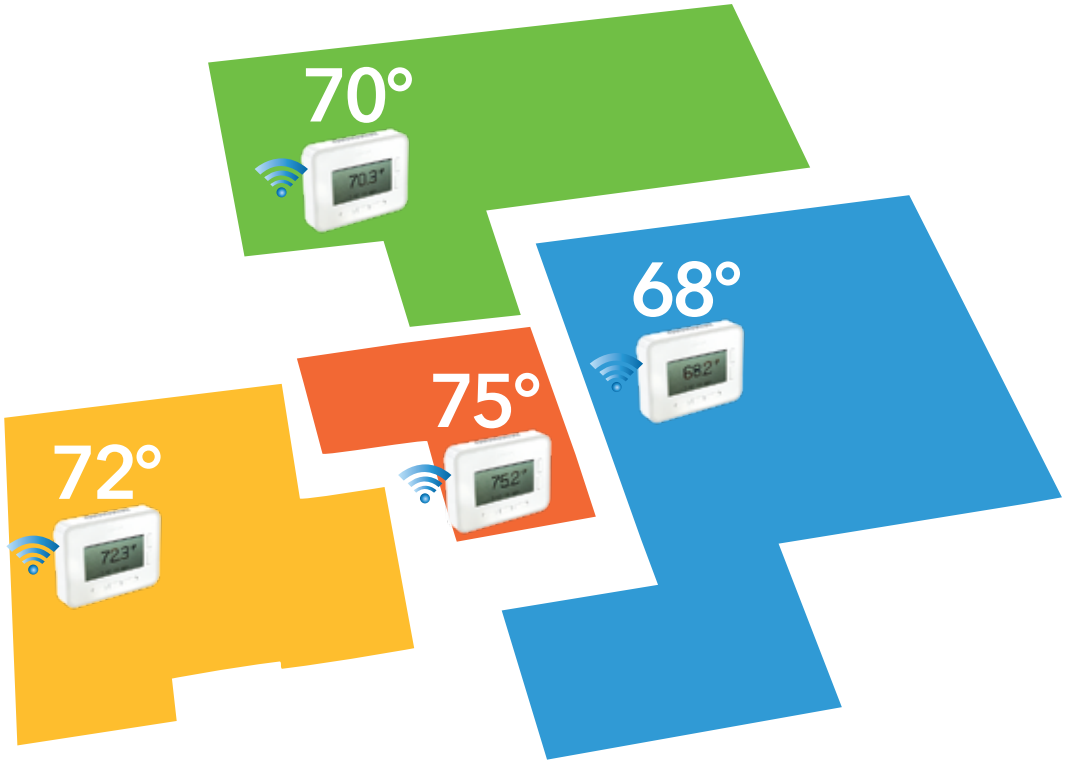
GEN III - VVT

VOTE BASED AUTO CHANGEOVER VAV

with ***WIRELESS PROGRAMMABLE THERMOSTATS***

A MODULATING SYSTEM



INSTALLATION AND APPLICATIONS MANUAL

Zonex SYSTEMS

comfort you control

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SYSTEM OVERVIEW

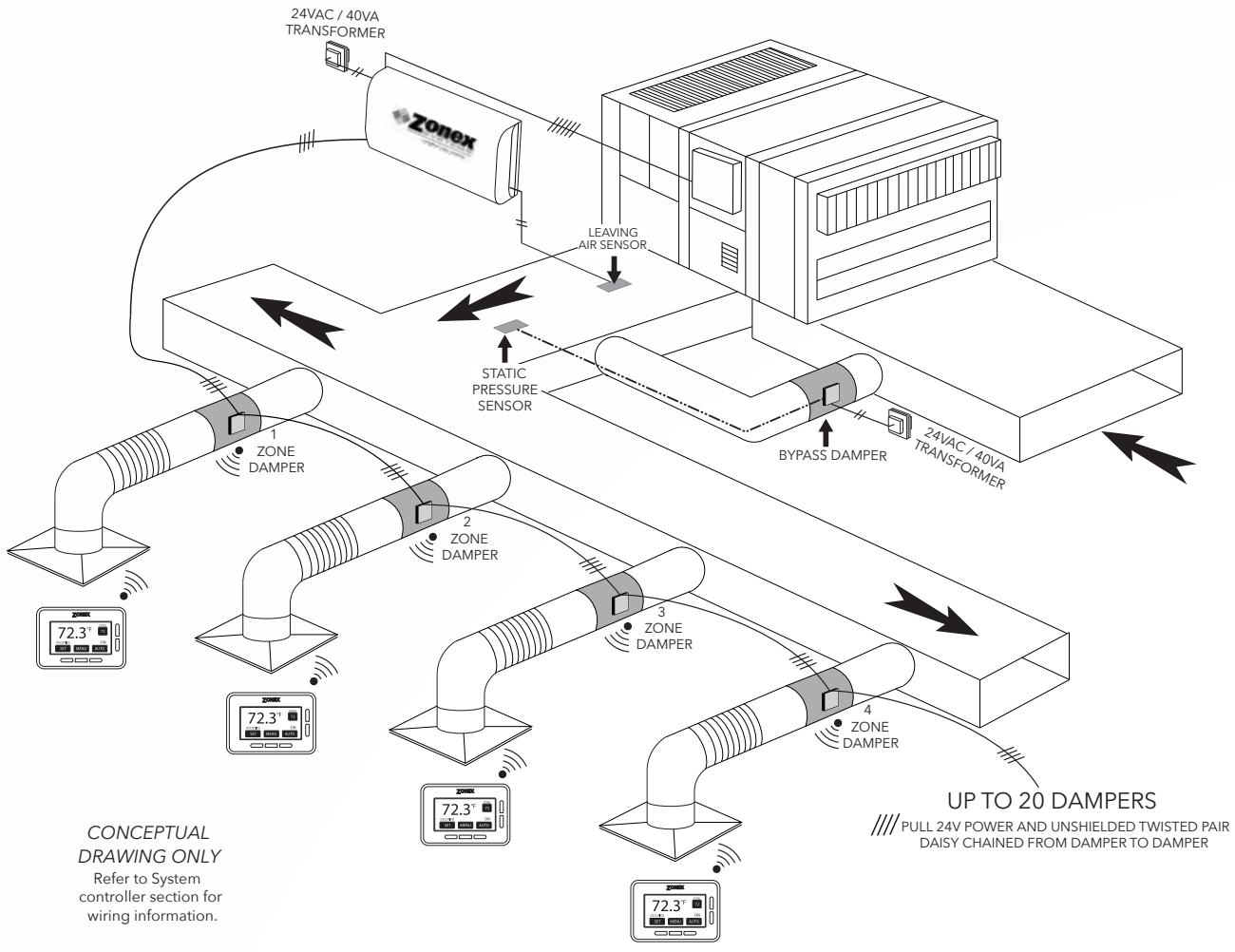
GEN III – VVT is a commercial modulating zone control system controlling 2-20 independent zones per unit utilizing wireless Zonex thermostats. The GEN III controller is designed for Auto Changeover, multi-stage Heat Pump (2C/3H) or Gas Electric (2C/2H) applications.

Sophisticated, integrated software in the wireless thermostat allows for a wide range of system control and changeover strategies, allowing the contractor to tailor the GEN III system to a specific application.

Additional features include LED status indication of all system functions, digital leaving air temperature, return air temperature and outside air temperature display, fully adjustable capacity control with on-board limit settings and optional staging strategies. An integrated clock allows for setup and night setback scheduling, globally or individually available for each wireless thermostat, with selectable 2 to 8 hour override, along with a unique feature to remotely lock each thermostat independently in the system.

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

GEN III is recognized as the Industry's easiest zone control system to install and wire. The GEN III System operates over an unshielded-two-wire data link, along with two 24 VAC power wires all daisy chained from damper to damper with no home run wiring required. Wireless thermostats do not require hardwire power or wiring between the thermostats and dampers. Each Wireless thermostat is synced with its corresponding modulating damper providing effective temperature control throughout the system.



GEN III-VVT
SYSTEM COMPONENTS
with Wireless Thermostats

COMPONENT SELECTION OVERVIEW

GEN III Controller

Part # - ***GEN III***

1 - Per RTU or Split System

Supports 2 - 20 Fully Modulating Zones

Daisy Chain: Belden 8740 Communications wire and 24VAC from Damper to Damper
1-24VAC / 40VA Transformer Powers the *GEN III* and All the Dampers in the System

GEN III Wireless Thermostat

Part # - ***WSTAT***

1 - Thermostat per Damper

Modulating Zone Dampers

Part #

WST + Damper Size **-** Round Damper (up to 1.75 S.P.)
WCD + Damper Size **-** Rectangular Dampers (up to 1.75 S.P.)

Slave up to 3 Zone Dampers per Stat
Use **STMPD** or **STCD** Damper for Slaves

Electronic Bypass Damper

(Includes Integrated Static Pressure Control)

Part #

STBP + Damper Size - Round Bypass Dampers
STCDBP + Damper Size - Rectangular Bypass Dampers

1-24 VAC / 40VA Transformer to Power Bypass Damper

For assistance, contact Zonex at (800) 288-2966
or visit *zonexproducts.com* for more information

Zonex SYSTEMS
comfort you control

SEQUENCE OF OPERATION

Vote Based Auto Changeover Bypass VAV with Programmable Wireless Thermostats

GEN III controller wires to the HVAC unit with legacy style connections Y1, Y2, W1, W2, OB, G, R. Once every minute the controller communicates to each damper via RS485 connection daisy chained along with 24 V of power wired damper to damper. Each damper is equipped with a damper board ID and synced to its wireless programmable thermostat, installed within 100 feet of the communicating damper board in the system.

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

When the last calling zone is satisfied in either heat or cool mode, the ***GEN III*** controller will terminate the HVAC outputs after the next "poll"; and the blower output will be de-energized (unless controller is configured for constant fan) after a 4-minute purge cycle. During the purge cycle no heat or cool calls are recognized.

The wireless zone thermostats control and modulate the zone dampers based on variance from set point to a position that will match the supply load to the demand requirement. When the HVAC unit is running, if a zone thermostat is not calling or is calling for the opposite mode, its corresponding damper fully closes. When the HVAC unit is not running, the thermostats open to the Vent mode to provide ventilation, if the indoor blower fan is running continuously.

While the HVAC unit is running, the capacity control LAT device monitors the leaving air temperature from the HVAC unit and will cycle the HVAC unit to maintain the air temperature with a preset range to eliminate coil freeze-up and premature heat exchanger failure. When the system is in the heating mode and a majority vote changes to cooling, a changeover timer begins and will run heating for 5 minutes or until heat call is satisfied and then cycle into a changeover purge. After a 4-minute purge cycle, Cooling is turned on until the cool call is satisfied or there is a majority vote for heat received by the ***GEN III*** controller. If all calls have been satisfied, after the 4 minute off delay, dampers will modulate to approximately 40% open position for ventilation mode.

The system fan/blower operation can be configured for ON or intermittent AUTO operation. The controllers are shipped from the factory for Auto fan operation. The only time the fan will run is when there is a call from the controller for heating or cooling. If the system is configured for fan ON operation, the fan will run continuously during occupied time and intermittently during unoccupied time.

All zone thermostats are synced or paired with its respective modulating zone damper, which is equipped with antenna and communicating damper board. One zone thermostat in the system shall be enabled as the Monitor thermostat and synced with the ***GEN III*** controller to interact and initiate control decisions for the system. The Monitor shall establish global or individual schedules for the system, lock thermostats individually and provide minimal local adjustment, establish master temperature settings individually or globally for the system, and provide diagnostic functions to streamline system troubleshooting. Air balance shortcuts, along with password protection, are also enabled at the Monitor thermostat. Sleep and energy saving modes are available to extend battery life and enhance operation.

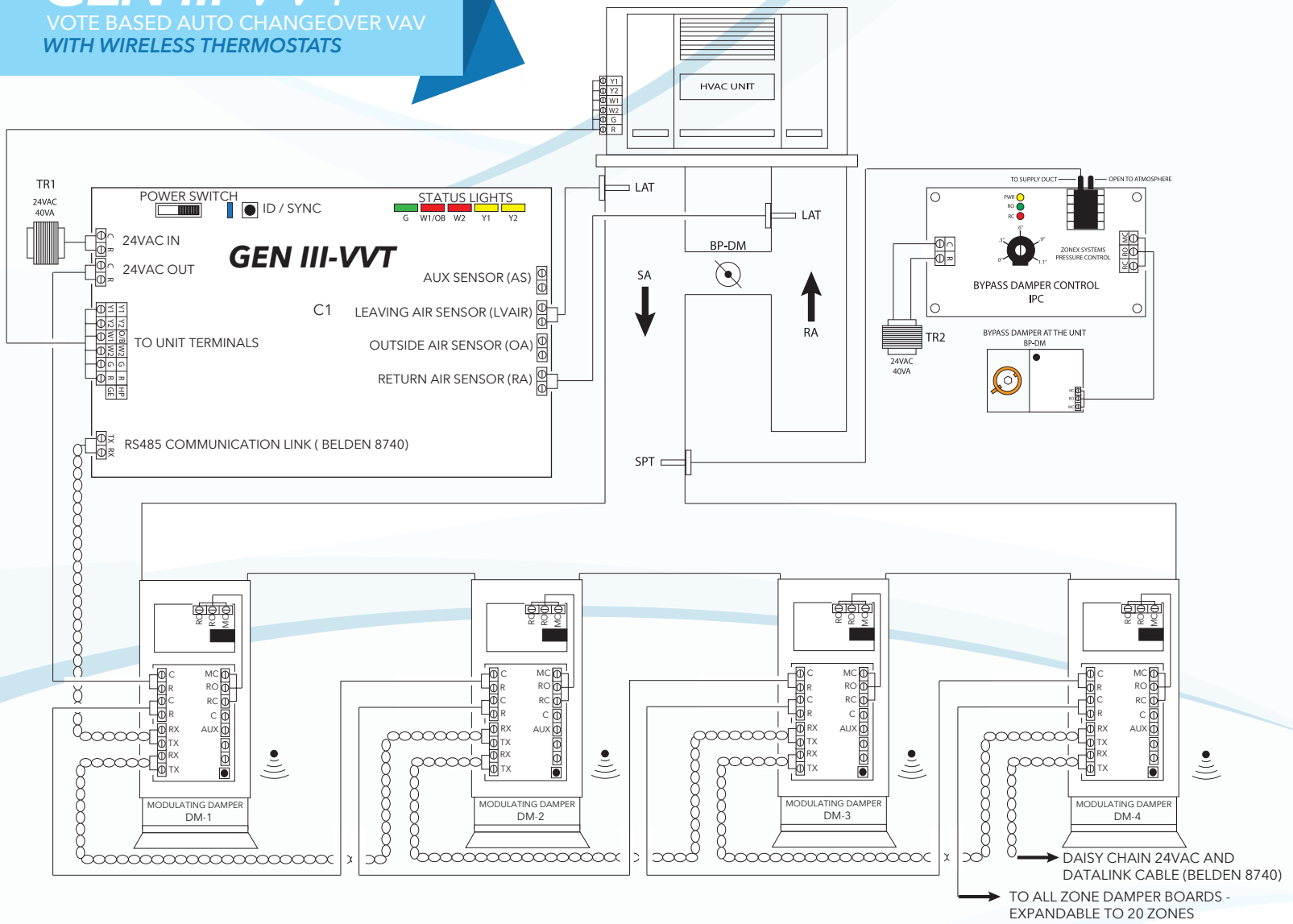
Voting demand strategy can be enhanced by adding Priority votes or by giving a NULL vote to individual thermostats in the system, thereby weighting certain zones more than others. Priority votes allow you to select 0, 1, 2, or 3 additional votes for a thermostat that has unusual loads, like a conference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

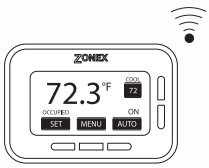
The ***GEN III*** provides effective temperature control and minimizes wiring issues by using wireless programmable zone thermostats. No computer or software tools are required for installation, commissioning or servicing the system.

GEN III-VVT

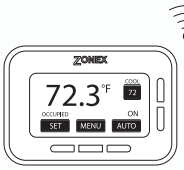
VOTE BASED AUTO CHANGEOVER VAV

WITH WIRELESS THERMOSTATS

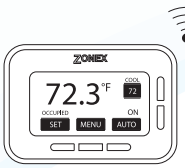




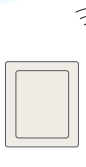
T-1
WIRELESS THERMOSTAT



T-2
WIRELESS THERMOSTAT



T-3
WIRELESS THERMOSTAT



RS-4
WIRELESS REMOTE SENSOR

DEVICE	ID	DESCRIPTION
CONTROL BOARD	C1	GEN III CONTROLLER CONTROLS 2-20 ZONE DAMPERS ONLY 1 24VAC 40VA TRANSFORMER POWERS ALL SUPPLY DAMPERS
THERMOSTAT	T1 -T20	ZONEX WIRELESS THERMOSTAT
REMOTE SENSOR	RS	ZONEX WIRELESS REMOTE SENSOR
ZONE DAMPER MOTOR	DM	SUPPLIED WITH ZONE DAMPER (FACTORY PRE-WIRED)
SYSTEM TRANSFORMER	TR1	24VAC/40VA TRANSFORMER SIZED @ (2VA PER ZONE DAMPER) DAISY CHAIN DAMPER TO DAMPER
BYPASS TRANSFORMER	TR2	IND. 24VAC/40VA TRANSFORMER TO POWER THE BYPASS DAMPER
SUPPLY / RETURN AIR LAT DISCHARGE SENSORS	LAT	SUPPLY LAT LOCATED BEFORE THE BYPASS. RETURN LAT LOCATED AFTER THE BYPASS
INTEGRATED STATIC PRESSURE CONTROL	IPC	SUPPLIED WITH THE ZONEX BYPASS DAMPER (FACTORY PRE-WIRED)
STATIC PRESSURE TUBE	SPT	LOCATED AFTER THE BYPASS BEFORE THE FIRST SUPPLY TAKEOFF
BYPASS DAMPER MOTOR	BP-DM	SUPPLIED WITH ZONEX BYPASS DAMPER (FACTORY PRE-WIRED)
WIRELESS COMMUNICATION		COMMUNICATES WITH WIRELESS DAMPER BOARD AND THERMOSTAT
RS485 COMMUNICATION LINK		TWISTED PAIR WIRING -BELDEN 8740 DAISY CHAIN DAMPER TO DAMPER

