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Installation
&
Operating Instructions
for

SLIMZONE
ENVIRONMENTAL MODULE
(SZEM)

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IMPORTANT

READ THIS BOOKLET THOROUGHLY IN ORDER TO UNDERSTAND ALL THE OPERATION FEATURES OF YOUR ENVIRONMENTAL MODULE.

RECORD THE SERIAL NUMBER IN THE SPACE PROVIDED.

SERIAL NUMBER _____

DATE OF INSTALLATION _____

SLIMZONE ENVIRONMENTAL MODULE (SZEM)

INTRODUCTION

The Slimzone Environmental Module (SZEM) is an optional component in the Slimzone Premier system. The module provides the following services:

- * Bypass Damper control and static pressure sensing
- * High/Low temperature limit signaling
- * Outdoor temperature measurement

DATA EXCHANGE

All information collected by the SZEM module is communicated to the Slimzone Premier control module (SZP) via a RS485 communication port at 1200 baud, 8 bits, no parity, with standard protocol. All information received by the SZP control module may be viewed by the user.



BYPASS SYSTEM

In order to maintain proper air flow and static pressure throughout the HVAC system, a bypass system should be used. In some two zone applications a bypass damper may

not be required. This is based on duct sizing where either zone is able to handle approximately 75% of the total system CFM (cubic feet/minute). This will result in only slightly higher air velocity at the discharge grille if only one zone is calling and yet allow for proper CFM across the cooling coil.

Bypass activities are fully controlled by the SZEM module, which monitors the system static pressure and modulates a motorized bypass damper accordingly. The static pressure value is communicated to the SZP control module.

HIGH AND LOW TEMPERATURE LIMITS

When bypassing conditioned air it is important to consider high and low limit control to prevent coil freeze up or overheating. The SZEM module also monitors the conditioned air temperature and signals the SZP control module when the high and low limits are exceeded.

System air temperature value is communicated to the SZP control module.

OUTDOOR TEMPERATURE MEASUREMENTS

In heat pump applications, the outdoor temperature may be used to determine when to lock out either the compressor(s) or auxiliary heat (high and low balance points). Outdoor air temperature is communicated to the SZP control module; outdoor temperature value may be displayed at both the SZP module and zone thermostats.

SZEM TERMINAL DESCRIPTIONS

Output terminals on the SZEM module are protected by current limiting devices which are activated when the current draw exceeds 0.3 Amps.

| TERMINAL DESIGNATION | DESCRIPTION |
|--|--------------------|
| 24 VAC | 24 VAC R |
| 24VAC (COMMON) | 24 VAC X |
| DAMPER OPEN | DAMPER OPEN |
| DAMPER COMMON | DAMPER COM |
| DAMPER CLOSE | DAMPER CLOSE |
| OUTDOOR TEMPERATURE PROBE WIRE 1 | ODT1 |
| OUTDOOR TEMPERATURE PROBE WIRE 2 | ODT2 |
| DISCHARGE AIR TEMPERATURE PROBE WIRE 1 | DUCT 1 |
| DISCHARGE AIR TEMPERATURE PROBE WIRE 2 | DUCT 2 |
| RS485 COMMUNICATIONS B | RS485 B |
| RS485 COMMUNICATIONS A | RS485 A |
| RS485 COMMUNICATIONS GND | DO NOT USE |

SZEM Terminal Designations

SETUP

TRANSFORMER

The SZEM module requires a separate transformer rated at a minimum of 20 VA to power the module and the bypass actuator.

LOCATION

CAUTION: Do not mount the SZEM module directly on the ductwork. Temperature fluctuations within the duct will adversely affect the operation of the module.

