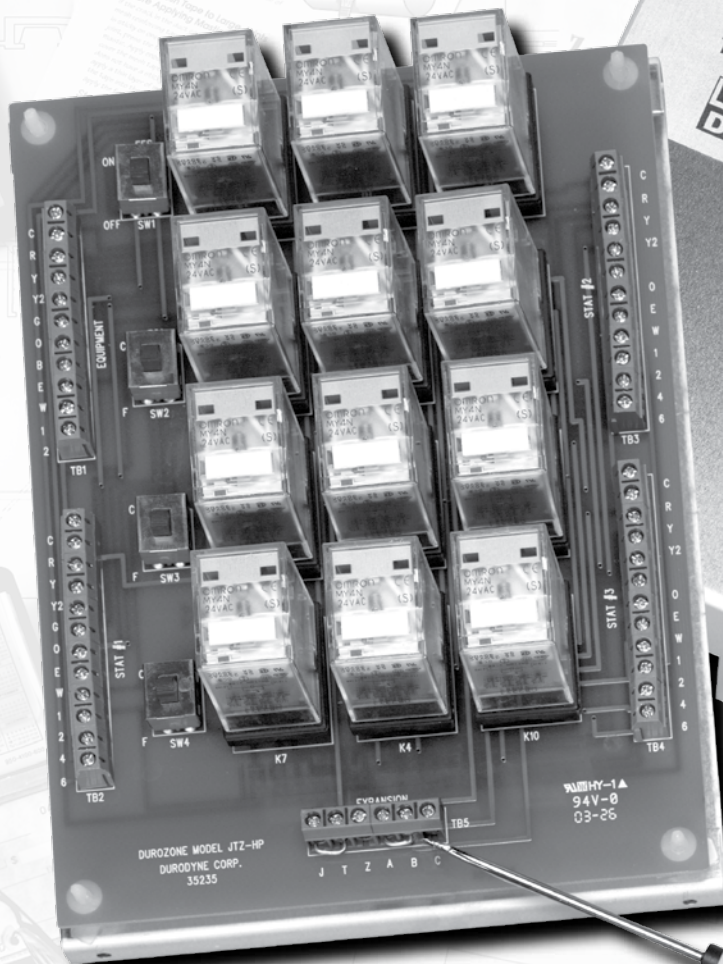


DuroZone

MODEL JTZ-HP ZONE CONTROL SYSTEM



DuroZone
MODEL JTZ-HP
ZONE CONTROL SYSTEM FOR HEAT PUMPS
PART NO. 35235
DURODYNE CORPORATION
81 SPENCE STREET
BAY SHORE, NY 11706

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PART# 35235

**HEALTHY
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A DESIGN & CONSTRUCTION GUIDE

The book every
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JOHN BOWER
INTERNATIONALLY RECOGNIZED HEALTHY HOUSING EXPERT

THE JTZ-HP INTRODUCTION

Congratulations on purchasing a DuroZone JTZ-HP control system. The JTZ-HP together with DuroZone Multiline Dampers will provide year-round comfort for your customer.

The JTZ-HP was designed to use standard heat pump thermostats on every zone. Zone # 1 thermostat determines what mode ("COOL" or "HEAT") the zone panel is in. All other zones will function only when their thermostats are in the same mode as the zone # 1 thermostat.

This panel has a built in fossil fuel function option available. The JTZ-HP panel is also expandable to control more than 3 zones.

JTZ-HP INSTALLATION INSTRUCTIONS

The following are simple step-by-step installation instructions. For your convenience, your JTZ-HP system is shipped with the panel detached from the mounting box. Do not attach the panel to the box before mounting the box to the desired surface or the mounting holes will be inaccessible.

1. Mount the box to any flat surface.
2. Mount the panel to the box with the nylon standoffs provided.
3. Strip the wires and attach them to the respective terminals.
4. Check the operation of all zones.
5. Snap the cover onto the box.

EQUIPMENT

The upper left terminal strip (TB1) is for wiring the equipment to the JTZ-HP panel.

From top to bottom:

Terminal "C" wires to the "C" or "COMMON" side of the Equipment Transformer.