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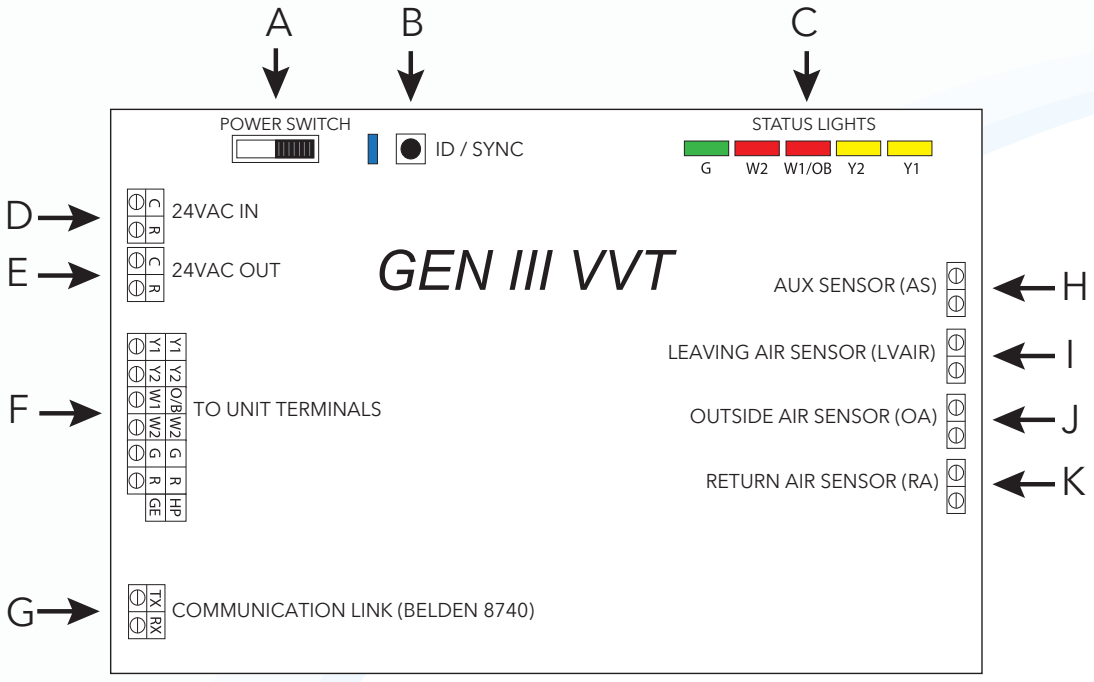
FOR APPLICATIONS ASSISTANCE CALL 800-228-2966

GEN III CONTROLLER

Controller Description

The ***GEN III*** is a micro-controller based, auto change-over Universal Gas/Electric or Heat Pump system controller (Part #***GEN III***). The ***GEN III*** 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 wireless thermostats. The ***GEN III*** gathers information every 60 seconds from each damper board while the wireless thermostats communicate with the system over a two-wire data link directing control based decisions to the HVAC equipment. The ***GEN III*** is powered with one 24 V 40VA transformer, which also powers all dampers in the system. Power from the controller, along with a two-wire twisted pair communications loop, is daisy chained damper to damper to streamline installation and system communications. The ***GEN III*** is equipped with integrated capacity control and High and Low temperature limits to protect the compressor and heat exchanger. Outside air and return air sensors are also provided. The HVAC unit is staged based on leaving air temperature and time. Auto change-over operation is vote based, predicated on a first call, first served majority wins on changeover algorithm. Additional control strategies are established on a Monitor Thermostat which initiates control decisions with the ***GEN III*** system controller. Review controller terminal connections on the exhibit below:



A. On/Off Switch
B. ID/Sync Button and Communication link light
C. Unit Status Lights
D. 24vac IN to power the GEN III board
E. 24vac OUT daisy chained out to the damper boards
F. Unit Terminals
G. RX/TX communication link (Belden 8740)
H. Aux Sensor (AS)
I. Leaving Air Sensor (LVAIR)
J. Outside Air Sensor (OA)
K. Return Air Sensor (RA)

COMMUNICATING DAMPER BOARD

A damper board resides on each zone damper to carry power and communications information from the damper to the GEN III controller. The damper control board has four LED lights providing damper and system information.

The BLUE LED (R) confirms communications and to sync the damper with its associated thermostat.
The RED LED (U) is illuminated when the damper is modulating to the closed position.
The GREEN LED (T) is illuminated when the damper is modulating to the open position.
The YELLOW LED (S) is illuminated when AUX heating is calling.

Once all dampers and the GEN III controller are wired into the system and the GEN III controller is turned ON, the BLUE light will flash 4 times when communicating with the GEN III controller, and 2 times when the damper control board communicates with the wireless thermostat.

The damper control board can be removed by slipping the mount away from the damper hat section, simplifying wiring from the GEN III controller and AUX heat if utilized.

Each damper control board must be synced with its respective thermostat. Once the damper is energized and associated thermostat has its ID set, press the ID button on the damper control board until blue light flashes continuously and then press the YES button on the wireless thermostat which will display **"SYNC SUCCESSFUL".**

L - RX/TX IN communication link(Belden 8740) daisy chained into damper board

M - RX/TX OUT communication link(Belden 8740) daisy chained out to the next damper board

N - R/C 24vac IN daisy chained into damper board

O - R/C 24vac OUT daisy chained out to the next damper board

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

Q - C/AUX wire in the base board heat, electric heat or reheat if available

R - COMM LINK ***BLUE*** LED indicates communication to the GEN III and thermostat

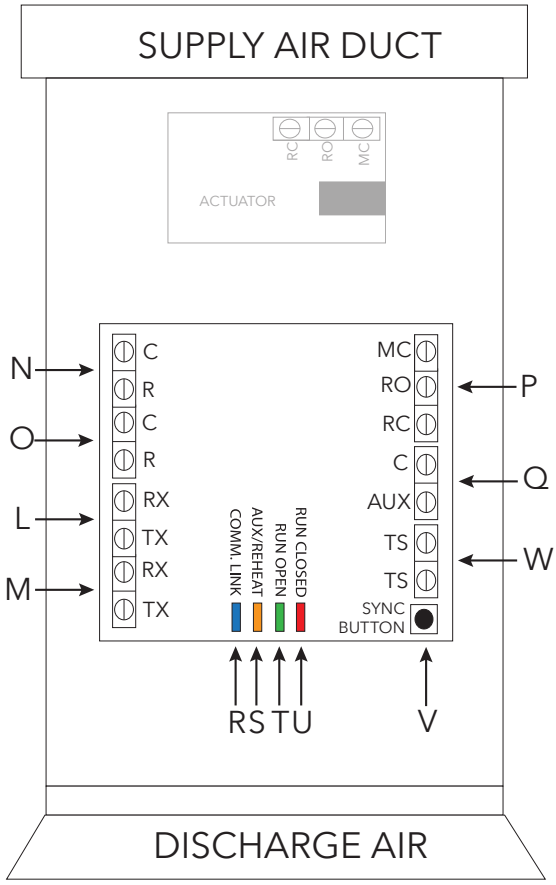
S - AUX/REHEAT ***YELLOW*** LED indicates Aux heat or Reheat is energized

T - RUN OPEN ***GREEN*** LED indicates the damper is being powered open

U - RUN CLOSED ***RED*** LED indicates the damper is being powered closed

V - SYNC BUTTON used to sync to wireless thermostat

W - NOT USED on GEN III system



GEN III WIRELESS THERMOSTAT

WSTAT – Wireless GEN III Modulating Thermostat

The WSTAT wireless thermostat is used in conjunction with the modulating damper to communicate calls for HEAT/COOL/VENT to the GEN III controller. Once the wireless thermostat is synced with its damper, the thermostat is polled each minute and sends information to the communicating damper board and then to GEN III controller. GEN III controller evaluates the information and determines if a majority of calls are for HEAT or COOL, or if no calls are present VENT Mode.

To turn the wireless stat on, press and hold the AUTO/OFF button for 15 seconds. When OFF is displayed, press and hold OFF button for 15 seconds until AUTO is displayed, release button, stat is in AUTO mode. If AUTO is displayed press AUTO button for 15 seconds until OFF is displayed, release button, stat is in OFF mode.
Note: Mount wireless thermostat within 100 feet of the communicating damper board

Sequence of operation

COOL CALL

When zone temperature rises 1 or more degrees above COOL set point, thermostat transmits COOL call to communicating damper board and GEN III controller. GEN III controller evaluates calls for HEAT and COOL for majority vote. If there is a majority vote for COOL, GEN III controller initiates a call for cooling and the damper modulates open. ***ON will be displayed*** and will flash until system is operating in the COOL mode. Once system is in COOL mode, ON will remain constant. When zone temperature lowers to COOL set point, COOL call is terminated and damper closes.

HEAT CALL

When the zone temperature falls greater than 1 degree below HEAT set point, thermostat will initiate a call for HEAT. On the next poll, wireless thermostat will transmit HEAT call to the communicating damper board and GEN III controller. GEN III controller will evaluate all calls for HEAT and COOL in the system and if there is a majority of calls for HEAT, GEN III controller will initiate heat call and ***ON*** icon will appear below the set point. ON icon will flash until system is operating in the HEAT mode. Once system is in the HEAT mode, ON will remain constant. Damper will modulate open and warm air will heat zone. As zone warms, thermostat will communicate with damper relay and damper will modulate to maintain zone comfort. When zone temperature rises to set point, damper is closed or at minimum position and WSTAT releases call for HEAT.

Baseboard HEAT

When wireless thermostat is configured for BASEBOARD heat, when zone temperature falls greater than 2 degrees below HEAT set point, AUX is energized and BASEBOARD heat is operating, ***ON will be displayed***. When zone temperature rises to HEAT set point, thermostat will release call for AUX operations.

REHEAT

When wireless thermostat is configured for REHEAT operation, when the zone temperature falls greater than 2 degrees below HEAT set point, thermostat transmits REHEAT call to the communicating damper board to modulate damper to 40% open and energizes AUX output, ***ON will be displayed***. When zone temperature rises to HEAT set point, thermostat satisfies, releases call for AUX REHEAT and closes damper.

VENT

When all calls for HEAT or COOL are satisfied, dampers will modulate to approx. 40% open and VENT will be displayed on thermostat indicating system is in ventilation mode.

INSTALLATION INSTRUCTIONS

Wire Unit to GEN III Controller

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

1. Gas/Electric Wiring

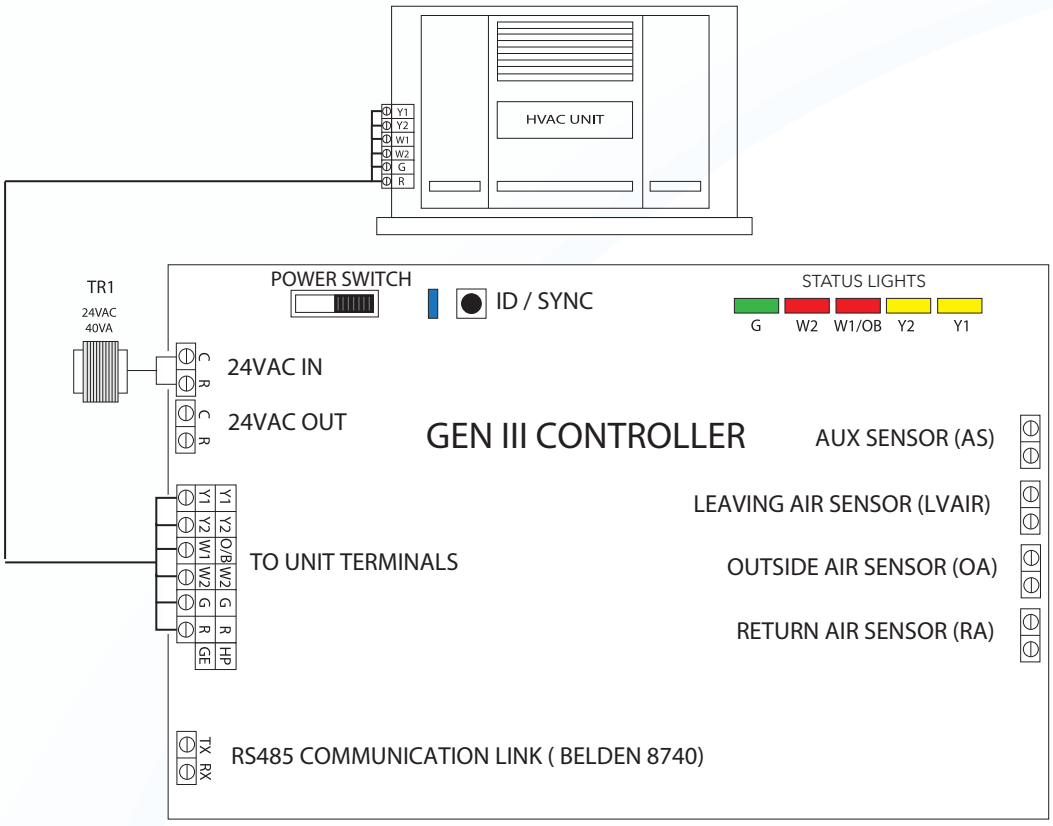
Gas/Electric systems use the same terminal designations, R power (24 volt), Y1 Cooling first stage, Y2 Cooling second stage, W1 Heating first stage, W2 Heating second stage and G Fan. From the GEN III controller, wire each required terminal, R on GEN III to R on HVAC unit, Y1 on GEN III to Y1 on HVAC unit, Y2 on GEN III to Y2 on HVAC unit (if used) the W1 on GEN III to W1 on HVAC unit, W2 on GEN III to W2 on HVAC unit (if used) and G on GEN III to G on HVAC unit.

2. HEAT PUMP Wiring– O/B operation

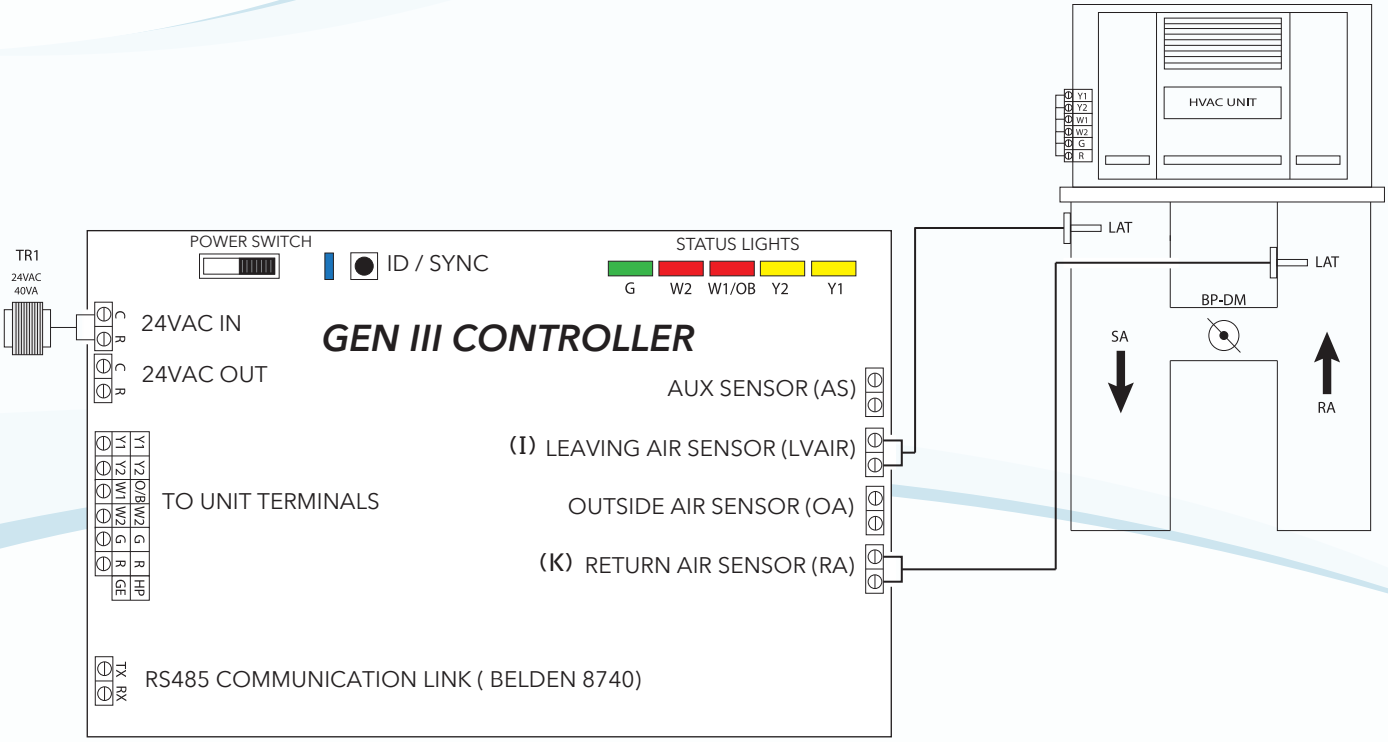
Heat Pump systems use the following terminal designations, R power (24 volt), Y1 Compressor first stage, Y2 Compressor second stage, O/B (W1) reversing valve, W2 Heating Auxiliary (3) stage, G Fan. From the GEN III controller, wire each required terminal, R on GEN III to R on HVAC unit, Y1 on GEN III to Y1 on HVAC unit, Y2 on GEN III to Y2 on HVAC unit (if used), O/B (W1) on GEN III to O on HVAC unit, W2 on GEN III to W2 on HVAC unit (if used) and G on GEN III controller to G on HVAC unit.

Note: 1. Many systems are single stage and will not use Y2 or W2 terminals for operations. Please confirm your system operation to ensure proper wiring.

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



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

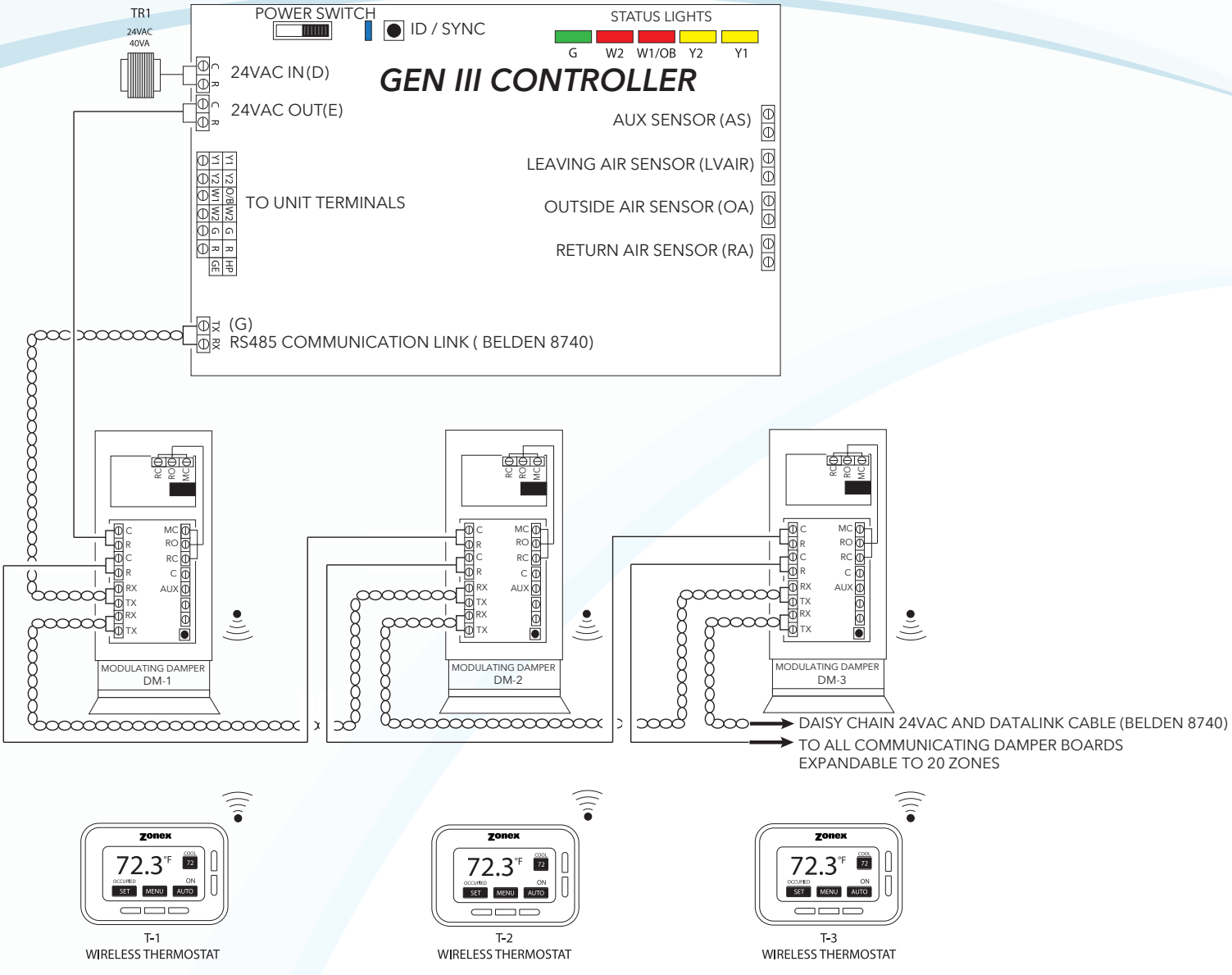


Dampers

Install dampers into HVAC duct so damper actuators and control boards are easily accessed. Damper may be mounted in an area where the ambient temperature is between 32 and 125 degrees Fahrenheit. Round dampers should be mounted with damper actuators between 9 and 3 O'clock position.

