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For changes of products and product specifications, there will be no further notification. There may be some difference between the actual products and the pictures. All products do not have all the features. The products delivered vary with regions. Please contact your sales representatives.

COLD STORAGE & FOOD
PROCESSING SOLUTIONS







In 1902, Dr. Willis Carrier invented the first modern air conditioning system in the world, making him one of the 100 most influential people of the 20th century (TIME magazine).

Carrier Company

Carrier Global Corporation is a leading global provider of innovative heating, ventilating and air conditioning (HVAC), refrigeration, fire, security and building automation technologies. Supported by the iconic Carrier name, the company is committed to making the world safer and more comfortable for generations to come through its industry-leading brands such as Carrier, Kidde, Edwards, LenelS2 and Automated Logic. For more information, visit www.Corporate.Carrier.com or follow us on social media at @Carrier.

Haier Carrier

Qingdao Haier Carrier Refrigeration Equipment Co., Ltd. is a joint venture established in 2001 by Haier Group and Carrier. Its products include supermarket display cabinets (more than 1,000 specifications), compressor units (scroll, piston and screw), and heat exchangers (air-cooled condenser and air cooler). It can provide customers with whole sets of freezing and refrigerating solutions. Relying on the support of Carrier Refrigeration's R&D centers in Mainz, Germany and Shanghai, China, the company now has several laboratories. The company is committed to providing energy-saving systems, including carbon dioxide systems, for customers in the Asia Pacific region.
In the past ten years, relying on abundant resources of the parent company, Haier Carrier has become a world-class facility that owns the ISO9001 certification and the ACE certification of United Technologies (Carrier's parent). With strong R&D strength, we are able to provide world-class freezing and refrigerating integrated solutions such as D2D hot gas defrosting (national patent), Ground Water (GSHP technology dedicated for freezing and refrigerating purposes), HybridCO2OL (carbon dioxide cascade refrigeration technology), and CO2OLtec (carbon dioxide transcritical refrigeration technology).

Carrier New Intelligent Production Base

Carrier is committed to innovative revolution and intelligent manufacturing. Since December 18, 2018, Carrier's new intelligent production base was relocated to No. 3734, Tuanjie Road, Huangdao District, Qingdao. The area of the new factory has been greatly expanded, and more newly upgraded production lines have been equipped, which has increased the production capacity by about 45%; the laboratories have been comprehensively upgraded, and the number has doubled. The laboratory has a complete set of experimental verification system and equipment. Currently, there are three double-station commercial display cabinet laboratories, which adopt domestic or international advanced equipment; product parameters meet or exceed national standards to protect food safety; a 24-hour multi-functional testing laboratory for air-cooled, water-cooled condensing units, as well as air coolers and condensers, can be used for timely detection to ensure energy-saving and reliable products, responsible for the end user.

CERTIFICATE OF HONOR AND QUALIFICATION CERTIFICATES

AUTHORITATIVE CERTIFICATION

EEL Energy Efficiency Label Compulsory Certification

All new products are
Energy Saving Products

Over 90% registered models are of EEL 3 or above. Carrier has the largest number of product certifications in the industry. *

We provide customers with comprehensive solutions for top-level energy efficiency for our main products.

- It became compulsory in September 2013, supervised by Quality and Technology Supervision Bureau. The remote cases are covered. (Plug-in cases are also covered from 2018)
- All products for sales are of EEL 5 at least
- It must be labeled on all cabinets
- All products registered by Carrier can be found on the website below and all new products are energy saving.

Website of China Energy Label: https://www.energylabelrecord.com

All Carrier products can be found on the website above

* The data is as of 2017

"Forerunner" Certificate

Carrier won
the 2021 Enterprise Standard
"FORERUNNER" CERTIFICATE

- The Enterprise Standard "Forerunner" System encourages enterprises to formulate enterprise standards higher than national, industry, and local standards by the government. Professional standardization organizations will compare and evaluate the published standards of enterprises. This system will improve the standard level as well as the product and service quality.
- The "Forerunner" series of evaluation standards cover nearly 200 industries with more than 160 institutions participating across the country.
- Carrier's enterprise standard of "High-efficiency Commercial Refrigerated Display Case" is higher than the national standard and was awarded the Forerunner Certificate. We offer high-quality and excellent products for our business partners.

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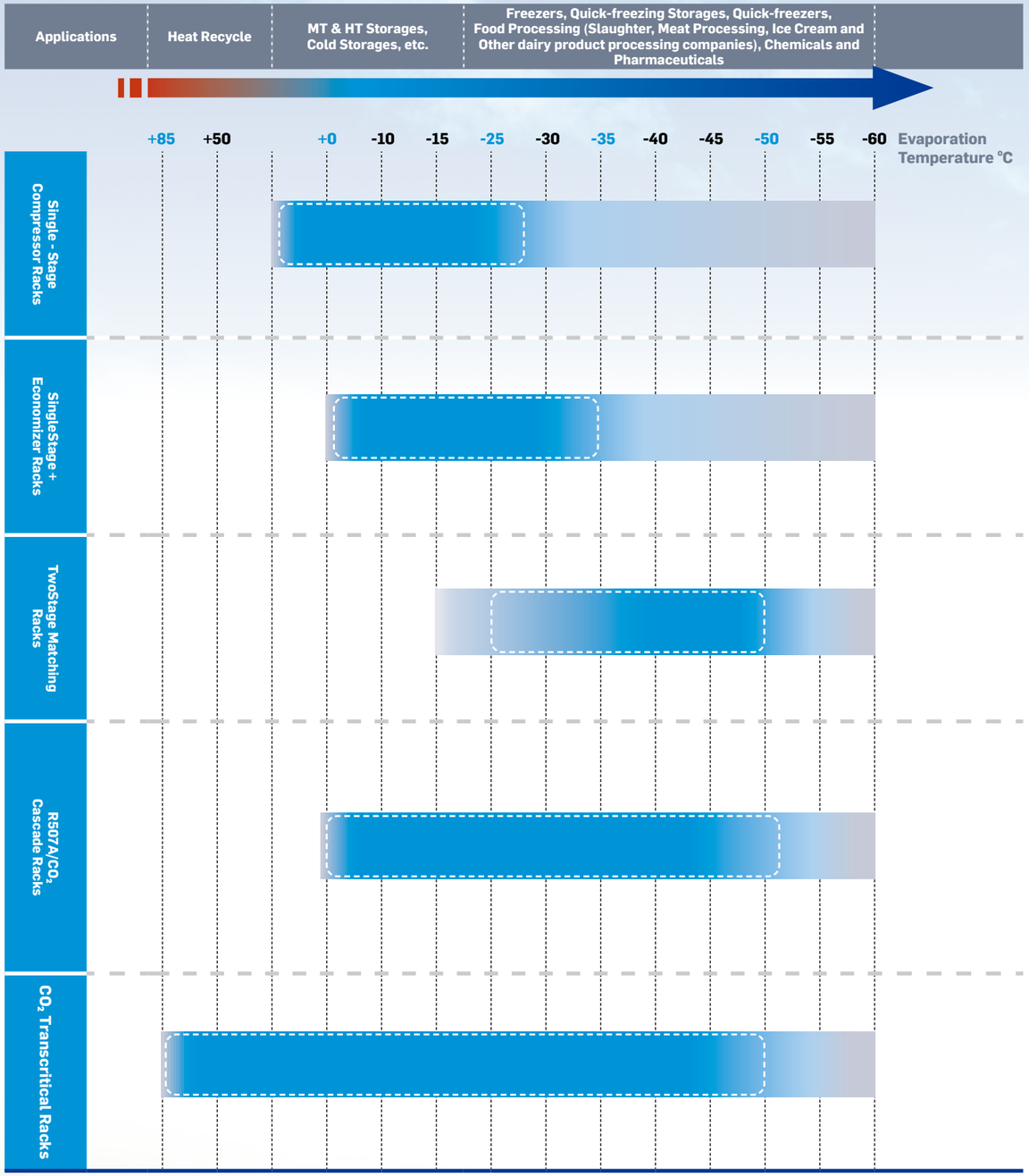
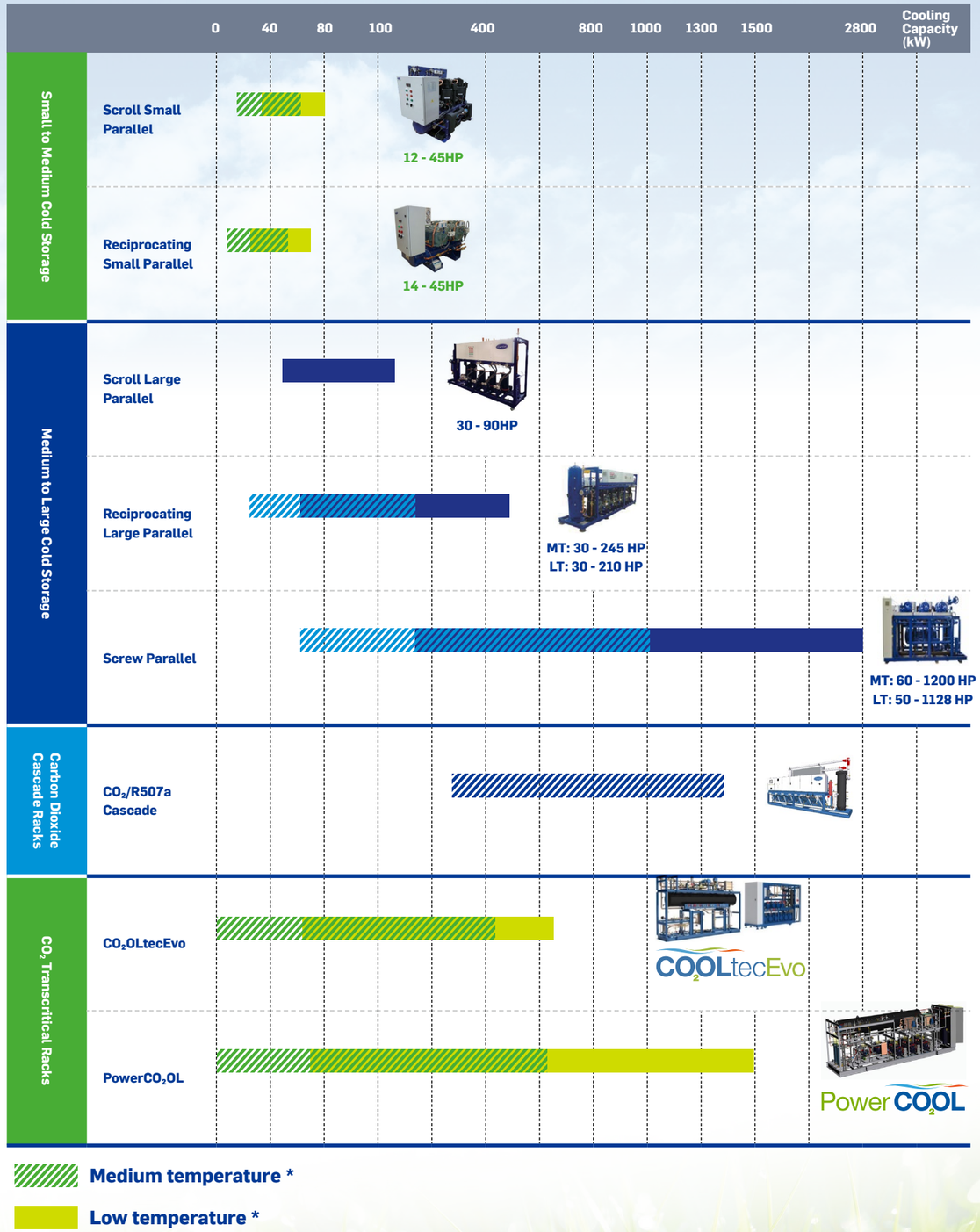
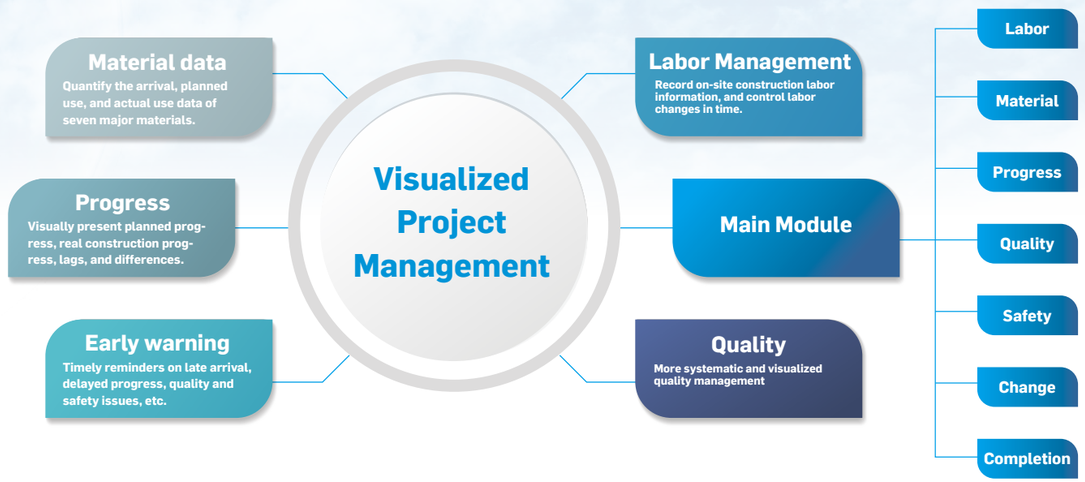


