



*Pictured with optional two line graphic display*

## SPM-3000 MICRO GUARDIAN SPACE PRESSURE MONITOR & ALARM SYSTEM

### DESCRIPTION

The **Micro Guardian** is a true differential space pressure measurement system. The **Micro Guardian** integrates the newest microprocessor technologies with state-of-the-art, industrial grade, highly accurate, ultra low range differential pressure sensing cells. The combination of these two technologies ensures exceptional accuracy and long-term stability.

The **Micro Guardian** is a complete system package including space and reference pressure sensors and a central signal processing module. The central module includes a flush mount electrical box, local LED indication of alarm status and operational mode, audible alarm with alarm acknowledge button, and offers an optional LCD for local display of the space pressure. Device monitoring and configuration is performed via LonWorks® or BACnet®-MS/TP communication networks. Additionally, the monitor can be configured locally via IR communication using a laptop or Palm Tungsten E2® (or equivalent). A separate BACnet® communication port is available for connection to an optional Remote Pressure Monitor (i.e. Nurses Station) offered by PCI. Communication network variables include the measured space pressure, high and low pressure alarm values, operational mode selection, alarm status, alarm delay value and audible alarm on/off selection.

The **Micro Guardian** also incorporates a form C SPDT room pressure alarm relay for remote alarm activation and an analog output signal linear to the measured space differential pressure. Device zero and span calibration is simply performed by removing the cover, applying the correct pressure, and depressing zero and span buttons located on the PC board. A successful calibration is indicated by a flashing green status LED.

### Features

- True differential pressure sensing down to one ten-thousandth of an inch water column (0.025 Pa) assuring no sensor fouling due to airborne particulate
- High accuracy and long-term stability
- LonWorks® and BACnet® certified by an independent testing laboratory
- Available in nine full scale ranges
- Analog output, linear to the space pressure, for remote monitoring and data logging purposes
- Form C SPDT relay for activation of a remote alarm
- LED's to indicate normal or alarm status
- LED's to indicate operating mode (positive, negative, or off)
- Audible local alarm and alarm acknowledge button
- High and low pressure time delay functions to prevent nuisance alarms
- Device monitoring or configuration can be performed through a LonWorks® or BACnet® communication network as well as locally via IR communication to a laptop or Palm Tungsten E2® (or equivalent)
- Optional two line graphic LCD display for indicating differential pressure
- Optional wash-down compliant to International Protection Rating standard IP64B

## SPM-3000 Technical Specifications

### 1. Transducer Full Scale Ranges

Bidirectional

- ±0.05 in. of water (12.45 Pa)
- ±0.10 in. of water (24.91 Pa)
- ±0.25 in. of water (62.27 Pa)
- ±0.50 in. of water (124.54 Pa)
- ±1.00 in. of water (249.09 Pa)

### 2. Accuracy

±0.35% of full scale including linearity, hysteresis, deadband and repeatability

### 3. Operating Range

The operating range will be 100% of the transducer full scale range

### 4. Temperature Effect

Zero: ±0.025% of transducer full span per °F  
Span: ±0.025% of transducer full span per °F

### 5. Temperature Limits

Operating: 32 to 122°F (0 to 50°C)  
Storage: -20 to 158°F (-29 to 70°C)

### 6. Overpressure Limits

Proof Pressure: 15 psid (0.3447 bar)  
Burst Pressure: 25 psid (0.689 bar)

### 7. Humidity Limits

0 to 95% RH, non-condensing

### 8. Stability

Maximum Change F.S./Yr.: ±0.5%

### 9. Mounting Position Effect

Below 0.5 Inch wc (124.5 Pa): ≤ 0.25% full scale  
Above 0.5 Inch wc (124.5 Pa): ≤ 0.10% full scale

### 10. Span and Zero Adjustments

Performed by depressing Zero & Span buttons

## Indication

### 11. Display

- a. Green and Red LED's located on front panel
- b. Optional backlit, 2 line graphical LCD providing 8 characters of data display

## Communication

### 12. Network

LonWorks®  
BACnet MS/TP®

### 13. Local

IR communication via PC or PDA

## Variables

### 14. Room Identifier

Accepts 16 alpha/numeric characters

### 15. Operation Mode

Off  
Positive  
Negative

### 16. Filters

Output: 0 to 99 seconds  
Display: 0 to 99 seconds (optional)

### 17. Engineering Units

Inch w.c.  
Pa  
KPa  
mm of w.c.

