



Packaged CO₂ and Ammonia Cascade System

A natural refrigerant-based refrigeration system that is safe, sustainable, and energy efficient in all climates.



Design Features:

- Direct driven reciprocating compressor (1) CO₂ and (2) NH₃
- Plate & frame NH₃ condenser with 316SS plates
- Double tubesheet shell & tube cascade condenser
- Horizontal CO₂ recirculator with two liquid pumps
- PLC-based control system with touch screen user interface
- High efficiency oil rectification & management system
- Ammonia and CO₂ leak detection
- Built-in ventilation
- Pumped CO₂ at 2:1 recirculation rate
- Cooling capacities ranging from 40 to 200 tons at -20F to -60F

Benefits:

Contractor:

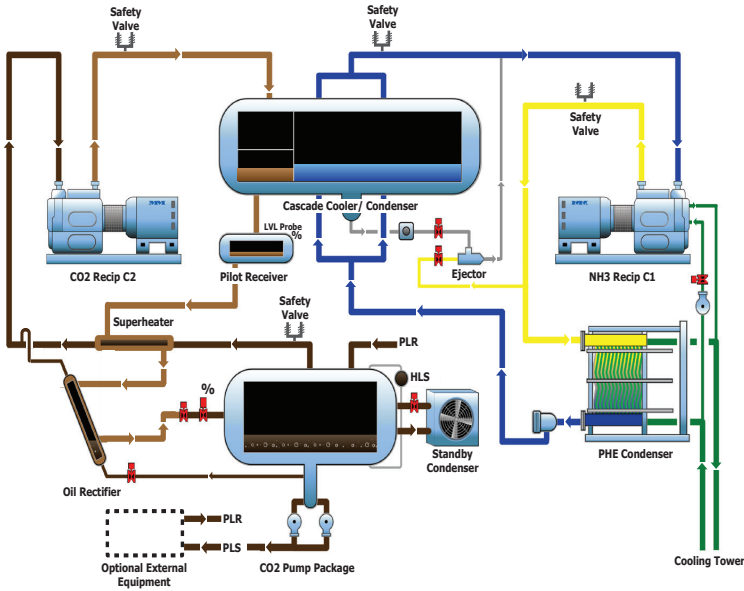
- Single point power connection
- Outdoor, indoor, floor mounted or roof mounted
- Insulated cold piping and vessels
- Full access doors for commissioning, start-up
- Easy rig points

End User:

- Energy efficient cascade system
 - Industrial grade recip compressor
 - Long product life
 - Higher level of reliability
 - Superior part-load efficiency vs. screw compressor
- Low installed cost:
 - Single point power
 - Plug and play design
- Lower maintenance
 - Fully serviceable compressor
- Reduced regulatory burdens
 - Low charge ammonia
- Increase revenue generating square footage by eliminating engine room
- Environmentally friendly, future-proof natural refrigerant
- Protection against CO₂/NH₃ contamination with double wall construction



System Diagram



Standard Package Includes:

- 316 SS plate & frame condenser for NH₃ side
- Mechanical float valve liquid makeup on the NH₃ side and motorized liquid makeup on the CO₂ side
- Two reciprocating compressors direct driven with 1800 rpm TEFC motors
- NEMA 4 VFD and solid state drives for compressor motors and pumps
- Horizontal CO₂ pump package with two CO₂ liquid pumps
- Shell & tube cascade condenser
- Automatic oil return on both the CO₂ and NH₃ side
- NH₃ and CO₂ leak detectors
- NH₃ and CO₂ detection horn and strobe
- Emergency/temperature exhaust fan
- PLC-based control system with touch screen interface

Options:

- Evaporative condenser
- Air Cooled condenser
- Adiabatic condenser
- Titanium condenser plates
- VFD for NH₃ compressor
- Outdoor enclosure with sound dampening
- Oversized CO₂ recirculator
- High circulation ratio CO₂ pumps

Technical Data

CO ₂ Compressor Model	NH ₃ Compressor Model	Model	Cooling Capacity (TR)	Total Power Consumption (BHP)	CO ₂ Condensing Temp. (°F)	NH ₃ Evaporating Temp. (°F)	NH ₃ Heating Capacity (MBH)	Approx. Minimum Ammonia Charge (lbs)	Approx. Minimum CO ₂ Charge (lbs)	COP	Approx. Dry Weight (lbs)	Approx. Dimensions LxWxH (ft)	Sound Pressure Level dB(A)
-40°F Evaporating													
HP024	SMC104L	24-104L	47	133	27	18	880	141	700	1.7	16000	16 x 7.5 x 8	80
HP026	SMC106L	26-106L	71	198	27	18	1317	213	800	1.7	20000	16 x 7.5 x 8	80
HP028	SMC108L	28-108L	94	264	27	18	1755	282	800	1.7	25000	16 x 7.5 x 8	82
HPC106S	SMC112L	106-112L	117	313	18	9	2120	351	1500	1.8	35000	20 x 8 x 9	82
HPC108S	SMC116L	108-116L	155	418	20	9	2809	465	1500	1.8	42000	20 x 8 x 9	83

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