LG HVAC SOLUTION

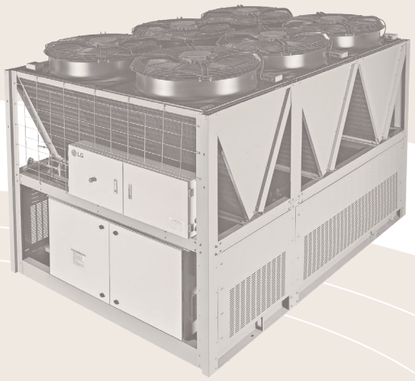
CENTRIFUGAL CHILLER

• 2025 LG Electronics. Printed in Korea. Aug. 2025

01 Full Line-up of Chiller Product

Scroll Chiller (Air Cooled)

17 ~ 67 RT

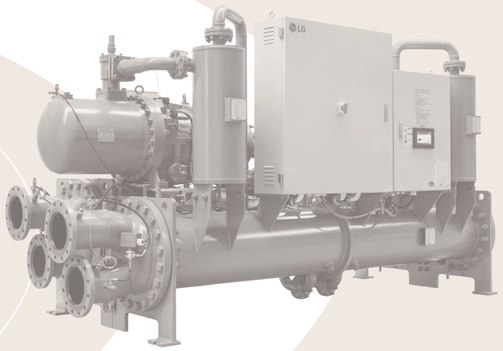


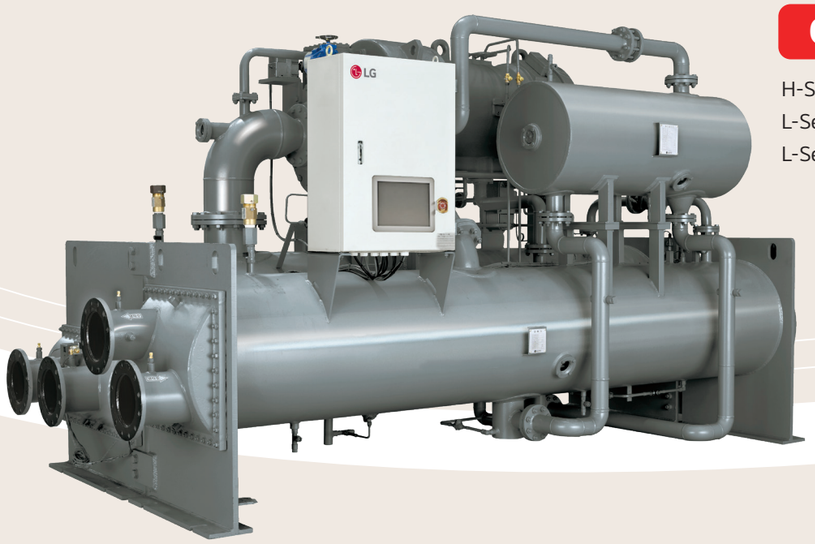
Screw Chiller (Air Cooled)

80 ~ 540 RT

Screw Chiller (Water Cooled)

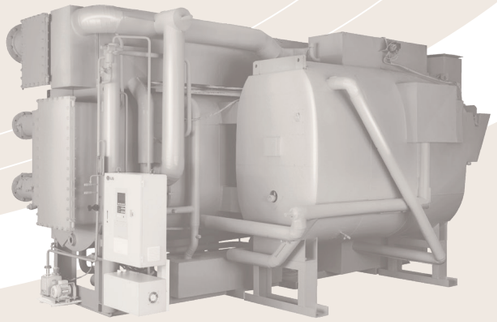
80 ~ 400 RT





Centrifugal Chiller

H-Series (Oil-Lubricant) : 200 ~ 5,000 RT
L-Series (Oil-Free) : 200 ~ 2,200 RT
L-Series (HFO, Oil-Free) : 400 ~ 4,000 RT

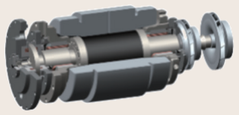


Absorption Chiller

Direct Fired : 100 ~ 1,500
Steam Fired : 100 ~ 1,500
Hot Water Driven : 80 ~ 2,000

02 Unique technology

LeviTech™



Own Technology magnetic bearing compressor for optimal part-load operation.

03 Reliability

AHRI CERTIFIED®
www.ahridirectory.org
Water-Cooled Chillers
AHRI Standard 550/590

AHRI Certification of Test Facility and Model Selection Program.

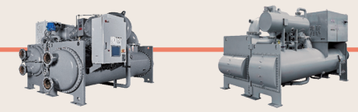
04 Various Application

H-Series (Oil-Lubricant) Centrifugal Chiller
- General
- Ice-Storage
- Heat Pump

L-Series (Oil-Free) Centrifugal Chiller
- General
- Low GWP Refrigerant
- Air-Cooled Centrifugal

05 Wide Range

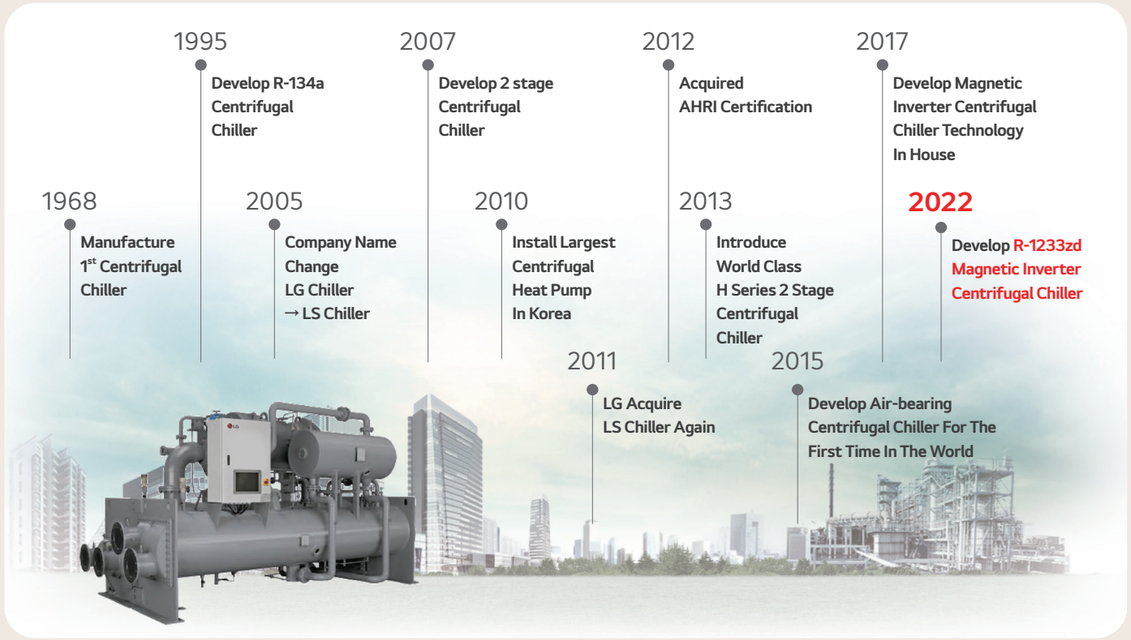
200 RT



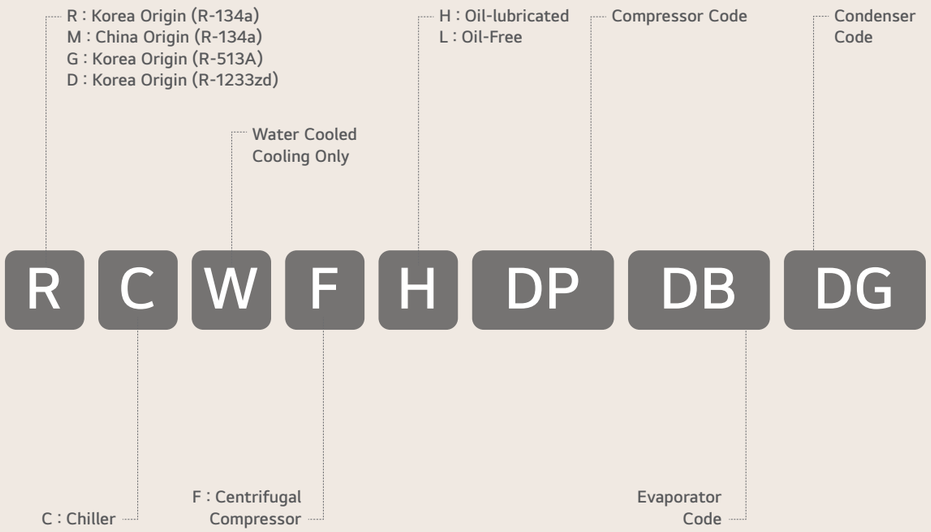
5,000 RT

LG History

LG is a one of leading chiller manufacturer with long experience of manufacturing chillers and advanced technology.

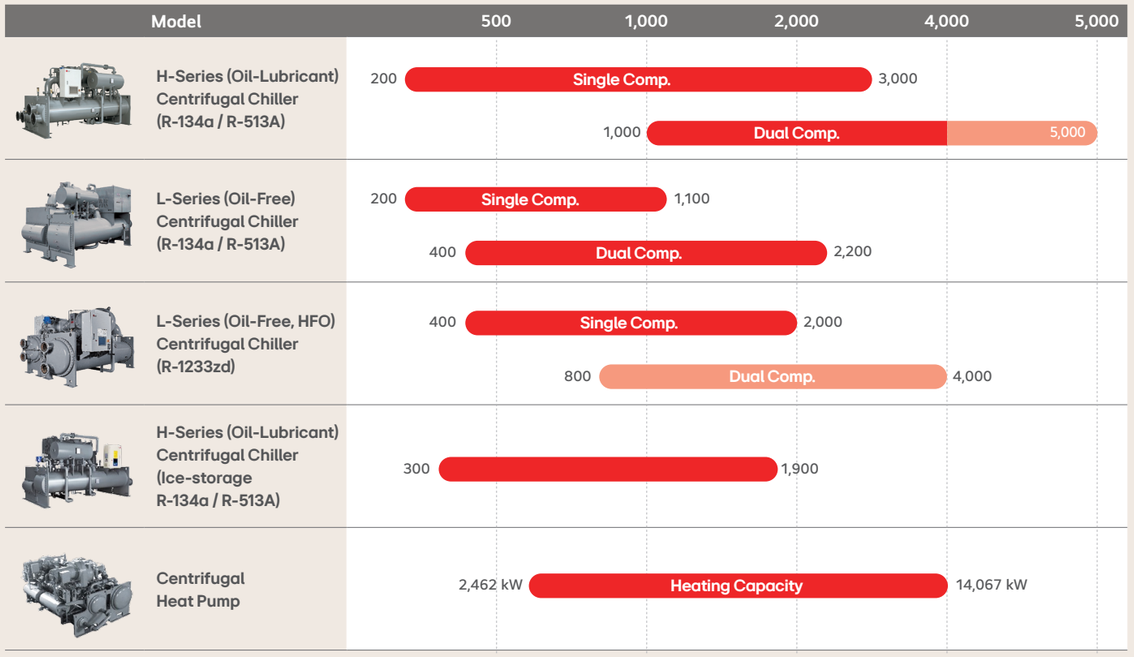


Nomenclature



Line-up

[usRT]



* Chilled water : 12 / 7°C, Cooling Water : 32 / 37°C
* It may vary cooling capacity depending on voltage.

* The above range is based on the nominal tonnage.
* Available on request

Trend of Refrigerant

LG uses R-134a which is in high safety Group, and low GWP R-513A substituted for R-134a. A new generation model is scheduled to be released focusing on R-1233zd which has a low GWP and A1 safety grade.

	CFCs	HCFCs	HFCs	HFOs
	Very High ODP & GWP	High ODP & GWP	ODP=0, But High GWP	ODP=0 GWP Low or Ultra Low
Low Pres.	R-11	R-123		R-514A, **R-1233zd** ✓
High Pres.		R-22	**R-134a** ✓, **R-513A** ✓	R-1234ze

	R-134a (HFC)	R-513A (Blend)	R-1234ze (HFO)	R-514A (Blend)	R-1233zd (HFO)
ODP	0	0	0	0	0
GWP	1,300	573	1	<2	1
Atmospheric Life	13.4 years	5.9 years	16 days	22 days	26 days
AHSRAE Class	A1	A1	A2L	B1	A1

Higher Flammability	A3	B3
Lower Flammability	A2	B2
	A2L R-1234ze	
No Flame Propagation	A1 **R-1233zd R-134a R-513A**	B1 R-123 R-514A
	Lower Toxicity	Higher Toxicity

Conventional Centrifugal Chiller

World Class 2 Stage Centrifugal Chiller

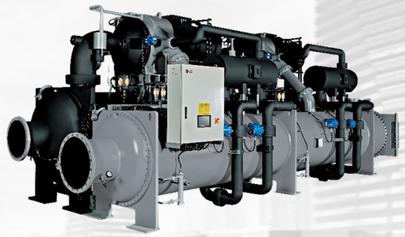
Single Comp. Centrifugal Chiller

- Cooling Capacity : 1,000 RT @AHRI Condition (7°C / 35°C)
- COP : 6.803 (0.5169 kW/RT, R-134a)
- Cooling Capacity : 2000 RT @AHRI Condition (7°C / 35°C)
- COP : 6.688 (0.5258 kW/RT , R-134a)

Dual Comp. Centrifugal Chiller

- Cooling Capacity : 1,000 RT @AHRI Condition (7°C / 35°C)
- COP : 7.241 (0.4856 kW/RT , R-134a)
- Cooling Capacity : 2,000 RT @AHRI Condition (7°C / 35°C)
- COP : 7.331 (0.4797 kW/RT , R-134a)

* Available with R-134a refrigerant with options for low GWP R-513A.



Benefit & Reliability

High Energy Efficiency
- Optimized 2 stage compressor cycle
- Economizer with variable refrigerant control
- High efficiency heat exchanger design

Eco-friendly
- Ozone free R-134a or R-513A refrigerant
- Less CO_2 emission by high energy performance

Stable Operation
- 2 stage refrigerant cycle with variable diffuser or 2nd I.G.V
- Oil reservoir against sudden power failure

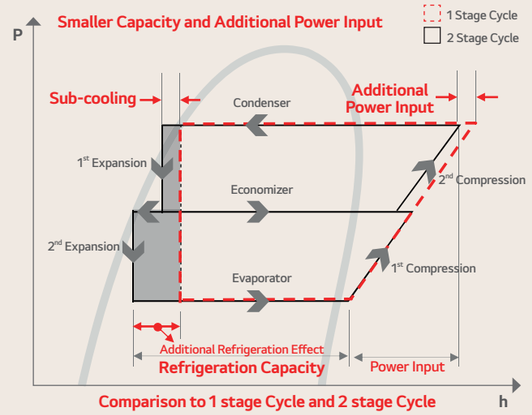
Convenience
- Compact design
- User friendly controller
- Easy BMS interface

Reliability
- AHRI performance certified program
- World class factory performance test facility
- ASME and PED high pressure vessel code

Optimized Design with 2-stage

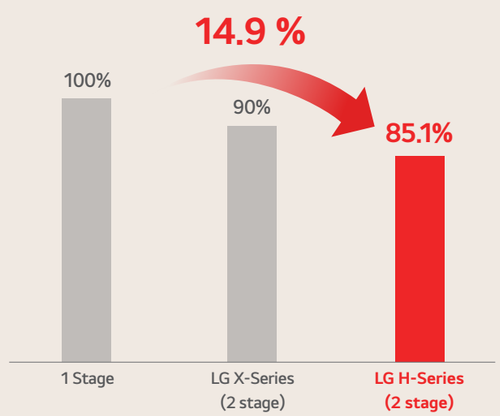
LG can provide high energy performance with optimized 2 stage refrigeration cycle.

• Cycle Comparison

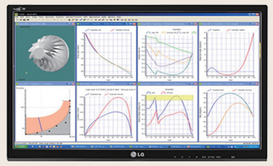


Comparison to 1 stage Cycle and 2 stage Cycle

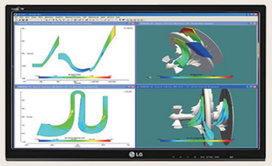
• Comparison of Annual Operation Cost



* The above operation cost is based on job site in Korea.

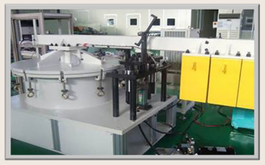


Impeller Design



Impeller 3D Simulation

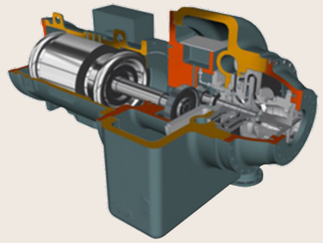
Test Facility



Over-speed Test (120%)

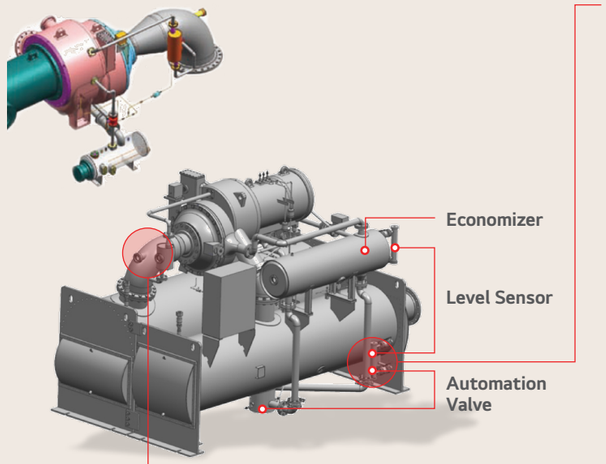
Compressor Capacity
- 200 ~ 3,000 RT

Compression Method
- 1 Stage, 2 Stage Compression

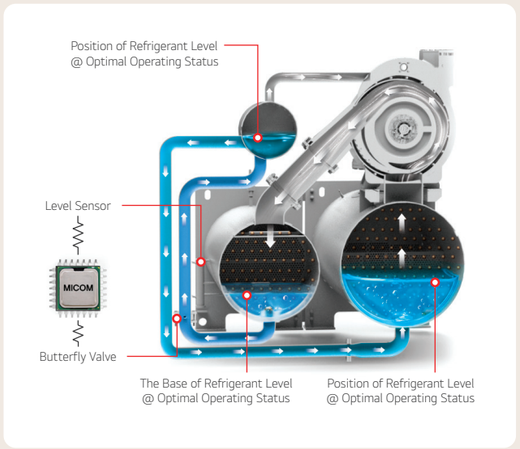


High Energy Efficiency on Partial Load

Keep refrigerant level at any load condition.



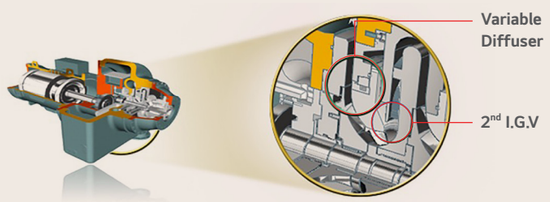
Operation Logic

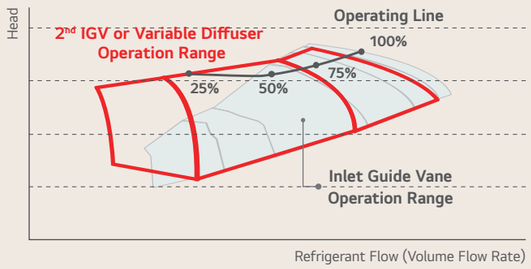


Oil Reclaim System

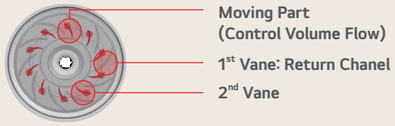
Stable oil supply to the compressor by directly recovering the oil discharged from the compressor to minimize the flow of oil into the evaporator

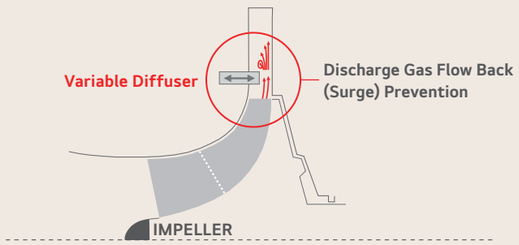
Enlarges the safety operation range at a low-load condition, and prevents surge by applying a 2nd I.G.V or variable diffuser.





Flow Rate Control by Tilting 2nd Vane (Tandem Type Return Channel)



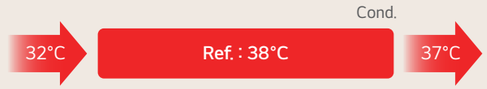


Benefit of Dual Compressor Design

The efficiency of dual - compressor system is improved by about 7% higher than the efficiency of single-compressor system at same operation condition.

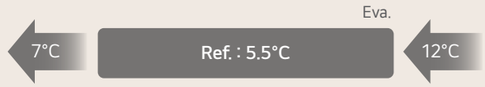
• 1 Compressor

- Cooling Water



→ Refrigerant ΔT: 32.5°C

- Chilled Water



• 2 Compressors (Series Counter Flow)

- Cooling Water

* Same LTD

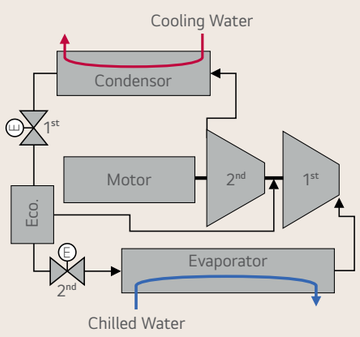
→ Refrigerant ΔT : 30°C → Refrigerant ΔT : 30°C

- Chilled Water

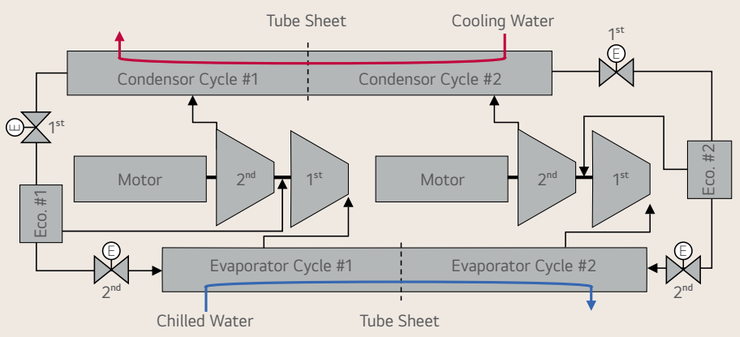
Refrigerant ΔT ∝ Compressor HEAD, As ΔT decreases by 1°C, the efficiency improves by about 2.7%.

→ When the refrigerant ΔT is lowered by 2.5°C, the improvement is about 7%.

• 1 Cycle Diagram



• 2 Cycle Diagram



Easy Maintenance

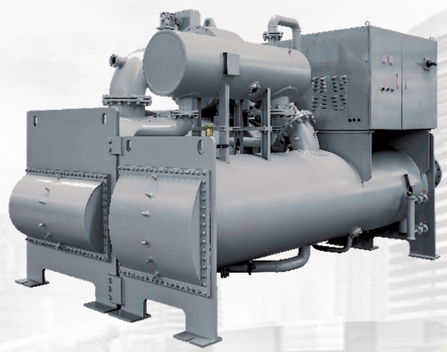
→ Since it consists of an independent cycle, there is no need to remove the entire refrigerant in the event of a breakdown.

Oil-Free Magnetic Bearing Centrifugal Chiller

Oil-Free Magnetic Bearing Centrifugal Chiller

- Cooling Capacity : 700 RT @AHRI Condition (7°C / 35°C)
- COP : 6.7 , IPLV 11.3 (R-134a)

* Available with R-134a refrigerant with options for low GWP R-513A.



Benefit & Reliability

High Energy Efficiency
- World class part load efficiency using inverter
- Maximum 30% annual cost saving (Compared to 2 stage centrifugal with constant speed)

Eco-friendly
- Ozone free R-134a or R-513A refrigerant
- Less CO_2 emission by high energy performance

Stable Operation
- No need of oil related parts, no oil related issues and simple tubing
- Optimized control logic, automated operation maintenance function
- Quick response against failure with Black box function

Convenience
- Reduces noise to 73 dB(A) level from optimized rotation control technology by each load
- Respond up to 1,100 RT by using inverter with one compressor

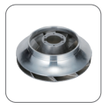
Reliability
- Uninterruptable Power Supply (UPS) prevents damage from sudden power failure
- High quality power feeding to motor with UPS
- High-precision temperature control (±0.1°C)

Energy Saving

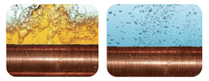
• LG's Technology

❶ Magnetic Bearing & VSD drive
- No contact magnetic bearing
- No oil related parts
- Improve part load efficiency

❷ High Efficiency Impeller
- Customized impeller based on operating condition (high lift, low lift)

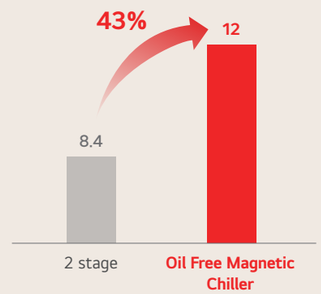


❸ Oil Free
- Improve Heat Exchange Efficiency



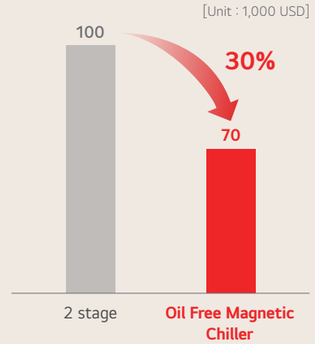
• Energy Efficiency

- IPLV



* AHRI Standard Condition, 500 RT

• Annual Operation Cost

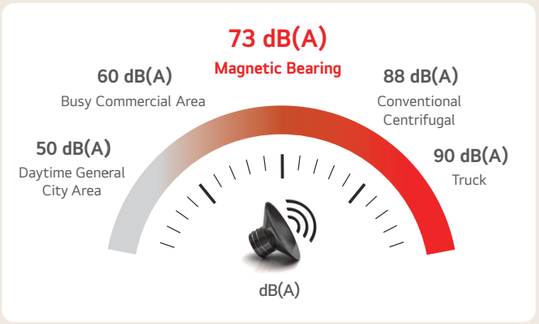


* Based on industrial electricity price.
* Cost of operation can vary by sites, work load and operation conditions.

Improved Working Environment

Ultra Quiet

- Low noise by controlling rotation speed at part load condition → **Minimum 73 dB(A)**
- Suitable for noise sensitive areas
- Provide comfort for operators

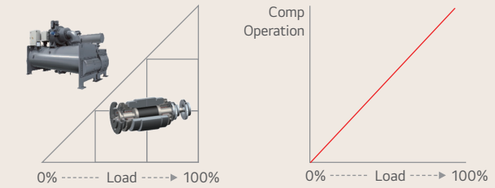


- No bearing friction, No gear friction, No oil friction
- Shrouded type impeller
- Adjusted RPM control at part load

Stable Operation

- The single compressor unit is engineered to support up to 1,100 RT, providing extensive coverage for cooling.
- Control capacity reliably from 20 to 100% with RPM, DGR control and hot gas by-pass control.

Capacity control stability



Dual Protection System to Prevent Shaft Damage

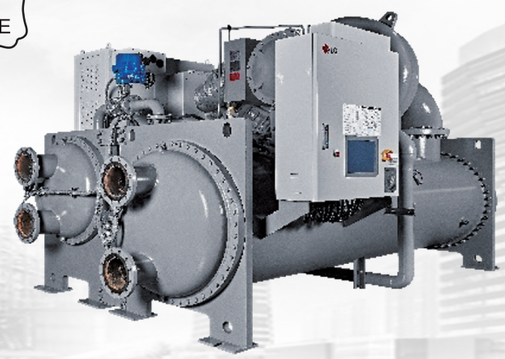
- Step 1: Stable landing is possible through power supply via UPS.
- Step 2: Extra ball bearings are installed to provide dual protection for the shaft.

