This form should be completed during the initial configuration for each room pressure controller.

**Room Name / Number**

**Unit Model Number and Serial Number (ESN)**

**Analog Input**
- Normal Operating Pressure (reading with door closed)
- Positive Isolation Setpoint
- Negative Isolation Setpoint
- Neutral Isolation Setpoint
- Pressure Deadband

**Analog Output**
- Analog Output Range (zero-based or offset)
- Analog Output Upper Limit (0 – 100%)
- Analog Output Lower Limit (0 – 100%)
- Analog Output Action (Direct or Reverse)

**PID Constants**
- Proportional Constant (0.5 – 100.0 %)
- Integral Constant (0.0 – 100.0 %)
- Derivative Constant (0.0 – 100.0 %)

**Alarm Limits**
- Positive Isolation High Alarm Setpoint
- Positive Isolation High Warning Setpoint
- Positive Isolation Low Warning Setpoint
- Positive Isolation Low Alarm Setpoint
- Negative Isolation High Alarm Setpoint
- Negative Isolation High Warning Setpoint
- Negative Isolation Low Warning Setpoint
- Negative Isolation Low Alarm Setpoint
<table>
<thead>
<tr>
<th><strong>Audible Alert</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Mode (audible or silent)</td>
<td></td>
</tr>
<tr>
<td>Delay Time Base (secs or mins)</td>
<td></td>
</tr>
<tr>
<td>Delay Setting (0 – 60)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Engineering Units</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches of Water or Pascals</td>
<td></td>
</tr>
</tbody>
</table>
Failure to follow the wiring diagrams could result in damage to your equipment and could void your warranty.

Under no circumstances should a single transformer be split between an actuator and controller. Doing so will damage the actuator, the transformer, the controller, or all units. A single 120/24V/30Va transformer is required for the controller and a separate 120/24V/20Va transformer is required for the actuator.
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Triatek reserves the right to change product specifications without notice.
## Specifications

### Electrical

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Analog Inputs</td>
<td>4-20mA, 0-5Vdc or 0-10Vdc</td>
</tr>
<tr>
<td>4 Analog Outputs</td>
<td>0-Vdc or 0-10Vdc</td>
</tr>
<tr>
<td>4 Digital Inputs</td>
<td>0-Vdc or 0-24Vdc, Active-High or Active-Low</td>
</tr>
<tr>
<td>4 Relay Outputs</td>
<td>1A@24Vdc/AC</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>0-5V = 100K, 0-10V = 16K, 4-20ma = 249 Ω</td>
</tr>
<tr>
<td>Output Impedance</td>
<td>75 Ω</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Class 2, 24VAC/DC ±10%, 30VA, universal 120/240 to 24 VAC, 60/50 Hz, step-down isolation transformer provided</td>
</tr>
</tbody>
</table>

### Communications

- LonWorks® FTT-10A peer-to-peer network: Two-Wire Twisted Pair, FTT-10A signaling
- Recommended Cable Type: Connect-Air W221p-2001 or Equivalent

### Touchscreen User Interface

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD Size</td>
<td>3.2” diagonal</td>
</tr>
<tr>
<td>LCD Type</td>
<td>Transmissive</td>
</tr>
<tr>
<td>Resolution</td>
<td>240 x 320 portrait</td>
</tr>
<tr>
<td>Viewing Area</td>
<td>50.60 mm x 66.80 mm</td>
</tr>
<tr>
<td>Color Depth</td>
<td>18-bit or 262K colors</td>
</tr>
<tr>
<td>Backlight Color</td>
<td>White</td>
</tr>
<tr>
<td>Luminous Intensity</td>
<td>min 2500 cd/m²</td>
</tr>
</tbody>
</table>

### Mechanical

- FMS-1655L Display Module Housing (Surface Mount): 3”W x 5”H x 1.13”D
- FMS-1655L Display Module Housing (Flush Mount): 5.6”W x 8.5”H x 0.75”D
- FMS-1655L Controller Housing: 4.6”W x 6.6”H x 1.9”D

### Environmental

- Operating Temperature: 32° to 125° F Operating
- Operating Humidity: 10% - 95% RH, Non-condensing

### Venturi Valve (Order Separately)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>8”, 10”, 12”, 14” O.D.</td>
</tr>
<tr>
<td>CFM Range</td>
<td>35-2100</td>
</tr>
<tr>
<td>Materials</td>
<td>Aluminum, Stainless Steel, Heresite Coating</td>
</tr>
<tr>
<td>Insulation</td>
<td>Optional</td>
</tr>
<tr>
<td>Actuation</td>
<td>Electronic or Pneumatic</td>
</tr>
</tbody>
</table>

### Part Number Guide

- FMS1655L - 0 -

<table>
<thead>
<tr>
<th>Case Style</th>
<th># of Remote Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>T = thin (flush)</td>
<td>1 = single sensor</td>
</tr>
<tr>
<td>S = surface</td>
<td>2 = dual sensor</td>
</tr>
</tbody>
</table>
The Triatek FMS-1655L Room Pressure Controller is an ultra-sensitive instrument used to control and/or monitor air pressure in hospital rooms, labs, and clean rooms. It is capable of measuring and displaying air pressures down to 0.0001" wc.