### 18. Alarm Values

Positive High Alarm Value  
Positive Low Alarm Value  
Negative High Alarm Value  
Negative Low Alarm Value  
Alarm Delay Value; Adjustable 0 to 999 seconds

### 19. Audible Alarm

Selection of ON/OFF  
Selection of continuous/interval

### 20. Alarm Delay

Delays alarm activation after an alarm event occurs from 0 to 999 seconds. The default is 30 seconds.

### 21. Field Password

Accepts up to 5 numeric characters

## Inputs/Outputs

### 22. Digital Input

Remote alarm disable

### 23. Analog Output

Field selectable 4 to 20mA or 0 to 10 VDC

### 24. Relay Output

Remote Alarm: single (1 form C) dry contacts rated for 1 amp at 30 VDC / 3 amps at 125 VAC / 2 amps at 250 VAC resistive load

## Power

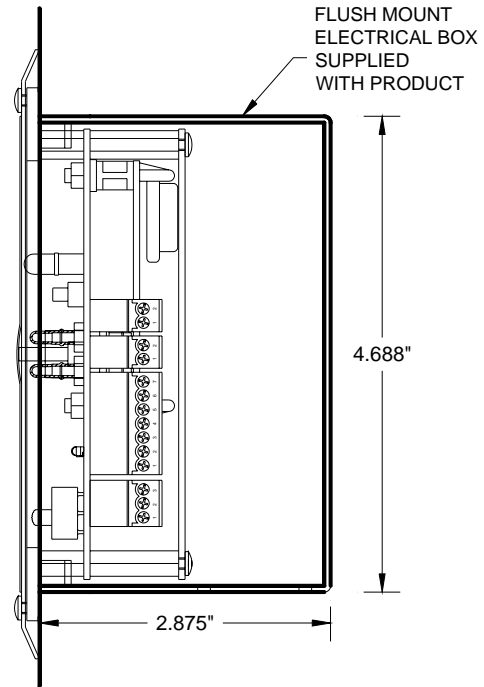
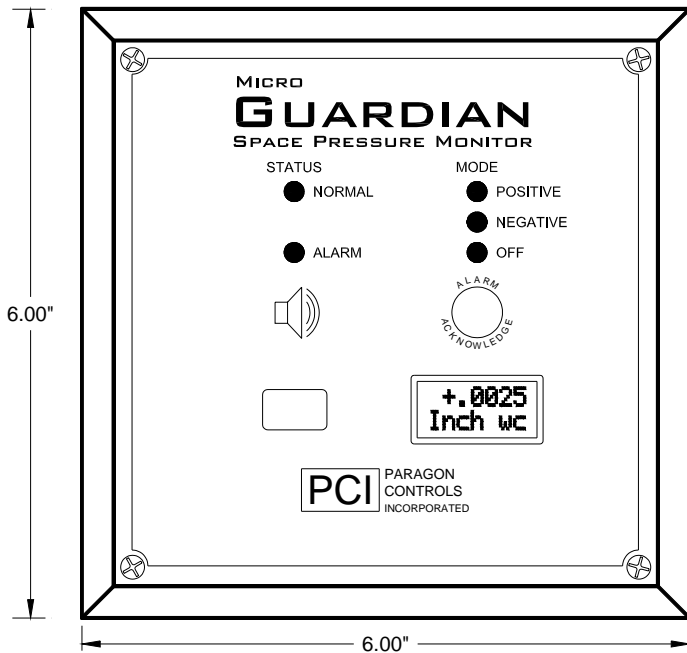
### 25. Power Supply