Step 1 Step 2

HFO Oil-Free Magnetic Bearing Centrifugal Chiller

HFO Refrigerant Oil-Free Magnetic Bearing Centrifugal Chiller

- Cooling Capacity : 700 RT @AHRI Condition (7°C / 35°C)
- COP : 7.0 , IPLV 12.1 (R-1233zd)



Benefit & Reliability

Excellent Energy Efficiency
- Partial load (IPLV) efficiency improved by 7% compared to the 2-stage R-134a oil-free centrifugal chiller

Low GWP Refrigerant R-1233zd Applied
- R-134a (GWP 1,300)
  → Significantly reduced to R-1233zd (GWP 1)
- Refrigerant charge reduced by 25%
  (0.9 kg / RT, Based on R-134a_LG model)

Easy Operation & Maintenance
- No oil related parts and simplifed piping
- Optimized operation and online UPS

Improved Convenience of Use and Maintenance
- Improved UI and visibility by applying 15-inch large screen
- Controller modularization, Easy firmware update (SD card, FOTA)
- In-house repair, prompt repair through nationwide service network

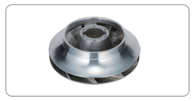
Securing Chiller Durability
- Application of bearing damage prevention technology during emergency stops
- Machine learning-based surge protection control

Improved Efficiency

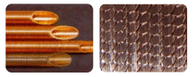
• **LG's Technology**

❶ Magnetic Bearing & Inverter
- Non-contact magnetic bearings
- Elimination of oil-related parts
- Improved partial load efficiency

❷ High Efficiency Impeller
- Application of optimally designed impeller according to operating conditions

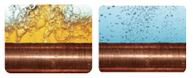


❸ High Efficiency Enhanced Tube
- Optimization of shape inside and outside the pipe



Falling Film Type[1] Evaporator
- Improved heat transfer efficiency

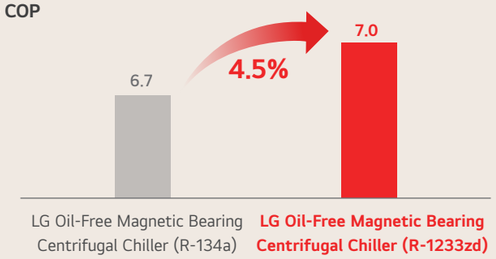
❹ Oil Free
- Improved heat exchange efficiency



1) Falling Film Type : A method in which liquid refrigerant falls into the tube through gravity.

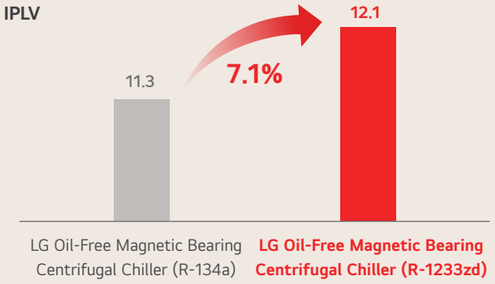
• **Efficiency (COP) comparison**

- COP



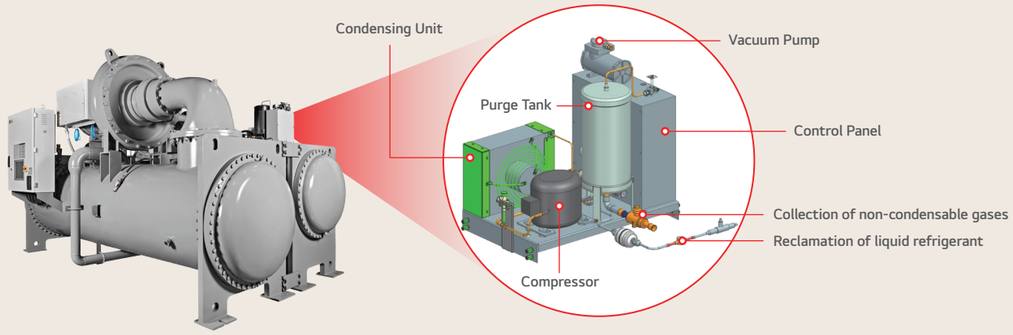
• **Partial load efficiency comparison**

- IPLV



Smart Mode Purge System

LG R-1233zd centrifugal chillers have optimal purge system to keep cycle stable and efficient.

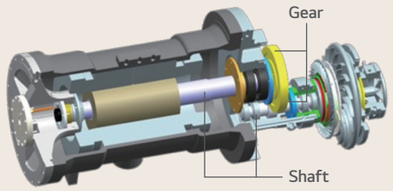


Operation Mode	Operation	How	Recommended
Smart	Predictive & Automatic Operation	By Logic based on Running History	Periodical Chiller Operation
On / Off	Manual Operation	By Manual	Chiller turned off over 1 month
Auto	Automatic Operation	By sensing the Comp. & Inlet Temp.	General Operation

Simplified Structure

Reliability and efficiency have been improved through direct drive through oil-free technology.

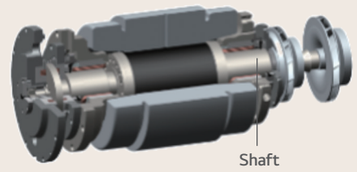
Conventional (Lubricant)



Gear	2	Oil Pump	1
Shaft	2	Bearing	4

- The axes of the impeller and the motor are different
  → Gears are required for power transmission
- An oil pump is required for oil circulation

Magnetic Bearing

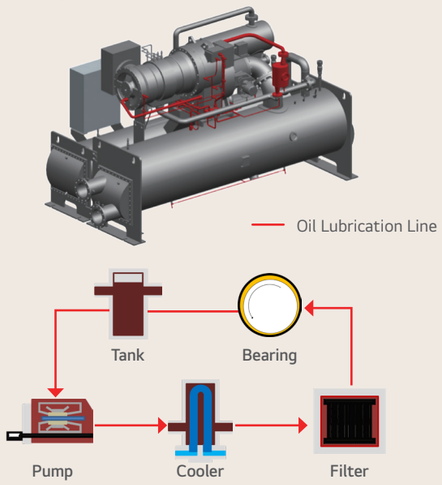


Gear	0	Oil Pump	0
Shaft	1	Bearing	4

- Simple structure with direct drive between impeller and motor
  → Improved reliability
- Deleted parts related to oil circulation
  → Improved efficiency by reducing driving parts

Oil system piping and parts have been deleted, simplifying piping configuration and reducing maintenance points.

• Oil Flow Diagram



• Inspection List of Oil Line

Components of Inspection	Conventional Centrifugal	Oil-Free Centrifugal
Heater, Oil Cooler, Oil Pump, Oil Temp. Sensor, Oil Piping & valve, Oil Line Filter, Oil Inspection of Oil Level Inspection of Oil Condition Replace of Oil	Needed	Not Needed

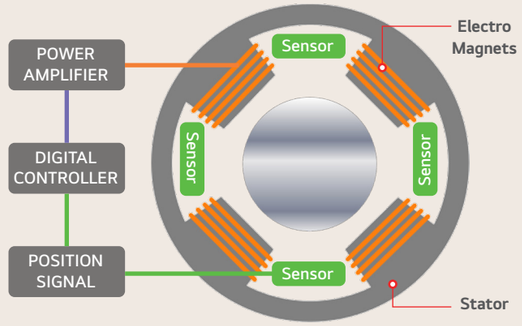
Magnetic Bearing Reliability

Stable Operation with LG LeviTech™

• Gap Sensor

- Sensing and Control Rotor Position in every 50 micro-sec

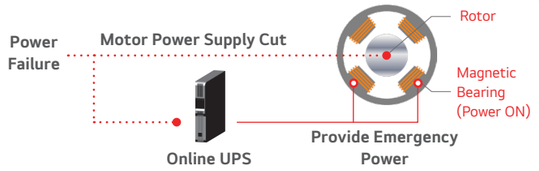
2 kHz Sensing Rotor Position Check → Electromagnet Magnetic Adjustment → Rotor Position Adjustment



1) UPS : Uninterruptable Power Supply

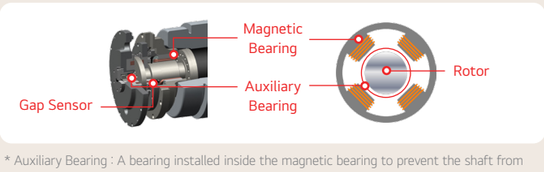
• Bearing protection in case of power outage

- Online UPS : Additional power is being delivered to the motor maintaining levitation and leading the bearings to soft-landing in case of power outage.



* Around 10 minutes until the shaft stops during a power outage, UPS Capacity : 15 minutes

- Auxiliary bearing durability : Since there is no magnetism on the shaft due to the use of an induction motor, it lands smoothly
  → No problem even when landed more than 50 times.



* Auxiliary Bearing : A bearing installed inside the magnetic bearing to prevent the shaft from impacting the magnetic bearing in the event of an accident such as a power outage.

Harmonic Clean Inverter

It supplies high-quality power of TDDi 5% or less and does not have harmonic effects on other devices.

Low Harmonics

Reduced Operation Cost

Item	Spec.	Note
Input Voltage	3 ph. 380 V ~ 460 V, 50 Hz ~ 60 Hz	± 10%
Maximum Frequency	300 Hz	-
Output Voltage	380 V	-
Control Method	V/F (Space Vector PWM)	-
Acceleration Frequency	5 Hz / Sec (Default)	-
Communication Method	RS 485	-
Cooling Method	Refrigerant cooling, forced air cooling	-

• Energy Friendly

- Optimized frequency control by partial load
- Soft start / Soft stop

• Low Harmonics

- Reduce harmonic distortion by DC reactor
- IEEE 519 (THDc <5%)
- TDDi < 30% (Standard), TDDi <5% (Option)

• Reliability Inverter

- Adoption of highly reliable inverter components (Texas Instrument / Infineon)

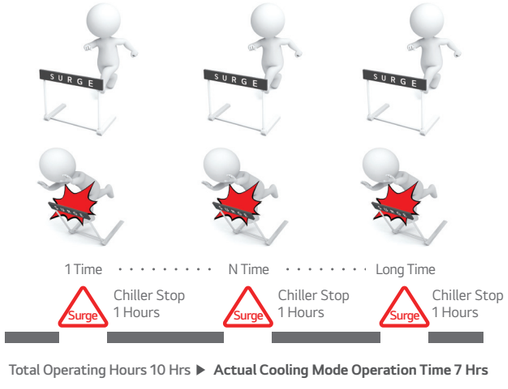
• Compact Design

- Unit mounted type
- Compact panel size

Surge Protection Control

General Centrifugal Chiller

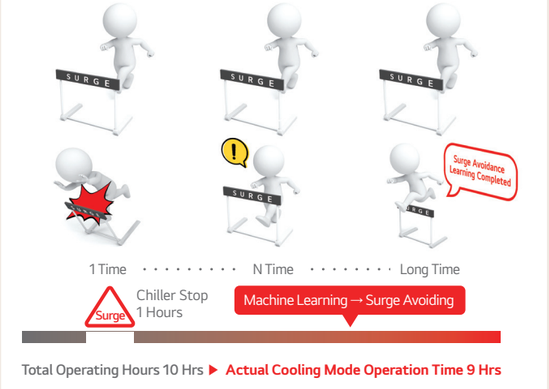
- If a surge occurs during operation, operation is stopped by protection logic.
- After this, driving will stop in the same situation.



Total Operating Hours 10 Hrs ▶ **Actual Cooling Mode Operation Time 7 Hrs**

LG Machine Learning Continuous Operation

- Based on machine learning, it learns the occurrence of surges and then updates it to operate by avoiding the operating point where surges occur to prevent surges from occurring.
- Because it operates to avoid the occurrence of surges, trips due to surges are reduced and continuous operation is possible.



Total Operating Hours 10 Hrs ▶ **Actual Cooling Mode Operation Time 9 Hrs**

* This is simulation to aid understanding and may vary depending on the actual usage environment

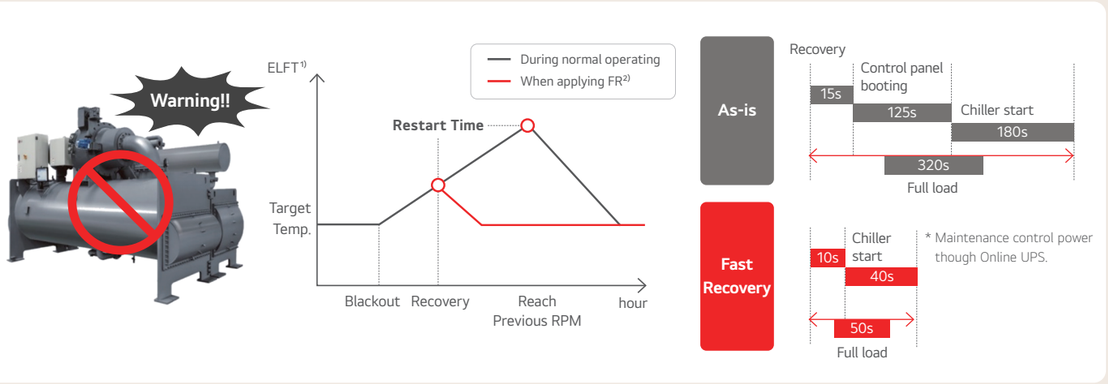
Fast Recovery

General Oil-Free Inverter Chiller

- If a power outage occurs during operation, operation is stopped by protection logic.
- After power is restored, the driver must check for any abnormalities before proceeding with operation.

Oil-Free Inverter Chiller with Fast Recovery

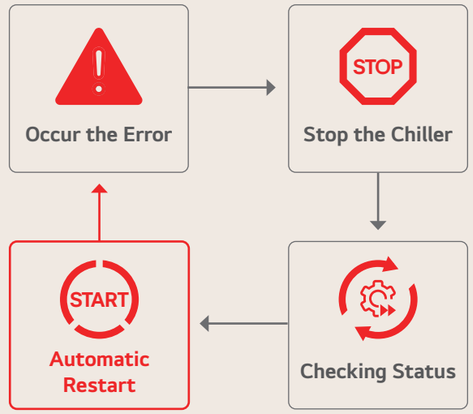
- By using compressor rotation startup technology and rapid startup technology, the target temperature value before power outage is quickly recovered and stabilized.
- For sites that require quick load recovery in the event of a power outage (e.g. IDC).



1) ELFT : Evaporator Leaving Fluid Temperature
2) FR : Fast Recovery

Automatic Restart

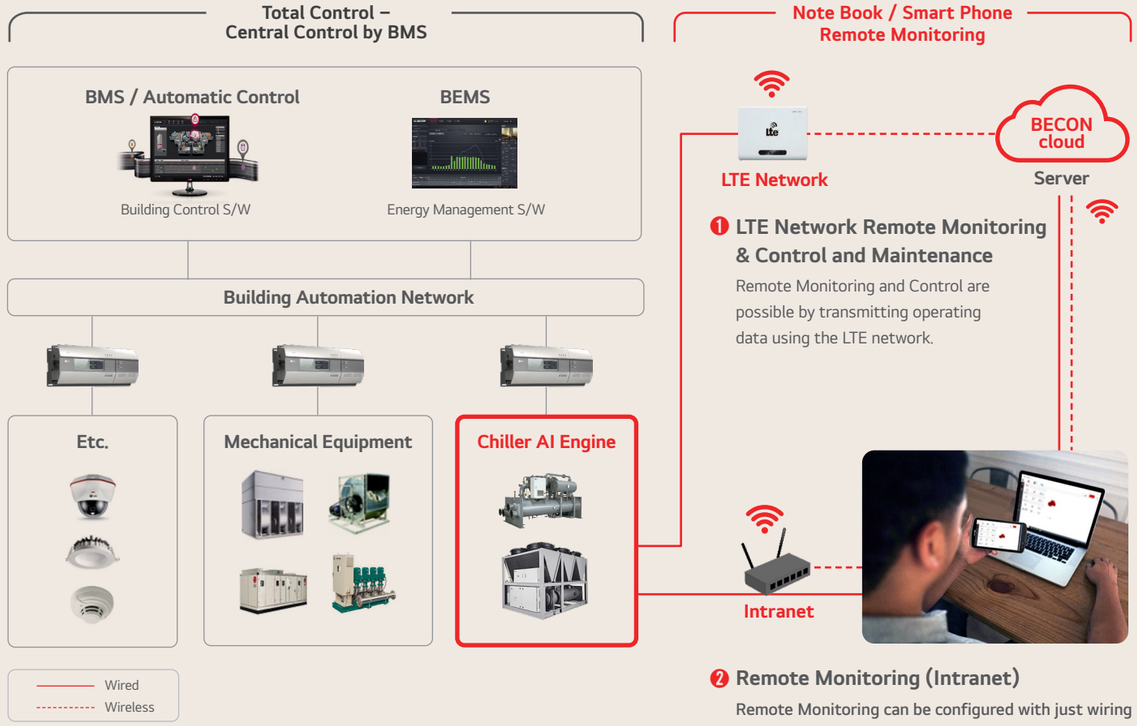
Even if an alarm occurs, if the situation is resolved, the chiller will automatically restart and operate without a manual reset procedure.



- The chiller stops due to an alarm, but automatically restarts when the alarm condition is cleared.
- The minimum waiting time may vary depending on the type of chiller.

* Control power maintenance conditions
* Standby for safe start (Delay time)
1) Conventional : No need the waiting time
2) Oil-Free : 2 minutes when using check valve, 15 minutes when not using

Control Scalability



❶ LTE Network Remote Monitoring & Control and Maintenance

Remote Monitoring and Control are possible by transmitting operating data using the LTE network.

❷ Remote Monitoring (Intranet)

Remote Monitoring can be configured with just wiring without adding Separate Equipment.

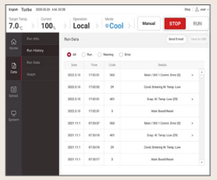
Same Display with HMI

LG Chiller AI Engine

The 15-inch large screen has improved visibility, operability and supports various functions such as report functions.

❶

❷



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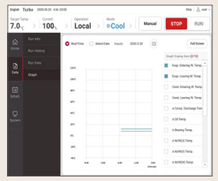

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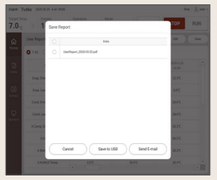


Chiller AI Engine

❶ 15-inch Touch Screen

Visibility has been improved by applying a 15-inch large screen. The pressure-sensitive touch method allows operation even while wearing gloves.

❷ History Management

Displays operating/alarm/abnormal messages. You can check the message occurrence date/error code/detailed information.

❸ Operating Graph

Chiller operation data is displayed as a graph. You can easily understand operation trends by graphing the chiller's operation data in real time and on specific dates.

❹ User Report

Users can conveniently check the data they want (20 selected) on one screen and send it via email[1] to create a operation log without having to write it down individually on site. (SD card storage is also possible.)

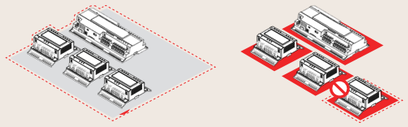
* Please refer to manual for detailed instructions.

1) Need to connect network.

By upgrading the parts that make up the controller, you can maintain it quickly and conveniently at low cost.

• Modular Controller

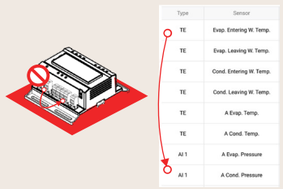
- The main controller and IO module are separated, saving repair costs and time by replacing only the broken parts in the event of a breakdown.



Replace / Repair range

• Site Engineering the Sensors

- If one IO port breaks down, normal operation is possible immediately by changing the port settings in the control panel without replacing parts, and there is no replacement cost.



Type	Sensor
TE	Evap. Entering W. Temp.
TE	Evap. Leaving W. Temp.
TE	Cond. Entering W. Temp.
TE	Cond. Leaving W. Temp.
TE	A Evap. Temp.
TE	A Cond. Temp.
AI 1	A Evap. Pressure
AI 1	A Cond. Pressure

• Easy Firmware Update

X30

- Requires cable connection between computer and control panel

Direct Manual

Chiller AI Engine

- Only replace SD card

Direct Manual Simple

- Remote Firmware Update (BECON cloud)

Remote Auto Simple

* SD cards are not provided to customers for service use, and only service personnel certified by our company are authorized to use them.

BECON cloud

❸ Remote Firmware Update

❶ ❷ BECON cloud

- Remote monitoring is possible by transmitting driving data using an LTE communication network or wired network without separate wiring.
- Provide regular reports on chiller status using collected operation data.[1)]
- Real-time mobile abnormality notification : push alarm by BECON cloud app.
- Monitoring through BECON cloud separate web screen.

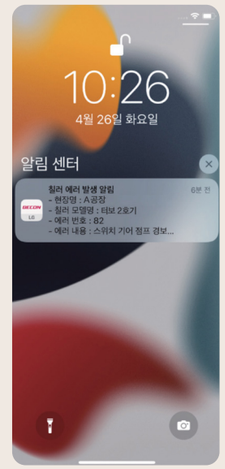
❸ Remote Firmware Update[2)]

- Like remotely updating car navigation system, this is a function to remotely update the firmware of the Chiller AI Engine from BECON cloud server.
- Through the BECON cloud server connected to the LTE network, you can always maintain the latest firmware.

Note :
1) Applied LG Chiller AI Engine.
2) Telecommunication policies may vary depending on the country.
3) This service is not available in some countries.

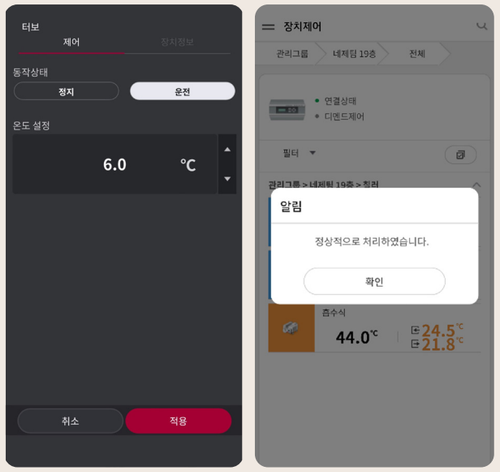
Possible to check the status of the device in real time and control it remotely through web / app monitoring of detailed data by site and product, and mobile abnormality notification.

• Real-time Mobile Alarm



- Regardless of the location of the field manager, app-based push alarm notify of device abnormalities, enabling quick response.

• Remote Control



- The field manager can turn the chiller on/off anytime, anywhere.
- Outlet water temperature can be controlled.

AHRI Certificates

LG chiller performance and test facilities has been certified according to international certification agency standards.

AHRI 550 / 590 (AHRI 551 / 591) Standard

Performance Evaluation for Vapor Compression Chiller and Heat Pump (50 / 60 Hz)

"AHRI Performance AWARD" award for 7 consecutive years.

* Qualification : Pass the 1st round of follow-up test for 3 years

Test Facilities Certification

Equipment Capacity		Test Items
No 1 200 ~ 300 RT	No 2 150 ~ 400 RT	• Tests - Performance test : low load, part load, power consumption, Heat Balance - Leakage test & Hydrophilic test - Voltage : 380 V ~ 13,800 V, 50 / 60 Hz • Performance test before delivery • Witness performance test (option)
No 3 500 ~ 1,000 RT	No 4 500 ~ 1,000 RT	
No 5 1,000 ~ 3,000 RT	No 6 1,000 ~ 3,000 RT	

Performance Test

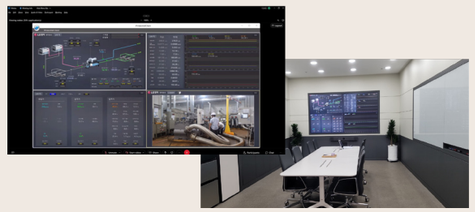
Special Space For Comfortable Witness

Efficient Integrated Control System

- Remote control and monitoring of facility and chiller by wireless network.
- Real-time Graph on chiller and facility operating information.
- Variety information by Multi Vision monitor.

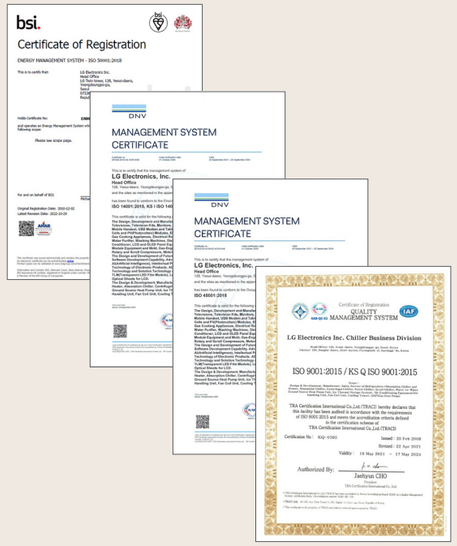
Online Customer Witness Test

- Cost and time saving solution.
- Allow customer to witness anywhere in the world (WebEx, etc)
- Provide real time live streaming of operating data including real chiller.



Standards and Codes

LG chiller has been certified according to international certification agency standards.



- ISO – International Organization for Standardization
- AHRI 550 / 590 (AHRI 551 / 591) - Water chilling packages using the vapor compression cycle.
- ANSI / ASHRAE 34 - Number designation and safety classification of refrigerants.
- ASME section VIII - Boiler and pressure vessel.
- CE - Conform to CE testing services for construction of chillers and provide CE listed mark
- KGS AA111 / 112 – Facility / Technical / Inspection code for manufacture of high pressure gas refrigerators.
- KS B 6270 - Manufacturing, testing and quality assurance procedures based KS standard in centrifugal chillers.
- ANSI / ASHRAE Standard 15 safety code.
- Manufactured in an EN ISO 9001 accredited organization.
- ETL – Conforms to ANSI / UL STD 1995 certified to CAN / CSA STO C22.2.
- N.E.C. – National electrical code.
- OSHAS 18001 - Occupational safety and health act.
- EAC – Conformity document required for import and sales of products in the countries of the Eurasian Customs Union

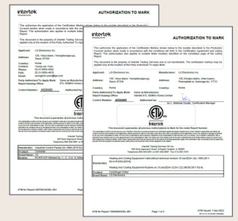
< ISO >

ASME (America Society of Mechanical Engineers)

- ASME Section VIII Boiler and Pressure Vessel code
  ASME Section VIII is the section of the ASME Boiler & Pressure Vessel Code (BPVC) that covers pressure vessels. It specifically refers to the pressure vessels that operate at pressures, either internal or external, that exceed 15 psig.

ETL (Electrical Testing Laboratory)

- Safety certification mark in the Americas.
  ETL is approved by the U.S. federal government, each state government, and each city to provide comprehensive safety testing services, and is a safety mark for electrical and electronic products commonly used in the U.S. with a certification equivalent to the UL certification mark.



CE (Conformité Européenne)

- Safety certification mark in the Europe.
  The CE marking means that the product complies with the conditions of European standards related to safety, health, environment and consumer protection.

