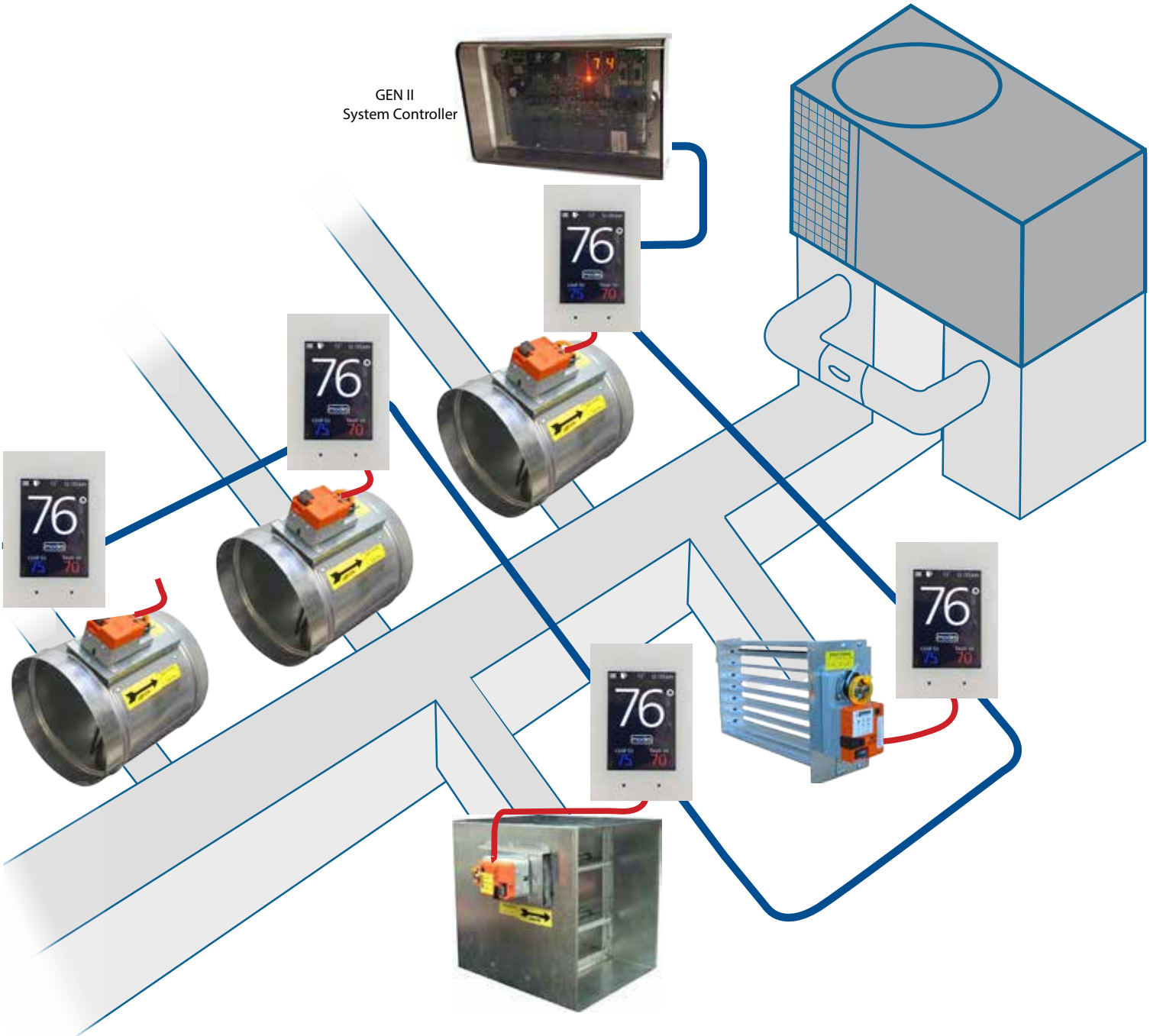
GEN II-VVT

VOTE BASED AUTO CHANGEOVER *VVT*

A MODULATING SYSTEM

COMMERCIAL ZONING - SIMPLIFIED



Installation and Applications Manual

Zonex SYSTEMS
comfort you control

GEN II
QUICK START AND COMMISSIONING

Follow these Quick steps for a successful job

If you need additional information, please read the GEN II Manual

1. Install GEN II controller inside the conditioned space, in an easily accessible location for your customer.

2. Install an independent 24 volt 100 VA transformer, and connect to the TR1 and TR2 terminals on the GEN II controller. **Do not ground out the transformer.**

3. Install the LAT sensor in the supply air, ahead of any bypass takeoffs. Wire sensor to the S S terminals on the GEN II controller.

4. Install Dampers and Bypass Dampers.

5. Install all thermostat sub-bases.

6. Wire TR1 and TR2 terminals from the GEN II controller to the first thermostat sub-base TR1 and TR2 - only (18 ga thermostat wire).

7. Wire A & B terminals from GEN II controller using Zonex TWPR or STPR Plenum rated twisted pair wire to the first thermostat sub-base A & B - only.

8. Damper wiring - connect RO, RC, MC wires from each thermostat to its damper actuator using 18 ga thermostat wire.

9. Attach the first EzTouch thermostat to it's sub-base.

10. Address the thermostat as #1 and select damper type operation - see page 11-12 for EzTouch installation, addressing and operation.

11. Turn on GEN II controller switch "E". Power light should light up and look at the display "G" on the GEN II controller, and the #01 should appear on the display. This indicates you are communicating with the first thermostat.

12. If you don't see the #01 and 00 is displayed, check the address. If the address on the stat is #01, then check wires for TR1 & TR2 polarity and A & B for correct connections.

13. If #01 is displayed on the GEN II controller, then daisy chain wires from thermostat #1 to the next thermostat and address it #2; then repeat the ON-OFF switch operation and confirm the #02 shows up on the display indicating the system is now communicating with 2 thermostats.

14. Continue adding EzTouch thermostats; and confirm communication by repeating the ON-OFF switch operation until all thermostats are wired and the total number of thermostats on the job show up on the display on the GEN II controller.

15. Go to any EzTouch and make a Cool Call. Look at the GEN II controller and confirm Y1 (yellow LED) and G (green LED) lights are on.

16. Turn OFF the Cool Call to be sure Y1 and G turn OFF at the GEN II controller.

17. Repeat with a Heat Call for W1 (red LED).

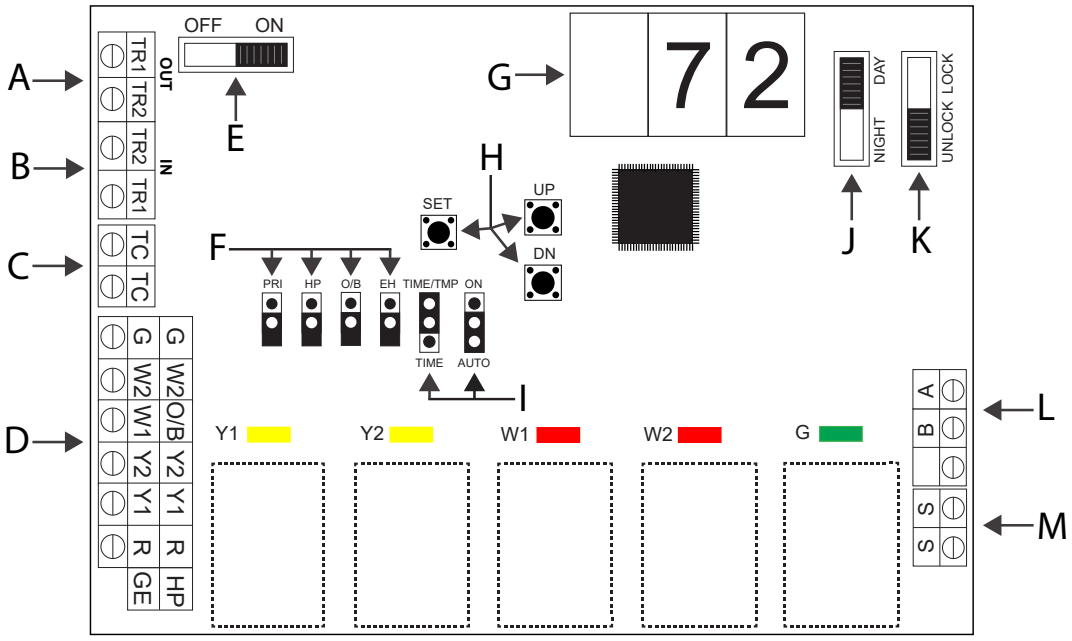
18. Wire GEN II controller to the A/C unit.

19. Set thermostat to call for cooling, and check register to be sure each damper opens and closes as you make and satisfy the call.

For Advanced Feature Configuration or additional operating information, review the attached GEN II manual.

GEN II
QUICK START AND COMMISSIONING

GEN II-VVT



The ***GEN II*** is equipped with a ***Digital Display (G) that constantly displays Leaving Air Temperature from the unit.*** At startup, this display also reports the number of thermostats communicating with the ***GEN II*** controller. The display and 3 buttons (**H**) beneath the display provide the installing contractor the ability to tailor the system to your specific application.

The ***GEN II*** controller is shipped from the factory configured for basic Gas/Electric operation. However, the following should be checked as part of the initial installation setup procedures:

1. **EH** jumper **(F)** is installed by the factory on one pin for normal gas heat operation where the fan is controlled by the HVAC system fan control. When a fan output is required from the GEN II controller on a call for heat, place the **EH** jumper over both pins for several seconds and then remove. Place the jumper tab on one pin.
2. **O/B** and **HP** jumpers **(F)** should both be on one pin or removed for GE operation.
3. **PRIORITY (PRI)** jumper **(F)** should be on one pin.
   Note: If the Priority opposing zone strategy is to be used, this jumper position will be changed after the initial system start-up is completed.
   See Advanced Feature Configuration on page 21.
4. Set the Power Switch **(E)** to **ON**.
5. Set the **NIGHT DAY** switch **(J)** to the **DAY** position.
6. Set the fan jumper **(I)** to **AUTO** for intermittent operation or **ON** for constant ON operation in the Occupied mode.
7. Place the **LOCK** – **UNLOCK** switch **(K)** in the UNLOCK position.
8. Place the **TIME/TEMP** jumper **(I)** on the middle and upper pins to control Y2 and W2 staging on run time and supply air temperature.

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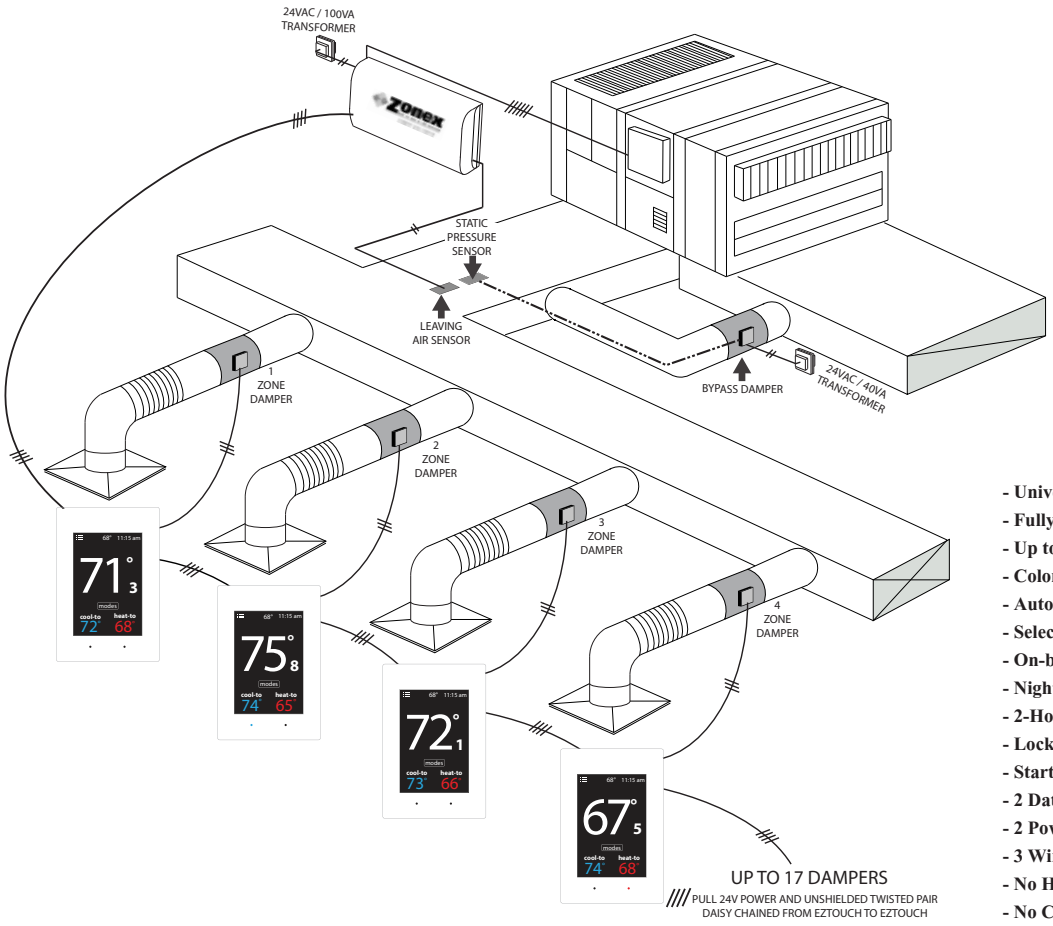


System Features

- **Universal for G/E or H/P Units**
- **Fully Modulating Zone Dampers**
- **Up to 17 Zones Per Unit**
- **Color Touch Screen Thermostats**
- **Auto- Changeover Operation**
- **Selectable Priority**
- **On-board Capacity Control**
- **Night Setback Included**
- **2-Hour Override**
- **Lock Stats Remotely**
- **Start Up Diagnostic**
- **2 Data Wires**
- **2 Power Wires**
- **3 Wire Stat to Damper**
- **No Home Run Wiring**
- **No Computer Required For Setup**

SYSTEM OVERVIEW

The ***GEN II*** is a commercial modulating zone control system controlling 2-17 independent zones per unit. The ***GEN II*** controller is designed for Auto Changeover, multi-stage Heat Pump (2C/3H) and Gas Electric (2C/2H) applications.

The ***GEN II*** system uses the Zonex EzTouch, which modulates and controls the “ST” series, 3-wire, 24-volt, power open / power close round and rectangular dampers.

Sophisticated, integrated software allows for a wide range of system control and changeover strategies, allowing the contractor to tailor the ***GEN II*** system to your specific application.

Additional features include LED status indication of all system functions, digital LAT display, fully adjustable capacity control with on-board limit settings, and optional staging strategies. Night setback operation is standard, with selectable 2-hour override at each stat, along with a unique feature to remotely lock thermostats in the system.

The system provides the installing contractor with a simple startup diagnostic to minimize wiring errors and speed installation.

GEN II is recognized as the Industry’s easiest commercial zone control system to install and wire. The ***GEN II*** system operates over an unshielded two-wire data link, along with two 24v power wires all daisy chained from stat to stat with no home run wiring required. Three wires from the stat to actuator control a modulating damper in each zone.

The ***GEN II*** system does not require a computer to set up or operate.

GEN II offers the following additional control features:

1. *Set Cooling and Heating capacity cut-out set points*
2. *Adjustable timing to initiate 2nd stage operation*
3. *Adjustable opposing call changeover timing*
4. *Priority demand votes on a stat-by-stat basis*
5. *Provide default occupied and unoccupied set points on every stat*
6. *Automatically open all dampers for air balancing*

GEN II components:

- ***GEN II*** controller (includes integrated capacity control)
- Zone thermostats
- Modulating power open / power close 24vac supply dampers
- Modulating power open / power close 24vac bypass damper with static pressure control
- Communication cable (Belden 8740) twisted pair or Zonex supplied equal
- Time Clock
- 24vac 100va transformers: to control system and all supply dampers
- 24vac 40va transformers: for bypass damper and static pressure control

GENERAL SEQUENCE OF OPERATION

When the GEN II controller is powered up, the total number of addressed thermostats (EzTouchs) are determined and verified on the display. This confirms the controller is communicating with all thermostats in the system. If there are no active heat or cool calls detected, the supply dampers will modulate to 40% open for ventilation mode. The system blower operation can be configured for constant ON or intermittent Auto. The controllers are shipped from the factory for Auto fan.

The GEN II systems can be field configured for adjustable time based opposing call changeover, vote based majority changeover, or priority vote changeover by thermostat assignment. The GEN II controller is shipped from the factory for 10-minute opposing call changeover. The GEN II controller “polls” the thermostats once per minute to determine the thermostat demand status for heat and cool. The heat and cool changeover functions will operate by the type of changeover selected on the controller. When the GEN II controller changes modes, a 5-minute purge cycle is initiated before the changeover is completed.

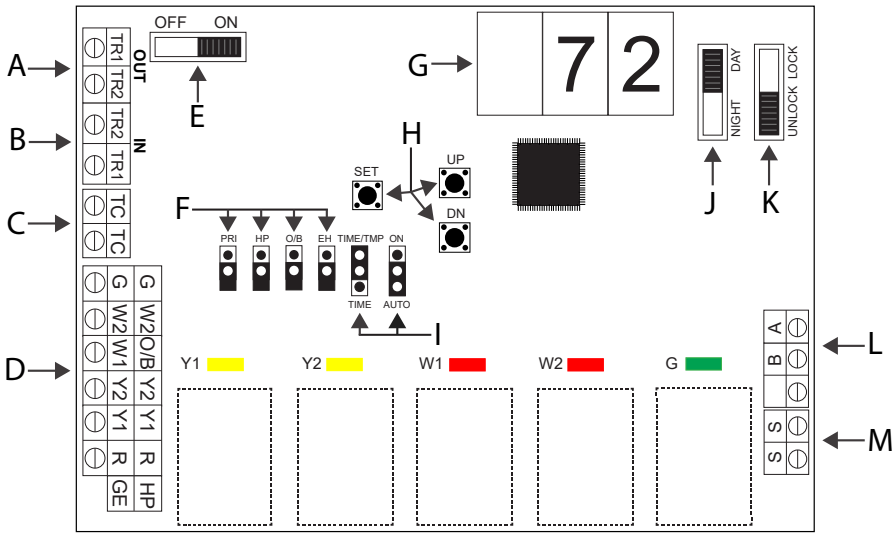
On active heat or cool calls, the non-calling zones will modulate to the closed position. When the last calling zone is satisfied in either heat or cool mode, the GEN II controller terminates the HVAC outputs after the next “poll” and the blower output will be de-energized (unless controller is configured for constant fan) for a 5-minute purge cycle. During the purge cycle no heat or cool calls are recognized.

