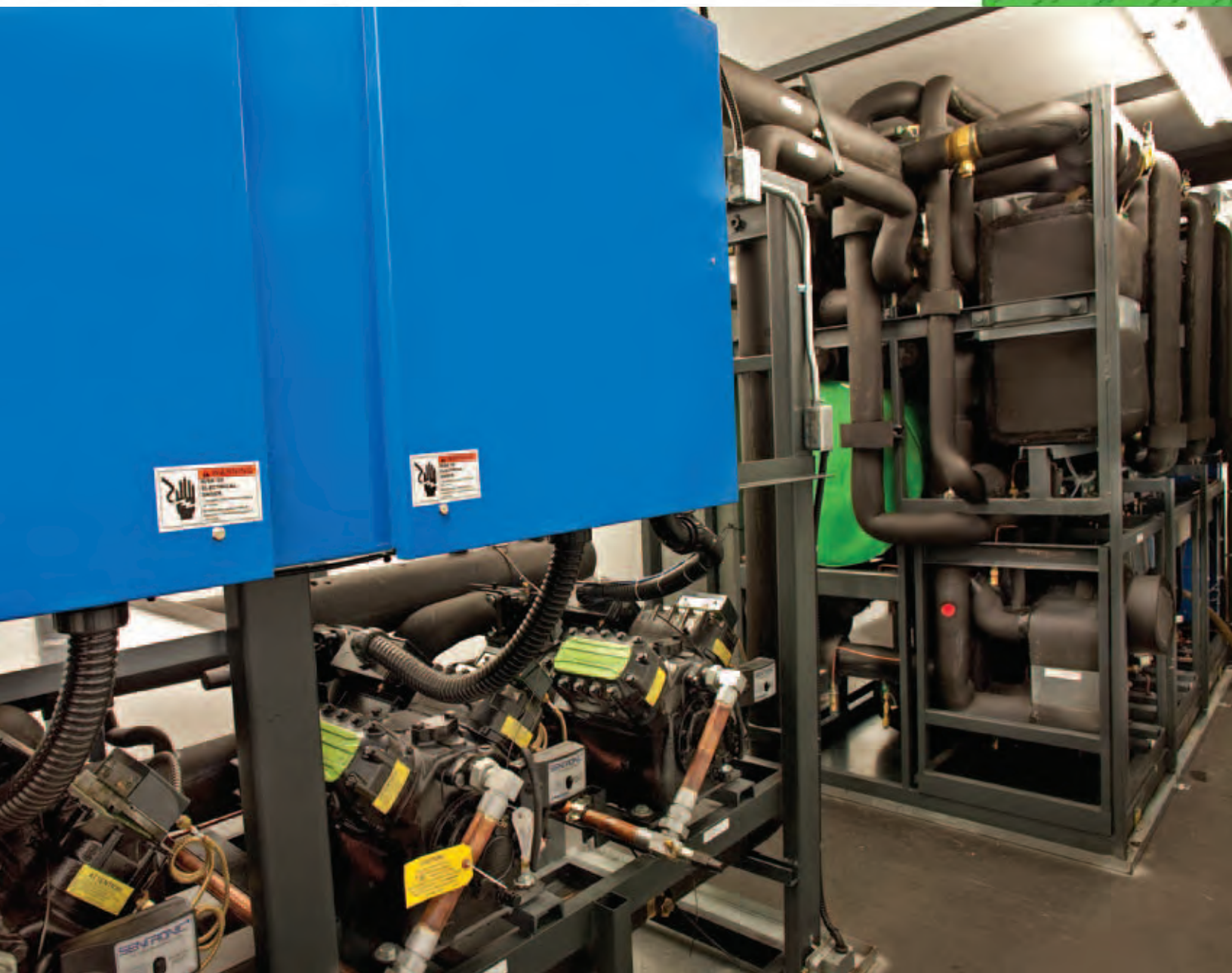
Hill PHOENIX
REFRIGERATION SYSTEMS

Second Nature CO_2

SNMT2LX

Introducing CO_2 Refrigeration Technology



Key System Benefits

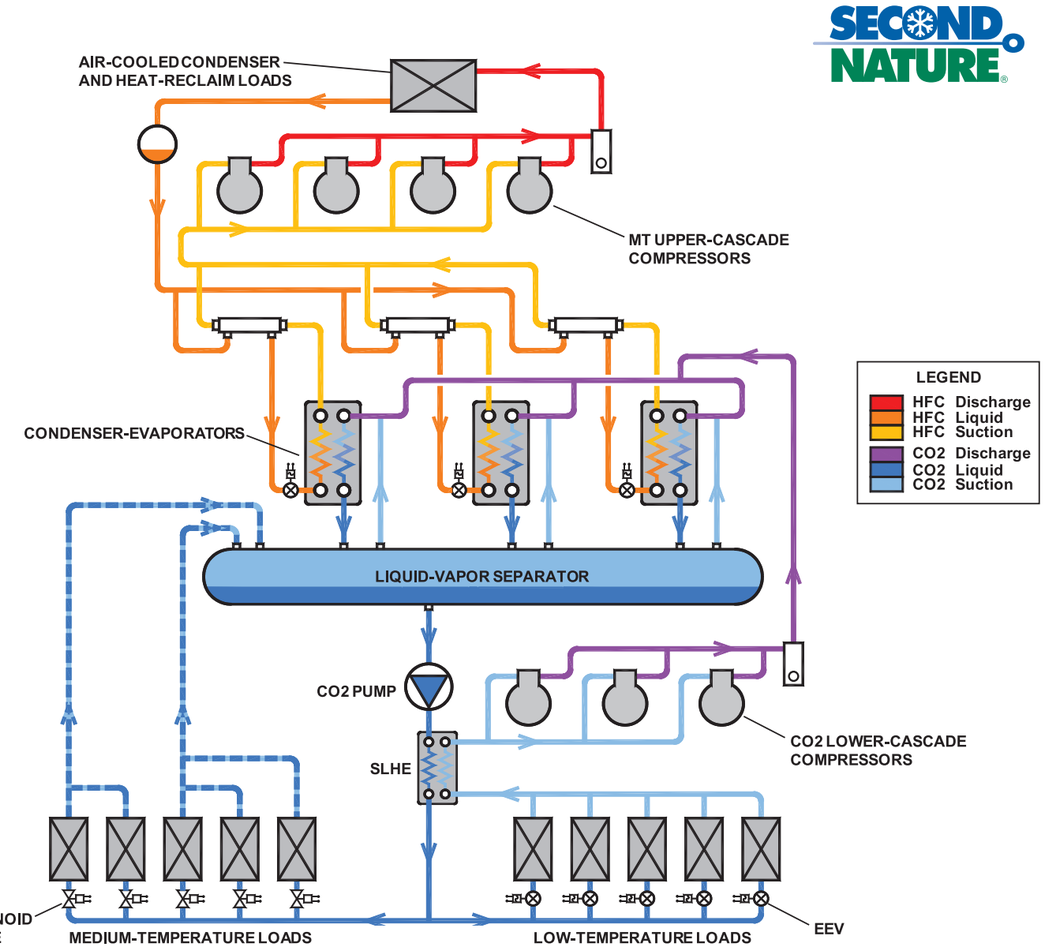
- Energy efficient design saves operating costs
- Low cost natural refrigerant widely available
- Very low global warming potential
- Smaller copper piping lowers cost and carbon footprint
- System components widely available for ease of maintenance when required

System Operation and Features

- Second Nature® MT2LX system utilizes CO_2 as a secondary coolant for the medium-temperature system and CO_2 as a direct-expansion cascade refrigerant for the low-temperature system.
- A CO_2 pump, typically installed as a primary pump with a parallel backup pump, delivers liquid CO_2 through the supply distribution piping to both the low and medium-temperature evaporators.
- Low-temperature evaporators designed specifically for CO_2 direct expansion operation.
- CO_2 as a direct expansion refrigerant with better heat transfer properties compared to conventional HFCs.
- Medium-temperature evaporators designed for fully-flooded CO_2 secondary operation.
- The low-temperature display cases and freezers are equipped with the Hill PHOENIX Smart Valve™ system with EEV's for steady, automatic control of superheat leaving the evaporators.
- Medium-temperature display cases and coolers are equipped with solenoid valves which control the flow of CO_2 into the evaporators.

Benefits of Using Second Nature CO_2 Refrigeration Technology

- CO_2 is considered a natural refrigerant with very low global warming potential (GWP=1).
- CO_2 is inexpensive refrigerant compared with HFC and is widely available.
- An excess of 70 percent reduction in HFC refrigerant charge can be achieved. The entire primary refrigerant charge is confined to the machine room and condenser to enable simple leak detection and servicing.
- The piping system utilizes a modified-loop copper piping system - CO_2 lines are typically one to two sizes smaller than traditional DX piping systems.



- Excellent material compatibility – most equipment for commercial refrigeration can be used .
- Medium-temperature system uses CO_2 as a two-phase secondary coolant taking advantage of CO_2's high latent heat capacity – this dramatically lowers flow rates (typical 90% reduction) and pumping power compared to conventional secondary fluids (e.g. glycols).
- System energy performance equivalent or better than conventional HFC systems.

System Options

- Low-temperature system features either Copeland CO_2 hermetic scroll or Bitzer reciprocating compressors and a high-efficiency plate suction-liquid heat exchanger.
- HFC system charge can be further minimized by using water-cooled condensers and hydronic heat-reclaim loops.
- Multiple suction groups on low-temperature system can further improve system efficiency.

HILL PHOENIX®
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