Features include:

- Digital display of pressure with a programmable description
- Full-color touchscreen with audible and visual alarms
- Patent-pending Safety Halo™ with 180° edge lighting
- Four relay outputs for transmitting alarm conditions to a remote location such as a central monitoring station
- Auxiliary analog inputs for use with optional sensors
- Analog outputs used in control applications
- Dual sensor split screen viewing mode
- Password protection of programmed setup
- Optional keylock switch for isolation select protection
- Comprehensive real-time diagnostics tool built into each unit

The FMS-1655L has enhanced graphics and Safety Halo™ edge lighting that provides a full 180° of status visibility. The product is shipped with the Safety Halo™ at full brightness, but may be dimmed or even disabled completely using the Display Setup menu.

Bright graphical color changes are used to indicate the three different statuses of the monitored space. These graphical backgrounds indicate Normal when the room pressure is within defined limits, Warning when the room pressure is approaching an out-of-limits condition, and Alarm when the room pressure is outside the defined acceptable and safe limits.

The room pressure ranges are configured by the user, either directly from the display or over the network from the building management system (BMS). Room pressure selection of positive, negative, or no isolation is set using the user menu or an optional keylock switch.

Alarm conditions are defined by the user in terms of desired pressure settings for the room being monitored. When an alarm condition occurs, it can be annunciated in four ways: 1) on the display, 2) with an audible alarm, 3) transmitted via contacts to a remote monitoring station, and 4) over the LonWorks® network. The alarm will automatically reset when the unit senses that room pressure has returned to proper limits, or the attendant can mute the audible alarm by touching the Alarm Audible button at the bottom of the screen.

The FMS-1655L provides four relay outputs that can be used for remote alarms or pilot control functions. The operation of each relay can be configured to trigger on defined control functions of the FMS-1655L, except for Relay 2, which is reserved for the display power control.

It is often important to have room variables such as temperature or relative humidity displayed along with the room pressure. These variables can be enabled or disabled by the user in the Display Setup menu.

The FMS-1655L provides additional analog inputs which can be configured for 4-20 ma current or for voltage input signals. The input can be scaled as needed to display correct values, and a suitable description can be applied.

The FMS-1655L provides analog outputs which can be set up for 0-5v or 0-10v output. It can be programmed to be a proportional output for providing a linear signal to an automation system, or programmed for a PID floating point output for direct control of damper actuators, speed drives, etc.

When configured for dual sensor mode (see page 35), the FMS-1655L can monitor a secondary pressure and display its real time measurement on the screen along with the primary pressure in a split screen view (see Figure 4). This secondary monitored pressure reading has no alarming capabilities and is for display purposes only. The Safety Halo™ edge lighting continuously displays the alarm status of the primary channel, and is not affected by the secondary channel.

The user can set multiple access level passwords to protect against unauthorized access to the FMS-1655L.

The FMS-1655L provides built-in diagnostic tools for troubleshooting during installation, including manual override capabilities and a comprehensive real-time view that allows the real-time values and states of each analog and digital input and output to be conveniently displayed. This tool facilitates the verification and certification processes conducted by test and balance personnel during commissioning. There are also options for storing configuration settings and for restoring those settings, as well as performing a complete restoration of the factory default configuration settings.
FMS-1655L Surface Mount Case Dimensions

Cable provided terminated at control unit

Left Angle Side View

Right Side View

Control Unit

Adapter (Inside Control Unit)
The FMS-1655L Flush Mount display is mounted flush to the wall using the supplied retro fit ring or wall box. Use the retro fit ring as a template to mark the wall for cutout.
The FMS-1655L display backplate may be mounted directly to a standard single-gang wall box using the two slots along the centerline. Use the backplate as a template to mark the mounting holes and the cable access hole at the center of the backplate.
Remote Sensor Installation

FMS-1655L Room Pressure Controllers ordered with a remote sensor must be installed in the wall between the isolation room and the adjoining corridor. Port P1 must be oriented towards the isolation room and Port P2 toward the corridor. Please see illustration on page 13.

With this sensor orientation, a positive pressure value indicates that the isolation room is positive with respect to the corridor.

**NOTE:** A three conductor cable must be connected between the remote sensor and the FMS-1655L. Maximum length of this cable is 1,000 feet.

