

Oil-Free Direct-Drive Inverter Magnetic Levitation Centrifugal Chiller with Oxidative Cooling

THE SIXTH-GENERATION OF OXIDATIVE DIRECT COOLING FREQUENCY MAGNETIC LEVITATION CENTRIFUGAL CHILLER



Reliable Quality

The compressor features a magnetic levitation structure with no mechanical contact, eliminating the need for oil lubrication. All core components are selected from internationally renowned brands and undergo strict testing before delivery.

High Efficiency and Energy Saving

Equipped with a new generation of magnetic levitation inverter-driven centrifugal compressor, achieving a part-load efficiency (IOLV) above 9.0 and a power consumption reduction of more than 45%. High-precision liquid level sensors combined with electronic expansion valves enhance chiller efficiency, ensuring optimal matching between refrigerant flow and system load. Custom-designed oil-free flooded evaporator and condenser with high-efficiency heat transfer tubes ensure overall efficiency and energy savings.

Low Noise and Vibration

The unit operates at a maximum sound level of only 73 dB, with minimal vibration. Flexible installation is possible at multiple locations.

Advanced Control System

Equipped with a lightweight controller that is easy to operate, fast in computation, and resistant to electromagnetic interference, using a high-performance PAC control system.

The controller ensures stable operation, further improves system efficiency, and provides more than 50 built-in safety protections. Key parameters offer alarm, fault shutdown, and dual protections.

Environmentally Friendly

The controller supports multiple communication interfaces, enabling remote monitoring, real-time reporting, email alerts, and linkage with third-party operation systems.

The unit uses a non-ozone-depleting, low-toxicity refrigerant R134a, requires less system maintenance, eliminates the need for oil system upkeep, and prevents refrigerant exchange during maintenance, thereby reducing cooling media loss.

Low power consumption and low electricity demand help reduce CO₂ emissions.

Compact and Lightweight

Optimized unit size saves installation space. The lightweight design facilitates transportation and installation, increases engineering design flexibility, and the compact module layout allows easy passage through standard industrial entrances. On-site installation is more flexible and requires less central air conditioning modification.

Product Description

The magnetic levitation inverter centrifugal water-cooled chiller includes three series: Q1, Q2 and Q3, with a cooling capacity range from 250 kW (71 RT) to 5,624 kW (1,600 RT).

Kingair magnetic levitation chiller integrates world-class technology, achieving a new level of efficiency.

The units deliver not only outstanding operational efficiency and reliability, but also continuous energy savings, representing a new generation of chillers.

Key features of the Kingair magnetic levitation chiller series:

- >> Magnetic levitation inverter centrifugal compressor
- >> Extremely high integrated part-load value (IPLV) and full-load efficiency (COP)
- >> R134a refrigerant that does not damage the ozone layer
- >> Oil-free lubrication fundamentally solves return oil issues of traditional chillers and significantly improves cooling capacity and energy efficiency
- >> Low noise and vibration
- >> Compact size and lightweight
- >> PAC programmable automatic controller
- >> Very low start-up current, no impact on the power grid
- >> Intelligent alarm and fault diagnostics

High-Efficiency Bright Tube Full Liquid Condenser and Evaporator

High-efficiency bright tube full liquid condenser and evaporator

>> Designed to adapt to various water flow conditions and meet the system design requirements for large flow differences.

Using high-performance heat exchange tubes and thermal efficiency chiller design, manufacturing and testing in accordance with national standards.

Oil-free full liquid system with special evaporator and condenser design greatly improves heat transfer efficiency.

Using high-efficiency enhanced heat transfer tubes, the chiller achieves significant improvement in cooling effect; with built-in baffle plates, the system efficiency is further enhanced.

>> Powerful Controller

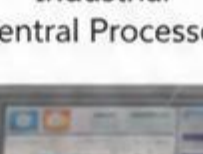
The powerful control capabilities of the compressor under various operating conditions provide comprehensive protection, while optimizing system performance in different working conditions. High-efficiency operation at the lowest load. Strong anti-interference capability ensures highest reliability. Intelligent vibration control enables the chiller to operate within its limits based on actual conditions, achieving safe and efficient operation.

>> Touch Screen Control

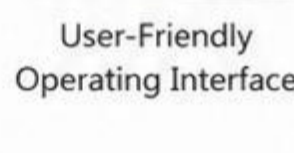
The unit features a 10.4-inch high-resolution touch screen with user-friendly interface. All parameters and historical fault information of the compressor and the chiller can be displayed and queried. Multi-language display; the interface is clear and intuitive.



High-Efficiency Heat Transfer Tube



Industrial Central Processor



User-Friendly Operating Interface

Product Features

>> Magnetic levitation shaft bearing technology: all moving parts are contact-free, no wear, and maintenance-free.

>> Ultra-low starting current (only 2A), reducing impact on the power grid.

>> Precise outlet water temperature control: accuracy ±0.1°C, improving the uniformity of the oxidation film.

>> No plate heat exchanger, cooling tower or chilled water storage tank required, saving installation space.

>> High efficiency: maximum energy efficiency ratio (EER) up to 36.8; specific power consumption of magnetic bearing compressor only 32 kW/ton; hardness of oxidation film as low as 0.38 degrees (in less than one hour), over 60% higher than that of world-renowned brand chillers currently in use.