*Note: Temperature ranges are for reference only. Specifically, the plan must be determined based on the real project needs, taking into account performance and initial investment.



Products & Intelligent Systems 01
1-2 / Smart Sites

Smart Site Project Management Advantages



Smart Site Project Management Advantages

Quotes and Bids
- Material library
- Quotation cost analysis
- Quotation plan comparison
- Quotation task reminding

Preparations for Winning the Bid
- Construction plan optimization
- Optimized cost analysis
- Preparations before entering the site
- Required inspections and training

Construction
- Schedule management
- Labor management
- Material management
- Safety management
- Quality management
- Change management

Completion and After-Sales
- Project completion and acceptance
- Real cost analysis
- After-sales project management
- Repair and maintenance

Precise quotation, full-process price management, and high precision.

Full-process control for construction, and respond timely and quickly.

Effective labor and material management, data- and transparency-driven.

More systematic and visible safety and quality management.

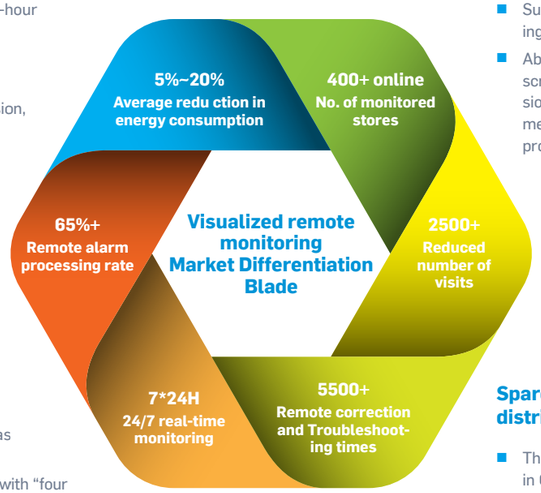
Clear data comparison, easy to understand

User Interface - Store Operations Dashboard

Keys to Navigate

Visualized remote monitoring

- Full business coverage with five-hour ahead troubleshooting
- Green, light carbon solutions: supermarkets + cold rooms
- Manual handling, alarm conversion, and smart processing
- CDU + cabinets, 100% remote monitoring as standard,
- going online when powered on.



National service network

- Three service management areas throughout China
- National QHC service engineers with “four technical certificates”, Having 10 to 20 years of rich experience.

Technical support center

- Supporting the start-up commission-ing of supermarkets and cold rooms
- Able to maintain reciprocating and screw compressors, annual commis-sioning of nearly 100 sets of equip-ment, including screw racks, CO_2 project, CDU project, etc.

Spare parts and consumables distribution center

- Three major spare parts warehouses in Qingdao, Nanjing and Chengdu, respectively.
- Timely: delivery in one to three days.
- Diversified: 1500+ categories
- Carrier brand

Alarm Processing in Worry-free Services

01 Store Alarm

Response within 15 minutes
100% alarm analysis
Monitoring center members with 5+ years of service experience

02 Data Diagnosis

Equipment operation data analysis
Expert diagnosis
Preferred remote repair

03 Remote Troubleshooting

Equipment operation data analysis
Expert diagnosis
Preferred remote repair

04 On-site Services

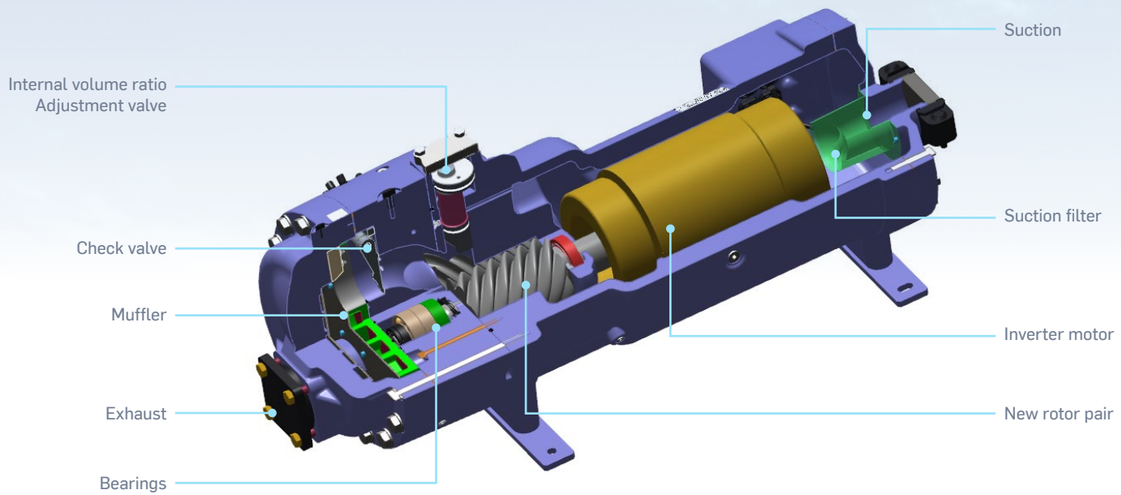
Notify maintenance provider for on-site repairs by phone, SMS, or on the APP.

