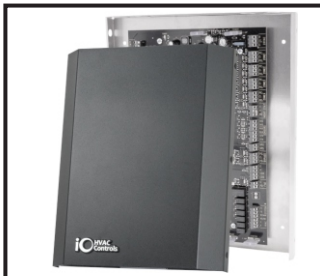# INSTALLATION GUIDE

ZP4-ESP-FAV

FORCED AIR ZONING SYSTEM

![iO HVAC CONTROLS logo]

Indianapolis, IN 46237

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OVERVIEW

The ZP4-ESP-FAV is a residential and light commercial forced air zone control system that allows a single HVAC unit to have up to 4 separate zones. The panel can be used with single stage or multi-stage heat/cool equipment as well as heat pump and dual fuel systems having up to 3 stages of heating and 2 stages of cooling. Simple slide switch configurations allow for a wide range of system setup and control options best suited for each zoning application. The ZP4-ESP-FAV incorporates an integrated ESP static pressure control logic designed to eliminate the need for a conventional bypass damper when used with 3-wire zone dampers or can be used with a single motorized bypass damper through installer selection. A Graphics Display Module (GDM) allows real time monitoring of discharge air, return air and outside air temperature when used with appropriate sensors. The GDM is also used to set high and low limits, high and low outdoor balance points, timed upstaging, high and low limits for fresh air ventilation as well as fresh air ventilation timing and selection of designated ESP zones or use of a single electronic bypass damper in place of the ESP function.

SEQUENCE OF OPERATION

Each zone is controlled by its own space thermostat and motorized zone damper. If any zone thermostat calls for heating or cooling, the zones not calling will have their dampers powered closed and the zones calling will have their dampers powered open. If the ESP feature is enabled, non-calling zones will modulate open enough to maintain system static pressure. If conventional bypass is selected, all non-calling zones will go to the closed position and the heating or cooling equipment will be energized. When all zones are satisfied, the heating or cooling equipment will turn off. Zone dampers will then reposition based on ventilation mode selection. The system uses **First Call Priority** - **Time Share** mode of operation.

First Call Priority - Time Share:
The first zone that calls for heating or cooling establishes the equipment mode of operation. If an opposite call takes place, it will be delayed until the first call is satisfied or after twenty minutes at which time the equipment will change mode of operation.

DESIGN AND INSTALLATION GUIDLINES

[ ] Zone control begins with good HVAC design.

[ ] Proper load calculations used to determine duct and equipment sizing are essential in achieving optimum performance.

[ ] Install zone thermostats in their respective zones.

[ ] System wires should be tagged to match the panel terminal designations and zone identification.

[ ] Zone dampers should be installed at least 10' back from discharge air grills whenever possible.

[ ] Zone dampers need to be located where they can be accessed for trouble shooting.

[ ] Flex or lined duct is recommended on the last 5' of each branch run.

[ ] Thermostats and zone dampers can typically be located up to 300' from the control panel when 18AWG copper thermostat wire is used.

[ ] Always use a separate 24VAC transformer rated at the proper VA to power the panel, zone dampers, thermostats and other optional peripherals.

[ ] Never use the equipment transformer regardless of its VA rating.

[ ] When using forced air zoning with a variable speed HVAC system, the fan should be set at 400 CFM per ton of cooling.

ZP4-ESP-FAV PANEL LAYOUT

3 AMP FUSE PROTECTS CIRCUIT BOARD

POWER LED

POWER

3 AMP SPARE 3 AMP POWER
3 AMP   3 AMP

ZONE 1 THERMOSTAT — ZONE STAT 1: C R Y1 Y2 W1-AUX W2-O/B G

GRAPHIC PROGRAMMING DISPLAY MODULE

ZP4-ESP-FAV

SELECT UP DOWN

R / NOT USED / C — **24VAC** — **24 VOLT POWER**

ZD1 — PC₂ C₁ PO₃ — **ZD1** — **ZONE 1 DAMPER**

ZD2 — PC₂ C₁ PO₃ — **ZD2** — **ZONE 2 DAMPER**

ZONE DAMPER POSITION LEDs (ON WHEN OPEN)

ZD3 — PC₂ C₁ PO₃ — **ZD3** — **ZONE 3 DAMPER**

ZD4 — PC₂ C₁ PO₃ — **ZD4** — **ZONE 4 DAMPER**

ZONE 2 THERMOSTAT — ZONE STAT 2: C R Y1 Y2 W1-AUX W2-O/B G

OCCUPIED — C R NS — **NIGHT STAT** — **OPTIONAL NIGHT STAT**

DAS — DAS DAS RAS RAS OTS OTS — **SENSORS** — **DISCHARGE AIR SENSOR** / **RETURN AIR SENSOR** / **OUTDOOR SENSOR**

ZONE 3 THERMOSTAT — ZONE STAT 3: C R Y1 Y2 W1-AUX W2-O/B G

OTS

SPS — SPS SPS — **STATIC PRESSURE SENSOR**

BP — PC₂ C₁ PO₃ — **BYPASS** — **BYPASS DAMPER**

CO2 — C R CO2 CO2 — **CO2 SENSOR**

FAD — C PO — **FAD** — **FRESH AIR DAMPER**

AUXILIARY LEDS

ZONE 4 THERMOSTAT — ZONE STAT 4: C R Y1 Y2 W1-AUX W2-O/B G

DEHUMIDIFACTION INPUT — DH DH

SYSTEM SETUP SWITCHES

1 2 3 4 5 6

HP	HC	SYSTEM
FOSSIL	CONV	HEAT PUMP
B	O	REV VALVE
ELECT	GAS	FAN
1 MIN	OFF	PURGE
2 ZONES	OFF	CAP CTRL

HVAC SYSTEM LEDs

Y1
Y2
W1-AUX
W2-O/B
G

Y1 Y2 W1-AUX W2-O/B G R — **SYSTEM** — **HVAC EQUIPMENT** — **HVAC**

TIME DELAY SPEED UP BUTTON

SPEED UP

3 SEC = 1 MIN

3 AMP SPARE 3 AMP SYSTEM
3 AMP   3 AMP

3 AMP FUSE PROTECT RELAY CONTACTS

SYSTEM WIRING

WARNING!
1. Turn power off to HVAC equipment and control panel during installation to prevent serious injury from electrical shock and/or damage to the system.
2. Use extreme care when making duct openings and handling sheet metal to avoid injury.
3. Install all components in a manner that provides easy access for test, check, and startup.

CAUTION!
1. Installation of this system must be in compliance with all applicable codes.
2. HVAC system must be properly sized and balanced to assure optimum system performance.
3. All low voltage cable must be 18 gauge solid (not stranded) wire.
4. All wiring should be color coded and tagged for proper identification.

Mounting the Panel
Carefully remove the panel from the shipping carton. Remove the cover and any packing material. Position the panel on a flat, non-condensating, vertical surface near the indoor unit that will facilitate ease of wiring and service access. Use appropriate anchors and screws to secure the panel to the surface.
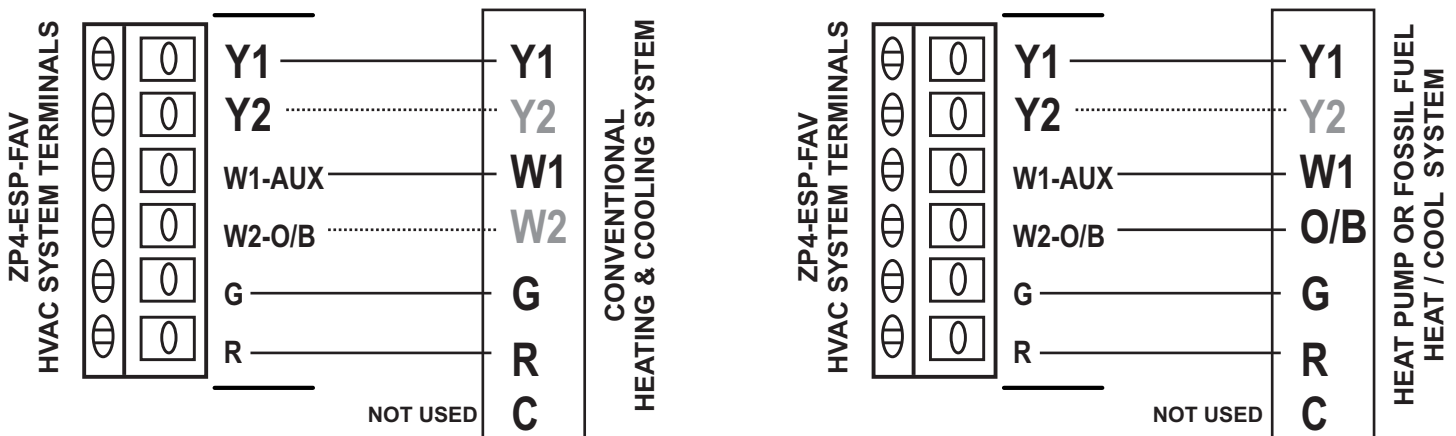
System Power
1. Wire a 24VAC, 75VA transformer to the 24VAC 'R' and 'C' terminals on the ZP4-ESP-FAV panel.

