



## SPM-2000 GUARDIAN PLUS SPACE PRESSURIZATION MONITOR AND CONTROLLER

### Description

The **GuardianPlus** is designed to meet the stringent requirements for critical space pressure monitoring, alarming, and control applications such as; hospital patient isolation and operating rooms, research facility laboratories, pharmaceutical sterile fill areas, and semiconductor FAB's and cleanrooms.

The **GuardianPlus** is a complete system package consisting of space and reference pressure sensors and a central processing module with an integral three-mode controller. The central module measures and displays the space pressure with a resolution of up to one ten-thousandth of an inch water column (0.025 Pascal's). The **Guardian Plus** three-mode (P, I, 1/D) controller modulates a control damper, VFD, etc., to maintain the desired space pressure to within +/-0.0005 inches of water (0.125 Pascal's).

The central processing module also includes a local LED indicating both normal and alarm status, audible alarm with alarm acknowledge switch, and auxiliary dry contacts for remote alarm. A key locking front panel allows for controlled access to field configurable functions including audible alarm silence and adjustable time delay as well as critical alarm and controller setpoint values.

### Features

- True differential pressure sensing down to one ten-thousandth of an inch water column
- Integral three-mode controller
- Door interrupt option to freeze controller output or ramp to pre-determined output value when door is open
- High accuracy and long-term stability
- Available in seven pressure ranges
- Analog output, linear to the space pressure, for remote monitoring and data logging purposes
- Audible local alarm and alarm acknowledge switch
- Positive and negative pressure monitoring
- Time delay to prevent nuisance alarms
- Simple field adjustment of control, alarm and time delay setpoints
- LED with four digit resolution for local indication of the measured differential pressure
- LED's to indicate normal or alarm status



## **SPM-2000 Technical Specifications**

### **Space Pressure Monitor Specifications**

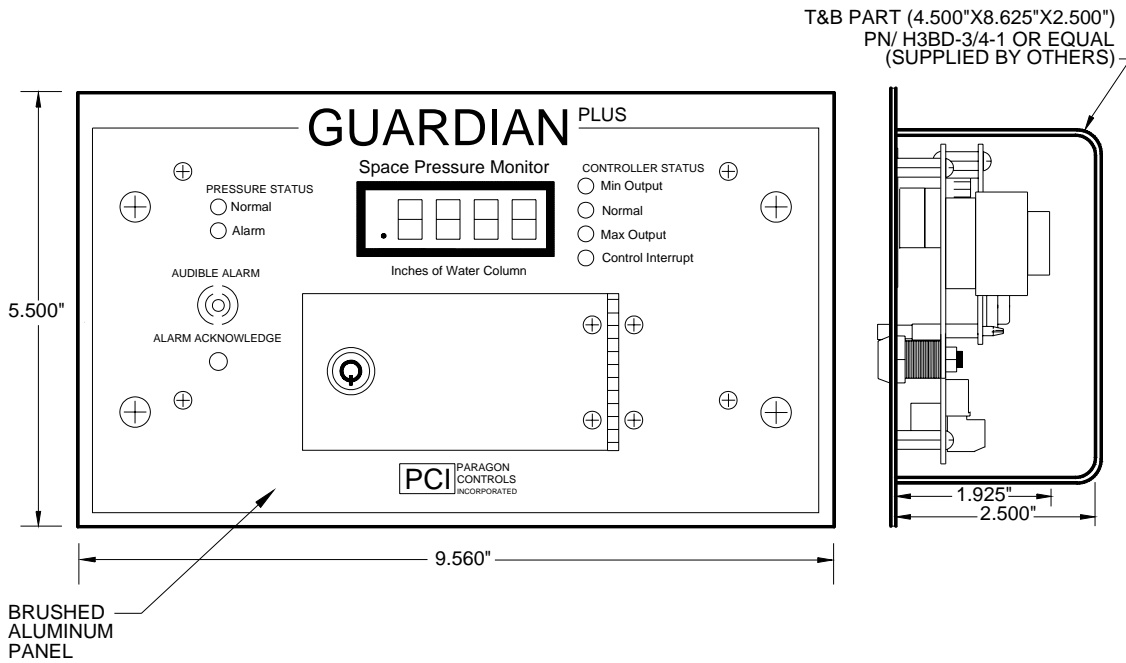
- 1. Accuracy**  
±0.5% F.S. Terminal Point (±0.35% F.S. BFSL)
- 2. Stability**  
<±1.0% F.S. per year
- 3. Temperature Effects**  
<±0.03% F.S./°F (0.05% F.S./°C)
- 4. Over-pressure**  
5 psi proof and 25 psi burst
- 5. Response**  
<0.25 seconds for full span input
- 6. Signal Conditioning**  
Low pass filter, factory set @ 0.8 Hz
- 7. Standard Range**  
±0.05 in. w.g. (12.46 Pa)
- 8. Optional Ranges**  
±0.1, ±0.2, ±0.5, ±1.0, ±2.0 and ±5.0 in.w.g.
- 9. Process Input Connections**  
¼ inch barb fittings
- 10. Display**  
4 digit LED, 0.5 inch height
- 11. Analog Output**  
Field selectable 4 to 20mA or 0 to 10 VDC
- 12. Alarm Output**  
SPDT relay
- 13. Contact UL/CSA Rating**  
0.6A @ 125VAC; 0.6A @ 110VDC; 2.0A @ 30VDC
- 14. Alarm Dead Band**  
0.1% FS

