GEN V

VOTE BASED AUTO CHANGEOVER *VVT*

RESIDENTIAL ZONING - SIMPLIFIED

Installation and Applications Manual

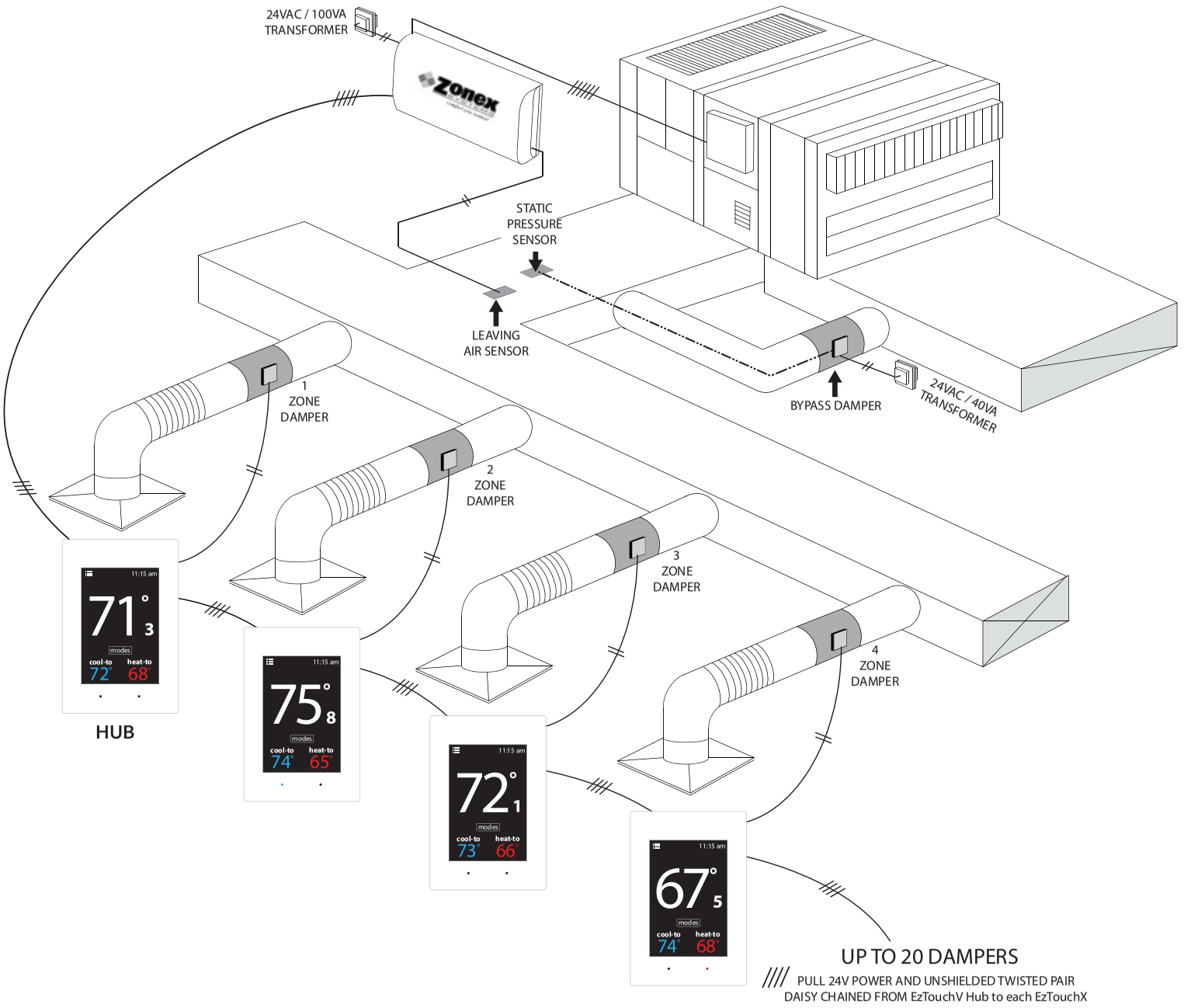
Zonex SYSTEMS

comfort you control

CONCEPTUAL OVERVIEW

GEN V - CONTROL SYSTEM

ON-SITE HUB ACCESS FOR SYSTEM CONFIGURATION AND OPERATION



NOTE: ***USE ZONEX, 2 WIRE TWISTED PAIR COMMUNICATION LINK***

** FOR THE 24V POWER, SIZE THE WIRE BASED ON LENGTH OF RUN*

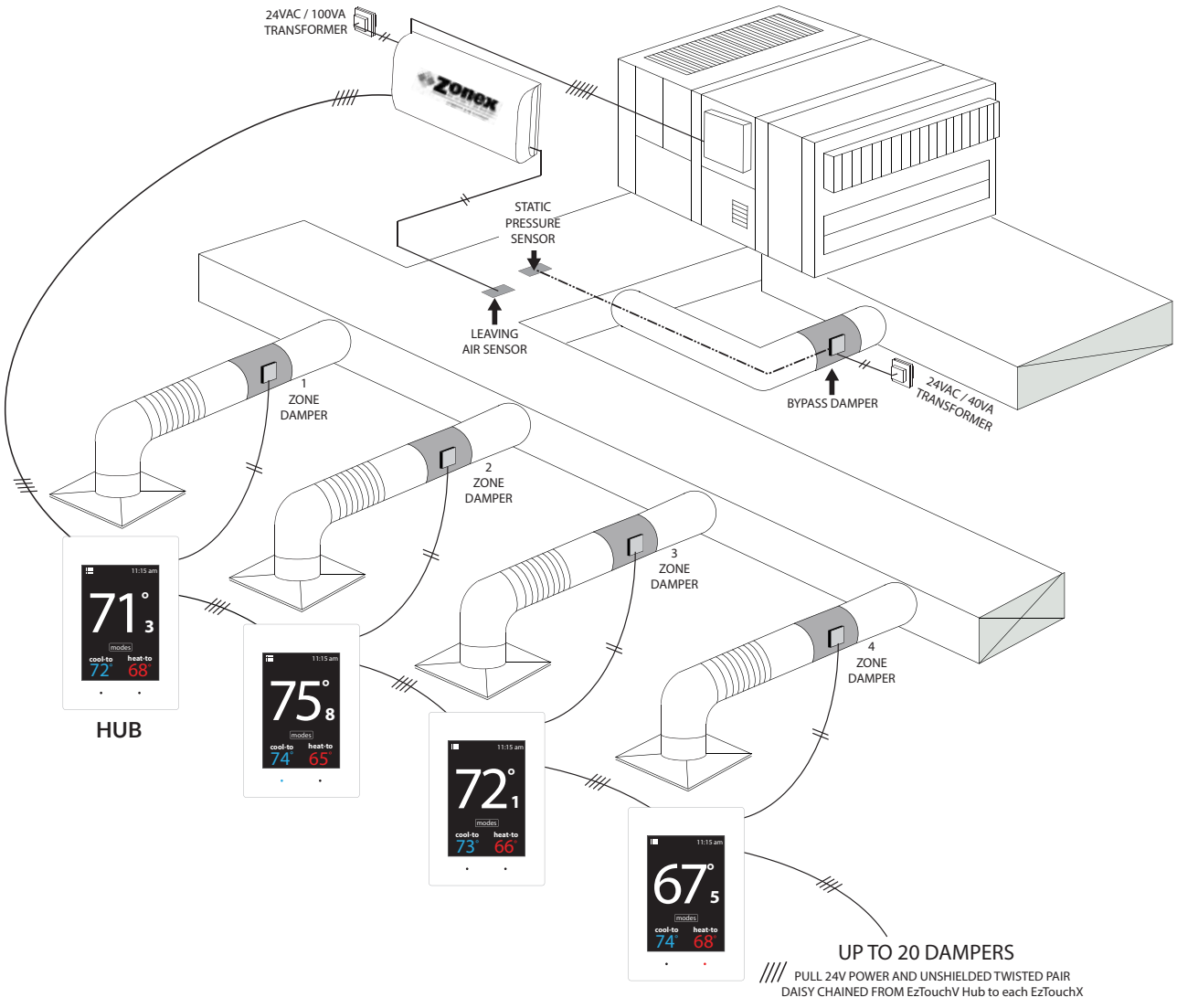
GEN V is a commercial modulating bypass VAV system controlling 2-10 independent zones per RTU or split system utilizing Zonex thermostats.

The GEN V controller is designed for Auto Changeover, bypass VAV operation for multi-stage Heat Pump (2C/3H), Gas Electric (2C/2H) or VRF applications. The GEN V supports VAV boxes and VFD type systems.

The GEN V HUB thermostat allows for a wide range of system control and changeover strategies, allowing the contractor to tailor the GEN V system to a specific application.

Additional features include LED status indication of all system functions, digital leaving air temperature, return air temperature display, fully adjustable capacity control with on-board limit settings and optional staging strategies. Morning warm up, priority votes, and air balance features are also included. An integrated clock allows for setup, night setback, vacation scheduling, globally or individually for each zone thermostat, with selectable 2 to 8 hour override, and the ability to remotely lock each thermostat in the system. Additionally a unique system tool provides the installing contractor with a simple startup diagnostic to quickly alert and identify any system wiring errors, all from the HUB thermostat. ADR and FDD alerts are also available, along with fan control strategies to insure pre and post building purge.

The GEN V system operates over a plenum rated twister pair data link, along with two 24VAC power wires daisy chained from thermostat to thermostat with no home run wiring required. Communication and configuration is done through the HUB thermostat. GEN V can control zoned systems along with standalone units. Zonex stand alone thermostats are utilized to control stand-alone (non-zoned) HVAC equipment.



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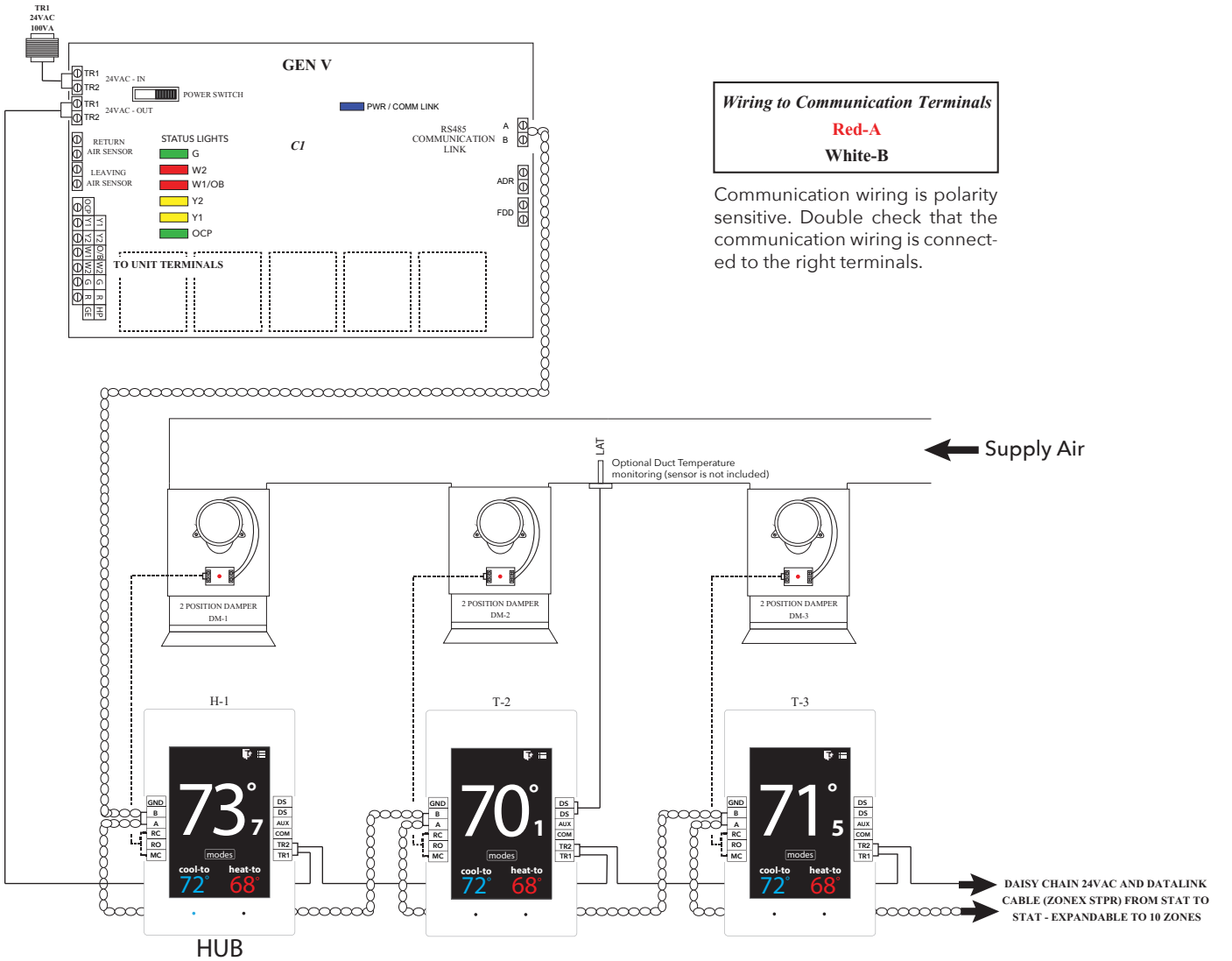
Wiring and Installation

1. Install GEN V contoller inside the conditioned space, in an area that is easily accessible.
2. Install an independent 24VAC/100VA transformer, wire the secondary 24VAC output to the TR1 and TR2 (IN) on the GEN V controller. **Do not ground out the transformer.**
3. Install the leaving air sensor (LV AIR) in the spply duct, prior to the bypass. Wire the leaving air sensor to the LV AIR terminals on the GEN V controller. Install the return air sensor (RTN AIR) in the return duct, before the bypass. Wire the return air sensor to the RTN AIR terminals. (If needed extend sensor wire using 18/2 thermostat wire.)(See page 13)
4. Install Supply dampers and Bypass dampers. (See page 56)
5. Wire TR1 and TR2 (OUT) top terminal from the GEN V controller to the **HUB thermostat** (EzTouchV) TR1 and TR2 using 18/2 thermostat wire. (See page 12.) Continue daisy chaining TR1 and TR2 on the EzTouchV to the next thermostat (EzTouchX) until the last EzTouchX or Standalone thermostat (SATouchX) in the system. Make sure TR1 and TR2 polarity is consistent throughout the system.
6. Wire A and B from the GEN V controller using Zonex 2 wire twisted pair plenum rated wire (Part #STPR) to the **HUB thermostat** (EzTouchV). (See page 12.) Continue daisy chaining from A and B on the EzTouchV to the next thermostat (EzTouchX) until at the last EzTouchX board or SATouchX in the system. Make sure A and B polarity is consistent throughout the system.
7. Turn ON the GEN V controller, confirm that the GEN V , EzTouchV, EzTouchX's, and SATouchX's (if applicable) are powered. A Blue light on the GEN V controller indicates it is powered. If you do not have a blue power light confirm power at the transformer and check TR1 and TR2 wiring.



COMPONENT SELECTION GUIDE

GEN V Control Solutions

Manage the entire system from one central HUB

Part # - **GEN V**

1 - Per RTU or Split System

Supports 2 - 10 Power closed / Spring open dampers

Daisy Chain: Zonex communication wire Part#-TWPR or STPR and 24VAC from Thermostat to Thermostat
Only 1-24VAC / 100VA Transformer Powers the GEN V and up to 10 PC/SO dampers

HUB - Touch Screen Thermostat

Part # - **EzTouchV**

Need 1 Hub Thermostat per GEN V system
Slave Up to 3 Zone Dampers per Stat

Zone Touch Screen Thermostat

Part # - **EzTouchX**

1- Thermostat per Damper
Slave Up to 3 Zone Dampers per Stat

Low Pressure Zone Dampers

Part #

TR + Damper Size **-** Round Damper (up to .5" S.P.)
TREC + Damper Size **-** Rectangular Dampers (up to .5" S.P.)