R

NOT USED   24VAC

C

24VAC   120/208/240/480 VAC
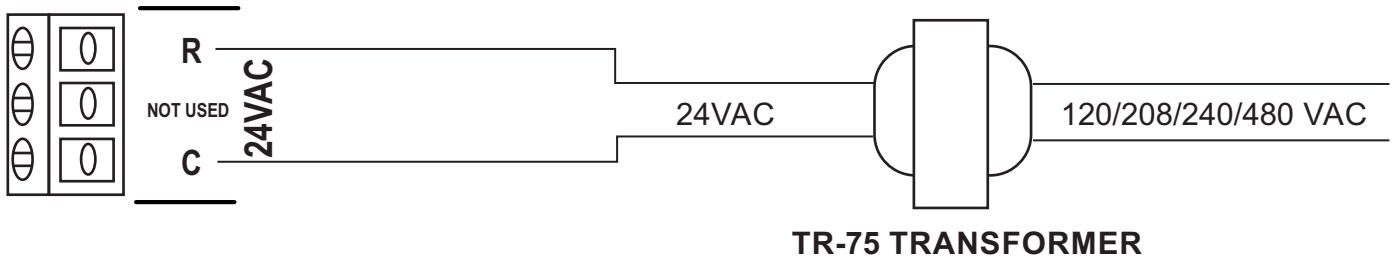
TR-75 TRANSFORMER

HVAC System
2. Wire the HVAC equipment to the HVAC SYSTEM terminals on the ZP4-ESP-FAV panel.

ZP4-ESP-FAV HVAC SYSTEM TERMINALS

Y1 —— Y1
Y2 ······ Y2
W1-AUX —— W1
W2-O/B ······ W2
G —— G
R —— R
NOT USED   C

CONVENTIONAL HEATING & COOLING SYSTEM

ZP4-ESP-FAV HVAC SYSTEM TERMINALS

Y1 —— Y1
Y2 ······ Y2
W1-AUX —— W1
W2-O/B —— O/B
G —— G
R —— R
NOT USED   C

HEAT PUMP OR FOSSIL FUEL HEAT / COOL SYSTEM

WARNING! NEVER USE THE EQUIPMENT TRANSFORMER
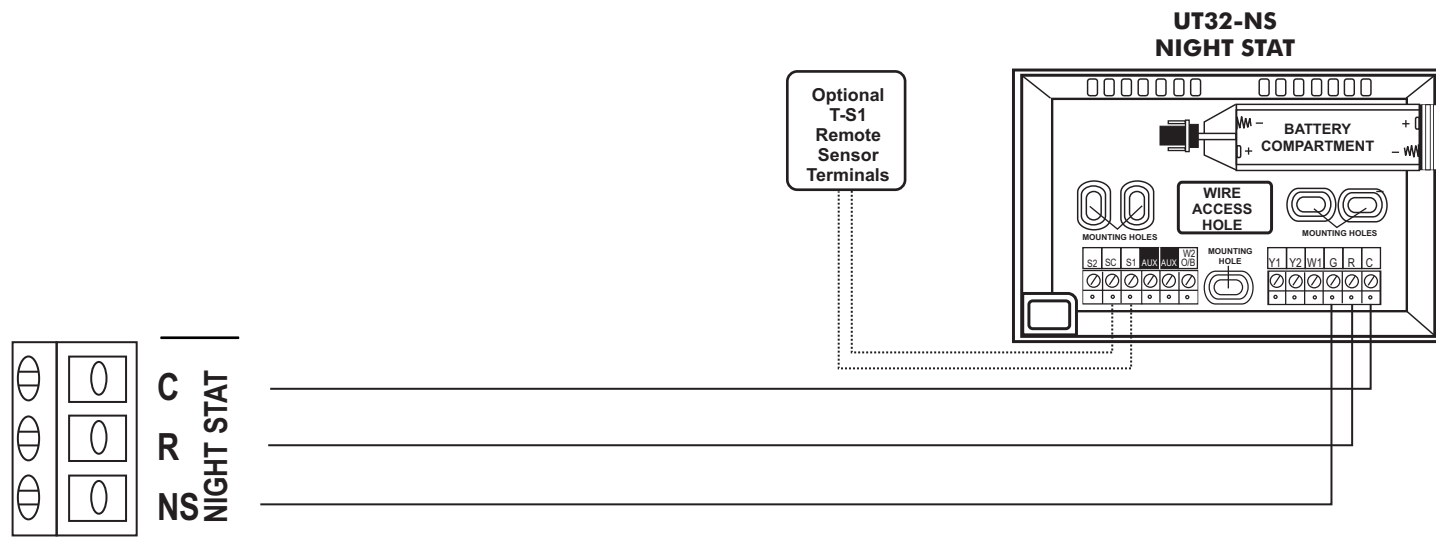**24V COMMON**

SYSTEM WIRING

DH Terminals

The ZP4-ESP-FAV has a set of terminals marked DH that are a normally open dry contact input designed for an optional dehumidistat. When the HVAC system is in the cooling mode and the humidity is above the dedhumidistat setpoint, the cooling setpoint will be overridden and the equipment will continue to run until either the dehumidistat setpoint is reached or the equipment is shut off based on a selectable run time from 1 minute to 15 minutes in 1 minute increments. Dehumidification is ignored during the heating mode.

DEHUMIDISTAT INPUT N.O. CONTACTS — DH DH
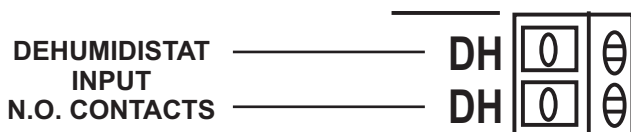
Night Stat (Optional)

The NIGHT STAT terminals are designed to be used with a UT32-NS programmable thermostat for occupied and unoccupied scheduling of the ZP4-ESP-FAV panel. This feature is suitable for commercial applications and eliminates the need for programmable thermostats in each zone. Remove the factory jumper across the R and NS terminals on the panel. Wire the 24V Common C from the panel to the Common C on the thermostat. Wire the 24V Hot R on the panel to the Hot R on the thermostat. Wire the NS terminal on the panel to the G terminal on the thermostat. The thermostat can also be fitted with a remote sensor in applications where the Night Stat is located in an equipment room or maintenance office. Refer to the Night Stat Setup and Scheduling section in this Installation Guide.

UT32-NS NIGHT STAT

Optional T-S1 Remote Sensor Terminals

BATTERY COMPARTMENT

WIRE ACCESS HOLE

MOUNTING HOLES

MOUNTING HOLES

S2 SC S1 AUX AUX W2 O/B

MOUNTING HOLE

Y1 Y2 W1 G R C

C R NS — NIGHT STAT

SYSTEM WIRING

SENSORS

The SENSOR terminals provide inputs for Discharge Air (DAS), Return Air (RAS) and Outdoor Temperature (OTS) sensors. All sensors are NTC Type III thermistors rated at 10K Ohms @ 77° F.

