COMMERCIAL CONTROLS
2022 WINNER
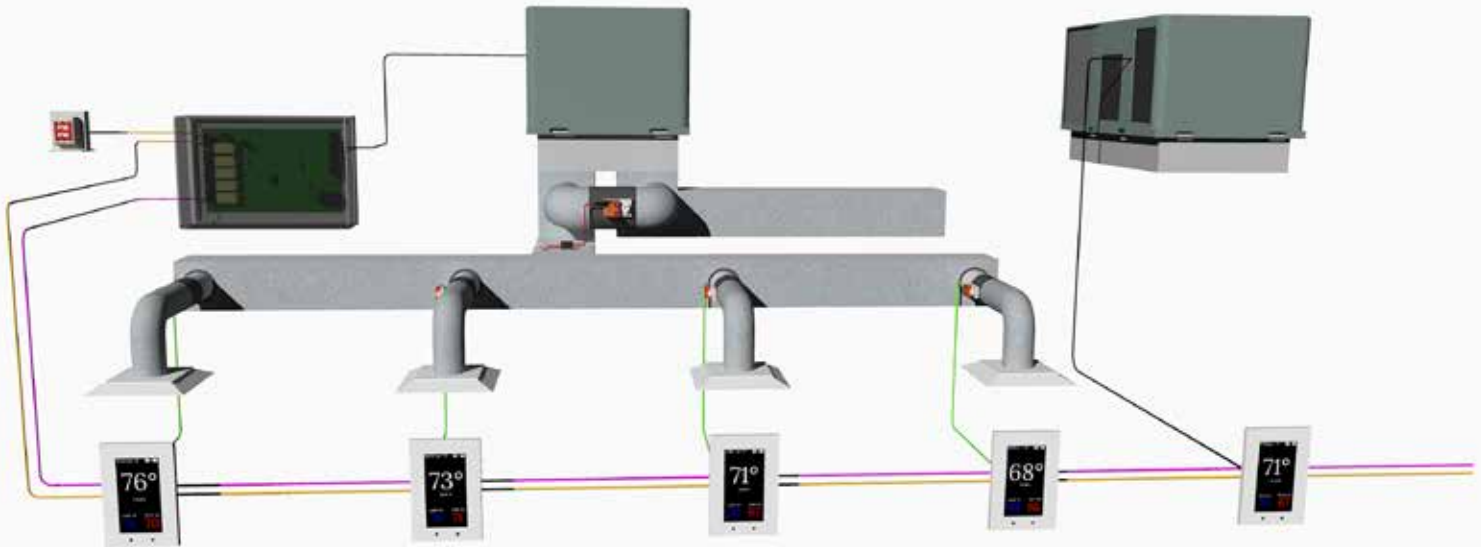
2022
DEALER DESIGN
AWARDS
theNEWS | GOLD

GEN V - VVT

VOTE BASED AUTO CHANGEOVER *VVT*

COMMERCIAL ZONING - **SIMPLIFIED**

Engineering & Application Guide

ZONEX
SYSTEMS
comfort you control

GEN V - VVT Engineering Guide

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Vote Based Auto Changeover Bypass VAV with Central HUB Thermostat

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

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

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

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

While the HVAC unit is running, the capacity control LAT (leaving air temperature sensor) 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 prevent 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 4 minutes or until heat call is satisfied and then cycle into a changeover purge. After a 3-minute purge cycle, cooling is energized until the cool call is satisfied or there is a majority vote for heat received by the GEN V controller. If all calls have been satisfied, after the 3-minute off delay, dampers will modulate to approximately 40% open position for ventilation mode.
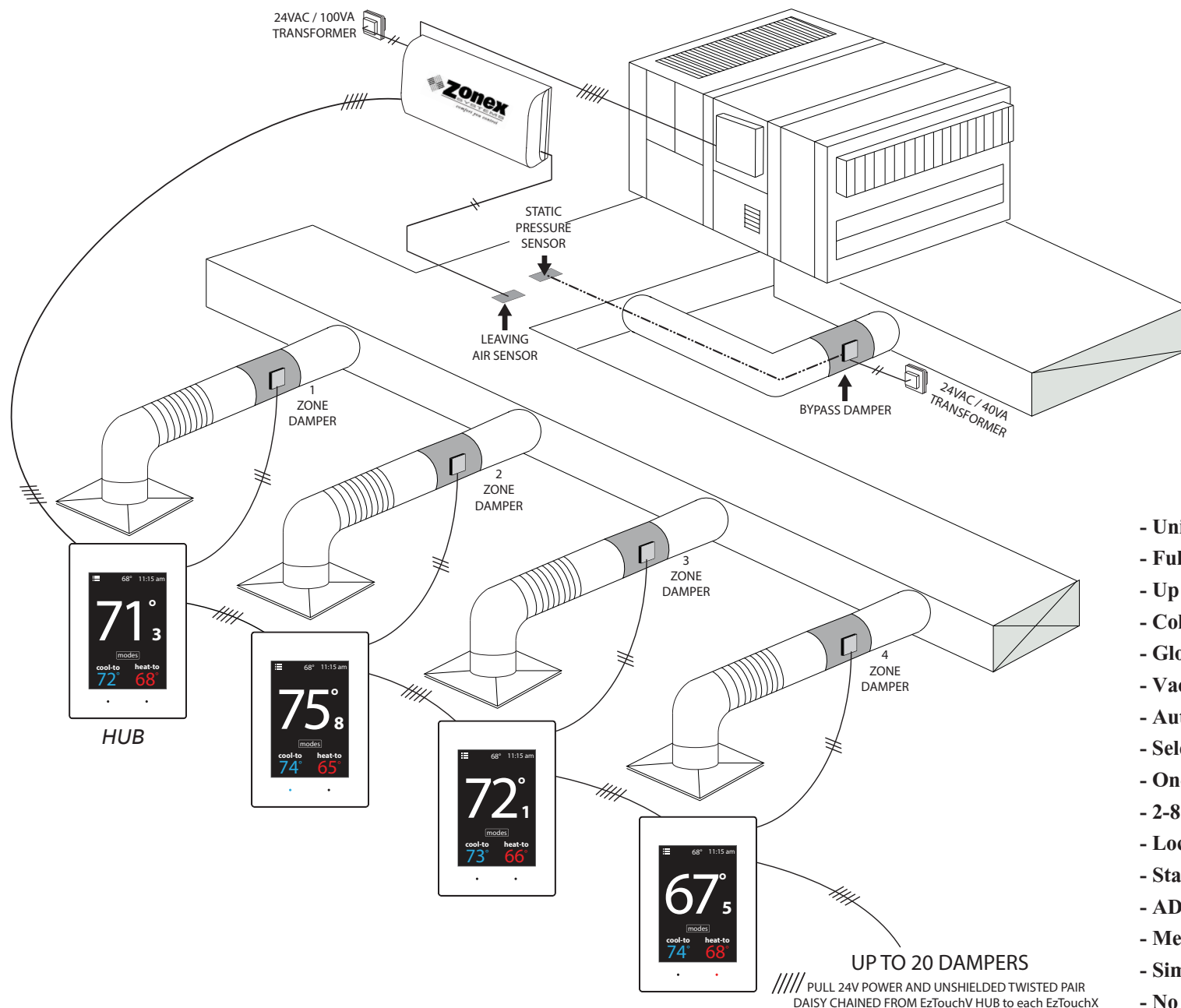
The system fan/blower operation can be configured for ON or intermittent AUTO operation.

All Zone thermostats are wired to there respective modulating zone damper. Thermostats, scheduling and diagnostic reports to streamline system troubleshooting, are generated at the HUB thermostat that interacts with all thermostats. The HUB thermostat shall establish global or individual schedules for the system, lock thermostats individually and provide local adjustment.

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, such as a conference room. A change to 0 for priority in that zone stat configuration will create a NULL vote for the 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.

GEN V - CONTROL SYSTEM
ON-SITE HUB ACCESS FOR SYSTEM CONFIGURATION AND OPERATION

24VAC / 100VA
TRANSFORMER

Zonex

STATIC
PRESSURE
SENSOR

LEAVING
AIR SENSOR

1
ZONE
DAMPER

2
ZONE
DAMPER

3
ZONE
DAMPER

4
ZONE
DAMPER

BYPASS DAMPER

24VAC / 40VA
TRANSFORMER

68° 11:15 am
71°₃
modes
cool-to heat-to
72° 68°

HUB

68° 11:15 am
75°₈
modes
cool-to heat-to
74° 65°

68° 11:15 am
72°₁
modes
cool-to heat-to
73° 66°

68° 11:15 am
67°₅
modes
cool-to heat-to
74° 68°

UP TO 20 DAMPERS
PULL 24V POWER AND UNSHIELDED TWISTED PAIR
DAISY CHAINED FROM EzTouchV HUB to each EzTouchX

System Features

- **Universal for G/E or H/P Units**
- **Fully Modulating Zone Dampers**
- **Up to 20 Zones Per Unit**
- **Color Touch Screen Thermostats**
- **Global or Individual Scheduling**
- **Vacation Scheduling**
- **Auto- Changeover Operation**
- **Selectable Priority**
- **On-board Capacity Control**
- **2-8 Hour Override**
- **Lock Stats Remotely**
- **Start Up Diagnostic and Overview**
- **ADR and FDD Compliant**
- **Meets Title 24 Requirements**
- **Simple daisy chain wiring**
- **No Home Run Wiring**
- **No Computer Required For Setup**

