Pirani Gauge Enhanced – Passive

PGE050

The INFICON Pirani Gauge Enhanced 050 (PGE050) is the passive version of our active convection enhanced Pirani gauges PGE300 and PGE500. Equipped with the same sensor technology, the PEG050 works in conjunction with our VGC031 passive gauge controller unit to produce the same higher accuracy readings in the measurement range between 100 to 1000 mbar.
With its wider measuring range and higher accuracy, especially at lower pressures, the PGE050 is the first choice when replacing thermocouple gauges in your vacuum system. The rugged gauge and sensor design makes the PGE050 a high value/low cost of ownership choice and qualifies this gauge for many applications where an economical vacuum measurement form low to high vacuum range is required.

Advantages

- Convection Enhanced Pirani Technology for wide measurement range and higher accuracy near atmosphere
- Gold plated tungsten filament
- Mechanical strengh, highly robust and less susceptible to mechanical shock and vibration
- Choice of flange options
- Compliance & standards: CE, RoHS
- Direkt drop in replaces Granville-Phillips® Convectron® gauge sensor (same plug/ pinouts)
- PGE050 accepts Granville-Phillips® Convectron® controllers, cables and modules
- Ideal gauge sensor for upgrading your installed thermocouple gauges

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

Ordering Information

Type	MPG400 Tungsten gold-plated
DN 16 ISO-KF	352-500
DN 25 ISO-KF	352-501
DN 40 ISO-KF	352-502
DN 16 CF-R	352-503
DN 40 CF-R	352-504
4 VCR female	352-505
8 VCR female	352-506
1/8" NPT	352-507

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PEG050 (continued)

Specifications

Type		PEG050
Filament		Tungsten gold-plated
Measurement range	mbar	1.3×10^{-4} ... 1333
	Torr	1×10^{-4} ... 1000
	Pa	1.3×10^{-2} ... 133000
Accuracy (N_2) [1]		
1.3×10^{-4} ... 1.3×10^{-3} mbar		0.1×10^{-3} mbar resolution
1.3×10^{-3} ... 530 mbar	% of reading	±10
530 ... 1333 mbar	% of reading	±2.5
1×10^{-4} ... 1×10^{-3} Torr		0.1 mTorr resolution
1×10^{-3} ... 400 Torr	% of reading	±10
400 ... 1000 Torr	% of reading	±2.5
Repeatability (N_2) [1]	% of reading	±2
Temperature		
Operation (ambient)	°C	0 ... +50
Bakeout [2]	°C	≤150
Materials exposed to vacuum		gold-plated tungsten, 304 & 316 stainless steel, glass, nickel, Teflon®
Internal volume	cm³ (in.³)	26 (1.589)
Internal surface area	cm² (in.²)	59.7 (9.25)
Weight	g (oz)	85 (3)

[1] typically
[2] non-operating, with electronics cable detached

Dimensions

mm (in.)

Dimension A	mm	(in)
DN 16 ISO-KF	33	(1.3)
DN 25 ISO-KF	33	(1.3)
DN 40 ISO-KF	33	(1.3)
DN 16 CF-R	27.4	(1.08)
DN 40 CF-R	37.3	(1.47)
4 VCR female	47.2	(1.86)
8 VCR female	44.5	(1.75)
1/8" NPT male	25.4	(1)

Vacuum Gauge Controller

VGC031

The INFICON Vacuum Gauge Controller 031 (VGC031) is designed for use in conjunction with the INFICON Pirani Gauge Enhanced 050 (PGE050) and acts as a convenient power supply, control and readout. VGC031 and PGE050 are a felxible combination to monitor your vacuum system in the range from 1.3×10^{-4} up to 1333 mbar (1×10^{-4} up to 1000 Torr). The VGC031 with its space saving panel mount housing supports a variety of technical features as 2 set point relays, 4 user selectable analog outputs and offers additionally RS232 / RS485 digital interfaces. The bright, sharp and clear OLED display with the integrated keypad user interface rounds out this user friendly vacuum gauge controller package. The rugged industrial design makes the VGC031 in combination with the convection enhanced PGE050 gauge sensor a very good choice for many vacuum applications were economical vacuum measurement from low to high vacuum range is required.

