GEN V-VRF-VAV

VOTE BASED AUTO CHANGEOVER *VVT*

COMMERCIAL VRF - SIMPLIFIED

Installation and Applications Manual

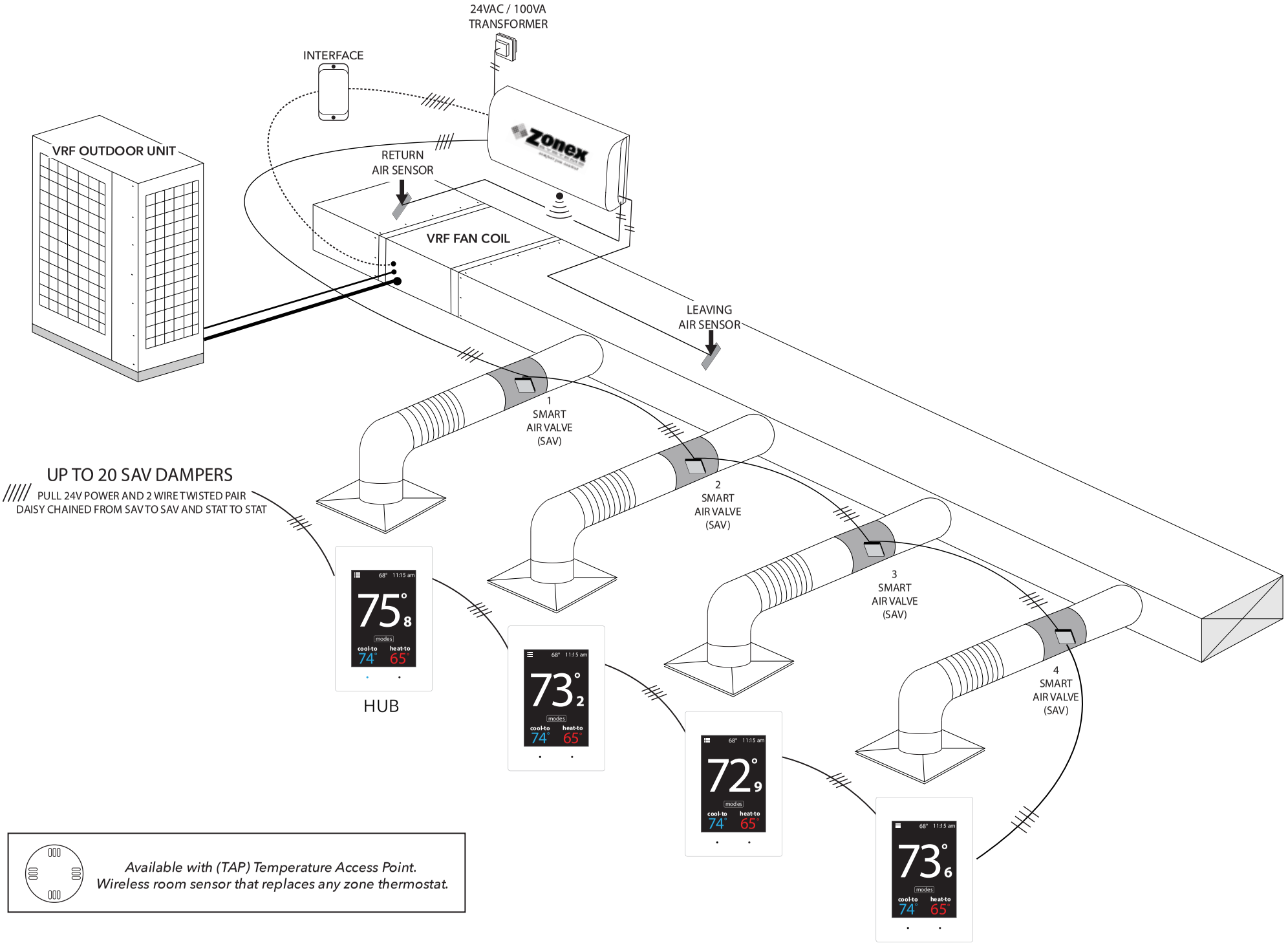
Zonex SYSTEMS

comfort you control

GEN V-VRF-VAV

CONCEPTUAL OVERVIEW

An innovative product bringing VAV to VRF systems using SMART AIR VALVEs. This System's energy savings enhances VRF operation and eliminates multiple indoor units, refrigerant lines, condensate lines, electrical circuits and cost



Providing VAV system control to VRF Equipment with VRF-VAV

VRF-VAV is an innovative concept in air delivery providing the benefits of **VAV** with the efficiency of **VRF** technology using pressure independent self-balancing **Smart Air Valves (SAVs)** to enhance VRF operation. VRF-VAV eliminates multiple indoor units, refrigerant lines, condensate lines, electrical runs and more to simplify and streamline VRF installations and operation.

Zonex Smart Air Valves **(SAV)** control an indoor fan coil's air flow while respective VRF manufacturer's outdoor and indoor units control and manage the refrigerant flows.

The Zonex system is controlled by the **GEN V** controller, System configuration, onsite management, and control are performed via the GEN V's HUB thermostat. The HUB thermostat is a zone stat that is also the single point where system wide changes can be made such as scheduling, set point changes, lock/unlock stats, system diagnostics, system configuration and much more.

The **GEN V** controller communicates with the indoor unit or fan coil through the VRF manufacturer's 24V thermostat interface. This interface accepts standard thermostat inputs, which reside on the **GEN V** controller, and converts standard 24V legacy connections through the VRF interface to provide VRF protocol from the information the Zonex system reports and instructs the fan coil to initiate.

This operation does not alter in any way how the VRF System operates – this is important to understand as VRF System maintains internal operations and communications as designed from the manufacturer. Smart Air Valves do not generate excess air and the air velocity controls the fan, eliminating the need for a bypass damper.

GEN V controls 2-20 independent **Smart Air Valves (SAV)** per fan coil. SAVs intelligently operate like an indoor unit without affecting VRF operation.

This is an exciting system, truly innovative and game changing for the VRF market. Enabling the engineer or contractor to reduce costs, adhere to Code Requirements, and provide greater comfort and efficiency using the Zonex VRF - VAV System to simplify and streamline VRF installation while reducing ongoing maintenance and enhancing operation.

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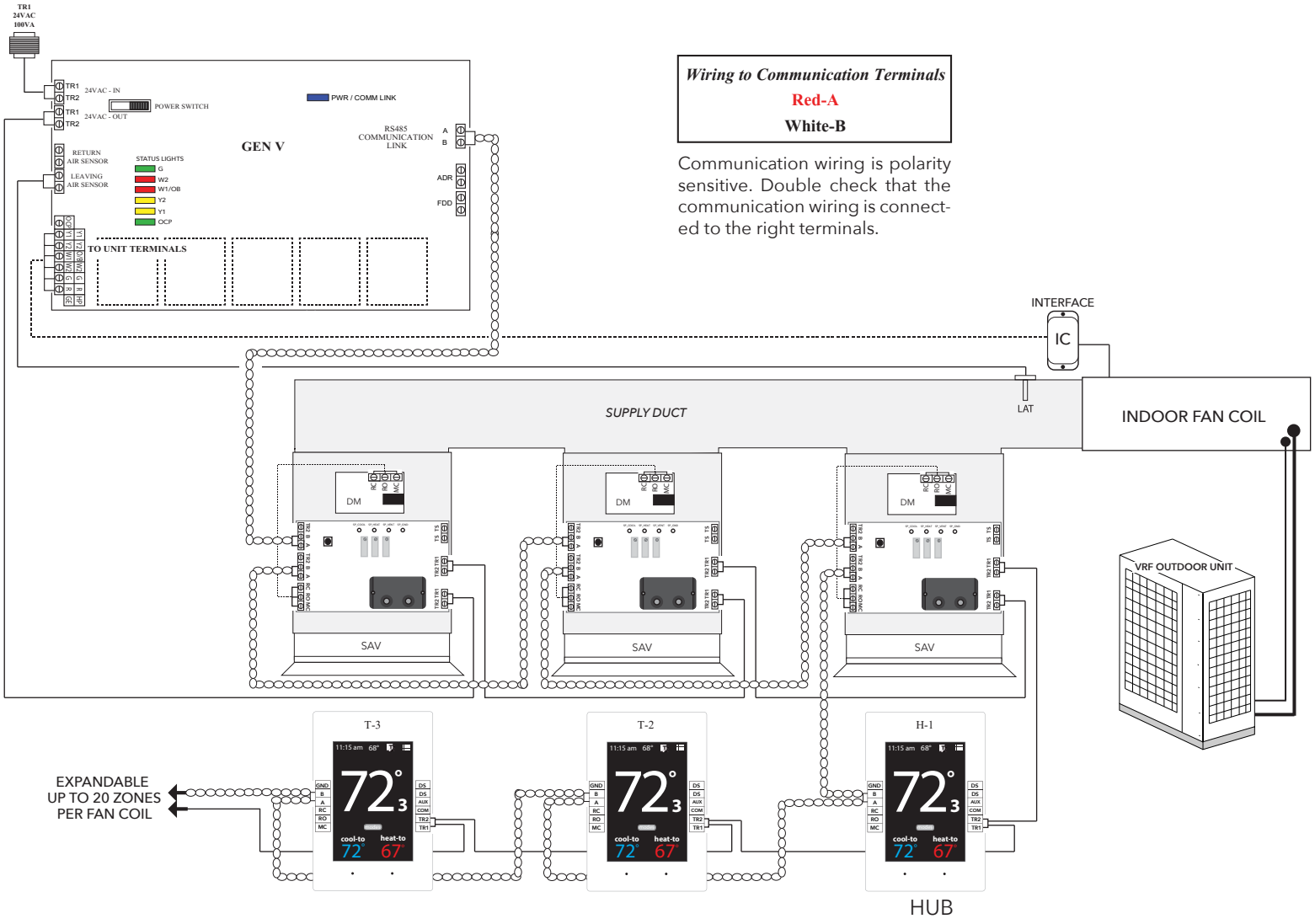
Wiring and Installation

1. Install GEN V controller inside the conditioned space, in a area that is easily accessible.
2. Install an Independent 24VAC 100VA transformer, wire the secondary 24VAC output to the TR1 and TR2 (IN) bottom terminal on the GEN V controller. **Do not ground out the transformer.**
3. Install the Leaving air sensor (LV Air) in the supply duct before the 1st supply take off. Wire the Leaving air sensor to the LV Air terminals on the GEN V controller. Install Return air sensor (RA) in the return duct. Wire Return air sensor to the RA terminals. (If needed you can extend sensor wire using 18/2 thermostat wiring.) (See page 16)
4. Install Smart Air Valves, 3 feet off the plenum.
5. Wire TR1 and TR2 (OUT) top terminal from the GEN V controller to the first SAV board TR1 and TR2 using 18/2 thermostat wire. (See page 9) Continue daisy chaining TR1 and TR2 on the SAV board to the next SAV board until the last SAV board in the system. Make sure TR1 and TR2 polarity is consistent throughout the system. Continue daisy chaining TR1 and TR2 on the last SAV board to the EzTouchV (HUB) and to the next EzTouchX until he last EzTouchX in the system.
6. Wire A and B terminals from the GEN V controller using Zonex 2 wire plenum rated twisted pair wire (Part # STPR) to the first SAV board A and B. (See page 9) Continue daisy chaining A and B on the SAV board to the next SAV board until the last SAV board in the system. Continue daisy chaining A and B on the last SAV board to the EzTouchV (HUB) and to the next EzTouchX until the last EzTouchX in the system.



COMPONENT SELECTION GUIDE

GEN V Control Solutions

Manage the entire system from one central HUB

Part # - **GEN V**

1 - VRF Coil or VRF RTU

***Supports 2 - 20* Smart Air Valves (SAV)**

***Requires manufacturer's thermostat interface**

Daisy Chain: Zonex communications wire STPR and 24VAC from SAV to SAV and Stat to Stat

1-24VAC / 100VA Transformer Powers the GEN V, All the SAV's, and Thermostats in the system

HUB - Touch Screen Thermostat

Part # - **EzTouchV**

Need 1 Hub Thermostat per GEN V system

Zone Touch Screen Thermostat

Part # - **EzTouchX**

1 - Thermostat per Smart Air Valve (SAV)

Smart Air Valves (SAV)

Part #

SAV + Damper Size - Round (up to 1.75 S.P)

SAV WxH - Rectangular (up to 1.75 S.P)

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

***Requires manufacturer's thermostat interface**

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

Zonex Systems GEN V: VRF-VAV System enhances VRF operation, providing engineers, contractors and building owners a means to maximize system efficiency, reduce installation costs, and provide greater comfort to individual zones within a building. This system allows up to 20 Smart Air Valves (SAV) to be connected to a VRF Fan Coil and uses VRF Manufacturer's Legacy Thermostat Interface to place calls for heating, cooling, or ventilation without compromising VRF operations or logic, in any way.

The GEN V system is an auto changeover, vote based VAV system. The system's algorithm is based on a first call, first served majority wins on changeover. As thermostats call for heating or cooling, votes are tallied by the GEN V controller. Each minute the GEN V controller polls all thermostats in the system to determine majority vote and then initiates a call for Heat, Cool, or if no votes for heating or cooling are present – VENT mode of operation is initiated. If voting majority switches from Heat to Cool or vice versa, GEN V controller will initiate a changeover sequence shutting down the current mode of operation, performing a time delay and after delay energize majority call to meet current majority demand.

System configuration, onsite management, and control are performed via the GEN V's HUB thermostat. The HUB thermostat is a zone stat that is also the single point where system wide changes can be made such as scheduling, set point changes, lock/unlock stats, system diagnostics, system configuration and much more.

Cooling

Each Smart Air Valve (SAV) is controlled via the EzTouchX zone thermostat that monitors zone temperature. When zone temperature rises 1° above zone thermostat's cooling set point it will send a vote for cooling. On the next poll of the GEN V controller, this vote will be counted and if there is a single vote or majority vote for cooling, GEN V controller will initiate a call for cooling.

Once cooling call is initiated, GEN V controller will energize 24-volt legacy outputs to VRF 24-volt thermostat interface (Interface is VRF Manufacturer Specific and is supplied by others). Y and G will be energized for cooling operations. The VRF interface will convert 24-volt input and forward this call for cooling to VRF Air Handler. VRF Air Handler then uses proprietary logic to bring on the VRF unit in the cooling mode. VRF Air Handler will automatically set fan speed, enable compressor operation, and allow superheat to be communicated to outdoor unit to maximize efficiency and provide desired comfort.

