

IntelliZone2

Comfort Zoning System

Six Zone Capability

Installation Information

Damper Installation

Thermostat Installation

Electrical

Startup Procedures

Wiring Schematic



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IntelliZone2 Components



IntelliZone2 Relay Board (Firmware Version 2.01 or Later)

The IntelliZone2 relay board provides basic relay logic for the damper operation and serves as a common connection point for all IntelliZone2 thermostats and the heat pump.



IntelliZone2 MasterStat

The IntelliZone2 MasterStat is the master control for the system and has all of the programming for operation. It is a 4.3 in. communicating color touch screen device that also functions as a zone thermostat for Zone 1. Optional remote sensor capability is also available.



IntelliZone2 ZoneStat (Optional)

The IntelliZone2 ZoneStat is a zone thermostat option for any of Zones 2 through 6. It has full setback capability and communicates to the IntelliZone2 system.



IntelliZone2 SensorStat (Optional)

The IntelliZone2 SensorStat is a zone thermostat option for any of Zones 2 through 6. It has full setback capability (through the MasterStat interface only) and communicates to the IntelliZone2 system.



IntelliZone2 Outdoor Sensor

The IntelliZone2 Outdoor Sensor measures the outdoor temperature and communicates to the IntelliZone2 system. This temperature is displayed on the MasterStat, and also used to balance response as well as auxiliary electric heat use. The Outdoor Sensor is included in every IntelliZone2 kit.



TPCC32U01 (Optional) (Firmware Version 3.01 or Later)

The TPCC32U01 is a 4.3in communicating color touch screen device that can be used as a zone thermostat for zones 2 through 6. It has full set back capability and communicates to the IntelliZone2 System.



SensorStat-Remote-Kit (Optional)

The SensorStat-Remote-Kit is an option for an invisible thermostat installation and communicates with the IntelliZone2 relay panel. The kit will include the SensorStat Remote, TSU03 (mud in sensor) and wire nuts. This kit will monitor the zone temperature in zones 2 through 6. All set point adjustments are made at the MasterStat.

General Installation Information

Safety Considerations

Installing and servicing heating and air conditioning equipment can be hazardous due to system electrical components. Only trained and qualified service personnel should install, repair or service heating and air conditioning equipment. When working on equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply. Follow all safety codes. Wear safety glasses and work gloves.



WARNING: Before performing service or maintenance operations on the system, turn off main power switches to the indoor unit. Turn off accessory heater power switch if applicable. Electrical shock could cause serious personal injury.

Delivery Information

When the equipment is received, all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. Examine the contents for shipping damage, removing them from the cartons if necessary. If any damage is noted, the carrier should make the proper notation on the delivery receipt, acknowledging the damage.

General rules to follow when installing a zone system:



CAUTION: When installing the IntelliZone2 in a structure with fossil fuel (oil, gas, propane) appliances, it is important that both supply and return dampers are used in each zone to avoid potential back-drafting of fossil-fueled appliances.

- Up to six zones on variable speed, up to four zones with dual capacity units (two with single-speed units).
- All dampers should be located as close to the main trunk as possible to limit the amount of pressurized trunk line and thus limit air leakage.
- No less than three branch runs in a zone to prevent a single branch obstruction (curtains or clothes etc.) from affecting unit airflow.
- Insulate and seal around rectangular dampers to prevent leakage.
- All dampers must be wired with 18-gauge wire.
NOTE: Crimp connections should never be used on solid conductor wire.
- Ensure that the transformer can handle the power requirements of the system.
- No more than three dampers per zone.
- Ductboard-mounted dampers should be supported within six inches of the damper due to the weight and stress on the ductboard.

Installation and Design Steps

The IntelliZone2 Comfort Zoning system is to be used only with heat pumps/air handlers equipped with Aurora AXB or AHB controls. If the heat pump/air handler does not have Aurora AXB or AHB controls you must use the IntelliZone2•24V Comfort Zoning system.

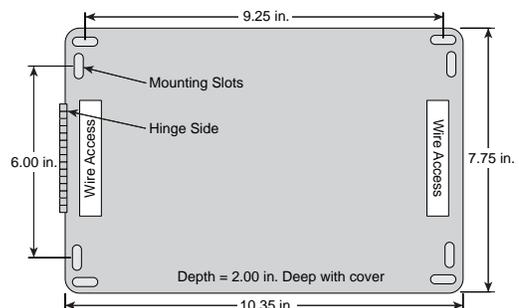
1. Decide which areas of a home or office will comprise each of the individual zones. A maximum of six individual zones (four with dual capacity and two with single-speed equipment) can be chosen.
2. Calculate loads using software or other recognized methodology.
3. Use software to determine the equipment size and performance based on the total heating and cooling demands of the building, not the sum of the individual zone demands.
4. Find the peak heating and cooling demands and the peak cfm required for each of the zones.
5. Determine zone design air flow and zone size settings using IntelliZone2 Design software.
6. Lay out and size the supply air ductwork and dampers. Care should be taken to avoid under sizing either the supply air systems, return air systems, or diffusers.
7. Decide where to locate the thermostats.
8. Install the unit and the IntelliZone2 Comfort Zoning system.

IntelliZone2 Control Panel

Locate the IntelliZone2 panel in an indoor area that has enough space for service personnel to perform maintenance or repair. Provide sufficient room to make electrical connection(s). The IntelliZone2 is not approved for outdoor installation and, therefore, must be installed inside the structure being conditioned. Do not locate the control panel in areas where ambient conditions are not maintained within 45°F to 95°F and are greater than 75% relative humidity. The IntelliZone2 control panel should be mounted on or as close to the unit as possible by using the sheet metal screws provided. See Figure 1 for mounting hole locations.

NOTE: IntelliZone2 Relay Panel to be mounted indoors.

Figure 1: IntelliZone2 Relay Panel Mounting



NOTE: Use longer screws (not provided) to penetrate through drywall into stud.

Damper Installation

Installing Rectangular Dampers in Metal Ductwork

1. Cut out dimensions A and B as shown in Figure 2 by using sheet metal snips. **NOTE:** Dimensions A and B are listed in the Dimensional Examples table.
2. Use foam insulation tape on the top and bottom of the zone damper to prevent excessive air bypass. Also check the cross emboss for excessive air bypass (see Figure 2).
3. Slide the zone damper into the ductwork making sure no obstructions will interfere with damper blade operation.
4. Use the screws provided to mount the damper flange to the ductwork. Four to six mounting holes are provided as shown in Figure 3.
5. Use drive cleats or regular duct mounting brackets to attach ductwork to joist within six inches on both sides of the damper (see Figure 3).
6. Check damper blade operation for obstructions by holding the manual release button and rotating the damper shaft CCW (Open) and CW (Closed) 3 Wire only as shown in Figure 4.

Dimensional Examples

Damper Model	H	W	A	B
ZDR1024	10 in.	24 in.	10 in.	3.75 in.
ZDR0812	8 in.	12 in.	8 in.	3.75 in.

Six Zone System Representational Layout

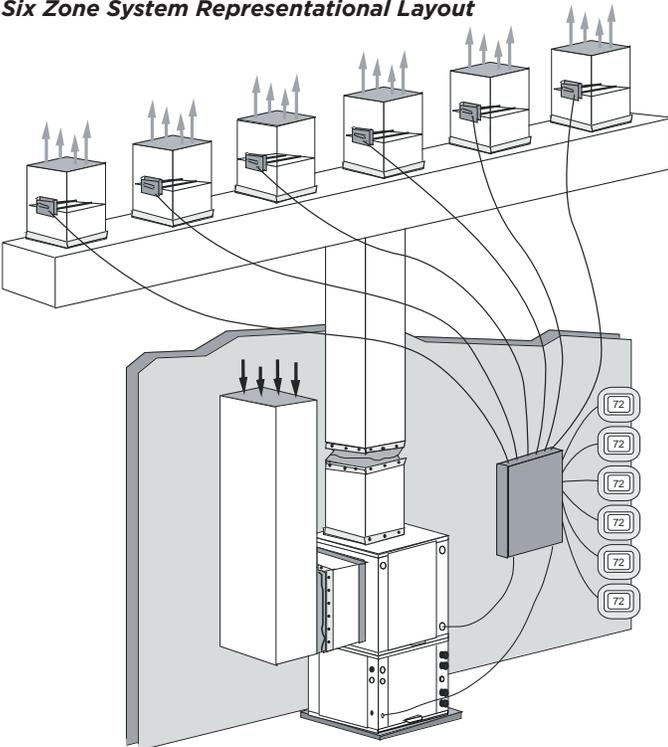


Figure 2: Foam Taping Zone Damper

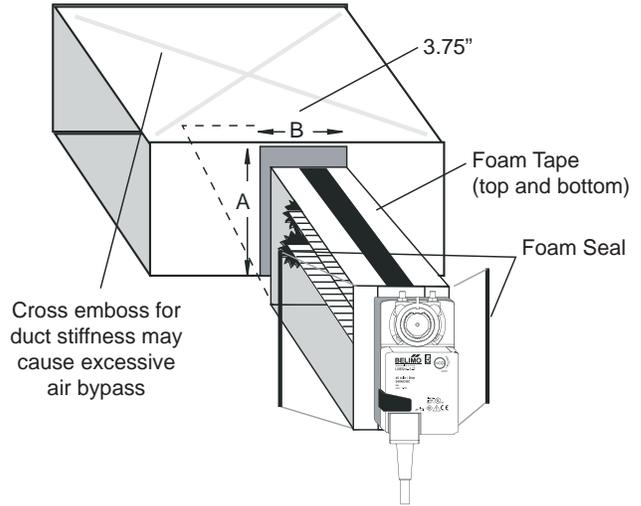


Figure 3: Mounting Damper

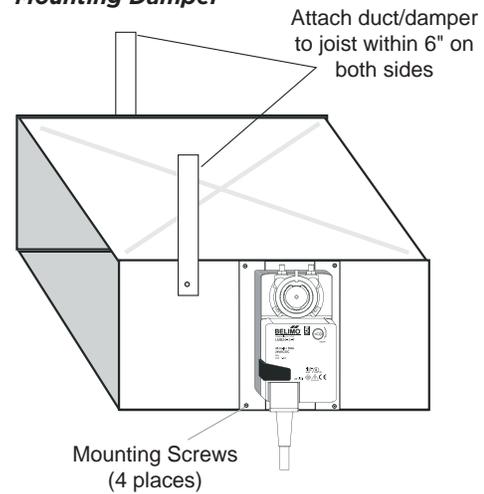
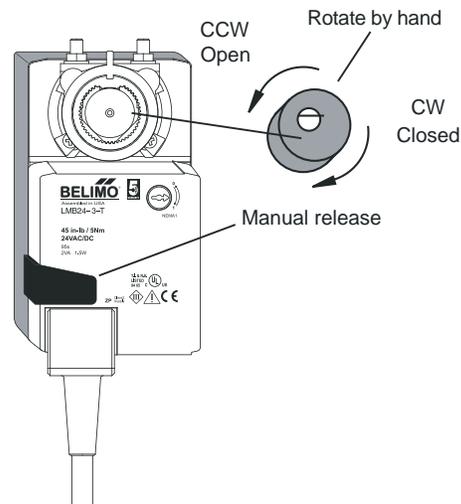


Figure 4: Checking Damper Blade for Obstructions



Damper Installation cont.

Insulating Rectangular Dampers in Metal Ductwork

Insulate ductwork as shown in Figure 5. All metal must be covered. Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Rectangular Dampers in Ductboard

1. Cut out dimensions A and B by using a ductboard knife. **NOTE:** Dimensions A and B are listed in the Dimensional Examples table.
2. A ductboard spacer should be installed on the end of the damper frame as shown in Figure 7 to prevent excessive air bypass. For example: A one-inch-thick, 8 in. x 20 in. ductboard and a 8 in. x 20 in. zone damper would have a one-inch gap at the end of the frame once it is installed without a ductboard spacer. Use the piece cut out for installation.
3. Foam insulation tape should be used on the top and bottom of the zone damper to prevent excessive air bypass as shown in Figure 7.
4. Slide the zone damper into the ductboard making sure no obstructions will interfere with damper blade operation.
5. Tape the damper face flange to the ductboard using foil tape making sure the damper is secure and air tight as shown in Figure 8.
6. Support the full length of the ductboard underside within six inches and on both sides of the damper as shown in Figure 8.
7. Check the damper blade operation for obstructions by holding the manual release button and rotating the damper shaft CCW and CW (see Figure 4).

Figure 5: Insulating Rectangular Metal Ductwork

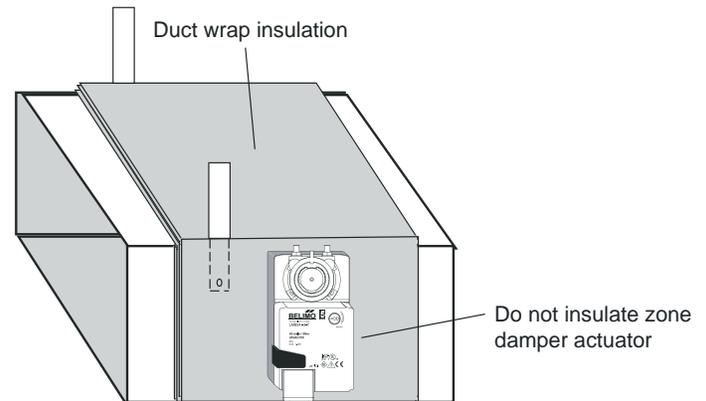


Figure 7: Taping Zone Damper with Foam Tape

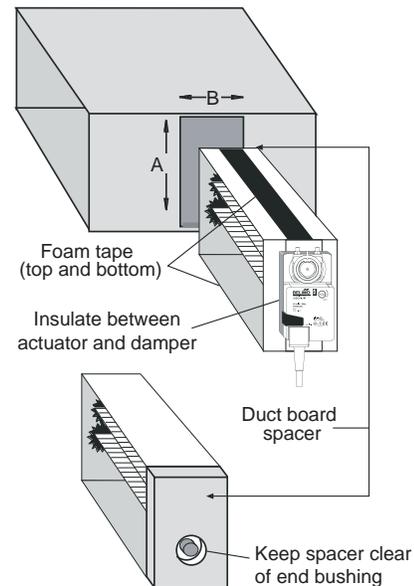
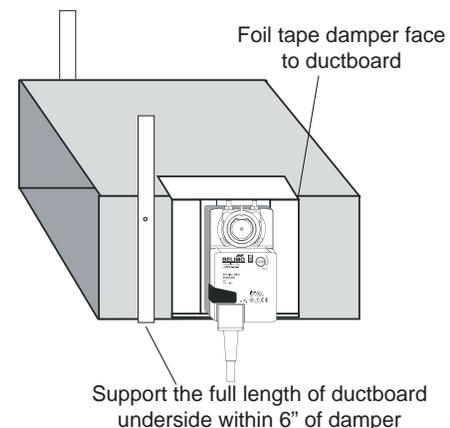


Figure 8: Taping Damper Flange to Ductboard



Damper Installation cont.

Insulating Rectangular Ductboard/ Metal Sleeve

Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Circular Dampers in Round Metal Duct

1. Crimp the end of the duct that is the supply air to damper. Insert into circular damper no more than 1.5 inches.
2. Fasten the duct to the damper with three screws. Screws installed more than one inch from either end may obstruct damper blade rotation.
3. Seal completely around the duct with metal duct tape or mastic to prevent air leakage as shown in Figure 10.
4. Check the damper blade operation for obstructions by holding the manual release button and rotating damper shaft CCW and CW (3 wire only). See Figure 4.
5. Support the duct to joist within six inches of the damper as shown in Figure 9.

Figure 9: Taping Round Duct to Circular Damper

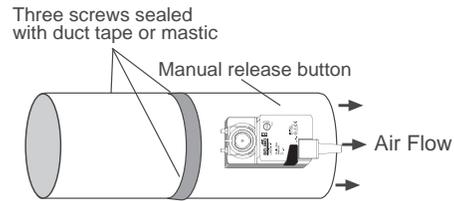
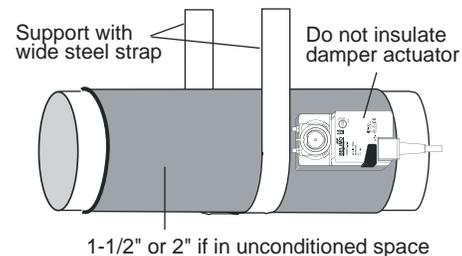


Figure 10: Supporting and Insulating Circular Damper



Insulating Circular Dampers in Round Metal Duct

Insulate ductwork as shown in Figure 10. All metal must be covered to prevent condensation. Care must be taken not to obstruct the shaft from rotating when insulating. Do not insulate the zone damper actuator.

Installing Circular Dampers in Flexible Duct

1. Slide flexible duct two to three inches over the damper pipe past the damper rib as shown in Figure 11.
2. Fasten duct to damper with a nylon duct strap, screwing the strap to the pipe to prevent the duct from slipping off. Screws installed more than one inch from either end may obstruct damper rotation.
3. Seal completely around the duct with metal duct tape or mastic to prevent any air leakage.
4. Check the damper blade operation for obstructions by holding the manual release button and rotating damper shaft CCW (Open) and CW (Closed) - 3 wire only. See Figure 4.
5. Support the damper to joist within six inches on both sides of the damper as shown in Figure 12.