05 Operation Confirmation

On-site and remote operation confirmation

Carlyle Screw Compressor - 06Z Inverter Screw Compressor

- 06Z full inverter compressors always operate efficiently with different operating loads. The variable Vi adjustment allows the rack's internal compression ratio to match the system's at any time to avoid energy loss caused by over- or under-compression.



- Suitable for projects where a single rack has a large cooling capacity, the rack operates under partial load for a long time, or the load changes significantly. The rack realizes energy saving by the inverter.
- Full range of inverter compressor technology for various operating loads with high efficiency.
- Carrier's patented new 7:8 rotor pair design, less internal leakage, and high-efficiency screw profile technology
- The variable Vi adjustment allows the rack's internal compression ratio to match the system's at any time to avoid energy loss caused by over- or under-compression.

Casing size (mm)	HP
139	130
168	215
199	325

Energy-saving

- 20% energy saving*

*Versus the last generation of 06T design

Reliable

- 100,000-hour full load bearing test
- A simpler and more reliable mechanical structure with no slide valve

Silent

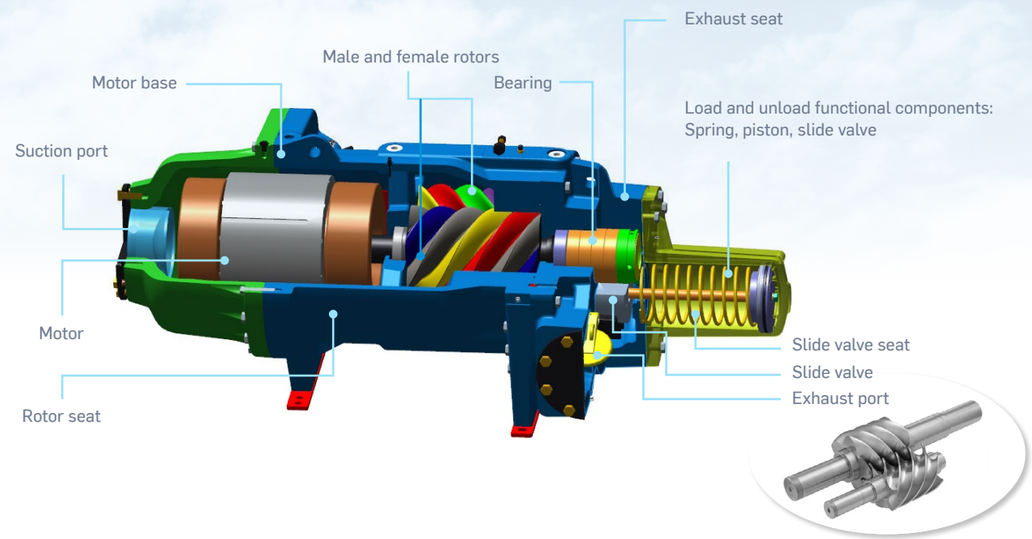
- An integrated silencer on the exhaust end cover IRA effectively absorbs pressure pulsations, thereby reducing noise by 6dBA*

Flexible

- Full inverter for LT to MT integrated applications

Carlyle Screw Compressor - 06T Semi-Hermetic Screw Compressor

- Available for high, medium, and low temperature applications, Series 06T semi-hermetic twin-screw compressors are compatible with all standard refrigerants and lubricants with a wide operating range. This makes them suitable for a variety of applications.



- 06T semi-hermetic twin-screw compressor, the TS, TT, TU, and TV series (15% - 100% stepless slide valve adjustment)
- Stepless slide valve adjustment can ensure that the compressor operates with high energy efficiency, meeting the energy adjustment needs of the cold storage.
- Carrier's patented high-efficiency profiles with stable and reliable pressure ratio and low internal leakage
- 25% - 100% stepless slide valve adjustment to meet the energy adjustment needs of the cold storage
- Efficient Y-Δ unloading, a stable state
- Integrated economizer operation with high energy efficiency
- TU (675 m^3/h@50Hz), large cooling capacity expansion to 2.7MW per compressor, suitable for large cold storage projects to effectively reduce the initial investment of the solution.

Category	Product Description	Capacity (HP)
Low Temperature Screw Compressor (190-944 m^3/h)	06TSR137SG1DA3 400-3P-50	50
	06TSR155SJ1DA3 400-3P-50	60
	06TSR186SJ1DA3 400-3P-50	75
	06TSR223SJ1DA3 400-3P-50	90
	06TTR266SP1DA3 400-3P-50	100
	06TTR301SS1DA3 400-3P-50	125
	06TTR356SS1DA3 400-3P-50	150
	06TUR483SW4D-A31A3	188
	06TVR680SX4D-A43A3	283
Medium Temperature Screw Compressor (190-944 m^3/h)	06TSM137SJ4D-A19A3 400-3P-50	60
	06TSM155SJ4D-A20A3 400-3P-50	75
	06TTM223SM4D-A51SA3	90
	06TTM266SS4D-A21A3 400-3P-50	125
	06TTM301SS4D-A22A3	150

*Note: 1) Refrigerant: R507a, R404A

Carlyle Screw Compressor

The superior design of Carrier compressors results in their reliability and durability.

Even under harsh application scenarios with high-frequent extreme working conditions, the first-year failure rate is as low as 0.29%.

Carrier's advanced technology and high efficiency can save a lot of energy and expenses over the compressor's service life.

Superior performance

- 35 - 550RTon (50Hz, no economizer)
- R507a/R404A/R448A/R449A/R407C/ R134a and other refrigerants
- Air conditioning or refrigeration conditions
- Patented high-efficiency geometric profile design
- Sophisticated processing technology

Better load matching

- Stepless energy adjustment of 15% - 100%
- Vi optimization under partial load
- Easy dual solenoid valve control

Reliable SKF or NSK rolling bearings

- Good sealing to minimize load
- Long service life, no need to be checked or replaced during maintenance
- Powerful thrust bearing design
- No oil pump required

Easy maintenance & installation

- Semi-hermetic design
- Easy to assemble and disassemble
- External oil filter, long service life, easy to replace.
- Preset oil system management accessories

Outstanding quality and reliability

- 100% factory operation tested
- Fewer parts - less breakage and downtime
- "33 points" process inspection

Higher efficiency

- All Paragon series can realize economizer operation
- A variety of compressors realize dual control of inverter and slide valve to adjust capacity for more energy-saving operation.

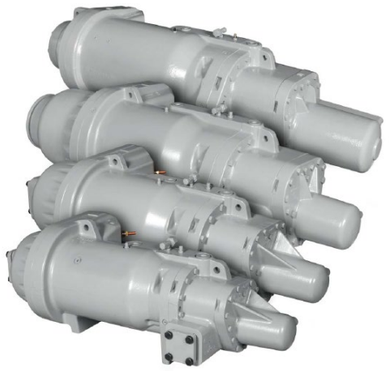
High torque motor

- Y- △ conversion start or direct start
- High motor efficiency
- Suction port with filters
- Thermal protection integrated NTC winding sensor
- Sliding fit improves motor applicability
- Applicable to all standard voltages

Built-in check valve and safety valve

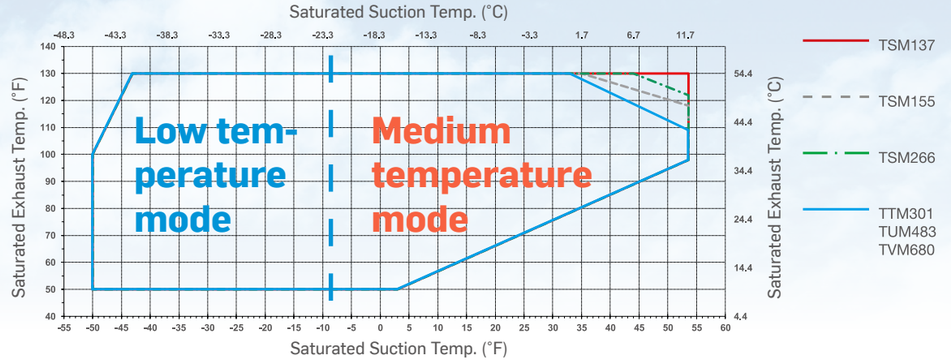
- Built-in check valve effectively prevents rotor wear caused by reverse rotation when shutting down.
- The safety valve effectively ensures the safe operation of the compressor.

Efficient·Reliable·Durable



Carlyle Dual Temperature Screw Compressor

- A single screw compressor with a wide temperature range not only operates stably under low-to-medium temperatures but also keeps the same high COP energy efficiency.



