

DA03B

Heated (150°C to 200°C) Absolute Baratron® Capacitance Manometer with EtherCAT® Communications



The DA03B Baratron® capacitance manometer operates at sensor temperatures up to 200°C and is well suited for use in advanced applications such as Chemical Vapor Deposition (CVD), Atomic Layer Deposition (ALD), semiconductor processes, and lyophilization. High temperature operation minimizes the deposition of process byproducts within the sensor, reducing output drift caused by contamination. The DA03B product leverages the same proven digital architecture and EtherCAT® communications as the industry-standard DA02A, but utilizes a larger sensor than in the DA03A or 631D product for increased sensitivity and decreased process related zero drift.

The DA03B is completely self-contained and is available in either +24 VDC or ±15 VDC input power configurations. Its Inconel® sensor is resistant to corrosion, and its

overpressure rating of 45 psia ensures good repeatability and stability regardless of the system operating conditions. Optional sensors and deposition traps are available for enhanced zero drift capabilities. The high-performance digital electronics of the DA03B also includes fail-safe over-temperature protection and LED status lights to indicate the operating state. Solid state relay outputs provide indication of sensor at temperature and heater failure. Additional options include an internally-mounted set of two (2) UL recognized solid state trip relays provided for pressure trip points for control of external equipment or components. The pressure trip relays may be set by the user over the EtherCAT bus at atmospheric pressure, eliminating the need for vacuum pumps during set point adjustment.

Product Features

- Sensor operating temperature of 150°C to 200°C (factory set)
- High 45 psia overpressure rating for improved stability and repeatability
- Optional internally-mounted, user programmable solid state process relays for external control
- Insensitive to gas composition
- EtherCAT interface and analog outputs



Key Benefits

- Long-term performance in ALD, CVD, Lyophilization, and other advanced manufacturing processes
- Minimizes the deposition of byproducts
- Provides fail-safe over-temperature protection
- All-Inconel larger sensor for superior sensitivity, corrosion resistance, and long-term stability

Specifications

Full Scale Pressure Ranges		1, 2, 3, 5, 10, 20, 100, 1000 Torr
Accuracy^{1,2}		±0.25% of Reading
Temperature Coefficients - Zero	150°C/160°C	<ul style="list-style-type: none"> ±0.004% Full Scale/°C for >1 Torr ±0.008% Full Scale/°C for 1 Torr range
	200°C	<ul style="list-style-type: none"> ±0.008% Full Scale/°C for >1 Torr ±0.016% Full Scale/°C for 1 Torr range
Temperature Coefficients - Span		±0.02% Reading/°C
Response Time	Analog/Digital EtherCAT	<ul style="list-style-type: none"> 35 ms (nominal) influenced by pressure range, step size, and digital pressure filter settings Refresh Rate = 3.3 ms
Internal Volume		6.3 cm ³ typical. Contact MKS for volumes with specific flanges.
Input Power		±15 VDC @ 1.6A or +24 VDC @ 1.3A at start up (factory set)
Output Signal		Analog 0-10 VDC into >10kΩ load, EtherCAT
Warmup Time		2.5 hours typical
Operating Temperature Range		15 to 50°C
Ambient Airflow Requirements	150/160°C Models	<ul style="list-style-type: none"> 50 ft/min for ambient temperatures of 40 - 50°C
	200°C Models	<ul style="list-style-type: none"> 150 ft/min for ambient temperatures of 40 - 50°C
Resolution³		0.001% of Full Scale
Overpressure Limit		45 psia
Materials Exposed to Process Gases		Inconel [®] and Incoloy [®] nickel alloys (some fitting options are 300 Series Stainless)
Trip Relays	Standard	<ul style="list-style-type: none"> Two (2) internal solid state relays provided for heater "at temperature" status and heater failure. Relay capacity of 1 amp at 30 VDC.
	Optional	<ul style="list-style-type: none"> Two (2) internal process pressure trip relays, solid state, independently adjustable by customer at atmospheric pressure from 0.5% to 100% of Full Scale range. Relay capacity of 1 amp @ 30 VDC.
Fittings	Standard	<ul style="list-style-type: none"> ½" (12 mm) OD tube
	Optional	<ul style="list-style-type: none"> Swagelok[®] 8 VCR[®] female, 8 VCR male, NW16-KF, NW25-KF, Mini-CF, 1.5" TriClover, and 2" TriClover
Compliance⁴		CE, UL1577 (Trip Relays only)

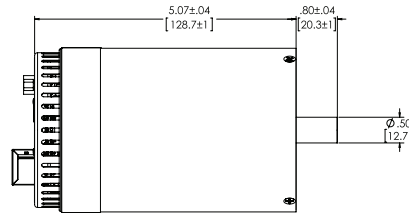
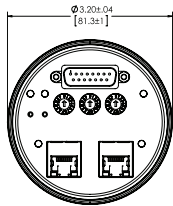
¹ Includes non-linearity, hysteresis, and non-repeatability.

² Accuracy specification and NIST-traceable calibration points included on calibration sheet are from Full Scale to 10% of Full Scale.