The display unit can be installed outside the room, at the nurses station, in the engineering office, or at any other location as needed.

Mounting Steps:

1. Cut an opening in the wall of the isolation room for the single-gang low voltage bracket and remote sensor electronics. Nominal hole dimensions are 3.65” H x 2.15” W.
2. Drill a 16” hole through the opposite wall for the flow tube as shown.
3. Bring the 3-conductor signal wire through the cut-out.
4. Install the single-gang low voltage mounting bracket in the cutout. Route a length of supplied flow tube through the mounting bracket and through the 7/16” hole in the opposite wall.
5. Push a length of 3-conductor cable from the FMS-1655L controller down wall to the opening of the single-gang low voltage mounting bracket. Connect cable wires to +Vin, GND, and IO at the sensor’s 9 pin connector.
6. Attach the flow tube to the sensor port, then push the tube and sensor module into place and secure to the mounting enclosure with two 6-32 x 3/4 screws supplied.
7. Install the louvered cover plate.
8. On the opposite side (corridor) attach the flow tube to the barbed fitting of the flow tube mounting plate.
9. Press the mounting plate into place, allowing the excess tube length to go into the wall space. Secure with the screws and anchors.
10. Install the louvered cover plate.
11. At the FMS-1655L controller, connect the three leads from the remote sensor to the terminals marked +V, AI_1, and GND. Remote sensor +Vin goes to terminal +V, remote sensor IO goes to terminal AI_1, and remote sensor GND goes to controller GND.
12. If configured for dual sensor mode, repeat steps 1 through 10 for the secondary remote sensor and proceed to step 13.
13. At the FMS-1655L controller, connect the three leads from the secondary remote sensor to the terminals marked +V, AI_2, and GND. Remote sensor +Vin goes to terminal +V, remote sensor IO goes to terminal AI_2, and remote sensor GND goes to controller GND.

---

Triatek reserves the right to change product specifications without notice.
Remote Sensor Installation

Remote Sensor Installation
(Side View)

Stainless Steel Flow Tube Mounting Plate
Gasket
Stainless Steel Mounting Plate
Gasket
Louvered Cover Plate
Wall Section (cutaway view)

Flow Tube
When Flow Tube mounting plate is located directly opposite the sensor, flow tubing must be cut as short as possible to prevent kinks.

Terminal
For connection of transmitter to FMS-1655L

Thin Silicone Caulking
(apply around tube and between stainless steel plate and wall to seal unit)

Orange wall bracket to be installed first by using the rotating clamps for secure wall attachment.

To FMS Controller

- 13 -

Triatek reserves the right to change product specifications without notice.
Remote Sensor Installation

Stainless Steel Flow Tube Mounting Plate

Gasket

Flow Tube
When Flow Tube mounting plate is located directly opposite the sensor, flow tubing must be cut as short as possible to prevent kinks.

Terminal
For connection of transmitter to FMS-1655L

To FMS Controller

Wall Section (cutaway view)

Rotating clamps secure assembly to wall board

Stainless Steel Mounting Plate

Gasket

Thin Silicone Caulking (apply around tube and between stainless steel plate and wall to seal unit penetration)

CORRIDOR

Remote Sensor Installation
(Bottom View)
The electrical connections to the FMS-1655L are made via a convenient removable terminal block as shown below. All wiring should conform to the local regulations and National Electrical Code.

Take care not to run sensor wiring in the same conduit as line voltage or other conductors that supply highly inductive loads such as generators, motors, solenoids, contactors, etc. Use 22 AWG or larger.
## Function Descriptions

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUX Power Output</td>
<td>Power supply outputs used for power auxiliary devices. Each is supply limited to 100 ma.</td>
</tr>
<tr>
<td>LON Communications</td>
<td>LON FTT-10A Free Topology Network building automation system can access the status and configuration of the unit. Also used by configuration software to configure unit.</td>
</tr>
<tr>
<td>Analog Output</td>
<td>Unit has 4 analog outputs which can be configured for 0-5 VDC or 0-10VDC.</td>
</tr>
<tr>
<td>Analog Input</td>
<td>Unit has 4 analog inputs which can be configured for 4-20 mA, 0-5VDC, or 0-10VDC.</td>
</tr>
<tr>
<td>Power</td>
<td>The FMS-1655L can be powered by either 24 VAC or 24 VDC. A 120 VAC to 24 VAC Step Down Isolation Transformer is provided and recommended. This power must be from a Class 2 supply only.</td>
</tr>
<tr>
<td>Digital Input</td>
<td>The unit has 4 digital inputs with selectable pull-up voltages of 0V, +5V and +20V.</td>
</tr>
<tr>
<td>Relay Output</td>
<td>The unit has 4 SPDT relay outputs with normally open contacts.</td>
</tr>
</tbody>
</table>
Mounting / Wiring Remote Sensor