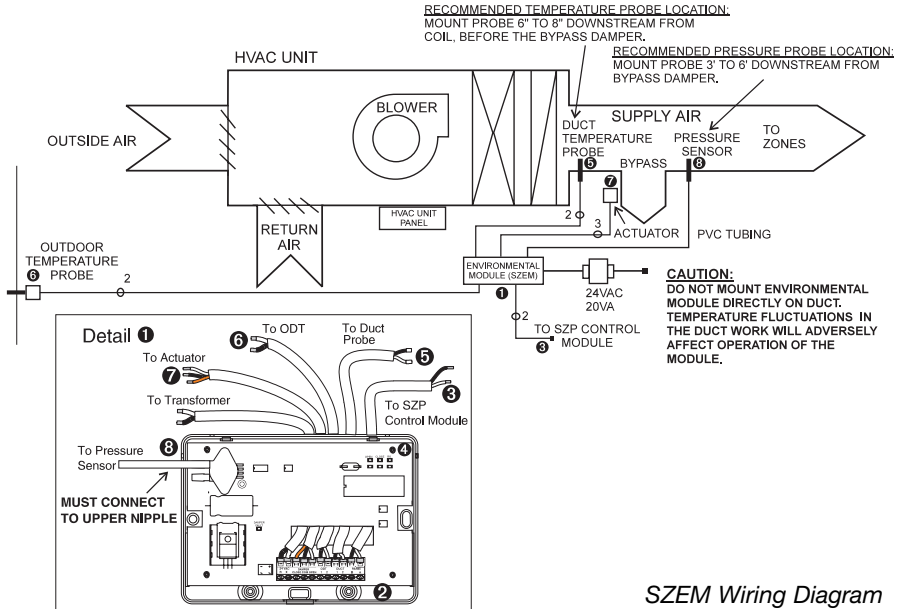
INSTALLATION

Fasten the module with the two #8 sheet metal screws provided with the module and install in a convenient location near the bypass damper, allowing for proper placement of the duct temperature and pressure probes.

BYPASS SYSTEM OPERATION AND INSTALLATION

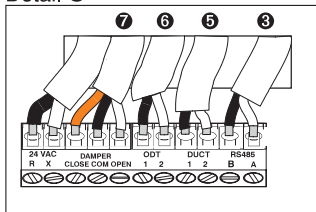
OPERATION

The SZEM module monitors the system's static pressure using an electronic duct-mounted pressure sensor with a range of 0 to 1" WC, and modulates a bypass damper accordingly. Two triac outputs (24 VAC, 300 mA) control the bypass actuator. The **OPEN** LED indicates when the drive open actuator is energized, and the **CLOSE** LED indicates when the drive close actuator is energized. The static pressure is measured by an electronic pressure sensor,

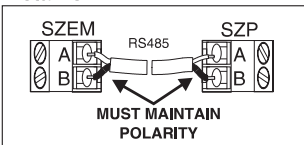


SZEM Wiring Diagram

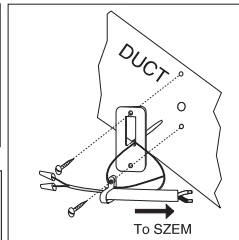
Detail 2



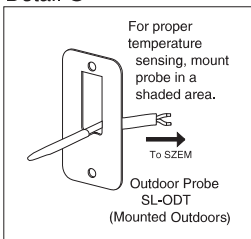
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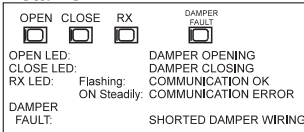
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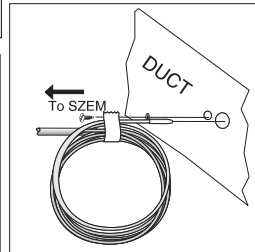
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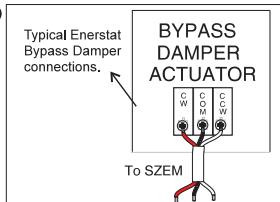
Detail 4



Detail 8



Detail 7



which is connected to the ductwork by means of a coiled 8' (2.4m) length of 1/8" (3.2mm) PVC tubing. The length of the tubing provides protection from fluctuations in pressure and temperature of air in the tube that may adversely affect the readings. Air feeds through the tubing under pressure to the sensor.

CAUTION: DO NOT CUT OR SHORTEN THE PRESSURE SENSOR TUBING. IT MAY BE LENGTHENED IF REQUIRED. USE 1/8" NONCOLLAPSIBLE TUBING.

The module will use the static pressure in the ductwork when all zones are open, fan is on, and the bypass damper is closed as the nominal pressure of the system. Zone dampers opening and closing cause changes in pressure in the ductwork. The SZEM module will respond to these changes by opening or closing the bypass damper to return the static pressure to nominal.

PRESSURE PROBE INSTALLATION

Drill a 1/4"(4mm) hole into the ductwork close to the module, at a recommended distance of 3' to 6' (1m-1.8m) downstream from the bypass damper. Push the end of the tube with the probe and fastener into the hole until the fastener touches the ductwork (Page 7 – Detail 8). Secure the fastener using the #8 sheet metal screw provided with the probe. Connect the opposite end of the tube to the upper nipple of the SZEM module's pressure sensor (Page 6 – Detail 1).

BYPASS DAMPER INSTALLATION

The bypass damper must be installed in the main supply plenum in a straight section of equal duct size. The bypass air may be discharged into the return air plenum or above the ceiling if this area is used as a common return.

BYPASS SYSTEM SETUP

NOTE: The bypass setup is done by the SZP control module. Refer to section 6 of the SlimZone Premier Installation and Operation Manual “Start Up and Test” for the startup sequence.

1. Ensure that all components in the bypass system have been properly installed.
2. At the SZP module, select the Bypass Setup menu.