- 15. Alarm Delay Range**  
0 to 30 seconds
- 16. Alarm Sound Pressure Level**  
80 dB
- 17. Power**  
22 to 26VAC; 50/60Hz
- 18. Power Consumption**  
4.0VA
- 19. Operating Temperature**  
32 to 160°F (0 to 70°C)
- 20. Storage Temperature**  
-40 to 180°F (-40 to 82°C)
- 21. Weight**  
2.1 pounds (4.6 Kg)

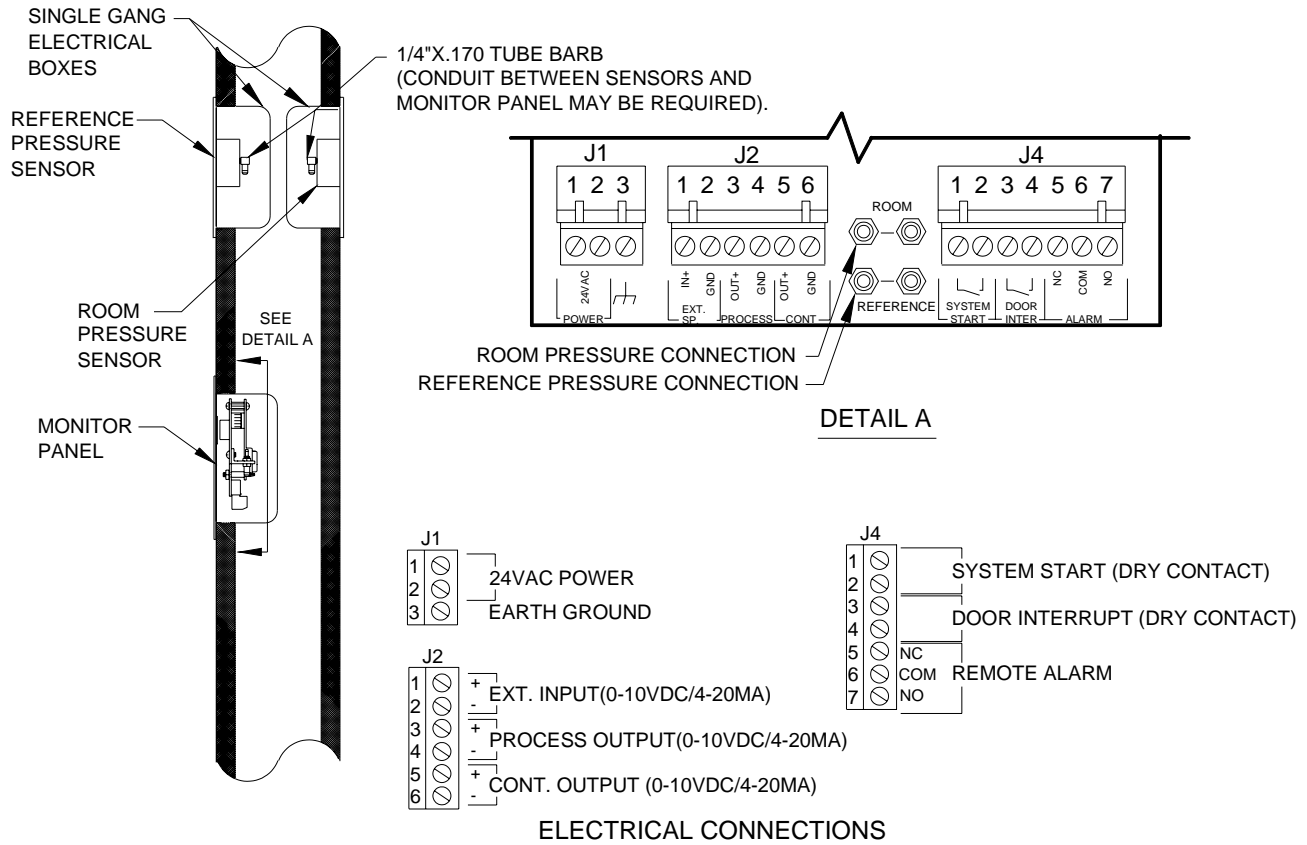
### **Three Mode Controller (P, I, 1/D) Specifications**

