Granville-Phillips® Stabil-Ion® Module

Superior Stabil-Ion gauge performance in compact package.

Accurate vacuum pressure measurement from the 10^{-11} Torr range (10^{-11} mbar, 10^{-9} Pa)

Dual gauge filaments increase equipment uptime

Analog, RS-485, or DeviceNet interface

All metal design eliminates glass and provides high immunity to RF noise

Modular design allows for quick and easy gauge replacement

CE Compliant DeviceNet Version

Modular Stabil-Ion Gauge

Granville-Phillips vacuum gauge modules are an ideal solution for applications that do not need front panel displays and controls. These compact, convenient, and reliable modules mount the controller electronics directly on the gauge. The Stabil-Ion module makes available all the features and benefits of the Stabil-Ion gauge in a modular device. The Stabil-Ion module is available in analog, RS-485, or DeviceNet versions. The RS-485 version comes with one setpoint relay, and the DeviceNet version comes with two setpoint relays. These relays can be used for process control or safety interlocking. The DeviceNet version is also available with an optional display that provides local indication of vacuum system pressure. The Stabil-Ion module is part of the Granville-Phillips modular family of products that include the Mini-Convectron® module, Micro-Ion® module, and the Micro-Ion Plus module.

Stabil-Ion Gauge Technology

The stability, accuracy, and reliability of the Stabil-Ion gauge are the results of many years of testing and design. Stabil-Ion gauges are the only high vacuum process control gauge that do not change calibration over time. Its patented design is based on a number of enhancements including tensioned filaments, a precision-wound stress-relieved grid, and electrostatic shields. These enhancements result in an ionization gauge that is superior to all other designs in terms of accuracy, repeatability, and gauge-to-gauge reproducibility. The high measurement performance and rugged design of the Stabil-Ion gauge make it the gauge of choice for critical vacuum processes.

HELIX

Stabil-Ion Module Features and Benefits

Wide Measurement Range - Monitor vacuum system performance continuously from 1 x 10^{-9} to 2 x 10^{-2} Torr

Simple Modular Design - Electronics and sensor are combined in one compact, easy to install module. The gauge can be easily and quickly replaced without the need for tools.

Three Output Versions - The module is available with an analog output, without setpoints; RS-485 output, with one setpoint, or DeviceNet communications with two setpoints.

DeviceNet Network Power Flexibility - Gauge power can be supplied either through the DeviceNet micro connector or through a separate connector.

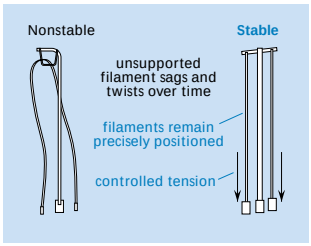
Process Setpoints - On those versions with process setpoints, these contact relays provide for control of other vacuum components or safety interlocking. The settings are stored in non-volatile memory.

Local Display DeviceNet Version - An easy-to-read LED display is available in the DeviceNet version, that provides point-of-use pressure indication. The display orientation can be electronically inverted for flexibility in mounting locations.

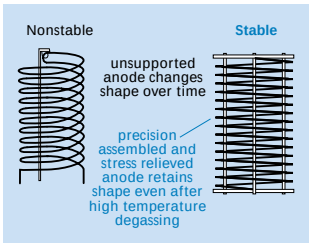
CE Compliant - the DeviceNet version is CE compliant.

Long-term, accurate measurement is assured by the unique design and careful manufacturing of the Stabil-Ion Gauges.

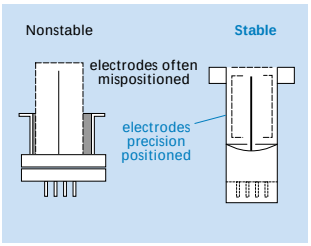
Here are the more important problems with older BA gauge designs that we removed in order to achieve accuracy over time and gauge-to-gauge. Sophisticated computer simulations of electron and ion trajectories helped greatly in identifying the causes of nonstable behavior.



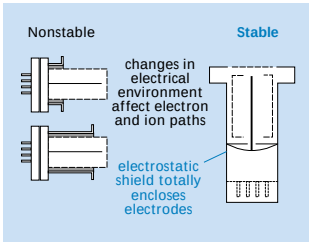
Filament must remain in position over time.



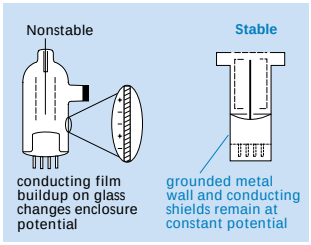
Anode must remain in position over time



Electrode position relative to wall must not vary gauge to gauge.



Electrical environment must not change.