NOTE: The SZP control module will automatically setup the bypass system. The equipment for the zone dampers and bypass dampers will be activated accordingly during the setup sequence. The duration of the setup is approximately 5 minutes.

3. Proceed with the setup. The SZP module will proceed with the following 7 steps:

NOTE: The duration of each setup is approximate. Step 3 may repeat several times; when

| STEP | DESCRIPTION | DURATION |
|-------------|---|-----------------|
| 6 | Time delay – equalize system | 30 seconds |
| 5 | Self calibrate – 0 pressure | 30 seconds |
| 4 | Wait state – Status calibration | Instantaneous |
| 3 | Fan on – bypass closed, open dampers, measure system pressure | 90 seconds |
| 2 | Store operation pressure | Instantaneous |
| 1 | Read data from module | Instantaneous |
| 0 | Read data from module | Instantaneous |

- NOTE: The duration of each setup is approximate. Step 3 may repeat several times; when this happens the time will reset and count down to zero again.
4. The SZP module will proceed to the environmental test menu to display the current status. The bypass damper may be closed or opened by the user at this point to ensure it is operating properly.
 5. Setup is complete.

HIGH/LOW LIMITS OPERATION AND INSTALLATION OPERATION

The SZEM module measures the temperature of the discharged or conditioned air using a temperature probe with a range of 22°F to 194°F (-6°C to 90°C). High and low temperature limits are programmed by the user at the SZP control module, and are monitored by the SZEM module. The module will signal the SZP module whenever the discharged air temperature exceeds one of the limits and will indicate which of these was tripped, either high or low.

The SZP control module will respond to these errors by signaling the equipment to shut down. If more than one stage of equipment is energized, the control module will downstage the equipment, shutting down one stage at a time, at an approximate interval of five minutes. Once the air being circulated by the fan cools down or heats up to conform to the proper set-point, the control module will once again allow calls for heating or cooling to be processed.

TEMPERATURE PROBE INSTALLATION

Drill a 1/4" (4mm) hole into the ductwork at a recommended distance of 6" to 8" (15cm – 20cm) downstream from the coil, but before the bypass damper. Push the end of the wire with the probe and fastener into the hole until the fastener touches the ductwork. Secure using the two #8 sheet metal screws with anchors provided with the probe. Connect the opposite end of the wires to the Duct 1 and Duct 2 terminals on the environmental module (polarity is unimportant).

IMPORTANT!

If the SZEM module is to be installed without the duct temperature probe, set the low limit setpoint down to a value of 21°F (-6°C) in order to ensure the low limit alarm will not be triggered. The SZEM module will read a value of approximately 21°F (-6°C) when the duct temperature probe is not connected.

OUTDOOR TEMPERATURE PROBE OPERATION AND INSTALLATION OPERATION

The SZEM module measures the outdoor temperature using a temperature probe, with a range of -55°F to 118°F (-48°C to 48°C). The module communicates this information to the SZP control module via the communication link, which in turn makes this information available to the DSL-520P zone thermostats.

In the heat pump mode, the SZP control module uses the outdoor temperature to monitor deviation from the maximum and minimum balance points. These balance points are programmed by the user at the SZP control module. An outside temperature that exceeds the

high balance point will cause the SZP control module to disable the auxiliary heat source, and heating will be provided by the compressor only. An outside temperature that is below the low balance point disables the compressor, and heating will be provided by the auxiliary heat source only.

OUTDOOR TEMPERATURE PROBE INSTALLATION

Select a location for the outdoor probe that will provide accurate readings. Drill a hole to feed the cable to the SZEM. Do not locate the probe where it will be influenced by sunlight. The north side of the building or under the shadows of eaves are good locations. Avoid locations close to dryer vents or other sources of heat.

Mount the probe on the outside of the building using the screws and wall anchors provided so that the tip is well away from the surface of the wall. The probe's cable length is 8' (2.4m); additional 2 conductor cable may be added to increase the length. Route the cable to the SZEM module and connect the wires to the terminals marked ODT 1 and ODT 2 respectively (polarity is unimportant).

WARRANTY

LIMITED TWO YEAR WARRANTY

The manufacturer warrants to the original purchaser that its product and component parts will be free from defects in workmanship and materials for a period of two years from the date of purchase. Your dealer will provide free replacement of your thermostat upon proof of purchase.

EXCLUSIONS

This warranty does not apply in the event of misuse, abuse, or as a result of unauthorized alterations or repairs. The manufacturer will not be liable for any consequential damages including, without limitation, damages resulting from defects, loss of use or misuse.

This equipment, if installed in strict accordance with the manufacturer's instructions, complies with the limits for a class B computing device pursuant to Subpart J of Part 15 of FCC rules.

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