

DA01B

Absolute Baratron® Capacitance Manometer with DeviceNet™ Communications



The DA01B is a dual-output absolute vacuum transducer with both DeviceNet™ digital communications and legacy 0-10 VDC analog output signals. Available in four different operating temperatures for different applications, the DA01B uses an efficient microprocessor-based digital structure that provides exceptional stability and repeatability under demanding conditions such as semiconductor manufacturing equipment. The DA01B also uses the patented MKS all-welded Inconel® diaphragm sensor, which has exceptionally high resistance to corrosion from common process chemicals. It is able to tolerate bursts of pressure to as much as 45 psia (310 kPa) without suffering physical damage or permanent calibration shifts.

The DeviceNet communications and main power are fed through a bayonet-style 5-pin connector on the top of the product, and the analog output signal is available on the standard 9-pin D-subminiature electrical connector. It is available in unheated, 45°C, 80°C, or 100°C versions in Full Scale pressure ranges from 1000 to 1 Torr (133 to 0.13 kPa) for the unheated models, and 1000 to 0.1 Torr (133 to 0.013 kPa) for the heated versions.



Product Features

- Full Scale ranges of 1000 to 1 Torr/mbar (unheated), 1000 to 0.1 Torr/mbar (heated)
- Fully-welded Inconel and Incoloy® sensor offers extremely high corrosion resistance from common process gases
- Standard or etch sensors available
- High overpressure specification of 45 psia (3 bar/310 kPa) prevents shifting or permanent calibration changes

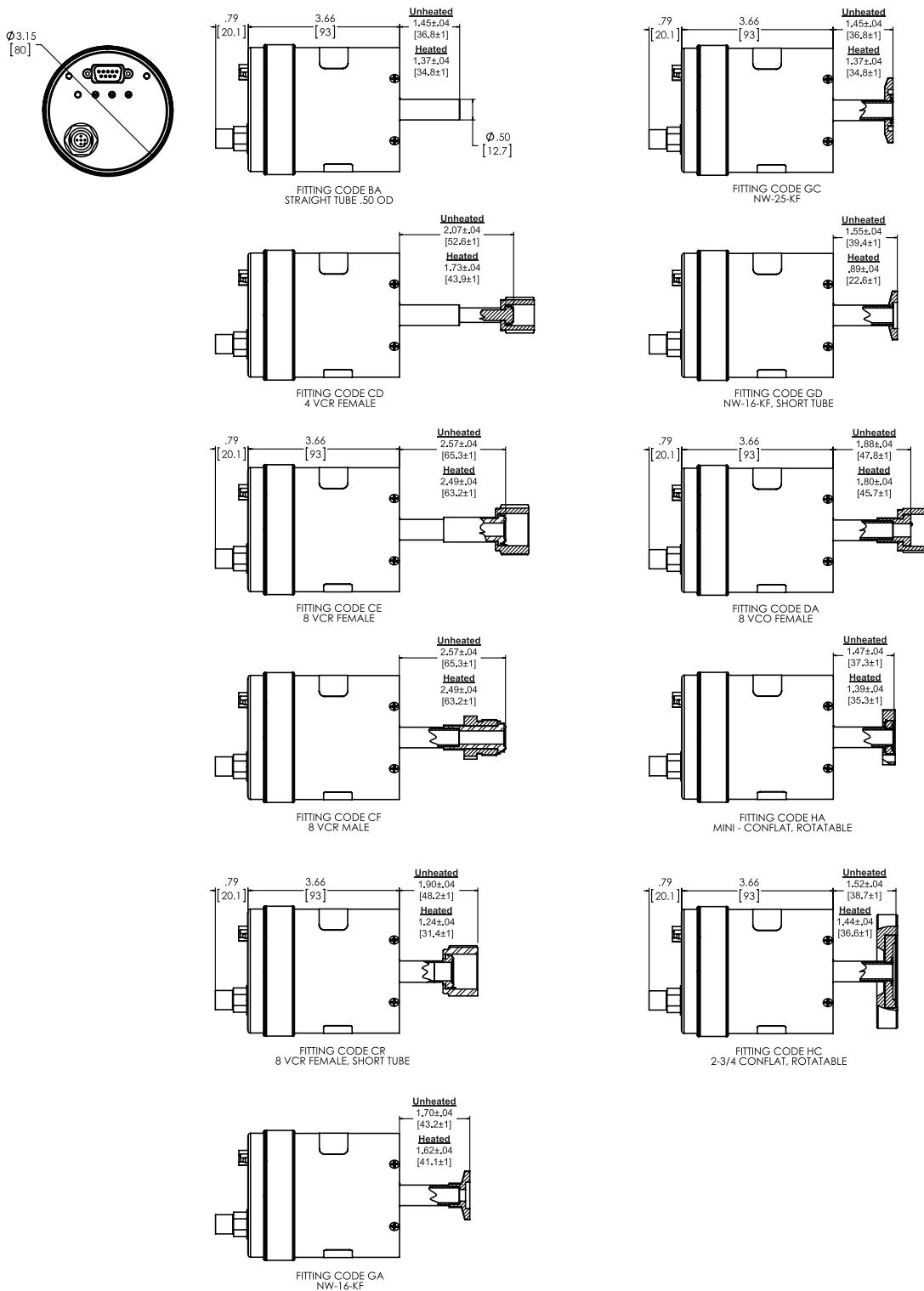
Key Benefits

- Excellent long-term stability
- Microprocessor-based electronics provide superior accuracy and repeatability
- Tolerates burst pressure without causing damage