Analog Output to Modulated Air Controller

**CONNECTIONS FOR POWERED OUTPUT**

---

**Wiring Guide Legend**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
</tr>
<tr>
<td></td>
<td>Field Wiring w/ space for Number</td>
</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit</td>
</tr>
<tr>
<td></td>
<td>Between Room and Corridor</td>
</tr>
</tbody>
</table>

**Jumper Setting**

- **0-5v (JP7)**
  - AI 4: 4
  - AI 3: 3
  - AI 2: 2
  - AI 1: 1

- **4-20mA (JP6)**
  - AO 4: 4
  - AO 3: 3
  - AO 2: 2
  - AO 1: 1

Note: Each Analog Input or Output value can be set independent of one another. Example:
- AI 1 can be set to 0-5v jumper OFF (JP7 PIN 1)
- AI 2 can be set to 0-10v jumper ON (JP7 PIN 2)
- AI 3 can be set to 4-20mA jumper ON (JP6 PIN 3) and jumper OFF (JP7 PIN 3)
- AO 1 can be set to 0-10v jumper ON (JP5 PIN 1)
- AO 2 0-5v can be set to 0-5v jumper OFF (JP5 PIN 2)

---

Purchased Separately

- Power Supply
- Optional External Transmitter

4-20mA Loop

Purchased Separately

- Air Control Modulator

---

Triatek reserves the right to change product specifications without notice.
Analog Input to Remote Pressure Sensor - 4-20mA Out

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
</tr>
<tr>
<td></td>
<td>Field Wiring w/space for Number</td>
</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>

**Wiring Guide Legend**

**Jumper Setting**

- Analog Input 0-5v (JP7)
  - A1 4 4
  - A2 3 3
  - A3 2 2
  - A4 1 1

- Analog Input 4-20mA (JP6)
  - AI 4 4
  - AI 3 3
  - AI 2 2
  - AI 1 1

- Analog Output 0-5v (JP5)
  - AO 4 4
  - AO 3 3
  - AO 2 2
  - AO 1 1

- Analog Output 0-10v (JP5)
  - AO 4 4
  - AO 3 3
  - AO 2 2
  - AO 1 1

Note: 4-20mA can only be used if the corresponding JP7 Analog Input Jumper is set to OFF.

Example:
- AI 1 can be set to 0-5v jumper OFF (JP7 PIN 1)
- AI 2 can be set to 0-10v jumper ON (JP7 PIN 2)
- AI 3 can be set to 4-20mA jumper ON (JP6 PIN 3) and jumper OFF (JP7 PIN 3)
- AO 1 can be set to 0-10v jumper ON (JP5 PIN 1)
- AO 2-0 5v can be set to 0-5v jumper OFF (JP5 PIN 2)

Triatek reserves the right to change product specifications without notice.
Mounting / Wiring

Analog Input to 2 Remote Pressure Sensors - 4-20mA Out

Wiring Guide Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
</tr>
<tr>
<td></td>
<td>Field Wiring w/ space for Number</td>
</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>

Jumper Setting

Analog Input 0-5v (JP7)

<table>
<thead>
<tr>
<th>AI 4</th>
<th>4</th>
<th>JUMPER OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AI 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AI 1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Analog Input 4-20mA (JP6)

<table>
<thead>
<tr>
<th>AI 4</th>
<th>4</th>
<th>JUMPER OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AI 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AI 1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Analog Output 0-5v (JP5)

<table>
<thead>
<tr>
<th>AO 4</th>
<th>4</th>
<th>JUMPER OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AO 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AO 1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Analog Output 0-10v (JP5)

<table>
<thead>
<tr>
<th>AO 4</th>
<th>4</th>
<th>JUMPER OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AO 2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AO 1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Note: 4-20mA can only be used if the corresponding JP7 Analog Input Jumper is set to OFF.

Note: Each Analog Input or Output value can be set independent of one another. Example:
- AI 1 can be set to 0-5v jumper OFF (JP7 PIN 1)
- AI 2 be set to 0-10v jumper ON (JP7 PIN 2)
- AI 3 can be set to 4-20mA jumper ON (JP6 PIN 3) and jumper OFF (JP7 PIN 3)
- AO 1 can be set to 0-10v jumper ON (JP5 PIN 1)
- AO 2 0-5v can be set to 0-5v jumper OFF (JP5 PIN 2)

Triatek reserves the right to change product specifications without notice.
Analog Input to Temperature Sensor

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit</td>
</tr>
<tr>
<td></td>
<td>Between Room and Corridor</td>
</tr>
</tbody>
</table>

Purchased Separately

Power Supply

Temperature Sensor

Note: Each Analog Input or Output value can be set independent of one another.