H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	RCWFHAL	RCWFHAM	RCWFHAN	RCWFHAP	RCWFHBM	RCWFHBN
Cooling Capacity		usRT	200	250	275	300	400	450
		kW	703	879	967	1,055	1,407	1,583
Weight	Shipping	kg	5,100	5,100	5,200	5,200	6,700	6,800
	Operating	kg	5,700	5,800	6,000	6,000	7,700	7,900
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	150	150	150	150	200	200
	Flow Rate	m^3/h	109.0	135.9	149.5	163.1	217.5	244.7
	Pressure Drop	mH_2O	4.16	3.41	9.46	3.45	3.31	3.45
	Pass Number	EA	2	2	3	2	2	2
Condenser	Nozzle Connection	A	150	150	150	150	200	200
	Flow Rate	m^3/h	137.8	171.5	188.4	205.4	272.9	306.3
	Pressure Drop	mH_2O	4.98	4.95	4.21	5.00	5.02	4.85
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	3,500	3,500	3,700	3,500	3,500	3,500
	Width	mm	2,010	2,010	2,010	2,010	2,240	2,240
	Height	mm	2,020	2,020	2,020	2,020	2,230	2,230

IP Unit

Model		Units	RCWFHAL	RCWFHAM	RCWFHAN	RCWFHAP	RCWFHBM	RCWFHBN
Cooling Capacity		usRT	200	250	275	300	400	450
		kW	703	879	967	1,055	1,407	1,583
Weight	Shipping	lb	2,313	2,313	2,359	2,359	3,039	3,084
	Operating	lb	2,585	2,631	2,722	2,722	3,493	3,583
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	inch	6	6	6	6	8	8
	Flow Rate	GPM	24.7	30.9	34.0	37.0	49.4	55.6
	Pressure Drop	ftH_20	1.27	1.04	2.88	1.05	1.01	1.05
	Pass Number	EA	2	2	3	2	2	2
Condenser	Nozzle Connection	inch	6	6	6	6	8	8
	Flow Rate	GPM	31.3	39.0	42.8	46.7	62.0	69.6
	Pressure Drop	ftH_20	1.52	1.51	1.28	1.52	1.53	1.48
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	inch	138	138	146	138	138	138
	Width	inch	79	79	79	79	88	88
	Height	inch	80	80	80	80	88	88

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
3. Due to our policy of innovation some specifications may be changed without prior notification.
4. All data in this table is rated in accordance with AHRI standard 551/591 (550/590).
5. For other than above this table, contat nearest LG electronics office.

H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	RCWFHBP	RCWFHCM	RCWFHCN	RCWFHCP	RCWFHDM	RCWFHDN
Cooling Capacity		usRT	500	550	600	700	800	900
		kW	1,758	1,934	2,110	2,462	2,813	3,165
Weight	Shipping	kg	6,900	7,600	8,500	8,700	10,100	11,500
	Operating	kg	8,000	8,900	10,000	10,200	11,900	13,800
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	200	200	250	250	250	300
	Flow Rate	m^3/h	271.9	299.1	326.2	380.6	435.0	489.4
	Pressure Drop	mH_2O	3.44	3.43	3.45	3.98	6.22	6.77
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	A	200	200	250	250	250	300
	Flow Rate	m^3/h	339.9	375.3	409.8	475.0	545.3	612.2
	Pressure Drop	mH_2O	5.04	4.91	4.90	4.83	8.40	7.37
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	3,500	3,500	3,500	3,500	4,150	4,150
	Width	mm	2,240	2,330	2,330	2,330	2,660	2,660
	Height	mm	2,230	2,470	2,470	2,470	2,800	2,800

IP Unit

Model		Units	RCWFHBP	RCWFHCM	RCWFHCN	RCWFHCP	RCWFHDM	RCWFHDN
Cooling Capacity		usRT	500	550	600	700	800	900
		kW	1,758	1,934	2,110	2,462	2,813	3,165
Weight	Shipping	lb	3,130	3,447	3,856	3,946	4,581	5,216
	Operating	lb	3,629	4,037	4,536	4,627	5,398	6,260
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	inch	8	8	10	10	10	12
	Flow Rate	GPM	61.7	67.9	74.1	86.4	98.8	111.1
	Pressure Drop	ftH_20	1.05	1.05	1.05	1.21	1.90	2.06
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	8	8	10	10	10	12
	Flow Rate	GPM	77.2	85.2	93.1	107.9	123.8	139.0
	Pressure Drop	ftH_20	1.54	1.50	1.49	1.47	2.56	2.25
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	inch	138	138	138	138	163	163
	Width	inch	88	92	92	92	105	105
	Height	inch	88	97	97	97	110	110

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	RCWFHDP	RCWFHEM	RCWFHEN	RCWFHEP	RCWFHF1	RCWFHF2
Cooling Capacity		usRT	1,000	1,100	1,300	1,500	1,600	1,800
		kW	3,517	3,869	4,572	5,275	5,627	6,330
Weight	Shipping	kg	11,800	13,900	19,300	18,300	20,700	21,800
	Operating	kg	14,100	16,300	23,600	22,100	25,100	26,500
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	300	300	400	400	400	400
	Flow Rate	m^3/h	543.7	598.1	706.8	815.6	870.0	978.7
	Pressure Drop	mH_2O	5.50	6.64	6.64	7.91	6.64	11.14
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	A	300	300	400	400	400	400
	Flow Rate	m^3/h	678.5	750.4	883.2	1,015.4	1,095.4	1,228.6
	Pressure Drop	mH_2O	8.16	8.24	6.77	10.29	9.33	14.71
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	4,150	4,340	4,690	4,690	4,890	5,090
	Width	mm	2,660	3,190	3,190	3,190	3,740	3,740
	Height	mm	2,800	3,100	3,100	3,100	3,440	3,440

IP Unit

Model		Units	RCWFHDP	RCWFHEM	RCWFHEN	RCWFHEP	RCWFHF1	RCWFHF2
Cooling Capacity		usRT	1,000	1,100	1,300	1,500	1,600	1,800
		kW	3,517	3,869	4,572	5,275	5,627	6,330
Weight	Shipping	lb	5,352	6,305	8,754	8,301	9,389	9,888
	Operating	lb	6,396	7,394	10,705	10,024	11,385	12,020
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	inch	12	12	16	16	16	16
	Flow Rate	GPM	123.5	135.8	160.5	185.2	197.6	222.3
	Pressure Drop	ftH_20	1.68	2.02	2.02	2.41	2.02	3.40
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	12	12	16	16	16	16
	Flow Rate	GPM	154.1	170.4	200.6	230.6	248.8	279.0
	Pressure Drop	ftH_20	2.49	2.51	2.06	3.14	2.84	4.48
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	inch	163	171	185	185	193	200
	Width	inch	105	126	126	126	147	147
	Height	inch	110	122	122	122	135	135

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	RCWFHF3	RCWFHG1	RCWFHG2	RCWFHG3	RCWFHHD
Cooling Capacity		usRT	2,000	2,150	2,350	2,500	3,000
		kW	7,034	7,561	8,265	8,792	10,549
Weight	Shipping	kg	22,900	29,200	27,700	28,200	39,100
	Operating	kg	28,200	36,100	34,400	35,000	47,600
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	1				
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	450	450	450	450	500
	Flow Rate	m^3/h	1,087.5	1,169.0	1,277.8	1,359.3	1,634.6
	Pressure Drop	mH_2O	15.23	3.17	3.55	3.36	3.60
	Pass Number	EA	2	1	1	1	1
Condenser	Nozzle Connection	A	400	450	400	450	500
	Flow Rate	m^3/h	1,363.3	1,462.5	1,598.0	1,699.8	2,034.4
	Pressure Drop	mH_2O	2.38	3.10	4.66	4.66	3.80
	Pass Number	EA	1	1	1	1	1
Dimension	Length	mm	5,900	6,400	7,400	7,400	7,840
	Width	mm	3,740	3,850	3,850	3,850	4,210
	Height	mm	3,440	3,920	3,920	3,920	4,150

IP Unit

Model		Units	RCWFHF3	RCWFHG1	RCWFHG2	RCWFHG3	RCWFHHD
Cooling Capacity		usRT	2,000	2,150	2,350	2,500	3,000
		kW	7,034	7,561	8,265	8,792	10,549
Weight	Shipping	lb	10,387	13,245	12,565	12,791	17,735
	Operating	lb	12,791	16,375	15,604	15,876	21,591
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	1				
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	18	18	18	18	20
	Flow Rate	GPM	247.0	265.5	290.2	308.7	371.2
	Pressure Drop	ftH_20	4.64	0.97	1.08	1.02	1.10
	Pass Number	EA	2	1	1	1	1
Condenser	Nozzle Connection	inch	16	18	16	18	20
	Flow Rate	GPM	309.6	332.2	362.9	386.1	462.1
	Pressure Drop	ftH_20	0.73	0.94	1.42	1.42	1.16
	Pass Number	EA	1	1	1	1	1
Dimension	Length	inch	232	252	291	291	309
	Width	inch	147	152	152	152	166
	Height	inch	135	154	154	154	163

Note :
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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	MCWFHAL	MCWFHAM	MCWFHAN	MCWFHAP	MCWFHBM	MCWFHBN	MCWFHBP
Cooling Capacity		usRT	200	250	275	300	400	450	500
		kW	703	879	967	1,055	1,407	1,583	1,758
Weight	Shipping	kg	6,024	6,004	6,094	6,085	7,856	8,034	8,124
	Operating	kg	5,624	5,604	5,694	5,685	7,256	7,434	7,524
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply			3 Ph / 380 ~ 440 V / 50 (60) Hz						
Evaporator	Nozzle Connection	A	150	150	150	150	200	200	200
	Flow Rate	m^3/h	121.0	151.2	166.3	181.4	241.9	272.2	302.4
	Pressure Drop	mH_2O	6.50	6.50	6.50	6.50	6.50	6.50	6.50
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	A	150	150	200	200	200	200	200
	Flow Rate	m^3/h	140.9	176.1	193.7	211.3	281.6	316.8	352.0
	Pressure Drop	mH_2O	9.10	9.10	9.10	9.10	9.10	9.10	9.10
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	mm	3,634	3,634	3,634	3,634	3,706	3,706	3,706
	Width	mm	2,150	2,150	2,150	2,150	2,250	2,250	2,250
	Height	mm	2,375	2,375	2,375	2,375	2,419	2,419	2,419

IP Unit

Model		Units	MCWFHAL	MCWFHAM	MCWFHAN	MCWFHAP	MCWFHBM	MCWFHBN	MCWFHBP
Cooling Capacity		usRT	200	250	275	300	400	450	500
		kW	703	879	967	1,055	1,407	1,583	1,758
Weight	Shipping	kg	2,732	2,723	2,764	2,760	3,563	3,644	3,685
	Operating	kg	2,551	2,542	2,583	2,579	3,291	3,372	3,413
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply			3 Ph / 380 ~ 440 V / 50 (60) Hz						
Evaporator	Nozzle Connection	A	6	6	6	6	8	8	8
	Flow Rate	m^3/h	27.5	34.3	37.8	41.2	54.9	61.8	68.7
	Pressure Drop	ftH_2O	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	A	6	6	8	8	8	8	8
	Flow Rate	m^3/h	32.0	40.0	44.0	48.0	64.0	72.0	79.9
	Pressure Drop	ftH_2O	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	mm	143	143	143	143	146	146	146
	Width	mm	85	85	85	85	89	89	89
	Height	mm	94	94	94	94	95	95	95

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	MCWFHCM	MCWFHCN	MCWFHCP	MCWFHDM	MCWFHDN	MCWFHDP
Cooling Capacity		usRT	550	600	700	800	900	1,000
		kW	1,934	2,110	2,462	2,813	3,165	3,517
Weight	Shipping	kg	9,875	10,152	10,399	12,495	12,946	13,110
	Operating	kg	9,275	9,452	9,699	11,695	12,046	12,110
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply			3 Ph / 380 ~ 440 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	250	250	250	300	300	300
	Flow Rate	m^3/h	332.6	362.9	423.4	483.9	544.3	604.8
	Pressure Drop	mH_2O	6.50	6.60	6.50	9.60	9.60	10.50
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	A	250	250	250	300	300	300
	Flow Rate	m^3/h	387.0	422.2	492.6	562.7	633.1	703.0
	Pressure Drop	mH_2O	9.20	9.20	9.20	10.80	9.00	10.80
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	3,870	3,870	3,870	4,627	4,627	4,627
	Width	mm	2,679	2,679	2,679	2,944	2,944	2,944
	Height	mm	2,630	2,630	2,630	2,959	2,959	2,959

IP Unit

Model		Units	MCWFHCM	MCWFHCN	MCWFHCP	MCWFHDM	MCWFHDN	MCWFHDP
Cooling Capacity		usRT	550	600	700	800	900	1,000
		kW	1,934	2,110	2,462	2,813	3,165	3,517
Weight	Shipping	kg	4,479	4,605	4,717	5,668	5,872	5,947
	Operating	kg	4,207	4,287	4,399	5,305	5,464	5,493
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	1					
Power Supply			3 Ph / 380 ~ 440 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	10	10	10	12	12	12
	Flow Rate	m^3/h	75.6	82.4	96.2	109.9	123.6	137.4
	Pressure Drop	ftH_2O	1.98	2.01	1.98	2.93	2.93	3.20
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	A	10	10	10	12	12	12
	Flow Rate	m^3/h	87.9	95.9	111.9	127.8	143.8	159.7
	Pressure Drop	ftH_2O	2.80	2.80	2.80	3.29	2.74	3.29
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	152	152	152	182	182	182
	Width	mm	105	105	105	116	116	116
	Height	mm	104	104	104	116	116	116

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	MCWFHEM	MCWFHEN	MCWFHEP	MCWFHF1	MCWFHF2
Cooling Capacity		usRT	1,100	1,300	1,500	1,600	1,800
		kW	3,869	4,572	5,275	5,627	6,330
Weight	Shipping	kg	18,176	18,989	19,938	24,352	24,928
	Operating	kg	17,076	17,589	18,238	22,652	23,028
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	1				
Power Supply			3 Ph / 3,300 ~ 13,800 V /50 (60) Hz				
Evaporator	Nozzle Connection	A	350	350	350	400	400
	Flow Rate	m^3/h	665.3	786.3	907.2	967.7	1,088.7
	Pressure Drop	mH_2O	12.00	11.80	11.80	4.40	4.50
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	350	350	400	450	450
	Flow Rate	m^3/h	773.7	914.4	1,055.1	1,127.2	1,268.1
	Pressure Drop	mH_2O	12.31	11.88	11.88	6.40	6.30
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	4,980	4,980	4,980	5,103	5,103
	Width	mm	3,146	3,146	3,146	3,440	3,440
	Height	mm	3,031	3,031	3,031	3,550	3,550

IP Unit

Model		Units	MCWFHEM	MCWFHEN	MCWFHEP	MCWFHF1	MCWFHF2
Cooling Capacity		usRT	1,100	1,300	1,500	1,600	1,800
		kW	3,869	4,572	5,275	5,627	6,330
Weight	Shipping	kg	8,245	8,613	9,044	11,046	11,307
	Operating	kg	7,746	7,978	8,273	10,275	10,445
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	1				
Power Supply			3 Ph / 3,300 ~ 13,800 V /50 (60) Hz				
Evaporator	Nozzle Connection	A	14	14	14	16	16
	Flow Rate	m^3/h	151.1	178.6	206.0	219.8	247.3
	Pressure Drop	ftH_2O	3.66	3.60	3.60	1.34	1.37
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	14	14	16	18	18
	Flow Rate	m^3/h	175.7	207.7	239.6	256.0	288.0
	Pressure Drop	ftH_2O	3.75	3.62	3.62	1.95	1.92
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	196	196	196	201	201
	Width	mm	124	124	124	135	135
	Height	mm	119	119	119	140	140

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	MCWFHF3	MCWFHG1	MCWFHG2	MCWFHG3
Cooling Capacity		usRT	2,000	2,150	2,630	3,000
		kW	7,034	7,560	9,248	10,549
Weight	Shipping	kg	25,575	31,744	34,604	35,567
	Operating	kg	23,575	29,544	31,404	32,267
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply			3 Ph / 3,300 ~ 13,800 V /50 (60) Hz			
Evaporator	Nozzle Connection	A	400	450	450	500
	Flow Rate	m^3/h	1,209.6	1,300.4	1,590.7	1,814.4
	Pressure Drop	mH_2O	4.50	9.20	11.40	11.80
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	450	500	500	600
	Flow Rate	m^3/h	1,408.0	1,514.3	1,852.4	2,113.0
	Pressure Drop	mH_2O	6.40	11.80	12.16	12.41
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	5,103	6,103	6,903	6,903
	Width	mm	3,440	3,590	3,590	3,590
	Height	mm	3,550	3,732	3,732	3,732

IP Unit

Model		Units	MCWFHF3	MCWFHG1	MCWFHG3	MCWFHHD
Cooling Capacity		usRT	2,000	2,150	2,630	3,000
		kW	7,034	7,560	9,248	10,549
Weight	Shipping	kg	11,601	14,399	15,696	16,133
	Operating	kg	10,694	13,401	14,245	14,636
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply			3 Ph / 3,300 ~ 13,800 V /50 (60) Hz			
Evaporator	Nozzle Connection	A	16	18	18	20
	Flow Rate	m^3/h	274.7	295.3	361.3	412.1
	Pressure Drop	ftH_2O	1.37	2.80	3.47	3.60
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	18	20	20	24
	Flow Rate	m^3/h	319.8	343.9	420.7	479.9
	Pressure Drop	ftH_2O	1.95	3.60	3.70	3.78
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	201	240	272	272
	Width	mm	135	141	141	141
	Height	mm	140	147	147	147

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	GCWFHAL	GCWFHAM	GCWFHAN	GCWFHAP	GCWFHBM	GCWFHBN	GCWFHBP
Cooling Capacity		usRT	180	225	245	270	380	425	470
		kW	633	791	861	949	1,336	1,494	1,653
Weight	Shipping	kg	5,200	5,300	5,400	5,400	7,300	7,400	7,500
	Operating	kg	5,900	6,100	6,200	6,300	8,700	8,900	9,000
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz						
Evaporator	Nozzle Connection	A	150	150	150	150	200	200	200
	Flow Rate	m^3/h	98	123	133	147	207	232	256
	Pressure Drop	mH_2O	2.80	2.81	3.33	2.82	3.04	3.09	3.07
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	A	150	150	150	150	200	200	200
	Flow Rate	m^3/h	127	159	173	190	260	291	322
	Pressure Drop	mH_2O	2.76	3.00	2.99	3.61	3.00	3.34	4.08
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	mm	3,596	3,596	3,596	3,596	3,631	3,631	3,631
	Width	mm	2,113	2,113	2,113	2,113	2,242	2,242	2,242
	Height	mm	2,021	2,021	2,021	2,021	2,231	2,231	2,231

IP Unit

Model		Units	GCWFHAL	GCWFHAM	GCWFHAN	GCWFHAP	GCWFHBM	GCWFHBN	GCWFHBP
Cooling Capacity		usRT	180	225	245	270	380	425	470
		kW	633	791	861	949	1,336	1,494	1,653
Weight	Shipping	lb	2,359	2,404	2,449	2,449	3,311	3,357	3,402
	Operating	lb	2,676	2,767	2,812	2,858	3,946	4,037	4,082
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz						
Evaporator	Nozzle Connection	inch	6	6	6	6	8	8	8
	Flow Rate	GPM	22.3	27.8	30.3	33.4	47.0	52.6	58.2
	Pressure Drop	ftH_2O	0.85	0.86	1.02	0.86	0.93	0.94	0.94
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	6	6	6	6	8	8	8
	Flow Rate	GPM	28.9	36.0	39.2	43.1	59.2	66.1	73.0
	Pressure Drop	ftH_2O	0.84	0.91	0.91	1.10	0.91	1.02	1.24
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	inch	142	142	142	142	143	143	143
	Width	inch	83	83	83	83	88	88	88
	Height	inch	80	80	80	80	88	88	88

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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	GCWFHCM	GCWFHCN	GCWFHCP	GCWFHCQ	GCWFHDN	GCWFHDP	GCWFHEM
Cooling Capacity		usRT	510	550	660	750	850	940	1,030
		kW	1,793	1,934	2,321	2,637	2,989	3,305	3,622
Weight	Shipping	kg	9,400	9,400	10,000	10,000	12,800	12,900	22,100
	Operating	kg	11,200	11,200	12,100	12,100	15,700	15,800	28,200
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz						
Evaporator	Nozzle Connection	A	200	250	250	250	300	300	400
	Flow Rate	m^3/h	278	300	360	409	463	512	561
	Pressure Drop	mH_2O	2.98	2.92	4.28	6.64	4.92	5.32	5.15
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	A	200	250	250	250	300	300	400
	Flow Rate	m^3/h	349	376	450	512	580	641	703
	Pressure Drop	mH_2O	2.77	3.21	5.78	9.37	5.04	6.14	6.00
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	mm	3,736	3,736	4,386	4,386	4,525	4,525	6,456
	Width	mm	2,409	2,409	2,409	2,409	2,861	2,861	3,428
	Height	mm	2,466	2,466	2,466	2,466	2,800	2,800	3,265

IP Unit

Model		Units	GCWFHCM	GCWFHCN	GCWFHCP	GCWFHCQ	GCWFHDN	GCWFHDP	GCWFHEM
Cooling Capacity		usRT	510	550	660	750	850	940	1,030
		kW	1,793	1,934	2,321	2,637	2,989	3,305	3,622
Weight	Shipping	lb	4,264	4,264	4,536	4,536	5,806	5,851	10,024
	Operating	lb	5,080	5,080	5,488	5,488	7,121	7,167	12,791
Compressor	Type	-	2-stage Centrifugal Compressor						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz						
Evaporator	Nozzle Connection	inch	8	10	10	10	12	12	16
	Flow Rate	GPM	63.1	68.1	81.7	92.8	105.2	116.3	127.5
	Pressure Drop	ftH_2O	0.91	0.89	1.31	2.02	1.50	1.62	1.57
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	8	10	10	10	12	12	16
	Flow Rate	GPM	79.3	85.4	102.2	116.2	131.7	145.6	159.8
	Pressure Drop	ftH_2O	0.85	0.98	1.76	2.86	1.54	1.87	1.83
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	inch	147	147	173	173	178	178	254
	Width	inch	95	95	95	95	113	113	135
	Height	inch	97	97	97	97	110	110	129

Note :
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5. For other than above this table, contat nearest LG electronics office.

H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	GCWFHEN	GCWFHEP	GCWFHF1	GCWFHF2
Cooling Capacity		usRT	1,200	1,400	1,470	1,610
		kW	4,220	4,923	5,169	5,661
Weight	Shipping	kg	22,100	22,100	25,100	25,100
	Operating	kg	28,200	28,200	31,800	31,800
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz			
Evaporator	Nozzle Connection	A	400	400	450	450
	Flow Rate	m^3/h	654	763	801	877
	Pressure Drop	mH_2O	6.95	9.43	8.13	9.73
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	400	400	450	450
	Flow Rate	m^3/h	818	952	1,007	1,101
	Pressure Drop	mH_2O	8.06	10.88	8.63	10.30
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	6,456	6,456	6,526	6,526
	Width	mm	3,428	3,428	3,884	3,884
	Height	mm	3,265	3,265	3,572	3,572

IP Unit

Model		Units	GCWFHEN	GCWFHEP	GCWFHF1	GCWFHF2
Cooling Capacity		usRT	1,200	1,400	1,470	1,610
		kW	4,220	4,923	5,169	5,661
Weight	Shipping	lb	10,024	10,024	11,385	11,385
	Operating	lb	12,791	12,791	14,424	14,424
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz			
Evaporator	Nozzle Connection	inch	16	16	18	18
	Flow Rate	GPM	148.5	173.2	181.9	199.2
	Pressure Drop	ftH_2O	2.12	2.87	2.48	2.97
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	inch	16	16	18	18
	Flow Rate	GPM	185.7	216.2	228.8	250.2
	Pressure Drop	ftH_2O	2.46	3.32	2.63	3.14
	Pass Number	EA	2	2	2	2
Dimension	Length	inch	254	254	257	257
	Width	inch	135	135	153	153
	Height	inch	129	129	141	141

Note :
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H-Series (Oil-Lubricant) Centrifugal Chiller

SI Unit

Model		Units	GCWFHF3	GCWFHG1	GCWFHG2	GCWFHG3
Cooling Capacity		usRT	1,740	2,030	2,150	2,340
		kW	6,118	7,138	7,560	8,228
Weight	Shipping	kg	26,300	33,900	31,400	31,400
	Operating	kg	33,000	43,900	40,300	40,300
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz			
Evaporator	Nozzle Connection	A	450	500	500	500
	Flow Rate	m^3/h	948	1,106	1,171	1,275
	Pressure Drop	mH_2O	11.34	16.13	3.01	3.55
	Pass Number	EA	2	2	1	1
Condenser	Nozzle Connection	A	450	500	500	500
	Flow Rate	m^3/h	1,189	1,392	14,73	1,602
	Pressure Drop	mH_2O	11.97	13.54	2.57	3.03
	Pass Number	EA	2	2	1	1
Dimension	Length	mm	6,526	7,526	7,846	7,846
	Width	mm	3,884	4,086	3,877	3,877
	Height	mm	3,572	3,864	3,844	3,844

IP Unit

Model		Units	GCWFHF3	GCWFHG1	GCWFHG2	GCWFHG3
Cooling Capacity		usRT	1,740	2,030	2,150	2,340
		kW	6,118	7,138	7,560	8,228
Weight	Shipping	lb	11,929	15,377	14,243	14,243
	Operating	lb	14,969	19,913	18,280	18,280
Compressor	Type	-	2-stage Centrifugal Compressor			
	No.	EA	1			
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz			
Evaporator	Nozzle Connection	inch	18	20	20	20
	Flow Rate	GPM	215.3	251.2	266.1	289.6
	Pressure Drop	ftH_2O	3.46	4.92	0.92	1.08
	Pass Number	EA	2	2	1	1
Condenser	Nozzle Connection	inch	18	20	20	20
	Flow Rate	GPM	270.0	316.1	334.5	363.8
	Pressure Drop	ftH_2O	3.65	4.13	0.78	0.92
	Pass Number	EA	2	2	1	1
Dimension	Length	inch	257	296	309	309
	Width	inch	153	161	153	153
	Height	inch	141	152	151	151

Note :
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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	RCWFLAL	RCWFLAM	RCWFLAN	RCWFLAP	RCWFLBM
Cooling Capacity		usRT	200	250	275	300	400
		kW	703	879	967	1,055	1,407
Weight	Shipping	kg	5,800	5,900	6,000	6,000	7,400
	Operating	kg	6,400	6,600	6,800	6,800	8,700
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	150	150	150	150	200
	Flow Rate	m^3/h	110	137	151	165	220
	Pressure Drop	mH_2O	3.51	3.53	3.53	3.54	3.42
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	150	150	150	150	200
	Flow Rate	m^3/h	136	169	186	203	269
	Pressure Drop	mH_2O	4.83	4.84	4.84	4.86	3.83
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	3,506	3,506	3,506	3,506	3,506
	Width	mm	2,576	2,576	2,576	2,576	2,592
	Height	mm	1,981	1,981	1,981	1,981	2,042

IP Unit

Model		Units	RCWFLAL	RCWFLAM	RCWFLAN	RCWFLAP	RCWFLBM
Cooling Capacity		usRT	200	250	275	300	400
		kW	703	879	967	1,055	1,407
Weight	Shipping	lb	2,631	2,676	2,722	2,722	3,357
	Operating	lb	2,903	2,994	3,084	3,084	3,946
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	6	6	6	6	8
	Flow Rate	GPM	25.0	31.1	34.3	37.5	50.0
	Pressure Drop	ftH_2O	1.07	1.08	1.08	1.08	1.04
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	inch	6	6	6	6	8
	Flow Rate	GPM	30.9	38	42	46	61
	Pressure Drop	ftH_2O	1.47	1.48	1.48	1.48	1.17
	Pass Number	EA	2	2	2	2	2
Dimension	Length	inch	138	138	138	138	138
	Width	inch	101	101	101	101	102
	Height	inch	78	78	78	78	80