Once GEN III controller and supply dampers are installed, install 24 VAC 40 VA transformer and wire secondary 24 volts to the C R (IN - **D**) terminals on GEN III controller. Using 18 ga. thermostat wire, wire C R (OUT - **E**) terminals and daisy chain power wires to the first damper. Continue daisy chain wiring from first damper to second, third, etc., until all supply dampers are wired with power.
Note: Maintain R and C wiring polarity throughout the system to improve communications.

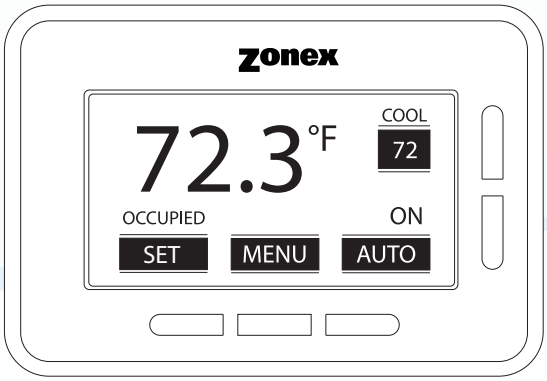
Once power wiring is daisy chained to all supply dampers in the system, use Belden 8740 twisted pair communications wire to install communications loop. Install communications wire using the RX and TX (**G**) terminals on GEN III controller and daisy chain to the first supply damper in the system and wire to RX TX terminals of the communication damper board. Continue daisy chain to the next damper using RX TX terminals of communication damper board to the RX TX of the next damper control board, repeating this process until all supply dampers are wired into the communications loop. Communications wiring is polarity specific, if RED communications wire is on RX at the GEN III controller, then RED wire is connected to RX throughout the system.

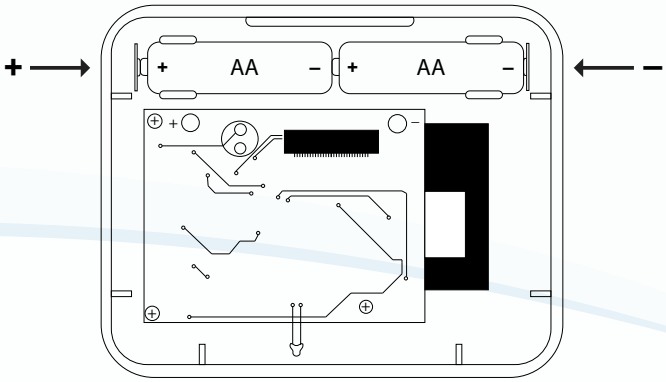


MOUNTING AND BATTERY INSTALLATION

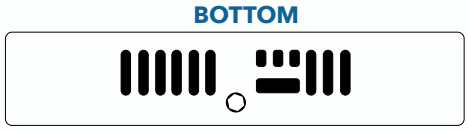
Battery Installation/Replacement

The GEN III Wireless Thermostat requires two AA batteries. When the battery ICON on GEN III wireless controller indicates batteries are low, replacement of batteries is required. To access batteries, locate GEN III Wireless Thermostat set screw on the bottom of the thermostat. Turn screw clockwise - this will cause the screw to move into stat sub-base. Once set screw is free of GEN III stat, remove stat from sub-base. Remove batteries from the back of thermostat and insert replacement batteries; ensuring positive and negative poles match battery to thermostat. Place thermostat on sub-base and turn set screw counter clockwise to fasten thermostat to sub-base. Reset time on the GEN III after battery replacement.





Replace with AA batteries and install the thermostat back on the mounting plate.

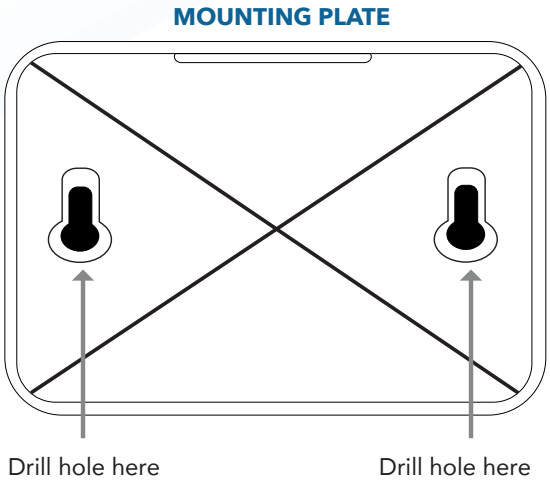


With a flat head screwdriver unscrew CW to release the thermostat from the mounting plate.

Mounting the WirelessThermostat

Once you have determined where you want to place the thermostat place the mounting plate in that spot and with a pencil mark where the drill holes will be. Drill holes using a 1/8 drill bit. Install screw anchors supplied with the thermostat. Install the screws into the screw anchors half way and place the mounting plate over the screws. Once the mounting plate is level tighten the screws down to secure the plate to the wall. Install the thermostat back on the mounting plate and turn the flat head screw CCW to secure the thermostat back to the plate.

Note: Install the thermostat within 100 feet of its communicating damper board. In some applications, concrete walls, floors or other dense structures may interfere with thermostat communications. Contact factory to review alternatives
(800) 228-2966

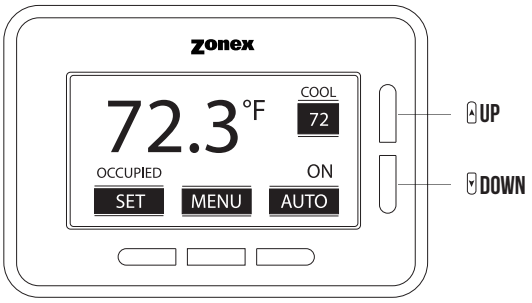


COMMISSIONING START-UP

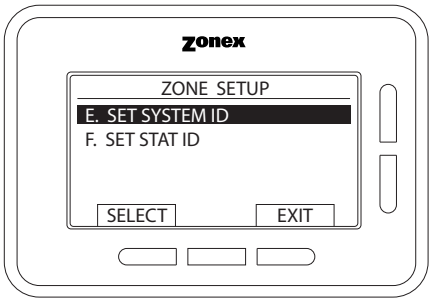
Sync Dampers and Wireless Thermostats

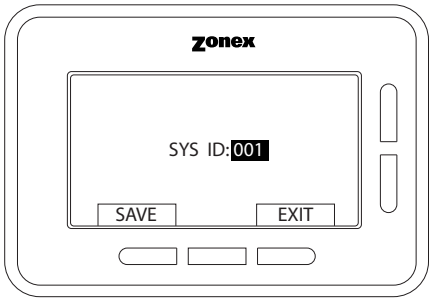
Each Damper will need to be ID'd and Synced with its control thermostat. Beginning with the first damper in the daisy chain closest to the GEN III controller, place provided label #1 on the damper. Locate associated zone thermostat and insert batteries, confirm display appears on stat. If no display is seen, check battery installation. At this time power and turn on the GEN III controller at the ON/OFF switch located on the left hand corner of the GEN III controller.

On the wireless thermostat, press the MENU button followed by the OFF/AUTO button, release when display reads **ZONE SETUP**.

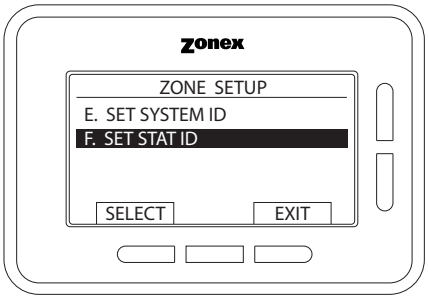


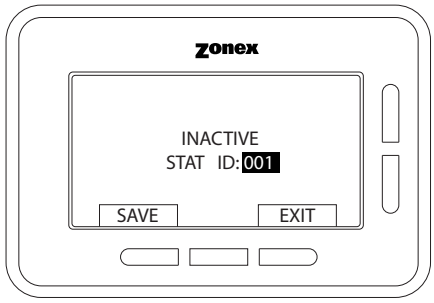
Use the UP or DOWN button to highlight item (E) SET SYSTEM ID and press SELECT. Set the SYSTEM ID to 001 for the first GEN III controller in the building. (If you have more then one GEN III controller in the building you will need to give each one its own SYSTEM ID ranging from 001-100). Once System ID is set, press EXIT to SAVE.





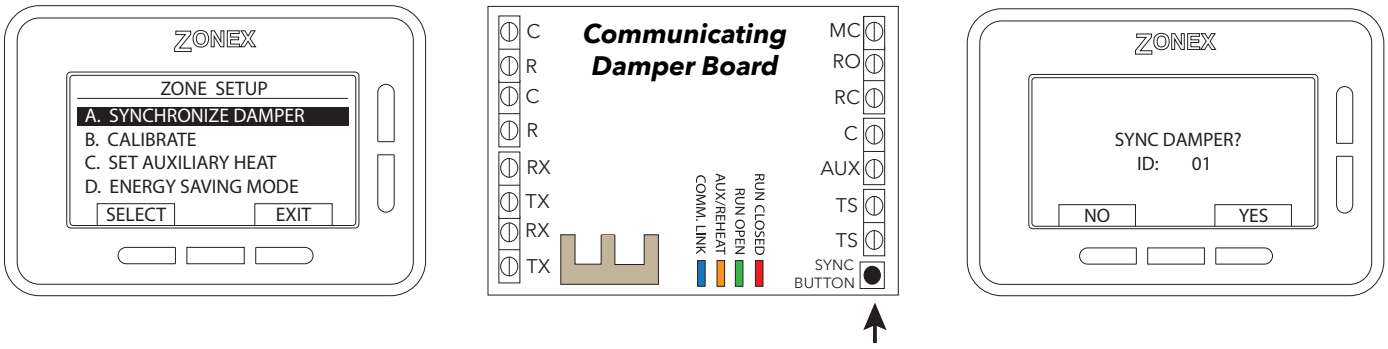
While still in the Zone Setup screen, use the UP or DOWN buttons to highlight item (F) SET STAT ID menu item and then press SELECT. Set STAT ID for the first stat to 001, place provided label #1 on the inside of the thermostat sub-base (All stats are SYNCED with its damper ID 001 to 020, maximum of 20 zone on one GEN III system). Once System ID is set, press EXIT to SAVE.





Note: You can only Sync one damper at a time.

While still in ZONE SETUP use the UP or DOWN to highlight and select item (A) SYNCHRONIZE DAMPER. Go to the damper control board and press the SYNC button and hold until blue communications light flashes continuously and then press YES on thermostat to Synchronize. When damper and stat are synced, the message SYNC IS COMPLETE will be displayed on the thermostat. Press Exit to return to normal operation. Continue to the next damper and thermostat in daisy chain and repeat increasing stat IDs in numerical order.



Note: Before syncing Monitor Thermostat, ensure all thermostats are first synced to their respective damper.

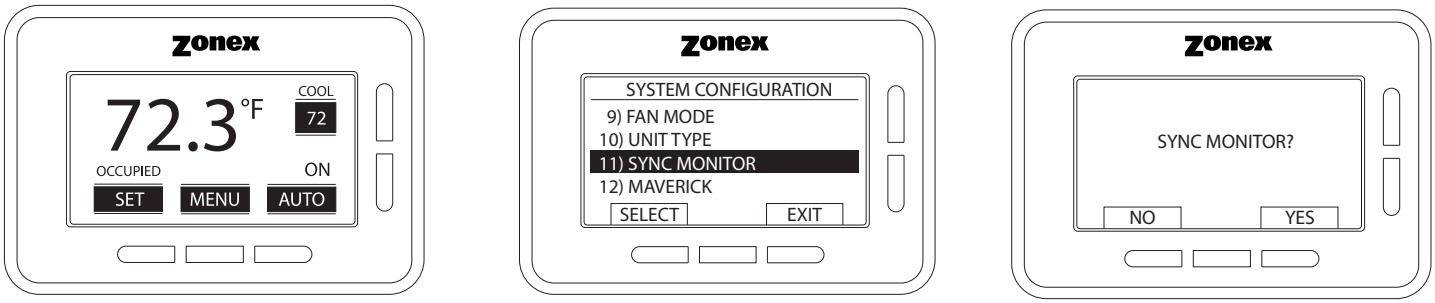
Sync Monitor Thermostat with GEN III Controller

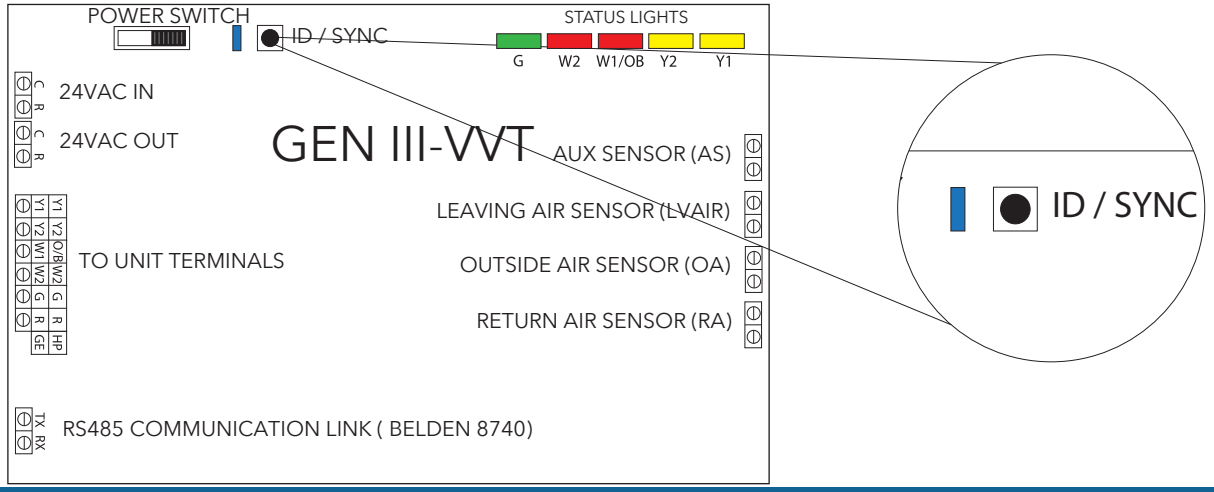
Identify which of the thermostats will be the **Monitor Stat** and turn ON GEN III Controller (GEN III controller will flash blue communications light when energized). The monitor will now be the primary user interface to make and execute control decisions for the system.

On Monitor STAT press the MENU button then SET button and hold both to enter SYSTEM CONFIGURATION MENU. Use UP or DOWN button to highlight item 11 – SYNC MONITOR and press select, when asked SYNC MONITOR? Go to the GEN III controller and press the ID button until the BLUE LED flashes continuously. Press YES on MONITOR STAT, it will take up to 2 minutes for MONITOR to SYNC with GEN III controller. When MONITOR is synced with GEN III, display will report SYNC SUCCESSFUL.

Note: Only one thermostat in the system can be the MONITOR STAT.

The blue light flashing indicates communication between the GEN III controller and the communicating damper board.



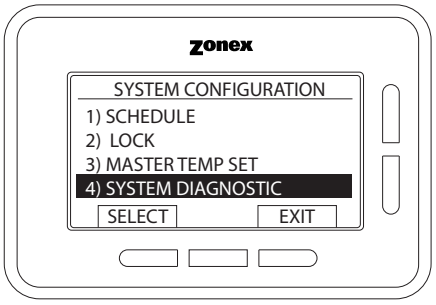


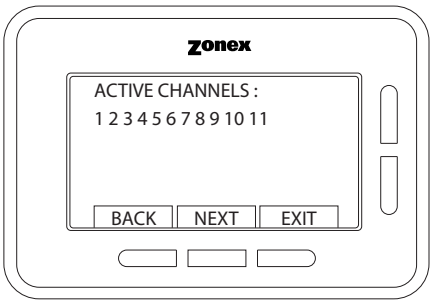
COMMISSIONING AND STARTUP

Once GEN III controller is mounted, Monitor Thermostat is synced with GEN III controller and associated damper and zone stats are synced with their associated dampers, system is ready to be commissioned and started up. Prior to wiring control outputs to the HVAC unit, turn on the GEN III controller and confirm all communicating damper boards are flashing blue lights, this indicates that all dampers are powered. If damper lights are not flashing, check power wires and confirm communications wiring.

Confirm Wireless Thermostat Communications

From the Monitor Thermostat, access **SYSTEM CONFIGURATION MENU** by pressing and holding the MENU button and then the SET buttons until **SYSTEM CONFIGURATION** appears on display. Release button and use the UP or DOWN button to highlight item (4) **SYSTEM DIAGNOSTIC** and press the **SELECT** button. **SYSTEM DIAGNOSTIC** menu consists of two diagnostic screens, system temperatures and number of zones communicating. The first screen provides temperature information, press NEXT to access number of zones communicating. Each zone ID the system is communicating with will be displayed on this page. Confirm all zone dampers in the system are reporting on the **MONITOR STAT**. If there are missing IDs, check damper and associated thermostat to confirm ID set up and Sync. This feature will lead to any installation or wiring issues providing simplified troubleshooting of the system.

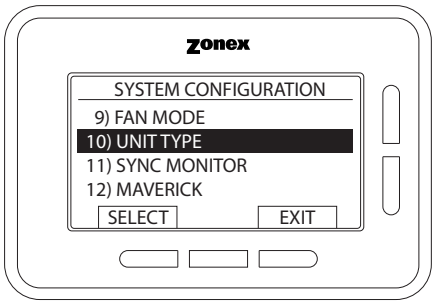


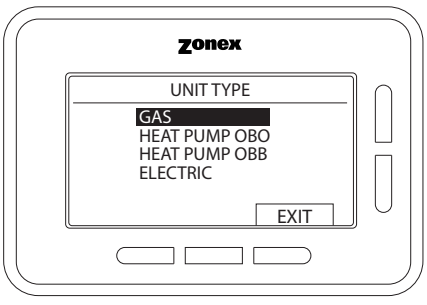


Note: If RF Error is displayed on the system diagnostic screen, see troubleshooting page

Set Type of Unit

Confirm the type of unit the GEN III is controlling, GAS, ELECTRIC, HEAT PUMP (O), or HEAT PUMP (B). Factory default for UNIT TYPE is GAS, if application is ELECTRIC or HEAT PUMP, MONITOR STAT configuration is needed. Access the **SYSTEM CONFIGURATION** on **MONITOR STAT**, use the UP or DOWN buttons to highlight Menu Item (10) - Unit Type and press select. Use the UP or DOWN buttons to highlight type of UNIT, GAS, HEAT PUMP 0, HEAT PUMP B, or ELECTRIC, once highlighted, press select and save to return to configuration menu.