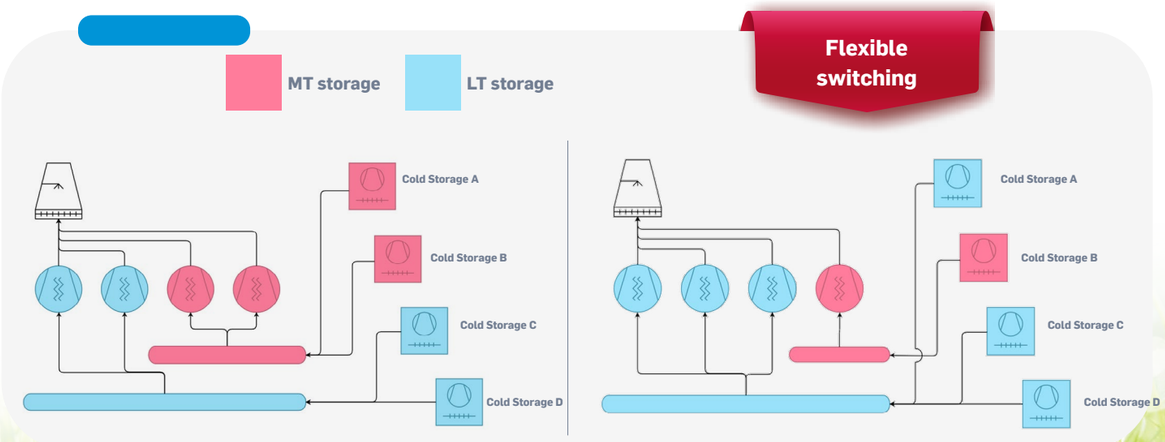
06T compressor operation range - R507a/R404A , integrating low and medium temperatures

*Note: Please contact our sales for 06Z compressor operation range and working conditions.

Zoned Temperature Change Technology

- Flexible switching, one compressor for multiple storages
- The different connections and valve switching of the compressor - return air header - terminal loop can fulfill the temperature change needs from a single cold storage to all cold storages.
- Stepless slide valve: 25%-100%, ensuring that a single compressor operation can meet the energy regulation needs of the storage.

Models		Low Temperature Tefrigeration (R507a/R404A)									Medium Temperature Refrigeration (R507a/R404A)					
		06T									06T					
		TSR137	TSR155	TSR186	TSR223	TTR226	TTR301	TTR356	TUR483	TVR680	TSM137	TSM155	TTM266	TTM301	TUM483	TVM680
@60Hz	HP	60	75	75	90	120	150	150	225	340	75	75	150	150	225	390
	CFM	137	155	186	266	266	301	356	483	680	137	155	266	301	483	680
	RT	19	21	25	30	39	46	54	73	103	30	32	63	70	132	158
Displacement (m^3h@50Hz)	4	190	215	258	310	369	418	494	670	944	190	215	369	418	670	944



Product Overview

- Applications: refrigeration and low-temperature freezing
- No. of compressors: 1 to 6

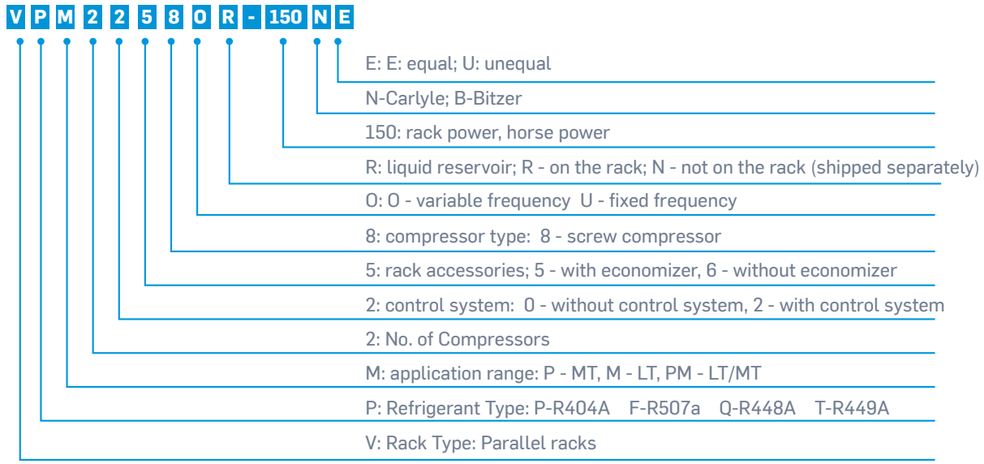
Standard Order Scope

Refrigerant		
Models		
No. of Compressors	1 to 6, equal parallel	1 to 6, equal parallel

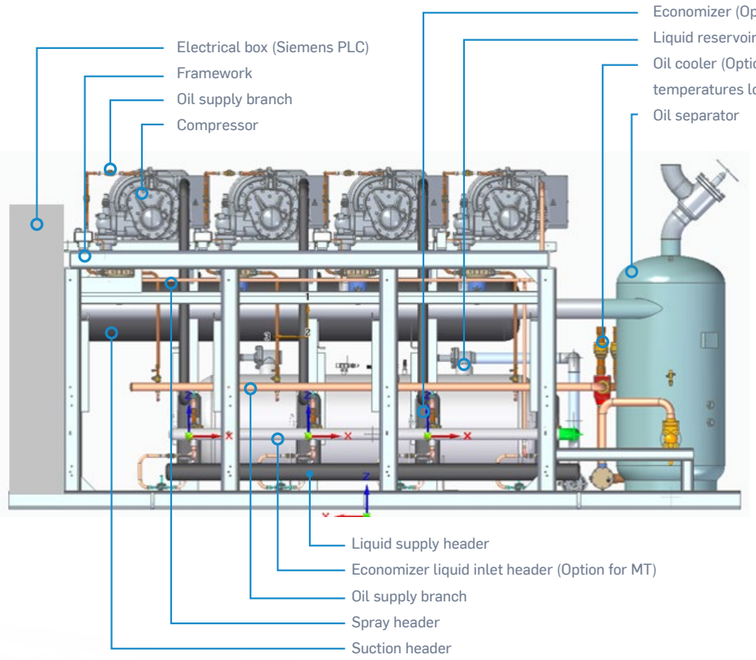
Non-Standard Order Scope

Refrigerant	R404A/R507a, etc.				
Models					
No. of Compressors	2 to 6, unequal parallel	2 to 6, unequal parallel	2 to 6, parallel		
Options	1. An inverter can be added to one of the racks. 2. Multiple low-to-medium temperature integrated machines with different suction temperatures (different suction temperatures, applicable for high pressure)				

Nomenclature and Parameters



Standard Product Layout (LT four-parallel rack as an example)



*Note: Application of heat recuperative gas-liquid separator

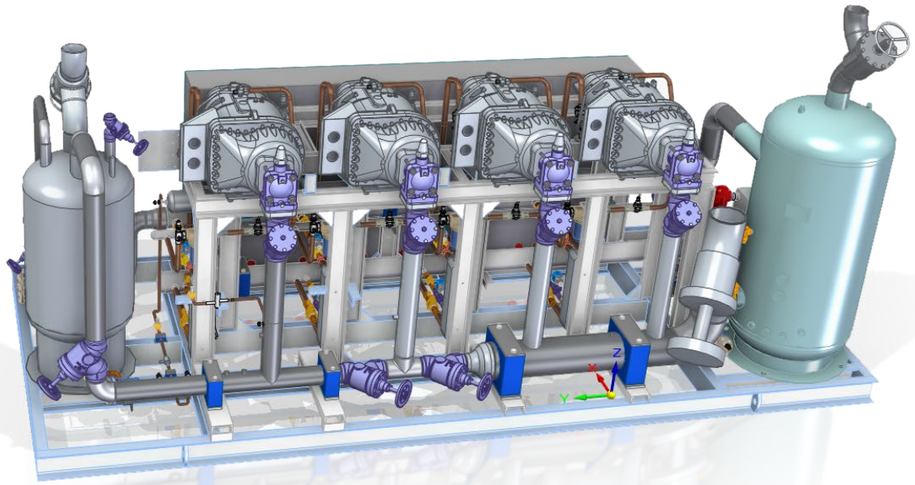
Options:

- Inverter
- Heat recuperative gas separator
- Constant pressure defrost with exhaust gas
- Oil heating belt
- Filter accessories
- Evaporative cooling control
- Liquid supply ways
- External pipe diameter of the rack

New Platform Modular MT/LT Screw Parallel Racks

Customer Value

- 120 models, more flexible choices under the corresponding cooling capacity
- Carrier's Carlyle stepless slide valve regulating compressor (25%~100%), 10% - 20% energy saving.
- Adopt Siemens PLC controller, 10-inch graphical operation interface, friendly human-machine interaction, more versatile
- More customized options, flexible configuration
- Adopting integrated and modularized design, a compact structure.
- Fully automatic control system enables remote monitoring and easy maintenance



	Compressor		No. of Compressors and Total HP of the Rack		
Project	Models	HP			
LT Low temperature	06T SR137	50	100	200	300
	06T SR155	60	120	240	360
	06T SR186	75	150	300	450
	06T TR266	100	200	400	600
	06T TR301	125	250	500	750
	06T TR356	150	300	600	900
MT Medium temperature	06T SM137	60	120	240	360
	06T SM155	75	150	300	450
	06T TM266*	125	250	500	750
	06T TM301	150	300	600	900

Applications

MT Screw Racks

- Refrigerant: R507a/R404A/R448A/R449A
- Cooling capacity: 112~1711kW (R404A/R507a)
- Evaporating temperature: -15°C - +5°C
- Storage temperature: -10°C - +15°C

LT Screw Racks

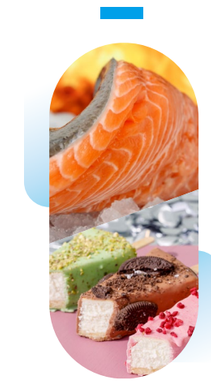
- Refrigerant: R507a/R404A/R448A/R449A
- Cooling capacity: 62~999kW (R404A/R507a)
- Evaporating temperature: -45°C - -15°C
- Storage temperature: -40°C - +5°C

*Cooling capacity range based on: evaporating temperature: MT -10°C, LT -30°C, condensing temperature: 40°C; Degree of subcool/super heat: 0/10K

High temperature storage
Storage temperature: 0°C - 10°C
Storage capacity: 1,000t - 3,500t
Stored goods: vegetables and fruits

Medium temperature storage
Storage temperature: -20°C - 0°C
Storage capacity: 2,000t - 8,000t
Stored goods: meat, fish, etc.