Figure 11: Attaching Flexible Duct to Damper

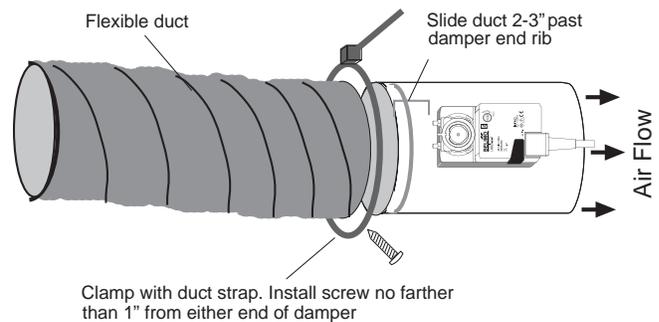
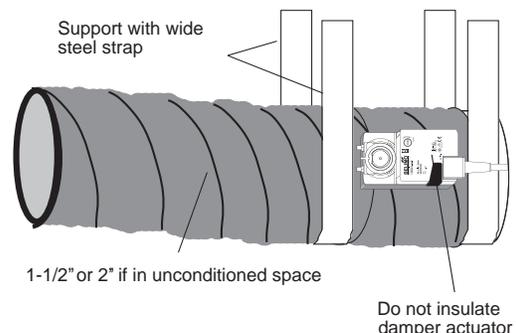


Figure 12: Supporting and Insulating Circular Damper



Insulating Damper Actuators

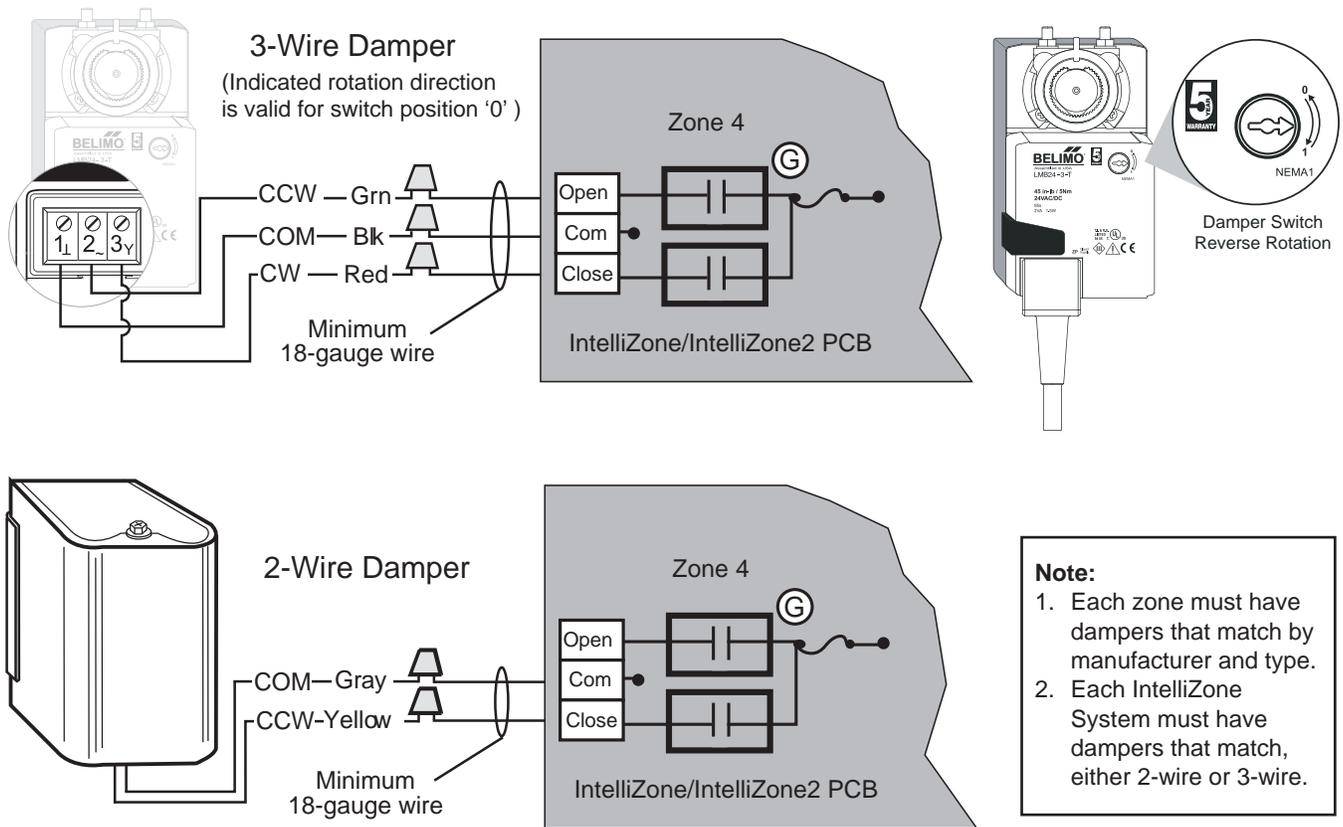
Insulate the damper as shown in Figure 12. All metal must be covered to prevent condensation. When insulating, care must be taken not to obstruct the shaft from rotating. Do not insulate the zone damper actuator.

Electrical Wiring

Wiring Damper Actuators

All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage. All wiring should be run back to the control panel. Keep wires a minimum of 12 inches from any high voltage lines. Follow the damper wiring schematic as shown in Figure 13. Verify that damper rotation direction is correct. The 3-wire damper rotation direction is reversible with switch on front cover.

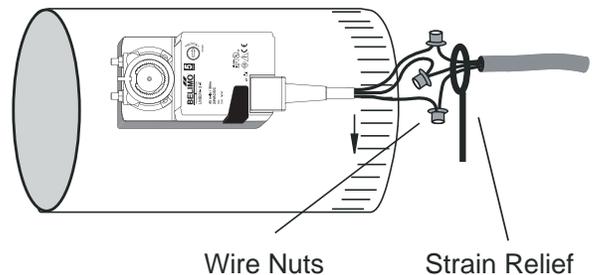
Figure 13: Damper Actuator Wiring



Damper Actuator Wiring Notes

1. Minimum of 18-gauge thermostat wire is recommended.
2. Use wire nuts to connect the thermostat wire to the actuator wire (solid wire to stranded wire) as shown in Figure 14.
3. The actuator wiring should be secured using a wire tie to prevent the wires from being separated (see Figure 14).

Figure 14: Actuator Wiring



Electrical Wiring cont.

Transformer Sizing

Providing adequate transformer power (VA) to supply the system is an important requirement. Each 3-wire damper requires 3.0 VA at nominal voltage. Each 2-wire damper requires 7.0 VA at nominal voltage. The standard transformer available is a 75VA with circuit breaker (Part # ZTK240).

Transformer 'VA' Calculation (3-wire actuator)

Zone 1 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 2 Dampers	Power to 1 IZ2 Dampers	3.0 VA
Zone 3 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 4 Dampers	Power to 3 IZ2 Dampers	9.0 VA
Zone 5 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Zone 6 Dampers	Power to 2 IZ2 Dampers	6.0 VA
Total VA Draw		36.0 VA



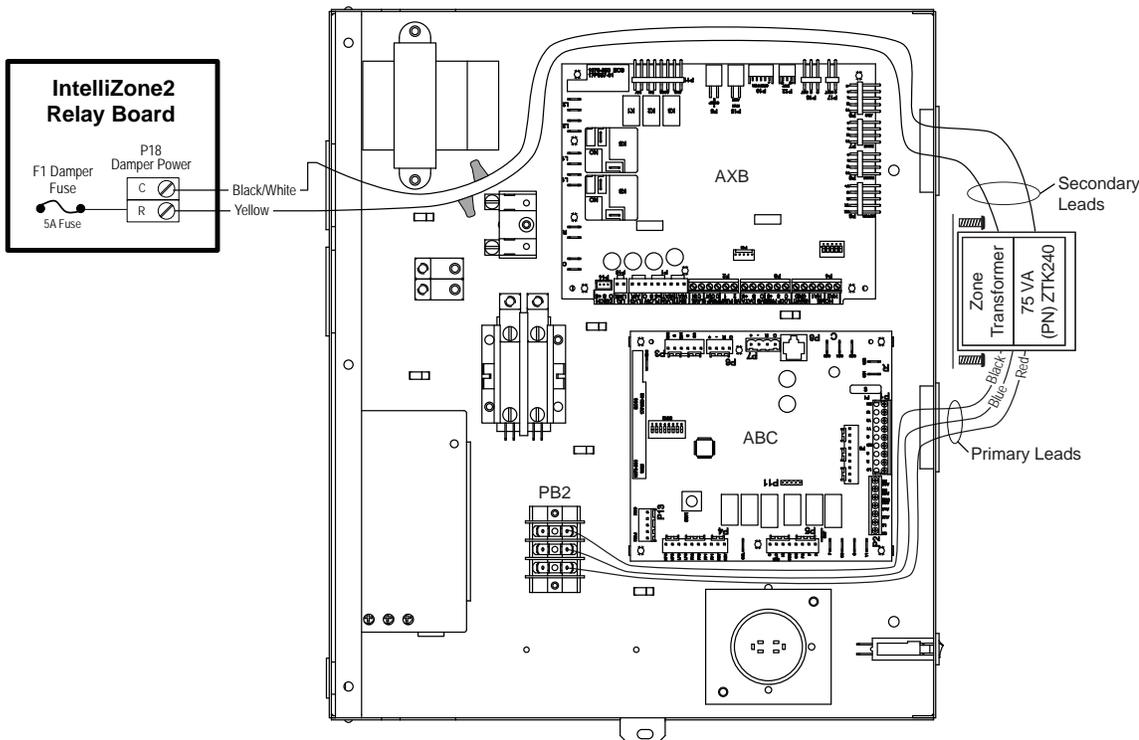
WARNING: All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage.

Mount the transformer onto the side of the unit's control box on the single and dual capacity heat pump and on the back of the control box on the variable speed heat pump by inserting and tightening screws (provided) into the pre-punched holes. Thread all transformer wires through the hole with bushing and follow the wiring schematic for connecting the transformer primary and secondary leads as shown in Figure 15 (single and dual capacity heat pump) and Figure 16 (variable speed heat pump).

For zone transformer mounting on split system heat pumps refer to the Split Section of the manual.

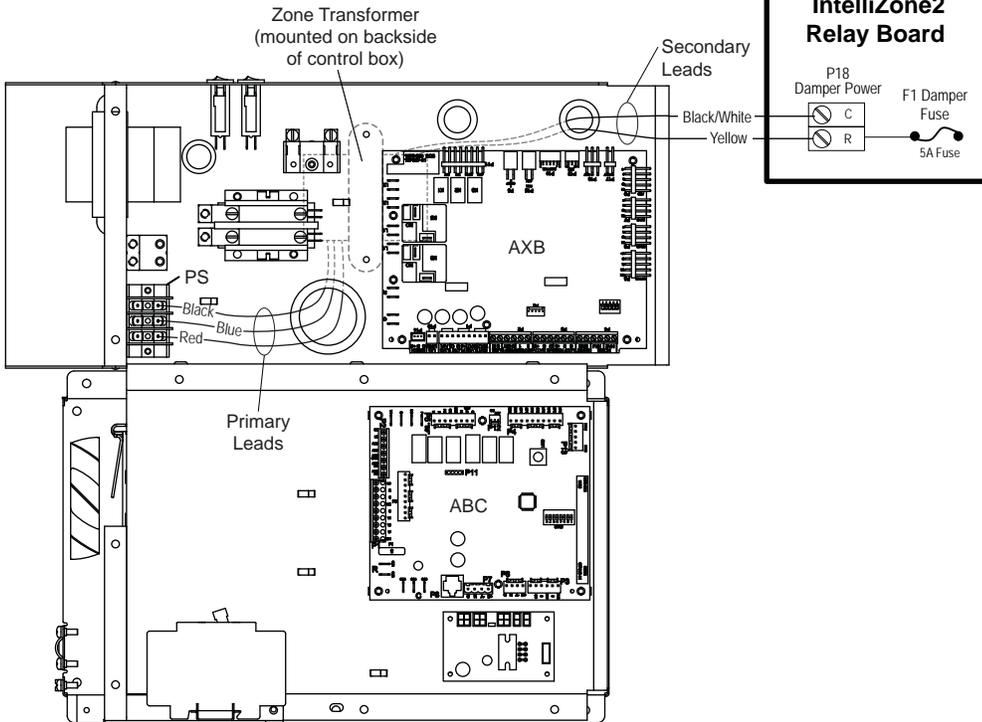
For 208 volt operation, the red and blue transformer wires must be switched. Use wire nuts only for connections to thermostat wire.

Figure 15: Mounting and Wiring Transformer to Control Box (Single and Dual capacity shown)



Electrical Wiring cont.

Figure 16: Mounting and Wiring Transformer to Control Box (Variable Speed heat pump shown)



Wiring IntelliZone2 to the Unit

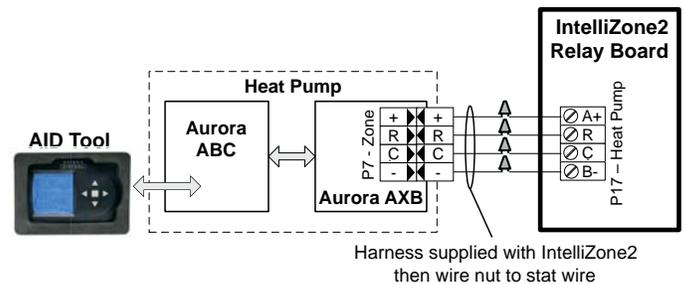


WARNING: All wiring must comply with local and state codes. Disconnect the power supply before beginning to wire to prevent electrical shock or equipment damage.

Follow the wiring schematic in Figure 17 for unit control connections. Strip the wires back 1/4 inch (longer strip lengths may cause shorts) and insert the thermostat wires into the unit's connector as shown in Figure 17. Tighten the screws to ensure tight connections. Use a minimum of 18-gauge thermostat wire for connections.

For wiring IntelliZone2 to split system heat pumps refer to the Split Section of the manual.

Figure 17: IntelliZone2 to heat pump Control Wiring



Note: The harness supplied with IntelliZone2 is designed to plug into the Aurora AXB P7-Zone connection only. The IntelliZone2 cannot be connected to P7 on the ABC board.

Thermostat Installation

Locating the Thermostats

The thermostats must be located in the room or zone that each controls. Locate a thermostat about five feet above the floor. Do not locate a thermostat where it may be exposed to direct sunlight, drafts or direct supply air. Do not place a thermostat on an outside wall. Follow the same guidelines that apply with standard thermostat installation. If two or more rooms are on a single zone, locate the thermostat in a hallway or area where it can sense the return air from all rooms.

Figure 18: Four Zone Thermostat Location



Thermostat Installation cont.

Mounting and Wiring the Thermostats

Position the thermostat subbase against the wall so that it is level and the thermostat wires protrude through the middle of the subbase. Mark the position of the subbase mounting holes and drill holes with a 3/16-inch bit. Install supplied anchors and secure base to the wall. Use 4-conductor 18 or 20 AWG thermostat wire unless issues with EMI are anticipated. In that situation, use 24 AWG shielded twisted pair cable grounded to “C” terminal on the relay board end. Strip the wires back 1/4 inch (longer strip lengths may cause shorts) and insert the thermostat wires into the IntelliZone2 connector as shown in Figure 19. Tighten the screws to ensure tight connections. The thermostat has the same type connectors, requiring the same wiring. Caulk the hole in the wall where the wires enter the thermostat.

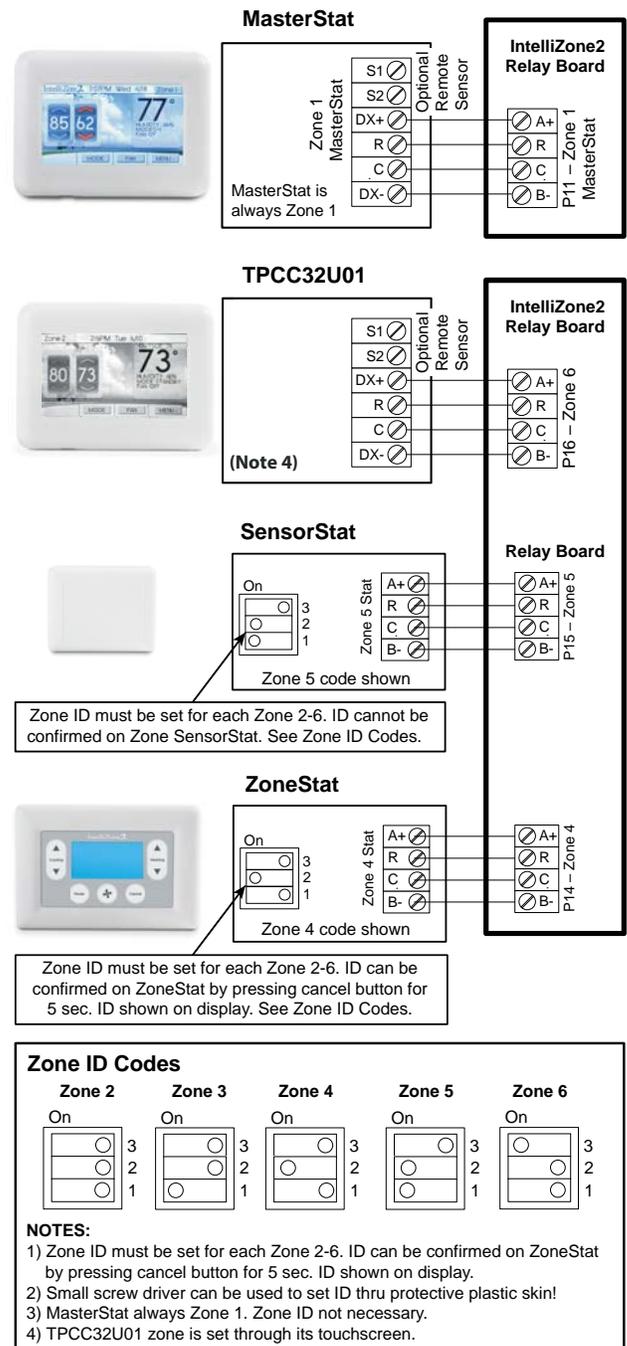
NOTE: See the instructions enclosed in the thermostat for detailed installation and operation information.

Cleaning the Thermostat Display

Lightly dampen a clean non-abrasive cloth with water or any non-abrasive household cleaner. To clean, gently wipe the surface of the thermostat.

NOTE: Do not spray liquids directly on the thermostat.