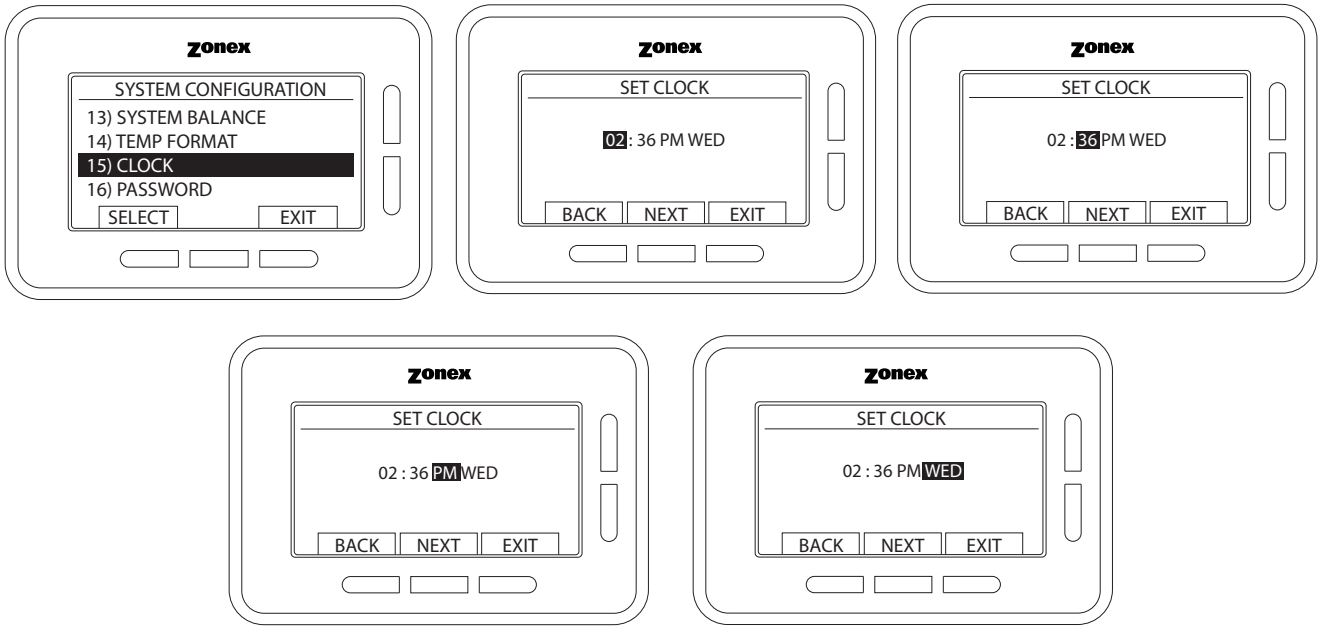




Note: 1. To ensure operation or menu selection is executed, you must exit the system configuration menu and return to the active thermostat mode.
2. When system is configured for heat pump, High Limit is reset to 115 degrees F.

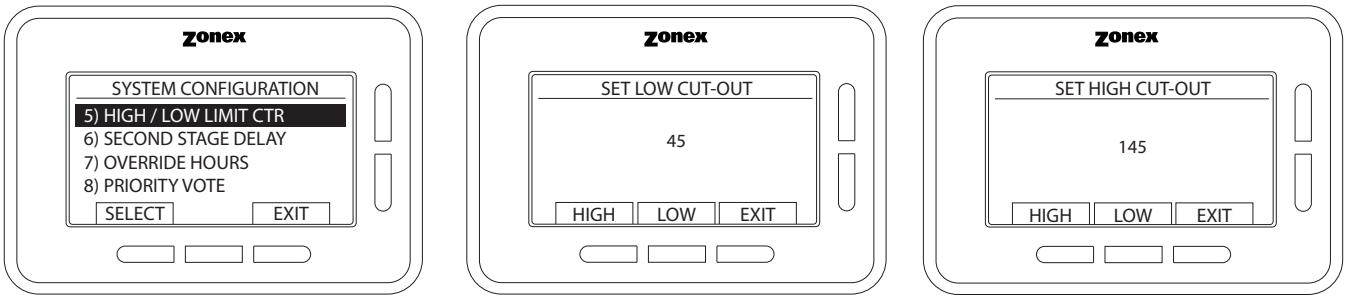
Set Clock

From the MONITOR STAT the master clock is set for all system devices. To set the clock time and day, access SYSTEM CONFIGURATION Menu on the MONITOR STAT, use the UP or DOWN buttons to highlight MENU Item 15 – CLOCK and press select. Hour option will be highlighted, use the UP or DOWN button to change the hour to current hour, once current hour is displayed, press NEXT button to highlight MINUTES option and use the UP or DOWN button to select current minutes. Once minutes are set press NEXT button and select AM or PM by using the UP or DOWN buttons, then press NEXT to select the day of the week using the UP or DOWN buttons to select current day. Once hour, minutes, AM/PM, and day of week are set press the exit button to save and return to System Configuration Menu.



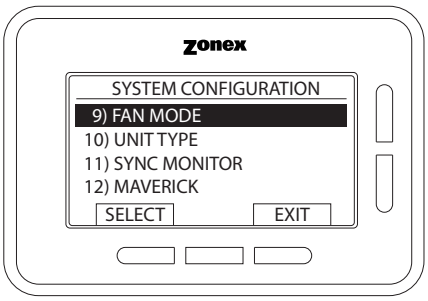
Confirm High/Low Limits

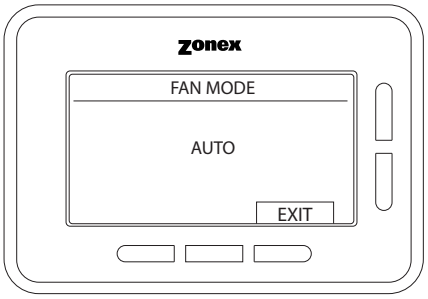
Factory defaults for GAS/ELECTRIC units are set for 45 degrees Low Limit and 145 degrees High Limit. Heat Pump O and B machines are set for 45 degrees Low Limit and 115 degrees High Limit. These may be adjusted in the field to meet unit specification. To confirm or adjust, access the SYSTEM CONFIGURATION menu on MONITOR STAT, use the UP or DOWN buttons to highlight Menu Item 5 HIGH/LOW LIMIT and press select. Press HIGH button to show High Limit temperature, press LOW button to show Low Limit temperature. If adjustment is needed, use the UP or DOWN button to reset temperature. When complete, press exit button and YES to save settings and return to System Configuration Menu.

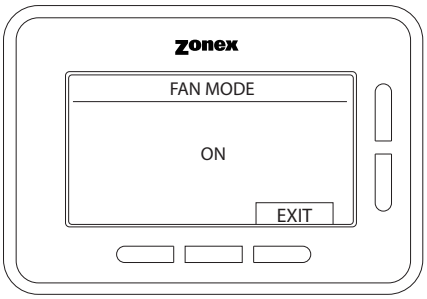


Set Fan Operation

Configuration of FAN is set at the factory for AUTO operation, when there is a call for HEAT or COOL, fan will run. If continuous fan is required, fan will need to be configured for fan ON and will run anytime during Occupied time, and AUTO during unoccupied. To set fan mode, **SYSTEM CONFIGURATION** Menu on the MONITOR STAT, use the UP or DOWN buttons to highlight MENU Item 9 FAN MODE. AUTO or ON will appear on the display, use the UP or DOWN button to change FAN MODE, when desired mode is displayed press exit to return to **SYSTEM CONFIGURATION** Menu.

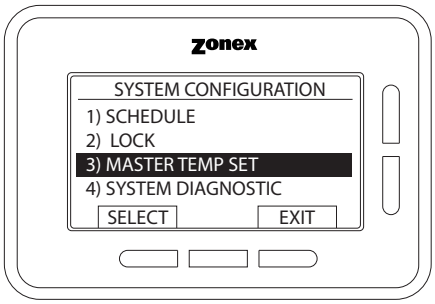


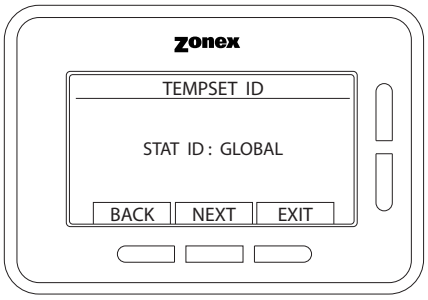


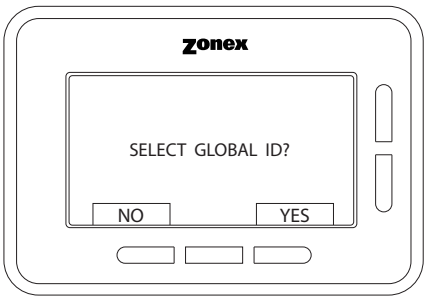


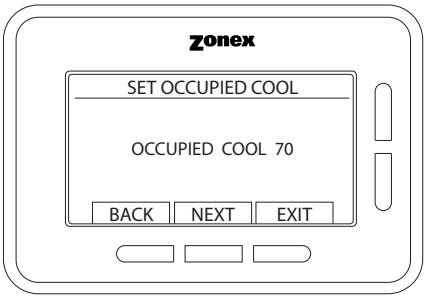
Confirm Cool Call and Damper Operation

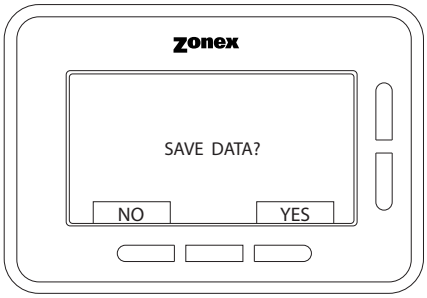
From the MONITOR STAT access **SYSTEM CONFIGURATION** Menu and highlight MASTER TEMP SET menu option and press select. TEMP SET ID will appear on display, using the UP and DOWN buttons, select **STAT ID: GLOBAL** and press NEXT button. When prompted with **SELECT GLOBAL ID** press YES. SET OCCUPIED COOL - using the UP or DOWN buttons select a temperature lower than building temperature and press EXIT to save and set all thermostats in cooling mode. Within 2 minutes, a call for cooling will be made from GEN III controller. Confirm Y1 and G lights are on at the GEN III controller. Go to each zone and confirm damper is open and "ON" appears on thermostat display indicating an active COOL CALL has been received. Once all dampers are confirmed open, satisfy cooling calls at each wireless stat. At each zone stat, raise COOL set point by pressing SET button and using the UP button to raise the set point. Confirm "ON" disappears and damper closes once call is satisfied. Continue to satisfy all cool calls one at a time until all calls are satisfied and dampers are closed. If damper does not close confirm wiring installation.

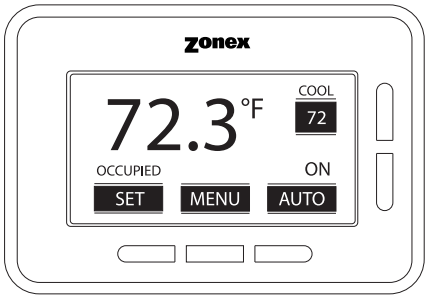






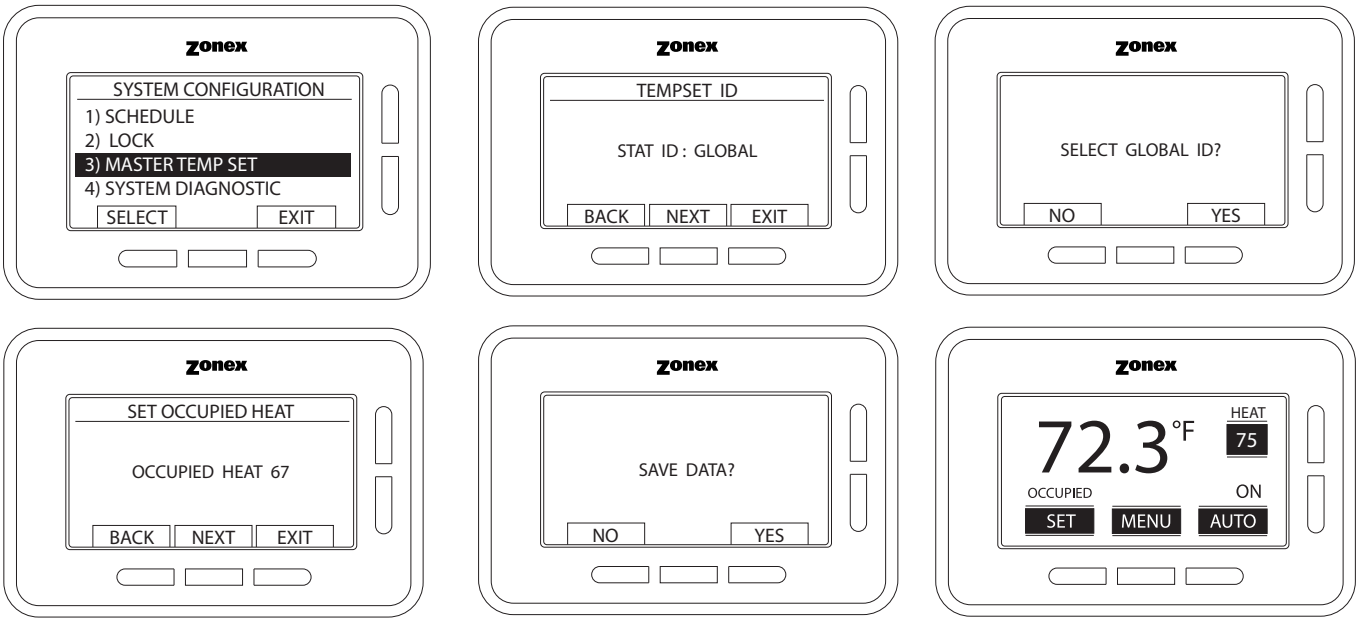






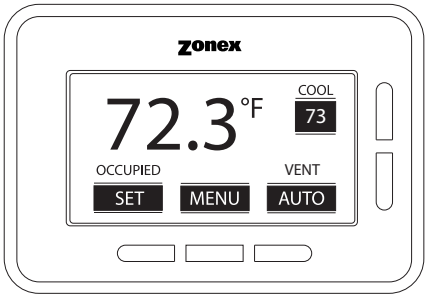
Confirm Heat Call and Damper Operation

From the MONITOR STAT access SYSTEM CONFIGURATION MENU and highlight menu item (3) MASTER TEMP SET menu option and press select. TEMP SET ID will appear on display, using the UP and DOWN buttons, select **STAT ID: GLOBAL** and press NEXT button. When prompted with **SELECT GLOBAL ID** press YES. SET OCCUPIED COOL, press NEXT to access SET OCCUPIED HEAT - using the UP or DOWN buttons select a temperature higher than building temperature and press EXIT to save and set all thermostats in heating mode. Within 2 minutes a call for heating will be made from GEN III controller and confirm W1 light is on at the GEN III controller. Go to each zone and confirm damper is open. Once all dampers are confirmed open, satisfy heating calls at each wireless stat. At each zone stat, lower heat set point by pressing SET button and using the DOWN button to lower the set point. Confirm "ON" disappears and damper closes once call is satisfied. Continue to satisfy all heat calls one at a time until all calls are satisfied and dampers are closed. If damper does not close confirm wiring installation.



Vent

With all calls satisfied all dampers modulate to VENT position, 40% open, confirm stat display indicates "VENT" and dampers are 40% open.

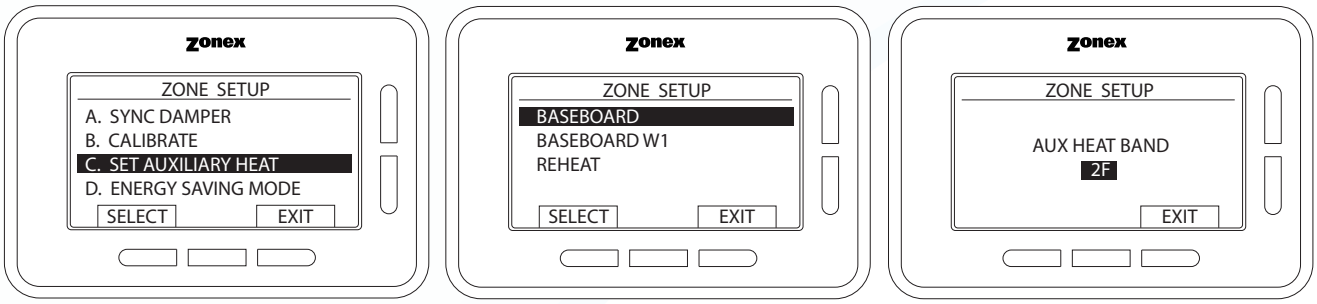


AUXILIARY HEAT/REHEAT

The Wireless Thermostat provides Auxiliary Heat options; Baseboard, Baseboard W1 and Reheat options are configured using the menu screen on the thermostat. When zone temperature drops 2 degrees below heat set point, auxiliary heat operations are energized. If configured for Reheat operation when zone temperature drops 2 degrees below thermostat set point, damper modulate to 40% open providing air flow over electric heat strips, the AUX terminal will energize and strip heat will provide reheat.
Note: When using electric strip heater, an airflow switch is required to prove airflow for safe operation.

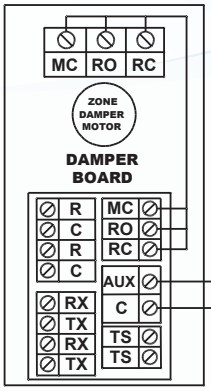
If the Thermostat is configured for Baseboard heat operation auxiliary output will energize at 2 degrees below heat set point. Auxiliary operations will remain energized until heat call is satisfied. If you desire the Auxiliary heat to energize before the unit heat you will want to configure the thermostat for Baseboard W1 heat operation auxiliary output energizes first at 1 degree below set point and at 2 degrees below set point, the unit heater will energize and remain energized until the heat call is satisfied.

Configuration of Auxiliary Heat/Reheat is accomplished by selecting the "SET AUXILIARY HEAT" function in **ZONE SETUP** Menu. To do this press MENU and AUTO buttons and scroll down to (C) SET AUXILIARY HEAT. When SET AUXILIARY HEAT option is highlighted, press select. Three options are offered, BASEBOARD, BASEBOARD W1 or REHEAT. If BASEBOARD is desired press select, display will provide an option for heat dead band set up. Auxiliary heat can be set up for 2, 3, or 4 degrees, use UP/DOWN buttons to select desired temperature dead band, when selection is highlighted, press EXIT to return to previous menu, EXIT again to get back to main menu. If BASEBOARD W1 is desired press select, display will provide an option for heat dead band set up. Auxiliary heat can be set up for 2, 3, or 4 degrees, use UP/DOWN buttons to select desired temperature dead band, when selection is highlighted, press EXIT to return to previous menu, EXIT again to get back to main menu. If REHEAT operations are desired, press the MENU button and scroll through menu options until SET AUX HEAT is highlighted, press select. Use UP/DOWN button to highlight REHEAT and press select button, display will provide an option for auxiliary heat dead band set up. Reheat can be set up for 2, 3, or 4 degrees, use UP/DOWN buttons to set dead band. Once desired HEAT DEAD BAND is set, press EXIT to return to previous menu, EXIT again to get back to main menu.