When the system is in the heating mode and calls for cooling are received, an opposing call timer strategy operates. This timer is adjustable from 10 - 30 minutes. The factory default is 10 minutes. At the end of the selected time period, if the opposing call is 3° away from set point, heating is turned off. After a 5-minute purge mode, Cooling is turned on until the cool call is satisfied. If necessary, GEN II will return to the heating mode, If all calls have been satisfied, dampers will modulate to the 40% open position for ventilation. If the opposing zone strategy is not desired, this feature may be disabled.

This mode may be enhanced by adding Priority votes to each thermostat in the system, thereby weighting certain zones more than others. This Priority mode allows you to select 0, 1, or 2 additional votes for a thermostat that has unusual loads, like a conference room.

Minimum / Maximum damper positions can be set to provide ventilation. Each thermostat has Auxiliary contacts that support and control a supplemental heat source i.e., baseboard, reheat, or hot water coil, to meet the temperature requirements of any commercial application.

GEN II-VVT



LEGEND

A TR1 & TR2 Power out to EzTouch TR1 & TR2 (18 ga thermostat wire)

B TR1 & TR2 24-Volt Transformer

C TC – TC Time Clock Terminals

D Unit Terminals

E On / Off Switch

F *Priority Jumper* (Allows for Priority Vote Setup)
H/P Jumper (Jump for Heat Pump Operation)
O/B Jumper (Heat Pump Only – Reversing Valve Operation)
EH Jumper (Set Up Fan Operation for Electric Heat)

G Digital Display (Leaving Air Temperature and configuration)

H Up / Down / Set Buttons (High Limit, Low Limit, Set)

I *Fan Jumper* (Continuous or Auto)
Staging Strategy (Time / Temperature or Time Only)

J Day / Night Switch

K Lock / Unlock (Lock Thermostats)

L A / B Communications Wire

M S S Terminals – Leaving Air Sensor (LAT)

TERMINAL FUNCTIONS / CONNECTIONS

TX-A / RX-B - Data Transmit / Receive
S S – Leaving / Supply Air Sensor Input
G – Fan Output
W2 – Stage 2 Heat Output
W1 – Stage 1 Heat Output
Y2 – Stage 2 Cool Output
Y1 – Stage 1 Cool Output
R – 24vac from Unit Transformer
TC / TC – Time Clock Input for Occupied / Unoccupied Operation
TR1 / TR2 – 24vac Power Input / Common
TR1 / TR2 - Stat Power Daisy Chain Stat to Stat (18GA Thermostat wire)

General Installation Instructions

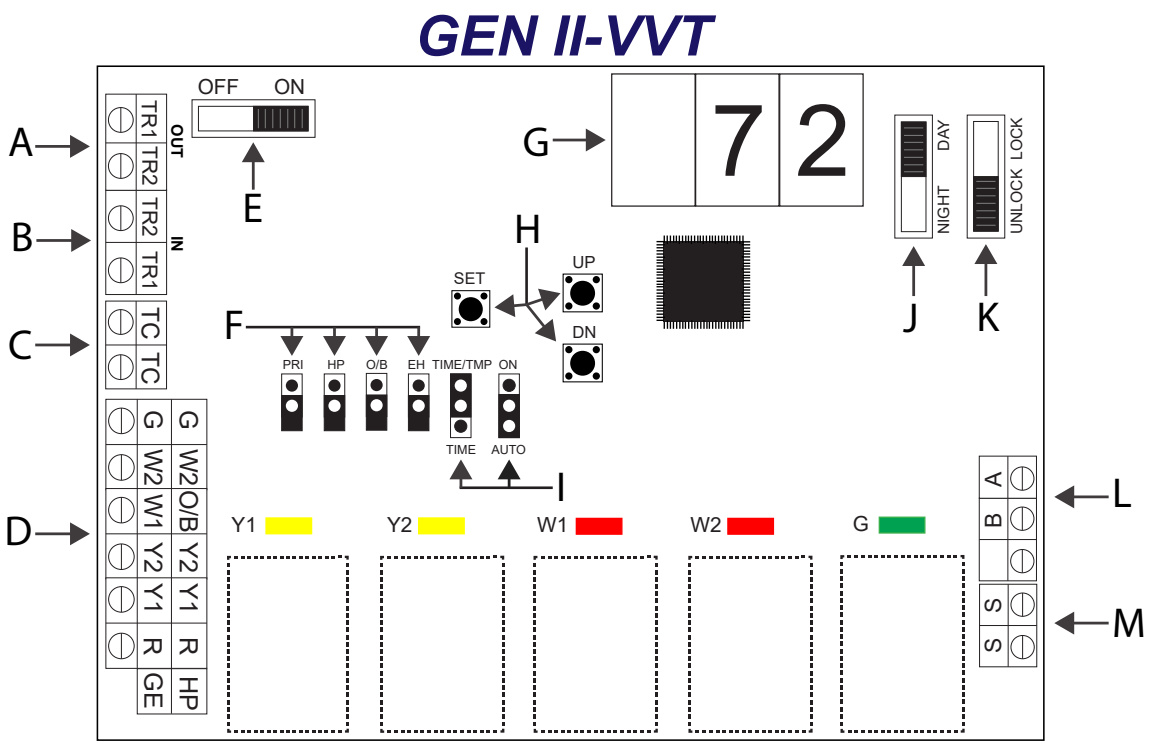
GEN II Controller

1. Install the ***GEN II*** controller on an interior wall where the ambient temperature is between 32°-120°F (0°- 48°C) non-condensing. This controller is to be installed in an accessible interior area; not in attics or above ceilings.
2. The controller is to be powered by a **dedicated** 24vac 100va transformer. The transformer secondary is wired to **TR1 TR2** on the controller **(B). DO NOT ground out the transformer**
   The secondary voltage to the controller must be 24 to 28vac. **DO NOT ground out the transformer.**

3. Install the leaving air sensor (LAT) in the supply air, ahead of the bypass take-off. Sensor wires are connected to the **S S** terminals on the controller **(M).** The LAT sensor leads may be extended using standard 18/2 thermostat wire.
4. The leaving air sensor (LAT) is calibrated to the controller at the factory. However, the calibration should be checked as part of the system setup procedure. If adjustments are required, use the Blue potentiometer labeled R44 located in the upper right hand corner of the *GEN II* controller. Screw the pot clockwise to lower the display temperature and counter - clockwise to raise the temperature. **NOTE**: The display will update every 10 seconds.
5. Confirm you have connected the **A** and **B** communication wires and **TR1** and **TR2** from the thermostats to the Gen II controller (**A & L**), A=(TR1, TR2), L=(A, B). (Communication wire maxmum is 4,000 ft. from the Gen II controller to the farthest EzTouch).
6. Connect the output wires from the controller to the HVAC system using standard 18 GA thermostat wire.

The LAT sensor leads may be extended using standard 18/2 thermostat wire.

Gas Electric - Basic *GEN II* Controller Configuration



The ***GEN II*** is equipped with a ***Digital Display (G) that constantly displays Leaving Air Temperature from the unit.*** The display and 3 buttons beneath the display provide the installing contractor the ability to tailor the system to your specific application.

The ***GEN II*** controller is shipped from the factory configured for basic Gas/Electric operation. However, the following should be checked as part of the initial installation setup procedures:

1. **EH** jumper **(F)** is installed by the factory on one pin for normal gas heat operation where the fan is controlled by the HVAC system fan control. When a fan output is required from the GEN II controller on a call for heat, place the **EH** jumper over both pins for several seconds and then remove. Place the jumper tab on one pin.

2. **O/B** and **HP** jumpers **(F)** should both be on one pin or removed, for GE operation.
3. **PRIORITY** jumper **(F)** should be on one pin.
   Note: If the Priority opposing call strategy is to be used, this jumper position will be changed after the initial system start-up is completed.
   See Advanced Feature Configuration.
4. Set the power switch **(E)** to **ON**.
5. Set the **NIGHT DAY** switch **(J)** to the **DAY** position.
6. Set the fan jumper **(I)** to **AUTO** for intermittent operation or **ON** for constant ON operation in the Occupied mode.
7. Place the **LOCK** – **UNLOCK** switch **(K)** in the UNLOCK position.
8. Place the **TIME/TEMP** jumper **(I)** on the middle and upper pins to control Y2 and W2 staging on run time and supply air temperature.

GEN II Gas Electric Advanced Feature Configuration

Gas Electric Capacity Control - Cool and Heat cut-out temperature adjust

The factory setting for the Cool and Heat cut-out temperatures is 45°- 145°F (7°- 62°C). This can be easily changed with the following procedure:

1. ***Cool cut-out temp*** – Press the DN button **(H)**; "C" will be displayed and then the cut-out temperature.
2. LOWER – Press the DN button; after the "C" is displayed, continue to hold the DN button until the desired temperature is displayed; then release.
   NOTE: The controller will not change the Cool cut-out lower than 40°F (4°C).
3. RAISE – Press the DN button; after "C" is displayed, immediately release the DN button and press the UP button. Hold until the desired temperature reading is displayed and release.
4. Press the DN button to verify the new cool cut-out temperature.

Heat cut-out temperature - Press and hold the UP button; after the "H" is displayed, use the same procedure as above to raise or lower the displayed temperature.

Electric Heat - Fan Configuration

EH jumper **(F)** is installed by the factory on one pin for normal gas heat operation where the fan is controlled by the HVAC system fan control. When a fan output is required from the ***GEN II*** controller on a call for heat, place the **EH** jumper over both pins for several seconds and then remove. Place the jumper tab on one pin.

2nd Stage Heat and Cool Cut-in / Cut-out Configuration

The GEN II controller is set up at the factory to stage Y2 and W2 cut-in operation based on a 3-minute time delay and supply air temperature. This is done using the TIME/TEMP (I) jumper. Time may be field configured from 3-20 minutes by the contractor during system configuration. The cut-in temperatures are fixed in the controller program at 58°F (14°C) and higher for Y2 and 120°F (48°C) and lower for W2. The GEN II controller second stage cut-out temperature is fixed in the controller program at 50°F (10°C). Y2 will de-energize when it drops below 50°F and re-energize when it rises above 58°F. If the air temperature drops below the low cut-out (45°F) Y1 and Y2 are de-energized and the controller will go into a 5 minute purge mode. After 5 minute purge, if the temperature has risen above the low cut-out Y1 is re-energized. Heat W1 and W2 will de-energize if leaving air temperature rises above heat cutout and will be locked out for 5 minutes. After 5 minute lockout, if a heat call remains and leaving air temperature is lower than heat cutout, W1 will re-energize. By placing jumper on bottom two pins, a time only strategy may be configured into the system. (see below);

Adjust 2nd Stage Cut-in Time Delay

1. To increase the Y2 and W2 cut-in delay, press and hold the SET and DN buttons **(H)** simultaneously. When 03 appears in the display, release the buttons and immediately press the UP button and hold until the desired delay time is displayed, and release. The time delay is fully adjustable from 3 - 20 minutes. To verify the change, press and hold the SET and DN buttons simultaneously until the delay time is shown, and release.

2. To decrease the Y2 and W2 cut-in delay, press and hold the SET and DN buttons **(H)** simultaneously. When delay time appears in the display, release the buttons and immediately press the DN button and hold until the desired delay time is displayed, and release. To verify the change, press and hold the SET and DN buttons until the delay time is shown, and release.

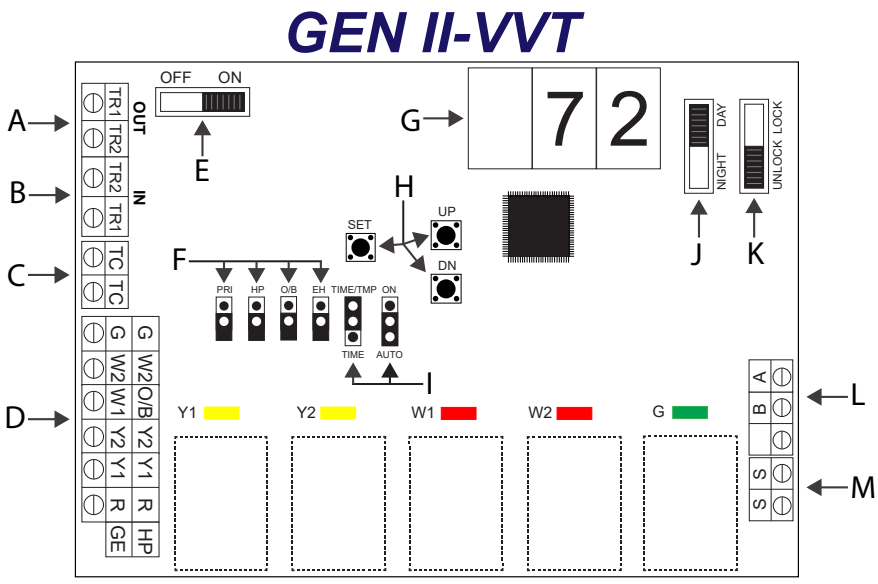
Configure 2nd Stage Cut-in for Time Delay and Thermostat Demand Only

1. Place the 2nd stage configuration jumper **(I)** on the middle and lower pins - TIME.

2. If the cut-in time delay must be changed from the factory setting of 03 (3 min), follow the above procedures to raise or lower the time delay value.

3. Verify time delay value by pressing the SET and DN buttons simultaneously.

HEAT PUMP OPERATION



LEGEND

- **A** TR1 &TR2 Power out to EzTouch TR1 & TR2 (18 ga thermostat wire)
- **B** TR1 & TR2 24-Volt Transformer
- **C** TC – TC Time Clock Terminals
- **D** Unit Terminals
- **E** On / Off Switch
- **F** *Priority Jumper* (Allows for Priority Vote Setup)
  H/P Jumper (Jump for Heat Pump Operation)
  O/B Jumper (Heat Pump Only – Reversing Valve Operation)
  EH Jumper (Set Up Fan Operation for Electric Heat)
- **G** Digital Display (Leaving Air Temperature and configuration)
- **H** Up / Down / Set Buttons (High Limit, Low Limit, Set)
- **I** *Fan Jumper* (Continuous or Auto)
  Staging Strategy (Time / Temperature or Time Only)
- **J** Day / Night Switch
- **K** Lock / Unlock (Lock Thermostats)
- **L** A / B Communications Wire
- **M** S S Terminals – Leaving Air Sensor (LAT)

TERMINAL FUNCTIONS / CONNECTIONS

TX-A / RX-B - Data Transmit / Receive
S S – Leaving / Supply Air Sensor Input
G – Fan Output
W2 – Auxiliary / Emergency Heat
O/B – Reversing Valve Output
Y2 – Stage 2 Cool Output
Y1 – Stage 1 Cool Output
R – 24vac from Unit Transformer
TC / TC – Time Clock Input for Occupied / Unoccupied Operation
TR1 / TR2 – 24vac Power Input / Common
TR1 / TR2 - Stat Power Daisy Chain Stat to Stat (18GA Thermostat wire)

General Installation Instructions

GEN II Controller

1. Install the ***GEN II*** controller on an interior wall where the ambient temperature is between 32°-120°F (0°- 48°C) non-condensing. This controller is to be installed in an accessible interior area; not in attics or above ceilings.
2. The controller is to be powered by a **dedicated** 24vac 100va transformer. The transformer secondary is wired to **TR1 TR2** on the controller **(B).** The secondary voltage to the controller must be 24 to 28vac. **DO NOT ground out the transformer**.
3. Install the LAT air sensor in the supply air between the indoor coil and electric strip heat elements.
4. The leaving air sensor (LAT) is calibrated to the controller at the factory. However, the calibration should be checked as part of the system setup procedures. If adjustments are required, use the Blue potentiometer labeled R44 located in the upper left hand corner of the *GEN II* controller. Screw the pot clockwise to lower the display temperature and counter - clockwise to raise the temperature. **NOTE**: The display will update every 10 seconds.
5. Confirm you have connected the **A** and **B** communication wires and **TR1** and **TR2** from the thermostats to the Gen II controller (**A & L**), A=(TR1, TR2), L=(A, B). (Communication wire maximum is 4,000 ft. from the Gen II controller to the farthest EzTouch).
6. Connect the output wires from the controller to the HVAC system using standard 18 GA thermostat wire.

   The LAT sensor leads may be extended using standard 18/2 thermostat wire.

Heat Pump operation "O" reversing valve

Cool Call – When a majority active cool call is received by the ***GEN II*** controller, Y1, O/B and G LEDs are illuminated; and the outputs are energized (within 1.5 to 3 minutes). After 3 minutes, if the leaving air temperature is 58°F (14°C) or above, Y2 will energize for 2-stage systems. Y2 will de-energize when it drops below 50°F and re-energize when it rises above 58°F. If the supply air temperature drops one degree below the Cool cut-out temperature, Y1 and Y2 will de-energize for 5 minutes.

"B" reversing valve – Sequence of operation is the same: O/B is energized in the heat mode.

Heat Call - When a majority active heat call is received by the ***GEN II*** controller, Y1 and G LEDs are illuminated; and the outputs are energized (within 1.5 to 3 minutes). If after 3 minutes the leaving air temperature is 94°F (34°C) or less, Y2 will energize. If after 6 minutes of run time the leaving air temperature is 91°F (32°C) or less, W2 will energize. If the supply air temperature exceeds 126°F (52°C), Y1, Y2 and W2 (if energized) will drop out; and Y1 can then energize after a 5-minute time delay. NOTE: If the system fan is configured for "AUTO" on the ***GEN II*** controller, the "G" output will be de-energized in the temperature cut-out mode.