Specifications

Full Scale Ranges		0.1 (heated models only), 0.25 (heated models only), 1, 2, 10, 20, 100, 200, 500, and 1000 Torr/mbar
Resolution		0.001% Full Scale on digital output
Operating Temperatures		<ul style="list-style-type: none"> • Unheated • 45°C • 80°C and 100°C
Accuracy (including non-linearity, hysteresis, and non-repeatability)	Unheated 45°C 80°C and 100°C	<ul style="list-style-type: none"> • 0.25% Reading • 0.12% Reading for 1-1000 Torr/mbar, 0.15% Reading for < 1 Torr/mbar • 0.25% Reading for 1-1000 Torr/mbar, 0.50% Reading for < 1 Torr/mbar
Temperature Coefficients - Zero	Unheated Heated	<ul style="list-style-type: none"> • 10 - 1000 Torr 0.005% Full Scale/°C, 2 Torr 0.010% Full Scale/°C, 1 Torr 0.015% Full Scale/°C • 1 to 1000 Torr 0.002% Full Scale/°C; 45°C < 1 Torr 0.005% Full Scale/°C • 80°C and 100°C: < 1 Torr 0.010% Full Scale/°C
Temperature Coefficients - Span	Unheated Heated	<ul style="list-style-type: none"> • 0.04% of Reading/°C, 50 psia to 3000 psia; 0.08% of Reading/°C, 1000 Torr • 0.04% Reading/°C • 0.02% Reading/°C
Materials Exposed to Gases		Inconel and Incoloy nickel alloys (Some optional fittings are made from 300-series stainless steel)
Internal Sensor Volume		6.3 cm ³
Overpressure Limit		45 psia (310 kPa)
Fittings	Standard Optional	<ul style="list-style-type: none"> • ½" (12.7 mm) O.D. tube standard • 4 and 8 female VCR®, 8 male VCR, 8 female VCO®, 1.33" (33.7 mm) and 2.75" (69.9 mm) O.D. CF, NW16-KF, and NW25-KF (NW-KF fittings may be ordered with standard-length inlet port or reduced-length inlet port)
Digital Protocol		DeviceNet, Group 2
Digital Electrical Connector		5-pin sealed micro-style male bayonet with anti-rotation device
Data Rate/Network Length		User-selectable data rate: 125 kbps and 500 m (1,640 ft), 250 kbps and 250 m (820 ft), or 500 kbps and 100 m (328 ft)
Level of Filtering		Adjustable via user software
Digital Functions		Read pressure, set digital trip points and hysteresis, select units (Torr, Pa, mbar, in H ₂ O, psi), set zero, reset factory defaults, monitor transducer trip point status, change user tags and device address
Data Rate Switch		4 positions: 125, 250, 500, PGM (programmable via network)
MAC ID Switches		2 switches, 10 positions: 0,0 to 6,3 are hardware ID numbers; 7,0 to 9,9 are software ID numbers; 6,4 to 6,9 are unused and if selected will default to hard ID number 6,3
Network Message Control		Master/slave information flow
Input Power	Unheated 45°C 80°C and 100°C Heated Models	<ul style="list-style-type: none"> • 11 to 25 VDC @ ≤5 watts • Operation with heater requires 18 to 25 VDC @ ≤15 watts • Operation with heater requires 18 to 25 VDC @ ≤25 watts • Can provide only network communications at <18 VDC (i.e. heater does not operate if input voltage is <18 VDC)
Network Size		64 nodes maximum
Network Topology		Linear (trunkline/dropline) power and signal on same network cable
Analog I/O		0 to 10 VDC into > 10KΩ load
Output Connector		9-pin female D-subminiature
Compliance		CE

Dimensional Drawings



Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).

Ordering Code Example: DA01B12TCES24A00	Code	Configuration
Model		
DA01B DeviceNet™ Capacitance Manometer	DA01B	DA01B
Pressure Range		
0.1 (heated models only) 0.25 (heated models only) 1 2 10 20 100 200 500 1000	.1 RE 01 02 11 21 12 22 52 13	12
Units of Measurement		
Torr absolute mbar absolute kPa absolute	T M K	T
Fittings		
½" OD tube 4 female VCR (ranges > 2 Torr only) (V sensor only) 8 female VCR 8 male VCR 8 female VCR, short inlet tube (can only be used with code T sensors) KF16 KF25 KF16, short inlet tube 8 VCO female 1.33" OD CF 2.75" OD CF	BA CD CE CF CR GA GC GD DA HA HC	CE
Sensor Type		
Standard sensor Etch sensor (range ≤ 100 Torr) ¼" dia. tube (CD fitting only) Short tube standard sensor	S E V T	S
Analog Output Voltage		
0-10 VDC	2	2
Sensor Temperature		
Unheated 45°C 80°C 100°C	0 4 8 1	4
Electrical Connector		
DeviceNet 5-pin bayonet-style with female 9-pin D-subminiature analog connector	A	A
Calibration Orientation		
Standard (ranges ≥ 1 Torr) Vertical (standard for ranges < 1 Torr) Horizontal (available for ranges < 1 Torr only)	0 V H	0
Accuracy		
Standard accuracy	0	0