RAETTS®

The global innovator of
energy-saving blower system solutions.

National high-tech enterprises

National-level specialized new "small giant" enterprises

The Ministry of Industry and Information Technology of the
State "Star of Energy Efficiency" equipment products

Recommended products of energy-saving technology and
equipment in the field of national industry and information technology

Major environmental protection technology and equipment products
that the state encourages development

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RAETTS®

Industry First,
Four-Stage Maglev Compressor



RAETTS MAGLEV REFRIGERANT COMPRESSOR

UFRC algorithm | Self-sweeping frequency | Intelligent frequency conversion | Oil-Free Machine

25%-40%
Energy saving

15%-30%
Reduce costs by

RAETTS Intelligent Equipment (Guangdong) Co.,Ltd.

ABOUT US

RAETTS Intelligent Equipment (Guangdong) Co.,Ltd.

RAETTS Intelligent Equipment (Guangdong) Co.,Ltd. established in 2011. It is a technology enterprise with both air levitation and magnetic levitation core technologies.

The headquarters of RAETTS is located in Dongguan City, Guangdong Province, the hinterland of Guangdong-Hong Kong-Macao Greater Bay Area. The R&D and production bases in South China and Central China with an area of over 100000㎡, achieving the full industry chain R&D and manufacturing of air bearing blower, maglev turbo blower, maglev turbo compressors, maglev centrifugal chiller and other products.

RAETTS has established multiple subsidiaries and service institutions in Beijing, Jiangxi, Jiangsu, Sichuan and other provinces and cities to provide high-quality and convenient services to customers. In addition, RAETTS customers are located in Germany,France, Malaysia, and Thailand, and other countries.

RAETTS has been rated as “ Specialized, Sophisticated, Distinctive and Innovative "Little Giant" Enterprises", as “ Pilot enterprises of the multiplication plan ", and selected as a reserve enterprise for listing in Dongguan City.

Innovation never stops, and technology reigns supreme.RAETTS has undergone more than a decade of development, breaking through international technological monopolies. It innovatively creates air bearing blower products across the entire power range and has developed UFRC maglev blowers and air compressors. In recent years, RAETTS has focused on researching and developing maglev refrigerant compressor technology, forming mature products such as chillers, heat pump units, and waste heat power generation units.

In addition, in order to improve the energy efficiency of the industry's motors, RAETTS has focused on the R&D of rare earth permanent magnet synchronous motors, providing a strong heart for RAETTS's products and serving industrial customers for motor upgrades and renovations.



2011 year
In 2011 RAETTS established

100000+m²
The R&D and production bases

High-tech Enterprise
National High-tech Enterprise

Listed
Listed reserve enterprise

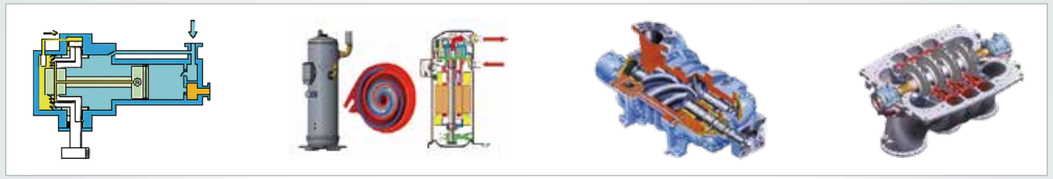
Specialized, Sophisticated, Distinctive and Innovative "Little Giant" Enterprises
National cultivation enterprise

Multiplication plan
Pilot enterprises of the multiplication plan



Traditional Compressors

Mechanised bearing transmission, amazing power consumption



Piston-type compressor | Vortex compressor | Screw-type compressor | Centrifugal compressor

01 Motor inefficiency

Ordinary motor, efficiency 70-80%, many faults

02 Poor adaptability

High compressive ratio and poor performance under changing working conditions, easy to gasp