Advantages

- Display's and controls wide measurement range from 1.3×10^{-4} up to 1333 mbar (1×10^{-4} up to 1000 Torr).

- Bright digital OLED display with keypad for simple set up and operation

- 4 user selectable analog output signals

- 2 set point relays

- RS232 / RS485 digital interface

- Space saving design - 1/8-Din panel mount housing for rack mount installation or as standalone unit

- Powered through user supplied 12 to 28 V (dc) or by INFICON's VGC031 Power SUpply

- Compliance & standards: CE, RoHS

- VGC031 controller and PGE050 convection enhanced vacuum gauge sensor and cable can direct drop in replace Granville-Phillips® 375 and 475 controllers and 275 Convectron® gauge sensors and gauge cable (Remote interface, relay and power connectors are different)

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

Ordering Information

Type	VGC031
	399-570

VGC031 – continued

Accessories

Gauges	PGE050 (see PEG050)
Power supply for VGC031 [1]	399-575
Cable VGC031 to PGE050 in m (ft) [2]	
3 (10)	399-580
8 (25)	399-581
15 (50)	399-582
Mating connector kit for PGE050	399-591

[1] The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide
[2] Other length on request

Specifications

Type		VGC031
Measurement channels		1
Display		OLED
Display update rate	1/s	0.5s
Connectable gauge with display range		
PGE050 (see PGE050)	mbar	$1.3 \times 10^{-4} \ldots 1333$
	Torr	$1 \times 10^{-4} \ldots 1000$
	Pa	$1.3 \times 10^{-2} \ldots 133000$
Connector	gauge	9-pin D-Sub female [1]
	analog output, serial interface	9-pin D-Sub male
	relay outputs	6-pin pluggable terminal block [2]
	power	2-pin pluggable terminal block [2]
Measurement unit (selectable)		mbar, Torr, Pa
Setpoint relay		2 (single-pole double-throw relays (SPDT))
		1 A at 30 V (dc) resistive, or V (ac) non-inductive
Analog output		
Range (selectable)	V (dc)	0 … 7 or 1 … 8 (log-linear, 1 V/decade)
	V (dc)	0 … 10 (linear)
	V (dc)	0.375 … 5.659 (non-linear S-curve)
	V (dc)	0 … 9 (non-linear S-curve)
Interface (digital)		RS232, RS485
Supply voltage	V (dc)	+12 … +28 [3]
Temperature		
Operation (ambient)	°C	0 … 40
Storage	°C	−40 … +70
Housing		1/8-DIN panel-mount enclosure (aluminum extrusion)
Weight	g (oz)	250 (9)

[1] mating connector provided as part of the gauge cable
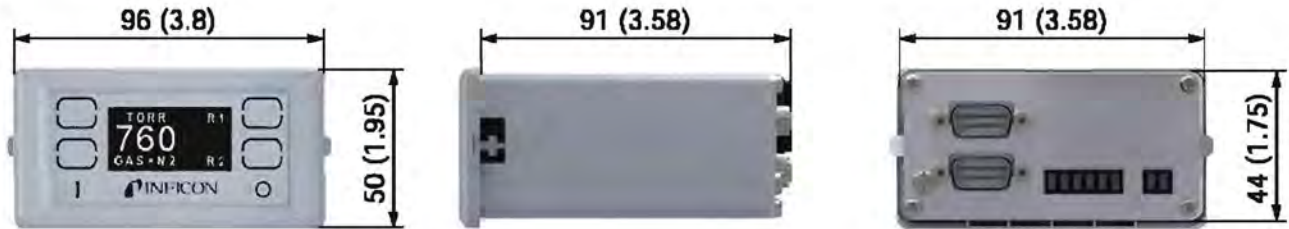[2] mating connector included
[3] 2 W protected against power reversal and transient over-voltages

VGC031 – continued

Dimensions

mm (in.)