SUBMITTAL
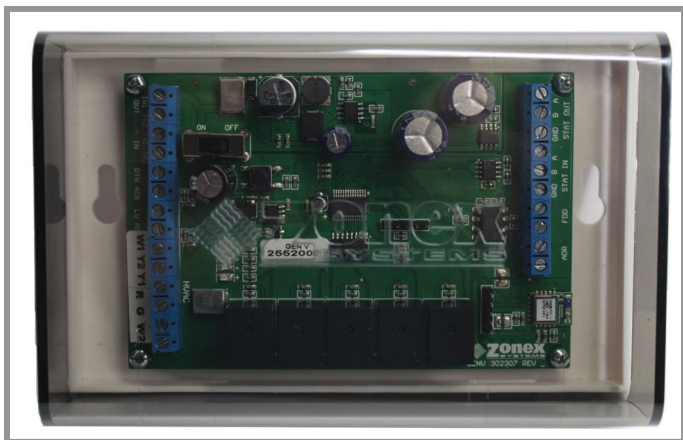
GEN V
System Controller

DESCRIPTION

The *GEN V* is a microcontroller based, auto changeover Universal Gas/Electric or Heat Pump system controller (Part # GEN V). The *GEN V* controls a zoned 2H/2C Gas/Electric HVAC unit or 3H/2C zoned Heat Pump unit and supports ADR and FDD requirements, along with fan control strategies to insure pre and post building purge and communicates with and supports up to 20 zones, utilizing pressure dependent, modulating dampers.

Standalone units may also be networked in and controlled from one central location using the SATouchX thermostat on each RTU or Split system.

The *GEN V* gathers information every 60 seconds from each thermostat in the system over a 3-wire data link.

The *GEN V* is equipped with integrated capacity control and High and Low temperature limits to protect compressors 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 changeover operation is vote based, predicated on a first call, first served, majority wins on changeover algorithm.

When the current mode callers are satisfied, a four-minute purge cycle is initiated prior to mode change-over.

The *GEN V* communicates with an EzTouchV HUB thermostat that allows configuration of *GEN V* controller along with every zone stat controlling modulating dampers or stand-alone units. From the Hub thermostat you can monitor communications and operations of the entire system. Modify zone thermostat set points individually or globally, set a global or individual schedule per zone and vacation schedules. The system operation meets Title 24 requirements.

Additional control strategies, including variance from setpoint, are also selectable features to initiate changeover.

The *GEN V* provides a software-based feature to assign priority. A priority vote of 0, 1, 2, or 3 votes may be established for every stat in the system at the *GEN V* controller.

The *GEN V* controller is equipped with a lock / unlock feature providing a central point to remotely lock all the EzTouchX's in the system. Locked thermostats will support a +/- 2° local adjustment or 0° variance. Each thermostat also supports a 2-8 hour override during unoccupied periods.

An on-board diagnostic feature identifies and leads the Installer to wiring errors quickly, if required.

TECHNICAL DATA

Electrical
Supply Voltage: 24vac
Power consumption: 0.7 VA
Inputs:
    24vac
    1 Temperature Sensing Thermistor
Outputs:
    24vac
    5 SPST dry contacts, 1A @ 24vac
Fuse protection: Use Fused Transformer

Environmental
**Operating temperature*:* 32 to 160° F (0 to 71° C)
Operating humidity: 10-95**%,** non-condensing
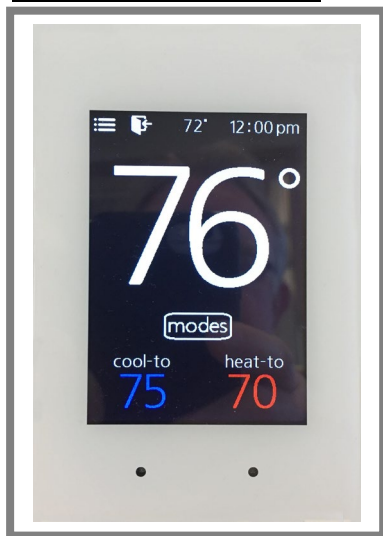**Storage temperature:** 0 to 160° F (-18 to 71° C)

General
Communications: 3 wire Plenum rated twisted pair Zonex Wire
Enclosure Dimensions: 4" H x 6 1/8" W x 1 3/4" D

12/2/20

EzTouchV – Color Touch Screen HUB Controller and Zone Thermostat

SUBMITTAL

EzTouchV – HUB Thermostat Controller
Communicating / Modulating
Color Touch Screen Zone Thermostat
for use with the GEN V Building Automation System

DESCRIPTION

The **EzTouchV** is the central HUB for configuring & managing both the system's thermostats and the GEN V controller. The EzTouchV also functions as a zone thermostat operating two position (spring open/power close), modulating medium pressure, heavy-duty dampers, and communicate with SAVs for VRF-VAV systems.

The EzTouchV/HUB stat is the interface for the management and programming of 2 - 20 thermostats which can change set points, lock/unlock stats, and scheduling of the thermostats. The HUB stat is also the interface for the management and control of the GEN V controller. This includes the unit type (Gas, Heat Pump, or VRF operation), unit staging, ADR, vacation scheduling, override operation, zone overview, and system diagnostic overview. The EzTouchV is the central HUB and operational center to control and manage all system components.

The EzTouchV controls modulating zone dampers based on variance from set point to a position that will match the supply load to the demand requirement. While the HVAC unit is running and 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. Additionally, the EzTouchV also functions as a zone thermostat operating several damper types. Two position dampers remain open when the system is in the vent mode or when the EzTouchV is calling for the same mode as the HVAC unit is currently operating in. If the EzTouchV is calling for the mode opposite to what the HVAC unit is calling for or is satisfied the two-position damper will remain closed.

The space ambient temperature is continuously displayed with a range of 55° to 95° F and reports RH% in the space. Set points can be manually adjusted at the thermostat or from the management interface. The thermostat can be locked through the management interface to limit or prevent set point adjustment at the thermostat. Override operation can be configured for a 2-8 hour window to provide for after-hours operation.

The EzTouchV can be field configured for baseboard and reheat* operations, including Fan Powered Boxes. With an adjustable 2-4° dead band for auxiliary heat operations.

***NOTE**: An air proving switch must be used for this application; field supplied.*

TECHNICAL DATA

Electrical
Input voltage: 24VAC
Power consumption: 5VA maximum
Output:
- RO/RC Triacs – 24VAC @ .3 amp max
- AUX Heat Relay – 15VA @ 24 VAC max

Temperature/Humidity Sensors
Display Range: 55° to 95° F
Humidity Sensor: (0-100% RH) +/-2% RH

Environmental
Operating Temperature: 35° to 130° F (2° to 54° C)
Operating Humidity: 5 to 95% non-condensing
Storage Temperature: 0° to 150° (-18° to 66° C)

General
Dimensions: 4 1/2" H x 3" W x 1" D
Accuracy: +/- 0.8° F
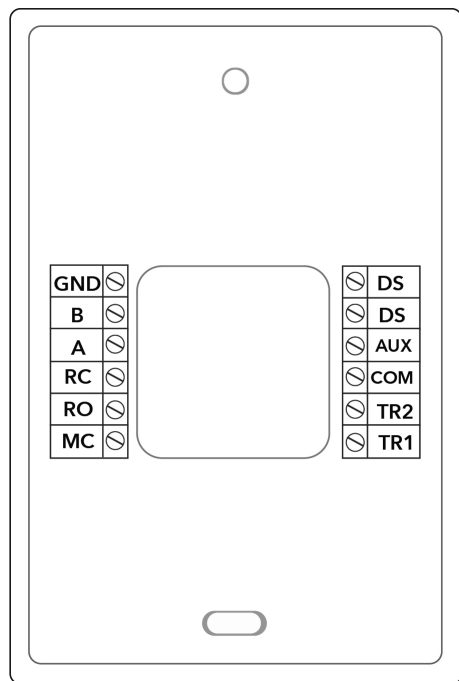**Memory:** Non-volatile EEPROM
Display: 320x480 3.5 TFT
Viewing Angle: 140°

Communication: RS485 - 2 wire Plenum rated twisted pair Zonex Wire

4/12/21

EzTouchV – Color Touch Screen HUB Controller and Zone Thermostat

TERMINAL FUNCTIONS

GND
B
A
RC
RO
MC

DS
DS
AUX
COM
TR2
TR1

24V Terminal Block
RO – Run Open, damper
RC – Run Close, damper
MC – Damper common

AUX – Reheat/AUX Heat Output
COM – Aux Common

DS – Duct Sensor (optional)
DS – Duct Sensor (optional)

TR1- 24vac power - In and Out
TR2- 24vac common - In and Out
(18 ga. Minimum wire size)

Communication Terminal Block
A – Data Transmit - In and Out
B – Data Receive - In and Out
GND – Not Used
(Use Zonex Two wire twisted pair
communication wire)

FEATURES

- Full Color Touch Screen Display
- High Tech look and operation
- Auto Changeover
- Adjustable Aux or Reheat operation
- Control Round or Rectangular dampers
- Diagnostic tool for thermostat communication and operation
- Control fully modulating dampers
- Relative Humidity reporting

- Set point lock
- Display lock out
- Auto / Off / Cool only / Heat only
- Non-volatile memory retains stored set points
- *Slave capability – up to 3 dampers per stat
- Temperature Calibration
- F° or C° Temperature operation
- Optional Duct Temperature monitoring (LAT sensor is not included)

ACCESSORIES

Part No.	Description
EzTouchV-RS	EzTouchV thermostat with remote sensor
LAT	Leaving Air Temperature sensor

*Smart Air Values (SAV) dampers cannot be slaved

EzTouchX – Color Touch Screen Zone Thermostat

SUBMITTAL

ZONEX
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EzTouchX
Communicating / Modulating
Color Touch Screen Zone Thermostat
for use with the
GEN X, GEN V and GEN XV Building Automation Systems

DESCRIPTION

The **EzTouchX** is a microprocessor based, auto changeover, communicating color touch screen zone thermostat used with the **GEN X, GEN V and GEN XV** (for VRF-VAV) control systems. The EzTouchX can operate two position (spring open/power close), modulating medium pressure, heavy-duty dampers, and communicate with SAVs for VRF-VAV systems.