- 22. Proportional Band**  
Set to 10%
- 23. Reset**  
Adjustable from 0.6 to 6.0 repeats per minute
- 24. Inverse Derivative**  
Adjustable from 0.5 to 7 minutes
- 25. Hysteresis & Dead Band**  
Within 0.01% of span
- 26. Tracking Accuracy**  
±1% of span
- 27. Repeatability**  
Within 0.1% of span
- 28. Output Signals**  
0-10 VDC or 4-20 mA

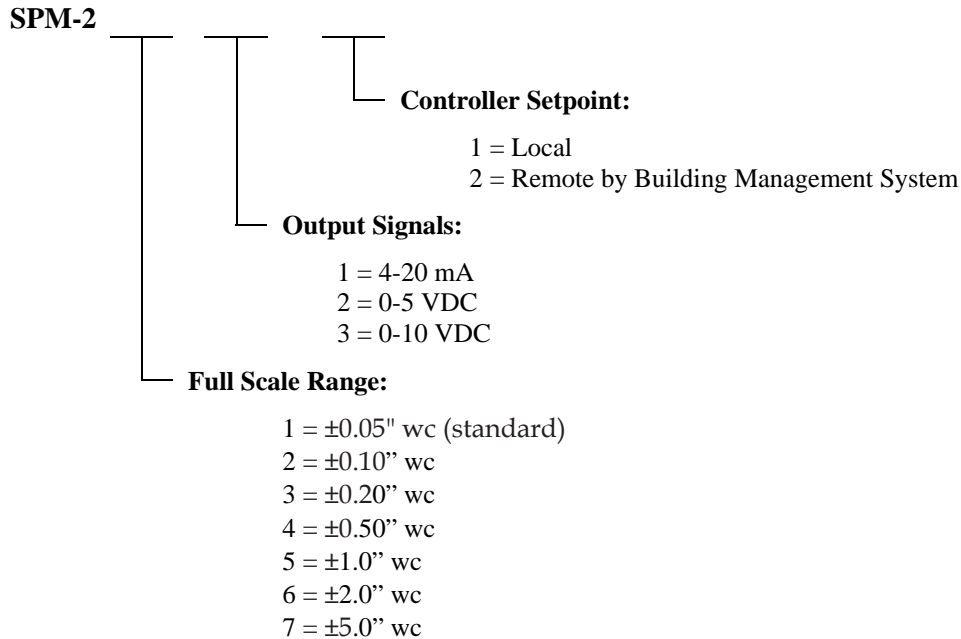
## SPM-2000 Dimensions



## SPM-2000 Installation and Field Connections



## SPM-2000 Ordering Information



## SPM-2000 Specification Guide

1. The space pressure monitor shall be capable of measuring the differential pressure between two individual spaces utilizing industrial quality differential pressure transducer technology and shall be capable of issuing a 0-10VDC or 4-20mA control output signal utilizing 3-mode (P, I, I/D) control circuitry to maintain the desired differential pressure between these two areas.
2. Implied pressure measurement systems utilizing thermal (hot wire) air velocity measurement are not acceptable.
3. The space pressure monitor shall provide an analog output linear to the space pressure being monitored and a digital output to indicate the alarm status of the space for remote monitoring purposes. Remote alarm status shall be via a Form C dry contact. Local, high visibility, LED space pressure status lights and audible alarm with alarm acknowledgment (silence) button shall be provided. Local indication shall display the measure differential pressure to the ten thousandth of an inch of water column.
4. The space pressure monitor shall be factory configured for either positive or negative space pressure monitoring based on its scheduled usage.
5. The positive/negative pressure alarm activation value, control setpoint value, and alarm activation delay value are to be field adjustable.
6. Switch selectable control mode values shall allow for "In Operation" controller tuning of proportional band, reset (integral), and inverse derivative to match system dynamics. The controller shall also be provided with the following:
  - a. Auto/ Manual control output selection.
  - b. Local or remote adjustment of the required differential pressure setpoint value.
  - c. Controller output/setpoint display selection switch.
  - d. Door interrupt feature to freeze or ramp the controller output to a predetermined value when the room door is opened.
  - e. Control accuracy of +/- 0.5% F.S.
7. The space pressure controller shall be the GuardianPlus as manufactured by Paragon Controls Incorporated, Santa Rosa, CA (707) 579-1424