Example:

AI 1 can be set to 0-5v jumper OFF (JP7 PIN 1)
AI 2 can be set to 0-10v jumper ON (JP7 PIN 2)
AI 3 can be set to 4-20mA jumper ON (JP6 PIN 3) and jumper OFF (JP7 PIN 3)
AI 1 can be set to 0-10v jumper ON (JP5 PIN 1)
AO 1 can be set to 0-5v jumper OFF (JP5 PIN 2)
AO 2 can be set to 0-5v jumper OFF (JP5 PIN 2)

- Triatek reserves the right to change product specifications without notice.
A switch having normally-open or normally-closed contacts may be used with the FMS-1655L to serve as a timed alarm buzzer inhibitor, when the room door has been opened. An optional door switch (part number SWD-100) may be purchased from Triatek for this specific purpose.

JP4 is set at factory to +5 setting. User can change voltage setting to suit application requirement.

### Wiring Guide Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
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<tr>
<td></td>
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<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>

Purchased Separately
Digital Input to Flow Switch

JP4 is set at factory to +5 setting. User can change voltage setting to suit application requirement.

Purchased Separately

Wiring Guide Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
</tr>
<tr>
<td></td>
<td>Field Wiring w/space for Number</td>
</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>
Digital Input to Occupancy Sensor

JP4 is set at factory to +5 setting. User can change voltage setting to suit application requirement.

Purchased Separately

Wiring Guide Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>No Connection to Field Wiring</td>
</tr>
<tr>
<td></td>
<td>Field Wiring with space for Number</td>
</tr>
<tr>
<td></td>
<td>Internal Wiring</td>
</tr>
<tr>
<td></td>
<td>Screw Terminal</td>
</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>
Mounting / Wiring

Relay Output to Alarm

Purchased Separately

Monitor Output 1

External
Power
30VDC Max

2A Max

NOTES: Relay 3 & 4 Share a common contact terminal block pin, (C3/4).

Wiring Guide Legend

<table>
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<tr>
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</tr>
<tr>
<td>Air Flow To and From Unit Between Room and Corridor</td>
<td></td>
</tr>
</tbody>
</table>
**Mounting / Wiring**

**Relay Output 1**

![Diagram of Relay Output 1 with various components labeled]

**Wiring Guide Legend**

<table>
<thead>
<tr>
<th>Symbol</th>
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<tbody>
<tr>
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<td></td>
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</tr>
</tbody>
</table>

Due to continuous improvement, Triatek reserves the right to change product specifications without notice.
Mounting / Wiring

Power

Step Down Isolation Transformer
120V/240VAC/24VAC/30VA
(Provided by Triagek)

Wiring Guide Legend

<table>
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</tr>
<tr>
<td></td>
<td>Air Flow To and From Unit Between Room and Corridor</td>
</tr>
</tbody>
</table>
Isolated Power Supply

Red / 24 VAC / 30VA connected to the FMS

Transformer 50/60 Hz

Blue

240 VAC 50/60 Hz

120 VAC 50/60 Hz

White

Black

Stepdown Isolation Transformer (provided with FMS Controller)

Ground

1 Amp Slow Blow Fuse

Only Class 2 wiring in this compartment.

Note:
This product should be installed with the manufacturer provided isolated power supply and connected to an electrical circuit protected by a minimum 20A circuit breaker. This circuit breaker should be mounted in an approved electrical enclosure located separately, but in close proximity to this product.
**COMMUNICATIONS**

**FMS-1655L CONTROLLER**

**Wiring**

**Wiring Guide Legend**

<table>
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<td></td>
<td>Screw Terminal</td>
</tr>
</tbody>
</table>

|        | Air Flow To and From Unit         |
|        | Between Room and Corridor         |

**Free Topology Cable Specifications**

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Maximum Node-to-Node Distance (FT)</th>
<th>Maximum Total Wire Length (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belden 85102</td>
<td>1640 ft</td>
<td>1640 ft</td>
</tr>
<tr>
<td>Belden 8471</td>
<td>1312 ft</td>
<td>1640 ft</td>
</tr>
<tr>
<td>Level IV, 22AWG</td>
<td>1312 ft</td>
<td>1640 ft</td>
</tr>
<tr>
<td>JY (l0) Y x2x0.8</td>
<td>1049 ft</td>
<td>1640 ft</td>
</tr>
<tr>
<td>TIA Category 5</td>
<td>820 ft</td>
<td>1476 ft</td>
</tr>
</tbody>
</table>

*Triatek recommended cable*

For more details, refer to Echelon's Junction Box and Wiring Guideline Bulletin at echelon.com/support/documentation/bulletin/005-0023-01P_Jbox_wiring.pdf

Triatek reserves the right to change product specifications without notice.
Wiring

**LonWorks® Wiring Instructions**
Communication connections require that the FMS-1655L units be connected with twisted pair communication cables to each unit in the network. The unique network address of each FMS unit is set by a network management tool like LonMaker.