Low temperature storage
Storage temperature: -40°C - -20°C
Storage capacity: 2,000t - 8,000t
Stored goods: seafood, meat, ice cream, etc.



Single Quick-Freezing Line
Freezing temperature: -28°C - -32°C
Quick freezing line capacity: 0.5t/h - 2t/h
Stored goods: seafood, frozen food, etc.

Standard Configuration

Standard LT Rack Configuration:

- Compressor
- Economizer
- Integrated vertical reservoir
- Oil cooler
- Display and control software
- Pressure/temperature sensors
- Siemens PLC controller
- Oil cooling system
- Compressor suction valve, removable suction filter
- Removable oil filter
- Exhaust/return/supply stop valve
- Removable oil filter
- Oil separator

Standard MT Rack Configuration:

- Compressor
- Integrated vertical reservoir
- Oil cooler
- Siemens PLC controller
- Compressor suction valve, removable suction filter
- Removable oil filter
- Exhaust/return/supply stop valve
- Oil separator
- Removable oil filter
- Removable liquid supply filter drier

Options

Options for racks:

- Horizontal reservoir, external reservoir or increased reservoir volume
- Oil heating belt
- Split horizontal reservoir
- Barrel pump liquid supply
- Evaporative cooling control
- Inverter
- Multi-branch liquid supply/gas return assembly(including stop valve)
- Exhaust gas constant pressure valve(northern region)
- Oil cooling options: water cooling, air cooling,siphon cooling
- Optional economizer for MT racks
- Optional oil distribution cooling for MT racks
- Shell and tube condenser
- Filter cartridge spare parts
- External pipe diameter of the rack

R507a Screw Rack Technical Parameters - LT

Models	SDT Condensing Temperature °C	Cooling Capacity Q Input Power P (kW)	Evaporation Temperature (oC)											
			Two-parallel				Four-parallel				Six-parallel			
			-45	-35	-25	-15	-45	-35	-25	-15	-45	-35	-25	-15
TSR 137	35	Q	64.0	108.6	163.8	199.8	128.0	217.2	327.7	399.6	191.9	325.8	491.5	599.4
		P	68.1	74.4	80.8	70.8	136.2	148.8	161.6	141.6	204.2	223.2	242.5	212.4
	40	Q	57.5	99.3	153.3	181.6	115.0	198.6	306.6	363.2	172.5	298.0	460.0	544.8
		P	75.5	81.8	89.0	77.2	151.0	163.6	177.9	154.4	226.6	245.5	266.9	231.6
	45	Q	49.7	89.9	142.0	163.2	99.4	179.8	284.0	326.4	149.1	269.8	426.1	489.6
		P	84.0	90.9	98.6	84.0	168.0	181.8	197.3	168.0	252.0	272.6	295.9	252.0
TTR 266	35	Q	131.8	213.7	323.5	407.2	263.6	427.4	647.0	814.4	395.4	641.0	970.6	1221.6
		P	130.3	139.9	149.7	134.0	260.7	279.7	299.4	268.0	391.0	419.6	449.2	402.0
	40	Q	120.1	199.0	304.7	374.0	240.1	398.0	609.5	748.0	360.2	596.9	914.2	1122.0
		P	145.4	155.4	166.0	145.6	290.8	310.8	332.0	291.2	436.2	466.2	497.9	436.8
	45	Q	107.2	183.3	285.0	340.2	214.5	366.5	570.0	680.4	321.7	549.8	855.0	1020.6
		P	162.2	172.8	184.2	159.2	324.5	345.7	368.4	318.4	486.7	518.5	552.5	477.6
TUR 483	35	Q	253.6	404.3	600.6	741.3	507.1	808.6	1201.1	1482.7	760.7	1212.8	1801.7	2224.0
		P	225.9	247.0	270.4	244.7	451.9	494.0	540.8	489.4	677.8	741.0	811.2	734.1
	40	Q	235.3	381.8	572.8	682.3	470.5	763.7	1145.5	1364.6	705.8	1145.5	1718.3	2046.9
		P	249.4	271.6	296.6	262.4	498.7	543.2	593.1	524.9	748.1	814.8	889.7	787.3
	45	Q	214.8	357.4	543.1	622.3	429.7	714.8	1086.2	1244.6	644.5	1072.3	1629.3	1866.9
		P	275.3	298.9	325.7	282.0	550.5	597.9	651.4	564.1	825.8	896.8	977.1	846.1
TVR 680	35	Q	357.3	552.4	811.0	1044.4	714.5	1104.8	1621.9	2088.9	1071.8	1657.2	2432.9	3133.3
		P	290.0	321.2	357.8	369.8	580.1	642.3	715.6	739.6	870.1	963.5	1073.4	1109.4
	40	Q	335.4	523.8	773.4	966.5	670.8	1047.5	1546.8	1933.0	1006.2	1571.3	2320.2	2899.6
		P	319.8	352.5	391.6	391.6	639.6	705.0	783.1	783.2	959.4	1057.5	1174.7	1174.8
	45	Q	311.3	492.8	733.5	885.9	622.6	985.7	1467.0	1771.8	933.9	1478.5	2200.6	2657.7
		P	353.1	387.6	429.3	416.5	706.3	775.1	858.6	833.1	1059.4	1162.7	1288.0	1249.6

R507a Screw Rack Technical Parameters - MT

Models	SDT Condensing Temperature °C	Cooling Capacity Q Input Power P (kW)	Evaporation Temperature (oC)											
			Two-parallel				Four-parallel				Six-parallel			
			-35	-25	-15	0	-35	-25	-15	0	-35	-25	-15	0
TSM 137	35	Q	108.6	163.8	208.0	394.8	217.2	327.7	416.0	789.7	325.8	491.5	624.0	1184.5
		P	74.4	80.8	87.2	96.2	148.8	161.6	174.4	192.4	223.2	242.5	261.6	288.6
	40	Q	99.3	153.3	189.2	355.5	198.6	306.6	378.4	711.1	298.0	460.0	567.6	1066.6
		P	81.8	89.0	95.8	105.6	163.6	177.9	191.6	211.2	245.5	266.9	287.4	316.8
	45	Q	89.9	142.0	170.0	316.4	179.8	284.0	340.0	632.9	269.8	426.1	510.0	949.3
		P	90.9	98.6	105.6	116.2	181.8	197.3	211.2	232.4	272.6	295.9	316.8	348.6
TSM 155	35	Q	117.8	177.5	238.5	453.4	235.6	355.0	476.9	906.8	353.5	532.4	715.4	1360.2
		P	77.9	85.9	96.8	107.6	155.7	171.8	193.6	215.2	233.6	257.8	290.4	322.8
	40	Q	109.5	167.0	214.7	403.9	219.0	333.9	429.4	807.8	328.6	500.9	644.1	1211.8
		P	85.7	94.1	105.4	117.8	171.4	188.2	210.8	235.6	257.1	282.2	316.2	353.4
	45	Q	100.2	155.7	191.4	356.2	200.5	311.4	382.8	712.4	300.7	467.2	574.1	1068.6
		P	95.0	103.7	115.2	129.0	189.9	207.5	230.4	258.0	284.9	311.2	345.6	387.0
TTM 266	35	Q	213.7	323.5	460.1	847.2	427.4	647.0	920.2	1694.3	641.0	970.6	1380.2	2541.5
		P	139.9	149.7	168.2	189.2	279.7	299.4	336.4	378.4	419.6	449.2	504.6	567.6
	40	Q	199.0	304.7	421.4	767.4	398.0	609.5	842.8	1534.9	596.9	914.2	1264.2	2302.3
		P	155.4	166.0	183.6	206.0	310.8	332.0	367.2	412.0	466.2	497.9	550.8	618.0
	45	Q	183.3	285.0	381.2	688.0	366.5	570.0	762.5	1375.9	549.8	855.0	1143.7	2063.9
		P	172.8	184.2	200.4	224.4	345.7	368.4	400.8	448.8	518.5	552.5	601.2	673.2
TTM 301	35	Q	251.9	374.3	528.6	978.3	503.9	748.5	1057.1	1956.5	755.8	1122.8	1585.7	2934.8
		P	153.9	168.5	187.2	211.6	307.8	337.0	374.4	423.2	461.8	505.5	561.6	634.8
	40	Q	238.0	356.9	478.7	878.0	475.9	713.9	957.3	1756.1	713.9	1070.8	1436.0	2634.1
		P	169.3	184.8	202.8	230.6	338.5	369.6	405.6	461.2	507.8	554.5	608.4	691.8
	45	Q	222.7	338.5	429.2	780.2	445.5	676.9	858.4	1560.4	668.2	1015.4	1287.6	2340.6
		P	186.3	203.0	220.8	250.6	372.6	406.0	441.6	501.2	558.9	608.9	662.4	751.8
TTM 483	35	Q	404.3	600.6	836.8	1325.6	808.6	1201.1	1673.7	2651.2	1212.8	1801.7	2510.5	3976.8
		P	247.0	270.4	295.3	356.8	494.0	540.8	590.6	713.6	741.0	811.2	886.0	1070.4
	40	Q	381.8	572.8	802.4	1282.2	763.7	1145.5	1604.7	2564.4	1145.5	1718.3	2407.1	3846.6
		P	271.6	296.6	323.5	396.0	543.2	593.1	647.1	792.0	814.8	889.7	970.6	1188.0
	45	Q	357.4	543.1	766.3	1239.2	714.8	1086.2	1532.5	2478.4	1072.3	1629.3	2298.8	3717.6
		P	298.9	325.7	354.8	447.0	597.9	651.4	709.6	894.0	896.8	977.1	1064.5	1341.0
TVM 680	35	Q	552.4	811.0	1126.0	1867.0	1104.8	1621.9	2252.1	3734.0	1657.2	2432.9	3378.1	5601.0
		P	321.2	357.8	393.0	524.2	642.3	715.6	786.0	1048.4	963.5	1073.4	1179.0	1572.6
	40	Q	523.8	773.4	1077.3	1810.2	1047.5	1546.8	2154.6	3620.4	1571.3	2320.2	3231.9	5430.6
		P	352.5	391.6	432.1	579.8	705.0	783.1	864.1	1159.6	1057.5	1174.7	1296.2	1739.4
	45	Q	492.8	733.5	1026.2	1751.4	985.7	1467.0	2052.5	3502.8	1478.5	2200.6	3078.7	5254.2
		P	387.6	429.3	474.4	650.2	775.1	858.6	948.7	1300.4	1162.7	1288.0	1423.1	1950.6

