

ASHP Operation for Premisys DOAS

MESCA – Energy Recovery and Ventilation



As demand for heat pump technology continues to rise for comfort heating and cooling equipment, centralized ventilation is also picking up on the same demand. The Premisys DOAS now has an air-sourced heat pump (ASHP) option for primary heating/cooling with back up heating. We will take a closer look how this works:

The Premisys DOAS using ASHP option comes with integrated secondary heating (i.e. Gas Furnace, Electric SCR coil, or Hot Water Coil). The ASHP will operate in heating mode down to 10°F. Below this ambient temperature, ASHP will be locked out and the secondary heater will turn on and provide heat to meet LAT of 70°F (adj.). This is a quick switchover between the primary heating (HP) to the secondary heating, which uses a built-in logic in the DDC controller. Cooling mode will run as normal with the heat pump coil. Cooling lockout set at 65°F (adj.).

The ASHP has integrated defrost sequence in place to alleviate potential frost build up on the outdoor coil (condenser coil) during heating operation. The controller will initiate a defrost sequence based on OA air conditions and saturated suction temperature that the controller is continuously monitoring. When the defrost sequence is active the ASHP operation switches to cooling mode for a short period of time (about 3-5 minutes) to allow hot refrigerant flow through the outdoor coil. During defrost, the secondary heating device takes over seamlessly to continue providing fresh, heated air in the building. When defrost cycle is complete, primary heating is switched back and resumes operation.

In summary, there are 3 scenarios when the back-up heat will be activated:

1. Ambient temperature dips below 10°F
2. Defrost mode enabled
3. Supplementary heating required to meet LAT if HP coil does not have enough capacity. This scenario wont exist if Premisys is equipped with ERV

With this heat pump option, the need for gas or electric heating resistance is greatly reduced due to the ASHP system being used primarily for the majority of the year. The Premisys ASHP system is capable of handling up to 22 tons capacity and is available in 575V, 460V, 230V, and 208V power.