MCAC-2012-26

AIR-COOLED SCROLL MODULAR CHILLER

R410A (25kW-200kW) 50Hz

2012

GD Midea Refrigeration Equipment Co., Ltd.
Have received ISO 9001 certification for quality assurance.
Certificate Registration
NO.01 100 019209

ISO 9001:2000

GD Midea Refrigeration Equipment Co., Ltd.
Have received environmental management system
Standard ISO 14001 certification
Certificate NO.CC 1417

ISO 14001:2004

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Corporate Introduction

Midea Group

From its humble beginnings in 1968, Midea has developed into a large corporation, covering HVAC, appliances, lighting, industrial components, logistics, and real estate. Its 40 years of relentless growth has brought its global turnover to $14 billion USD in 2009. Consequently, Midea has created over 150,000 jobs both within China and all over the world. In addition to providing affordable goods to consumers worldwide, Midea is a responsible corporate citizen, and has contributed to several social causes.

Midea believes in creating value through rapid response to market demands, cost-efficient operations and consumer satisfaction. As a result, Midea wields vast production capacities to meet these demands, a fully integrated manufacturing process, and a comprehensive range of affordable, high-quality products to serve its global customers.

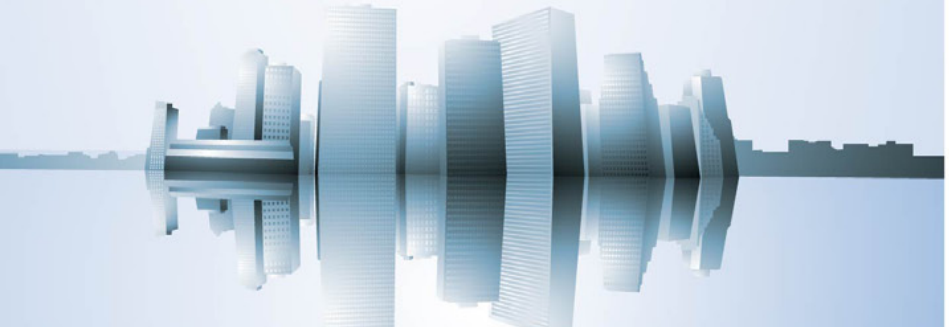
Today, Midea is a home appliance leader in China. The company continues to actively globalize its operation by opening plants in Vietnam, Belarus and Egypt. Additionally, Midea has several forthcoming plants in order to offer enhanced products and services closer to the market.

Midea TID

As a key part of Midea Group, The International Division (TID) of Midea Air-conditioning and Refrigeration Sector is a comprehensive export platform for residential and commercial air-conditioners, washing machines, refrigerators and heat pump water heaters. As a result, the division provides top-class service to customers worldwide.

With the core values, "safety, quality, cost and efficiency," Midea TID has achieved significant international growth while successfully maintaining leadership in RAC, CAC, washing machine and refrigerator exports. Now, the competitive advantages of innovation, production capacity and dedicated support services have made Midea TID a leading white goods supplier in the global market.

Contents



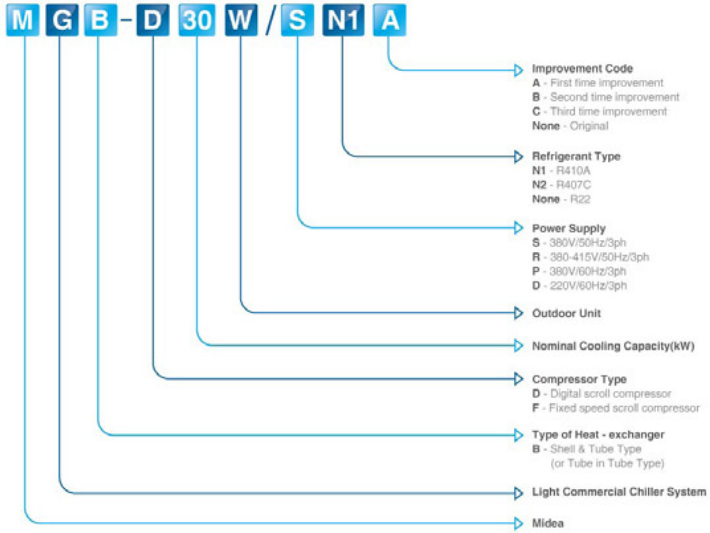
Product introduction

Air cooled modular chiller is a kind of central air-conditioning unit which adopts air as the cooling or (Heating) source and water as the cooling or (heating) medium to cool down or (heat) the indoor ambient temperature through the indoor terminal(AHU/FCU). Air cooled chiller typically have a lower initial investment and maintenance cost than water cooled system since it does not require a cooling tower, condenser water pump, and associated condenser water chemical treatment system.

Modular design concept makes the application from single unit to multiple form systems to several thousand tons of installed capacity.Adopting high reliable and excellent efficiency system Midea air cooled scroll become one of the best choice for all kinds of air cooled projects. With the latest modular design technology, high efficiency V type heat exchanger and precise gas flow control technology and digital compressor application, Midea air cooled scroll chiller system always work at the most high efficiency stage. Modular and compressor operation are adjusted by the real load requirement intelligently to keep the most economical working status. They are widely applied in school, hospital, shopping mall, office as well as the factory and manufacturing processing area.

School | Factory | Hotel | Hospital | Office

Nomenclature



Features and benefits

Outstanding reliability

- Multiple independent refrigeration circulate for built-in standby
- Each module with independent refrigeration circuit
- Completed performance and electric test before shipment
- Waterproof and anti corrosive design for outdoor installation

Excellent efficiency

- Highly efficient scroll compressors
- Air cooled V-shaped condenser coils with optimum heat exchange capability
- Big axis air volume increase the heat exchange in the condenser
- Modular concept makes individual module work at it's peak efficiency all the time

Design flexibility

- Four basic capacity modules, wide array of module combinations
- Standard module for flexible stock and fast delivery
- Install only the capacity required at the time

Easy to install, simple for maintenance

- Compact size and module design save the transportation, lifting and installation cost
- Most components are standard, off-the-shelf design
- Modules connect easily and quickly
- A complete factory run test is performed on each unit without any potential start up problem

Stable control system

- Operates only the capacity required by the load
- Operates at peak efficiency at any given load
- Wire controller used for easy setting and operation



MODULAR DESIGN

Midea air cooled modular chiller is designed to four basic modules. The modules can be field-coupled to meet large project tonnage requirements. The modular design also accommodates future expansions by allowing modules to be added in stages, to precisely match the expanded cooling requirements. Modular design provides excellent partial load efficiency. It provides big cost saving in shipping, transportation, lifting and installation. It also provides the possibility to stock in the distributor side for fast delivery.

Strong backup make the system safe all the time

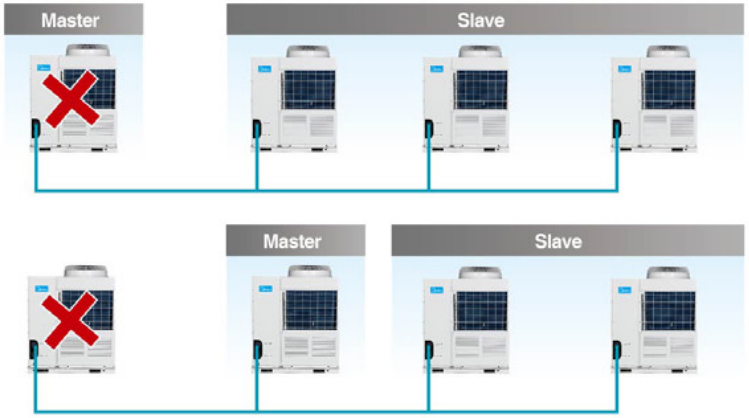
Every module with independent system and modular system provide redundant back up in module itself as well as the modular system. In the event of a malfunction in one module, the adjacent available standby module will provide back up. One failed module will not disrupt the other chillers or system. In the modular system the Master units and Slave units can be setting easily for service or emergency treatment. Strong back up for system is showing as follow:

When unit is failure

- If one slave unit fails, failure unit will stop but the others will keep running
- If master unit fails, all the units will stop but any of the slave one can be set as the master unit by manual setting in a very short time.

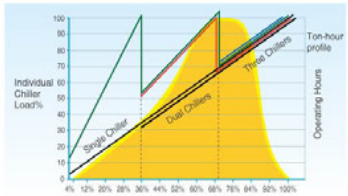
When unit is under protection

- If master unit's protection occurs, protected unit will stop but the others will keep running.
- If slave unit's protection occurs, protected unit will stop but the others will keep running.

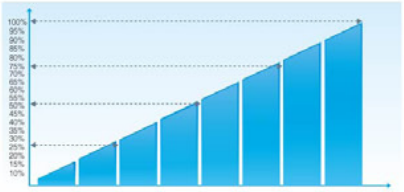


Modular system leads a excellent IPLV

In a single chiller system the output capacity is proportional to the load of the building. In the partial load condition the single chiller system will operate at 10% to 70% which is a very low efficiency for a system and lead to a very low IPLV/NPLV. In a multiple system the system output capacity is not proportion to the load of the building and only one chiller will operate in the low efficiency area and other chiller will work in the high efficiency area. The IPLV/NPLV will be increased significantly by the modular design.



