



Pressure &

Vacuum Measurement Solutions

WWW.MKSINST.COM

## 631D

### HEATED (150°C OR 200°C) ABSOLUTE BARATRON® CAPACITANCE MANOMETER

The 631D Baratron® capacitance manometer, operating at very high internal temperatures, minimizes the deposition of process byproducts within the sensor—nearly eliminating output drift caused by contamination. Its available operating temperatures are 150°C or 200°C, permitting use in the most demanding vacuum processes in semiconductor manufacturing, such as metal etching and nitride film chemical vapor deposition (CVD). Its new packaging reduces the amount of installation space needed by at least 40%, making it even easier to design into new systems or retrofit into existing equipment.

The 631D is completely self-contained, requiring only input power of  $\pm 15\text{VDC}$  for operation. No separate electronics modules are used, which both reduces the amount of installation space needed and provides better performance due to elimination of noise-generating interconnecting cables. Its Inconel® sensor offers extremely high resistance to corrosion, and its overpressure rating of 45 psia ensures good repeatability and stability regardless of the system operating conditions. The 631D high-performance analog electronics also include fail-safe overtemperature protection and LED status lamps to indicate its operating state. An internally-mounted set of two (2) UL-approved solid-state trip relays for pressure and one (1) UL-approved electromechanical relay for heater failure is also available, allowing the manometer to control external equipment or components. The pressure trip relays may be adjusted by the user independently at atmospheric pressure, eliminating the need for vacuum pumps during set point adjustment.

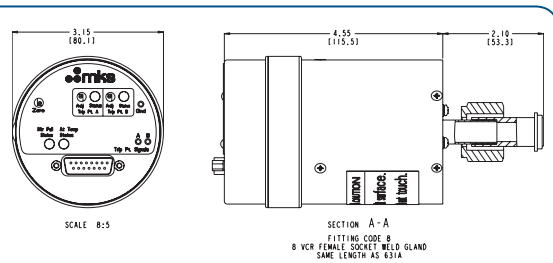
### Features & Benefits

- Sensor operating temperature of 150°C or 200°C
- All-Inconel capacitance sensor
- High 45 psia overpressure rating
- Compact design
- Optional internally-mounted process relays, solid-state
- Long-term performance in nitride CVD, metal etch, and sterilizing processes
- Reduces installation space, and eliminates noise caused by interconnecting cables
- Insensitive to gas composition
- Performance is unaffected by occasional pressure bursts



# Specifications and Ordering Information

<b>Full Scale Pressure Ranges</b>	1, 2, 10, 30, 100, and 1000 Torr (mm Hg)
<b>Accuracy</b>	0.50% of Reading
<b>Temperature Coefficients</b>	
Zero	0.004% Full Scale/°C (0.008% Full Scale/°C for 1 Torr range) for 150°C products; 0.008% Full Scale/°C (0.016% Full Scale/°C for 1 Torr range) for 200°C products
Span	0.02% Reading/°C
<b>Response Time</b>	50 msec
<b>Internal Volume</b>	6.3 cm <sup>3</sup>
<b>Input Power</b>	± 15VDC (±5%) @ 1.0 amps max
<b>Output Signal</b>	Analog 0-10VDC into >10 k Ω load
<b>Warmup Time</b>	4 hours or less
<b>Operating Temperature Range</b>	15 to 50°C
<b>Ambient Airflow Requirements</b>	
150°C Models	50 ft/min for ambient temperatures of 45 – 50°C
200°C Models	150 ft/min for ambient temperatures of 40 – 50°C
<b>Resolution</b>	0.01% of Full Scale
<b>Overpressure Limit</b>	45 psia
<b>Materials Exposed to Process Gases</b>	Inconel® or Incoloy® nickel alloys <sup>1</sup>
<b>Trip Relay Option</b>	Two (2) internally mounted 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 0.20 amps @ 30 VDC. Comply with UL1577 requirements. Option also includes one (1) UL-approved non-adjustable electromechanical relay for heater failure, rated at 1.0 amps @ 30 VDC.
<b>Fittings</b>	
Standard	0.50" (12 mm) OD tube
Optional	Swagelok® 8 VCR® female, NW16-KF, 1.5" TriClover, and 2" TriClover
<b>Compliance</b>	CE <sup>2</sup>



## Dimensional Drawing —

Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).  
For dimensions on other configurations, please contact MKS Applications Engineering.

## Ordering Code Example: GGGXXUYZTRR Absolute Manometer

Model (GGGG)	Code	Configuration
631D Absolute Manometer	631D	631D
<b>Ranges (XX)</b>		
1	01	11
2	02	
10	11	
30	31	
100	12	
1000	13	
<b>Units of Measurement (U)</b>		
Torr	T	T
Mbar	M	
Pascal	L	
<b>Fittings (Y)</b>		
½" OD tube	A	B
8 VCR female, 1.58" (40.1 mm) port length	B	
8 VCR female, 2.10" (53.3 mm) port length	8	
8 VCR female, 2.50" (63.5 mm) port length	9	
NW16-KF <sup>3</sup>	D	
1.5" TriClover	M	
2.0" TriClover	N	
<b>Accuracy (Z)</b>		
0.50% Reading	F	F
<b>Temperature (T)</b>		
150°C	H	H
200°C	P	
<b>Integral Relays (RR)</b>		
No relays	None	AA
Trip Point A Above Set Point, Trip Point B Above Set Point <sup>4</sup>	AA	
Trip Point A Above Set Point, Trip Point B Below Set Point <sup>4</sup>	AB	
Trip Point A Below Set Point, Trip Point B Below Set Point <sup>4</sup>	BB	
Trip Point A Below Set Point, Trip Point B Above Set Point <sup>4</sup>	BA	

- Products with TriClover fittings have 316L stainless steel fittings.
- For CE compliance, the mating electrical connector must be properly grounded.
- Contact MKS Applications Engineering for sealing material recommendations.
- Unless otherwise specified, both relays will be set to activate at 50% of Full Scale.



## MKS Instruments, Inc. Global Headquarters

2 Tech Drive, Suite 201  
Andover, MA 01810  
Tel: 978.645.5500  
Tel: 800.227.8766 (in U.S.A.)  
Web: www.mksinst.com

## MKS Instruments, Inc. Pressure & Vacuum Measurement Solutions

Six Shattuck Road  
Andover, MA 01810  
Tel: 978.975.2350