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SRMTEC

Secondary Refrigerant Unit

Smart Modularized NH_3/CO_2 Secondary Refrigerant Units

Global unified service hotline
400-109-6660

SRMTEC

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Automatic control and highly integrated design ensures superior performance with reliable operation.

High efficient oil separator

High precision control sensor

Smart control screen

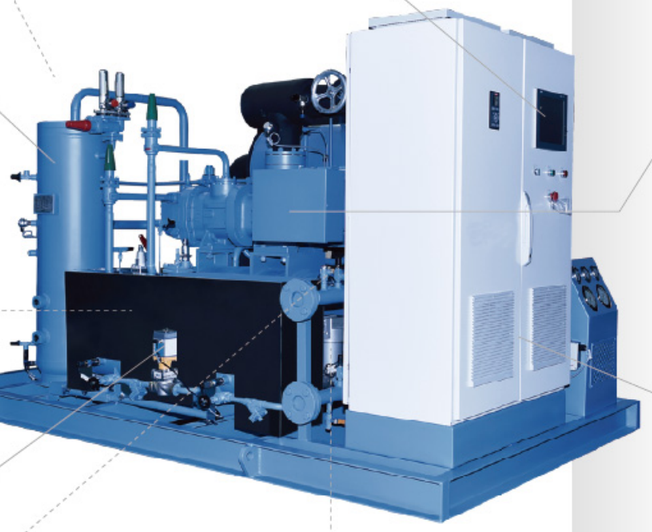


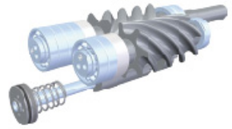
Plate-shell heat exchanger