Example of three chillers operation profile



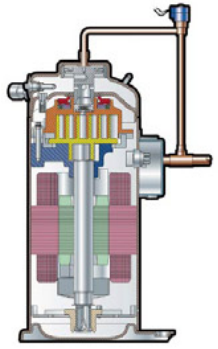
Stepless capacity control

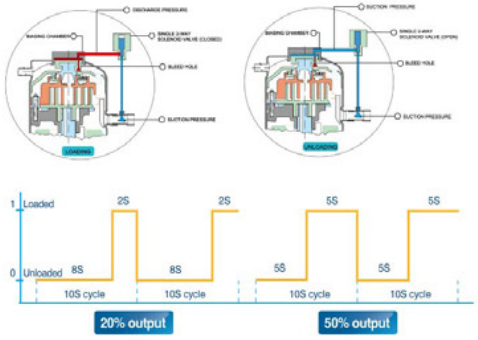
DIGITAL SCROLL COMPRESSOR

A scroll is an involute spiral which generates a series of crescent-shaped gas pockets between the two members(fixed scroll and orbiting scroll). In the digital scroll compressor the controlled separation of the scrolls is achieved using a solenoid valve and a bypass connection between the discharge chamber and the intake gas. The scrolls are designed so that the upper scroll can separate from the bottom scroll by 1mmvertically. A piston is attached on top of the upper scroll and will lift up the upper scroll when it moves up. When the solenoid valve is closed, the Digital Scroll operates as a normal Scroll compressor and the compressed gas is discharged at high pressure through the normal piping. When the solenoid valve is opened, the discharge chamber and intake gas pressure becomes connected, thereby releasing some of the discharge pressure. This leads to less pressure holding the piston down thereby causing the piston to shift upwards, which in turn lifts the upper scroll. Once the Scrolls separate, any gas passing through is no longer compressed.

With the digital scroll technology the widest capacity adjustment rang can be achieved and the reliability of the compressor, comfort of the room temperature, efficiency of the whole system can be improved significantly.

In order to gain the most precise and intelligent capacity output Midea air cooled scroll adopt the digital scroll compressor in small module of 25/30/60/65kW. It is one of the advanced technical advantages in air cooled modular product.





Product line up

Model	Mode	Compressor quantity		Refrigeration system	Electrical controller no.	Maximum combinations	Maximum Capacity kW
		Digital	Constant				
MGB-D25W/RN1	Cooling & Heating	1	1	2	1	16	400
MGB-F25W/RN1	Cooling & Heating	0	2	2	1	16	400
MGB-D30W/RN1	Cooling & Heating	1	1	2	1	16	480
MGB-F30W/RN1	Cooling & Heating	0	2	2	1	16	480
MGB-F55W/RN1	Cooling & Heating	0	2	2	1	16	960
MGB-F60W/RN1	Cooling & Heating	0	2	2	1	16	960
MGB-D65W/RN1	Cooling & Heating	1	2	2	1	16	1040
MGB-F65W/RN1	Cooling & Heating	0	2	2	1	16	1040
MGB-F130W/RN1	Cooling & Heating	0	4	4	2	8	1040
MGB-F200W/RN1	Cooling & Heating	0	6	6	3	5	1000

25/30kW module

55/60 /65kW module

130kW module

200kW module

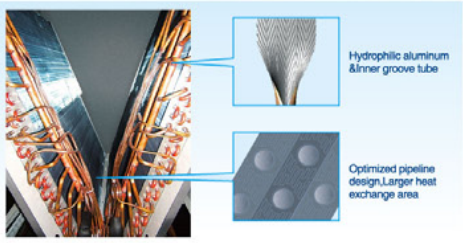
General information

All Midea air cooled chillers are factory run-tested to confirm proper operation. Units are checked on a computer-based test stand at typical ambient and water conditions and control operation is monitored. Units ship with a full operating charge of Zero Ozone Depletion Potential refrigerant R410A and oil. Compressors, heat exchangers, condenser fans, piping, and controls shall be mounted on a heavy-gauge steel frame. Electrical controls, contactors, and relays for each module shall be mounted within that module. Exposed steel surfaces shall be provided with a powder-coat paint finish. The module is provided with a heavy-gauge, galvanized steel power coated enclosure suitable for outdoor installation.

Compressor

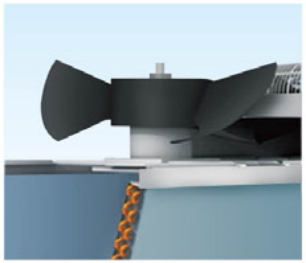
Midea Modular Air Cooled Chillers are equipped with highly efficient Scroll compressors. These rugged hermetic compressors are constructed with an integral cast iron frame, cast iron scrolls, three Teflon impregnated bearings, and three oil filtration devices for each compressor. The orbiting scrolls only touch with enough force to create a seal. There is no wear between the scroll plates. The fixed and orbiting scrolls are made of high strength cast iron which results in less thermal distortion, less leakage, and higher efficiencies. Compressor-crankcase heaters are also included for extra protection against liquid migration. As a design requirement, this compressor characteristically offers extremely smooth performance, efficiency and operational reliability. Each compressor is mounted in the unit with vibration isolation, with oil sump heating and fitted with a heat overload cut-out.

Air-cooled condenser



The air cooled condenser coils with V-shaped consist of staggered rows of 3/8" OD seamless copper tube, mechanically expanded onto die formed aluminum fins to ensure optimum heat exchange capability. Condensers are factory leak tested with air underwater at 2.9Mpa air pressure.

Fan and motor



The fans are direct drive by weatherproof motor to ensure reliable continuous operation. Statically and dynamically balanced drive motor design with maintenance-free bearings for outdoor installation. The fan motor safety class IP 54 for outdoor application in long period. Fans are multi-blade vane-axial type, made of plastic composite material for quiet operation. They are designed for maximum efficiency and are statically and dynamically balanced for vibration-free operation. The fans are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed of heavy-gauge, rust-resistant, coated steel.

Evaporator

The smaller module lower than 35kW mode adopts the tube in tube heat exchanger for the compact design. Capacity from 60kW to 200kW modes adopt shell and tube heat exchanger for easy maintenance.

- High efficiency, direct-expansion type cooler with refrigerant in tubes and chilled liquid through the baffled shell without any of the oil return problem comparing with flooded type evaporator.
- Design working pressure of the shell waterside is 1Mpa, and 2.4Mpa for the refrigerant side. Working pressure of 1.6Mpa or 2.0Mpa is optional.
- Water baffles fabricated from galvanized steel to resist corrosion. Removable heads allow access to internally-enhanced, seamless, copper tubes. Water vent and drain connections included.
- The 20mm thickness insulation covers all low temperature surfaces to include the evaporator, water boxes, oil return lines, chilled water flow switch piping etc.

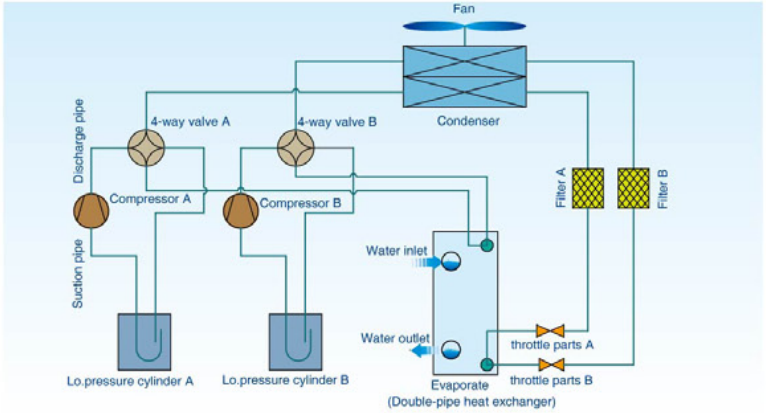
Refrigerant circuit

The refrigerant circuit is factory brazed and evacuated before accurately charged with R410A to ensure optimum operating requirement. To ensure flawless continuous operation, each refrigerant circuit is equipped with a carefully sized electronic expansion and capillary valve for stable and accurate control. The refrigerant circuit is high pressure testing before gas charging. 480 steps EXV plus capillary for stable and accurate gas flow control.