Discharge Air Sensor

Mount the discharge air sensor in the main supply duct out of the line of sight of the heat exchanger or cooling coil and upstream of any duct transitions or zone dampers. Wire the sensor to the DAS terminals on the panel. The sensor is used for High and Low Limit protection as well as display of discharge air temperature.
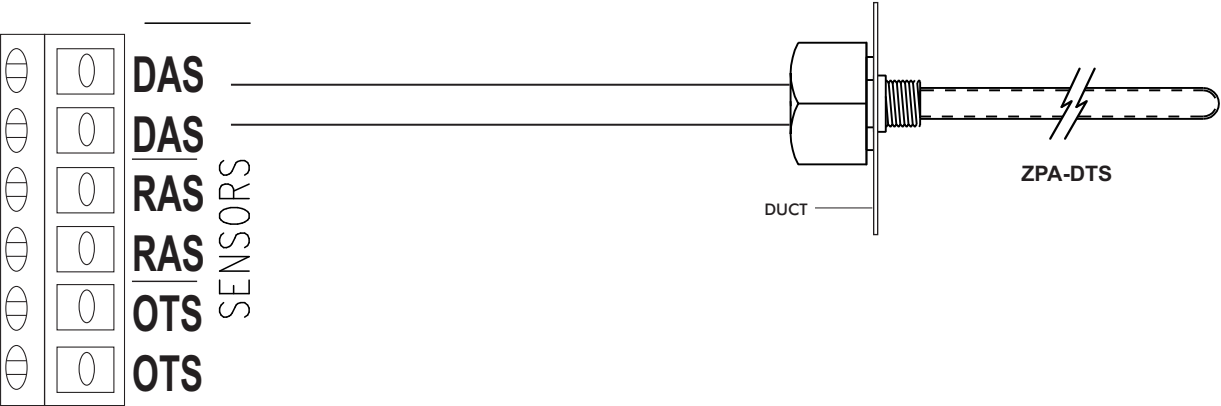
Return Air Sensor (Optional)

Mount the return air sensor in the main return duct. Wire the sensor to the RAS terminals on the panel. The sensor is used to display return air temperature only.
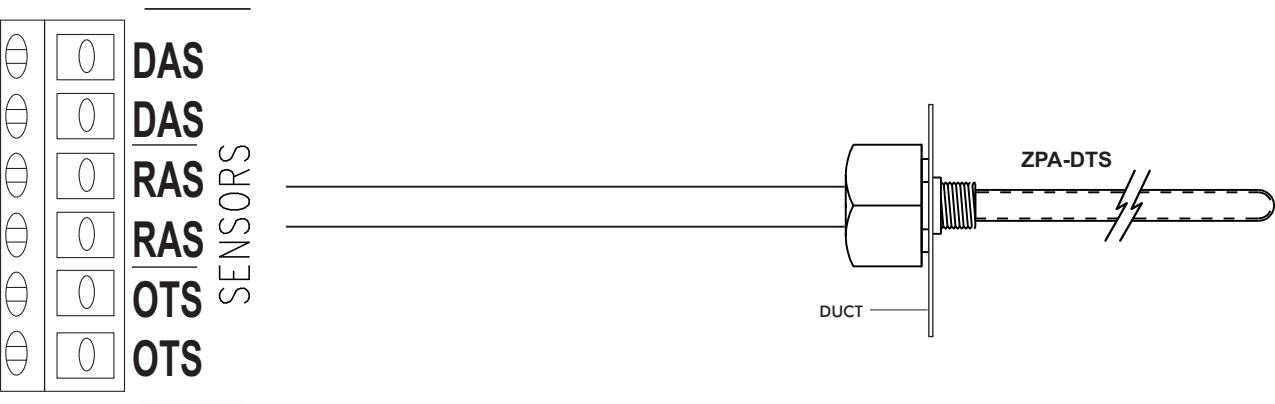
Outdoor Temperature Sensor (Optional)

The outdoor temperature sensor is used for High and Low Balance Point control in heat pump and dual fuel applications but can also be used for High and Low outdoor temperature limits for fresh air ventilation as well as outdoor temperature display. Mount the sensor inside the outdoor unit where it will not be directly exposed to sunlight, water, snow or ice. Wire the sensor to the OTS terminals on the panel.
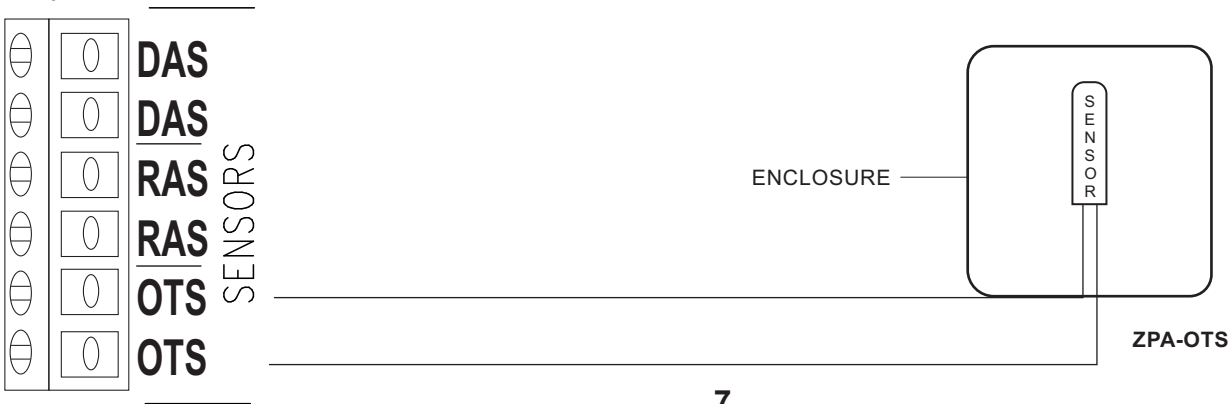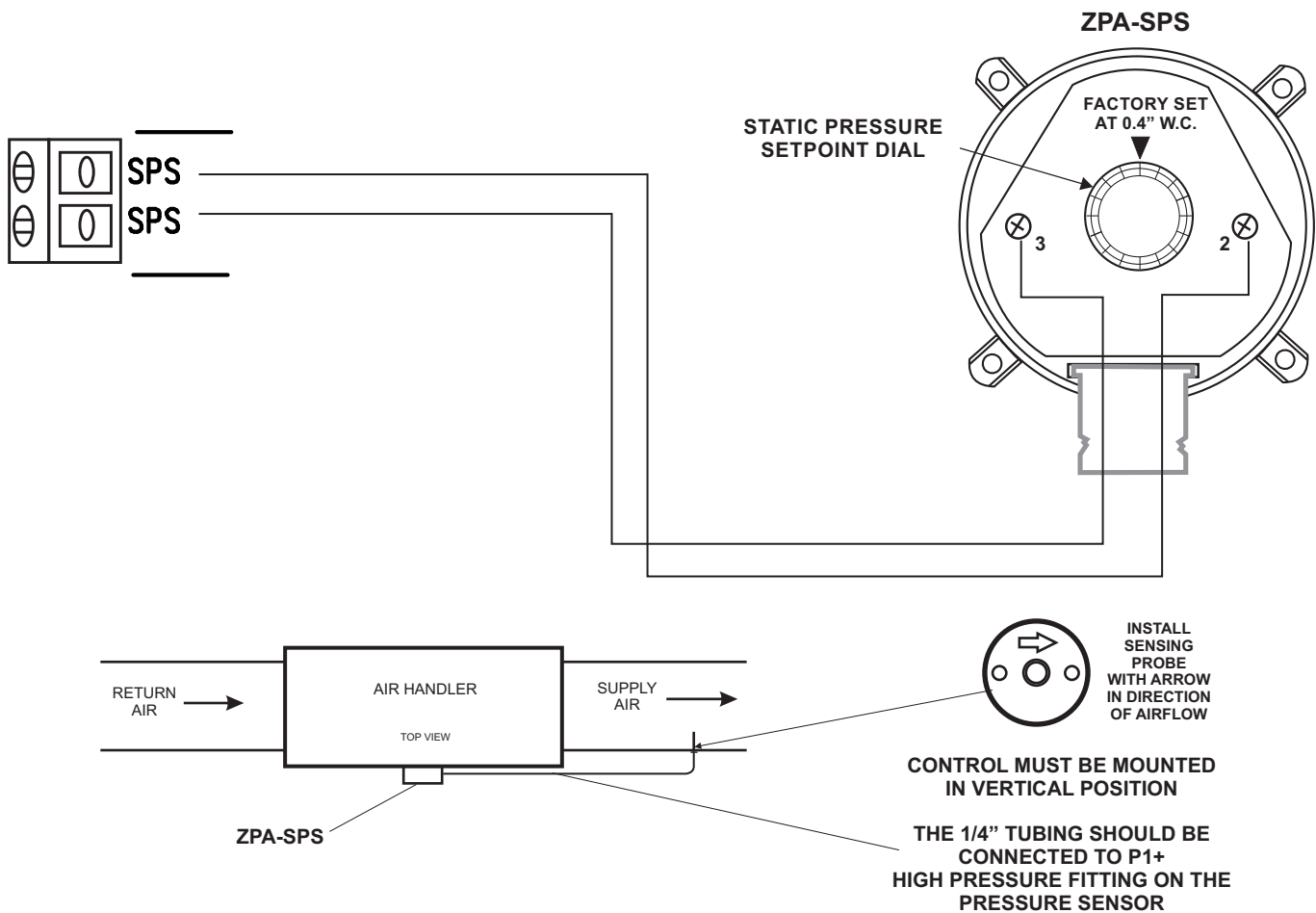
SYSTEM WIRING

