



Pressure Measurement & Control

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Baratron[®] Absolute Capacitance Manometers

GENERAL PURPOSE & HIGH ACCURACY SELECTION GUIDE

Features & Benefits

- Direct total pressure measurement, independent of gas composition
- All Inconel[®] construction for high corrosion resistance
- Full Scale ranges as low as 0.02 Torr
- Temperature-controlled versions from 45°C to 200°C

General Purpose Capacitance Manometers Selection Guide

Type / Number	Most Economical			Bakeable
	622A / 626A	722A	623A	121A
Output	General purpose 0-10 VDC output	Lowest price 0-10 VDC output	0-10 VDC output with trip point relays	0-10 VDC output remote electronics
Electrical Connector	622: detachable 5-pin terminal block 626: 15-pin "D" connector	detachable 5-pin terminal block, 9-pin "D" connector, 15-pin "D" connector on 6 inch cable	detachable 5 & 8-pin terminal blocks	14-pin ribbon connector
Full Scale Range (Torr) (1)	0.10 (626 only) 1 2 10 100 1000	1 2 10 20 100 1000	10 100 1000	1 2 10 100 1000
Ambient Operating Temperature (°C)	0 to 50°C 15 to 40°C (626 - 0.10 Torr only)	0 to 50°C 15 to 40°C (722-1 and 2 Torr only)	0 to 50°C	Sensor & cable: 0 to 150°C (bakeable to 200°C with cable removed) Preamp: 0 to 50°C
Sensor Operating Temperature (°C) (2)	Ambient	Ambient	Ambient	Ambient (bakeable to 150°C)
Accuracy in % of Reading (3)	0.50% 0.10 Torr 0.25% 1 to 1000 Torr 0.15% 10 to 1000 Torr (optional)	0.5%	0.25% standard 0.15% optional	0.5%
Lowest Suggested Reading (Torr) (4)	5 x 10 ⁻⁵ -0.10 Torr 5 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -2 Torr 5 x 10 ⁻³ -10 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -2 Torr 5 x 10 ⁻³ -10 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻³ -10 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -2 Torr 5 x 10 ⁻³ -10 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr
Lowest Suggested Control Pressure (Torr) (5)	5 x 10 ⁻⁴ -0.10 Torr 5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr 5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr	5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr 5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr	5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr	5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr 5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr
Proper Zero Adjust Pressure (Torr) (6)	<5 x 10 ⁻⁶ -0.10 Torr <5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr <5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr <5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr <5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr
Initial Warm-up Time	15 minutes	15 minutes	15 minutes	15 minutes (preamp)
Input Power Requirements or Interface	±15 VDC (±5%) @ 35 mA	+13 to 32 VDC @ 10 mA max.	±15 VDC (±5%) @ 75 mA	±15 VDC (±5%) @ 35 mA

(1) Some types are available with full-scale ranges higher than 1000 Torr.

(2) 45°C temperature controlled Baratron® can be selected for applications where ambient temperature is less than 40°C. Higher temperature controlled Baratrons® should be selected when ambient temperatures are needed to preclude effluent condensation and contamination build up.

(3) Accuracy includes non-linearity, hysteresis, and repeatability.