System sketch drawing

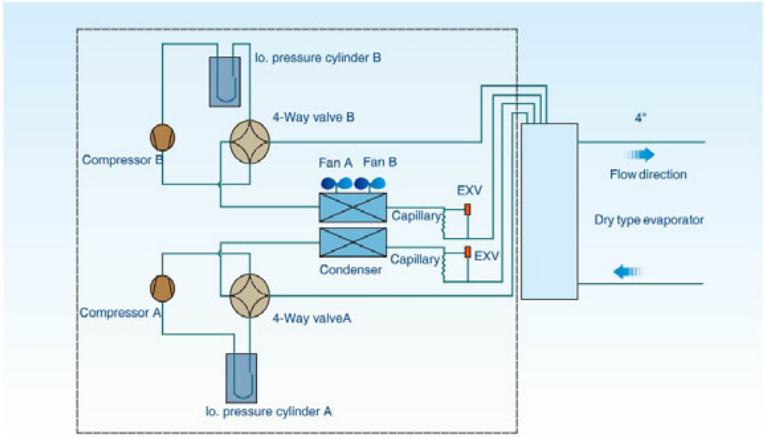
25/30/ module refrigeration system sketch drawing

Each module has two compressors with two separate A/C systems, one double-pipe evaporate for two systems.



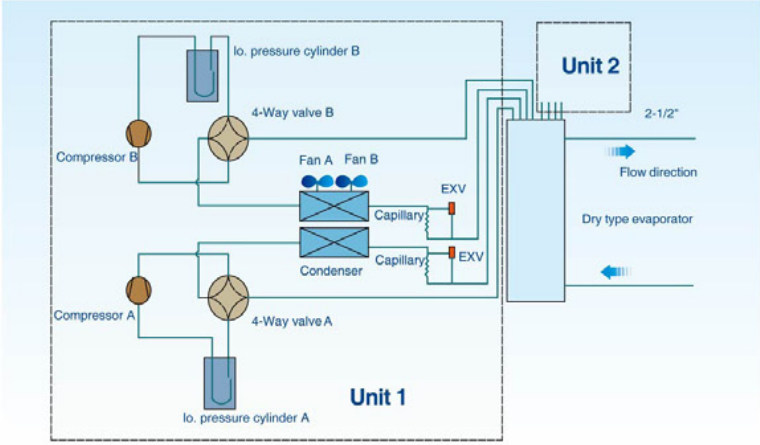
55/60/65 module refrigeration system sketch drawing

Each module has two compressors with two separate A/C system, one shell and tube evaporate for two systems.



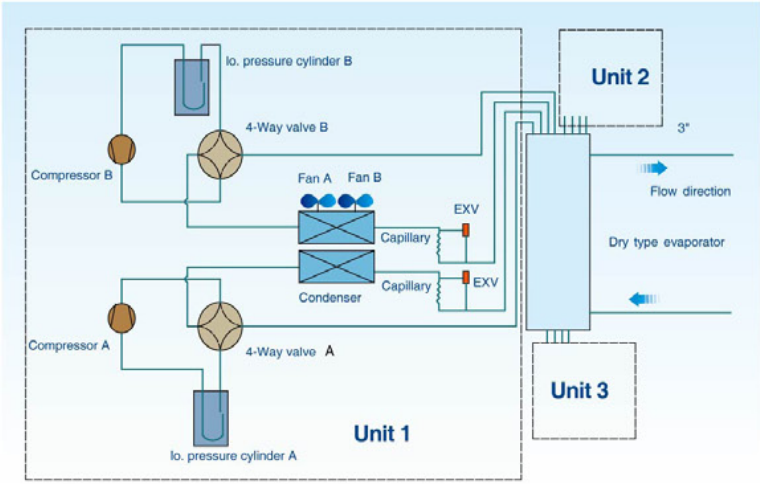
130 module refrigeration system sketch drawing

Each module has four compressors with two separate units, one shell and tube evaporate for four systems



200 module refrigeration system sketch drawing

Each module has six compressors with three separate units, one shell and tube evaporate for six systems.



Specification

Model			MGB-F25W/RN1	MGB-D25W/RN1	MGB-F30W/RN1	MGB-D30W/RN1	MGB-F55W/RN1
Cooling Capacity		kW	28	28	30	30	55
Heating Capacity		kW	29.5	29.5	32	32	59
		V/Ph/Hz	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50	380-400/3/50
Power supply	Manual switch	A	50	50	50	50	125
	Fuse	A	36	36	36	36	100
Compressor	Type		Scroll (fixed speed)	Digital Scroll + Fixed speed	Scroll (fixed speed)	Digital Scroll + Fixed speed	Scroll (fixed speed)
	Brand		Copeland	Copeland	Copeland	Copeland	Danfoss
	Quantity	Pieces	2	1+1	2	1+1	2
Power input	Cooling	kW	9.3	9.3	10.0	10.0	17.5
	Cooling rated current	A	14.6	14.6	16.3	16.3	30.5
	Heating	kW	9.2	9.2	9.8	9.8	18.3
	Heating rated current	A	14.3	14.3	16.0	16.0	31.5
Max. Input consumption		kW	12.6	12.5	12.6	12.5	28.2
Max. Current		A	21.8	21.5	21.8	21.5	47.6
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
	Weight	kg	3.5x2	3.5x2	3.5x2	3.5x2	7.0x2
Condenser (Air side)	Air side heat-exchanger type		Fin-coil	Fin-coil	Fin-coil	Fin-coil	Fin-coil
	Quantity of fan motor	Pieces	1	1	1	1	2
	Air flow volume	$10^3m^3/h$	12	12	12	12	24
	Fan motor model		YDK400-8-YA	YDK400-8-YA	YDK400-8-YA	YDK400-8-YA	YDK550-6D
	Fan motor rated current	A	3.1	3.1	3.1	3.1	4.5x2
	Fan motor input	kW	0.4	0.4	0.4	0.4	0.55x2
Evaporator (Water side)	Water side heat-exchanger type		Double-pipe	Double-pipe	Double-pipe	Double-pipe	Shell-tube
	Water resistance loss	kPa	60	60	60	60	15
	Water inlet/outlet pipeline inside normal diameter	mm	DN40	DN40	DN40	DN40	DN100
	Water flow volume	m^3/h	4.4	4.4	5.2	5.2	9.4
	Max. Pressure	MPa	1	1	1	1	1
	Water pipe connection type		Flexible joint	Flexible joint	Flexible joint	Flexible joint	Flexible joint
Dimension	Net(WxHxD)	mm	1514x1865x841	1514x1865x841	1514x1865x841	1514x1865x841	2000x900x1880
	Packing size(WxHxD)	mm	1590x2065x995	1590x2065x995	1590x2065x995	1590x2065x995	2090x985x2020
Weight	Net weight	kg	380	380	380	380	580
	Operation weight	kg	400	400	400	400	650
Connection	Power current	mm^2	10x4+10x1	10x4+10x1	10x4+10x1	10x4+10x1	16x4+16x1
	Signal wiring	mm^2	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding
Control type			Wired controller	Wired controller	Wired controller	Wired controller	Wired controller
Safety protection device			1) High pressure protection. 2) Low suction pressure protection. 3) Power supply phase sequence protection. 4) Anti-frozen protection in cooling mode. 5) Anti-frozen protection in low ambient temperature. 6) Compressor over current protection. 7) Compressor overload protection. 8) Outlet and inlet water temperature difference protection. 9) Compressor high discharge temperature protection. 10) Water flow cut-off protection. 11) Sensor malfunction protection.				
Noise level		dB(A)	65	65	65	65	65
Operation water temp		°C	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50
Ambient temp		°C	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21

Note:
Specifications are based on the following conditions:
- Cooling : chilled water inlet/outlet: 12°C / 7°C, and outdoor air temp. of 35°(117°F)CDB.
- Heating : warm water inlet/outlet: 40°C / 45°C, and outdoor air temp. 7°CDB/6°CWB.
- Water side fouling factor: 0.086m^2·°C/kW.