Accessories

Power supply for VGC031 [1]			352-575
Input power:	V (ac)		100 ... 240
Output power:	V (dc)		+24
Cable length:	m (ft)		2 (6)

[1] The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide

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Bayard Alpert Vacuum Gauge Heads – Passive

BAG050, BAG051, BAG052, BAG053

The INFICON Bayard-Alpert passive vacuum gauge heads BAG050, BAG051, BAG052 and BAG053 are designed for use with the INFICON Vacuum Gauge Controller VGC083A & VGC083B. Yttria coated iridium filaments are offered for general vacuum applications in air and inert gases such as N_2 and argon. Select tungsten filaments for gases that are not compatible with yttria coated iridium filaments. BAG05x gauges may also be operated with compatible vacuum gauge controllers from other manufacturers. The INFICON passive Bayard-Alpert ionization vacuum gauges (BAG05x) are offered in three different configurations: BAG050 is a EB-degas UHV nude ionization vacuum gauge capable of pressure measurement as low as 2×10^{-11} Torr

BAG051 is a resistive degas (I^2R) nude ionization vacuum gauge capable of pressure measurement as low as 4×10^{-10} Torr

BAG052 and BAG053 are resistive degas (I^2R) glass enclosed ionization vacuum gauges capable of pressure measurement as low as 4×10^{-10} Torr.

Advantages

- Reliable and proven gauge head design
- Drop in for most nude hot ion guage heads
- Wide range of emission currents (100 µA to 10 mA)
- Available with single / dual yttria coated iridium and dual tungsten filament cathode assemblies
- Degas: All models can be degased using EB (electron bombardment).
  BAG051, BAG052 and BAG053 can also be degased using resistive degas (I^2R)

Applications

- UHV and research
- Industrial coating
- General vacuum measurement and control in the low to ultra high vacuum range

BAG050, BAG051, BAG052, BAG053 (continued)

Ordering Information BAG050 HOT ION GAUGE

Type	BAG050
BA nude EB-degas, DN40CF, **dual iridium** filament (Ir)	399-720
BA nude EB-degas, DN40CF, **dual tungsten** filament (W)	399-721
Spare **dual iridium** filament (Ir)	399-730
Spare **dual tungsten** filament (W)	399-731

Ordering Information BAG051 HOT ION GAUGE

Type	BAG051
BA nude I²R, DN40CF, **single iridium** filament (Ir)	399-725
BA nude I²R, DN40CF, **dual iridium** filament (Ir)	399-726
BA nude I²R, DN40CF, **dual tungsten** filament (W)	399-727
Spare **V-iridium** filament (Ir)	399-735
Spare **dual iridium** filament (Ir)	399-736
Spare **dual tungsten** filament (W)	399-737

Ordering Information BAG052 HOT ION GAUGE

Type	BAG052
BA glass I²R, **¾" Kovar metal inlet port**, single iridium filament (Ir)	399-740
BA glass I²R, **1" Kovar metal inlet port**, single iridium filament (Ir)	399-741
BA glass I²R, **¾" glass inlet port**, single iridium filament (Ir)	399-742
BA glass I²R, **1" glass inlet port**, single iridium filament (Ir)	399-743
BA glass I²R, **DN25KF**, single iridium filament (Ir)	399-744
BA glass I²R, **DN40KF**, single iridium filament (Ir)	399-745
BA glass I²R, **DN16CF**, single iridium filament (Ir)	399-746
BA glass I²R, **DN40CF**, single iridium filament (Ir)	399-747

Ordering Information BAG053 HOT ION GAUGE

Type	BAG053
BA glass I²R, **¾" Kovar metal inlet port**, dual tungsten filament (W)	399-750
BA glass I²R, **1" Kovar metal inlet port**, dual tungsten filament (W)	399-751
BA glass I²R, **¾" glass inlet port**, dual tungsten filament (W)	399-752
BA glass I²R, **1" glass inlet port**, dual tungsten filament (W)	399-753
BA glass I²R, **DN25KF**, dual tungsten filament (W)	399-754
BA glass I²R, **DN40KF**, dual tungsten filament (W)	399-755
BA glass I²R, **DN16CF**, dual tungsten filament (W)	399-756
BA glass I²R, **DN40CF**, dual tungsten filament (W)	399-757

