

ROOM PRESSURE MONITORS

A. General

1. The Isolation Room Pressure Monitors ("Monitor") to measure and/or control the pressure differential between the room and adjacent corridors shall be provided at all locations shown on the prints. Each room shall have its own Monitor capable of stand-alone operation or complete system integration. Each Monitor shall have a local LCD display, room alarm status indicator, visual and audible alarm annunciator, dual alarm relay outputs, analog output, serial asynchronous communications port, internal or remote sensor, keylock switch, keypad selection of three isolation types, alarm silence keypad used to mute the audible alarm, test keypad, and a separate power supply. All of these items shall have the characteristics of and meet the specifications below.

B. Acceptable Manufacturers

1. The Isolation Room Pressure Monitor design shall be field proven with at least four (4) years of successful operation in room pressurization applications.
2. The Isolation Room Monitor shall be the FMS-1630 Series from TRIATEK INC., 2976 Pacific Drive, Norcross, GA 30071, Telephone (770) 242-1922, Fax (770) 242-1944.

C. Performance Requirements

1. The Isolation Room Pressure Monitor shall be capable of measuring ultra low pressures or flows with both positive and negative standard pressure calibration ranges of 0 to 0.010"WC, 0 to 0.050"WC, 0 to 0.100"WC or 0 to 0.200"WC. The Room Pressure Monitor shall be factory calibrated with NIST traceable standards and shall have accuracy as follows:

<u>PRESSURE RANGE</u>	<u>ACCURACY @ 72° F +5° F</u>
0 to .01000"WC	± .0001"WC
0 to .05000"WC	± .0005"WC
0 to .10000"WC	± .0010"WC
0 to .20000"WC	± .0020"WC

Monitor accuracy and displayed resolution shall be achieved by use of 12-bit analog-to-digital and digital-to-analog conversion processes. Internal calculations shall be accomplished using true floating point math algorithms to ensure the minimum required accuracy and performance.

2. The Isolation Room Pressure Monitor shall use thermal anemometry having a small micro area flow path to provide for high sensitivity and the precision accuracy shown in the preceding section. The Sensor shall constantly monitor bi-directional room pressurization using through-the-wall sensing referenced to the central corridor or hall. The air tubing assembly including wall mounted assembly, tubing, fittings, and stainless steel cover plate for the isolation room shall be provided with the Monitor as a complete unit.

A remote sensor/transmitter shall be available as a standard feature in lieu of the internal pressure sensor.

3. The Isolation Room Pressure Monitor shall provide for tri-state monitoring of room pressurization modes including Negative Isolation, Positive Isolation, or No Isolation. These three modes shall be selectable from the touch pads on the front of the Monitor and shall be keylock switch protected. The integral keylock switch shall permit authorized selection of room pressurization mode or change of the room pressurization mode previously set. Dual alarm setpoints shall be stored for both the Negative and the Positive Isolation modes. For No Isolation the alarms shall be disabled and there will be no indication from the Status Indicators, i.e. the Green, Amber, and Red LED's on the FMS Status Panel shall all be de-energized.

The Monitor shall store three separate control setpoints for use in the PID control mode so as to control to a specifically defined pressure for each isolation type. No isolation has a setpoint which can be defined to maintain proper building static for most economical building operation when isolation is not required for that room.

4. The Isolation Room Pressure Monitor shall have an LCD alphanumeric display consisting of four, sixteen-character lines to show actual room pressure readings in "WC or in metric units to five decimal places. Systems that require the user to multiply the displayed reading by a factor will be unacceptable. The Monitor shall be capable of displaying both English and Metric readings simultaneously on two separate lines of the display. An eight-character programmable descriptor shall be capable of displaying the room name or the room number associated with the concurrently displayed pressure reading. Where other variables are displayed on the additional display lines included with the Monitor, these shall also include the eight-character descriptor. Display update time shall be one second maximum. Systems displaying pressure in less than five decimal place readings will be unacceptable.