Throttle valve

CO_2 circulation drum

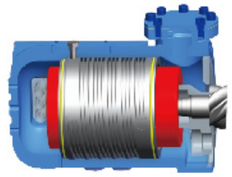
CO_2 pump

Sweden SRM fifth generation "i" line profile, 5:7 gear ratio



High precision and wear-resistant bearing

Semi-hermetic compressor

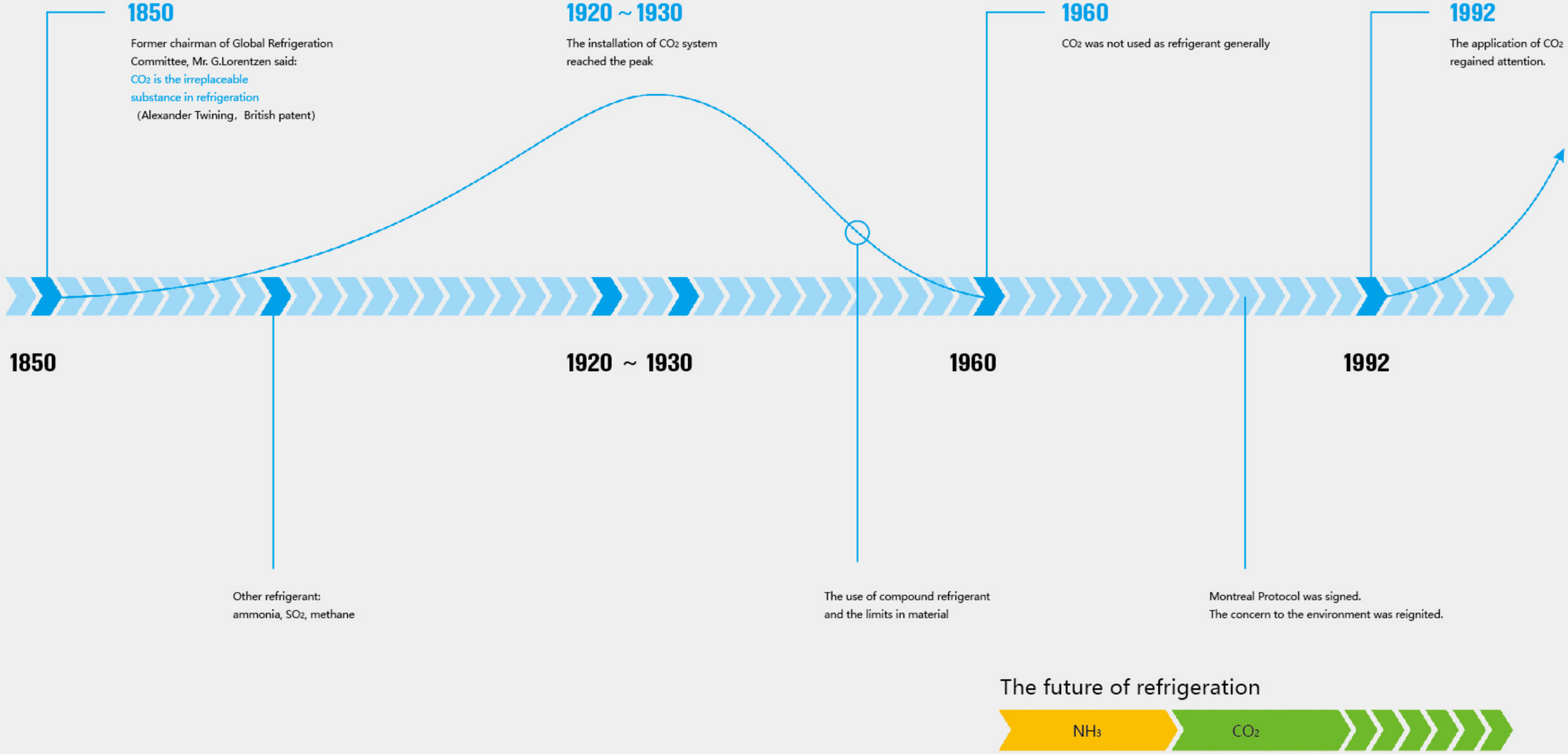


Specially designed motor cooling

Stepless/ step control

Unit control center

The Chronicle of the Application of CO_2 In Refrigeration



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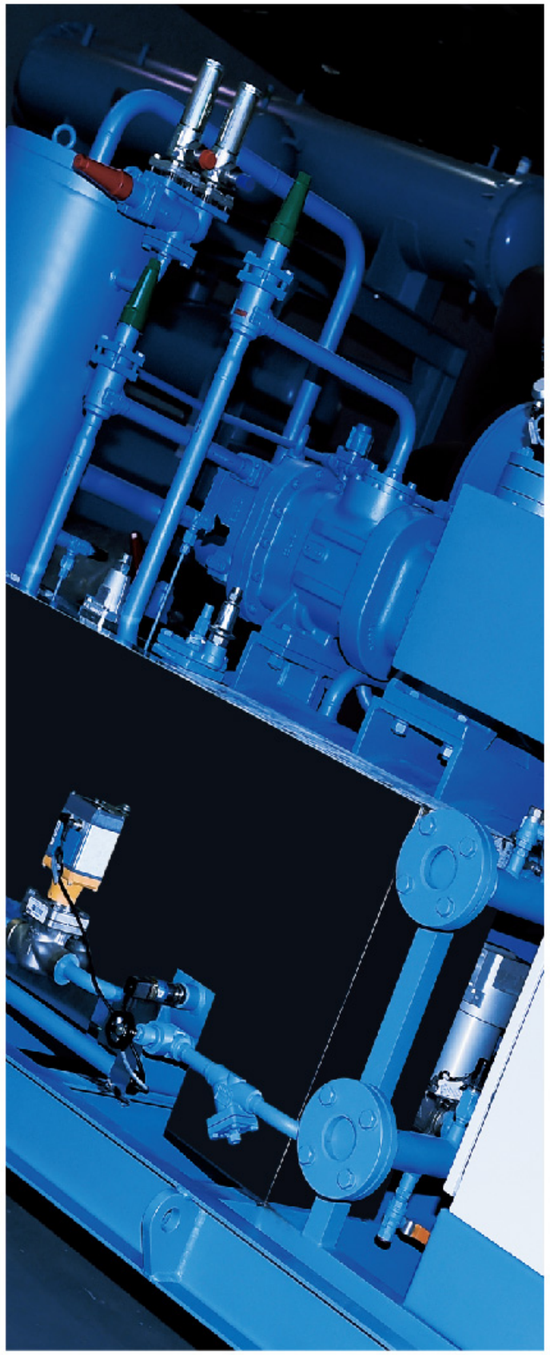
Safe, Efficient, Smart, Modularized Compressor Units