Model E Reciprocating Small Parallel Racks

Model E Reciprocating Small Parallel Racks
(Two- to three-parallel, 13HP - 45HP)

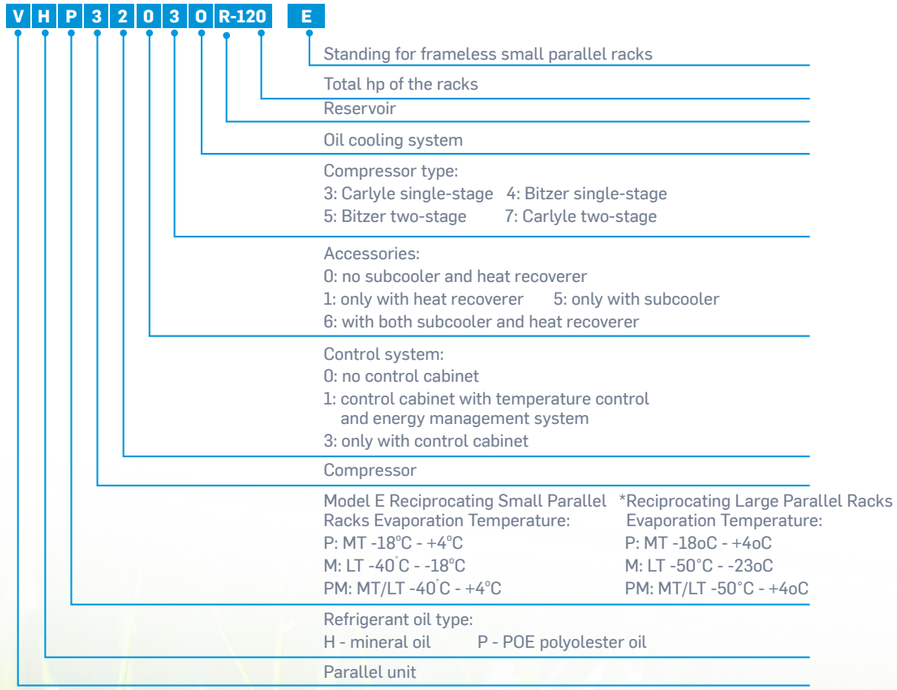
Customer Value

- Applicable for multiple refrigerants and scenarios
- Numerous non-standard customization for various sites
- High energy efficiency, reducing operating costs
- The racks supports VFD drives for more efficient energy regulation
- Reliable operation, safe and stable
- System with good oil return and long service life
- Compact structure, small footprint

Benefits at a Glance

- Adopting the 06D small cooling capacity compressor, smaller overall capacity (13HP - 45HP)
- Frameless, compact design, small footprint
- Standard oil return system with oil pumps ensures stable lubrication of the system, extending the compressor's service life.
- Dixell controller for better fulfilling capacity adjustment needs (optional)

Naming Rule and Parameters of Model E Reciprocating Small and Large Parallel Racks



Standard Configuration

- Compressor
- Crankcase heater
- LT rack rack head fan
- Low-pressure controller
- Oil balancer
- Exhaust stop valve
- Return stop valve
- Oil pressure switch
- Gas-liquid separator
- Storage-type oil separator
- Horizontal reservoir
- Filter drier
- Liquid supply ball valve
- Liquid return ball valve
- Moisture sight glass
- Single safety valve
- High pressure guage
- Low pressure guage
- Condensing pressure switch

Options

- Electronic regulator
- Discharge line muffler
- Accessory pack
- Condensing pressure control

Note: The accessory pack contains: return air filter, return air filter cartridge, exhaust ball valve and return air ball valve, one for each.

Model E Reciprocating Parallel Racks (R404A)

LT Racks

Rack Models	Compressor Configuration Models and Number	Evaporating Temperature: -37°C		Evaporating Temperature: -35°C		Evaporating Temperature: -30°C	
		Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)
VPM2203OR-13E	2*06DR725	7.48	6.4	8.72	7.02	12.28	8.58
VPM2203OR-15E	2*06DR228	10.18	8.28	11.78	9.08	16.18	11.4
VPM2203OR-20E	2*06DR337	14.94	11.96	16.64	12.78	21.54	14.96
VPM2203OR-30E	2*06DR541	23.7	17.2	18.08	14.98	23.7	17.2
VPM3203OR-30E	3*06DR337	22.41	17.94	24.96	19.17	32.31	22.44
VPM3203OR-45E	3*06DR541	35.55	25.8	27.12	22.47	35.55	25.8

MT Racks

Rack Models	Compressor Configuration Models and Number	Evaporating Temperature: -12°C		Evaporating Temperature: -10°C		Evaporating Temperature: -5°C	
		Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)
VPP2203OR-15E	2*06DA825	27.28	13.72	30.28	14.26	38.68	15.44
VPP2203OR-20E	2*06DA328	33.86	16.74	37.22	17.28	46.66	18.48
VPP2203OR-30E	2*06DA537	47.26	22.82	51.72	23.62	64.14	25.4
VPP3203OR-35E	2*06DA328+06DA537	57.49	28.15	63.08	29.09	78.73	31.18
VPP3203OR-40E	06DA328+2*06DA537	64.19	31.19	70.33	32.26	87.47	34.64
VPP3203OR-45E	3*06DA537	70.89	34.23	77.58	35.43	96.21	38.1

1) The cooling capacity and input power of all racks are based on the condensing temperature of +45°C, liquid without subcooling.
2) Power supply for the racks: three-phase 380V/50Hz
3) Optional refrigerant: R448/R449/R404A
4) Height and weight calculation of LT includes head fans.
5) Excluding freight.

Reciprocating Large Parallel Racks

Reciprocating Large Parallel Racks
(Two- to six-parallel, 30HP - 210HP)

★ Please refer to Page23 for rack naming rules

Customer Value

- Applicable for multiple refrigerants and scenarios, with a cooling capacity of 210 HP
- Numerous non-standard customization for various sites
- High energy efficiency, low operation cost, LT two-stage reciprocating parallel racks save at least 30% energy while the MT racks save around 5%.
- The racks supports VFD drives for more efficient energy regulation
- Reliable operation, safe and stable
- System with good oil return and long service life
- Compact structure, small footprint

Benefits at a Glance

- Multi-compressor parallel design, optional cooling capacity range: 13 HP - 210 HP
- Refrigerant options: R448 R449/R404A and others
- Multiple non-standard options are available.
- Self-developed special refrigeration compressors, reliable and efficient
- Compressors and system with separate pressure switches and electric protection for reliable operation
- Three-stage oil separator with an efficiency of >98%
- Integrated structure design, compact and easy to install

Standard Configuration

LT Two-stage Reciprocating Parallel Racks Standard Configuration:

- Compressor
- Subcooler
- Mechanical oil balancer
- Integrated vertical reservoir
- Muffler
- Removable liquid supply filter drier
- Gas-liquid separator
- Exhaust/return/liquid supply stop valve or ball valve

MT/LT Single-stage Reciprocating Parallel Racks Standard Configuration:

- Compressor
- Mechanical oil balancer
- Integrated vertical reservoir
- Exhaust check valve
- Muffler
- Alarm relay
- Reservoir outlet filter drier
- Exhaust/return/liquid supply stop valve or ball valve

LT Single-stage & MT Reciprocating Parallel Racks Standard Configuration:

- Compressor
- Mechanical oil balancer
- Integrated vertical reservoir
- Return air filter
- Gas-liquid separator (standard for LT version, no for MT version)
- Reservoir outlet filter drier
- Muffler
- Exhaust/return/liquid supply stop valve or ball valve

Options

LT Two-stage Reciprocating Parallel Racks Optional Configuration:

- Danfoss, Carel controllers
- Number of liquid supply and gas return branches
- Electronic oil balancer
- Multiple suction pressure racks
- Inverter
- Remote control

MT/LT Single-Stage Reciprocating Parallel Racks Optional Configuration:

- Subcooler
- Danfoss, Carel controllers
- Electronic oil balancer
- Split horizontal/vertical reservoir
- Condensing switch
- Exhaust check valve
- Hot gas defrost system

LT Single-stage & MT Reciprocating Parallel Racks Optional Configuration:

- Subcooler
- Danfoss, Carel controllers
- Electronic oil balancer
- Split horizontal/vertical reservoir
- Condensing pressure switch
- With shock-absorbing hoses
- Multiple suction pressure racks
- Inverter
- Remote control

1)The cooling capacity and input power are based on an ambient temperature of 32°C, the condensing temperature of 45°C, no liquid subcooling; and the temperature of the interstage cooling liquid for two-stage is 4.4°C. For example, if SIT+2.8>4.4°C, the temperature is SIT+5.6°C.
2)The power supply for the racks is three-phase 380V/50Hz, and the power for the control operation is one-phase 220V/50Hz.
3)If the racks are aiming to operate at different evaporating temperatures or at too high or too low ambient temperatures, please contact us.
4)For an application at a temperature of ※ (i.e., -50°C), please contact our technicians.

