UNITRONICS®

Application Story

Vision280™ Cools Ammonia Refrigerant in Chilling System Application

Two Vision280™ OPLCs Controlling 2 Large Ammonia Compressors

All over the world, industries such as food, dairy, meat processing, and pharmaceutical are using refrigeration compressors and chilling systems for frozen storage. Seagull Refrigeration, Ltd., an industrial refrigeration company based in the Republic of Ireland, specializes in the supply of ammonia refrigeration systems. The units also compress refrigerants such as CO2, F-Gasses and many other refrigerants using motor sizes ranging from 55Kw to 455Kw. In this particular application for a pharmaceutical plant they were in need of a control system that gave Seagull Refrigeration the ability to add I/O options inexpensively, and adapt easily to their individual customer requirements. Driven by a 315Kw motor, the compressors are speed controlled. In this particular case, the compressor is designed to cool ammonia to -29° C. This ammonia refrigerant then cools Methanol (an alcohol based coolant) to -25° C. Methanol is then used to cool the vessels in the production of the drug. The Vision280™ was chosen to monitor and control the compressor. “The keyboard was useful as these units can be located in machine rooms where a touch screen option may not be suitable.” Said Denis Morrissey of Seagull Refrigeration. “The unit we chose was a cost effective and reliable solution.”

The compressors that Seagull supplies are manufactured in France by Samifi France, so they needed to develop the program in two languages- French and English. This was managed by the controller’s string library option- this particular controller can support up to 8 different languages. When cooling is required, the controller sends an output to start the compressor oil pump. Once oil pressure is established, the controller starts the main motor. If more cooling is required, the controller speeds up the motor to a maximum of 3600rpm. If less cooling is required, the controller slows the motor to a minimum speed of 1500rpm.

While the compressor is running, the Vision280™ is monitoring the following: low oil pressure, low inlet gas pressure, high outlet gas pressure, methanol temperature, oil filter differential pressure high, high

motor amps, high ammonia temperature, low oil temperature, and motor bearing temperatures. Many digital inputs are also used- such as remote start, coolant flow, change set point, etc. A total of 17 digital outputs, 17 digital outputs, 18 analog inputs, and 2 analog outputs were used in the control process. “The main benefit of this unit is that we could adapt the program easily to the customer’s needs.” Said Denis. “Combined PLC and HMI make the unit compact and easy to install. The communication possibilities are a huge advantage as most dedicated controllers use 1 dedicated protocol.” Denis continues- “One of the best aspects of Unitronics is their customer support. If the topic is not covered in the examples or forum, an email to customer support has never failed to return a prompt and comprehensive solution to any problems that we have had. Of course, the product’s reliability was also a plus.”

Because of high noise levels inside the room, they installed one Vision570™ Outside connected via CANbus to the Vision280™ units.