Model			MGB-F60W/RN1	MGB-F65W/RN1	MGB-D65W/RN1	MGB-F130W/RN1	MGB-F200W/RN1
Cooling Capacity		kW	60	65	65	130	185
Heating Capacity		kW	64	69	69	138	200
		V/Ph/Hz	380-400/3/50	380-400/3/50	380-415/3/50	380-400/3/50	380-400/3/50
Power supply	Manual switch	A	125	125	100	250	400
	Fuse	A	100	100	70	200	350
Compressor	Type		Scroll (fixed speed)	Scroll (fixed speed)	Scroll (fixed speed+digital scroll)	Scroll (fixed speed)	Scroll (fixed speed)
	Brand		Danfoss	Danfoss	Copeland	Danfoss	Danfoss
	Quantity	Pieces	2	2	3	4	6
Power input	Cooling	kW	19.3	20.4	20.4	40.8	63
	Cooling rated current	A	33.6	36.5	36.5	73	110
	Heating	kW	19.8	21.5	21.5	43	61
	Heating rated current	A	34.3	37.2	37.2	74.4	107
Max. Input consumption		kW	28.2	28.2	27.5	55.5	78.3
Max. Current		A	47.6	47.6	46	93.8	133.4
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
	Weight	kg	7.0x2	7.0x2	7.0x2	7.0x4	7.0x6
Condenser (Air side)	Air side heat-exchanger type		Fin-coil	Fin-coil	Fin-coil	Fin-coil	Fin-coil
	Quantity of fan motor	Pieces	2	2	2	4	6
	Air flow volume	$10^3m^3/h$	24	24	24	48	72
	Fan motor model		YDK550-6D	YDK550-6D	YDK550-6E	YDK550-6D	YDK550-6D
	Fan motor rated current	A	4.5x2	4.5x2	4.5x2	4.5x4	4.5x6
	Fan motor input	kW	0.55x2	0.55x2	0.55x2	0.55x4	0.55x6
Evaporator (Water side)	Water side heat-exchanger type		Shell-tube	Shell-tube	Shell-tube	Shell-tube	Shell-tube
	Water resistance loss	kPa	15	15	15	25	30
	Water inlet/outlet pipeline inside normal diameter	mm	DN100	DN100	DN100	DN65	DN80
	Water flow volume	m^3/h	10.3	11.2	11.2	22.4	31.8
	Max. Pressure	MPa	1	1	1	1	1
	Water pipe connection type		Flexible joint	Flexible joint	Flexible joint	Flexible joint	Flexible joint
Dimension	Net(WxHxD)	mm	2000x900x1880	2000x900x1880	2000x1880x900	2000x1685x2090	2850x2000x2110
	Packing size(WxHxD)	mm	2090x985x2020	2090x985x2020	2090x2020x985	2080x1755x2240	2980x2135x2260
Weight	Net weight	kg	580	580	600	1150	1730
	Operation weight	kg	650	650	670	1270	2000
Connection	Power current	mm^2	16x4+16x1	16x4+16x1	25x4+16x1	35x4+16x1	50x4+25x1
	Signal wiring	mm^2	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding	0.75x3-core with shielding
Control type			Wired controller	Wired controller	Wired controller	Wired controller	Wired controller
Safety protection device			1) High pressure protection. 2) Low suction pressure protection. 3) Power supply phase sequence protection. 4) Anti-frozen protection in cooling mode. 5) Anti-frozen protection in low ambient temperature. 6) Compressor over current protection. 7) Compressor overload protection. 8) Outlet and inlet water temperature difference protection. 9) Compressor high discharge temperature protection. 10) Water flow cut-off protection. 11) Sensor malfunction protection.				
Noise level		dB(A)	65	65	65	68	72
Operation water temp		°C	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50	Cooling: 0~17 Heating: 22~50	Cooling:5~17 Heating:45~50	Cooling:5~17 Heating:45~50
Ambient temp		°C	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21	Cooling: 10~46 Heating: -10~21	Cooling:10~46 Heating:-10~21	Cooling:10~46 Heating:-10~21

Note:
Specifications are based on the following conditions:
- Cooling : chilled water inlet/outlet: 12°C / 7°C, and outdoor air temp. of 35°(117°F)CDB.
- Heating : warm water inlet/outlet: 40°C / 45°C, and outdoor air temp. 7°CDB/6°CWB.
- Water side fouling factor: 0.086m^2·°C/kW.

Capacity table

MGB-F(D)25W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	31.35	8.19	29.52	8.44	27.85	8.71	26.32	8.97	24.66	9.42	22.69	9.89
6.00	32.41	8.32	30.49	8.58	28.73	8.84	27.13	9.11	25.45	9.57	23.44	10.05
7.00	33.54	8.49	31.52	8.75	29.68	9.02	28.00	9.30	26.29	9.77	24.24	10.25
8.00	34.57	8.74	32.46	9.01	30.54	9.29	28.78	9.58	27.06	10.06	24.97	10.56
9.00	35.55	8.83	33.35	9.10	31.34	9.38	29.51	9.67	27.77	10.16	25.66	10.66
10.00	36.90	8.96	34.58	9.24	32.47	9.52	30.54	9.82	28.77	10.31	26.62	10.82
11.00	37.93	9.05	35.51	9.33	33.31	9.62	31.31	9.91	29.52	10.41	27.34	10.93
12.00	38.79	9.18	36.29	9.46	34.01	9.76	31.93	10.06	30.15	10.56	27.95	11.09
13.00	39.49	9.25	36.90	9.54	34.55	9.84	32.41	10.14	30.63	10.65	28.43	11.18
14.00	40.47	9.32	37.79	9.61	35.35	9.90	33.13	10.21	31.34	10.72	29.11	11.26
15.00	40.99	9.36	38.23	9.65	35.73	9.95	33.46	10.26	31.68	10.77	29.47	11.31

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	18.34	5.76	22.92	6.54	26.97	7.27	29.96	29.96	32.57	8.32	36.47	8.82	41.95	9.52
41.00	17.72	5.87	22.18	6.67	26.12	7.42	29.06	29.06	31.62	8.49	35.35	8.99	40.58	9.71
42.00	17.21	5.99	21.56	6.81	25.43	7.57	28.32	28.32	30.85	8.66	34.42	9.18	39.45	9.91
43.00	16.79	6.12	21.07	6.95	24.88	7.72	27.73	27.73	30.24	8.84	33.69	9.37	38.54	10.12
44.00	16.47	6.24	20.69	7.09	24.45	7.88	27.29	27.29	29.80	9.02	33.13	9.56	37.84	10.32
45.00	16.23	6.37	20.41	7.24	24.16	8.04	26.99	26.99	29.50	9.20	32.75	9.75	37.33	10.53
46.00	15.91	6.43	20.04	7.31	23.74	8.12	26.56	26.56	29.06	9.29	32.20	9.85	36.64	10.64
47.00	15.44	6.56	19.47	7.46	23.10	8.28	25.87	25.87	28.33	9.48	31.33	10.05	35.60	10.85
48.00	14.83	6.76	18.73	7.68	22.24	8.53	24.93	24.93	27.34	9.76	30.18	10.35	34.23	11.18
49.00	14.02	7.03	17.73	7.99	21.08	8.87	23.66	23.66	25.97	10.15	28.62	10.76	32.40	11.62
50.00	13.12	7.38	16.61	8.39	19.77	9.32	22.22	22.22	24.41	10.66	26.86	11.30	30.35	12.20

■ Ratings are based on an evaporator temperature difference of 5°C.

MGB-F(D)30W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	33.59	8.81	31.63	9.08	29.84	9.36	28.20	9.65	26.42	10.13	24.31	10.64
6.00	34.72	8.94	32.66	9.22	30.79	9.51	29.07	9.80	27.27	10.29	25.11	10.80
7.00	35.93	9.13	33.77	9.41	31.80	9.70	30.00	10.00	28.17	10.50	25.97	11.03
8.00	37.04	9.40	34.78	9.69	32.72	9.99	30.84	10.30	28.99	10.82	26.76	11.36
9.00	38.09	9.49	35.73	9.79	33.58	10.09	31.62	10.40	29.75	10.92	27.49	11.47
10.00	39.53	9.63	37.05	9.93	34.79	10.24	32.73	10.56	30.83	11.08	28.52	11.64
11.00	40.63	9.73	38.05	10.03	35.69	10.34	33.54	10.66	31.63	11.19	29.29	11.75
12.00	41.56	9.87	38.88	10.18	36.44	10.49	34.22	10.82	32.30	11.36	29.94	11.92
13.00	42.31	9.95	39.54	10.26	37.02	10.58	34.73	10.90	32.82	11.45	30.46	12.02
14.00	43.36	10.02	40.48	10.33	37.87	10.65	35.49	10.98	33.58	11.53	31.19	12.10
15.00	43.92	10.07	40.97	10.38	38.29	10.70	35.85	11.03	33.95	11.58	31.57	12.16

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	19.89	6.13	24.86	6.97	29.25	7.74	32.50	8.42	35.33	8.86	39.57	9.39	45.50	10.14
41.00	19.22	6.26	24.06	7.11	28.34	7.90	31.52	8.59	34.30	9.04	38.34	9.58	44.02	10.35
42.00	18.67	6.38	23.39	7.26	27.58	8.06	30.72	8.76	33.46	9.22	37.34	9.78	42.79	10.56
43.00	18.22	6.52	22.86	7.40	26.98	8.23	30.08	8.94	32.80	9.41	36.54	9.98	41.81	10.77
44.00	17.86	6.65	22.44	7.55	26.53	8.39	29.61	9.12	32.32	9.60	35.94	10.18	41.04	10.99
45.00	17.60	6.78	22.14	7.71	26.21	8.57	29.28	9.31	32.00	9.80	35.52	10.39	40.49	11.22
46.00	17.26	6.85	21.74	7.79	25.76	8.65	28.81	9.40	31.52	9.90	34.92	10.49	39.74	11.33
47.00	16.75	6.99	21.12	7.94	25.06	8.82	28.06	9.59	30.73	10.10	33.99	10.70	38.61	11.56
48.00	16.09	7.20	20.31	8.18	24.13	9.09	27.05	9.88	29.66	10.40	32.74	11.02	37.13	11.90
49.00	15.21	7.49	19.23	8.51	22.87	9.45	25.67	10.27	28.17	10.81	31.05	11.46	35.15	12.38
50.00	14.23	7.86	18.02	8.93	21.45	9.92	24.10	10.79	26.48	11.36	29.13	12.04	32.92	13.00

■Ratings are based on an evaporator temperature difference of 5°C.