03 Non-environmental protection

Lubricating oil is needed, affecting air quality andrefrigeration efficiency

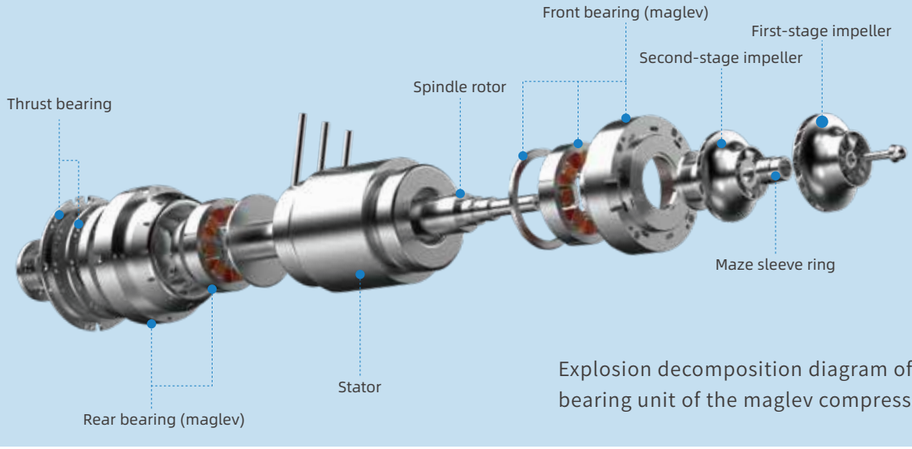
04 High cost

High failure rate, large consumables, high operation and maintenance cost



RAETTS Maglev Compressor

Magnetic Levitation Bearing Direct Drive - Revolutionizing Traditional Technology



Explosion decomposition diagram of the bearing unit of the maglev compressor

Permanent magnet synchronous motor

Integrated electronic control module

Oil-Free Machine direct drive integration

2A low-current start

Ultra-high pressure ratio 7.2

Accurate temperature ±0.1℃

Long life ＞30years

Eco-friendly Refrigerant R1234ze



Maglev controller chip



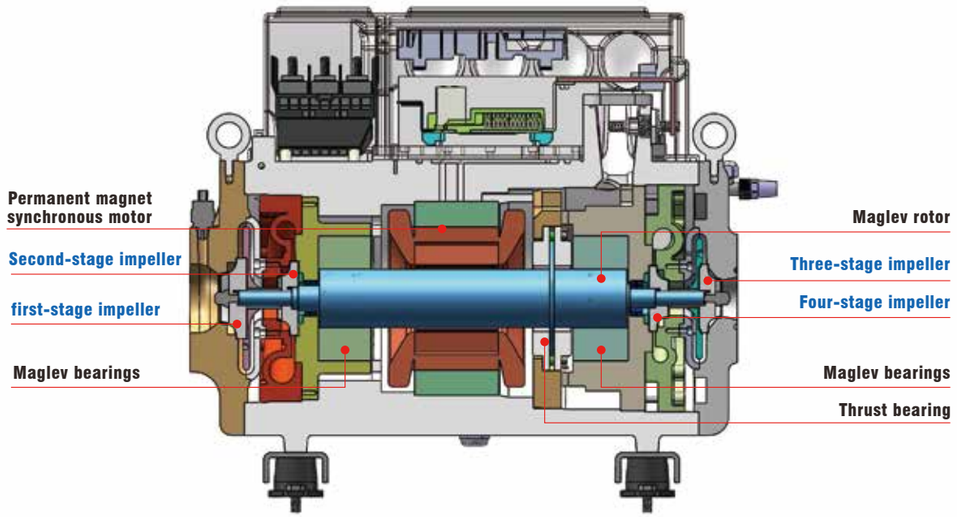
Maglev compressor rotor



The maglev compressor Bearing Assembly

WORLD'S FIRST · FOUR-STAGE COMPRESSION

Pressure Ratio Breakthrough 13.0 Cooling to -40℃ and Heating to 130℃



UFRC Algorithm

Precision control for enhanced reliability

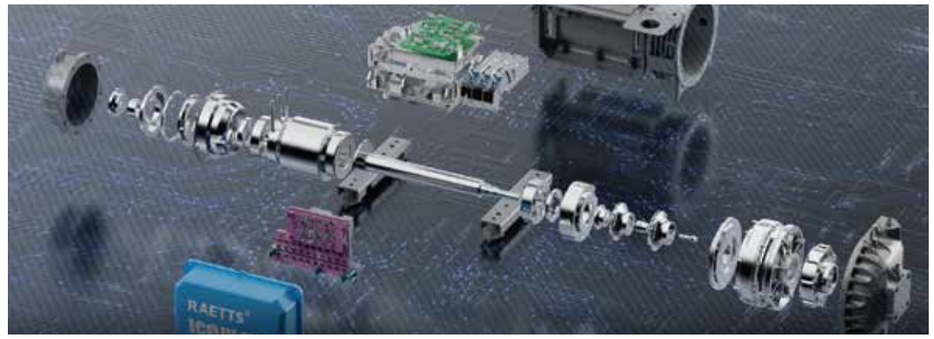
RAETTS maglev UFRC Algorithm

- Rapid acquisition of displacement
- Extreme computing processing
- Extreme control output

