



# TripleGauge® BCG450

## Bayard-Alpert Pirani Capacitance Diaphragm Gauge

The INFICON Bayard-Alpert Pirani Capacitance Diaphragm Gauge, BCG450, combines the advantages of three different technologies in a single, compact, economical package to measure process and base pressure from  $5 \times 10^{-10}$  to 1500 mbar ( $3.75 \times 10^{-10}$  to 1125 Torr). The BCG450 is designed to take the place of three sensors (hot ion, convection enhanced Pirani and vacuum switch), thus reducing cost and valuable tool space.

### ADVANTAGES

- BCG450 saves cost and tool space and reduces the complexity of vacuum measurement installation and setup
- Gas-type-independent pressure measurement above 10 Torr provides more reliable loadlock control for any gas mixture
- Pirani interlock protects the hot filament from premature burnout
- Automatic high vacuum Pirani adjustment reduces operator interventions
- Differential pressure measurement at atmosphere eliminates uncertainty related to atmospheric pressure changes
- Easy-to-exchange sensing element with on-board calibration data guarantees reproducibility
- Optional graphic display and Fieldbus interfaces available

### APPLICATIONS

- Pressure measurement in Semiconductor process, transfer and loadlock chambers
- Industrial coating
- General vacuum measurement and control on systems in the low to ultra high vacuum range



2004 Award Winner



TripleGauge  
Bayard-Alpert  
Pirani Capacitance

### ORDERING INFORMATION

Type	BCG450 without LCD display	BCG450 with LCD display	BCG450-SP with Profibus DP <sup>2)</sup>	BCG450-SD with DeviceNet <sup>2)</sup>	BCG450-SR with RS485 <sup>1), 2)</sup>
DN 25 ISO-KF	353-550	353-552	353-554	353-557	353-559
DN 40 CF-R	353-551	353-553	353-556	353-558	353-560
Replacement sensor 25 ISO-KF	354-492	354-492	354-492	354-492	354-492
Replacement sensor 40 CF-R	354-493	354-493	354-493	354-493	354-493

<sup>1)</sup> on request

<sup>2)</sup> not available with LCD display

### ACCESSORIES

Power supply 24V DC / RS 232 C line	353-511
Baffle	353-512
Centering ring with baffle	211-113

## SPECIFICATIONS

			<b>BCG450 Standard</b>	<b>BCG450 Display</b>
Measurement range	mbar (Torr)		$5 \times 10^{-10}$ ... 1500	$(3.75 \times 10^{-10}$ ... 1125)
Accuracy	$10^{-8}$ ... $10^{-2}$ mbar	% of reading	±15	
	$10^{-2}$ ... 50 mbar	% of reading	±15	
	50 ... 950 mbar	% of reading	±5	
	950 ... 1050 mbar	% of reading	±2.5	
Repeatability	$10^{-8}$ ... $10^{-2}$ mbar	% of reading	5	
Hot ion emission on (selectable high / low, via RS232 / Fieldbus)	mbar		$2 \times 10^{-2}$ (high)	
	mbar		$8 \times 10^{-3}$ (low)	
Degas <sup>1)</sup> $p < 7.2 \times 10^{-6}$	mbar		electron bombardment, max. 3 min	
Pressure, max.	bar (absolute)		5	
Temperature				
Operation (ambient)	°C		0 ... +50	
Storage	°C		-20 ... +70	
Bakeout				
At flange	°C		80	
Electronics removed	°C		150	
Supply voltage	V / A DC		20 ... 28 / 0.8	
Output signal analog	V		0 ... 10.3	
Measurement range	V		0.774 ... 10.3	
Relation voltage / pressure	V / Decade		0.75	
Error signal	V		0.3 / 0.5	
Minimum load	kΩ		10	
Interface (digital) <sup>2)</sup>			RS232C	
Connector			D-sub, 15 pin, male	
Cable length, max. <sup>3)</sup>	m (ft)		100 (330)	
Materials exposed to vacuum			Yt <sub>2</sub> O <sub>3</sub> , Ir, Mo, Cu, W, NiFe, NiCr, Al <sub>2</sub> O <sub>3</sub> , SnAg, stainless steel, glass	
Internal volume KF / CF	cm <sup>3</sup> (inch) <sup>3</sup>		24 (1.46) / 34 (2.1)	
Weight KF / CF	g		285 / 550	
Protection type			IP30	