TECHNICAL PARAMETERS

JKCxxWAH-C Series Oxidative Direct Cooling Frequency Magnetic Levitation Centrifugal Chiller						
Model		JCK530WAH-C	JCK1060WAH-C	JCK1600WAH-C	JCK2100WAH-C	
Standard Conditions (7°C)	Cooling Capacity	kW	530	1060	1590	
		kcal/h×10 ⁴	45.58	91.16	136.74	
	Power Input (kW)	98	196	294	392	
NPLV (kW/kW)		10.7	10.7	10.7	10.7	
AHRI Conditions (18°C)	Cooling Capacity	kW	738.5	1477	2215.5	
		kcal/h×10	63.51	127.02	190.53	
	Power Input (kW)	91	182	173	164	
NPLV (kW/kW)		17.45	17.45	17.45	17.45	
Refrigerant		15%~14% Diluted Aqueous Solution of Lithium Bromide				
Power Supply		3PH~380V/50Hz				
Compressor	Configuration		Inverter Magnetic Levitation Centrifugal			
	Quantity		1 set	2 sets	3 sets	4 sets
	Max. Operating Current (A)		180	360	540	720
	Piping Size (mm)		95	2×95	3×95	4×95
Unloading Capacity (%)		0~100%				
Refrigerant		R134a				
Condenser	High-Efficiency Flooded Evaporative Type					
	Cooling Water Flow (m ³ /h)	142.7	269.7	396.7	523.7	
	Water Pressure Drop (kPa)	65.0	66.0	65.0	68.0	
Cooling Water Inlet / Outlet Temperature		Inlet ≥30°C, Outlet ≤35°C				
Evaporator	High-Efficiency Flooded Evaporative Type					
	Chilled Water Flow (m ³ /h)	316.5	633	949.5	1266.0	
	Water Pressure Drop (kPa)	63.0	61.0	62.0	63.0	
Chilled Water Inlet / Outlet Temperature		Inlet 20°C, Outlet 18°C				
Flow Control		Electronic Expansion Valve				
Safety Protection		Compressor locking protection, power failure protection, overload protection, reverse phase protection, refrigerant high/low pressure protection, compressor over-temperature protection, evaporator anti-freeze protection, oil pressure protection, lack of water protection, etc.				
Piping Connections	Cooling Water Inlet	DN150	DN200	DN250	DN300	
	Chilled Water Inlet	DN200	DN300	DN350	DN400	
Noise (dB(A))		70	73	75	80	
Weight (kg)		4500	5800	6500	8000	
Overall Dimensions (L×W×H) (mm)	3000		3650	4000	4500	
	1450		1750	1700	1700	
	1700		2100	2000	2000	

Note: 1. The AHRI condition parameters are calculated based on 20°C entering water temperature and 18°C leaving water temperature.

2. NPLV is calculated according to the actual ambient wet-bulb temperature at Zhejiang JinHua.

Magnetic Levitation Energy Saving Calculation Example

MAGNETIC LEVITATION ENERGY SAVING CALCULATION

2025 Average Annual Ambient Temperature Statistics									
No.	1	2	3	4	5	6	7	8	9
Temperature Range (°C)	-4.9~0	0.1~5	5.1~10.0	10.1~15.0	15.1~20.0	20.1~25.0	25.1~30.0	30.1~35.0	35.1~40.0
Hours (h)	0	44	453	1149	1399	1786	2765	1120	44

The above can be divided into three categories as follows:

Category	Temperature Range (°C)	Hours (h)	Chilled Water Calculation Temp.	Remarks
Group 1	-1.9~25	4831	20°C	
Group 2	25.1~30.0	2765	25°C	
Group 3	30.1~35.0	1120	30°C	

Energy savings calculation based on 1,200 operating hours per user

Group 1 Electricity Calculation						
Model	Cooling Capacity (kW)	Power (kW)	Energy (kWh)	Operating Hours (h)	Electricity Cost (W/kWh)	Operating Cost (¥)
Magnetic Levitation	939.37	45.34	20.72	4831	0.8	¥ 175,216
Screw Type	939.37	156.56	6.00	4831	0.8	¥ 605,079
Group 1 Energy Saving = Screw Type Operating Cost - Magnetic Levitation Operating Cost						¥ 429,863

Group 2 Electricity Calculation						
Model	Cooling Capacity (kW)	Power (kW)	Energy (kWh)	Operating Hours (h)	Electricity Cost (W/kWh)	Operating Cost (¥)
Magnetic Levitation	933	56.14	16.62	2765	0.8	¥ 124,175.45
Screw Type	933	155.50	6.00	2765	0.8	¥ 943,966
Group 2 Energy Saving = Screw Type Operating Cost - Magnetic Levitation Operating Cost						¥ 219,790.55

Group 3 Electricity Calculation						
Model	Cooling Capacity (kW)	Power (kW)	Energy (kWh)	Operating Hours (h)	Electricity Cost (W/kWh)	Operating Cost (¥)
Magnetic Levitation	950.63	74.38	12.78	1120	0.8	¥ 66,648.24
Screw Type	950.63	158.44	6.00	1120	0.8	¥ 141,960.74
Group 3 Energy Saving = Screw Type Operating Cost - Magnetic Levitation Operating Cost						¥ 75,312.51

Equipment Maintenance and Protection Cost					¥ 30,000
Annual Energy Saving Using Magnetic Levitation Chiller (kWh/h)			37	Annual Operating Cost Saving	¥ 324,120
Total Annual Energy Saving (¥)					¥ 1,079,086.51

The above calculation demonstrates the advantages of magnetic levitation chillers in different ambient temperature conditions. Calculations are based on actual measured data from magnetic levitation chillers. The screw chiller is calculated based on the industry standard highest efficiency "1" grade.

The chilled water system is assumed to operate continuously. In practice, the operating hours can be adjusted according to actual needs. The energy saving and cost saving of a magnetic levitation chiller can reach around 300,000 RMB per year.