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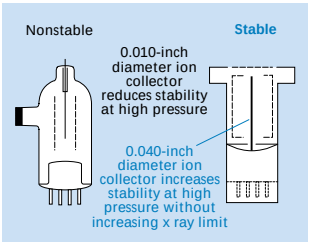
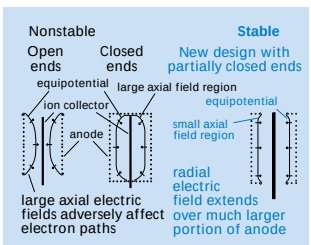
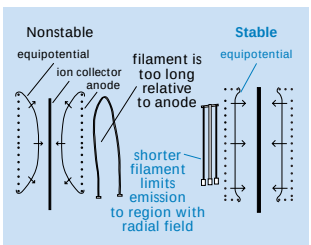


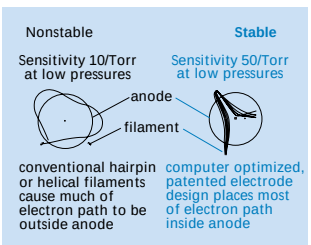
Ion space charge at high pressures must be minimized.



Axial electric fields must be minimized.



Electron emission must be limited to central region of anode.



Electron trajectories must be controlled.

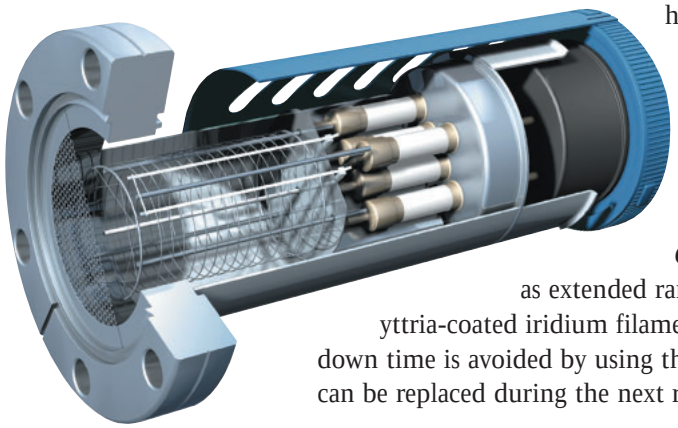
Stabil-Ion Gauge Features and Benefits

Rugged Stainless Steel Enclosure - Prevents grid and filament damage during mounting and eliminates the risk of glass breakage.

Tensioned Filaments - Stay precisely positioned to maintain calibration.

Electrostatic Shields - Completely surround the electrode structure - providing a stable, accuracy enhancing electrical environment.

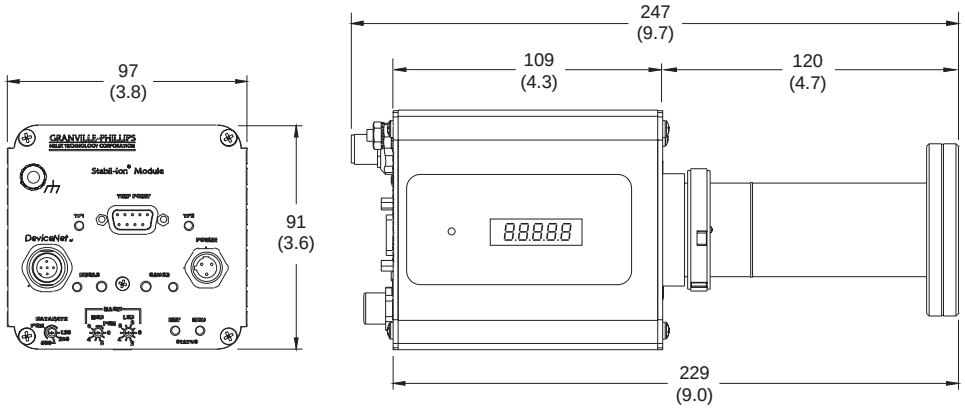
Precision-Wound, Stress-Relieved Grid - Retains its original shape even after high-temperature degassing, thus reducing measurement errors.



Vacuum Fired Components - The gauge is designed, constructed, and processed to minimize outgassing. The gauge is never touched by bare hands during manufacturing.

Choice of Range and Dual Filaments - Available as extended range or ultra-high vacuum, with burn-out resistant yttria-coated iridium filaments or corrosion resistant tungsten. Unscheduled down time is avoided by using the second filament as a back-up until the gauge can be replaced during the next routine maintenance cycle.

Dimensions



Dimensions are shown in millimeters (inches)