The EzTouchX controls modulating zone dampers based on variance from set point to a position that will match the supply load to the demand requirement. While the HVAC unit is running and 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. Two position dampers remain open when the system is in the vent mode or when the EzTouchX is calling for the same mode as the HVAC unit is currently operating in. If the EzTouchX is calling for the mode opposite to what the HVAC unit is calling for or is satisfied the two-position damper will remain closed.

The EzTouchX is easy to configure and adjust via the touch screen display. Zone ambient temperature is continuously displayed with a range of 55° to 95° F and reports the RH% of the space it is located in. Set points can be manually adjusted at the thermostat or from the management interface. Thermostats can be locked through the management interface to limit or prevent set point adjustment at the thermostat. Override operation can be configured for a 2-8 hour window to provide for after-hours operation.

The EzTouchX can be field configured for auxiliary heat operations: baseboard, reheat*, and fan powered boxes with an adjustable dead band of 2-4°.

***NOTE**: An air proving switch must be used for this application; field supplied.*

TECHNICAL DATA

Electrical
Input voltage: 24VAC
Power consumption: 5VA maximum
Output:
  • RO/RC Triacs – 24VAC @ .3 amp max
  • AUX Heat Relay – 15VA @ 24 VAC max

Temperature/Humidity Sensors
Display Range: 55° to 95° F
Humidity Sensor: (0-100% RH) +/-2% RH

Environmental
Operating Temperature: 35° to 130° F (2° to 54° C)
Operating Humidity: 5 to 95% non-condensing
Storage Temperature: 0° to 150° (-18° to 66° C)

General
Dimensions: 4 1/2" H x 3" W x 1" D
Accuracy: +/- 0.8° F
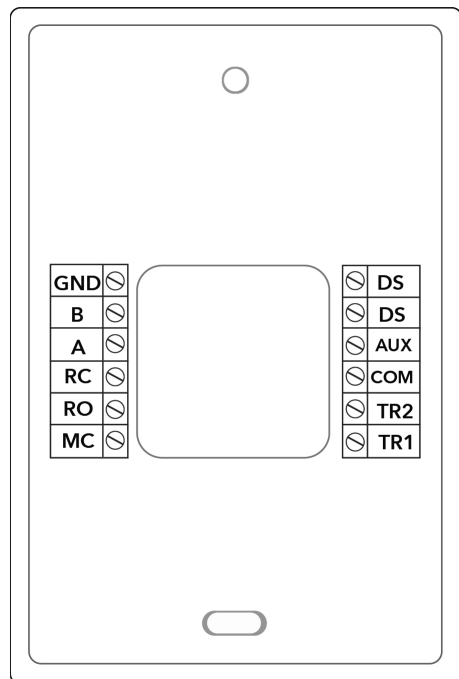**Memory:** Non-volatile EEPROM
Display: 320x480 3.5 TFT
Viewing Angle: 140°

Communication: RS485 - 2 wire Plenum rated twisted pair Zonex Wire

Rev 4/30/21

EzTouchX – Color Touch Screen Zone Thermostat

TERMINAL FUNCTIONS

GND				DS
B				DS
A				AUX
RC				COM
RO				TR2
MC				TR1

24V Terminal Block
RO – Run Open, damper
RC – Run Close, damper
MC – Damper Common

AUX – Reheat/AUX Heat Output
COM – Aux Common

DS – Duct Sensor (optional)
DS – Duct Sensor (optional)

TR1- 24vac power - In and Out
TR2- 24vac common - In and Out
(18 ga. Minimum wire size)

Communication Terminal Block
A – Data Transmit - In and Out
B – Data Receive - In and Out
GND – Not Used
(Use Zonex Two wire twisted pair
communication wire)

FEATURES

- Full Color Touch Screen Display
- High Tech look and operation
- Auto Changeover
- Adjustable Aux or Reheat operation
- Control Round or Rectangular Dampers
- Diagnostic tool for thermostat communication and operation
- Control fully modulating dampers
- Relative Humidity reporting

- Set point lock
- Display lock out
- Auto / Off / Cool only / Heat only
- Non-volatile memory retains stored set points
- *Slave capability – up to 3 dampers per stat
- Temperature Calibration
- F or C Temperature operation
- Optional Duct Temperature monitoring (LAT sensor is not included)

ACCESSORIES

| Part No.	Description
RZKITX	Thermostat and actuator as a package for VVT upgrades
EzTouchX-RS	EzTouchX thermostat with remote sensor
LAT	Leaving Air Temperature sensor

*Smart Air Values (SAV) dampers cannot be slaved

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.