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BAG050, BAG051, BAG052, BAG053 (continued)

Specifications (Torr based standard products)

Typ		BAG050	BAG051	BAG052	BAG053
Measurement range	mbar	$2.7 \times 10^{-11} \dots 1.3 \times 10^{-3}$		$5.3 \times 10^{-10} \dots 1.3 \times 10^{-3}$	
	Torr	$2 \times 10^{-11} \dots 1 \times 10^{-3}$		$4 \times 10^{-10} \dots 1 \times 10^{-3}$	
	Pa	$2.7 \times 10^{-9} \dots 1.3 \times 10^{-1}$		$5.3 \times 10^{-8} \dots 1.3 \times 10^{-1}$	
Accuracy (N$_2$)	%			20	
X-ray limit	Torr	2×10^{-11}		4×10^{-10}	
Sensitivity (N$_2$)	Torr	25^{-1}		10^{-1}	
Degas					
EB (electr. bombardment)	W	≤40	70 nominal, ≤100	≤100	
I^{2}R (resistance heated)		-		6.3 ... 7.5 V (ac) at 10 A	
Filament					
Current	A	2.5 ... 3.5		4 ... 6	
Voltage	V (dc)	3 ... 5		3 ... 5	
Potential	V (dc)	+30		+30	
Grid potential	V (dc)			+180	
Collector potential	V			0	
Bakeout temperature	°C			450	
Collector		tungsten (W), ø0.005"		tungsten (W), ø0.010"	
Filament		dual iridium (Ir), or dual tungsten (W)	single hairpin iridium (Ir) or dual hairpin iridium (Ir), or dual tungsten (W)	single hairpin iridium (Ir)	dual hairpin tungsten (W)
Grid		photo etched closed grid		non-sag double helical 0.025" tungsten (W) grid	
Insulator		ceramic		glass to metal	
Glass envelope		-		2 1/4" dia x 5" long	
Mounting orientation				any	
Length					
Overall	in.	4 1/8		6	
Insertion	in.	3		-	
Flange		2 ¾" CF / NW35CF Conflat		¾" Kovar metal port 1" Kovar metal port ¾" glass port 1" glass port NW25KF NW40KF 1 1/3" / NW16CF Mini-Conflat 2 ¾" CF / NW35CF Conflat	
Flange material		stainless steel 304		glass Nonex 7720	

Vacuum Gauge Controller

VGC083A, VGC083B

The INFICON Vacuum Gauge Controller VGC083 is designed for use with passive gauge heads BAG05x and PGE050 in a fixed combination of two PGE050 gauges and one BAG05x gauge. The VGC083 controlls and monitors vacuum pressure from ATM down to 2.7×10^{-11} mbar using the BAG and PGE gauges. Six (6) single-pole relays assignable to any of the gauge heads along with RS232 and RS485 interfaces aid in system integration. The rugged industrial design of the VGC083 in combination with the passive gauge heads provide a reliable and economical system for vacuum applications requiring a wide vacuum measurement range.

Advantages

- Simple operation with special OLED display for parameter, sensor or general settings with softkeys
- Very bright and clear LED display for long distance vacuum pressure read-out
- Three analog outputs, user assignable to any of the gauges
- Degas electron bombardment or I²R resistive heating for gauge conditioning depending on gauge head type
- Remote digital I/O sensor & emission on/off
- Sensor 1 can be automatically turned on/off from sensor 2 or 3
- Three definable setpoints per channel with adjustable hysteresis
- RS232 / RS485 serial communication
- 6 assignable single pole double through setpoint relays
- Ion gauge overpressure protection
- Alternative active gauge use
- User selectable filament
- Direct drop in replaces Granville-Phillips® 307 Bayard-Alpert Gauge Controller

Ordering Information

Type	VGC083A	VGC083B
Vacuum Gauge Controller	399-700	399-701
Power supply VGC083A/B	399-710	399-710
Rack mount adapter one VGC083A/B	399-714	399-714
Rack mount adapter two VGC083A/B	399-715	399-715

VGC083A, VGC083B (continued)