SPS Terminals
The SPS terminals wire to the ZPA-SPS Static Pressure Sensor. The sensor should be installed on a flat surface so that the diaphragm is in the vertical position. Use the 1/4" x 36" tubing provided and connect one end to the (P1+) high pressure fitting on the sensor. The other end of the tubing should be connected to the plastic sensing probe mounted in the main discharge air plenum prior to any zone dampers or duct transitions. The sensing probe is 2-1/8" x 1/4" O.D. Install and mount the probe with the arrow in the direction of airflow. The pressure sensor is factory set for 0.4" W.C. but is fully adjustable from 0.08 to 1.2" W.C. The terminals are not polarity sensitive. Use 18-2 thermostat wire. After removing the outer jacket, strip approximately 1/8" insulation off of each wire. Land the wires to terminals 2 and 3 on the pressure sensor and repeat the process on the other end by landing the wires to the SPS terminals 2 and 3 on the panel.

NOTE: The ESP function only works with 3-wire, power open / power close dampers.

ZPA-SPS

STATIC PRESSURE SETPOINT DIAL

FACTORY SET AT 0.4" W.C.

SPS
SPS

INSTALL SENSING PROBE WITH ARROW IN DIRECTION OF AIRFLOW

RETURN AIR

AIR HANDLER

TOP VIEW

SUPPLY AIR

ZPA-SPS

CONTROL MUST BE MOUNTED IN VERTICAL POSITION

THE 1/4" TUBING SHOULD BE CONNECTED TO P1+ HIGH PRESSURE FITTING ON THE PRESSURE SENSOR

How ESP works when selected over conventional bypass
As zone dampers open and close, the ZPA-SPS Static Pressure Sensor continuously monitors the system static pressure. If the static pressure goes above the static pressure setpoint, the sensor will send a signal to the panel which will begin to open selected non-calling zone dampers until the static pressure setpoint is maintained. The SPS LED will come on until the static pressure reaches setpoint and then turns off. Selected non-calling ESP zone LEDs will blink when their dampers are in a floating position. The small amount of air allowed to bleed into non-calling zones eliminates air noise and ensures proper airflow through the HVAC system. This also prevents coil freeze up and high temperature issues. When all zones are satisfied, all zone dampers will go to the full open position provided no thermostat is calling for ventilation mode.
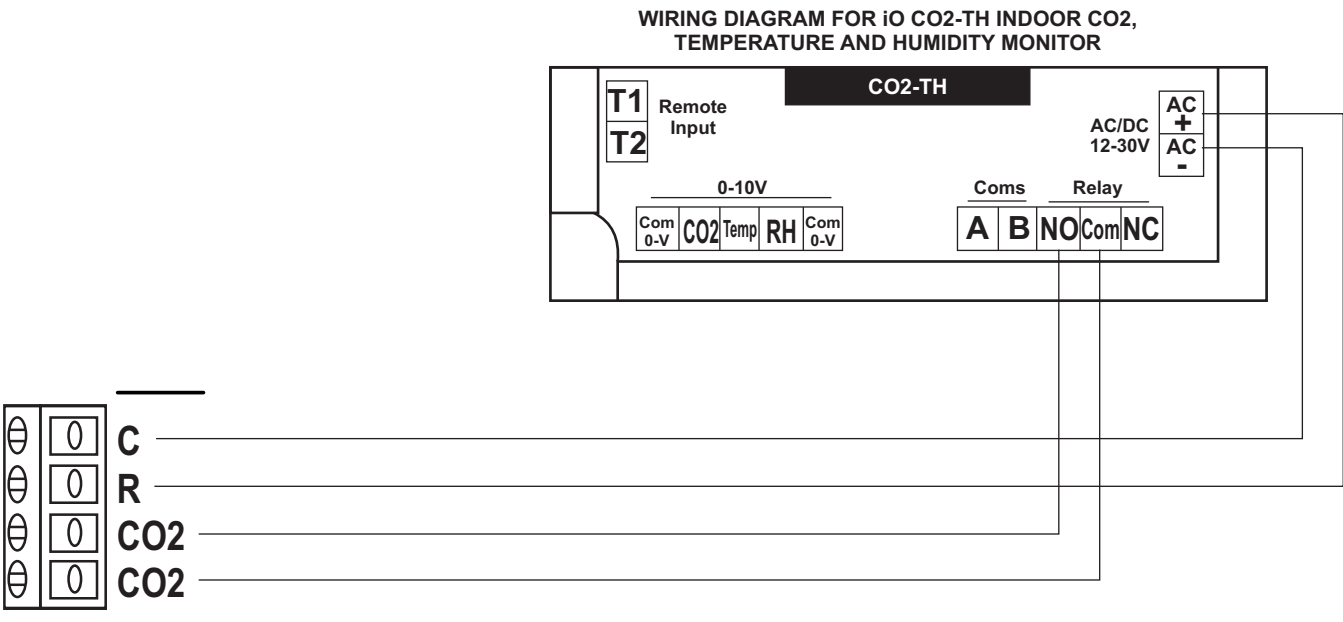
SYSTEM WIRING

Using a conventional electronic bypass damper

A conventional electronic bypass damper can be used in place of the ESP feature. When selected, the bypass damper wires to the BYPASS terminals on the panel which is then controlled by the ZPA-SPS static pressure control.

FP18-MOTOR

24VAC/DC
2.5 VA   1.5W

1 Comm
2 Close
3 Open

BYPASS
- PC_2
- C_1
- PO_3
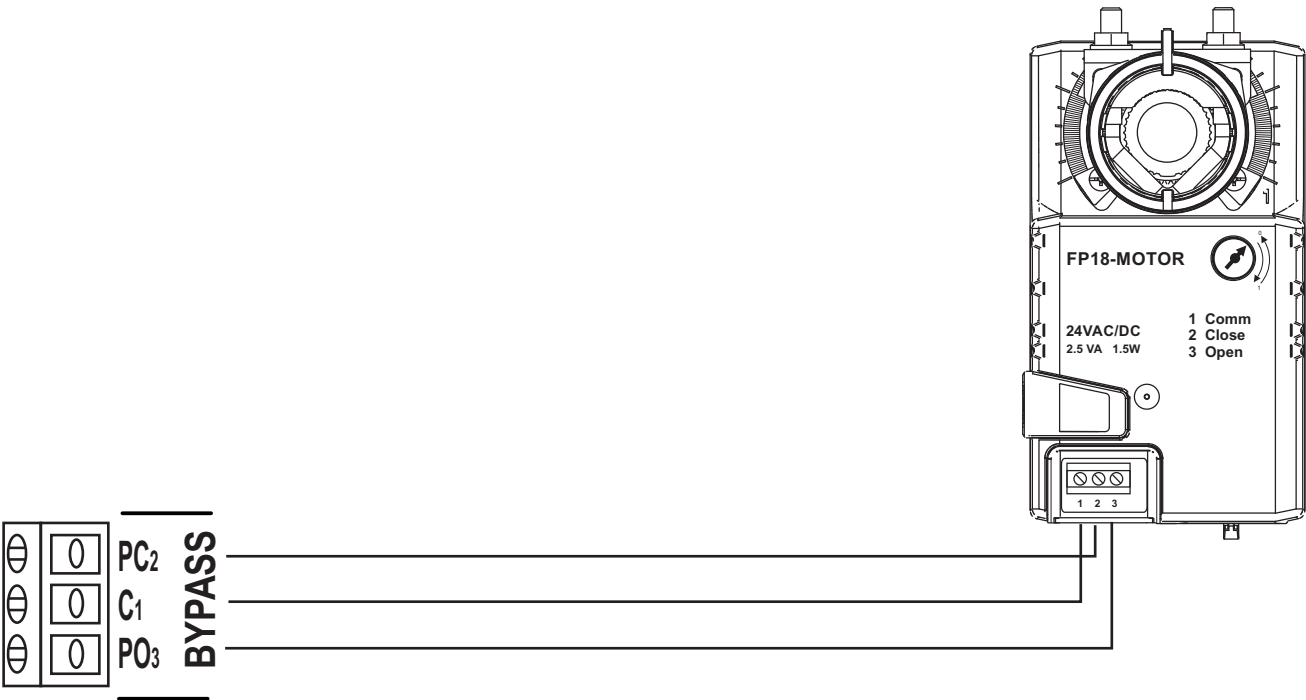
CO2 Sensor

The ZP4-ESP-FAV panel has an input for a CO2 sensor having a normally open dry contact output. When CO2 reaches a pre-selected setting on the sensor, the CO2 contacts will close causing a fresh air damper to open and the system fan to run regardless of what mode the equipment is in. Once the CO2 level falls below the sensor setting, the contact will open and the fresh air damper will close and the fan will go intermittent with the equipment.