CONTROL RELAY

HEATING COIL
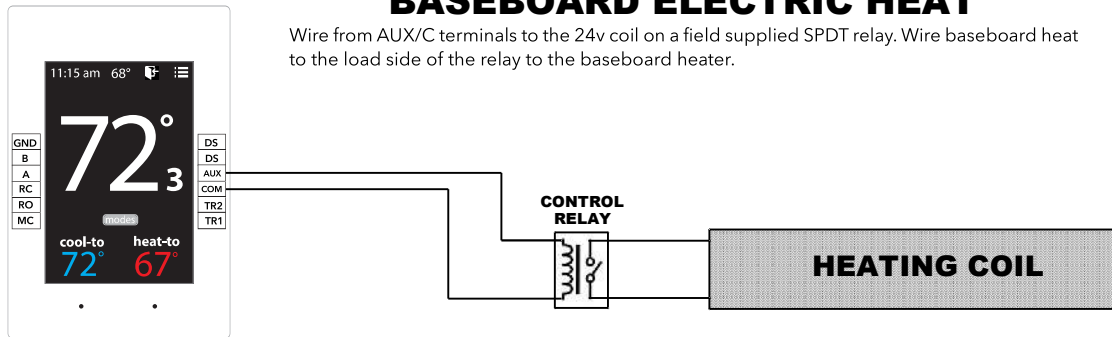
VAV DUCT REHEAT

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

AIRFLOW PROVING SWITCH

HEAT RELAY

HEATING COIL

CONTROL DAMPER
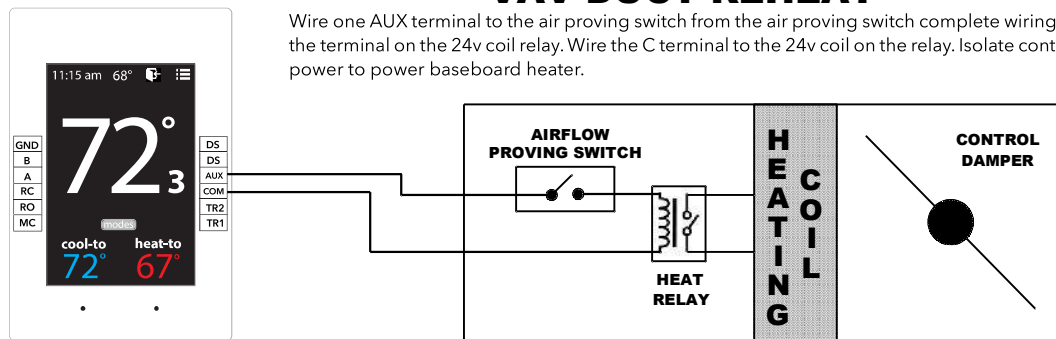
DUCT FAN REHEAT

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

AIRFLOW PROVING SWITCH

FAN RELAY

FAN

HEAT RELAY

HEATING COIL

CONTROL RELAY

24 VOLT TRANSFORMER
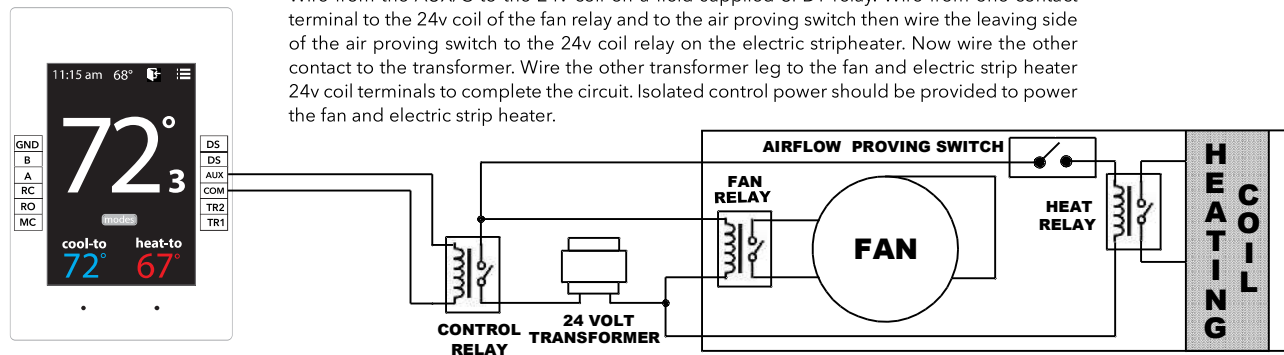
BASEBOARD HYDRONIC HEAT

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

CONTROL RELAY

HYDRONIC VALVE

24 VOLT TRANSFORMER

HEATING COIL
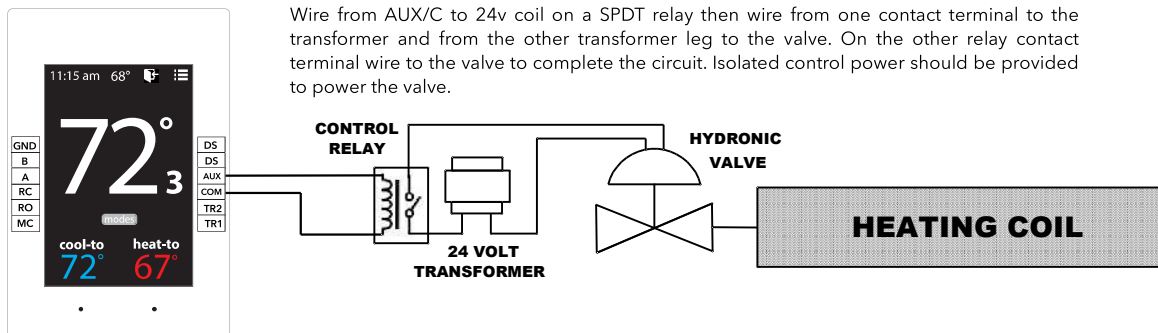
SUBMITTAL

SATouchX
Controls Stand Alone units
Programmable Communicating
Gas/Electric / Heat Pump Thermostat

DESCRIPTION

The Zonex Systems **SATouchX** is a microprocessor based, auto changeover, touch screen programmable communicating standalone thermostat. The universal standalone communicating thermostat operates and com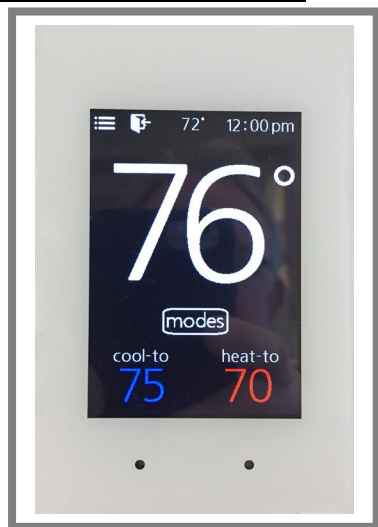municates with GEN X, GEN XV and GEN UC systems with our remote based App from a Wi-Fi mobile device and through the HUB stat for the GEN V system.

The SATouchX is quite easy to configure for Gas/ Elec (2-stage Cool / Heat) or Heat Pump (2-stage Cool / 3-stage Heat) configuration. The SATouchX is hard wired to the unit and communicates back to the control board via the RS- 485 communication link.

The SATouchX is equipped with a 24v occupied output signal to the economizer when the SATouchX is in occupied operation.

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

The ambient space temperature is continually displayed with large, easy-to-read numbers. The temperature display range is 45° to 95° F. FAN mode, Heat or Cool set points and operation modes are all indicated on the display. The SATouchX comes with a Supply and Return air sensor to monitor the air temperature.

Programmed set points can be manually adjusted at the thermostat or electronically locked and controlled through a mobile device, to provide limited manual set point adjustment. There is a 2-8 hour override, provided for after hour's operation.

TECHNICAL DATA

Electrical:

Supply Voltage: 24VAC
Power consumption: 5VA
Input:
- 24VAC
- Humidity/Temperature (0-100% RH) +/-2% RH and +/-0.2 °C

Output:
- 1 x 24VAC Bistable Relay
- 6 x 24VAC @ 2A Relay's

Communication: RS-485 – Zonex 2 wire twisted pair plenum rated wire

Environmental:
Operating Temperature: 35° to 130° F (2° to 54° C)
Operating Humidity: 5 to 95% non-condensing
Storage Temperature: 0° to 150° (-18° to 66° C)

General:
Dimensions: 4 1/2" H x 3" W x 3/4" D
Temperature Display Range: 55° to 95° F
Accuracy: +/- 0.8° F
Memory: Non-volatile EEPROM
Display: 320x480 3.5 TFT
Viewing Angle: 140°
Included Accessories: Supply and Return Air Sensors

Notes:
*Compatible with GEN X, GEN V, GEN XV, and GEN UC

Rev 7/21/21

SATouchX PROGRAMMABLE COMMUNICATING THERMOSTAT

TERMINAL FUNCTIONS

```
GND ⊘          ⊘ R
  B ⊘          ⊘ G
  A ⊘          ⊘ W1-O/B
OCP ⊘          ⊘ Y1
 W2 ⊘          ⊘ TR2
 Y2 ⊘          ⊘ TR1
```

Supply Air [AT1]
Return Air [AT2]
Remote Sensor [AT3]
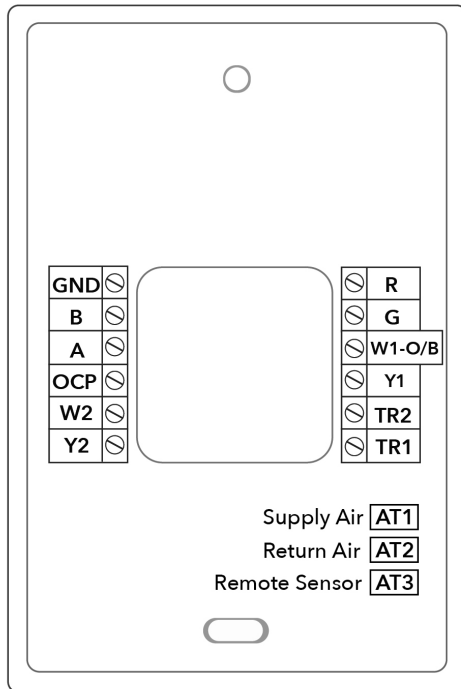
Unit Terminal Block
Y1 -   First stage cool
Y2 -   Second stage cool
W1 / O/B - First stage heat or Reversing Valve
W2 -   Second stage heat
G -   Fan
R-   24v from the unit
OCP – 24v output when in occupied mode

24v from Independent Transformer
TR1 - 24vac power input - In and Out
TR2 - 24vac power common - In and Out
Use 18 ga. Minimum wire size

Communication Terminal Block
A - Data Transmit - In and Out
B - Data Receive - In and Out
GND – Not Used
Use Zonex 2 Wire Twisted Pair

Supply, Return Air and Remote sensor plugs
AT1 - Supply Air sensor harness plug
AT2 - Return Air sensor harness plug
AT3 - Remote Sensor harness plug

FEATURES

- Full Color Touch Screen Display
- Gas /Elect (2C/2H) or Heat Pump (2C/3H) standalone control
- Emergency Heat operation
- Auto Changeover 7-day Programmable
- Attractive design
- Accurate temperature control
- Electronic Lock feature
- Supply and Return Air monitoring
- Relative Humidity reporting
- Optional Remote Sensor operation

- Configurable fan operation for Occupied mode
- F° or C° Temperature Operation
- Auto / Heat only / Cool only / Off operation
- Non-volatile memory: Retains temperature set points, time, date, and schedules
- RS-485 communication
- Temperature Calibration
- Communicates with GEN X mobile App
- 24v occupied output signal to RTU for economizer operation

ACCESSORIES

Part No.	Description
SATouchXRS	SATouchX thermostat with Remote Sensor
WPLT	Wall Plate

SUBMITTAL

Zonex
SYSTEMS
comfort you control

STMPD
Round Medium Pressure Modulating Supply Damper

DESCRIPTION

The **STMPD** is a medium pressure power open, power close pressure dependent supply air damper. The dampers are available from 6" – 18" round, with a maximum pressure differential of 1.75" W.C.   The STMPD may also function as a modulating bypass damper.

STMPD dampers feature an elliptical blade for linear air volume delivery throughout the damper range of travel.

The 6" – 10" damper cylinders are fabricated from 22 gauge steel; the 12" – 18" cylinders from 20 gauge steel. Each cylinder features two rolled beads, which provide maximum structural integrity. The trailing end is crimped for ease of installation. A positive air seal is accomplished through use of a high-density foam gasket around the blade perimeter. The damper blade is bolted to the hexagonal damper shaft.

 STMPD dampers feature 24V ac, full stall motors, which do not require use of end switches to terminate travel. Each STMPD is powered and controlled from its respective zone thermostat.

STMPD dampers can be wired in parallel to provide additional zone CFM capacity when required.

Damper motors are easily removed for damper shaft and motor inspection. Each actuator hat section is insulated to prevent condensation.   The actuator provides minimum open and close stops for air balance requirements.

For supply applications, the STMPD is wired to a Zonex thermostat for modulating operation.