→ spindle vibration ＜3μm
→ Efficiency increase by 28%
→ Noise ＜73dB
→ Expand the working range
→ Adapt to complex working conditions
→ Improve system reliability

Revolutionary Performance Redefining Industry Standards

Beyond Conventional Heating/Cooling Limits



Extreme-load bearing endurance
Unexpected power outage, fearless of falling

4-Stage Compression adapts to high temperature differences
Satisfy cooling to -30 ℃ and Satisfy heating to 130 ℃

Inductive sensor
No More Eddy Sensor Failures

Ceramic protected bearings
More adaptable to high speed, high temperature, and corrosion resistance

Intelligent automatic parameter tuning
Add UFRC algorithm to traditional PID+negative feedback

National Double Level Energy Efficiency Certification
IPLV up to 11.58, COP up to 7.2

Other competitors' compressors	VS	RAETTS Maglev Compressor
Permanent magnet biased bearings: suitable for stable working conditions, bulky systems, and easy demagnetization at high temperatures	**Magnetic bearings**	Electromagnetic bias bearing: no permanent magnet, no demagnetization risk, flexible control, and real-time adjustment of magnetic field strength
Protecting bearings, sensors, and thrust disc layout from instability and the risk of downtime caused by heat	**Spindle stability**	Precision design for protecting bearings, sensors, and thrust discs, with almost zero temperature drift under harsh operating conditions
Eddy current sensor: can withstand temperatures less than 80 ℃ (not suitable for heat pump conditions)	**Sensor**	Inductive sensor: suitable for ultra-high temperature working conditions of 150 ℃ and ultra-low temperature working conditions of -50℃
Steel ball bearings: not suitable for high speeds, require surface treatment, limited temperature resistance	**Protective bearings**	Ceramic bearings: higher speed, more stable, and more wear-resistant.Specializing in extreme cooling and heating environments.
Surge and power outage pressure backflow impact the spindle, causing downtime	**Failure rate**	Still not afraid of falling under surge and power outage, suspended normally
PID+negative feedback: spindle offset 10-20 μm	**Control algorithm**	UFRC+PID+negative feedback: spindle offset of 1-2 μm
Last century technology, outdated systems	**Inverter**	Independently developing new technologies for higher cost-effectiveness