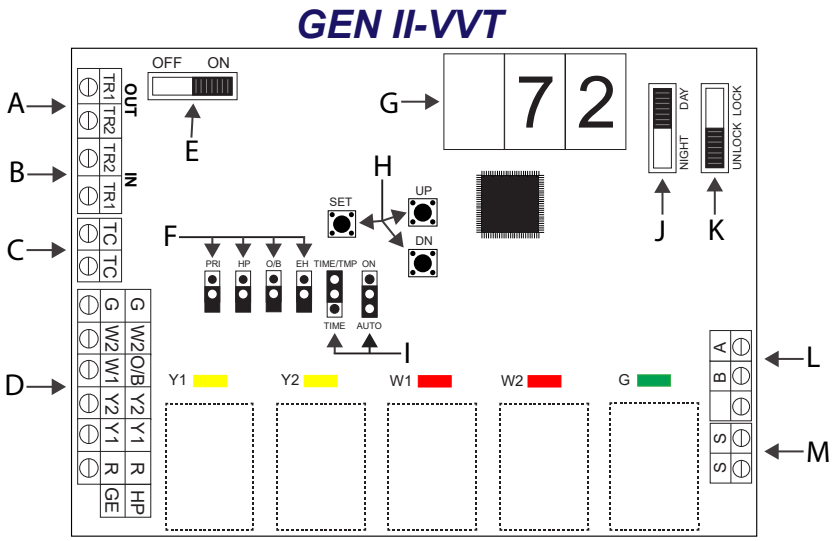
When the last active call satisfies, the ***GEN II*** controller goes into a 5-minute purge cycle with all supply dampers closing; then all dampers modulate open for ventilation.

Heat Pump operation "B" reversing valve

By placing the O/B jumper (B) on both pins, the ***GEN II*** controller is configured for "B" reversing valve operation. The operation and setup procedures are the same as with "O" mode reversing valve, except the reversing valve will be energized for heat operation.

GEN II Heat Pump Basic Configuration

The ***GEN II*** controller is shipped from the factory for Gas Electric operation.
The controller must be field configured for Heat Pump operation.



Heat Pump configuration:

1. Switch controller to OFF **(E)**.
2. Set the O/B jumper **(F)** on one pin for "O" reversing valve (energizes for cool) *or*
   Set the O/B jumper **(F)** on both pins for "B" reversing valve (energizes for heat).
3. Set the HP jumper **(F)** on both pins for Heat Pump operation.
4. Set the Priority jumper **(F)** on one pin.
5. Set the TIME / TEMP jumper **(I)** on the middle and upper pins.
6. Set NIGHT / DAY switch **(J)** for DAY position.
7. Set LOCK / UNLOCK switch **(K)** to UNLOCK.
8. Switch the controller to ON **(E)**.
9. Press the UP button **(H)**, and verify the "H" (cut-out) temperature reads 126°F (52°C) on the controller display **(G)**.

NOTE: The heat cut-out temperature must not be changed from the factory setting.

GEN II Heat Pump Advanced Feature Configuration

Heat Pump Capacity Control - Cool and Heat cut-out temperature adjustment

When the ***GEN II*** controller is configured for Heat Pump (HP jumper **(F)** on both pins), the Cool and Heat cut-out temperatures are 45°- 126°F (7°- 52°C). The cut-out temperatures can be changed with the following procedure:

Heat cut-out temp – To eliminate the possibility of the Heat Pump tripping out on high head pressure or short cycling in the heat mode, the heat cut-out temperature should never be changed from the factory setting of 126°F (52°C).

1. ***Cool cut-out temp*** – Press the DN button **(H)**; "C" will be displayed, then the cut-out temperature.
2. LOWER – Press the DN button. After the "C" is displayed, continue to hold the DN button until the desired temperature is displayed; then release.
   NOTE: The controller will not change the Cool cut-out lower than 40°F (4°C).
3. RAISE – Press the DN button. After "C" is displayed, immediately release the DN button, and press the UP button. Hold until the desired temperature reading is displayed; then release.
4. Press the DN button to verify the new cool cut-out temperature.

2nd Stage Heat and Cool Cut-in / Cut-out Configuration

The GEN II controller is set up at the factory to stage Y2 and W2 cut-in operation based on a 3-minute time delay and supply air temperature. This is done using the TIME/TEMP (I) jumper. Time may be field configured from 3-20 minutes by the contractor during system configuration. The cut-in temperatures are fixed in the controller program at 58°F (14°C) and higher for Y2 and 120°F (48°C) and lower for W2. The GEN II controller second stage cut-out temperature is fixed in the controller program at 50°F (10°C). Y2 will de-energize when it drops below 50°F and re-energize when it rises above 58°F. If the air temperature drops below the low cut-out (45°F) Y1 and Y2 are de-energized and the controller will go into a 5 minute purge mode. After 5 minute purge, if the temperature has risen above the low cut-out Y1 is re-energized. Heat W1 and W2 will de-energize if leaving air temperature rises above heat cutout and will be locked out for 5 minutes. After 5 minute lockout, if a heat call remains and leaving air temperature is lower than heat cutout, W1 will re-energize. By placing jumper on bottom two pins, a time only strategy may be configured into the system. (see below);

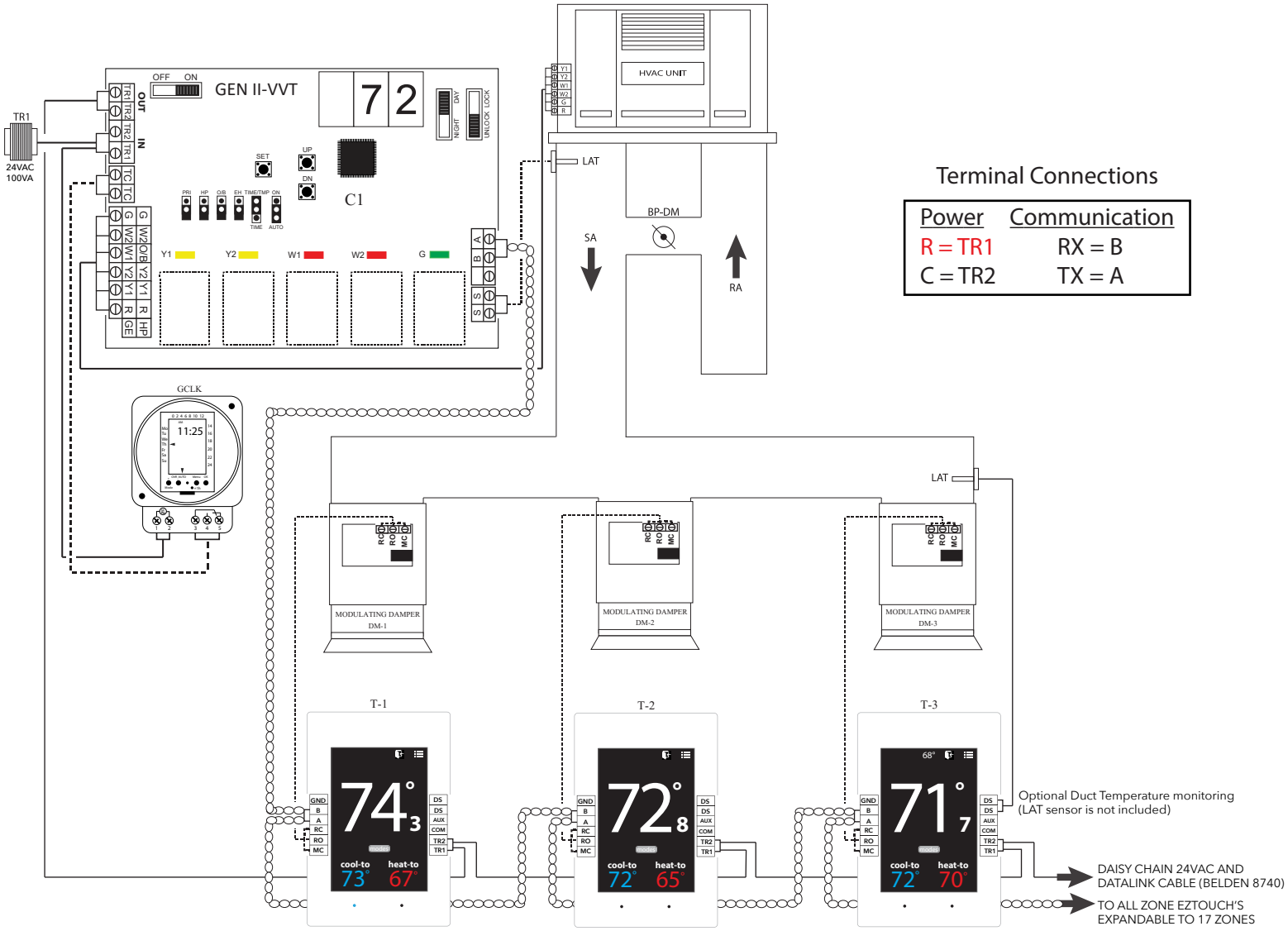
Adjust 2nd Stage Cut-in Time Delay

1. To increase the Y2 and W2 cut-in delay, press and hold the SET and DN buttons **(H)** simultaneously. When 03 appears in the display, release the buttons and immediately press the UP button and hold until the desired delay time is displayed, and release. The time delay is fully adjustable from 3 - 20 minutes. To verify the change, press and hold the SET and DN buttons simultaneously until the delay time is shown, and release.

2. To decrease the Y2 and W2 cut-in delay, press and hold the SET and DN buttons **(H)** simultaneously. When delay time appears in the display, release the buttons and immediately press the DN button and hold until the desired delay time is displayed, and release. To verify the change, press and hold the SET and DN buttons until the delay time is shown, and release.

Configure Y2 and W2 Cut-in for Time Delay and Thermostat Demand Only

1. Place the 2nd stage configuration jumper **(I)** on the middle and lower pins - **TIME**.
2. If the Y2 cut-in time delay must be changed from the factory setting of 03 (3 min), follow the above procedures to raise or lower the time delay value.
   NOTE: The cut-in delay timing for W2 (Aux Heat) is set for approximately 3 minutes in the control program and cannot be manually changed.
3. Verify time delay value by pressing the SET and DN buttons simultaneously.



Terminal Connections

Power	Communication
R = TR1	RX = B
C = TR2	TX = A

Installation

Wiring

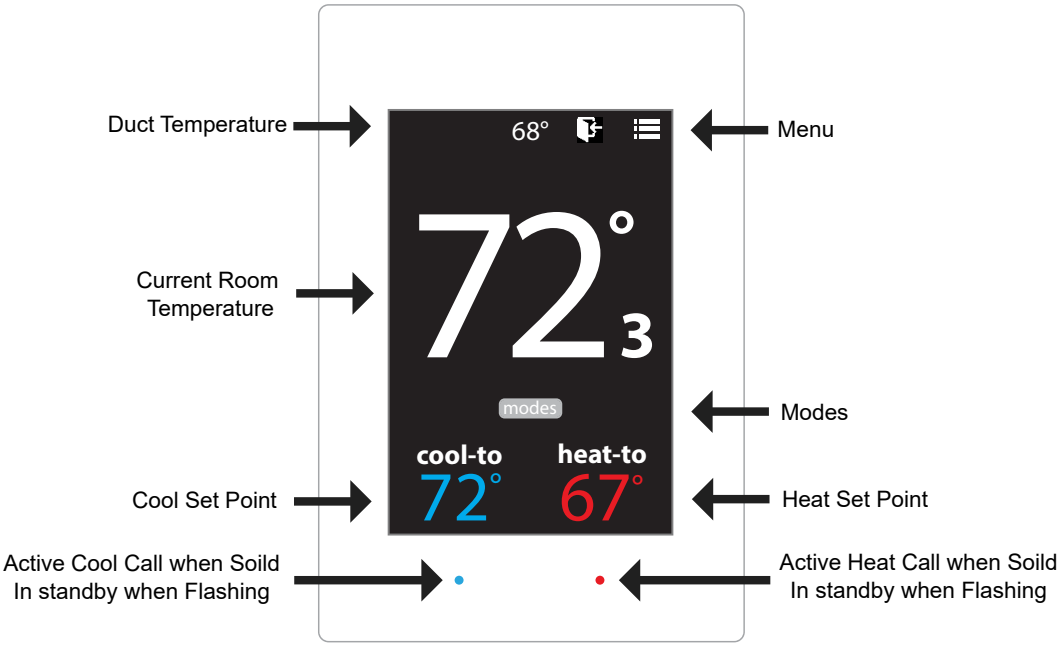
All 24-volt and communication wiring connections are made to terminal blocks on the thermostat sub-base. The communication terminal block (A/B / A/B) is designed as a junction for two sets of 22 ga tinned copper, twisted pair communications cable. The cable should be daisy chained from thermostat to thermostat (use Belden 8740 or Zonex supplied equal).

1. Install the thermostat sub-base on an interior wall away from direct sunlight, supply air currents, or any heat generating source. Mounting screws and anchors are provided. The sub-base may be installed on a horizontal 2x4 electrical box.

2. Connect the control wires from the EzTouch's TR1 & TR2, to the ***GEN II*** controller TR1 & TR2 (**A**). Verify TR1 & TR2 polarity is the same on each thermostat (18 ga Thermostat wire)

3. On the EzTouch, connect the damper output wires from MC, RC and RO to the actuator motor terminals.

4. Connect the A / B communication wires on the left hand terminal block; there are 2 sets of A / B terminals to make the daisy chain wiring easier.
   NOTE: The communication wire must be twisted pair Belden 8740, 8450 (shielded), 82442 (plenum rated) or Zonex supplied equal.



Addressing Zone Thermostats

Every thermostat in the system needs a unique ID ranging from 1-17. They must be in numerical order the way the communication wire is daisy chained. Confirm no duplicate addresses.

To set the stat's ID access the Advanced Configuration menu by tapping on the degree symbol next to the room temp O. The degree symbol will change from white to green and then tap

Once in the Thermostat Advanced Menu, Select **SET ID**

Use the ^ and v arrows and set the new ID ranging from 1-17

Tap to save changes, to return to the home screen tap

Select Damper Type

The EzTouch needs to be configured for the type of damper that it is wired to. There are 4 options, round, rectangular or spring loaded.

To set the stat's ID access the Advanced Configuration menu by tapping on the degree symbol next to the room temp O. The degree symbol will change from white to green and then tap

While in Thermostat Configuration Menu, Select **Damper Type**

Select round, rectangular or spring loaded damper operation

Tap to save changes, to return to the home screen tap

Display Temperature Calibration

Thermostats are calibrated at the factory and should require no further adjustment. However, the display space temperature may be field calibrated by the following procedure:

To access the Thermostat Configuration Menu: Tap

While in Thermostat Configuration Menu, Select **Calibrate Display**

Use the ^ and v arrows to calibrate the thermostat display to a external temperature probe temperature reading.

Tap to save changes, to return to the home screen tap

Adjusting Set Points

The Heat or Cool set points are displayed at the bottom of the screen. To adjust the set points, tap on the heat-to or cool-to temperatures; the set points will be displayed on the screen.

Use the ^ and v arrows over the flame/snowflake icons to set the desired heat and cool set points.

Tap to save changes

The Heat and Cool set points can be individually set for the Occupied and Unoccupied modes.

Occupied Mode: Heat to and Cool to settings - When the Day/Night switch is in the DAY position, or time clock in Occupied.

Unoccupied Mode: Heat to and Cool to settings - When the Day/Night switch is in the NIGHT position, or time clock in Unoccupied.

Changing Mode

The thermostats are auto changeover, but specific modes may be selected. Heat/Cool mode is the default.

System Heat/Cool - Tap on modes , select “Heat/Cool”. Tap to save changes

System Heat Only - Tap on modes , select “Heat Only”. Tap to save changes

System Cool Only - Tap on modes , select “Cool Only”. Tap to save changes

System Off - Tap on modes , select “Off”. Tap to save changes

Override Operation

When the thermostat displays the unoccupied icon a 2-hour temporary override may be initiated by tapping the “Override” will appear. When additional override time is required, tap the unoccupied icon again.

Auxiliary Heat / Reheat

The zone thermostat provides the following Auxiliary Heat options; Baseboard, Baseboard W1 and Reheat (see figure on the following page for more details) with configurable dead band of 2°, 3°, or 4°. **Note: Reheat has a fixed 2° dead band. And when using in duct electric strip heater, an airflow proving switch is required for safe operation.**

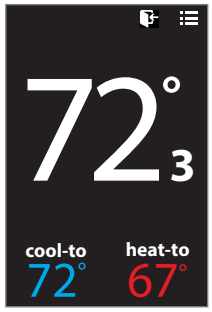
Configuration of Auxiliary Heat/Reheat is accomplished by selecting “SELECT AUX HEAT” function in the Advanced Menu. To access the Advanced Menu tap the O degree symbol of the room temperature (the degree symbol should change color to green) then tap the in the upper right corner of the thermostat, Tap “Select Aux Heat”, Select the desired Auxiliary Heat/Reheat and dead band (2°, 3°, or 4°). Tap on to save desired settings. To return to the home screen tap

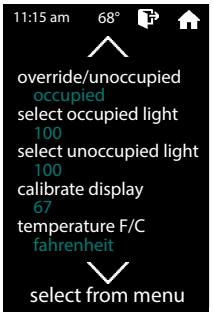
THERMOSTAT CONFIGURATION MENU

To access the Thermostat Configuration Menu: Tap

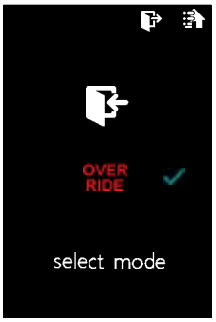
The **THERMOSTAT CONFIGURATION MENU** allows you to:

Override/Unoccupied
Calibrate Display
Select Occupied Light
Temperature F/C
Select Unoccupied Light
Set Display Accuracy





OVERRIDE/UNOCCUPIED



When a thermostat displays "unoccupied mode ", a 2-hour temporary override maybe initiated.

While in the Thermostat Configuration Menu, Select **Override/Unoccupied**

Tap "**override**" to place the thermostat into a override mode.

Tap to save changes, to return to the home screen tap

Shortcut note: Tap on to place the thermostat into 2 hour override mode

SELECT OCCUPIED LIGHT

The brightness of the thermostat during occupied mode is adjustable from 100% down to off .

While in Thermostat Configuration Menu, Select **Occupied Light**

Use the and arrows to select the desired brightness.

Tap to save changes, to return to the home screen tap

Note: If "off" is selected, just touch stat to wake it up.

SELECT UNOCCUPIED LIGHT

The brightness of the thermostat during unoccupied mode is adjustable from 100% down to off .

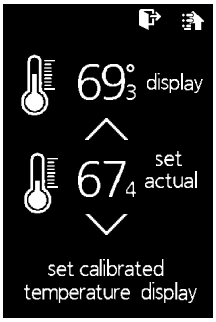
While in Thermostat Configuration Menu, Select **Unoccupied Light**

Use the ∧ and ∨ arrows to select the desired brightness.

Tap to save changes, to return to the home screen tap

Note: If "off" is selected, just touch stat to wake it up.

