



## IGM-402 Hornet Miniature-Ionization Vacuum Gauge Module with Dual Convection

**Ion gauge with space-saving built-in controller and display operates 3 different gauges.**

**Full chamber control from  $1 \times 10^{-9}$  Torr to atmosphere plus monitoring of your foreline.**

**Low cost of ownership: Significant cost reduction in controller, space, cabling costs and sensor replacement.**

**Built-in bright yellow digital OLED display for wide viewing angle, RS-485 digital interface, 3 set-point relays and 3 log-linear analog outputs.**

**Rugged and compact metal construction Ionization Gauge with dual hot filament design.**

**The first modular Ionization vacuum gauge capable of operating two Convection gauges.**



**IGM-402 Ionization Gauge with Dual Convection**

### InstruTech IGM-402 "Hornet" Modules

#### Technology

**Gauge:** The IGM-402 Miniature-Ionization vacuum gauge module provides the basic signal conditioning required to turn the gauge into a complete measuring instrument. It incorporates numerous design features to enhance performance and reduce cost. The electrometer auto zeroes to ensure that readings are not subject to temperature drift. This eliminates the need for unnecessary and expensive circuitry which further reduces the cost.

**Multiple Gauges :** The IGM-402 is capable of operating two external Convection vacuum gauges simultaneously.

**Full Range Measurement:** The IGM-402 can combine the vacuum measurement from the Ion gauge and a Convection gauge to provide full range measurements from  $1 \times 10^{-9}$  Torr to atmosphere, or simply operate the Ion gauge and the two Convection gauges as individual gauges.

**Display:** The standard built-in bright yellow OLED display provides a convenient user interface for setup and operation of the vacuum gauges. The display screen can show all three measurements on the same screen or display them sequentially. Service screens can diagnose filament problems and monitor the filament life. Warnings will be displayed for all fault conditions.

**Operation:** The operation of the gauge including Degas, filament on/off and emission current is set by using digital inputs, via RS485 or the front panel push buttons.

**Sensor:** Dual Yttria Coated Iridium filaments are offered for general vacuum applications. The optional dual Tungsten filaments are available for use in applications not compatible with Yttria filaments such as those gases containing chlorine, fluorine, etc.

#### Low Cost of Ownership

**Controller:** The compact modular design with the built-in Controller and display operates three different gauges without requiring expensive external Controllers.

**Space:** No rack space required. The Modular design negates the need for expensive and limited rack space.

**Cabling Cost:** The cabling cost to connect a nude/glass Ionization gauge to a rack-mount Controller can be excessive and installation is time consuming. With the IGM-402 no Ion gauge cable is required and one 10-ft Convection gauge cable is included.

**Sensor Replacement:** Full range combination gauges provide full measurement range from atmosphere to high vacuum with multiple sensors built into one assembly. A sensor failure may require replacement of the entire sensor assembly often approaching 50% of the initial cost of the vacuum gauge itself.

The IGM-402 provides an alternative to these gauges by combining the vacuum measurements from the Ion gauge and one of the Convection gauges to provide a full range measurement gauge. A sensor replacement requires only the replacement of the damaged sensor and not all the other sensors at once.

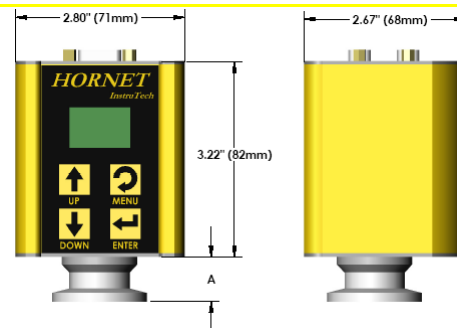
The IGM-402 Ion gauge sensor assembly can be easily replaced in the field by simply removing four socket head cap screws.

**Additional Point of Use:** In addition to one Ion gauge and one Convection gauge, the IGM-402 can provide vacuum measurements from a second Convection gauge without the need for another expensive Controller. This results in significant cost savings for monitoring the foreline or an additional point of use.