All wiring must be done in accordance with the National Electric Code as well as regulations of all authorities having jurisdiction, and must conform to applicable codes. When required by code, communications wiring may be installed in conduit of a type designed specifically for this purpose.

**Wire Terminations**
The FMS-1655L is provided with a removable connector block with convenient screw terminals. Make the LON FTT-10 communications connections as follows:

- Connect a cable lead to the “NT1” terminal (#1). Connect a cable lead to the “NT2” terminal (#2).

**Guidelines for Wiring**
Following these guidelines will help to keep wiring-related communications problems to a minimum:

1. Do not splice communications cable or wire at any point between controllers.
2. Avoid the “stub T-tap” technique of routing/connecting communications cable. Conductor discontinuities produced by such connections may generate RFI or other electromagnetic interference on the communications circuit.
3. Do not use wire nut devices for connecting communications cable.
4. Do not route any part of the communications cable through conduit, junction boxes, or other devices containing AC electrical wiring.
5. Do not strap communications cable to any conduit or other device containing AC electrical wiring, or run communications cable parallel to (or against) such devices.

**Typical Network Topologies**

- **Singly Terminated Bus Topology**
- **Doubly Terminated Bus Topology**
- **Star Topology**
- **Loop Topology**
- **Mixed Topology**

Wire the LON network in accordance with LON network standards.

NOTE: Be sure to observe installation instructions regarding possible need for a termination load or other device that may have to be attached on the end of a run.

NOTE: AC electrical devices such as transformers, disconnects, fluorescent lighting, motor-controllers, variable frequency drives or other high voltage power sources may generate RF interference which could cause intermittent problems in the communications network.
Introduction
Following the installation, apply power to the unit. Upon power up, the Safety Halo™ status indication bezel will cycle through seven colors (red, green, blue, yellow, magenta, cyan, and white), and then the Triatek splash screen indicating serial numbers, firmware version numbers, Neuron ID, Program ID, and current network address will be displayed.

The splash screen remains displayed for approximately 10 seconds, and then disappears to reveal the main display screen. The information displayed on the splash screen during the power up sequence may also be redisplayed using the About This FMS option on the Diagnostics menu.

The FMS-1655L incorporates a full-color touchscreen with an easy-to-use menu system that allows the user to quickly setup the controller for immediate use.

There are several hotspots that provide quick access to various settings. Refer to page 37 for details on using these hotspots as display settings shortcuts. Touching the screen anywhere other than one of the reserved hotspots invokes the menu system, unless one or more security passwords have been entered.

Main Display Screen (Single Sensor Models)
All FMS-1655L units are shipped from the factory in the neutral isolation mode, which is represented by a blue screen with a slashed circle. The information that is displayed on the main screen includes the following from top to bottom (see Figure 1):

• Isolation room name in the upper window (up to 25 characters)
• Current differential pressure (default units: in wc)
• Current isolation mode and status
• Status icon centrally located
• Current relative humidity in the lower window (if equipped)
• Current temperature in the lower window (if equipped)

Located just below the lower window with the temperature and humidity display is the Alarm Audible button.

A green background with a check mark at the center indicates that the current differential pressure is within allowable limits of the desired setpoint (see Figure 2).

A yellow background with an exclamation point at the center indicates that the current differential pressure has drifted outside the allowable limits of the desired setpoint and is in the caution range (see Figure 3).

A red background with an exclamation point indicates that the current differential pressure has reached an unsafe condition, as it is beyond the safe operating range (see Figure 4). An alarm buzzer will sound at this screen as well providing an audible alert of the unsafe conditions.

Figure 1. The main screen of the FMS-1655L in neutral mode

Figure 2. The main screen of the FMS-1655L

Figure 3. Warning mode

Triatek reserves the right to change product specifications without notice.
Basic Programming

Main Display Screen (Dual Sensor Models)
When configured for dual sensor mode, the FMS-1655L unit is shipped with the primary sensor channel in neutral isolation mode.

The secondary sensor channel has no isolation mode associated with it, and is displayed with a green graphical background.

The split screen view (see Figure 5) includes the names associated with each monitored space (up to 25 characters), the current differential pressures for each space, the current status icon, and the alarm buzzer enable status at the lower right corner. The colors of the graphical background associated with the primary pressure (top view) are as described in the previous section, and represent the status of the primary monitored space.