The idea solution for future refrigeration system



ENERGY SAVING

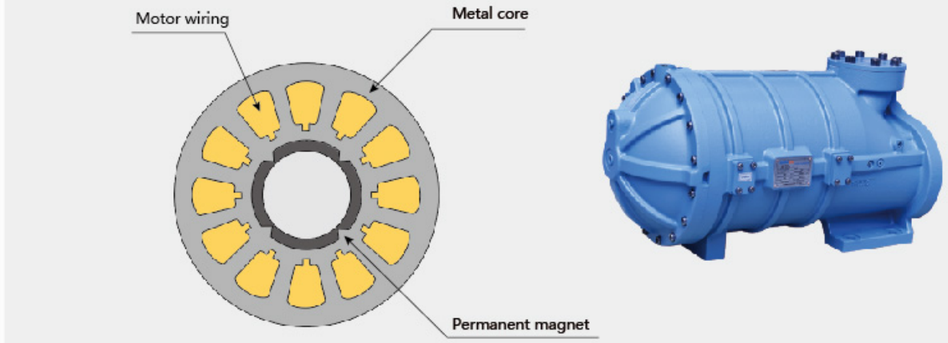
• Refrigeration substance with high efficiency
NH_3 has the best thermal properties at–35 deg Cas refrigerant.
CO_2 has great thermal properties and fluidity under low temp.
NATURE compressor unit combines the two in a perfect way and has high efficiency.

• Screw compressor with high efficiency
The compressor unit adopts the most advanced semi-hermetic 2-stage screw compressor technology and "MEI technology" from SRM equipped with high speed permanent magnet synchronous motor. The design is innovative and efficiency is high.

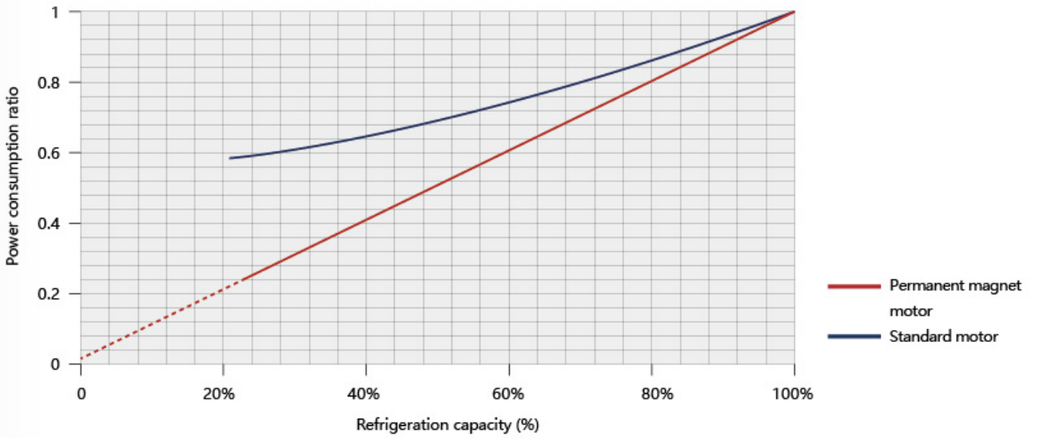
• Highly efficient VSD technology
Compressors coupled with SVPWM control, which distributes torque properly, have improved efficiency.

• Heat exchanger with high efficiency
The latest plate&shell heat exchangers from VAHTERUS, our global strategic partner has been used. The heat exchangers use specially shaped plate and compact design, which reduces the refrigerant charge significantly.
Heat exchange through patterned plates with low fouling is highly efficient.
80% more space is saved compared to traditional shell- tube heat exchangers.
Round plate and shell design- stronger structure.
Fully welded plate bundle-no need for gaskets.
Unique design-resistant to heat and pressure impact.
Anti- explosive, anti- leaking, anti- corrosive.
Frozen proof, strong, reliable and never crack.

The illustration of high speed permanent magnet synchronous motor



• High speed VSD permanent magnet synchronous motor
High power factor, little copper loss, generally 10% more energy saving than standard motors.



• Clean and safe CO_2 system
CO_2 system is completely clean without refrigeration oil remnant. Its performance under low temperature is significantly better than traditional ammonia or Freon system. Temperature drops faster; operation time is lower; less electricity cost. Meanwhile, there is no refrigeration oil remnant in pipelines, air coolers or drainage pipes.

• Precise control
Highly precise electrical actuated valves combined with unique PID control mode can adjust load faster and more precisely to improve efficiency further on.

• Industrial grade reliable valve components
Compressor unit uses valves, filters, transmitters from internationally renowned companies to improve COP and achieve higher precision in control.