Figure 19: Wiring the Thermostat to the IntelliZone2



IntelliZone2 Configuration

Aurora System and Communication Configuration of IntelliZone2

Aurora Communication Basics

The Aurora Control functions around the concept of modularity and intercommunications between these boards. The communication is a 4 wire ModBus protocol. ModBus protocol is an open source protocol becoming more popular with equipment manufacturers for use in HVAC equipment. The Aurora has one 'bus' for the ABC, AXB, AHB, AWL, VS Drive, EEV, and thermostats. The AID Tool only plugs into the ABC AID Tool port, SAH Air Handler AID Tool port or the AWL (RJ style connector) and will not work at any other location. The AXB has 3 other independent ports for differing protocols; for IntelliZone2, ClimateTalk Components, and Communicating ECM blower motors. None of these ports comply with the ModBus protocol set up for the rest of the Aurora system.

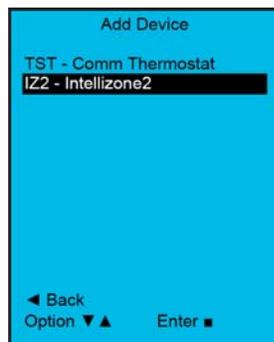
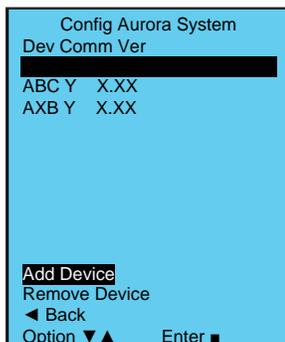
The ModBus communication is accomplished within the cabinet using shielded and ground cabling. This shield is most important in variable speed heat pump applications where the VS Drive component, by its very nature, emits electro-magnetic interference and can interfere with ModBus communications. Round ferrite 'donuts' can be observed at various locations to aid in cleaning the communication lines. Each line is comprised of an R (+24VAC), C (common) and a '+' and '-' communication line. At times the 'R' and 'C' lines may not be connected or needed. The terminals marked '+' and '-' should not be switched, although damage may not occur to the boards, communication is not possible. The communication voltage and current are small therefore 24 awg wire is adequate for these communication lines and a shield is not required but recommended in high EMI environments.

An extra 'expansion' connector is available for connecting other devices onto the main ABC ModBus.

A small LED is located next to each of the communication ports to aid in evaluating active communication at that specific port. This is true for each board. The blinking indicates transmission or receiving communication activity.

Configuring the Aurora for the IntelliZone2

'Adding' the IntelliZone2 to the Aurora system can be accomplished using the AID Tool via the 'Config Aurora' screen and scrolling to IntelliZone2 selecting and adding. As always a 'Y' in the communication column shows that communication is OK. This will initiate communication between the IntelliZone2 system and the Aurora AXB/ABC.



Software Versions

Software versions of the IntelliZone2 MasterStat can be found in the startup screen or in the AID Tool Aurora Config screen. The software version on the TPCC32U01 can be found on the settings screen. Firmware can be uploaded to the MasterStat or TPCC32U01 via the USB port on the thermostat. Consult your local manufacturer representative or tech service for details.

NOTE: When updating the firmware on the TPCC32U01 each thermostat will need to be updated. Firmware for the MasterStat and TPCC32U01 are NOT the same. After the TPCC32U01 firmware is updated to v3.01, or later, go into the installers screen and select restore defaults. If you do not restore the default setting the zone will not be displayed on the TPCC32U01.

Wiring and Configuring the Thermostats/Sensors

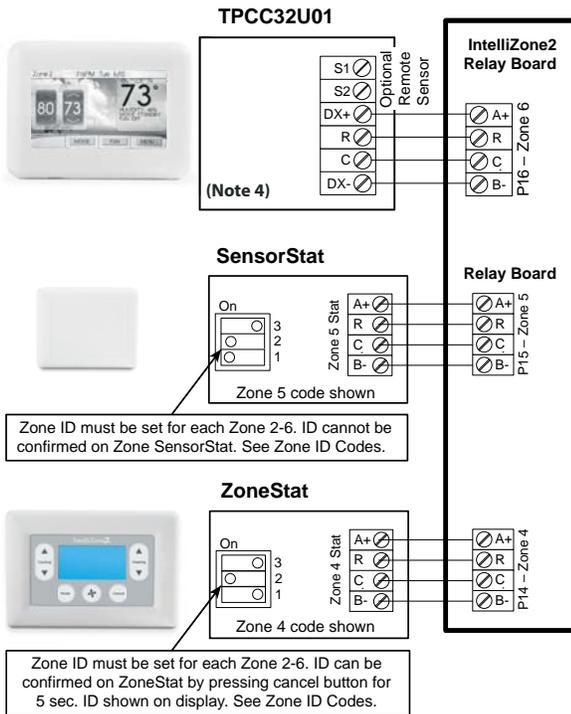
The Zone Sensors should be wired with the MasterStat on Zone 1 using standard 4-wire thermostat cable (if issues with EMI, shielded cable should be used and grounded at the '-' terminal on one end). The other zones should be added sequentially on the relay board until complete. The dip switch on the back of each ZoneStat or SensorStat should be selected for the appropriate zone number; for instance, Zone 2 stat should be selected using the DIP switch on the back for 'off, off, off'.

The TPCC32U01 will auto detect that it is attached to the IntelliZone2 relay panel and will display the screen below.



Use the up/down arrows ▲▼ to select the zone. If more than one zone is assigned the same zone number an error will be displayed on the TPCC32U01 and MasterStat. After the initial configuration, to change the zone numbers enter the configuration mode by holding a finger over the Zone number in the upper left hand corner of the Main screen for 5 sec. Select zone number and use the up/down arrow ▲▼ to adjust.

IntelliZone2 Configuration cont.



Zone ID Codes

Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
On	On	On	On	On
3	3	3	3	3
2	2	2	2	2
1	1	1	1	1

NOTES:

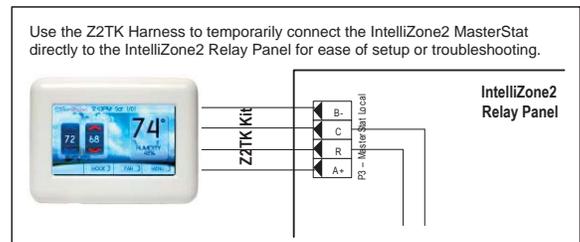
- 1) Zone ID must be set for each Zone 2-6. ID can be confirmed on ZoneStat by pressing cancel button for 5 sec. ID shown on display.
- 2) Small screw driver can be used to set ID thru protective plastic skin!
- 3) MasterStat always Zone 1. Zone ID not necessary.
- 4) TPCC32U01 zone is set through its touchscreen.

Once added to the Aurora system, the setup and configuration mode should be entered at the MasterStat by holding a finger over the IntelliZone2 logo for 5 sec. The Configuration and Setup mode will appear automatically.

NOTE: These options are intended to be used by the installer. End users are not advised to change or modify any of these settings. Doing so may make your equipment stop working properly and/or may void the warranty of the zoning system as well as the equipment connected to the thermostat.



It should be noted that the MasterStat Z2TK troubleshooting harness can be useful during setup by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.



Equipment and Number of Zones

The first screen is Equipment and # of Zones. Here the total number of desired zones and the type of equipment is selected. Equipment is automatically detected. Press the up and down arrows until the desired number of zones appears. **The zones should always be installed sequentially starting with the MasterStat always in Zone 1.**



- Single speed equipment is limited to a maximum of 2 zones
- Dual Capacity equipment is limited to a maximum of 4 zones
- Variable speed equipment can have up to the maximum of 6 zones.

NOTE: If the number of zones selected is less than 6, the remaining zones will be disabled.

IntelliZone2 Configuration cont.

Damper

The Damper screen allows the selection of either 2 wire (spring open) or 3 wire (power open/power closed) type.



Staging

Staging allows custom selection of staging for cooling and heating, independently.

The IntelliZone2 system allows separate staging options for cooling and heating. There are four options for each mode which are explained below. As an example, staging for cooling can be set for 'Normal' while staging for heating is set for 'Faster2'. Allowing heating and cooling staging to be independent of each other will provide better comfort all year long. Once the compressor call has been initiated by a zone, the compressor will be upstaged using one of the four staging options.

Single and Dual Staging

Normal - This "as shipped" mode will upstage the blower and compressor normally.

Quicker - This mode will upstage the blower, compressor and auxiliary electric heat more expediently than "normal" mode for increased comfort.

Faster1 - This mode allows for a timed element in compressor (heating and cooling) and electric heat (heating) upstaging in 45% and 70% zones for situations in which 'Quicker' upstaging is inadequate. If the heat pump is already operating in first stage and a 45% or 70% zone has had a heating or cooling demand for 30 continuous minutes then second stage will be activated. For heating, if after another continuous 30 minutes the H3 demand is still present from a 45% or 70% zone, third stage will be activated until the zone call is reduced to a H2. Airflow will increase with compressor staging/EH during this period. For heating, if the heat pump is already operating in second stage and a 45% or 70% zone has had a demand for 30 continuous minutes then third stage will be activated until the demand is reduced to H2. Airflow will be increased to EH selection during this period.

Faster2 - This mode allows for a timed element in compressor (heating and cooling) and electric heat (heating) upstaging in 45% and 70% zones for situations in

which 'Faster 1' upstaging is inadequate. If the heat pump is already operating in first stage and a 45% or 70% zone has had a heating or cooling demand for 15 continuous minutes then second stage will be activated. For heating, if after another continuous 15 minutes the H3 demand is still present from a 45% or 70% zone, third stage will be activated until the zone call is reduced to a H2. Airflow will increase with compressor staging/EH during this period. For heating, if the heat pump is already operating in second stage and a 45% or 70% zone has had a demand for 15 continuous minutes then third stage will be activated until the demand is reduced to H2. Airflow will be increased to EH selection during this period.

Variable Speed Staging

For heating in all staging options below, the total of the zone demands will determine when auxiliary heat is energized which could be anywhere from compressor speed 9 to speed 12. If auxiliary heat is energized while on compressor speed 9-11 the compressor speed automatically increases to speed 12. Airflow will increase with compressor speed/EH during this period.

Normal - This "as shipped" mode will upstage the blower and variable speed compressor normally.

Quicker - This mode will upstage the blower, compressor and auxiliary electric heat more expediently than "normal" mode for increased comfort. Generally the compressor will be upstaged 1 extra speed more than normal.

Faster1 - This mode allows for a timed element in compressor and electric heat upstaging in 45% and 70% zones for situations in which quicker staging is not meeting demand. When an H3 (heating) or C2 (cooling) demand is initially received the compressor will upstage two speeds more than normal. After 15 continuous minutes of an H3 or C2 demand the compressor will upstage one more compressor speed and will continue to upstage one compressor speed with every 15 minutes of a continuous H3 or C2 demand until auxiliary electric heat is energized for heating or C2 or maximum compressor speed for cooling.

Faster2 - This mode also allows for a timed element in compressor and electric heat upstaging in 45% and 70% zones for situations in which Faster1 is not meeting heating demand. When an H3 (heating) or C2 (cooling) demand is initially received the compressor will upstage two speeds more than normal. After 15 continuous minutes of an H3 or C2 demand the compressor will upstage two more compressor speeds and will continue to upstage two compressor speeds with every 15 minutes of a continuous H3 demand until auxiliary electric heat is energized or maximum compressor speed for cooling.

IntelliZone2 Configuration cont.

Zone Configuration

Zone configuration allows the selection of the zone size and the zone priority. The zone can be selected by touching the upper right screen text noting the zone. In this way you can cycle thru all of the active zones to view the configuration.



Zone Percentage

Selecting the zone percentage can also be calculated by using the IntelliZone2 Design software. This percentage represents an approximation of the maximum heating or cooling load percentage of the zone and thus to a certain extent volume of airflow. The IntelliZone2 allows 0, 25, 45, and 70% selections. Some general rules to follow in this selection procedure are as follows:

- Pick the larger percentage for major living areas such as family rooms, etc.
- Pick the smaller percentage for minor living areas such as dens or bedrooms.
- Pick a larger percentage if more branches are required than the load indicates due to large area per load (i.e. unfinished insulated basement).
- The IntelliZone2 Design software should be used to aid in the selection and calculation of design cfm.
- The IntelliZone2 determines modes as a proportion of the total demand. A simple example of this to begin with is a two-zone system in the cooling mode. If each zone is set at 70% we have the following scenario:

Zone 1 = 50%
Zone 2 = 50%

NOTE: All Zone % calculations are 'normalized using the following process: We now must determine what percentage of the total load each zone represents. To perform this operation, add the two zones together 70 + 70 = 140. One zone would then be 70/140 or 50%.

The IntelliZone2 then reduces the total demand based upon thermostat demand. A "Y1" call in the above example will result in one half of the zone demand in this case 1/2 of 50% for a 25% system demand. A common complaint is insufficient cooling when only one zone is calling for cooling. The IntelliZone2 will not initiate a "Y2" output to the unit until it senses a 51% total system demand (This is when the IntelliZone2 is set for normal upstaging). If the IntelliZone2 is set for quicker upstaging it drops the total system demand required to 41% to initiate a Y2 output.

By this example, it will require a "Y2" call from one zone (50%) and a "Y1" call from the second zone (25%). This will give us a total system demand of 50% + 25% = 75%. System demand for three- and four-zone systems are computed in the same manner.

Heating demand is determined in the same manner, but we now have a third stage instead of two for cooling. The IntelliZone2 assigns values as follows:

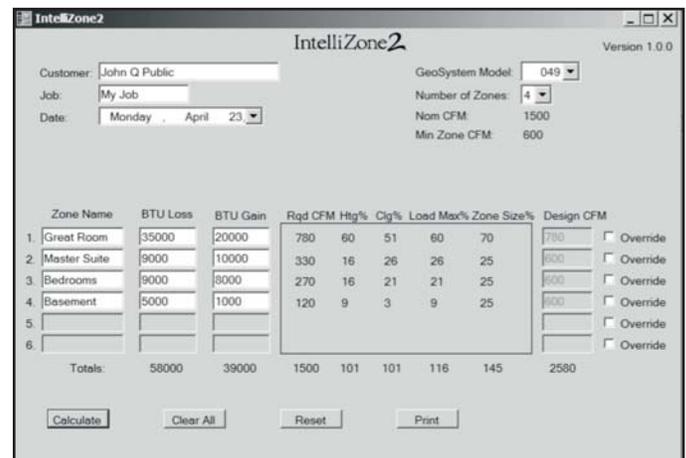
Y1 = 40%
Y2 = 80%
Y3 = 100%

We know from the previous example that the IntelliZone2 will initiate a "Y2" output to the compressor when it is set to normal upstaging and 51% of total demand is needed. It will issue a "W" call to the unit when there is a 90% total demand.

It is a common assumption that if you have a house with two zones equally divided each zone should be set at an equal amount, usually 70%. As can be seen in the above example, it will take a "Y3" call from one zone as well as a "Y2" call from the second zone to obtain auxiliary heat.

This is a simple example, but three- and four-zone systems are calculated in the same manner. Blower speeds are also assigned upon the percentage of system demand and a complete understanding of this process is not necessary for day-to-day decisions. As a serviceman, the temptation arises, in some instances, to influence the logic of the board by jumping "Y1" and "Y2". While this will create a quicker response, the ductwork of that zone must be capable of handling the cfm delivered by the unit (i.e., if a "Y2" signal is given to the unit, can the ductwork handle the total cfm of the unit).

When setting up a new system remember that if you have unused zones they must be set to zero. If they are not, the setting that they have will be included in the total demand preventing the other zones from operating correctly, as there will be no inputs on those zones.



The IntelliZone2 allows the selection of either comfort or economy mode in each individual zone to provide maximum savings in areas that allow it (such as workshops and basements), while maintaining perfect comfort in the zones where accurate temperature is most desired (such as bedrooms and baths).

IntelliZone2 Configuration cont.

Zone Priority

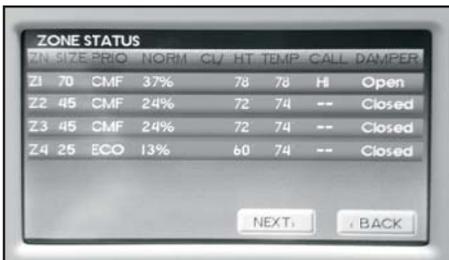
Comfort Mode - A single zone call (Y1) for conditioning will engage the compressor and allow a minimal set point variation, thus providing ultimate comfort.

Economy Mode - A single zone call (Y1) for conditioning will be ignored by the IntelliZone2 until either a Y2 call is initiated from the same zone or another zone calls for conditioning (Y1). This allows a slightly greater set point variation than in comfort mode. This setting prevents less important zones from energizing the compressor unless it is really needed, thus saving money. As a bonus in this mode, upon a Y1 call, the IntelliZone2 may try to precondition the zone with return air from other zones already satisfied and, in some cases, can preclude the need for energizing the compressor.

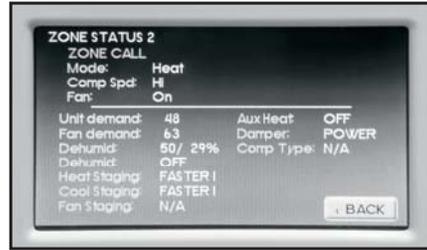
Variable Speed Fan Staging - Variable Speed Fan Staging allows the ability to expand the blower levels. Options are Normal and Expanded. There are three airflow speeds assigned to a compressor speed and the airflow level is determined by the fan demand total zone %. Normal is the recommended airflow level. Selecting Expanded will increase the highest airflow level by one level and decrease the lowest airflow level by one level from Normal. Not available for single speed or dual capacity models.



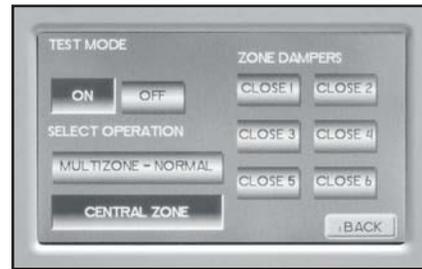
Zones - Displays the inputs that the IntelliZone2 is receiving.



Status - Displays the outputs that the IntelliZone2 is sending to the equipment.



Test Mode - In Test mode 'Central Zone' mode can be selected. In Central mode all dampers are opened and thermostat readings are taken ONLY from the Zone 1 MasterStat. This will approximate operation without a zone system (all dampers open and IntelliZone2 MasterStat temperature control) and can be useful during initial construction of the home or during service etc.