When cooling call has been initiated by the GEN V controller, all Smart Air Valve (SAV) devices connected to this GEN V controller are notified that VRF System is operating in cooling mode.

SAV dampers calling for cooling will use smart technology located within the SAV controller to adjust damper position to provide designed airflow. Airflow design varies based on the size of SAV damper, see sizing and engineering charts for airflow information. The SAV controller monitors air velocity continuously and automatically repositions the SAV in order to provide targeted CFM to that zone. When zone temperature has reached set point the zone thermostat will end call for cooling and on the next poll of GEN V this vote will be removed from the tally. If other cooling calls remain in the majority, cooling operation will continue, satisfied zone thermostats will reset their SAVs to a minimum CFM position while other calling SAVs will continue to maintain targeted air flows. Minimum CFM position is also set by SAV controller, again measuring air velocity, adjusting damper for targeted velocity, and CFM. During this ventilation mode, a minimal amount of cool air will enter zone to assist in maintaining room temperature. If room temperature falls 2° below cooling set point the SAV will fully close or drive to its minimum position.

Heating

Each Smart Air Valve (SAV) is controlled via the EzTouchX zone thermostat that monitors zone temperature. When zone temperature drops 1° below zone thermostat's heating set point it will send a vote for heating. On the next poll of the GEN V controller, this vote will be counted and if there is a single vote or majority vote for heating, GEN V controller will initiate the heating call.

Once heating call is initiated, GEN V controller will energize 24-volt legacy outputs to VRF 24-volt thermostat interface (Interface is VRF Manufacturer Specific and is supplied by others). W will be energized for heating operations. The VRF interface will convert 24-volt input and forward this call for heating to VRF Air Handler. VRF Air Handler then uses proprietary logic to bring on the VRF unit in the heating mode. VRF Air Handler will automatically set fan speed, enable compressor operation, and allow superheat to be communicated to outdoor unit to maximize efficiency and provide desired comfort.

When heating call has been initiated by the GEN V controller, all Smart Air Valve (SAV) devices connected to this GEN V controller are notified that VRF System is operating in heating mode. SAV dampers calling for heating will use smart technology located within the SAV controller to adjust damper position to provide designed airflow. Airflow design varies based on the size of SAV damper, see sizing and engineering charts for airflow information. The SAV controller monitors air velocity continuously and automatically repositions SAV in order to provide targeted CFM to that zone. When zone temperature has reached set point the zone thermostat will end call for heating and on the next poll of GEN V this vote will be removed from the tally. If other heating calls remain in the majority, heating operation will continue, satisfied zone thermostats will reset their SAVs to a minimum CFM position while other calling SAVs will continue to maintain targeted air flows. Minimum CFM position is also set by SAV controller, again measuring air velocity, adjusting damper for targeted velocity, and CFM. During this ventilation mode, a minimal amount of warm air will enter zone to assist in maintaining room temperature. If room temperature rises 2° above heating set point the SAV will fully close or drive to its minimum position.

Each zone thermostat has the ability to control auxiliary or supplemental heating devices such as reheat or baseboard heat. Auxiliary heat is configured at the zone thermostat. If there is a cool call, heat call, or the VRF system is a cooling only unit, the zone thermostat will energize AUX heat outputs if the zone temperature drops 2° below heat set point. If the zone thermostat is configured for reheat, SAV will position SAV damper to provide airflow over electric strip heat, hot water coil or other heating element.

Changeover

GEN V: VRF-VAV is an auto changeover system with an algorithm that operates on a majority vote or first call, first served operation. GEN V controller polls all associated EzTouchX zone thermostats each minute to tally calls for cooling and heating. If the majority of calls are for cooling, the system will operate in cooling mode. If the majority of calls are for heating, the system will operate in heating mode.

If the system is operating in cooling and after system poll a majority of the zone thermostats are calling for heating, GEN V recognizes this and will initiate a changeover strategy allowing cooling to run for an additional period (Configured via the HUB stat), shut down cooling operations and then run a 8-minute time delay to protect the equipment. At the end of the time delay, GEN V will initiate Heat operation.

If the system is operating in heating and after system poll a majority of zone thermostats are calling for cooling, GEN V will initiate a changeover strategy allowing heating to run for an additional period (Configured via the HUB stat), then shut down heating operations and run a 8-minute time delay to protect equipment. At the end of the time delay, GEN V will initiate cool operations.

All Calls Satisfied

When all calls for cooling and heating are satisfied EzTouchX zone thermostats will operate in Vent Mode. Outputs for cooling and heating are de-energized and the GEN V controller will continuously run the fan. The VRF Air Handler blower will be operational during Occupied times and ventilation air will be provided to all zones.

GEN V - VRF – VAV - designed to simplify and streamline VRF installations and operation.

GEN V

VRF-VAV *WITH SMART AIR VALVES*

DEVICE	ID	DESCRIPTION	DEVICE	ID	DESCRIPTION
CONTROL BOARD	C1	GEN V CONTROLLER CONTROLS 2-20 SMART AIR VALVES - ONLY 1-24VAC 100VA TRANSFORMER POWERS ALL SAV's AND THERMOSTATS	SYSTEM TRANSFORMER	TR1	24VAC/100VA TRANSFORMER SIZED @ (5VA PER SMART AIR VALVE) DAISY CHAIN SAV TO SAV
EZTOUCHV THERMOSTAT	H-1	HUB - COLOR TOUCH SCREEN THERMOSTAT	RS485 COMMUNICATION LINK	○○○	ZONEX 2 WIRE TWISTED PAIR
EZTOUCHX THERMOSTAT	T2-T20	COLOR TOUCH SCREEN ZONE THERMOSTAT	UNIT TERMINAL WIRING	------	18 AWG THERMOSTAT WIRE
SMART AIR VALVE ACTUATOR	DM	SUPPLIED WITH SMART AIR VALVE (FACTORY PRE-WIRED)	SUPPLY LAT DISCHARGE SENSOR	LAT	SUPPLY LAT
SMART AIR VALVE (SAV)	SAV	PRESSURE INDEPENDENT SELF BALANCING SMART AIR VALVE	WIRELESS COMMUNICATION	)))	COMMUNICATES WIRLESSLY TO A NETWORK OR DEVICE
INTERFACE CONTROLLER	IC	INTEGRATES 24V THERMOSTAT OUTPUTS TO VRF SYSTEM (FIELD SUPPLIED)			

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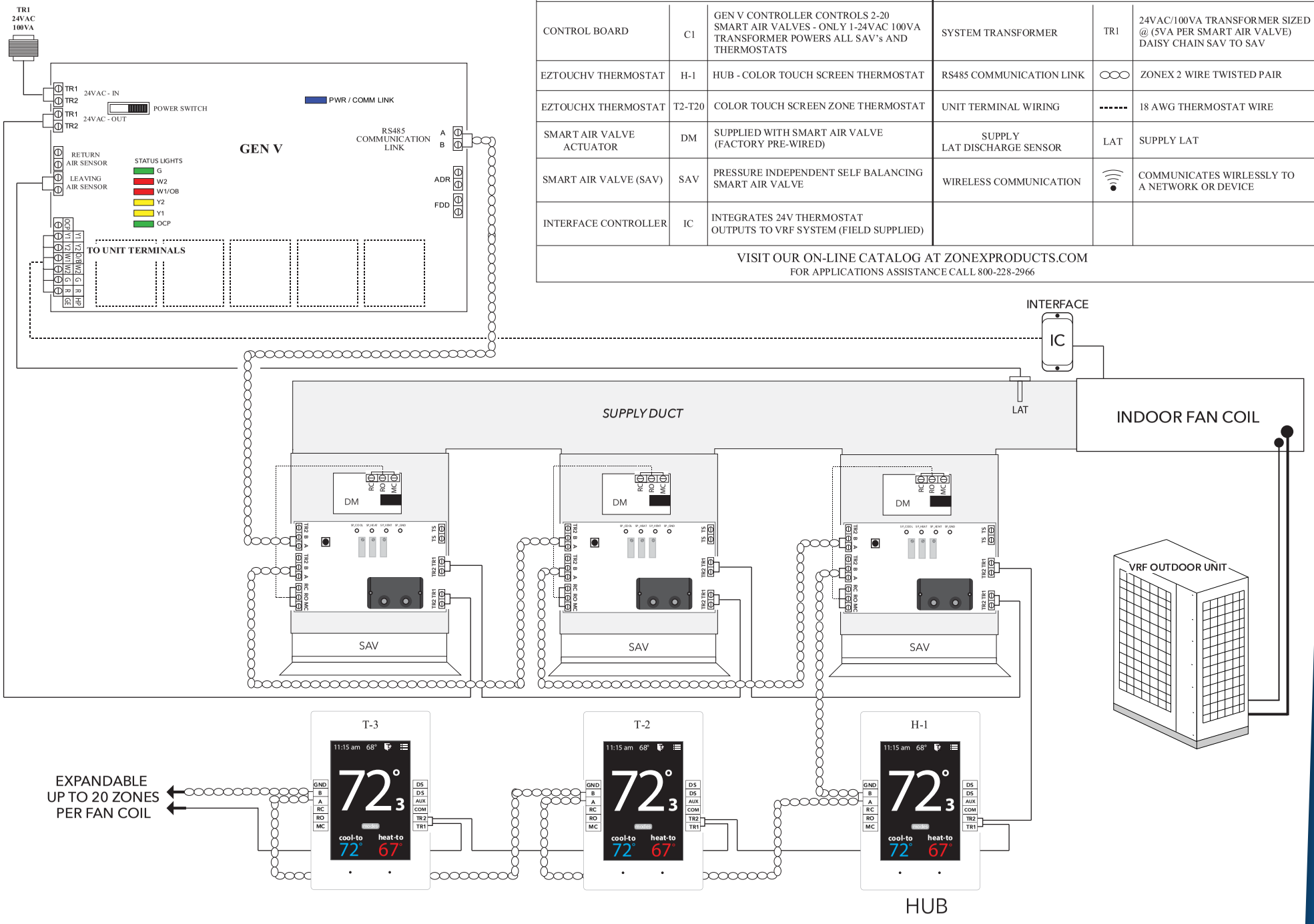
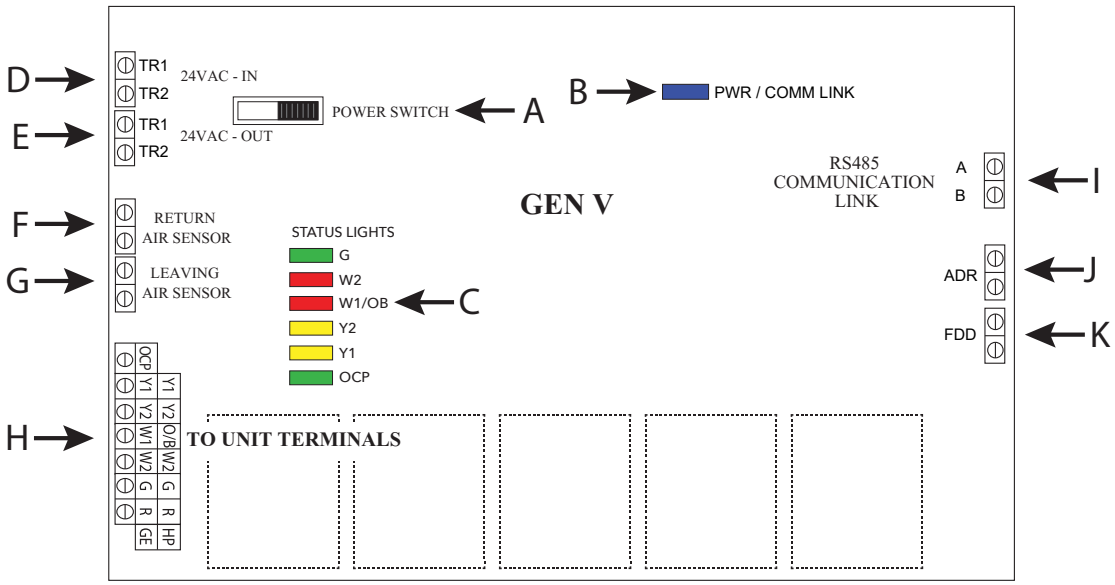
FOR APPLICATIONS ASSISTANCE CALL 800-228-2966



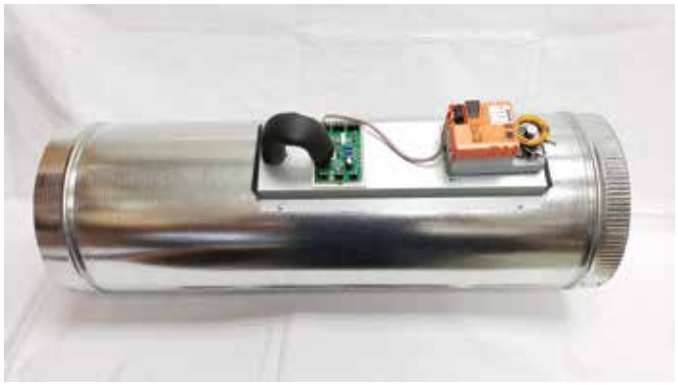
GEN V
VRF-VAV with Smart Air Valves
Schematic Overview

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 loop, 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)

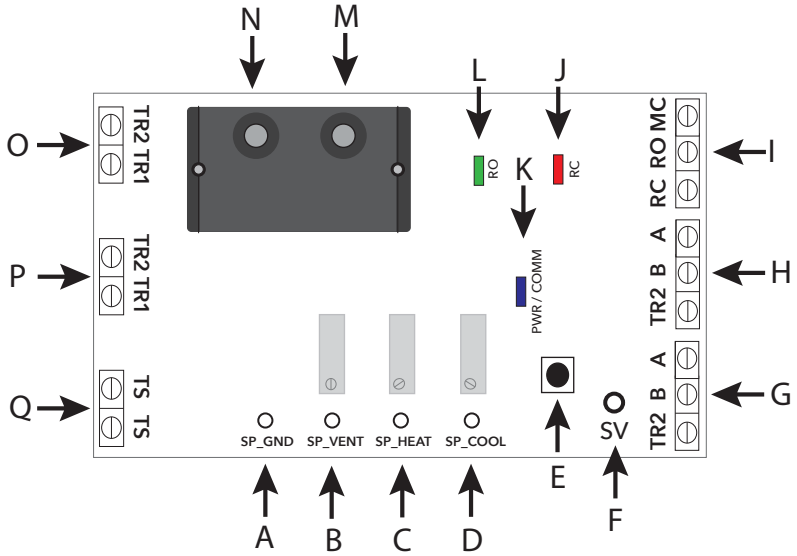
SMART AIR VALVE (SAV)



VENT/LOW position when zone call is satisfied.