Configuring the FMS-1655L
Configuring the FMS-1655L settings can be accomplished in three simple steps:

1. Configure alarm limits
2. Set target setpoints
3. Setting up the analog output

The FMS-1655L comes pre-configured to operate with a remotely mounted differential pressure sensor module. The first step in configuring the FMS-1655L, following installation, is to configure the alarm and warning setpoints for each mode of isolation.

If this unit is only used for monitoring and is not used to control a damper actuator to maintain a pressure setpoint, then this is the only required step to set up the FMS-1655L.

Configuring Alarm Limits
To determine the limits at which the unit status changes from normal to warning, and from warning to alarm, the alarm limits must be configured.

To access the alarm limit settings, select the Unit Setup option from the Main Setup Menu. At the Unit Setup menu, select the Alarm Limits option. The high and low alarm limits, as well as the high and low warning limits, for the currently selected isolation mode may be specified in sequence. These limits should be specified to set the differential pressure range which should be considered normal, as well as the range which indicates a warning condition, and the range which is considered critical and indicates an alarm condition.

Set Target Setpoints
If this FMS-1655L is being used for monitoring only and does not control an exhaust or supply damper actuator to maintain a specified differential pressure, then skip this step and the analog output step. Otherwise, target setpoints must be specified to allow the unit to control to specific differential pressures for each mode of isolation.

To specify the target setpoints for the FMS-1655L select the Unit Setup option from the Main Setup Menu, and then select the Room Setup option. At the Isolation Room Setup menu, select the Edit Setpoints option. The target setpoints for positive, negative, and neutral isolation modes may be specified in sequence for either occupied or unoccupied modes.

The final step in setting up the FMS-1655L is to configure the analog output used to control the damper actuator in the monitored isolation room.
Basic Programming

Changing the Isolation Mode
The FMS-1655L can be set for positive, negative, or neutral modes of isolation. To change the isolation mode, select the Unit Setup option from the Main Setup Menu, and then select the Room Setup option.

At the Isolation Room Setup menu, select the Isolation Mode option which allows the user to select one of three isolation modes, unless the available modes has been restricted to either positive or negative plus neutral. Changing the mode of isolation automatically selects the pre-programmed setpoint and analog output action mode associated with each mode.

Adding Password Security
The FMS-1655L menu system can be protected by adding up to 10 multi-level passwords to the system. The Password Setup option on the System Setup menu allows the user to manage the security passwords. Options on the Password Setup menu include those for adding, editing, and deleting entries from the system as shown in Figure 7.

To add a new password entry, select the Add Password option from the Password Setup menu, which prompts the user to enter a minimum of four and up to eight digits. There is also an option that allows all of the system password entries to be purged.

Once a valid password has been specified, the user is prompted to specify one of four access levels: unrestricted, standard, basic, and restricted. The first password entry is automatically saved as unrestricted.

All password entries are saved to non-volatile memory. In the event that a password has been forgotten, there is a factory-default password that will provide unrestricted access to the user menu system. Please consult the factory for more information regarding this password.

Changing Display Settings
The Safety Halo™ feature significantly enhances the status visibility of individual units installed along a long corridor or hallway, and allows an unsafe condition to be immediately recognized. The Safety Halo™ display settings may be configured using the Safety Halo™ option on the Display Setup menu.

This option may be disabled if not required by the installation, which simply turns off the Safety Halo™ edge lighting. If enabled, the brightness may be adjusted from full intensity down to barely visible in daylight conditions.

Triatek reserves the right to change product specifications without notice.
Basic Programming

The brightness of the FMS-1655L main display screen may also be adjusted using the Set Brightness option on the Display Setup menu. All brightness settings are stored to non-volatile memory and remain in effect through a power cycle.

When configured for single sensor mode, the main display screen may be customized using options on the Display Setup menus. The Display Options menu option allows specific information to be individually suppressed by deselecting the unwanted items from the Set Display Options selection screen. Dual sensor models do not have configurable display settings, other than the brightness of the Safety Halo™ settings.

Built-in Diagnostics
The FMS-1655L incorporates several diagnostic tools (see Figure 8) including an About This FMS option, an Override option, a Real-Time View feature, and an option to perform a Factory Restore of the FMS-1655L. The About This FMS option on the Diagnostics menu provides information specific to this particular unit, including the firmware versions and electronic serial number of the display module, the Neuron ID associated with the controller module, as well as its network address.

During the test and balance phase, it is often convenient to be able to adjust exhaust damper actuators to a specific position to force a specific airflow condition.

The analog outputs may be individually overridden by selecting the Overrides option from the Diagnostics menu, the Analog Outputs option, and then selecting the specific analog output to be overridden.

The user can then, in real-time, dynamically move the damper actuator to a specific position using the slider on the override screen.

While in override mode, the selected analog output is disconnected from its PID control loop, if configured for PID mode. Canceling override mode effectively resumes the PID or direct analog output control.