Bypass Damper

Part #

101ABBD + Damper Size - Round Bypass Dampers
RBB + Damper Size - Rectangular Bypass Dampers

Optional - Wireless Temperature Access Point

Part # - **TAP**

1- TAP per Damper
Mount anywhere and communicate wirelessly to its damper

Thermostat to Control Standalone Units

Part # - **SATouchX**

Controls and Networks Standalone RTU or Split systems
with SA / RA / RH reporting

THIS COMPLETES YOUR GEN V SYSTEM

For assistance, contact Zonex at (800) 228-2966
or visit zonexproducts.com for more information

Zonex SYSTEMS
comfort you control

Vote Based Auto Changeover Bypass VAV with Central HUB Thermostat

GEN V controller wires to the HVAC unit with legacy style connections Y1, Y2, W1/OB, W2, G, R. Every minute the controller communicates to each zone thermostat via RS485 connection daisy chained along with 24VAC power wired thermostat to thermostat. Each thermostat must be assigned a unique ID so they can communicate back to the GEN V controller.

The GEN V is an auto changeover, vote based VAV system. As thermostats call for heating or cooling, votes are tallied by the GEN V controller and based on the majority of votes received the HVAC unit operates in the mode of majority votes. If majority changes, the system controller will automatically initiate a changeover sequence with built in time delays to protect the equipment before changing over to the new mode of operation.

When the last calling zone is satisfied (in either heat or cool mode), the GEN V controller will terminate outputs to the HVAC unit after the next “poll”; and the blower output will de-energize (unless controller is configured for constant fan) after a 3-minute purge cycle. During the purge cycle no heat or cool calls are recognized.

The zone thermostats control and modulate zone dampers based on variance from set point to a position that will match the demand requirement. When the HVAC unit is running, if a zone thermostat is not calling or is calling for the opposite mode, its corresponding damper fully closes. When the HVAC unit is not running, the thermostats open to the Vent mode to provide ventilation if the indoor blower fan is running continuously. When configured for Reheat operation and the zone temperature drops 2° below thermostat set point, the damper modulates to approximately 40% open providing airflow over electric heat strips or other supplemental heat source, the AUX terminal will energize and strip heat will energize.

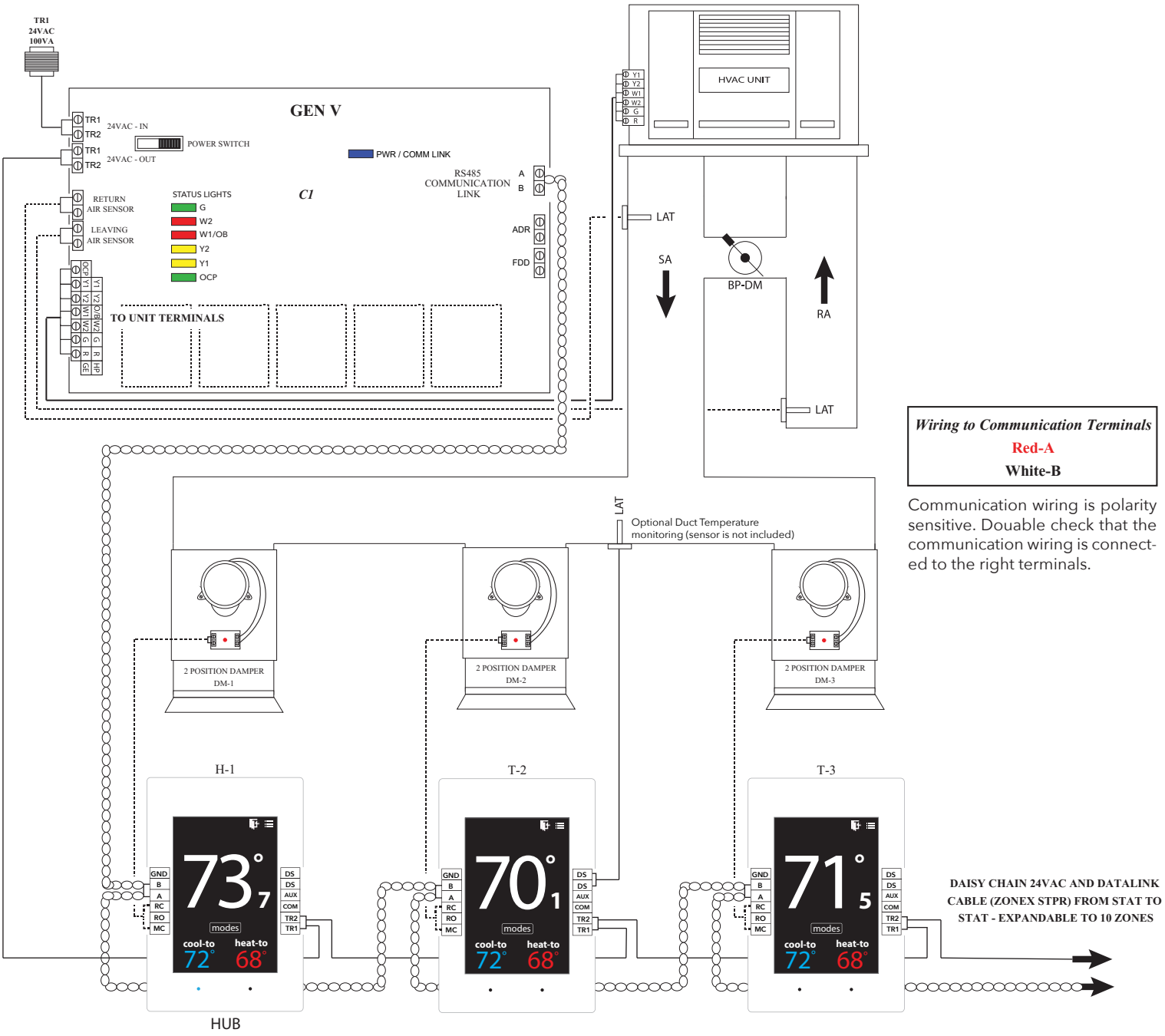
The HVAC unit's leaving air temperature is continuously monitored and compared against configurable low and high limits. When the low limit is exceeded the controller will cease cooling operation to prevent coil freeze-up and protect the compressor(s). When the high limit is exceeded the controller will cease heating operation to protect the unit's heat exchanger and/or compressor(s). After a 3-minute purge cycle, the GEN V will ensure that the leaving air temperature does not exceed the low or high limits before resuming system operation.

The GEN V is a vote based system where majority wins on changeover. For example, when the system is in the heating mode and a majority of the votes change from heating to cooling a changeover timer begins that allows unit to operate in the heating mode for 4 minutes or until heat call is satisfied (whichever comes first). Heating operation is then terminated and a 3-minute purge cycle is begun. After the purge cycle is complete cooling operation is energized until all cool calls are satisfied or there is a majority vote for heat received by the GEN V controller. After all calls have been satisfied a 3-minute purge delay begins and then all dampers will modulate to approximately 40% open position for ventilation mode.

The system fan/blower operation can be configured for ON or intermittent AUTO operation.

All zone thermostats are wired to and control/modulate their respective modulating zone damper. The HUB thermostat has the ability to issue individual or global commands to each thermostat in the system. Management and configurations such as scheduling, set point changes, locking thermostats, and much more are all done from the HUB thermostat. Additionally the HUB thermostat provides useful diagnostics information such as communication status, system status, current zone temperatures & set points, and more.

Voting demand strategy can be enhanced by adding additional votes or by giving a NULL vote to individual thermostats in the system, thereby weighting certain zones more than others. Priority votes allow you to select 0, 1, 2, or 3 additional votes for a zone that has unusual loads, such as a conference room. A change to 0 will create a NULL vote and will not allow the stat to place a call for heat or cool, but will only control damper operation based on system mode of operation, and zone requirements.



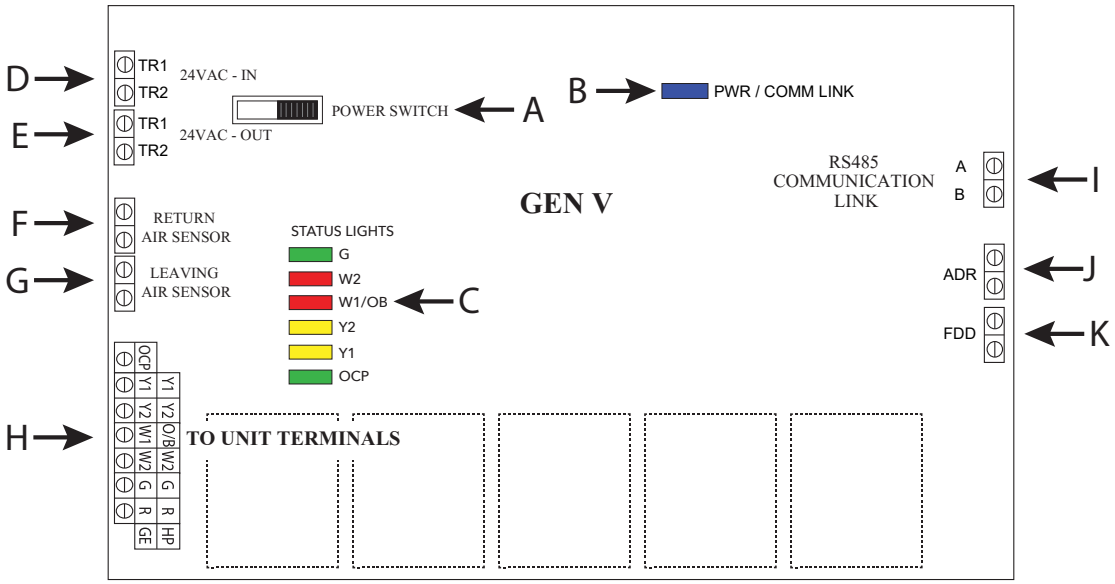
Wiring to Communication Terminals
Red-A
White-B

Communication wiring is polarity sensitive. Douable check that the communication wiring is connected to the right terminals.

DEVICE	ID	DESCRIPTION	DEVICE	ID	DESCRIPTION
CONTROL BOARD	C1	GEN V CONTROLLER CONTROLS 2-10 POWER CLOSED / SPRING OPEN DAMPERS 1-24VAC/100VA TRANSFORMER POWERS ALL SUPPLY DAMPERS	SYSTEM TRANSFORMER	TR1	24VAC/100VA TRANSFORMER (SIZED @ 15VA PER ZONE) DAISY CHAIN STAT TO STAT
EZTOUCHV THERMOSTAT	H-1	HUB COLOR TOUCH SCREEN THERMOSTAT	SUPPLY / RETURN AIR LAT DISCHARGE SENSORS	LAT	SUPPLY LAT LOCATED BEFORE THE BYPASS. RETURN LAT LOCATED AFTER THE BYPASS
EZTOUCHX THERMOSTAT	T2-T20	COLOR TOUCH SCREEN THERMOSTAT	24VOLT WIRING TO EzTouchX's	——	USE 18GA THERMOSTAT WIRE TO DAISY CHAIN THE 24VOLTS FROM STAT TO STAT
ZONE DAMPER ACTUATOR	DM	SUPPLIED WITH ZONE DAMPER	RS485 COMMUNICATION LINK	○○○	2 WIRE TWISTED PAIR (TWPR or STPR)

VISIT OUR ON-LINE CATALOG AT ZONEXPRODUCTS.COM
FOR APPLICATIONS ASSISTANCE CALL 800-228-2966

The GEN V is a micro-controller based, auto changeover Universal Gas/Electric, Heat Pump or VRF system controller (Part # ***GEN V***). The ***GEN V*** controls a zoned 2H/2C Gas/Electric HVAC unit or 3H/2C zoned Heat Pump unit and communicates with and supports up to 20 zones, utilizing pressure dependent, modulating dampers and zone thermostats. The ***GEN V*** gathers information every 60 seconds from each thermostat and communicates with the system over a 2-wire plenum rated twisted pair data link directing control based decisions to the HVAC equipment. The ***GEN V*** is powered with one 24VAC/ 100VA transformer, which also powers all thermostats and dampers in the system. Power from the controller, along with a 2-wire communications Ibus, is daisy chained thermostat to thermostat to streamline installation and system communications. The ***GEN V*** is equipped with integrated capacity control and High and Low temperature limits to protect the compressor and heat exchanger. Supply air and return air sensors are also provided. The HVAC unit is staged based on leaving air temperature and time. Auto changeover operation is vote based, predicated on a first call, first served majority wins on changeover algorithm. Additional control strategies are established with the HUB thermostat (EzTouchV) which initiates control decisions with the ***GEN V*** system controller. **Review controller terminal connections below:**



A. On /Off Power Switch
B. Power / Communication link LED
C. Unit Status Lights
D. 24VAC IN to power the GEN V board
E. 24VAC OUT daisy chained out to zone thermostats
(Independent 24VAC /100VA Transformer)
F. Return Air Sensor (RA)
G. Leaving Air Sensor (LVAIR)
H. Unit Terminals
I. A/B 2 wire communication link, daisy chained OUT to zone thermostats
J. Automated Demand Response (ADR)
K. Fault Detection Device (FDD)

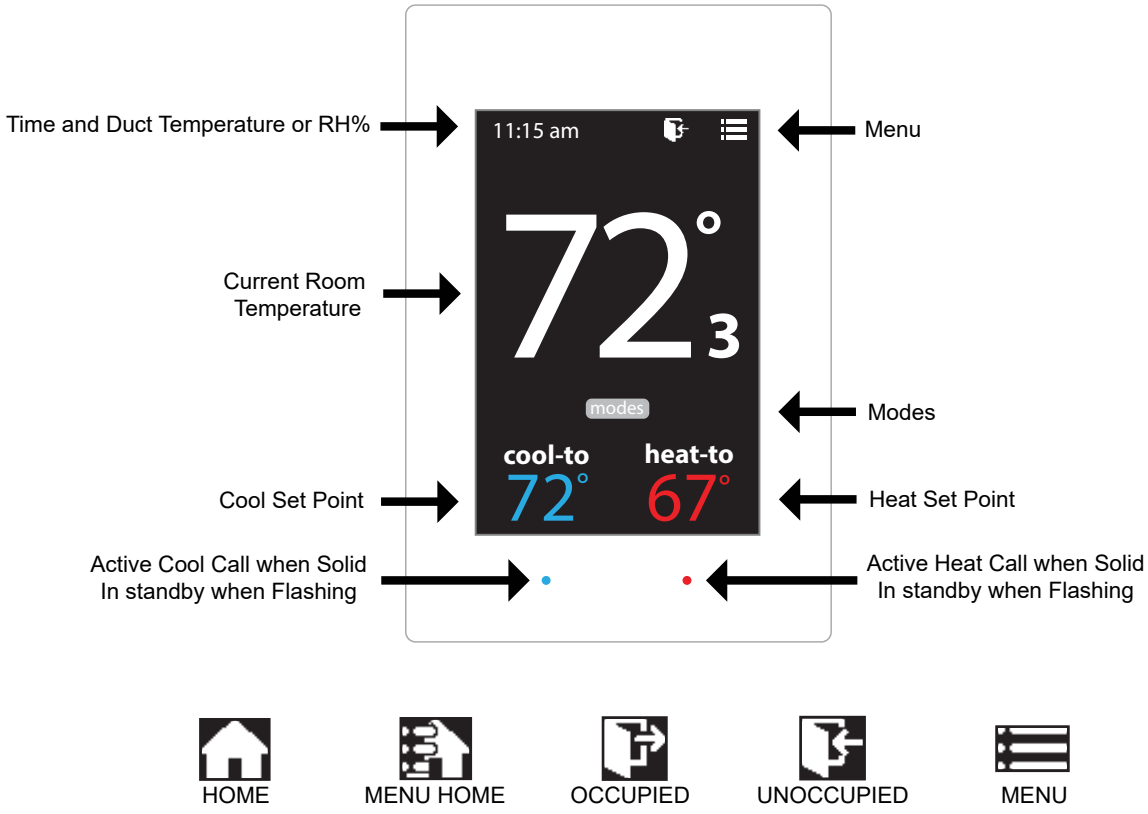
DESCRIPTION

The zone thermostats EzTouchV and EzTouchX are a microprocessor based, auto changeover, programmable communicating zone thermostat.

The zone thermostat controls medium pressure modulating round or rectangular commercial or spring loaded two position low pressure dampers. The zone thermostats control modulating zone dampers based on variance from set point to a position that will match the supply load to the demand requirement.

When the HVAC unit is running and a zone thermostat is satisfied or is calling for the opposite mode its damper will fully close. When all zones are satisfied the thermostats modulate their damper to 40% open (called Vent mode) to provide ventilation if the indoor blower fan is running continuously.

All zone thermostats require a unique ID numbered 2 - 20 so they can be identified and communicate back to the GEN V controller. All system management and configuration is performed at the GEN V HUB thermostat (EzTouchV) such as global or individual schedules for the system, lock thermostats, master temperature settings individually or globally for the system. This user interface provides diagnostic functions to streamline system troubleshooting along with air balance shortcuts and many additional functions.