TECHNICAL DATA

Electrical:
Supply Voltage: 24vac
Power consumption: 2 VA maximum (1.5w)

Environmental:
Operating temperature*: 20 to 125° F (-7 to 52° C)
Operating humidity: 10-95% non-condensing
Storage temperature: **-**20 to 130° F (-29 to 54° C)

General:
Shell: 20-22 gauge cold rolled galvanized steel
Shaft: 1/2" dia. aluminum, hexagonal
Bushings: Celcon
Actuator: Power Open/Power Close
Stroke: 60°
Pressure drop: < .04" W.C. @ rated CFM

Rev 3/3/21

TYPICAL CAPACITIES*

	Diameter	Nominal CFM	Velocity FPM	ΔP "WC
STMPD06	6"	110	540	.014
STMPD08	8"	250	700	.015
STMPD10	10"	410	750	.015
STMPD12	12"	660	850	.015
STMPD14	14"	1000	925	.035
STMPD16	16"	1450	1070	.036
STMPD18	18"	2000	1100	.036

* Capacities are for reference only. Duct friction rate should be established by use of ACCA Manual D, Manual Q or equivalent.

Dimensional Data

	Diameter	Length	Width
STMPD06	6"	10"	9"
STMPD08	8"	10"	11"
STMPD10	10"	12"	13"
STMPD12	12"	14"	15"
STMPD14	14"	16"	17"
STMPD16	16"	18"	19"
STMPD18	18"	23 1/2"	21"

ORDERING INFORMATION

Part No.	Description
STMPD06	Medium pressure zone damper, round, 6" diameter.
STMPD08	Medium pressure zone damper, round, 8" diameter.
STMPD10	Medium pressure zone damper, round, 10" diameter.
STMPD12	Medium pressure zone damper, round, 12" diameter.
STMPD14	Medium pressure zone damper, round, 14" diameter.
STMPD16	Medium pressure zone damper, round, 16" diameter.
STMPD18	Medium pressure zone damper, round, 18" diameter.

TERMINAL FUNCTIONS

Rc ⟷ ⊘ 3
Ro ⟷ ⊘ 2
Mc ⟷ ⊘ 1

RC- 24vac run damper closed
RO- 24vac run damper open
MC- 24vac motor common

SUBMITTAL

ZONEX SYSTEMS
comfort you control

STRD
Heavy Duty Round Supply Damper
Part # STRD

DESCRIPTION

The **STRD** is a fully modulating pressure dependent supply air damper. The dampers are available from 20", 22" and 24" round, with a maximum pressure differential of 2.5" W.C.

STRD dampers feature a round frame and triple V blades for automatic air control.

Damper cylinders and blades are fabricated from 16 gauge steel. Each damper is built with low leakage seals and stainless steel bearing.

STRD dampers feature 24V ac, full stall motors which do not require end switches. Each damper is controlled by its respective zone thermostat.

STRD dampers can be paralleled to provide additional CFM capacity when required.

Damper actuators can be easily removed from damper for servicing and motor inspection. Each actuator hat section is insulated to prevent condensation. The actuator allows for minimum and maximum stops for air balance.

TECHNICAL DATA

Electrical:
Supply Voltage: 24vac
Power consumption: 2 VA maximum (1.5W)

Environmental:
Operating temperature: 25 to 180° F (-32 to -83°)
Operating humidity: 10-95% non-condensing
Storage temperature: -25 to 180° F (-32 to -83°)

General:
Shell: 16 gauge cold rolled galvanized steel
Shaft: 1/2" dia. aluminum, hexagonal
Bushings: Synthetic
Actuator: Power Open / Power Close
Stroke: 90°
Pressure drop: < .04" W.C. @ rated CFM

Rev 5/13/19

Typical Capacities

	Diameter	Nominal CFM	Velocity FPM	ΔP "WC
STRD20	20"	2600	1200	.10
STRD22	22"	3250	1250	.10
STRD24	24"	4100	1350	.10

* Capacities are for reference only. Duct friction rate should be established by use of ACCA Manual D, Manual Q or equivalent.

Dimensional Data

	Diameter	Depth	Length	Width
STRD20	20"	20"	24"	27"
STRD22	22"	22"	24"	27"
STRD24	24"	24"	24"	27"

ORDERING INFORMATION

Part No.   **Description**

STRD20   Medium pressure zone damper, round, 20" diameter.
STRD22   Medium pressure zone damper, round, 22" diameter.
STRD24   Medium pressure zone damper, round, 24" diameter.
.

TERMINAL FUNCTIONS

Rc ←→ ⊘ 3
Ro ←→ ⊘ 2
Mc ←→ ⊘ 1

RC- 24vac run damper closed
RO- 24vac run damper open
MC- 24vac motor common

STCD MODULATING SUPPLY DAMPER

SUBMITTAL

zonex SYSTEMS
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STCD
Modulating Supply Damper

DESCRIPTION

The **STCD** is a heavy duty modulating or power open / power close supply air damper, which is designed for applications on Zonex control systems. The dampers are available from 8" X 8" to 24" X 24" in 2" increments, and from 24" X 24" 48" X 48" in 4" increments. The STCD will operate with a maximum pressure differential of 1.75" W.C.

STCD dampers feature parallel blade construction for height dimensions to 14" and opposed blade construction for height dimensions 16" through 48". STCD dampers 8" in height use a single damper blade.

The damper assembly is enclosed in a 16" long, 20 gauge galvanized steel sleeve, with standard slip and drive connections. Damper blades are bolted to a hexagonal damper shaft which rotates within stainless steel Oilite bushings. Damper blades close against steel blade stops. The damper linkage is non-adjustable and fully enclosed within the damper. Damper minimum and maximum positions are field adjustable on the actuator.

For supply applications, the STCD is wired to the ModStat for modulating operation.

TECHNICAL DATA

Electrical:
Supply Voltage: 24vac
Power consumption: 2 VA maximum (1.5W)

Environmental:
Operating temperature: 20 to 125° F (-7 to 52° C)
Operating humidity: 10-95% non-condensing
Storage temperature: -20 to 130° F (-29 to 54° C)

General:
Shell: 20 gauge cold rolled galvanized steel
Shaft: 1/2" dia. plated steel, hexagonal
Blades: 16 gauge galvanized
Bushings: Stainless steel oilite
Actuator: Modulating or Power Open / Power Close
Stroke: 90°

REV 2/1/18

5622 Engineer Drive / Huntington Beach, CA 92649 (800) 228-2966

STCD MODULATING SUPPLY DAMPER

TYPICAL RECTANGULAR SUPPLY CAPACITY

WIDTH IN INCHES →

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

HEIGHT IN INCHES (vertical label)

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.

WIDTH	HEIGHT	DEPTH
W	H	16"
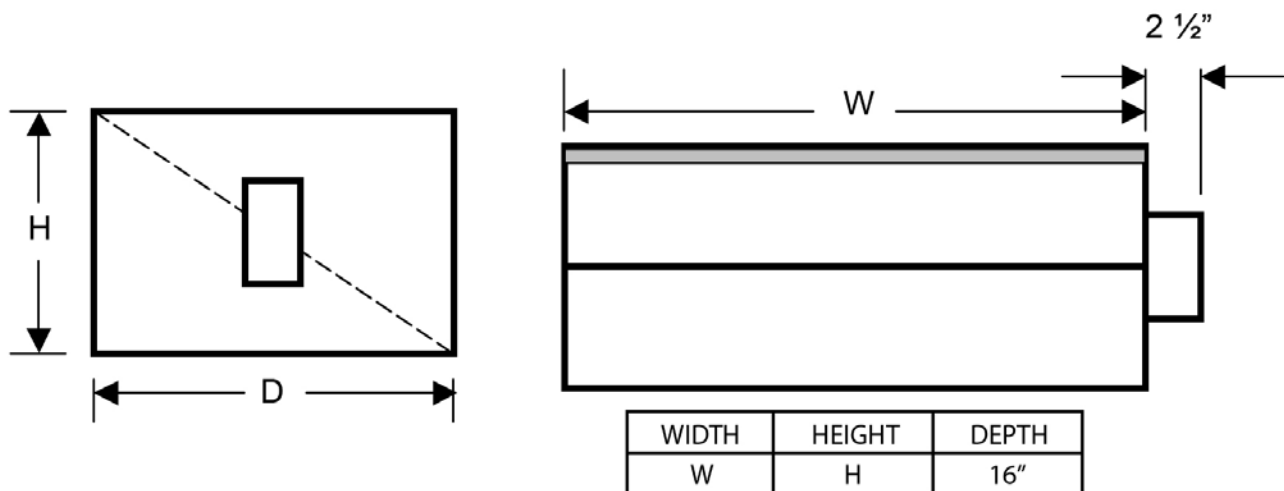
Sizes available from 8" x 8" up to 48" x 48"

2 ½"

SUBMITTAL

Zonex SYSTEMS
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Round Electronic Bypass Damper
with
Integrated Static Pressure Control
(Part # STBP)

DESCRIPTION

The **Electronic Bypass Damper** includes a factory mounted actuator and electronic static pressure controller used to control static pressure in zoned systems. The Electronic Static Pressure Control is adjustable, controlling a modulating bypass damper to maintain static pressure as zone dampers modulate. The bypass system reduces air noise from the supply outlets caused by excessive air velocity.