Also in 'Central Zone' mode each damper can be individually cycled off/on to verify operation during Installation or service. It should be noted that the MasterStat Z2TK troubleshooting harness can be useful here by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.

Thermostat Type



NORMAL/DUAL FUEL

Normal - used for normal operation
 Dual Fuel - used on dual fuel systems; needs outdoor sensor to lockout dual fuel

IntelliZone2 Configuration cont.

Dual Fuel (Single Speed/Dual Capacity) - When Dual Fuel is selected for 'Thermostat Type' and a 'W' call is present operation will be as follows:

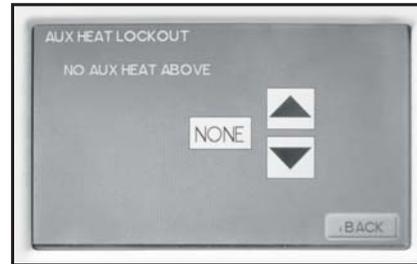
1. The temperature will be controlled by the MasterStat while other zones are ignored.
2. All zone dampers will open, Y1, Y2, G, W outputs shall run for 60 seconds. After 60 seconds Y1 and Y2 will be dropped and output only W and G (if Fan with Heat Option is selected otherwise G will be dropped).
3. There will be a two minute minimum run time once Dual Fuel operation has been entered, regardless if MasterStat heat call has been satisfied.
4. Once the two minute minimum run time expires and the 'W' call is satisfied at the MasterStat then Dual Fuel operation will be terminated. There will be no down staging.
5. Once Dual Fuel operation is terminated all zone dampers will close.
6. There will be a 4 minute time delay once Dual Fuel operation is terminated before compressor operation for cooling or heating may begin.

Dual Fuel (Variable Speed) - When Dual Fuel is selected for 'Thermostat Type' and a 'W' call is present operation will be as follows.

1. The temperature will be controlled by the MasterStat while other zones are ignored.
2. All zone dampers will open, the current compressor speed, G and W outputs shall run for 60 seconds. After 60 seconds the compressor will be stopped and output only W and G (if Fan with Heat Option is selected otherwise G will be dropped).
3. There will be a two minute minimum run time once Dual Fuel operation has been entered, regardless if MasterStat heat call has been satisfied.
4. Once the two minute minimum run time expires and the 'W' call is satisfied at the MasterStat then Dual Fuel operation will be terminated. There will be no down staging.
5. Once Dual Fuel operation is terminated all zone dampers will close.
6. There will be a 4 minute time delay once Dual Fuel operation is terminated before compressor operation for cooling or heating may begin.

Fan with Heat Option (Dual Fuel Applications) - Options are ON or OFF. This selection determines whether G (fan) output is to be ON or OFF when W (auxiliary heat) output is ON.

Aux Heat Lockout - Allows the configuration to lockout electric heat above a selected outdoor temperature. The outdoor sensor (OAT) must be installed on the IntelliZone2 Relay Board. This setting is adjustable in 5°F increments from NONE to 40°F. This will provide full heat pump capacity without electric heat above the selected temperature. When the outdoor temperature drops below the selected temperature, then electric heat will be energized when the demand is present.



Differential



This adjustment will vary the number of degrees, from the set point, before a call for heating or cooling is made. Adjustments can range between 0.2° and 4° differential. Default is 0.5° differential. (If your set point is 70° in heating, your thermostat will not call for heat until the room temperature is 69.5°, when using a 0.5° differential setting).

Offsets

Temperature Offsets - This option allows calibration (or deliberate miscalibration) of the room temperature sensor(s). The Offset function only works on the MasterStat. There are various reasons why the displayed temperature would be adjusted to a higher or lower value. NOTE: Do not adjust for 30 minutes after installation because board may be heated by handling. The selected number is the number of degrees, plus or minus, which will be added to actual temperature. The numbers can range between -5° and +5°. Default values are set to 0° offset.

Indoor Offset (MasterStat internal sensor)
Remote Indoor Offset (if sensor is attached)
Outdoor Offset (if sensor is attached)

Humidity Offset - This option allows calibration of the humidity sensor. Adjustments can range between -10% and +10%. Default is 0% offset.

IntelliZone2 Configuration cont.

Humidity

Humidify - Turns on the H output when the room humidity is below the set point and there is an active heating call.

Dehumidify - Turns on the DH output when the room humidity is above the set point and the MODE is set to COOL or AUTO when Cool was the last mode run.

-Turns on Active Dehumidification (VS systems)

Both - HUMIDIFY operates in the HEAT mode and DEHUMIDIFY operates in COOL mode.

NONE - Neither is active.

Temperature Sensors - Allows the configuration of the remote sensor to be remote only, average of remote and internal, or no remote sensor. Allows the configuration of the outdoor sensor to be zone panel, MasterStat, or no outdoor sensor. Because IntelliZone2 ships standard with an outdoor sensor this option needs to be selected.

NOTE: LAS on IntelliZone2 relay board = OAT



Accessories -

Each of these options has settings for Cumulative Run Time and Calendar Time. Messages will flash at the top of the Main screen when these events are met to alert the owner that it is time service these options.

Air Filter - Cumulative Run Time default is 1000 hours and Calendar Time is 3 months. Values can range from NONE-2500 hours for Cumulative Run Time (in 100 hour increments), or Calendar Time can be set to NONE to 12 months (in 3 month increments).

Humidifier - Cumulative Run Time default is NONE hours (OFF) and Calendar Time is NONE. Values can range from NONE, 400-2500 hours for Cumulative Run Time (in 100 hour increments), or Calendar Time can be set to NONE, to 12 months (in 3 month increments).

UV Lamp - Cumulative Run Time default is NONE hours (OFF) and Calendar Time is NONE. Values can range from NONE, 400-3600 hours for Cumulative Run Time (in 100 hour increments), or Calendar Time can be set to NONE to 48 months (in 3 month increments).

Air Cleaner - Cumulative Run Time default is 0 hours (NONE) and Calendar Time is NONE. Values can range from NONE, 400-2500 hours for Cumulative Run Time (in 100 hour increments), or Calendar Time can be set to NONE to 12 months (in 3 month increments).

Dealer Information - Allows the input of the dealer name, phone, address, e-mail and website. Simply press the screen segment where you want to enter information and a keypad will appear.

Fault Status - Shows the last 10 IntelliZone2 system Faults (heat pump fault history is displayed at the heat pump on the AID Tool). The faults can be cleared or refreshed from this screen.

Restore Defaults - This will allow you to revert to the factory default settings.

Restart Thermostat/Upgrade Software - This allows a convenient way to restart the thermostat or upload the latest software using the USB port without killing power to the whole system.

USB - Allows the import and export of data using the USB port.
Importation of: Installer settings, User Settings, Program, Dealer Details
Exportation of: Installer settings, User Settings, Program, Dealer Details

Data Logging - Allows the USB thumb drive to record the data from the zoning system every 5 seconds.

F°/C° - Allows selection of either Fahrenheit or Celsius temperature scale

Residential/Commercial - Future Use.

Energy Demo - These screens allow a dealer to show the end user an example of the information that will be displayed on daily and monthly screens once their system is operating. This is only an example and not actual data from their system.

Photo Upload - The IntelliZone2 will allow personal photo upload to be displayed once the thermostat goes into sleep mode. The MasterStat can only accept photos that are TCI format. Common photo formats can be converted to the TCI format, which is used by the thermostat, by using our photo converter software. Once the photos have been converted and uploaded to the MasterStat they will be displayed as a slide show when the thermostat goes into sleep mode. Sleep mode occurs after 5 minutes of inactivity (no screen touches). The photo conversion software and instructions for uploading the photos can be found at www.auroracontrols.com.

IntelliZone2 Configuration cont.

SuperBoost (Variable Speed Heat Pumps ONLY) -

SuperBoost can be found under the main menu settings of the thermostat. The SuperBoost option temporarily enables a larger cooling capacity range. Normal cooling mode is limited to compressor speeds 1-9 and SuperBoost allows compressor speeds 10-12 if needed. This screen will allow the homeowner to turn the SuperBoost option ON or OFF. The SuperBoost option will be enabled, by default, for a 24-hour period of time then will automatically be disabled. **NOTE:** Continuous use of SuperBoost could result in overheating the ground loop.

Dehumidification - Active (Variable Speed Heat Pumps Only) -

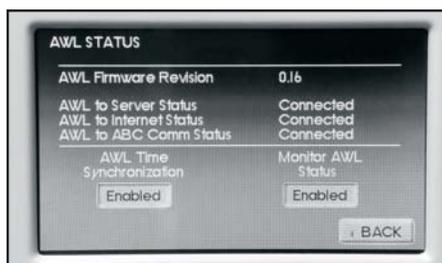
Active dehumidification will only activate during cooling operation, when cooling demand from the IntelliZone2 MasterStat is compressor speed 4 or lower and the humidity setpoint of the MasterStat is at least 5% below the actual relative humidity. The green status LED will flash code 2 when active. The compressor will ramp up and airflow will begin at a low level. Airflow is then reduced periodically until air coil temperature setpoint is reached. If coil temperature continues to drop, the airflow is increased until air coil setpoint is maintained. After 20 minutes of operation in the Active Dehumidification mode normal cooling operation will resume for 5 minutes. This cycle continues until the dehumidification setpoint is reached or the room temperature is more than 1.5°F below the cooling set point or IntelliZone2 MasterStat cooling demand requires greater than compressor speed 4 (normal cooling takes over). In IntelliZone2 systems, the main zone will remain open during active dehumidification.

AWL Status (If Installed)

This screen displays the AWL firmware revision and provides the current AWL communication status relating to an Aurora WebLink (AWL) device. This screen is available whether an AWL is installed on the system or not.

AWL Time Synchronization - When enabled the AWL will synchronize the thermostat's date and time with internet time servers. This option by default is disabled. **NOTE: setting the proper time zone in the Symphony Portal is necessary for correct operation.**

Monitor AWL Status - When enabled, the thermostat will monitor the AWL's RS485, INTERNET, and SERVER status. The thermostat will display "AWL Comm Err" when the AWL is not communicating properly with the Aurora Modbus Network, "AWL Internet Err" when the AWL is unable to communicate to the symphony Servers. This option by default is disabled.



Description of Operation - Package Unit

IntelliZone2 Operation

Upon a call (or calls) from the zones, the IntelliZone2 “weighs” each zone based upon two components: 1) the level of call (Y1, Y2, Y3) coming from the zone; and 2) the size of the zone (zone % selected). This gives a very accurate picture of not only overall heating or cooling requirements (as in other control methods), but also how much heating or cooling is really required for each separate zone.

This, in turn, defines how much compressor (1st or 2nd stage), blower (speeds 2 thru 5), and auxiliary heat should be engaged for each particular situation. The result is a system that utilizes lower compressor and blower speeds more often for improved comfort and energy savings, while relying upon auxiliary heat less often for more energy savings than non-zoned systems.

Heating, Unit 1st stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 1st stage (Y1). Blower speed will be the ‘L’ setting of the ECM which is set up at the heat pump control.

Heating, Unit 1st stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 1st stage (Y1). Blower speed will be the ‘Y1’ setting of the 5-Speed ECM which is set at the motor.

Heating, Unit 2nd stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 2nd stage (Y1, Y2). Blower speed will be the ‘H’ setting of the ECM which is set up at the heat pump control.

Heating, Unit 2nd stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 2nd stage (Y1, Y2). Blower speed will be the ‘Y2’ setting of the 5-Speed ECM which is set at the motor.

Heating, Unit 3rd Stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 3rd stage (Y1, Y2, W). Blower speed will be the ‘H’ (Premier control) or ‘Aux’ (ABC control) setting of the ECM which is set up at the heat pump control.

Heating, Unit 3rd Stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 3rd stage (Y1, Y2, W). Blower speed will be the ‘W’ setting of the 5-Speed ECM which is set at the motor.

Heating

(Variable Speed Compressor)

The unit will operate based upon demand as calculated by the IntelliZone2. The resulting compressor speed (1-12) will also select an appropriate blower speed for the selected compressor speed. Auxiliary heat will be available on compressor speeds 9-12, depending on the zone inputs. When auxiliary heat is engaged with compressor speed 9-11, the compressor speed automatically increases to speed 12 for maximum output.

Cooling, Unit 1st stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 1st stage (Y1, O). Blower speed will be the ‘L’ setting of the ECM which is set up at the heat pump control.

Description of Operation - Package Unit cont.

Cooling, Unit 1st stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 1st stage (Y1, O). Blower speed will be the 'Y1' setting of the 5-Speed ECM which is set at the motor.

Cooling, Unit 2nd stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 2nd stage (Y1, Y2, O). Blower speed will be the 'H' setting of the ECM which is set up at the heat pump control.

Cooling, Unit 2nd stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 2nd stage (Y1, Y2, O). Blower speed will be the 'Y2' setting of the 5-Speed ECM which is set at the motor.

Cooling

(Variable Speed Compressor)

The unit will operate based upon demand as calculated by the IntelliZone2. The resulting compressor speed, speeds 1-9, (speeds 10-12 are reserved for SuperBoost mode only) will also select an appropriate blower speed.

Emergency Heat

Emergency heat mode may be engaged by selecting at the MasterStat. All zone thermostat fault LED's begin to flash two quick flashes, followed by a pause, indicating that emergency heat mode has been activated. The temperature of the structure will be controlled by the zone 1 MasterStat while other zones are ignored. When a demand for heat occurs at the MasterStat all zone dampers are opened and emergency heat is energized. Emergency heat will continue to operate until the MasterStat demand is satisfied.

Emergency heat mode may be exited by selecting OFF (or one of the other mode selections) at the MasterStat, as well as all zone thermostat fault LED's stop flashing, indicating emergency heat mode has been deactivated and normal IntelliZone2 operation may resume.

Continuous Blower

The unit's blower will be operated on blower speed 1 (G-LED) while heating or cooling is suspended for any zone(s) selected for continuous blower operation at the zone thermostat. Upon any heating or cooling call to the unit, all continuous blower operation ceases.

Lockout Mode

(Single/Dual Speed Compressor)

During the unit lockout mode, the appropriate Fault code will be communicated to the IntelliZone2 MasterStat. The blower will continue to operate on blower speed 1. If the collective zones translate into a > 24% heating call, emergency heat operation will occur and all zone dampers will open. Blower speed will be Aux Heat speed setting.

Lockout Mode

(Variable Speed Compressor)

During lockout mode the appropriate Fault code will be communicated to the IntelliZone2 MasterStat. The blower will continue to operate on blower speed 'G'. If the collective zones translate into $\geq 40\%$, all zone dampers will open and emergency heat operation will occur until the demand is $\leq 24\%$.

Blower Data - Package Unit

Airflow Selection (Single or Dual Capacity)

When equipped with a Variable Speed ECM airflow from the IntelliZone2 is communicated to the Aurora via a 'Blower Level %'. These blower levels are 55, 70, 85, and 100%. The Aurora will dictate actual airflow based upon these percentages. Below is a graphic showing how the IntelliZone2 would signal for a 55-100% blower level percent and the resulting airflow based upon the ABC setpoints of speed 5 for med and speed 8 for high in the example AID Tool setting. Notice that a blower level of 85% would result in a blower speed of 7 with these settings. All airflows are rounded to the nearest 1-12 blower speeds. Continuous blower and aux heat blower speeds are set independently of the compressor blower speeds.

Heating Airflow Selection (Single or Dual Capacity)

From IZ2 Air Level %	Selected in AID Tool				
	Blower Speed	Cont Blower	Low	High	Aux Heat
	1				
	2				
	3				
	4				
Comp Stage Low 55%	5		---		
Comp Stage Low 70%	6				
Comp Stage High 85%	7				
Comp Stage High 100%	8				
	9				
	10				
	11				---
	12				

NOTES:

- 1) Continuous Blower activated by G only call from IntelliZone2 (selection can be anywhere)
- 2) Aux Heat Airflow activated by Aux or Emergency heat call (selection must be greater than high and allow proper airflow for the installed electric heat/heat pump model)

In cooling a similar procedure occurs with the exception that when dehumidification reduces airflow it is a reduction as shown below. Therefore in dehumidification mode, if blower speed 5 is selected the resulting airflow will be blower speed 5, less 15%. If cooling airflow is configured to be 15% less than heating airflow then there is no difference between cooling and dehumidification cooling airflow.

Cooling Airflow Selection (Single or Dual Capacity)

From IZ2 Air Level %	Actual Blwr Spd*	Selected in AID Tool				
		Blwr Speed	Cont Blwr	Low	High	Aux Heat
		1				
		2				
		3				
		4				
Comp Stage Low 55%	Blwr Spd 5 - 15%	5		---		
Comp Stage Low 70%	Blwr Spd 6 - 15%	6				
Comp Stage High 85%	Blwr Spd 7 - 15%	7				
Comp Stage High 100%	Blwr Spd 8 - 15%	8				
		9				
		10				
		11				---
		12				

NOTES:

- 1) Continuous Blower activated by G only call from IntelliZone2 (selection can be anywhere)
- 2) Aux Heat Airflow activated by Aux or Emergency heat call (selection must be greater than high and allow proper airflow for the installed electric heat/heat pump model)

Airflow Selection (Variable Speed)

Airflow from the IntelliZone2 is communicated to the Aurora via a blower Level %. These blower levels are 25, 40, 55, 70, 85, and 100%. The Aurora will dictate actual airflow based upon these percentages. Below is a graphic showing how the IntelliZone2 would signal for a 25-100% blower level percent and the resulting airflow based upon the ABC setpoints of speed 3 for low and speed 8 for high in the example AID Tool setting. Notice that a Blower level of 85% would result in a blower speed of 7 with these settings. All airflows are rounded to the nearest 1-12 blower speeds. Continuous blower and aux heat blower speeds are set independently of the compressor blower speeds.

Heating Airflow Selection (Variable Speed)

From IZ2 Air Level %	Selected in AID Tool				
	Blwr Speed	Cont Blwr	Low Comp	Hi Comp	Aux Heat
	1				
	2				
Comp Speeds 1 & 2 Low Selection 25%	3		---		
Comp Speeds 3 & 4 40%	4				
Comp Speeds 5 & 6 55%	5				
Comp Speeds 7 & 8 70%	6				
Comp Speeds 9 & 10 85%	7				
Comp Speeds 11 & 12 High Selection 100%	8				
	9				
	10				
	11				---
	12				

Continued on the next page.