EzTouchV / EzTouchX - Sequence of operation

COOL CALL

When zone temperature rises 1° or more degrees above COOL set point, thermostat transmits COOL call to the GEN V controller. GEN V controller evaluates calls for HEAT and COOL for majority vote. If there is a majority vote for COOL, GEN V controller initiates a call for cooling and the damper modulates open. ***A BLUE light* will flash** until system is operating in the COOL mode. Once system is in COOL mode, The BLUE light will remain constant. As zone cools, thermostat will communicate with the zone damper and modulate to maintain zone comfort. When zone temperature reaches set point, damper is closed or at minimum position and EzTouchV / EzTouchX releases call for COOL.

HEAT CALL

When the zone temperature falls greater than 1 degree below HEAT set point, thermostat will initiate a call for HEAT. GEN V controller will evaluate all calls for HEAT and COOL in the system and if there is a majority of calls for HEAT, GEN V controller will initiate heat call and the damper modulates open. ***A RED light* will flash** until system is operating in the HEAT mode. Once system is in HEAT mode, The RED light will remain constant. As zone heats, thermostat will communicate with the zone damper and modulate to maintain zone comfort. When zone temperature reaches set point, damper is closed or at minimum position and EzTouchV / EzTouchX releases call for HEAT.

Baseboard / Supplemental HEAT

When zone thermostat is configured for BASEBOARD heat and zone temperature falls greater than 2° below HEAT set point, the thermostat will energize AUX heat and BASEBOARD heat is now operating, When calling the RED light will remain constant. When zone temperature rises to HEAT set point, thermostat will satisfy call for AUX operations.

REHEAT

When zone thermostat is configured for REHEAT operation, and the zone temperature falls greater than 2° below HEAT set point, thermostat transmits a call for REHEAT. The thermostat modulates the damper to 40% open and energizes AUX output REHEAT, When calling the RED light will remain constant. When zone temperature rises to HEAT set point, thermostat satisfies, releases call for AUX REHEAT and closes damper.

VENT

When all calls for HEAT or COOL are satisfied, dampers will modulate to approx. 40% open.

Zone Damper Installation

Install dampers into HVAC duct so damper actuators are easily accessible. Damper may be mounted in an area where the ambient temperature is between 32 and 140 degrees Fahrenheit. Round dampers should be mounted with damper actuators between 9 and 3 O'clock position.

Installing 24VAC wiring

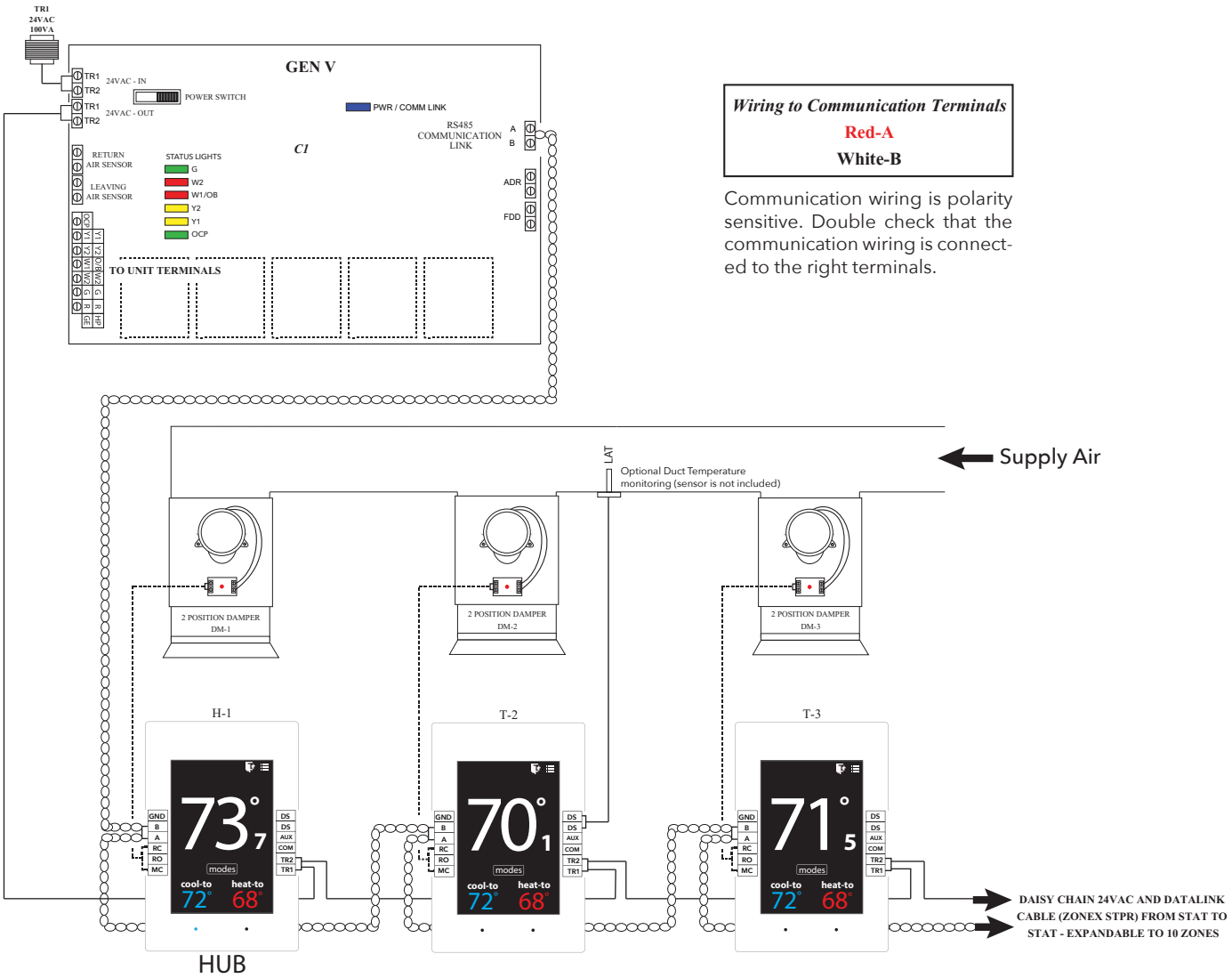
Once GEN V controller and supply dampers are installed, install one 24VAC/100VA transformer, and wire secondary 24 volts to the TR1 / TR2 bottom terminals on GEN V controller. Using 18 ga. thermostat wire, wire TR1 / TR2 top terminals and daisy chain power wires to the first zone thermostat. Continue daisy chain wiring from first thermostat to second, third, etc., until all zone thermostats are wired with power.

Note: Maintain TR1 and TR2 wiring polarity throughout the system to improve communications.

Do not ground out the transformer.

Installing Communication Wire RS485

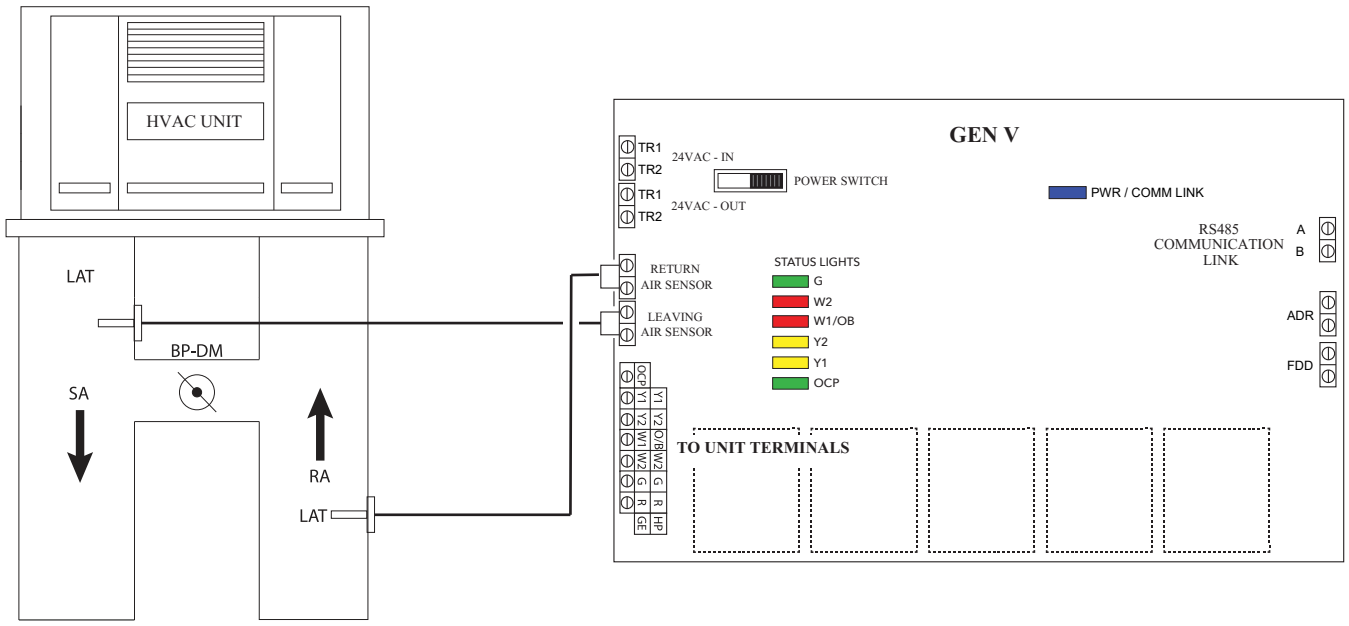
Once power wiring is daisy chained to all zone thermostats in the system, use Zonex STPR plenum rated twisted pair communications wire to install communications loop. Install communications wire using the A and B terminals on GEN V controller and daisy chain to the first zone thermostat in the system and wire to A and B terminals. Continue daisy chain to the next thermostat using A and B terminals to the A and B of the next thermostat, repeating this process until all zone thermostats are wired into the communications loop. Communications wiring is polarity specific, if RED communications wire is on A at the GEN V controller, then RED wire is connected to A throughout the system.



Wiring in the Leaving and Return Air Sensors to GEN V controller

The LAT Capacity Controller protects both the air conditioner and furnace by constantly monitoring the leaving air temperature. If the air gets to cold (drops below the cool cut-out set point), it breaks the"Y" connection, disengaging the compressor. If the air gets to warm (rises above the heat cut-out set point), it breaks the "W" connection, de-energizing the furnace. To prevent short cycling, the compressor or furnace cannot re-energize for at least 4 minutes after cut-out. The heating and cooling cut-out set points can be changed by the installer from the App.

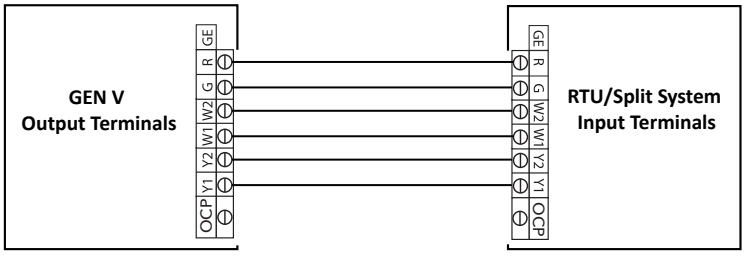
Install Leaving Air Temperature Sensor (LAT) to the LVAIR terminals on the GEN V controller and place the sensor in the supply duct prior to the bypass takeoff. Install Return Air Temperature Sensor (LAT) to the RA terminals on the GEN V controller and place the sensor in the return duct after the bypass takeoff.
(Note: If extension of wire is needed, 18 ga. thermostat wire may be used).



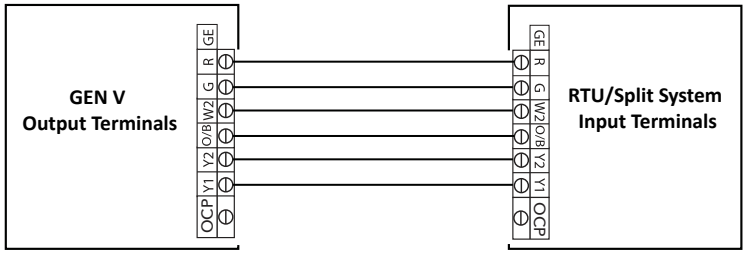
Wire Unit to GEN V Controller

Using standard 18 ga. thermostat wire, connect GEN V unit outputs to HVAC unit. Standard HVAC control terminal designations are used, R Y1 Y2 W1(O/B) W2 G, and energize HVAC unit.

1. Gas/Electric Wiring

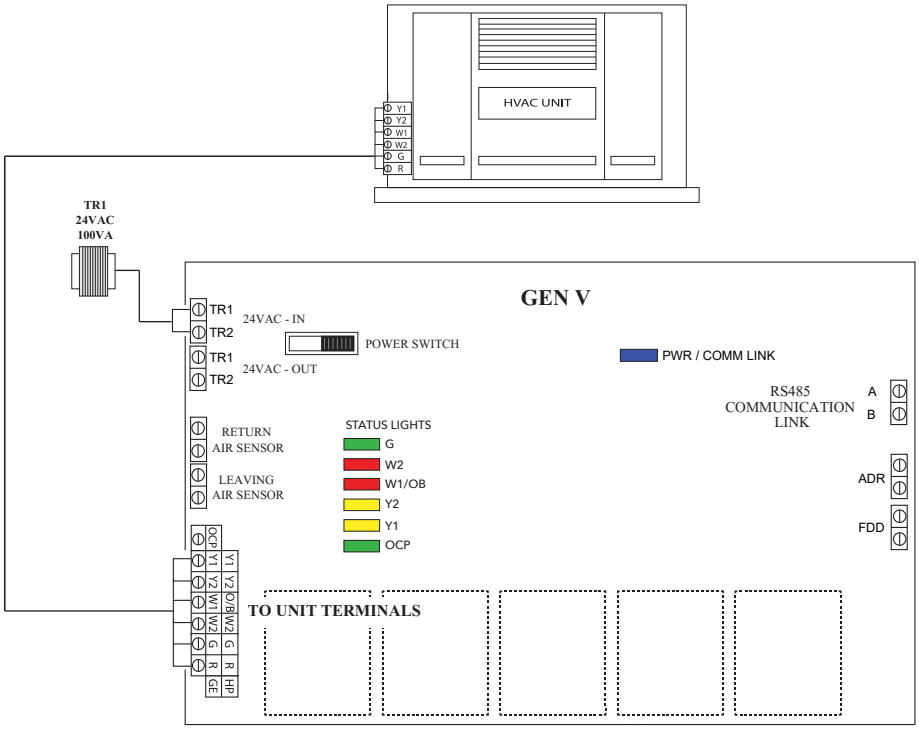


2. Heat Pump Wiring– O/B operation



Note: 1. Single stage systems will not use Y2 or W2 terminals for operation. Please confirm your system operation to ensure proper wiring.

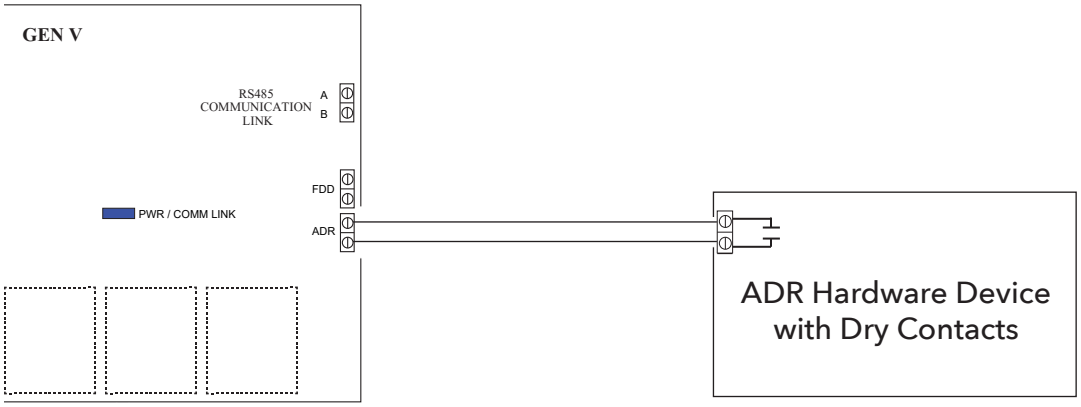
2. For Heat Pump applications with Gas/Electric inputs, set system for gas operation and reset high limit on the App to 115 degrees.



