX TECHNOLOGY CORPORATION

Advanced Vacuum Measurement Solutions

5675 Arapahoe Avenue • Boulder, Colorado 80303-1332, USA
Phone: (+1) 303-443-7660, toll-free in USA: 1-800-776-6543
Fax: (+1) 303-443-2546 • email: custserv@granville.com
World Wide Web: www.helixtechnology.com