<sup>1)</sup> Reduced accuracy during degas

<sup>2)</sup> Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed

<sup>3)</sup> For RS232C operation <30m

## SPECIFICATIONS

			<b>BCG450-SP Profibus DP</b>
Baud rates	kBaud		9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud		1.5 / 12
Address			2 switches (address 00 - 127) or network programmable
Digital functions			read pressure, select units: Torr, mbar, Pa degas function monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions			0 ... 10 V analog output pressure indication two setpoint relays A + B
Setpoint relays			2
Range	mbar		$1 \times 10^{-9}$ ... 1400
Relay contact			n.o., potential free
Hysteresis	% of reading		10
Contact rating	V / A DC		60 / 0.5
Connector for Profibus DP			D-sub, 9 pin, female
Connector for BCG (analog output, supply voltage, setpoints)			D-sub, 15 pin, male

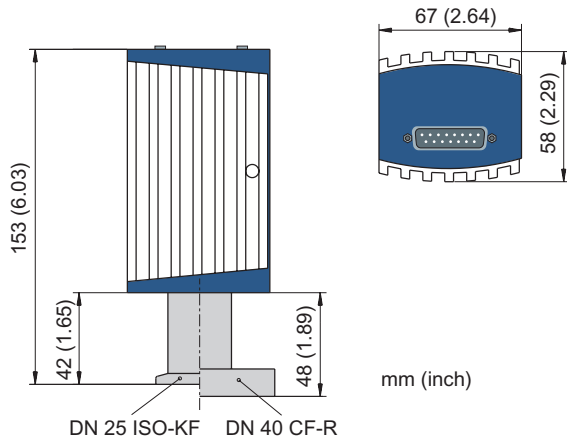
## SPECIFICATIONS

			<b>BCG450-SD DeviceNet™</b>
Protocol			DeviceNet™, group 2 slave only
Data rate switch	kBaud		125, 250, 500 or network programmable
Cable length			
125 kbps	m (ft)		500 (1650)
250 kbps	m (ft)		250 (825)
500 kbps	m (ft)		100 (330)
MAC ID			2 switches (address 00 - 63) or network programmable
Network size			up to 64 nodes per segment
Digital functions			read pressure, select units: Torr, mbar, Pa degas function monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions			0 ... 10 V analog output pressure indication two setpoint relays A + B
Visual communication indicators			LED network status (green / red) LED module status (green / red)
Specification			DeviceNet™ "Vacuum Gauge Device Profile"
Device type			"CG" for combination gauge
I / O slave messaging			polling only
Setpoint relays			2
Range	mbar		$1 \times 10^{-9}$ ... 1400
Relay contact			n.o., potential free
Hysteresis	% of reading		10
Contact rating	V / A DC		60 / 0.5
Connector			D-sub, 15 pin, male
Supply for DeviceNet™	V / A DC		11 ... 25 / 0.5
Supply for gauge	V DC		20 ... 28
Connector for DeviceNet™			Microstyle, 5 pin
Connector for BCG (analog output, supply voltage, setpoints)			D-sub, 15 pin, male

## SPECIFICATIONS

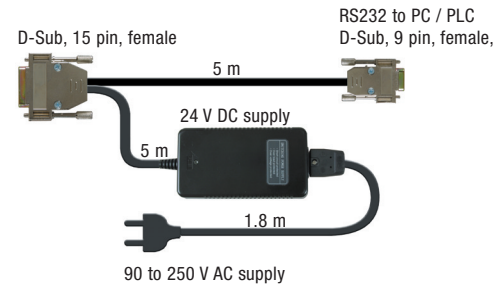
			<b>BCG450-SR RS485</b>
Baud rates	kBaud		0.3 / 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 28.8
Address			2 switches (address 00 - 127) or network programmable
Digital functions			read pressure, select units: Torr, mbar, Pa degas function, Pirani full scale adjust monitor gauge status detailed alarm and warning information
Analog functions			0 ... 10 V analog output pressure indication two adjustable setpoint relays A + B
Setpoint relays			2
Range	mbar		$1 \times 10^{-9}$ ... 100
Relay contact			n.o., potential free
Hysteresis	% of reading		10
Contact rating	V / A DC		60 / 0.5
Connector for RS485			D-sub, 9 pin, male
Connector for BCG (analog output, supply voltage, setpoints)			D-sub, 15 pin, male

## DIMENSIONS



## ACCESSORIES

### Power supply 24 V DC / RS 232 C line



### Baffle:

Prevents contamination of the sensor.  
Easy installation into the vacuum connection - no tools required.



**INFICON** Instruments for Intelligent Control™

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