Note: GEN V does not control the unit economizer.

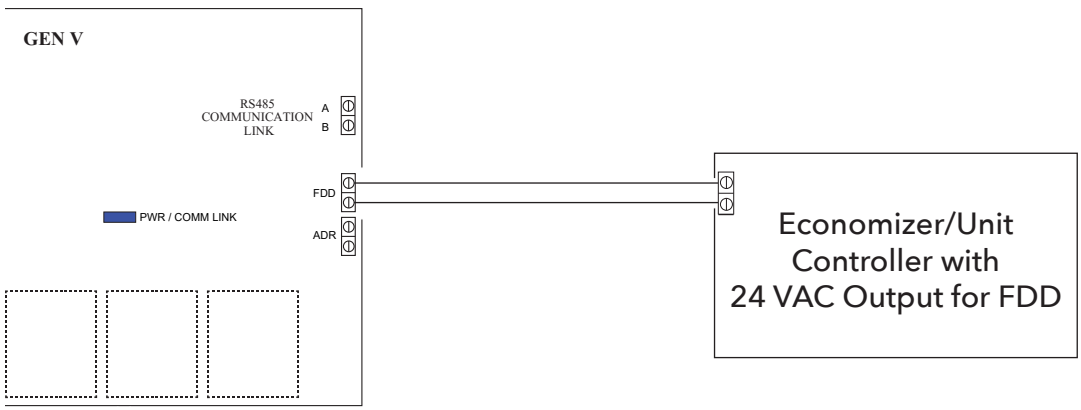
Wiring in the Automated Demand Response (ADR) to GEN V controller

ADR (Automated Demand Response) is a load shedding strategy implemented by local utilities to curb electricity usage during high demand periods. The local utility provider sends out a signal from a VTN or DRAS (Virtual Top Node or Demand Response Automated Server) from their facility and is received by a VEN (Virtual End Node) located at the customer's location. The purpose of the signal is it to setback thermostat set points 4° for both the heating and cooling modes of the facility's HVAC equipment. **The GEN V does not directly accept signals from the local utility provider.** For the GEN V to setback thermostat set points it must be used in conjunction with a VEN hardware device that supports Open ADR **(contact the local utility provider for the most current protocol requirements for your area)** and must be equipped with a set of dry normally open contacts that close during an ADR event. The contacts of the VEN are wired to the ADR terminal of the GEN V (see diagram below). When the VEN receives an ADR signal from the VTN or DRAS its contacts close, the GEN V will set back the thermostats 4° for both the heating & cooling modes and lock the thermostat set points so they cannot be adjusted at the thermostat during the ADR event. Once the ADR event has concluded the thermostats unlock and return to their original set points. For a list of Open ADR products please visit **http://products.openadr.org** or contact your local utility provider. **This feature can be enabled/disabled on a thermostat by thermostat basis.** Go to Settings ->Change ADR settings -> Check the boxes to enable ADR for that thermostat.



Wiring in the Fault Detection and Diagnostics (FDD) to GEN V controller

The purpose of the **Fault Detection & Diagnostics (FDD)** is to meet the requirement of Title 24 Part 6 section 120.2(i)6A or other states regulations in the event that a fault is detected by the economizer/unit controller so that appropriate facility personnel are notified. FDD must be triggered at the GEN V by a 24 VAC signal from the economizer/unit controller in the event of a fault. A "fdderror" notification will be displayed on the HUB themostat when a fault is detected. No additional configuration is required to make this feature operational. **Verify with the HVAC unit manufacturer that a 24 VAC for FDD alerting is provided prior to installation.**



Setting ID on the EzTouchV / EzTouchX Thermostat

Each thermostat must be ID'd. Beginning with the first thermostat in the daisy chain closest to the GEN V controller. Locate associated zone thermostat and confirm display appears on stat. If not, turn ON the GEN V controller at the ON/OFF switch located on the upper left hand corner of the controller. If no display is seen, check that you have 24VAC between TR1 and TR2 on the GEN V controller and then at the thermostat. The EzTouchV (HUB) thermostat is ID'd as #01 and can not be changed. All EzTouchX zone thermostats require a unique ID 02 to 20. Note: HUB in addition to being the control center also controls the damper in that zone.

To ID and configure thermostats 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 .

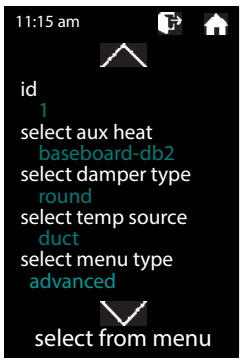
Setting STAT ID for the Zone Thermostat

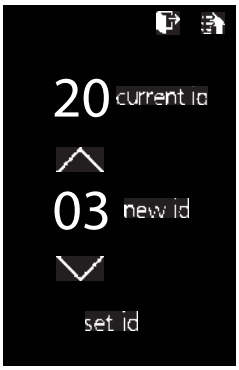
While in the Thermostat Advanced Menu, Select **SET ID**

Use the and arrows to set the new ID ranging from 2-20

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

Note: The EzTouchV (HUB) will always have ID #01. All EzTouchX thermostats receive a unique ID 02 to 20, maximum of 20 zones per GEN V controller.





Select Damper Type Operation

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

To set the damper type 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

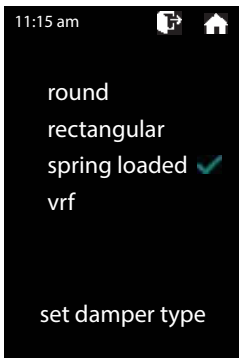
EzTouchV (HUB) - select configure hub stat, **Select Damper Type**

EzTouchX - Thermostat Advanced Menu, **Select Damper Type**

Select **spring loaded** damper operation

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

Note: Only select VRF damper type when SAV dampers are installed on VRF systems.



Confirm Gen V and Thermostat Communications

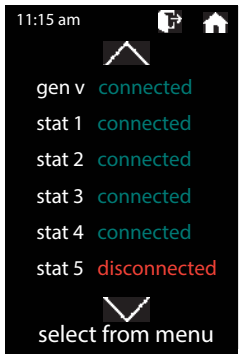
From the **EzTouchV (HUB)** thermostat, confirm that all the zones are showing connected in system diagnostic screen. If it shows any disconnected with in your zone count confirm wiring is correct and check stat ID. The GEN V will report up to 20 zones, anything above the zone count will report back disconnected.

To access the **System Diagnostic** screen tap on the degree symbol next to the room temp. The degree symbol will change from white to green and then tap

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

Zone quick view: Tap on any connected zone to see communication status, thermostat type, current room temperature, set points, mode, current call and status.

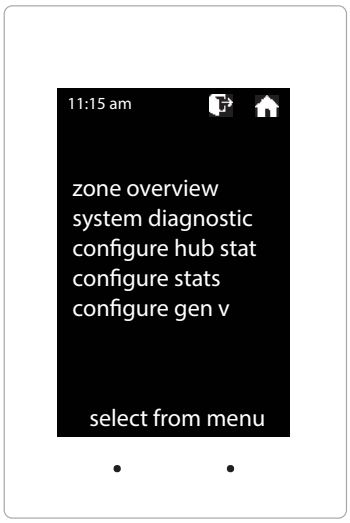
Note: If a thermostat is showing up disconnected with in system the zone count when it should be connected, check the thermostat ID and wiring is correct.

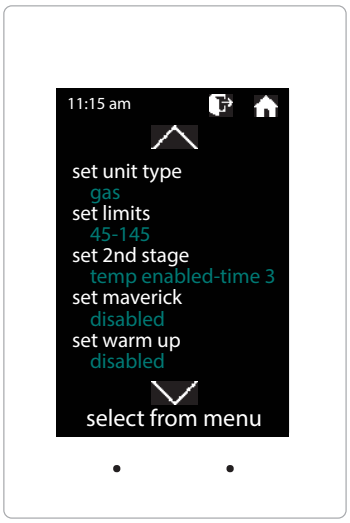


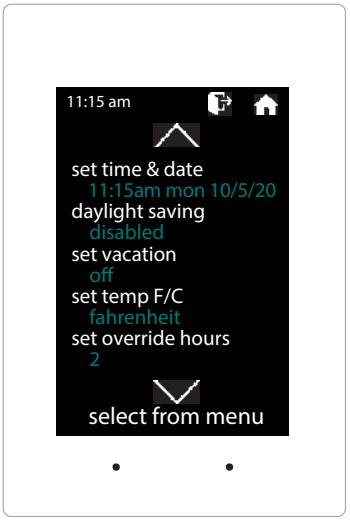
CONFIGURING GEN V CONTROLLER

Once GEN V controller is mounted, all zone stats are ID'd and there are no communication errors the system is ready to be commissioned and started up. Follow the steps below from the HUB thermostat.

To **configure gen v** controller 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.







Set Type of Unit

Confirm the type of unit the GEN V is controlling: GAS, ELECTRIC, HEAT PUMP (O), HEAT PUMP (B), or VRF. Factory default for UNIT TYPE is GAS, if application is ELECTRIC, HEAT PUMP or VRF, you will need to select one of these options through the HUB thermostat.

While in the configure gen v, **Select Set Unit Type**

Select the desired unit type operation

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

Note: Only select VRF unit type when SAV dampers are installed on VRF systems.

Set Time and Date

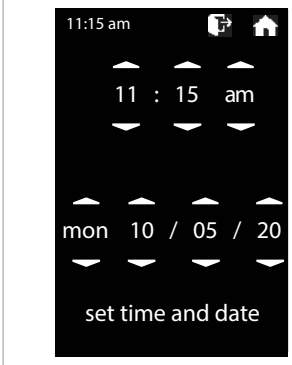
From the HUB thermostat time and date is set for all system devices. To set the time and date, access configure gen v on the HUB thermostat.

While in the configure gen v, **Select Set Time and Date**

Use the ^ and v arrows to set the time and date

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

Note: If the GEN V is in a daylight savings time zone, "Enable" daylight savings while in the configure gen v menu.



Confirm High/Low Limits

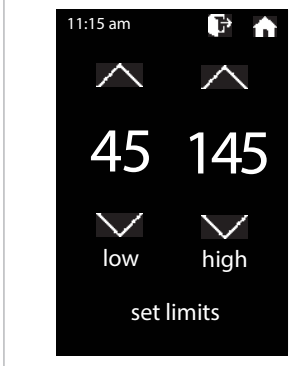
Factory defaults for GAS/ELECTRIC units are set for 45 degrees Low Limit and 145 degrees High Limit. Heat Pump O and B machines are set for 40 degrees Low Limit and 115 degrees High Limit. These may be adjusted in the field to meet installation/application requirements.

While in the configure gen v, **Select Set Limits**

Use the ^ and v arrows to set the High / Low Limits

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

Note: Ensure that the RTU/Split systems high and low limit settings do not conflict with the GEN V's.



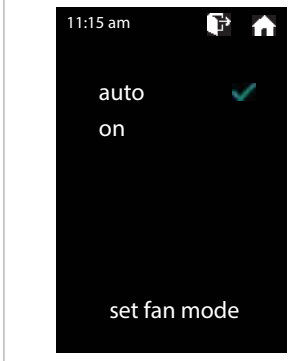
Set Fan Operation

Configuration of FAN is set at the factory for AUTO operation and will operate only when a call for heat or cool is present. If continuous fan is required, fan will need to be configured for fan ON and will run anytime during Occupied time, and AUTO during unoccupied. To set fan mode, access configure gen v on the HUB thermostat.

While in the configure gen v, **Select Set Fan Mode**

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

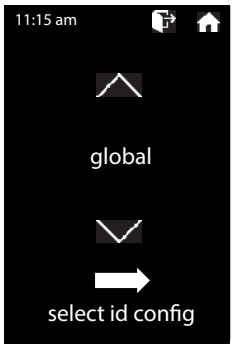
Tap to save changes, to return to the home screen tap

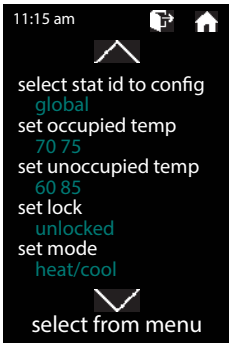


Confirm Cool, Heat Call and Damper Operation

From the HUB thermostat go to **configure stats** 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

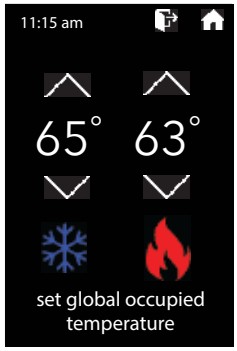
Use the and arrows to select **Global** tap the arrow below to global configuration.

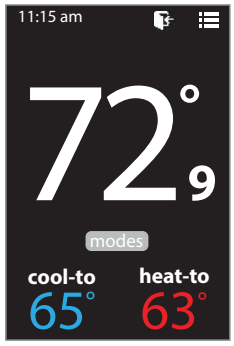




Tap **set occupied temp,** to make a occupied global temperature change.

Use the and arrows over the snowflake icon to lower the cool set point, so all zones will make a cool call. Tap to save changes, return to the home screen by tapping





All zone thermostats should now be calling for cooling. Confirm the GEN V controller has energized in cooling. When the RTU or Split system is cooling confirm all zone dampers are open and conditioned air is entering the zones.

Once you have confirmed the zone dampers are open, start satisfying each zone individually and confirm the dampers close.

Repeat the steps above on a call for heating.

Vent

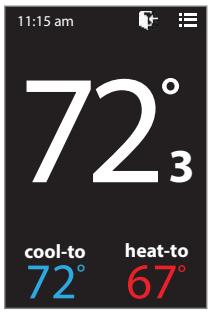
With all calls satisfied all dampers modulate to the vent position, approximately 40% open.

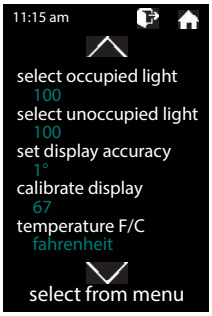
THERMOSTAT USER MENU

To access the Thermostat User Menu: Tap

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

Select Occupied Light
Select Unoccupied Light
Set Display Accuracy
Calibrate Display
Temperature F/C (view only)
Current Schedule (view only)
Time & Date (view only)





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**

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**

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.

SET DISPLAY ACCURACY

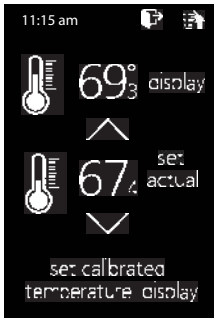
Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

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

Select the desired display accuracy

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

CALIBRATE DISPLAY



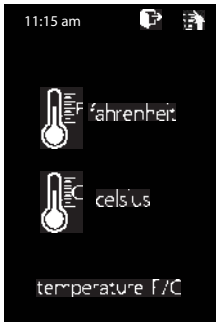
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

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



Thermostats can be configured for F° or C° operation through the HUB thermostat.

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

To view the current temperature operation *(View only function)*

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

CURRENT SCHEDULE

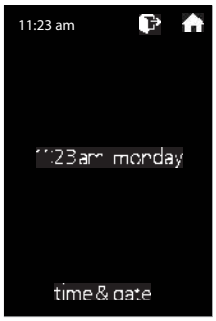
View the current thermostat schedule, given by the Gen V system

While in the Thermostat Configuration Menu, Select **Current Schedule**

This allows you to view the schedule for that zone. Changes to the schedule are done through the HUB thermostat. *(View only function)*

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

TIME & DATE



View the current time and date, given by the Gen V system.

While in the Thermostat Configuration Menu, Select **Time & Date**

To view the current time and date on the Gen V system *(View only function)*

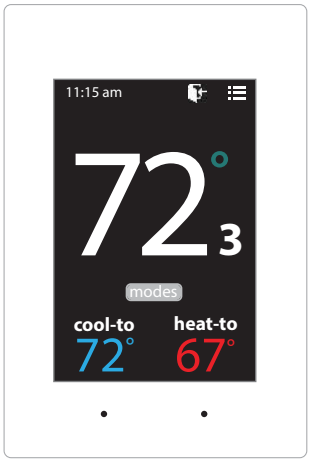
Tap to go back to the menu, to return to the home screen tap

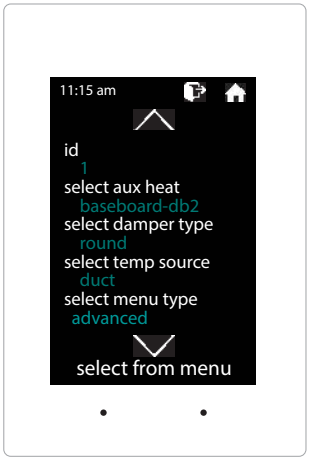
THERMOSTAT ADVANCED MENU

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 .