When the system is satisfied, the bypass damper will remain 25% open, if intermittent fan is used. On systems utilizing continuous fan operation, bypass will modulate based on system static. Bypass controller is adjustable to maintain static pressure range from .15" - .95" W.C. The Integrated Static Pressure Control **(IPC)** includes a quick start option or may be field adjusted to specified static pressure.

The electronic bypass is a modulating damper used for bypass applications. Bypass dampers are available from 6" - 18" round and 10x10 - 40x30 rectangular, with a maximum pressure differential of 1.75" W.C.

The 6"-10" damper cylinders are fabricated from 22 gauge steel; the 12"-18" cylinders from 20 gauge steel. Each cylinder features two rolled beads, which provide maximum structural integrity. A positive air seal is accomplished through the use of a high-density foam gasket around the blade perimeter. The damper blade is bolted to a hexagonal damper shaft.

Bypass Dampers feature 24V ac actuator. The integrated electronic pressure controller operates the motor, and each actuator hat section is insulated to prevent condensation.

Bypass Dampers can be paralleled or slaved to provide additional bypass CFM when required. If slaving two or more bypass dampers, consider utilizing a larger rectangular bypass.

TECHNICAL DATA

Electronic Integrated Bypass Damper

Electrical:
Supply voltage: 24vac
Power consumption: 2.3va
Input: 24vac
Outputs:
- 24vac (Run open)
- 24vac (Run closed)

General:
Control Range: .15" to .95" W.C.

By-Pass Damper
Electrical:
Supply Voltage: 24vac
Power consumption: 2va maximum (1.5W)

Environmental:
Operating temperature*:* 20 to 125° F (-7 to 52° C)
Operating humidity: Non-condensing
Storage temperature: **-**20 to 130° F (-29 to 54° C)

General:
Shell: 20-22 gauge cold rolled galvanized steel
Shaft: 1/2" Hexagonal aluminum
Bushings: Celcon
Actuator: Belimo
Stroke: 90°
Pressure drop: < .04" W.C. @ rated CFM

Rev 10/5/12

STBP ELECTRONIC BYPASS DAMPER

TYPICAL CAPACITIES

Round Bypass Selection Table

Diameter	CFM
8"	560
10"	900
12"	1250
14"	1700
16"	2200
18"	2600

Dimensional Data

Part #	Diameter	Length	Width
STBP08	8"	10"	11"
STBP10	10"	12"	13"
STBP12	12"	14"	15"
STBP14	14"	16"	17"
STBP16	16"	18"	19"
STBP18	18"	20"	21"
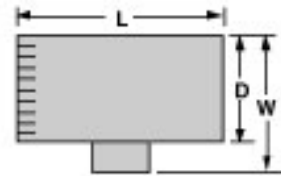
SENSOR LOCATION

IPC – Air Tube
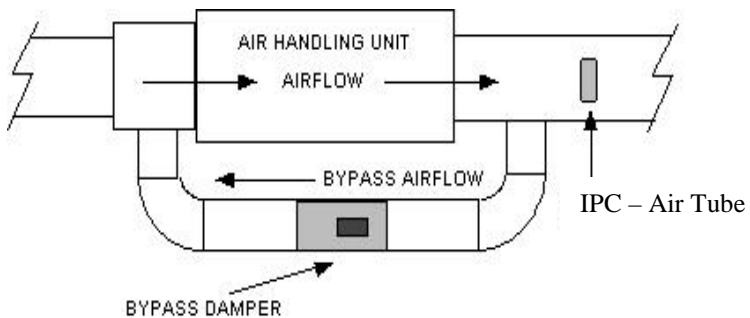
SUBMITTAL

Zonex
SYSTEMS
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Rectangular Electronic Bypass Damper *with*
Integrated Static Pressure Control
(Part # STCDBP)

DESCRIPTION

The *Electronic Bypass Damper* includes a factory mounted actuator and electronic static pressure controller used to control static pressure in zoned systems. The Electronic Static Pressure Control is adjustable, controlling a modulating bypass damper to maintain static pressure as zone dampers modulate. The bypass system reduces air noise from the supply outlets caused by excessive air velocity.

When the system is satisfied, the bypass damper will remain 25% open, if intermittent fan is used. On systems utilizing continuous fan operation, bypass will modulate based on system static. Bypass controller is adjustable to maintain static pressure range from .15" - .95" W.C. The Integrated Static Pressure Control **(IPC)** includes a quick start option or may be field adjusted to specified static pressure.

STCDBP dampers feature parallel blade construction for height dimensions to 14" and opposed blade construction for height dimensions 16" through 48". STCDBP dampers 8" in height use a single damper blade.

The damper assembly is enclosed in a 16" long, 20-gauge galvanized steel sleeve, with standard slip and drive connections. Damper blades are bolted to a hexagonal damper shaft, which rotate within a stainless steel Oilite bushing. Damper blades close against steel blade stops.

TECHNICAL DATA

Electronic Integrated Bypass Damper

Electrical:
Supply Voltage: 24vac
Power consumption: 2 VA maximum (1.5 watt)

Environmental:
Operating temperature*:* 20 to 125° F (-7 to 52° C)
Operating humidity: 10-95% non-condensing
Storage temperature: -20 to 130° F (-29 to 54° C)

General:
Shell: 20 gauge cold rolled galvanized steel
Shaft: 1/2" dia. plated steel, hexagonal
Blades: 16 gauge galvanized
Bushings: Stainless steel Oilite
**Actuator:** Power open / Power close
Stroke: 90°

STCDBP RECTANGULAR ELECTRONIC BYPASS DAMPER

TYPICAL CAPACITIES*

WIDTH 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	883	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

(Left axis: HEIGHT IN INCHES)

 * Capacities are for reference only at 1500 FPM. Duct friction rate should be established by use of ACCA Manual D, Manual Q, or equivalent.

SENSOR LOCATION

IPC – Air Tube
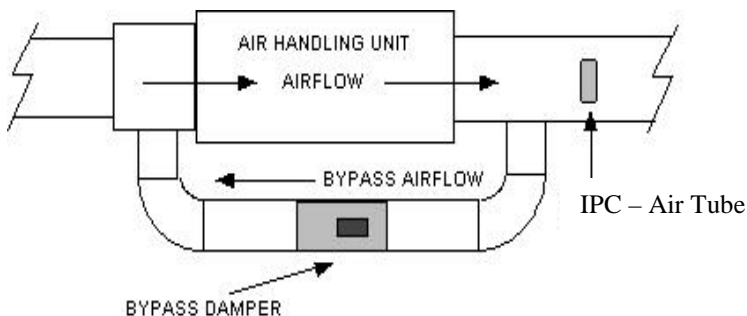
COMPONENT SELECTION GUIDE

GEN V *Control Solutions*
Manage the entire system from one central HUB

Part # - **GEN V**

1 - Per RTU or Split System
Supports 2 - 20 Fully Modulating Zones or Standalone Units

Daisy Chain: Zonex communication wire Part# STPR and 24VAC from Thermostat to Thermostat
Only 1-24VAC / 100VA Transformer Powers the GEN V and up to 20 modulating dampers

HUB - Touch Screen Thermostat
Part # - **EzTouchV**
Need 1 Hub Thermostat per GEN V system
Slave Up to 3 Zone Dampers per Stat

Zone Touch Screen Thermostat
Part # - **EzTouchX**
1- Thermostat per Damper
Slave Up to 3 Zone Dampers per Stat

Modulating Zone Dampers
Part #
STMPD + Damper Size - Round Damper (up to 1.75 S.P.)
STCD + Damper Size - Rectangular Dampers (up to 1.75 S.P.)

Electronic Bypass Damper
(Includes Integrated Static Pressure Control)

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

1-24vac / 40va Transformer to Power Bypass Damper

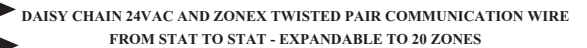## Thermostat to Control Standalone Units
Part # - **SATouchX**
Controls and Networks Standalone RTU or Split systems
with SA / RA / RH reporting

THIS COMPLETES YOUR GEN V SYSTEM

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

ZONEX
SYSTEMS
comfort you control

GEN V - CONTROL SYSTEM

VOTE BASED AUTO CHANGEOVER BYPASS VAV

TR1
24VAC
100VA

TR1
TR2

TR1
TR2

24VAC - IN

POWER SWITCH

24VAC - OUT

GEN V

PWR / COMM LINK

C1

RS485
COMMUNICATION
LINK

A
B
ADR
FDD

HVAC UNIT

OCP
Y1
Y2
W1
W2
G
R

LAT

BP-DM

SA

RA

LAT

SPT

TO SUPPLY DUCT   OPEN TO ATMOSPHERE

PWR
RO
RC

ZONEX SYSTEMS
PRESSURE CONTROL

-.6"   .9"

0   1.1"

BYPASS DAMPER CONTROL
IPC

RC RO MC

BYPASS DAMPER AT THE UNIT
BP-DM

MC
RO
RC

TR2

24VAC
40VA

RETURN
AIR SENSOR

LEAVING
AIR SENSOR

STATUS LIGHTS

G
W2
W1/OB
Y2
Y1
OCP

OCP
Y1
Y2
O/B
W1
W2
G
R
HP

TO UNIT TERMINALS

LAT

Optional Duct Temperature
monitoring (sensor is not included)