MGB-F55W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	61.58	15.41	57.98	15.89	54.70	16.38	51.70	16.89	48.44	17.73	44.57	18.62
6.00	63.65	15.65	59.88	16.14	56.44	16.64	53.30	17.15	49.99	18.01	46.04	18.91
7.00	65.88	15.97	61.91	16.47	58.30	16.98	55.00	17.50	51.65	18.38	47.62	19.29
8.00	67.91	16.45	63.77	16.96	59.99	17.48	56.54	18.03	53.15	18.93	49.06	19.87
9.00	69.83	16.61	65.50	17.12	61.56	17.65	57.97	18.20	54.55	19.11	50.40	20.07
10.00	72.48	16.86	67.92	17.38	63.78	17.92	60.00	18.47	56.52	19.40	52.28	20.37
11.00	74.50	17.03	69.75	17.55	65.43	18.10	61.50	18.66	57.99	19.59	53.70	20.57
12.00	76.20	17.28	71.28	17.81	66.81	18.36	62.73	18.93	59.22	19.87	54.89	20.87
13.00	77.56	17.41	72.49	17.95	67.87	18.51	63.67	19.08	60.17	20.03	55.84	21.04
14.00	79.49	17.53	74.22	18.08	69.43	18.64	65.07	19.21	61.56	20.17	57.19	21.18
15.00	80.51	17.62	75.10	18.17	70.19	18.73	65.72	19.31	62.24	20.27	57.88	21.29

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	40.40	11.45	45.84	13.01	53.93	14.46	59.92	15.71	65.13	16.54	72.95	17.53	83.89	18.94
41.00	35.44	11.68	44.36	13.28	52.24	14.75	58.11	16.04	63.24	16.88	70.70	17.89	81.16	19.32
42.00	34.42	11.92	43.13	13.55	50.86	15.05	56.63	16.36	61.69	17.22	68.85	18.26	78.90	19.72
43.00	33.58	12.17	42.14	13.82	49.75	15.36	55.46	16.70	60.48	17.58	67.38	18.63	77.08	20.12
44.00	32.94	12.41	41.38	14.11	48.91	15.67	54.58	17.04	59.59	17.93	66.26	19.01	75.67	20.53
45.00	32.46	12.67	40.83	14.39	48.32	15.99	53.99	17.39	59.00	18.30	65.49	19.40	74.66	20.95
46.00	31.82	12.79	40.08	14.54	47.49	16.15	53.12	17.56	58.12	18.48	64.39	19.59	73.28	21.16
47.00	30.88	13.05	38.94	14.83	46.20	16.48	51.73	17.91	56.66	18.85	62.67	19.98	71.19	21.58
48.00	29.66	13.44	37.45	15.27	44.48	16.97	49.87	18.45	54.68	19.42	60.37	20.58	68.45	22.23
49.00	28.05	13.98	35.46	15.89	42.16	17.65	47.32	19.19	51.95	20.19	57.24	21.41	64.80	23.12
50.00	26.24	14.68	33.22	16.68	39.55	18.53	44.43	20.14	48.83	21.20	53.71	22.48	60.69	24.28

■Ratings are based on an evaporator temperature difference of 5°C.

MGB-F60W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	67.17	17.00	63.25	17.52	59.67	18.07	56.40	18.62	52.85	19.56	48.62	20.53
6.00	69.44	17.26	65.33	17.80	61.57	18.35	58.14	18.91	54.54	19.86	50.23	20.85
7.00	71.87	17.61	67.54	18.16	63.60	18.72	60.00	19.30	56.34	20.27	51.95	21.28
8.00	74.09	18.14	69.57	18.70	65.44	19.28	61.68	19.88	57.98	20.87	53.51	21.92
9.00	76.18	18.32	71.46	18.89	67.16	19.47	63.24	20.07	59.51	21.08	54.99	22.13
10.00	79.06	18.59	74.10	19.17	69.58	19.76	65.45	20.37	61.66	21.39	57.03	22.46
11.00	81.27	18.78	76.09	19.36	71.38	19.96	67.09	20.57	63.27	21.60	58.58	22.68
12.00	83.13	19.05	77.76	19.64	72.88	20.25	68.43	20.87	64.60	21.92	59.88	23.01
13.00	84.61	19.20	79.08	19.80	74.04	20.41	69.46	21.04	65.64	22.09	60.91	23.20
14.00	86.72	19.34	80.97	19.94	75.74	20.55	70.99	21.19	67.15	22.25	62.38	23.36
15.00	87.83	19.43	81.93	20.03	76.57	20.65	71.70	21.29	67.90	22.36	63.14	23.47

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	39.78	12.39	49.73	14.08	58.50	15.64	65.00	17.00	70.65	17.90	79.13	18.97	91.00	20.49
41.00	38.44	12.64	48.11	14.37	56.67	15.96	63.04	17.35	68.59	18.26	76.69	19.36	88.04	20.91
42.00	37.33	12.90	46.78	14.66	55.17	16.29	61.43	17.70	66.92	18.64	74.68	19.75	85.59	21.33
43.00	36.43	13.16	45.71	14.96	53.97	16.62	60.16	18.07	65.61	19.02	73.09	20.16	83.61	21.77
44.00	35.73	13.43	44.88	15.26	53.05	16.96	59.21	18.43	64.64	19.40	71.88	20.57	82.09	22.21
45.00	35.21	13.71	44.29	15.57	52.41	17.31	58.56	18.81	64.00	19.80	71.04	20.99	80.99	22.67
46.00	34.52	13.84	43.48	15.73	51.51	17.48	57.62	19.00	63.04	20.00	69.85	21.20	79.49	22.89
47.00	33.50	14.12	42.24	16.05	50.11	17.83	56.12	19.38	61.46	20.40	67.98	21.62	77.22	23.35
48.00	32.18	14.54	40.63	16.53	48.25	18.36	54.09	19.96	59.31	21.01	65.48	22.27	74.26	24.05
49.00	30.43	15.12	38.46	17.19	45.74	19.10	51.33	20.76	56.35	21.85	62.09	23.16	70.29	25.01
50.00	28.47	15.88	36.03	18.05	42.90	20.05	48.20	21.80	52.97	22.94	58.26	24.32	65.84	26.26

■Ratings are based on an evaporator temperature difference of 5°C.

MGB-F(D)65W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	72.77	17.97	68.52	18.52	64.64	19.10	61.10	19.69	57.25	20.67	52.67	21.70
6.00	75.23	18.25	70.77	18.81	66.70	19.39	62.99	19.99	59.08	20.99	54.41	22.04
7.00	77.85	18.62	73.17	19.19	68.90	19.79	65.00	20.40	61.04	21.42	56.27	22.49
8.00	80.26	19.18	75.36	19.77	70.90	20.38	66.82	21.01	62.81	22.06	57.97	23.17
9.00	82.52	19.36	77.41	19.96	72.76	20.58	68.51	21.22	64.47	22.28	59.57	23.39
10.00	85.65	19.65	80.27	20.26	75.38	20.89	70.91	21.53	66.80	22.61	61.79	23.74
11.00	88.04	19.85	82.44	20.46	77.33	21.09	72.68	21.75	68.54	22.83	63.47	23.98
12.00	90.06	20.14	84.24	20.76	78.95	21.40	74.13	22.06	69.98	23.17	64.87	24.33
13.00	91.66	20.30	85.67	20.93	80.21	21.57	75.25	22.24	71.11	23.35	65.99	24.52
14.00	93.94	20.44	87.72	21.07	82.05	21.72	76.90	22.40	72.75	23.52	67.58	24.69
15.00	95.15	20.54	88.76	21.18	82.95	21.83	77.67	22.51	73.55	23.63	68.41	24.81

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	42.89	13.45	53.61	15.29	63.07	16.99	70.08	18.46	76.17	19.43	85.31	20.60	98.11	22.25
41.00	41.45	13.73	51.87	15.60	61.10	17.33	67.96	18.84	73.95	19.83	82.68	21.02	94.92	22.70
42.00	40.25	14.01	50.44	15.92	59.48	17.69	66.23	19.22	72.15	20.24	80.52	21.45	92.28	23.17
43.00	39.28	14.29	49.28	16.24	58.18	18.05	64.86	19.62	70.74	20.65	78.80	21.89	90.15	23.64
44.00	38.52	14.58	48.39	16.57	57.20	18.42	63.84	20.02	69.69	21.07	77.50	22.33	88.50	24.12
45.00	37.96	14.88	47.75	16.91	56.51	18.79	63.14	20.43	69.00	21.50	76.59	22.79	87.31	24.61
46.00	37.22	15.03	46.87	17.08	55.54	18.98	62.12	20.63	67.97	21.72	75.31	23.02	85.70	24.86
47.00	36.12	15.33	45.54	17.42	54.03	19.36	60.50	21.04	66.27	22.15	73.29	23.48	83.26	25.36
48.00	34.69	15.79	43.80	17.95	52.02	19.94	58.32	21.67	63.95	22.81	70.60	24.18	80.06	26.12
49.00	32.80	16.42	41.47	18.66	49.31	20.74	55.34	22.54	60.75	23.73	66.95	25.15	75.78	27.16
50.00	30.69	17.24	38.85	19.60	46.25	21.77	51.96	23.67	57.10	24.91	62.81	26.41	70.98	28.52

■Ratings are based on an evaporator temperature difference of 5°C.