Blower Data - Package Unit cont.

In cooling a similar procedure occurs with the exception that compressor speed is limited to a maximum of speed 9. However compressor speed 10-12 is available for a short period of time and the resulting airflow during the 'SuperBoost' mode is shown below. Another exception is when dehumidification reduces airflow; it is a reduction as shown below. Therefore, in dehumidification mode, if blower speed 3 is selected, the resulting airflow will be blower speed 3, less 15%.

Cooling Airflow Selection (Variable Speed)

		From IZ2 Air Level %	Actual Blower Speed*
Comp Speeds 1 & 2	Low Selection	25%	Blower Spd 3 - 15%
Comp Speeds 3 & 4		40%	Blower Spd 4 - 15%
Comp Speeds 5 & 6		55%	Blower Spd 5 - 15%
Comp Speeds 7 & 8		70%	Blower Spd 6 - 15%
Comp Speeds 9 & 10	Cooling Max	85%	Blower Spd 7 - 15%
Comp Speeds 11 & 12	SuperBoost Only	100%	Blower Spd 8 - 15%

Selected in AID Tool				
AID Reported Blower Speed	Cont Blower	Low Comp	Hi Comp	Aux Heat
1				
2				
3		---		
4				
5				
6				
7				
8				---
9				
10				
11				---
12				

NOTE: * Denotes default cooling airflow setting of 15% less than heating mode airflow.

Dual or Single Capacity

Heating Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
H1	55 or 70%	na
H2	85 or 100%	na
H2, W	Aux Blower	na
W	Aux Blower	na
G	G Only (cont Blower)	na
Cooling Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
C1	55 or 70%	55 or 70% less 15% cfm
C2	85 or 100%	85 or 100% less 15% cfm
G	G Only (cont Blower)	G Only (cont Blower)

Variable Speed Capacity

Heating Unit Call	Blower Level Call (Normal Staging Shown)	Blower Level Call (Dehumid)
H1 or H2	25% or 40%	na
H3 or H4	25% or 40% or 55%	na
H5 or H6	40% or 55% or 70%	na
H7 or H8	55% or 70% or 85%	na
H9 or H10	70% or 85% or 100%	na
H11 or H12	85% or 100%	na
H9-H12, W	Aux Blower	na
W	Aux Blower	na
G	G Only (cont Blower)	na
Cooling Unit Call	Blower Level Call (norm)	Blower Level Call (Dehumid)
C1 or C2	25% or 40%	Norm less 15% cfm
C3 or C4	25% or 40% or 55%	Norm less 15% cfm
C5 or C6	40% or 55% or 70%	Norm less 15% cfm
C7 or C8	55% or 70% or 85%	Norm less 15% cfm
C9 or C10	70% or 85% or 100%	Norm less 15% cfm
C11 or C12	85% or 100%	Norm less 15% cfm
G	G Only (cont Blower)	G Only (cont Blower)

NOTE: C10-C12 are only available in SuperBoost mode.

Blower Data - Package Unit cont.

Single Speed with Variable Speed ECM

Model	Max ESP	Blower Speed Settings with IntelliZone2 Blower Level Percentages											
		1	2	3	4	5	6	7	8	9	10	11	12
036	0.50	650	750	850 G	1000	1100 L 55%	1200 70%-85%	1300 H 100%	1400	1500	1550 Aux		
036 w/1hp*	0.75	800	1000 G	1100 L 55%-70%	1300 H 85%-100%	1500	1600	1800	1950	2100	2200 Aux		
042	0.50	650	800	900 G	1050	1150 L 55%	1250 70%	1350 85%	1450 H 100%	1550	1600 Aux		
042 w/1hp*	0.75	800	900 G	1000	1200 L 55%-70%	1400 H 85%-100%	1600	1700	1850	2000	2200 Aux	2300	2400
048	0.50	650	800	900	1050 G	1150	1250	1350 L 55%	1450 70%-85%	1550 H 100%	1600 Aux		
048 w/1hp*	0.75	800	900	1000 G	1200	1400 L 55%-70%	1600 H 85%-100%	1700	1850	2000	2200 Aux	2300	2400
060	0.75	800	950	1100 G	1300	1500 L 55%	1750 70%-85%	1950 H 100%	2100	2300	2325 Aux		
070	0.75	800	950	1100 G	1300	1500 L 55%	1750 70%-85%	1950 H 100%	2100	2300	2325 Aux		

Blower level percentages are shown with factory recommended blower speed settings
Factory settings are at recommended G-L-H-Aux speed settings

6/8/12

L-H settings MUST be located within boldface CFM range

"Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package

"G" may be located anywhere within the airflow table

CFM is controlled within 5% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

Dual Capacity with Variable Speed ECM

MODEL	MAX ESP	AIR FLOW SPEED SETTINGS											
		1	2	3	4	5	6	7	8	9	10	11	12
026	0.50		400 G	500	600 L 55%	700 70%	800 85%	900 H 100%	1000	1100	1200 Aux		
038	0.50	650	750 G	850 L 55%	1000	1100	1200	1300 H 100%	1400	1500	1550 Aux		
038 w/1hp*	0.75	800 G L 55%	1000 70%	1100 85%	1300 H 100%	1500	1600	1800	1875	1925	2000 Aux		
049	0.50	650	800 G	900	1050 L 55%	1150	1250 70%	1350 85%	1450	1550 H 100%	1575 Aux		
049 w/1hp*	0.75	800	900 G	1000 L 55%	1200 70%	1400 85%	1600 H 100%	1700	1850	2000	2200 Aux	2300	2400
064	0.75	800	950 G	1100 L 55%	1300 70%	1500 85%	1750 H 100%	1950	2100	2300	2325 Aux		
072	0.75	800	950	1100 G	1300 L 55%	1500	1750 85%	1950 H 100%	2100	2300	2325 Aux		

Factory settings are at recommended G-L-H-Aux speed settings

10/5/12

L-H settings MUST be located within boldface CFM range

"Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package

"G" may be located anywhere within the airflow table

CFM is controlled within 35% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

Variable Speed with Variable Speed ECM

Model	Max ESP	Variable Speed Heat Pump Blower Settings with IntelliZone2 Blower Level Percentages											
		Speed 1	Speed 2	Speed 3	Speed 4	Speed 5	Speed 6	Speed 7	Speed 8	Speed 9	Speed 10	Speed 11	Speed 12
036	0.50	285	380 G	525 L 25%	675 40%	815	980 55%	1100 70%	1220	1330 85%	1440 H 100%	1540 Aux	1575
036 w/1hp*	0.75	480	565 G	665 L 25%	761 40%	870	1000 55%	1100 70%	1200	1300 85%	1410 H 100%	1520 Aux	1630
048	0.75	475	620 G	730 L 25%	850 40%	1020	1140 55%	1270 70%	1400	1520 85%	1650 H 100%	1790 Aux	1925
060	0.75	400	600 G	830 L 25%	1050 40%	1230	1400 55%	1560 70%	1700	1870 85%	2010 H 100%	2140 Aux	2265
**VS Compressor Speed				1-2	3-4		5-6	7-8		9-10	11-12		

Blower level percentages are shown with factory recommended blower speed settings

6/7/12

** VS Compressor speed is given for the factory default cfm settings. When the cfm default settings are changed it will change the relationship to the compressor speed that is shown in the table. In cooling mode compressor speeds 10-12 are only available when SuperBoost mode is selected at the thermostat.

* optional 1 HP ECM

Factory speed settings are at recommended G, L, H and Aux positions

"G" may be located anywhere within the airflow table

"L" setting should be located within the boldface CFM range

"H" setting MUST be located within the shaded CFM range

"Aux" setting MUST be equal to or greater than the minimum allowable CFM for the auxiliary heater kit (see auxiliary heat ratings table)

CFM is controlled within 5% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

Blower Data - Package Unit cont.

Single Speed with 5-Speed ECM Motor

Model	Motor Speed	Motor Tap	T'stat Cnct.	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
022	High	5	W	9 x 7	1/2	980	960	940	930	920	905	890	875	860	840	820	800	745	-	-	-
	Med High	4	Y1			890	878	865	845	825	813	800	785	770	753	735	710	665	-	-	-
	Med	3				830	815	800	788	775	755	735	723	710	690	670	640	600	-	-	-
	Med Low	2	G			780	760	740	703	665	653	640	620	600	585	570	-	-	-	-	
	Low	1				625	593	560	535	510	495	480	455	430	410	390	-	-	-	-	
030	High	5	W	9 x 7	1/2	1407	1381	1354	1327	1300	1267	1233	1201	1168	1131	1094	1009	-	-	-	
	Med High	4	W			1146	1134	1122	1111	1099	1085	1071	1062	1052	1042	1031	966	-	-	-	
	Med	3	Y1			1023	1012	1001	985	969	959	949	937	925	913	901	-	-	-	-	
	Med Low	2				978	962	946	934	922	907	891	882	872	858	843	-	-	-	-	
	Low	1	G			795	777	759	748	737	718	698	686	673	650	626	-	-	-	-	
036	High	5	W	11 x 10	1/2	1530	1503	1476	1453	1429	1413	1397	1376	1355	1342	1329	1276	1231	1173	-	-
	Med High	4	Y1			1413	1388	1363	1342	1321	1303	1285	1263	1240	1226	1212	1173	1016	946	-	-
	Med	3				1355	1325	1294	1276	1258	1235	1212	1188	1164	1144	1123	982	909	883	-	-
	Med Low	2				1336	1299	1261	1242	1222	1202	1181	1157	1132	1111	1090	937	874	830	-	-
	Low	1	G			1243	1182	1121	1061	1000	964	928	856	784	744	703	647	592	-	-	
042	High	5	W	11 x 10	1	1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	4	W			1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
	Med	3				1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	2	Y1			1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	1	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
048	High	5	W	11 x 10	1	1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	4	W			1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
	Med	3	Y1			1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	2				1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	1	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
060	High	5	W	11 x 10	1	2245	2230	2214	2194	2173	2155	2136	2120	2103	2087	2070	2032	1998	1957	1910	1825
	Med High	4				2092	2073	2054	2035	2015	1995	1975	1958	1940	1922	1904	1880	1843	1806	1767	1728
	Med	3				1951	1931	1910	1889	1868	1850	1831	1812	1793	1774	1755	1722	1688	1654	1612	1562
	Med Low	2	Y1			1812	1796	1780	1761	1741	1718	1695	1682	1668	1651	1633	1591	1555	1518	1480	1433
	Low	1	G			1682	1661	1640	1616	1591	1573	1555	1533	1510	1495	1480	1441	1400	1351	1316	1263
070	High	5	W	11 x 10	1	2472	2454	2435	2414	2393	2371	2349	2328	2306	2289	2271	2230	2189	2121	2033	1936
	Med High	4	Y1			2271	2248	2225	2205	2184	2166	2147	2129	2110	2094	2078	2039	2011	1977	1930	1846
	Med	3				2133	2115	2096	2072	2047	2030	2013	1996	1979	1965	1950	1909	1873	1837	1793	1748
	Med Low	2				2008	1985	1962	1939	1915	1898	1880	1862	1843	1828	1812	1774	1742	1703	1669	1635
	Low	1	G			1806	1784	1761	1742	1722	1696	1669	1656	1642	1625	1607	1564	1527	1490	1443	1404

Factory speed settings are in Bold

Air flow values are with dry coil and standard filter

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [fpm] = Airflow [cfm] / Face Area [sq ft]).

Then for velocities of 200 fpm reduce the static capability by 0.03 in. wg, 300 fpm by 0.08 in. wg, 400 fpm by 0.12in. wg., and 500 fpm by 0.16 in. wg.

Highest setting is for auxiliary heat (W) and lowest setting is for constant blower (G). The "Y1" and "Y2" settings must be between the "G" and "W" settings.

The gray wire is not factory wired to the motor and is tied to the wire harness. This wire can be field connected and can be used with 3ht/2cl thermostats or IntelliZone2 to deliver the required air flow for the Y2 signal.

6/14/12

Dual Capacity with 5-Speed ECM

Model	Motor Speed	Motor Tap	T'stat Cnct.	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
026	High	5	W	9 x 7	1/2	1120	1109	1097	1082	1066	1055	1044	1028	1011	1001	991	932	839	-	-	-
	Med High	4	Y2			1020	1006	991	980	968	950	932	922	911	894	876	849	812	-	-	-
	Med	3				917	906	895	884	872	854	836	824	812	792	772	754	719	-	-	-
	Med Low	2	Y1			836	824	812	794	776	765	754	735	715	703	691	653	631	-	-	-
	Low	1	G			735	721	707	687	666	653	640	622	603	589	574	533	-	-	-	
038	High	5	W	11 x 10	1/2	1530	1503	1476	1453	1429	1413	1397	1376	1355	1342	1329	1276	1231	1173	-	-
	Med High	4	Y2			1413	1388	1363	1342	1321	1303	1285	1263	1240	1226	1212	1173	1016	946	-	-
	Med	3	Y1			1355	1325	1294	1276	1258	1235	1212	1188	1164	1144	1123	982	909	883	-	-
	Med Low	2				1336	1299	1261	1242	1222	1202	1181	1157	1132	1111	1090	937	874	830	-	-
	Low	1	G			1243	1182	1121	1061	1000	964	928	856	784	744	703	647	592	-	-	
049	High	5	W	11 x 10	1	1934	1910	1886	1871	1855	1827	1799	1780	1760	1747	1734	1700	1659	1617	-	-
	Med High	4				1799	1783	1767	1744	1720	1693	1666	1649	1631	1617	1603	1560	1530	1492	-	-
	Med	3	Y2			1694	1680	1666	1642	1617	1592	1567	1552	1537	1519	1500	1453	1421	1372	-	-
	Med Low	2	Y1			1575	1560	1540	1520	1502	1487	1471	1448	1424	1409	1393	1351	1308	1266	-	-
	Low	1	G			1454	1406	1358	1333	1308	1285	1261	1239	1217	1198	1179	1072	1002	988	-	-
064	High	5	W	11 x 10	1	2245	2230	2214	2194	2173	2155	2136	2120	2103	2087	2070	2032	1998	1957	1910	1825
	Med High	4	Y2			2092	2073	2054	2035	2015	1995	1975	1958	1940	1922	1904	1880	1843	1806	1767	1728
	Med	3				1951	1931	1910	1889	1868	1850	1831	1812	1793	1774	1755	1722	1688	1654	1612	1562
	Med Low	2	Y1			1812	1796	1780	1761	1741	1718	1695	1682	1668	1651	1633	1591	1555	1518	1480	1433
	Low	1	G			1682	1661	1640	1616	1591	1573	1555	1533	1510	1495	1480	1441	1400	1351	1316	1263
072	High	5	W	11 x 10	1	2472	2454	2435	2414	2393	2371	2349	2328	2306	2289	2271	2230	2189	2121	2033	1936
	Med High	4	Y2			2271	2248	2225	2205	2184	2166	2147	2129	2110	2094	2078	2039	2011	1977	1930	1846
	Med	3				2133	2115	2096	2072	2047	2030	2013	1996	1979	1965	1950	1909	1873	1837	1793	1748
	Med Low	2	Y1			2008	1985	1962	1939	1915	1898	1880	1862	1843	1828	1812	1774	1742	1703	1669	1635
	Low	1	G			1806	1784	1761	1742	1722	1696	1669	1656	1642	1625	1607	1564	1527	1490	1443	1404

Factory speed

IntelliZone2 CFM Design

	Model	Max CFM	Zone Design CFM	CFM Percentage
Single Speed	030	1000	700	50
	036	1200	850	50
	042	1300	900	50
	048	1500	1000	50
	060	1800	1100	50
	070	2000	1100	50
Dual Capacity	026	800	600	40
	038	1200	600	40
	049	1500	800	40
	064	1800	950	40
	072	2000	1100	40
Variable Speed	036	1500	300	20
	048	1800	450	20
	060	2100	450	20

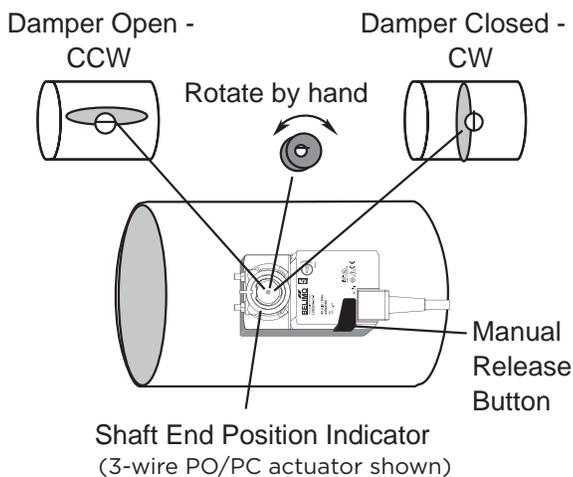
System Startup and Checkout

It should be noted that the MasterStat Z2TK troubleshooting harness can be useful during startup by allowing the temporary connection of the MasterStat directly at the IntelliZone2 relay board for ease of configuration or servicing.

Before powering the unit, check the following:

- Fuses, breakers and wire size are correct.
- Low voltage wiring has been completed.
- MasterStat has been configured correctly.
- Thermostats are wired and DIP switches are set for proper zone #.
- Blower speed has been set on the AID Tool.
- Aurora control is configured for IntelliZone2.

Figure 25: Checking the Shaft Position Indicator



Damper and Continuous Blower Checkout

1. Push the “Fan” button to the ON position on all thermostats. (alternate method shown in the note below)
2. All dampers should start to open immediately.
3. The blower should come on continuous fan speed. The green zone LED’s flash while the dampers are opening, once completely open the green LED will be solid ON. The amber LED will illuminate to indicate fan ON.
4. After approximately 100 seconds, all IntelliZone2 dampers should be completely opened. Check the shaft position indicator on all damper actuators as shown in Figure 25.
5. Push the “Fan” button to the OFF position on all thermostats.
6. The blower and the amber LED should cycle off.
7. All dampers should start to close immediately. After approximately 100 seconds, all dampers should be completely closed. Check the shaft position indicator on all damper actuators shown in Figure 25.