Terminal "R" wires to the "R" or HOT" side of the Equipment Transformer.

Terminal "Y" wires to the Heat Pump Control Terminal "Y" or "Y1".

Terminal "Y2" wires to the Heat Pump Control Terminal "Y2". (Optional, only used on two stage heat pump units.)

Terminal "G" wires to the Heat Pump Fan Control Terminal "G".

Terminal "O" wires to the Heat Pump Reversing Valve Control Terminal "O" if the valve is energized in cool mode.

Terminal "B" wires to the Heat Pump Reversing Valve Control Terminal "B" if the valve is energized in heat mode.

Terminal "E" wires to the Emergency Heat Control Terminal "E". (This is optional. Use it only if required.)

Terminal "W" wires to the Auxiliary Heat Control Terminal "W" or "W2" (electric element or fossil fuel).

Terminals "1" and "2" wire to a Separate 24-volt Transformer to power the DuroZone dampers. The polarity does not matter. DuroZone's PT-40 24 volt 40va transformer, (part#35054) is recommended.

ZONE THERMOSTATS AND DAMPERS

The terminal strip below the equipment strip (TB2) is for wiring the Zone #1 Thermostat and Damper(s). The upper (TB3) and lower right (TB4) terminal strips are for the Thermostats and Dampers of zones #2 and #3.

Terminal "C" wires to the "C" on the Thermostat.

Terminal "R" wires to the "R" on the Thermostat.

Terminal "Y" wires to the "Y" on the Thermostat.

Terminal "Y2" wires to the "Y2" on the Thermostat. (This is optional and is only used on two stage Heat Pump units.)

Terminal "G" wires to the "G" on the Thermostat. (Zone #1 Thermostat only)

Terminal "O" wires to the "O" on the Thermostat. .

Terminal "E" wires to the "E" on the Thermostat.

Terminal "W" wires to the "W", "W1", or "W2" on the Thermostat. (Any terminal designated for Auxiliary Heat should wire to "W" on the JTZ-HP)

Terminal "1" wires to terminal "1" on the DuroZone Damper. (24vac, common)

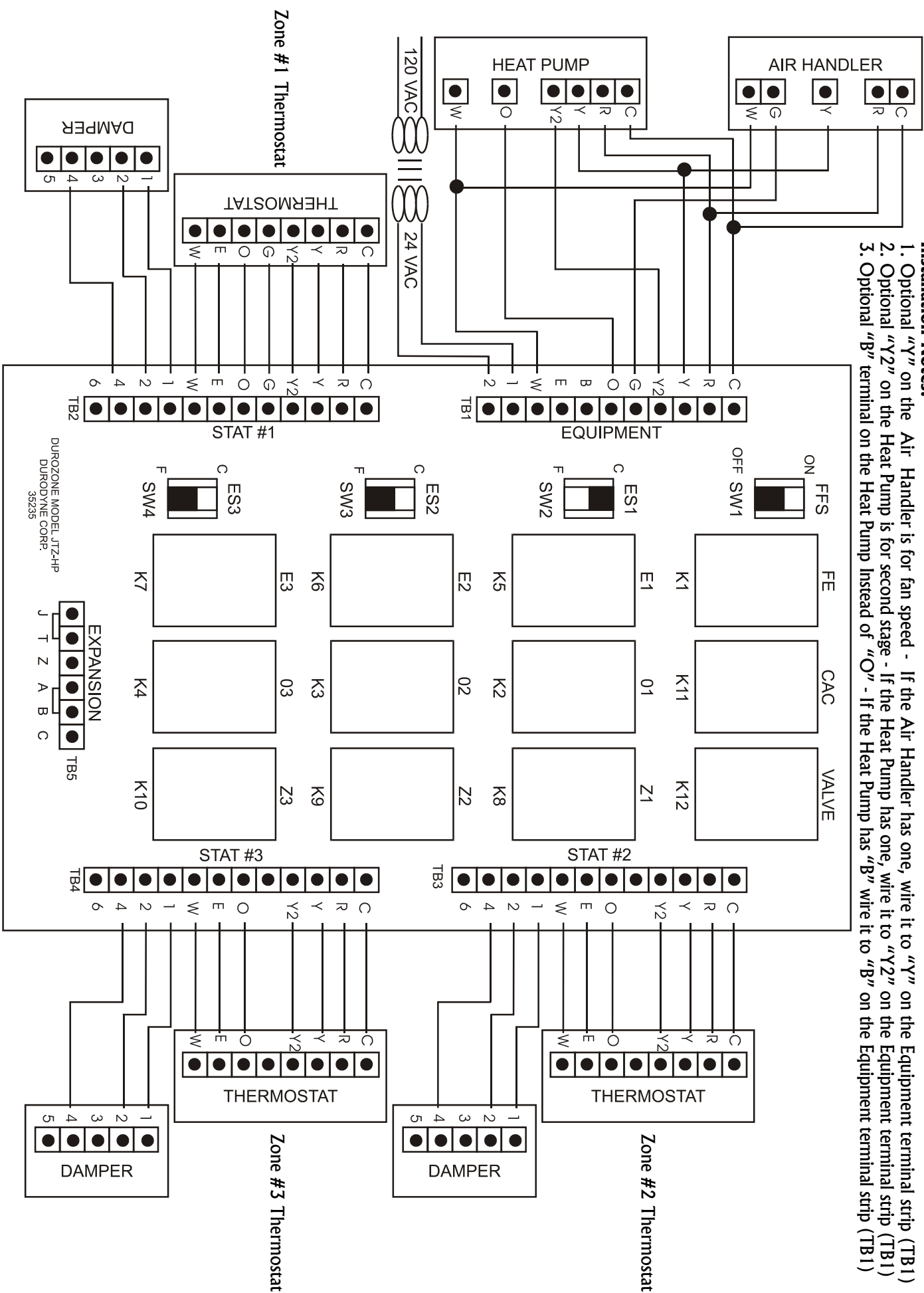
Terminal "2" wires to terminal "2" on the DuroZone Damper. (24vac, hot)