MGB-F130W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	145.54	35.93	137.04	37.05	129.29	38.19	122.20	39.37	114.50	41.34	105.34	43.41
6.00	150.46	36.49	141.54	37.62	133.40	38.78	125.97	39.98	118.16	41.98	108.83	44.08
7.00	155.71	37.24	146.34	38.39	137.80	39.58	130.00	40.80	122.07	42.84	112.55	44.98
8.00	160.52	38.35	150.72	39.54	141.79	40.76	133.64	42.02	125.62	44.13	115.95	46.33
9.00	165.05	38.73	154.83	39.92	145.52	41.16	137.02	42.43	128.94	44.55	119.14	46.78
10.00	171.31	39.31	160.55	40.52	150.75	41.78	141.82	43.07	133.59	45.22	123.57	47.48
11.00	176.08	39.69	164.87	40.92	154.66	42.19	145.36	43.49	137.08	45.67	126.93	47.95
12.00	180.11	40.28	168.49	41.52	157.91	42.81	148.27	44.13	139.97	46.34	129.75	48.65
13.00	183.33	40.60	171.33	41.85	160.42	43.15	150.49	44.48	142.22	46.71	131.98	49.04
14.00	187.89	40.88	175.43	42.14	164.11	43.45	153.80	44.79	145.50	47.03	135.17	49.38
15.00	190.30	41.08	177.52	42.35	165.90	43.66	155.34	45.01	147.11	47.26	136.81	49.63

■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	85.78	26.91	107.22	30.57	126.14	33.97	140.16	36.93	152.34	38.87	170.63	38.33	196.22	41.39
41.00	82.89	27.45	103.75	31.20	122.20	34.66	135.93	37.68	147.91	39.66	165.36	39.11	189.83	42.24
42.00	80.50	28.01	100.87	31.83	118.96	35.37	132.47	38.45	144.30	40.47	161.04	39.91	184.55	43.10
43.00	78.55	28.59	98.56	32.48	116.37	36.09	129.73	39.23	141.47	41.30	157.60	40.72	180.29	43.98
44.00	77.03	29.17	96.78	33.15	114.39	36.83	127.67	40.03	139.38	42.14	154.99	41.55	177.00	44.88
45.00	75.92	29.76	95.49	33.82	113.01	37.58	126.27	40.85	138.00	43.00	153.18	45.58	174.63	49.23
46.00	74.43	30.06	93.74	34.16	111.07	37.96	124.24	41.26	135.93	43.43	150.61	46.04	171.39	49.72
47.00	72.23	30.66	91.09	34.85	108.05	38.72	121.00	42.08	132.53	44.30	146.58	46.96	166.52	50.71
48.00	69.38	31.58	87.60	35.89	104.04	39.88	116.64	43.35	127.89	45.63	141.19	48.37	160.11	52.23
49.00	65.61	32.85	82.94	37.33	98.62	41.47	110.69	45.08	121.50	47.45	133.89	50.30	151.56	54.32
50.00	61.38	34.49	77.70	39.19	92.50	43.55	103.93	47.33	114.21	49.83	125.63	52.81	141.96	57.04

■Ratings are based on an evaporator temperature difference of 5°C.

MGB-F200W/RN1

■ Cooling:

Chilled water outlet temp.	Outdoor Air Temp.(°C)											
	21.00		25.00		30.00		35.00		40.00		46.00	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5.00	207.12	55.49	195.03	57.20	183.99	58.97	173.90	60.80	162.94	63.83	149.91	67.03
6.00	214.11	56.35	201.42	58.09	189.84	59.89	179.27	61.74	168.15	64.83	154.87	68.07
7.00	221.59	57.50	208.26	59.28	196.10	61.11	185.00	63.00	173.72	66.15	160.17	69.46
8.00	228.44	59.22	214.49	61.06	201.78	62.94	190.18	64.89	178.77	68.13	165.00	71.54
9.00	234.87	59.80	220.33	61.65	207.06	63.55	194.99	65.52	183.49	68.80	169.54	72.24
10.00	237.19	60.70	222.30	62.57	208.73	64.51	196.36	66.50	184.97	69.83	171.10	73.32
11.00	243.81	61.29	228.28	63.19	214.15	65.14	201.27	67.16	189.80	70.52	175.75	74.04
12.00	249.38	62.19	233.29	64.11	218.64	66.10	205.29	68.14	193.80	71.55	179.65	75.13
13.00	253.84	62.69	237.23	64.63	222.13	66.63	208.37	68.69	196.91	72.12	182.74	75.73
14.00	260.15	63.12	242.91	65.08	227.23	67.09	212.96	69.16	201.46	72.62	187.15	76.25
15.00	263.49	63.43	245.79	65.40	229.71	67.42	215.09	69.50	203.69	72.98	189.43	76.63

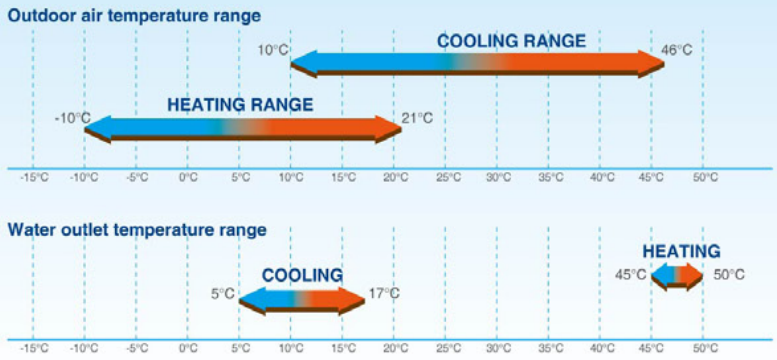
■ Heating:

Hot water outlet temp.	Outdoor Air Temp.(°C)													
	-10		-6		-2		2		7		10		13	
	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power	Capacity	Power
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
39.00	124.31	38.17	155.39	43.37	182.81	48.19	203.13	52.38	220.79	55.14	247.28	58.45	284.38	63.12
41.00	120.14	38.95	150.36	44.26	177.10	49.18	197.00	53.45	214.36	56.26	239.65	59.64	275.12	64.41
42.00	116.66	39.74	146.19	45.16	172.40	50.18	191.98	54.54	209.13	57.41	233.39	60.86	267.46	65.73
43.00	113.85	40.55	142.84	46.08	168.65	51.20	188.01	55.66	205.03	58.58	228.40	62.10	261.29	67.07
44.00	111.64	41.38	140.26	47.02	165.79	52.25	185.03	56.79	202.00	59.78	224.62	63.37	256.52	68.44
45.00	110.03	42.22	138.40	47.98	163.79	53.31	183.00	57.95	200.00	61.00	222.00	64.66	253.09	69.83
46.00	107.87	42.65	135.86	48.46	160.97	53.85	180.06	58.53	197.00	61.61	218.28	65.31	248.40	70.53
47.00	104.69	43.50	132.01	49.43	156.60	54.92	175.36	59.70	192.08	61.81	212.43	66.61	241.33	71.94
48.00	100.55	44.80	126.96	50.91	150.78	56.57	169.04	61.49	185.35	63.67	204.63	68.61	232.05	74.10
49.00	95.08	46.60	120.20	52.95	142.93	58.83	160.41	63.95	176.08	66.21	194.05	71.36	219.66	77.06
50.00	88.96	48.93	112.61	55.60	134.05	61.78	150.62	67.15	165.52	69.52	182.07	74.92	205.74	80.92

■Ratings are based on an evaporator temperature difference of 5°C.

