GEN X
Mobile APP based VVT System
Using
Programmable Wireless or Wired Thermostats

GENERAL SEQUENCE OF OPERATION

GEN X controller wires to the HVAC unit with legacy style connections Y1, Y2, W1/OB, W2, G, and R. Each minute the controller communicates to each zone via RS485 connection daisy chained along with 24v of power wired damper to damper with wireless thermostats, or wired stat to stat when wired thermostats are utilized. Wired and wireless thermostats may be mixed throughout the system. Each zone thermostat, wired or wireless is configured with a unique address for the system. Each wireless damper is equipped with a damper board ID and synced to its wireless programmable thermostat in the system.

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

When the last calling zone is satisfied (in either heat or cool mode), the *GEN X* 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 the zone dampers 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. 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 and will then energize the AUX terminal and strip heat will energize.

While the HVAC unit is running onboard capacity controller, LAT (leaving air temperature sensor), monitors leaving air temperature from the HVAC unit to provide high and low limit protection for the equipment. Using adjustable high and low limits set in controller via the mobile App, the *GEN X* control will cycle the HVAC unit to protect against coil freeze-up, premature heat exchanger failure or manual reset limits found within HVAC unit. 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 X* controller. If all calls have been satisfied, after the 3-minute off delay, dampers will modulate to approximately 40% open position for ventilation mode and distribute recirculation air if the system fan/blower operation is configured for continuous or ON operation during Occupied time. Fan/Blower operation may be configured for ON or Auto operation via the mobile App. When configured for ON, fan/blower will run whenever the system is in occupied mode. When configured for Auto fan/blower will operate only when there is a call for heating or cooling.

All Zone thermostats are paired with its respective modulating zone damper. Wireless thermostats are synced with respective damper via the communicating damper board (CDB). Thermostats, scheduling and diagnostic reports to streamline system troubleshooting, are generated from a mobile App that interacts with all thermostats every minute and initiates control decisions for the system. The mobile App establishes global or individual schedules for the system, lock thermostats individually or globally, generates e-mail and text alerts and provides local adjustment, on site or remotely over internal Wi-Fi or the Internet. Air balance shortcuts, along with password protection, are also enabled from the App. Sleep and energy saving modes are available to extend battery life and enhance operation of wireless thermostats.

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 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 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.

All system configurations including startup & commissioning, thermostat management, scheduling, and diagnostic reports to streamline system installation & troubleshooting are done with our free Mobile APP. With the free Mobile APP users can remotely establish global or individual schedules for the system, lock thermostats individually or globally, adjust set points, on site or remotely over internal Wi-Fi or the internet. System management can also be performed from any web browser by visiting www.genxcontrol.com and entering your username and password.

The *GEN X* provides effective temperature control and minimizes wiring issues by using wired or wireless programmable zone thermostats. Additional zoned systems, along with stand-alone units, may be controlled with the GEN X RM that supports and networks additional units. Mobile Wi-Fi or web based App streamlines installation, commissioning or servicing the system.