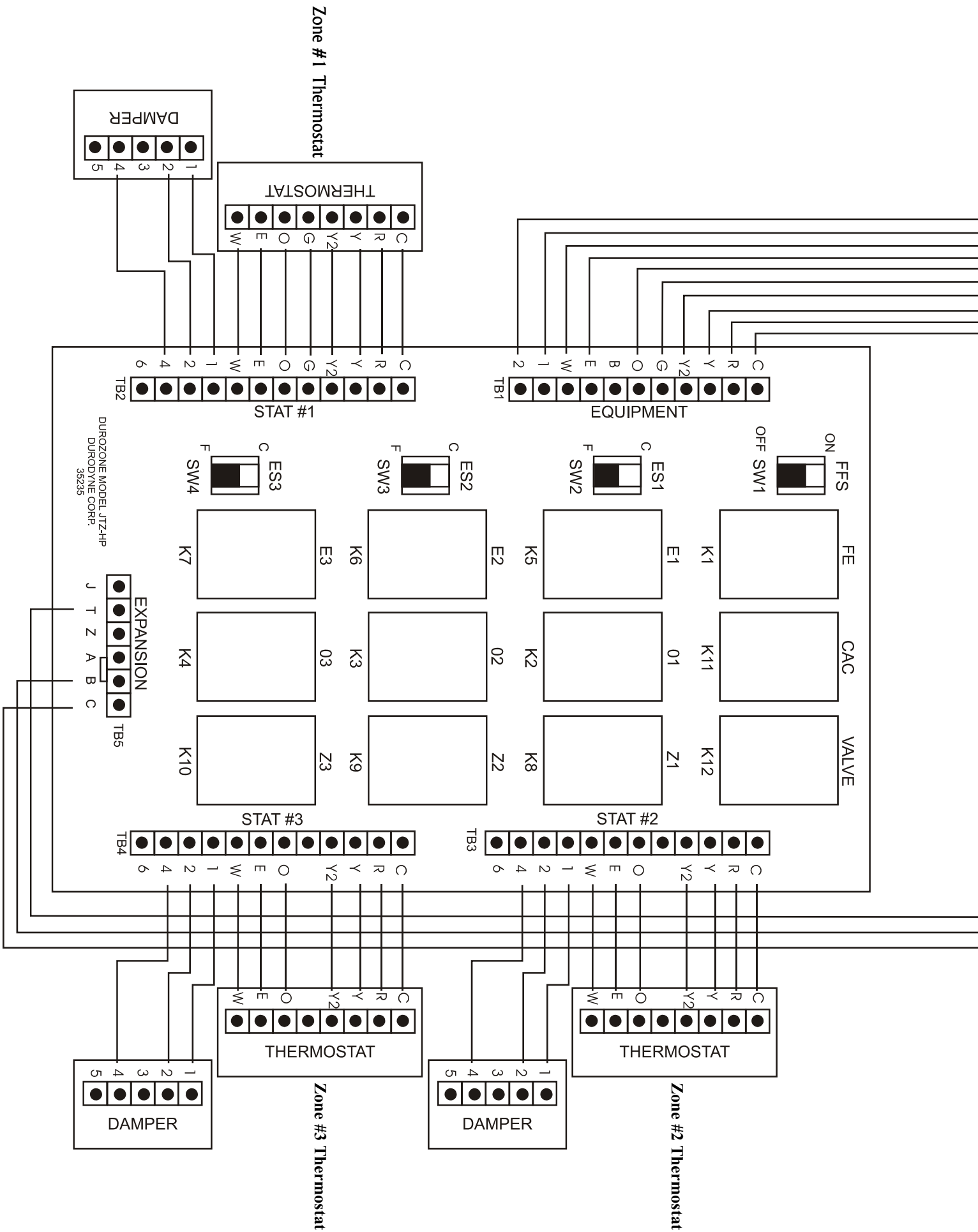
Terminal "4" wires to terminal "4" on the DuroZone Damper. (24vac, controlling - This terminal is hot on a signal to open.)