Specifications

Type		VGC083A	VGC083B
Measurement channels		3	
Display			
Pressure indication		LED - 3 independent pressure display channels	
Programming & set-up screen		OLED	
Connectable gauges with display range			
PGE050	mbar/Torr	$1.3 \times 10^{-4} \ldots 1333 / 1 \times 10^{-4} \ldots 1000$	$1.3 \times 10^{-4} \ldots 1333 / 1 \times 10^{-4} \ldots 1000$
BAG050	mbar/Torr	$2 \times 10^{-11} \ldots 1.3 \times 10^{-3} / 2 \times 10^{-11} \ldots 1 \times 10^{-3}$	-
BAG051	mbar/Torr	-	$4 \times 10^{-10} \ldots 1333 / 4 \times 10^{-10} \ldots 1000$
BAG052, BAG053	mbar/Torr	-	$4 \times 10^{-10} \ldots 1333 / 4 \times 10^{-10} \ldots 1000$
Sensor 1 over pressure protection		turns hot ion gauge off at the following factory default settings	
		1×10^{-3} Torr at 100 μA emission current	
		5×10^{-4} Torr at 4 μA emission current	
		1×10^{-4} Torr at 10 μA emission current	
Connectors	BAG supply	CPC [1]	
	BAG col	BNC [1]	
	PGE050	D-sub, 9 p-pin female	
	Remote digital I/O	D-sub, 9 p-pin male	
	RS232	D-sub, 9 p-pin female	
	RS485	D-sub, 9 p-pin male	
	Analog out	2 pole pluggable	
	Analog in	3 pole pluggable	
	Relay	each 3 pole pluggable	
	DC power	3 pole pluggable	
		terminal block, mating connectors included	
Measurement unit (selectable)		mbar (default), Torr, Pa	
Setpoint relays		6 single-pole double-throw relays (SPDT), user assignable to any of the gauges	
Contact rating		5 A at 30 V (dc), 5 A at 250 V (ac), resistive load	
Analog output			
BAG analog output	V (dc)	0 ... 10 (log-linear, 1 V/decade)	
	V (dc)	1.7 ... 9.3 (nominal 1.8 ... 8.7 (log-linear, 0.8 V/decade)	
	V (dc)	0 ... 10 (linear, usable over 3 decades)	
Combination BAG & PEG analog	V(dc)	0.5 ... 7 (log-linear, 0.5 V/decade)	
PEG analog output	V (dc)	1 ... 8 (log-linear, 1 V/decade)	
	V (dc)	0 ... 7 (log-linear, 1 V/decade)	
	V (dc)	0 ... 10 (linear, usable over 3 decades)	
	V (dc)	0.375 ... 5.659 (non-linear, S-curve usable over 3 decades)	
Interface (digital)		RS232, RS485 [2]	
Supply voltage (external)	V (dc)	+20 ... +28 [3]	
Temperature			
Operation (ambiance)	°C	+0 ... +40	
Storage	°C	-40 ... +70	
Humidity		0 ... 95% relative humidity, non-condensing	
Housing		aluminium housing	
Weight	kg / lb.	0.7 / 1.7	

[1] Gauge cable assemblies provided by INFICON
[2] Command protocol compatibility with GP307
[3] 200 W protected against power reversal and transient over-voltages

VGC083A, VGC083B (continued)