Note :
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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	RCWFLBN	RCWFLBP	RCWFLCM	RCWFLCN	RCWFLCP
Cooling Capacity		usRT	450	500	550	600	700
		kW	1,582	1,758	1,934	2,110	2,461
Weight	Shipping	kg	7,500	7,600	9,500	10,000	10,600
	Operating	kg	8,800	8,900	10,900	11,500	12,300
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	200	200	200	250	250
	Flow Rate	m^3/h	247	275	302	330	385
	Pressure Drop	mH_2O	3.42	3.53	2.97	3.53	4.07
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	200	200	200	250	250
	Flow Rate	m^3/h	303	336	370	403	470
	Pressure Drop	mH_2O	3.83	4.96	4.03	3.68	4.98
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	3,506	3,506	3,506	3,506	3,506
	Width	mm	2,592	2,592	3,029	3,029	3,029
	Height	mm	2,042	2,042	2,530	2,530	2,530

IP Unit

Model		Units	RCWFLBN	RCWFLBP	RCWFLCM	RCWFLCN	RCWFLCP
Cooling Capacity		usRT	450	500	550	600	700
		kW	1,582	1,758	1,934	2,110	2,461
Weight	Shipping	lb	3,402	3,447	4,309	4,536	4,808
	Operating	lb	3,992	4,037	4,944	5,216	5,579
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	8	8	8	10	10
	Flow Rate	GPM	56.1	62.5	68.6	74.9	87.4
	Pressure Drop	ftH_2O	1.04	1.08	0.91	1.08	1.24
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	inch	8	8	8	10	10
	Flow Rate	GPM	69	76	84	92	107
	Pressure Drop	ftH_2O	1.17	1.51	1.23	1.12	1.52
	Pass Number	EA	2	2	2	2	2
Dimension	Length	inch	138	138	138	138	138
	Width	inch	102	102	119	119	119
	Height	inch	80	80	100	100	100

Note :
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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	RCWFLDM	RCWFLDN	RCWFLDP	RCWFLDP
Cooling Capacity		usRT	800	900	1,000	1,100
		kW	2,813	3,165	3,516	3,868
Weight	Shipping	kg	12,400	13,900	14,200	11,514
	Operating	kg	14,500	16,300	16,700	13,723
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	A	250	300	300	300
	Flow Rate	m^3/h	440	495	550	605
	Pressure Drop	mH_2O	4.95	5.60	6.13	7.40
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	250	300	300	300
	Flow Rate	m^3/h	537	603	668	738
	Pressure Drop	mH_2O	3.60	6.50	7.96	8.10
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	4,156	4,156	4,156	4,156
	Width	mm	3,550	3,550	3,550	3,550
	Height	mm	3,377	3,377	3,377	3,377

IP Unit

Model		Units	RCWFLDM	RCWFLDN	RCWFLDP	RCWFLDP
Cooling Capacity		usRT	800	900	1,000	1,100
		kW	2,813	3,165	3,516	3,868
Weight	Shipping	lb	5,625	6,305	6,441	5,223
	Operating	lb	6,577	7,394	7,575	6,225
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	inch	10	12	12	12
	Flow Rate	GPM	99.9	112.4	124.9	137.4
	Pressure Drop	ftH_2O	1.51	1.71	1.87	2.26
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	inch	10	12	12	12
	Flow Rate	GPM	122	137	152	168
	Pressure Drop	ftH_2O	1.10	1.98	2.43	2.47
	Pass Number	EA	2	2	2	2
Dimension	Length	inch	164	164	164	164
	Width	inch	140	140	140	140
	Height	inch	133	133	133	133

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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	MCWFLAL	MCWFLAM	MCWFLAN	MCWFLAP	MCWFLBM
Cooling Capacity		usRT	200	250	275	300	400
		kW	703	879	967	1,055	1,407
Weight	Shipping	kg	6,700	6,800	6,800	6,900	8,500
	Operating	kg	7,300	7,500	7,600	7,700	9,600
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	150	150	150	150	200
	Flow Rate	m^3/h	110	137	151	165	220
	Pressure Drop	mH_2O	3.51	3.53	3.53	3.54	3.42
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	150	150	150	150	200
	Flow Rate	m^3/h	136	169	186	203	269
	Pressure Drop	mH_2O	4.83	4.84	4.84	4.86	3.83
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	3,506	3,506	3,506	3,506	3,506
	Width	mm	2,576	2,576	2,576	2,576	2,592
	Height	mm	1,981	1,981	1,981	1,981	2,042

IP Unit

Model		Units	MCWFLAL	MCWFLAM	MCWFLAN	MCWFLAP	MCWFLBM
Cooling Capacity		usRT	200	250	275	300	400
		kW	703	879	967	1,055	1,407
Weight	Shipping	lb	3,039	3,084	3,084	3,130	3,856
	Operating	lb	3,311	3,402	3,447	3,493	4,354
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	6	6	6	6	8
	Flow Rate	GPM	25.0	31.1	34.3	37.5	50.0
	Pressure Drop	ftH_2O	1.07	1.08	1.08	1.08	1.04
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	inch	6	6	6	6	8
	Flow Rate	GPM	30.9	38.4	42.2	46.1	61.1
	Pressure Drop	ftH_2O	1.47	1.48	1.48	1.48	1.17
	Pass Number	EA	2	2	2	2	2
Dimension	Length	inch	138	138	138	138	138
	Width	inch	101	101	101	101	102
	Height	inch	78	78	78	78	80

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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	MCWFLBN	MCWFLBP	MCWFLCM	MCWFLCN	MCWFLCP
Cooling Capacity		usRT	450	500	550	600	700
		kW	1,582	1,758	1,934	2,110	2,461
Weight	Shipping	kg	8,600	8,800	11,200	11,400	12,000
	Operating	kg	9,800	10,100	12,900	13,200	14,000
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	200	200	200	250	250
	Flow Rate	m^3/h	247	275	302	330	385
	Pressure Drop	mH_2O	3.42	3.53	2.97	3.53	4.07
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	200	200	200	250	250
	Flow Rate	m^3/h	303	336	370	403	470
	Pressure Drop	mH_2O	3.83	4.96	4.03	3.68	4.98
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	3,506	3,506	3,506	3,506	3,506
	Width	mm	2,592	2,592	3,029	3,029	3,029
	Height	mm	2,042	2,042	2,530	2,530	2,530

IP Unit

Model		Units	MCWFLBN	MCWFLBP	MCWFLCM	MCWFLCN	MCWFLCP
Cooling Capacity		usRT	450	500	550	600	700
		kW	1,582	1,758	1,934	2,110	2,461
Weight	Shipping	lb	3,901	3,992	5,080	5,171	5,443
	Operating	lb	4,445	4,581	5,851	5,987	6,350
Compressor	Type	-	Magnetic Bearing				
	No.	EA	1				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	8	8	8	10	10
	Flow Rate	GPM	56.1	62.5	68.6	74.9	87.4
	Pressure Drop	ftH_2O	1.04	1.08	0.91	1.08	1.24
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	inch	8	8	8	10	10
	Flow Rate	GPM	68.8	76.3	84.0	91.5	106.7
	Pressure Drop	ftH_2O	1.17	1.51	1.23	1.12	1.52
	Pass Number	EA	2	2	2	2	2
Dimension	Length	inch	138	138	138	138	138
	Width	inch	102	102	119	119	119
	Height	inch	80	80	100	100	100

Note :
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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	MCWFLDM	MCWFLDN	MCWFLDP	MCWFLDP
Cooling Capacity		usRT	800	900	1,000	1,100
		kW	2,813	3,165	3,517	3,868
Weight	Shipping	kg	14,900	15,000	14,200	11,514
	Operating	kg	17,100	17,400	16,700	13,723
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	A	250	300	300	300
	Flow Rate	m^3/h	440	495	550	605
	Pressure Drop	mH_2O	4.95	5.60	6.13	7.40
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	250	300	300	300
	Flow Rate	m^3/h	537	603	668	738
	Pressure Drop	mH_2O	3.60	6.50	7.96	8.10
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	4,156	4,156	4,156	4,150
	Width	mm	3,550	3,550	3,550	3,550
	Height	mm	3,377	3,377	3,377	3,377

IP Unit

Model		Units	MCWFLDM	MCWFLDN	MCWFLDP	MCWFLDP
Cooling Capacity		usRT	800	900	1,000	1,100
		kW	2,813	3,165	3,516	3,868
Weight	Shipping	lb	6,759	6,804	6,441	5,223
	Operating	lb	7,756	7,893	7,575	6,225
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	inch	10	12	12	12
	Flow Rate	GPM	99.9	112.4	124.9	137.4
	Pressure Drop	ftH_2O	1.51	1.71	1.87	2.26
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	inch	10	12	12	12
	Flow Rate	GPM	122.0	137.0	151.7	167.6
	Pressure Drop	ftH_2O	1.10	1.98	2.43	2.47
	Pass Number	EA	2	2	2	2
Dimension	Length	inch	164	164	164	163
	Width	inch	140	140	140	140
	Height	inch	133	133	133	133

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
3. Due to our policy of innovation some specifications may be changed without prior notification.
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5. For other than above this table, contat nearest LG electronics office.

L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	GCWFLAL	GCWFLAM	GCWFLAN	GCWFLAP	GCWFLBM	GCWFLBN	GCWFLBP
Cooling Capacity		usRT	180	225	245	270	380	425	470
		kW	633	791	861	949	1,336	1,494	1,653
Weight	Shipping	kg	5,900	6,000	6,000	6,100	8,100	8,200	8,300
	Operating	kg	6,700	6,900	7,000	7,000	9,700	9,800	9,800
Compressor	Type	-	Magnetic Bearing						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz						
Evaporator	Nozzle Connection	A	150	150	150	150	200	200	200
	Flow Rate	m^3/h	98	123	134	147	207	232	256
	Pressure Drop	mH_2O	2.80	2.81	3.33	2.82	3.04	3.09	3.07
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	A	150	150	150	150	200	200	200
	Flow Rate	m^3/h	127	158	172	189	260	290	320
	Pressure Drop	mH_2O	2.74	2.97	2.97	3.58	2.98	3.32	4.05
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	mm	3,596	3,596	3,596	3,596	3,631	3,631	3,631
	Width	mm	2,574	2,574	2,574	2,574	2,430	2,430	2,430
	Height	mm	2,040	2,040	2,040	2,040	2,172	2,172	2,172

IP Unit

Model		Units	GCWFLAL	GCWFLAM	GCWFLAN	GCWFLAP	GCWFLBM	GCWFLBN	GCWFLBP
Cooling Capacity		usRT	180	225	245	270	380	425	470
		kW	633	791	861	949	1,336	1,494	1,653
Weight	Shipping	lb	2,676	2,722	2,722	2,767	3,674	3,719	3,765
	Operating	lb	3,039	3,130	3,175	3,175	4,400	4,445	4,445
Compressor	Type	-	Magnetic Bearing						
	No.	EA	1						
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz						
Evaporator	Nozzle Connection	inch	6	6	6	6	8	8	8
	Flow Rate	GPM	22.3	27.8	30.3	33.4	47.0	52.6	58.2
	Pressure Drop	ftH_20	0.85	0.86	1.02	0.86	0.93	0.94	0.94
	Pass Number	EA	2	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	6	6	6	6	8	8	8
	Flow Rate	GPM	28.8	35.9	39.0	42.9	58.9	65.8	72.7
	Pressure Drop	ftH_20	0.84	0.90	0.90	1.09	0.91	1.01	1.23
	Pass Number	EA	2	2	2	2	2	2	2
Dimension	Length	inch	142	142	142	142	143	143	143
	Width	inch	101	101	101	101	96	96	96
	Height	inch	80	80	80	80	86	86	86

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L-Series (Oil-Free) Centrifugal Chiller

SI Unit

Model		Units	GCWFLCM	GCWFLCN	GCWFLCP	GCWFLCQ	GCWFLDN	GCWFLDP
Cooling Capacity		usRT	510	550	660	750	850	940
		kW	1,793	1,934	2,321	2,637	2,989	3,305
Weight	Shipping	kg	11,200	11,100	11,700	11,700	15,000	15,100
	Operating	kg	13,300	13,100	14,000	14,000	18,000	18,200
Compressor	Type	-	Magnetic Bearing					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	200	250	250	250	300	300
	Flow Rate	m^3/h	278	300	360	409	463	512
	Pressure Drop	mH_2O	2.98	2.92	4.28	6.64	4.92	5.32
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	A	200	250	250	250	300	300
	Flow Rate	m^3/h	348	375	448	512	578	639
	Pressure Drop	mH_2O	2.75	3.19	5.74	9.37	5.01	6.10
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	mm	3,736	3,736	4,386	4,386	4,525	4,525
	Width	mm	3,331	3,331	3,331	3,331	3,314	3,314
	Height	mm	2,439	2,439	2,439	2,439	3,001	3,001

IP Unit

Model		Units	GCWFLCM	GCWFLCN	GCWFLCP	GCWFLCQ	GCWFLDN	GCWFLDP
Cooling Capacity		usRT	510	550	660	750	850	940
		kW	1,793	1,934	2,321	2,637	2,989	3,305
Weight	Shipping	lb	5,080	5,035	5,307	5,307	6,804	6,849
	Operating	lb	6,033	5,942	6,350	6,350	8,165	8,255
Compressor	Type	-	Magnetic Bearing					
	No.	EA	1					
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz					
Evaporator	Nozzle Connection	inch	8	10	10	10	12	12
	Flow Rate	GPM	63.1	68.1	81.7	92.8	105.2	116.3
	Pressure Drop	ftH_2O	0.91	0.89	1.31	2.02	1.50	1.62
	Pass Number	EA	2	2	2	2	2	2
Condenser	Nozzle Connection	inch	8	10	10	10	12	12
	Flow Rate	GPM	79.0	85.1	101.8	116.2	131.3	145.1
	Pressure Drop	ftH_2O	0.84	0.97	1.75	2.86	1.53	1.86
	Pass Number	EA	2	2	2	2	2	2
Dimension	Length	inch	147	147	173	173	178	178
	Width	inch	131	131	131	131	130	130
	Height	inch	96	96	96	96	118	118

Note :
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L-Series (Oil-Free, HFO) Centrifugal Chiller

SI Unit

Model		Units	DCWFLBA	DCWFLBC	DCWFLCC	DCWFLDC
Cooling Capacity		usRT	400	500	700	1,000
		kW	1,407	1,758	2,461	3,516
Weight	Shipping	kg	11,845	11,971	14,995	20,894
	Operating	kg	13,245	13,582	17,152	23,803
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	A	200	200	250	300
	Flow Rate	m^3/h	218	273	382	545
	Pressure Drop	mH_2O	5.10	5.20	6.40	9.80
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	A	200	200	250	350
	Flow Rate	m^3/h	273	341	477	681
	Pressure Drop	mH_2O	5.38	5.41	7.04	8.63
	Pass Number	EA	2	2	2	2
Dimension	Length	mm	4,440	4,440	4,954	5,545
	Width	mm	2,875	2,875	3,318	3,806
	Height	mm	2,757	2,757	3,228	3,704

IP Unit

Model		Units	DCWFLBA	DCWFLBC	DCWFLCC	DCWFLDC
Cooling Capacity		usRT	400	500	700	1,000
		kW	1,407	1,758	2,461	3,516
Weight	Shipping	lb	5,373	5,430	6,802	9,477
	Operating	lb	6,008	6,161	7,780	10,797
Compressor	Type	-	Magnetic Bearing			
	No.	EA	1			
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz			
Evaporator	Nozzle Connection	inch	8	8	10	12
	Flow Rate	GPM	49.5	61.9	86.8	123.8
	Pressure Drop	ftH_2O	1.55	1.58	1.95	2.99
	Pass Number	EA	2	2	2	2
Condenser	Nozzle Connection	inch	8	8	10	14
	Flow Rate	GPM	61.9	77.4	108.3	154.7
	Pressure Drop	ftH_2O	1.64	1.65	2.15	2.63
	Pass Number	EA	2	2	2	2
Dimension	Length	inch	175	175	195	218
	Width	inch	113	113	131	150
	Height	inch	109	109	127	146

Note :
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H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	RCWFHBW	RCWFHCT	RCWFHCU	RCWFHCW	RCWFHDT
Cooling Capacity		usRT	1,000	1,150	1,300	1,400	1,600
		kW	3,516	4,044	4,571	4,923	5,626
Weight	Shipping	kg	13,700	16,200	16,800	17,300	21,600
	Operating	kg	16,000	18,900	19,700	20,500	25,800
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	250	300	300	300	300
	Flow Rate	m^3/h	604.8	695.5	786.2	846.7	967.7
	Pressure Drop	mH_2O	4.23	9.16	7.10	5.50	6.71
	Pass Number	EA	1	1	1	1	1
Condenser	Nozzle Connection	A	250	300	300	300	350
	Flow Rate	m^3/h	604.8	695.5	786.2	846.7	967.7
	Pressure Drop	mH_2O	4.23	9.16	7.10	5.50	6.71
	Pass Number	EA	1	1	1	1	1
Dimension	Length	mm	7,206	7,206	7,206	7,206	7,961
	Width	mm	2,172	2,342	2,342	2,342	2,861
	Height	mm	2,231	2,466	2,466	2,466	2,800

IP Unit

Model		Units	RCWFHBW	RCWFHCT	RCWFHCU	RCWFHCW	RCWFHDT
Cooling Capacity		usRT	1,000	1,150	1,300	1,400	1,600
		kW	3,516	4,044	4,571	4,923	5,626
Weight	Shipping	lb	6,214	7,348	7,620	7,847	9,798
	Operating	lb	7,257	8,573	8,936	9,299	11,703
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	10	12	12	12	12
	Flow Rate	GPM	137.4	158.0	178.6	192.3	219.8
	Pressure Drop	ftH_2O	1.29	2.79	2.16	1.68	2.05
	Pass Number	EA	1	1	1	1	1
Condenser	Nozzle Connection	inch	10	12	12	12	14
	Flow Rate	GPM	137.4	158.0	178.6	192.3	219.8
	Pressure Drop	ftH_2O	1.29	2.79	2.16	1.68	2.05
	Pass Number	EA	1	1	1	1	1
Dimension	Length	inch	284	284	284	284	313
	Width	inch	86	92	92	92	113
	Height	inch	88	97	97	97	110

Note :
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H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	RCWFHDU	RCWFHDW	RCWFHET	RCWFHEU	RCWFHEW
Cooling Capacity		usRT	1,800	2,000	2,300	2,600	3,000
		kW	6,329	7,033	8,087	9,142	10,549
Weight	Shipping	kg	22,300	22,900	29,900	31,900	33,100
	Operating	kg	26,700	27,600	35,500	38,800	40,800
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	350	350	400	400	450
	Flow Rate	m^3/h	1,088.6	1,209.6	1,391.0	1,572.5	1,814.4
	Pressure Drop	mH_2O	6.25	5.91	6.91	5.80	7.70
	Pass Number	EA	1	1	1	1	1
Condenser	Nozzle Connection	A	350	350	400	400	450
	Flow Rate	m^3/h	1,088.6	1,209.6	1,391.0	1,572.5	1,814.4
	Pressure Drop	mH_2O	6.25	5.91	6.91	5.80	7.70
	Pass Number	EA	1	1	1	1	1
Dimension	Length	mm	7,961	7,961	8,161	8,161	8,161
	Width	mm	2,861	2,861	2,996	3,250	3,377
	Height	mm	2,800	2,800	3,095	3,222	3,349

IP Unit

Model		Units	RCWFHDU	RCWFHDW	RCWFHET	RCWFHEU	RCWFHEW
Cooling Capacity		usRT	1,800	2,000	2,300	2,600	3,000
		kW	6,329	7,033	8,087	9,142	10,549
Weight	Shipping	lb	10,115	10,387	13,562	14,470	15,014
	Operating	lb	12,111	12,519	16,103	17,599	18,507
Compressor	Type	-	2-stage Centrifugal Compressor				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	14	14	16	16	18
	Flow Rate	GPM	247.2	274.7	315.9	357.1	412.1
	Pressure Drop	ftH_2O	1.90	1.80	2.11	1.77	2.35
	Pass Number	EA	1	1	1	1	1
Condenser	Nozzle Connection	inch	14	14	16	16	18
	Flow Rate	GPM	247.2	274.7	315.9	357.1	412.1
	Pressure Drop	ftH_2O	1.90	1.80	2.11	1.77	2.35
	Pass Number	EA	1	1	1	1	1
Dimension	Length	inch	313	313	321	321	321
	Width	inch	113	113	118	128	133
	Height	inch	110	110	122	127	132

Note :
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H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	RCWFHF6	RCWFHF7	RCWFHF8
Cooling Capacity		usRT	3,300	3,600	4,000
		kW	11,604	12,659	14,065
Weight	Shipping	kg	38,100	38,300	38,600
	Operating	kg	46,400	46,600	47,000
Compressor	Type	-	2-stage Centrifugal Compressor		
	No.	EA	2		
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz		
Evaporator	Nozzle Connection	A	500	500	550
	Flow Rate	m^3/h	1,995.8	2,177.3	2,419.2
	Pressure Drop	mH_2O	5.40	6.40	7.90
	Pass Number	EA	1	1	1
Condenser	Nozzle Connection	A	500	500	550
	Flow Rate	m^3/h	1,995.8	2,177.3	2,419.2
	Pressure Drop	mH_2O	5.40	6.40	7.90
	Pass Number	EA	1	1	1
Dimension	Length	mm	9,255	9,255	9,255
	Width	mm	3,840	3,840	3,840
	Height	mm	3,575	3,575	3,575

IP Unit

Model		Units	RCWFHF6	RCWFHF7	RCWFHF8
Cooling Capacity		usRT	3,300	3,600	4,000
		kW	11,604	12,659	14,065
Weight	Shipping	lb	17,282	17,373	17,509
	Operating	lb	21,047	21,137	21,319
Compressor	Type	-	2-stage Centrifugal Compressor		
	No.	EA	2		
Power Supply		-	3 Ph / 3,300 ~ 13,800 V / 50 (60) Hz		
Evaporator	Nozzle Connection	inch	20	20	22
	Flow Rate	GPM	453.3	494.5	549.4
	Pressure Drop	ftH_2O	1.65	1.95	2.41
	Pass Number	EA	1	1	1
Condenser	Nozzle Connection	inch	20	20	22
	Flow Rate	GPM	453.3	494.5	549.4
	Pressure Drop	ftH_2O	1.65	1.95	2.41
	Pass Number	EA	1	1	1
Dimension	Length	inch	364	364	364
	Width	inch	151	151	151
	Height	inch	141	141	141

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H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	GCWFHAW	GCWFHBW	GCWFHCW	GCWFHCX	GCWFHDW	GCWFHEW
Cooling Capacity		usRT	540	940	1,320	1,500	1,880	2,800
		kW	1,899	3,305	4,641	5,274	6,611	9,846
Weight	Shipping	kg	10,400	13,900	18,100	20,200	23,300	36,600
	Operating	kg	12,100	16,600	22,000	24,500	28,400	44,700
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	2					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	A	250	300	300	300	300	350
	Flow Rate	m^3/h	302.0	521.0	732.0	834.0	1,042.0	1,553.0
	Pressure Drop	mH_2O	37.30	32.20	46.60	33.90	51.60	57.40
	Pass Number	EA	1	1	1	1	1	1
Condenser	Nozzle Connection	A	250	300	300	300	350	350
	Flow Rate	m^3/h	386.0	654.0	919.0	1,046.0	1,309.0	1,950.0
	Pressure Drop	mH_2O	39.60	45.90	56.90	40.80	63.70	56.30
	Pass Number	EA	1	1	1	1	1	1
Dimension	Length	mm	7,306	7,306	8,241	7,468	8,439	8,601
	Width	mm	2,113	2,310	2,409	2,760	2,930	3,790
	Height	mm	2,150	2,231	2,466	2,740	2,800	3,640

IP Unit

Model		Units	GCWFHAW	GCWFHBW	GCWFHCW	GCWFHCX	GCWFHDW	GCWFHEW
Cooling Capacity		usRT	540	940	1,320	1,500	1,880	2,800
		kW	1,899	3,305	4,641	5,274	6,611	9,846
Weight	Shipping	lb	4,717	6,305	8,210	9,163	10,569	16,601
	Operating	lb	5,488	7,530	9,979	11,113	12,882	20,276
Compressor	Type	-	2-stage Centrifugal Compressor					
	No.	EA	2					
Power Supply		-	3 Ph / 380 ~ 13,800 V / 50 (60) Hz					
Evaporator	Nozzle Connection	inch	10	12	12	12	12	14
	Flow Rate	GPM	68.6	118.3	166.3	189.4	236.7	352.7
	Pressure Drop	ftH_2O	11.37	9.81	14.20	10.33	15.73	17.50
	Pass Number	EA	1	1	1	1	1	1
Condenser	Nozzle Connection	inch	10	12	12	12	14	14
	Flow Rate	GPM	87.7	148.5	208.7	237.6	297.3	442.9
	Pressure Drop	ftH_2O	12.07	13.99	17.34	12.44	19.42	17.16
	Pass Number	EA	1	1	1	1	1	1
Dimension	Length	inch	288	288	324	294	332	339
	Width	inch	83	91	95	109	115	149
	Height	inch	85	88	97	108	110	143

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4. All data in this table is rated in accordance with AHRI standard 551/591 (550/590).
5. For other than above this table, contat nearest LG electronics office.

L-Series (Oil-Free) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	RCWFLAW	RCWFLBW	RCWFLCW	RCWFLDW	RCWFLDX
Cooling Capacity		usRT	600	1,000	1,400	2,000	2,200
		kW	2,110	3,516	4,923	7,033	7,736
Weight	Shipping	kg	11,900	14,100	19,600	30,300	31,000
	Operating	kg	13,200	17,400	23,100	35,400	36,000
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	250	300	350	450	450
	Flow Rate	m^3/h	330	550	770	1,100	1,210
	Pressure Drop	mH_2O	6.46	12.01	11.64	5.81	6.22
	Pass Number	EA	2	2	2	1	1
Condenser	Nozzle Connection	A	250	300	350	450	450
	Flow Rate	m^3/h	406	674	939	1,341	1,482
	Pressure Drop	mH_2O	11.04	12.07	14.49	7.62	7.34
	Pass Number	EA	2	2	2	1	1
Dimension	Length	mm	4,986	5,500	5,981	7,306	7,306
	Width	mm	2,576	2,592	3,320	3,249	3,249
	Height	mm	1,981	2,042	2,796	2,970	2,970

IP Unit

Model		Units	RCWFLAW	RCWFLBW	RCWFLCW	RCWFLDW	RCWFLDX
Cooling Capacity		usRT	600	1,000	1,400	2,000	2,200
		kW	2,110	3,516	4,923	7,033	7,736
Weight	Shipping	lb	5,398	6,396	8,890	13,744	14,061
	Operating	lb	5,987	7,893	10,478	16,057	16,329
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	10	12	14	18	18
	Flow Rate	GPM	74.9	124.9	174.9	249.8	274.8
	Pressure Drop	ftH_2O	1.97	3.66	3.55	1.77	1.90
	Pass Number	EA	2	2	2	1	1
Condenser	Nozzle Connection	inch	10	12	14	18	18
	Flow Rate	GPM	92	153	213	305	337
	Pressure Drop	ftH_2O	3.36	3.68	4.42	2.32	2.24
	Pass Number	EA	2	2	2	1	1
Dimension	Length	inch	196	217	235	288	288
	Width	inch	101	102	131	128	128
	Height	inch	78	80	110	117	117

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
3. Due to our policy of innovation some specifications may be changed without prior notification.
4. All data in this table is rated in accordance with AHRI standard 551/591 (550/590).
5. For other than above this table, contat nearest LG electronics office.