WIRING DIAGRAM FOR iO CO2-TH INDOOR CO2, TEMPERATURE AND HUMIDITY MONITOR

CO2-TH

T1 Remote
T2 Input

AC/DC
12-30V

AC +
AC −

0-10V   Coms   Relay

Com 0-V | CO2 | Temp | RH | Com 0-V   A | B   NO | Com | NC

- C
- R
- CO2
- CO2

SYSTEM WIRING

FAD (Fresh Air Damper)

The ZP4-ESP-FAV has a fresh air damper terminal designed to be used with a 24VAC Power Open / Spring Close, 2-wire damper. The fresh air damper can be used for both timed fresh air ventilation and/or CO_2 ventilation.

**TYPICAL 2-WIRE
POWER OPEN / SPRING CLOSE
FRESH AIR DAMPER**

C
P0 FAD
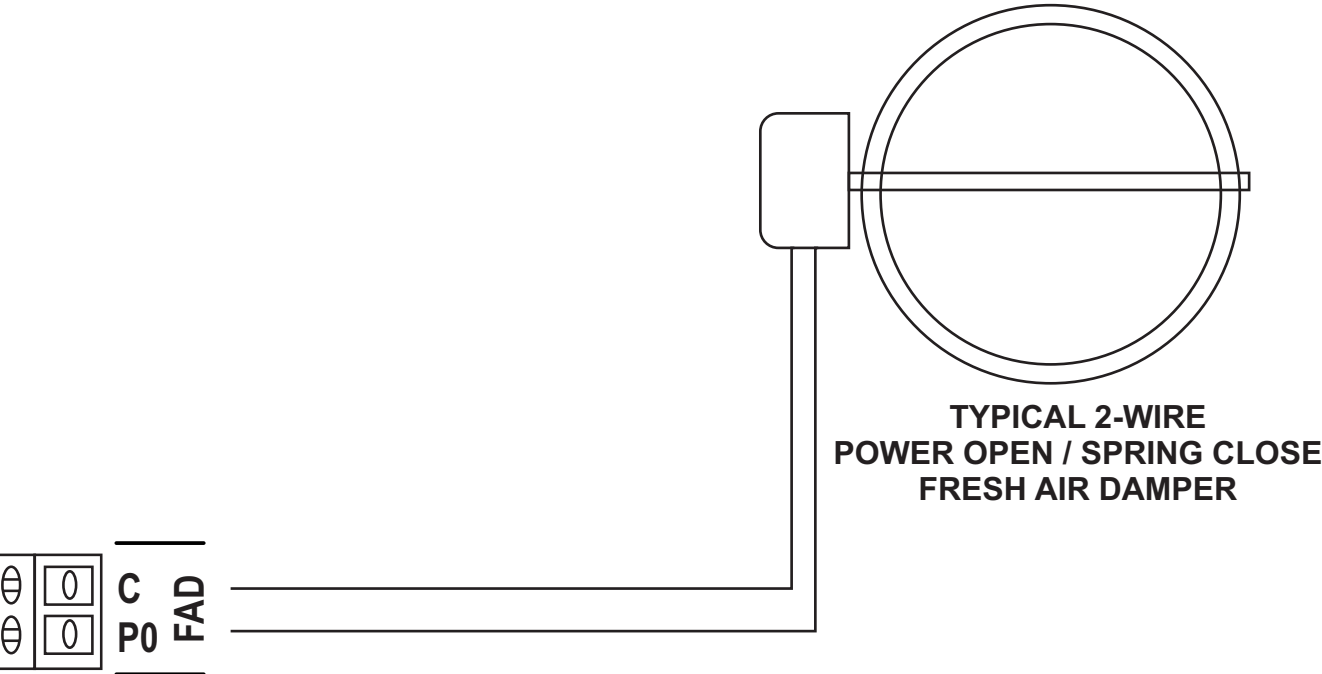
Zone Dampers

The panel has dedicated terminals for each zone damper. Dampers have three-wire, floating point actuators rated at 2.5VA.

NOTE: 3-wire dampers must be used with the ESP function that eliminates the need for a traditional bypass damper.

FP18-MOTOR

24VAC/DC
2.5 VA   1.5W

1 Comm
2 Close
3 Open

1 2 3

PC_2
C_1 ZD1
PO_3

10
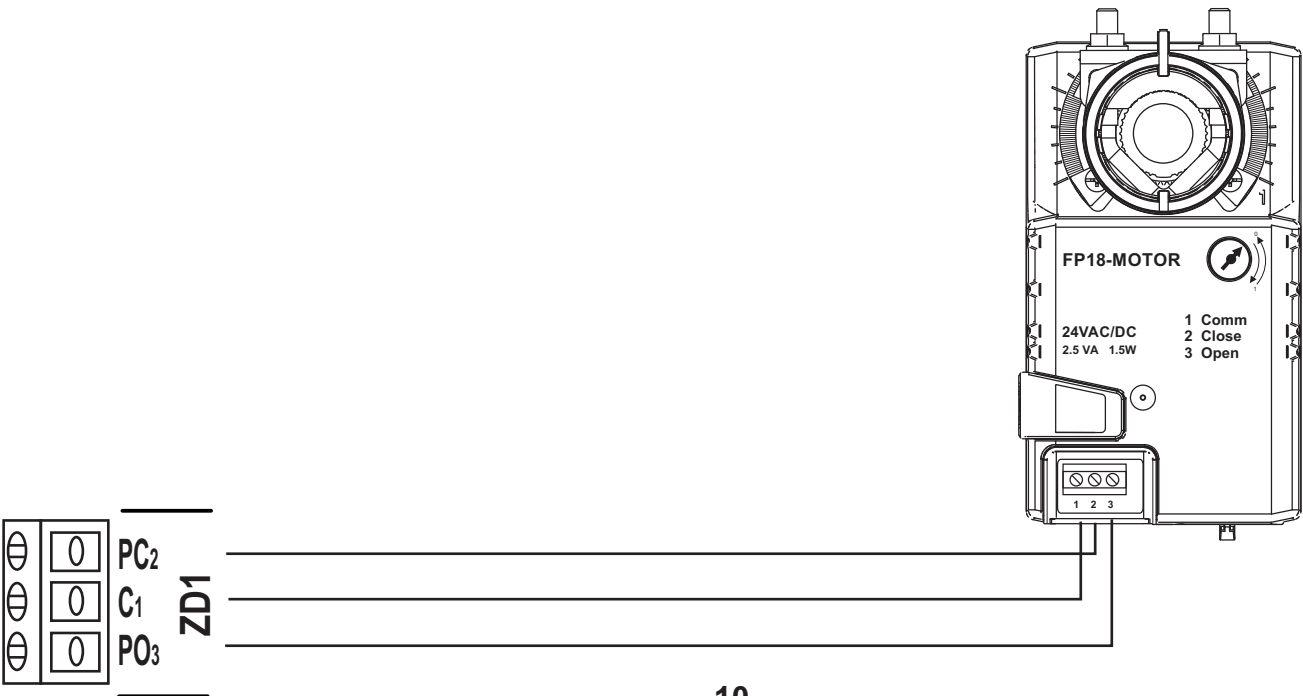
PANEL SETUP

Switch Configurations

The ZP4-ESP-FAV panel has a row of slide switches that are used to configure the panel for the specific equipment application. The switches also provide other control options.

