

CLEAN.

NATURAL.

SMART.

CO₂

Micro Thermo Technologies CO₂ Solutions

Refrigeration Control Products



ENGINEERING YOUR SUCCESS.



Sporlan's Micro Thermo Technologies is at the forefront of CO₂ refrigeration management systems.

Micro Thermo Technologies has designed and installed more transcritical CO₂ systems in North America than any other refrigeration controls company.

Micro Thermo
Technologies

CO₂

- Low global warming potential (GWP) of 1
- High efficiency refrigerant
- Safe and natural (non-toxic, non-flammable)
- Not affected by HFC legislation

Sporlan's Micro Thermo Technologies' CO₂ control solutions cover the three main types of CO₂ refrigeration systems:

- 1 Subcritical Cascade
- 2 Liquid CO₂ (Secondary)
- 3 Transcritical (Booster)



1 Subcritical CO₂ DX Cascade Systems

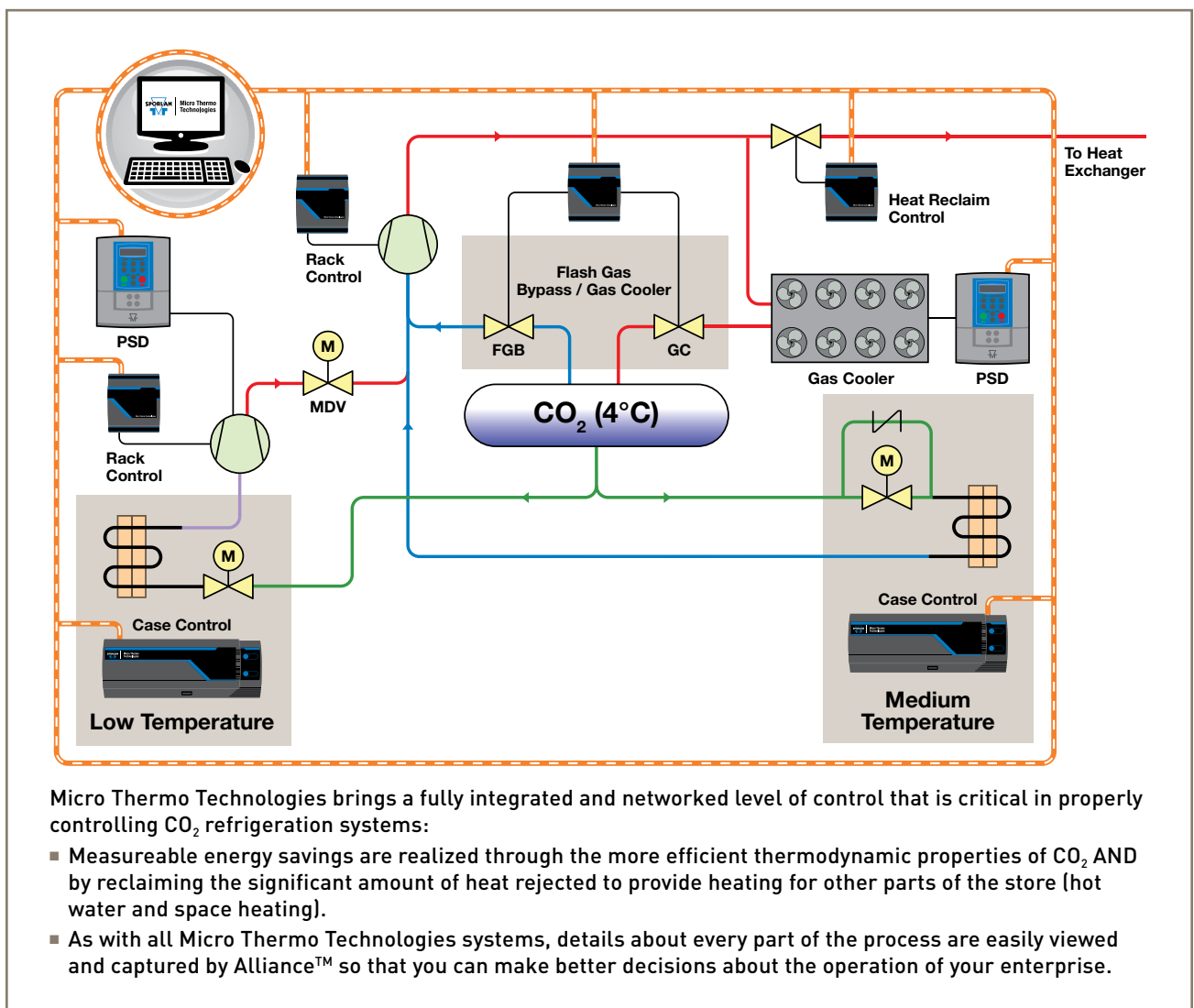
In a CO₂ subcritical application, liquid CO₂ passes through an electric expansion valve into an evaporator just like other refrigerants in a direct-expansion system. To keep pressures from getting too high (which happens in transcritical applications), a subcritical CO₂ DX system is used as the low pressure side of a cascade system. So for most CO₂ cascade applications, control of the flow of CO₂ is handled in the same manner as other types of refrigerants.