Terminal "6" is for special situations and should only be used under the direction of the DuroZone Technical Support Dept.. (24vac, controlling - This terminal is hot on a signal to close.)

Installation Notes:

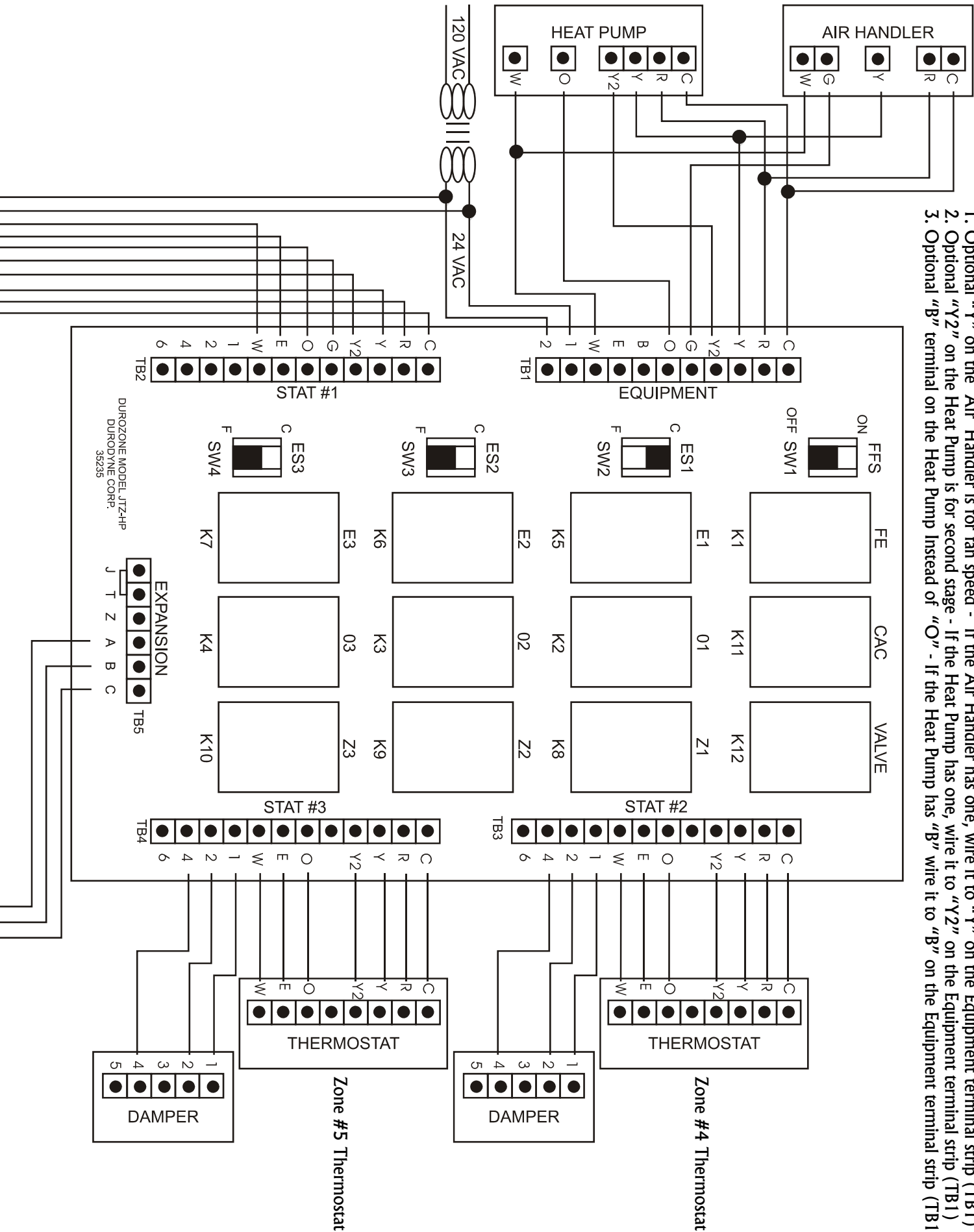
1. Optional "Y" on the Air Handler is for fan speed - If the Air Handler has one, wire it to "Y" on the Equipment terminal strip (TB1)
2. Optional "Y2" on the Heat Pump is for second stage - If the Heat Pump has one, wire it to "Y2" on the Equipment terminal strip (TB1)
3. Optional "B" terminal on the Heat Pump instead of "O" - If the Heat Pump has "B" wire it to "B" on the Equipment terminal strip (TB1)