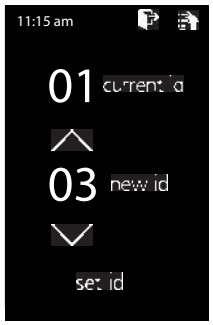
The **THERMOSTAT ADVANCED MENU** allows you to:

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





STAT ID



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

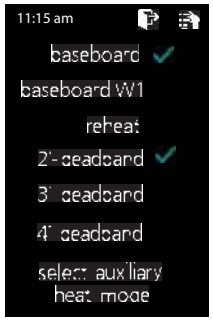
While in the Thermostat Advanced Menu, Select **SET ID**

Use the ∧ and ∨ arrows to set the new ID ranging from 02-20

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

Note: All thermostats receive a unique ID 02 to 20, maximum of 20 zones.
The EzTouchV is hard set to ID 01 and can not be changed

SELECT AUX HEAT



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

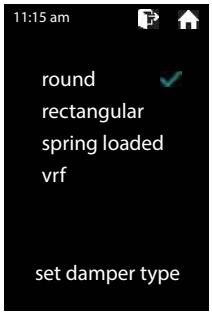
While in the Thermostat Advanced Menu, Select **Aux Heat**

Select 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



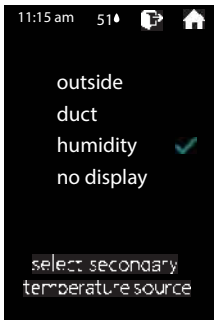
The thermostat must be configured for the appropriate damper type that it will be connected to and controlling. There are 4 options, round, rectangular, spring loaded or vrf.

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

Select round, rectangular, spring loaded or vrf damper operation

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

TEMP SOURCE



The thermostat can display the outside air temperature, supply air duct , relative humidity, or no value will be displayed at the top of the home screen. An optional LAT temperature sensor must to be installed to report outside air or supply air duct temperature.

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

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

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

Note: If an LAT is not installed a temperature reading of "00°" will be displayed.

MENU TYPE

The menu allows user to access advanced configuration and management features. When this feature is selected the Advance menu will be displayed whenever the menu is accessed. .

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 thermostat Diagnostic screen will allow you to confirm communication with the GEN V controller, 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

HUB Thermostat

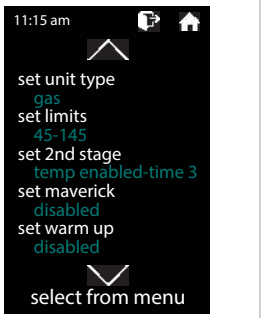
A HUB zone thermostat is used with the GEN V controller to interact and initiate control decisions for the system, the HUB coordinates global or individual schedules for the system, locks thermostats individually and provides a user interface to make adjustments and establish master temperature settings individually or globally for the system. This user interface provides diagnostic functions to streamline system troubleshooting along with air balance shortcuts and more.

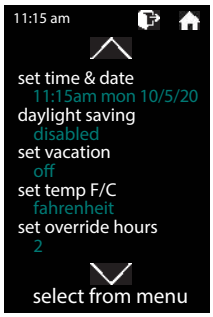
The HUB Thermostat performs all the functions of a zone thermostat along with Advanced Configuration Menu to access 14 unique functions to control and schedule the GEN V system. To access the Advanced Configuration menu follow the steps below:

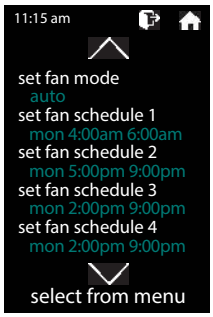
GEN V Configuration

All GEN V system configuration and management is done at the HUB stat from the Advanced Configuration Menu.

To configure the GEN V system 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 then tap and then tap configure gen v



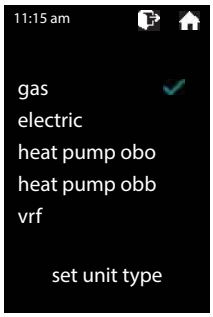




GEN V MENU FEATURES:

1) UNIT TYPE
2) SET LIMITS
3) SET 2ND STAGE
4) SET MAVERICK
5) SET WARM UP
6) SET TIME AND DATE
7) DAYLIGHT SAVING
8) SET VACATION
9) SET TEMP F/C
10) SET OVERRIDE HOURS
11) SET FAN MODE
12) SET FAN SCHEDULE
13) SET AIR BALANCE
14) SELECT DIAGNOSTIC

SET UNIT TYPE



The GEN V is designed as a universal GAS / ELECTRIC / HEAT PUMP / VRF controller. Factory default is set for GAS operations.

While in the configure gen v, Select **Set Unit Type**

Select the desired unit type operation

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

Note: Only select VRF unit type when SAV digital dampers are installed on VRF systems.

SET LIMITS

For system protection the GEN V has high and low limit protections built into the controller. Factory defaults for Gas/Electric operations are High Limit of 145°F and Low Limit of 40°F, for Heat Pump operations factory defaults are High Limit of 115°F and Low Limit of 40°F, for VRF operations factory defaults are High Limit of 110°F and Low Limit of 50°F. These can be field configured as required.

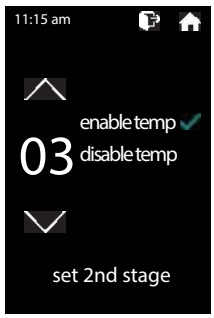
While in the configure gen v, Select **Set Limits**

Use the and arrows to set the High / Low Limits

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

Note: Check the RTU / Split System's High / Low limits and adjust them on the GEN V below the units cut out limit.

SET 2ND STAGE



The GEN V controller can be configured for TIME/TEMP or TIME only second stage operation. TIME/TEMP strategy uses both run time and leaving air temperature to determine when to stage on second stage heat or cool. Time only strategy uses run time to stage on second stage heat and cool. Factory default for run time is preset to 3 minutes; however this can be reset for up to 30 minutes.

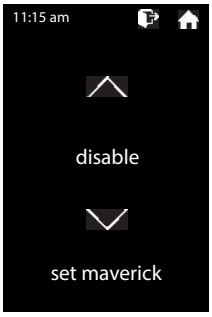
While in the configure gen v, Select **Set 2nd Stage**

Select enable / disable temp

Use the and arrows to set 2nd stage time delay (3-30 minutes)

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

SET MAVERICK



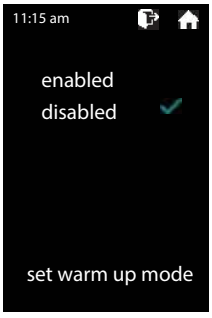
Maverick operations allow the system to recognize an outlier call in the system. When most zones in a system are calling for heat and single zone is calling for cooling, the system will initiate a MAVERICK CALL protocol by starting a time clock. Logic in the controller will provide a time period from 3-30 minutes for first calls to satisfy, then run a purge cycle and then maverick call. Maverick call will remain on until zone is satisfied, then run purge and return to majority operations.

While in the configure gen v, Select **Set Maverick**

Use the ^ and v arrows to set the time period or disable

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

SET WARM UP



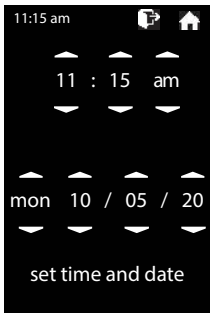
In cold climates a MORNING WARM UP sequence will assist in preheating the building prior to occupancy. The GEN V system provides a strategy for morning warm up based on a sophisticated algorithm built into the system controller. When enabled, the system will switch from Unoccupied to Occupied two hours prior to system start time if any zones are 10° or more below the set point the system will run heating for 20 minutes to evaluate time needed to raise building temperature, after 20 minutes system will return to Unoccupied mode. Using the information gathered from the 20 minute warm up evaluation, thermostats will reset individual occupied start times to provide morning warm up for each zone in the building.

While in the configure gen v, Select **Set Warm Up**

Select the desired operation; enabled / disabled

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

SET TIME AND DATE



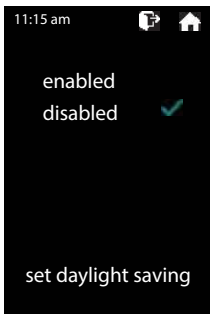
System time and date operation, including all scheduling functions are based on the system time clock. Set the time to your local time at startup

While in the configure gen v, Select **Set Time & Date**

Use the ^ and v arrows to set the time, day, and date

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

DAYLIGHT SAVING



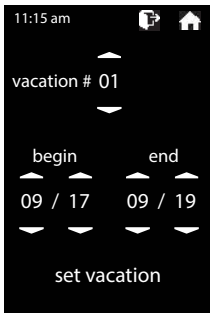
The GEN V will follow daylight savings time when it is enabled

While in the configure gen v, Select **Daylight Saving**

Select the enabled / disabled if you desire daylight savings operation

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

SET VACATION



The GEN V can be configured for up to 20 vacation schedules.

While in the configure gen v, Select **Set Vacation**

Use the and arrows to select the vacation #. For multiple vacation dates adjust the vacation # for each additional vacation schedule.

Use the and arrows to set the vacation begin and end dates

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

Note: Vacation schedules will need to be adjusted every year.

SET TEMP F/C

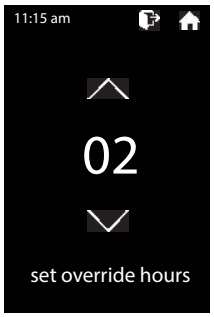
GEN V may be configured for F° or C° operations.

While in the configure gen v, Select **Set Temp F/C**

Select the desired temperature format

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

SET OVERRIDE HOURS



Select the number of hours for override operation. Select 2-8 hours in the setback mode.

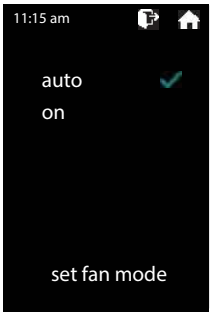
While in the configure gen v, Select **Set Override Hours**

Use the ^ and v arrows to set the desired overtime hours from 2-8 hours.

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

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

SET FAN MODE



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

While in the configure gen v, Select **Set Fan Mode**

Select auto / on for fan operation

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

SET FAN SCHEDULE

Fan schedule allows the fan to be scheduled to run during a scheduled time. Up to 4 schedules can be given.

While in the configure gen v, Select **Set Fan Schedule**

Tap on mon-fri, sat or sun to set a schedule for those days.

Use the ^ and v arrows to set the on and off times

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

Note: To disable the fan schedule, set all times to 12:00am / 12:00am

SET AIR BALANCE

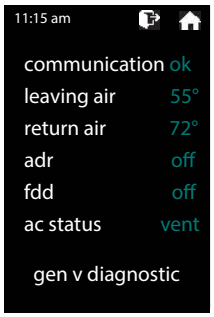
During the start up and commissioning of the system, an air balance may be required. Tap ON, this will drive all dampers to the open position, energize the fan and lock out compressor or heat function. When air balance is complete, Tap OFF to place system back into normal operation.

While in the configure gen v, Select **Set Air Balance**

Select off / on for air balance operation

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

SELECT DIAGNOSTIC



This function allows the user to review the current conditions for the GEN V System. Communication with the HUB thermostat, Leaving Air Temperature, Return Air Temperature, Automated Demand Response (ADR), Fault Detection and Diagnostics (FDD) and system status.

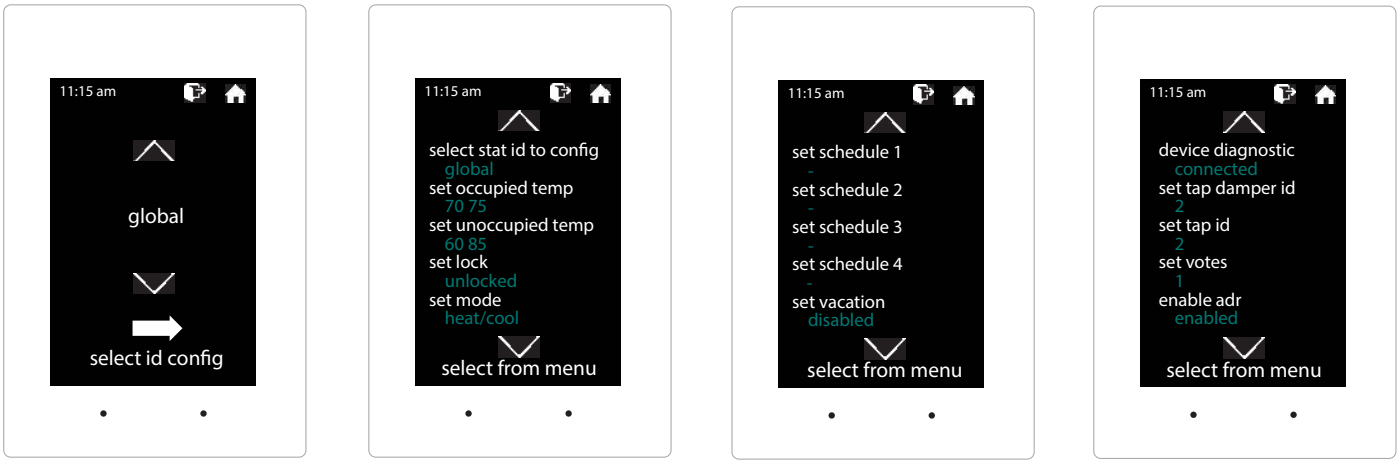
While in the configure gen v, Select **Diagnostic**

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

Configuration of Thermostats

All thermostats can be managed from the HUB stat

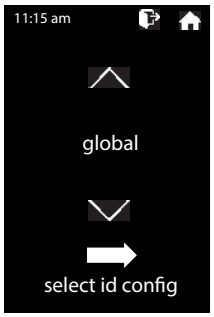
To configure access the Advanced Configuration menu by tapping on the degree symbol next to the room temp. The degree symbol will change from white to green and then tap and then tap configure stats



CONFIGURE STATS MENU OPTIONS:

1) SELECT STAT ID TO CONFIG
2) SET OCCUPIED TEMP
3) SET UNOCCUPIED TEMP
4) SET LOCK
5) SET MODE
6) SET SCHEDULE 1, 2, 3, AND 4
7) SET VACATION
8) DEVICE DIAGNOSTIC
9) SET TAP DAMPER ID
10) SET TAP ID
11) SET VOTES
12) ENABLE ADR

SELECT STAT ID TO CONFIG



Select stat id to config, allows you to select one thermostat or all thermostats in the GEN V system that you want to make changes to.

While in the configure stats, **Select Stat ID to Config**

Use the ^ and v arrows to select the desired ID or Global

Tap on the → to select the ID or Global configuration

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

SET OCCUPIED TEMP

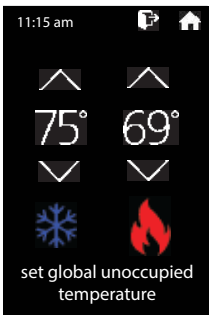
When in the "Set Occupied Temp" screen you can adjust the occupied heat/cool set points to their desired temperature settings.

While in the configure stats, Select **Set Occupied Temp**

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

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

SET UNOCCUPIED TEMP



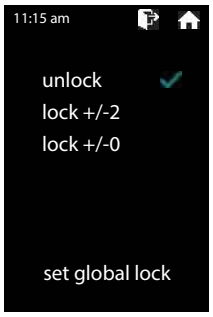
When in the "Set Unoccupied Temp" screen you can adjust the unoccupied heat/cool set points to their desired temperature settings.

While in the configure stats, Select **Set Unoccupied Temp**

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

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

SET LOCK



Thermostats can be locked independently or globally through the HUB stat. When a thermostat is locked, the end user will have limited operability of thermostat with adjustment of only +/- 2° or no variance +/- 0° from the heating or cooling set points.

While in the configure stats, Select **Set Lock**

Select the desired lock mode

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

SET MODE

Thermostat mode allows the thermostat to be set to heat/cool, cool only, heat only or off operation.

While in the configure stats, Select **Set Mode**

Select the desired mode operation

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

SET SCHEDULE

Set Schedule, allows you to set a 5-1-1 or 7 day schedule format. The GEN V will allow up to 4 schedules per zone thermostat.