2 Liquid CO₂ Overfeed System

Liquid CO₂ can be used as a very efficient heat transfer fluid. Essentially, a chiller using traditional refrigerants is used to cool liquid CO₂, which is then pumped through coils, similar to water or brine coils. The product or space is cooled and liquid CO₂ is allowed to partially change state to take advantage of the thermodynamic properties of liquid boiling. The low viscosity and high heat transfer coefficient of liquid CO₂ increases system efficiency. This type of system is easy to install and commission and uses significantly less HFC refrigerant charge.

3 Transcritical CO₂ Systems

Transcritical systems make the most efficient use of CO₂'s excellent heat transfer properties. But it's also the trickiest one to properly set up and manage. Micro Thermo Technologies' controls makes it easier. In transcritical systems the CO₂ liquid density and vapor density converge at a particular temperature. These systems run at very high pressures (1000+ psi). Systems operating at transcritical temperatures have very high heat reclaim effectiveness and because of the high pressures, components sizes can be much smaller.



Micro Thermo Technologies brings a fully integrated and networked level of control that is critical in properly controlling CO₂ refrigeration systems:

- Measureable energy savings are realized through the more efficient thermodynamic properties of CO₂ AND by reclaiming the significant amount of heat rejected to provide heating for other parts of the store (hot water and space heating).
- As with all Micro Thermo Technologies systems, details about every part of the process are easily viewed and captured by Alliance™ so that you can make better decisions about the operation of your enterprise.

Micro Thermo Technologies CO₂ Control Platforms



Case Control

- Uses a predictive information model to optimize control, improving overall refrigeration performance
- Saves up to 8% in energy consumption
- Saves on installation costs due to reduced wiring pulls
- Smart fan control
- Superheat Control Performance Alarm Monitoring
- Built-in tools for refrigeration contractors to ease start-up (vacuum mode)
- Controls CO₂ and all conventional synthetic refrigerant systems



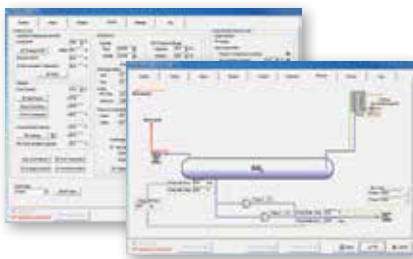
Rack Control

- Manages reciprocating, scroll and screw compressors
- Support for multiple unloaders per compressor
- Advanced sequencing algorithms to minimize cycling and run times, extending compressor life
- Variable speed compressor control



Flash Gas Bypass / Gas Cooler Control

- Digital or analog inputs (0-10V / 4-20mA)
- Controls using actual valve flow curves
- Web browser or Android app interface via Bluetooth
- One controller controls both valves



Software

- Alliance™ enterprise software connects everything for data sharing and advanced control - in the store and across the organization
- Specialized plug-ins provide detailed process control
- Remote access, advanced alarm management and energy management

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Sporlan CO₂ Solutions

