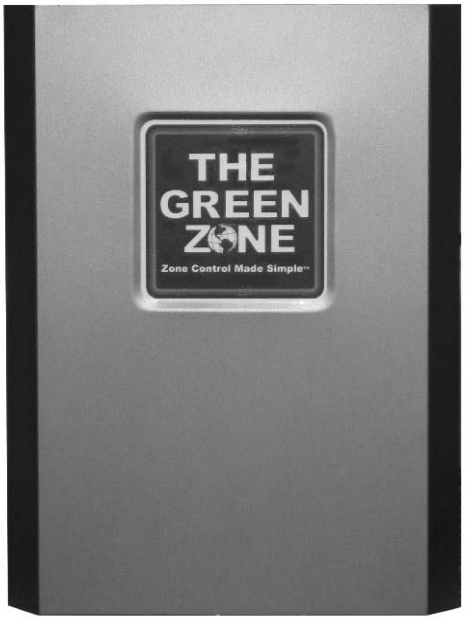
THE GREEN ZONE™
Zone Control Made Simple™

Z-300-HPS Installation and Operation Instructions

3 Heat / 2 Cool Heat Pump with Fossil Fuel option
Auto Changeover - First Call Priority - Time Share



Sequence of Operation:
The Green Zone™ Z-300-HPS is a residential / light commercial zone control system that allows a single HVAC unit to have up to three separate zones. Each zone is controlled by its own space thermostat and motorized zone damper. If a zone thermostat calls for heating or cooling, the zones not calling will have their dampers powered closed, and the zone calling will have its damper opened. The heating or cooling equipment will also be brought on at the same time. When the zone calling is satisfied, the heating or cooling equipment turns off. If one zone calls for heating and another zone calls for cooling, the first zone to call receives priority. When the first call is satisfied, the system will changeover and take care of the opposite call. If a zone being served (heating or cooling) has not been satisfied within 20 minutes while an opposite call is taking place, the system will changeover. When the zone is satisfied or 20 minutes has elapsed, the system will again changeover if an opposite call exists. This is referred to as Auto Changeover - First Call Priority - Time Share. In the event of a tie, cooling will receive priority. The changeover valve only changes position when the mode of operation changes.

High and Low Limit Protection:
The Z-300-DAS Discharge Air Sensor should be mounted on the discharge air plenum of the HVAC unit and wired to the DAS terminals on the panel. If the heating temperature rises above 140° F (160° F when fossil fuel is selected) or if the cooling temperature falls below 45° F, the sensor will cycle the equipment, while the fan continues to run. When the system goes out on low limit a 3 minute time delay is activated before cooling is allowed to energize (providing the discharge air temperature has risen above 45° F). LIMIT LED blinks when high or low limit is reached.

Ventilation Mode:
Zone ventilation is established by the individual zone thermostat fan setting. Any thermostat set in the fan AUTO mode will not receive ventilation air when there are no heating or cooling calls. Any thermostat set in the fan ON mode will receive ventilation air whenever there are no heating or cooling calls taking place.

Power Requirements:
The Z-300 requires a separate 24 Vac transformer. A 40 VA transformer will power the panel and up to four (4) dampers. A 75 VA transformer will power the panel and up to seven (7) dampers. If more than three (3) dampers for an individual zone are required, a RY-1-HB relay should be used with an additional properly sized transformer. Jackson Systems HD-XXXX rectangular and D-XX round dampers are powered closed / spring return open. Damper actuators are rated at 10 VA. If 3-wire dampers (powered open / powered closed) are installed, VA ratings will vary depending on the damper actuator used.

Wiring:
All wiring should be conventional 18 gauge thermostat wire. Thermostats and zone dampers may be located up to 300 feet from the Z-300 panel.

