DA05A

Absolute Baratron® Digital Capacitance Manometer with EtherCAT® Communications (Full Scale Pressures <1 Torr/mbar)*

The DA05A Baratron® Capacitance Manometer is the next generation EtherCAT® manometer from MKS, the industry leader in capacitance manometer pressure gauges.

The DA05A builds off the same Inconel® sensor as the industry and process proven MKS 600 Series and DA02 Baratron Capacitance Manometer, resulting in long life, low maintenance, exceptional corrosion resistance, and high maximum overpressure limit. The manometer is equipped with a 1 ms EtherCAT® communication refresh rate, 12 ms nominal pressure response time, extensive use of automotive grade electronics, and an extended maximum ambient operating temperature of 60°C. The advanced electronics in the DA05A also provides an improved signal to noise ratio and faster response time than the industry-standard DA02. Further, the resolution and response of both the analog and digital pressure signal can be user optimized for the specific application through adjustment of the programmable filter setting.

Available with the standard MKS sensor or optional proprietary etch/fluorine/deposition friendly sensor for enhanced stability and reduced process induced zero drift in critical etch or deposition applications.



Product Features

- 1 ms EtherCAT refresh rate
- 12 ms pressure signal response time (typical)
- Available in 45°C, 80°C or 100°C versions
- Expanded ambient operating temperature to 60°C for 80°C and 100°C manometers
- Standard MKS sensor or etch/fluorine/deposition friendly sensor option available
- Digital filter value can be used to optimize the analog and digital response time/signal noise for users application
- "Sensor ready" and "device fault" relay contacts included
- Optional pressure-based relay contacts can be user configured through EtherCAT
- Meets current ETG Semiconductor Technical Working Group profiles including the Common Device Profile, Firmware Update and Vacuum Pressure Gauge profiles

Key Benefits

- Improved signal-to-noise ratio and configurable filtering allows full optimization of noise floor and response time.
- Inconel® sensor offers superior process immunity over other materials, enabling longer life and more stable control under harsh process conditions
- High maximum overpressure limit of 45 PSIA, protects the sensor from permanent damage from high pressure excursions
- Excellent long-term stability reduces maintenance needs
- Optional etch/fluorine/deposition friendly sensor minimizes process byproduct induced zero drift

**See DA07A product for pressure ranges of 1 Torr/mbar or greater.*

Specifications

Full Scale Ranges[1]		100 mTorr, 250 mTorr
Resolution[2]		0.001% Full Scale
Operating Temperatures	**45°C** **80°C and 100°C**	• 15° to 40°C • 15° to 60°C
Accuracy[3, 4]	**45°C** **80°C and 100°C**	• 0.15% Reading for ranges < 1 Torr • 0.50% of Reading for ranges < 1 Torr
Temperature Coefficients - Zero	**45°C** **80°C and 100°C**	• 0.005% Full Scale/°C for ranges < 1 Torr • 0.010% Full Scale/°C for ranges < 1 Torr
Temperature Coefficients - Span		0.02% Reading/°C
Materials Exposed to Gases		Inconel and Incoloy nickel alloys (Fittings are made from 300 series stainless steel)
Internal Sensor Volume		6.3 cm^3 for ½'' OD tube fitting. Volumes with other fitting available on request
Warmup Time		4 hours nominal
Overpressure Limit		45 psia (310 kPa)
Input Power	**45°C** **80°C and 100°C**	• +24 VDC ±10% @ 560 mA ±15 VDC @ 480 mA • +24 VDC ±10% @ 800 mA ±15 VDC @ 700 mA
Output Signal	**Analog** **Digital**	• 0 – 10 VDC into > 10 kΩ load • EtherCAT
Response Time	**Pressure** **EtherCAT Update Rate**	• 12 ms nominal (10-90% of a step response) influenced by step size and digital pressure filter setting • Refresh Rate 1 ms
Trip Relays	**Standard** **Optional**[5]	• Two solid state relays for "sensor ready" and "device fault" status. • Two optional internally mounted process pressure trip relays, solid state, independently adjustable through EtherCAT by customer at atmospheric pressure from 0.5% to 100% of Full Scale range. Relay capacity of 0.375 amps @ 30 VDC. Complies with UL1577 requirements
Electrical Connectors	**Analog** **EtherCAT**	• 15-pin D-subminiature male • Two (2) RJ45 female receptacles for incoming and network signals
External Indicators		Multicolor status LED and two (2) red/green LEDs for EtherCAT communications status
Connection Fittings		• ½'' (12 mm) OD tube • 8 VCR® male or female compatible • NW16-KF • 1.33'' (34 mm) OD CF
Compliance[6]		• EU27: CE • United Kingdom: UKCA • US: FCC 15B • Canada: CAN ICES-3(B)/NMB-3(B) • Australia: AS CISPR11 • South Korea: KC • Japan: JIS C 61326-1 • Taiwan: CNS 13803 • EtherCAT: ETG.5003.2080 S (R) V1.30 Vacuum Pressure Gauge

[1] See DA07A product for pressure ranges 1 Torr/mbar or greater.

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

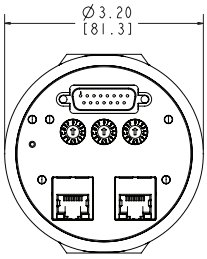
[3] Includes non-linearity, hysteresis, and non-repeatability.