CALIBRATE DISPLAY



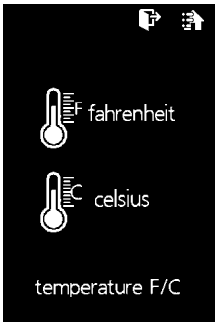
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

While in Thermostat Configuration Menu, Select **Calibrate Display**

Use the ∧ and ∨ arrows to calibrate the thermostat display to a external temperature probe temperature reading.

Tap to save changes, to return to the home screen tap

TEMPERATURE F/C



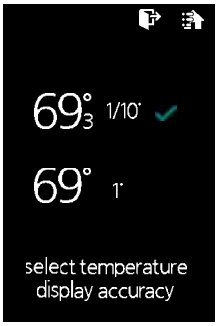
The EzTouch can be configured for F° or C° operation.

While in the Thermostat Configuration Menu, Select **Temperature F/C**

Select the the desired temperature operation

Tap to save changes, to return to the home screen tap

SET DISPLAY ACCURACY



Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

While in the Thermostat Configuration Menu, Select **Set Display Accuracy**

Select the the desired display accuracy

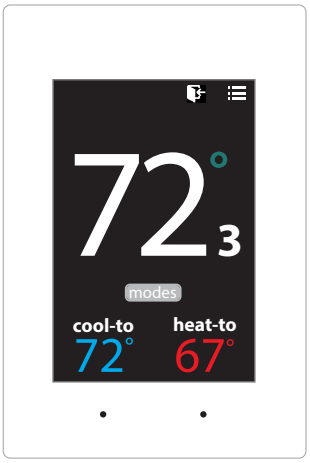
Tap to save changes, to return to the home screen tap

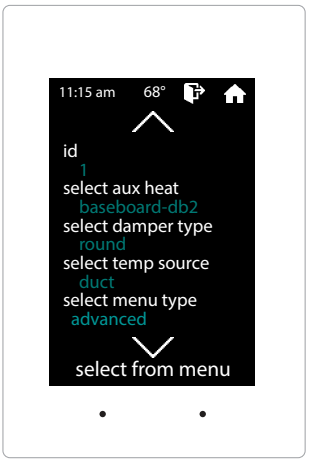
THERMOSTAT ADVANCED MENU

To access the Thermostat Advanced Menu: Tap on the degree symbol next to the room temp. The degree symbol will change color from white to green and then tap .

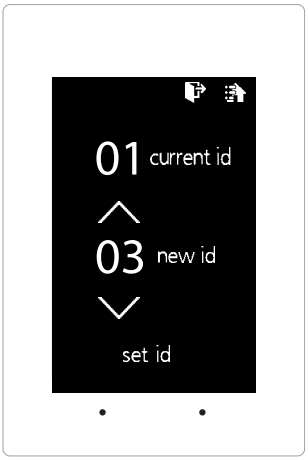
The **THERMOSTAT ADVANCED MENU** allows you to:

Set ID	Select Aux Heat	Select damper type
Temp Source	Select Menu Type	Diagnostic





STAT ID



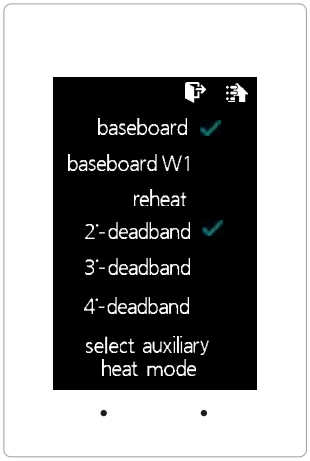
Every thermostat in the system needs a unique ID. They must be ID'ed in numerical order the way the communication wire is daisy chained. No duplicate addresses.

While in the Thermostat Advanced Menu, Select **SET ID**

Use the ^ and v arrows to set the new ID ranging from 1-17

Tap to save changes, to return to the home screen tap

SELECT AUX HEAT



The zone thermostat provides the following Auxiliary Heat options; Baseboard, Baseboard W1 and Reheat with configurable dead band of 2°, 3°, or 4°.

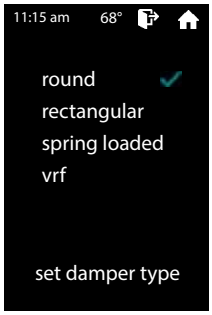
While in the Thermostat Advanced Menu, Select **Aux Heat**

Select the the desired auxiliary heat operation and dead band

Tap to save changes, to return to the home screen tap

Note: Reheat has a fixed 2° dead band.

SELECT DAMPER TYPE



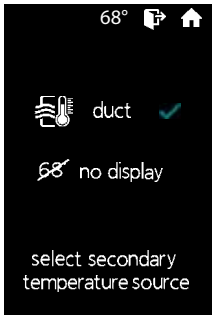
The EzTouch needs to be configured for the type of damper that it is wired to. There are 4 options, round, rectangular orspring loaded.

While in the Thermostat Advanced Menu, **Select Damper Type**

Select round, rectangular or spring loaded damper operation

Tap to exit diagnostic screen, to return to the home screen tap

TEMP SOURCE



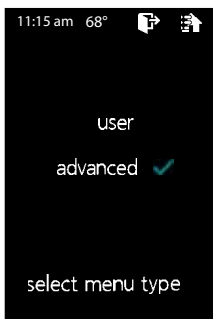
Temp source allows the thermostat to display the outside air temperature, supply air duct or relative humidity at the top on the home screen. A LAT sensor needs to be installed to report this reading. It will read 00 if no sensor is installed.

While in the Thermostat Advanced Menu, Select **Temp Source**

Select outside, duct, humidity or no display to diplay or not display the duct temperature

Tap to save changes, to return to the home screen tap

SELECT MENU TYPE



Menu type will allow you to see the advanced menu options under the user menu when advanced is selected.

While in the Thermostat Advanced Menu, Select **Menu Type**

Select **user** to hide the advanced options
Select **advanced** to show the advanced options under the user menu

Tap to save changes, to return to the home screen tap

DIAGNOSTIC

The EzTouch Diagnostic screen will allow you to confirm communication with the GEN II controller and allow you to confirm damper, aux relay, and LED operation.

While in the Thermostat Advanced Menu, Select **Diagnostic**

Tap **damper** to confirm closed/open operation
Tap **aux relay** to confirm it energizes and de-energizes
Tap **blue led** to confirm the blue led illuminates
Tap **red led** to confirm the red led illuminates

Tap  to exit diagnostic screen, to return to the home screen tap 

The zone thermostat provides the following Auxiliary Heat options; Baseboard, Baseboard W1 and Reheat (see figure on the following page for more details) with configurable dead band of 2°, 3°, or 4°. **Note: Reheat has a fixed 2° dead band.**

Baseboard: the thermostat's auxiliary output will energize when the room temperature drops 2° - 4° below the heat set point. Auxiliary heat operations will remain energized until the heat call is satisfied.

Baseboard W1: the auxiliary output will energize before the unit heater at 1° below heat set point. When the room temperature drops 2° - 4° below set point the thermostat will send a heat call to the unit heater. Auxiliary heat operations will remain energized until the heat call is satisfied.

Reheat: when the zone temperature drops 2° below the heat set point the damper will modulate to approximately 40% providing air flow over the electric heat strips, the AUX terminal will energize, and strip heat will provide reheat.
Note: When using in duct electric strip heater, an airflow proving switch is required for safe operation.

Configuration of Auxiliary Heat/Reheat is accomplished by selecting "SELECT AUX HEAT" function in the Advanced Menu. To access the Advanced Menu tap the degree symbol of the room temperature (the degree symbol should change color to green) then tap the in the upper right corner of the thermostat, see **Fig 1**. Tap "Select Aux Heat", see **Fig 2**. Select the desired Auxiliary Heat/Reheat and dead band (2°, 3°, or 4°) see **Fig 3**. Tap on to save desired settings. To return to the home screen tap

Home Screen

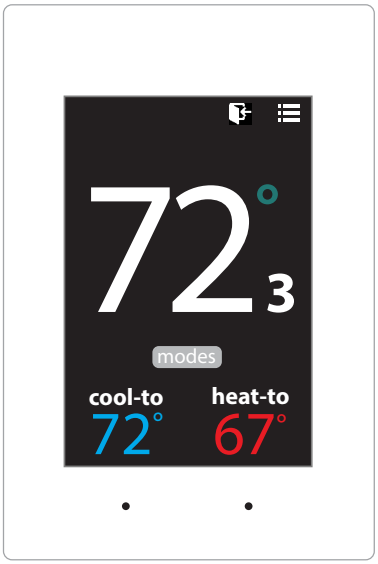


Fig 1

Advanced Menu

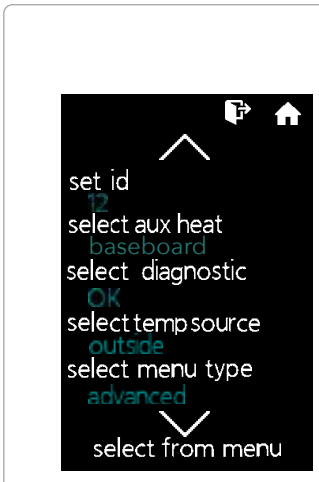


Fig 2

Select Aux Heat Menu

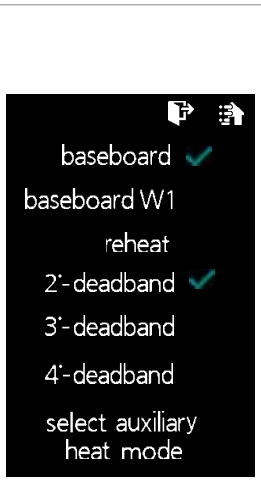
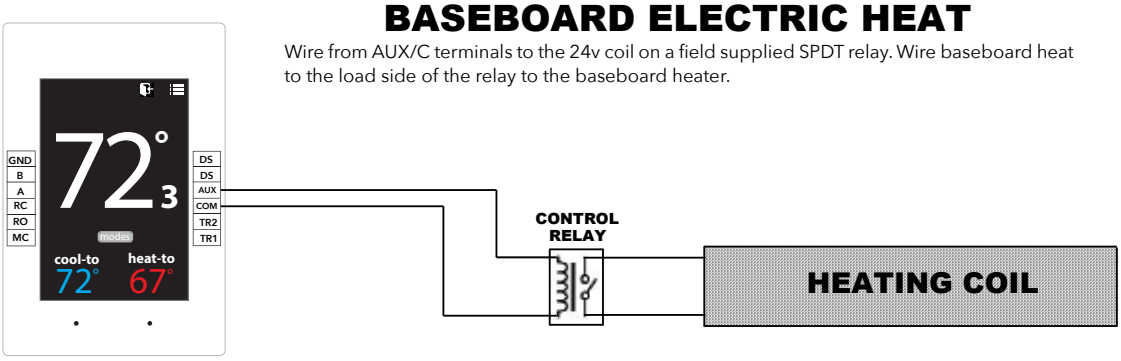


Fig 3

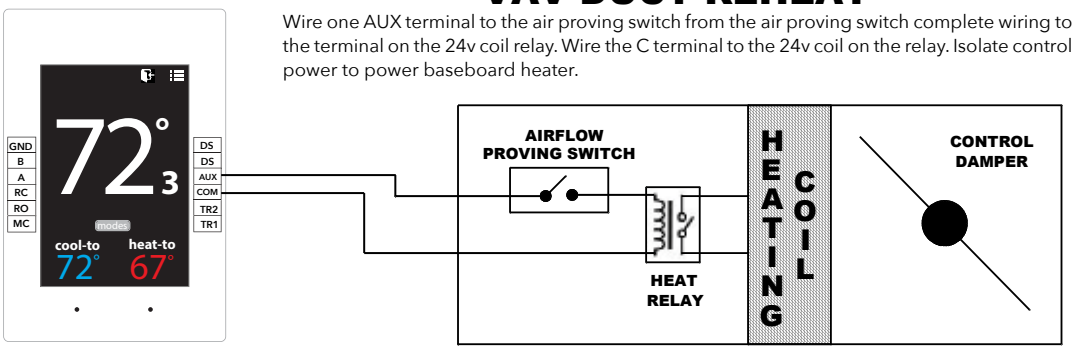
BASEBOARD ELECTRIC HEAT

Wire from AUX/C terminals to the 24v coil on a field supplied SPDT relay. Wire baseboard heat to the load side of the relay to the baseboard heater.



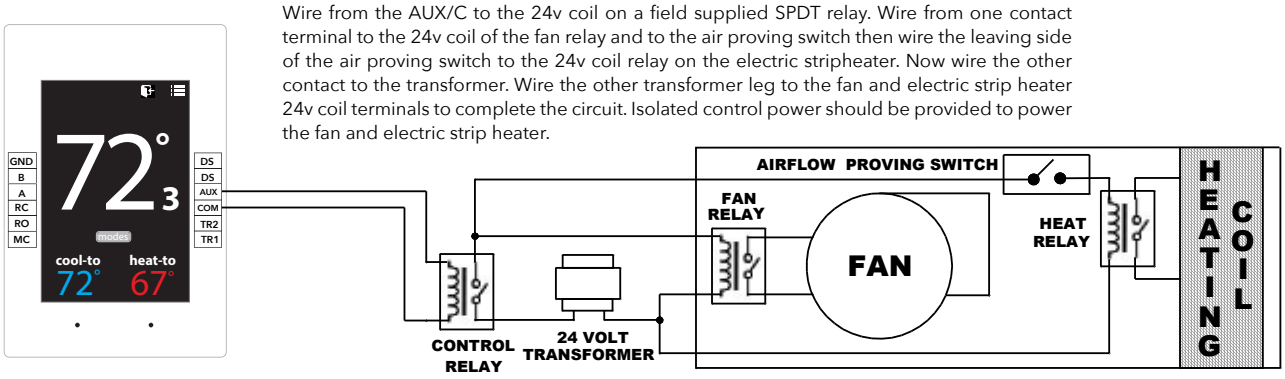
VAV DUCT REHEAT

Wire one AUX terminal to the air proving switch from the air proving switch complete wiring to the terminal on the 24v coil relay. Wire the C terminal to the 24v coil on the relay. Isolate control power to power baseboard heater.



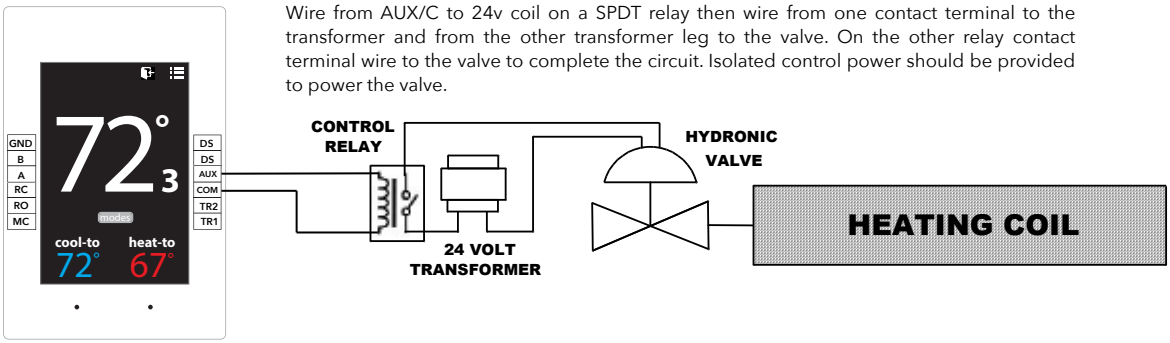
DUCT FAN REHEAT

Wire from the AUX/C to the 24v coil on a field supplied SPDT relay. Wire from one contact terminal to the 24v coil of the fan relay and to the air proving switch then wire the leaving side of the air proving switch to the 24v coil relay on the electric stripheater. Now wire the other contact to the transformer. Wire the other transformer leg to the fan and electric strip heater 24v coil terminals to complete the circuit. Isolated control power should be provided to power the fan and electric strip heater.



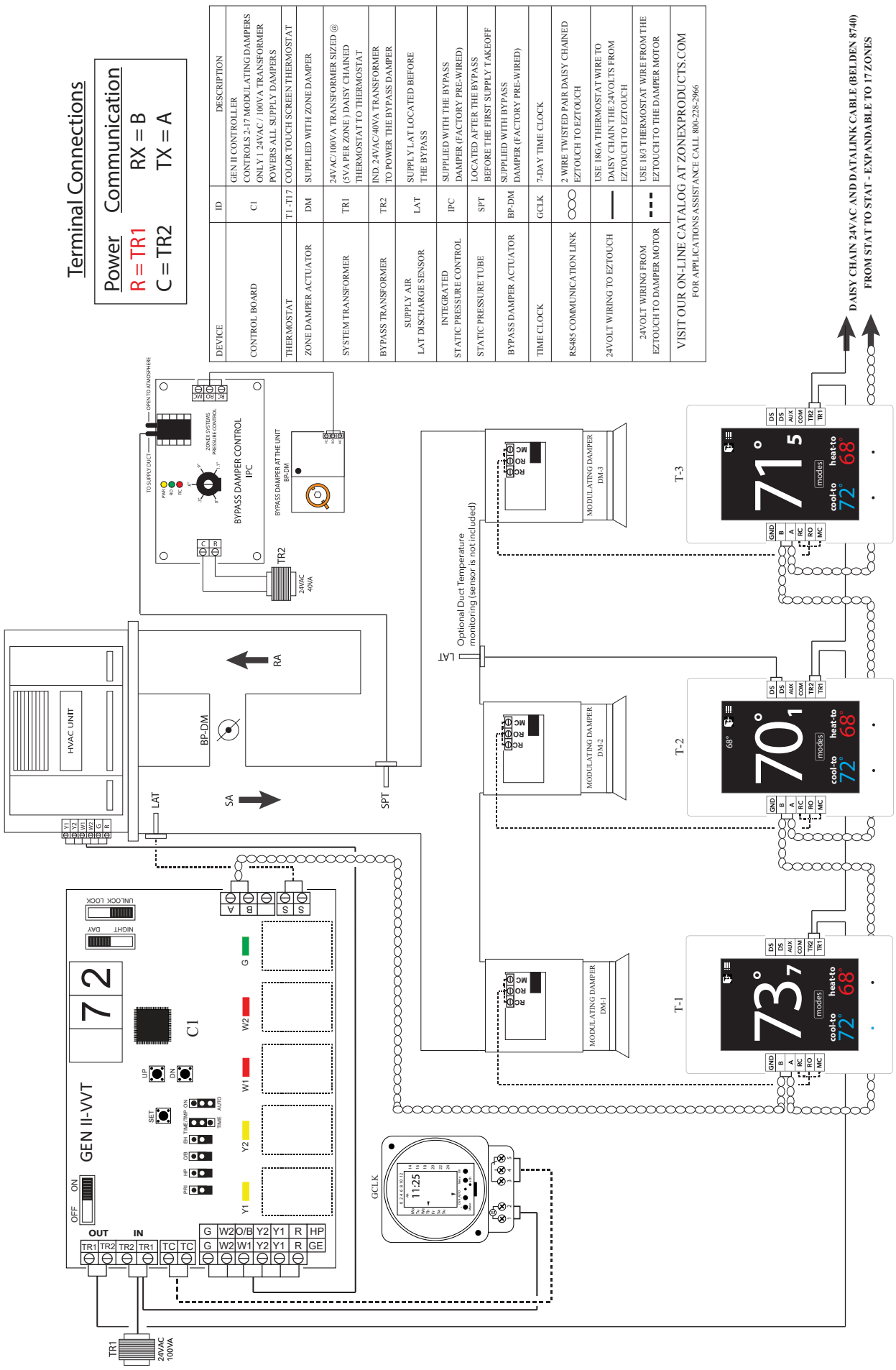
BASEBOARD HYDRONIC HEAT

Wire from AUX/C to 24v coil on a SPDT relay then wire from one contact terminal to the transformer and from the other transformer leg to the valve. On the other relay contact terminal wire to the valve to complete the circuit. Isolated control power should be provided to power the valve.