SAFETY

• Natural working substance
CO_2 comes from nature, toxic less, inflammable;

• High standard design
High standard safety design for the continuous operation of CO_2 system, such as bypass on high pressure side, double seat safety valve, vent design and etc.;

• Smart and safe
Smart control system with a multitude of preventive safety protection and alarming functions;

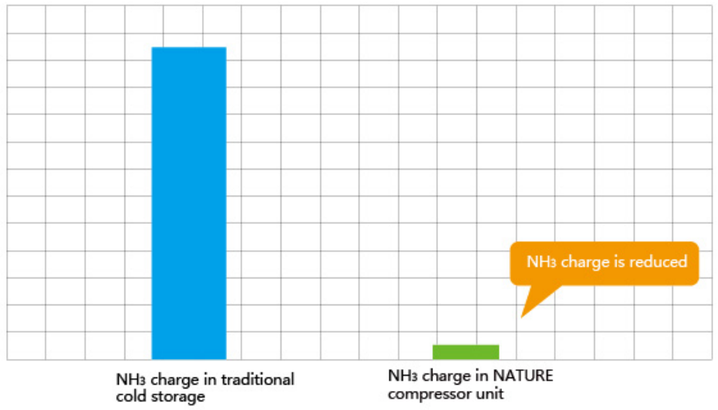
• Factory test guaranteed
Screw compressor units pass factory test in all performance range to assure reliability;

• Reliable oil return
Refrigeration oil is only stored inside compressor units with multiple oil return protection. Except under maintenance, there is no need to add in more oil.
It completely solves the oil leakage, oil supplement or oil collection problems of the traditional low temp system;

• Tightly sealed
Integrated design of screw compressor and motor with reliable sealing to eliminate the risk of leakage.

Lower the risk of NH_3 leakage

NH_3 only exist inside the compressor unit, so the amount of charge is low.



Environmental protection

The Kigali Amendment to the Montreal Protocol has added provisions for gradually reducing the production and consumption of HFCs, which has restricted the use of HFCs refrigerants. We must find alternative refrigerants to HFCs. The refrigerant NH_3 and the heat transfer medium CO_2 used in the NATURE unit are both natural and environmentally friendly working fluids.

		ODP	GWP
Refrigerant	NH_3	0	<1
Heat transfer medium	CO_2	0	1

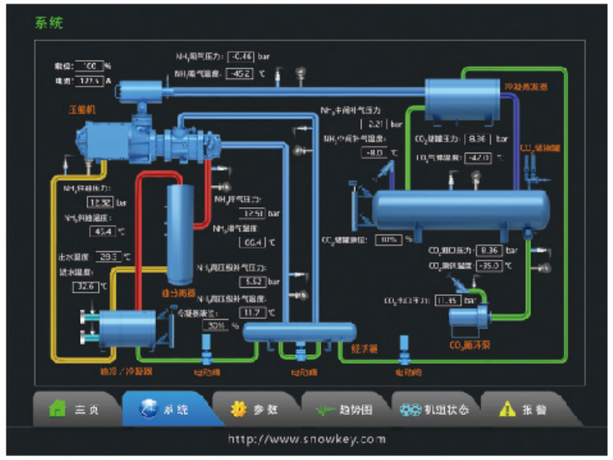
SMART

• Convenient control
One- button start, humanized UI, multi language support.

• Dynamic tracking
Real- time monitoring, auto logging of operative parameters and failures.

• Safety protection
Equipped with preventative safety protection system, no need for personal.

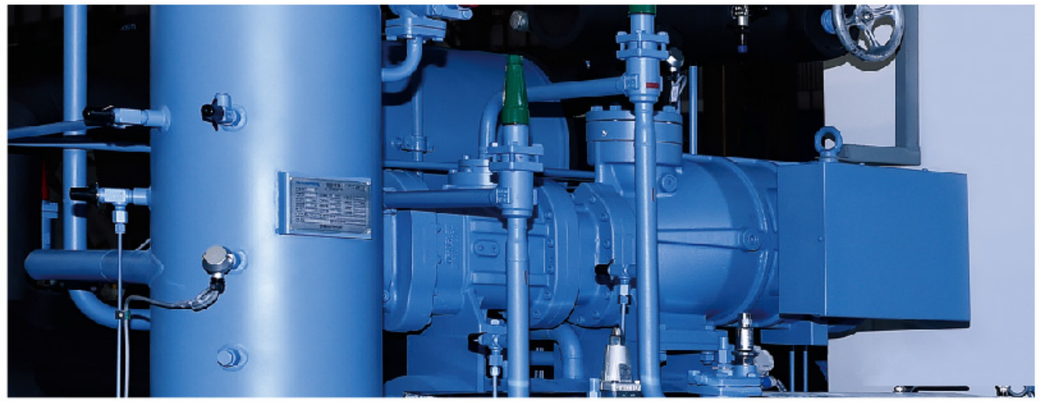
• Remote communication
Compressor unit can do remote communication, such as remote control, diagnose and alarming.