Installation Notes:

1. Optional "Y" on the Air Handler is for fan speed - If the Air Handler has one, wire it to "Y" on the Equipment terminal strip (TB1)
2. Optional "Y2" on the Heat Pump is for second stage - If the Heat Pump has one, wire it to "Y2" on the Equipment terminal strip (TB1)
3. Optional "B" terminal on the Heat Pump instead of "O" - If the Heat Pump has "B" wire it to "B" on the Equipment terminal strip (TB1)



EXPANSION

The terminal strip (TB5) is located at the bottom center of the JTZ-HP panel.

For single panel applications jumpers must be in place between "J" to "T" and "A" to "B".

Terminal "Z" and "C" are not used.

For expanded panel applications follow the wiring diagram supplied.

Note: when expanded you will need to increase the power output of the damper transformer.

JTZ-HP SYSTEM SWITCHES

FFS (FOSSIL FUEL SWITCHES)

Put the FFS in the "ON" position if the equipment has a Fossil Fuel Auxiliary Heat System. When the FFS is in the "ON" position, a "W" call from any of the thermostats will turn off the Heat Pump and activate the Fossil Fuel Equipment. The Fossil Fuel Equipment will continue to operate through all stages of heat until all the heat calls are satisfied. The Fossil Fuel Equipment will then shut down until the next "W" call.

Put the FFS in the "OFF" position if the system has Electric Strip Auxiliary Heating.

When the FFS is in the "OFF" position a "W" call from any of thermostat will activate the Auxiliary Heat along with the Heat Pump.

ES1, 2 AND 3 SWITCHES (EMERGENCY HEAT MODE OPERATION)

The ES Switches must be set according to how the Emergency Heat Mode operates at the thermostat.

Set the ES Switch to position "F" if when the thermostat is in the Emergency Heat Mode it energizes the "E" terminal only on the first stage call for heat.

Set the ES Switch to position "C" if when the thermostat is in Emergency Heat Mode it energizes the "E" terminal constantly.