Specifications

Temperature-Controlled			
220D	624B / 627B / 629B	625B / 628B / 629B	631B
Temperature controlled to 45°C, 0-10 VDC & 4-20mA	624: with trip point relays 629: optional external zero 624, 627, 629: 0-10 VDC	625: with trip point relays 629: optional external zero 625, 628, 629: 0-10 VDC	0-10 VDC
AC versions: MS3106A-14S-6P DC versions: MS3106A-18-1S	624 & 627: 15-pin "D" connector 629: 9-pin "D" connector	625 & 628: 15-pin "D" connector 629: 9-pin "D" connector	15-pin "D" connector
1 10 100 1000	0.02 (627, 629 only) 0.05 (627, 629 only) 0.10 (627, 629 only) 1 2 (627, 629 only) 10 20 50 100 1000	0.05 (628, 629 only) 0.10 (628, 629 only) 1 2 (628, 629 only) 10 20 50 100 1000	1 2 10 100 1000
15 to 40°C	15 to 40°C	15 to 50°C	150°C models: 10 to 45°C 200°C models: 10 to 50°C
Temperature-controlled to 45°C	Temperature-controlled to 45°C	Temperature-controlled to 100°C	Temperature-controlled to 150° or 200°C
0.15%	0.12% (1 Torr and greater) 0.15% (0.05 and 0.100 Torr) 0.25% (0.02 Torr)	0.25% (1 Torr and greater) 0.5% (less than 1 Torr)	0.5%
5 x 10 ⁻⁴ -1 Torr 5 x 10 ⁻³ -10 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	1 x 10 ⁻⁵ -0.02 Torr 2.5 x 10 ⁻⁵ -0.05 Torr 5 x 10 ⁻⁵ -0.10 Torr 5 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -2 Torr 5 x 10 ⁻³ -10 Torr 1 x 10 ⁻² -20 Torr 2.5 x 10 ⁻² -50 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	2.5 x 10 ⁻⁵ -0.05 Torr 5 x 10 ⁻⁵ -0.10 Torr 5 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -2 Torr 5 x 10 ⁻³ -10 Torr 1 x 10 ⁻² -20 Torr 2.5 x 10 ⁻² -50 Torr 5 x 10 ⁻² -100 Torr 5 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr (621 only) 5 x 10 ⁻³ -10 Torr 5 x 10 ⁻³ -100 Torr 5 x 10 ⁻² -1000 Torr
5 x 10 ⁻³ -1 Torr 5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -1000 Torr	1 x 10 ⁻⁴ -0.02 Torr 2.5 x 10 ⁻⁴ -0.05 Torr 5 x 10 ⁻⁴ -0.10 Torr 5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr 5 x 10 ⁻² -10 Torr 1 x 10 ⁻¹ -20 Torr 2.5 x 10 ⁻¹ -50 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr	2.5 x 10 ⁻⁴ -0.05 Torr 5 x 10 ⁻⁴ -0.10 Torr 5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr 5 x 10 ⁻² -10 Torr 1 x 10 ⁻¹ -20 Torr 2.5 x 10 ⁻¹ -50 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr	5 x 10 ⁻³ -1 Torr 1 x 10 ⁻² -2 Torr (621 only) 5 x 10 ⁻² -10 Torr 5 x 10 ⁻¹ -100 Torr 5 -1000 Torr
<5 x 10 ⁻⁵ -1 Torr <5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<1 x 10 ⁻⁷ -0.02 Torr <2.5 x 10 ⁻⁶ -0.05 Torr <5 x 10 ⁻⁶ -0.10 Torr <5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr <5 x 10 ⁻⁴ -10 Torr <1 x 10 ⁻³ -20 Torr <1 x 10 ⁻³ -20 Torr <2.5 x 10 ⁻³ -50 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<2.5 x 10 ⁻⁶ -0.05 Torr <5 x 10 ⁻⁶ -0.10 Torr <5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr <5 x 10 ⁻⁴ -10 Torr <1 x 10 ⁻³ -20 Torr <2.5 x 10 ⁻³ -50 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr	<5 x 10 ⁻⁵ -1 Torr <1 x 10 ⁻⁴ -2 Torr (621 only) <5 x 10 ⁻⁴ -10 Torr <5 x 10 ⁻³ -100 Torr <5 x 10 ⁻² -1000 Torr
4 hours	2 hours for >1 Torr range 4 hours for <1 Torr	2 hours for >1 Torr range 4 hours for <1 Torr	4 hours
AC Version: 115/230 Vac @ 250/125 mA DC Version: +22 to 30 VDC @ 600 mA	624: ±15VDC (±5%) @ 400mA 627: ±15VDC (±5%) @ 250mA 629: ±15VDC (±5%) @ 250mA	±15 VDC (±5%) @ 600mA	±15VDC (±5%) @ 800mA max (steady state)

- (4) Lower readings are often possible, but not always practical when considering the application or environment.
- (5) The pressures noted in this column are for reference. A 50 millivolt DC signal is usually the preferred minimum signal level when integrating any electronic component into complex processing systems.
- (6) All Baratron® require initial, and periodic zeroing at a pressure lower than their minimum resolution in order to assure the full dynamic range specified can be achieved. Zeroing a Baratron® at some pressure above its stated minimum resolution will create an artificial zero pressure relative to the system on which the Baratron® is located.