The Smart Air Valve (SAV) is a pressure independent self-balancing damper. This SAV works in conjunction with a VRF system to provide multiple zone control for individual air handlers within a VRF System. Smart Air Valve provide different air flow volumes depending on zone temperature demand and thermostat requirements. SAV's use pitot tubes to establish air flow velocity and set damper position to deliver designed air flow for High Position – Active Call for HEAT or COOL, or

Smart Air Valves are factory set for design velocity and CFM and automatically self balance to deliver design CFM to each zone. SAV's use pitot tubes to constantly measure velocity and make adjustments to valve positions as needed do to changes in system static pressure to provide consistent air flow levels to zones requiring conditioning. As room temperature approaches thermostat set points, the SAV will reset valve position to VENT/LOW and remove call for HEAT or COOL from system tally, this will allow for conditioned air at a lower volume to assist in maintaining comfort in the zone and avoid ON/OFF operations of the VRF system.



A - SP_GND voltage set point / test point

B - SP_VENT voltage set point / test point

C - SP_HEAT voltage set point / test point

D - SP_COOL voltage set point / test point

E - SYNC BUTTON used to sync to thermostat

F - "SV" - SENSOR VOLTAGE test point

G- A/B (IN) 3-wire communication link daisy chained out to the next SAV board

H- A/B (OUT) 3-wire communication link daisy chained into SAV board

I - MC/RO/RC Factory wired to the damper actuator runs open, runs closed

J - RUN CLOSED RED LED indicates the SAV is being powered closed

K - COMM LINK BLUE LED indicates communication to the GEN V and thermostat

L - RUN OPEN GREEN LED indicates the SAV is being powered open

M - TOTAL STATIC PRESSURE TUBE

N - STATIC PRESSURE TUBE

O - TR1/ TR2 24VAC (IN) daisy chained in to the SAV board

P - TR1/ TR2 24VAC (OUT) daisy chained out to the next SAV board

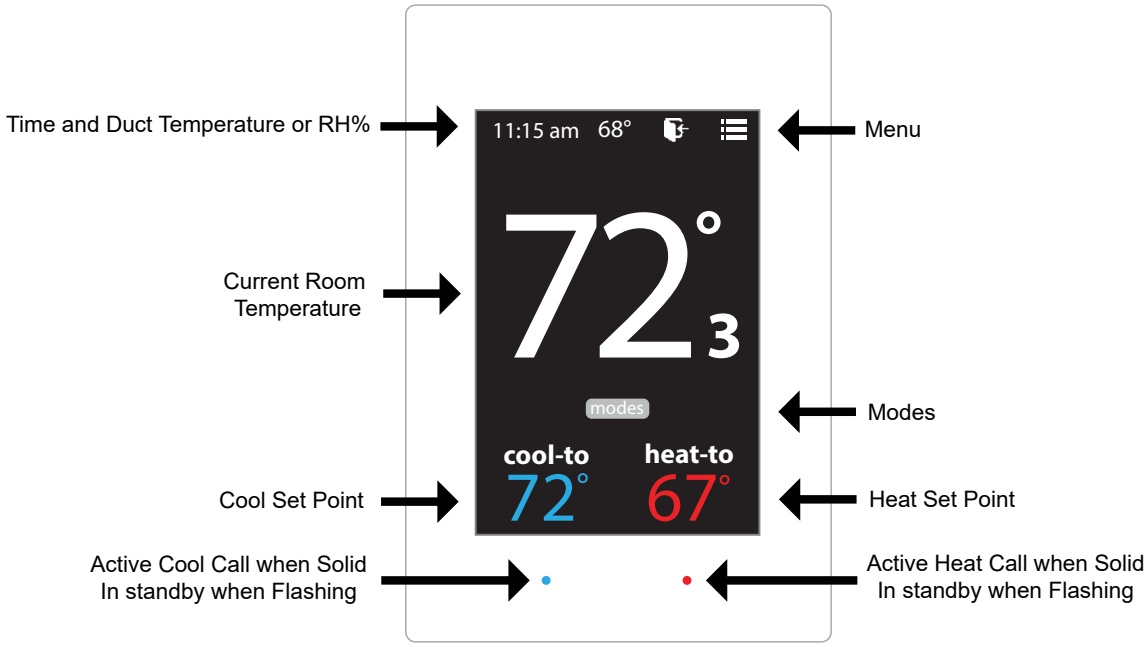
Q - NOT USED on GEN V system

DESCRIPTION

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

The zone thermostats control a Smart Air Valve (SAV) and monitors zone temperature. When the EzTouchX calls for Cooling or Heating the SAV that it controls will adjust damper position to provide designed airflow to the zone. When the EzTouchX senses room temperature has lowered to set point, EzTouchX will end call for cooling or heating, and go into Vent mode the SAV will adjust to a vent CFM position, if room temperature falls / rises 2° of the set point the EzTouchX will set the Smart Air Valve to fully close or drive to its minimum position.

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

The EzTouchV / EzTouchX controls a Smart Air Valve (SAV) and monitors zone temperature. When zone temperature rises 1° above cooling set point, a EzTouchV / EzTouchX will call for cooling. On the next poll of the GEN V controller, this vote will be counted and if there is a single vote or majority vote for cooling, GEN V controller will initiate cooling call sending 24v through the interface to the fan coil.

When cooling call has been initiated by the GEN V controller, all SAV devices connected to this GEN V controller are notified that VRF System is operating in cooling mode. SAV dampers calling for cooling will use smart technology located within the SAV controller to adjust damper position to provide designed airflow. Airflow design vary based on the size of SAV damper, see sizing and engineering charts for airflow information. The SAV controller monitors air velocity continuously and automatically repositions SAV in order to provide targeted CFM to zone. When EzTouchV / EzTouchX senses room temperature has lowered to set point, EzTouchV / EzTouchX will end call for cooling and on the next poll of GEN V this vote will be removed from tally. If other cooling calls remain in the majority, cooling call will remain in the system, satisfied SAV will reset to a vent CFM position while other calling SAVs will continue to maintain targeted air flows. Vent CFM position is also set by SAV controller, again measuring air velocity and adjusting damper for targeted velocity and CFM. During this time, a minimal amount of cool air will enter zone to assist in maintaining room temperature. If room temperature falls 2° below cooling set point, SAV will fully close or drive to its minimum position.

HEAT CALL

When zone temperature falls 1° below heating set point, a EzTouchV / EzTouchX will call for heating. On the next poll of the GEN V controller, this vote will be counted and if there is a single vote or majority vote for heating, GEN V controller will initiate heating call sending 24v through the interface to the fan coil.

When heating call has been initiated by the GEN V controller, all SAV devices connected to this GEN V controller are notified that VRF System is operating in heating mode. SAV dampers calling for heating will use smart technology located within the SAV controller to adjust damper position to provide designed airflow. Airflow design vary based on the size of SAV damper, see sizing and engineering charts for airflow information. The SAV controller monitors air velocity continuously and automatically repositions SAV in order to provide targeted CFM to zone. When EzTouchV / EzTouchX senses room temperature has risen to set point, EzTouchV / EzTouchX will end call for heating and on the next poll of GEN V this vote will be removed from tally. If other heating calls remain in the majority, heating call will remain in the system, satisfied SAV will reset to a vent CFM position while other calling SAVs will continue to maintain targeted air flows. Vent CFM position is also set by SAV controller, again measuring air velocity and adjusting damper for targeted velocity and CFM. During this time, a minimal amount of warm air will enter zone to assist in maintaining room temperature. If room temperature rises 2° above heating set point, SAV will fully close or drive to its minimum position.

Baseboard / REHEAT

Each EzTouchV / EzTouchX has the ability to control auxiliary heating devices such as reheat or baseboard heat. Auxiliary heat is configured at the EzTouchV / EzTouchX. If there is a cool call, heat call, or the VRF system is a cooling only unit, the EzTouchV / EzTouchX will energize AUX heat outputs if the zone temperature drops 2° below heat set point. If the EzTouchV / EzTouchX is configured for reheat, SAV will position damper to provide airflow over electric strip heat, hot water coil or other heating element.

SYSTEM VENT MODE

When all calls for cooling and heating are satisfied EzTouchV / EzTouchX will operate in Vent Mode. Outputs for cooling and heating are de-energized and if GEN V controller is configured for Fan On – Continuous, VRF Air Handler blower will be operational during Occupied times and ventilation air will be provided to all zones.

SMART AIR VALVE BOARD (SAV)

A Smart Air Valve board resides on each SAV carrying power and communications information from the SAV and thermostats to the GEN V controller. The SAV board has three LED lights providing SAV and system information. See diagram below.

The BLUE LED (J) confirms communications and to sync the damper with its associated thermostat.
The RED LED (I) is illuminated when the damper is closing.
The GREEN LED (K) is illuminated when the damper is opening.

Once all Smart Air Valves, thermostats and GEN V controller are wired into the system and the GEN V controller is turned ON, the BLUE light on the SAV boards will illuminate indicating power to the SAV.

Each SAV damper board must be synced with its respective thermostat.

