

About these instructions

These instructions explain how to install the Granville-Phillips® Series 342 triode vacuum gauge or Series 343 Bayard-Alpert vacuum gauge.

Both gauges measure vacuum pressure by producing a current that is proportional to the density of the gas inside the gauge tube.

⚠ WARNING

Using the gauge to measure the pressure of flammable or explosive gases can cause a fire or explosion resulting in severe property damage or personal injury.

Do not use the gauge to measure the pressure of flammable or explosive gases.

Implosion and explosion

Glass gauge tubes can implode if they are improperly handled during operation at vacuum pressure or can explode if they operate above atmospheric pressure.

To avoid property damage or personal injury resulting from breakage of the glass gauge tube, install a protective shield around the gauge.

⚠ CAUTION

Operating the gauge above 760 Torr (1013 mbar, 101 kPa) total pressure could cause the glass tube to break, resulting in severe property damage or serious personal injury.

Do not operate the gauge above 760 Torr (1013 mbar, 101 kPa) pressure.

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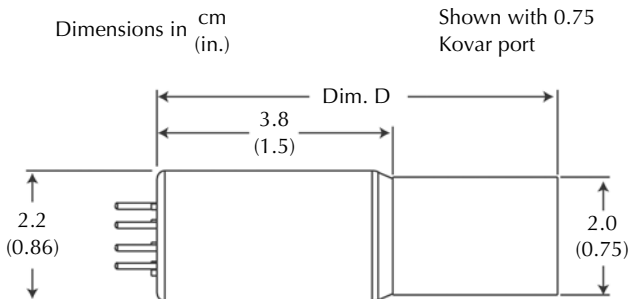
Gauge port

At higher vacuum pressures, the size of the gauge port is unimportant. As pressure approaches the low pressure limit of the gauge, conductance between the gauge tube and the vacuum system can cause erroneous pressure readings.

Table 1 342 or 343 standard gauge catalog numbers and fittings

Catalog number	Fitting	Dim. D	
		cm	in.
343001	0.75 Kovar® port	6.5	2.55
343002	NW16KF fitting	7.7	3.05
343003	1.33 ConFlat® fitting	7.7	3.05
342003	0.75 Kovar port	6.5	2.55
342004	NW16KF fitting	7.7	3.05
342027	0.75 Kovar port	6.5	2.55

Figure 2 Dimensions of 342 or 343 standard gauge



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Mounting and orientation

- The gauge may be oriented in any position. If the gauge is mounted horizontally, make sure the Mini-Ion™ logo is at the top and bottom of the gauge tube, as illustrated in Figure 1.
- Locate the gauge in the place within the vacuum system where pressure measurement is most important. Valves or other constrictions near the gauge may cause erroneous pressure readings.
- Do not locate the gauge near the pump, where gauge pressure might be lower than normal vacuum pressure.
- Do not locate the gauge near a gas inlet or other source of contamination, where inflow of gas or particulates causes atmospheric pressure to be higher than system atmosphere.

Figure 1 342 or 343 gauge orientation for horizontal mounting



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Figure 3 Dimensions of 343 pinched-off gauge

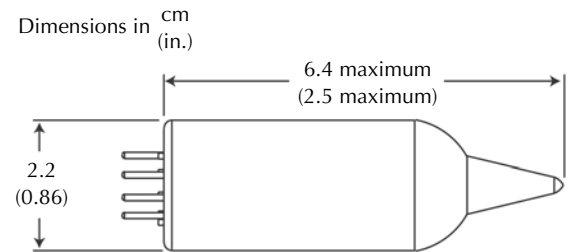
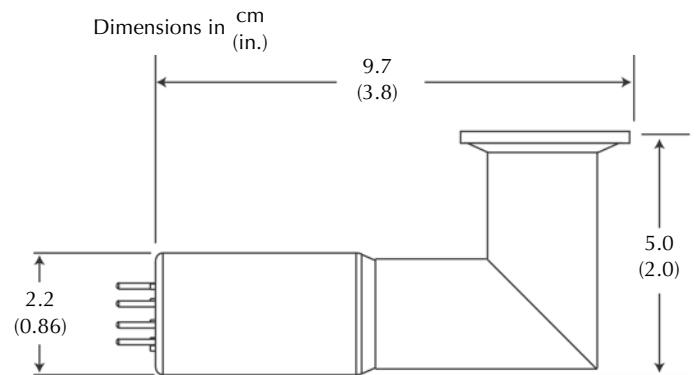


