

PCG550, PCG552, PCG554

Pirani Capacitance Diaphragm Gauge

The INFICON Pirani Capacitance Diaphragm Gauge (PCG55x) combines the INFICON Pirani technology with the advantages of a ceramic capacitance diaphragm sensor in a single product.

In the measurement range between 10 mbar and atmosphere the capacitance diaphragm technology provides gas-type independent, highly accurate values for reliable pressure measurement. The PCG55x offers also a variety of features which allows the right product configuration for the demanded application.



ADVANTAGES

- Gas-type independent above 10 mbar – allows safe venting with any gas mixture
- High accuracy and reproducibility at atmosphere – for reliable atmospheric pressure detection
- Fast atmospheric detection – eliminates waiting time and shortens process cycle
- Measuring performance independent of mounting orientation for maximum engineering freedom in tool design
- Available with tungsten (PCG550) or nickel (PCG552) filament or with a fully ceramic coated (PCG554) sensor unit for highly corrosive applications
- Easy to exchange plug and play sensor element with on-board calibration data – guarantees high reproducibility and low cost of ownership
- Selectable output signal for easy integration
- Optional atmospheric switch, display and digital interfaces e.g. EtherCAT®, DeviceNet™ etc.
- Latest EtherCAT® protocol generation 2.0
- Diagnostic port on all versions
- Compliance and standards: CE, EN, UL, CSA, RoHS

APPLICATIONS

- Load lock control
- For vacuum pressure measurement
- Safety circuits in vacuum systems
- General vacuum measurement and control in the medium and rough vacuum range

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ORDERING INFORMATION

3 P C 1 - 0 0 1 - 1 1 0 1											
Filament				Unit²⁾				Measurement range			
Tungsten	1									0	0.61 ... 10.23 V ³⁾
Nickel	2									1	1.2 ... 8.68 V
Ceramic coated	3									2	0.375 ... 5.659 V
Tungsten, galv. isolated ¹⁾	6									3	1.57 ... 9.05 V
Nickel, galv. isolated ¹⁾	7									Digital interface	
Ceramic coated, galv. isolated ¹⁾	8									0	None ³⁾
				mbar	0					1	DeviceNet™ 4) 7)
				Torr	1					2	Profibus DP™ 1) 7)
				Pa	2					G	EtherCAT® 1) 7) 9)
				micron	3					-	RS485 ⁸⁾
				Flange				Electrical connection			
				DN 16 ISO-KF	1					0	FCC, 8-pin ³⁾
				DN 16 ISO-KF long tube	2					1	D-Sub, 9-pin
				DN 16 CF-F	4					2	D-Sub, 15-pin HD
				DN 16 CF-R long tube	5					4	D-Sub, 15-pin HD, with RS485 ^{5) 7)}
				DN 25 ISO-KF	6					Display, switching functions	
				4 VCR female	D					0	None
				8 VCR female	E					1	LCD display
				1/8 in. NPT	F					2	2 setpoints (solid state)
				Surface mount 29 mm / 1.15 in.	K					3	ATM and 2 setpoints (solid state)
				4 VCR 90° female	M					4	LCD display and 2 setpoints (solid state)
				7/16-20 UNF male	N					5	ATM and LCD display and 2 setpoints (solid state)
										6	2 setpoints (mechanical) ⁶⁾
										7	ATM and 2 setpoints (mechanical) ⁶⁾

- 1) Only with D-Sub 9-pin connector available
- 2) When selecting LCD (liquid crystal display) choose desired pressure unit
- 3) Choose these settings when using the INFICON VGC40x/PGD controllers or if selecting "4" under electrical connections
- 4) Only with D-Sub 9-pin connector and galvanically isolated available
- 5) Only without additional digital interface available
- 6) Only with D-Sub 9-pin connector without LCD display available
- 7) Fieldbus options only available together with switching functions (select number "2", "3", "4", or "5" from table "Display, switching functions")
- 8) Just selectable via number "4" from table "Electrical connection
- 9) EtherCAT protocol generation 2.0; protocol generation 1.0 still available on request

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Spare parts	PCG550 Tungsten	PCG552 Nickel	PCG554 Ceramic coated
DN 16 ISO-KF	357-925	357-936	357-947
DN 16 ISO-KF long tube	357-926	357-937	357-948
DN 16 CF-F	357-927	357-938	357-949
DN 16 CF-R long tube	357-928	357-939	357-950
DN 25 ISO-KF	357-929	357-940	357-951
4 VCR female	357-932	357-943	357-954
8 VCR female	357-931	357-942	357-953
1/8 in. NPT	357-930	357-941	357-952
Surface mount 29 mm (1.15 in.)	357-934	357-945	357-956
4 VCR 90° female	357-935	357-946	357-957
7/16-20 UNF male	357-933	357-944	357-955

Accessories	Part no.
Centering ring with filter (DN 16 ISO-KF)	211-097
Diagnostic: Communication adapter (2 m) for PC RS232C serial port ¹⁾	303-333