RC RO MC

MODULATING DAMPER
DM-1

RC RO MC

MODULATING DAMPER
DM-2

RC RO MC

MODULATING DAMPER
DM-3

H-1

11:15 am

73°₇

modes

cool-to   heat-to
72°   68°

HUB

GND
B
A
RC
RO
MC

DS
DS
AUX
COM
TR2
TR1

T-2

11:15 am

70°₁

modes

cool-to   heat-to
72°   68°

GND
B
A
RC
RO
MC

DS
DS
AUX
COM
TR2
TR1

T-3

11:15 am

71°₅

modes

cool-to   heat-to
72°   68°

GND
B
A
RC
RO
MC

DS
DS
AUX
COM
TR2
TR1

DAISY CHAIN 24VAC AND ZONEX TWISTED PAIR COMMUNICATION WIRE
FROM STAT TO STAT - EXPANDABLE TO 20 ZONES

DEVICE	ID	DESCRIPTION
CONTROL BOARD	C1	GEN V CONTROLLER CONTROLS 2-20 MODULATING DAMPERS ONLY 1-24VAC/100VA TRANSFORMER POWERS ALL SUPPLY DAMPERS
EZTOUCHV THERMOSTAT	H-1	HUB - COLOR TOUCH SCREEN THERMOSTAT
EZTOUCHX THERMOSTAT	T2 -T20	COLOR TOUCH SCREEN THERMOSTAT
ZONE DAMPER ACTUATOR	DM	SUPPLIED WITH ZONE DAMPER
SYSTEM TRANSFORMER	TR1	24VAC/100VA TRANSFORMER SIZED @ (5VA PER ZONE) DAISY CHAINED THERMOSTAT TO THERMOSTAT
BYPASS TRANSFORMER	TR2	IND. 24VAC/40VA TRANSFORMER TO POWER THE BYPASS DAMPER
SUPPLY AIR LAT DISCHARGE SENSOR	LAT	SUPPLY LAT LOCATED BEFORE THE BYPASS
RETURN AIR LAT DISCHARGE SENSOR	LAT	RETURN LAT LOCATED BEFORE THE BYPASS
INTEGRATED STATIC PRESSURE CONTROL	IPC	SUPPLIED WITH THE BYPASS DAMPER (FACTORY PRE-WIRED)
STATIC PRESSURE TUBE	SPT	LOCATED AFTER THE BYPASS BEFORE THE FIRST SUPPLY TAKEOFF
BYPASS DAMPER ACTUATOR	BP-DM	SUPPLIED WITH BYPASS DAMPER (FACTORY PRE-WIRED)
RS485 COMMUNICATION LINK	◯◯◯	ZONEX TWISTED PAIR WIRE DAISY CHAINED EZTOUCHV TO EZTOUCHX
24VOLT WIRING TO EZTOUCH	——	USE 18/2 THERMOSTAT WIRE TO DAISY CHAIN THE 24VOLTS FROM EZTOUCH TO EZTOUCH
24VOLT WIRING FROM EZTOUCH TO DAMPER MOTOR	- - -	USE 18/3 THERMOSTAT WIRE FROM THE EZTOUCH TO THE DAMPER MOTOR

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

GEN V Control System
Using
Programmable Thermostats

Automatic Temperature Control Specification

Section 15950 - Controls and Automation

PART 1: General

1.1 The automatic temperature controls (ATC) under this section will be supplied and installed in accordance with the General Conditions, Supplementary Conditions, and all Division I General Requirements and Referenced Documents.

1.2 The installation of the ATC shall be in accordance with all National, State and Local codes pertaining to this type of work.

1.3 All work must comply with Section 15050 − Basic Materials and Methods − and all other Division 15 Sections, as applicable.

1.4 The scope shall include furnishing and installing a temperature control system to include remote control panels, temperature control devices, appurtenances, etc. to accomplish specific control sequences specified herein, to provide overheating and freeze protection for HVAC units, sensing and indicating devices, temperature indicating instruments, supporting structures and other required components.

1.5 The scope shall include all thermostats, sensors, dampers, actuators, microprocessor central controllers, VAV diffusers, static pressure sensors, fan powered boxes, and reheat products and all other new components of the system requiring connections.

PART 2: General Instructions

2.1 The Building Automation System/Automatic Temperature Control (BAS/ATC) Systems as specified herein shall be provided in their entirety by the BAS/ATC Contractor. The BAS/ATC Contractor shall base his Bid on the system as specified and on the sequence of operations.

2.2 As part of his Bid, the BAS/ATC Contractor shall submit for review by the owner's authorized representatives a written description of his BAS/ATC systems, including block diagrams, showing all major components and control panels and required cabling between each.

2.3 The BAS/ATC contractor shall include manufacturer's literature for each type of panel, controller, or device that may be shown on the Riser Diagram.

2.4 The Riser Diagram shall show schematically the entire building system with all major components identified.

PART 3: Scope of Work

3.1 The BAS/ATC systems shall be supplied and installed completely under the BAS/ATC Contract. Control components shall be mounted and wired by the BAS/ATC Contractor.

3.2 The BAS/ATC Contractor shall provide the engineering, installation, calibration, software programming and checkout necessary for complete and fully operational BAS/ATC systems, as specified hereafter.

3.3 Wiring in exposed areas and in mechanical rooms shall be in EMT. Wiring in accessible, concealed areas shall be plenum rated cable.

PART 4: Submittals

4.1 The following data/information shall be submitted for approval:

4.2 Complete sequence of operation.

4.3 Control system drawings, including all pertinent data, to provide a functional operating system.

4.4 Damper schedules showing size, configuration, capacity and location of all equipment.

4.5 Data sheets for all hardware control components.

4.6 A description of the installation materials including conduit, wire, flex, etc.

4.7 Thermostat/Sensor locations.

4.8 Control panel locations.

4.9 Provide as part of the submittal five copies of all data and control drawings.

PART 5: Qualifications

5.1 The BAS/ATC Contractor shall have an office within a 100-mile radius of the job site, staffed with factory trained personnel capable of providing instruction, routine maintenance and 24-hour emergency maintenance service for all system components.

5.2 The BAS/ATC Contractor shall have a minimum of three years' experience installing and servicing similar microprocessor-based control systems.

5.3 The Contractor shall be prepared to provide evidence of this history as a condition of acceptance and approval prior to bidding.

PART 6: System Description

6.1 The SYSTEM shall be a commercial modulating Auto Changeover Building Automation System with modulating Bypass that controls a single HVAC unit and supports 2 - 20 modulating zones per RTU or split system. Zones shall be controlled via wired programmable thermostats or a wireless zone sensor. The *GEN V* control panel shall be Universal and support Gas/Electric or Heat Pump applications with two cooling stages and three stages of Heat.

6.2 The "HUB" thermostat shall be central control point for the system to configure, manage, and monitor system operation.

6.3 Zone dampers shall be fully modulating with elliptical dampers. The system shall poll each thermostat every 60 seconds to evaluate the number of heating and cooling calls in the System. Control decisions shall be Vote based. A priority selection device shall be available to weight or add priority to one or more zones from the HUB thermostat. Priority selections shall be 0, 1, 2, or 3 votes selectable for each thermostat or wireless sensor independently. System shall also provide an Opposed Call feature to address maverick or rouge zones in the system.

6.4 The HUB thermostat shall display outside air temperature and Leaving and Return Air Temperatures at all times from the unit and provide for an adjustable setting for cooling and heating cut out set points. Occupied and unoccupied set up and set back capability shall also be available with 2 – 8-hour override capability. An individual or global thermostat locking function shall be available from the HUB providing minimum local control at each thermostat in the system.

6.5 The System shall provide full control of HVAC heating and cooling equipment in multiple zone applications. System shall also support non zoned RTU or split systems networked into the system and all systems and zones shall be accessible to view, monitor and control from the HUB thermostat.

PART 7: Control Manufacturer

7.1   The control system will be the *GEN V – Control* System, as manufactured by Zonex Systems, Huntington Beach, CA. Any substitution of the above specified control system will require a 10-day prior approval by the engineer.

7.2   For pricing, contact the factory at 800-228-2966 or visit www.zonexproducts.com

7.3   For substitution, submit a complete description, engineering data, and names of existing installations of substitute products.

7.4   Be prepared to provide a field inspection by the engineer, if they choose to observe the actual installation of proposed substitution.

PART 8: Stand Alone System Controller

8.1   Each zoned HVAC unit shall contain a stand-alone microprocessor controller capable of supporting up to 20 modulating zones, to be controlled with wired thermostats or wireless zone sensors on site directly from the HUB thermostat. A computer, mobile device, or internet connection is not required for system operation.

8.2   The system controller shall be universal and equipped to handle Gas / Electric or Heat Pump units and will communicate and power all zones with one twisted 2 wire data link and 24-volt AC power daisy chained stat to stat, System controller shall power all modulating or 2-wire zone dampers in the system with no more than 1 – 24V 100 VA transformer.

8.3   The system controller will be automatic changeover logic. The system utilizes first call priority and majority rule operation. System must address or have the ability to address opposing calls. When a call is made to the system, the HVAC system will be turned on to the proper mode. During the operation of the HVAC unit the GEN V system controller will poll all zones every 60 seconds to determine that the majority of zones are being satisfied and not requiring opposite mode operation.

8.4   If the majority of the zones want the opposite mode during the polling, the changeover to the opposite mode will start after a maximum of five minutes in the existing mode to attempt to satisfy all calls in this mode. After five minutes, the existing mode of operation is terminated with the blower continuing to purge the system for 240 seconds. After the purge cycle is completed, the dampers will take 90 seconds to reposition themselves for the opposite mode. After the dampers reposition themselves, the opposite mode is energized. If the system has satisfied all calls, all dampers shall modulate to approximately 40% position for ventilation.