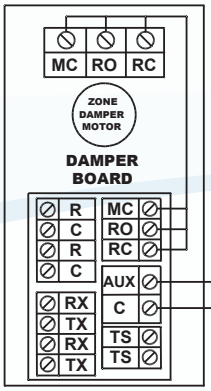
SUPPLEMENTAL HEAT APPLICATIONS

BASEBOARD ELECTRIC HEAT

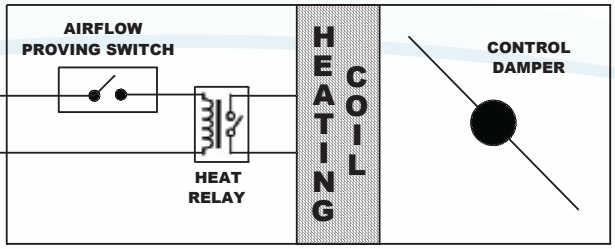


Wire from AUX/C terminals to the 24v coil on a field supplied SPDT relay.
Wire baseboard heat to the load side of the relay to the baseboard heater.

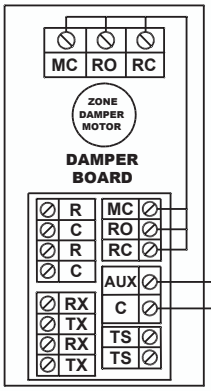
VAV DUCT REHEAT



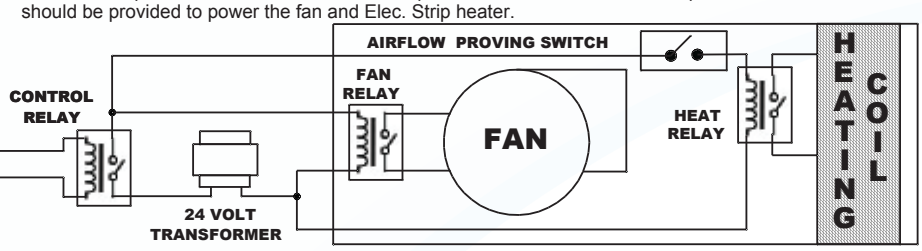
Wire one AUX terminal to the air proving switch from the air proving switch complete wiring to the terminal on the 24v coil relay. Wire the C terminal to the 24v coil on the relay. Isolated control power should be provided to power baseboard heater.



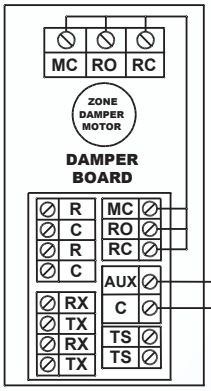
DUCT FAN REHEAT



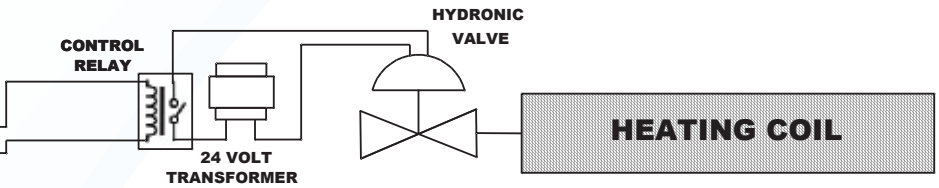
Wire from the AUX/C to the 24v coil on a field supplied SPDT relay.
Wire from one contact terminal to the 24v coil of the fan relay and to the air proving switch then wire the leaving side of the air proving switch to the 24v coil relay on the Elec. Strip heater.
Now wire the other contact to the transformer.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



BASEBOARD HYDRONIC HEAT



Wire from AUX/C to 24v coil on 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.



WIRELESS PROGRAMMABLE THERMOSTAT

DESCRIPTION

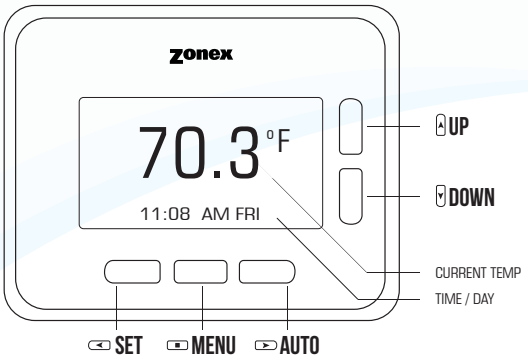
The **WSTAT** wireless thermostat is a microprocessor based, auto changeover, programmable communicating zone thermostat. The zone thermostat controls modulating round or rectangular commercial modulating dampers. The communicating zone thermostat is used with the GEN III-VVT zoning system and communicates over a proprietary wireless network protocol, with up to 100' transmission range.

The wireless zone thermostats control and modulate zone dampers based on variance from set point to a position that will match the supply load to the demand requirement. When the HVAC unit is running, if a zone thermostat is not calling or is calling for the opposite mode, its corresponding damper fully closes. When the HVAC unit is not running, the thermostats open to the Vent mode to provide ventilation, if the indoor blower fan is running continuously.

All zone thermostats are synced with its respective modulating zone damper, which is equipped with antenna and communicating damper board. One zone thermostat in the system is enabled as the Monitor thermostat and synced with the GEN III controller to interact and initiate control decisions for the system. The Monitor coordinates global or individual schedules for the system, locks thermostats individually and provides minimal local adjustment, establishes master temperature settings individually or globally for the system, and provides diagnostic functions to streamline system troubleshooting. Air balance shortcuts, along with password protection, are also enabled at the Monitor thermostat. Sleep and Energy Saving modes are available to extend battery life and enhance operation.

Each wireless zone thermostat is synced or paired with its corresponding zone damper. Each thermostat communicates wirelessly and modulates the damper based on variance from set point at the stat.

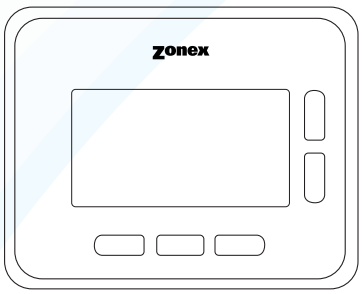
During normal operation the Wireless Zone Stat is in the sleep mode to extend battery life. It is operating and communicating in the background, but sleep mode or energy saving mode will significantly extend battery life.



SLEEP MODE

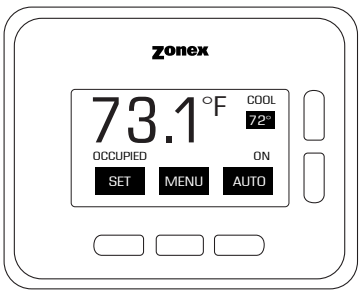
This screen represents the thermostat display in Sleep Mode with temperature, time and day.

ENERGY SAVER MODE



This screen represents the thermostat in Energy Saving Mode.

ACTIVE MODE

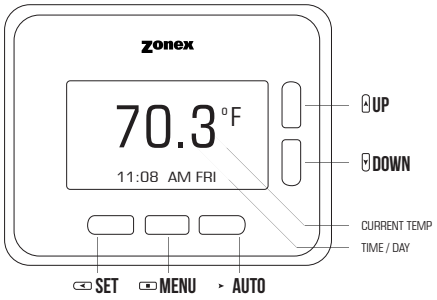


This screen represents the thermostat in Active Mode.

END USER THERMOSTAT OPERATION

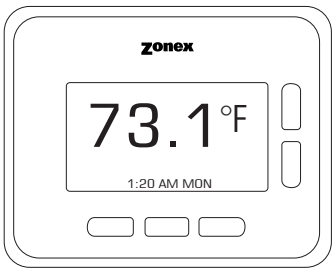
Set Thermostat Set Point

Press any button to access Operations Mode of the Thermostat.
Press the SET button - COOL or HEAT icon will flash on top right of the display.
If COOL icon is flashing, use the UP or DOWN buttons to raise or lower COOL set point to desired temperature.
If HEAT icon is flashing, use the UP or DOWN buttons to raise or lower HEAT set point to desired temperature.
To change from COOL to HEAT, or HEAT to COOL, press the SET button.



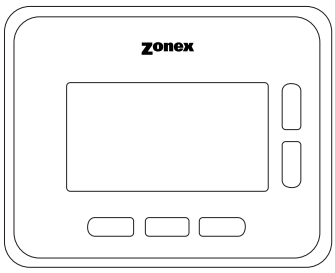
Confirm thermostat is in the Auto Mode. If OFF is displayed, hold OFF button for 15 seconds, OFF icon will change to AUTO, then release button for AUTO operation.

SLEEP MODE



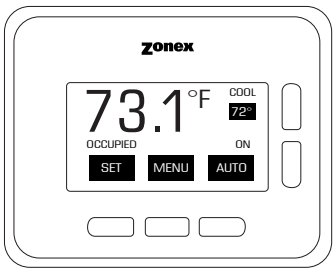
This screen represents the thermostat display in Sleep Mode.

ENERGY SAVER MODE



This screen represents the thermostat in Energy Saving Mode.

ACTIVE MODE



This screen represents the thermostat in Active Mode displaying the temperature, set points and operating functions.

How to make a call for HEAT or COOL

Press any button to access Operations Mode of the Thermostat

Cool Call

If cooling is desired, set COOL set point 1 or more degrees below room temperature. Once desired temperature is set, ON icon will appear below set point. ON icon will flash until system is operating in COOL mode. Once system is in cooling mode, ON will remain constant.

Heat Call

If heating is desired, set HEAT set point 1 or more degrees above room temperature. Once desired temperature is set, ON icon will appear below set point. ON icon will flash until system is operating in HEAT mode. Once system is in heating mode, ON will remain constant.

Vent Mode

When all calls for heating and cooling are satisfied, damper controller will set the damper into VENT position and report to the thermostat VENT operations. During this time if GEN III controller is configured for FAN ON, recirculating air will be circulated to all zones.

Lock Thermostats

This is done at the MONITOR STAT, SYSTEM CONFIGURATION MENU Contact building manager for advanced configuration

Override

To override thermostat operations when in the Unoccupied mode, press the AUTO button once and system will run in the Occupied mode for configured override time. System will terminate override after configured run time, if scheduled changeover occurs, or if AUTO button is pressed again.

Replace Batteries

Use a flat head screwdriver to unscrew clockwise to release the thermostat from the sub-base. Set screw will recess into the sub-base.
Remove batteries from the thermostat and replace with new batteries confirming polarity of batteries.
Place the thermostat back on sub-base and tighten set screw counter clockwise.

Two menus are available at each zone thermostat. A Zone Setup Menu and System Configuration Menu. **ZONE SETUP MENU** is available from every thermostat in the system. **SYSTEM CONFIGURATION MENU** may be viewed on every thermostat BUT only controllable from the assigned MONITOR THERMOSTAT in the system.

The ZONE SETUP MENU allows you to:

A. Synchronize the stat to its respective damper
B. Calibrate the zone thermostat
C. Set Auxiliary heat
D. Place Stat in Energy Savings mode
E. Set System ID
F. Set Stat ID
G. Set 7-Day Schedule

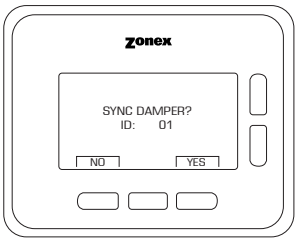
TO ACCESS THE ZONE SETUP MENU

Press any key to display operations mode on the thermostat then press **MENU** once
Then press and hold the **MENU** and **AUTO** button simultaneously until the Zone Setup Menu is displayed.
Then use the **UP** and **DOWN** buttons to scroll through Zone Setup Menu options.

A SYNCHRONIZE DAMPER

Once your zone thermostat has been assigned an ID number you will need to synchronize with its corresponding zone damper. Two steps are required to Sync the thermostat to the damper.

SYCHRONIZE DAMPER

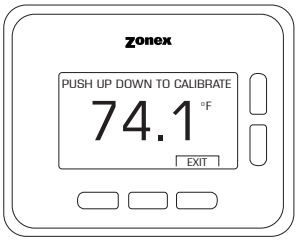


1. Place damper in Sync mode by pushing the black button in the lower corner of the communicating damper board.
   This will energize a blue flashing light indicating Sync or pairing mode is active.
2. Once damper light is blinking and in active Sync mode return to the thermostat and enter **Zone Setup Menu**. Use the **UP** and **DOWN** buttons to scroll and highlight item (A) **SYNC DAMPER**. Press **SELECT** confirm ID matches the ID# you assigned earlier. Push **YES** to Sync.

B CALIBRATE THERMOSTAT

Thermostat is equipped with an accurate temperature sensor.

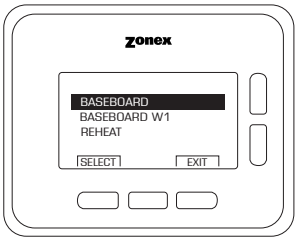
CALIBRATE THERMOSTAT



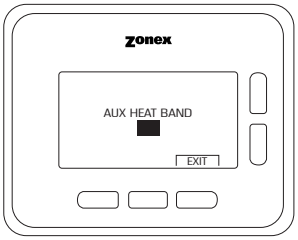
If you require field calibration return to the **Zone Setup Menu** and scroll to item (B) **CALIBRATION**.
Use the **UP** and **DOWN** buttons to calibrate the temperature display with your external thermostat, then push **EXIT** to save changes.
Confirm temperature display now reports the updated room temperature you provided.

C SET AUXILIARY HEAT

SET AUXILIARY HEAT



AUX HEAT BAND



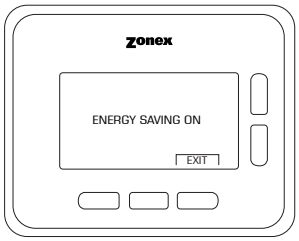
Access the **Zone Setup Menu** select item (C) **SET AUXILIARY HEAT** press **SELECT**.
Select BASEBOARD, BASEBOARD W1 or REHEAT using the **UP** and **DOWN** arrows or button
Then press **SELECT** and enter the temperature range you would like to energize base board or reheat.

Default settings initiate supplemental heat 2 degrees below the heat set point. You can select 2,3,or 4 degrees using the **UP** and **DOWN** buttons.

D ENERGY SAVING MODE

Energy savings mode prolongs battery life and starts 30 minutes after your selection. Display will appear blank.

ENERGY SAVING MODE



In the **Zone Setup Menu** select item (D), **Energy Savings Mode** and press SELECT.

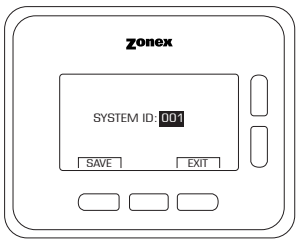
Use UP and DOWN buttons to toggle between Energy Savings OFF or ON
Then exit to save.

Note: Thermostat is operating behind the scenes and is fully operational. Touching any button will immediately refresh the display. During Unoccupied period, Energy Savings Mode (blank screen) is also displayed on each thermostat.

E SET SYSTEM ID

Each GEN III controller will require a unique ID number to correspond and communicate with its respective zone dampers.

SET SYSTEM ID



In the **Zone Setup Menu** select item (E) **SET SYSTEM ID** and press SELECT.

Use the UP and DOWN buttons to select a **System ID** number for this zone thermostat.

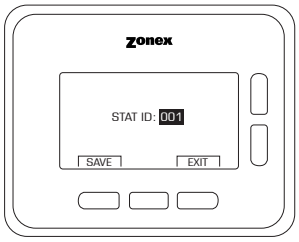
Then save to SAVE ID and return to **Zone Setup Menu**.

Note: If you have more than one GEN III controller, each will require a unique system ID ranging from 001 - 100.

F SET STAT ID

Each Thermostat will require a unique ID number to correspond and communicate with its respective zone damper.

SET STAT ID



In the **Zone Setup Menu** select item (F) set **STAT ID** and press SELECT.

Use the UP and DOWN buttons to select a **STAT ID** number for this zone thermostat.

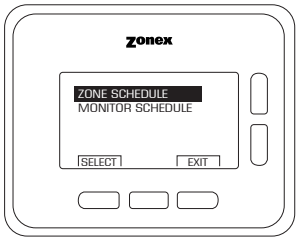
Then save to SAVE ID and return to **Zone Setup Menu**.

Note: It is recommended to use and record a map to list each damper ID number and damper location.
A system setup directory is provided for this purpose on page 46.

G SET 7-DAY SCHEDULE

Establish an independent 7-day schedule, unique to this or any zone thermostat in the system.

SET 7-DAY SCHEDULE



In the **Zone Setup Menu** select item (G) set **SET 7-DAY-SCHEDULE** and press SELECT.

Use the UP and DOWN buttons to select and hightlight **ZONE SCHEDULE** then use the UP and DOWN buttons to select hour and continue to press **NEXT** to set minutes, AM/PM, etc for each day of the 7-day schedule.

Press EXIT to save this information and return to **Zone Setup Menu**.
Press EXIT again to return to normal operation.
Note: Highlight MONITOR SCHEDULE if not using 7-Day programming.

Monitor Thermostat

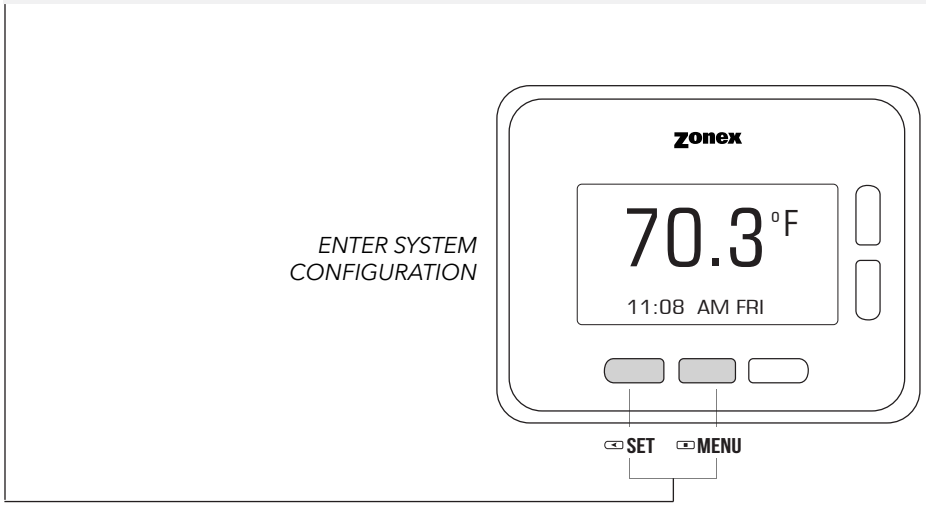
One wireless zone thermostat in the system is enabled as the Monitor Thermostat and synced with the GEN III controller to interact and initiate control decisions for the system, the Monitor coordinates global or individual schedules for the system, locks thermostats individually and provides a user interface 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, password protection and more functions are also enabled at the Monitor Thermostat.

The Monitor Thermostat performs all the functions of a zone thermostat along with its active System Configuration menu to access 20 unique functions to control and schedule the GEN III system. To access the System Configuration menu use options 1-20 outlined below:

System Configuration

System feature changes are configured at the MONITOR THERMOSTAT for all slave stats and the GENIII System controller.