ZONEX GEN II-VVT

VOTE BASED AUTO CHANGEOVER BYPASS VAV



STAND ALONE UNIVERSAL THERMOSTAT

The SATouch is a universal color touch screen programmable G/E or H/P thermostat, microprocessor based, auto changeover, stand alone thermostat used to control stand alone fan coil units with the GEN II system. The SATouch is configured for Gas/Electric (2H, 2C) with selectable fan operation. The SATouch reports the supply and return air temperatures and has a large, easy to read display.

The SATouch is very easy to configure through the mobile App or by manually adjusting settings at the thermostat.

The SATouch features an on board thermistor for precise temperature measurement. In the event of power loss, the Heat and Cool set points are stored in non-volatile memory, without the need for battery backup.

Space ambient temperature is continually displayed with large, easy-to-read numbers. SATouch temperature display range is 47° - 95°F. Heat and Cool set points and operation modes are all indicated on the display.

Programmed set points can be manually adjusted at the thermostat or electronically locked through the mobile app to provide limited manual set point adjustment. During unoccupied hours, temporary operation can be overridden with a touch of a button.

Thermostat Operation

COOL - The thermostat will make a Y1 cool call when the space temperature rises 1° above set point. Y2 will energize when the space temperature rises 2° above the cool set point or whatever the 2nd stage temperature is set for. When the room temperature reaches set point Y1 and Y2 will de-energize. O or B energize for the reversing valve circuit, depending on configuration. The G circuit is energized for fan.

HEAT - The thermostat will make a W1 heat call when the space temperature is 1° below the heat set point. W2 will energize when the space temperature is 2° below the heat set point or whatever the 2nd stage temperature is set for. When the room temperature reaches set point W1 and W2 will de-energize.

Note: When the thermostat is configured for GAS operation the fan circuit is not energized in heat mode.
Note: When the thermostat is configured for ELECTRIC operation the fan circuit is energized in heat mode.

EMERGENCY HEAT - When Emergency Heat is selected in the configuration menu on the thermostat on a call for heat, there is an output signal on “W2” for backup heat and “G” for the fan. The compressor circuits Y1 and Y2 are locked out during heat calls, until the emergency heat function has been turned off in the configuration menu.

FAN MODE - Is factory set for “Auto”, to configure the thermostat to run the fan constant “On”. Go to Thermostat Advanced Menu, Select Fan Mode; Select the the desired fan operation “Auto” or “On”.

INSTALLATION

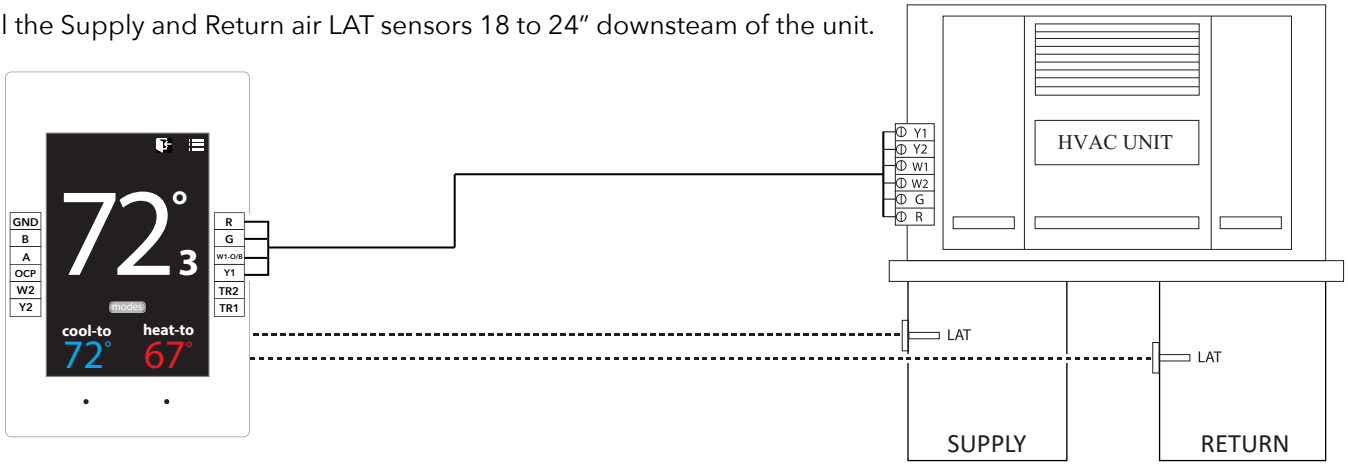
Thermostat and Terminal base

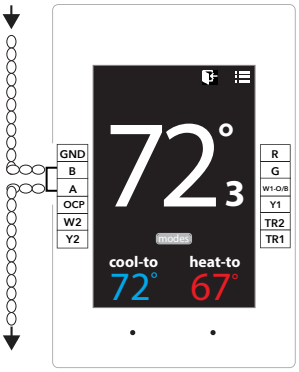
1. Install the thermostat on an interior wall, away from drafts, supply air currents and direct sunlight or any heat generating source.
2. Remove the thermostat from its sub-base, by pulling the thermostat and sub-base appart.
3. Install the thermostat sub-base to the wall using the provided anchors and screws.

WIRING THE UNIT, SUPPLY AND RETURN AIR SENSORS TO THE SATouch

Use 18/6 thermostat wire, wire from SATouch to the RTU/split system. Make sure to match up the unit terminals to the SATouch terminals R, Y1, Y2, W1/O/B, W2, G. Wire in the Supply and Return air sensors using 18/4 thermostat wire.

Install the Supply and Return air LAT sensors 18 to 24" downsteam of the unit.

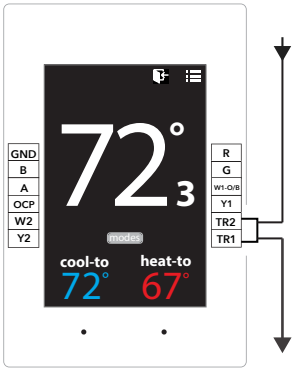




DAISY CHAIN THE COMMUNICATION WIRE

Using Zonex TWPR communication wire. Wire **IN** and **OUT** of A, B to and from SATouch's in a daisy chain configuration.

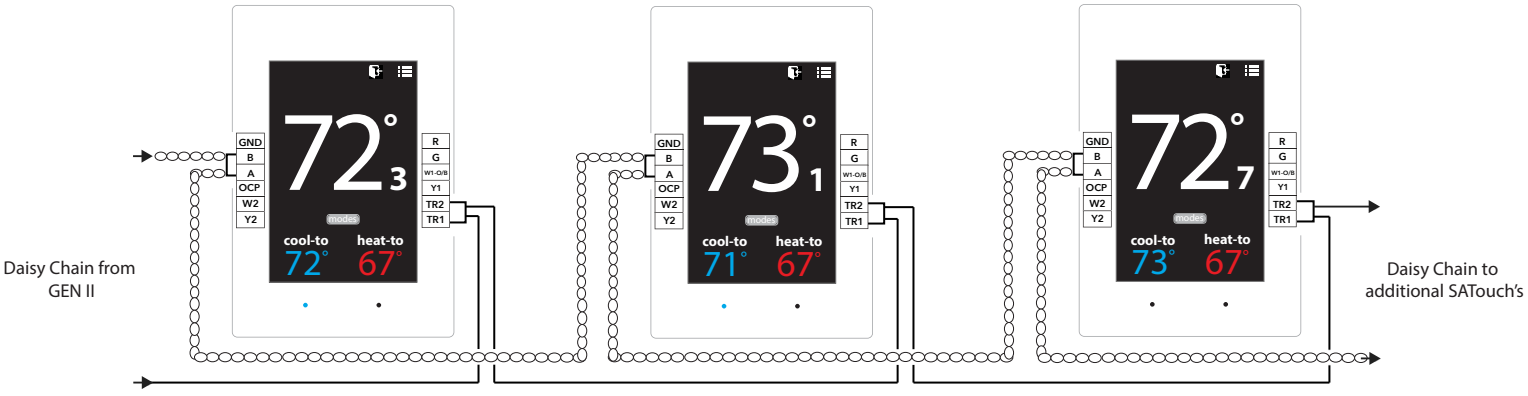
Wiring to Communication Terminals
Red-A
White-B

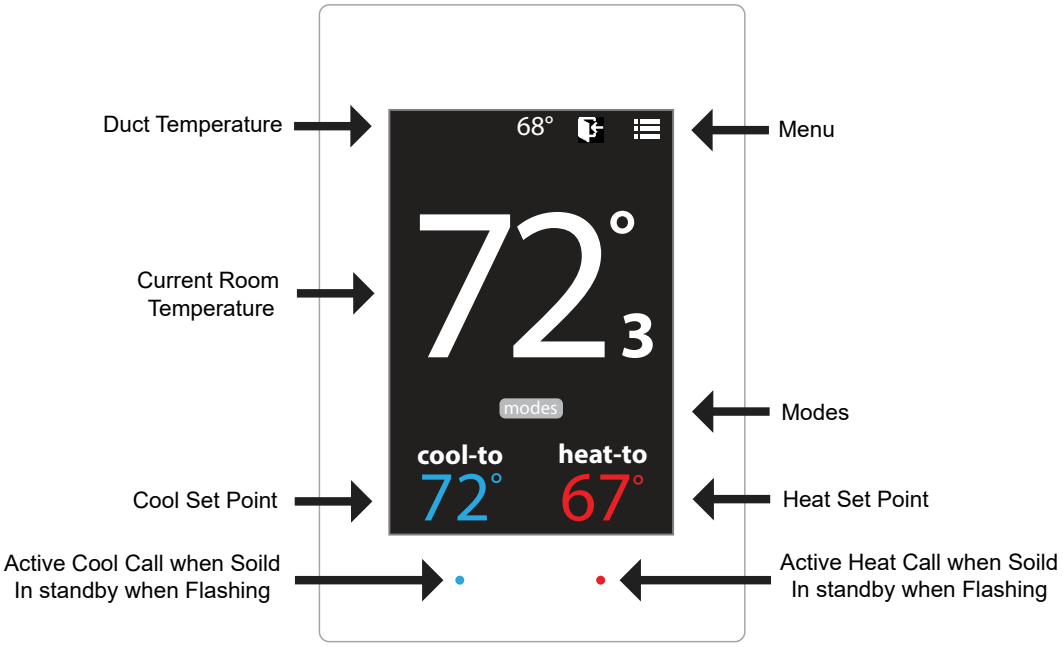


DAISY CHAIN 24V POWER FROM GEN II

SATouch is powered by the independent transformer connected to the GEN II. Using 18/2 wire for the 24vac power, daisy chain from TR1, TR2 **IN** and **OUT** to and from the SATouch's.

Daisy Chain Multiple SATouch's





Addressing Zone Thermostats

Every thermostat in the system needs a unique ID ranging from 1-20. They must be in numerical order the way the communication wire is daisy chained. Confirm no duplicate addresses.

To set the stat's ID access the Advanced Configuration menu by tapping on the degree symbol next to the room temp . The degree symbol will change from white to green and then tap

Once in the Thermostat Advanced Menu, Select **SET ID**

Use the and arrows and set the new ID ranging from 1-20

Tap to save changes, to return to the home screen tap

Select Unit Type

The SATouch is designed as a universal GAS/ELECTRIC/HEAT PUMP thermostat. Factory default is set for GAS operations.

While in the Thermostat Advanced Menu, Select Unit Type

Select the the desired unit type operation

Tap to save changes, to return to the home screen tap

Display Temperature Calibration

Thermostats are calibrated at the factory and should require no further adjustment. However, the display space temperature may be field calibrated by the following procedure:

To access the Thermostat Configuration Menu: Tap 

While in Thermostat Configuration Menu, Select **Calibrate Display**

Use the  and  arrows to calibrate the thermostat display to a external temperature probe temperature reading.

Tap  to save changes, to return to the home screen tap 

Adjusting Set Points

The Heat or Cool set points are displayed at the bottom of the screen. To adjust the set points, tap on the heat-to or cool-to temperatures; the set points will be displayed on the screen.

Use the  and  arrows over the flame/snowflake icons to set the desired heat and cool set points.

Tap  to save changes

Changing Mode

The thermostats are auto changeover, but specific modes may be selected. Heat/Cool mode is the default.

System Heat/Cool - Tap on modes , select “Heat/Cool”. Tap  to save changes

System Heat Only - Tap on modes , select “Heat Only”. Tap  to save changes

System Cool Only - Tap on modes , select “Cool Only”. Tap  to save changes

System Off - Tap on modes , select “Off”. Tap  to save changes

Override Operation

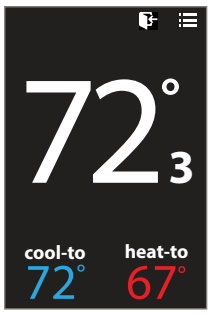
When the thermostat displays the unoccupied icon  a 2-hour temporary override may be initiated by tapping the  “Override” will appear. When additional override time is required, tap the unoccupied icon again.

THERMOSTAT CONFIGURATION MENU

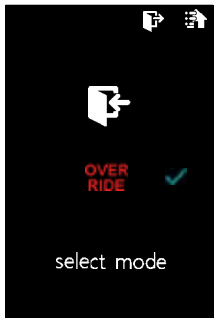
To access the Thermostat Configuration Menu: Tap

The **THERMOSTAT CONFIGURATION MENU** allows you to:

Override/Unoccupied	Select Occupied Light	Select Unoccupied Light
Calibrate Display	Temperature F/C	Set Display Accuracy



OVERRIDE/UNOCCUPIED



When a thermostat displays "unoccupied mode ", a 2-hour temporary override maybe initiated.

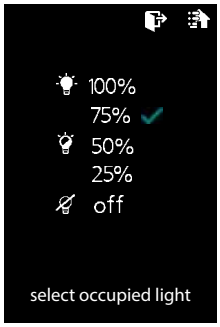
While in the Thermostat Configuration Menu, Select **Override/Unoccupied**

Tap "**override**" to place the thermostat into a override mode.

Tap to save changes, to return to the home screen tap

Shortcut note: Tap on to place the thermostat into 2 hour override mode

SELECT OCCUPIED LIGHT



The brightness of the thermostat during occupied mode is adjustable from 100% down to off .

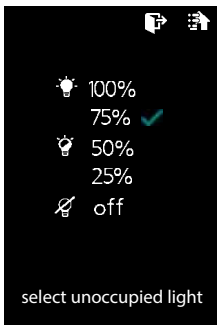
While in Thermostat Configuration Menu, Select **Occupied Light**

Use the and arrows to select the desired brightness.

Tap to save changes, to return to the home screen tap

Note: If "off" is selected, just touch stat to wake it up.

SELECT UNOCCUPIED LIGHT



The brightness of the thermostat during unoccupied mode is adjustable from 100% down to off .

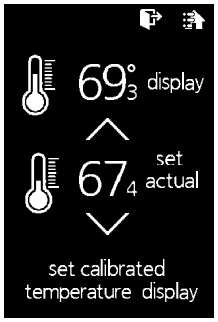
While in Thermostat Configuration Menu, Select **Unoccupied Light**

Use the ^ and v arrows to select the desired brightness.

Tap to save changes, to return to the home screen tap

Note: If "off" is selected, just touch stat to wake it up.

CALIBRATE DISPLAY



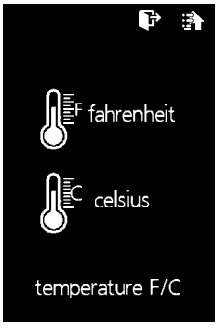
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

While in Thermostat Configuration Menu, Select **Calibrate Display**

Use the ^ and v arrows to calibrate the thermostat display to a external temperature probe temperature reading.

Tap to save changes, to return to the home screen tap

TEMPERATURE F/C



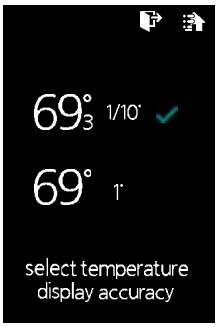
The SATouch can be configured for F° or C° operation.