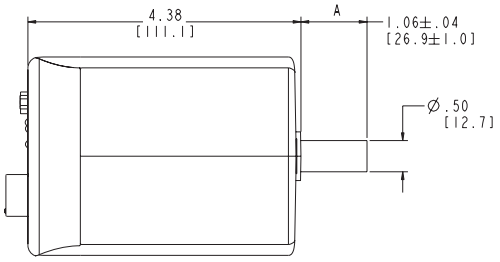
[4] Accuracy specification and NIST-traceable calibration points included on calibration sheet are from Full Scale to 10% of Full Scale.

[5] Relay hysteresis default setting of 0.5% of Full Scale and is adjustable through EtherCAT.

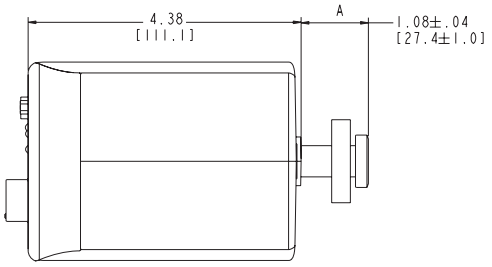
[6] When connected to a properly shielded cable, grounded at both ends.

Dimensional Drawings

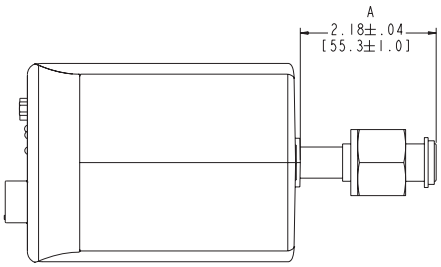




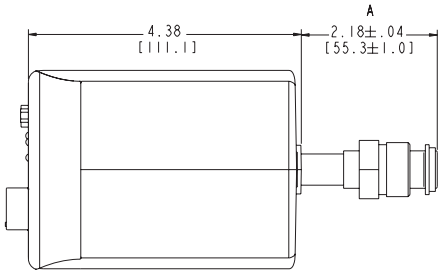
FITTING CODE -BA-
Ø.50 TUBULATION



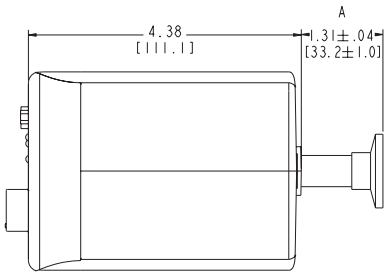
FITTING CODE -HA-
1.33" CF ROTATABLE



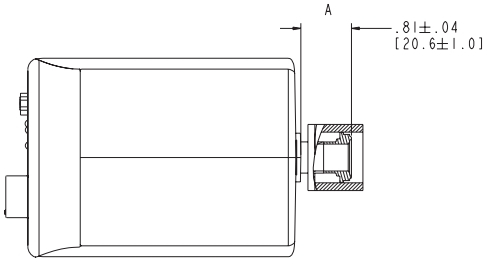
FITTING CODE -CE-
8VCR COMPATIBLE FEM SKT WLD



FITTING CODE -CF-
8VCR COMPATIBLE MALE SKT WLD



FITTING CODE -GA-
NW-16-KF SKT WLD



FITTING CODE -CR-
8VCR COMPATIBLE FEM SHORT BUTT WLD

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

Ordering Code Example: DA05A.1TCES24BAA0V0	Code	Configuration
Model		
DA05A Baratron Digital Capacitance Manometer	DA05A	DA05A
Pressure Range		
0.1 0.25	.1 RE	.1
Units of Measurement		
Torr absolute mbar absolute	T M	T
Fittings		
½'' OD tube 8 VCR (compatible) female 8 VCR (compatible) male 8 VCR (compatible) female, short inlet tube (use with sensor type T or M) NW-16KF 1.33'' OD CF (rotatable)	BA CE CF CR GA HA	CE
Sensor Type		
Standard sensor, standard inlet tube length Short tube, standard sensor (use with fitting code CR) Etch/fluorine/deposition/friendly sensor Short tube etch/fluorine/deposition friendly sensor (use with fitting code CR)	S T L M	S
Input/Output Voltages		
±15 VDC input, 0-10 VDC analog output 24 VDC input, 0-10 VDC analog output	2 3	2
Sensor Temperature		
45°C 80°C 100°C	4 8 1	4
Electrical Connector		
15-pin D-subminiature male connector with screw lock 15-pin D-subminiature male connector with slide lock	B P	B
Trip Points*		
None Trip A above 50%, Trip B above 50% of Full Scale Range Trip A above 50%, Trip B below 50% of Full Scale Range Trip A below 50%, Trip B below 50% of Full Scale Range Trip A below 50%, Trip B above 50% of Full Scale Range	00 AA AB BB BA	AA
Reserved		
Reserved	0	0
Calibration Orientation		
Vertical Horizontal	V H	V
Accuracy		
Standard accuracy	0	0

Notes:
[1] Units with trip points have default setpoints and actuation direction based on the part number code but are user adjustable through EtherCAT.
[2] Custom part numbers can be requested for copy exact applications.
[3] 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.

www.MKS.com

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