20 to 28 VAC (50/60HZ) at 3 VA

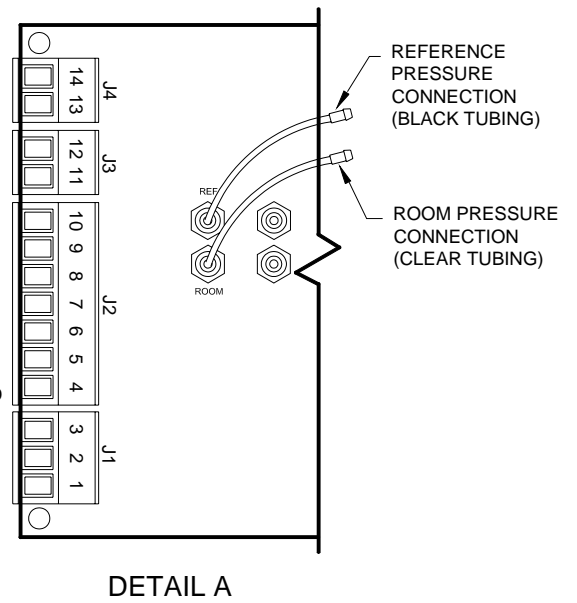
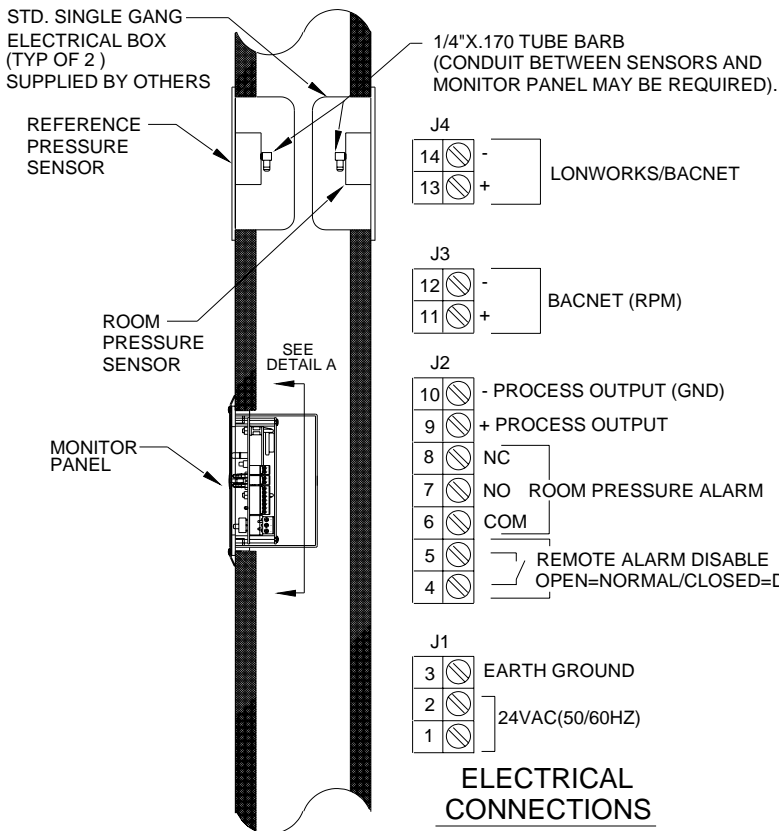
### 26. Circuit Protection