System Configuration

Switch 1 selects the type of system. **Heat Pump** or **Heat / Cool**
Switch 2 selects the type of Heat Pump. **Fossil Fuel** or **Conventiona**l

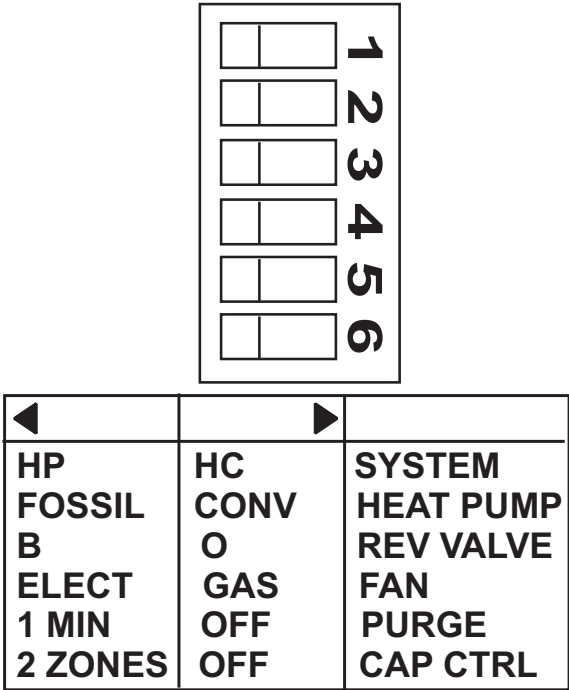> Note**:** For heat pump applications, zone thermostats should be configured for heat pumps with electric backup regardless of if heat pump system is conventional or fossil fuel.

Switch 3 selects the heat pump reversing valve. **B** (Energized in Heating) or **O** (Energized in cooling)
Switch 4 selects the fan operation. **Electric** or **Gas**
Switch 5 selects the purge option. **1 MIN** (Zone dampers maintain position and fan runs for 1 minute after call is satisfied) or **OFF** (No purge cycle after call is satisfied)
Switch 6 selects Capacity Control. Capacity Control can be used in multi-stage equipment applications to prevent a second stage from energizing until at least two zones are calling. It still requires a second stage call from at least one of the zone thermostats. **2 ZONES** for Capacity Control or **OFF** for no Capacity Control.

| ◄	►	
HP	HC	SYSTEM
FOSSIL	CONV	HEAT PUMP
B	O	REV VALVE
ELECT	GAS	FAN
1 MIN	OFF	PURGE
2 ZONES	OFF	CAP CTRL

PANEL SETUP

GDM (Graphic Display Module)

The GDM is designed to provide real-time display of discharge air, return air and outdoor air temperatures when the appropriate sensors are wired to the panel. The GDM is also used to set Low Limit, High Limit, Low Balance Point, and High Balance Point setpoints as well as initiation of the automatic upstage timer. The GDM is backlit and has been factory calibrated to provide the best contrast.

Discharge Air Sensors

When the ZP4-ESP-FAV panel is first powered up, the GDM will illuminate and momentarily display the firmware version information and then the Discharge Air Temperature. If the word **No Sensor** appears, the sensor has not been connected.

Discharge

No Sensor

SELECT   UP   DOWN
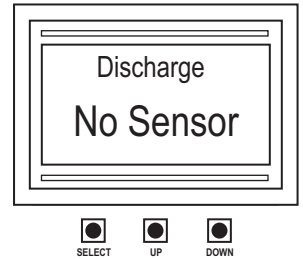
Return Air Sensor

Press **SELECT** again and the Return Air Temperature will be displayed. If the word **No Sensor** appears, the sensor has not been connected.

Return

No Sensor

SELECT   UP   DOWN
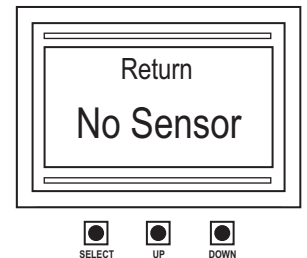
Outdoor Temperature Sensor

Press **SELECT** again and the outdoor temperature will be displayed. If the word **No Sensor** appears, the sensor has not been connected.
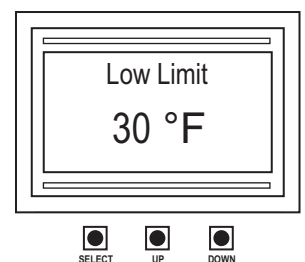
Outdoor

No Sensor

SELECT   UP   DOWN
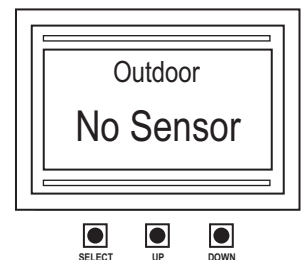
Setting High Limit

Press **SELECT** again and the High Limit setpoint will be displayed. Depending on the equipment application, the High Limit can be set from 100° F to 180° F. Use the UP or DOWN buttons to adjust the High Limit setpoint. Once the limit setpoint is made, it will be maintained in non-volatile memory.

High Limit

180 °F

SELECT   UP   DOWN
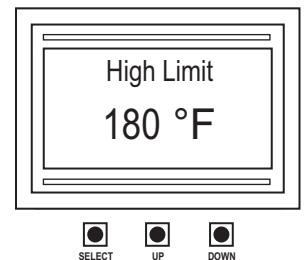
Setting Low Limit

Press the **SELECT** button and the Low Limit setpoint will be displayed. Use the UP or DOWN buttons to adjust the Low Limit Setpoint. The setpoint range is from 30° F to 55° F. The recommended setting is 46° F.

Low Limit

30 °F

SELECT   UP   DOWN

PANEL SETUP

Setting High Balance Point
High Balance Point only functions in heat pump and dual fuel configuration. It is designed to prevent the auxiliary heat from coming on if the outdoor air temperature is above the High Balance Point setpoint. Press the **SELECT** button to display the High BP. Use the UP or DOWN buttons to adjust the setpoint. The setpoint range is from 20° F to 60° F.

High BP

**60 °F**

SELECT   UP   DOWN
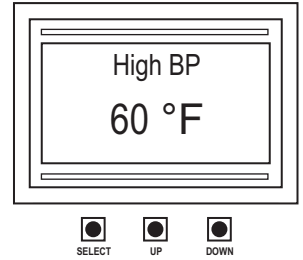
Setting Low Balance Point
Low Balance Point only functions in heat pump and dual fuel configuration. It is designed to prevent the compressors from coming on and immediately switch to auxiliary heat if the outdoor air temperature falls below the Low Balance Point setpoint. Press the **SELECT** button to display the Low BP. Use the UP or DOWN buttons to adjust the setpoint. The setpoint range is from 0° F to 40° F.

Low BP

0 °F

SELECT   UP   DOWN
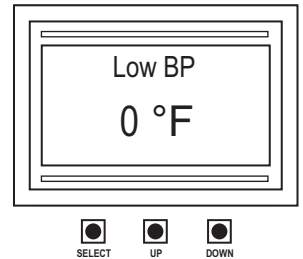
Upstage Timer Option
If single stage zone thermostats are used with multi-stage equipment, an automatic Upstage Timer can be initiated. Press the **SELECT** button to display the Upstage Timer option. Default = Disable; adjustable from 5 to 20 minutes.

Upstage Timer

Disable

SELECT   UP   DOWN
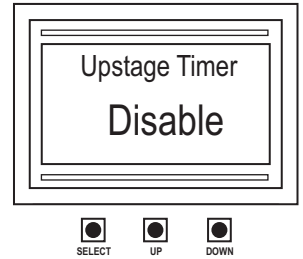
Selecting ESP zones
You can select which zones you want to apply the ESP function by toggling to the ESP Zones menu. Press the **SELECT** button to highlight the zone.

ESP Zones
● **Zone 1**   ● Zone 2
● Zone 3   ● Zone 4
Bypass

SELECT   UP   DOWN
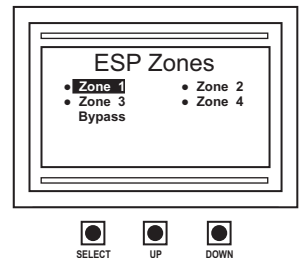
The factory default for all zones is active ESP function as indicated by the bullet (●) next to each zone. To deselect a zone, press the UP or DOWN button until the bullet disappears.

ESP Zones
Zone 1   ● Zone 2
● Zone 3   ● Zone 4
Bypass

SELECT   UP   DOWN
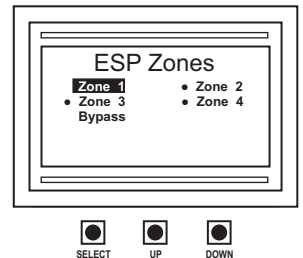
Selecting Conventional Bypass Damper
A conventional motorized bypass damper can be used in place of the ESP feature. Deselect all four ESP zones and select **Bypass** as illustrated.