8.5   The system controller will communicate to the zone thermostats the mode the system is in, and the zone thermostats will notify the damper of which position to meet that zone's needs.

8.6   The system controller shall include an onboard capacity controller and algorithm to protect the HVAC equipment.

8.7   GEN V controller shall support ADR functions and provide FDD alerts to meet California Title 24 and other states energy requirements.

PART 9: (Communications Hub)

9.1   Any thermostat in the system shall be capable of communicating with the *GEN V* Controller to initiate control sequences.

9.2   System schedules i.e. set up and set back times along with days of operation shall be established at the HUB thermostat.

9.3   Set points shall be lockable, either individually or globally, from the HUB thermostat, allowing for minimum temperature adjustment at each local thermostat.

9.4   The HUB thermostat shall monitor temperatures, both occupied and unoccupied set points, shall be established either individually or globally from the HUB thermostat.

9.5   Second Stage delay operation shall be initiated by time or temperature selection from the HUB.

9.6   The HUB shall provide adjustable override hours for system thermostats for 2 – 8 hours.

9.7   The HUB thermostat shall provide a selectable fan option for continuous or intermittent operation.

9.8   The system shall include an onboard capacity controller and algorithm based on time and discharge air temperature to protect the HVAC equipment. High and low limit protections to protect the coil from freeze up or premature heat exchanger failure shall be built in to allow adjustment and calibration from the HUB thermostat.

9.9   System shall be vote based and the HUB thermostat shall provide the ability to establish system priority with 1, 2 or 3 additional votes on one or all thermostats in the system, establishing priority votes to accelerate changeover operation. A "0" or null option shall also be available.

9.10   Unit type Gas, Electric, Heat Pump OBO or OBB shall be established from the HUB thermostat.

9.11   The system controller shall be equipped with an onboard diagnostic accessed via the HUB thermostat to ensure the installing contractor's control wiring and communication wiring are operational.

9.12   The HUB thermostat shall provide the air balance contractor with the ability to open all zone dampers and energize the fan from the HUB thermostat.

9.13   The system controller shall allow the contractor to provide default occupied and unoccupied set points for every thermostat or sensor in the system directly from the HUB thermostat.

9.14   Maverick or rogue system calls shall be recognized and, if not addressed with a field selectable 15 – 30-minute period, system shall purge and satisfy the maverick call. This feature may be enabled or disabled from the HUB thermostat.

9.15   Temperature format F Fahrenheit or C Celsius shall be selectable at the HUB thermostat and, when selected, any and all temperature or sensing devices shall be displayed in that temperature format.

9.16   HUB thermostat shall provide all time clock functions for the system.

9.17   HUB thermostat shall enable / disable vacation scheduling.

9.18   Morning warm-up shall be enabled from the HUB thermostat.

9.19   HUB thermostat shall provide password capability to protect the system and to ensure only authorized operators interact and control the system functions.

9.20   GEN V controller shall retain all set points in non-volatile memory.

9.21   All thermostat functions shall be available for review from each system thermostat to streamline service and system trouble shooting.

9.22   Manufacturer's default settings may be established or reset from the HUB thermostat.

Part 10: Capacity Controller (HVAC Equipment Protection)

10.1   The capacity control receives the heating or cooling signal from the system controller and the cut in and cut out set points established at the HUB to regulate the equipment (on and off) to meet the building requirements.

10.2   The *GEN V* controller shall be equipped with a Leaving Air Temperature sensor to constantly monitor and display the discharge air temperature along with Return Air Temperature. Outside air temperatures shall be displayed at the HUB's system diagnostics screen.

10.3   The capacity control shall have the capability to shut down stages based on a rise or fall in leaving air temperature above or below a fully adjustable range of temperatures. The system

shall provide protection from short cycling and protect the unit from coil freeze up or overheating the heat exchanger.

10.4 Capacity control shall also provide second stage heating or cooling operation based on a fully adjustable timer with a range of 3 – 30 minutes in increments of 1 minute. Second stage operation shall be initiated based on time and leaving air temperature selectable options on the HUB.

PART 11: Zone Temperature Sensors (Zone Thermostats)

11.1 The typical Zone Temperature Sensor is a wired thermostat (EzTouchX) and will contain all of the electronics to:

11.2 Control fully modulating or two position zone dampers to provide for proper temperature control.

11.3 Thermostats shall be color LCD touch screen control to set independent heating and cooling set points and to contain a minimum two-degree dead band.

11.4 Thermostats shall include touch screen that allows the operator to change or review the thermostat set points along with multiple and selectable thermostat control functions, display options and diagnostic capabilities.

11.5 The thermostat, if remotely locked from the HUB, shall provide local control of +/- 2 degrees from the locked heating or cooling set point or "0" degrees if required. The adjustable temperature range is from 55 to 95 degrees F. Celsius display shall also be available.

11.6 Each zone thermostat shall contain one microprocessor that receives the current temperature from the space, which communicates to the central *GEN V* control microprocessor via a 2-wire RS 485 data communications link.

11.7 The zone thermostat shall have a large digital display showing current space temperature, time, day, current mode of operation, and the heating & cooling set points established for that zone.

11.8 Each zone thermostat shall have the ability to be switched to the OFF mode; when initiated, its zone damper will drive to the fully closed position.

11.9 Each zone thermostat can control up to three slaved modulating dampers. Two or more slaved two position dampers shall require an additional transformer and relay(s).

11.10 Thermostat shall be available with Remote sensor capability.

11.11 When utilizing perimeter electric or hot water baseboard heating for supplemental heating, the thermostat operates a zone damper only for airflow and energizes the supplemental heat when the temperature drops two degrees below set point. At one degree below set point, it signals the system of a heating call. Heat range shall be adjustable at the HUB thermostat from 2-4 degrees.

11.12 When utilizing reheat feature, the thermostat shall energize reheat and modulate damper 40% to provide space temperature heating.

11.13 System shall support control and one or multiple standalone units using the SATouch X LCD color touch screen thermostat integrated into same system, all accessible locally from the HUB.

PART 12: Bypass Dampers and Controls

12.1 The modulating bypass damper(s) with integrated static pressure control are to be installed as shown on accompanying drawings. When utilizing a ceiling return, there must be a short return plenum with the bypass directly connected to the supply and return plenum.

12.2 When the HVAC unit utilizes an economizer section, the return air inlet to the return air plenum must contain counter balanced dampers to prevent air pressurization of the return air system.

12.3 Each round bypass damper (Model STBP) shall consist of 20-22 gauge galvanized metal duct fitted with an elliptical damper to provide linear airflow. The damper shall contain a foam seal to prevent leakage when fully closed. Each damper will contain a full stall 24-volt modulating

actuator, which shall not draw more than 2 VA on one drive assembly. The damper shell will be crimped on one end and beaded on both ends for damper rigidity.

12.4 Each rectangular bypass damper (Model STCDBP) shall be constructed of a 20-gauge "snap-lock" steel frame with S & Drive connections. The total length of the damper will be 16". Dampers 10" and smaller in height will utilize single blade construction; dampers larger than 10" in height will utilize opposed blade construction. The damper blades are of formed steel design with gasketed stops to provide quiet operation and structural integrity.

12.5 The bypass damper shall be controlled by an electronic integrated static pressure control. This bypass sensor shall be located downstream of the bypass connection from the supply plenum and upstream from the first zone damper. This device continually senses the discharge air static pressure and signals the bypass damper to modulate open or close.

12.6 Bypass may be slaved with additional dampers, if required, to provide additional bypass; or consider utilizing one larger rectangular bypass.

PART 13: Zone Dampers

13.1 Each round zone damper (Model STMPD) used with wired thermostats, shall consist of 20-22 gauge galvanized metal duct fitted with an elliptical damper to provide linear airflow. The damper shall contain a foam seal to prevent leakage when fully closed. Each damper will contain a full stall 24-volt modulating actuator, which shall not draw more than 2 VA on one drive assembly. The damper shell will be crimped on one end and beaded on both ends for damper rigidity. Dampers shall be equipped with min/max position stops and indicators. A damper board to accommodate 24 V power shall reside on each damper.

13.2 Each rectangular zone damper (Model STCD) shall be constructed of a 20-gauge "snap-lock" steel frame with S & Drive connections. The total length of the damper will be 16". Dampers 10" and smaller in height will utilize single blade construction; those dampers larger than 10" in height will utilize opposed blade construction. The damper blades are of formed steel design with gasketed stops to provide quiet operation and structural integrity. Dampers shall be equipped with min/max position stops and indicators. A damper board to accommodate 24 V power shall reside on each damper.

13.3 Zone dampers shall be fully modulating in operation based on input received from each zone thermostat. Modulation shall be predicated on variance from set point. If the system has satisfied all calls, all dampers shall modulate to the 40% position for ventilation.

PART 14: Transformers and Wiring

14.1 An independent 24-volt transformer sized at 5 VA per zone damper shall power the *GEN V* System Controller and all dampers in the system.

14.2 The bypass dampers shall be served by an independent 40 VA / 24-volt transformer.

14.3 All power wiring of this system shall be 24-volt AC.

<div align="center">END OF SECTION 15950</div>

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