Rack Application Scope

Mode	Reciprocating Compressor					
	MT		LT, Single-stage		LT, Two-stage	
Refrigerant	R448/R449	R404A	R448/R449	R404A	R448/R449	R404A
Evaporation Temperature	-18~ +7	-18~ +4	-37~ -18	-40~ -18	-50~ -24	-50~ -24

Reciprocating Large Parallel Racks (R404A)

LT two-stage parallel racks

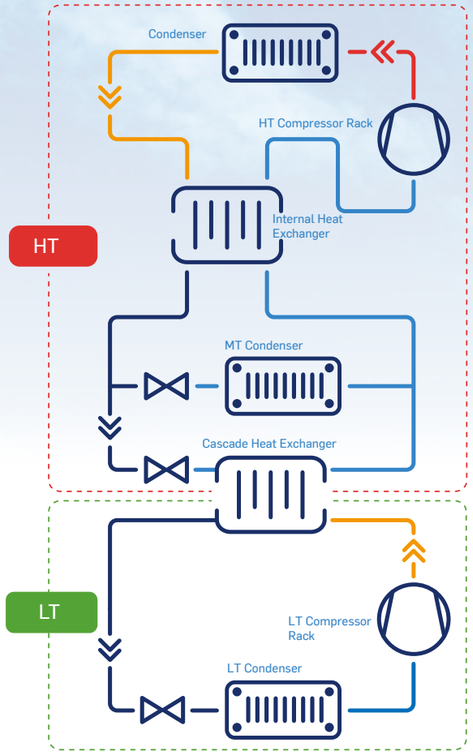
Rack Models	Compressor Configuration Models and Number	Evaporating Temperature: -50°C		Evaporating Temperature: -45°C		Evaporating Temperature: -40°C		Evaporating Temperature: -35°C	
		Cooling capacity: Q(kW)	Input power P(kW)	Cooling capacity: Q(kW)	Input power P(kW)	Cooling capacity: Q(kW)	Input power P(kW)	Cooling capacity: Q(kW)	Input power P(kW)
VPM22570R-30	2*06CC550	—	—	—	—	17.40	11.48	23.94	13.40
VPM22570R-40	2*06CC675	19.96	13.78	25.06	16.5	32.16	19.38	41.06	22.20
VPM32570R-45	3*06CC550	—	—	—	—	26.10	17.22	35.91	20.10
VPM32570R-60	3*06CC675	29.94	20.67	37.59	24.75	48.24	29.07	61.59	33.30
VPM32570R-90	3*06CC899	42.99	30.66	52.23	36.12	65.64	41.70	82.62	47.25
VPM42570R-120	4*06CC899	57.32	40.88	69.64	48.16	87.52	55.60	110.16	63.00
VPM52570R-150	5*06CC899	71.65	51.11	87.05	60.20	109.40	69.50	137.70	78.75
VPM62570R-180	6*06CC899	85.98	61.32	104.46	72.24	131.28	83.40	165.24	94.50

LT parallel racks

Rack Models	Compressor Configuration Models and Number	Evaporating Temperature: -40°C		Evaporating Temperature: -35°C		Evaporating Temperature: -30°C		Evaporating Temperature: -25°C	
		Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)
VPM22030R-30	2*06ER450	12.88	12.94	20.42	17.14	28.94	21.26	38.58	25.24
VPM22030R-50	2*06ER475	18.84	18.64	29.04	23.84	40.96	29.26	54.90	34.80
VPM32030R-45	3*06ER450	19.32	19.41	30.63	25.71	43.41	31.89	57.87	37.86
VPM32030R-60	3*06ER475	28.26	27.96	43.56	35.76	61.44	43.89	82.35	52.20
VPM32030R-90	3*06ER399	41.22	40.35	58.56	49.71	78.78	59.67	102.42	70.08
VPM42030R-120	4*06ER399	54.96	53.80	78.08	66.28	105.04	79.56	136.56	93.44
VPM52030R-130	3*06ER399 +2*06ER475	60.06	58.99	87.60	73.55	119.74	88.93	157.32	104.88
VPM52030R-150	5*06ER399	68.70	67.25	97.60	82.85	131.30	99.45	170.70	116.80
VPM62030R-160	4*06ER399 +2*06ER475	73.80	72.44	107.12	90.12	146.00	108.82	191.46	128.24
VPM62030R-180	6*06ER399	82.44	80.70	117.12	99.42	157.56	119.34	204.84	140.16

MT parallel racks

Rack Models	Compressor Configuration Models and Number	Evaporating Temperature: -15°C		Evaporating Temperature: -12oC		Evaporating Temperature: -10°C		Evaporating Temperature: -5°C	
		Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)	Cooling Capacity Q(kW)	Input Power P(kW)
VPP22030R-30	2*06EM450	49.02	24.78	57.26	26.94	63.20	28.34	79.72	31.66
VPP22030R-40	2*06EM475	77.50	37.62	89.92	40.72	98.88	42.78	123.98	47.84
VPP32030R-45	3*06EM450	73.53	37.17	85.89	40.41	94.80	42.51	119.58	47.49
VPP32030R-75	3*06EM475	116.25	56.43	134.88	61.08	148.32	64.17	185.97	71.76
VPP32030R-105	3*06EM499	180.78	87.06	199.89	92.40	213.48	95.52	250.92	102.60
VPP42030R-120	2*06EM499 +2*06EM475	198.02	95.66	223.18	102.32	241.20	106.46	291.26	116.24
VPP42030R-130	3*06EM499 +06EM475	219.53	105.87	244.85	112.76	262.92	116.91	312.91	126.52
VPP42030R-140	4*06EM499	241.04	116.08	266.52	123.20	284.64	127.36	334.56	136.80
VPP52030R-155	3*06EM499 +2*06EM475	258.28	124.68	289.81	133.12	312.36	138.30	374.90	150.44
VPP52030R-175	5*06EM499	301.30	145.10	333.15	154.00	355.80	159.20	418.20	171.00
VPP62030R-190	4*06EM499 +2*06EM475	318.54	153.70	356.44	163.92	383.52	170.14	458.54	184.64
VPP62030R-210	6*06EM499	361.56	174.12	399.78	184.80	426.96	191.04	501.84	205.20



Two-Stage Matching System Features

Tailored System

- Based on various customer needs, matching the most fit two-stage compression system.
- Flexible matching of intermediate loads based on system load characteristics
- Adjust the model and quantity of high and low pressure compressors for different application types

With high and low temperature loads

- Just one rack for high temperature storage and low temperature quick freezers.
- Rapid cooling, more energy-saving

Available parallel racks

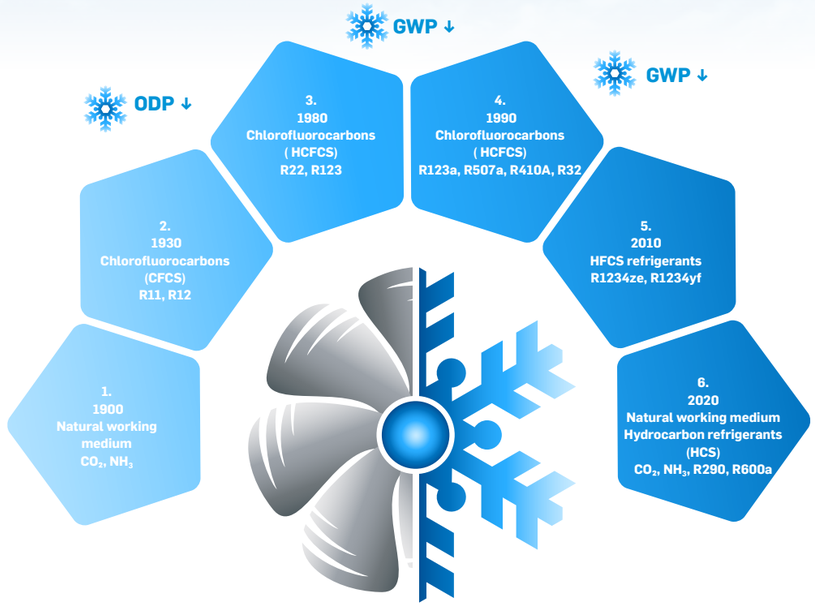
- Application that requires large cooling capacity
- Unequal parallel for precise matching Saving initial investment

Current Non-Standard Order Scope

Refrigerant	R507a/R404A
Low pressure side	Carlyle- TT/TS 50HP~150HP / Bitzer-HSKB 50HP~110HP / 1~6 并联
High pressure side	Carlyle- TS/TT/TU 50HP~188HP / Bitzer-HSK 60HP~320HP / 1~6 并联
Application temperature range	Low side evaporating temperature: -50°C - -25°C

CO_2 Refrigerant's Physical Properties and Features:

- Natural, non-toxic
- Does not destroy the atmospheric ozone layer, ODP =0
- Global Warming Potential GWP=1
- ASHRAE safety class A1
- Common refrigerant, cost-effective
- High latent heat under low temperatures, suitable for low-temperature sections of cascade systems



CO_2 Cascade System Advantages:

- At lower evaporating temperatures (approx. -38°C), cascade systems have a higher COP than two-stage ones.
- Benefit from the high cooling capacity per unit volume of CO_2, the compressor, separator, and other equipment can be small in size, with a lower refrigerant amount required.
- CO_2 is a safe medium for entering operation rooms and storages, which minimizes the risks brought by the NH3 system, ensuring the safety of the staff and food.