NOTES: To cycle dampers open and closed, access the ‘Test Mode’ Screen in the Installer Setup mode on the IntelliZone2 MasterStat. Once here each damper can be cycled individually by pushing the specific zone damper button to check for proper operation. “Central Zone” mode can also be used to open all dampers.

System Startup and Checkout cont.

In the following procedure, check for proper calls on the Status Screen.



System Checkout

1. Set all of the zone thermostats to the cooling mode.
2. Reduce the cooling set point to 1° below the actual zone temperature on all thermostats.
3. First stage cooling should energize after a delay.
4. Be sure the compressor and blower are activated. Check that the zone, cool, and fan speed LEDs are on.
5. Decrease the cooling set point two more degrees and check to see that the fan speed increases and second stage cooling is energized. Using the AID tool, check the fan speed and compare to the Blower Speed tables.
6. In variable speed applications, when operating in low compressor speeds, ensure that there is adequate air flow from each register so as to get sufficient throw into the conditioned space. If there is not sufficient airflow, try increasing the selected blower speed.
7. Adjust the thermostats until the temperature displayed is 5° higher than the actual temperature on all thermostats.
8. The call for cooling should be canceled after a delay.
9. Set all of the zone thermostats to the heating mode.
10. Increase the heating set point to 1° above the actual zone temperature on all thermostats.
11. After a delay, the unit should start up in the first stage heating mode (H1). Using the AID tool, check the fan speed and compare to the Blower Speed tables.
12. Increase the heating set points two more degrees and check to see that the fan speed increases and second stage heating is energized (H2). Using the AID tool check the fan speed and compare to the Blower Speed table.
13. Increase the heating set point to 4° above the actual zone temperatures. Be sure the auxiliary heat is energized and the fan speed increases. Using the AID tool check the fan speed and compare to the Blower Speed tables.
14. Set system to maintain desired comfort level.
15. Instruct the owner/operator of correct thermostat and system operation.
16. Fill out and forward all warranty registration papers to the manufacturer.

NOTE: Unit check out can be accomplished by going to the Test Mode screen at the MasterStat and selecting Central Zone. The system will be controlled only by the MasterStat. Any time superheat and subcooling is being checked, the zone system must be in the central zone mode.

Blower Speed Tables

Single or Dual Capacity		
Heating Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
H1	55 or 70%	N/A
H2	85 or 100%	N/A
H2, W	Aux Blower	N/A
W	Aux Blower	N/A
G	G Only (Cont Blower)	N/A
Cooling Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
C1	55 or 70%	55 or 70% less 15% cfm
C2	85 or 100%	85 or 100% less 15% cfm
G	G Only (Cont Blower)	G Only (Cont Blower)

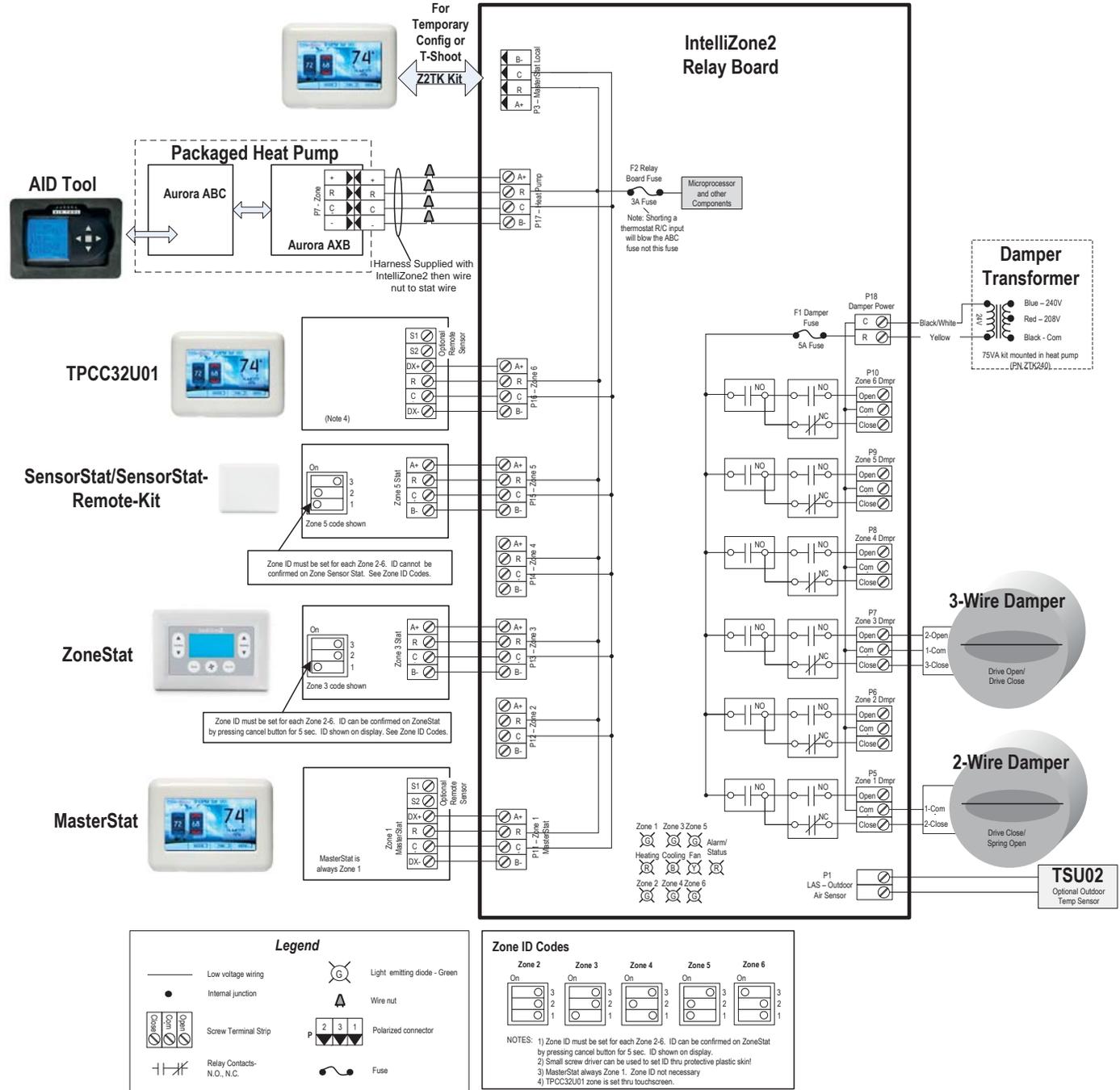
Variable Speed Capacity		
Heating Unit Call	Blower Level Call (Normal Staging Shown)	Blower Level Call (Dehumid)
H1 or H2	25%	N/A
H3 or H4	40%	N/A
H5 or H6	55%	N/A
H7 or H8	70%	N/A
H9 or H10	85%	N/A
H11 or H12	100%	N/A
H9-H12, W	Aux Blower	N/A
W	Aux Blower	N/A
G	G Only (Cont Blower)	N/A
Cooling Unit Call	Blower Level Call (Norm)	Blower Level Call (Dehumid)
C1 or C2	25%	25% less 15% cfm
C3 or C4	40%	40% less 15% cfm
C5 or C6	55%	55% less 15% cfm
C7 or C8	70%	70% less 15% cfm
C9 or C10	85%	85% less 15% cfm
C11 or C12	100%	100% less 15% cfm
G	G Only (Cont Blower)	G Only (Cont Blower)

IntelliZone2 Configuration

Once added to the Aurora control system, the setup and configuration mode should be entered at the MasterStat by holding a finger on the IntelliZone2 logo for 5 seconds. The Configuration and Setup mode will appear automatically.

Wiring Schematic - Package Unit

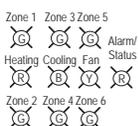
IntelliZone2 System



NOTE: This drawing is for visual reference for wiring and configuring a zone. Do not skip zones as shown here. Zones MUST be wired in numerical sequence.

IntelliZone2 Fault Codes

The following are IntelliZone2 fault codes that can appear on the IntelliZone2 relay board LEDs and MasterStat. All Aurora control errors will be displayed on the MasterStat as "Exx" (xx equals error number) style and fault information can be found in AID Tool and Aurora Control literature.



Power/Com LED Codes

Flash Code	Description
On	No Faults
Flashing	Communications Error
Code 1	No Damper Power
Code 2	Voltage < 19V
Code 3	Voltage < 16 V
Code 4	OAT Shorted
Code 5	OAT Open

ZONE LED Codes

Flash Code	Description
Off	Damper Closed
On	Damper Open
Flashing	Damper Moving

Other LED Codes

LED Code	Description
Heat On	Heating Mode
Cool On	Cooling Mode
Fan On	Fan Only Mode

IZZ MasterStat Errors (displayed on Master Stat)

Code	Description
Z1-1	Humidity Temp Sensor Open
Z1-2	Humidity Temp Sensor Shorted
Z1-3	Outdoor Temp Sensor Error
Z1-4	Humidity Reading too Low
Z1-5	Humidity Reading too High
Z1-6	Humidity Sensor Failure
Z1-8	Remote Room Sensor Error
Z1-9	Primary Temp Sensor Open
Z1-10	Primary Temp Sensor Shorted
Z1-11	Temp Reading Too Low
Z1-12	Temp Reading Too High
Z1-13	AXB Control no Communications
Z1-14	Low Voltage under 19 VAC
Z1-15	Low Voltage under 16 VAC
Z1-97	IntelliZone2 Panel no Communications
Z1-98	Zone 2 Sensor no Communications
Z1-99	Zone 3 Sensor no Communications
Z1-100	Zone 4 Sensor no Communications
Z1-101	Zone 5 Sensor no Communications
Z1-102	Zone 6 Sensor no Communications

Notes: -Where * equals the number of the zone.
-Example: Z3-4 = Zone 3 Sensor Control Error

IZZ Sensor Errors (displayed on Master Stat)

Code	Description
Z*-4	Zone Sensor Control Failure
Z*-6	Zone Sensor Temperature Reading Difference
Z*-8	Primary Temp Sensor Shorted
Z*-9	Primary Temp Sensor Open
Z*-10	Secondary Temp Sensor Shorted
Z*-11	Secondary Temp Sensor Open
Z*-14	Temp above 99 degF
Z*-15	Temp Below 40 degF
Z*-16	Temp 2 above 99 degF
Z*-17	Temp 2 below 40 degF
Z*-19	Low Voltage below 19VAC
Z*-20	Low Voltage below 16VAC

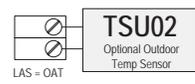
Notes: -Where * equals the number of the zone.
-Example: Z3-4 = Zone 3 Sensor Control Error

IZZ Panel Errors (on Master Stat)

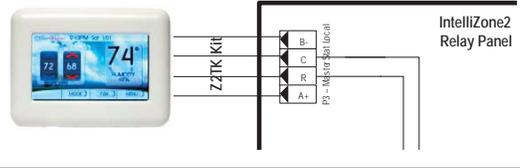
Code	Description
ZP-1	No Damper Power
ZP-2	Low Voltage Below 19 VAC
ZP-3	Low Voltage Below 16 VAC
ZP-4	OAT Sensor Shorted
ZP-5	OAT Sensor Open

Notes: -Example: ZP-4 = Zone Panel OAT Sensor Shorted

Note: E Codes displayed on the IntelliZone2 Master Stat originate from the heat pump. I.E. "E11=Freeze Detection Sensor error"



Use the Z2TK Harness to temporarily connect the IntelliZone2 MasterStat directly to the IntelliZone2 Relay Panel for ease of setup or troubleshooting.



IntelliZone2 with SAH Air Handler

Electrical Wiring

Transformer Mounting

It is not recommended to mount the zone transformer in the single and dual capacity Outdoor Split compressor section and should be mounted to the air handler. For the single and dual capacity Indoor Split the zone transformer can be mounted to the air handler or in the compressor section. If the zone transformer is mounted to the air handler power will come from the PB located in the Air Handler electrical compartment. Depending on the air handler configuration, connect the zone transformer primary leads to the quick connect or screw lug terminals. All wiring connections have to be made inside the electrical box area. Wrap the third (unused) primary lead with electrical tape and secure.

Electrical Wiring cont.

For 208 volt operation, the red & blue transformer wires must be switched, use wire nuts only for connections to thermostat wire.

Figure 20: Mounting and Wiring Transformer to Control Box (Single and Dual capacity Indoor Split shown)

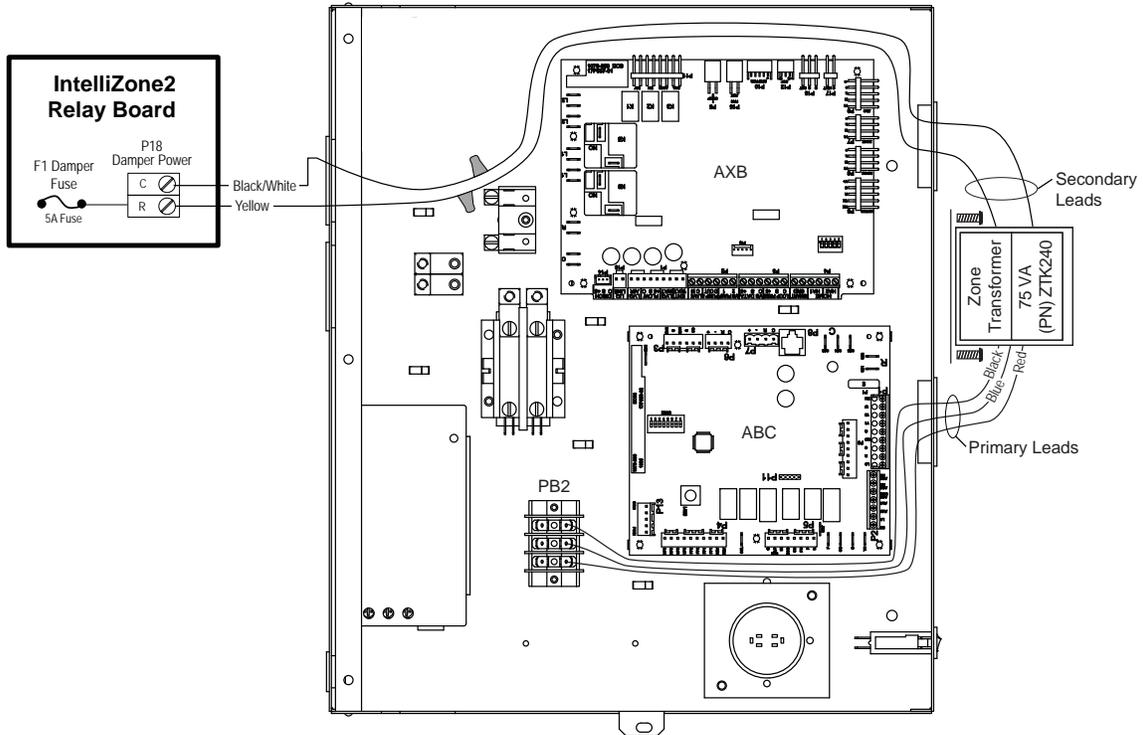
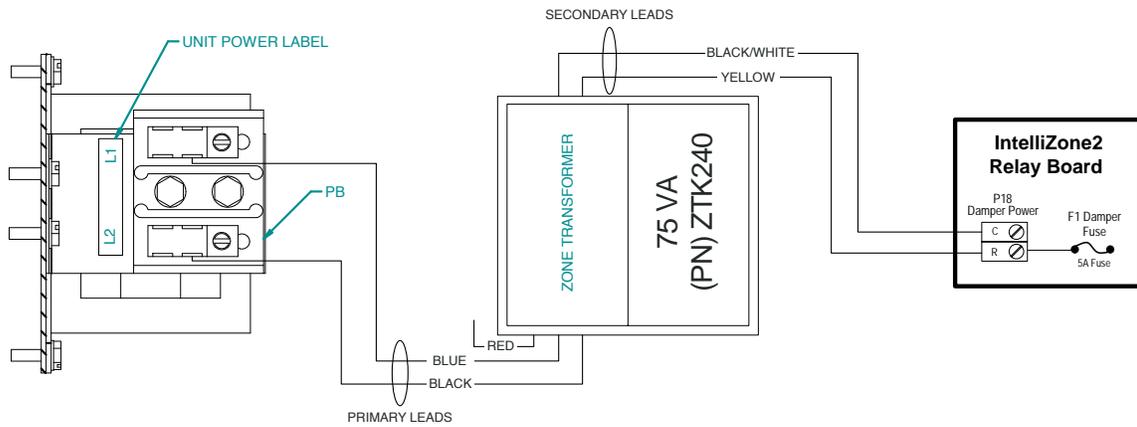


Figure 21: Wiring transformer to SAH Air Handler

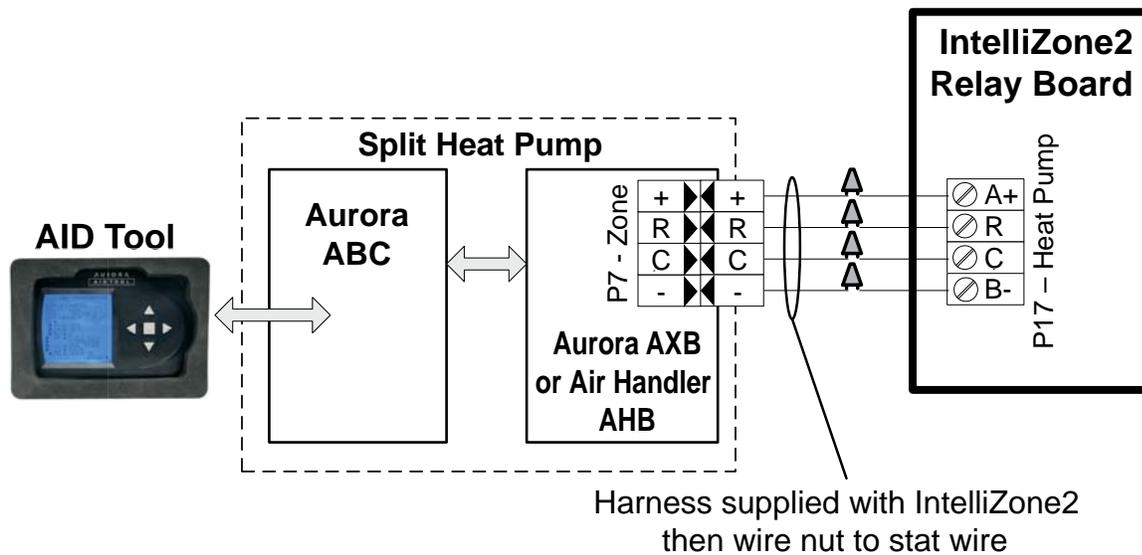


Electrical Wiring Cont.

