



Pelican Wireless Systems

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September 20, 2019

Pelican PEARL Ventilation

When a Pelican PEARL is controlling an Outside Air Damper it can be configured to provide ventilation for the indoor space. Ventilation is through either a fixed Minimum Damper Position or Demand Controlled Ventilation. Below is the sequence of operation for either condition:

Sequence Of Operation - Minimum Damper Position

When using a Minimum Damper Position, the PEARL is configured to open the Outside Air Damper anytime the unit is set to run a heating, cooling, or ventilation cycle. This position is configured as a fixed percentage. Ventilation can be scheduled so it only occurs during Occupied periods to prevent excess outdoor air from being brought into the space during unoccupied hours.

When there are multiple fan speeds or a variable speed fan, the PEARL will adjust the Minimum Damper Position based on the fan speed to retain the correct ventilation rate. The PEARL uses the Minimum Outside Air Damper Position configured as the position to set the outside air damper when the fan is at 100% speed. Therefore, if the fan is running slower then the outside air damper will open further, in the same ratio, to keep the amount of outside air coming in the same. For example, if the Minimum Outside Air Damper Position is set to 10% open at 100% fan speed, then when the fan is running at 60% the Outside Air Damper will open to 14%. There are five (5) inputs for fan speeds in the PEARL: First Stage Cooling, Second Stage Cooling, First Stage Heating, Second Stage Heating, Fan Running.

Sequence Of Operation - Demand Control Ventilation

When using Carbon Dioxide (CO²) with the PEARL, the PEARL can be configured for Demand Control Ventilation. This means the PEARL will adjust the Outside Air Damper anytime the CO²

reading in the space rises above the CO² setpoint. CO² is an indication that people are present and the amount of CO² (in parts per million (PPM)) indicates how many people are in the space. The higher the CO² reading, the higher the occupancy and more ventilation is required.

There are two configurations inputs for Demand Control Ventilation: Minimum Damper Position and Maximum Damper Position. The PEARL will place the Outside Air Damper in the Minimum Damper Position anytime the unit is set to run a heating, cooling, or ventilation cycle and the CO² levels are below the CO² setpoint. As the CO² levels rise, the outside air damper will be opened further until reaching the Maximum Damper Position, at which point the damper will not open further. This sequence occurs as the CO² levels adjust. Ventilation can be scheduled so it only occurs during Occupied periods to prevent excess outdoor air from being brought into the space during unoccupied hours.

When there are multiple fan speeds or a variable speed fan, the PEARL will open the outside air damper further in proportion to the fan speed change. Therefore, if the fan is running slow, the outside air damper will open further to keep the amount of outside air being brought into the space the same no matter the fan speed. This outside air damper fan change ratio corresponds across all damper positions during all CO² readings. There are five (5) inputs for fan speed in the PEARL: First Stage Cooling, Second Stage Cooling, First Stage Heating, Second Stage Heating, Fan Running.