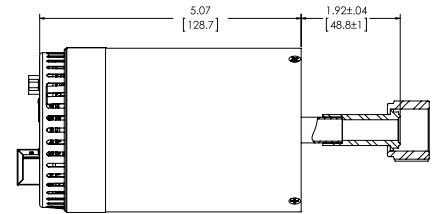
³ Theoretical resolution under ideal laboratory conditions. Actual resolution in service is usually determined by system design factors not under MKS's control.

⁴ When connected to a properly shielded cable, grounded at both ends.

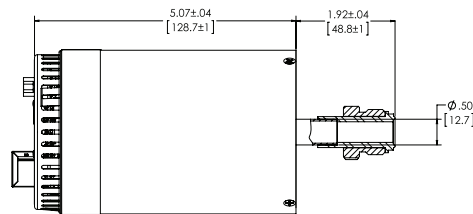
Dimensional Drawings



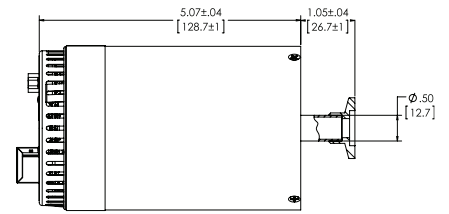
FITTING CODE -BA-
Ø.50 TUBULATION



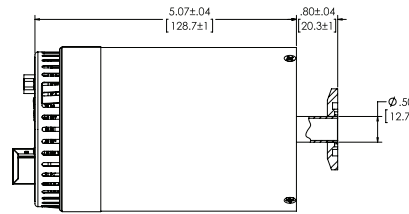
FITTING CODE -CE-
8 VCR FEM SKT WLD



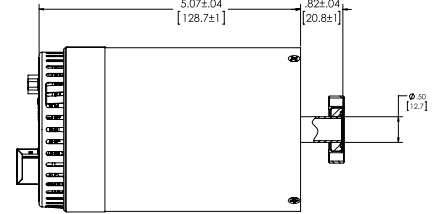
FITTING CODE -CF-
8 VCR MALE



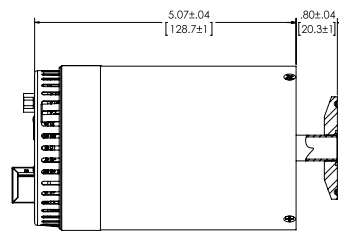
FITTING CODE -GA-
NW-16-KF SOCKET WELD



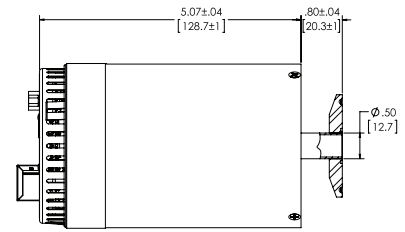
FITTING CODE -GC-
NW-25-KF FACE WELD



FITTING CODE -HA-
1.33 INCH CONFLAT, ROTATABLE



FITTING CODE -KA-
1.50 TRI-CLOVER FLANGE



FITTING CODE -KB-
2.00 TRI-CLOVER FLANGE

Unless otherwise specified, dimensions are nominal values in inches (mm referenced). For sensor code L, dimension A is 0.03" longer.

Ordering Code Example: DA03B11TCES36BAA0000	Code	Configuration
Model		
DA03B Absolute Manometer	DA03B	DA03B
Ranges (Torr)		
1	01	11
2	02	
3	03	
5	05	
10	11	
20	21	
100	12	
1000	13	
Units of Measurement (as shown on calibration sheet)		
Torr	T	T
mbar	M	
kPa	K	
Fittings		
½" OD tube	BA	CE
8 VCR female	CE	
8 VCR male	CF	
NW16-KF	GA	
NW25-KF	GC	
Mini-CF	HA	
1.5" TriClover ¹	KA	
2.0" TriClover ¹	KB	
Sensor Type		
Standard	S	S
Deposition/Fluorine Friendly (1, 2, 10, 100, 1000 Torr)	L	
Input/Output Voltages		
±15 VDC	2	3
+24 VDC	3	
Sensor Temperature		
200°C	2	6
160°C	6	
150°C	5	
Electrical Connector²		
15-pin D with Screw Locks	B	B
15-pin D with Slide Lock Posts	P	
Integral Relays³		
No Relays	00	AA
Trip Point A Above Set Point, Trip Point B Above Set Point	AA	
Trip Point A Above Set Point, Trip Point B Below Set Point	AB	
Trip Point A Below Set Point, Trip Point B Below Set Point	BB	
Trip Point A Below Set Point, Trip Point B Above Set Point	BA	
Reserved		
Reserved For Future Use	0	0
Calibration Orientation		
Ranges 1 Torr and above (not required)	0	0
Accuracy		
Standard	0	0
Other Options		
None	0	0

Notes:

¹ Products with TriClover fittings have Type 316L stainless steel fittings.

² For CE compliance, the mating electrical connector must be properly grounded.

³ Units with trip points have default set points of 50% of Full Scale, a default hysteresis of 0, and actuation direction based on the part number code. The settings are user adjustable through EtherCAT.

* Custom part numbers can be requested for copy exact applications.

** Standard part numbers will ship with the latest firmware at the date of manufacture. A custom part number should be requested for locked firmware/EtherCAT ESI file.