The FMS-1655L incorporates a convenient feature that allows the installer to view the real-time conditions of all of the hardware resources as well as several system variables. These include the analog inputs, analog outputs and digital inputs. Selecting the Real-Time View option from the Diagnostics menu allows the user to view the real-time conditions of any of the listed resources.

For example, selecting the Analog Inputs option from the Real-Time View menu invokes the real-time view configuration screen. To skip to the next set of resources to view, tap the Next button. To cancel the real-time view display at any time, tap the Exit button to return to the Real-Time View menu.

To reset all of the modifiable configuration parameters of the FMS-1655L to their original default settings, the Factory Restore option on the Diagnostics menu may be selected.

Selecting this option invokes a warning message informing the user that all existing configuration settings will be erased and replaced with the factory-configured default settings. The user is then prompted for a password before proceeding to completely reset all configuration settings to their factory default values.
## Configuring Display Module Settings

### Options Dipswitch (S1) – internal use only

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Graphics Chip Mode Selection</td>
<td>OFF = Programming Mode</td>
</tr>
<tr>
<td>2.</td>
<td>Touch Screen Calibration Mode</td>
<td>OFF = Force calibration</td>
</tr>
<tr>
<td>3.</td>
<td>Reserved</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Reserved</td>
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</table>

### Options Dipswitch (S2) – Product Configuration

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<table>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sensor Mode</td>
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</tr>
<tr>
<td>2.</td>
<td>Test Mode</td>
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</tr>
<tr>
<td>3.</td>
<td>Product Type</td>
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<tr>
<td>4.</td>
<td>Operational Mode</td>
<td>OFF = Demo Mode</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushbutton Switch (SW1)</td>
<td>Reset Button</td>
</tr>
<tr>
<td>Pushbutton Switch (SW2):</td>
<td>Options Configuration</td>
</tr>
</tbody>
</table>
Module Settings

Tratek reserves the right to change product specifications without notice.
CLEANING THE DISPLAY

Cleaning the FMS-1655L Display

- Use a clean cloth that is dry, or lightly dampened with a mild cleaner or Ethanol. Be sure the cloth is only lightly dampened, not wet. Never apply cleaner directly to touch panel surface; if cleaner is spilled onto touch panel, soak it up immediately with absorbent cloth.
- Cleaner must be neither acid nor alkali (neutral pH).
- Wipe the surface gently; if there is a directional surface texture, wipe in the same direction as the texture.
- Never use acidic or alkaline cleaners, or organic chemicals such as: paint thinner, acetone, toluene, xylene, propyl or isopropyl alcohol, or kerosene.

Hot-Spot Features of FMS-1655L Touchscreen Display

(Single sensor model)

Touching the current name text brings up an alphanumeric keyboard to quickly change the name of the monitored room.

Touch the Status line to invoke the popup screen to quickly change the isolation mode.

Touching anywhere else on the screen enters the Main Setup Menu if no password is stored. Otherwise, a password must be entered before the Main Setup Menu can be accessed.

Automatically reverts back to audible mode when alarm condition is removed.

Touching the units brings up Engineering Units selection popup to quickly change differential pressure units.
Complete Flow Diagram
Setup Menu

- System Setup
  - Password Setup
    - Add Password
    - Edit Password
    - Delete Password
    - PurgeAll

- Display Setup
  - Safety Field
    - Disable/Enable 0 – 100%
  - Display Options
    - Iso Mode, Temperature, Humidity
  - Set Brightness
    - 0 – 100%

- Diagnostics
  - About
  - Overrides
    - Analog Outputs
      - Lock/Unlock 0 - 100%
    - Real Time View
      - Analog Inputs
        - AI-1, AI-2, AI-3, AI-4 Units
      - Analog Outputs
        - AO-1, AO-2, AO-3, AO-4 %
      - Digital Inputs
        - DI-1, DI-2, DI-3, DI-4
      - Relay Outputs
        - RLY-1, RLY-2, RLY-3, RLY-4

- Factory Restore

Due to continuous improvement, Triatek reserves the right to change product specifications without notice.
Headquartered in Norcross, Georgia, Triatek has been on the forefront of designing and manufacturing innovative airflow solutions for critical environments since 1985. Triatek provides complete end-to-end solutions for healthcare facilities and laboratories including Venturi valves, room pressure controllers, fume hood controllers, monitors, sensors, actuators, and more, all designed to seamlessly integrate into a facility’s building automation system.

Triatek’s customer service is unparalleled. Our product support system includes on-site installations, phone support, repairs, calibrations, and in-depth training sessions.

From our knowledgable engineers and sales team to our talented field technicians, Triatek goes above and beyond to ensure our products are installed correctly and our customers’ critical environments are working properly.