L-Series (Oil-Free) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	MCWFLAW	MCWFLBW	MCWFLCW	MCWFLDW	MCWFLDX
Cooling Capacity		usRT	600	1,000	1,400	2,000	2,200
		kW	2,110	3,516	4,923	7,033	7,736
Weight	Shipping	kg	11,900	14,100	19,600	30,300	31,000
	Operating	kg	13,200	17,400	23,100	35,400	36,000
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	250	300	350	450	450
	Flow Rate	m^3/h	330	550	770	1,100	1,210
	Pressure Drop	mH_2O	6.46	12.01	11.64	5.81	6.22
	Pass Number	EA	2	2	2	1	1
Condenser	Nozzle Connection	A	250	300	350	450	450
	Flow Rate	m^3/h	406	674	939	1,341	1,482
	Pressure Drop	mH_2O	11.04	12.07	14.49	7.62	7.34
	Pass Number	EA	2	2	2	1	1
Dimension	Length	mm	4,986	5,500	5,981	7,306	7,306
	Width	mm	2,576	2,592	3,320	3,249	3,249
	Height	mm	1,981	2,042	2,796	2,970	2,970

IP Unit

Model		Units	MCWFLAW	MCWFLBW	MCWFLCW	MCWFLDW	MCWFLDX
Cooling Capacity		usRT	600	1,000	1,400	2,000	2,200
		kW	2,110	3,516	4,923	7,033	7,736
Weight	Shipping	lb	5,398	6,396	8,890	13,744	14,061
	Operating	lb	5,987	7,893	10,478	16,057	16,329
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	10	12	14	18	18
	Flow Rate	GPM	74.9	124.9	174.9	249.8	274.8
	Pressure Drop	ftH_2O	1.97	3.66	3.55	1.77	1.90
	Pass Number	EA	2	2	2	1	1
Condenser	Nozzle Connection	inch	10	12	14	18	18
	Flow Rate	GPM	92.2	153.1	213.3	304.6	336.6
	Pressure Drop	ftH_2O	3.36	3.68	4.42	2.32	2.24
	Pass Number	EA	2	2	2	1	1
Dimension	Length	inch	196	217	235	288	288
	Width	inch	101	102	131	128	128
	Height	inch	78	80	110	117	117

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
3. Due to our policy of innovation some specifications may be changed without prior notification.
4. All data in this table is rated in accordance with AHRI standard 551/591 (550/590).
5. For other than above this table, contat nearest LG electronics office.

L-Series (Oil-Free) Centrifugal Chiller (Dual Comp.)

SI Unit

Model		Units	GCWFLAW	GCWFLBW	GCWFLCW	GCWFLCX	GCWFLDW
Cooling Capacity		usRT	540	940	1,320	1,500	1,880
		kW	1,899	3,305	4,641	5,274	6,611
Weight	Shipping	kg	11,700	16,700	26,200	28,100	35,100
	Operating	kg	13,700	20,200	31,900	34,200	44,200
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	A	150	200	250	250	300
	Flow Rate	m^3/h	294	512	719	817	1,024
	Pressure Drop	mH_2O	8.01	6.47	10.41	13.05	14.64
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	A	150	200	250	250	300
	Flow Rate	m^3/h	377	639	895	1,018	1,274
	Pressure Drop	mH_2O	9.58	8.00	8.49	11.07	11.37
	Pass Number	EA	2	2	2	2	2
Dimension	Length	mm	5,111	5,355	6,456	6,456	7,526
	Width	mm	2,430	3,380	3,490	3,970	4,180
	Height	mm	2,290	2,700	3,210	3,560	3,580

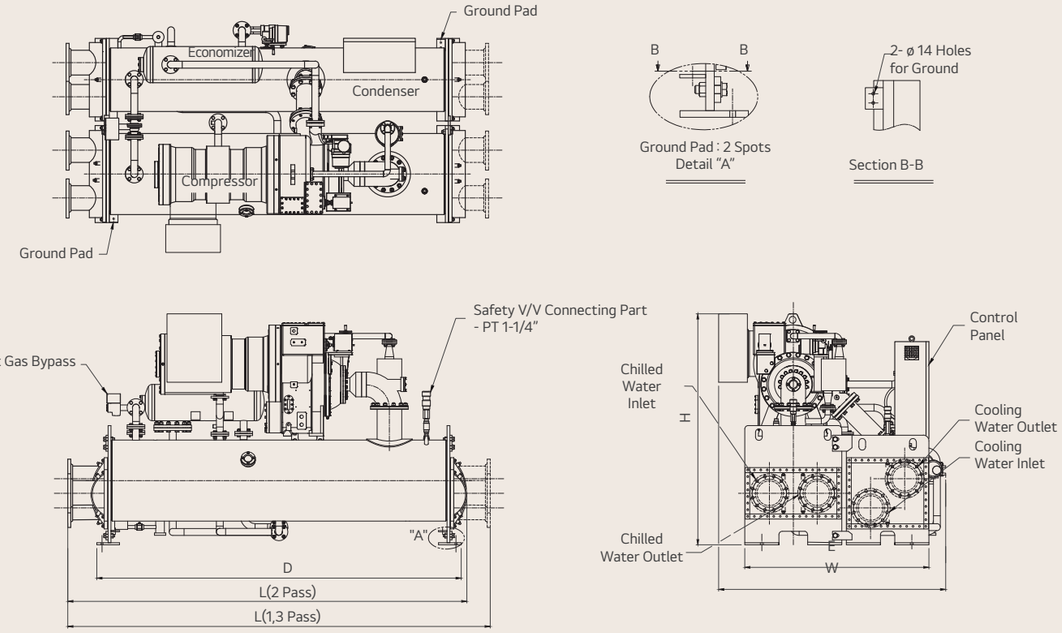
IP Unit

Model		Units	GCWFLAW	GCWFLBW	GCWFLCW	GCWFLCX	GCWFLDW
Cooling Capacity		usRT	540	940	1,320	1,500	1,880
		kW	1,899	3,305	4,641	5,274	6,611
Weight	Shipping	lb	5,307	7,575	11,884	12,746	15,921
	Operating	lb	6,214	9,163	14,470	15,513	20,049
Compressor	Type	-	Magnetic Bearing				
	No.	EA	2				
Power Supply		-	3 Ph / 380 ~ 460 V / 50 (60) Hz				
Evaporator	Nozzle Connection	inch	6	8	10	10	12
	Flow Rate	GPM	66.8	116.3	163.3	185.6	232.6
	Pressure Drop	ftH_2O	2.44	1.97	3.17	3.98	4.46
	Pass Number	EA	2	2	2	2	2
Condenser	Nozzle Connection	inch	6	8	10	10	12
	Flow Rate	GPM	85.7	145.0	203.3	231.1	289.4
	Pressure Drop	ftH_2O	2.92	2.44	2.59	3.38	3.47
	Pass Number	EA	2	2	2	2	2
Dimension	Length	inch	201	211	254	254	296
	Width	inch	96	133	137	156	165
	Height	inch	90	106	126	140	141

Note :
1. This table is for the standard model and the design may vary depending on the site.
2. The water box is designed as a head type, and if it is changed to a marine type, the length will change.
3. Due to our policy of innovation some specifications may be changed without prior notification.
4. All data in this table is rated in accordance with AHRI standard 551/591 (550/590).
5. For other than above this table, contat nearest LG electronics office.

Outline Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller



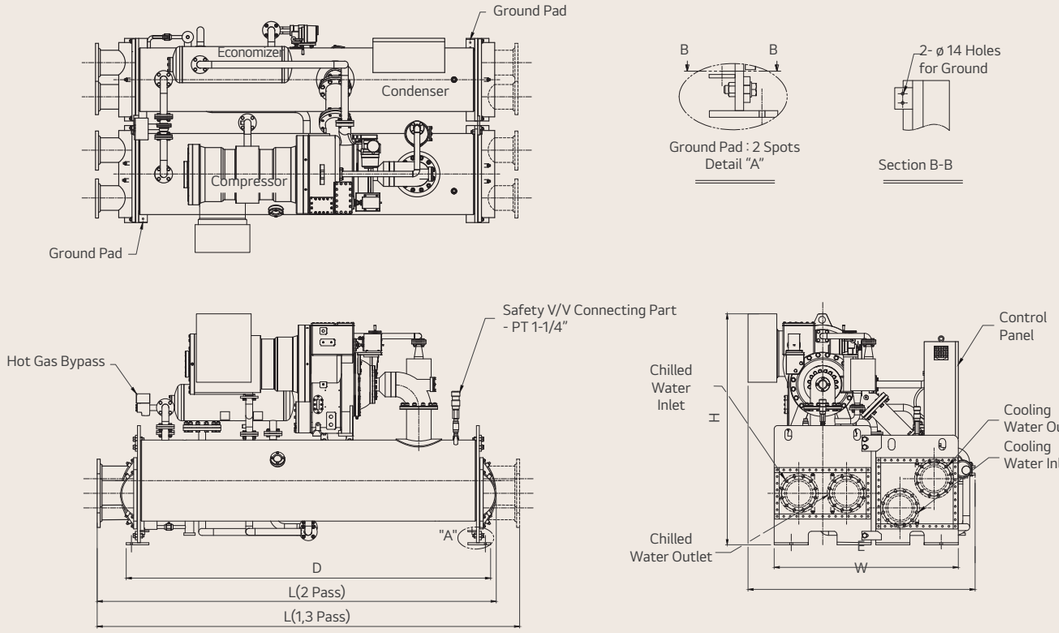
[Unit : mm (inch)]

Model		Dimension					
		L		W	H	D	E
		2 Pass	1, 3 Pass				
RCWFH	AL~AP	3,500 (138)	3,700 (146)	2,010 (79)	2,020 (80)	3,200 (126)	1,620 (64)
	BM~BP	3,500 (138)	3,700 (146)	2,240 (88)	2,230 (88)	3,200 (126)	1,900 (75)
	CM~CP	3,500 (138)	3,700 (146)	2,330 (92)	2,470 (97)	3,200 (126)	2,070 (81)
	DM~DP	4,150 (163)	4,350 (171)	2,660 (105)	2,800 (110)	3,850 (152)	2,390 (94)
	EM	4,340 (171)	4,550 (179)	3,190 (126)	3,100 (122)	3,850 (152)	2,820 (111)
	EN~EP	4,690 (185)	4,900 (193)	3,190 (126)	3,100 (122)	4,200 (165)	2,820 (111)
	F1	4,890 (193)	4,900 (193)	3,740 (147)	3,440 (135)	4,200 (165)	3,020 (119)
	F2	5,090 (200)	5,300 (209)	3,740 (147)	3,440 (135)	4,680 (184)	3,020 (119)
	F3	5,690 (224)	5,900 (232)	3,740 (147)	3,440 (135)	5,200 (205)	3,020 (119)
	G1	6,190 (244)	6,400 (252)	3,850 (152)	3,920 (154)	5,700 (224)	3,160 (124)
	G2~G3	7,190 (283)	7,400 (291)	3,850 (152)	3,920 (154)	6,700 (264)	3,160 (124)
GCWFH	AL~AP	3,596 (142)	3,796 (149)	2,113 (83)	2,021 (80)	3,200 (126)	1,620 (64)
	BM~BP	3,631 (143)	3,831 (151)	2,242 (88)	2,231 (88)	3,200 (126)	1,900 (75)
	CM~CN	3,736 (147)	3,936 (155)	2,409 (95)	2,466 (97)	3,200 (126)	2,070 (81)
	CP~CQ	4,386 (173)	4,586 (181)	2,409 (95)	2,466 (97)	3,850 (152)	2,070 (81)
	DM~DP	4,525 (178)	4,725 (186)	2,861 (113)	2,800 (110)	3,850 (152)	2,390 (94)
	EM	6,456 (254)	6,656 (262)	3,428 (135)	3,265 (129)	5,700 (224)	2,820 (111)
	F1	6,526 (257)	6,726 (265)	3,884 (153)	3,572 (141)	5,700 (224)	3,020 (119)
	G1	7,526 (296)	7,726 (304)	4,086 (161)	3,864 (152)	6,700 (264)	3,160 (124)
	G2~G3	7,846 (309)	8,046 (317)	3,877 (153)	3,844 (151)	6,700 (264)	3,160 (124)

Note :
1. The height is measured from the bottom of the heat exchanger bed.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to preventing external force to the chiller.
4. To improve the performance, some specification can be changed without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller



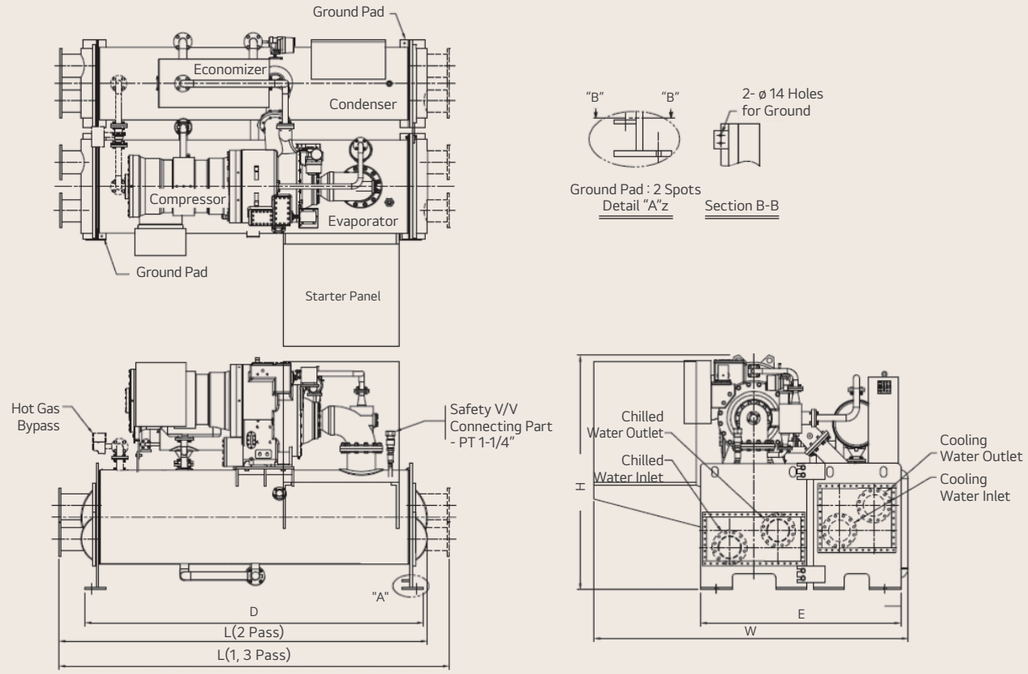
[Unit : mm (inch)]

Model		Dimension					
		L		W	H	D	E
		2 Pass	1, 3 Pass				
MCWFH	AL~AP	3,634 (143)	3,834 (151)	2,150 (85)	2,375 (94)	3,096 (122)	1,656 (65)
	BM~BP	3,706 (146)	3,906 (154)	2,250 (89)	2,419 (95)	3,096 (122)	2,012 (79)
	CM~CP	3,870 (152)	4,070 (160)	2,679 (105)	2,630 (104)	3,096 (122)	2,075 (82)
	DM~DP	4,627 (182)	4,827 (190)	2,944 (116)	2,959 (116)	3,730 (147)	2,137 (84)
	EM~EP	4,980 (196)	5,180 (204)	3,146 (124)	3,031 (119)	3,730 (147)	2,396 (94)
	F1~F3	5,103 (201)	5,301 (209)	3,440 (135)	3,550 (140)	4,098 (161)	2,961 (117)
	G1	6,103 (240)	6,313 (249)	3,590 (141)	3,732 (147)	5,340 (210)	3,160 (124)
	G2~G3	6,903 (272)	7,113 (280)	3,590 (141)	3,732 (147)	5,840 (230)	3,160 (124)

Note :
1. The height is measured from the bottom of the heat exchanger bed.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to preventing external force to the chiller.
4. To improve the performance, some specification can be changed without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller (Unit Mounted)



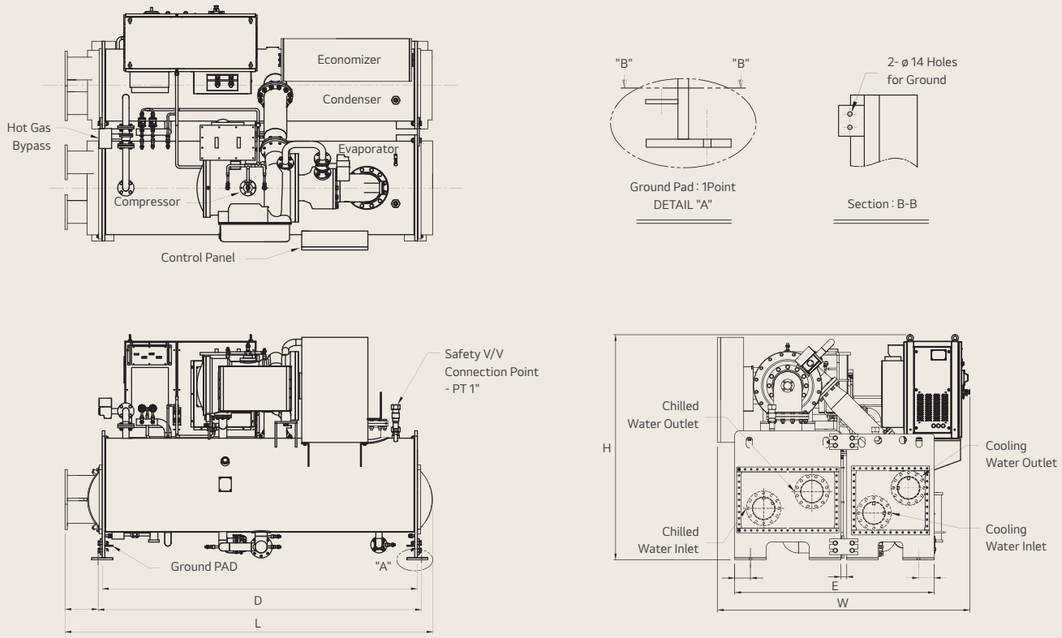
[Unit : mm (inch)]

Model		Dimension					
		L		W	H	D	E
		2 Pass	1, 3 Pass				
RCWFH	AL~AP	3,500 (138)	3,700 (146)	2,720 (107)	2,020 (80)	3,200 (126)	1,620 (64)
	BM~BP	3,500 (138)	3,700 (146)	2,880 (113)	2,230 (88)	3,200 (126)	1,900 (75)
	CM~CP	3,500 (138)	3,700 (146)	3,450 (136)	2,470 (97)	3,200 (126)	2,070 (81)
	DM~DP	4,150 (163)	4,350 (171)	3,750 (148)	2,800 (110)	3,850 (152)	2,390 (94)
GCWFH	AL~AP	3,596 (142)	3,796 (149)	2,720 (107)	2,021 (80)	3,200 (126)	1,620 (64)
	BM~BP	3,631 (143)	3,831 (151)	2,880 (113)	2,231 (88)	3,200 (126)	1,900 (75)
	CM~CN	3,736 (147)	3,936 (155)	3,450 (136)	2,466 (97)	3,200 (126)	2,070 (81)
	CP~CQ	4,386 (173)	4,586 (181)	3,450 (136)	2,466 (97)	3,850 (152)	2,070 (81)
	DM~DP	4,525 (178)	4,725 (186)	3,750 (148)	2,800 (110)	3,850 (152)	2,390 (94)
MCWFH	AL~AP	3,620 (143)	3,790 (149)	2,030 (80)	2,300 (91)	3,230 (127)	1,660 (65)
	BM~BP	3,710 (146)	3,930 (155)	2,160 (85)	2,280 (90)	3,230 (127)	1,900 (75)
	CM~CP	3,710 (146)	3,870 (152)	2,250 (89)	2,630 (104)	3,230 (127)	1,900 (75)
	DM	4,520 (178)	4,730 (186)	2,490 (98)	2,630 (104)	3,880 (153)	2,170 (85)
	DN	4,170 (164)	4,370 (172)	2,640 (104)	2,630 (104)	3,880 (153)	2,350 (93)
	DP	4,170 (164)	4,370 (172)	2,740 (108)	2,890 (114)	3,880 (153)	2,470 (97)
	EM	4,160 (164)	4,360 (172)	2,750 (108)	3,040 (120)	3,880 (153)	2,440 (96)
	EN	4,640 (183)	4,840 (191)	2,750 (108)	3,040 (120)	4,230 (167)	2,440 (96)
	EP	4,640 (183)	4,840 (191)	2,960 (117)	3,040 (120)	4,280 (169)	2,750 (108)

Note :
1. The height is measured from the bottom of the heat exchanger bed.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to preventing external force to the chiller.
4. To improve the performance, some specification can be changed without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

L-Series (Oil-Free) Centrifugal Chiller



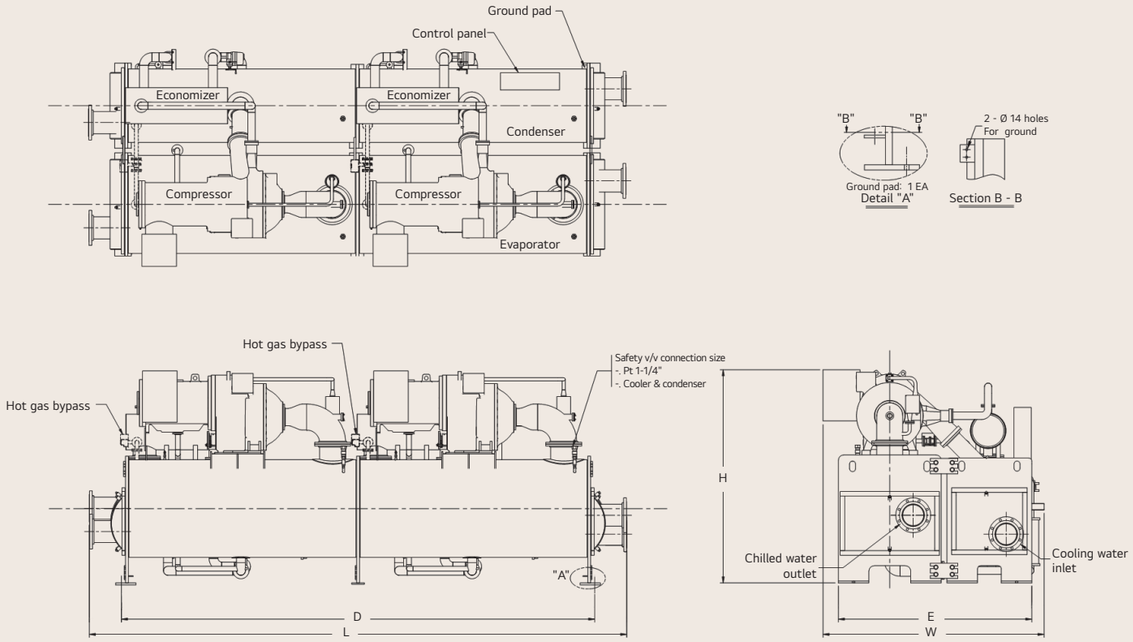
[Unit : mm (inch)]

Model		Dimension					
		L		W	H	D	E
		2 Pass	1, 3 Pass				
RCWFL	AL~AP	3,506 (138)	3,706 (146)	2,576 (101)	1,981 (78)	3,080 (121)	1,620 (64)
	BM~BP	3,506 (138)	3,706 (146)	2,592 (102)	2,042 (80)	3,080 (121)	1,900 (75)
	CM~CP	3,506 (138)	3,706 (146)	3,029 (119)	2,530 (100)	3,080 (121)	2,070 (81)
	DM~DP	4,156 (164)	4,356 (171)	3,350 (132)	3,377 (133)	3,730 (147)	2,610 (103)
GCWFL	AL~AP	3,596 (142)	3,796 (149)	2,574 (101)	2,040 (80)	3,080 (121)	1,620 (64)
	BM~BP	3,631 (143)	3,831 (151)	2,592 (102)	2,042 (80)	3,115 (123)	1,900 (75)
	CM~CN	3,736 (147)	3,936 (155)	3,331 (131)	2,439 (96)	3,220 (127)	2,070 (81)
	CP~CQ	4,386 (173)	4,586 (181)	3,331 (131)	2,439 (96)	3,870 (152)	2,070 (81)
	DN~DP	4,525 (178)	4,725 (186)	3,314 (130)	3,001 (118)	4,100 (161)	2,610 (103)
MCWFL	AL~AP	3,506 (138)	3,706 (146)	2,576 (101)	1,981 (78)	3,080 (121)	1,620 (64)
	BM~BP	3,506 (138)	3,706 (146)	2,592 (102)	2,042 (80)	3,080 (121)	1,900 (75)
	CM~CP	3,506 (138)	3,706 (146)	3,029 (119)	2,530 (100)	3,080 (121)	2,070 (81)
	DM~DP	4,156 (164)	4,356 (171)	3,350 (132)	3,377 (133)	3,730 (147)	2,610 (103)

Note :
1. The height is measured from the bottom of the heat exchanger.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to prevent external force to the chiller.
4. All specifications are subject to change without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)



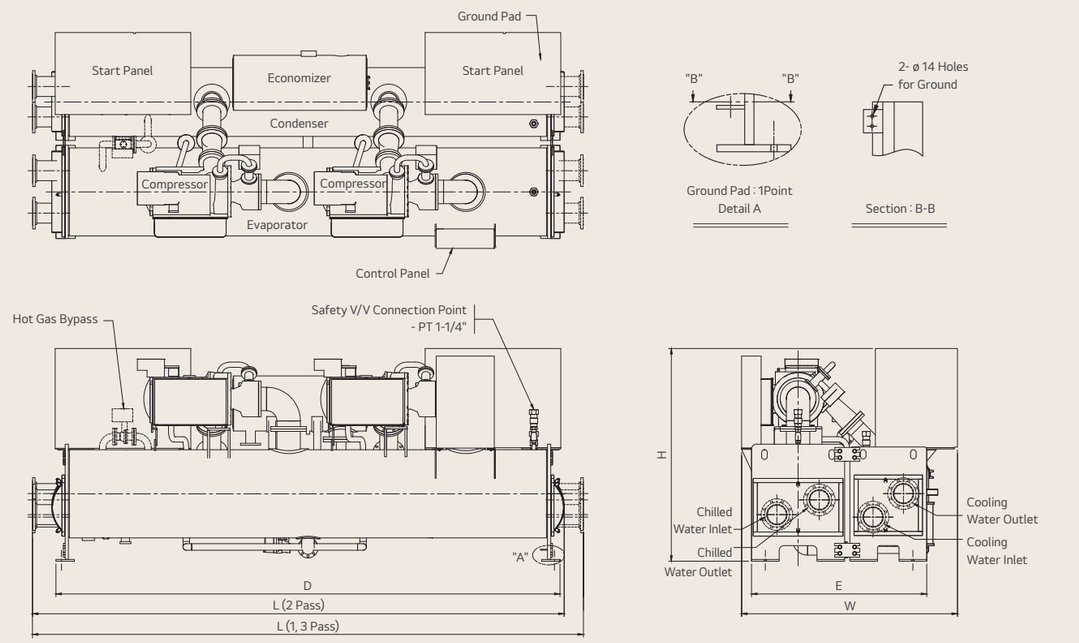
[Unit : mm (inch)]

Model		Dimension				
		L	W	H	D	E
RCWFH	BW	7,206 (284)	2,172 (86)	2,231 (88)	6,580 (259)	1,900 (75)
	CT~CW	7,206 (284)	2,342 (92)	2,466 (97)	6,580 (259)	2,072 (82)
	DT~DW	7,961 (313)	2,861 (113)	2,800 (110)	7,335 (289)	2,392 (94)
	ET	8,161 (321)	2,996 (118)	3,095 (122)	7,335 (289)	2,686 (106)
	EU	8,161 (321)	3,250 (128)	3,222 (127)	7,335 (289)	3,018 (119)
	EW	8,161 (321)	3,377 (133)	3,349 (132)	7,335 (289)	3,068 (121)
	F6~F8	9,255 (364)	3,840 (151)	3,575 (141)	7,335 (289)	3,128 (123)
GCWFH	AW	7,306 (288)	2,113 (83)	2,150 (85)	6,580 (259)	1,900 (75)
	BW	7,306 (288)	2,310 (91)	2,231 (88)	6,580 (259)	2,072 (82)
	CW	8,241 (324)	2,409 (95)	2,466 (97)	7,335 (289)	2,392 (94)
	CX	7,468 (294)	2,760 (109)	2,740 (108)	6,580 (259)	2,686 (106)
	DW	8,439 (332)	2,930 (115)	2,800 (110)	7,335 (289)	2,686 (106)
	EW	8,601 (339)	3,790 (149)	3,640 (143)	7,335 (289)	3,128 (123)

Note :
1. The height is measured from the bottom of the heat exchanger bed.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to preventing external force to the chiller.
4. To improve the performance, some specification can be changed without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

L-Series (Oil-Free) Centrifugal Chiller (Dual Comp.)