## Specifications

measurement range:	Ionization	$1 \times 10^{-9}$ to $5 \times 10^{-2}$ Torr / $1.3 \times 10^{-9}$ to $6.7 \times 10^{-2}$ mbar / $1.3 \times 10^{-7}$ to 6.7 Pa
	Convection	$1 \times 10^{-4}$ to 1000 Torr / $1 \times 10^{-4}$ to 1333 mbar / $1 \times 10^{-2}$ Pa to 133 kPa
	used as a full range measurement gauge	$1 \times 10^{-9}$ to 1000 Torr / $1.3 \times 10^{-9}$ to 1333 mbar / $1.3 \times 10^{-7}$ Pa to 133 kPa
display		OLED graphical display, 3 digits plus 2 digits exponent, bright yellow
functionality		Ionization gauge can operate up to 2 Convection gauges
materials exposed to gases		Dual Filaments: Yttria Coated Iridium or optional Tungsten Ion Collector: Tungsten Grid: Tantalum Others: 316/304 SS, Glass, Nickel
sensitivity		Factory pre-set. Also user adjustable between 2 to 99.
X ray limit		$< 5 \times 10^{-10}$
emission current		100 uA, 4 mA
degas		3 Watts e-beam
overpressure protection		Gauge turns off at factory default setting of $5 \times 10^{-2}$ Torr
internal gauge volume		$1.0 \text{ in}^3$ ( $16.4 \text{ cm}^3$ )
operating temperature		0 to + 40° C
bakeout temperature		200° C (sensor only - electronics removed)
humidity		0 to 95% RH non-condensing
weight		0.6 Lbs (0.27 kg) with NW25 KF flange
mounting orientation		Any
digital interface		RS485
analog outputs (3 total)	Ionization gauge	One log-linear 0 to 9 Vdc, 1 V/decade or one log-linear 0.5 to 7 Vdc, 0.5 V/decade when used as a full range gauge with one Convection gauge
	Convection vacuum gauges 1 & 2	Two log-linear 1-8 Vdc, 1 V/decade or non-linear 0.375 to 5.659 Vdc
setpoint relays (3 total)		Three single-pole, double-throw (SPDT), 1A at 30 Vdc resistive, 0.3 A at 125 Vac non-inductive. Adjust setpoints using front panel push buttons or RS-485
status outputs		Degas & filament on/off status are determined by an open collector transistor or via RS485 digital communications protocol
input signal/controls		Degas and filament on/off & emission current are set by continuity to ground using digital inputs, via RS485 or manually via front panel push buttons
filament selection		User selectable between filament 1 or 2 using the front panel push buttons or via RS485 commands
input Power		20 to 28 Vdc, 15 W
I/O Connector		(2) 9-pin D-Sub, (2) terminal blocks, (2) Convection gauge connectors
Convection gauge compatibility		InstruTech Worker Bee CVG101 or Granville Phillips 275 Convector®
Convection gauge specifications		Refer to InstruTech Worker Bee CVG101 data sheet
RF/EMI protection		CE compliant

Fitting	dimension A
NW16KF	1.45" (37mm)
NW25KF	1.45" (37mm)
NW40KF	1.45" (37mm)
1-1/3" Mini CF	1.85" (47 mm)
2-3/4" Conflat®	1.70" (43 mm)



## Ordering Information

## Part Numbers

IGM-402 Module With Fitting:	W. Yttria Filaments	W. Tungsten Filaments	Convection Gauge Cable Assembly	Replacement Ion Sensors	
				Yttria	Tungsten
NW16KF	IGM402YBD	IGM402TBD	HB431-1-3F (3-FT)	IG4YB	IG4TB
NW25KF	IGM402YCD	IGM402TCD	HB431-1-10F (10-FT)	IG4YC	IG4TC
NW40KF	IGM402YDD	IGM402TDD	HB431-1-25F (25-FT)	IG4YD	IG4TD
1-1/3" / NW 16CF Mini- Conflat®	IGM402YED	IGM402TED	HB431-1-50F (50-FT)	IG4YE	IG4TE
2-3/4" CF / NW35CF Conflat®	IGM402YFD	IGM402TFD	> 50 ft – Consult Factory	IG4YF	IG4TF

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Conflat® is a registered trade mark of Varian Vacuum Technologies.



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