While in the Thermostat Configuration Menu, Select **Temperature F/C**

Select the the desired temperature operation

Tap to go back to the menu, to return to the home screen tap

SET DISPLAY ACCURACY



Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

While in the Thermostat Configuration Menu, Select **Set Display Accuracy**

Select the the desired display accuracy

Tap  to save changes, to return to the home screen tap 

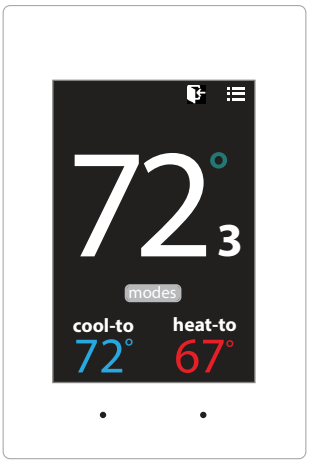
THERMOSTAT ADVANCED MENU

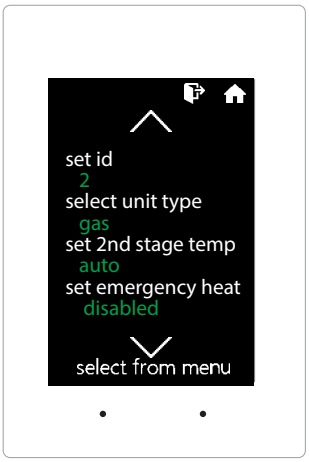
To access the Thermostat Advanced Menu: Tap on the degree symbol next to the room temp

The degree symbol will change color from white to green and then tap

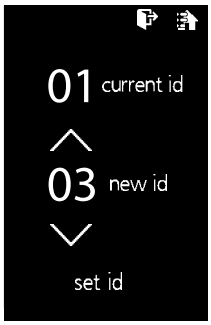
The **THERMOSTAT ADVANCED MENU** allows you to:

Set ID	Select Fan Mode	Set Emergancy Heat	Temp Source
Select Unit Type	Set 2nd Stage Temp	Diagnostic	Menu Type





STAT ID



Every thermostat in the system needs a unique ID. They must be ID'ed in numerical order the way the communication wire is daisy chained. No duplicate addresses.

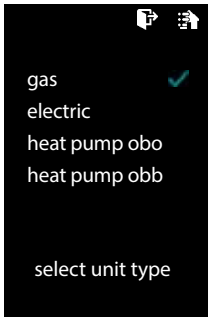
While in the Thermostat Advanced Menu, Select **SET ID**

Use the ^ and v arrows to set the new ID ranging from 1-20

Tap to save changes, to return to the home screen tap

Note: (All thermostats recieve a unique ID 001 to 017, maximum of 17 zones per GEN II)

SELECT UNIT TYPE



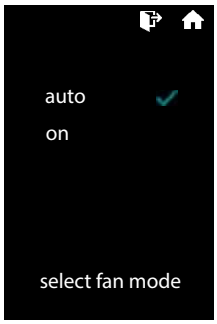
The SATouch is designed as a universal GAS/ELECTRIC/HEAT PUMP thermostat. Factory default is set for GAS operations.

While in the Thermostat Advanced Menu, Select **Unit Type**

Select the the desired unit type operation

Tap to save changes, to return to the home screen tap

SELECT FAN MODE



Fan operation is configured for either Fan ON or AUTO. When system is configured for ON operation, the Fan will run during Occupied schedule and will revert to Auto operations during Unoccupied schedule. When thermostat is configured for Auto operation, Fan will only run when there is a call for heating or cooling.

While in the Thermostat Advanced Menu, Select **Fan Mode**

Select the the desired fan operation “Auto” or “On”.

Tap to save changes, to return to the home screen tap

SET 2ND STAGE TEMP

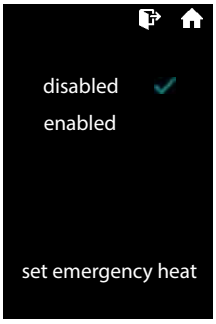
The SATouch’s 2nd stage operation is based on room temperature. Staging is adjustable from 2°- 8° from thermostat room temperature.

While in the Thermostat Advanced Menu, Select **Set 2nd Stage Temp**

Use the and arrows to set the 2nd stage temp range from 2°-8°

Tap to save changes, to return to the home screen tap

SET EMERGANCY HEAT



The SATouch has an emergency heat function that will lock out the compressor, and energize the Aux heat in the unit.

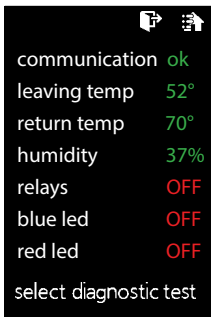
While in the Thermostat Advanced Menu, Select **Set Emergancy Heat**

Select “Enabled” for emergancy heat operation.

Tap to save changes, to return to the home screen tap

Note: Only emergancy heat calls will be seen when enabled.

DIAGNOSTIC



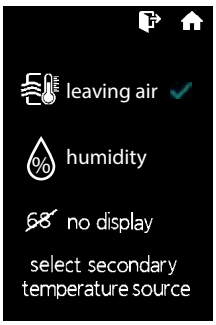
The SATouch Diagnostic screen will allow you to confirm communication with the GEN II controller and allow you to confirm the relays operation, LED operation and report the leaving/return temperatures as well as the relative humidity.

While in the Thermostat Advanced Menu, Select **Diagnostic**

Tap **relays** to confirm they energize and de-energize
Tap **blue led** to confirm the blue led illuminates
Tap **red led** to confirm the red led illuminates

Tap to exit diagnostic screen, to return to the home screen tap

TEMP SOURCE



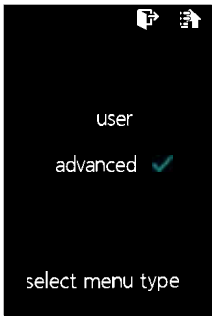
Temp source allows the thermostat to display the leaving air temperature or the relative humidity at the top on the home screen. A LAT sensor needs to be installed to report this reading. It will read 00 if no sensor is installed.

While in the Thermostat Advanced Menu, Select **Temp Source**

Select leaving air, humidity or no display to diplay or not display the temperature

Tap to save changes, to return to the home screen tap

MENU TYPE



Menu type will allow you to see the advanced menu options under the user menu when advanced is selected.

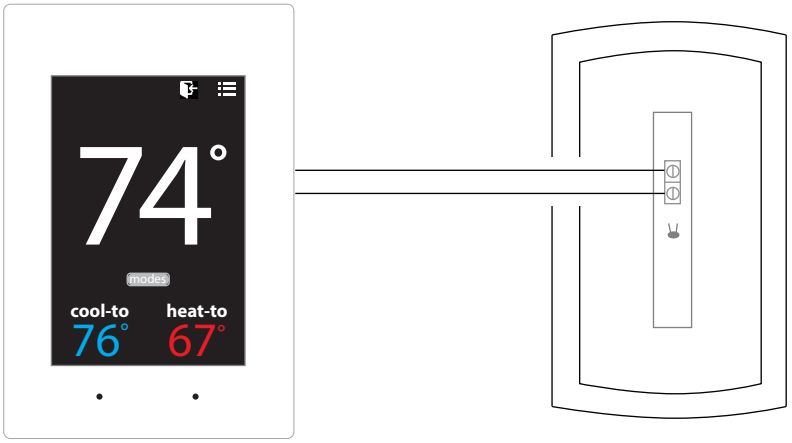
While in the Thermostat Advanced Menu, Select **Menu Type**

Select **user** to hide the advanced options
Select **advanced** to show the advanced options under the user menu

Tap to save changes, to return to the home screen tap

REMOTE SENSOR

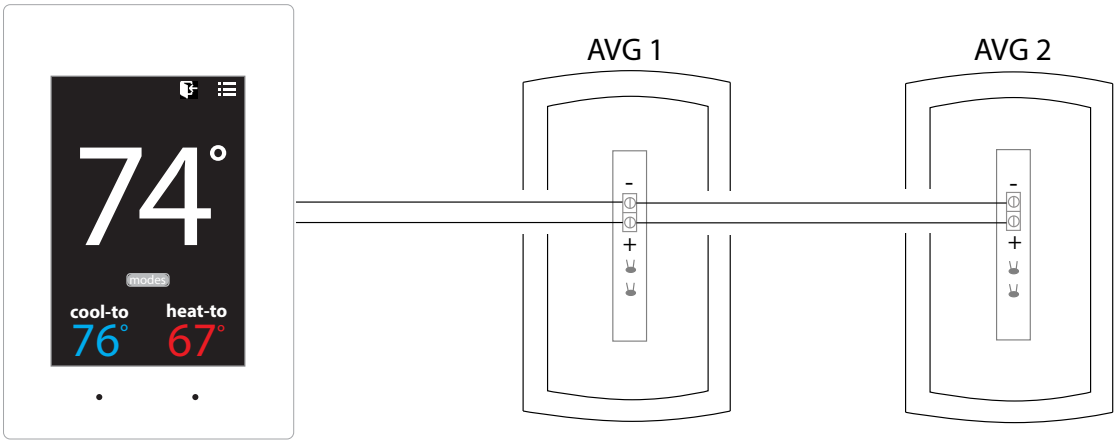
The following wiring diagram is used when remote temperature sensing is desired on a job. A Zonex Systems EzTouch-RS is required, as is a remote sensor (part # RS). Thermostats and sensors are wired in parallel.



Install thermostat per installation instructions. All remote sensors include a wiring harness. Plug wiring harness into the back of the thermostat, this will provide two wires to connect the remote sensor to the thermostat. Per the drawing above, wire the remote sensor in parallel, one wire from the thermostat will connect to + terminal on the sensor, the second wire will connect to - terminal using 18AWG thermostat wire. Verify sensor operations.

TEMPERATURE AVERAGING

The following wiring diagram is used when temperature averaging is desired on a job. This wiring diagram is to average two areas of a building for one thermostat. A Zonex Systems EzTouch-RS is required, as are two AVG averaging sensors (part # AVG). Thermostats and sensors are wired in parallel.



Install thermostat per installation instructions. All averaging sensors include a wiring harness. Plug wiring harness into the back of the thermostat, this will provide two wires to connect the averaging sensor to the thermostat. Per the drawing above, wire the AVG averaging sensor in parallel, one wire from the thermostat will connect to + terminal on the sensor, the second wire will connect to - terminal using 18AWG thermostat wire. Extend these wires to + and - terminals on the second AVG sensor. Verify sensor operations.

System Start Up and Test

1. Plug all thermostats into sub-bases. Turn ***GEN II*** power switch **(E**) to ON.
2. Find the first Thermostat in the Daisy chain and change its address from 20 to 001. (See EzTouch installation instructions– Configuration – Addressing).
3. Turn ***GEN II*** power switch OFF and then ON. The Display should flash 01 and then show the leaving air temperature. This confirms your successful wiring and communication with that thermostat.
4. If 01 is displayed, change the next thermostat's address from 20 to 002. Turn the ***GEN II*** power switch OFF and then ON. The display should flash 02 and then show the temperature. Re-address thermostats one at a time.
5. After each stat is re-addressed, turn the power switch off and then on. This will verify that the re-addressed stat has been found by the ***GEN II*** Controller.

This procedure will simplify your installation and will confirm your wiring is correct and that the ***GEN II*** controller can communicate over the 2-wire twisted pair data link with every thermostat in your system.

Troubleshooting

When stat #1 is not found:

1. Check thermostat to verify that it is addressed as 01.
2. Check all TR1 and TR2 wiring for proper color-to-color connections. Even if the stats are lighted, all TR1 wires at the thermostat must be connected to the GEN II TR1 terminal. All TR2 wires must be connected to the GEN II TR2 terminal. Confirm the daisy chain wiring is correct at this time.
3. Check A, B wires for proper color code and connections; polarity is imperative. All A connections must land on A terminal on the following thermostat, and all B connections must connect to B terminal on each thermostat.
4. Check TR1 and TR2 wires for opens or shorts.

Checking the Daisy Chain for opens or shorts:

Start from the GEN II board, and follow A, B wires to the first sub-base. Remove the A, B wires going to the next sub-base in the link. Plug a stat into the first sub-base, and address it as #1. Turn the GEN II power switch Off, then On, to see if the display flashes 01, at the GEN II controller.

1. If 01 is displayed, the first link of the daisy chain is OK. Reconnect the wires going to sub-base.
2. Repeat these steps with a stat numbered 02. If the number 02 is displayed, then communication is confirmed.

When the correct number does not appear for a link, that link is either shorted or open. **A link of the daisy chain, which is open or shorted, must be repaired before the next thermostat is checked.**

When the thermostats are correctly addressed, wired and linked, the total number of stats on your job connected to the GEN II control board will be displayed when the board is turned on.

After the correct number of connected thermostats is displayed, complete the wiring of the AC unit or heat pump connections, next make heat and cool calls to the GEN II controller.

Occupied / Unoccupied fan operation

The factory setting for FAN operation is AUTO, with the FAN jumper **(I)** on the middle and lower pins. In this setting, the fan circuit on "G" is only energized on an active cool call in Gas/Electric mode or on an active heat call or cool call in Heat Pump mode. This applies to both Occupied and Unoccupied modes. When the FAN jumper is in AUTO, there is no output on "G" with an active heat call in Gas/Electric mode.

- Constant Fan in the Occupied (DAY) mode – Place the FAN jumper **(I)** on the center and upper pins on ON. The fan output on "G" will be constant in the Occupied (DAY) mode and will revert to auto in the Unoccupied (NIGHT) mode.

Opposing Call Changeover

The ***GEN II*** controllers are configured at the factory for Opposing Call Changeover with a time delay setting of 10 minutes. With this configuration, any number of thermostats can make a like active call (heat or cool). During this time, if a single thermostat makes an opposite call, a timer is started at the next poll. This timer starts a time delay operation to allow the initial calling thermostats to satisfy. If the initial active thermostats do not completely satisfy after 10 minutes, the dampers all close and the controller drops out the HVAC outputs and goes into a 5 minute purge cycle. When the purge cycle times out, the opposing thermostat call is initiated; and the appropriate HVAC outputs are energized, and the supply damper opens. The thermostat with the opposing call must now satisfy before the GEN II controller will recognize any of the initially calling thermostats.

The opposing call timer is factory adjusted for 10 minutes. However, the delay time can be field adjusted from 5 to 30 minutes, or disabled.

To increase the opposing call time delay:

1. Press the SET and UP buttons.
2. Release the SET button when the display changes, and continue to hold down the UP button.
3. Release the UP button when the desired time is displayed.

To lower the time delay:

4. Press the SET and UP buttons.
5. Release the SET button, and immediately press and hold the DN (down) button until the desired time is indicated; then release.

The Opposing Call feature can be disabled by performing steps 1 through 3 and then releasing the UP button when the display indicates 32. With this feature disabled, the ***GEN II*** controller will operate changeover by majority vote from the zone thermostats.

Priority active Heat and Cool call operation

The ***GEN II*** controller may be configured in the field for majority vote changeover but also assign multiple votes for selected thermostats to enhance the changeover operation for special requirements. Each thermostat represents one vote for heat or cool operation; a majority of active calls will determine which mode the controller will operate in. With the Priority feature, any thermostat may be assigned one or more additional votes to allow it to have priority to bring a mode changeover more quickly. To keep proper overall temperature control, this priority vote change should be limited to as few zones as possible. Follow the procedure to implement Priority vote operation:

1. Determine which thermostat address is to have an additional one or two votes.
2. Place the PRIORITY jumper **(F)** on both pins.
3. Press and hold the SET and UP buttons **(H)**, and the LED display will scroll through the number of zones starting with 01.
4. When the display indicates the address (01 to 17) of the thermostat you want to add votes to, release both buttons and press the DN button. The display will scroll through 00, 01, 02. To add one additional vote, release the DN button when the display indicates 01 (this assigns a total of 2 votes). To increase the votes by two, press the DN button and wait until the display indicates 02 and then release the DN button (this assigns a total of 3 votes maximum).
5. To change the votes back to a single vote, press the DN button on the selected address and release when the display indicates 00.
6. To review the vote status of all of the thermostats in the system, press the UP button; and the display will first indicate the address number starting with 01and then the vote status for that address. 00 = 1 vote 01 = 2 votes 02 = 3 votes. Upon review, if stat #1 has 2 votes, the display will show Stat 01 followed by 02 signifying the number of Priority votes assigned to Stat 1. Stat 02 will appear followed by a blank display, indicating only 1 vote; and Stat 03 will appear followed by a blank screen, indicating no priority votes have been added to Stats 02 or 03.
7. Be certain to **Place the PRIORITY jumper on one pin** to put the controller back into normal operation with the changes that were made.

Thermostat security - Set Point LOCK

The ***GEN II*** system provides the ability to electronically lock all of the zone thermostats (global). When the thermostats are in the LOCK mode, there will be a padlock icon on each thermostat display. The LOCK mode limits the manual changing of the heat and cool set points to a maximum of 2° above or below the initial heat and cool set point temperatures.

To set the thermostats for the LOCK mode, simply change the switch position **(K)** from UNLOCK to LOCK. All of the thermostats will change to LOCK on the next system poll. To unlock, set the switch to the UNLOCK position; and the thermostats will drop the icon after the next system poll and revert to normal operation.

Air Balance - Force Dampers Open

When performing an air balance on the supply air outlets, the ***GEN II*** controller provides a unique feature to simplify this procedure. The ***GEN II*** controller will put all thermostats in a cool call which will open the dampers 100% and bring on the system blower.

1. Place the **EH** jumper **(F)** over both pins
2. Press the **SET** and **UP** buttons **(H)** simultaneously – This puts a global cool set point of 58°F (14°C) on all of the zone thermostats, and the controller energizes the “G” fan output only; Y1 is not energized.
3. When the air balance procedure is completed, press the **SET** and **DN** buttons simultaneously, which will assign 70°F (21°C) Heat and 75°F (23°C) Cool set points on all of the zone thermostats.
4. Press and hold the SET and DN buttons; and while holding these buttons, remove the EH jumper tab and place it on one pin. Release the **SET** and **DN** buttons. This procedure returns the *GEN II* controller to normal operation. For Electric Heat fan configuration, see Page 5.

Default Thermostat Set Point Programming

Global default set points can be established from the ***GEN II*** controller.

The following procedure will provide a 75°F (23°C) Cool and 70°F (21°C) Heat occupied set point along with Unoccupied 58°F (14°C) Heat and 85°F (29°C) Cool set point for every thermostat in the system. This handy feature minimizes visits to the thermostats. To establish these default set points:

1. **EH** jumper (F) - place the jumper over both pins.
2. Press the **SET** and **DN** button (H) simultaneously to engage default set points.
3. Remove the EH jumper, and place on one pin to put controller back into normal operation.
4. To view the unoccupied set points place the Night / Day switch (L) to the NIGHT position. Following a poll, the thermostat backlights will turn off; and the unoccupied set points will be displayed.