A - SP_GND voltage set point / test point

B - SP_VENT voltage set point / test point

C - SP_HEAT voltage set point / test point

D - SP_COOL voltage set point / test point

E - SYNC BUTTON used to sync to thermostat

F - "SV" SENSOR VOLTAGE test point

G - A/B (IN) 3-wire communication link daisy chained out to the next SAV board

H - A/B (OUT) 3-wire communication link daisy chained into SAV board

I - MC/RO/RC Factory wired to the damper actuator runs open, runs closed

J - RUN CLOSED RED LED indicates the SAV is being powered closed

K - COMM LINK BLUE LED indicates communication to the GEN V and thermostat

L - RUN OPEN GREEN LED indicates the SAV is being powered open

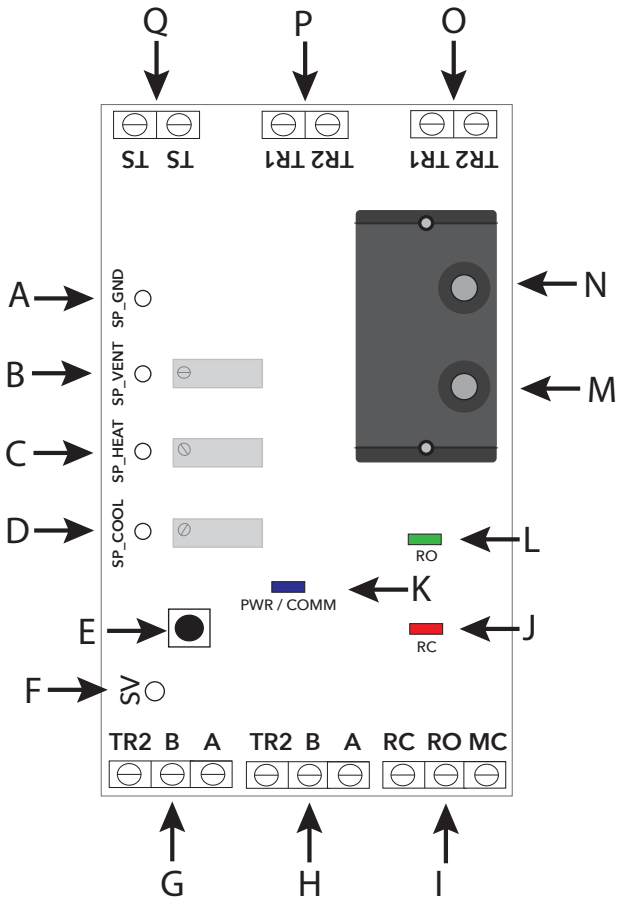
M - TOTAL STATIC PRESSURE TUBE

N - STATIC PRESSURE TUBE

O - TR1/ TR2 24VAC (IN) daisy chained in to the SAV board

P - TR1/ TR2 24VAC (OUT) daisy chained out to the next SAV board

Q - NOT USED on GEN V system



Smart Air Valve (SAV) Installation

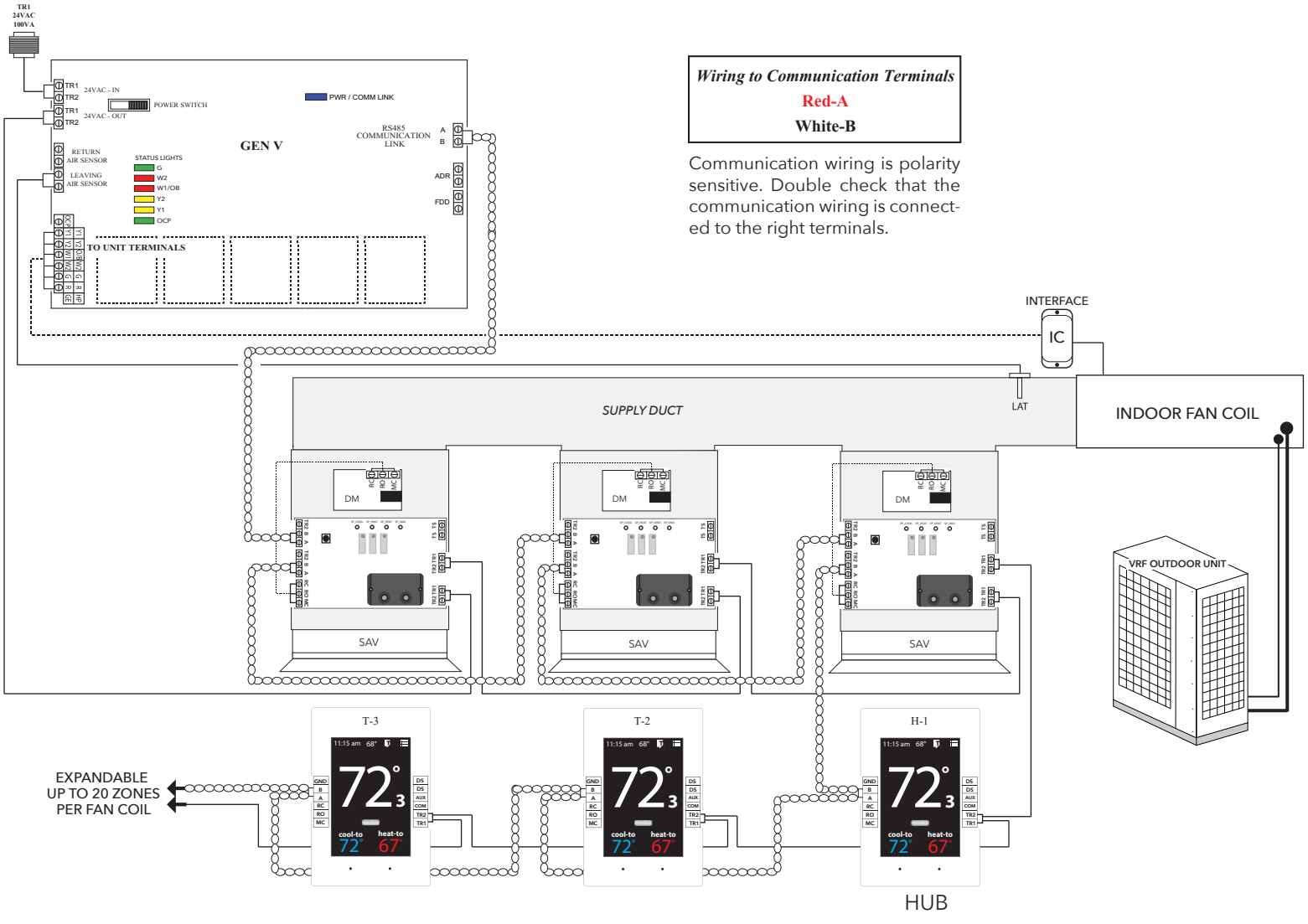
Install dampers into HVAC duct so damper actuators are easily accessible. Smart Air Valve may be mounted in an area where the ambient temperature is between 32 and 140 degrees Fahrenheit. Round dampers should be mounted with damper actuators between 9 and 3 O'clock position.

Installing 24VAC wiring

Once GEN V controller and Smart Air Valves 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 SAV board. Continue daisy chain wiring from first SAV board to second, third, etc., until all SAV boards are wired with power. Continue daisy chain wiring from last SAV baord to the first zone thermostat and to the second, third, etc., until all 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 SAV boards and zone thermostats in the system, use Zonex STPR plenum rated twisted 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 SAV board in the system and wire to A and B. Continue daisy chain to the next SAV board using A and B boards. Continue daisy chain wiring from last SAV board to the first zone thermostat and to the second, third, etc., until all thermostats are wired into to 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.

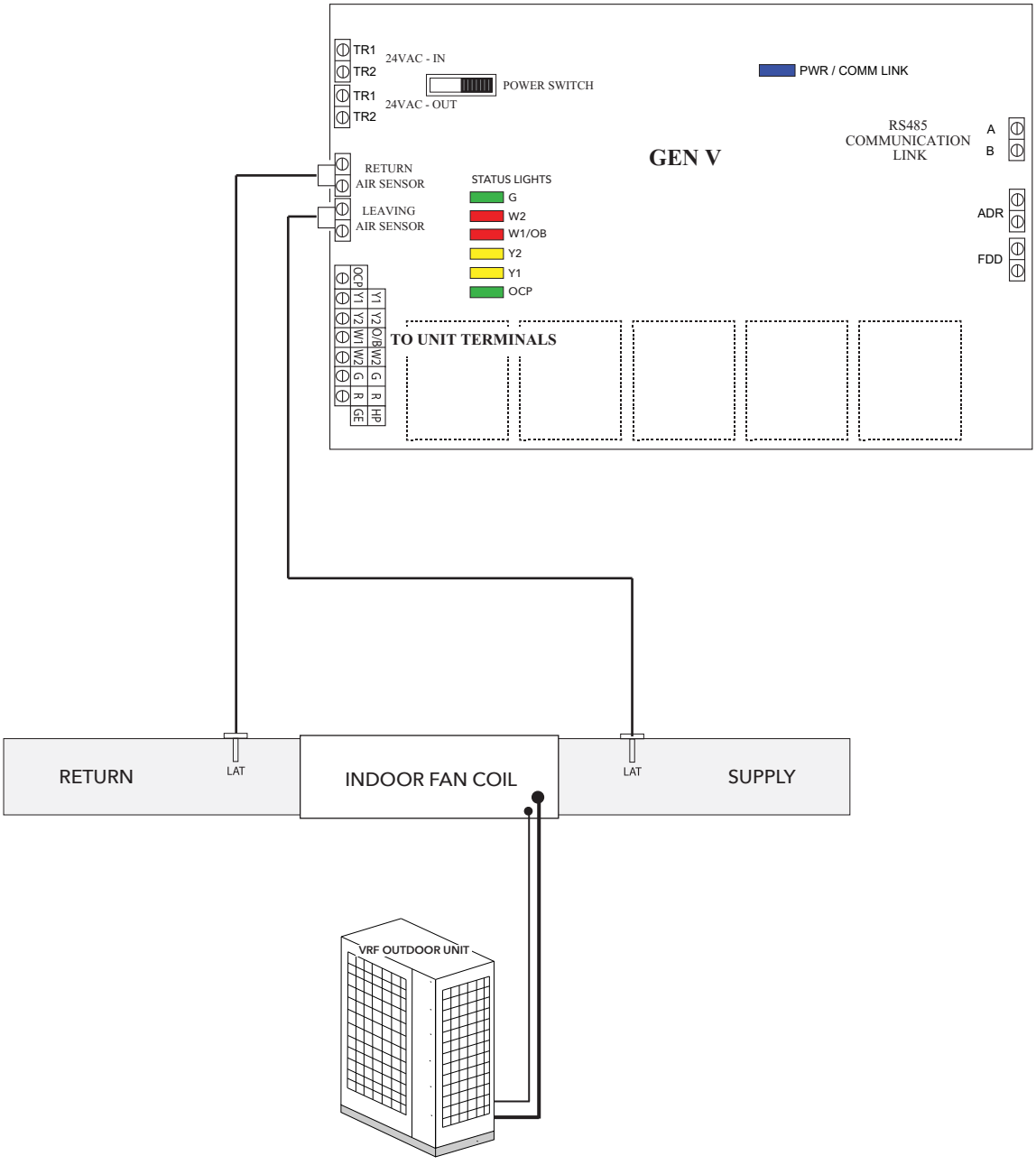


Wiring in the Leaving and Return Air Sensors to GEN V controller

The LAT provides information on leaving air and return air temperature viewed via EzTouchV (HUB).

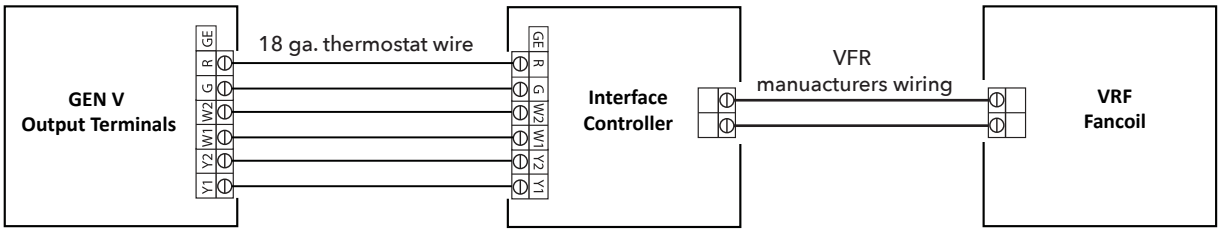
Install Leaving Air Temperature Sensor (LAT) to the LVAIR terminals on the GEN V controller and place the sensor in the supply duct. Install Return Air Temperature Sensor (LAT) to the RA terminals on the GEN V controller and place the sensor in the return duct.

(Note: If extension of wire is needed, 18 ga. thermostat wire may be used).

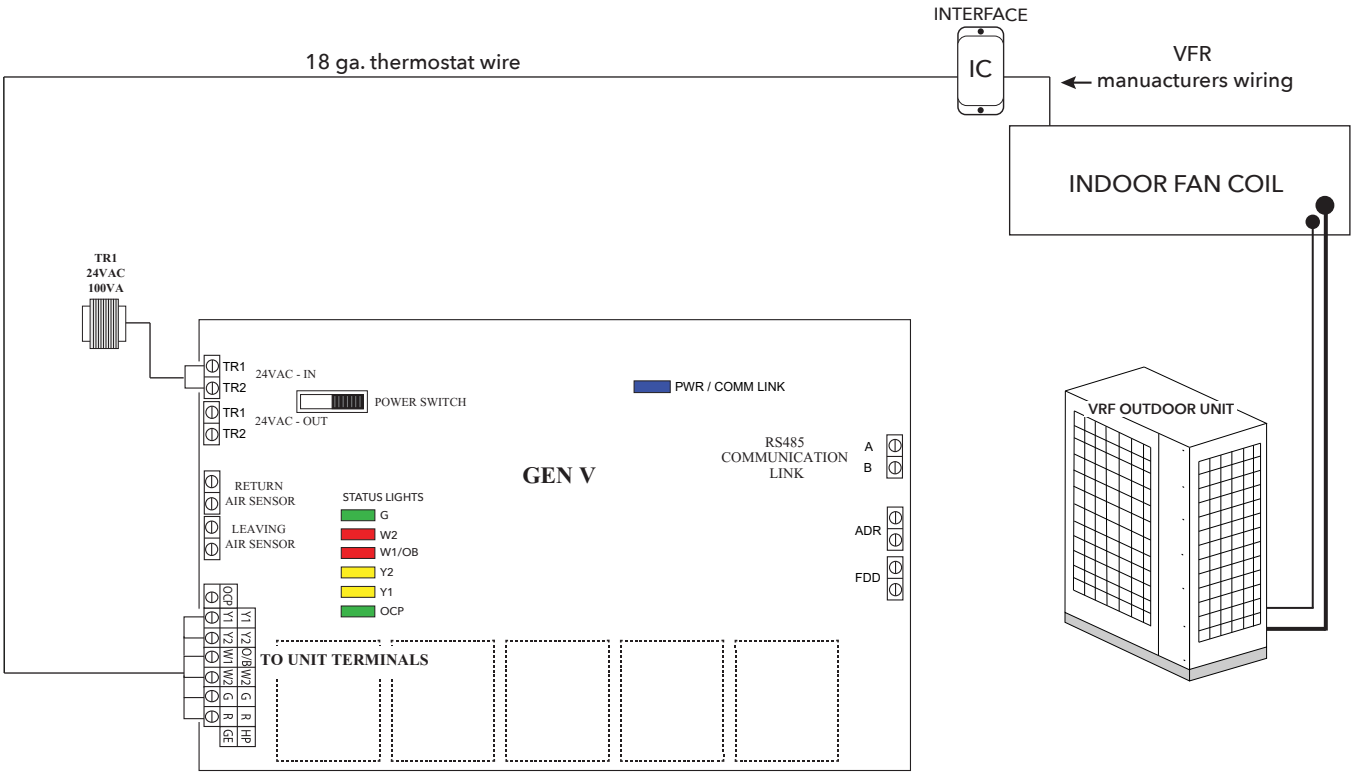


Wire Unit to GEN V Controller

Using standard 18 ga. thermostat wire, connect GEN V unit outputs to interface controller and than to the VRF fan coil. Terminal designations are used, R Y1 Y2 W1 W2 G.

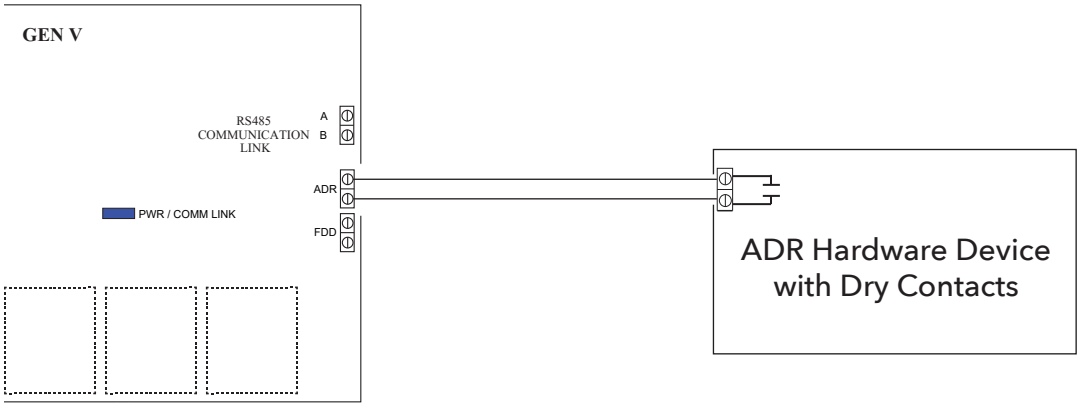


Note: Follow the manufacturers interface installation instructions, when wiring the GEN V to the interface.



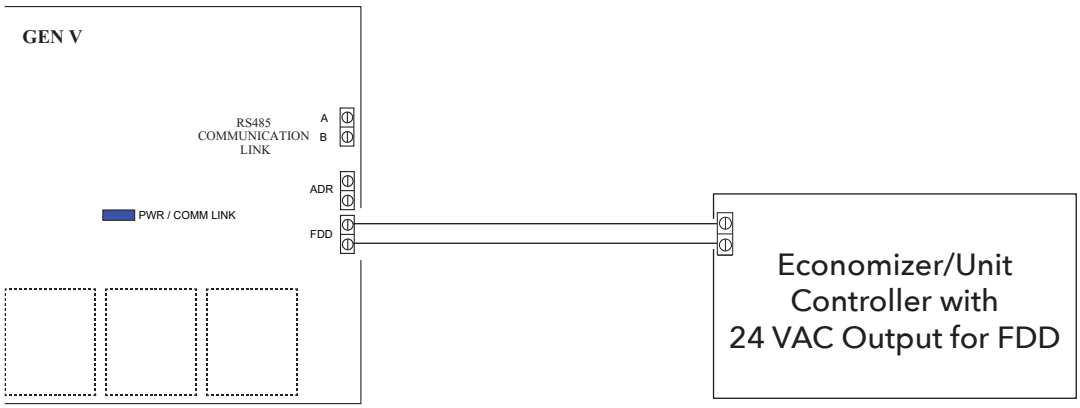
Wiring in the Automated Demand Response (ADR) to GEN V controller

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 .