The majority of thermostat manufacturers design their heat pump thermostats to energize the "E" terminal on the first stage call for heat. (ES Switch in position "F").

If you are unsure how to configure the ES Switches, install and wire the thermostats and the JTZ-HP panel as per the instructions. Power up the JTZ-HP panel, put the thermostats in the Emergency Heat Mode and set the temperature on the thermostats so they are below room temperature. (Thermostats are not calling for heat). If any of the relays marked E1 (K5), E2 (K6), or E3 (K7) are energized (the L.E.D. indicator is on), put the corresponding ES Switch to position "C". If any of the relays marked E1 (K5), E2 (K6), or E3 (K7) are not energized put the corresponding ES Switch to position "F". Now, to verify that position "F" is correct, set the temperature on the thermostats so they are above room temperature and calling for heat. The relays marked E1 (K5), E2 (K6) and E3 (K7) should now be energized.

JTZ-HP SYSTEM CHECKOUT PROCEDURE

THE CHECKOUT PROCEDURE, WHICH FOLLOWS, IS FOR A 2 OR 3 ZONE SYSTEM. FOR EXPANSION SYSTEMS (MORE THAN 3 ZONES), CONTACT DUROZONE TECHNICAL SUPPORT FOR ASSISTANCE.

Important Note: All damper(s) will remain open when all zones are satisfied.

The following checkout procedure requires a voltmeter set to read 24 volts AC. The following test procedures must be performed in the sequence shown. Do not skip any of the steps.

1. There must be 24 volts present at terminals "R" & "C" of the JTZ-HP Panel Equipment Terminal Strip (TB1). (The HVAC equipment supplies this power and feeds the equipment and the JTZ-HP panel)

2. There must be 24 volts present at terminals "1" & "2" of the JTZ-HP Panel Equipment Terminal Strip (TB1). (An independent transformer supplies this power, which feeds the dampers.)

3. DuroZone Damper Test Procedure

A. Place all the thermostats in the "OFF" position. None of the relays on the panel should be energized. (No LED indicators are on.) All the Dampers should now be in the open position. One zone at a time, remove the #4 wire from the Zone Panel or that Zone Damper(s) and confirm that the Damper(s) in that zone have closed. Return the #4 wire and confirm that the Damper(s) in that zone have returned to the open position. (DuroZone Multi Blade dampers can be 180 degrees

out of phase. This would reverse the test results. To correct this, remove the motor assembly and move the damper linkage 180 degrees. Re-install the motor assembly.) If this procedure is not correct, test for 24 volts at terminals "1" & "2" at the Damper. (Constant non-controlling 24 volts ac) Then test for 24 volts at Damper terminals "1" & "4". (Controlling 24 volts on a call open) Voltage readings at the Panel Terminals "1", "2" and "4" should match readings on corresponding Damper Terminals. If the voltages are not present at the damper but are on the panel, a break in the wiring is indicated. If the test voltages are not present at the panel call DuroZone Technical Support.

