

## BACnet VVT® PARALLEL (INTERMITTENT) FAN POWERED TERMINAL CONTROL WITH PROPORTIONAL HOT WATER HEAT PRESSURE DEPENDENT CARRIER CONTROL PACKAGE NO. 8860

### Application:

Parallel fan powered terminals equipped with the above control package are designed to work with cooling only primary air source equipment and provide pressure dependent, variable volume, variable temperature (VVT) control when connected to a VVT zone thermostat. The intermittent terminal fan is used to pull in ceiling plenum air as the first stage of heat and provide sufficient airflow when the hydronic heat is energized. These systems allow a low minimum inlet static pressure, permitting the use of smaller, more energy efficient fan systems. Hot water reheat coils located at each terminal can additionally satisfy zone heating loads when the equipment is providing cooling. The minimum airflow set points can be set to zero. The fan provides airflow across the heat coil when the primary air source is off.

A wall-mounted thermostat located in each zone will sense load requirements and activate the control sequence to accommodate cooling or heating. Load requirements and sound level acceptability govern terminal sizing. This control package provides the following sequences of operations:

- A. Cooling: When the primary air source is providing cooling (as detected by the primary air sensor), refer to numbers on flow diagram. See Fig. 1.
- 1-2 indicates that maximum airflow is established by the user-defined maximum damper position until the zone comes under control at 2.
  - Beginning at 2, the airflow is regulated over a throttling range by the damper until the user-defined minimum damper position is reached at 3.
  - 3-4 indicates that, should the zone temperature continue to fall, the damper will hold the minimum damper position. % AIRFLOW

NOTE: The minimum damper position could be set to zero on any one zone. In this case, the damper will hold a fully closed position if the zone temperature continues to fall.

B. Hot water reheat: When the primary air source is cooling, refer to numbers on flow diagram.

- As the zone temperature falls below the occupied heating set point, the Occupied Heating mode is in effect.
- Below the heating set point, the airflow is increased to the user-defined maximum heat limit. The terminal fan is energized. At this point the hot water valve modulates to maintain occupied heating setpoint.

NOTE: If hydronic heat is configured on and the system fan has not yet been energized the valve will be open for a period of time before the system fan will be commanded on to allow the coil to heat up before delivering conditioned air.

- As the zone temperature rises, the hot water valve modulates closed and the fan is deenergized.

C. Unoccupied time period: (cooling)

When the unoccupied period is reached, the user-defined occupied cooling set point is reset upward to a user-defined unoccupied cooling set point. The damper will throttle in the same manner (as per A) during the unoccupied period, using the unoccupied cooling set point.

D. Unoccupied time period: (auxiliary heat)

When the unoccupied period is reached, the user-defined occupied heating set point is reset downward to a user-defined unoccupied heating set point. The hot water valve and fan will operate as required to satisfy the heating load.

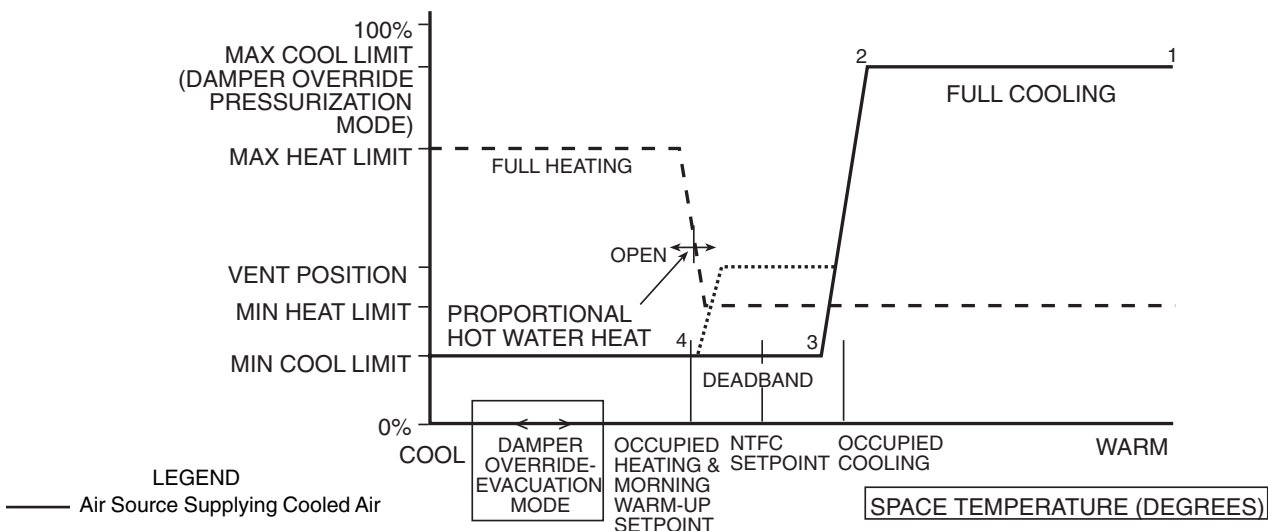


Figure 1 - Sequence of Operation for VVT, Cooling with Proportional Hot Water Heat

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