Technical Specifications

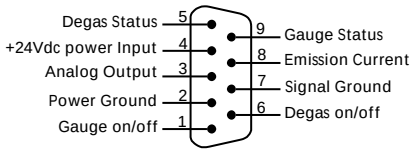
Measuring range for N_2 or air [1, 2]	
UHV gauge	
Torr	2×10^{-11} to 2×10^{-2}
mbar	3×10^{-11} to 3×10^{-2}
Pa	3×10^{-9} to 3
Extended range gauge	
Torr	2×10^{-10} to 2×10^{-2}
mbar	3×10^{-10} to 3×10^{-2}
Pa	3×10^{-8} to 3
Accuracy for N_2 [4]	±25% of reading from 1×10^{-8} to 1×10^{-4} Torr
Repeatability [5]	±3% of reading from 1×10^{-8} to 1×10^{-4} Torr
Emission currents	0.1 mA and 4.0 mA
X-ray limit [3]	
UHV	2×10^{-11} Torr; 3×10^{-11} mbar; 3×10^{-9} Pa
Extended range	2×10^{-10} Torr; 3×10^{-10} mbar; 3×10^{-8} Pa
Degas	Electron bombardment, 20W with 2-minute timer
Filament material	Tungsten or yttria-coated iridium
Operating temperature	0 °C to 40 °C ambient, non-condensing
Non-operating temperature	-40 °C to 70 °C
Gauge bakeout temperature	450 °C with electronics removed
Power	24Vdc ±15%, 75W maximum, 3.75 A at 20 Vac
Case material	Aluminum
CE compliance (DeviceNet only)	
EMC directive	89/336/EEC; EN 50081-2, EN 50082-2, EN 61326
Low voltage directive	73/23/EEC; EN 61010
Approximate weight	800 gm (1lbs, 12.5 oz)
Optional display [6]	3-digits plus exponent, green LED: Torr, mbar or Pa
Set-point relays [7]	Single-pole, double-throw (SPDT)
Contact rating	1A at 30 Vdc resistive, non-inductive
RS-485 version	One relay
DeviceNet version	Two relays
Materials exposed to gas	All vacuum fired, UHV compatible
Internal volume	73.0 cm^3, (4.45 $inch^3$) to the port screen

Notes:

1. Measurements will change with different gases and mixtures. Correction factors for common gases are provided in the instruction manual.
2. Stabil-Ion gauges are not intended for use with flammable or explosive gases.
3. The x-ray limit is the absolute lowest indication from the gauge. It is not practical to make repeatable measurements near the x-ray limit.
4. Accuracy (the difference between the gauge reading and a calibrated reference standard) is determined statistically and includes the combined performance of the gauge and electronics.
5. Repeatability refers to the ability of the same module to read the same pressure at different times.
6. Display available only with DeviceNet version.
7. Two relays with DeviceNet version, one relay with RS-485 version, and no relays with analog version.

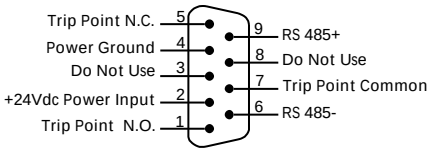
Analog Version

Output	1 volt/decade, logarithmic, 0-7 Vdc
Remote input signals	Gauge on/off, degas on/off, set by continuity to ground
Remote output signals	Gauge and degas status by open collector transistor



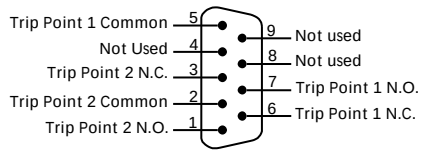
RS-485 Version

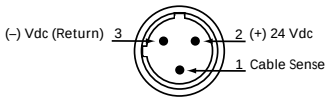
Data format	ASCII, 8 data bits, one stop-bit, no parity (default value)
Baud rates	1200, 2400, 4800, 9600, 19200, 38400
Adjustable parameters	Data format (baud rate, data bits, parity), trip point (value, direction), gauge on/off, degas on/off
Trip points	One

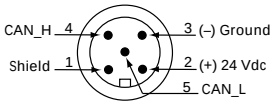


DeviceNet Version

Device type	Vacuum/pressure gauge device
Messaging	Polled I/O and explicit
Data rates	125K, 250K, or 500K switch selectable
Adjustable parameters	Trip points (value, direction, hysteresis), gauge on/off, degas on/off, measurement units
Trip points	Two







Ordering Information

Stabil-Ion Gauge Module

Select an output configuration, gauge filament type, gauge type, and measurement units to create the appropriate catalog number.

Stabil-Ion Gauge Module 347 ### - ## - #

Output Configuration

Analog output, no relays[1]	054
RS-485 output, one relay[1,2]	055
DeviceNet, no display	031
DeviceNet, digital display	032

Gauge Filament[3]

Yttria-coated iridium	Y
Tungsten	T

Gauge Type[2]

Extended range	E
UHV	U

Measurement units

Torr	T
mbar	M
Pa	P

[1] Analog and RS-485 modules available in Torr measurement units only. Conversion to mbar and pascal made by user externally with conversion factor.

[2] RS-485 version available for use with extended range gauge only.

[3] Tungsten Filament only available in DeviceNet version.

Ordering Example

To order a Stabil-Ion module with analog output, extended range gauge, with yttria-coated iridium filaments, and display in Torr, select catalog number 347054-YE-T.

Options

Accessory Power Supplies (for use with DeviceNet versions only) 347039 - #

North America 115Vac	1
North America 240 Vac	2
Universal Europe 220 Vac	3
United Kingdom 240 Vac	4

Configuration Tools

Call us or visit our website (www.helixtechnology.com) for software configuration tools available at no charge to help you set up your Granville-Phillips DeviceNet modules.

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 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).

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