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5. The Isolation Room Pressure Monitor shall have an analog output that is field selectable as either a linear signal directly relating to pressure or as a PID floating point control output. Output shall be selectable as either mADC or voltage. This output shall be field scaleable to provide the exact offset and span required to yield the best operating results, i.e., compressed span for quick operation. For pneumatic applications this output shall be connected to TRIATEK's CP-3000 Series I/P to provide a pneumatic control signal.
6. The Isolation Room Pressure Monitor shall have two (2) analog inputs. One of these shall be dedicated to the room pressure sensor and the other shall be available as an auxiliary or spare input for display of another variable such as room temperature or room humidity. The second analog input shall be displayed simultaneously with the room pressure. It shall be field scaleable to values suitable to the other variable selected.
7. The Isolation Room Pressure Monitor shall have both audible and visual alarms having adjustable setpoints. Alarm sequence shall be such that pressure readings and alarm status lights have instantaneous response to insufficient isolation pressure. Audible alarms shall have a programmable time delay which has a resolution of one second to provide a time lag before the audible alarm is activated and latched on. This programmable delay shall be adjustable from instantaneous (no delay) to 600 seconds minimum in 1 second increments. An input for an optional door switch shall be provided and can be user selected to activate a second time delay on the audible alarm. The audible alarm shall be muted from the ALARM SILENCE keypad provided on the face of the Monitor. Dual alarm output relays shall be furnished to transmit alarms to remote monitoring equipment. Both alarm output relays and room status indicators shall have user adjustable low and high alarm setpoints and shall be individually adjustable. Alarm annunciation shall be selectable by the user for Automatic or Manual Reset. Under Automatic Reset, any alarm condition sensed after the time delay will be reset automatically when the alarm condition goes away and pressurization has been restored. That is, the alarm is not latched in and the alarms shall be annunciated only as long as the alarm condition exists. Under Manual Reset and alarm condition sensed after the time delay will be latched or held until someone manually resets it by depressing the ALARM SILENCE keypad after the alarm condition has been corrected and pressurization has been restored. This will allow for logging of the alarm when it is reset. In either Automatic Reset or Manual Reset the audible alarm can be acknowledged, or silenced, at any time, leaving the visual alarm to reflect the actual room status. Dual adjustable alarm output relays shall be SPDT and shall be rated: 0.6A @ 125 VAC and or 2.0A @ 30 VDC/VAC.  
  
All alarm indicators shall be automatically disabled when No Isolation is selected and shall be set to indicate "NORMAL" as long as this mode is selected.
8. The Isolation Room Pressure Monitor shall have three LED room pressure status indicators that have adjustable ON and OFF setpoints. These shall have colors of green, amber and red, indicating NORMAL, CAUTION, and ALARM, conditions respectively.
9. The Isolation Room Pressure Monitor shall have all setpoints and other programmable variables stored in nonvolatile memory to avoid loss of information due to power outages.
10. The Isolation Room Pressure Monitor shall have a 110/24 VAC power supply having a fused transformer and mounted in an appropriately rated enclosure shall be furnished as part of the Isolation Room Monitor. Contractor shall mount the isolation power supply in the above ceiling, connect it to the emergency power bus and run low voltage (24VAC) through the wall to the Monitor. Each Isolation Monitor will be connected to its own power supply to provide isolation from the power line and between each Monitor.
11. The Isolation Room Pressure Monitor shall be capable of operating under temperatures from 32° F to 125° F and relative humidity between 10% to 95% non-condensing.
12. The Isolation Room Pressure Monitor shall be self-contained and capable of stand-alone operation whether in monitoring only or in control mode. In addition, the Monitor furnished shall provide output signals and alarm contacts that are suitable for connection to:
  - a. a central remote monitoring and data logging system,
  - b. a central remote monitoring and data logging system which also has control capability,
  - c. an existing automation system.

In addition, the Monitor shall incorporate a serial asynchronous communications RS-485 port. The communications port circuits shall be electrically isolated from the control electronics of the Monitor to prevent voltage transients on the communications line from damaging the Monitor. Sufficient memory space shall be available in the Monitor for storing the software needed for executing building automation compatible communications protocol.