While in the configure stats, Select **Set Schedule 1**

Tap on the to set zone schedule 1

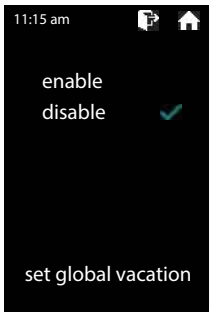
Select 5-1-1 or 7 day schedule type; Tap on the to confirm.

Use the and arrows to set the occupied and unoccupied time

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

Note: To disable or ignore the schedule, set all times to 12:00am / 12:00am

SET VACATION



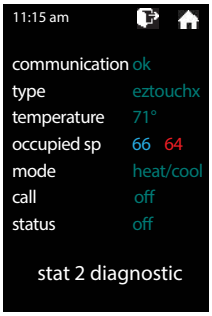
Set Vacation, enables or disables the zone thermostat from following the vacation schedule set for the GEN V system.

While in the configure stats, Select **Set Vacation**

Select enable / disable to follow the vacation schedule

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

DEVICE DIAGNOSTIC

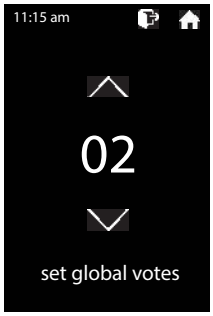


Device Diagnostic, allows you to see all the vitals of that zone thermostat. From the device diagnostic you can confirm communication with the GEN V and HUB thermostat, type of thermostat, current room temperature, current set points, mode, active call, and GEN V status.

While in the configure stats, Select **Device Diagnostic**

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

SET VOTES



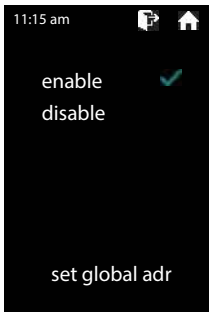
This function allows the GEN V to determine the weight of each vote sent from thermostats. Factory default is set to 1, or 1 vote per thermostat. When needed a thermostat can be set for higher weight by adding votes to the thermostat. Thermostats may have up to two additional votes for a total weight to 3 votes. Additionally, if there is a desire for a thermostat to not be able to place a call for heat or cool, a null vote may be configured by using a value of 0.

While in the configure gen v, Select **Set Votes**

Use the and arrows to set the desired votes

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

ENABLE ADR



When the 3rd party device receives an Automated Demand Response (ADR) signal from the utility service provider its contacts close, the GEN V will set back their thermostats 4° for both the heating & cooling modes and lock the thermostat set points so they cannot be adjusted at the thermostat during the ADR event. Once the ADR event has concluded the thermostats unlock and return to their original set points.

While in the configure stats, Select **Enable ADR**

Select enabled / disabled to allow ADR events

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

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.**

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

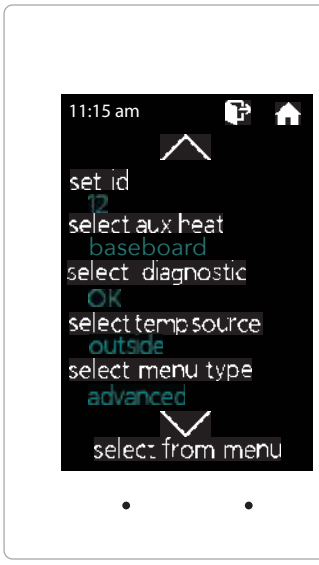


Fig 2

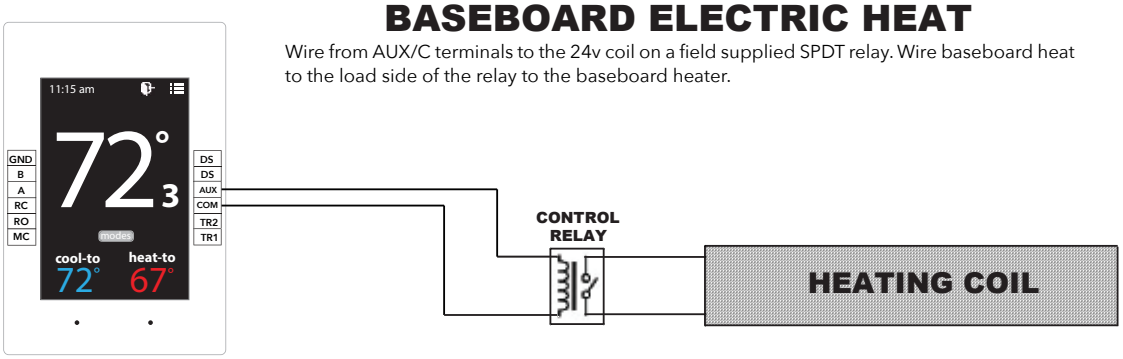
Select Aux Heat Menu

Fig 3

SUPPLEMENTAL HEAT APPLICATIONS

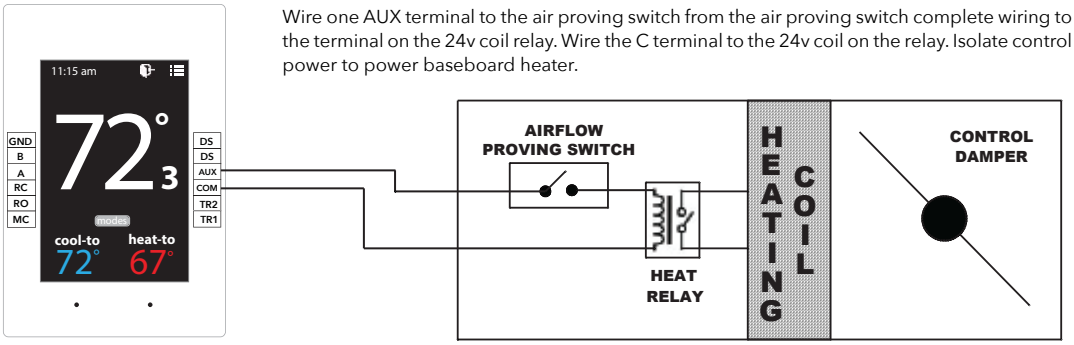
BASEBOARD ELECTRIC HEAT

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.



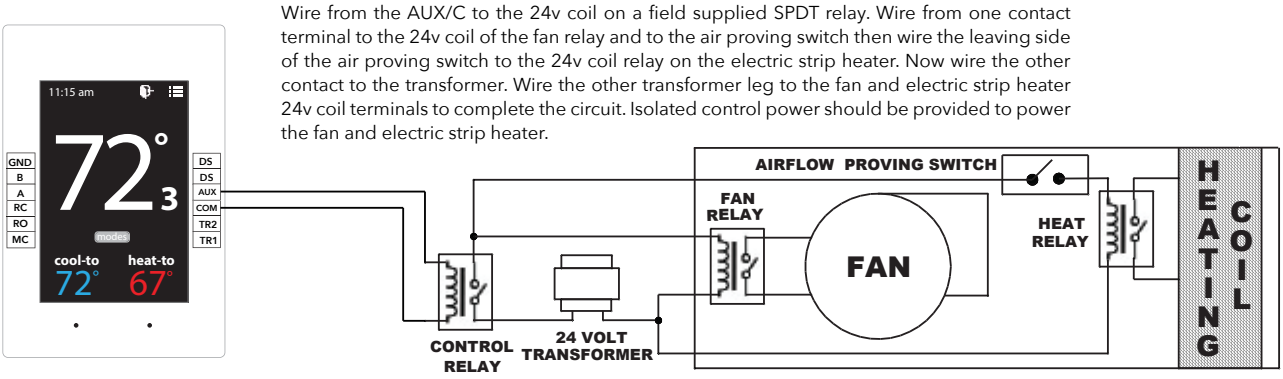
VAV DUCT REHEAT

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.



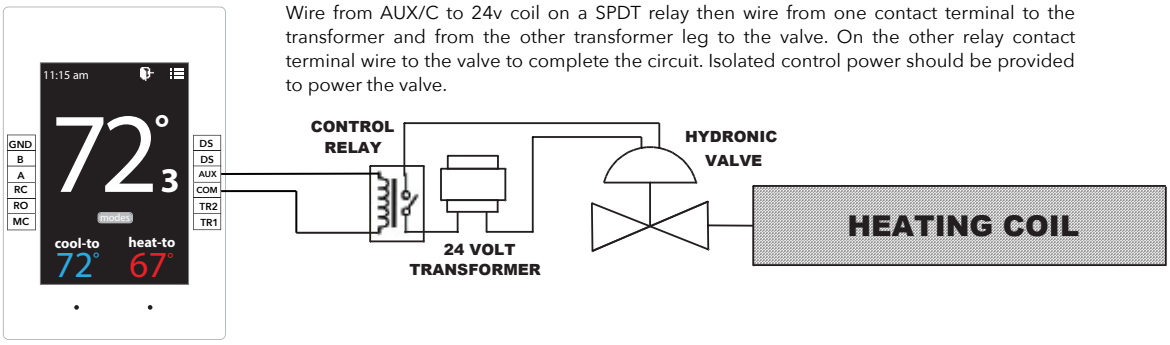
DUCT FAN REHEAT

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 strip heater. 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.



STAND ALONE UNIVERSAL THERMOSTAT

The SATouchX 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 units with the GEN V system. The SATouchX is configured for Gas/Electric (2H, 2C) with selectable fan operation. The SATouchX reports the humidity, supply and return air temperatures and has a large, easy to read display.

The SATouchX 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. SATouchX temperature display range is 47° - 95°F. Heat and Cool set points and operation modes are all indicated on the display.

Set points can be locally adjusted at the stat or from the HUB stat. The stat can be locked 0° or +/-2° to limit users from adjusting set point, this function is done from the HUB stat. During unoccupied hours the thermostat can be put into a 2 - 8 hour override with a single tap on

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".

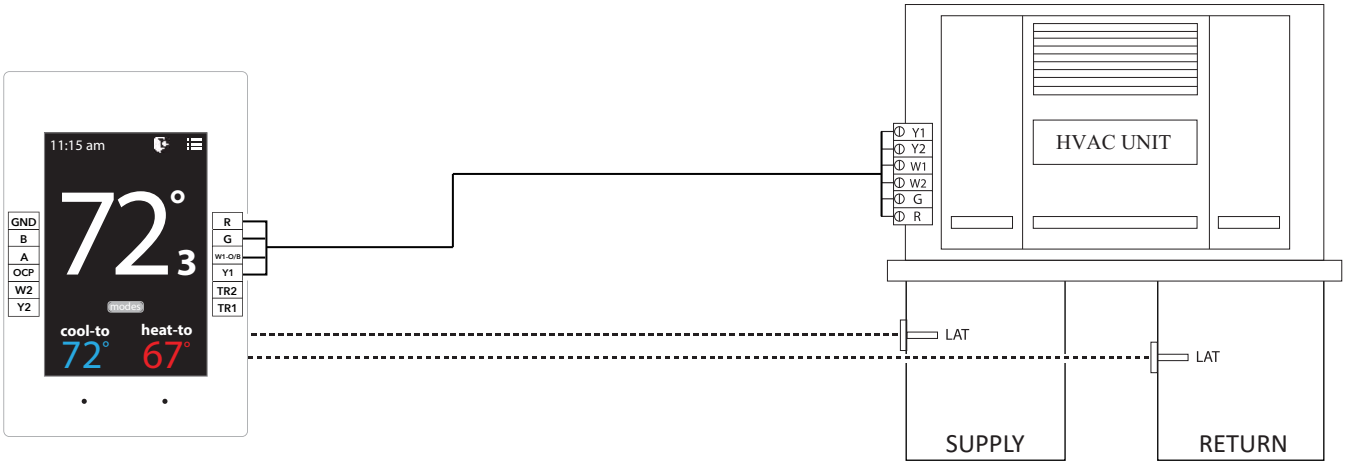
INSTALLATION

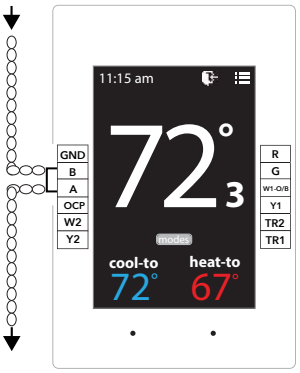
Thermostat and Terminal base

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 apart.
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 SATouchX

Use 18/6 thermostat wire, wire from SATouchX to the RTU/split system. Make sure to match up the unit terminals to the SATouchX 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 (AT1) and Return Air (AT2) LAT sensors 18 to 24" downstream of the unit.

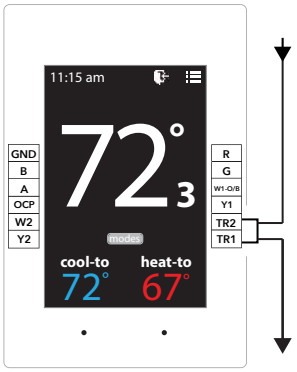




DAISY CHAIN THE COMMUNICATION WIRE

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

Wiring to Communication Terminals
Red-A
White-B

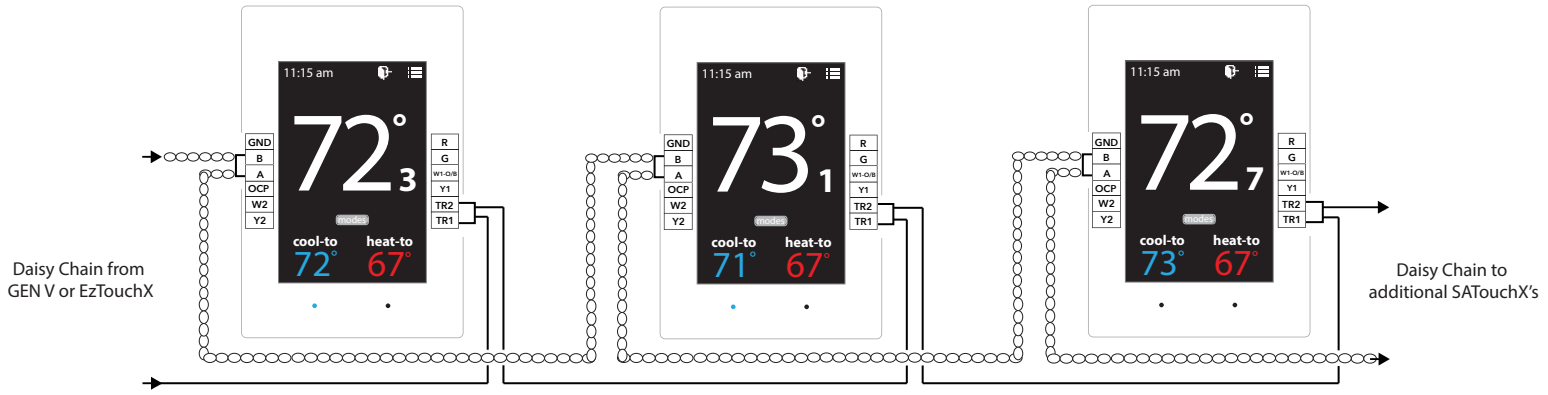


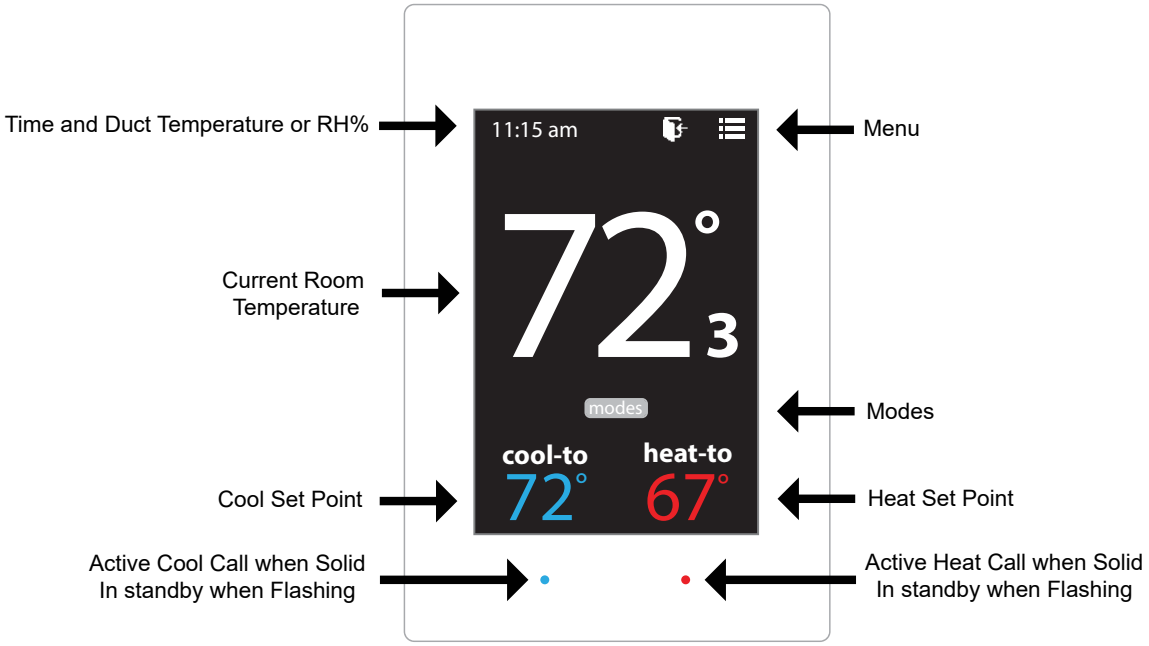
DAISY CHAIN 24V POWER FROM GEN V CONTROLLER

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

Note: Do not use power from RTU/Split system to power the SATouchX.