Connectable Gauges

	VGC083A	VGC083B
BAG050 Hot Ion Gauge		
BA nude EB-degas, DN40CF, **dual iridium** filament (Ir)	399-720	–
BA nude EB-degas, DN40CF, **dual tungsten** filament (W)	399-720	–
BAG051 Hot Ion Gauge		
BA nude I²R, DN40CF, **single iridium** filament (Ir)	–	399-725
BA nude I²R, DN40CF, **dual iridium** filament (Ir)	–	399-726
BA nude I²R, DN40CF, **dual tungsten** filament (W)	–	399-727
BAG052 Hot Ion Gauge		
BA glass I²R, ¾" Kovar metal inlet port, single iridium filament (Ir)	–	399-740
BA glass I²R, 1" Kovar metal inlet port, single iridium filament (Ir)	–	399-741
BA glass I²R, ¾" glass inlet port, single iridium filament (Ir)	–	399-742
BA glass I²R, 1" glass inlet port, single iridium filament (Ir)	–	399-743
BA glass I²R, **DN25KF**, single iridium filament (Ir)	–	399-744
BA glass I²R, **DN40KF**, single iridium filament (Ir)	–	399-745
BA glass I²R, **DN16CF**, single iridium filament (Ir)	–	399-746
BA glass I²R, **DN40CF**, single iridium filament (Ir)	–	399-747
BAG053 Hot Ion Gauge		
BA glass I²R, ¾" Kovar metal inlet port, dual tungsten filament (W)	–	399-750
BA glass I²R, 1" Kovar metal inlet port, dual tungsten filament (W)	–	399-751
BA glass I²R, ¾" glass inlet port, dual tungsten filament (W)	–	399-752
BA glass I²R, 1" glass inlet port, dual tungsten filament (W)	–	399-753
BA glass I²R, **DN25KF**, dual tungsten filament (W)	–	399-754
BA glass I²R, **DN40KF**, dual tungsten filament (W)	–	399-755
BA glass I²R, **DN16CF**, dual tungsten filament (W)	–	399-756
BA glass I²R, **DN40CF**, dual tungsten filament (W)	–	399-757
PGE050 Pirani Gauge Enhanced		
Pirani Gauge, **DN 16 ISO-KF**, tungsten filament (W)	352-500	352-500
Pirani Gauge, **DN 25 ISO-KF**, tungsten filament (W)	352-501	352-501
Pirani Gauge, **DN 40 ISO-KF**, tungsten filament (W)	352-502	352-502
Pirani Gauge, **DN 16 CF-R**, tungsten filament (W)	352-503	352-503
Pirani Gauge, **DN 40 CF-R**, tungsten filament (W)	352-504	352-504
Pirani Gauge, **4 VCR female**, tungsten filament (W)	352-505	352-505
Pirani Gauge, **8 VCR female**, tungsten filament (W)	352-506	352-506
Pirani Gauge, **1/8" NPT**, tungsten filament (W)	352-507	352-507

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VGC083A, VGC083B (continued)

Accessories

Cable to VGC083A/B for	BAG050/051 200 °C	BAG050/051 50 °C	BAG052/053 50 °C	PGE050 50 °C
3 m (9.0 ft)	399-770	399-780	399-790	399-580
8 m (25.0 ft)	399-771	399-781	399-791	399-581
15 m(50.0 ft)	399-772	399-782	399-792	399-582

Other lengths on request

Dimensions

VGC083A, VGC083B   mm (in.)

Threaded Male PEM Stud
(10 - 32 × 0.4 in.) × 4
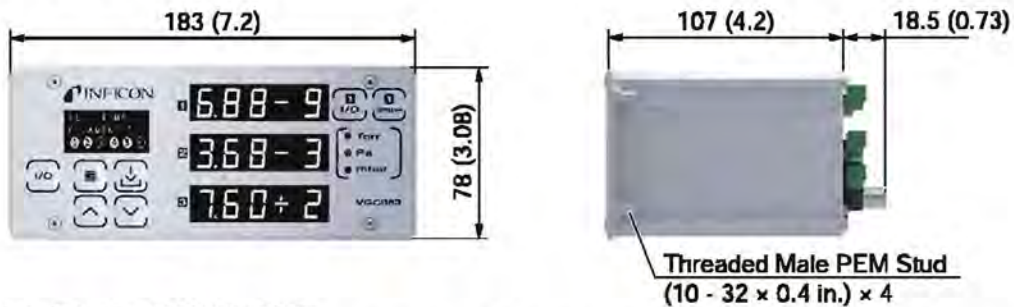
Optional rack mount adapter for one VGC083A, VGC083B
Optional rack mount adapter panel (aluminium - power paint finish) for installation of one VGC083A/B as a left-mount or a right-mount in a 2U, 19 inch wide rack.

Optional rack mount adapter for two VGC083A, VGC083B
Optional rack mount adapter panel (aluminium - power paint finish) for installation of two VGC083A/B side-by-side in a 2U, 19 inch wide rack.