

Digi-DXR Reduced Refrigeration Energy 35% Poultry Processing Plant Application

Project Information

Since August 2024, the Digi-DXR system has been successfully implemented in two refrigeration systems at a poultry processing plant:

- **System A:** Equipped with two SW1L5000-L4 compressors, each rated at 37 kW, featuring three-step slide valves.
- **System B:** Equipped with two SWL7000-L4 compressors, each rated at 52 kW, also with three-step slide valves.

The facility maintains a constant space temperature of 0°F, operating 24/7, with hourly variable utility rates.

Two Digi-DXR controllers have been installed to manage Systems A and B independently. Additionally, a variable frequency drive (VFD) has been added to one compressor in each system.

The Digi-DXR system optimizes performance through:

- Suction pressure setpoint adjustments based on utility rates and space temperature.
- Implementation of the optimal compression ratio.
- Optimization of condensing temperature and pressure setpoints.
- Variable speed control for condenser fans and compressors.



Figure 1: Photo of Digi-DXR Control Board

The implementation of Digi-DXR has significantly improved system reliability and safety while reducing energy consumption and utility costs by over 35%. During cool weather conditions, the full-capacity equivalent power demand drops to as low as 30% (See Figure 2 for detail).

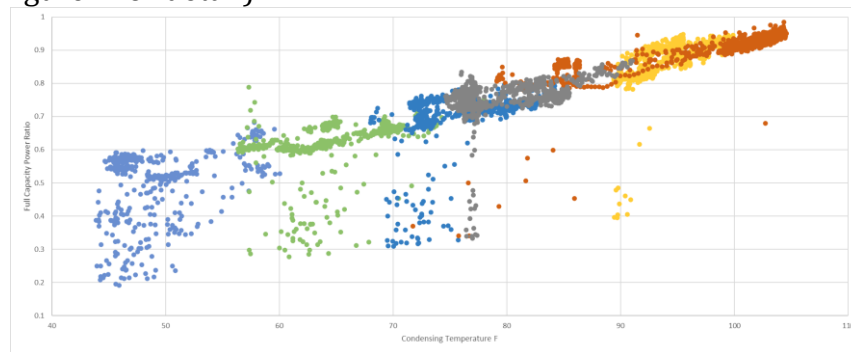


Figure 2: Measured Full Refrigeration Capacity Power Ratio Under Different Operation Conditions