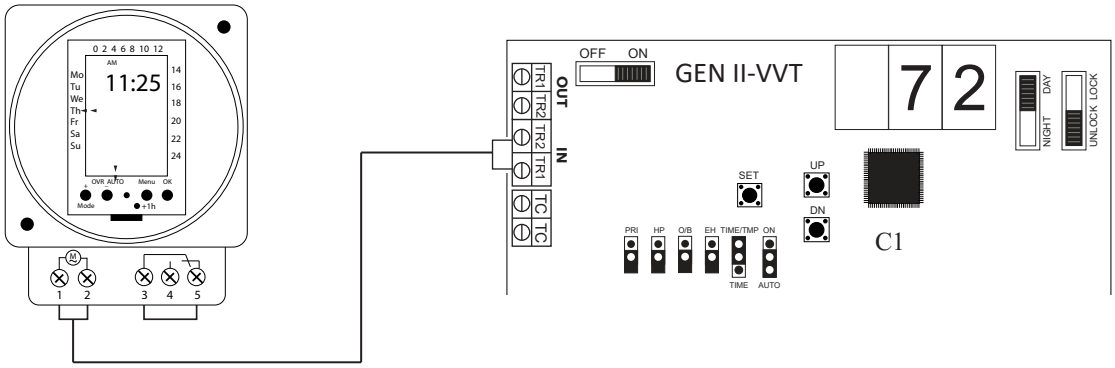
Time Clock

The GCLK is a 24vac 7-Day programmable time clock offered by Zonex Systems, exclusively for the GEN II control system. This digital time clock will enable the control system to operate with up to 10 “Global” Occupied and Unoccupied schedules in a 7-day format. The GCLK is powered from the GEN II controller power supply, and there is a backup battery to protect the time clock program for up to 100 hours.

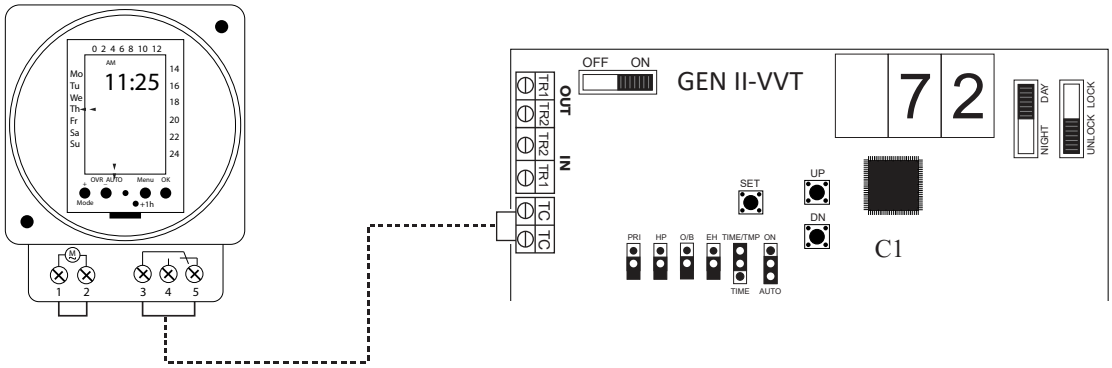
Installation

The GCLK must be installed on an interior wall next to the GEN II controller. Both the GEN II controller and GCLK time clock must be easily accessible to monitor status and to make program and function changes.

1. Remove the clear dust cover lens and loosen two screws on opposite corners of the clock module.
2. Remove the housing that surrounds the time clock and wire terminal cover.
3. Remove the clock module by pulling straight out from the base. Install the backing plate to the wall with 3 screws (provided).
4. The GCLK is powered from TR1 and TR2 on the GEN II controller to terminals 1 and 2 on the time clock terminal base. See wiring diagram below.



5. The Normally Open switch contacts on the time clock 3 and 5 are wired to the TC terminals on the GEN II Controller. See wiring diagram below.



6. Press the clock module back into place in the base, making certain that it is seated correctly.
7. Install the wire terminal cover and the clock housing with the 2 screws.
8. Install the clear dust cover lens in place.

Programming

See Programming and Configuration included with the GCLK.

Zonex Systems zone dampers are used in cooling/heating systems to provide room by room zone control. The damper is provided with a factory mounted actuator. Each zone damper is controlled by a zone thermostat. More than one damper can be controlled by one zone thermostat. Use this table to determine which zone dampers to use.

DAMPER MODEL	MAXIMUM DIFFERENTIAL PRESSURE	MAXIMUM SYSTEM SIZE	MAXIMUM DUCT SIZE
STMPD Round Med. Pressure	1.75”	Any Size	18”
STMRTD Rect. Med. Pressure	1”	5 Tons	24”W x 20”H
STCD Rect. Heavy Duty	1.75”	Any Size	48”W x 48”H
STRD Round Heavy Duty	1.75”	Any Size	24”
D-FUSER	0.1”	Any Size	10”

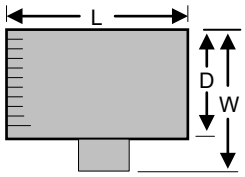
Maximum Differential Pressure refers to the maximum static pressure drop in inches of water column between the input (upstream) of the zone damper and the output (downstream) when the damper is closed.

ROUND MEDIUM PRESSURE ZONE DAMPERS

Zonex Systems round medium pressure zone dampers are recommended for systems with a maximum differential static pressure up to 1.75”. This modulating power open/power close damper is manufactured from 20-22 gauge galvanized steel with rolled-in stiffening beads for superior rigidity. Mechanical minimum and maximum set stops are provided and are easily adjustable. The damper is elliptical, which allows the airflow to be tracked linearly. The damper pipe is furnished with one crimped end and one straight end for easy installation. Do not install damper in an inverted position. A hat section supports a reversing 24vac, 60Hz, 2 VA motor. A magnetic clutch allows for continuous power to the motor and longer motor life. Motor drive time from full open to full close is 90 seconds.

MEDIUM PRESSURE (STMPD)

ROUND MEDIUM PRESSURE DAMPER PART NUMBERS AND SIZES



ROUND DIMENSIONAL DATA

PART #	SIZE	D	L	W
STMPD06	6	6”	10”	9”
STMPD08	8	8”	10”	11”
STMPD10	10	10”	12”	13”
STMPD12	12	12”	14”	15”
STMPD14	14	14”	16”	17”
STMPD16	16	16”	18”	19”
STMPD18	18	18”	20”	21”
STRD20	20	20”	24”	27”
STRD22	22	22”	24”	27”
STRD24	24	24”	24”	27”

Note: Round dampers over 18” will be heavy duty style STRD dampers. Part # STRD size

TYPICAL ROUND CAPACITIES

These air quantities were derived from a duct sizing chart 0.1” friction loss per 100’ of duct. All CFMs listed are approximate. For accurate selection, use duct sizing table or device.

DUCT DIAMETER	NOMINAL CFM	DUCT VELOCITY FPM	DAMPER ΔP “ WC
6”	110	540	.014
8”	250	700	.015
10”	410	750	.015
12”	660	850	.022
14”	1000	925	.035
16”	1450	1070	.036
18”	2000	1100	.036
20”	2600	1200	.039
22”	3250	1250	.039
24”	4100	1325	.041

RECTANGULAR ZONE DAMPERS

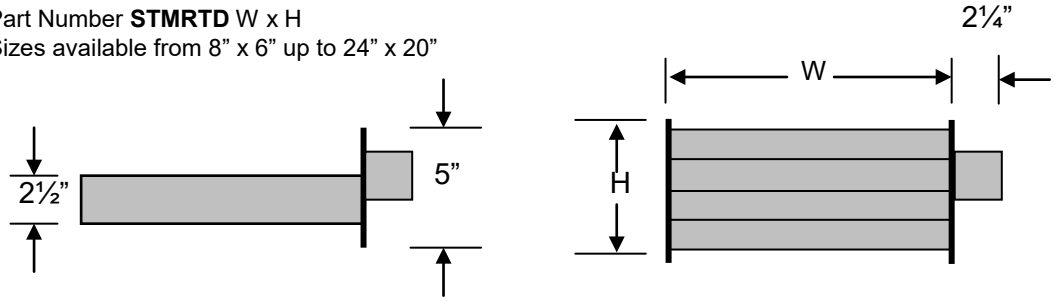
The rectangular zone dampers are available in either medium pressure or heavy duty. For systems under 5 tons, use medium pressure dampers. For systems 5 tons or over, use heavy duty dampers. Motor drive time open and close is 90 seconds.

RECTANGULAR MEDIUM PRESSURE ZONE DAMPERS (STMRTD)

Zonex Systems rectangular medium pressure dampers are recommended for systems under 5 tons with a maximum differential static pressure of 1". These are fully modulating, power open, power close dampers. They are constructed from heavy duty aluminum and stainless steel. The damper is an opposed blade type that slips into a 3¼-inch wide cutout in the existing duct and attaches with screws via a duct mounting plate. The duct mounting plate is 5 inches wide. A hat section supports a reversing 24vac, 60Hz, 2 VA motor. A magnetic clutch allows for continuous power to the motor and longer motor life. Two set screws connect the motor to the damper shaft, allowing quick motor replacement if necessary. Motor drive time from full open to full close is 90 seconds.

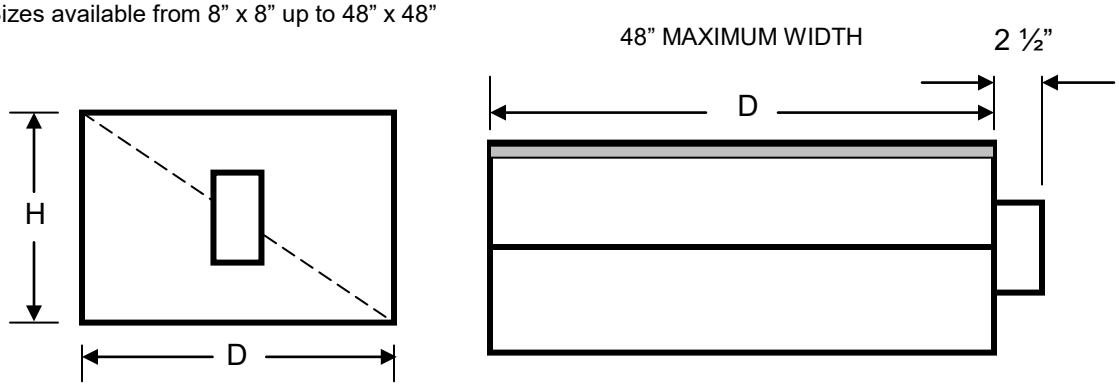
MEDIUM PRESSURE RECTANGULAR DIMENSIONAL DATA

Part Number **STMRTD** W x H
Sizes available from 8" x 6" up to 24" x 20"



HEAVY DUTY RECTANGULAR DIMENSIONAL DATA

Part Number **STCD** W x H
Sizes available from 8" x 8" up to 48" x 48"



RECTANGULAR HEAVY DUTY ZONE DAMPERS (STCD)

Zonex Systems rectangular heavy duty dampers are recommended for systems 5 tons or larger with a maximum differential static pressure of 1.75". These are fully modulating, power open / power close dampers made of 20 gauge "snaplock" steel frame with S & Drive duct connections. Allow a 16" gap in the duct for the damper. Formed steel blade stops incorporate a gasket for quiet operation and improved structural rigidity. Rectangular dampers under 10" in height incorporate a single blade design. Dampers 10" or over use opposed blade design. A full stall motor, drawing 2 VA, drives the motor from full open to full close in 90 seconds.

Rectangular Damper Capacities*

WIDTH IN INCHES

HEIGHT IN INCHES	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
8	300	400	500	610	710	820	925	1050	1175	1250	1400	1500	1600	1725	1825	2000	2100	2200	2275	2400	2525
10	400	540	680	825	975	1125	1300	1400	1590	1750	1975	2100	2175	2400	2600	2775	2900	3000	3200	3400	3600
12	500	680	850	1000	1200	1400	1600	1850	2000	2300	2550	2700	2850	3100	3400	3600	3800	3975	4200	4450	5775
14	610	825	1000	1250	1500	1750	2000	2250	2500	2900	3150	3425	3625	3825	4200	4600	4800	5000	5300	5750	6000
16	710	975	1200	1500	1800	2100	2450	2700	3000	3600	3950	4200	4425	4650	5100	5600	5780	6025	6500	7000	7400
18	820	1125	1400	1750	2100	2500	2850	3080	3600	4400	4600	4950	5100	5600	6000	6500	7000	7150	7600	8100	8600
20	925	1300	1600	2000	2450	2850	3400	3775	4000	4800	5500	5700	6000	6600	7100	7900	8025	8500	9000	9600	10075
22	1050	1400	1850	2250	2700	3080	3775	4300	4800	5100	6000	6350	6800	7200	7800	8600	9000	9600	10000	11500	12500
24	1175	1590	2000	2500	3000	3600	4000	4800	5400	6100	7000	7150	7600	8600	9100	10000	10700	11500	12000	13050	14700
26	1250	1750	2300	2900	3600	4400	4800	5100	6100	6700	7800	8400	8900	10000	10900	11075	12050	13000	14000	15000	15900
28	1400	1975	2550	3150	3950	4600	5500	6000	7000	7800	8400	9150	10000	10700	11900	13000	13800	14900	15200	16500	17500
30	1500	2100	2700	3425	4200	4950	5700	6350	7150	8400	9150	10000	11000	11800	12400	13800	14200	15000	16000	17400	18500
32	1600	2175	2850	3625	4425	5100	6000	6800	7600	8900	10000	11000	11250	12700	13900	14900	15200	16900	17300	19000	20500
34	1725	2400	3100	3825	4650	5600	6600	7200	8600	10000	10700	11800	12700	14100	15000	16500	17200	18100	19200	20500	21900
36	1825	2600	3400	4200	5100	6000	7100	7800	9100	10900	11900	12400	13900	15000	16100	17400	18500	20000	21500	22900	24200
38	2000	2775	3600	4600	5600	6500	7900	8600	10000	11075	13000	13800	14900	16500	17400	17800	20000	21900	22600	24000	25100
40	2100	2900	3800	4800	5780	7000	8025	9000	10700	12050	13800	14200	15200	17200	18500	20000	21000	22200	24900	25000	27000
42	2200	3000	3975	5000	6025	7150	8500	9600	11500	13000	14900	15000	16900	18100	20000	21900	22200	22800	25100	26900	30000
44	2275	3200	4200	5300	6500	7600	9000	10000	12000	14000	15200	16000	17300	19200	21500	22600	24900	25100	26500	30000	32000
46	2400	3400	4450	5750	7000	8100	9600	11500	13050	15000	16500	17400	19000	20500	22900	24000	25000	26900	30000	30500	32800
48	2525	3600	5775	6000	7400	8600	1075	12500	14700	15900	17500	18500	20500	21900	24200	25100	27000	30000	32000	32800	35600

* These air quantities were derived from duct sizing chart .1" friction loss per 100' of duct. All CFMs listed are approximate.
For accurate selection use duct sizing table or

SIZING ZONE DAMPERS

If the ductwork already exists, simply size the damper to fit the ductwork. For new systems or retrofit jobs:

A. Determine CFM from heat gain or loss calculations.
B. Select damper size using either the round capacities chart, the rectangular capacities chart or by using a duct sizing table or calculator.
C. Select a Zonex Systems damper to fit the duct size selected for that zone.

Make sure your zone dampers match the type specified in the table showing Maximum Differential Pressure.

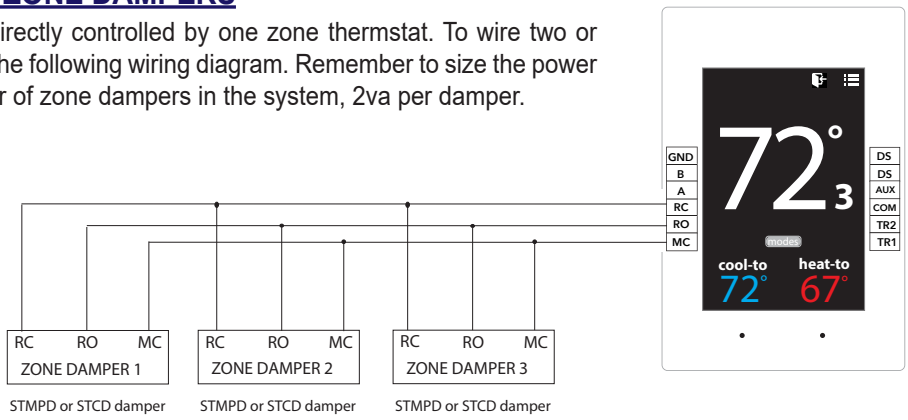
INSTALLATION NOTES

1. Do not exceed 700 FPM in a register/diffuser branch duct.
2. If a damper is installed within 3 feet of a register/diffuser, install sound attenuating flex duct between damper and outlet.
3. Zone dampers should be preceded by 2' − 4' of straight pipe where possible.
4. In attic installations and high humidity areas, the Zonex Systems damper should be insulated along with the ductwork. The hat section on the round damper is delivered with insulation between the hat section and pipe. Therefore, insulation should be applied to the round pipe and be butted against the hat section (do not insulate the motor). The motor generates enough heat so that no condensation will develop on it.
5. Remember to allow a 16" gap in the duct for heavy duty rectangular dampers.
6. Medium pressure rectangular dampers slide into a 3¼" wide cutout in the side of the preexisting ductwork.
7. Minimum open and close positioning is field adjustable on the actuator. The damper is shipped from the factory to close 100%.

NOTE: Dampers should not be installed with motor upside down in the 6:00 position.

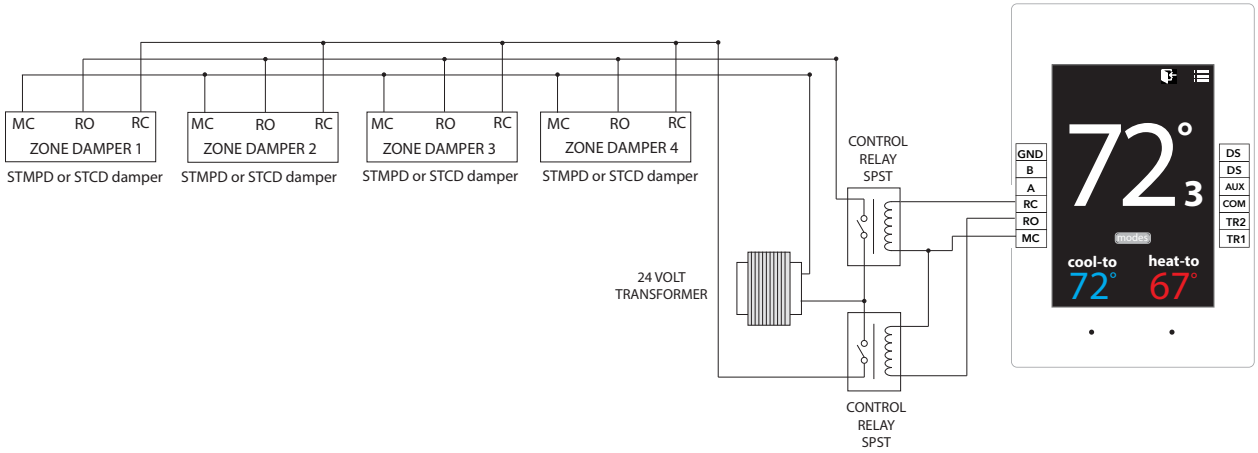
SLAVING UP TO THREE ZONE DAMPERS

Up to three dampers can be directly controlled by one zone thermstat. To wire two or three dampers for a zone, use the following wiring diagram. Remember to size the power transformer for the total number of zone dampers in the system, 2va per damper.