RAETTS Maglev Compressor

Six core advantages

01 Oil-free design, low noise and environmental protection

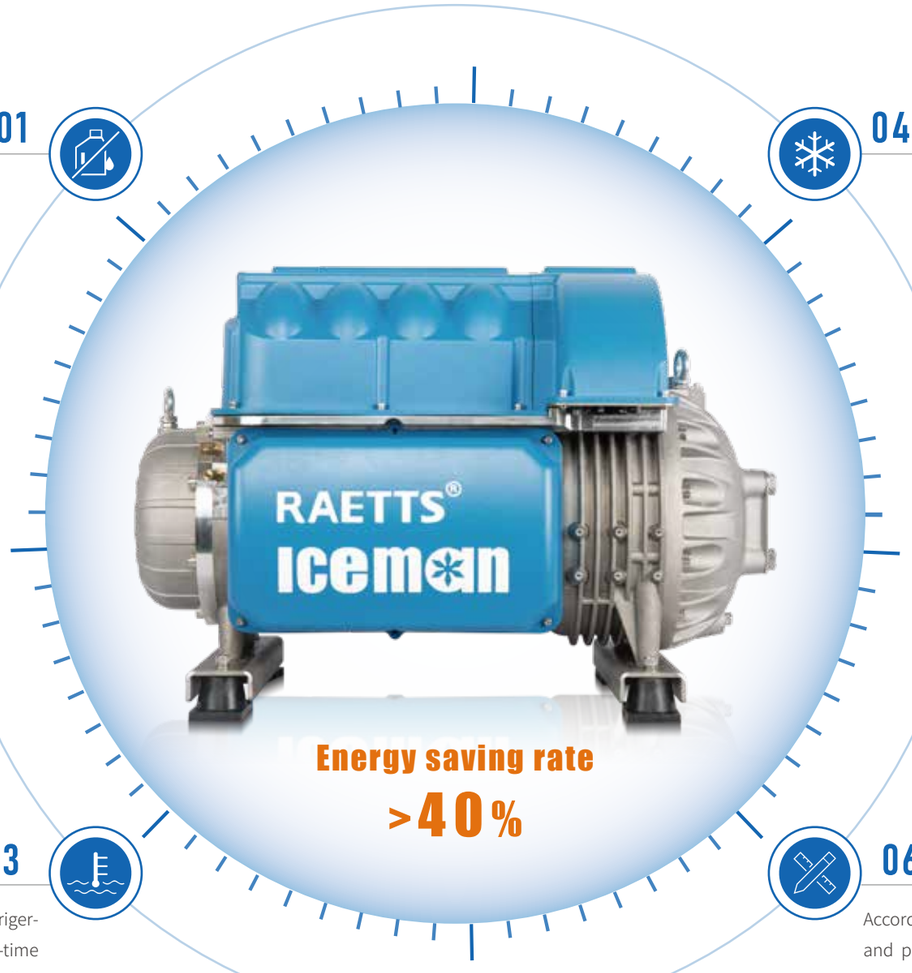
Magnetic levitation bearings can eliminate mechanical friction losses, oil thermal conductivity losses, and complex oil circuit systems, while also breaking through the traditional upper limit of rotor speed. Combined with fully variable frequency intelligent control, they create the most efficient compressor performance. The whole machine has low vibration and noise below 73dB.

02 2A low-current startup

Only 2A of electricity is needed to start (traditional chillers require 500-600A of electricity), which can reduce the maximum power load, avoids grid shocks, and further save costs for owners.

03 More precise refrigerant and temperature control

By using high-precision electronic expansion valves and liquid level sensors, the refrigerant flow rate and container liquid level can be accurately controlled based on real-time load changes in the refrigeration system. Adopting high-precision temperature controller, the water temperature control accuracy is ± 0.1 ℃.



04 Wide operation, large cooling capacity

The entire unit can achieve a wide range of operation with 10% to 100% stepless adjustment, and the compressor series with different sizes can reach a minimum of 2%. A single unit can be equipped with up to 8 maglev compressors, with a maximum cooling capacity of 1600RT.

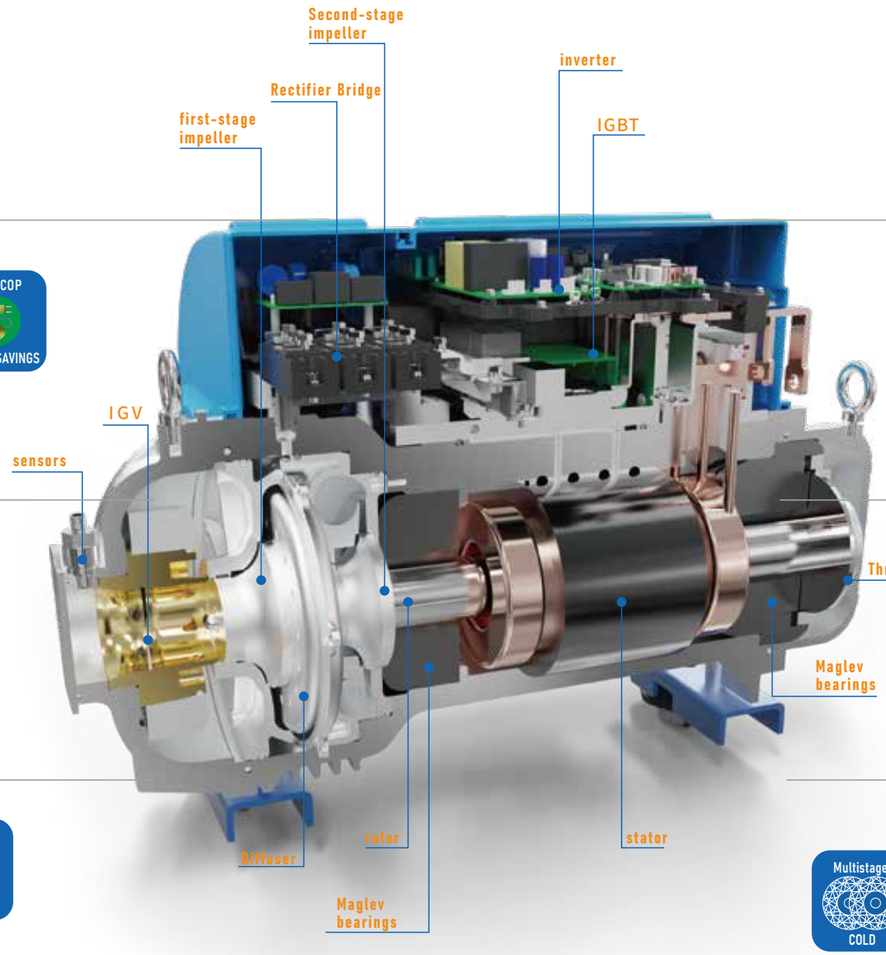
05 Matched multi compressors, shared fluorine system