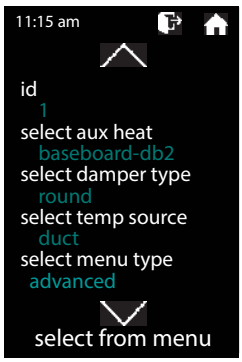
Setting STAT ID for the Zone Thermostat

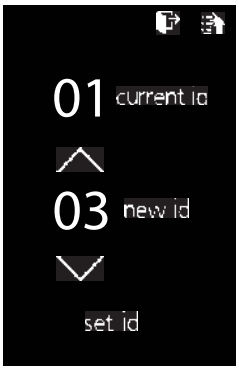
While in the Thermostat Advanced Menu, Select **SET ID**

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.

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

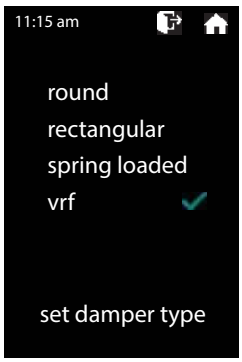
EzTouchV (HUB) - select configure hub stat, **Select Damper Type**

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

Select **vrf** 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

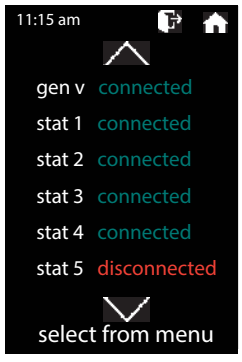
From the **EzTouchV (HUB)** thermostat, confirm that all the zones are showing connected in system diagnostic screen. If it shows any disconnected with in your zone count confirm wiring is correct and check stat ID. The GEN V will report up to 20 zones, anything above the zone count will report back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

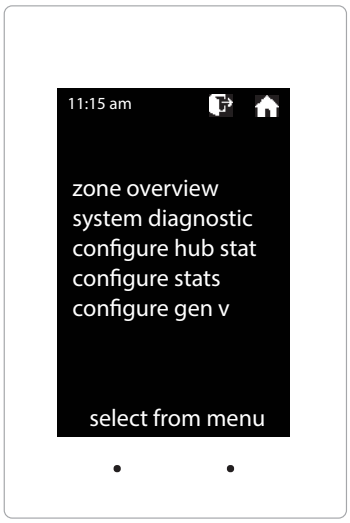
Note: If a thermostat is showing up disconnected with in system the zone count when it should be connected, check the thermostat ID and wiring is correct.

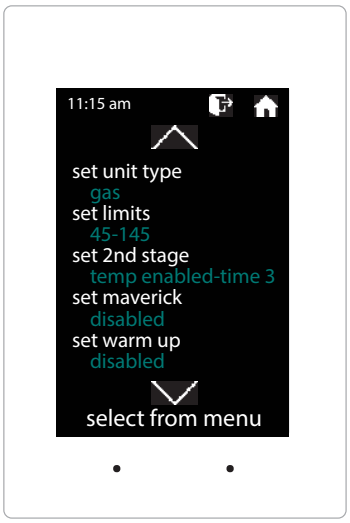


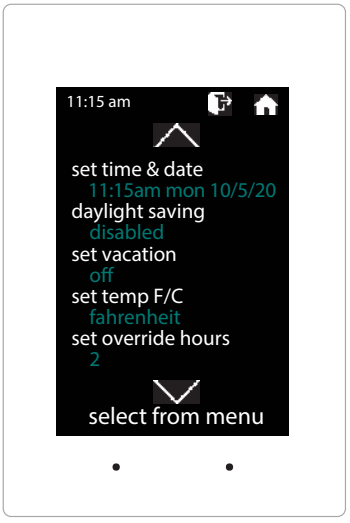
CONFIGURING GEN V CONTROLLER

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

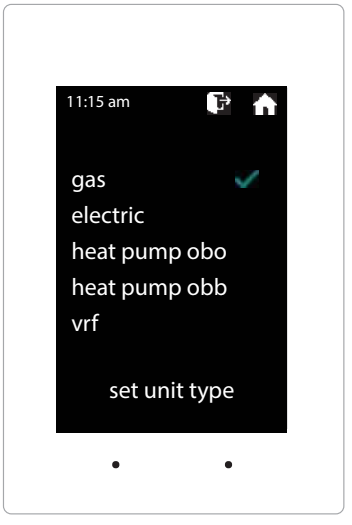
Confirm the type of unit the GEN V is controlling: GAS, ELECTRIC, HEAT PUMP (O), HEAT PUMP (B), or VRF. Factory default for UNIT TYPE is GAS, if application is ELECTRIC, HEAT PUMP or VRF, you will need to select one of these options through the HUB thermostat.

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

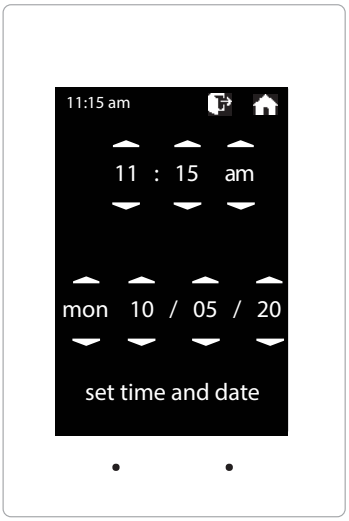
From the HUB thermostat time and date is set for all system devices. To set the time and date, access configure gen v on the HUB thermostat.

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

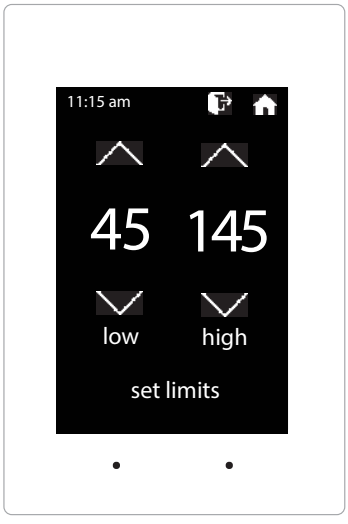
Factory defaults for GAS/ELECTRIC units are set for 45 degrees Low Limit and 145 degrees High Limit. Heat Pump O and B machines are set for 40 degrees Low Limit and 115 degrees High Limit. These may be adjusted in the field to meet installation/application requirements.

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

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

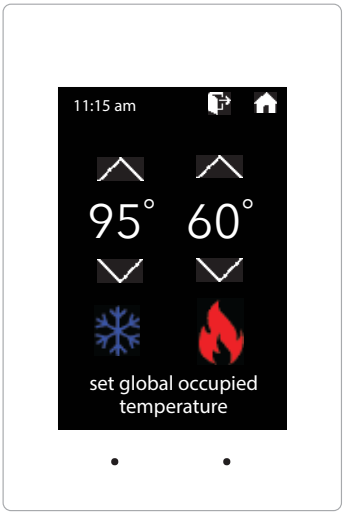
Tap  to save changes, to return to the home screen tap 

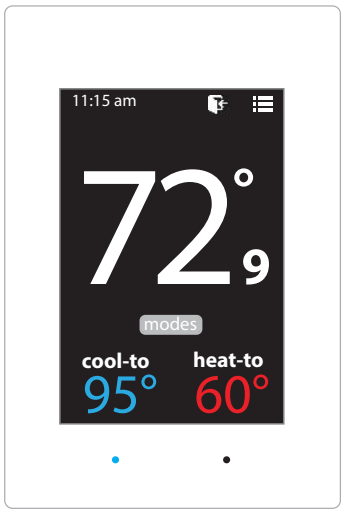
Note: Ensure that the RTU/Split systems high and low limit settings do not conflict with the GEN V's.



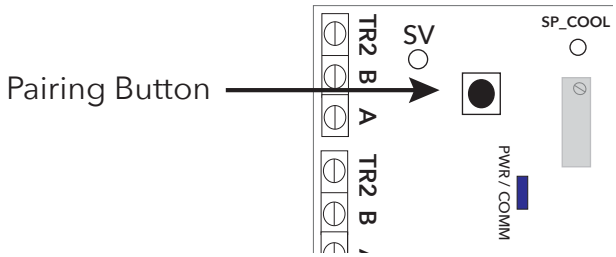
Pairing the Smart Air Valve to its Thermostat

Tap on Zone #1 and adjust Heat temperature to 60° and Cool temperature to 95°. Return to the home screen tap  . This will send a command for pairing to all SAV boards. All SAV boards blue lights will be flashing.

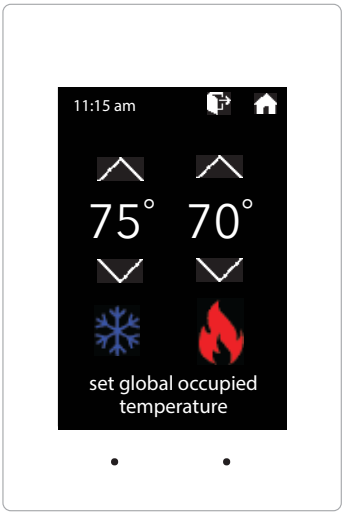


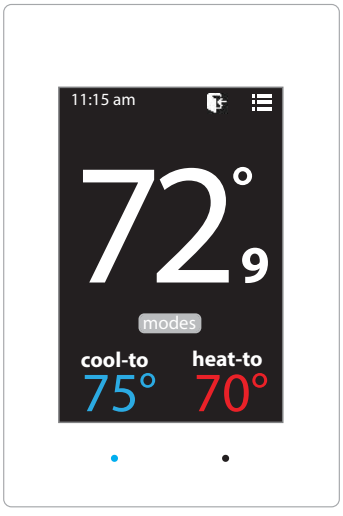


Locate the SAV board that will be paired to the thermostat addressed as #1. When the blue light is flashing, Press and Hold the pairing button on the SAV board for 15 seconds. The pairing is complete when the blue light stops flashing.



Once the pairing is complete, adjust the Heat/Cool setting on Zone #1 back to 70° Heat and 75° Cool. Repeat the steps above increasing one zone # at a time till all SAV boards are paired to there EzTouchV / EzTouchX's. Note: You can only pair one SAV at a time.

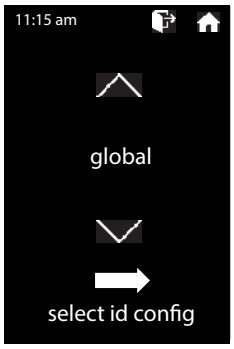


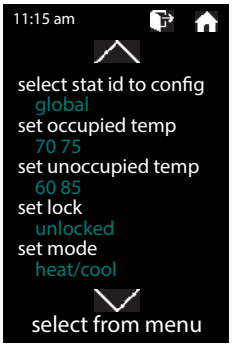


Confirm Cool, Heat Call and Damper Operation

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

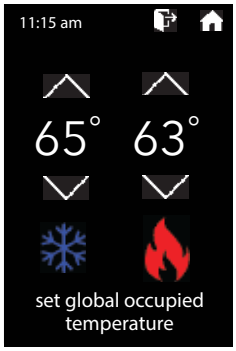
Use the and arrows to select **Global** tap the arrow below to global configuration.

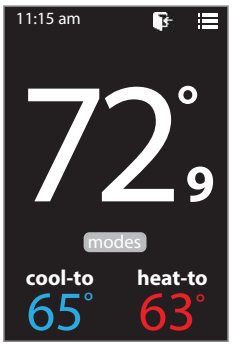




Tap **set occupied temp,** to make a occupied global temperature change.

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





Go to each zone thermostat and confirm blue light appears on the the display indicating an active cool call.

Confirm the the RED and GREEN LED's on the SAV's control boards are flashing ON and OFF, this indicates the SAV's are communicating to the prospective thermostats.

Once all SAV's are confirmed open, satisfy cooling calls at each zone thermostat. Confirm blue light disappears and SAV is in Vent position once call is satisfied.

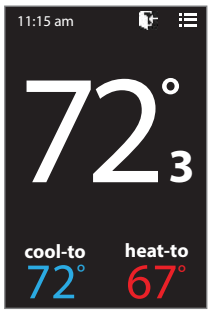
Continue to satisfy all cool calls one at a time until all calls are satisfied and SAV's are in Vent position. If SAV's control boards, LED's are not flashing confirm power, SAV pairing and communication wiring installation.

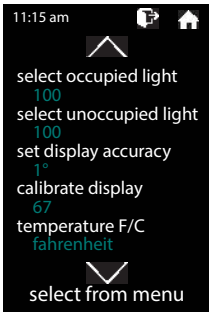
THERMOSTAT USER MENU

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 .

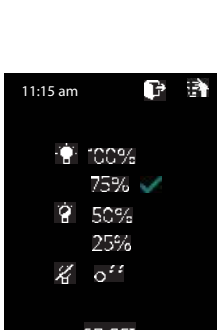
While in Thermostat Configuration Menu, Select **Occupied Light**

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

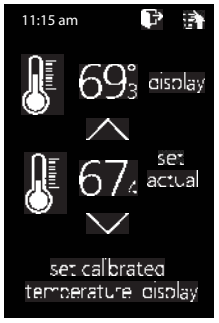
Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

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



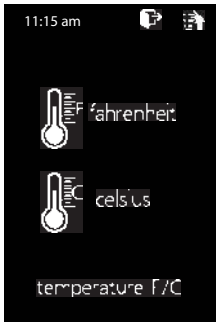
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

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

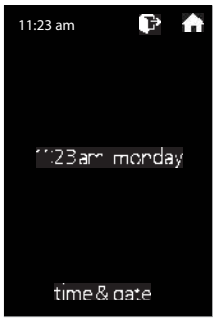
View the current thermostat schedule, given by the Gen V system

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)*

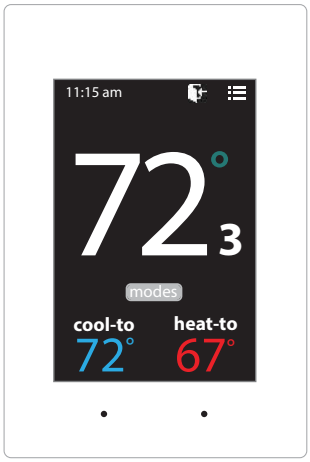
Tap to go back to the menu, to return to the home screen tap

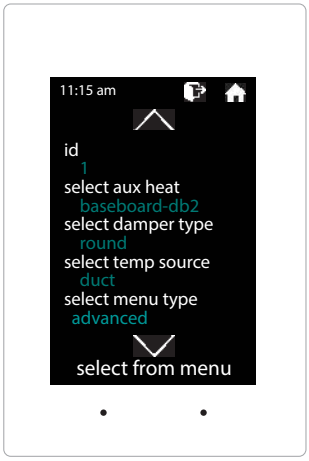
THERMOSTAT ADVANCED MENU

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 .