To enter System Configuration
Press and hold MENU button followed by the SET button simultaneously until System Configuration is displayed. then use the UP and DOWN button to scroll through the system configuration options.
SET and **MENU** for 10 seconds



OPTION ITEMS:

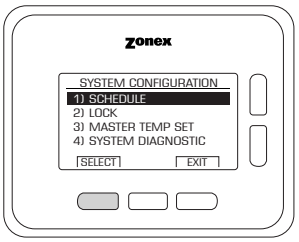
1) SCHEDULE
2) LOCK
3) MASTER TEMP SET
4) SYSTEM DIAGNOSTIC
5) HIGH/LOW LIMIT CONTROL
6) SECOND STAGE DELAY
7) OVERRIDE HOURS
8) PRIORITY VOTE
9) FAN MODE
10) UNIT TYPE
11) SYNCING MONITOR THERMOSTAT
12) MAVERICK VOTE
13) SYSTEM AIR BALANCE
14) TEMP FORMAT
15) SET SYSTEM CLOCK
16) PASSWORD
17) NUMBER OF DAMPERS
18) LAT CALIBRATION
19) MORNING WARMUP
20) MFG DEFAULTS

TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until system configuration is displayed. Then use the Up and Down button to scroll through the System Configuration options.

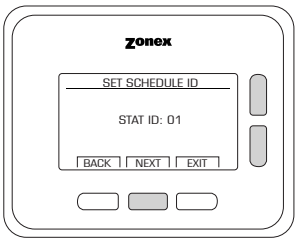
01 SCHEDULE

SET SCHEDULE



While in **SYSTEM CONFIGURATION** menu, press **SELECT** on the **SCHEDULE** menu item, *(instructions above)*.

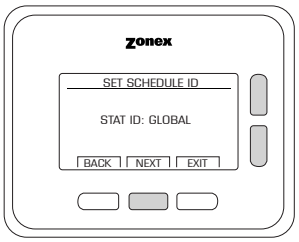
SET SCHEDULE ID



Select desired **Stat ID** or **GLOBAL** using the up and down buttons to configure all thermostats in the system and press **NEXT** to schedule night and day operation.

You can set individual thermostat schedules. To do so, use the **UP** or **DOWN** button to select the desired thermostat, then press the **NEXT** button.

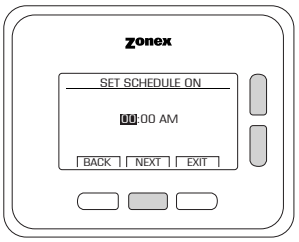
GLOBALLY SET SCHEDULE ID



Selecting **GLOBAL** Stat ID will configure all stats in the system simultaneously. When prompted with **STAT ID: GLOBAL**, press **YES** to confirm.

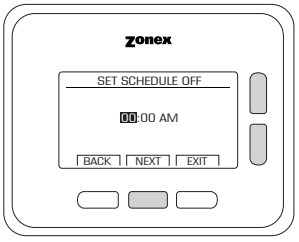
DAY OPERATION

SET SCHEDULE ON TIME



SET SCHEDULE ON Set the hour for daily operations using the **UP** and **DOWN** buttons for each of the following items.
Press **NEXT** button to set the minutes.
Press **NEXT** button to set AM or PM.
Press **NEXT** button to set **Scheduled Off** time

SET SCHEDULE OFF TIME

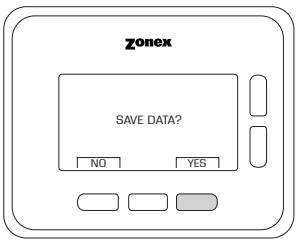


SET SCHEDULE OFF Set the hour for daily operations using the **UP** and **DOWN** buttons for each of the following items.
Press **NEXT** button to set the minutes.
Press **NEXT** button to set AM or PM.

Select 5-day schedule Mon-Fri
or press the up button for 7-day Schedule ALL WEEK.

Once you complete the scheduling for day and night operations you can complete the process.

SAVE SETTINGS



Press **EXIT** when you have set the time.
Press **YES** to save the settings.

When in the Unoccupied Mode, the thermostat may be overridden by pressing the AUTO button once. The word OVERRIDE will replace UNOCCUPIED confirming the operation. Override is initiated at each thermostat independently and will only override that zone. To terminate Override, press AUTO button once.

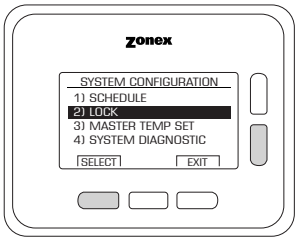
TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until System Configuration is displayed. Then use the Up and Down button to scroll through the System Configuration options.

02 LOCK

Thermostats can be locked independently or globally through the MONITOR STAT, when a thermostat is locked, the end user will have limited operability of thermostat, with adjustment of only +/- 2° from the heating or cooling set points.

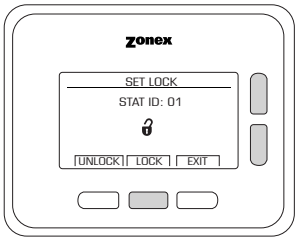
THERMOSTAT LOCK



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (2) **LOCK** menu item, *(instructions above).*

SET STAT ID TO LOCK /UNLOCK

SAVE DATA



Select desired **Stat ID** or **GLOBAL** selection to configure all thermostats in the system by using the **UP** or **DOWN** buttons.
Press desired option **UNLOCK** or **LOCK**.

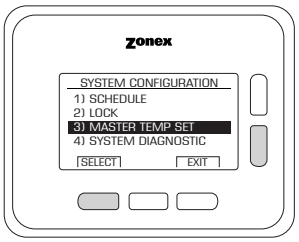
A 🔒 will be displayed on any locked thermostats.

Press **EXIT** when you have selected the thermostats to lock.
Press **YES** to save the settings.

03 MASTER TEMP SET

Master Temp Set allows the building manager to set temperatures for all thermostats globally or individually via MONITOR STAT for Occupied and Unoccupied operations, from one central location.

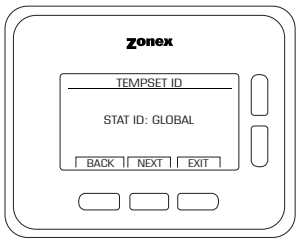
MASTER TEMP SET



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (3) **MASTER TEMP SET** menu item, *(instructions above).*

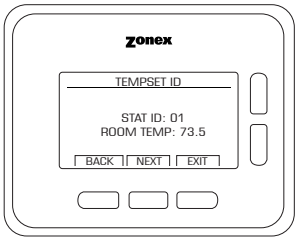
Select desired **Stat ID** or **GLOBAL** selection to configure all thermostats in the system by using the **UP** or **DOWN** buttons.

GLOBAL TEMP SET



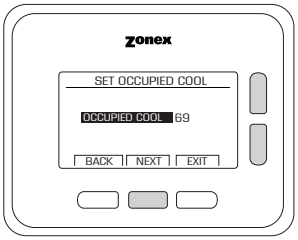
Press **NEXT** if **GLOBAL** is desired to select **GLOBAL ID** or use the **UP/DOWN** buttons to independently select individual thermostats. Then follow the instructions below to set **OCCUPIED** and **UNOCCUPIED** Heating and Cooling set points.

INDIVIDUAL TEMP SET AND REVIEW

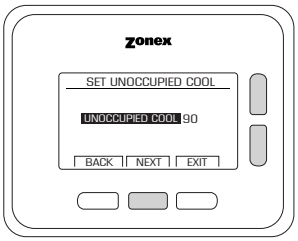


Individual temperatures on each thermostat or zone can also be reviewed. Use the **UP/DOWN** buttons to scroll and review current temperature status for each zone in the system.

SET OCCUPIED COOL THEN OCCUPIED HEAT



SET UNOCCUPIED COOL THEN UNOCCUPIED HEAT



NEXT SCREEN
Use the **UP** or **DOWN** to set the desired **OCCUPIED COOL** temperature.
Press **NEXT** to advance to the Occupied Heat menu.

NEXT SCREEN
Use the **UP** or **DOWN** to set the desired **OCCUPIED HEAT** temperature.
Press **NEXT** to advance to the Unoccupied Cool menu.

NEXT SCREEN
Use the **UP** or **DOWN** to set the desired **UNOCCUPIED COOL** temperature.
Press **NEXT** to advance to the Unoccupied Heat menu.

NEXT SCREEN
Use the **UP** or **DOWN** to set the desired **UNOCCUPIED HEAT** temperature.

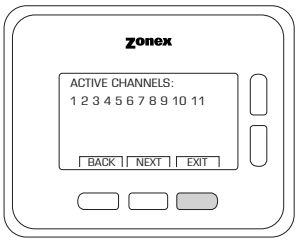
Press **EXIT** when you have set the scheduled on/off times for each thermostat.
Press **YES** to save the settings.

Note: Display goes blank during the Unoccupied Mode to conserve battery life. Touching any button will immediately refresh the display.

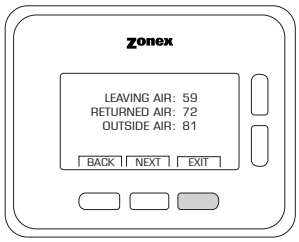
04 SYSTEM DIAGNOSTIC

This function allows the user to review the current conditions for the GEN III System. Number of Channels in the system – How many zones are communicating, Leaving Air Temperature, Return Air Temperature, Outside Air Temperature all from the Monitor Stat.

ACTIVE CHANNELS DIAGNOSTIC INFO



SYSTEM DIAGNOSTIC SCREEN



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (4) **SYSTEM DIAGNOSTIC** menu item, *(instructions above).*
To review active communicating channels, leaving air temperature, return and outside air may also be reviewed by pressing the NEXT button.

Press **EXIT** to return to the System Configuration screen.

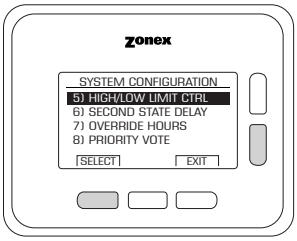
Note: If RF Error or RS 485 Error displays on stat, review the following.

A. Confirm the communicating damper board light is flashing.
B. Confirm STAT ID and re-sync with communicating damper board.
C. Move stat closer to the communicating damper board to enhance communication.

05 HIGH/LOW LIMIT

For system protection the GEN III has high and low limit protections built into the MONITOR STAT configurations. Factory defaults for Gas/Electric operations are High Limit of 145 F and Low Limit of 45 F, for Heat Pump operations factory defaults are High Limit of 115 F and Low Limit of 45 F. These can be field configured as required.

HIGH/LOW LIMIT CONTROL

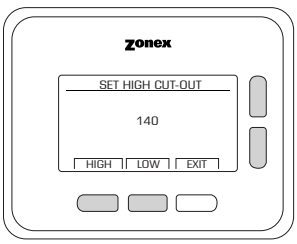


While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (5) **HIGH/LOW LIMIT CTRL** menu item, *(instructions above).*

Press **HIGH** button to access and set High Cut-out.

Use the **UP** or **DOWN** to set the desired **HIGH CUT-OUT TEMPERATURE LIMIT**.

SET HIGH/LOW CUT-OUT



Press **LOW** button to advance to the Low Cut-Out Temperature Limit.

Use the **UP** or **DOWN** to set the desired **LOW CUT-OUT TEMPERATURE LIMIT**.

Press **EXIT** to advance to Save the settings.
Press **YES** to save the settings.

SAVE DATA

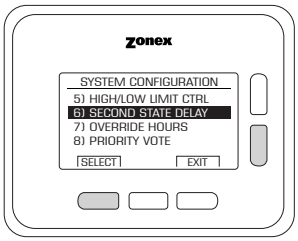
TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until System Configuration is displayed. Then use the Up and Down button to scroll through the System Configuration options.

06 SECOND STAGE DELAY

Monitor thermostat is used to configure GEN III controller 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.

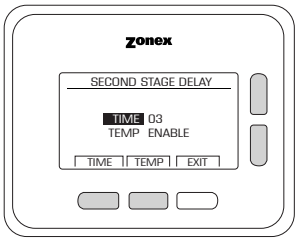
SECOND STAGE DELAY



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (6) **SECOND STAGE DELAY** menu item, *(instructions above)*.

SET DELAY TIME OR TEMP

SAVE DATA



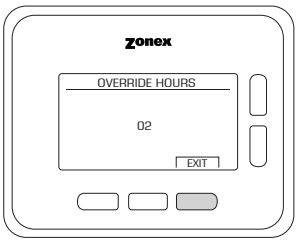
Press **TIME** then
Use the **UP** or **DOWN** button to set the desired **DELAY TIME** to select 3-30 minutes
Press **TEMP** to advance to the TEMPERATURE menu.
Use the **UP** or **DOWN** to Disable or Enable.
When disabled, temperature is not used to Stage Up.

Press **EXIT** to advance to Save the settings.
Press **YES** to save the settings.

07 OVERRIDE HOURS

Select the number of hours to initiate override operation. Select 2-8 hours in the setback mode. The AUTO button is pressed once on the thermostat to initiate override operation. The button can be pressed again to terminate override operation.

OVERRIDE HOURS



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (7) **OVERRIDE HOURS** menu item, *(instructions above)*.

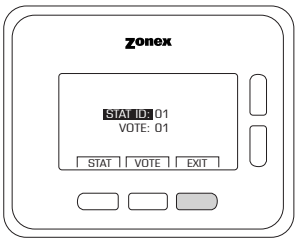
Use the **UP** or **DOWN** to set the desired **OVERRIDE TIME** from 2-8 hours.

Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

08 PRIORITY VOTE

This function allows system configuration to determine the weight of each vote sent from thermostats. While in the System Configuration Menu, use the UP and DOWN buttons to highlight Priority Vote, menu item # 8. Factory default is set to 1, or 1 vote per thermostat. When needed a thermostat can be set for higher weight by changing the number and adding extra votes to the thermostat. If needed 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 in the Priority Vote menu.

SET PRIORITY VOTE FOR EACH THERMOSTAT



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (8) **PRIORITY VOTE** menu item, *(instructions above)*.

Press **STAT** or **VOTE** to set the desired **STAT ID** or **VOTE** configuration.
Use the **UP** or **DOWN** to set the desired **STAT ID** to configure.
Use the **UP** or **DOWN** to set the desired **PRIORITY VOTE** for each thermostat to select the number of votes.

SAVE SETTINGS

Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

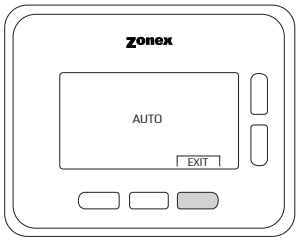
Note: A setting of 0 is available and is a null vote. If selected, this stat will not call for Heat or Cool but will control the zone based on the system mode of operation.

TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until System Configuration is displayed. Then use the Up and Down button to scroll through the system configuration options.

09 FAN MODE

SET FAN OPERATION



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 system is configured for Auto operation, Fan will only run when there is a call for heating or cooling.

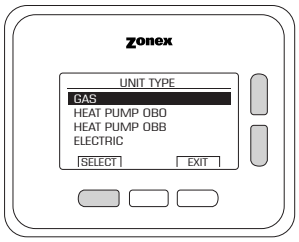
While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (9) **FAN MODE** menu item, *(instructions above).*

Use the **UP** or **DOWN** to set the **Fan Mode** to AUTO or ON.

Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

10 UNIT TYPE

SET UNIT TYPE



The GEN III is designed as a universal GAS/ELECTRIC/HEAT PUMP Controller. Factory default is set for GAS operations, and may require field configuration when applying this product to Electric or Heat Pump applications.

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (10) **UNIT TYPE** menu item, *(instructions above).*

Use the **UP** or **DOWN** to set the desired **Unit Type** for each thermostat
Select Gas, Heat Pump OBO, Heat Pump OBB, Electric.

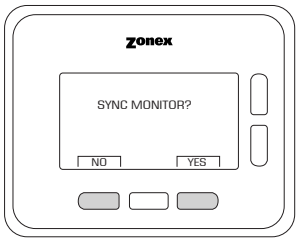
Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

Note: Some heat pump units use GAS/ELECTRIC inputs – confirm your unit's operation to ensure proper configuration.

11 SYNC MONITOR

SYNCHRONIZE MONITOR

SAVE SETTINGS



Each system has one thermostat which operates as the Monitor Thermostat for the system. This thermostat must be synchronized with the GEN III control board.

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (11) **SYNC THE MONITOR** menu item, *(instructions above).*

Press **YES** to Sync Monitor or **NO** to Exit.
If yes is selected, do not exit this screen. You will need to press the SYNC button on the GEN III controller and allow the thermostat to sync in Monitor mode.

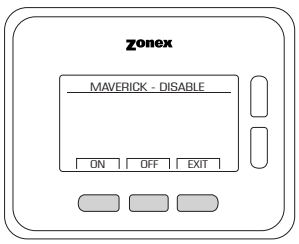
Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

Note: Only one thermostat in a system can be an enabled Monitor Thermostat. All other stats will review only.

12 MAVERICK

ENABLE/DISABLE MAVERICK

SAVE SETTINGS



Maverick operations allow the system to recognize an outlier call in the system. When most zones in a system are calling for heat and 1 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 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 **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (12) **MAVERICK** menu item, *(instructions above).*

Select **ON** to enable Maverick or **OFF** to disable.
If ON is selected, press the **UP** or **DOWN** buttons to select the period 15-30 minutes.

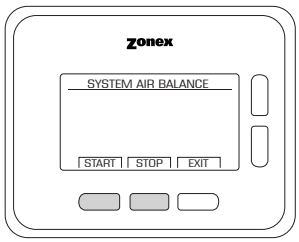
Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until system configuration is displayed. Then use the up and down button to scroll through the system configuration options.

13 SYSTEM AIR BALANCE

SYSTEM AIR BALANCE



During the start up and commissioning of the system, an air balance may be required. From the System Configuration menu, use the UP or DOWN button to highlight System Air Balance and press the select button. Press the START button, this will drive all dampers to the open position, energize the fan and lock out compressor or heat function. When air balance is complete, press the STOP button and then Exit button to place system back into normal operation.

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (13) **SYSTEM AIR BALANCE** menu item *(instructions above).*

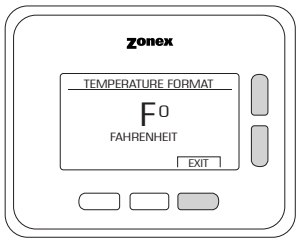
Select **START** to start System Air Balance. Do not exit screen or air balance will terminate.
STOP to complete operation.

Press **EXIT** to return to the System Configuration screen.

14 TEMPERATURE FORMAT

TEMPERATURE FORMAT

SAVE SETTINGS



GEN III may be configured for F° or C° operations. From the configuration menu toggle the UP or DOWN button to highlight TEMP FORMAT. When desired temperature format is displayed press the EXIT button and save data.

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (14) **TEMPERATURE FORMAT** menu item *(instructions above).*

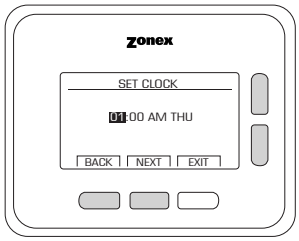
Toggle **UP** and **DOWN** to set the desired Temperature Format.

Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

15 CLOCK

TIME CLOCK

SAVE SETTINGS



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

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (15) **CLOCK** menu item *(instructions above).*

Set the hour by using the **UP** and **DOWN** buttons for each of the following items.
Press **NEXT** button to set the minutes. Press **NEXT** button to set AM or PM.
Press **NEXT** button to set day of the week.