Figure 4 Dimensions of Mini-Ion gauge with NW16KF fitting and 90° elbow



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Connecting cable

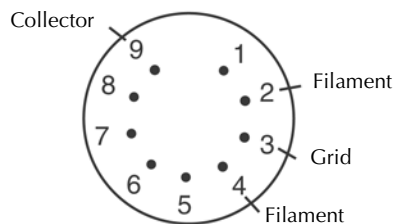
- Cable is user-supplied. Helix Technology does not supply cable.
- Cover gauge pins with connectors or pin covers. Do not use cables with exposed connectors such as alligator clips.
- Clamp all gauge cables to the vacuum station to minimize strain that will be transmitted to the gauge pins if the vacuum station and ionization gauge controller move relative to each other.

Gauge pins

Figure 5 illustrates the 9-pin miniature tube pinout.

- Pin diameter is 0.40 in. (10.15 mm); pin length is 0.27 in. (6.858 mm).
- Pins are numbered clockwise in ascending order.
- Table 2 lists pin designations.

Figure 5 9-pin miniature tube pinout



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Pressure measurement range for N₂ or air

342 triode gauge	5 x 10 ⁻⁷ to 5 x 10 ⁻² Torr 6.66 x 10 ⁻⁷ to 6.66 x 10 ⁻² mbar 6.66 x 10 ⁻⁵ to 6.66 Pa
343 Bayard-Alpert gauge	5 x 10 ⁻⁸ to 5 x 10 ⁻³ Torr 6.66 x 10 ⁻⁸ to 6.66 x 10 ⁻³ mbar 6.66 x 10 ⁻⁶ to 0.66 Pa

Typical accuracy

342 triode gauge	±15%
343 Bayard-Alpert gauge	-15% to +30%

Sensitivity for N₂ or air

342 triode gauge	6.2/Torr 8.2/mbar 826/Pa
343 Bayard-Alpert gauge	5.2/Torr 6.9/mbar 693/Pa

Electrical specifications

Filament voltage	1.5 to 3.5 V
Filament current	1.75 to 2.25 A
Grid voltage	120 to 250 VDC
Collector voltage	-20 to -50 V
Emission current	0 mA max., 2 mA or less recommended
Typical operating power	3 to 4 W

Mechanical specifications

Filament	Thoria coated iridium
Bulb material	Lime glass
Tube diameter	0.855 in. (21.59 mm) max. outside diameter
Tube length	2.8 in. (71.12 mm) max., including pins

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Table 2 Gauge pin designations

Pin number	Pin designation
2	Filament pin
3	Grid pin
4	Filament pin
9	Collector pin

Grounding

Make sure all exposed conductive parts of the gauge, controller, and vacuum chamber are properly grounded.

⚠ WARNING

Improper grounding could cause a high-voltage electrical discharge through a gas or plasma, resulting in severe product damage or serious personal injury.

Follow ground network requirements for the facility.

- Maintain all exposed conductors at earth ground.
- Make sure the vacuum port to which the gauge is mounted is properly grounded.
- Make sure all exposed conductive parts of the gauge, controller, and vacuum chamber are properly grounded.

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Series 342 and 343 Vacuum Gauge Installation Instructions



To obtain a copy of these instructions online, visit www.helixtechnology.com (Adobe® Reader® version 5.0 or higher required)

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