Wiring IntelliZone2 to Split System Heat Pump

Follow the wiring schematic in Figure 22 for unit control connections. Strip the wires back 1/4 inch (longer strip lengths may cause shorts) and insert the thermostat wires into the units connector as shown in Figure 22. Tighten the screws to ensure secure connections. Use a minimum of 18-gauge thermostat wire for connections.

Figure 22: IntelliZone2 to Single and Dual Capacity Split Control Wiring



Note: The harness supplied with IntelliZone2 is designed to plug into the Aurora AXB or AHB P7-Zone connection only. The IntelliZone2 cannot be connected to P7 on the ABC board.

Description of Operation - Split System

IntelliZone2 Split Operation

For the split system to be compatible with IntelliZone2 there must be either an AXB in the compressor section or an AHB in the SAH Air Handler. As always an ABC board must be in the compressor section as well.

Upon a call (or calls) from the zones, the IntelliZone2 “weighs” each zone based upon two components: 1) the level of call (Y1, Y2, Y3) coming from the zone; and 2) the size of the zone (zone % selected). This gives a very accurate picture of not only overall heating or cooling requirements (as in other control methods), but also how much heating or cooling is really required for each separate zone.

This, in turn, defines how much compressor (1st or 2nd stage), blower and auxiliary heat should be engaged for each particular situation. The result is a system that utilizes lower compressor speed more often for improved comfort and energy savings, while relying upon auxiliary heat less often for more energy savings than non-zoned systems.

The variable speed ECM motor allows 6 air flow levels with IntelliZone2 while the 5 Speed ECM will allow 4 air flow levels. Although the 5 speed ECM works with the IntelliZone2 the additional available air flow levels and air flow adjustability make the variable speed ECM the better option for zoning.

Heating, Unit 1st stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 1st stage (Y1). Blower speed will be the ‘L’ setting of the ECM which is set up at the heat pump control.

Heating, Unit 1st stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 1st stage (Y1). Blower speed will be the ‘Y1’ setting of the 5-Speed ECM which is set at the motor.

Heating, Unit 2nd stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 2nd stage (Y1, Y2). Blower speed will be the ‘H’ setting of the ECM which is set up at the heat pump control.

Heating, Unit 2nd stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 2nd stage (Y1, Y2). Blower speed will be the ‘Y2’ setting of the 5-Speed ECM which is set at the motor.

Heating, Unit 3rd Stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 3rd stage (Y1, Y2, W). Blower speed will be the ‘H’ (Premier control) or ‘Aux’ (ABC control) setting of the ECM which is set up at the heat pump control.

Heating, Unit 3rd Stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and W being translated into unit call 3rd stage (Y1, Y2, W). Blower speed will be the ‘W’ setting of the 5-Speed ECM which is set at the motor.

Cooling, Unit 1st stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 1st stage (Y1, O). Blower speed will be the ‘L’ setting of the ECM which is set up at the heat pump control.

Cooling, Unit 1st stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 1st stage (Y1, O). Blower speed will be the ‘Y1’ setting of the 5-Speed ECM which is set at the motor.

Cooling, Unit 2nd stage

(Single/Dual Capacity Compressor and Variable Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 2nd stage (Y1, Y2, O). Blower speed will be the ‘H’ setting of the ECM which is set up at the heat pump control.

Cooling, Unit 2nd stage

(Single/Dual Capacity Compressor and 5-Speed ECM)

Operation as stated above with separate zone call levels of Y1, Y2, and O being translated into unit call 2nd stage (Y1, Y2, O). Blower speed will be the ‘Y2’ setting of the 5-Speed ECM which is set at the motor.

Dehumidification (Variable Speed ECM)

If dehumidification is desired it is set via the AID Tool on the ABC control by selecting -5% to -15% in the cooling airflow setup or by setting SW2-4 to OFF on the Premier control (85% of normal CFM). Not available with 5-Speed ECM

Description of Operation - Split System cont.

Emergency Heat

Emergency heat mode may be engaged by selecting at the MasterStat. All zone thermostat fault LED's begin to flash two quick flashes, followed by a pause, indicating that emergency heat mode has been activated. The temperature of the structure will be controlled by the zone 1 MasterStat while other zones are ignored. When a demand for heat occurs at the MasterStat all zone dampers are opened and emergency heat is energized. Emergency heat will continue to operate until the MasterStat demand is satisfied.

Emergency heat mode may be exited by selecting OFF (or one of the other mode selections) at the MasterStat, as well as all zone thermostat fault LED's stop flashing, indicating emergency heat mode has been deactivated and normal IntelliZone2 operation may resume.

Continuous Blower

All dampers are open and the unit's blower will be operated while heating or cooling is suspended for any zone(s) selected for continuous blower operation at the zone thermostat. Upon any heating or cooling call to the unit, all continuous blower operation ceases.

Lockout Mode

(Single/Dual Speed Compressor)

During the unit lockout mode, the appropriate Fault code will be communicated to the MasterStat and the blower will operate continuously. If the collective zones translate into a > 24% heating call, emergency heat operation will occur and all zone dampers will open. Blower speed will be highest selected speed setting at the heat pump.

SAH 5 Speed ECM Blower Performance Data Option A

Blower Performance 5 Speed ECM Control Option A

Model	Motor Speed	Motor Tap	T'stat Connection	Blower Size	Motor HP	Airflow (cfm) at External Static Pressure (in. wg)															
						0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
022	High	5	W	9 x 7	1/2	1130	1115	1100	1090	1080	1065	1050	1040	1030	1015	1000	980	950	-	-	-
	Med High	4	Y2*			1040	1025	1010	1000	990	975	960	945	930	915	900	880	850	-	-	-
	Med	3				950	935	920	905	890	875	860	845	830	815	800	760	730	-	-	-
	Med Low	2	Y1			860	845	830	815	800	785	770	755	740	720	700	660	590	-	-	-
	Low	1	G			740	720	700	680	660	645	630	605	580	540	500	460	-	-	-	-
026	High	5	W	9 x 7	1/2	1130	1115	1100	1090	1080	1065	1050	1040	1030	1015	1000	980	950	-	-	-
	Med High	4	Y2*			1040	1025	1010	1000	990	975	960	945	930	915	900	880	850	-	-	-
	Med	3				950	935	920	905	890	875	860	845	830	815	800	760	730	-	-	-
	Med Low	2	Y1			860	845	830	815	800	785	770	755	740	720	700	660	590	-	-	-
	Low	1	G			740	720	700	680	660	645	630	605	580	540	500	460	-	-	-	-
030	High	5	W	9 x 7	1/2	1220	1205	1190	1180	1170	1160	1150	1140	1130	1115	1100	1050	930	-	-	-
	Med High	4	Y2*			1130	1115	1100	1090	1080	1070	1060	1045	1030	1015	1000	980	950	-	-	-
	Med	3				1040	1030	1020	1005	990	975	960	945	930	915	900	890	850	-	-	-
	Med Low	2	Y1			950	935	920	905	890	875	860	845	830	815	800	770	730	-	-	-
	Low	1	G			790	770	750	735	720	700	680	660	640	620	600	530	500	-	-	-
036	High	5	W	10 x 8	1/2	1450	1435	1420	1405	1390	1375	1360	1345	1330	1315	1300	1270	1250	1210	-	-
	Med High	4	Y2*			1350	1335	1320	1305	1290	1275	1260	1245	1230	1215	1200	1170	1140	1100	-	-
	Med	3	Y1			1170	1150	1130	1115	1100	1080	1060	1045	1030	1015	1000	960	920	880	-	-
	Med Low	2				1000	980	960	940	920	905	890	870	850	825	800	760	710	650	-	-
	Low	1	G			990	915	840	800	760	730	700	680	660	630	600	520	470	430	-	-
042	High	5	W	11 x 10	1	1960	1945	1930	1915	1900	1880	1860	1845	1830	1810	1790	1750	1700	1660	-	-
	Med High	4	Y2*			1790	1775	1760	1745	1730	1710	1690	1670	1650	1535	1420	1560	1500	1450	-	-
	Med	3				1700	1685	1670	1650	1630	1615	1600	1575	1550	1525	1500	1450	1400	1350	-	-
	Med Low	2	Y1			1630	1560	1600	1520	1560	1535	1510	1490	1470	1445	1420	1370	1300	1250	-	-
	Low	1	G			1490	1445	1400	1375	1350	1325	1300	1270	1240	1210	1180	1120	1000	930	-	-
048	High	5	W	11 x 10	1	1960	1945	1930	1915	1900	1880	1860	1845	1830	1810	1790	1750	1700	1660	1600	-
	Med High	4	Y2*			1790	1775	1760	1745	1730	1710	1690	1670	1650	1535	1420	1560	1500	1450	-	
	Med	3				1700	1685	1670	1650	1630	1615	1600	1575	1550	1525	1500	1450	1400	1350	1350	-
	Med Low	2	Y1			1630	1560	1600	1520	1560	1535	1510	1490	1470	1445	1420	1370	1300	1250	-	
	Low	1	G			1490	1445	1400	1375	1350	1325	1300	1270	1240	1210	1180	1120	1000	930	-	
060	High	5	W	11 x 10	1	2210	2230	2190	2194	2170	2155	2130	2120	2100	2087	2060	2020	2000	1960	1920	1890
	Med High	4	Y2*			2030	2073	2000	2035	1970	1995	1940	1958	1910	1922	1870	1840	1800	1760	1720	1680
	Med	3				1850	1931	1820	1889	1790	1850	1760	1812	1730	1774	1680	1640	1600	1560	1510	1450
	Med Low	2	Y1			1770	1796	1740	1761	1710	1718	1680	1682	1630	1651	1590	1560	1500	1450	1400	1340
	Low	1	G			1570	1661	1540	1616	1510	1573	1460	1533	1420	1495	1370	1320	1250	1200	1100	1020
066	High	5	W	11 x 10	1	2390	2454	2370	2414	2340	2371	2320	2328	2290	2289	2270	2230	2200	2170	2140	2100
	Med High	4	Y2*			2210	2248	2180	2205	2160	2166	2140	2129	2100	2094	2070	2040	2000	1960	1940	1890
	Med	3	Y1			2030	2115	2010	2072	1980	2030	1950	1996	1900	1965	1880	1840	1800	1760	1720	1680
	Med Low	2				1860	1985	1830	1939	1800	1898	1770	1862	1730	1828	1690	1640	1600	1570	1510	1460
	Low	1	G			1780	1784	1750	1742	1720	1696	1680	1656	1640	1625	1600	1550	1500	1460	1400	1380

Factory speed settings are in Bold

Air flow values are with dry coil and standard filter

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [fpm] = Airflow [cfm] / Face Area [sq ft]).

Then for velocities of 200 fpm reduce the static capability by 0.03 in. wg, 300 fpm by 0.08 in. wg, 400 fpm by 0.12in. wg., and 500 fpm by 0.16 in. wg.

Highest setting is for auxiliary heat (W) and lowest setting is for constant blower (G). The "Y1" and "Y2" settings must be between the "G" and "W" settings.

***Single speed compressor section units will need to remove the TAN wire on the 5 speed motor and replace it with the RED wire. Tape end and secure the TAN wire.**

The SAH Air Handler blower is factory wired for dual speed compressor section operation.

1/10/17

SAH 5 Speed ECM Blower Performance Data Option A cont.

5-Speed ECM Constant Torque Motors

The 5-Speed ECM is a 'Constant Torque' ECM motor and delivers air flow similar to a PSC but operates as efficiently as an ECM Motor. Because it's an ECM Motor, the 5-Speed ECM can ramp slowly up to down like the ECM motor. There are 5 possible speed taps available on the 5-Speed ECM motor with #1 being the lowest airflow and #5 being the highest airflow. These speed selections are preset at the time of manufacture and are easily changed in the field if necessary.

If more than one tap are energized at the same time, built in logic gives precedence to the highest tap number and allows air flow to change with G, Y1, Y2 and W signals. Each of those 5 speeds has a specific 'Torque' value programmed into the motor for each speed selection. As static pressure increases, airflow decreases resulting in less torque on the rotor. The motor responds only to changes in torque and adjusts its speed accordingly.

The 5-Speed ECM motor is powered by line voltage but the motor speed is energized by 24 VAC.

5-Speed ECM Benefits:

- High Efficiency
- Soft Start
- 5 speeds with up to 4 speeds on-line
- Built-in logic allows air flow to change with G, Y1, Y2 and W signals
- Super efficient low airflow continuous blower setting.

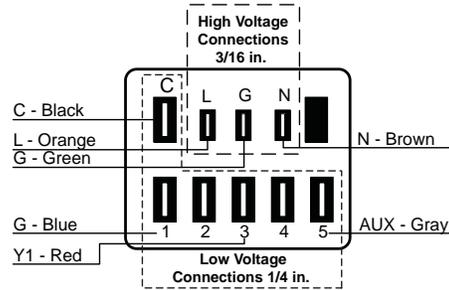
Setting Blower Speed - 5-Speed ECM

5-Speed ECM blower motors have five (5) speeds of which three (3) are selectable on single speed and four (4) are selectable on dual capacity.

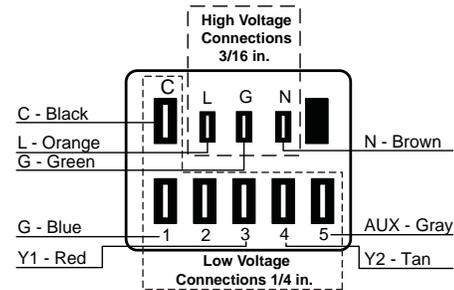


Caution: Disconnect all power before performing this operation.

5-Speed ECM Motor Connections - Single Speed Splits



5-Speed ECM Motor Connections - Dual Capacity Splits



SAH Blower Performance Data Option C

Single Speed Split with SAH Air Handler

Split Model	SAH Model	Motor HP	MAX ESP	Variable Speed ECM Settings with IntelliZone2 Blower Level Percentages											
				1	2	3	4	5	6	7	8	9	10	11	12
036	036	1/2	0.50	550	650	700	800 G	850	900	950	1050 L 55%	1100 70%-85%	1200 H 100%	1300 Aux	
042	042	1	0.75	650	750	800	900 G	1000	1150 L 55%	1200 70%	1300 85%	1400 H 100%	1500	1600 Aux	1700 Aux
048	048	1	0.75	650	750	800	900	1000 G	1150	1200	1300 L 55%	1400 70%	1500 85%	1600 H 100%	1700 Aux
060	060	1	0.75	950	1100 G	1200	1350	1500 L 55%	1650 70%	1700	1800 85%	2000 H 100%	2100 Aux	2200	
070	066	1	0.75	950	1100 G	1200	1350	1500	1650 L 55%	1700 70%	1800	2000 85%	2100 H 100%	2200 Aux	

Blower level percentages are shown with factory recommended blower speed settings 3/10/2017
L and H settings MUST be located within boldface CFM range
 "Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
 "G" may be located anywhere within the airflow table
 CFM is controlled within 5% up to the maximum ESP
 Max ESP includes allowance for wet coil and standard filter
 SAH Air Handler with control option "C"

Dual Capacity Split with SAH Air Handler

Split Model	SAH Model	Motor HP	MAX ESP	Variable Speed ECM Settings with IntelliZone2 Blower Level Percentages											
				1	2	3	4	5	6	7	8	9	10	11	12
026	026	1/2	0.50		400 G	500	600 L 55%	700 70%	800 85%	900 H 100%	1000	1100	1200 Aux		
038	036	1/2	0.50	550	650	700 G	800	850 L 55%	900	950 70%	1050 85%	1100	1200 H 100%	1300 Aux	
049	048	1	0.75	650	750	800 G	900	1000 L 55%	1150	1200 70%	1300	1400 85%	1500	1600 H 100%	1700 Aux
064	060	1	0.75	950 G	1100 L 55%	1200	1350 70%	1500	1650	1700 85%	1800	2000 H 100%	2100 Aux	2200	
072	066	1	0.75	950	1100 G	1200	1350 L 55%	1500	1650 70%	1700	1800 85%	2000	2100 H 100%	2200 Aux	

Blower level percentages are shown with factory recommended blower speed settings 3/10/2017
L and H settings MUST be located within boldface CFM range
 "Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
 "G" may be located anywhere within the airflow table
 CFM is controlled within 5% up to the maximum ESP
 Max ESP includes allowance for wet coil and standard filter
 SAH Air Handler with control option "C"

Blower Performance Data Option C cont.

Setting Blower Speed - Variable Speed ECM

The ABC board's Yellow Config LED will flash the current ECM blower speed selections for "G", low, and high continuously with a short pause in between. The speeds can also be confirmed with the AID Tool under the Setup/ECM Setup screen. The Aux will not be flashed but can be viewed in the AID Tool. The ECM blower motor speeds can be field adjusted with or without using an AID Tool.

ECM Setup without an AID Tool

The blower speeds for "G", Low (Y1), High (Y2), and Aux can be adjusted directly at the Aurora ABC board which utilizes the push button (SW1) on the ABC board. This procedure is outlined in the ECM Configuration Mode portion of the Aurora 'Base' Control System section. The Aux cannot be set manually without an AID Tool.