Daisy Chain Multiple SATouchX's





Addressing Standalone Thermostats

Every thermostat in the system needs a unique ID ranging from 2-20. 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 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 02-20

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

Select Unit Type

The SATouchX 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

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

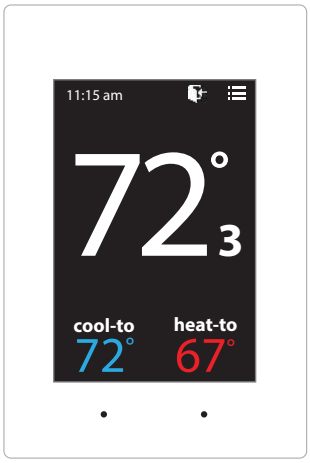
When the thermostat displays the unoccupied icon a 2-8 hour temporary override may be initiated by tapping the “Override” will appear. When additional override time is required, tap the unoccupied icon again.

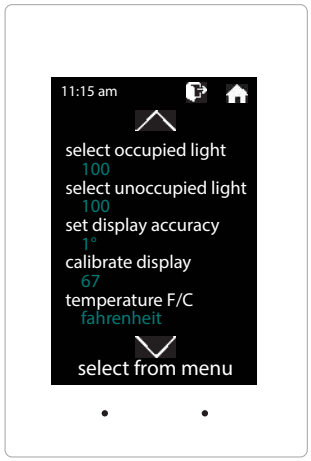
THERMOSTAT USER MENU

To access the Thermostat User Menu: Tap

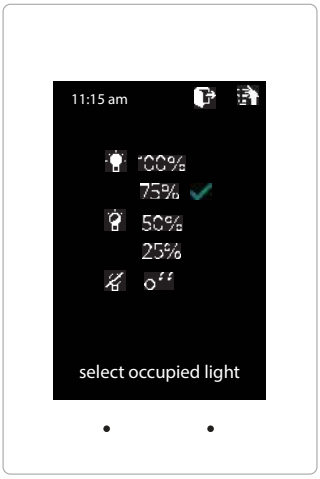
The **THERMOSTAT USER MENU** allows you to:

Select Occupied Light
Select Unoccupied Light
Set Display Accuracy
Calibrate Display
Temperature F/C
Current Schedule
Time & Date





SELECT OCCUPIED LIGHT



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

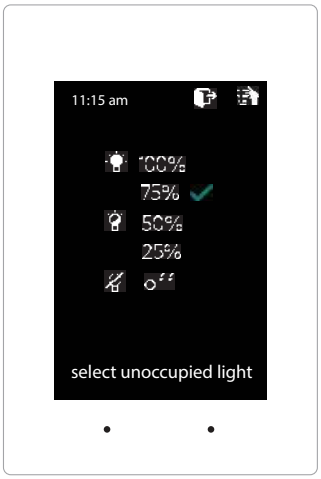
While in Thermostat Configuration Menu, Select **Occupied Light**

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 .

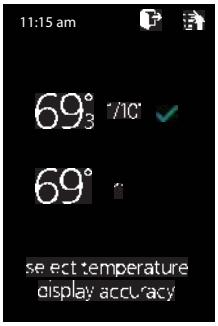
While in Thermostat Configuration Menu, Select **Unoccupied Light**

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.

SET DISPLAY ACCURACY



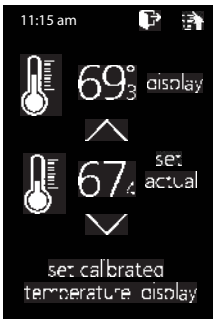
Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

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

Select the desired display accuracy

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

CALIBRATE DISPLAY



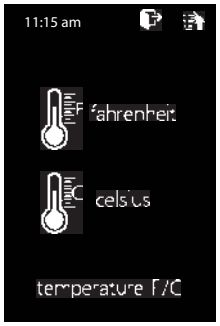
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

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



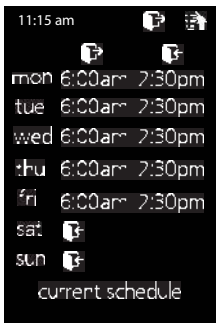
Thermostats can be configured for F° or C° operation through the HUB thermostat.

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

To view the current temperature operation *(View only function)*

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

CURRENT SCHEDULE



View the current thermostat schedule, given by the Gen V system

While in the Thermostat Configuration Menu, Select **Current Schedule**

This allows you to view the schedule for that zone. Changes to the schedule are done through the HUB thermostat *(View only function)*

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

TIME & DATE

View the current time and day, given by the Gen V system

While in the Thermostat Configuration Menu, Select **Time & Date**

View the current time and date on the Gen V system *(View only function)*

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

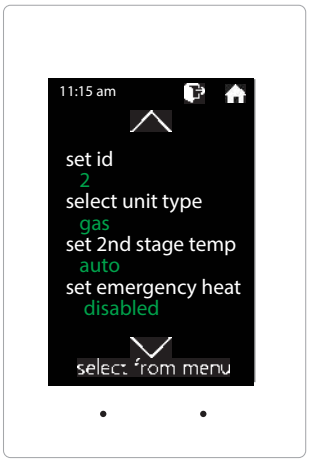
THERMOSTAT ADVANCED MENU

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

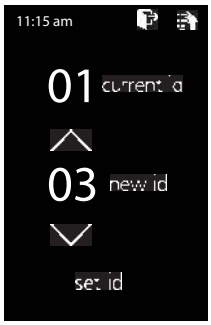
The degree symbol will change color from white to green and then tap

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

Set ID	Select Fan Mode	Set Emergency 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'd in numerical order the way the communication wire is daisy chained. No duplicate addresses.

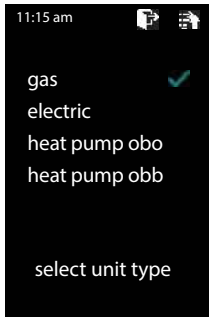
While in the Thermostat Advanced Menu, Select **SET ID**

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

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

Note: All thermostats receive a unique ID 01 to 20, maximum of 20 zones.

SELECT UNIT TYPE



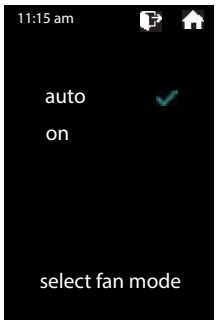
The SATouchX is designed as a universal GAS/ELECTRIC/HEAT PUMP thermostat. Factory default is set for GAS operations.

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

Select the desired unit type operation

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

SELECT FAN MODE



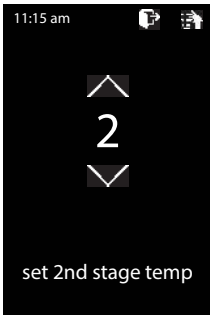
Fan operation is configured for either Fan ON or AUTO. When system is configured for ON operation, the Fan will run during Occupied schedule and will revert to Auto operations during Unoccupied schedule. When thermostat is configured for Auto operation, Fan will only run when there is a call for heating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

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

Select the desired fan operation "Auto" or "On".

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

SET 2ND STAGE TEMP



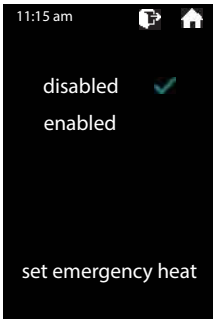
The SATouchX's 2nd stage operation is based on room temperature. Staging is adjustable from 2°- 8° from thermostat room temperature.

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

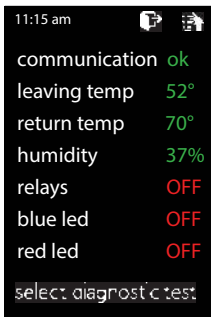
While in the Thermostat Advanced Menu, Select **Set Emergancy Heat**

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 SATouchX Diagnostic screen will allow you to confirm communication with the GEN V 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. An 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 display 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

ZONE DAMPERS

Use the table below to determine which zone dampers to use.

SYSTEM SIZE	MAXIMUM DIFFERENTIAL PRESSURE	ROUND DAMPER	RECTANGULAR DAMPER
5 TONS OR UNDER	0.5"	LOW PRESSURE	LOW PRESSURE
UNDER 7.5 TONS	1"	MEDIUM PRESSURE	MEDIUM PRESSURE
7.5 TONS OF LARGER	1.75"	MEDIUM PRESSURE	HEAVY DUTY

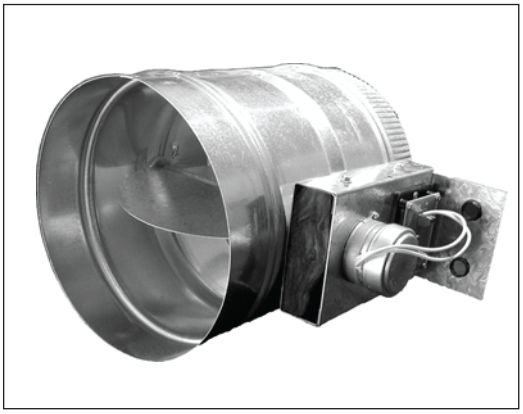
Maximum Differential Pressure refers to the maximum static pressure drop in inches of water column between the input (upstream) of the zone damper and the output (downstream) when the damper is closed.

ROUND ZONE DAMPERS

There are two styles of round zone dampers, low pressure or medium pressure. For systems 5 tons or under with a maximum differential static pressure of 0.5", use low pressure dampers. Otherwise use medium pressure for up to 1.75" differential pressure on any system over 5 tons.

ROUND LOW PRESSURE ZONE DAMPERS (TR Series)

Zonex Systems round low pressure zone dampers can be used for systems up to 5 tons with a maximum differential static pressure of 0.5". These are two position, spring open, power close dampers for very simple operation. Round damper sizes 9 inches and under are manufactured from 24 gauge steel. Sizes 10", 12", 14" and 16" are made from 20-22 gauge steel. All sizes are designed with rolled-in stiffening beads for superior rigidity. The damper pipe is furnished with one crimped end and one straight end for easy installation. A hat section supports a synchronous 24v AC 60Hz 7.5VA motor and terminal board. The motor is designed for continuous full stall operation. Special winding and heavy duty gearing provide for long motor life and easy spring open operation. A cross pin on the motor shaft provides positive direct drive to the damper blade shaft without a coupling or set screws, allowing for a quick and easy motor change if required. Motor drive time from full open to full close in 30 seconds. A red LED will be illuminated on the damper terminal board to indicate when the damper is being powered closed. The LED will remain on when the dampers is fully closed and cycle off when the damper is opening or in the full opened position. Since this is a spring open damper, in the event of power failure, the damper fails to the full open position. Round damper sizes 6" -16" offer an adjustable range stop of 15% and 30% of the total CFM of the damper.



LOW PRESSURE (TR Series)

ROUND MEDIUM PRESSURE ZONE DAMPERS (STMPD Series)

The Zonex Systems round medium pressure zone dampers are recommended for any size system above 5 tons, 2000 CFM, and are rated for a maximum of 1.75" SP. These dampers are constructed from 20-22 gauge galvanized steel, with an elliptical damper disc. The damper shell is manufactured with the supply end crimped and an air flow direction arrow. The damper is driven by a 24-volt open / power close, direct coupled actuator rated at 2VA. The actuator assembly includes manual open and close stop adjustments and mechanical drive release. The actuator is designed for full stall operation in the open and close positions and requires no end switches.

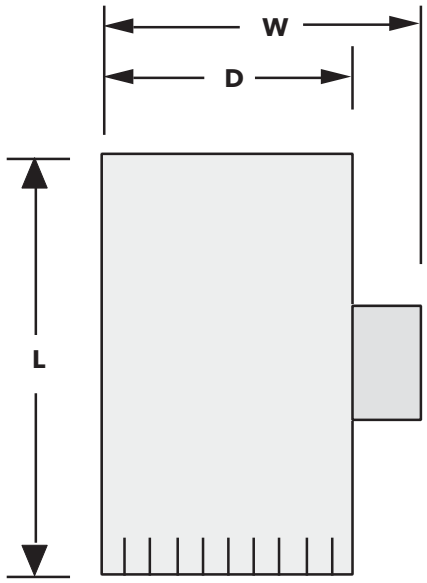
MEDIUM PRESSURE (STMPD Series)

ROUND LOW PRESSURE DAMPER

PART #	SIZE	DIAMETER (D)	LENGTH (L)	WIDTH (W)
TR04	4"	4"	10"	6"
TR05	5"	5"	10"	7"
TR06	6"	6"	10"	9"
TR07	7"	7"	10"	10"
TR08	8"	8"	10"	11"
TR09	9"	9"	11"	12"
TR10	10"	10"	12"	13"
TR12	12"	12"	14"	15"
TR14	14"	14"	16"	17"
TR16	16"	16"	18"	18 1/2"

ROUND MEDIUM PRESSURE DAMPER

PART #	SIZE	DIAMETER (D)	LENGTH (L)	WIDTH (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"



TYPICAL ROUND CAPACITIES*

Duct Diameter	Nominal CFM	Duct Velocity FPM	Damper ΔP " WC
4"	40	450	.013
5"	70	525	.013
6"	110	540	.014
7"	160	600	.014
8"	250	700	.015
9"	320	725	.015
10"	410	750	.015
12"	660	850	.022
14"	1000	925	.035
16"	1450	1070	.036
18"	2000	1100	.036

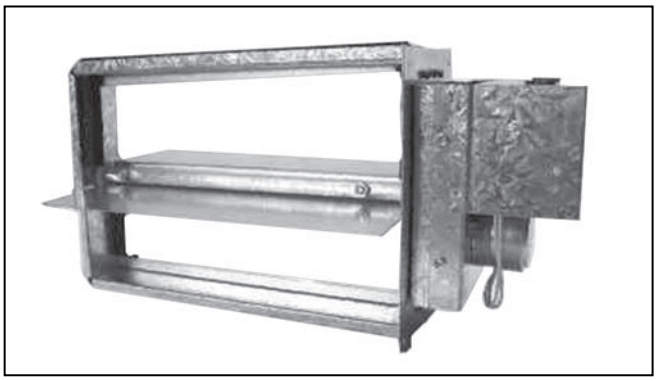
* These air quantities were derived from a duct sizing chart .1" friction loss per 100' of duct. All CFMs listed are approximate. For accurate selection use duct sizing table or device.

RECTANGULAR ZONE DAMPERS

Rectangular zone dampers are available for the GEN V controller in three (3) styles:
TREC WxH for low pressure applications (5 tons or less) rated at .5" SP;
STMRTD WxH for medium pressure applications up to 7.5 tons, rated at 1" SP;
STCD WxH for heavy duty applications over 7.5 tons, rated at 1.75" SP.

RECTANGULAR LOW PRESSURE ZONE DAMPERS (TREC W x H)

Zonex Systems rectangular low pressure dampers can be used for systems up to 5 tons with a maximum differential static pressure of 0.5". These are two position, spring open, power closed dampers. They are constructed from heavy duty galvanized steel. The damper is a single blade type that slips into a 2-1/2" wide cutout in the existing duct and attaches with screws via a duct mounting plate. The duct mounting plate is 5" wide. The drive assembly supports a sychronous 24V AC 60Hz 7.5VA motor and terminal board. The motor is designed for continuous full stall operation. Special winding and heavy duty gearing provide for long motor life and easy spring open operation. A cross pin on the motor shaft provides positive direct drive to the damper shaft without a coupling or set screws. Motor drive time from full open to full close is 30 seconds. A red LED will illuminate on the damper terminal board to indicate when the damper is being powered closed. The LED will remain on when the damper is fully closed and cycle off when the damper is opening or in the full opened position. Since this is a spring open damper, in the event of power failure the damper fails to the full open position.