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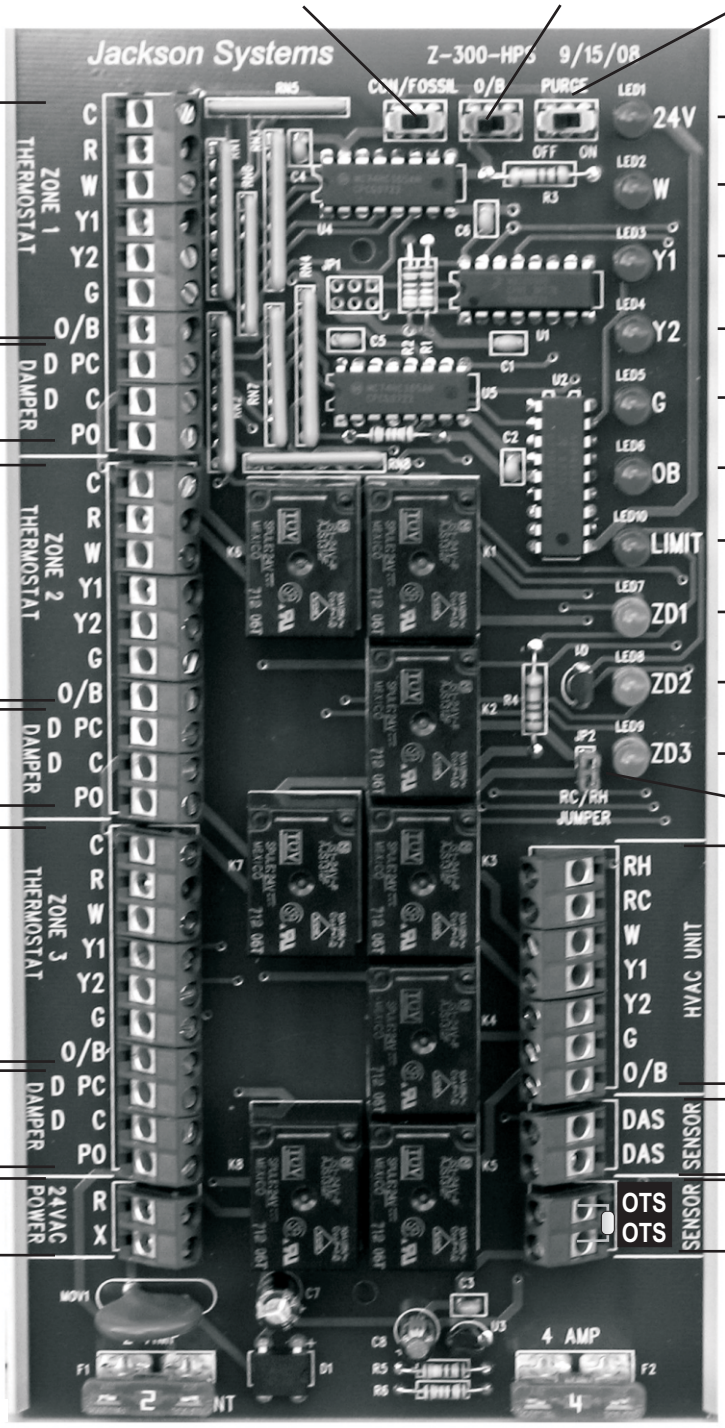

CONVENTIONAL HEAT PUMP OR FOSSIL FUEL SWITCH

O/B REVERSING VALVE SWITCH

PURGE SWITCH
(When set to ON, fan will continue to run and air will be purged to last zone calling for 1 minute after call is satisfied)

24 VOLT POWER LED

AUXILIARY HEAT LED

FIRST STAGE COMPRESSOR LED

SECOND STAGE COMPRESSOR LED

FAN LED

REVERSING VALVE LED

HIGH / LOW LIMIT LED

ZONE 1 DAMPER LED

ZONE 2 DAMPER LED

ZONE 3 DAMPER LED

RH/RC JUMPER

ZONE 1 THERMOSTAT

ZONE 1 DAMPER

ZONE 2 THERMOSTAT

ZONE 2 DAMPER

ZONE 3 THERMOSTAT

ZONE 3 DAMPER

24 VOLTS

HVAC UNIT TERMINALS

DISCHARGE AIR SENSOR

OUTDOOR SENSOR (USED FOR FOSSIL FUEL APPLICATIONS) IF NOT USED, LEAVE FACTORY JUMPER IN

2 Amp fuse protects the relay contacts

4 Amp fuse protects printed circuit board

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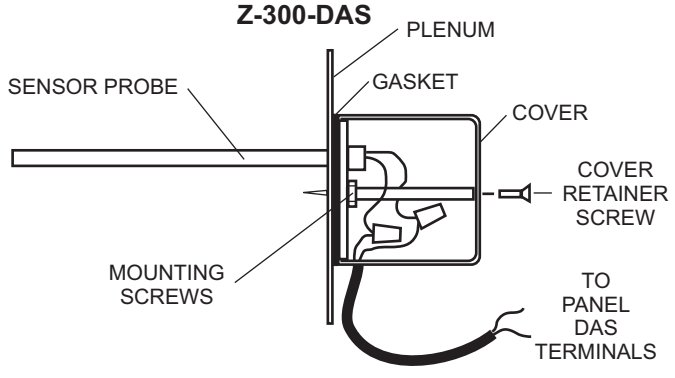
Installation

Mounting the Panel:
Carefully remove the Z-300 panel and cover from the shipping carton. Slide the PC board out of the snap track base and mount the base to a flat surface either on or near the HVAC indoor unit in an area that will facilitate easy access for wiring. Reinstall the PC board by carefully centering it over the base and snapping it back into the track groves.