By designing a multi compressor co fluorine system, the utilization rate of the entire heat exchange area can reach 100% during partial load operation, resulting in higher efficiency. The combination of large and small compressors enables more precise control of partial loads and higher load utilization efficiency.

06 Integrated design, customized according to non-standard requirements

According to user needs, a left-right or up-down structure can be adopted, and the direction and position of the water pipe interface can also be customized. Users can assemble according to the on-site space. Supports both skid-mounted and non-skid-mounted configurations.

Six core performance features Achieve system energy saving 25%-45%



Permanent magnet synchronous motor improves energy efficiency:

Permanent magnet excitation, power factor＞0.9, Energy efficiency＞95%, Compared with the asynchronous motor, it is about 10% higher

HIGH COP
ENERGY SAVINGS

UFRC algorithm+self scanning frequency function

High precision micron displacement, 0-2000Hz self-sweep frequency, automatic parameter adjustment, fault warning, adaptive reliability improvement.

SELF-SCANNING
UFRC
INTELLIGENT CONTROL

Maglev bearings improve energy efficiency

Magnetic levitation has 0 friction and 0 vibration, and no lubricating oil is required, while the friction of contact mechanical bearings is difficult to reduce

Maglev
0 Friction 0 Vibration

Direct connection direct drive integrated design

High-speed motor direct drive rotor impeller, without coupling, less consumables, low operation and maintenance costs, unit life of more than 25 years.

INTEGRATED
LOW COST

Oil-free systems prevent energy efficiency decay

A 3.5% oil content will reduce the energy efficiency of the unit by 8%; The entire RAETTS machine operates without oil, with almost no energy efficiency degradation during operation.

100%
OIL FREE

Multi stage subcooling process design

The multi-stage subcooling process design, combined with energy-saving technology of the economizer, effectively controls the intermediate pressure to ensure reliable operation, with a maximum subcooling degree of up to 15 °C, an 8% increase in system refrigeration capacity, and a 7% increase in refrigeration efficiency.

Multistage
COLD

RAETTS Maglev Compressor

RAETTS maglev Chiller:
Revolutionizing Traditional Cooling Technology





Motor efficiency ＞**96%** Load adjustment **10-100%** **0**Friction**0**Lubricating Oil

Noise ＜**70dB**（A） Starting current **2A** The service life is up to**30** years

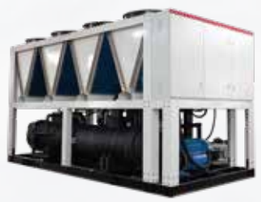
RAETTS Maglev Compressor,
providing the powerful heart for heating and cooling equipment.



RAETTS maglev chiller unit



Maglev High-Temperature Water Source Heat Pump Unit



Maglev Air Source Heat Pump



Maglev Multi-Split Direct Expansion Unit

BASIC PARAMETERS OF RAETTS MAGLEV COMPRESSOR

These parameters are intended for reference by HVAC designers, application engineers, consultants, and sales personnel.