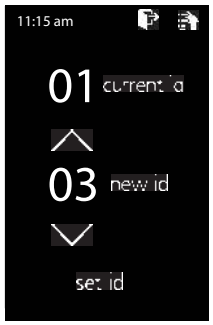
The **THERMOSTAT ADVANCED MENU** allows you to:

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

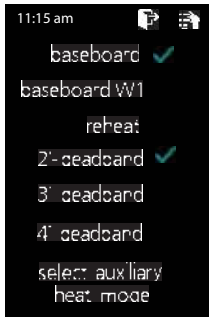
While in the Thermostat Advanced Menu, Select **SET ID**

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.

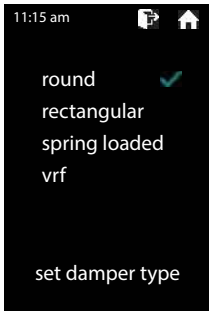
While in the Thermostat Advanced Menu, Select **Aux Heat**

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



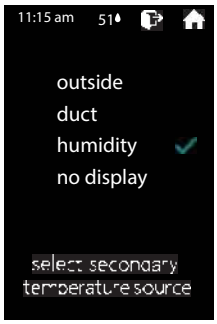
The thermostat must be configured for the appropriate damper type that it will be connected to and controlling. There are 4 options, round, rectangular, spring loaded or vrf.

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 

Note: Damper operation command does not work on VRF systems.

HUB Thermostat

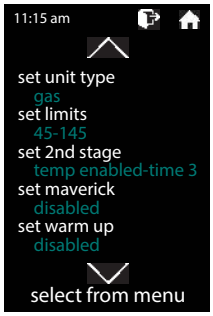
A HUB zone thermostat is used with the GEN V controller to interact and initiate control decisions for the system, the HUB coordinates global or individual schedules for the system, locks thermostats individually and provides a user interface to make adjustments and establish master temperature settings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

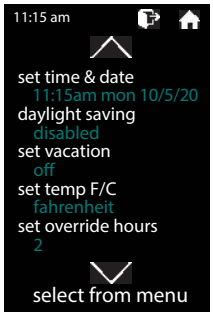
The HUB Thermostat performs all the functions of a zone thermostat along with Advanced Configuration Menu to access 14 unique functions to control and schedule the GEN V system. To access the Advanced Configuration menu follow the steps below:

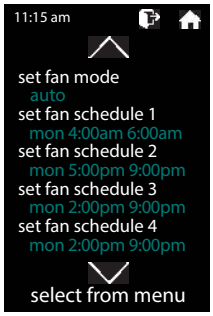
GEN V Configuration

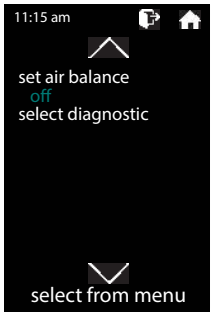
All GEN V system configuration and management is done at the HUB stat from the Advanced Configuration Menu.

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





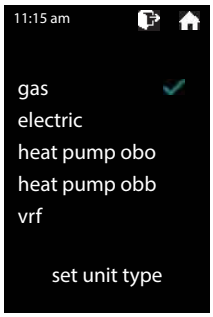




GEN V MENU FEATURES:

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.

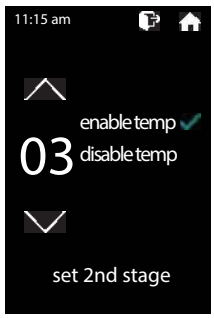
While in the configure gen v, Select **Set Limits**

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.

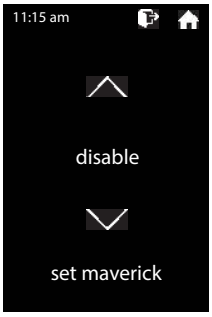
While in the configure gen v, Select **Set 2nd Stage**

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



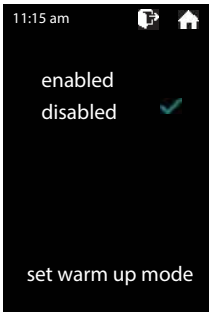
Maverick operations allow the system to recognize an outlier call in the system. When most zones in a system are calling for heat and single zone is calling for cooling, the system will initiate a MAVERICK CALL protocol by starting a time clock. Logic in the controller will provide a time period from 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



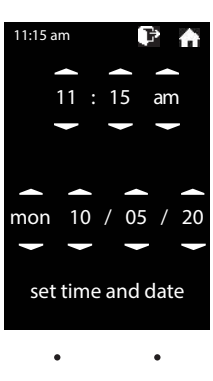
In cold climates a MORNING WARM UP sequence will assist in preheating the building prior to occupancy. The GEN V system provides a strategy for morning warm up based on a sophisticated algorithm built into the system controller. When enabled, the system will switch from Unoccupied to Occupied two hours 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



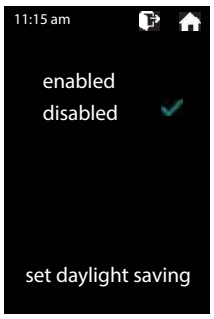
System time and date operation, including all scheduling functions are based on the system time clock. Set the time to your local time at startup

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



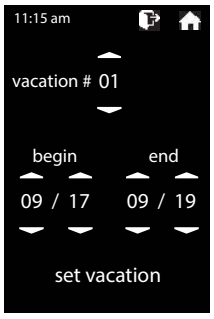
The GEN V will follow daylight savings time when it is enabled

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

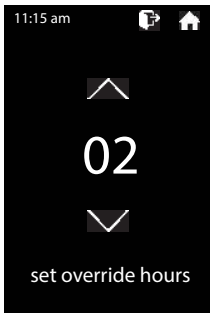
GEN V may be configured for F° or C° operations.

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.

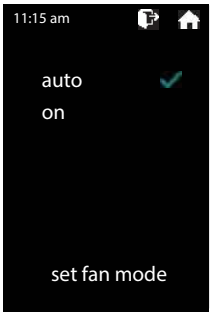
While in the configure gen v, Select **Set Override Hours**

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

Note: Fan mode is set to "ON" when configured for VRF operation.

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.

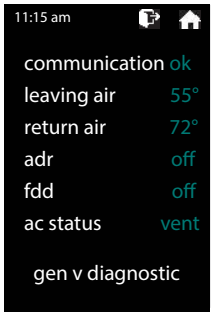
While in the configure gen v, Select **Set Air Balance**

Select off / on for air balance operation

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

Note: Set Air Balance mode should not be used on VRF operation.

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.

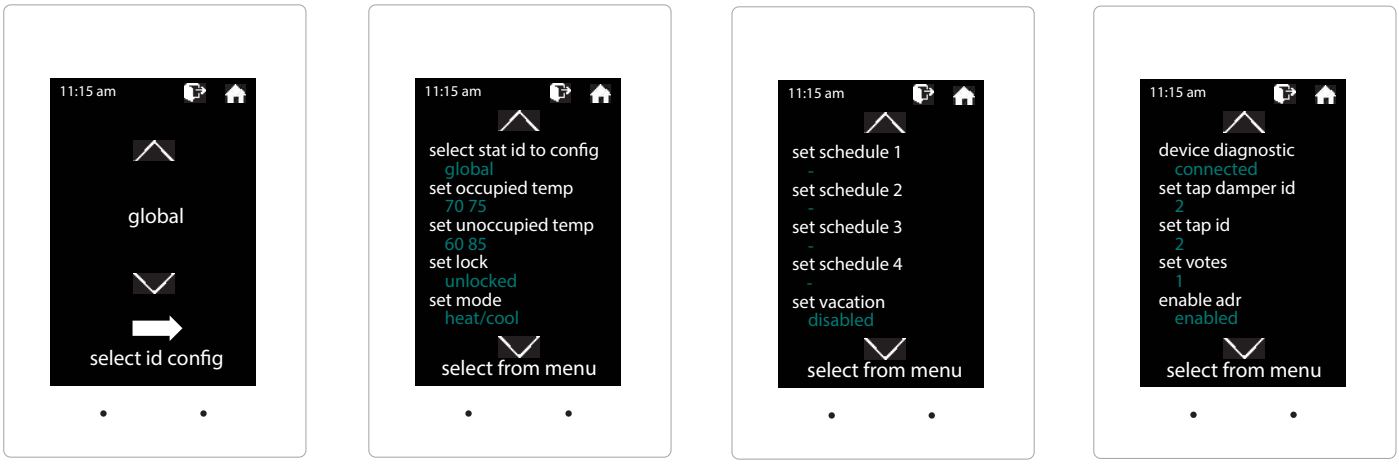
While in the configure gen v, Select **Diagnostic**

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

Configuration of Thermostats

All thermostats can be managed from the HUB stat

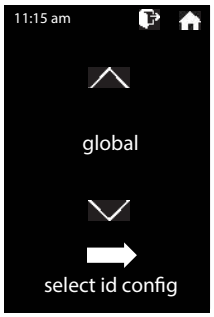
To configure access the Advanced Configuration menu by tapping on the degree symbol next to the room temp O. The degree symbol will change from white to green and then tap ☰ and then tap configure stats



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  to save changes, to return to the home screen tap 

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  to save changes, to return to the home screen tap 

SET UNOCCUPIED TEMP

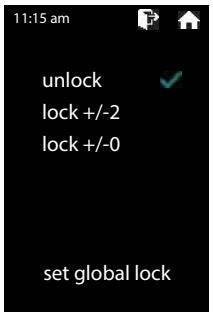
When in the "Set Unoccupied Temp" screen you can adjust the unoccupied heat/cool set points to their desired temperature settings.

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  to save changes, to return to the home screen tap 

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

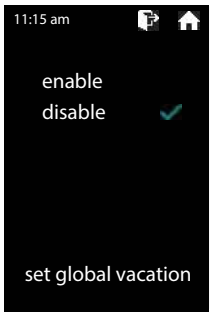
Select 5-1-1 or 7 day schedule type; Tap on the to confirm.

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



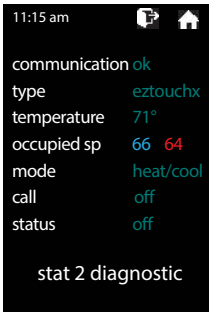
Set Vacation, enables or disables the zone thermostat from following the vacation schedule set for the GEN V system.

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

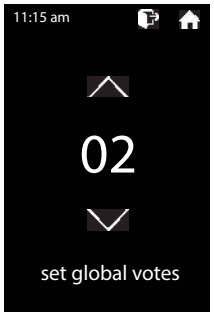


Device Diagnostic, allows you to see all the vitals of that zone thermostat. From the device diagnostic you can confirm communication with the GEN V and HUB thermostat, type of thermostat, current room temperature, current set points, mode, active call, and GEN V status.

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

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

SET VOTES



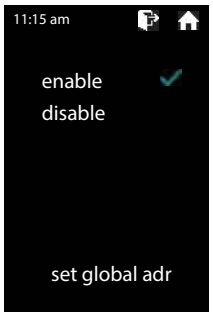
This function allows the GEN V to determine the weight of each vote sent from thermostats. Factory default is set to 1, or 1 vote per thermostat. When needed a thermostat can be set for higher weight by adding votes to the thermostat. Thermostats may have up to two additional votes for a total weight 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

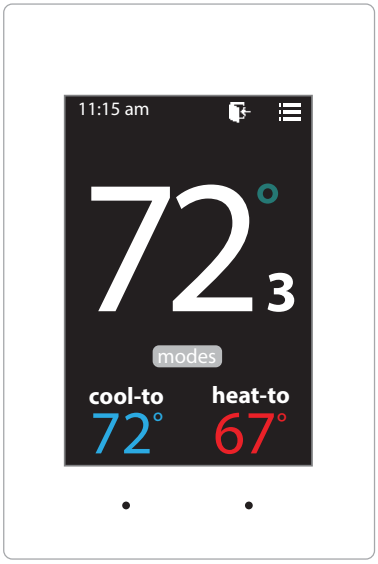


Fig 1

Advanced Menu

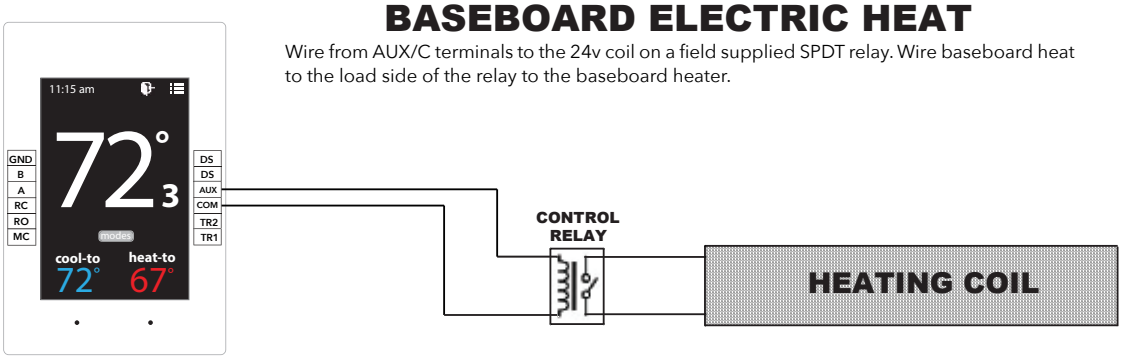
Fig 2

Select Aux Heat Menu

Fig 3

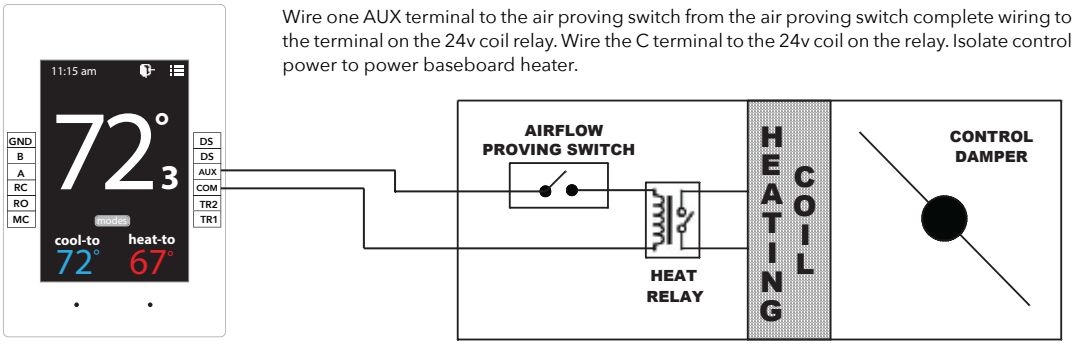
BASEBOARD ELECTRIC HEAT

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.