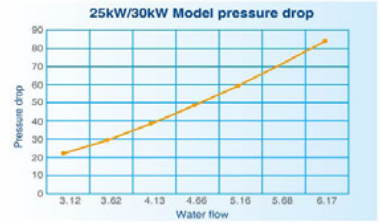
Application range

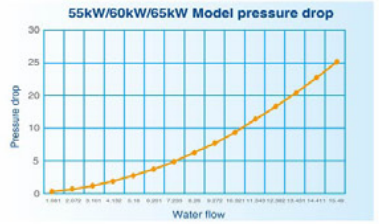
Operation temperature range

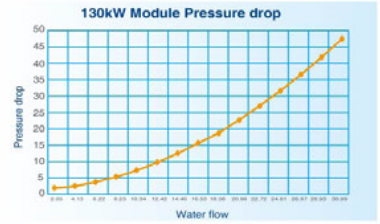


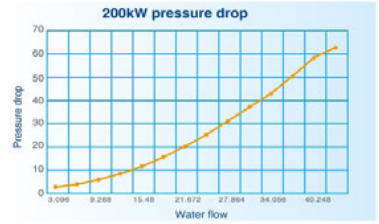
Model	Outdoor Air temperature range	Water outlet temperature range
Cooling	10°C ~ 46°C	5°C ~ 17°C (7°C is default)
Heating	-10°C ~ 21°C	45°C ~ 50°C (45°C is default)

Water pressure drop



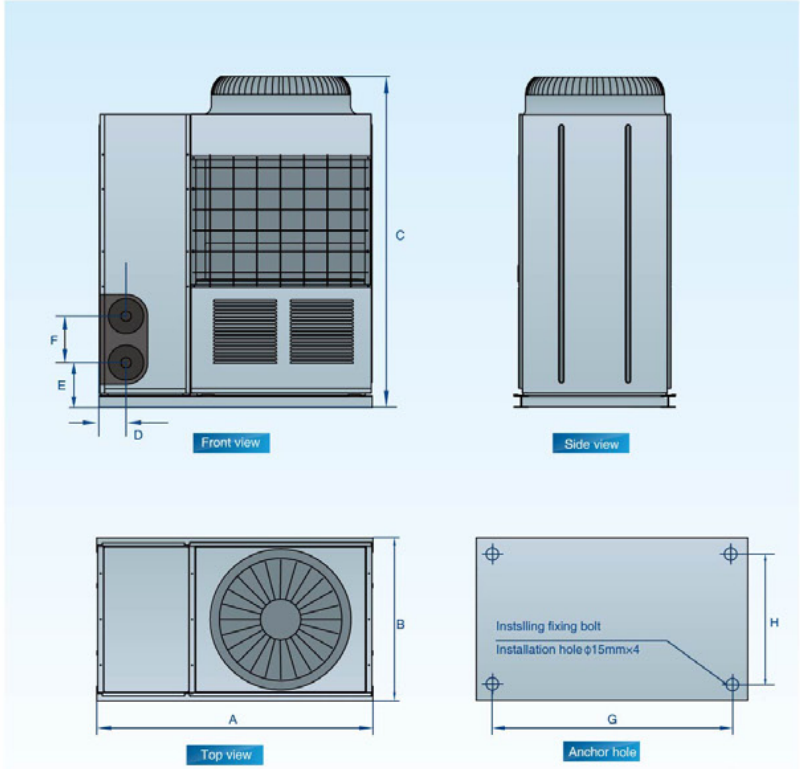






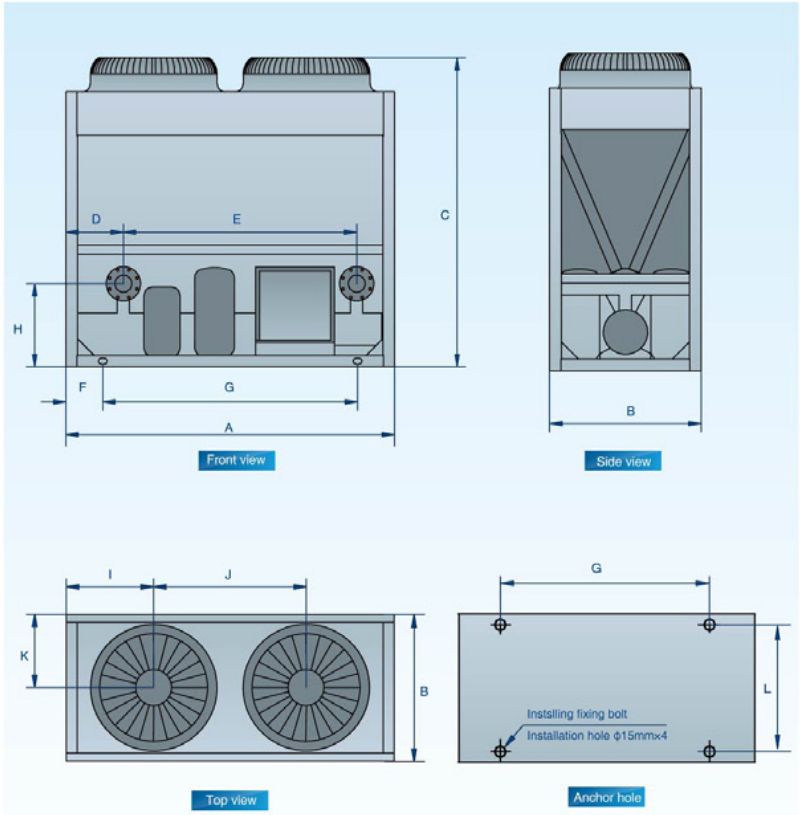
Dimension

25/30 module



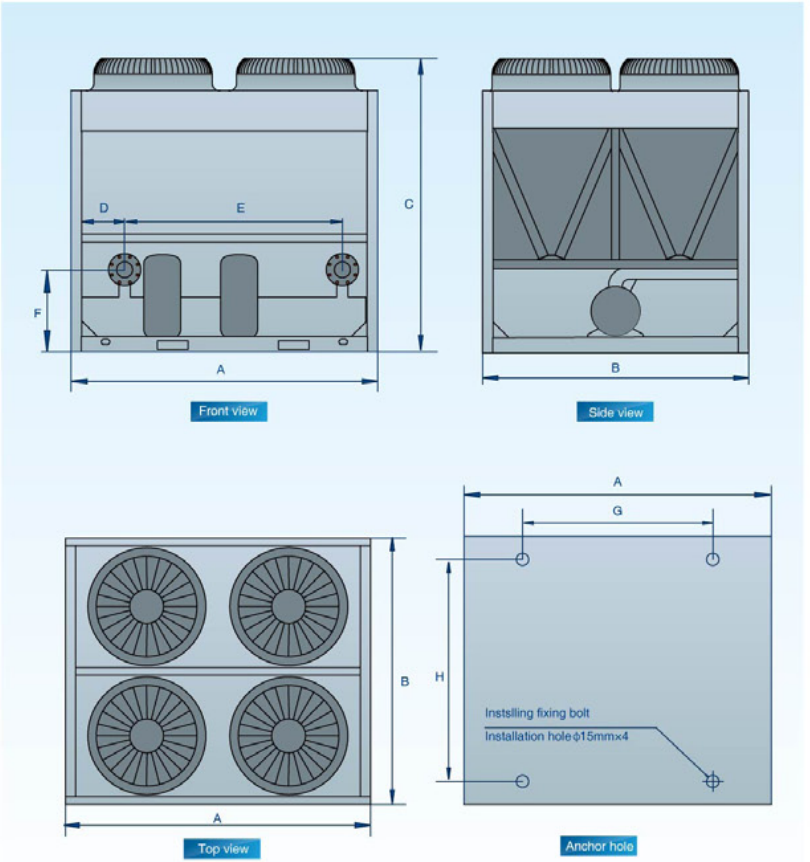
Model	Unit	A	B	C	D	E	F	G	H
MGB-F(D)25W/RN1 MGB-F(D)30W/RN1	mm	1514	841	1865	115	315	172	1470	852
	inch	59.6	33.11	73.43	4.53	12.4	6.77	57.87	33.54

55/60/65 module



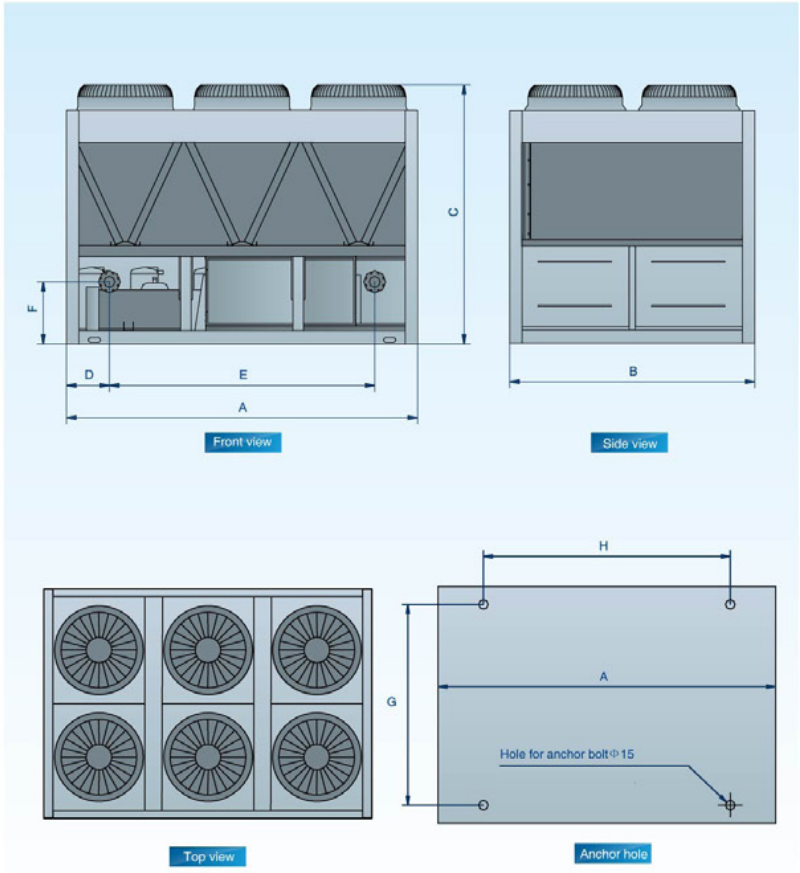
Model	Unit	A	B	C	D	E	F	G	H	I	J	K	L
MGB-F55W/RN1 MGB-F60W/RN1 MGB-F65W/RN1	mm	2000	900	1880	350	1420	225	1500	506	530	930	450	805
	inch	78.74	35.4	74	13.78	55.91	8.86	59.06	19.92	20.87	36.61	17.72	31.69