Wiring the Zone Thermostats and Dampers:
Refer to the logic panel wiring diagram. Wire zone 1 thermostat and its associated damper to the ZONE 1 terminals on the logic panel. Wire zone 2 and 3 thermostats and dampers in the same manner.

Wiring the HVAC Equipment:
Wire the HVAC unit to the Z-300-HPS HVAC UNIT terminals. Note: Do not wire the equipment common to the Z-300-HPS panel.

Installing and Wiring the Z-300-DAS Discharge Air Sensor:
Drill a ½"hole in the middle of the main discharge air plenum approximately 18" downstream from the heat pump electric stip heaters or furnace heat exchanger. Remove the Z-300-DAS cover. Slide the probe into the hole and use two self-tapping sheet metal screws to secure the base making sure that the gasket is in place. Use 18-2 thermostat wire and wire nuts to attach the sensor leads. Replace the cover and wire the sensor to the DAS terminals on the Z-300 panel.



Wiring the Transformer:
Wire a separate 24 Volt transformer of the proper VA to the logic panel terminals marked (R) and (X). Do not power the panel up until wiring is completed.

Test, Check and Startup:

1. Verify that all component wires have been connected to the proper terminals and are secure.
2. Disconnect the HVAC equipment (R) terminal wire at the panel and apply 24 volts to panel.
3. Take a jumper wire and momentarily short the DAS terminals. This will put the panel's time delays in "speed up" mode.
4. Place the zone thermostats in the OFF position.
5. Place zone 1 thermostat in the heating mode and have the thermostat call for heat. Confirm that (ZD1) LED is ON and that (W) LED is ON. Confirm that zone 1 damper is open and zone 2 and 3 dampers are closed. There will be no voltage across zone 1 (D) and (D) terminals and 24 volts on zone 2 and 3 (D) and (D) terminals.
6. Put zone 1 thermostat in the cooling mode and have the thermostat call for cooling. Confirm that (ZD1) LED is ON and that the (Y) and (G) LEDs are ON. If the thermostat has internal time delays, the cooling call may not activate immediately.
7. Turn zone 1 thermostat off and repeat steps 5 and 6 with zone 2 and 3 thermostat. Remember, the zone calling will have its damper open and there will be no voltage on the (D) and (D) terminals for that zone.
8. Determine the ventilation mode of each zone thermostat by setting the thermostats in the Fan AUTO or ON mode.
9. Remove 24 Volts to the panel and reconnect the HVAC (R) wire.
10. When 24 Volts is again applied to the panel, the internal time delays will be activated.
11. Confirm that the LIMIT LED is ON. If not, check LIMIT wiring. If the system goes out on high or low limit, the LIMIT LED will blink.

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Fossil Fuel Applications:

Fossil fuel may be used as the auxiliary heat source with the Z-300-HPS allowing for up to 2 stages of cooling and 3 stages of heating. For systems having a 2 stage furnace, W1 and W2 are jumpered at the furnace. This method utilizes the internal furnace upstage timer to bring on second stage fossil fuel.

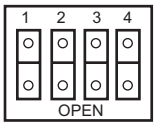
Sequence of Operation:

2 Heat / 1 Cool
When a zone thermostat calls for heating and the outdoor temperature is above the balance point as established by the Z-300-OTS, the heat pump operates as first stage heat. If there is a call for second stage heat (auxiliary), or if any thermostat is placed in the emergency heat mode, the panel will automatically de-energize the heat pump and bring on the furnace. When the outdoor temperature falls below the balance point, the heat pump will be locked out and the furnace will become first stage.

3 Heat / 2 Cool
When a zone thermostat calls for heating and the outdoor temperature is above the balance point as established by the Z-300-OTS, both compressor stages of the heat pump will operate as normal. If there is a call for third stage heat (auxiliary), or if any thermostat is placed in the emergency heat mode, the panel will automatically de-energize all heat pump stages and bring on the furnace. When the outdoor temperature falls below the balance point, the heat pump will be locked out and the furnace will become first stage.

Installing and wiring the Z-300-OTS
The Z-300-OTS is an adjustable electronic sensor used for both selecting the outdoor balance point and measuring the outdoor temperature. This information determines when the heat pump will be locked out and only the furnace will be used for heating.