The illustration of smart remote control

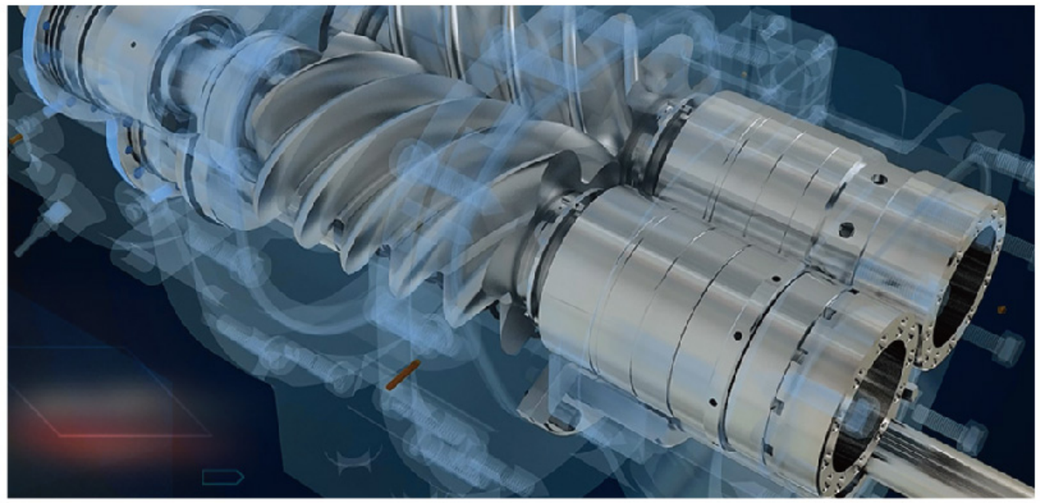
Screw Refrigeration Compressor

Globally renowned Sweden SRM screw compressor technology, manufactured completely according to European industrial standard，guaranteed stable operation around the clock.



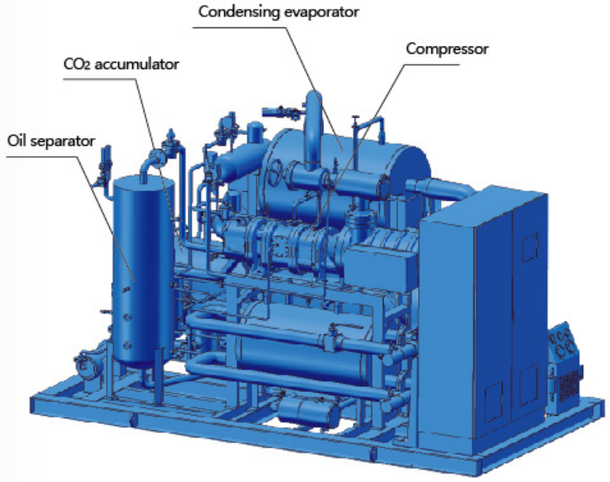
SRS ammonia semi- hermetic two-stage screw compressor

Advanced SRM "i" type profile line used on rotors,
Optimized 5+7 gear ratio，most energy efficient,
High speed VSD permanent magnet synchronous motor.



System and Features of NH_3/CO_2 Secondary Refrigeration Unit

NH_3/CO_2 secondary refrigeration unit uses CO_2 as secondary refrigerant and combines with NH_3 refrigeration system as cascade system.
The high temp system connects with lower stage through condenser and evaporator. The evaporator used in high temp stage is also used as condenser for lower stage.