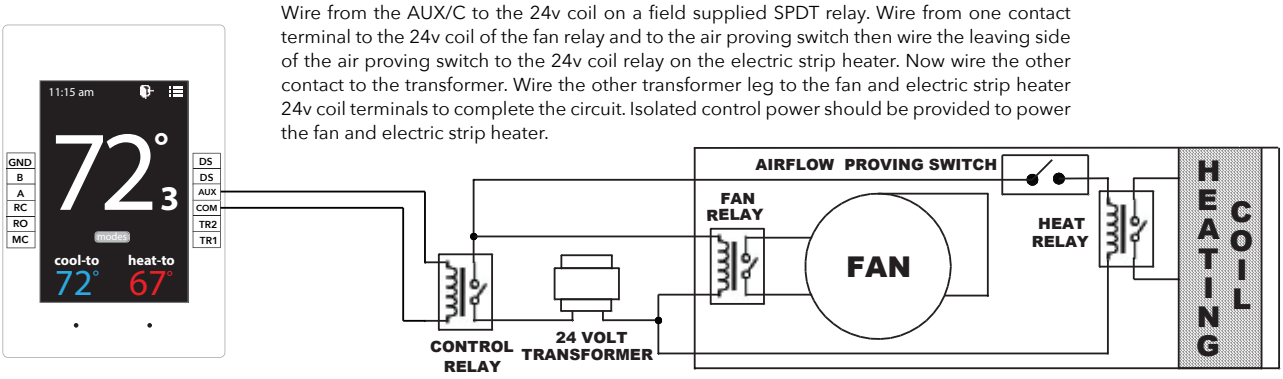
VAV DUCT REHEAT

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.



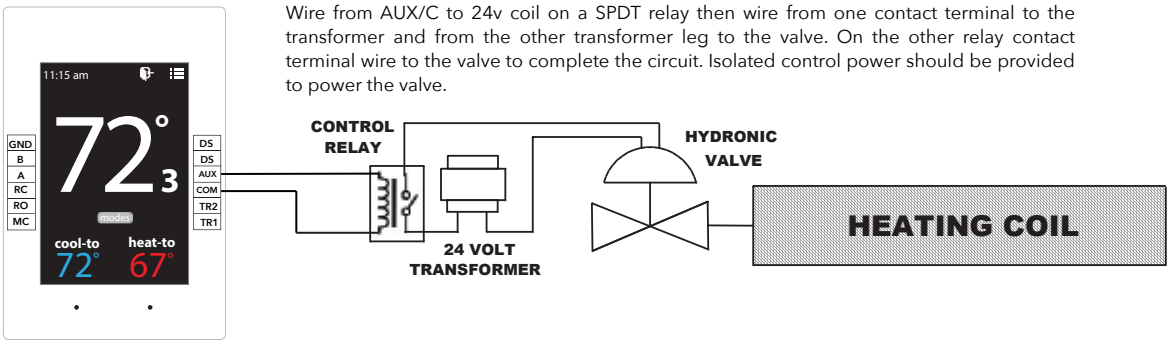
DUCT FAN REHEAT

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. **Note: A field supplied manufacturers VRF thermostat interface is needed when connecting to a VRF unit.**

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

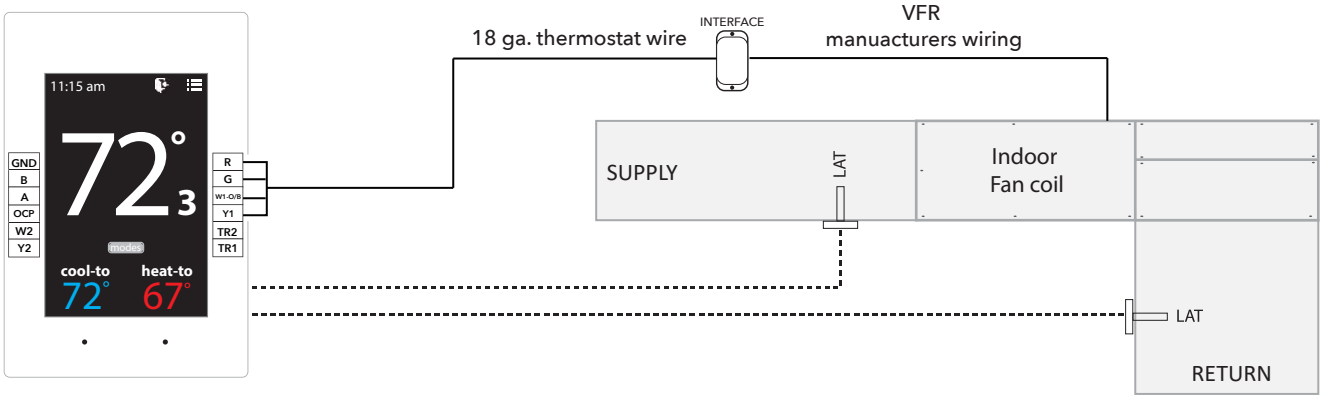
Thermostat and Terminal base

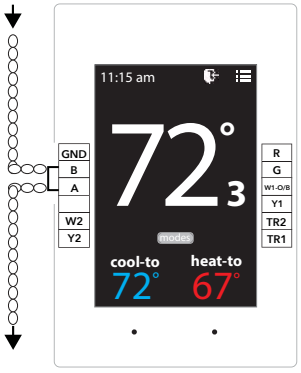
1. Install the thermostat on an interior wall, away from drafts, supply air currents and direct sunlight or any heat generating source.
2. Remove the thermostat from its sub-base, by pulling the thermostat and sub-base apart.
3. Install the thermostat sub-base to the wall using the provided anchors and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

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

Use 18/6 thermostat wire, wire from SATouchX to the VRF interface. Make sure to match up the VRF interface 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" downsteam of the unit.

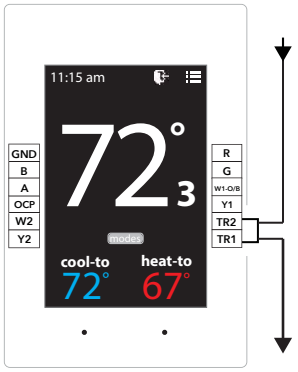




DAISY CHAIN THE COMMUNICATION WIRE

Using Zonex 2 wire communication wire. Wire to A and B **IN** and A and B **OUT**, to and from SATouchX's in a daisy chain configuration.

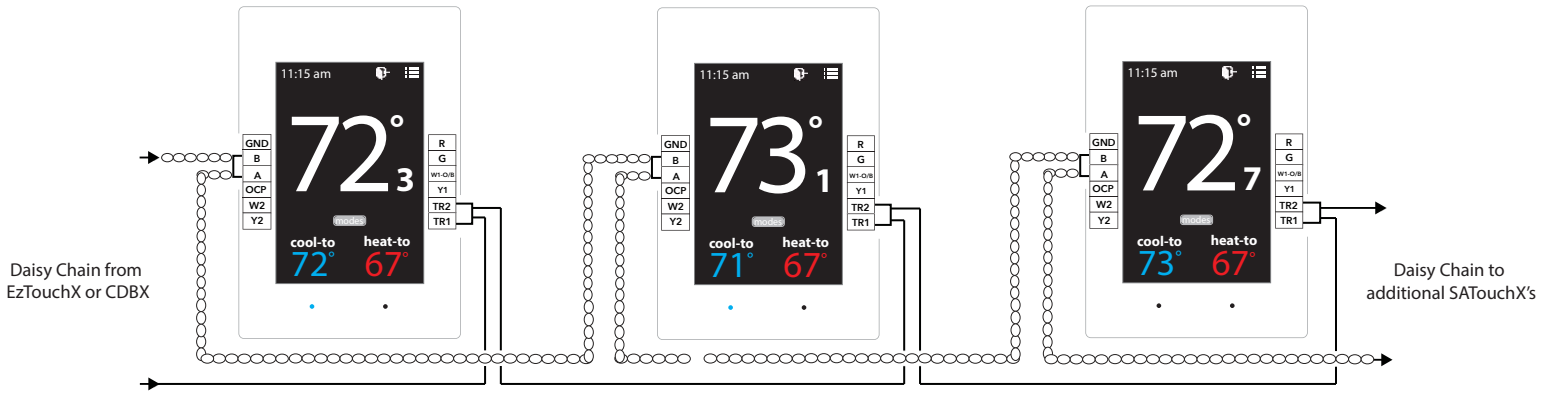
Wiring to Communication Terminals
Red-A
White-B

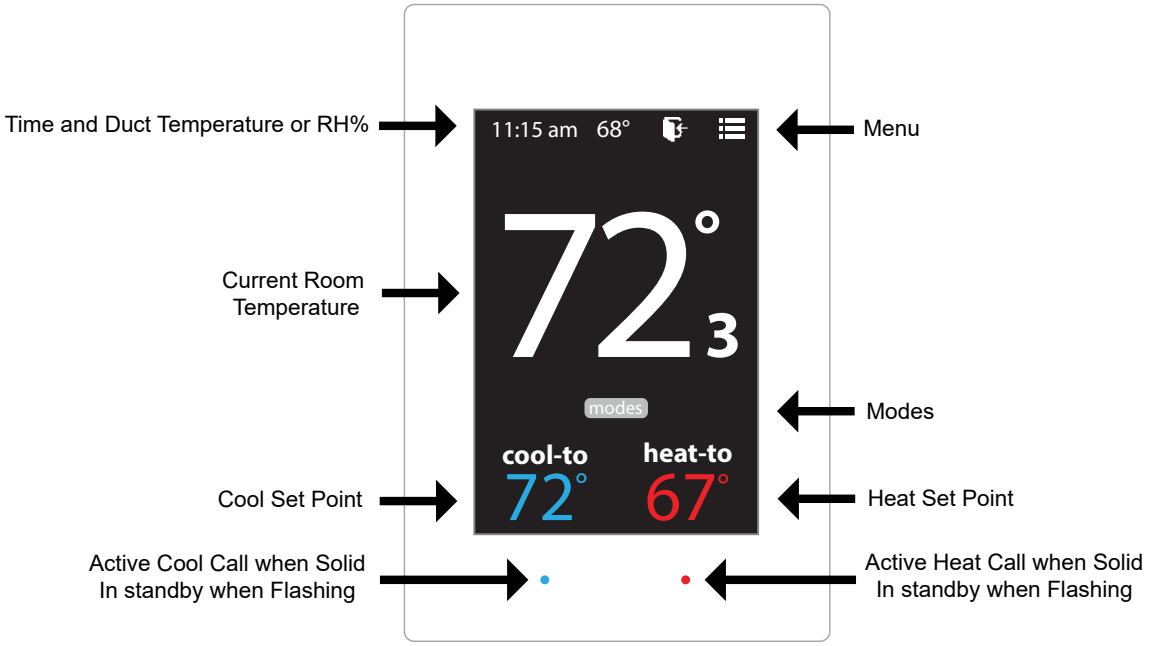


DAISY CHAIN 24V POWER FROM GEN V

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.

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

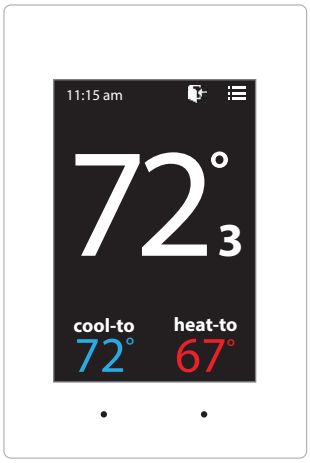
When the thermostat displays the unoccupied icon  a 2-8 hour temporary override may be initiated by tapping the  “Override” will appear. When additional override time is required, tap the unoccupied icon again.

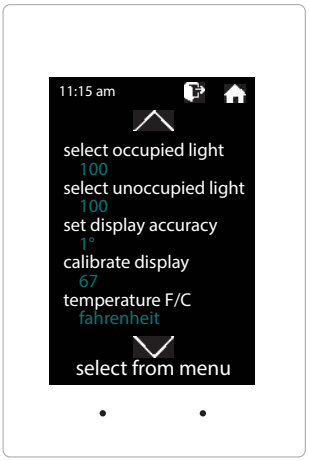
THERMOSTAT USER MENU

To access the Thermostat User Menu: Tap

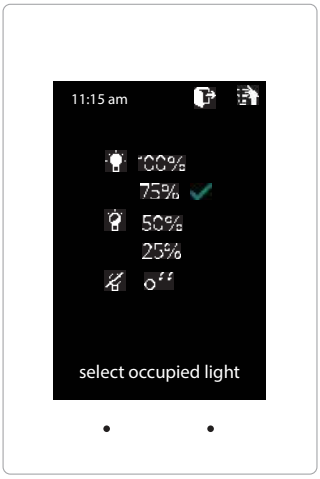
The **THERMOSTAT USER MENU** allows you to:

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 .

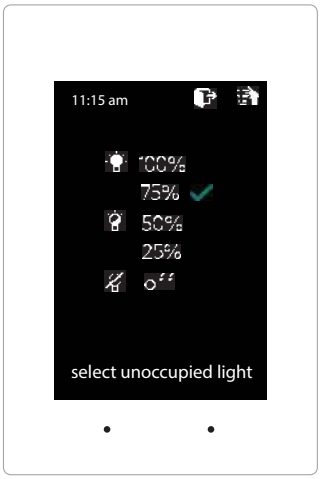
While in Thermostat Configuration Menu, Select **Occupied Light**

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 .