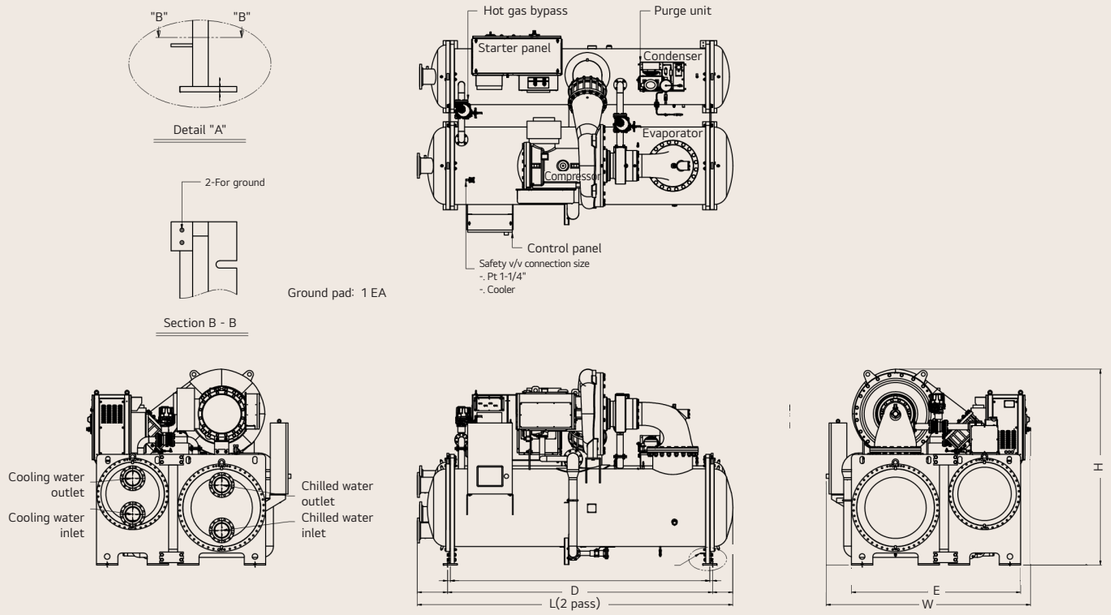
[Unit : mm (inch)]

Model		Dimension					
		L		W	H	D	E
		(2 Pass)	(1, 3 Pass)				
RCWFL	AR~AW	4,986 (196)	5,186 (204)	2,576 (101)	1,981 (78)	4,556 (179)	1,620 (64)
	BT~BW	5,500 (217)	5,700 (224)	2,592 (102)	2,042 (80)	5,070 (200)	1,900 (75)
	CT~CW	5,981 (235)	7,306 (288)	3,320 (131)	2,796 (110)	5,551 (219)	2,070 (81)
	DT~DX	7,306 (288)	7,506 (296)	3,249 (128)	2,970 (117)	6,876 (271)	2,610 (103)
MCWFL	AR~AW	4,986 (196)	5,186 (204)	2,576 (101)	1,981 (78)	4,556 (179)	1,620 (64)
	BT~BW	5,500 (217)	5,700 (224)	2,592 (102)	2,042 (80)	5,070 (200)	1,900 (75)
	CT~CW	5,981 (235)	7,306 (288)	3,320 (131)	2,796 (110)	5,551 (219)	2,070 (81)
	DT~DX	7,306 (288)	7,506 (296)	3,249 (128)	2,970 (117)	6,876 (271)	2,610 (103)
GCWFL	AR~AW	5,111 (201)	5,311 (209)	2,430 (96)	2,290 (90)	4,681 (184)	1,620 (64)
	BT~BW	5,355 (211)	5,555 (219)	3,380 (133)	2,700 (106)	4,925 (194)	1,900 (75)
	CT~CW	6,456 (254)	7,306 (288)	3,490 (137)	3,210 (126)	6,026 (237)	2,070 (81)
	CX	6,456 (254)	7,306 (288)	3,970 (156)	3,560 (140)	6,026 (237)	2,070 (81)
	DT~DW	7,526 (296)	7,726 (304)	4,180 (165)	3,580 (141)	7,096 (279)	2,610 (103)

Note :
1. The height is measured from the bottom of the heat exchanger.
This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to prevent external force to the chiller.
4. All specifications are subject to change without notice.
5. The dimensions can vary depending on the type of the water box.

Outline Drawing

L-Series (Oil-Free, HFO) Centrifugal Chiller



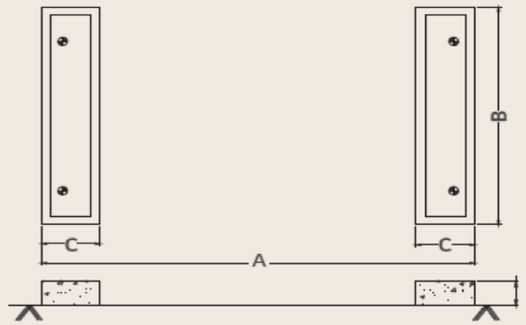
[Unit : mm (inch)]

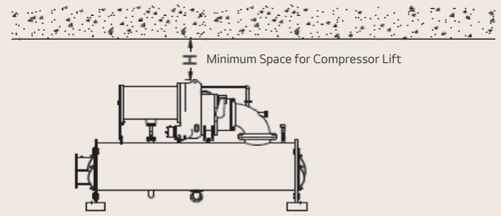
Model		Dimension					
		L		W	H	D	E
		(2 Pass)	(1 ,3 Pass)				
DCWFL	BA~BC	4,440 (175)	4,640 (183)	2,875 (113)	2,757 (109)	3,730 (147)	2,380 (94)
	CC	4,954 (195)	5,154 (203)	3,318 (131)	3,228 (127)	4,080 (161)	2,649 (104)
	DC	5,545 (218)	5,745 (226)	3,806 (150)	3,704 (146)	4,560 (180)	2,992 (118)

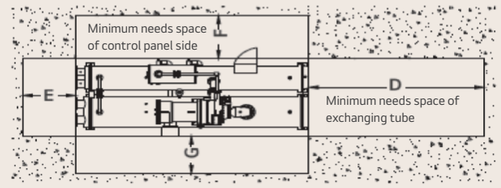
Note :
1. The height is measured from the bottom of the heat exchanger.
   This value does not include the height of the foundation and the vibration-absorbing pedestal.
2. All of the chilled water and cooling water connection flanges are of ANSI 150lb.
3. The water pipe facility shall be designed to prevent external force to the chiller.
4. All specifications are subject to change without notice.
5. The dimensions can vary depending on the type of the water box.

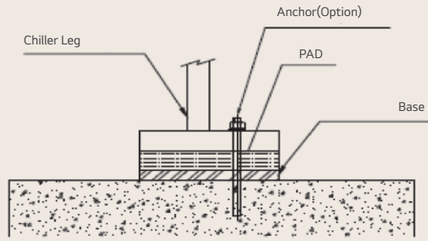
Foundation Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller









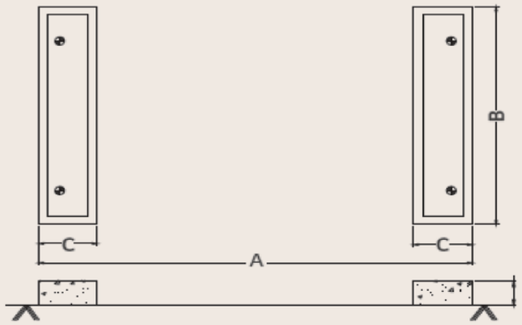
[Unit : mm (inch)]

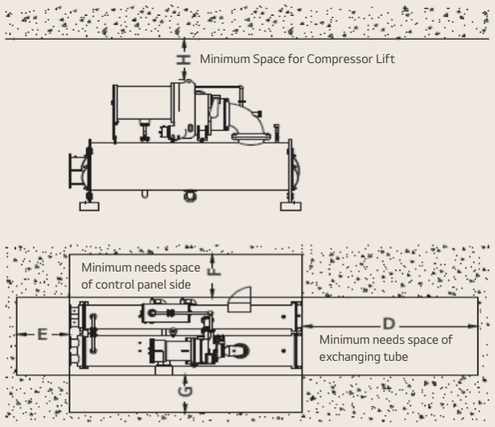
Model		A	B	C	D	E	F	G	H
RCWFH	AL~AP	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CP	3,400 (134)	2,270 (89)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DM~DP	4,050 (159)	2,590 (102)	400 (16)	3,800 (150)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	EM	4,050 (159)	3,020 (119)	400 (16)	3,800 (150)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	EN~EP	4,400 (173)	3,020 (119)	400 (16)	4,100 (161)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	F1	4,400 (173)	3,220 (127)	400 (16)	4,100 (161)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	F2	4,880 (192)	3,220 (127)	400 (16)	4,600 (181)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	F3	5,400 (213)	3,220 (127)	400 (16)	5,100 (201)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	G1	5,900 (232)	3,380 (133)	400 (16)	5,600 (220)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	G2~G3	6,900 (272)	3,380 (133)	400 (16)	6,600 (260)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
GCWFH	AL~AP	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CN	3,400 (134)	2,270 (89)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CP~CQ	4,050 (159)	2,590 (102)	400 (16)	3,800 (150)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DM~DP	4,050 (159)	3,020 (119)	400 (16)	3,800 (150)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	EM	5,900 (232)	3,020 (119)	400 (16)	5,600 (220)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	F1	5,900 (232)	3,380 (133)	400 (16)	5,600 (220)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	G1	6,900 (272)	3,380 (133)	400 (16)	6,600 (260)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	G2~G3	6,900 (272)	3,380 (133)	400 (16)	6,600 (260)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)

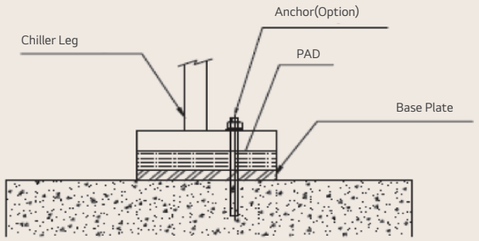
Note :
1. Using the installation equipment, level the chiller and attach the vibration proof pad to the chiller plate.
2. The operating weight shall be equally distributed on the 6 supports.
3. The foundation height shall be approximately 150-200 mm to work piping and drainage easily.
4. This drawing is the foundation drawing of the standard model. It is possible to differ depend on site conditions.

Foundation Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller







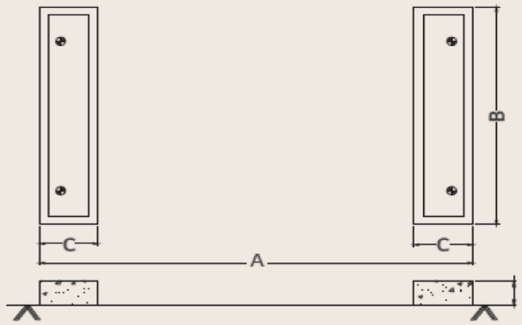
[Unit : mm (inch)]

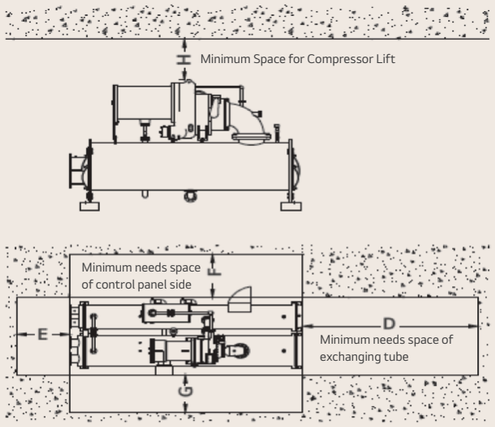
Model		A	B	C	D	E	F	G	H
MCWFH	AL~AP	3,292 (130)	1,756 (69)	500 (20)	3,050 (120)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,292 (130)	2,175 (86)	500 (20)	3,050 (120)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CP	3,292 (130)	2,372 (93)	500 (20)	3,050 (120)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	DM~DP	3,910 (154)	2,481 (98)	500 (20)	3,700 (146)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	EM~EP	4,296 (169)	2,687 (106)	500 (20)	4,050 (159)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	F1~F3	4,296 (169)	3,061 (121)	500 (20)	4,050 (159)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	G1	5,460 (215)	3,260 (128)	500 (20)	5,500 (217)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)
	G2~G3	5,960 (235)	3,260 (128)	500 (20)	6,000 (236)	1,500 (59)	1,500 (59)	1,500 (59)	1,500 (59)

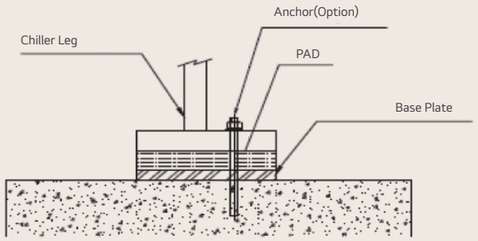
Note :
1. Using the installation equipment, level the chiller and attach the vibration proof pad to the chiller plate.
2. The operating weight shall be equally distributed on the 6 supports.
3. The foundation height shall be approximately 150-200 mm to work piping and drainage easily.
4. This drawing is the foundation drawing of the standard model. It is possible to differ depend on site conditions.

Foundation Drawing

L-Series (Oil-Free) Centrifugal Chiller







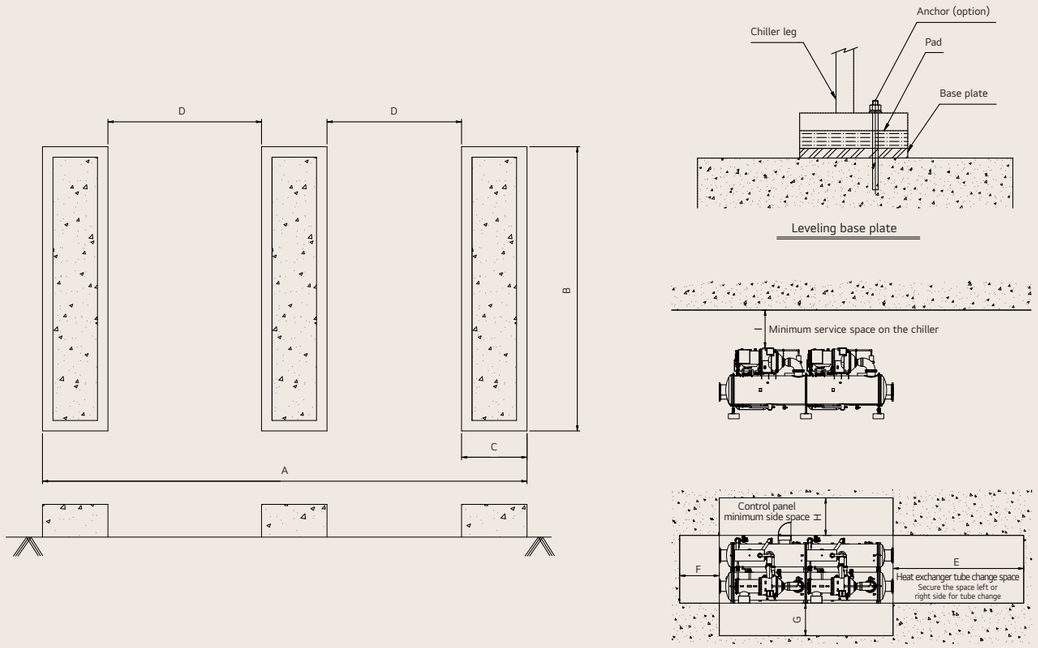
[Unit : mm (inch)]

Model		A	B	C	D	E	F	G	H
RCWFL	AL~AP	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CP	3,400 (134)	2,270 (89)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DM~DP	4,050 (159)	2,810 (111)	400 (16)	3,750 (148)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	AW	4,880 (192)	1,820 (72)	400 (16)	4,580 (180)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BW	5,400 (213)	2,100 (83)	400 (16)	5,100 (201)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CW	6,400 (252)	2,270 (89)	400 (16)	6,100 (240)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DW~DX	6,950 (274)	2,800 (110)	400 (16)	6,650 (262)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
GCWFL	AL~AP	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CN	3,400 (134)	2,810 (111)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CP~CQ	4,050 (159)	2,810 (111)	400 (16)	3,750 (148)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DN~DP	4,050 (159)	2,810 (111)	400 (16)	3,750 (148)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
MCWFL	AL~AP	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BM~BP	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CM~CP	3,400 (134)	2,270 (89)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DM~DP	4,050 (159)	2,810 (111)	400 (16)	3,750 (148)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	AW	4,880 (192)	1,820 (72)	400 (16)	4,580 (180)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BW	5,400 (213)	2,100 (83)	400 (16)	5,100 (201)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CW	6,400 (252)	2,270 (89)	400 (16)	6,100 (240)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DW~DX	6,950 (274)	2,800 (110)	400 (16)	6,650 (262)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
DCWFL	BA~BC	4,050 (159)	2,580 (102)	400 (16)	3,750 (148)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CC	4,400 (173)	2,849 (112)	400 (16)	4,100 (161)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DC	4,880 (192)	3,192 (126)	400 (16)	4,580 (180)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)

Note :
1. Using the installation equipment, level the chiller and attach the vibration proof pad to the chiller plate.
2. The operating weight shall be equally distributed on the 6 supports.
3. The foundation height shall be approximately 150-200 mm to work piping and drainage easily.
4. This drawing is the foundation drawing of the standard model. It is possible to differ depend on site conditions.

Foundation Drawing

H-Series (Oil-Lubricant) Centrifugal Chiller (Dual Comp.)



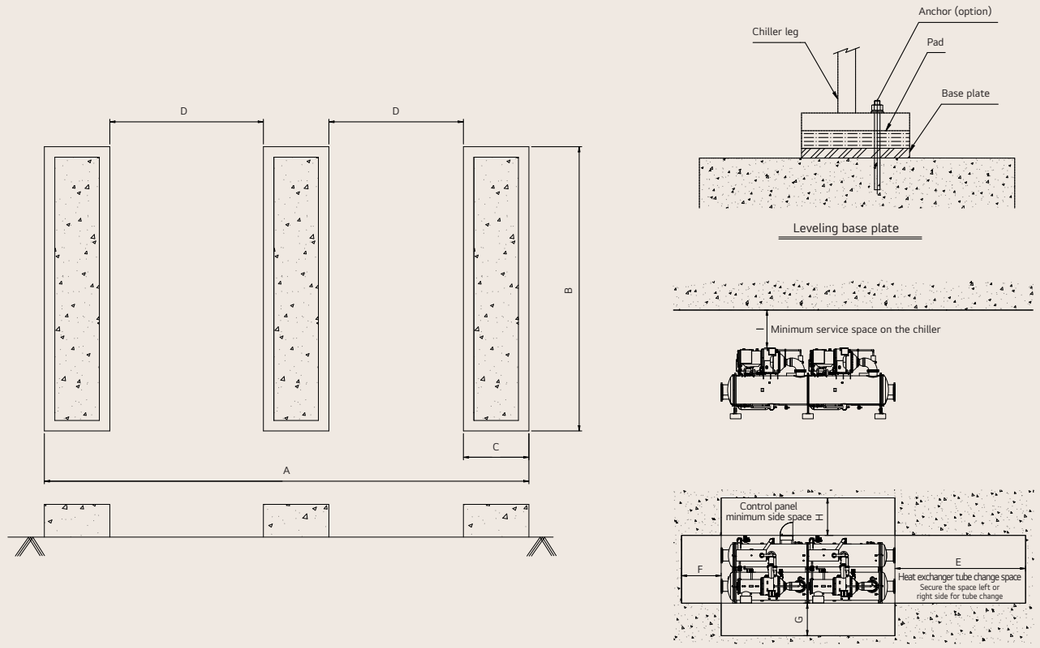
[Unit : mm (inch)]

Model		A	B	C	D	E	F	G	H
RCWFH	BW	6,900 (272)	2,100 (83)	400 (16)	2,850 (112)	6,605 (260)	2,000 (79)	1,500 (59)	1,500 (59)
	CT~CW	6,900 (272)	2,272 (89)	400 (16)	2,850 (112)	6,605 (260)	2,000 (79)	1,500 (59)	1,500 (59)
	DT~DW	7,656 (301)	2,592 (102)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	ET	7,656 (301)	2,886 (114)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	EU	7,656 (301)	3,218 (127)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	EW	7,656 (301)	3,268 (129)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	F6~F8	7,656 (301)	3,328 (131)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
GCWFH	AW	6,900 (272)	2,100 (83)	400 (16)	2,850 (112)	6,605 (260)	2,000 (79)	1,500 (59)	1,500 (59)
	BW	6,900 (272)	2,272 (89)	400 (16)	2,850 (112)	6,605 (260)	2,000 (79)	1,500 (59)	1,500 (59)
	CW	7,656 (301)	2,592 (102)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	CX	7,656 (301)	2,886 (114)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	DW	7,656 (301)	3,218 (127)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)
	EW	7,656 (301)	3,268 (129)	400 (16)	3,228 (127)	7,360 (290)	2,000 (79)	1,500 (59)	1,500 (59)

Note :
1. Using the installation equipment, level the chiller and attach the vibration proof pad to the chiller plate.
2. The operating weight shall be equally distributed on the 6 supports.
3. The foundation height shall be approximately 150-200 mm to work piping and drainage easily.
4. This drawing is the foundation drawing of the standard model. It is possible to differ depend on site conditions.

Foundation Drawing

L-Series (Oil-Free) Centrifugal Chiller (Dual Comp.)



[Unit : mm (inch)]

Model		A	B	C	D	E	F	G	H
RCWFL	AW	4,880 (192)	1,820 (72)	400 (16)	4,580 (180)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BW	5,400 (213)	2,100 (83)	400 (16)	5,100 (201)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CW	6,400 (252)	2,270 (89)	400 (16)	6,100 (240)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DW~DX	6,950 (274)	2,800 (110)	400 (16)	6,650 (262)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
GCWFL	AR~AW	3,400 (134)	1,820 (72)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	BT~BW	3,400 (134)	2,100 (83)	400 (16)	3,100 (122)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CT~CW	5,900 (232)	2,270 (89)	400 (16)	5,600 (220)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	CX	5,900 (232)	2,590 (102)	400 (16)	5,600 (220)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)
	DT~DW	6,950 (274)	3,220 (127)	400 (16)	6,650 (262)	2,000 (79)	1,500 (59)	1,500 (59)	1,500 (59)

Note :
1. Using the installation equipment, level the chiller and attach the vibration proof pad to the chiller plate.
2. The operating weight shall be equally distributed on the 6 supports.
3. The foundation height shall be approximately 150-200 mm to work piping and drainage easily.
4. This drawing is the foundation drawing of the standard model. It is possible to differ depend on site conditions.

Typical Piping & Wiring

Chilled / Cooling Water Piping

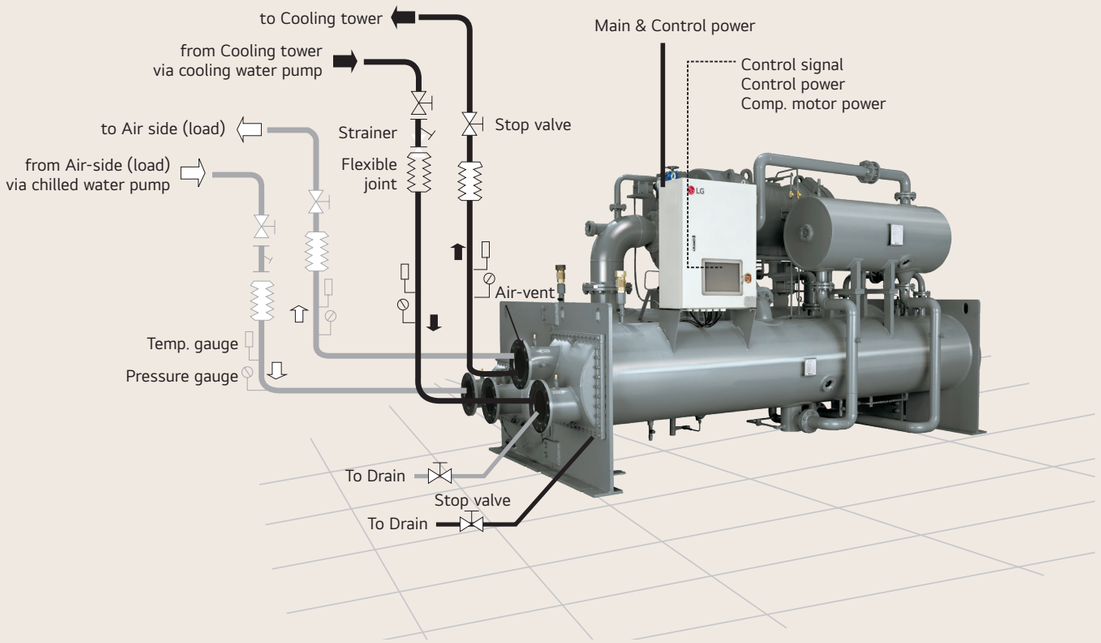
- As a standard, 10 kg/cm^2 of flange is adopted for evaporator and condenser nozzles.
- The inlet nozzle is located on the lower side and the outlet is positioned on the upper side as a standard.
- All piping should be supported independently in order not to convey any stress and vibration onto the Chiller and have sufficient space for maintenance purpose.
- On each water box of evaporator and condenser, it is requested to install air-vent cock, drain valve and piping as well.
- It is strongly to install strainers on each inlet of evaporator and condenser in order to filter foreign materials. If the foreign materials are flowed into the heat exchanger, there is high possibility of decreasing performance.
- It is recommended to install thermometer, pressure gauge and flow meter to measure the chiller operational condition.

Control of Cooling Water Temperature

As a standard, 10 kg/cm^2 of standard flange is adopted for evaporator and condenser nozzles. In general, if the atmospheric temperature falls lower than design temperature condition cooling water from the cooling tower decrease as well.

Therefore, for whole-year-operation chillers, it is strongly recommended to control the cooling tower fan according to outlet temperature of cooling tower and adopt by-pass system in parallel. The by-pass system is positioned on the outlet of cooling water and bypass the cooling water through 3-way control valve working at condensation pressure.

The 3-way control valve can be alternated with 2 units of butterfly valve. The system should maintain min. 14 degree C of temperature difference between cooling water outlet and chilled water outlet.

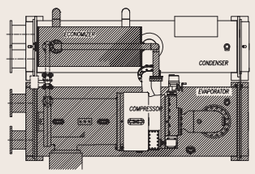


Note :
1. Control power - 3 Phase / 220 V / 50 Hz (60 Hz) - should be provided by the customer apart from main power source.
2. The Main power wiring to the starter and 2nd wiring between the chiller and starter must be done based on local regulation. And the work scope is purchaser's.