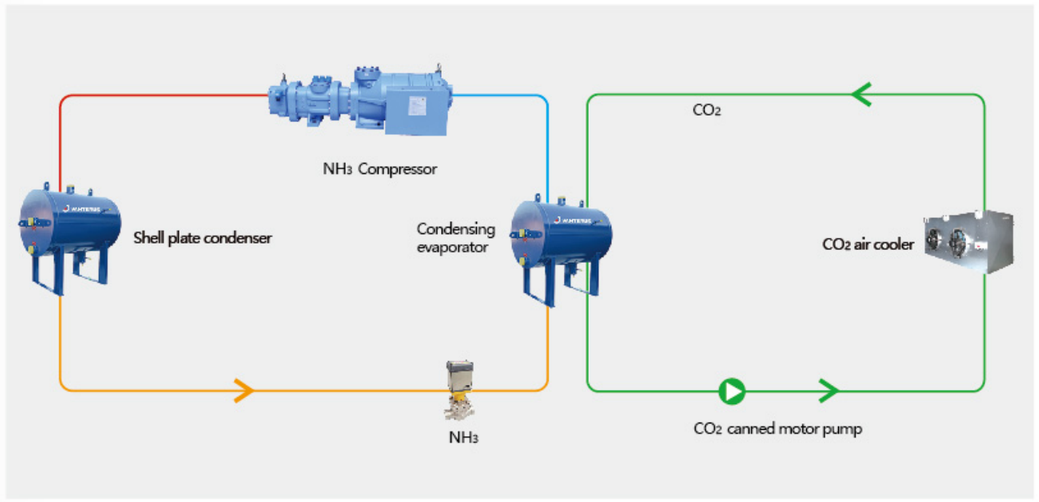


The features of NH_3/CO_2 secondary refrigeration unit

· The most advanced SRM ammonia screw compressor in the world.
· adopt the vast control strategy to improve IPLV by more than 35%.
· highly integrated shell plate heat exchanger, integrated heat exchanging and oil separation, high heat exchanging efficiency, compact structure, seme- hermetic structure, high pressure resistance, safety assurance.
· Smart system + Internet, safe and convenient, dynamic tracking and remote communication at the same time.
· Equipped with preventative safety system, fully optimized operation, operation crew reduced by 80%.
· Modular design, reduced cost in machine room design, 70% of reduced construction work on-site. Distributed and centralized installation can be chosen freely, which is convenient for transportation and installation.
· ammonium charge can be greatly reduced, no need to report for potential hazard, suitable for national safety policy.

NH_3/CO_2 secondary refrigerant system

NH_3/CO_2 secondary refrigerant system



High-efficiency Refrigeration Screw Compressor

Engineering data of NATURE Series NH_3/CO_2 secondary refrigerant unit

CO_2 Supply Temp: - 5℃ (Single stage compressor, - 20℃~10℃ working condition)

Model	Compressor							NH_3 Charge level (kg)	Outline dimension L×W×H(mm)	Net weight (kg)
	Working condition(℃)	Model	Displacement (m^3/h)	Type	Cooling capacity (kW)	Power consumption (kW)	COP			
NATURE 230C	-8/35	SRS-12M	230	2-stage single machine	225.1	66.8	3.37	70	3400×2150×2750	6500
NATURE 340C		SRS-14M	340		336.5	99.1	3.39	100	3600×2250×2750	7500
NATURE 450C		SRS-16M	450		432.1	117	3.69	120	3700×2500×2900	9500

CO_2 Supply Temp: - 32℃ (2- stage compressor, suitable for low temperature storage, freezer application)

Model	Compressor							NH_3 Charge level (kg)	Outline dimension L×W×H(mm)	Net weight (kg)
	Working condition(℃)	Model	Displacement (m^3/h)	Type	Cooling capacity (kW)	Power consumption (kW)	COP			
NATURE 332C	-38/35	SRS-1210SS	332	2-stage single machine	82	47.4	1.73	30	3400×2150×2750	5800
NATURE 463C		SRS-1210LL	463		115.2	65.8	1.75	50	3400×2150×2750	6500
NATURE 652C		SRS-1612LS	652		160.9	95.8	1.68	65	4500×2500×3100	8500

Note:
1. The rotational speed is 3600, the suction superheat is 5 degrees, and it is equipped with an economizer.
2. The data listed in the table are only for some models of this product. If you want to know more, please contact our company.

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Applicable Area

Under low temp, CO_2 is widely used in the refrigeration system for different application, different temp zone, because of its great thermal properties and fluidity. CO_2 refrigeration system is suitable for cold storage, low-temperature refrigeration, food blast freezing, brine water ice making, ice storage, chemical pharmaceutical industry, marine refrigeration, sport and other areas. Common CO_2 refrigeration system includes CO_2 secondary refrigerant system, CO_2 cascade system and etc.