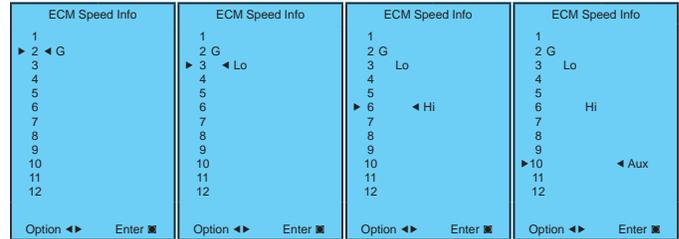
ECM Setup with an AID Tool

A much easier method utilizes the AID Tool to change the airflow using the procedure below. First navigate to the Setup screen and then select ECM Setup. This screen displays the current ECM settings. It allows the technician to enter the setup screens to change the ECM settings. Change the highlighted item using the ◀ and ▶ buttons and then press the ⏎ button to select the item.



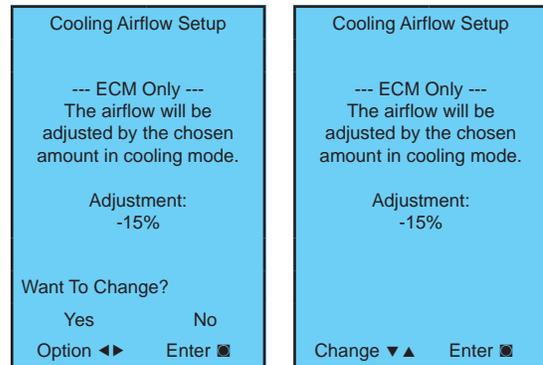
Selecting YES will enter ECM speed setup, while selecting NO will return to the previous screen.

ECM Speed Setup - These screens allow the technician to select the "G", low, high, and auxiliary heat blower speed for the ECM blower motor. Change the highlighted item using the ▲ and ▼ buttons. Press the ⏎ button to select the speed.



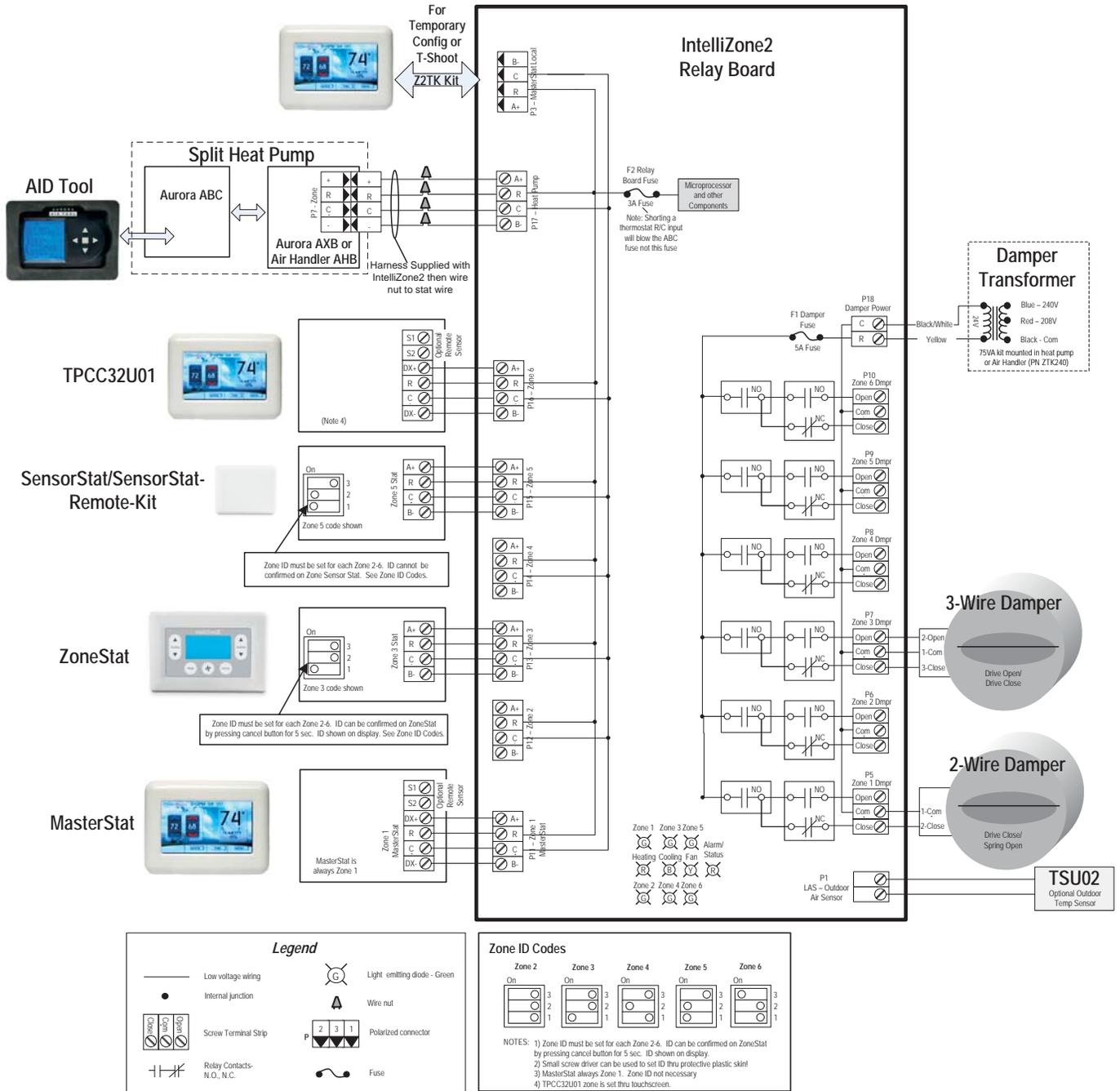
After the auxiliary heat speed setting is selected the AID Tool will automatically transfer back to the ECM Setup screen.

Cooling Airflow Setup - These screens allow the technician to select -15%, -10%, -5%, None or +5%. Change the adjustment percentage using the ▲ and ▼ buttons. Press the ⏎ button to save the change.



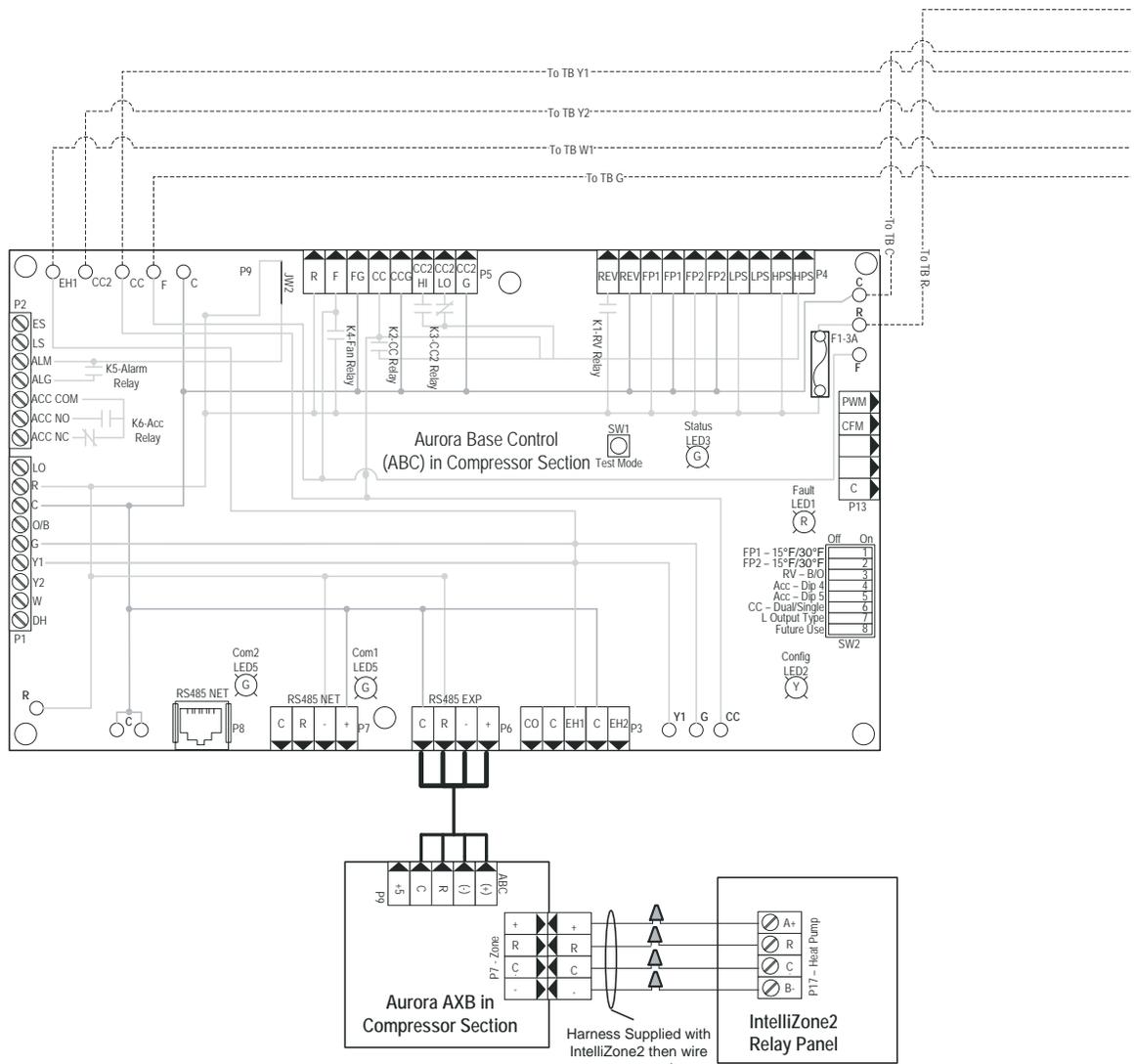
Wiring Schematic

Split Units



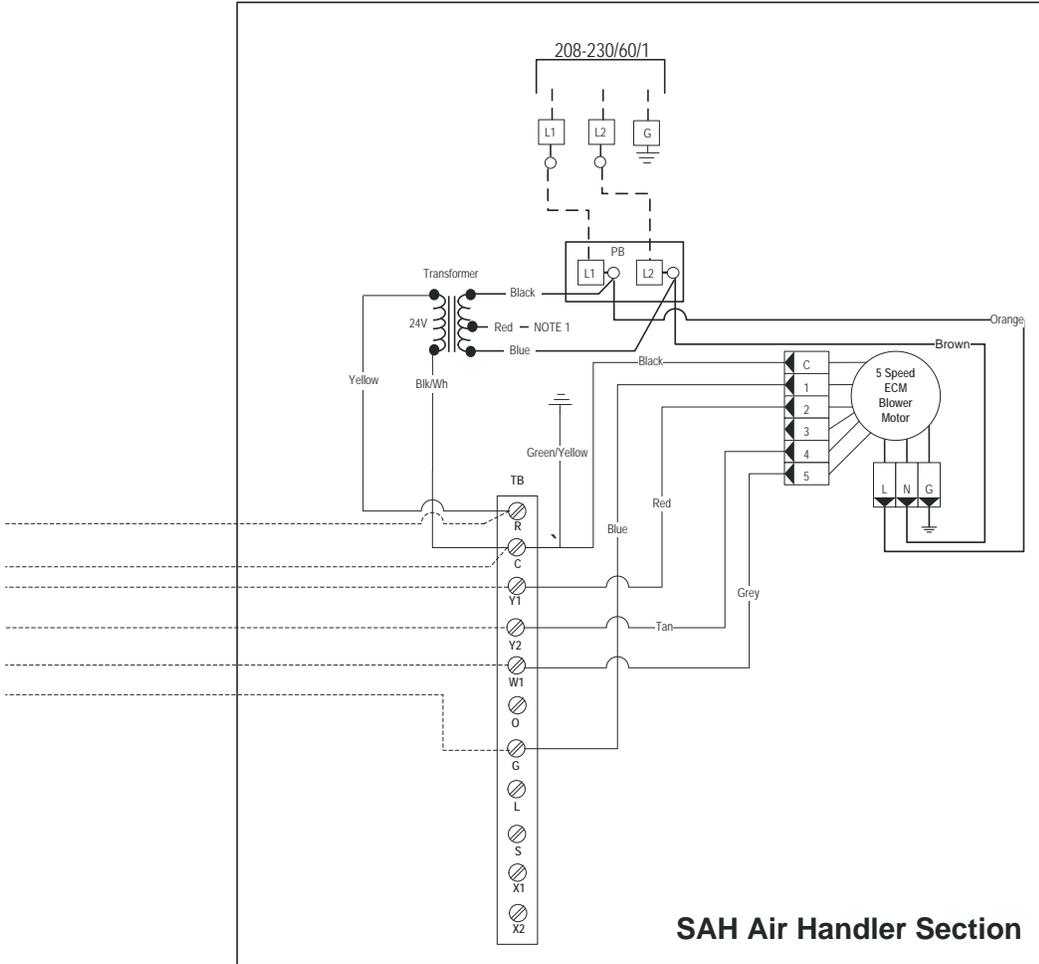
Wiring Schematic cont.

Split Units AXB and 5 Speed ECM



Wiring Schematic cont.

Split Units AXB and 5 Speed ECM



Legend

	Factory Low voltage wiring		Light emitting diode - Green
	Factory Line voltage wiring		208-230V Relay coil
	Field low voltage wiring		Electric Heat Contactor
	Field line voltage wiring		Polarized connector
	Optional block		Power block
	DC Voltage PCB traces		Heater element
	Internal junction		Breaker
	Quick connect terminal		
	Thermal Limit Switch		
	Field wire lug		
	Ground		
	N.O., N.C.		
	ER1 to ER4 - Aux heat stage relays		

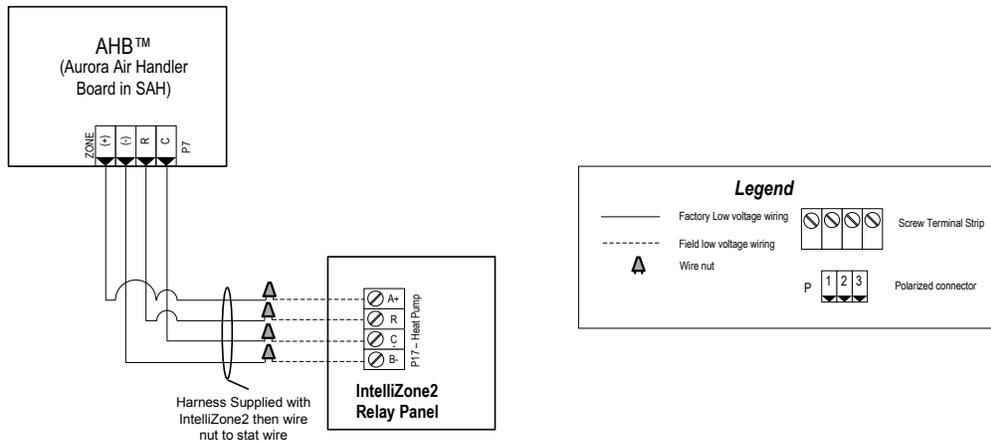
Notes:

1 - To operate in 208V mode replace the blue transformer wire connected to PB-L2 with red transformer wire.

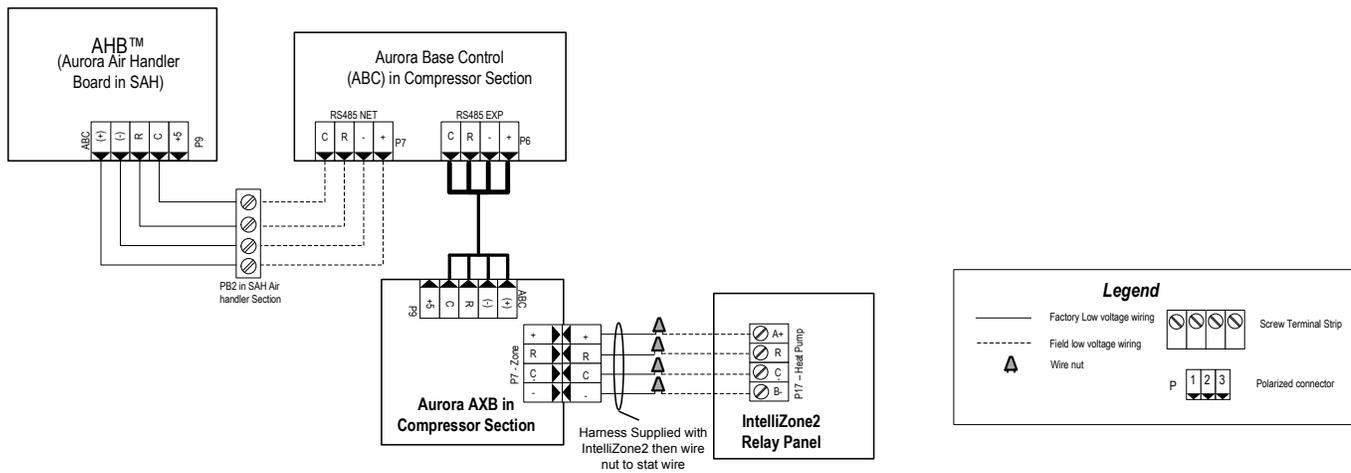
2 - Low voltage wiring CLASS 2.

Wiring Schematic cont.

IntelliZone2 with AHB and Variable Speed ECM



IntelliZone2 with Split ABC/AXB and SAH AHB and Variable Speed ECM



Revision Guide

Pages:	Description:	Date:	By:
Misc.	Updated Schematics, Added new Air Handler information	1 May 2017	JM
Misc.	Minor Revisions & Added SensorState Remote Kit	24 May 2016	JM
Misc.	Minor Revisions to Configuration section	03 Nov 2015	MA
18	Added 'Dual Fuel' Description	07 April 2015	MA
All	Minor Revisions, AWL Information Added	12 Feb 2015	MA
All	Software Update	04 June 2014	MA
4	Added Outdoor Sensor to Components	29 Apr 2014	DS
9	Updated Damper Wiring Diagrams	29 Apr 2014	DS
15-16	Updated Staging Descriptions and Features	29 Apr 2014	DS
23	Updated Dual Capacity Blower Table	29 Apr 2014	DS
29	Revision Table Added	29 Apr 2014	DS

Product: **IntelliZone2**
Type: Comfort Zoning System
Size: Six Zone Capability
Document: Installation Manual



PROUD MEMBER

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