ESP Zones
Zone 1   Zone 2
Zone 3   Zone 4
● **Bypass**

SELECT   UP   DOWN
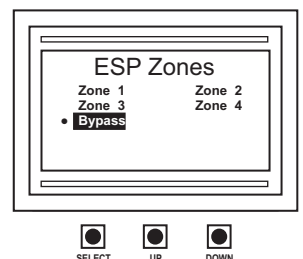
PANEL SETUP

Ventilation Timer

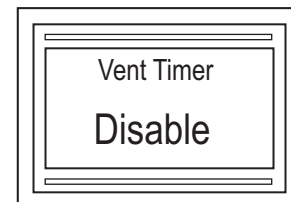The Ventilation Timer is designed to improve residential indoor air quality. This is accomplished by introducing fresh, outside air through a fresh air damper controlled by a logic panel. The panel controls the amount of fresh air required each hour based on the ASHRAE 62.2 - 2013 Ventilation and Indoor Air Quality Standard. The Ventilation Timer is adjustable from 1 minute to 60 minutes in 1 minute increments. The factory default is Disable.

Ventilation Timer Quick Reference Chart

The reference chart below is designed to provide FAV ventilation timer settings based on using 8" rigid straight duct with friction loss of 0.1" w.g. per 100 ft. This chart can be used for most applications.

VENTILATION TIMER SETTING (MINUTES PER HOUR)					
NUMBER OF BEDROOMS	ONE	TWO	THREE	FOUR	FIVE
<500	8	10	12	15	16
501-1000	12	15	16	19	21
1001-1500	16	19	21	23	25
1501-2000	21	23	25	27	29
2001-2500	25	27	29	31	33
2501-3000	29	31	33	35	37
3001-3500	33	35	37	39	41
3501-4000	37	39	41	43	45
4001-4500	41	43	45	47	49
4501-5000	45	47	49	51	53

HOME SIZE (Ft²)

FORMULA FOR SETTING THE VENTILATION TIMER

The FAV Ventilation Control System is designed to simplify selecting the minimum ventilation cycle rate to meet ASHRAE 62.2 - 2013 Standard by using a single dial to set the desired number of minutes per hour that ventilation will take place. The timer cycle rate is calculated as follows:

(Home Area in Sq. Ft. x 0.03) + ((Number of Bedrooms + 1) x 7.5) = Required Airflow in CFM
(Required Airflow in CFM x 60 ÷ Total Airflow of Fresh Air Duct) x 60 = Ventilation Minutes Per Hour

Example: Home Area = 2,500 Sq. Ft. with 4 bedrooms.
(2,500 x 0.03 = 75) + ((4 + 1) x 7.5 = 37.50) = **112.50 CFM**

Total airflow of 8" rigid fresh air duct @ 0.1" w.c. = 220 CFM x 60 = **13,200 Cubic Feet Per Hour**

(112.50 CFM x 60 Minutes = 6,750)   6,750 ÷ 13,200 x 60 = **30.68 Ventilation Minutes Per Hour**

The ventilation timer would be set for **31 Minutes**

Vent Timer
Disable

SELECT   UP   DOWN

14

PANEL SETUP

Ventilation Timer Hi Limit

When an outdoor sensor is wired to the panel and Timed Ventilation is being used, the fresh air damper will remain closed if the temperature exceeds the Hi Limit setting which is adjustable from 60° F to 90° F in 1 degree increments. The factory default is Disable.

```
Vent Hi Limit
Disable
```
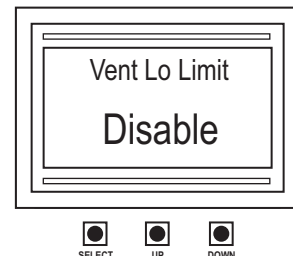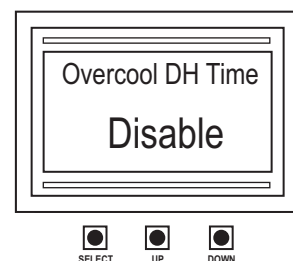SELECT   UP   DOWN
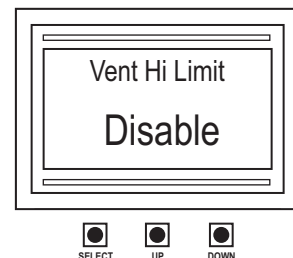
Ventilation Timer Lo Limit

When an outdoor sensor is wired to the panel and Timed Ventilation is being used, the fresh air damper will remain closed if the temperature falls below the Lo Limit setting which is adjustable from 1° F to 60° F in 1 degree increments. The factory default is Disable.

```
Vent Lo Limit
Disable
```
SELECT   UP   DOWN

Overcool DH Timer

When a dehumidistat is wired to the panel the amount of compressor overrun time can be adjusted from 1 minute up to 15 minutes in 1 minute increments. The timer setting will cancel cooling if the dehumidification setpoint has not been reached. The factory default is Disable.
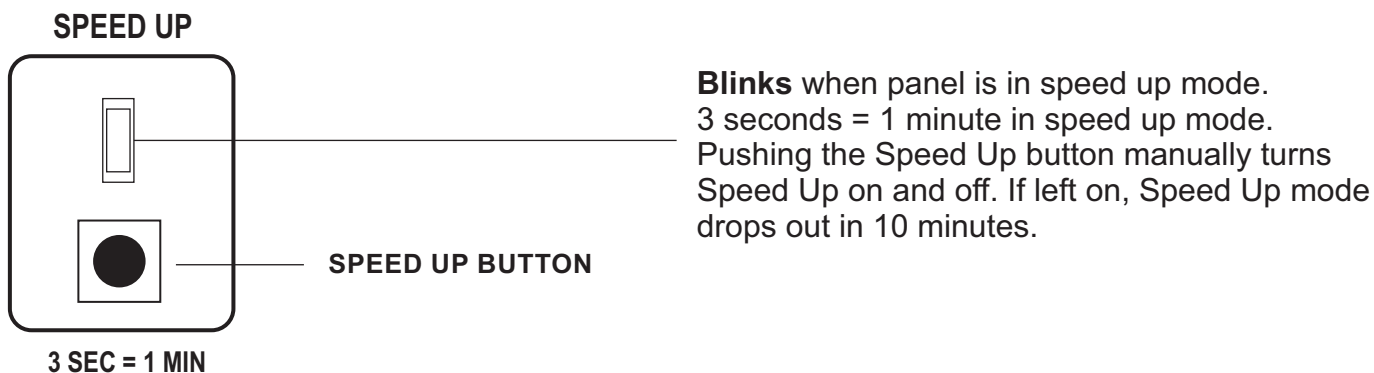
```
Overcool DH Time
Disable
```
SELECT   UP   DOWN

PANEL LED DEFINITIONS AND FUNCTIONS

POWER	**On** when 24V is applied to panel.	**Off** when bypass damper is closed **On** when bypass damper is opening. **Blinking** when bypass damper is less than 100% open and holding.		BP	
ZD1	**On** when damper is open. **Off** when damper is closed. **Blinking** when less than 100% open and holding due to ESP function.	**On** only if CO2 is tripped.		CO2	
ZD2		**Off** when closed and on when open.		FAD	
ZD3		**On** when selected HVAC output is energized.		Y1	
ZD4				Y2	
OCCUPIED	**On** when panel is in occupied mode.			W1-AUX	
DAS	**Off** when no sensor is detected. **On** when sensor is detected. **Blinking** when sensor is tripped.			W2-O/B	
OTS					
SPS	**On** only when SPS is tripped.			G	

PANEL LED DEFINITIONS AND FUNCTIONS

SPEED UP

3 SEC = 1 MIN

SPEED UP BUTTON

Blinks when panel is in speed up mode.
3 seconds = 1 minute in speed up mode.
Pushing the Speed Up button manually turns
Speed Up on and off. If left on, Speed Up mode
drops out in 10 minutes.

