### HUSSMAnn®

# TerraChill DX2

BRINGING BACK THE DX WITHOUT THE GWP

- A natural refrigerant solution.
- Subcritical operation.

- Lower HFC charge.

- Minimal energy impact.



## **TerraChill DX2 –** The CO<sub>2</sub> Cascade Rack.

#### A natural refrigerant solution.

Hussmann's TerraChill DX2 is a low temperature subcritical direct expansion refrigeration solution using  $CO_2$ , a naturally occurring refrigerant. The use of  $CO_2$  as a refrigerant reduces the HFC charge with a minimal impact on energy efficiency to reduce the carbon footprint of the system.

#### Subcritical operation.

TerraChill DX2 is a subcritical  $CO_2$  system. Unlike  $CO_2$  secondary or liquid recirculation systems, subcritical  $CO_2$  systems use a vapor compression cycle similar to traditional direct expansion systems. Instead of condensing against ambient air or water, the  $CO_2$ condenses against a primary refrigerant such as R404a.

#### Lower HFC charge.

TerraChill DX2 can reduce HFC charge up to 70% compared to typical central direct expansion systems. TerraChill DX2 is able to do this by using  $CO_2$  as the cooling media in the display cases and unit freezers, while a small amount of HFC is used to condense the  $CO_2$ .

#### Estimated HFC Refrigerant Charge Comparison (LT and MT)

System	Air-Cooled	Water-Cooled
Central DX Rack	2200 Lbs	1900 Lbs
TerraChill DX2	770 Lbs	550 Lbs
% Reduction	65%	71%



Because of it's subcritical operation, TerraChill DX2 will have a minimal increase in energy consumption versus a traditional direct expansion system. The CO<sub>2</sub> compressors are able to cycle on and off with load variations thus saving energy. The cases and unit freezers use electronic expansion valves and case controllers which ensures that the proper superheat is always maintained.

HUSSMANN UNDERSTANDS THE GROWING REFRIGERANT NEEDS REQUIRED FOR TODAY'S MARKETPLACE. THE TERRACHILL DX2 FEATURES A NATURAL REFRIGERANT SOLUTION THAT REDUCES THE HFC CHARGE AND OFFERS A LOWER CARBON FOOTPRINT.



#### Terrachill DX2 environmental advantages vs. traditional rack systems.

- Use of a lower cost natural refrigerant:
  - GWP of 1 vs. R404a with 3920.
  - Approximately an 80% reduction in total refrigerant cost.
- 60-70% reduction HFC charge:
  - All HFCs are removed from the sales area for low temperature loads.
  - Primary HFC receivers sized for winter flooding charge.
- 50-70% reduction in HFC leak rate:
  - HFCs can only be found in the machine room and the condenser, dramatically reducing the risk of refrigerant leaks.
- 30-50% reduction in carbon footprint:
  - Reduction in the HFC charge.
  - Lower HFC leak rates.
  - Use of  $CO_2$  as refrigerant.
  - Minimal increase in energy consumption.
- Less copper piping required:
  - CO<sub>2</sub> has 7x the volumetric efficiency of R404a which reduces line sizing tremendously.

CENTRAL DIRECT FOOTPRINT 10,500 METRIC TONS - 10 YRS. Other features.

- Standard EEV for cascade condensers:
  - Danfoss, Sporlan, or Emerson,
  - Accurately controls superheat and minimizes CO<sub>2</sub> temperature fluctuations.
- Scroll or reciprocating CO<sub>2</sub> compressors:
  - VFDs available on reciprocating compressors.
  - Digital modulation available on scroll compressors.
- Standard liquid to suction heat exchangers for primary and CO<sub>2</sub> sides:
  - Reduces the risk of liquid reaching the compressors.
- Electric defrost.
- Water heat reclaim de-super heater standard:
  - Improves efficiency and protects the cascade condenser.
  - Air heat reclaim optional.

#### Operational ranges.

- Saturated suction temperatures from -25°F to -15°F.
- CO<sub>2</sub> condensing temperatures from 22°F to 30°F: - 27°F is recommended for optimal efficiency.
- 7°F approach temperature on the cascade condenser.

**TERRACHILL DX2 FOOTPRINT** 6,300 METRIC TONS - 10 YRS.

THE TERRACHILL DX2 MAY BE **DESIGNED FOR YOUR SPECIFIC** LOCATION AND NEEDS.



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