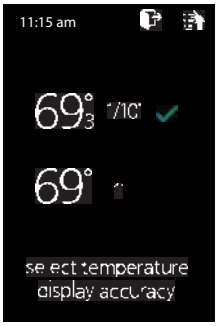
While in Thermostat Configuration Menu, Select **Unoccupied Light**

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



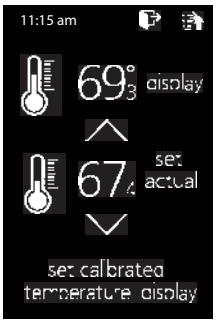
Display accuracy allows the thermostat to display the room temperature in 1/10° or 1°.

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



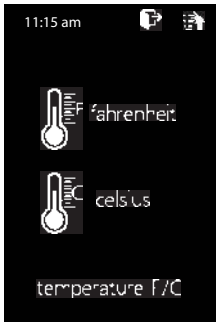
Thermostat is equipped with an accurate temperature sensor. If you require field calibration, follow the steps below.

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



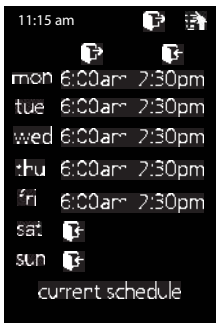
Thermostats can be configured for F° or C° operation through the HUB thermostat.

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 

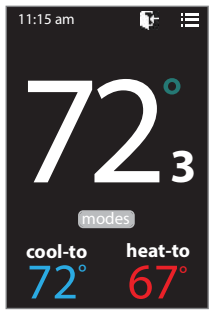
THERMOSTAT ADVANCED MENU

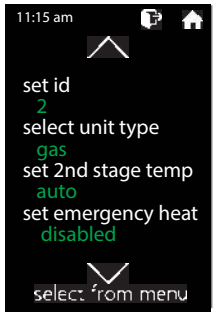
To access the Thermostat Advanced Menu: Tap on the degree symbol next to the room temp

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

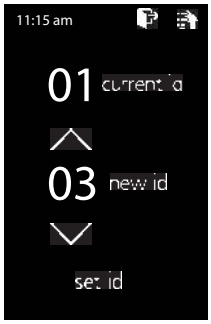
The **THERMOSTAT ADVANCED MENU** allows you to:

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

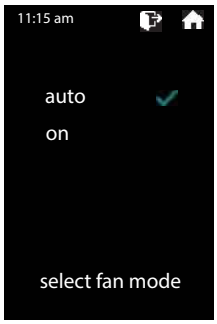
The SATouchX is designed as a universal GAS/ELECTRIC/HEAT PUMP thermostat. Factory default is set for GAS operations.

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



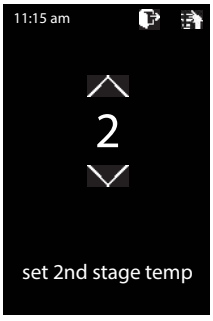
Fan operation is configured for either Fan ON or AUTO. When system is configured for ON operation, the Fan will run during Occupied schedule and will revert to Auto operations during Unoccupied schedule. When thermostat is configured for Auto operation, Fan will only run when there is a call for heating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



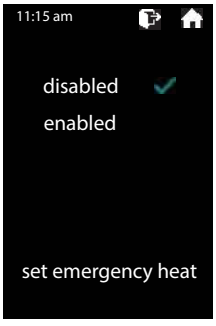
The SATouchX's 2nd stage operation is based on room temperature. Staging is adjustable from 2°- 8° from thermostat room temperature.

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.

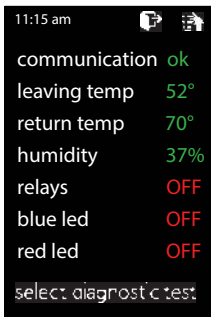
While in the Thermostat Advanced Menu, Select **Set Emergancy Heat**

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 

What the SAV Self Balancing Damper does?

It measures the amount of air being delivered to the zone, controlling air flow independent of the VRF system. Each SAV damper is wired to a zone sensor which provides the SAV with load requirements for the zone it is controlling. Based on this information, the SAV will request a call for cooling or heating to the GEN V controller which in turn sends information via the Interface to the air handler. Air handler will then control VRF operations as designed by manufacturer. SAV dampers are configured to deliver a targeted quantity of CFM through the damper and into the zone, based on variance from zone set point and zone temperature and emulate the operations of a VRF air handler.

When the zone load increases, SAV damper board will send a signal to GEN V controller, GEN V will forward to the VRF Interface and Air Handler will energize fan and call to outdoor unit. SAV damper will then Balance its damper position to provide 100 % of its targeted airflow to the zone. This is done by measuring air velocity through the SAV Self Balancing Damper and positioning damper to provide specified air flow requirement. As the zone sensor updates and the zone begins to approach set point, SAV will adjust its CFM requirement, adjusting damper position to provide a lower CFM to the zone in order to maintain comfort and allow the VRF system to maximize efficiency. The reduction in air flow will change refrigerant demand and EEV will sense this change and communicate with Outdoor unit reducing the speed of the compressor as is designed by the manufacturer. Added efficiency is gained as SAV damper provides a maintenance level of conditioned air to maintain zone comfort while allowing the VRF system to continue to operate without shutting the system off, more efficient.

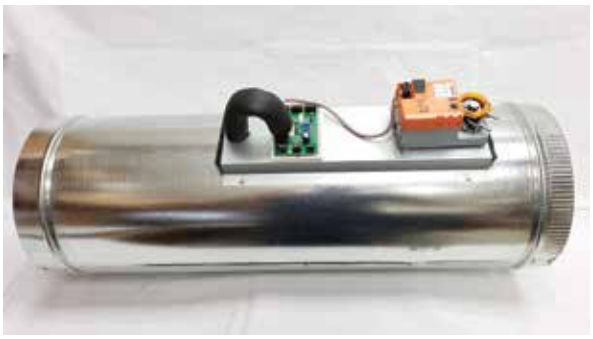
SAV DAMPERS

The SAV, (Smart Air Valve) is pressure independent, self-balancing damper utilized in VRF applications to deliver specific CFM to each zone in a ducted system. The Smart Air Valve has a built-in pitot tube measuring section that controls adjustable air velocities, that are measured by differential pressure sensors. The SAV velocity setting potentiometers will assign a target air velocity at each SAV. The SAV air delivery will adjust itself to locate the target velocity. Then the SAV will hold this assigned air delivery regardless of static pressure changes in the system.

The EzTouchV / EzTouchX used with a Smart Air Valve can request various preset air volume targets and send specific target request to the SAV. As the room temperature or zone approaches set point the thermostat will reduce the CFM or cooling to the space to the Vent mode to limit on/off compressor operation.

Round VRF-SAV (SMART AIR VALVE)

The 6" – 10" damper cylinders are fabricated from 22-gauge steel; the 12" – 14" cylinders from 20-gauge steel. Each cylinder features two rolled beads, which provide maximum structural integrity. The trailing end is crimped for ease of installation. A positive air seal is accomplished through use of a high-density foam gasket around the blade perimeter. The damper blade is bolted to the hexagonal damper shaft.

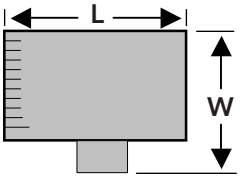


SAV dampers feature 24VAC, full stall motor, which do not require use of end switches to terminate travel. Each SAV is powered and controlled from its respective EzTouchV / EzTouchX.

Damper motors are easily removed for damper shaft and motor inspection. Each actuator hat section is insulated to prevent condensation.

Round Smart Air Valve Damper

PART NUMBERS AND SIZES



PART#	SIZE	L	W
SAV05	5"	30"	8"
SAV06	6"	30"	9"
SAV07	7"	30"	10"
SAV08	8"	30"	11"
SAV09	9"	30"	12"
SAV10	10"	30"	13"
SAV12	12"	30"	15"
SAV14	14"	32"	17"

Typical Round Capacities

These air quantities were derived from a duct sizing chart 0.1" friction loss per 100' of duct.

All CFMs

DUCT DIAMETER	*CFM HI	DUCT VELOCITY FPM	BTU HI
5"	120	800	3,677
6"	172	800	5,155
7"	234	800	7,016
8"	305	800	9,164
9"	387	800	11,598
10"	477	800	14,319
12"	687	800	20,619
14"	936	800	28,065

*Air delivery may very +/- 10% based on altitude, air density or installation.

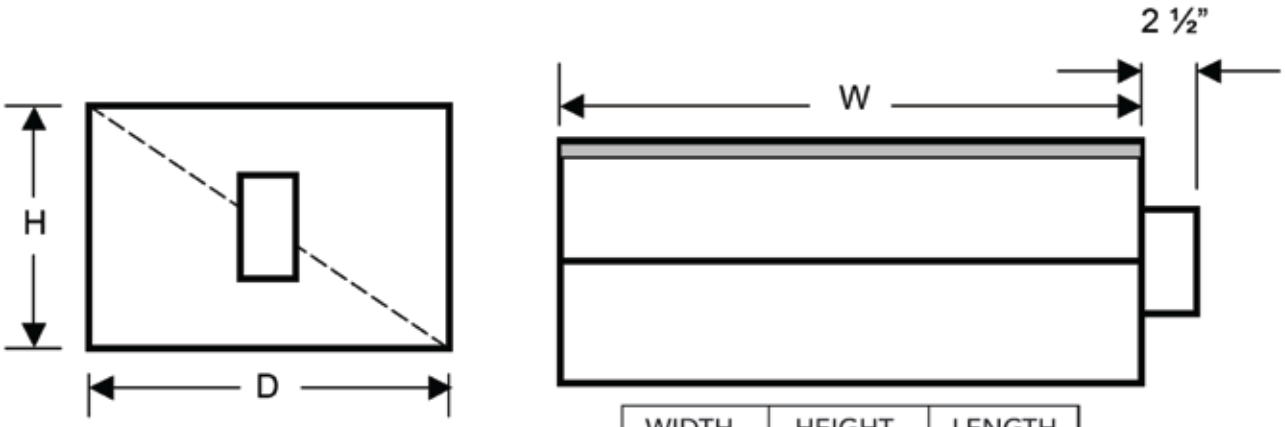
Rectangular VRF-SAV (SMART AIR VALVE)

Rectangular Smart Air Valves feature parallel blade construction for height dimensions to 14".

The damper assembly is enclosed in a 16" long, 20-gauge galvanized steel sleeve, with standard slip and drive connections. Damper blades are bolted to a hexagonal damper shaft. Damper blades close against steel blade stops. The damper linkage is non-adjustable and fully enclosed within the damper.

SAV dampers feature 24VAC, full stall motor, which do not require use of end switches to terminate travel. Each SAV is powered and controlled from its respective EzTouchV / EzTouchX.

Damper motors are easily removed for damper shaft and motor inspection. Each actuator hat section is insulated to prevent condensation.



WIDTH	HEIGHT	LENGTH
W	H	16"

Typical Rectangular Capacities

Designing a Rectangular Smart Air Valve (SAV)

CFM x .205 = Area in Square Inches Divide Square Inches by desired duct Height to find the duct Width

BTU	*CFM	SQ inches	SAV WxH		SAV WxH		SAV WxH		SAV WxH
16,745	558	102	13x8	or	10x10	or	9x12	or	7x14
17,894	596	109	13x8	or	11x10	or	9x12	or	8x14
18,551	618	113	14x8	or	11x10	or	9x12	or	8x14
19,536	651	119	15x8	or	12x10	or	10x12	or	8x14
20,439	681	125	15x8	or	12x10	or	10x12	or	9x14
21,342	711	130	16x8	or	13x10	or	11x12	or	9x14
22,245	741	136	17x8	or	13x10	or	11x12	or	10x14
23,148	772	141	17x8	or	14x10	or	12x12	or	10x14
24,050	802	147	18x8	or	14x10	or	12x12	or	10x14
24,953	832	152	19x8	or	15x10	or	12x12	or	11x14
25,856	862	158	19x8	or	15x10	or	13x12	or	11x14
26,759	892	163	20x8	or	16x10	or	13x12	or	11x14
27,662	922	169	20x8	or	16x10	or	14x12	or	12x14
28,565	952	174	21x8	or	17x10	or	14x12	or	12x14
29,468	982	180	22x8	or	17x10	or	15x12	or	12x14
30,371	1012	185	22x8	or	18x10	or	15x12	or	13x14
31,274	1042	191	23x8	or	18x10	or	15x12	or	13x14
32,177	1073	196	24x8	or	19x10	or	16x12	or	14x14
33,080	1103	202	24x8	or	19x10	or	16x12	or	14x14
33,983	1133	207	25x8	or	20x10	or	17x12	or	14x14
34,885	1163	213	26x8	or	20x10	or	17x12	or	15x14
35,788	1193	218	26x8	or	21x10	or	17x12	or	15x14
36,691	1223	224	27x8	or	22x10	or	18x12	or	15x14
37,594	1253	229	28x8	or	22x10	or	18x12	or	16x14
38,497	1283	235	28x8	or	23x10	or	19x12	or	16x14
39,400	1313	240	29x8	or	23x10	or	19x12	or	16x14
40,303	1343	246	29x8	or	24x10	or	20x12	or	17x14
41,206	1374	251	30x8	or	24x10	or	20x12	or	17x14
42,109	1404	257	31x8	or	25x10	or	20x12	or	18x14

*Air delivery may very +/- 10% based on altitude, air density or installation. These air quantities were derived from duct sizing chart .1" friction loss per 100' of duct. All CFMs listed are approximate. The pressure drop for these dampers is .1"

GEN V SYSTEM SETUP DIRECTORY

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

ZONE ID	ZONE / ROOM NAME	NOTES

NOTES

GEN V-VRF-VAV

VOTE BASED AUTO CHANGEOVER *VVT*

COMMERCIAL VRF - **SIMPLIFIED**

Zonex SYSTEMS
comfort you control

HOT LINE
(800) 228-2966

5622 Engineer Drive
Huntington Beach, CA 92649
Factory **(714) 898-9963**
Fax **(714) 898-6802**

VISIT OUR WEBSITE
www.zonexproducts.com

PATENTED PRODUCT

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DEC 2021