Power input is isolated and supplied with a 1A resettable fuse

**SPM-3000 Dimensions**



**SPM-3000 Installation and Field Connections**



## SPM-3000 Specification Guide

### Space Pressure Monitor and Alarm Systems

- Provide where indicated and/or scheduled a space pressure monitor and alarm system (SPM) capable of measuring the differential pressure between two spaces and alarming if any of the required control conditions are not maintained.
- The SPM shall measure the differential pressure between two spaces using industrial grade differential pressure transducers meeting the following performance criteria. Systems using air velocity measurement between two spaces which imply a specific space pressure exists are not acceptable.
  - Accuracy:  $\pm 0.35\%$  F.S. including linearity, hysteresis, deadband and repeatability
  - Temperature Effects:  $0.025\%$  F.S./deg F
  - Stability – Maximum Change F.S./Yr:  $\pm 0.5\%$
  - Over-pressure: 15 psid proof/25 psid burst
- Each SPM shall have local high intensity LED indicating lights identifying either normal or alarm status of the space being monitored, a local audible alarm, an alarm acknowledge button, and local indication of the measured space pressure down to one ten-thousandth of an inch of water (0.025 Pa).
- Each space shall have a dedicated SPM that shall be capable of both standalone operation as well as full integration into the building management system (BMS). The SPM shall also be capable of local communication and configuration via a handheld device having an integral and compatible IR communication port. SPM monitoring and configuration shall be performed through [LonWorks®] [BACnet®-MS/TP communication networks] and/or through local IR communication between the SPM and compatible portable device. The operational mode shall be selectable via the use of a remote mounted key switch.
- The SPM shall provide a field selectable 4-20 mA or 0-10 VDC analog output signal linear to the measured space differential pressure as well as a form C SPDT binary alarm relay for remote monitoring and alarming capability.
- Selections and adjustments that may be made at the jobsite shall include Positive and/or Negative pressurization mode selection, alarm setpoint values, and alarm delay value.
- All of the SPM system components shall meet International Protection Rating Standard IP64B for wash-down and intrusion compliance to allow for good housekeeping practices.
- Each SPM shall include a pressure monitoring module with mounting box and two space pressure sensors. All components of the space pressure monitoring system shall be designed for both flush mounting and surface mounting, and shall be furnished to comply with the specified project requirements.

### Manufacturer

- The SPM system manufacturer shall have a minimum of five (5) years of experience in space pressure monitoring and control, and shall be willing and able to provide a user list, with contact information, upon request.
- The space pressure monitoring system shall be the Micro Guardian model SPM-3000 as manufactured by Paragon Controls Incorporated, Santa Rosa, California, telephone (707) 579-1424.
- Alternatives requesting acceptance “as equal” less than 60 days prior to bid date or products submitted in non-conformance with the requirements of this specification will not be considered. For any product to be considered for substitution a written detailed exception/compliance document shall be submitted to the Engineer prior to any consideration for approval.

## SPM-3000 Ordering Information

<p><b>Full Scale Range:</b></p> <ul style="list-style-type: none"> <li>1 = <math>\pm 0.05</math> in. of water (12.45 Pa)</li> <li>2 = <math>\pm 0.10</math> in. of water (24.91 Pa)</li> <li>3 = <math>\pm 0.25</math> in. of water (62.27 Pa)</li> <li>4 = <math>\pm 0.50</math> in. of water (124.54 Pa)</li> <li>5 = <math>\pm 1.0</math> in. of water (249.09 Pa)</li> <li>6 = Other (Specify Range)</li> </ul>	<p><b>SPM-3</b></p> <p><b>Output:</b></p> <ul style="list-style-type: none"> <li>1 = 4-20 mA</li> <li>2 = 0-10 VDC</li> </ul>	<p><b>-</b></p> <p><b>Room Pressure:</b></p> <ul style="list-style-type: none"> <li>1 = Positive</li> <li>2 = Negative</li> </ul>	<p><b>Options: Separate each option code with a dash.</b></p> <ul style="list-style-type: none"> <li>1 = LonWorks® Communication with BAS</li> <li>2 = BACnet®-MS/TP Communication BAS</li> <li>5 = LCD Display</li> <li>6 = Wash-down Compliant IP64B</li> <li>7 = Surface Mount Electrical Box</li> <li>8 = Palm Tungsten E2® Programming/Monitoring Tool</li> <li>9 = Air Tight Flush Mount Electrical Box</li> </ul>
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