Model	IM250	IM300	IM350	IM400	IM700	IM1000	IM1800
Max Speed (rpm)	25500	25500	32000	26400	20000	20000	14000
Rated power (kW)	35	43	95	95	120	200	300
Highest design pressure (Kpa)	1800	1800	1800	1800	1800	1800	1800
Compression type	Two-stage compression						
Maximum pressure ratio	3.3	3.5	3.5	3.7	3.5	3.5	3.5
Voltage	380-480VAC						
Frequency	50/60Hz±5Hz						
Weak current voltage	24VDC						
Electrical system	Three-Phase Four-Wire System						
Rated current (A)	60	77	170	170	210	360	580
Rated frequency (Hz)	425	425	533	440	333	333	333
Structural form	Integrated frequency conversion						
Insulation class	C (200°C)						
Startup mode	Variable frequency start-up						
Protective performance	IP54						
Working temperature range	-1°C to 46°C (30°F to 115°F)						
Storage temperature range	-30°C to 50°C (-22°F to 122°F)						
Applicable condensation mode	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Refrigerant	HFC-134a						
cooling capacity (kW) Max. rotational speed (rpm)	230 / 25500	283 / 25500	440 / 32000	538 / 26400	704 / 20000	1055 / 20000	1760 / 14000
Nominal Cooling Capacity (USRT)	65	80	95 / 125	130 / 150	160 / 200	300	500
COP	5.89	6.02	6.35	6.29	6.80	6.81	6.83
Total mass (kg)	130	130	130	136	136	430	650
Inlet Guide Vane Control	Continuous control from 30% to 100%						
External dimensions (L*W*H)mm	752*513*520					1135*802*802	1135*802*802
Air tightness test	20.8kg/cm^{2}g						

RAETTS Maglev Compressor Basic Parameters

These parameters are intended for reference by HVAC designers, application engineers, consultants, and sales personnel.

Model	IM260G	IM450G	IM900G	IM300H	IM500H	IM1000H	IM350M	IM700M	IM1800M
Max Speed (rpm)	38000	28500	26870	28500	22000	15500	36000	19500	20000
Rated power (kW)	105	110	200	110	185	220	105	200	300
Highest design pressure (Kpa)	3000	3000	3000	2000	2000	2000	2000	2000	2000
Compression type	Four-stage compression			Three-stage compression			Two-stage compression		
Maximum pressure ratio	13	13	13	7.6	9	9	5.5	5.5	5.5
Voltage	380-480VAC								
Frequency	50-60Hz								
Weak current voltage	24VDC								
Electrical system	Three-Phase Four-Wire System								
Rated current (A)	210	220	400	187	250	440	190	380	580
Rated frequency (Hz)	633	475	448	475	366	258	600	325	333
Structural form	Integrated Variable Frequency Centrifugal Type			Split-Type Variable Frequency Centrifugal			Integrated Variable Frequency Centrifugal Type		
Insulation class	C (200°C)								
Startup mode	Variable frequency start-up								
Protective performance	IP54								
Working temperature range	-1°C to 46°C (30°F to 115°F)								
Storage temperature range	-30°C to 50°C (-22°F to 122°F)								
Applicable condensation mode	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Refrigerant	R507a			R245fa			R134a		
Total mass (kg)	150	185	480	105	350	450	136	350	450
Inlet Guide Vane Control	Continuous control from 50% to 100%			None	Continuous control from 50% to 100%	None	Continuous control from 50% to 100%		
External dimensions (L*W*H)mm	839*603*574	940*603*574	1324*881*800	1126*646*540	1318*848*690	1575*954*698	752*513*520	1135*802*802	1135*802*802
Air tightness test	27.5kg/cm²g			22kg/cm²g					

RAETTS Maglev Oil-free Ultra-High Pressure Centrifugal Compressor Performance Parameter Table

Model			IM450G				IM900G			
Number of Stages			Four Stage				Four Stage			
Refrigerant			R507a				R507a			
Structural form			Integrated Variable Frequency Centrifugal Type				Integrated Variable Frequency Centrifugal Type			
Outlet Water Temperature °C			41	45	50	55	41	45	50	55
Ambient Temperature °C	0	Heating Capacity (kW)	420	380	350	320	840	760	700	640
		Power (kW)	100				200			
		COP	4. 2	3.80	3.50	3.20	4.20	3.80	3.50	3.20
	-5	Heating Capacity (kW)	380	340	310	300	760	680	620	600
		Power (kW)	100				200			
		COP	3.80	3.40	3.10	3.00	3.80	3.40	3.10	3.00
	-10	Heating Capacity (kW)	350	320	290	265	700	640	580	530
		Power (kW)	100				200			
		COP	3.50	3.20	2.90	2.65	3.50	3.20	2.90	2.65
	-15	Heating Capacity (kW)	310	290	270	250	620	580	540	500
		Power (kW)	100				200			
		COP	3.10	2.90	2.70	2.50	3.10	2.90	2.70	2.50
	-20	Heating Capacity (kW)	280	270	260		560	540	520	
		Power (kW)	100				200			
		COP	2.80	2.70	2.60		2.80	2.70	2.60	
	-25	Heating Capacity (kW)	280	260			560	520		
		Power (kW)	100				200			
		COP	2.80	2.60			2.80	2.60		
	-30	Heating Capacity (kW)	270				540			
		Power (kW)	100				200			
		COP	2.70				2.70			