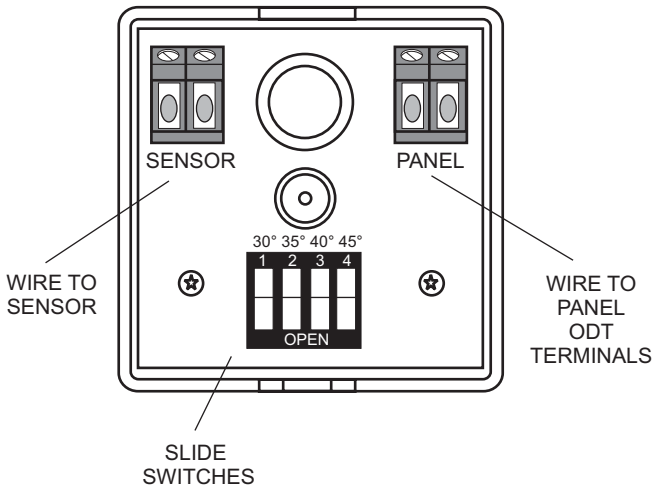
Before installing the Z-300-OTS, remove the retaining cover and select the outdoor balance point temperature using the slide switches.

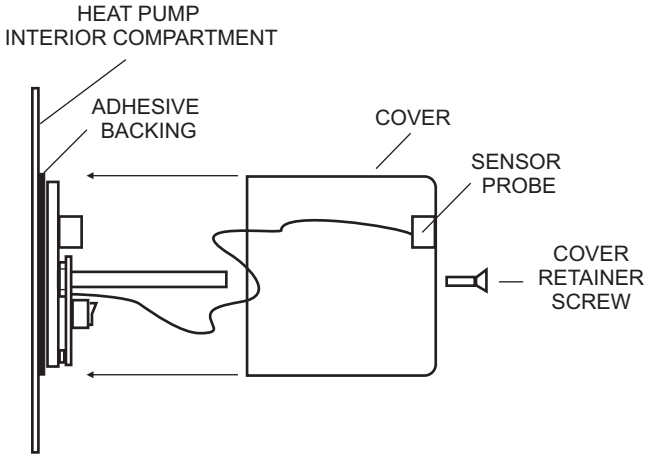


SETPOINT	SWITCH SETTING
30° F	1 Closed - 2,3,4 Open
35° F (Default)	2 Closed - 1,3,4 Open
40° F	3 Closed - 1,2,4 Open
45° F	4 Closed - 1,2 3 Open

Mount the Z-300-OTS on a vertical surface inside the heat pump cabinet to avoid direct sunlight, freezing rain or snow.

Z-300-OTS





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Specifications

Panel Dimensions:
Height: 8.0 Inches
Width: 6.0 Inches
Depth: 1.375 Inches

Mounting:
Snap Track with 2 back plate screws

Operating Temperature Rating:
-40° F to 150° F

Operating Humidity:
5% to 90% RH non-condensing

Wiring:
18-gauge wire for all equipment and system connections

Time Delays:
3 minutes minimum off between heating and cooling calls
3 minutes minimum off on high and low limit
20 minute time share
Purge ON = 1 minute

Thermostats:
Single or multi-stage heat pump
Programmable or non-programmable
Auto or manual changeover

Terminal Designations

Thermostats:

C	24Vac (Common)
R	24Vac (Hot)
W	Auxiliary Heat
Y1	First Stage Compressor
Y2	Second Stage Compressor
G	Fan

Dampers:

D PC	Powered Closed
D C	Common
PO	Powered Open

High / Low Limit

DAS	Discharge Air Sensor (2 wire)

Outdoor Thermostat

OTS	Used for Fossil Fuel (2 wire)

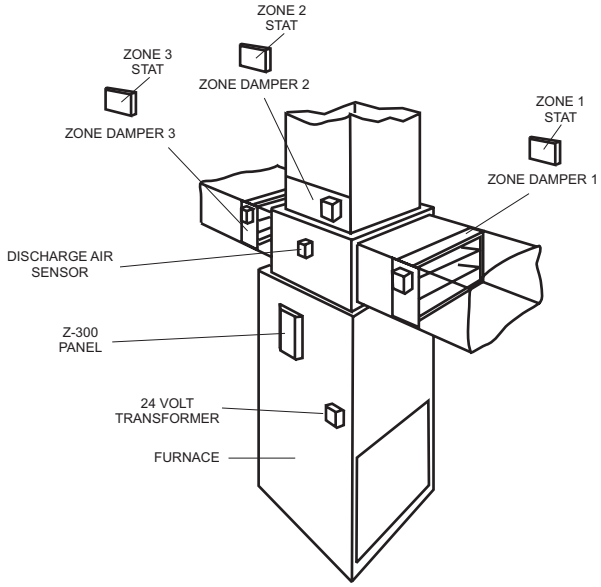
HVAC Equipment:

RH	24Vac Heating Transformer
RC	24Vac Cooling Transformer
W	Auxiliary Heat
Y1	First Stage Compressor
Y2	Second Stage Compressor
G	Fan
O/B	Reversing Valve

Panel Power:

R	24Vac (Hot)
X	24Vac (Common)

Typical System Layout



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