HybridCO₂OL Series CO_2 Cascade Parallel Compressor Racks

Product Benefits

- Compact equipment, small piping size, saving room space
- Highly efficient operation, saving 5%-10% energy annually compared to HFC racks
- Cost-effective refrigerant, low charging cost

Benefits at a Glance

- Adopt the natural working medium CO_2
- Compliant with EU F-Gas regulations, not subject to refrigerant phase-out regulations
- High CO_2 cooling capacity per unit volume, compact equipment, small footprint
- CO_2 has better heat transfer capacity and improves evaporating temperature by 2K, with higher energy efficiency
- A large cooling capacity ranges from 24 to 240 HP with 2 to 11 compressor heads
- The equipment is separately skid mounted, easy to install and maintain
- Able to be equipped with heat recycling; high comprehensive energy efficiency

*GWP: Global Warming Potential, ODP: Ozone Depleting Potential

CO_2 Cascade Racks Configuration

We offer total design solutions:

- Cold storage refrigeration and electrical system design
- Cold storage electrical box and control system
- Evaporating temperature: -50 - -35°C
- CO_2/HFC cascade systems
- Cold storage system commissioning
- Cooling capacity: 220kW - 1,320kW @SST-30, SDT-5°C

CO_2 Cascade Racks Configuration		
Configuration	HFC parallel racks, two- to six-parallel	Carlyle or Bitzer compressor
	Condensing and evaporating skid	400kW - 4,000kW
	CO_2 reciprocating compressor racks, two- to twelve-parallel	Dorin or Bitzer compressor
	Reservoir	$2m^3$ - $12m^3$
	Barrel pump skid	$2m^3$ - $12m^3$
	Cold room electrical boxes	
	Water defrosting pump control box	
Options	Machine room distribution box	
Miscellaneous	Based on specific applications and customer needs	

CO_2 Transcritical System

Electrical cabinet

- Global Warming Potential GWP=1
- ASHRAE Safety Group A1

Main Applications

- Warehouse & Distribution Centers
- Food Processing
- Sport Venues
- Other Usages

Operating mode

- One machine with a large capacity
- The low-temperature refrigeration capacity can reach 700kW, while the medium-temperature refrigeration capacity can reach 1,500kW.
  (Based on: medium temperature -6°C/low temperature -32°C/air cooler outlet temperature 37°C for direct expansion application)
- The heating capacity can reach 2,100kW.
- It can achieve higher capacities by combining units in parallel.

Multi-level heating

- High temperature rise, maximum 90°C per unit
- A same unit is capable to provide one to three levels of water temperatures.
- It's compatible with heat sources with low temperatures.

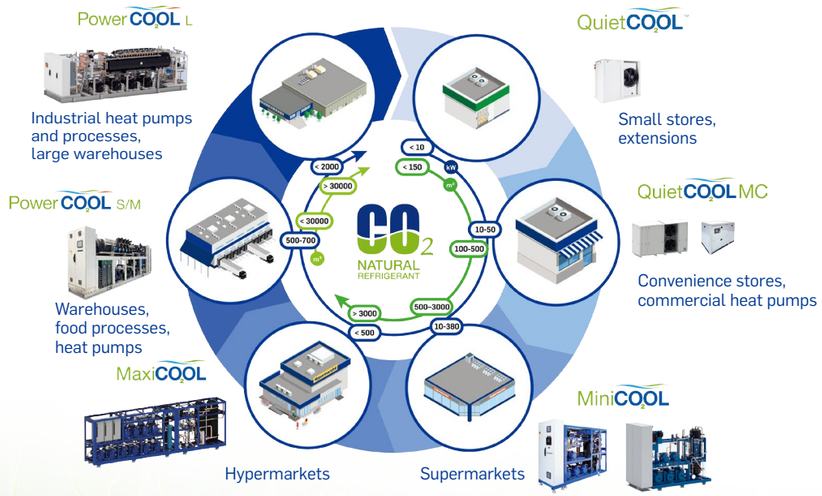
Improved energy efficiency

- The adjustable ejector achieves higher efficiency by raising the compressor suction pressure.
- Up to a 30% improvement in energy efficiency compared with standard CO_2 systems

User-friendly and connected control interface

- Latest generation of PLC (programmable logic controller) with large touchscreen
- Embedded communication module
- Monitoring through webserver and smartphone app
- Included 4G router for remote commissioning and service

Proven Solutions. Cooling | Heating Sustainable. Efficient.



1 KW~1.5 MW full cooling capacity multi-industry CO_2 total solution More than 20,000+ successful applications worldwide

National Speed Skating Oval (The Ice Ribbon)

LT 10–30°C
Anti-freeze floor

MT 30–60°C
Ice melting pool

HT 60–80°C
Domestic hot water | ice pouring truck | high temperature dehumidification

Project Highlights

Largest artificial ice surface in Asia

- Ice area 12,000 m²
- Ice areas are refrigerated and controlled separately.
- Realizing "operating together for different usages"

Transcritical CO_2 direct cooling ice making technology

- Applied in Olympic Games for the very first time
- With annual energy saving of about 2 million kWh.
- "Near-zero" carbon emissions

CO_2 refrigeration system Annual energy saving

Daily Energy Saving	Monthly Energy Saving	Annual Energy Saving
5,500 kWh	160,000 kWh	2000,000 kWh

Regional Distribution Center in Finland

Total floor area	Total storage capacity
62,000 m²	1,000,000 m³
Freezing and refrigerating area	**Warehouse height**
29,000 m²	22 m

Refrigeration kW load	Freezing load	Fast freezing load
2,446 kW @-10°C	810 kW @-34°C	240 kW @-48°C

Design Essentials

- The area where the distribution center is located restricts using ammonia as a refrigerant.
- A 1000 m3 water storage tank has been configured as an energy storage device for heating in winter and pre-cooling in summer.
- The design of the heating system fully leverages the heat recovery of the CO_2 system and sets the heat recovery to 2500 kW.
- The distribution center makes full use of green wind and hydroelectric energy with zero carbon emissions.

Compared with distribution centers of the same size,It saves up to 20%of energy. 20%

Screw Racks

JD Intelligent Industrial Park Phase II Cold Storage in Changsha

- A huge system with multiple parallel racks - more reliable
- A drum-pump system with two return oil technologies - more safety
- Sensor for intelligent defrost - more accurate
- Two-stage screw parallel racks - more energy-saving
- COP increased by 25% compared to common systems

Chengdu Tianfu Smart Kitchen Cold Storage

- Carrier's low-temperature, two-stage semi-hermetic compressor technology
- Faster temperature pulling
- Energy saving 30%

Phase II of VX Logistics' Cold Storage in Langfang

- Maximize efficiency and energy-saving with our integrated two-stage refrigeration system.
- Switchable dual-temperature cold storage: Adaptable to various temperature zones with one unit.

Zhenhua Group Cold Storage in Yantai

- After the logistics and distribution processing center was delivered, the overall energy consumption decreased by 15% compared with the industry average
- Carlyle rack's energy optimization function assists the cold storage in defrosting during off-peak hours.

CO_2 Cascade System

Sino-Ocean Pinghu Constant Temperature Supply Chain Industrial Park Project

- Compared with Freon, reduces carbon emissions by 8,800 tons/year
- Energy Saving by 10-15%

Sino-Ocean Food Processing Center in Taicang

- Reduced carbon emissions by 5,700 tons/year compared to Freon systems
- Dual machine room design, 2 buildings are equipped with a set of CO_2+R507a cascade system
- Comprehensive energy saving of about 10%-15%

CO_2 Transcritical System

A Renowned Food Processing Group in Tianjin

- CO_2 refrigerant has good heat exchange effect, high refrigeration efficiency, and high quality of oil production.
- Advanced transcritical CO_2 technology reduces energy consumption per unit of product by about 40%
- Environmentally friendly refrigerants ensure food safety

Sam's Club

- Successful application of CO_2 injection
- Compared to Freon, energy efficiency is improved by 25%
- Hot gas defrost, rapid defrost in 4-10 minutes
- Abundant heat recovery resources, maximum outlet temperature 80°C

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