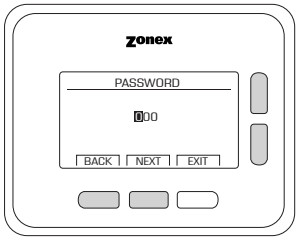
Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.

Note: If wireless thermostats are in Unoccupied mode when setting clock, press any button on each thermostat to update time and day settings.

16 PASSWORD

PASSWORD

SAVE SETTINGS



System can be password protected to prohibit access to all system functions at the Monitor Thermostat.

Set the password by using the **UP** and **DOWN** buttons for each of the three digits.
Press **NEXT** button to set next digit.

Press **EXIT** to return to the System Configuration screen.
Press **YES** to save the settings.
Write this password down and store in a safe location.

Note: If password is forgotten or needs to be updated, complete the following steps: 1. Remove batteries. 2. Re-install batteries while simultaneously pressing the Auto button. 3. Set new password.

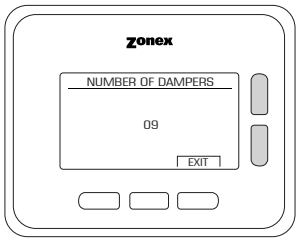
TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until system configuration is displayed. Then use the up and down button to scroll through the system configuration options.

17 NUMBER OF DAMPERS

Installer should set the number of dampers in the system. This reduces the time needed for the GEN III controller to poll and review each zone's needs. Installer can set the number of zones from 1-20.

SELECT NUMBER OF DAMPERS



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (17) **NUMBER OF DAMPERS** menu item, *(instructions above)*.

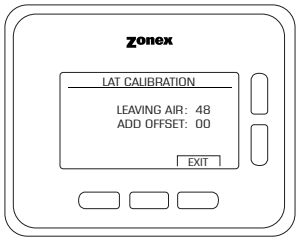
Press the **UP** or **DOWN** button to increase/decrease number of dampers for this installation.

Press **EXIT** button.
Press **YES** to save the settings.

18 LAT CALIBRATION

Installer should set the number of dampers in the system. This reduces the time needed for the GEN III controller to poll and review each zone's needs. Installer can set the number of zones from 1-20.

LAT CALIBRATION



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (18) **LAT CALIBRATION** menu item, *(instructions above)*.

Press the **UP** or **DOWN** button to increase or decrease OFFSET.

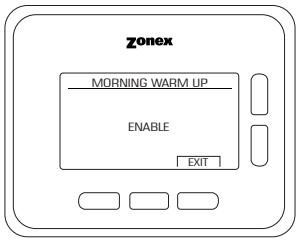
Adjust offset +/- X degrees and wait until the offset values returns back to 00 on its own. After the offset returns to 00, the new LAT value will also be displayed. You can continue to adjust the offset again if necessary.
Note: If 00 does not appear after your adjustment, the LAT update has not been saved. Please wait until 00 appears to confirm this adjustment.

Press **EXIT** button - Allow up to 2 minutes for CALIBRATION reset in system.

19 MORNING WARM UP

In cold climates a MORNING WARM UP sequence will assist in preheating the building prior to occupancy. The GEN III 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 and 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.

MORNING WARM-UP



While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the (19) **MORNING WARM UP** menu item, *(instructions above)*.

Press the **UP** or **DOWN** button to ENABLE or DISABLE.

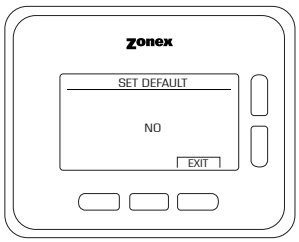
Press **EXIT** button.
Press **YES** to save the settings.

TO ENTER
System Configuration

Press and hold the **MENU** followed by the **SET** button simultaneously until system configuration is displayed. Then use the up and down button to scroll through the system configuration options.

20 MFG DEFAULTS

SET DEFAULT



If there is a need to return the MONITOR stat and GEN III controller to factory defaults, MFG DEFAULT can be used to reset controls to the manufacturer's defaults. Once this has been done, technician will need to review configuration settings and set as needed for proper system operations.

While in **SYSTEM CONFIGURATION** menu, press **DOWN** and press **SELECT** on the **MFG DEFAULTS** menu item, *(instructions above).*

Press the **UP** or **DOWN** button to change to YES.

Press **EXIT** to reset MONITOR STAT to default settings
Press **EXIT** to return to normal operations display

Manufacturers System Defaults

1 SCHEDULE
ON : 6:00 A.M. – Set back 6:00 P.M.
M-F operating schedule
Saturday and Sunday will follow Unoccupied schedule.

2 LOCK
UNLOCKED

3 MASTER TEMPERATURE SET
Occupied Cool 75 Unoccupied Cool 90
Occupied Heat 70 Unoccupied Heat 60

4 SYSTEM DIAGNOSTIC
No factory default required

5 HIGH LOW LIMIT
LOW limit **45** degrees
High limit Gas or Electric **145** degrees

6 SECOND STAGE DELAY
5 Minutes

7 OVERRIDE HOURS
2 hours

8 PRIORITY
1

9 FAN MODE
AUTO

10 UNIT TYPE
Gas / Electric

11 SYNC MASTER
No action required

12 MAVERICK
Disable

13 SYSTEM AIR BALANCE
No action required

14 TEMP FORMAT
Fahrenheit

15 CLOCK
No action required

16 PASSWORD
000

17 NUMBER OF DAMPERS
20

18 LAT CALIBRATION
No action required

19 MORNING WARM UP
Disable

20 FACTORY DEFAULTS
System ID – 001
Energy Savings Mode

If assistance is needed, call Tech Support at (800) 228-2966

ZONE DAMPERS

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

DAMPER MODEL	DIFFERENTIAL PRESSURE	MAXIMUM SYSTEM SIZE	MAXIMUM DUCT SIZE
WST Round Med. Pressure	1.75"	Any Size	18"
WMRTD Rect. Med. Pressure	1"	7.5 Tons	24"W x 20"H
WCD Rect. Heavy Duty	1.75"	Any Size	48"W x 48"H
WRD Round Heavy Duty	1.75"	Any Size	24"
WD-FUSER	0.1"	Any Size	10"

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

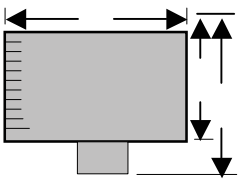
Round Medium Pressure Zone Dampers

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

MEDIUM PRESSURE (WST)

Round Medium Pressure Damper

PART NUMBERS AND SIZES



PART#	SIZE	D	L	W
WST06	6	6"	10"	9"
WST08	8	8"	10"	11"
WST10	10	10"	12"	13"
WST12	12	12"	14"	15"
WST14	14	14"	16"	17"
WST16	16	16"	18"	19"
WST18	18	18"	20"	21"
WRD20	20	20"	24"	27"
WRD22	22	22"	24"	27"
WRD24	24	24"	24"	27"

Note: Round dampers over 18" will be heavy duty style WRD dampers. Part # WRD size

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

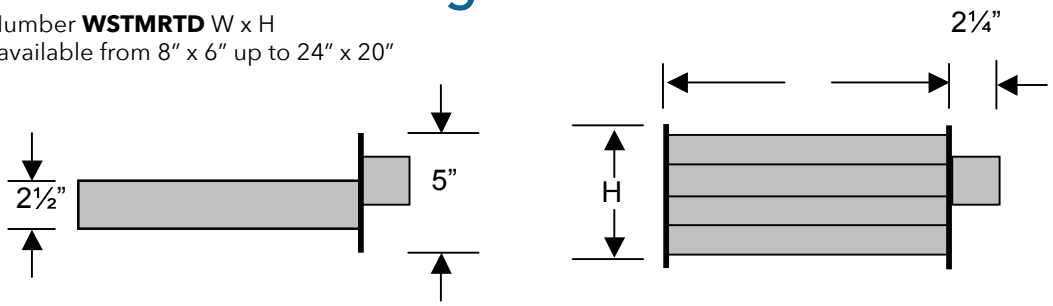
The rectangular zone dampers are available in either medium pressure or heavy duty. For systems under 7.5 tons, use medium pressure dampers, (part #WSTMRTD size). For systems 7.5 tons or over, use heavy duty dampers, (part #WCD size). Motor drive time open and close is 90 seconds.

Rectangular Medium Pressure Zone Dampers (WSTMRTD)

Zonex Systems rectangular medium pressure dampers are recommended for systems under 7.5 tons with a maximum differential static pressure of 1". The damper is equipped with a damper board designed to support and communicate with a Zonex wireless programmable thermostat. These are fully modulating, power open, power close dampers. They are constructed from heavy duty aluminum and stainless steel. The damper is an opposed blade type that slips into a 3 1/4 - inch wide cutout in the existing duct and attaches with screws via a duct mounting plate. The duct mounting plate is 5 inches wide. A hat section supports a reversing 24vac, 60Hz, 2 VA motor. A magnetic clutch allows for continuous power to the motor and longer motor life. Two set screws connect the motor to the damper shaft, allowing quick motor replacement if necessary. Motor drive time from full open to full close is 90 seconds.

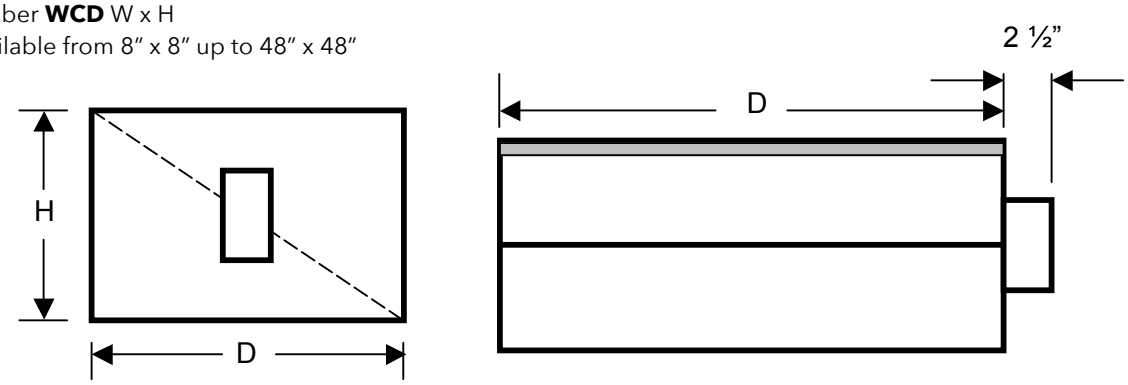
Medium Pressure Rectangular Dimensional Data

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



Heavy Duty Rectangular Dimensional Data

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



Rectangular Heavy Duty Zone Dampers (WCD)

Zonex Systems rectangular heavy duty dampers are recommended for systems 7.5 tons or larger with a maximum differential static pressure of 1.75". The damper is equipped with a damper board designed to support and communicate with a Zonex wireless programmable thermostat. These are fully modulating, power open / power close dampers made of 20 gauge "snap lock" steel frame with S & Drive duct connections. Allow a 16" gap in the duct for the damper. Formed steel blade stops incorporate a gasket for quiet operation and improved structural rigidity. Rectangular dampers under 10" in height incorporate a single blade design. Dampers 10" or over use opposed blade design. A full stall motor, drawing 2 VA, drives the motor from full open to full close in 90 seconds.

RECTANGULAR DAMPER SELECTION

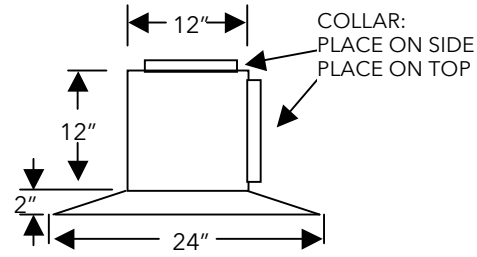
*Rectangular Damper Capacities**

HEIGHT IN INCHES \ WIDTH IN INCHES	8	10	12	14	16	18	20	22	24	26	28	30	32
8	300	400	500	610	710	820	925	1050	1175	1250	1400	1500	1600
10	400	540	680	825	975	1125	1300	1400	1590	1750	1975	2100	2175
12	500	680	850	1000	1200	1400	1600	1850	2000	2300	2550	2700	2850
14	610	825	1000	1250	1500	1750	2000	2250	2500	2900	3150	3425	3625
16	710	975	1200	1500	1800	2100	2450	2700	3000	3600	3950	4200	4425
18	820	1125	1400	1750	2100	2500	2850	3080	3600	4400	4600	4950	5100
20	925	1300	1600	2000	2450	2850	3400	3775	4000	4800	5500	5700	6000
22	1050	1400	1850	2250	2700	3080	3775	4300	4800	5100	6000	6350	6800
24	1175	1590	2000	2500	3000	3600	4000	4800	5400	6100	7000	7150	7600
26	1250	1750	2300	2900	3600	4400	4800	5100	6100	6700	7800	8400	8900
28	1400	1975	2550	3150	3950	4600	5500	6000	7000	7800	8400	9150	10000
30	1500	2100	2700	3425	4200	4950	5700	6350	7150	8400	9150	10000	11000
32	1600	2175	2850	3625	4425	5100	6000	6800	7600	8900	10000	11000	11250

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

WD-Fuser Zone Damper

Zonex Systems D-Fuser is a combination zone damper and diffuser. It mounts in a standard 2' x 2' T-bar ceiling opening, providing for simple installation and easy maintenance access. The D-Fuser is a cone shaped fluidic nozzle with a platen that modulates up and down to control air flow. As the platen moves up, the air volume is reduced; but the air velocity and throw remain constant. This keeps the air hugging the ceiling, which maximizes room air mixing and minimizes the "waterfall" effect. The damper is equipped with a damper board designed to support and communicate with a Zonex wireless programmable thermostat. The D-Fuser is a fully modulating power open / power close damper using a 24vac 60Hz 2 VA motor.



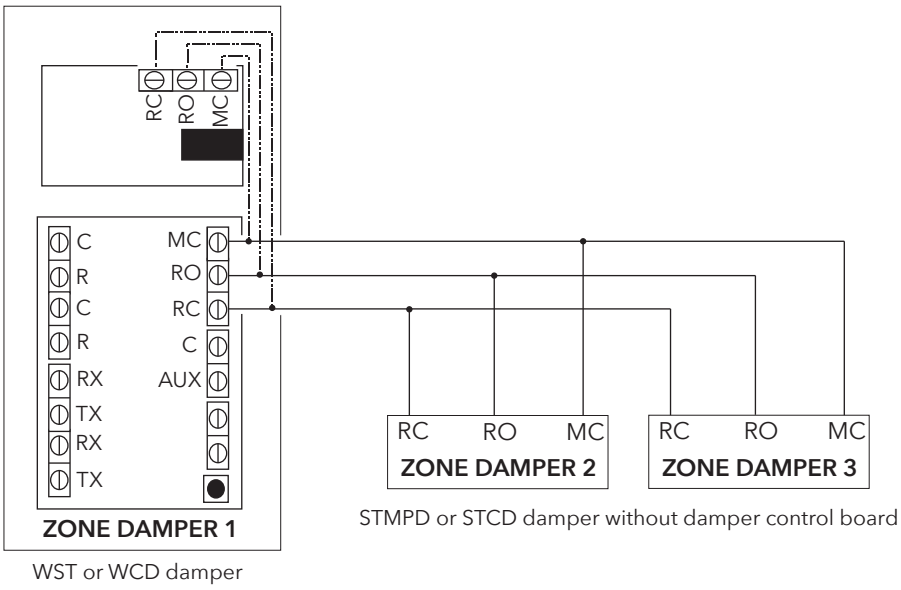
AT NECK VELOCITIES UP TO 700 FPM
NC LESS THAN 30

6"	**Neck Vel**	400	500	600	700	800	900
	ΔP	0.011	0.016	0.023	0.035	0.04	0.055
	CFM	80	98	120	135	157	176
	Throw 50 FPM	4′	4′	5′	6′	6′	7′
8"	**Neck Vel**	400	500	600	700	800	900
	ΔP	0.019	0.03	0.045	0.056	0.041	0.093
	CFM	140	170	207	247	280	315
	Throw 50 PM	5′	6′	7′	8′	9′	10′
10"	**Neck Vel**	400	500	600	700	800	900
	ΔP	0.029	0.045	0.066	0.09	0.12	0.146
	CFM	218	273	330	382	438	497
	Throw 50 FPM	6′	8′	9′	10′	11′	12′

SLAVING DAMPERS

Slaving Up To Three Zone Dampers

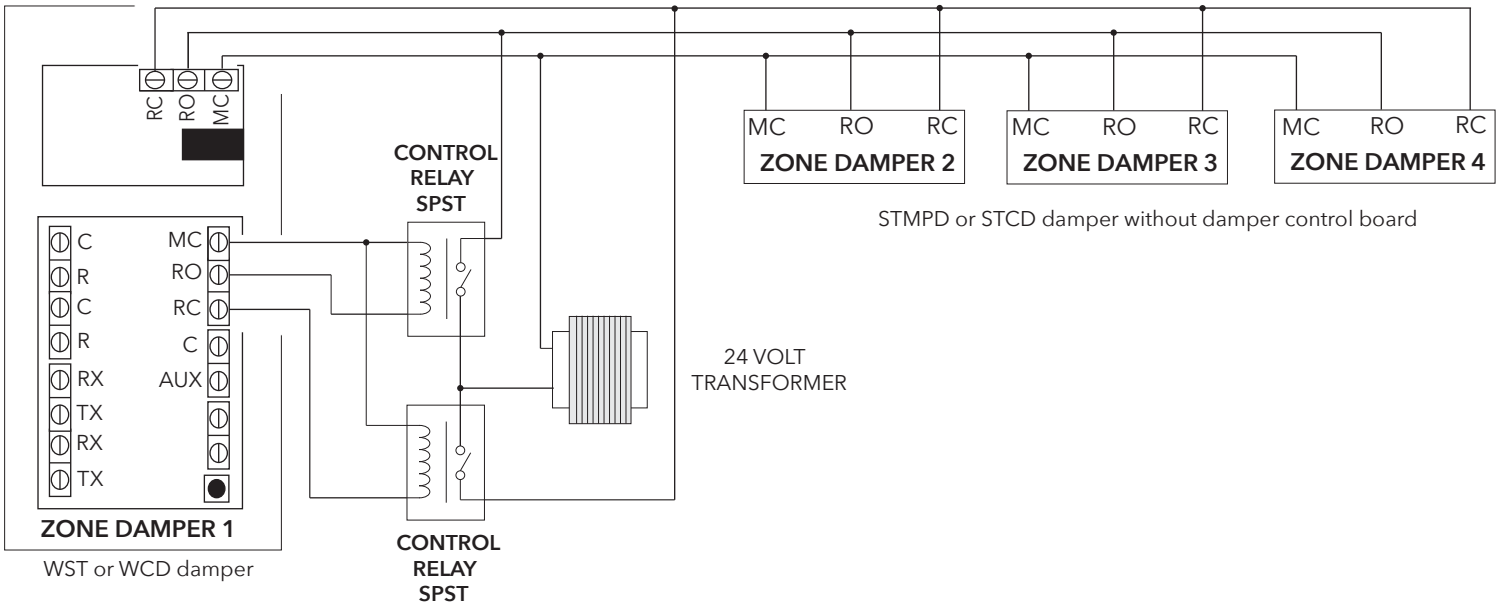
Up to three dampers can be directly controlled by one GEN III damper control board. The first damper must be a WST round or WCD rectangular damper, slave dampers will be STMPD round or STCD rectangular dampers without damper control boards. To wire two or three dampers for a zone, use the following wiring diagram. Remember to size the power transformer for the total number of zone dampers in the system, 2VA per damper



Slaving More Than Three Zone Dampers

When slaving more than three zone dampers, use the following diagram. An additional 24-volt transformer and control relays are needed for these applications.

