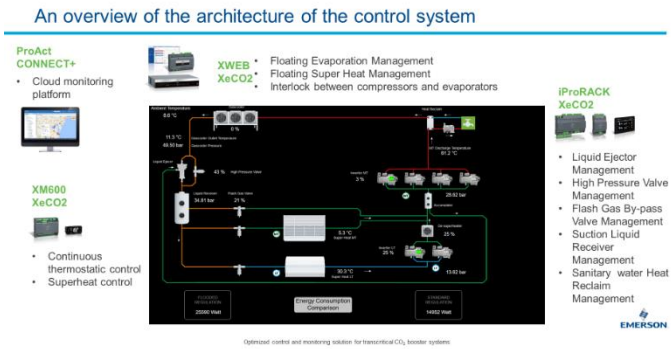
Sustainable cooling solutions:
Optimized and innovative control and monitoring solution, for transcritical CO_2 booster systems

CATEGORY:
Commercial Refrigeration

THE CONTEXT:
Client's site is a medium size supermarket, located in the Italian Alps, North of Venice. The focus was to support the customer's desire to switch towards a natural refrigerant system, while facing the most common challenges: efficiency versus complexity of the system and its maintenance costs.

SUSTAINABLE COOLING SOLUTION:

- As a result of the mild temperatures of the location, the system designer opted for a transcritical CO_2 booster system which incorporates a liquid ejector.
- **Emerson developed an innovative** electronics ecosystem, **$XeCO_2$** hosting the functionalities required to support the ejector's special requirements.
- Installed into the transcritical CO_2 booster system of the supermarket, $XeCO_2$'s **main objective was reached**: delivering the expected savings and preserve the system reliability, by coping with continuous fluctuations of operative conditions. The constant bi-directional communication among supervisory system, compressor rack controls and refrigerated display case controls, allowed to maximize the benefit of the liquid injector, while preserving the reliability of the entire system.



- Case controls feed data to the supervisor that defines when there is room to increase the evaporation temperature and save energy. After that condition is verified, a setpoint change is dispatched to the compressor rack control, in charge of maintaining the desired evaporation temperature. This also applies in the opposite direction when there is a need for more refrigeration capacity, at the expense of increased energy use.
- The rack controller monitors that there is a regular flow of refrigerant back to the compressors, imposing changes to the case controls, to preserve the system reliability.
- Featuring an easy setup and user-friendly interface, the **$XeCO_2$** supervisor helped the client to have easy remote access to the refrigeration system and to optimize the control system for energy efficiency and overall reliability.

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BENEFITS:

- CO2 as natural refrigerant solution
- Improved system efficiency
- Innovative algorithm that allows staged heat recovery for sanitary water and heating purposes
- Safe, reliable operation of the system – compressor protection
- Flexible control system, applicable to most of the already existing CO2 architectures
- Electronics ecosystem fully optimized for the CO2 natural refrigerant
- Reduced maintenance activities on the system
- User-friendly interface
- Easy setup
- Remote access

TOPIC:

- Building Automation and Control

GENERAL INFORMATION

NAME OF THE COMPANY:
Emerson Commercial and Residential Solutions

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HYPERLINK TO LEARN MORE ABOUT THE SUSTAINABLE COOLING SOLUTION:
https://climate.emerson.com/en-gb