LOW PRESSURE (TREC W x H)

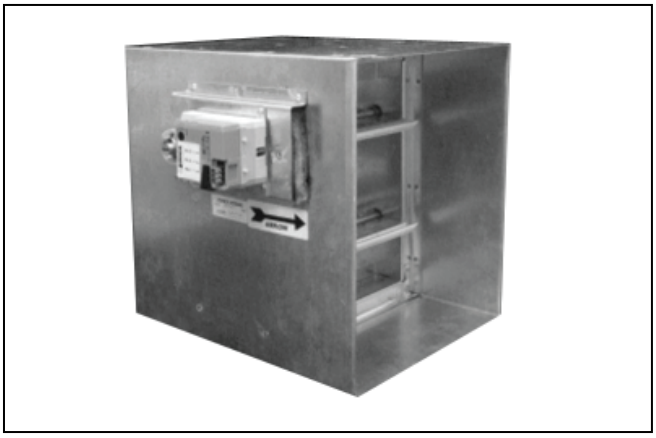
RECTANGULAR MEDIUM PRESSURE ZONE DAMPERS (STMRTD W x H)

Zonex Systems rectangular medium pressure dampers are recommended for systems under 7.5 tons with maximum differential static pressure of 1". These are power open, power close dampers. They are constructed from heavy duty aluminum and stainless steel. The dampers is an opposed blade type that slips into a 3-1/4" wide cutout in the existing duct and attaches with screws via a duct mounting plate. The duct mounting plate is 5" wide. Power consumption is 2VA. The motors are designed for continuous full stall operation. Special winding and heavy duty gearing provide for long motor life.

MEDIUM PRESSURE (STMRTD W x H)

RECTANGULAR HEAVY DUTY ZONE DAMPERS (STCD W x H)

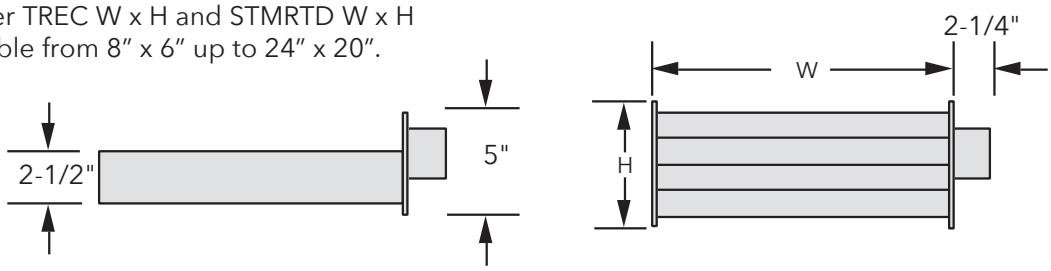
Zonex Systems rectangular heavy duty dampers are recommended for systems 7.5 tons or larger with a maximum differential static pressure of 1.75". These are power open, power close dampers made of 20 gauge "snap-lock" steel frame with S and drive duct connections. Allow a 16" gap in the duct for the damper. 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. Power consumption is 2VA. The motors are designed for continuous full stall operation. Special winding and heavy duty gearing provide for long motor life.



HEAVY DUTY (STCD W x H)

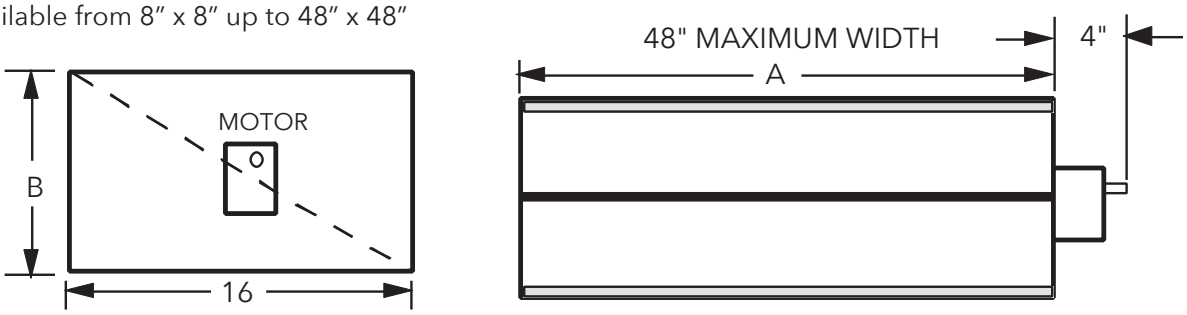
LOW AND MEDIUM PRESSURE RECTANGULAR DAMPER DIMENSIONS

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



HEAVY DUTY RECTANGULAR DAMPER DIMENSIONS

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



WIDTH	HEIGHT	DEPTH
A	B	16"

Rectangular heavy duty dampers should operate at 1500 FPM.
E.G. A 24" x 12" damper = 2 square feet.
2 square feet X 1500FPM = 3000 CFM.

RECTANGULAR DAMPER CAPACITIES*

Dampers listed below are standard sizes. For larger sizes and capacities, contact the factory.

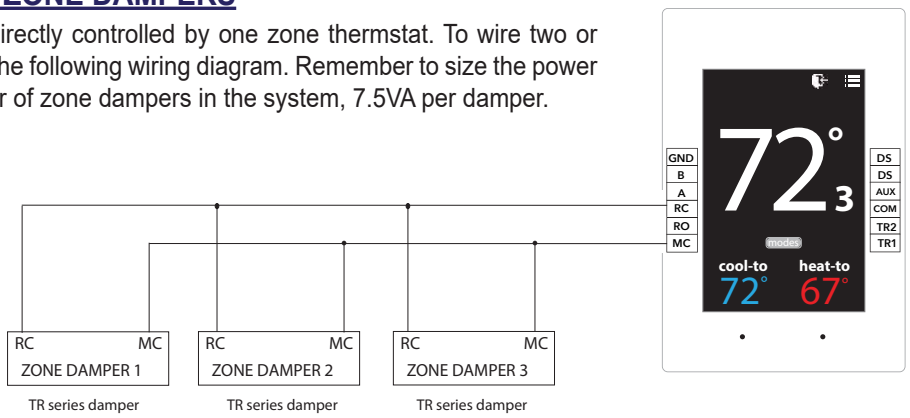
WIDTH IN INCHES

HEIGHT IN INCHES	8	10	12	14	16	18	20	22	24
6	200	250	310	390	440	500	570	630	700
8	280	390	490	590	680	770	900	960	1090
10	390	510	650	800	950	1100	1220	1400	1500
12	490	650	850	1000	1200	1400	1600	1850	2000
14			1000	1250	1500	1750	2000	2250	2500
16			1200	1500	1800	2100	2450	2300	3000
18			1400	1750	2100	2500	2850	3080	3600
20									4000

Motors on low and medium pressure dampers will be mounted on the Height (H) side. **Bottom mount motors will be located on the Width (W) side.** * These air quantities were derived from a duct sizing chart .1" friction loss per 100' of duct. All CFMs listed are approximate. For accurate selection use duct sizing table or device.

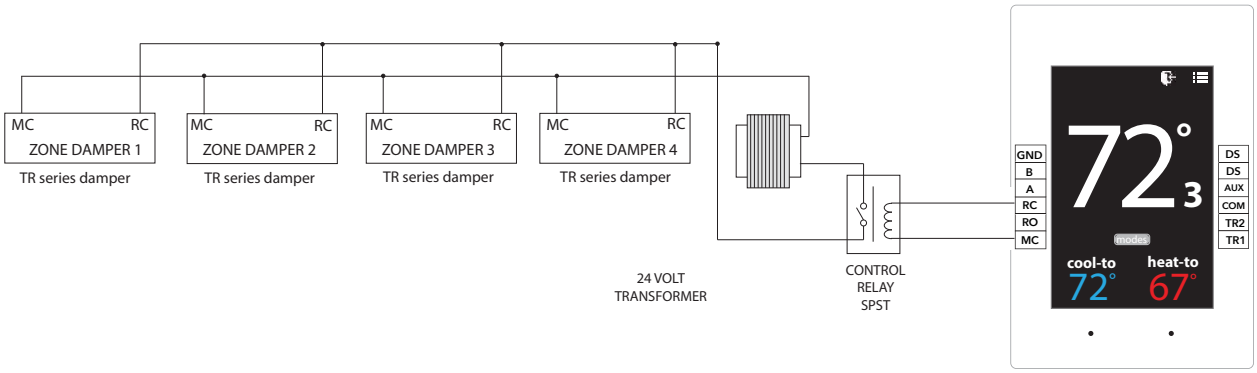
SLAVING UP TO THREE ZONE DAMPERS

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, 7.5VA 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 relay are needed for these applications. Note: All slave dampers need to be model TR / TREC



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 by using a duct sizing table or calculator.

c) Select a Zonex Systems damper to fit the duct size selected for that zone.

DAMPER INSTALLATION NOTES

1. Do not exceed 700 FPM in a register/diffuser branch duct.
2. If a damper is installed within 3 feet of 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 duct work. The hat section on the 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 terminal board). The motor generates enough heat so no condensation will develop on the hat section.
5. Remember to allow a 16" gap in the duct for Heavy Duty rectangular CD dampers.
6. Low and medium pressure rectangular dampers slide into a 3" wide cutout in the ductwork.
7. Install TR round dampers to the motor in the 9 to 3 o'clock position. Do not install damper so the motor is in the 4 to 8 o'clock position.

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.

Zonex Systems offers two types of bypass dampers, Barometric and electronic. Each is available in round or rectangular configuration. Barometric bypass dampers are limited to systems of 5 tons. Electronic bypass dampers can be used on any size system. For residential HVAC systems with variable speed blowers, the barometric or electric bypass dampers can be used. NOTE: When using the electric bypass (STBP/STCDBP), see the Bypass Dampers - Electronic Section, Pages 19-22; or contact Technical Support.

BYPASS DAMPERS – BAROMETRIC

The barometric bypass damper is for systems 5 tons or under. It utilizes a weighted damper blade to maintain constant duct pressure. This allows for easy installation without the need for electrical power or wiring. The round barometric damper can be installed in any position. The RBB rectangular damper must be installed with horizontal air flow only.

SIZING: When only the smallest zone is calling, the maximum amount of excess supply air flow through the bypass damper. To determine the proper size bypass damper to use, do the following steps:

Step 1: Calculate bypass air volume as follows.

A) Calculate total air volume at 400 CFM per ton.

B) Calculate air volume of smallest zone in CFM.

C) Calculate bypass air volume by subtracting the smallest zone air volume from the total. (A - B = C)

BAROMETRIC BYPASS SELECTION TABLE

Diameter	CFM
9"	650
10"	800
12"	1200
14"	1600
16"	2000

Step 2: Select damper from sizing table. Once you have calculated the bypass air volume from Step 1, use the BAROMETRIC BYPASS SELECTION TABLE. From the table, select the bypass damper with CFM rating equal to or greater than the value calculated in Step 1. For rectangular barometric dampers, use a ductulator to convert from round to rectangular.

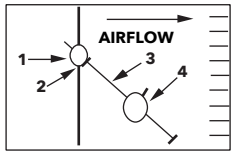
If bypassing more than 2000 CFM, use a electronic bypass.

Example: You have a 4 ton system. Your smallest zone will use 500 CFM. The total CFM is 1600 CFM (400*4). Your bypass CFM is 1100 (1600-500). From the table, you determine that a 12" bypass damper is needed.

Do not use the barometric bypass in any system over 5 tons. For systems over 5 tons, or to bypass more than 2000 CFM, use the electronic bypass.

RECTANGULAR & ROUND BAROMETRIC BYPASS

BAROMETRIC BYPASS DAMPER



1. Damper Shaft
2. Lock Nut
3. Lever Arm
4. Counter Weight

INSTALLATION

The round barometric bypass damper can be installed in any position. This damper is factory set for horizontal installation and can be field modified for vertical installation. Do not run speed screws into damper housing. Screws may interfere with damper travel. Make sure counterweight is not obstructed in any way.

a) Install the bypass damper between the supply and return plenums of the unit. It must be the first tap off the supply plenum.

b) 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. Be certain the damper shaft is horizontal.

c) Loosen counter weight with allen wrench.

d) Loosen lever arm from damper shaft and allow to hang straight down.

e) Fully close damper by grabbing damper shaft on side attached to lever arm and turning clockwise until it stops.

f) While holding the damper fully closed, rotate the lever arm a little to the right (facing the damper) and then screw in to tighten to the damper shaft. Then tighten lock nut.

g) Be sure the damper is being held closed by the counter weight. Proceed to setup.

BAROMETRIC BYPASS SETUP

a) Turn off all thermostats.

b) Turn on Controller and set fan switch to "ON" position. Allow fan to run for 5 minutes to equalize pressure.Then make sure all dampers are open by checking for air flow out of each damper.

c) By moving counter weight up or down the lever arm, adjust it so the damper just wants to start opening.

d) If the damper cannot be held closed with the counter weight all the way to the bottom of the lever arm, then hold the damper shaft, loosen the lever arm from the damper shaft, and rotate the lever arm farther to the right and retighten. Repeat Step C.

e) The barometric bypass damper is now calibrated.

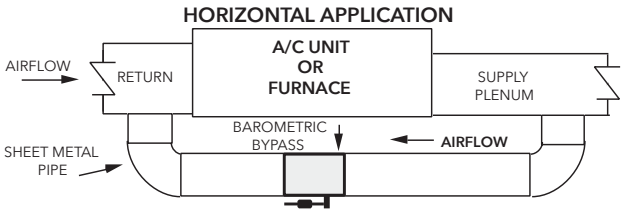
BAROMETRIC BYPASS STARTUP TEST

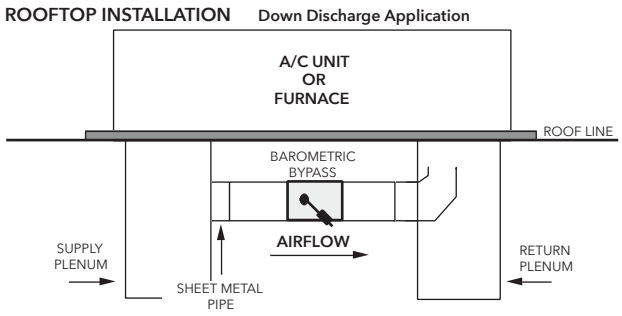
a) Have at least half of the zones call for either heating or cooling.

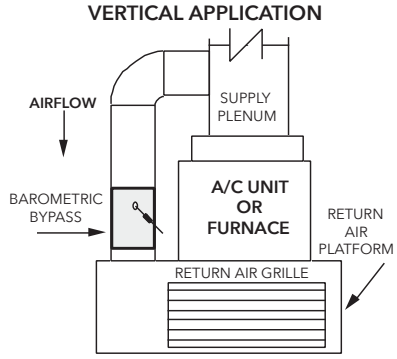
b) Check to be sure the calling zone dampers are open, (air is flowing).

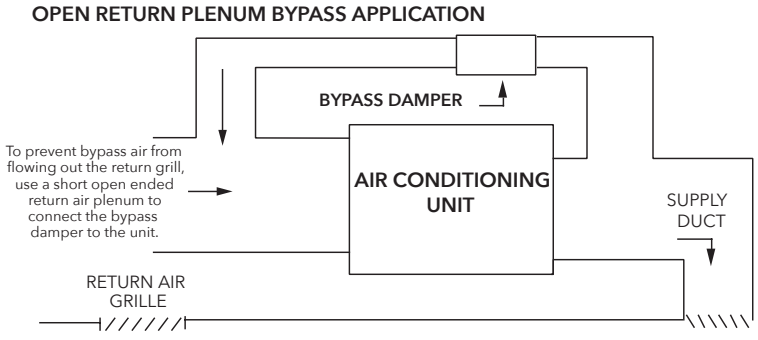
c) Verify the bypass damper is open. Note, the damper may not fully open.

d) If the open zones are not noisy, the bypass damper is set.









GEN V SYSTEM SETUP DIRECTORY

INSTALLING CONTRACTOR	DATE OF INSTALL
PHONE NUMBER	**SYSTEM ID#**

ZONE ID	ZONE / ROOM NAME	NOTES

NOTES

GEN V

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PART # GENVMAN
April 2021