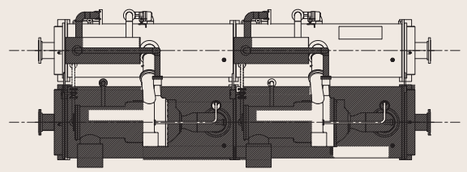
Insulation

Insulation Material

- Acrylonitrile-Butadiene Rubber (NBR), Black, Thickness: 19 mm↑

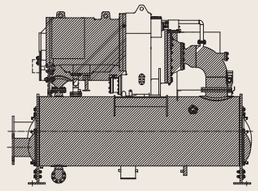


Top view

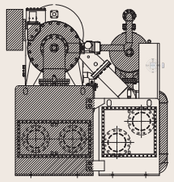


Top view

Insulation work scope

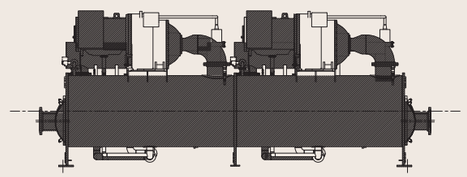


Front view

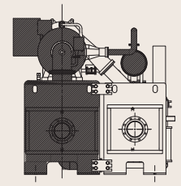


End view

< Single compressor >



Front view



End view

< Dual compressor >

Insulation Work Scope

- Compressor Motor, Suction refrigerant pipe, Evaporator, Economizer, Water box, Chilled inlet/outlet nozzle, Low pressure liquid refrigerant pipe, Refrigerant charging pipe and so on.

Caution for Insulation Work

1) Be careful not to cover the operating part (Vane starter, valve, handle etc.) with the insulation material or touch the insulation material.
2) Set up the insulation so that the insulation material can be removed at the part where the bolts are tightened in the water box so that the water box can be opened when cleaning the tube of the heat exchanger. Also consider keeping the cover of the water box easy to separate. (Also install the flange for the water pipe so that it is easy to separate.)
3) For the part where the compressor and main pipe bolts are located, set up the insulation so that it is easy to remove the insulation material during overhaul or check.
4) Be careful not to block the liquid level gauge and window with the insulation material.
5) Set up the insulation so that it is easy to separate and replace the temperature sensor etc.
6) For the insulation material, use product with thermal conductivity and quality or higher than specified in the specification provided LG Electronics.
7) Install the insulation material firmly using adhesive and completely close the gap between insulation material and the insulating part so that air does not go in.
8) For the thickness and specification of the insulation material, follow the construction drawing of insulation approved by LG Electronics and the standard design condition is as follows.
   - Dry bulb temperature
   - Relative humidity
9) After the insulation, be careful not to expose to excessive sunlight or cause any damage while working. Deformed or damaged part causes dew drops to form and must be reworked.

Guide Specification

2 Stage Centrifugal Chiller
RCWF H Series
GCWF H Series
MCWF H Series

Contents

1. Range of Application

This specifications is applied to all the models of the two-stage R-134a (R-513A) centrifugal chillers manufactured and supplied by LG Electronics.

2. Equipment Features

2.1. System Structure

1) The high efficiency centrifugal chiller apply the two-stage compression and two-stage expansion cycle and be designed to allow capacity change by applying an inlet guide vane (IGV) in the inlet of the compressor.
2) The economizer makes the maintenance convenient with external type.
3) By Controlling the refrigerant level of condenser and economizer, so that achieve high efficiency in the full load and partial load condition.
4) The compressor should secure the reliability of refrigerant leakage by applying the semi-hermetic type. The motor should guarantee the stability of the product by applying the cooling method using the refrigerant of the system itself.

2.2. Performance and Quality

1) The product should be evaluated complying with the standard of AHRI (Air Conditioning, Heating And Refrigeration Institute) Standard 550-590 / 551-591, the international authorized certified institute.
2) The refrigerant, R-134a (R-513A), environmental refrigerant with Ozone Depletion Potential (ODP) of zero, shall be applied.
3) The pressure vessel should be designed, produced, tested, complying with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) or GB Code and certified by the relevant certification agency.

2.3. Equipment Specification

2.3.1. Equipment Composition

The Chiller consists of the compressor and motor, evaporator, condenser, economizer, lubrication system, refrigerant control device, capacity control device, refrigerant pipe, control panel, stater panel, safety device, insulation & vibration isolator device for insulation and vibration-proof.

The starter panel is supplied by the manufacturer with chiller.

2.3.2. Compressor and Motor

1) The compressor is a high-efficiency semi-hermetic and centrifugal 2-stage type for R-134a (R-513A). The impeller is made of high-strength special aluminum alloy. The return channel installed between 1-stage impeller and 2-stage impeller is designed in structure that can optimize flow loss, so it should have structure that minimizes efficiency loss and easy service.
2) The motor shall be liquid refrigerant-cooled type and the outside of the motor should be insulated with anti-humidity insulation to prevent condensation.
3) The power specifications of the motor for compressor is 3 Ph / 380 - 13,800 V / 60 (50) Hz.
4) The motor shaft should be a both-end support structure with high efficiency. Motor winding temperature should be monitored at the control panel in real-time when running by embedding the motor winding temperature sensor.
5) The motor winding should have special insulation to keep refrigerant resistance about the R-134a (R-513A) and oil resistance in lubrication.
6) It should be applied the ball bearing. And when the oil pump and compressor are stopped at the same time due to the power failure, by the compressor has independent oil storage sump, oil should be supplied to the bearings for a certain time of remaining rotation, so that the bearings are lubricated.
7) The IGV controlling the compressor capacity has the structure with multiful vane, and should be able to minimize the flow loss in the impeller inlet.
8) To manage the stable operation of high-speed radial and axial bearing, it should be able to monitor and manage temperature in real time by installing the two (One spare included) bearing temperature sensor.

2.3.3. Lubrication System

1) A trochoid type semi-hermetic oil pump should be adopted for constant and stable oil supply with low noise / vibration. And it should be able to control the oil volume by the control valve.
2) The motor of oil pump should have special insulation to keep refrigerant resistance about the HFC R-134a and oil resistance in lubrication. It should be embedded type and structured to supply oil always stably from the oil tank to suction of oil pump.
3) The power specifications of the oil pump is 3 Ph / 380-460 V / 60 (50) Hz.
4) The oil filter should be a structure replaceable by installing the valve on the inlet/outlet for service.
5) The oil cooler should apply the external plate type heat exchanger which is durable and easy for maintenance, and it should be installed after the filter.
6) The oil heater should be controlled to maintain the appropriate temperature of the oil. And It should be structured that only the oil heater can be replaced for service.
7) The external oil separator should be installed on the refrigerant gas pipe returned from the oil tank. And heat exchange performance of heat exchanger should be optimized by minimizing the oil inflow to the heat exchanger so that minimizing solubility of oil in refrigerant at the heat exchanger.

2.3.4. Evaporator, Condenser and Economizer

1) The evaporator and condenser should be applied with the structure of the shell & tube type and high-efficiency heat-transfer tubes. The heat-transfer tubes shall be combined with mechanical expansion on the tube sheet so that it can be replaced for service. The tube sheet holes for the assemble of heat-transfer tubes should secure the long-term safety of leakage.
2) In the evaporator, a distribution plate with perforated sheet type should be installed at the liquid refrigerant inlet so that the refrigerant distribution can be uniformly supplied.
3) The condenser should have an anti-collision plate installed at the gas inlet, and the anti-collision plate must have a structure that allows noise reduction and stable diffusion of flow paths.
4) The heat-transfer tubes shall be machined to improve heat transfer performance inside and outside the tube and parts in contact with tube sheets and tube support plates shall not be machined.
5) The pressure vessel shall be designed and inspected in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) or GB Code and certified by the relevant certification agency.
6) On the top of the evaporator and condenser, a safety valve shall be installed in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC.VIII (Options). Spring type relief valves are in accordance with ANSI / ASHRAE STANDARD 15-1994 code.
7) It should be a structure available for air vent on top of the water box

and drain at the bottom of the water box.

8) The economizer is the external type and able to manage the service and operation state. It is manufactured with structure that has the function of separating the liquid and gaseous phases inside.

9) The water box of the evaporator and condenser applies the Head (Rectangle) type as a standard or Head (Circle) or marine.

10) When sea water is utilized as cooling water of chiller system, following specifications should be considered. (Optional)
- Titanium Tubes in condenser (Refer to PS-F8-635)
- Clad Plate for water box (Refer to PS-F8-636)
- Arch coating on condenser water box

11) It has two separate spaces in one shell by the middle tube sheet installed inside the shell. (Dual Compressor model only).

2.3.5. Refrigerant Level and Flow Control Device

1) To achieve high efficiency in the full load and partial load condition, The refrigerant level control device shall be installed in the condenser with micom, and gravity type of variable expansion device on the economizer, so that maintain optimal refrigerant level in each cycle. The refrigerant level control sensor installed in the condenser should make it possible without extracting refrigerant in case of inspection because the isolation valves are installed to make the service and maintenance easy.

2) The gravity type automatic expansion device that controls the refrigerant level by buoyancy without the electric control signal should be installed inside the economizer as a level control device.

3) It should make stable motor cooling and oil cooling possible even when the cooling water is operated at a low temperature by securing the appropriate refrigerant level in the condenser at the partial load condition.

2.3.6. Control Panel

1) The composition of the control panel

The control panel should compose the micom module(main module, input / output module, display and operation key, or touchpad module), power supply system to supply the stable power, breaker to perform the other control or secure the safety, electromagnetic contactor, and control relay

The protection grade of the control panel is IP41.

2) Main module

The control feature optimized to the mechanical device by applying the high-performance microprocessor shall be implemented. The high resolution A / D convertor (Analogue / Digital) shall be applied to display on screen or control by measuring each kind of temperature sensor value in real time. Also, it makes the customer's building automation ease response because the RS-485 communication port to support the customer's remote monitoring control is embedded in a standard.

3) Display and touchpad module

The display and touchpad module is composed of 1) the display part to display the various kinds operation data, setting value important for equipment operation and the abnormal data with the letter, 2) the touch input part to input the various kinds data and select the menu, 3) the display part to display equipment run/stop state important for equipment run, compressor run, chilled water/cooling water flow, abnormal occur state, refrigerant valve manual selection states with the letter.

Especially as for the operational function to use often by the operator when equipment is operating, it should be improved operator's convenience by operating with direct touch and other operation by choosing the menu. Especially, the operator's convenience should be improved by allowing the operator to directly touch and control the frequently used control functions while the equipment is operating, and for other function to control by selecting the menu.

The touchpad should offer the operation and monitoring convenience by composing the letter display part and menu choosing button on display. Also, the display part should display by choosing the operating state such as inlet/outlet temperature of chilled / cooling water, compressor discharge temperature, motor bearing temperature, condenser and evaporator pressure, operating current, refrigerant valve opening rate into Korean, Chinese, English.

4) Input / output module

The input / output module should be composed of the digital input part to check the operation state of various kinds of switches and the digital output to control the equipment operation. Also, the input / output port has a photo coupler blocking each kind of noise. Since all data is transmitted and received with the main module through communication, it secures high reliability by preventing the malfunction caused by electromagnetic wave to happen when transmitting and receiving the data of general cable.

2.3.7. The Feature of Control Function

1) Convenient operation data management

The controller makes any operation information check on one screen simultaneously by applying the big graphic liquid crystal display (15 inches). In addition, It also makes analog data (ex : temperature data) saved in every 5 second up to one year times and operation/error history (ex : run, stop) saved until 300 times are used when recording operation reports and maintaining the management. In addition, the trend identification of temperature and operation current change by marking the graphical information such as chilled water outlet temperature and operation current of the compressor motor should be easy. This graph should be checked in real time, and possible to call and check the saved operation data on a daily basis.

2) Self-diagnosis and save of abnormality history

Micom monitors the chiller state during chiller stop or running, makes notice to operator using a text, alarm lamp, buzzer, makes auto-saving of failure data and occurring time which can be utilized in repairing conveniently. Especially, the types of failures are classified into minor failure and major failure, and when a minor failure occurs, the contents of the minor failure are displayed in text and the operation continues to minimize unnecessary chiller stop.

3) It should be control the chiller by applying the optimized AI control algorism as follow.

a. Soft start

It should be control the vane gradually to prevent machinery shock such as surging caused by sudden increase in load when starting.

b. Digital PID control

When starting or changing the operating mode from manual to automation, by perceiving the optimized PID control point automatically and reflecting it in the control equation, the digital PID control that combined with soft start makes unnecessary machinery stop minimize and makes more stable and precised temperature control.

c. Preventive operation

By measuring each part temperature and pressure during the operation in real-time and performing the primary and secondary preventive operation according to measurement result, It should prevent the chiller stop caused by abnormality such as overload, high pressure of condenser, low pressure of evaporator, surging in advance.

d. Scheduled operating function

Scheduled operating function is available to choose the operation mode, set temperature, limit of motor current, which makes the convenience on chiller operation by applying the scheduled operating function one time or by day or by time within the selected period. It should be possible to choose the exception day of (reservation operating) scheduled operating and to register the overlapped schedule on the same day.

e. Service function

It makes the maintenance convenient by supporting the service function of the below content.
- The automatic sensor setting function that automatically sets each sensor by software.
- The function to display the number of starts and total operation time of the pump and motor attached to the main body.
- The function to send the operation data or abnormal data by email.

4) Strong customer support function

a. Help function

If the breakdown occurs, it makes the operator's convenience by recording failure details, and showing clarification of how to respond if the operator selects the type of failure from the menu.

b. Communication function for building automation and remote monitoring control

The zero voltage input / output should be provided to run / stop in the remote or to monitor the operating state of the chiller using the simple electric wiring.

5) Indications

All Indications are displayed as text on LCD.
a. Chiller run / stop
b. Compressor operation
c. Oil pump operation
d. Oil heater operation
e. Chilled water flow normal
f. Cooling water flow normal
g. Vane manual
h. Oil pump manual

2.3.8. Starter Panel

1) It is the steel plate cubicle type. It is installed with motor protection relay that protects against overcurrent, short circuit, phase loss, reverse phase, unbalance, restrictions, etc. The voltmeter, ammeter, current selection switch, power indicator, run lamp, abnormality lamp, stop lamp, breaker for circuit protection, reset switch used in case of abnormality should be attached to the panel.

2) Protective relay

a. Motor protection relay should be attached. (Overcurrent, short circuit, phase loss, reverse phase, unbalance, lock protection)
b. The low voltage, high voltage, SAG protective device by interlocking the control panel display should be provided.
c. Electric power monitoring should be possible by interlocking the control panel display.

3) Operation and instrument panel

Indicator lamp, breaker for circuit protection, voltmeter, ammeter, voltage and current phase conversion switch

4) Indicator lamp : The Indicator lamp turns on in the following three cases.
a. Power indicator lamp (White)
b. Operation indicator lamp (Red)
c. Stop indicator lamp (Green)

5) The starter type of compressor motor is reactor.

6) The starter panel is separately and exclusively installed from the chiller.

7) The Starter panel power cable is supplied from the top of panel.

2.3.9. Safety Device

1) Chilled Water Low Temperature [temperature sensor at chilled water outlet] _ Protect the evaporator from freeze.

2) Evaporator Low Pressure [evaporator pressure sensor] _ Protect evaporator from abnormal low pressure.

3) Condenser High Pressure [condenser pressure sensor] _ Protect chiller from abnormal high pressure of condenser.

4) Bearing High Temperature [bearing temperature sensor] _ Protect compressor from abnormal temperature of bearing.

5) Oil Differential Low Pressure [oil tank & discharge-side pressure sensor] _ Protect compressor from abnormal oil supply differential pressure.

6) Oil Differential High Pressure [oil tank & discharge-side pressure sensor] _ Protect compressor from abnormal oil supply differential pressure.

7) Oil High Temperature [oil tank temperature sensor] _ Protect compressor from high oil temperature.

8) Oil Low Temperature [oil tank temperature sensor] _ Protect compressor from low oil temperature.

9) Chilled Water Pump Abnormal [interlock with chilled water pump] _ Protect chiller from chilled water pump.

10) Cooling Water Pump Abnormal [interlock with cooling water pump] _ Protect chiller from abnormal cooling water pump.

11) Chilled Water Flow Rate Abnormal [chilled water differential pressure switch] _ Protect chiller from abnormal chilled water flow rate.

12) Surge Abnormal [control panel] _ Protect compressor from surges

13) Oil Pump Over-Current [over-current relay] _ Protect compressor from motor/oil pump over-current.

14) Motor Reverse Phase/Phase Loss/Over-Current _ Protect chiller from motor reverse phase / phase loss / over-current

15) Safety Valve [evaporator] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

16) Safety Valve [condenser] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

17) Current Limiting Function [control panel] _ Operation current limited operation, compressor protection / user convenience

※ The temperature of the cooling water shall be adjusted to keep the temperature difference 14°C or higher between the chilled water outlet and the cooling water outlet.

2.3.10. Isolator

The sandwich-type vibration-proof pad (Material : rubber and cork) for vibration isolator device is supplied.

2.3.11. Insulation

1) The Insulation is excluded from the supply range of the manufacturer (LG Electronics).

2.3.12. Start-up Commissioning

1) LG engineer or designated engineer for the start-up commissioning shall carry out start-up commissioning and provide the operation training.

3. Scope of Construction

Items	Supplied by	Notes
Painting	LG Electronics	Main body : Dawn Gray Control panel : Warm Gray Starter panel : RAL7035
Transportation and installation	LG Electronics	Transportation installation of installation place or basis
Leaking test, Insulation test, Put the refrigerant	LG Electronics	The work doing before start-up commissioning at the installation place
External piping	Customer	Mean the external pipe construction such as chilled water, cooling water and drain
Power system wiring (on the first side)	Consumer	Power wiring between customer MCC and stater panel
Control system wiring (on the first side)	Consumer	Supplies the 3 Ph, 440 V / 380 V / 220 VAC of control power to control panel.
Grounding	Customer	Grounding wiring construction of ground Pad installed in the main body of the chiller
Power system wiring (on the second side)	Customer	Power and grounding wiring construction between the chiller and starter panel
Control system wiring (on the second side)	Customer	Means the control wiring between starter panel and control panel
Building and foundation	Customer	Prepare the basis construction for chiller installation before its installation
Chiller horizontality work	LG Electronics	The work at the time of chiller installation
Start-up commissioning and operating guidance	LG Electronics	Conduct 1 time a day (8 hours) (Supply the necessary electricity, chilled water, cooling water)
Interlock wiring work for chilled water, cooling water pump	Customer	Wiring between control panel and pump control panel
Oil	LG Electronics	Oil is a polyester series and uses the chiller exclusive oil of LG Electronics.

4. Scope of Supply

Items	Whether if supply or not	Notes
Chiller body	LG Electronics	Refers to the body components
Vibration proof pad	LG Electronics	The pad for vibrational absorption.
The chiller instruction manual	LG Electronics	Installation and operation manual
Horizontal plate	LG Electronics	Parts used to horizontal level of chiller (Provided if request)
Starter panel	LG Electronics	Starter system of compressor motor.
Packing	LG Electronics	Shrink film

5. The Warranty and Service

5.1. Standard warranty period is 12 Months from date of commissioning or 18 Months from the date of shipment (STD) from factory whichever comes first. It's valid only if start up & commissioning work is carried out by certified LG Electronics service. Also, warranty shall not apply, if the Products have been subjected to misuse, abuse, negligence, improper installation, improper maintenance, improper transportation, accident, alteration or design change by anyone other than LGE.

5.2. Failure, caused by a defect in the parts, material, or operation during the warranty period, will be inspected by LG ELECTRONICS and fixed free of charge if it is agreed that it is defective.

5.3. For the following, LG Electronics don't fix free of charge.

1) If a failure occurs after the product is repaired at the shop that is not designated by LG ELECTRONICS.

2) If the failure is caused by user's mistakes in using and handling the equipment.

3) The monopoly or handover to other places during the warranty period

4) If a failure is caused by a fire or a natural disaster.

6. General Details

6.1. Before producing the chillers, getting the approval is required by submitting all the details about production to the customer and the production should be implemented after getting a permit in the negotiation with the customer, as for the details not included marked in these specifications.

6.2. Before the disposal of the product, if you monopoly or hand it over to others, you should inform LG electronics.

7. Caution Details

7.1. In case of drain work is progressed after completing the hydraulic pressure test or the circulation test of chilled/cooling water before the start-up and commissioning of the chiller, the chiller should be kept with opening each drain valve of pipe because the freeze and burst can occur by remaining water under the environmental condition of below 0°C outdoor temperature. (Until filling up the make-up water)

Guide Specification

Oil-Free Magnetic Bearing Centrifugal Chiller
RCWF L Series
GCWF L Series
MCWF L Series
(Oil-Free, Magnetic Bearing)

Contents

1. Range of Application

This specification is applied to all the models of the high efficient two-stage R-134a (R-513A) oil-free magnetic bearing centrifugal chillers manufactured and supplied by LG Electronics.

2. Special Specifications

1) Heat exchange efficiency should be improved by applying the oil-free system because of no containing of the oil into the refrigerant.
2) It should be a highly efficient product by applying the two-stage compression and two-stage expansion cycle (economizer equipped).
3) Because the inverter is applied, when the chiller starts, the peak current by soft starting should be low.
4) The capacity control should be controlled using the discharge gas recirculation (DGR) and inverter.
5) The chiller manufacturer must possess the production technology of the compressor, the core part. The compressor and heat exchanger should be produced and delivered from in the same manufacturer to guarantee the equipment performance.

3. Equipment Features

3.1. System Structure

1) The high efficiency centrifugal chillers apply the two-stage compression and two-stage expansion cycle and should be designed to operate stably at the partial load condition by applying the DGR in front of the impeller.
2) The compressor is applied with motor direct drive system and doesn't need the increasing gear. It should be applied with the magnetic bearing that doesn't need oil supply to lubricate.
3) The economizer makes the maintenance convenient with external type.
4) By Controlling the refrigerant level of condenser and economizer, so that achieve high efficiency in the full load and partial load condition.

3.2. Performance and Quality

1) The product should be evaluated complying with the standard of AHRI (Air Conditioning, Heating and Refrigeration Institute) Standard 550-590 / 551-591, the international authorized certified institute.
2) The refrigerant, R-134a (R-513A), environmental refrigerant with Ozone Depletion Potential (ODP) of zero, shall be applied.
3) The pressure vessel shall be designed and inspected in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) or GB Code and certified by the relevant certification agency.

3.3. Equipment Specification

3.3.1. Equipment Composition

The Chiller consists of the compressor and motor, evaporator, condenser, economizer, refrigerant control device, capacity control device, refrigerant pipe, control panel, stater panel, safety device, insulation & vibration isolator device for insulation and vibration-proof.

The starter panel is supplied by the manufacturer with chiller.

3.3.2. Compressor and Motor

1) The compressor is a high-efficiency semi-hermetic and centrifugal type for R-134a (R-513A). The impeller is made of high-strength special aluminum alloy. It should have structure that minimizes efficiency loss and easy service.
2) The DGR controlling the compressor capacity should be a structure minimizing the flow loss in the suction of impeller.
3) The compressor is applied with motor direct drive system and doesn't need the increasing gear. It should be applied with the magnetic bearing that doesn't need oil supply to lubricate.
4) The motor shall be liquid refrigerant-cooled type and the outside of the motor should be insulated with anti-humidity insulation to prevent condensation.
5) The power specifications of the motor for compressor is 3 Ph / 380-460 V / 60 (50) Hz.
6) The motor shaft should be a both-end support structure with high efficiency. Motor bearing temperature should be monitored at the control panel in real-time when running by embedding the motor bearing temperature sensor.
7) The motor winding should have special insulation to keep refrigerant resistance about the R-134a (R-513A).
8) By applying a magnetic bearing, lubrication by oil should not be required.
9) The magnetic bearings should be prevented from damage by using the UPS (Uninterruptible power supply) as a default specification and by supplying the stable power to the magnetic bearings in case of the power failure.
10) In case the UPS breakdown, ball bearings should be installed for auxiliary use.
11) At the full load or partial load condition, the number of rotation should be controlled automatically to control the compressor capacity.
12) The efficiency of the chiller should be improved by applying a two-stage cycle that is inflowing refrigerant from the economizer outlet to the two-stage compressor inlet.
13) The shaft vibration level should always be checked on the control panel in real time so that the customer can directly check the integrity of the compressor.
14) Magnetic bearing controller has separate storage devices so critical phenomena that occurs during compressor trip or abnormal operation can be checked later and swift action would follow.

3.3.3. Evaporator, Condenser and Economizer

1) The evaporator and condenser should be applied with the structure of the shell & tube type and high-efficiency heat-transfer tubes. The heat-transfer tubes shall be combined with mechanical expansion on the tube sheet so that it can be replaced for service. The tube sheet holes for the assemble of heat-transfer tubes should secure the long-term safety of leakage.
2) In the evaporator, a distribution plate with perforated sheet type should be installed at the liquid refrigerant inlet so that the refrigerant distribution can be uniformly supplied.
3) The condenser should have an anti-collision plate installed at the gas inlet, and the anti-collision plate must have a structure that allows noise reduction and stable diffusion of flow paths.
4) The heat-transfer tubes shall be machined to improve heat transfer performance inside and outside the tube and parts in contact with tube sheets and tube support plates shall not be machined.
5) The pressure vessel shall be designed and inspected in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) or GB Code and certified by the relevant certification agency.

6) On the top of the evaporator and condenser, a safety valve shall be installed in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC.VIII (Options). Spring type relief valves are in accordance with ANSI / ASHRAE STANDARD 15-1994 code..

7) It should be a structure available for air vent on top of the water box and drain at the bottom of the water box.

8) The economizer is the external type and able to manage the service and operation state. It is manufactured with structure that has the function of separating the liquid and gaseous phases inside.

9) The water box of the evaporator and condenser applies the Head (Rectangle) type as a standard or Head (Circle) or marine.

10) When sea water is utilized as cooling water of chiller system, following specifications should be considered. (Optional)
- Titanium Tubes in condenser (Refer to PS-F8-635)
- Clad Plate for water box (Refer to PS-F8-636)
- Arch coating on condenser water box

3.3.4. Refrigerant Level and Flow Control Device

1) To achieve high efficiency in the full load and partial load condition, The refrigerant level control device shall be installed in the condenser with micom, and gravity type of variable expansion device on the economizer, so that maintain optimal refrigerant level in each cycle. The refrigerant level control sensor installed in the condenser should make it possible without extracting refrigerant in case of inspection because the isolation valves are installed to make the service and maintenance easy.

2) The gravity type automatic expansion device that controls the refrigerant level by buoyancy without the electric control signal should be installed inside the economizer as a level control device.

3.3.5. Control Panel

1) The composition of the control panel

The control panel should compose the micom module(main module, input/output module, display and operation key, or touchpad module), power supply system to supply the stable power, breaker to perform the other control or secure the safety, electromagnetic contactor, and control relay

The protection grade of the control panel is IP41.

2) Main module

The control feature optimized to the mechanical device by applying the high-performance microprocessor shall be implemented. The high resolution A/D convertor (Analogue/Digital) shall be applied to display on screen or control by measuring each kind of temperature sensor value in real time. Also, it makes the customer's building automation ease response because the RS-485 communication port to support the customer's remote monitoring control is embedded in a standard.

3) Display and touchpad module

The display and touchpad module is composed of 1) the display part to display the various kinds operation data, setting value important for equipment operation and the abnormal data with the letter, 2) the touch input part to input the various kinds data and select the menu, 3) the display part to display equipment run / stop state important for equipment run, compressor run, chilled water/cooling water flow, abnormal occur state, refrigerant valve manual selection states with the letter.

Especially as for the operational function to use often by the operator when equipment is operating, it should be improved operator's convenience by operating with direct touch and other operation by choosing the menu. Especially, the operator's convenience should be improved by allowing the operator to directly touch and control the frequently used control functions while the equipment is operating, and for other function to control by selecting the menu.