4. Cool Mode Test Procedure.

- A.** Leave the Thermostats for Zones #2 and #3 in the "OFF" position. Put the Zone #1 Thermostat into the "COOL" mode, Fan in "AUTO" and adjust the temperature setting above room temperature (not calling for cooling). This should energize (LED indicators on) relays O1 (K2) and Valve (K12). If this is correct, proceed to step B. If relays O1 (K2) and Valve (K12) do not energize, test for 24 volts at "C" & "O" on the Zone #1 Terminal Strip (TB2). If there is no voltage reading, check the wiring and the thermostat for proper operation. If the voltage is present call DuroZone Technical Support.
- B.** Set the temperature on the Zone #1 Thermostat below the room temperature (calling for cooling). Relays O1 (K2), Valve (K12), Z1 (K8) and CAC (K11) should be energized and the Heat Pump Cooling should activate. (Some thermostats may have a time delay for short cycle protection) The Zone #1 Damper(s) should stay open and the Dampers for Zones #2 and #3 should close. Relays Z1 (K8) and CAC (K11) should both be energized. If either or both are not energized, test for 24 volts on the Zone #1 Terminal Strip (TB2) at "C" & "Y" for the Z1 (K8) Relay and "C" & "G" for the CAC (K11) Relay.
If there are no voltages present, check the Wiring and the Thermostat for proper operation. If 24 volts ac is present call DuroZone Technical Support.
If relays O1 (K2), Z1 (K8), Valve (K12) and CAC (K11) are energized and the Heat Pump Cooling does not activate, test for 24 volts at "C" & "Y", "C" & "G" and "C" & "O" on the Equipment Terminal Strip (TB1). If 24 volts is present, check the Wiring and the Heat Pump for proper operation. If no voltage is present at any one of these terminals call DuroZone Technical Support.
(Note: The Zone #1 Thermostat is the mode ("HEAT" or "COOL") selector. Zone #2 and Zone #3 will only function in the same system mode as Zone #1.)
- C.** The Zone #1 Thermostat should be in the "COOL" mode, and not calling for cooling. Put the Zone #2 Thermostat in the "COOL" mode and not calling for cooling. Relays O1 (K2), Valve (K12) and O2 (K3) should be energized. If all the relays are energized proceed to step D. If Relay O2 (K3) is not energized test for 24 volts ac at "C" & "O" of the Zone #2 Terminal Strip (TB3). If 24 volts is not present, check the Wiring and the Zone #2 Thermostat for proper operation. If the voltage is present and Relay O2 (K3) is not energized, call DuroZone Technical Support.
- D.** The Zone #1 Thermostat should be in the "COOL" mode, and not calling for cooling. Set only Zone #2 Thermostat to call for cooling. Relays O1 (K2), O2 (K3), Valve (K12) and Z2 (K9) should be energized and the Heat Pump Cooling should activate. The Zone #2 Damper(s) should open and the Dampers for Zones #1 and #3 should close. If the Relays, Dampers and Heat Pump operate correctly, proceed to step E. If Relay Z2 (K9) is not energized, test for 24 volts at "C" & "Y" of the Zone #2 Terminal Strip (TB3). If the voltage is not present check the Wiring and the Zone #2 Thermostat for proper operation. If the voltage is present and Relay Z2 (K9) is not energized, call DuroZone Technical Support.
- E.** The Zone #1 Thermostat should be in the "COOL" mode and not calling for cooling. Turn the Zone #2 Thermostat "OFF" and set the Zone #3 Thermostat to the "COOL" mode, but not calling for cooling. The relays O1 (K2), Valve (K12) and O3 (K4) should be energized. If the relays are energized, proceed to step F. If relay O3 (K4) is not energized, test for 24 volts at "C" & "O" of the Zone #3 Terminal Strip (TB4). If the voltage is not present, check the Wiring and the Zone #3 Thermostat for proper operation. If the voltage is present and Relay O3 (K4) is not energized, call DuroZone Technical Support.
- F.** The Zone #1 Thermostat should be in the "COOL" mode, and not calling for cooling. Set only the Zone #3 Thermostat to call for cooling. Relays O1 (K2), O3 (K4), Valve (K12) and Z3 (K10) should be energized and the Heat Pump Cooling should activate. The Zone #3 Damper(s) should open and the Dampers for Zone #1 and Zone #2 should close. If the Relays, Dampers and Heat Pump operate correctly, proceed to the "Heat Mode Test Procedure". If relay Z3 is not energized, test for 24 volts at "C" & "Y" of the Zone #3 Terminal Strip (TB4).
If the voltage is not present, check the Wiring and the Zone #3 Thermostat for proper operation. If the voltage is present and Relay Z3 (K10) is not energized, call DuroZone Technical Support.

