



# Adaptive Management Design Strategies

Advanced design with complete system integration and ongoing monitoring improves the stability, efficiency, and performance of the refrigeration system. Designing equipment with state-of-the-art technologies and control strategies achieves better energy savings, reduces wear on components, and maintains more consistent system pressures and temperatures.

## VFD on Compressors (MT & LT)

Variable Frequency Drives (VFDs) are used to control the speed of electric motors. They are particularly useful in systems with varying load requirements. By applying VFDs to medium and low temperature compressors, Sensori™ adjusts the compressor's speed and capacity according to the system's cooling demands. This achieves energy savings, precise control, and reduced stress on the compressor.

## Full Floating Head Condenser Control

Using a "floating head" control strategy allows the condensing pressure setpoint to be adjusted based on the outdoor ambient temperature. As the outdoor temperature changes, Sensori™ adjusts the condensing pressure to maintain efficient heat rejection. This helps prevent overcooling or undercooling of the refrigerant and optimizes system performance.

## Outdoor Temperature Reset

Outdoor temperature reset involves adjusting various system parameters (such as setpoints or control strategies) based on the outdoor ambient temperature. Sensori™ helps improve system efficiency and performance by adapting to the external conditions.

## PID Control for Compressor Staging

Proportional-Integral-Derivative (PID) control is a common control technique used to regulate processes. In the context of compressor staging, PID control of temperatures, pressures, flow, and speed can help manage multiple compressors' on/off cycling to match the cooling demand more precisely. Monitoring and controlling these processes help to optimize the performance of the compressors and ensure they operate within their intended ranges. 