Specifications

High Accuracy Selection Guide

Type / Number	Temperature Controlled		High Temperature, Bakeable	
	120A	690A*	590A*	615A*
Full Scale Range (Torr) (1)	0.1 1 10 100 10000	0.1 1 10 100 1000	1 10 100 1000	1 10 100 1000
Ambient Operating Temperature (°C)	15 to 40°C	15 to 40°C	40 to 65°C	15 to 200°C (8)
Sensor Operating Temperature (°C) (2)	Temperature controlled @ 45 or 80°C	Temperature controlled @ 45°C	Temperature controlled @ 70°C	Ambient (optional controller recommended)
Accuracy in % of Reading (3)	0.12, 0.08 or 0.05 (7)	0.12, 0.08 or 0.05	0.12	0.12 (8)
Lowest Suggested Reading (Torr) (4)	5 x 10 ⁻⁶ -0.1 Torr 1 x 10 ⁻⁵ -1 Torr 1 x 10 ⁻⁴ -10 Torr 1 x 10 ⁻³ -100 Torr 1 x 10 ⁻² -1000 Torr	1 x 10 ⁻⁶ -0.1 Torr 1 x 10 ⁻⁵ -1 Torr 1 x 10 ⁻⁴ -10 Torr 1 x 10 ⁻³ -100 Torr 1 x 10 ⁻² -1000 Torr	3 x 10 ⁻⁵ -1 Torr 1 x 10 ⁻⁴ -10 Torr 1 x 10 ⁻³ -100 Torr 1 x 10 ⁻² -1000 Torr	5 x 10 ⁻⁵ -1 Torr 5 x 10 ⁻⁴ -10 Torr 5 x 10 ⁻³ -100 Torr 5 x 10 ⁻² -1000 Torr
Lowest Suggested Control Pressure (Torr) (5)	1 x 10 ⁻⁴ -0.1 Torr 2 x 10 ⁻⁴ -1 Torr 2 x 10 ⁻³ -10 Torr 2 x 10 ⁻² -100 Torr 2 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻⁶ -0.1 Torr 2 x 10 ⁻⁴ -1 Torr 2 x 10 ⁻³ -10 Torr 2 x 10 ⁻² -100 Torr 2 x 10 ⁻¹ -1000 Torr	1 x 10 ⁻⁴ -1 Torr 1 x 10 ⁻³ -10 Torr 1 x 10 ⁻² -100 Torr 1 x 10 ⁻¹ -1000 Torr	5 x 10 ⁻⁵ -1 Torr 5 x 10 ⁻⁴ -10 Torr 5 x 10 ⁻³ -100 Torr 5 x 10 ⁻² -1000 Torr
Proper Zero Adjust Pressure (Torr) (6)	<5 x 10 ⁻⁷ -0.1 Torr <1 x 10 ⁻⁶ -1 Torr <1 x 10 ⁻⁵ -10 Torr <1 x 10 ⁻⁴ -100 Torr <1 x 10 ⁻³ -1000 Torr	<1 x 10 ⁻⁷ -0.1 Torr <1 x 10 ⁻⁶ -1 Torr <1 x 10 ⁻⁵ -10 Torr <1 x 10 ⁻⁴ -100 Torr <1 x 10 ⁻³ -1000 Torr	<1 x 10 ⁻⁶ -1 Torr <1 x 10 ⁻⁵ -10 Torr <1 x 10 ⁻⁴ -100 Torr <1 x 10 ⁻³ -1000 Torr	<5 x 10 ⁻⁶ -1 Torr <5 x 10 ⁻⁵ -10 Torr <5 x 10 ⁻⁴ -100 Torr <5 x 10 ⁻³ -1000 Torr
Initial Warm-up Time	4 hours	4 hours	4 hours	4 hours with MKS Type 273 Temperature Controller
Input Power Requirements or Interface	±15VDC @ 700mA or +24 to 30 VDC for 45°C ±15VDC @ 1.5Amps or +24 to 30 VDC for 80°C	MKS Type 670 or 274	MKS Type 670 or 274	MKS Type 670 or 274

* Requires 670 signal conditioner to complete measurement system.

(1) Some types are available in higher Full Scale ranges.

(2) Temperature controlled Baratron® are the preferred choice when precise, repeatable measurement is required at 100 millitorr. 45°C temperature controlled Baratron® can be selected for applications where ambient temperature is less than 40°C. Higher temperature controlled Baratron® should be selected when ambient temperatures are needed to preclude effluent condensation and contamination build up.

(3) Accuracy includes non-linearity, hysteresis, and repeatability.

(4) Lower readings are often possible, but not always practical when considering the application and environment.

(5) The pressures notes in this column are for reference. A 50 millivolt DC signal is usually the preferred minimum signal level when integrating any electronic component into complex processing systems.

(6) All Baratron® require initial and periodic zeroing at a pressure lower than their minimum resolution in order to assure the full dynamic range specified can be achieved. Zeroing a Baratron® at some pressure above its minimum resolution will create an artificial zero pressure relative to the system pressure on which the Baratron® is located.

(7) 0.05% accuracy not available in the 0.1 Torr range unit. 0.08% and 0.05% not available in the 80°C version of the Type 120A.

(8) The 1 Torr range unit has 0.25% accuracy.



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