PANEL TIME DELAYS

TIME DELAY	NORMAL MODE	SPEED UP MODE
Minimum OFF Time	4 Minutes	12 Seconds
Changeover	5 Minutes	15 Seconds
Time Share	20 Minutes	60 Seconds
Purge	1 Minute	3 Seconds

OPTIONAL NIGHT STAT SETUP AND SCHEDULING

OVERVIEW:

The UT32-NS programmable touchscreen thermostat can be used for occupied and unoccupied scheduling of the ZP4-ESP-FAV panel. When wired and configured properly, the thermostat takes the place of a separate 7-day clock, night stat and override timer. The UT32-NS Programmable Fan option is used to trigger the 'G' fan relay to open or close the Clock Contact 'NS' terminal on the ZP4-ESP-FAV panel that places the system in the occupied or unoccupied mode of operation. The thermostat can also be used with a T-S1 Indoor Remote Sensor. 24 volt power to the thermostat is supplied by the panel through dedicated Clock Power terminals 'C' and 'R'. The thermostat also has battery backup to maintain the real-time clock in the event of a power failure. The thermostat can be configured to provide 7-day scheduling with 2 events per day (occupied and unoccupied).

OPTIONAL NIGHT STAT SETUP AND SCHEDULING

HOW IT WORKS:
The UT32-NS does not control the HVAC equipment and only uses the 'G' fan relay to set the panel in either the occupied or unoccupied mode. This is accomplished by using the Programmable Fan option so that the fan relay is energized during occupied mode (Always On) and de-energized during unoccupied mode (Automatic). When in Automatic mode, the fan relay will only energize when the temperature falls below or rises above the programmed unoccupied heating and cooling setpoints.

RECOMMENDED SETUP:
After mounting and wiring the thermostat subbase to the ZP4-ESP-FAV panel, follow the recommended setup and scheduling steps.

SYSTEM SWITCH SETTINGS:
The UT32-NS contains a set of four system switches located on the printed circuit board on the back of the thermostat. Make sure the system switches are set as follows:

      Sw 1 = OFF
      Sw 2 = ON
      Sw 3 = ON
      Sw 4 = OFF

INSTALLER SETUP MENU CHANGES:
After the thermostat is powered up, touch and hold both the Clock and Mode section for 5 seconds to enter the Installer Menu. Touch Mode to advance forward through the menu or touch Fan to back up.

MENU CHANGES: (LEAVE ALL OTHER OPTIONS AT FACTORY DEFAULTS)

      1:PR = 2   (Program Schedules)
      4:PF = ON   (Programmable Fan)

After the above changes have been made, touch and hold Mode until the thermostat exits the Installer Setup menu.

SETTING THE CLOCK AND DAY OF WEEK:
It is important that the time of day and day of the week is set properly so that occupied and unoccupied programs are initiated correctly.
1. Touch and hold Clock and the hour will flash. Tap the UP or DOWN arrow to select the correct hour. Note: PM hours are indicated by PM on the LCD.
2. Tap Clock again and the minutes will flash. Tap the UP or Down arrow to select the correct minutes.
3. Tap Clock again and the month will flash. Tap the UP or DOWN arrow to select the month.
4. Tap Clock again and the day of the month will flash. Tap the UP or DOWN arrow to select the day of the month.
5. Tap Clock again and the year will flash. Tap the UP or DOWN arrow to select the year.
6. To exit the menu, touch Clock again. The thermostat will automatically display the correct day of the week.

DAYLIGHT SAVING TIME:
The thermostat automatically compensates for Daylight Saving Time. When Daylight Saving Time is active, DST is displayed next to the time of day.

OPTIONAL NIGHT STAT SETUP AND SCHEDULING

PROGRAMMING EVENTS:

When the thermostat is configured to provide 2 schedules per day (Occupied/Unoccupied), 7 days per week, each event is displayed on the LCD as DAY (Occupied) and NIGHT (Unoccupied).

1. Touch and hold Program until Mon (Monday) flashes.

2. Tap Program again until the hour flashes and Day is displayed on the LCD. Use the UP or DOWN arrow to set the hour start time. Note: PM hours are indicated by PM on the LCD.

3. Tap Program again until the minutes flash. Use the UP or DOWN arrow to set the minutes.

4. Tap Program again and the heating setpoint will flash. Leave the setpoint at the factory default of 70 degrees.

5. Tap Program again and the cooling setpoint will flash. Leave the setpoint at the factory default of 75 degrees.

6. Tap Program again and the fan option Always On will flash. This is the correct setting for the Day mode. If the fan option displays Automatic, use the UP or DOWN arrow to set the fan option Always On.

7. Tap Program again until the hour flashes and Night is displayed on the LCD. Use the UP or DOWN arrow to set the hour start time. Note: PM hours are indicated by PM on the LCD.

8. Tap Program again until the minutes flash. Use the UP or DOWN arrow to set the minutes.

9. Tap Program again and the heating setpoint will flash. You can use the UP or DOWN arrow to change the heating setpoint or use the factory default of 62 degrees.

10. Tap Program again and the cooling setpoint will flash. You can use the UP or DOWN arrow to change the cooling setpoint or use the factory default of 83 degrees.

11. Tap Program again and the fan option Automatic will flash. This is the correct setting for the Day mode. If the fan option displays Always On, use the UP or DOWN arrow to set the fan option to Automatic.

12. Tap Program again and CPY (Copy) will appear on the LCD. If you wish to copy the Monday program to additional days of the week, use the UP or DOWN arrow to add additional days. Example: Mon Tue Wed Thu Fri

13. Once you have selected the days to be copied, touch Program. CPY will begin to flash and then the next programming day will flash. Example: If you copy the Monday schedule through Friday, Sat (Saturday) will flash. Simply repeat the programming steps for any day where the building will be unoccupied. The only required change is that both the Day and Night fan option should be set to Automatic and the heating and cooling setpoints for Day should reflect the unoccupied setpoints for Night.

14. Once programming is completed, make sure the thermostat is set in the Auto mode of operation.

TYPICAL 7-DAY SCHEDULE
2 events per day with Saturday and Sunday unoccupied

PROGRAM	DAY	START TIME	HEAT SETPOINT	COOL SETPOINT	FAN
DAY	MON	7:00 AM	70	75	Always On
NIGHT		5:00 PM	62	83	Automatic

COPY MONDAY PROGRAM TO TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY

| PROGRAM	DAY	START TIME	HEAT SETPOINT	COOL SETPOINT	FAN
DAY	SAT	7:00 PM	62	83	Automatic
NIGHT		5:00 PM	62	83	Automatic

COPY SATURDAY PROGRAM TO SUNDAY

SPECIAL ADDENDUM
# Using iO ESP Zoning with A2L Refrigerant Systems

New HVAC equipment using A2L refrigerants (R-32, R-454B, etc.) may incorporate a Refrigerant Leak Detection System (RDS) as an added safety measure. **iO HVAC Controls ESP series zone panels** can accept a signal from the RDS in order to drive open all dampers when a leak is detected.

To connect the panel to the RDS, wire the output of the RDS to the SPS terminals on the zone panel. This can be done concurrently with the ZPA-SPS pressure sensor, letting you still use ESP pressure control with an RDS. If the SPS LED on the panel is constantly lit for over one minute, the RDS has likely detected a leak and the dampers should be opened. See wiring diagrams below:

RDS interface with ESP pressure control
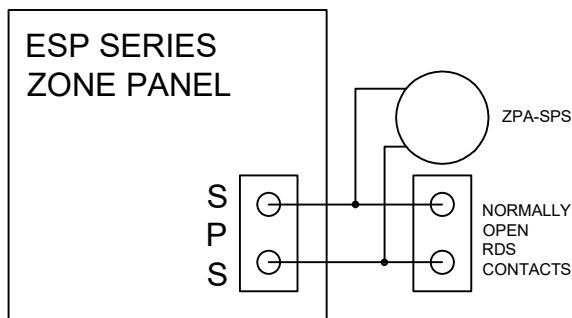
RDS interface only (using bypass for pressure control)
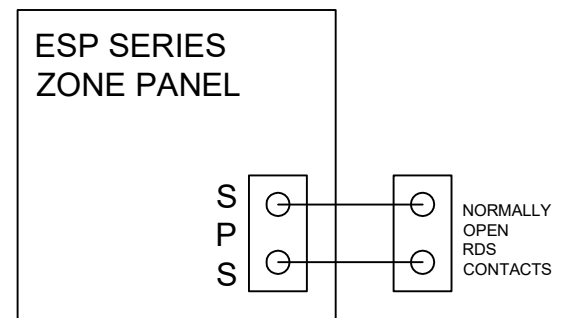
NOTE: All zones must be set to ESP ON via jumper or LCD display

ESP series zone panels require a normally open contact closure input to open dampers. For an RDS that outputs a different signal, reference the wiring diagrams below: