

# TripleGauge® BCG450

## Bayard-Alpert Pirani Capacitance Diaphragm Gauge

The INFICON Bayard-Alpert Pirani Capacitance Diaphragm Gauge, BCG450, combines the advantages of three different measurement 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.

Now available with Profinet digital interface.



### ADVANTANGES

- 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, e.g. EtherCAT®, DeviceNet™, Profinet® etc.
- Latest EtherCAT protocol generation 2.0
- RoHS compliance

### 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

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## ORDERING INFORMATION

Type	BCG450	BCG450 with LCD	BCG450-SP Profibus DP <sup>1)</sup>	BCG450-SD DeviceNet™ <sup>1)</sup>	BCG450-SE EtherCAT® <sup>1)</sup> <sup>2)</sup>	BCG450-PN PROFINET® <sup>1)</sup>
DN 25 ISO-KF	353-550	353-552	353-554	353-557	353-598	353-517
DN 40 CF-R	353-551	353-553	353-556	353-558	353-599	353-518
Replacement sensor 25 ISO-KF	354-492	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	354-493

<sup>1)</sup> not available with LCD

<sup>2)</sup> Communication standard ETG.5 == 3.2080 S (R) V1.3.0; old version V1.0.0 still available on request

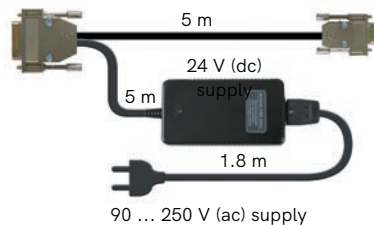
Accessories	Partno.
Power supply 24 V (dc) / RS 232 C line	353-511
Baffle	353-512
Centering ring with baffle DN 25 ISO-KF	211-113

### Power supply 24 V (dc) / RS232C line

D-Sub, 15-pin, female

RS232 to PC / PLC

D-Sub, 9-pin, female



### Baffle:

Prevents contamination of the sensor.  
Fast and easy installation.



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## SPECIFICATIONS

	BCG450 Standard	BCG450 Display
Measurement range	5 × 10 <sup>-10</sup> to 1500 mbar (3.75 × 10 <sup>-10</sup> to 1125 Torr)	
Accuracy		
10 <sup>-8</sup> ... 50 mbar		±15% of reading
50 ... 950 mbar		±5% of reading
950 ... 1050 mbar		±2.5% of reading
Repeatability 10 <sup>-8</sup> ... 10 <sup>-2</sup> mbar		5% of reading
Hot ion emission on (selectable high / low, via RS232 / Fieldbus)		2 × 10 <sup>-2</sup> mbar (high) 8 × 10 <sup>-3</sup> mbar (low)
Degas <sup>1)</sup> p < 7.2 × 10 <sup>-6</sup> mbar		Electron bombardment, max. 3 min
Pressure, max. (absolute)		5 bar
Temperature		
Operation (ambient)		0 ... +50°C
Storage		-20 ... +70°C
Bakeout		
At flange		80°C
Electronics removed		150°C
Supply voltage		20 ... 28 °C / 0.8 A (dc)
Output signal analog		0 ... 10.3 V
Measurement range		0.774 ... 10.3 V
Relation voltage / pressure		0.75 V / Decade
Error signal		0.3 / 0.5 V
Minimum load		10 kΩ
Interface (digital) <sup>2)</sup>		RS232C
Connector		D-sub, 15-pin, male
Cable length, max. <sup>3)</sup>		100 m (330 ft)
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	24 cm <sup>3</sup> (1.46 in. <sup>3</sup> ) / 34 cm <sup>3</sup> (2.1 in. <sup>3</sup> )	
Weight KF / CF	285 g / 550 g	
Degree of protection	IP30	

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

<sup>2)</sup> Simultaneous use of RS232C or VGC40x and VGC50x series controllers and Fieldbus is not allowed

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

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## SPECIFICATIONS INTERFACES

### DeviceNet™

Protocol	DeviceNet™, group 2 slave only
Data rate switch	125, 250, 500 kBaud or network programmable
Cable length	
125 kbps	500 m (1650 ft.)
250 kbps	250 m (825 ft.)
500 kbps	100 m (330 ft.)
MAC ID	Two switches (address 00 - 63) or network programmable
Digital functions	Read pressure, select units: Torr, mbar, Pa Degas function, Pirani full scale adjust 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	$1 \times 10^{-9}$ ... 100 mbar
Relay contact	NO, potential free
Hysteresis	10 % of reading
Contact rating	60 V / 0.5 A (dc)
Supply voltage for DeviceNet™	+11 - +25 V / 0.5 A (dc)
Supply voltage for gauge	+20 - +28 V / 0.8 A (dc)
Connector for DeviceNet™	Microstyle, 5-pin
Connector for Gauges (analog output, supply voltage, setpoints)	D-Sub, 15-pin, male

### EtherCAT®

Protocol	EtherCAT®
Communication standards	Semiconductor Device Profile ETG.5003 Part 1 Common Device Profile ETG.5003 Part 2080 "Specific Device Profile - Vacuum Pressure Gauge"
Process Data	Fixed PDO mapping and configurable PDO mapping
EtherCAT connector	RJ45, 8-pin (socket), IN and OUT
Cable	Shielded Ethernet CAT5e or higher
Cable length	≤100 m (330 ft.)
Data rate	100000 Kbps

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## PROFIBUS DP

Baud rates	9.6 / 19.2 / 93.75 / 187.5 / 500 kBaude 1.5 / 12 MBaud
Address	Two 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, filament 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	$1 \times 10^{-9}$ ... 100 mbar
Relay contact	NO, potential free
Hysteresis	10 % of reading
Contact rating	$\leq 30$ V / $\leq 0.5$ A (dc)
Connector for Profibus DP	D-Sub, 9-pin, female
Connector for BPG (analog output, supply voltage, setpoints)	D-Sub, 15-pin, male

## PROFINET™

Communication protocol	protocol specialized for PROFINET
Physical Layer	100BASE-Tx (IEEE 802.3)
Digital functions	
read	pressure, status, ID
set	set points, filter, zero adjust, reset, DC offset
PROFINET connector	2 × RJ45, 8-pin (socket), IN and OUT
Cable	Special Ethernet Patch Cable or Crossover Cable, shielded (CAT5e quality or higher)
Cable length	$\leq 100$ m (330 ft.)
Data rate	100000 Kbps

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## DIMENSIONS

mm (in.)