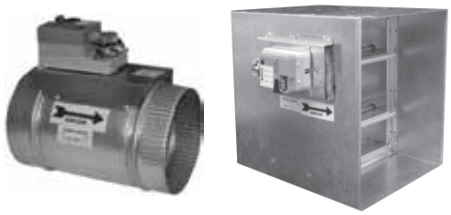
Note: All slave dampers need to be model STMPD / STCD



BYPASS DAMPERS – ELECTRONIC

Electronic Bypass Dampers

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



Sizing Electronic Bypass Dampers

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

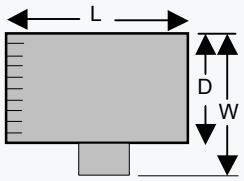
Example: A 5-ton system is rated at 2000 CFM (5x400 = 2000). When calculated at 1500 FPM, the bypass damper should be 16".
Never undersize the bypass damper.

ROUND BYPASS SELECTION

DIAMETER	CFM	PART #	SIZE	D	L	W
8"	560	ST BP 08	8	8"	10"	11"
10"	900	ST BP 10	10	10"	12"	13"
12"	1250	ST BP 12	12	12"	14"	15"
14"	1700	ST BP 14	14	14"	16"	17"
16"	2200	ST BP 16	16	16"	18"	19"
18"	2600	ST BP 18	18	18"	20"	21"

Round Bypass Damper Selection

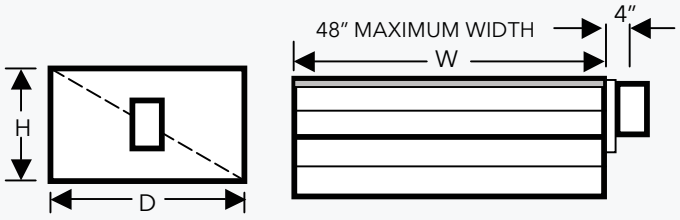
The Zonex Systems STBP damper is used for round bypass applications. When you know the bypass CFM requirements, use the ROUND BYPASS SELECTION TABLE to confirm the round damper size.



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

Rectangular Bypass Damper Selection

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



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

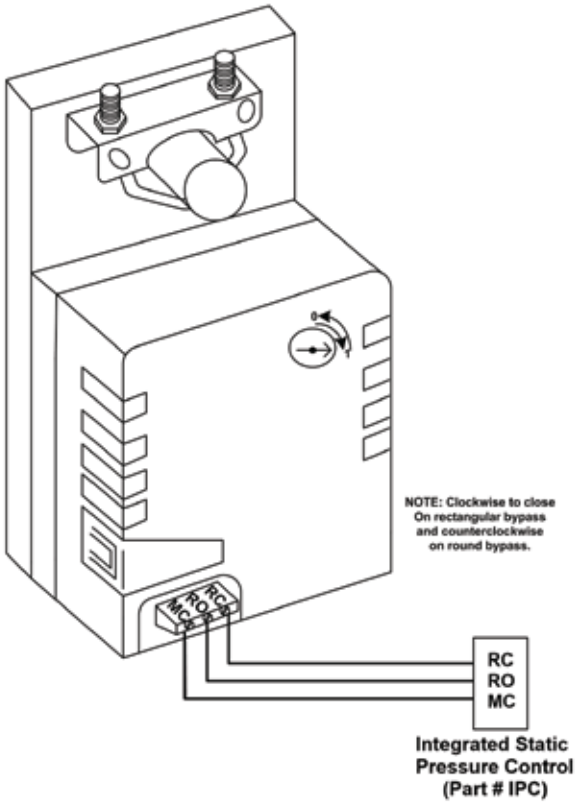
RECTANGULAR BYPASS SELECTION TABLE

WIDTH IN INCHES

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

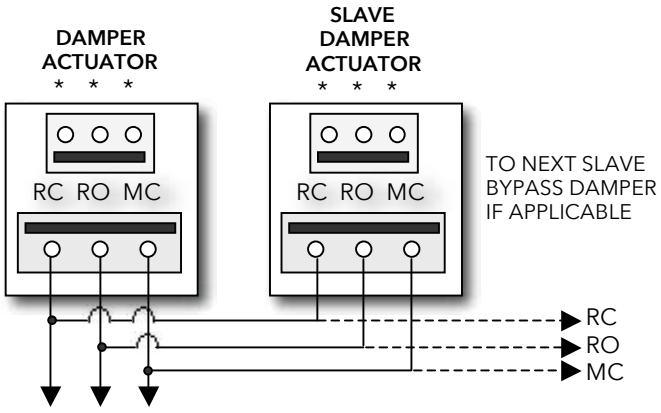
Bypass air in CFM. Calculated at 1500 FPM.
Formula used: B = W x H / 144 x 1500, where B = Bypass air in CFM, W = damper width in inches, H = damper height in inches, 144 = 144 sq. inches per sq. ft., 1500 = 1500 FPM.

ROUND AND RECTANGULAR BYPASS DAMPER MOTORS



Slaving Bypass Dampers

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



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

BYPASS DAMPER WITH INTEGRATED PRESSURE CONTROL

(Part # STBP or STCDBP)

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

Integrated Pressure Control Description

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

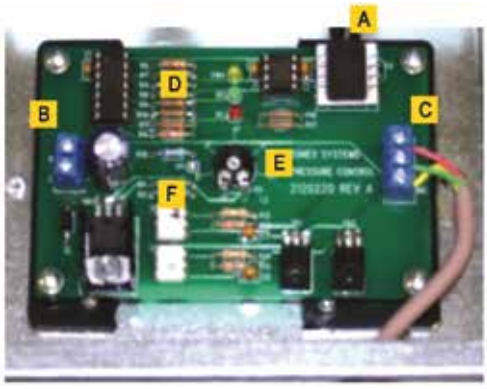


Fig. 1

Bypass Damper Installation

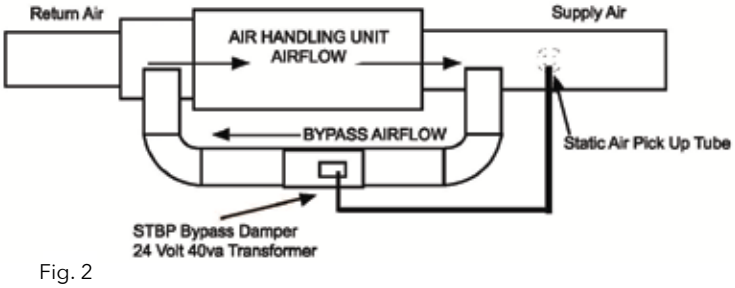


Fig. 2

1. Verify the bypass damper is sized properly to the system and not undersized. (Bypass damper sizing is recommended for 100% of system CFM.)
2. Bypass damper and controller are powered by a dedicated 24vac 40VA transformer.
3. Do not install the bypass damper outside.
4. Locate the Integrated Pressure Control (IPC) and air tube on the bypass damper.
5. Drill hole into the side of the supply duct 2' after the bypass and before the 1st supply take-off. Mount pressure supporting block over hole, align hole in block with hole in duct. Use provided sheet metal screws.
6. Install air tube into supply air duct by slipping supplied plastic tubing into holes in support block and duct. Slip tube 3" into the duct. Pickup tubing fits snugly into provided hole. Connect pressure tube from static air pickup to Integrated Pressure Controller (port closest to you).

Bypass Damper With Integrated Bypass Control Setup

1. Run all supply dampers to the full open position and have blower motor running at 100% fan speed. (See Note #1)
2. Manually close the bypass damper by pressing in the release lever on the motor side of the actuator. With the release lever pressed, rotate the damper actuator collar to close the damper and release the lever to lock the damper closed.
3. **Quick Set Option**: Turn the potentiometer on the damper control board to the full left position and slowly rotate RIGHT, until the "RC" RED LED turns on. Now rotate LEFT just slightly, until RC LED turns off. The **IPC** is ready for operation.

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

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

Static Pressure Voltage Chart

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

EXHIBIT A

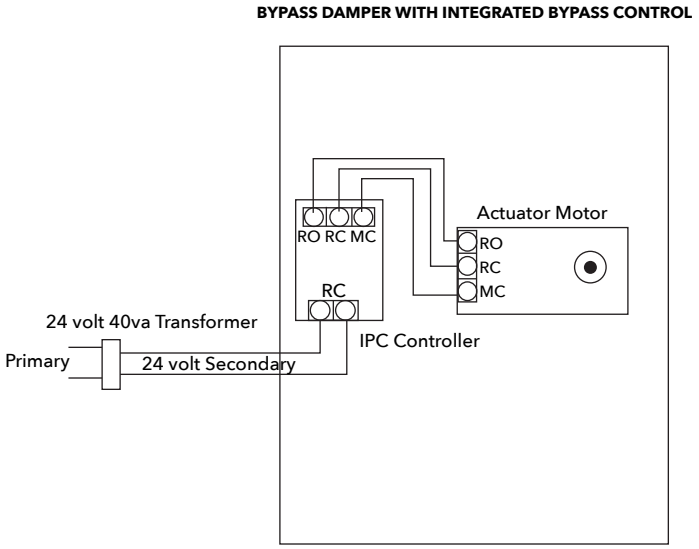
Note # 1: To open all dampers, it may be necessary to remove Y outputs to unit on the zone control board and to make full cool calls on all thermostats. This will modulate dampers fully open and lock out compressor.

On Zonex Systems use air balance modes for simplified bypass setup.

Bypass Checkout For Static Pressure Controller

1. Make cool call at the zone thermostat of the smallest zone.
2. Verify all zone dampers are closed except for calling zone.
3. Verify noise at zone registers is not excessive. Adjust the Integrated Pressure Control LEFT to lower noise (airflow) or RIGHT to increase airflow until too noisy.

Bypass Damper Wiring Diagram With Integrated Bypass Control



TROUBLESHOOTING

WIRELESS THERMOSTAT

PROBLEM	POSSIBLE CAUSE	SOLUTION
THERMOSTAT NOT COMMUNICATING	STAT / Damper ID Mismatch	1. Confirm STAT ID and Damper ID 2. Re-Sync STAT and Damper 3. Replace Batteries and Re-Sync STAT and Damper
THERMOSTAT SCREEN BLANK	Thermostat in Sleep Mode Batteries installed improperly, low or dead	1. Press any button to activate display, Zone Setup may be set for energy savings mode, blank screen during normal operations saves power. 2. Check Battery Power Icon for Low Battery 3. Confirm Batteries are installed properly 4. Replace Batteries 5. Replace STAT
SET POINT CANNOT BE CHANGED	Thermostat locked	1. Is Padlock Icon on Display? If so, thermostat is locked and will limit set point changes. Press SET button and wait for COOL or 2. HEAT Icon to flash; then use UP or DOWN buttons to adjust set points. 3. Replace batteries.
THERMOSTAT INDICATES "RF ERROR" IN SYSTEM DIAGNOSTIC SCREEN	No communication between thermostat and communicating damper board	1. Thermostat is not able to communicate with assigned damper control board. Move thermostat closer to assigned damper. 2. Confirm Power to damper control board and blue communications light on damper control board is flashing. 3. Re-Sync STAT and Damper control board. 4. Check or replace batteries.
THERMOSTAT NOT MAKING A COOL CALL	Cool set points incorrect	1. Set Cooling set point lower than room temperature 2. "ON" icon flashing – Waiting for changeover 3. "ON" icon solid – cool call is active - Confirm Cool Call, Y1, at GEN III controller. Y1 light should be energized - Check HVAC unit
THERMOSTAT NOT MAKING A HEAT CALL	Heat set points incorrect	1. Set Heating set point higher than room temperature 2. "ON" icon flashing – Waiting for changeover "ON" icon solid – heat call is active 3. - Check damper position - Confirm Heat Call, W1 (Y1, W1), at GEN III controller. W1 light should be energized for GAS/Electric units, Y1, O/B for Heat Pump units - Check HVAC unit
OVERRIDE DISPLAYED	Unit in Unoccupied Mode	1. Press Auto Button once to return to Unoccupied Mode 2. Confirm Schedule and modify
WRONG TIME AND DAY DISPLAYED	System Time and Day incorrect	1. Confirm Time and Day are correct on Monitor Thermostat, reset if necessary.
DAMPER MISSING FROM SYSTEM DIAGNOSTIC SCREEN	Communication lost between thermostat and damper control board	1. From Monitor Thermostat System Diagnostic confirm Damper Communications 2. Confirm Thermostat ID and Re-Sync with damper 3. Contact Technical Support

TROUBLESHOOTING

GEN III CONTROLLER

PROBLEM	POSSIBLE CAUSE	SOLUTION
NO FLASHING COMMUNICATIONS LIGHTS	No power	1. Check 24 volt Power from transformer 2. Check Power Switch is in ON position
NO COOL CALL – Y1 LIGHT	1. Thermostat(s) not calling for cooling 2. There are more calls for heat than cool 3. System off on low limit capacity control	1. Press any button to activate display, Zone Setup may be set for energy savings mode, blank screen during normal operations saves power 2. Check Battery Power Icon for Low Battery 3. Confirm Batteries are installed properly 4. Replace Batteries 5. Replace STAT
NO 2ND STAGE COOL CALL – Y2 LIGHT	1. Call for cooling exceeded stage time delay 2. Discharge air less than 57 degrees	1. Check staging time delay from any stat in the System Configuration menu 2. If so, second stage will remain off
NO HEAT CALL – W1, Y1 (O/B)	1. Thermostat(s) not calling for heat 2. A majority of thermostats are calling for cooling (a majority may be only 1 thermostat if all other thermostats are satisfied) 3. System off on High limit capacity control	1. Place a call for Heat at any thermostat 2. Check the number of thermostats calling for heat versus calls for cooling 3. Check System Diagnostic on any thermostat to review discharge air. 4. Wait 4 minutes for Heat call to recover
NO 2ND STAGE HEAT CALL – W2, Y2 (O/B) LIGHT	1. Call for heat exceeded stage time delay 2. Discharge air is greater than 120 degrees (G/E) or 90 degrees (HP)	1. Check staging time delay from any thermostat in System Configuration menu. If not, second stage will remain off until time has expired 2. If so, second stage will remain off
IN SYSTEM DIAGNOSTIC – SA, RA, OR OA DISPLAY NC	Sensor wiring or sensor	1. Check sensor wiring at terminal 2. If wire spliced, check wire splices 3. Check sensor 4. Check DC voltage across sensor terminal – Example – remove sensor wires on LVAIR terminals, use meter set to DC 20 volt scale to measure voltage, confirm 3.30 volts are present on terminals 5. Check OHMs value of sensor – 10k OHMs at 77 degrees 6. Contact Technical Support

FAN OPERATION

NO FAN WHEN SYSTEM IS SATISFIED	Fan ON not set in the system configuration	1. Confirm fan operation is set to fan ON in system configuration on Monitor STAT
FAN RUNS WHEN SYSTEM IS SATISFIED	Fan is set to ON in the system configuration	1. Confirm fan operation is set to fan AUTO in system configuration on Monitor STAT

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
DAMPER OPERATIONS		
NO LIGHTS ON THE COMMUNICATING DAMPER BOARD	No power to damper control board or faulty damper control board	1. Check 24 volt power to damper control board, R and C terminals - If 24 volt power is present, replace damper control board
DAMPER DOES NOT OPEN OR CLOSE	No call for cool/heat or faulty damper control board	1. Determine operating mode of system at the GEN III controller, VENT-COOL-HEAT, and make call at thermostat for operating mode. (If system is in cooling mode, make call at thermostat for cooling). Watch damper control board for Run Open (RO) light. If RO does not energize, go to the thermostat and make an opposing call, watching the damper control board for Run Closed (RC) light. If damper light energizes, confirm damper actuator opens damper. If damper does not move, use meter to confirm 24 volts at RO and MC or RC and MC on damper actuator. If power is present, replace actuator.
AUXILIARY HEAT – REHEAT/BASEBOARD		
DAMPER OPENS WHEN BASEBOARD HEAT IS CALLING	No call for heat or thermostat is not set up for Baseboard heat	1. Confirm there is no call for heating on GEN III controller. If there is a call for heating on GEN III, then damper will be open. If cold air is coming from supply register, check HVAC unit. 2. If there is no call for heating on GEN III controller, confirm auxiliary heat set on zone thermostat in Zone Set Up menu. For Baseboard Heat, confirm selection for BASEBOARD.
DAMPER CLOSED WHEN REHEAT IS CALLING	No call for heat or thermostat is not set up for Reheat	1. Confirm auxiliary heat set up for zone on zone thermostat in Zone Set Up menu. For REHEAT, confirm selection for REHEAT.

System Setup Directory

INSTALLING CONTRACTOR	DATE OF INSTALL

PHONE NUMBER	SYSTEM ID#

ZONE ID	ZONE / ROOM NAME	MONITOR STAT	NOTES

NOTES

FINAL SYSTEM REVIEW

MONITOR STAT - Configurations

- ☐ Have you SYNCED the MONITOR thermostat with GEN III controller?
  MENU ITEM #11
- ☐ Have you confirmed TIME and DAY are correct on thermostat display?
  MENU ITEM #15
- ☐ Is a PASSWORD required? If so, has it been set?
  MENU ITEM #16
- ☐ Do you need to enable MORNING WARMUP?
  MENU ITEM #19
- ☐ Have you set an Operating Schedule for the building? Yes____ No____
  MENU ITEM #1
  - ☐ If you have set a schedule, is it a GLOBAL schedule or Individual Schedule per thermostat?
  - ☐ Have you completed the SET UP DIRECTORY at the end of the Manual? This is important to identify each thermostat's location and corresponding damper.
- ☐ Should any thermostats be locked? Lock at MONITOR STAT.
  MENU ITEM #2
  (Reminder, when thermostats are locked, local control still allows for temperature adjustment of +/- 2 degrees and override operations).
- ☐ Using the System Diagnostic function, have you confirmed the following items below?
  MENU ITEM #3
  - ☐ a. Number of dampers in the System
  - ☐ b. All dampers are communicating with MONITOR STAT
  - ☐ c. Have you confirmed Leaving Air (SA), Return Air (RA), and Outside Air (OA) temperatures are displayed

  (Note: An NC in these fields indicates No Communication, sensor will need to be checked).
- ☐ Have you entered the number of dampers on Menu Item #17 into the MONITOR STAT?

  (Note: Manually entering number of dampers into MONITOR STAT will speed up communication and system operations).
- ☐ Have you set/confirmed settings for HIGH and LOW limits?
  MENU ITEM #5
  - ☐ a. Is LOW limit set for 45°?
  - ☐ b. Is HIGH limit set for 145° on GAS/Electric unit?
  - ☐ c. Is HIGH limit set for 115° on Heat Pump unit?

  (Note: HIGH and LOW limits may be adjusted in the field, in most applications 45 degree LOW and 145GE/115HP HIGH settings are standard).
- ☐ Have you configured FAN OPERATION – ON or AUTO?
  MENU ITEM #9

For Technical Support Contact (800) 228-2966

GEN III - VVT

HOTLINE

(800) 228-2966

5622 Engineer Drive, Huntington Beach, CA 92649

(714) 898-9963 | (714) 898-6802

FACTORY FAX

Zonex SYSTEMS

comfort you control