SLAVING MORE THAN THREE ZONE DAMPERS

When slaving more than three zone dampers, use the following diagram. An additional 24-volt transformer and control relays are needed for these applications. Note: All slave dampers need to be model STMPD / STCD



ELECTRONIC BYPASS DAMPERS

Bypass dampers are used to provide constant air delivery through the air handling unit. This is done by bypassing excess air from the supply duct back to the return duct. As a zone is satisfied, its zone damper closes. When this happens, the bypass damper opens just enough to bypass the excess air. This will control static pressure and noise at the diffusers.

The Electronic Bypass Damper is used on any size system over 5 tons. The damper can be round **(STBP)** or rectangular **(STCDBP)** with integrated static pressure control; and multiple dampers can be slaved together.

SIZING ELECTRONIC BYPASS DAMPERS

The bypass damper is to be sized for the total system CFM @ 1500 FPM. System CFM should be calculated at 400 CFM per ton.

Example: A 5-ton system is rated at 2000 CFM (5x400 = 2000). When calculated at 1500 FPM, the bypass damper should be 16". Never undersize the bypass damper.

ROUND BYPASS DAMPER SELECTION

The Zonex Systems **STBP** damper is used for round bypass applications. When you know the bypass CFM requirements, use the ROUND BYPASS SELECTION TABLE to confirm the round damper size.

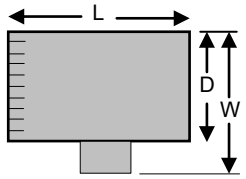
NOTE: Multiple round dampers can be slaved from one static pressure control to provide the correct capacity. One large rectangular bypass damper may be used instead of multiple round dampers. See below.

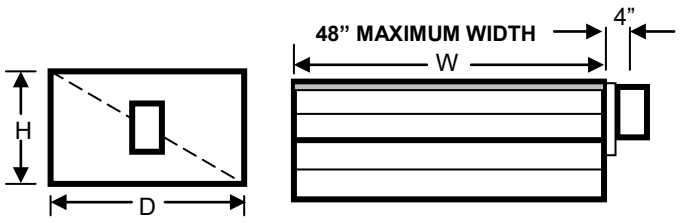
RECTANGULAR BYPASS DAMPER SELECTION

The Zonex Systems **STCDBP WxH** damper is used for rectangular bypass applications. These dampers are also sized for the total system CFM rated at 1500 FPM. Multiple dampers can be slaved from a single static pressure control.

ROUND BYPASS SELECTION TABLE

Diameter	CFM	PART #	SIZE	D	L	W
8"	560	STBP08	8	8"	10"	11"
10"	900	STBP10	10	10"	12"	13"
12"	1250	STBP12	12	12"	14"	15"
14"	1700	STBP14	14	14"	16"	17"
16"	2200	STBP16	16	16"	18"	19"
18"	2600	STBP18	18	18"	20"	21"
20"	3300	STRDBP20	20	20"	24"	27"
22"	4000	STRDBP22	22	22"	24"	27"
24"	4700	STRDBP24	24	24"	24"	27"





RECTANGULAR BYPASS DAMPERS
SELECT FROM 8 x 8 thru 48 x 48

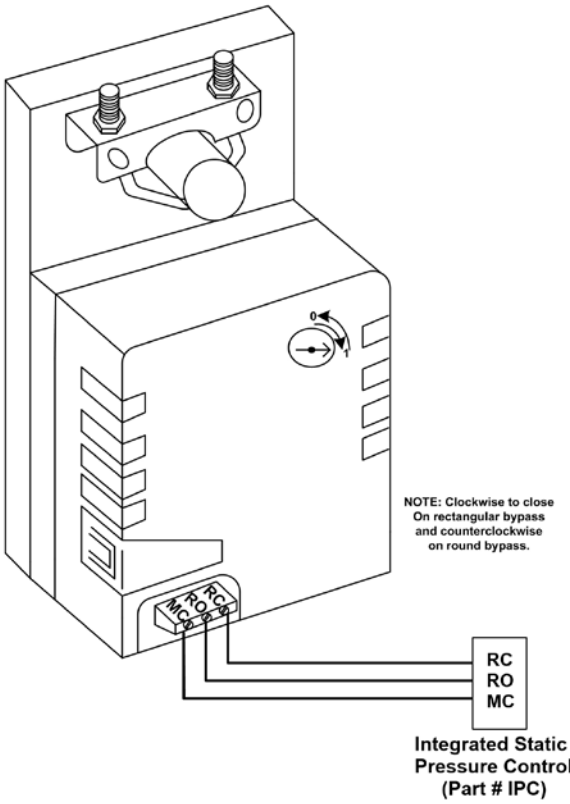
RECTANGULAR BYPASS SELECTION TABLE

WIDTH IN INCHES

HEIGHT IN INCHES	8	10	12	14	16	18	20	22	24	28	32	36	40	44	48
8	667	833	1000	1167	1333	1500	1667	1833	2000	2333	2667	3000	3333	3667	4000
10	833	1042	1250	1458	1667	1875	2083	2292	2500	2917	3333	3750	4167	4583	5000
12	1000	1250	1500	1750	2000	2250	2500	2750	3000	3500	4000	4500	5000	5500	6000
14	1167	1458	1750	2042	2333	2625	2917	3208	3500	4083	4667	5250	5833	6417	7000
16	1333	1667	2000	2333	2667	3000	3333	3667	4000	4667	5333	6000	6667	7333	8000
18	1500	1875	2250	2625	3000	3375	3750	4125	4500	5250	6000	6750	7500	8250	9000
20	1667	2083	2500	2917	3333	3750	4167	4583	5000	5833	6667	7500	8333	9167	10000
22	1833	2292	2750	3208	3667	4125	4583	5042	5500	6417	7333	8250	9167	10083	11000
24	2000	2500	3000	3500	4000	4500	5000	5500	6000	7000	8000	9000	10000	11000	12000
28	2333	2917	3500	4083	4667	5250	5833	6417	7000	8167	9333	10500	11667	12833	14000
32	2667	3333	4000	4667	5333	6000	6667	7333	8000	9333	10667	12000	13333	14667	16000
36	3000	3750	4500	5250	6000	6750	7500	8250	9000	10500	12000	13500	15000	16500	18000
40	3333	4167	5000	5833	6667	7500	8333	9167	10000	11667	13333	15000	16667	18333	20000
44	3667	4583	5500	6417	7333	8250	9167	10083	11000	12833	14667	16500	18333	20167	22000
48	4000	5000	6000	7000	8000	9000	10000	11000	12000	14000	16000	18000	20000	22000	24000

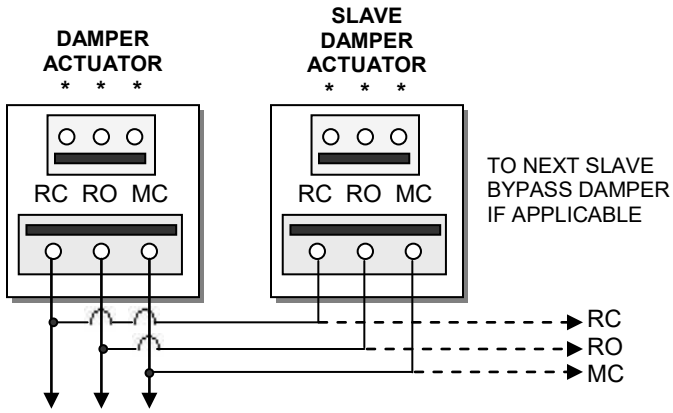
Bypass air in CFM. Calculated at 1500 FPM.
Formula used: B = W x H / 144 x 1500, where B = Bypass air in CFM, W = damper width in inches, H = damper height in inches, 144 = 144 sq. inches per sq. ft., 1500 = 1500 FPM.

ROUND AND RECTANGULAR BYPASS DAMPER MOTORS



SLAVING BYPASS DAMPERS

Use only one Pressure Sensor when slaving two or more Bypass Dampers together. Connect the Pressure Sensor to one damper as described above. Connect the slave dampers in parallel as shown. Up to 4 dampers can be slaved to one Sensor. The slaved dampers will self-synchronize each time the dampers reach full open or full close.



To Static Pressure Control, as shown on the Bypass Wiring Diagram on the next page.

INSTALLATION

The round and rectangular bypass damper can be installed in any position. Do not run speed screws into damper housing. Screws may interfere with damper travel.

1. Install the bypass damper between the supply and return plenums of the unit. It must be the first tap off the supply plenum. (Bypass damper sizing is recommended for 100% of system CFM.)

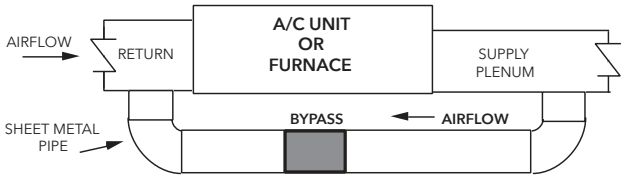
2. Be sure the air flows through the damper in the proper direction as indicated by the arrow on the damper. Airflow is always from supply to return plenum.

3. Do not install the bypass damper outside.

4. Bypass damper and controller are powered by a dedicated 24vac 40VA transformer.

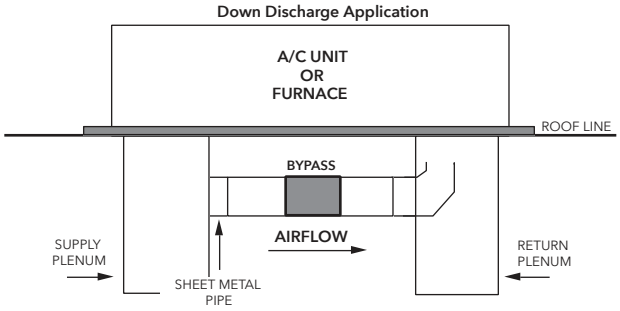
5. Follow the steps on the next page for Integrated Pressure Controller installation and set up.

HORIZONTAL APPLICATION

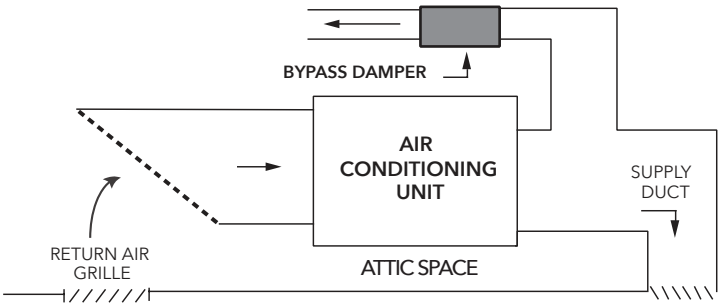


ROOFTOP INSTALLATION

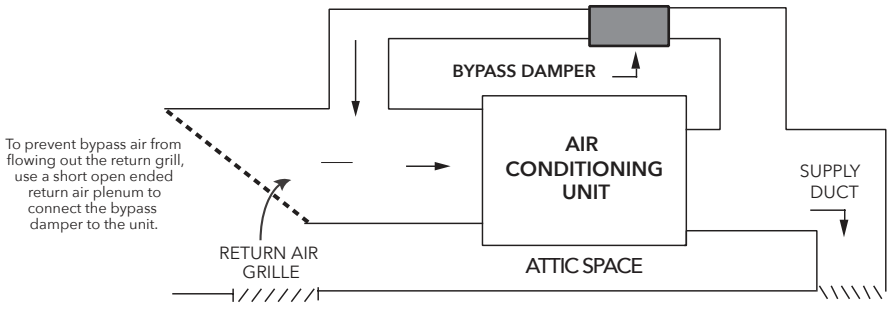
Down Discharge Application



OPEN RETURN PLENUM AND BYPASS APPLICATION



OPEN RETURN PLENUM BYPASS APPLICATION



Bypass Damper with Integrated Pressure Control is used to control bypass operations. The bypass damper modulates to maintain static pressure as zone dampers open and close. The bypass system reduces air noise from the supply registers caused by excessive air velocity. If the system is configured for intermittent fan mode and the system satisfies, there will be a 3-minute delay to allow for system purge, after which the bypass damper will open to 25%, preventing noisy rush of air through supply registers when fan starts up on a call for heat or cool. If the system is configured for fan continuous operation, the **STBP** (Round) or **STCDBP** (Rectangular) Electronic Bypass will monitor static pressure continuously, providing constant control of system static.

Integrated Pressure Control Description

A. Supply air tube
B. 24vac R and C
C. Damper Terminal RO, RC, MC
D. LED lights
E. Adjustable Potentiometer
F. TP1 Test Point

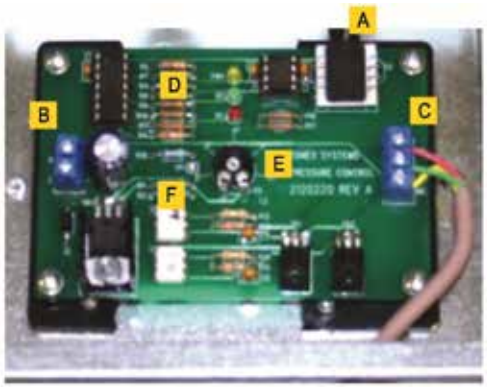


Fig. 1

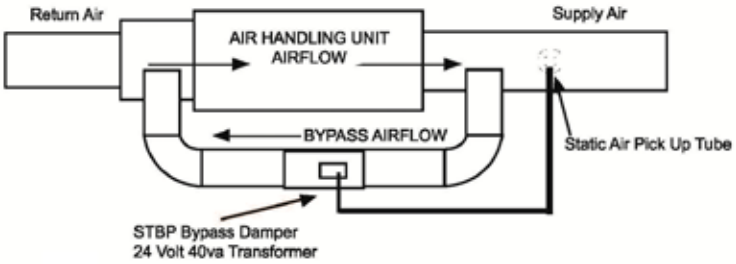


Fig. 2

IPC Installation

1. Locate the Integrated Pressure Control (IPC) and air tube on the bypass damper.
   Drill hole into the side of the supply duct 2' after the bypass and before the 1st supply take-off.

2. Mount pressure supporting block over hole, align hole in block with hole in duct. Use provided sheet metal screws.

3. Install air tube into supply air duct by slipping supplied plastic tubing into holes in support block and duct. Slip tube 3" into the duct. Pickup tubing fits snugly into provided hole.

4. Connect pressure tube from static air pickup to Integrated Pressure Controller (port closest to you).

Bypass Damper With Integrated Bypass Control Setup

1. Run all supply dampers to the full open position and have blower motor running at 100% fan speed. (See Note #1)

2. Manually close the bypass damper by pressing in the release lever on the motor side of the actuator. With the release lever pressed, rotate the damper actuator collar to close the damper and release the lever to lock the damper closed.

3. Quick Set Option: Turn the potentiometer on the damper control board to the full left position and slowly rotate RIGHT, until the "RC" RED LED turns on. Now rotate LEFT just slightly, until RC LED turns off. The **IPC** is ready for operation.

   "RC" RED LED means damper closing.
   "RO" GREEN LED means damper opening.

4. Static Pressure Option: The Integrated Pressure Control Board can be field configured for specified static pressure using a multi meter and the static pressure – voltage chart. (Exhibit A). This chart shows voltage (DC) to inches of W.C. (static pressure) relationship. Use a multi meter set on VDC and place the leads on the "C" terminal and "TP1" (test point one) next to the potentiometer. The Voltage reading translates to inches of W.C.

Static Pressure Voltage Chart

STATIC PRESSURE	TP1	STATIC PRESSURE	TP1
INCH W.C.	VOLTAGE (DC)	INCH W.C.	VOLTAGE (DC)
0.1	1.49	0.5	2.22
0.15	1.62	0.55	2.27
0.2	1.69	0.6	2.42
0.25	1.81	0.65	2.48
0.3	1.85	0.7	2.6
0.35	1.91	0.75	2.68
0.4	1.94	0.8	2.81
0.45	2.06	N/A	N/A

EXHIBIT A

Note # 1: To open all dampers, it may be necessary to remove Y outputs to unit on the zone control board and to make full cool calls on all thermostats. This will modulate dampers fully open and lock out compressor.

On the GEN II use air balance mode to simplified bypass setup.

Bypass Checkout For Static Pressure Controller

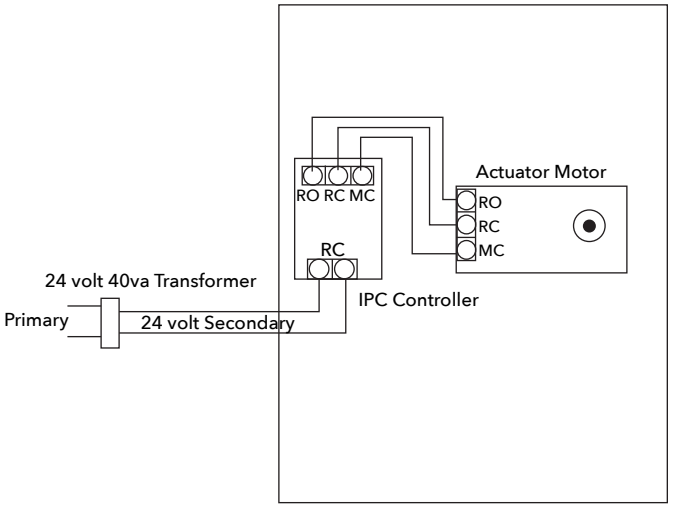
1. Make cool call at the zone thermostat of the smallest zone.

2. Verify all zone dampers are closed except for calling zone.

3. Verify noise at zone registers is not excessive. Adjust the Integrated Pressure Control LEFT to lower noise (airflow) or RIGHT to increase airflow until to noisy.

Bypass Damper Wiring Diagram With Integrated Bypass Control

BYPASS DAMPER WITH INTEGRATED BYPASS CONTROL



GEN II-VVT

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