The touchpad should offer the operation and monitoring convenience by composing the letter display part and menu choosing button on display. Also, the display part should display by choosing the operating state such as inlet/outlet temperature of chilled/cooling water, compressor discharge temperature, motor bearing temperature, condenser and evaporator pressure, operating current, refrigerant valve opening rate into Korean, Chinese, English.

4) Input / output module

The input / output module should be composed of the digital input part to check the operation state of various kinds of switches and the digital output to control the equipment operation. Also, the input / output port has a photo coupler blocking each kind of noise. Since all data is transmitted and received with the main module through communication, it secures high reliability by preventing the malfunction caused by electromagnetic wave to happen when transmitting and receiving the data of general cable.

3.3.6. The Feature of Control Function

1) Convenient operation data management

The controller makes any operation information check on one screen simultaneously by applying the big graphic liquid crystal display (15 inches). In addition, It also makes analog data (ex: temperature data) saved in every 5 second up to one year times and operation/error history (ex : run, stop) saved until 300 times are used when recording operation reports and maintaining the management. In addition, the trend identification of temperature and operation current change by marking the graphical information such as chilled water outlet temperature and operation current of the compressor motor should be easy.

This graph should be checked in real time, and possible to call and check the saved operation data on a daily basis.

2) Self-diagnosis and save of abnormality history

Micom monitors the chiller state during chiller stop or running, makes notice to operator using a text, alarm lamp, buzzer, makes auto-saving of failure data and occurring time which can be utilized in repairing conveniently. Especially, the types of failures are classified into minor failure and major failure, and when a minor failure occurs, the contents of the minor failure are displayed in text and the operation continues to minimize unnecessary chiller stop.

3) It should be control the chiller by applying the optimized AI control algorism as follow.

a. Soft start

The inverter frequency should be controlled slowly to prevent machinery shock such as surging caused by sudden increase in load when the chiller is starting.

b. Digital PID control

When starting or changing the operating mode from manual to automation, by perceiving the optimized PID control point automatically and reflecting it in the control equation, the digital PID control that combined with soft start makes unnecessary machinery stop minimize and makes more stable and precised temperature control.

c. Preventive operation

By measuring each part temperature and pressure during the operation in real-time and performing the primary and secondary preventive operation according to measurement result, It should prevent the chiller stop caused by abnormality such as overload, high pressure of condenser, low pressure of evaporator, surging in advance.

d. Scheduled operating function

Scheduled operating function is available to choose the operation mode, set temperature, limit of motor current, which makes the convenience on chiller operation by applying the scheduled operating function one time or by day or by time within the selected period.

It should be possible to choose the exception day of (reservation operating) scheduled operating and to register the overlapped schedule on the same day.

e. Service function

It makes the maintenance convenient by supporting the service function of the below content.
- The automatic sensor setting function that automatically sets each sensor by software.
- The function to display the number of starts and total operation time of the pump and motor attached to the main body.
- The function to send the operation data or abnormal data by email.

4) Strong customer support function

a. Help function

If the breakdown occurs, it makes the operator's convenience by recording failure details, and showing clarification of how to respond if the operator selects the type of failure from the menu.

b. Communication function for building automation and remote monitoring control

The zero voltage input / output should be provided to run / stop in the remote or to monitor the operating state of the chiller using the simple electric wiring.

5) Indications

All Indications are displayed as text on LCD.
a. Chiller run / stop
b. Compressor operation
c. Inverter normal
d. Bearing levitation
e. Chilled water flow normal
f. Cooling water flow normal
g. Vane manual
h. RPM manual

3.3.7. Inverter

1) The inverter is a unit mounted type and is equipped on the top of the chiller. It embeds the soft starter, converter, inverter, mainboard, fan, SMPS, communication connection board. It should be connected with the exterior through the power input terminal, motor output terminal, communication connection terminal. It perceives the H/W Fault (abnormal IGBT module part, abnormal sensor) and S/W Fault (Input part, IGBT module part, thyristor module part, abnormal of inverter drive) since self-diagnosis is possible with the embedded Micom. The inverter control should be possible with Modbus 485 communication and contact control.

2) H / W Fault
a. Perceives the abnormality of IGBT module and sensor.
b. IGBT module part abnormal : abnormal current (IGBT module trip stop)
c. Sensor abnormal : abnormal CT sensor offset, abnormal DC voltage sensing part

3) S / W Fault

Perceive the abnormality of input part, IGBT module part, thyristor module part, inverter drive.
a. Input part : detects the input part current
b. IGBT module part : abnormal current (Overcurrent/overload protection control), abnormal temperature (High temperature protection function)
c. Thyristor module part: abnormal temperature (High temperature protection function)
d. Inverter drive abnormal: abnormal voltage (DC-LINK over voltage / low voltage protection control)

4) The starter type of compressor motor is VSD.

5) The starter panel is attached and installed to the chiller unit.

6) The Starter panel power cable is supplied from the top of panel.

7) The harmonic filter has applied the standard (TDDi < 30%).

3.3.8. Safety Device

1) Chilled Water Low Temperature [temperature sensor at chilled water outlet] _ Protect the evaporator from freeze.

2) Evaporator Low Pressure [evaporator pressure sensor] _ Protect evaporator from abnormal low pressure.

3) Condenser High Pressure [condenser pressure sensor] _ Protect chiller from abnormal high pressure of condenser.

4) Chilled Water Pump Abnormal [interlock with chilled water pump] _ Protect chiller from chilled water pump.

5) Cooling Water Pump Abnormal [interlock with cooling water pump] _ Protect chiller from abnormal cooling water pump.

6) Chilled Water Flow Rate Abnormal [chilled water differential pressure switch] _ Protect chiller from abnormal chilled water flow rate.

7) Surge Abnormal [control panel] _ Protect compressor from surges

8) Motor / inverter overcurrent _ protects chiller when motor/inverter overcurrent happened.

9) Safety Valve [evaporator] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

10) Safety Valve [condenser] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

11) Current Limiting Function [control panel] _ Operation current limited operation, compressor protection / user convenience

※ The temperature of the cooling water shall be adjusted to keep the temperature difference 14°C or higher between the chilled water outlet and the cooling water outlet.

3.3.9. Isolator

The sandwich-type vibration-proof pad (Material : rubber and cork) for vibration isolator device is supplied.

3.3.10. Insulation

1) The Insulation is excluded from the supply range of the manufacturer (LG Electronics).

3.3.11. Start-up commissioning

1) LG engineer or designated engineer for the start-up commissioning shall carry out start-up commissioning and provide the operation training.

4. Scope of Construction

Items	Supplied by	Notes
Painting	LG Electronics	Main body: Dawn Gray Inverter & Control panel: Warm Gray
Transportation and installation	LG Electronics	Transportation installation of installation place or basis
Leaking test, Insulation test, Put the refrigerant	LG Electronics	The work doing before start-up commissioning at the installation place
External piping	Customer	Mean the external pipe construction such as chilled water, cooling water and drain
Power system wiring (on the first side)	Consumer	Power wiring between customer MCC and inverter
Control system wiring (on the first side)	Consumer	Supplies the 3Ph, 440 V / 380 V / 220 VAC of control power
Grounding	Consumer	Grounding wiring construction of ground Pad installed in the main body of the chiller
Power system wiring (on the second side)	Consumer	Power and grounding wiring construction between the chiller and inverter
Control system wiring (on the second side)	Customer	Means the control wiring between inverter and control panel
Building and foundation	LG Electronics	Prepare the basis construction for chiller installation before its installation
Chiller horizontality work	LG Electronics	The work at the time of chiller installation
Start-up commissioning and operating guidance	Consumer	Conduct 1 time a day (8 hours) (Supply the necessary electricity, chilled water, cooling water)
Interlock wiring work for chilled water, cooling water pump	Consumer	The work at the time of chiller installation

5. Scope of Supply

Items	Whether if supply or not	Notes
Chiller body	LG Electronics	Refers to the body components
Vibration proof pad	LG Electronics	The pad for vibrational absorption.
The chiller instruction manual	LG Electronics	Installation and operation manual
Horizontal plate	LG Electronics	Parts used to horizontal level of chiller (Provided if request)
Packing	LG Electronics	Shrink film

6. The Warranty and Service

6.1. Standard warranty period is 12 Months from date of commissioning or 18 Months from the date of shipment (STD) from factory whichever comes first. It's valid only if start up & commissioning work is carried out by certified LG Electronics service. Also, warranty shall not apply, if the Products have been subjected to misuse, abuse, negligence, improper installation, improper maintenance, improper transportation, accident, alteration or design change by anyone other than LGE.

6.2. Failure, caused by a defect in the parts, material, or operation during the warranty period, will be inspected by LG ELECTRONICS and fixed free of charge if it is agreed that it is defective.

6.3. For the following, LG ELECTRONICS don't fix free of charge.

1) If a failure occurs after the product is repaired at the shop that is not designated by LG ELECTRONICS.

2) If the failure is caused by user's mistakes in using and handling the equipment.

3) The monopoly or handover to other places during the warranty period.

4) If a failure is caused by a fire or a natural disaster.

7. General Details

7.1. Before producing the chillers, getting the approval is required by submitting all the details about production to the customer and the production should be implemented after getting a permit in the negotiation with the customer, as for the details not included marked in these specifications.

7.2. Before the disposal of the product, if you monopoly or hand it over to others, you should inform LG electronics.

8. Caution Details

In case of drain work is progressed after completing the hydraulic pressure test or the circulation test of chilled / cooling water before the start-up and commissioning of the chiller, the chiller should be kept with opening each drain valve of pipe because the freeze and burst can occur by remaining water under the environmental condition of below 0°C outdoor temperature. (Until filling up the make-up water) not included marked in these specifications.

Guide Specification

Oil-free Magnetic Bearing Centrifugal Chiller
DCWFL Series
(Oil-free, Magnetic Bearing, R-1233zd)

Contents

1. Range of Application

This specification is applied to all the models of the high efficient single-stage R-1233zd oil-free magnetic bearing centrifugal chillers manufactured and supplied by LG Electronics.

2. Special Specifications

1) Heat exchange efficiency should be improved by applying the oil-free system because of no containing of oil in the refrigerant.
2) It should be a highly efficient product by applying the single-stage compression and single-stage expansion cycle.
3) Because the inverter is applied, when the chiller starts, the peak current should be low with soft starting.
4) The capacity should be controlled using the discharge gas recirculation (DGR) and inverter.
5) The chiller manufacturer must possess the production technology of the compressor, the core part. The compressor and heat exchanger should be produced and delivered from in the same manufacturer to guarantee the equipment performance.

3. Equipment Features

3.1. System Structure

1) The high efficiency centrifugal chillers apply the single-stage compression and single-stage expansion cycle and should be designed to operate stably at the partial load condition by applying the DGR in front of the impeller.
2) The compressor is applied with motor direct drive system and doesn't need the increasing gear. It should be applied with the magnetic bearing that doesn't need oil supply for lubrication.
3) The evaporator should be a shell & tube type, specially falling film heat exchanger, and the condenser should be equipped with a refrigerant level control device using a floating type to maintain the optimal refrigerant level and enable a stable refrigerant cycle.
4) The purge device must have an independent refrigerant cycle and should be able to form a stable cycle by removing the introduced non-condensable gas.

3.2. Performance and Quality

1) The product should be evaluated complying with the standard of AHRI (Air Conditioning, Heating And Refrigeration Institute) Standard 550-590/551-591, the international authorized certified institute.
2) The refrigerant, R-1233zd, environmental refrigerant with Ozone Depletion Potential (ODP) of zero and Global Warming Potential (GWP) of 1 should be applied.
3) The pressure vessel shall be designed and inspected in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) and certified by the relevant certification agency.

3.3. Equipment Specification

3.3.1. Equipment Composition

The Chiller consists of the compressor and motor, evaporator, condenser, refrigerant control device, capacity control device, refrigerant pipe, control panel, stater panel, safety device, insulation & vibration isolator device for insulation and vibration-proof.

The starter panel is supplied by the manufacturer with chiller.

3.3.2. Compressor (Including Motor and Magnetic Bearing)

1) The compressor is a high-efficiency semi-hermetic and centrifugal type for R-1233zd. The impeller is made of high-strength special aluminum alloy. It should have structure that minimizes efficiency loss and easy service.
2) The DGR controlling the compressor capacity should be a structure minimizing the flow loss in the suction of impeller.
3) The compressor is applied with motor direct drive system and doesn't need the increasing gear. It should be applied with the magnetic bearing that doesn't need oil supply to lubricate.
4) The motor shall be liquid refrigerant-cooled type and the outside of the motor should be insulated with anti-humidity insulation to prevent condensation.
5) The power specifications of the motor for compressor is 3 Ph / 380-460 V / 60(50) Hz.
6) The motor shaft should be a both-end support structure with high efficiency. Motor bearing temperature should be monitored at the control panel in real-time when running by embedding the motor bearing temperature sensor.
7) The motor winding should have special insulation to keep refrigerant resistance for the R-1233zd.
8) By applying a magnetic bearing, lubrication by oil should not be required.
9) The magnetic bearings should be prevented from damage by using the UPS (Uninterruptible power supply) as a default specification and by supplying the stable power to the magnetic bearings in case of the power failure.
10) In case the UPS breakdown, oil-less ball bearings should be installed for auxiliary use.
11) At the full load or partial load condition, the number of rotation should be controlled automatically to control the compressor capacity.
12) The shaft vibration level should always be checked on the control panel in real time so that the customer can directly check the integrity of the compressor.
13) Magnetic bearing controller has separate storage devices so critical phenomena that occurs during compressor trip or abnormal operation can be checked later and swift action would follow.

3.3.3. Heat Exchanger (Evaporator, Condenser)

1) The evaporator and condenser should be applied with the structure of the shell & tube type and high-efficiency heat-transfer tubes. The heat-transfer tubes shall be combined with mechanical expansion on the tube sheet so that it can be replaced for service. The tube sheet holes for the assemble of heat-transfer tubes should secure the long-term safety of leakage.
2) In the evaporator, It should be falling film type and the distribution plate and tray with perforated sheet type should be installed at the liquid refrigerant inlet so that the refrigerant distribution can be uniformly supplied.
3) The condenser should have an anti-collision plate installed at the gas inlet, and the anti-collision plate must have a structure that allows noise reduction and stable diffusion of flow paths.
4) The heat-transfer tubes shall be machined to improve heat transfer performance inside and outside the tube and area in contact with tube sheets and tube support plates shall not be machined.
5) The pressure vessel shall be designed and inspected in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC. VIII (Options) or PED (Pressure Equipment Directive) or GB Code and certified by the relevant certification agency.

6) On the top of the evaporator and condenser, a safety valve shall be installed in accordance with KGS Code (High-Pressure Gas Safety Control Act) or ASME SEC.VIII (Options). Spring type relief valves are in accordance with ANSI/ASHRAE STANDARD 15-1994 code..

7) It should be a structure available for air vent on top of the water box and drain at the bottom of the water box.

8) The water box of the evaporator and condenser applies the Head (Rectangle) type as a standard or Head (Circle) or marine as an option.

9) Safety relief valve should be applied on top of the evaporator.

10) When sea water is utilized as cooling water of chiller system, following specifications should be considered. (Optional)
- Titanium Tubes in condenser (Refer to PS-F8-635)
- Clad Plate for water box (Refer to PS-F8-636)
- Arch coating on condenser water box

3.3.4. Refrigerant Level and Flow Control Device

1) The condenser should be equipped with a refrigerant level control device to maintain optimal cycle operation at full and partial loads, ensuring optimal refrigerant levels are maintained throughout each cycle.

2) The refrigerant level control device should be installed in the condenser and several sight glasses should be installed in the condenser for easy service and maintenance, allowing for the identification of operational issues.

3) The flow rate control based on the refrigerant level control must utilize a floating valve to control the lower orifice flow area based on the refrigerant level, no need for a separate control device.

3.3.5. Control Panel

1) The composition of the control panel

The control panel should be composed of a micom module (main module, input / output module, display and operation key, or touchpad module), power supply system to supply the stable power, breaker to perform the other control or secure the safety, electromagnetic contactor, and control relay.

The protection grade of the control panel is IP41.

2) Main module

The control feature optimized to the mechanical device by applying the high-performance microprocessor shall be implemented. The high resolution A/D convertor (Analogue / Digital) shall be applied to display on screen or control by measuring each kind of temperature sensor value in real time. Also, it makes the customer's building automation ease response because the RS-485 communication port to support the customer's remote monitoring control is embedded in a standard.

3) Display and touchpad module

The display and touchpad module is composed of 1) the display part to display the various kinds operation data, setting value important for equipment operation and the abnormal data with the letter, 2) the touch input part to input the various kinds data and select the menu, 3) the display part to display equipment run/stop state important for equipment run, compressor run, chilled water/cooling water flow, abnormal occur state, refrigerant valve manual selection states with the letter.

Especially as for the operational function to use often by the operator when equipment is operating, it should be improved operator's convenience by operating with direct touch and other operation by choosing the menu. Especially, the operator's convenience should be improved by allowing the operator to directly touch and control the frequently used control functions while the equipment is operating, and for other function to control by selecting the menu.

The touchpad should offer the operation and monitoring convenience by composing the letter display part and menu choosing button on display. Also, the display part should display by choosing the operating state such as inlet / outlet temperature of chilled / cooling water, compressor discharge temperature, motor bearing temperature, condenser and evaporator pressure, operating current, refrigerant valve opening rate into Korean, Chinese, English.

4) Input / output module

The input / output module should be composed of the digital input part to check the operation state of various kinds of switches and the digital output to control the equipment operation. Also, the input / output port has a photo coupler blocking each kind of noise.

Since all data is transmitted and received with the main module through communication, it secures high reliability by preventing the malfunction caused by electromagnetic wave to happen when transmitting and receiving the data of general cable.

3.3.6. The Feature of Control Function

1) Convenient operation data management

The controller makes any operation information check on one screen simultaneously by applying the big graphic liquid crystal display (15 inches). In addition, It also makes analog data (ex: temperature data) saved in every 5 second up to one year times and operation/error history (ex: run, stop) saved until 300 times are used when recording operation reports and maintaining the management. In addition, the trend identification of temperature and operation current change by marking the graphical information such as chilled water outlet temperature and operation current of the compressor motor should be easy.

This graph should be checked in real time, and possible to call and check the saved operation data on a daily basis.

2) Self-diagnosis and save of abnormality history

Micom monitors the chiller state during chiller stop or running, makes notice to operator using a text, alarm lamp, buzzer, makes auto-saving of failure data and occurring time which can be utilized in repairing conveniently. Especially, the types of failures are classified into minor failure and major failure, and when a minor failure occurs, the contents of the minor failure are displayed in text and the operation continues to minimize unnecessary chiller stop.

3) It should be control the chiller by applying the optimized AI control algorism as follow.

a. Soft start

The inverter frequency should be controlled slowly to prevent machinery shock such as surging caused by sudden increase in load when the chiller is starting.

b. Digital PID control

When starting or changing the operating mode from manual to automation, by perceiving the optimized PID control point automatically and reflecting it in the control equation, the digital PID control that combined with soft start makes unnecessary machinery stop minimize and makes more stable and precised temperature control.

c. Preventive operation

By measuring each part temperature and pressure during the operation in real-time and performing the primary and secondary preventive operation according to measurement result, It should prevent the chiller stop caused by abnormality such as overload, high pressure of condenser, low pressure of evaporator, surging in advance.

d. Scheduled operating function

Scheduled operating function is available to choose the operation mode, set temperature, limit of motor current, which makes the convenience on chiller operation by applying the scheduled operating function one time or by day or by time within the selected period. It should be possible to choose the exception day of (reservation operating) scheduled operating and to register the overlapped schedule on the same day.

e. Service function

It makes the maintenance convenient by supporting the service function of the below content.
- The automatic sensor setting function that automatically sets each sensor by software.
- The function to display the number of starts and total operation time of the pump and motor attached to the main body.
- The function to send the operation data or abnormal data by email.

4) Strong customer support function

a. Help function

If the breakdown occurs, it makes the operator's convenience by recording failure details, and showing clarification of how to respond if the operator selects the type of failure from the menu.

b. Communication function for building automation and remote monitoring control

The zero voltage input /output should be provided to run / stop in the remote or to monitor the operating state of the chiller using the simple electric wiring.

5) Indications

All Indications are displayed as text on LCD.

a. Chiller run / stop
b. Compressor operation
c. Inverter normal
d. Bearing levitation
e. Chilled water flow normal
f. Cooling water flow normal
g. Vane manual
h. RPM manual

6) Surge protection Logic based on machine learning

The control panels should incorporate machine learning-based surge protection logic to minimize surges occurring in the chiller.

3.3.7. Inverter

1) The inverter is a unit mounted type and is equipped on the top of the chiller. It embeds the soft starter, converter, inverter, mainboard, fan, SMPS, communication connection board. It should be connected with the exterior through the power input terminal, motor output terminal, communication connection terminal. It perceives the H/W Fault (abnormal IGBT module part, abnormal sensor) and S/W Fault (Input part, IGBT module part, thyristor module part, abnormal of inverter drive) since self-diagnosis is possible with the embedded Micom. The inverter control should be possible with Modbus 485 communication and contact control.

2) H/W Fault

a. Perceives the abnormality of IGBT module and sensor.
b. IGBT module part abnormal : abnormal current (IGBT module trip stop)
c. Sensor abnormal : abnormal CT sensor offset, abnormal DC voltage sensing part

3) S/W Fault

Perceive the abnormality of input part, IGBT module part, thyristor module part, inverter drive.

a. Input part: detects the input part current
b. IGBT module part : abnormal current (Overcurrent/overload protection control), abnormal temperature (High temperature protection function)
c. Thyristor module part: abnormal temperature (High temperature protection function)
d. Inverter drive abnormal: abnormal voltage (DC-LINK over voltage/ low voltage protection control)

4) The starter type of compressor motor is VSD.

5) The starter panel is attached and installed to the chiller unit.

6) The Starter panel power cable is supplied from the top of panel.

7) The inverter's harmonics is TDDi <30% as a default, and It can be applied harmonic filter (TDDi < 5%) that is made by LG Electronics as an option.

3.3.8. Purge device

1) It is mounted on the chiller unit. It has a built-in compressor, vacuum pump, condenser, purge tank, and controller. Pipes are connected to the condenser and evaporator, and it collects non-condensable gas and refrigerant from the condenser, and the liquid refrigerant is recovered to the evaporator through heat exchange in the purge device, and the non-condensable gas is released into the atmosphere. It must be electrically connected to the inverter and control panel through the power input terminal and input/output connection terminal. The controller is capable of automatic operation and self-diagnosis, so it receives the chiller operation status from the micom and operates automatically, and when a fault occurs, it controls the purge device and simultaneously sends a signal to the micom.

2) Mechanical Connections
- Condenser Connection: Connect the non-condensable collection pipe to the purge device.
- Evaporator Connection: Connect the condensed liquid refrigerant return pipe to the purge device.
- Purge Connection: Connect the non-condensable gas exhaust pipe to the purge device.

3) Electrical Connection
- Power Terminal: Internal power connection
- Input Terminal: Chiller operating status input
- Output Terminal: Purge device fault output

3.3.9. Safety Device

1) Chilled Water Low Temperature [temperature sensor at chilled water outlet] _ Protect the evaporator from freeze.

2) Evaporator Low Pressure [evaporator pressure sensor] _ Protect evaporator from abnormal low pressure.

3) Condenser High Pressure [condenser pressure sensor] _ Protect chiller from abnormal high pressure of condenser.

4) Chilled Water Pump Abnormal [interlock with chilled water pump] _ Protect chiller from chilled water pump.

5) Cooling Water Pump Abnormal [interlock with cooling water pump] _ Protect chiller from abnormal cooling water pump.

6) Chilled Water Flow Rate Abnormal [chilled water differential pressure switch] _ Protect chiller from abnormal chilled water flow rate.

7) Surge Abnormal [control panel] _ Protect compressor from surges

8) Motor/inverter overcurrent _ protects chiller when motor/inverter overcurrent happened.

9) Safety Valve [evaporator] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

10) Safety Valve [condenser] _ Discharge refrigerant to protect the chiller in case of the pressure is abnormally high.

11) Current Limiting Function [control panel] _ Operation current limited operation, compressor protection / user convenience

※ The temperature of the cooling water shall be adjusted to keep the temperature difference 14°C or higher between the chilled water outlet and the cooling water outlet.

3.3.10. Isolator

The sandwich-type vibration-proof pad (Material : rubber and cork) for vibration isolator device is supplied.

3.3.11. insulation

1) The cold Insulation is excluded from the supply range of the manufacturer (LG Electronics).

3.3.12. Start-up Commissioning

1) LG engineer or designated engineer for the start-up commissioning shall carry out start-up commissioning and provide the operation training.

4. Scope of Construction

Items	Supplied by	Notes
Painting	LG Electronics	Main body : Dawn Gray Inverter & Control panel: Warm Gray
Transportation and installation	LG Electronics	Transportation installation of installation place or basis
Leaking test, Insulation test, Put the refrigerant	LG Electronics	The work doing before start-up commissioning at the installation place
External piping	Customer	Mean the external pipe construction such as chilled water, cooling water and drain
Power system wiring (on the first side)	Consumer	Power wiring between customer MCC and inverter
Control system wiring (on the first side)	Consumer	Supplies the 3Ph, 440 V/ 380 V/ 220 VAC of control power
Grounding	Consumer	Grounding wiring construction of ground Pad installed in the main body of the chiller
Power system wiring (on the second side)	Consumer	Power and grounding wiring construction between the chiller and inverter
Control system wiring (on the second side)	Customer	Means the control wiring between inverter and control panel
Building and foundation	LG Electronics	Prepare the basis construction for chiller installation before its installation
Chiller horizontality work	LG Electronics	The work at the time of chiller installation
Start-up commissi-oning and operating guidance	LG Electronics	Conduct 1 time a day (8 hours) (Supply the necessary electricity, chilled water, cooling water)
Interlock wiring work for chilled water, cooling water pump	Consumer	Wiring between control panel and pump control panel

5. Scope of Supply

Items	Whether if supply or not	Notes
Chiller body	LG Electronics	Refers to the body components
Vibration proof pad	LG Electronics	The pad for vibrational absorption.
The chiller instruction manual	LG Electronics	Installation and operation manual
Horizontal plate	LG Electronics	Parts used to horizontal level of chiller (Provided if request)
Packing	LG Electronics	Shrink film

6. The Warranty and Service

6.1. Standard warranty period is 12 Months from date of commissioning or 18 Months from the date of shipment (STD) from factory whichever comes first. It's valid only if start up & commissioning work is carried out by certified LG Electronics service. Also, warranty shall not apply, if the Products have been subjected to misuse, abuse, negligence, improper installation, improper maintenance, improper transportation, accident, alteration or design change by anyone other than LGE.

6.2. Failure, caused by a defect in the parts, material, or operation during the warranty period, will be inspected by LG ELECTRONICS and fixed free of charge if it is agreed that it is defective.

6.3. For the following, LG ELECTRONICS don't fix free of charge.

1) If a failure occurs after the product is repaired at the shop that is not designated by LG ELECTRONICS.

2) If the failure is caused by user's mistakes in using and handling the equipment.

3) The monopoly or handover to other places during the warranty period

4) If a failure is caused by a fire or a natural disaster.

7. General Details

7.1. Before producing the chillers, getting the approval is required by submitting all the details about production to the customer and the production should be implemented after getting a permit in the negotiation with the customer, as for the details not included marked in these specifications

7.2. Before the disposal of the product, if you monopoly or hand it over to others, you should inform LG electronics.

8. Caution Details

8.1. In case of drain work is progressed after completing the hydraulic pressure test or the circulation test of chilled/cooling water before the start-up and commissioning of the chiller, the chiller should be kept with opening each drain valve of pipe because the freeze and burst can occur by remaining water under the environmental condition of below 0°C outdoor temperature. (Until filling up the make-up water)