¹⁾ Diagnostic SW available upon request

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SPECIFICATIONS

Type	PCG550 Tungsten	PCG552 Nickel	PCG554 Ceramic coated
Measurement range	$5 \times 10^{-5} \dots 1500 \text{ mbar}$ ($3.8 \times 10^{-5} \dots 1125 \text{ Torr}$)		
Accuracy			
$5 \times 10^{-4} \dots 1 \times 10^{-3} \text{ mbar (N}_2\text{)}$		$\pm 50\%$ of reading	
$1 \times 10^{-3} \dots 100 \text{ mbar (N}_2\text{)}$		$\pm 15\%$ of reading	
$100 \dots 950 \text{ mbar}$		$\pm 5\%$ of reading	
$950 \dots 1050 \text{ mbar}$		$\pm 2.5\%$ of reading	
Repeatability			
$1 \times 10^{-3} \dots 1100 \text{ mbar (N}_2\text{)}$		$\pm 2\%$ of reading	
Admissible pressure (absolute)		$\leq 5 \text{ bar}$	
Pressure, max. (absolute)		10 bar	
Admissible temperature			
Operation (ambient)		$+10 \dots +50^\circ\text{C}$	
Storage		$-20 \dots +65^\circ\text{C}$	
Bakeout at flange		$\leq 80^\circ\text{C}$	
Long tube		$\leq 250^\circ\text{C}$	
Supply voltage		$+15 \dots +30 \text{ V / A (dc)}$	
Power consumption			
Without fieldbus		$\leq 2.5 \text{ W}$	
DeviceNet™		$\leq 3 \text{ W}$	
Profibus DP		$\leq 3 \text{ W}$	
EtherCAT®		$\leq 4.5 \text{ W}$	
Output signal analog			
3PCx-0xx-xxx0		$0 \dots +10.23 \text{ V}$	
3PCx-0xx-xxx1		$0 \dots +8.68 \text{ V}$	
3PCx-0xx-xxx2		$0 \dots +5.659 \text{ V}$	
3PCx-0xx-xxx3		$0 \dots +9.05 \text{ V}$	
Measuring range			
3PCx-0xx-xxx0		$+0.61 \dots +10.23 \text{ V}$	
3PCx-0xx-xxx1		$+1.2 \dots +8.68 \text{ V}$	
3PCx-0xx-xxx2		$+0.375 \dots +5.659 \text{ V}$	
3PCx-0xx-xxx3		$+1.57 \dots +9.05 \text{ V}$	
Voltage vs. pressure			
3PCx-0xx-xxx0		1.286 V / Decade	
3PCx-0xx-xxx1		1 V / Decade	
3PCx-0xx-xxx2		1 V / Decade	
3PCx-0xx-xxx3		1 V / Decade	
Load impedance		$>10 \text{ k}\Omega$	

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Type	PCG550 Tungsten	PCG552 Nickel	PCG554 Ceramic coated
Setpoint relay		2	
Range (N ²)		5 × 10 ⁻⁵ ... 1500 mbar	
Relay contact		NO, potential free	
Hysteresis		10% of threshold	
Contact rating			
Solid state relays		≤30 V / ≤0.3 A (dc)	
Mechanical relays		≤30 V / ≤1 A (dc)	
Switching time		≤30 ms	
Interface (digital)		RS232C	
Electrical connection			
3PCx-0xx-x0xx		FCC, 8-pin	
3PCx-0xx-x1xx		D-sub, 9-pin, male	
3PCx-0xx-x2xx		D-sub, 15-pin HD, male	
3PCx-0xx-x4xx		D-sub, 15-pin HD with RS485, male	
Cable length		≤100 m (≤330 ft)	
RS232C operation		≤30 m (≤100 ft)	
Materials exposed to vacuum	W, Ni, NiFe, Al ₂ O ₃ , SnAg, stainless steel, glass	Ni, NiFe, Al ₂ O ₃ , SnAg, stainless steel, glass	Al ₂ O ₃ , stainless steel
Internal volume			
DN 16 ISO-KF		4.7 cm ³	
DN 16 ISO-KF long tube		14.5 cm ³	
DN 16 CF-F		8 cm ³	
DN 16 CF-R long tube		14 cm ³	
DN 25 ISO-KF, 4 VCR		5.5 cm ³	
8 VCR		7 cm ³	
1/8 in. NPT, 7/16-20 UNF		5.2 cm ³	
Surface mount 29 mm (1.15 in.)		4.9 cm ³	
4 VCR 90°		7.9 cm ³	
Weight			
Without fieldbus interface		115 ... 130 g	
With fieldbus interface		230 ... 250 g	
Degree of protection		IP 40	
Standards	EN 61000-6-2/-6-3, EN 61010, UL 61010-1, CSA 22.2 No. 61010-1		

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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	1×10^{-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 kBaud 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	1×10^{-9} ... 100 mbar
Relay contact	NO, potential free
Hysteresis	10 % of reading
Contact rating	≤ 30 V / ≤ 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

RS485C

Baud rates	kBaud	9.6 / 19.2 / 38.4 / 57.6
Address	Two switches (address 00 - 255)	
Digital functions	Read pressure, select units: Torr, mbar, Pa, micron, counts monitor gauge status, detailed alarm and warning information, safe state allows definition of behavior in case of error	
Connector for RS485	D-Sub, 15-pin HD, male	

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DIMENSIONS

mm (in.)