Note: The above data are based on an evaporator temperature difference of 5°C and a condenser temperature difference of 3°C, with a deviation of ±5%.

RAETTS Maglev Oil-free High Pressure Centrifugal Compressor Performance Parameter Table

Model			IM500H						IM1000H					
Number of Stages			Third stage						Third stage					
Refrigerant			R245fa						R245fa					
Structure Form			Split-Type Variable Frequency Centrifugal						Integrated Variable Frequency Centrifugal Type					
Outlet Water Temperature °C			60	70	80	85	90	95	60	70	80	85	90	95
Heat Source Temperature °C	25	Heating Capacity (kW)	779	634	554	502			1298	1056	924	836		
		Power (kW)	132						220					
		COP	5.90	4.80	4.20	3.80			5.90	4.80	4.20	3.80		
	30	Heating Capacity (kW)	871	686	581	541	502		1452	1144	968	902	836	
		Power (kW)	132						220					
		COP	6.60	5.20	4.40	4.10	3.80		6.60	5.20	4.40	4.10	3.80	
	35	Heating Capacity (kW)	990	792	620	594	528	502	1650	1320	1034	990	880	836
		Power (kW)	132						220					
		COP	7.50	6.00	4.70	4.50	4.00	3.80	7.50	6.00	4.70	4.50	4.00	3.80
	40	Heating Capacity (kW)	977	858	686	634	581	528	1628	1430	1144	1056	968	880
		Power (kW)	132						220					
		COP	7.40	6.50	5.20	4.80	4.40	4.00	7.40	6.50	5.20	4.80	4.40	4.00
	45	Heating Capacity (kW)		964	766	686	634	594		1606	1276	1144	1056	990
		Power (kW)	132						220					
		COP		7.30	5.80	5.20	4.80	4.50		7.30	5.80	5.20	4.80	4.50
	50	Heating Capacity (kW)			805	726	673	634			1342	1210	1122	1056
		Power (kW)	132						220					
		COP			6.10	5.50	5.10	4.80			6.10	5.50	5.10	4.80
	55	Heating Capacity (kW)			964	832	766	673			1606	1386	1276	1122
		Power (kW)	132						220					
		COP			7.30	6.30	5.80	5.10			7.30	6.30	5.80	5.10

Note: The above data are based on an evaporator temperature difference of 2°C and a condenser temperature difference of 3°C, with a deviation of ±5%.

RAETTS Maglev Oil-free Medium Pressure Centrifugal Compressor Performance Parameter Table

			IM350M						IM700M						IM1800M					
Number of Stages			Two-stage						Two-stage						Two-stage					
			R134a						R134a						R134a					
Structure Form			Integrated Variable Frequency Centrifugal Type						Split-Type Variable Frequency Centrifugal						Integrated Variable Frequency Centrifugal Type					
Condenser Outlet Water Temperature °C			35	40	45	50	55	60	35	40	45	50	55	60	35	40	45	50	55	60
Heat Source Temperature °C	17	Heating Capacity (kW)	966	809	704	620	546	494	2024	1694	1474	1298	1144	1034	2760	2310	2010	1770	1560	1410
		Power (kW)	105						220						300					
		COP	9.20	7.70	6.70	5.90	5.20	4.70	9.20	7.70	6.70	5.90	5.20	4.70	9.20	7.70	6.70	5.90	5.20	4.70
	12	Heating Capacity (kW)	725	651	578	525	483	441	1518	1364	1210	1100	1021	924	2070	1860	1650	1500	1380	1260
		Power (kW)	105						220						300					
		COP	6.90	6.20	5.50	5.00	4.60	4.20	6.90	6.20	5.50	5.00	4.60	4.20	6.90	6.20	5.50	5.00	4.60	4.20
	7	Heating Capacity (kW)	641	567	515	473	431	399	1342	1188	1078	990	902	836	1830	1620	1470	1350	1230	1140
		Power (kW)	105						220						300					
		COP	6.10	5.40	4.90	4.50	4.10	3.80	6.10	5.40	4.90	4.50	4.10	3.80	6.10	5.40	4.90	4.50	4.10	3.80
	-5	Heating Capacity (kW)	483	441	410				1012	924	858				1380	1260	1170			
		Power (kW)	105						220						300					
		COP	4.60	4.20	3.90				4.60	4.20	3.90				4.60	4.20	3.90			
	-10	Heating Capacity (kW)	441	410					924	858					1260	1170				
		Power (kW)	105						220						300					
		COP	4.20	3.90					4.20	3.90					4.20	3.90				
	-15	Heating Capacity (kW)	410						858						1170					
		Power (kW)	105						220						300					
		COP	3.90						3.90						3.90					