5. Heat Mode Test Procedure

- A.** Put the Thermostats for Zone #2 and Zone #3 in the "OFF" position, set the Zone #1 Thermostat in the "HEAT" mode, Fan in "AUTO" and adjust the temperature setting below room temperature (not calling for heat). None of the Relays should be energized. Adjust the temperature setting above room temperature on the Zone #1 Thermostat (call for heat). Relays Z1 (K8) and CAC (K11) should be energized and the heat pump should activate. The zone #1 damper(s) should open and the dampers for zone #2 and zone #3 should close. If the relays and the heat pump operate correctly, proceed to step B. If Relays Z1 (K8) and CAC (K11) are not energized, test for 24 volts at "C" & "Y" for relay Z1 (K8) and "C" & "G" for relay CAC (K11) on zone #1 terminal strip (TB2). If the voltage is not present, check the wiring and the thermostat for proper operation. If the voltage is present, call DuroZone Technical Support. If relays Z1 (K8) and CAC (K11) are energized and the heat pump does not activate, test for 24 volts at "C" & "Y" and "C" & "G" on the equipment terminal strip (TB1). If the voltage is present, check the wiring and the heat pump for proper operation. If no voltage is present, call DuroZone Technical Support.
- B.** Put the zone #1 thermostat in emergency "HEAT" mode. This should energize relays E1 (K5) and FE (K1). Relay CAC (K11) will be de-energized. The Heat Pump should disengage and the Auxiliary Heat should be on. If the Relays, Heat Pump and Auxiliary Heat operate correctly, proceed to step C. If Relay E1 (K5) is not energized, check for 24 volts at "C" & "E" on the Zone #1 Terminal Strip. If the voltage is not present, check the Wiring and the Zone #1 Thermostat for proper operation. If the voltage is present, call DuroZone Technical Support. If relay E1 (K5) is energized and the heat pump does not disengage, or the auxiliary heat does not activate, call DuroZone Technical Support.
- C.** Place the Zone #1 Thermostat in the "HEAT" mode and not calling for heat. Put the Zone #2 Thermostat in the "HEAT" mode and calling for heat. Relay Z2 (K9) should be energized and the Heat Pump should activate. The Damper(s) on Zone #2 should open and the Damper(s) in Zone #1 and Zone #3 should close. If Relay Z2 (K9), the Heat Pump and the Damper(s) operate correctly, proceed to step D. If Relay Z2 (K9) is not energized, test for 24 volts at "C" & "Y" on the Zone #2 Terminal Strip. If the voltage is not present, check the Wiring and the Zone #2 Thermostat for proper operation. If the voltage is present, call DuroZone Technical Support.
- D.** Set the Zone #2 Thermostat in the "EMERGENCY HEAT" mode. This should energize relay E2 (K6) and relay FE (K1). The Heat Pump should disengage and the Auxiliary Heat should activate. If the Relays, Heat Pump and Emergency Heat operate correctly, proceed to step E. If Relay E2 (K6) is not energized, check for 24 volts at "C" & "E" on the Zone #2 Terminal Strip. If the voltage is not present, check the Wiring and the Zone #2 Thermostat for proper operation. If the voltage is present, call DuroZone Technical Support. If relay E2 (K6) is energized and the Heat Pump does not disengage, or the Auxiliary Heat does not come on, call DuroZone Technical Support.
- E.** Leave the Zone #1 Thermostat in the "HEAT" mode and not calling for heat. Put the Zone #2 Thermostat in the "OFF" mode and put the Zone #3 Thermostat in the "HEAT" mode. Set the Zone #3 Thermostat to call for heat. Relay Z3 (K10) should be energized and the Heat Pump should activate. The Damper(s) on Zone #3 should open and the Dampers in Zone #1 and Zone #2 should close. If the Relay and Heat Pump operate correctly, proceed to step F. If relay Z3 (K10) is not energized, test for 24 volts at "C" & "Y" on the Zone #3 Terminal Strip. If the voltage is not present, check the Wiring and the Zone #3 Thermostat for proper operation. If the voltage is present, call DuroZone Technical Support.
- F.** Set the Zone #3 Thermostat in "EMERGENCY HEAT" mode. This should energize Relay E3 (K7) and Relay FE (K1). The Heat Pump should disengage and the Auxiliary Heat should be on. If the Relays, Heat Pump and Emergency Heat operate correctly, , check out is complete and the system should be operating properly. If Relay E3 (K7) is not energized, check for 24 volts at "C" & "E" on the Zone #3 Terminal Strip. If the voltage is not present, check the Wiring and the Zone #3 Thermostat for proper operation. If the voltage is present, call DuroZone Technical Support. If Relay E3 (K7) is energized and the Heat Pump does not disengage, or the Auxiliary Heat does not come on, call DuroZone Technical Support.

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