Note: The above data are based on an evaporator temperature difference of 2°C and a condenser temperature difference of 3°C, with a deviation of ±5%.

One set 200RT KONRAD Maglev Heat Pump

Compared to Screw Heat Pump



450,000 kWh
Annual Electricity Savings

58 Tons
Annual Coal Savings

290,000 RMB
Annual Electricity Cost Savings

149 Tons
Annual Carbon Emission Reduction

Over a 20-year lifecycle, a Screw Heat Pump incurs nearly 200,000 RMB in costs for lubricant oil and oil system maintenance alone, whereas the magnetic levitation heat pump requires zero lubricant oil with its oil-free system

KONRAD Maglev Heat Pump Key Application Cases



Guangzhou Xintang Sewage Treatment Plant
(Replacing vortex air-cooled
heat pumps and steam boilers)



Henan Ruimei Sodium Methoxide
Evaporation Crystallization
(Condensation-source heat pump application)



A Large Beverage Factory in Hebei
(Waste-heat water-source
heat pump application)

Heat Pump Types	Client Portfolio	Process Implementation	Quantity	Annual Electricity Cost Savings
Ice/Water-Source Ultra-Low Temperature Heat Pump	A Leading Domestic Beverage Manufacturer	Centralized Heating - Replacing Steam and Chilled Water	2 sets 1674 kW Cooling / Heating Capacity	Approx. 8.5 million RMB
Waste Water-Source Heat Pump	A Leading Beverage Manufacturer in Hebei	Hot Water Preheating - Replacing Steam	1 set 2100 kW Heating Capacity	Approx. 4.94 million RMB
Waste Heat & Sludge-Source Heat Pump	Guangzhou Xintang Sewage Treatment Plant	Replacing Vortex Air-Cooled Heat Pumps and Steam for Sludge Drying	1 set 150 RT Heating Capacity	Approx. 200,000 RMB
Condensation-Source Heat Pump	Henan Ruimei Technology Co., Ltd.	Sodium Methoxide Evaporation Crystallization	1 set 595 kW Operating Heating Capacity	Approx. 750,000 RMB
Hot Water-Source Heat Pump	A Well-Known Beverage Plant	Replacing Lithium Bromide (LiBr) Absorption Chiller/Heater	1 set 880 kW Heating Capacity	Approx. 760,000 RMB
Heat Rejection-Source Heat Pump	A Food Processing Plant in Jiangxi	Complete Replacement of Steam Heating	1 set 502 kW Cooling /Heating Capacity	Approx. 765,000 RMB
Mixed Acid & Concentrated Acid Heating Heat Pump	An Electric Vehicle (EV) Assembly Plant	Complete Replacement of Electric Heating & Cooling Tower Water	1 set 281 kW Cooling /Heating Capacity	Approx. 676,000 RMB
Process Cooling Heat Pump	A Domestic Biscuit (Cookie) Factory	Replacing Steam & Partial Cooling Tower Water	1 set 687 kW Cooling /Heating Capacity	Approx. 1.29 million RMB
Air-Source Heat Pump	A Central State-Owned Enterprise in Ganzhou	Replacing Gree Air-Cooled Screw Chiller Units	1 set 1231 kW Cooling Capacity	Approx. 410,000 RMB