130 module



Model	Unit	A	B	C	D	E	F	G	H
MGB-F130W/RN1	mm	2000	1685	2080	350	1420	506	1550	1586
	inch	78.74	66.34	81.89	13.78	55.91	19.92	61.02	62.44

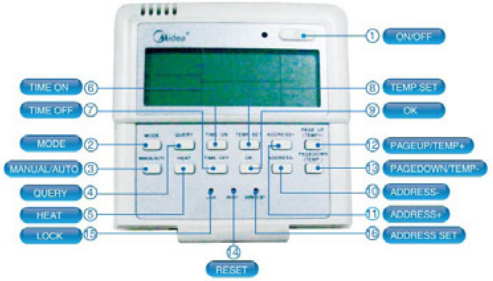
200 module

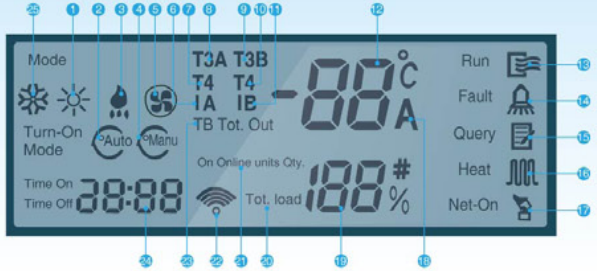


Model	Unit	A	B	C	D	E	F	G	H
MGB-F200W/RN1	mm	2850	2000	2110	3470	2156	506	1888	2388
	inch	112.2	78.74	83.07	136.61	84.88	19.92	74.33	94.02

Wire controller

Wire controller is a human-machine interaction(HMI) used for the communication between chiller operator and main board on the chiller itself. The setting and operation order can be send to the main board through the wire controller and the running condition can be displayed by the wire controller. KJR-08B/BE is a old wire controller which is used in the current module. KJR-120A/MBE is a new generation wire controller used in the 65Kw digital scroll module with the new function of temperature difference setting, checking points and remote control function displaying etc.





Item	Description	Item	Description
1	Heating mode.	14	The unit has error, the light is on.
2	AUTO running mode.	15	When query, the light is on.
3	Dehumidify mode.	16	When start up the auxiliary electric heater, the light is on.
4	MANUAL running mode.	17	When start up the net-on , the light is on.
5	Pump mode.	18	Current unit Amp.
6	The running current of compressor in system A	19	Actually output capacity.
7	The outdoor ambient temp. T4	20	Total load.
8	The piping temp. T3A of condenser in system A	21	Inspected the units quantity on line.
9	The piping temp. T3B of condenser in system B	22	The icon of unit quantity on line.
10	Setting water temp. TS	23	The total outlet water temp of plate heat exchanger.
11	The running current of compressor in system B	24	Display time of timing on or off.
12	Display query data.	25	Cooling mode.
13	Normally run, the light is on.		

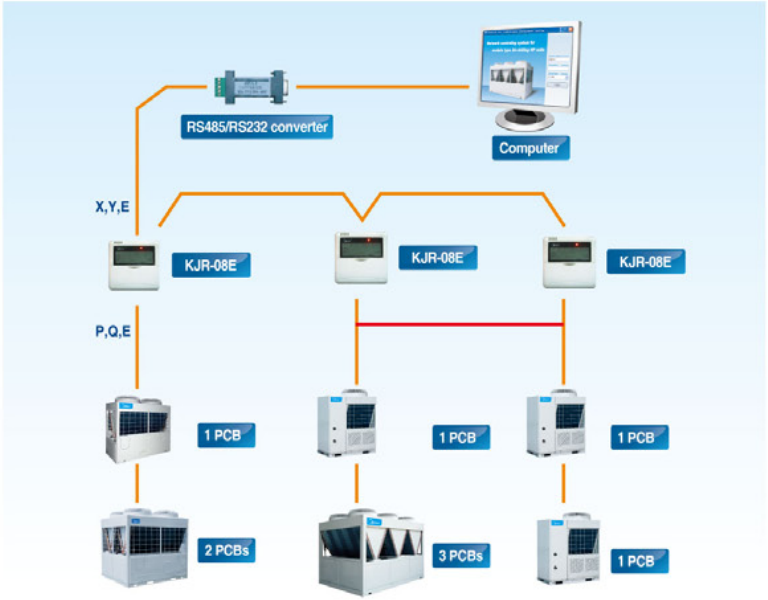
Network control system

SYSTEM INTRODUCTION

This system is mainly composed by Epistatic Unit (network control system of epistatic unit), KJR-08B wire controller as well as sub-module. Each Epistatic Unit connects with a 485 bus via serial port; mostly 16 set of KJR-08B wire controller could be connected with a bus, while each wire controller could be under connected with mostly 16 sets of Heat Pump Air Chilling module (i.e. mostly 256 sets of Heat Pump Air Chilling module could be connected in this system). The address 0 is the main unit, other address are auxiliary units.

Hardware composing

Computer, RS485-232 converter, KJR-08B/BE wire controller, Module unit group.



Main Function:

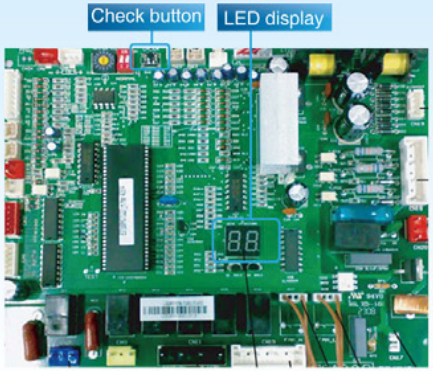
- Control operation mode in the refrigeration system.
- Query real-time operating parameter in the main system and subsystem.
- Set up the weekly timing that could realizes the schedule management for the refrigeration system.
- Record refrigeration system error.

Protection

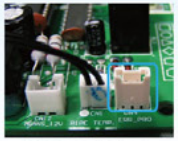
All the protection and alarm information will be showed on the LED display on the main board. The Chiller Controller continuously performs important self-diagnostic checks while monitoring system temperatures, pressures and protection devices. It wills automatically shut down a compressor, a refrigerant circuit or the entire unit if a fault occurs.

- Use the check button and LED display can check the system operating status.
- When under protection or error ,the LED will display protection code or error code .

No.	Code	Trouble
1	E0	Water flow detection error (The third time)
2	E1	Power phase sequence error
3	E2	Communication error
4	E3	Total water outlet temperature sensor error
5	E4	Outlet water temperature sensor in Shell and tube exchanger error
6	E5	Pipe temperature sensor in condenser A error
7	E6	Pipe temperature sensor in condenser B error
8	E7	Outdoor ambient temperature sensor error
9	E8	System A is air discharge temperature sensor in digital compressor error
10	E9	Water flow detection error (The first and second times)
11	EA	Main unit detect that auxiliary unit's quantity have decreased
12	EB	Freeze-proof temperature sensor 1 in shell and tube exchanger error
13	EC	Wire control did not found out any on-line module unit
14	ED	Wire control and module unit communication error
15	Ed	1-hour consecutive 4-times PE protection
16	EE	Wire control and computer communication error
17	EF	Inlet water temperature sensor error
18	P0	High pressure or air discharge temperature protection error in system A
19	P1	Low pressure protection system A
20	P2	High pressure or air discharge temperature protection in system B
21	P3	Low pressure protection System B
22	P4	Current protection in system A
23	P5	Current protection in system B
24	P6	Condenser high pressure protection in system A
25	P7	Condenser high pressure protection in system B
26	P8	System A is air discharge temperature sensor in digital compressor
27	P9	Protection of outlet and inlet water temperature difference
28	PA	Starting protection of low-temp cooling
29	Pb	System freeze-proof protection
30	PC	(Reserved failure code)
31	PE	Low-temperature protection of shell-and-tube heat exchanger
32	F1	EEPROM failure
33	F2	Failure of reduction of wired controller number at parallel connection of multiple wired controller (reserved) parallel connection of multiple wired controller




Compressor current protection


Phase protection

ADDITIONAL SAFETY PROTECTION

Midea modular air cooled chillers are equipped with intelligently designed safety control to ensure continuous safe operation. High and low pressure switch is provided to prevent the compressor damage resulting from either abnormally high discharge head pressure or low pressure. Differential pressure and paddle type flow switches are also provided with the units. The wire controller provides accurate water temperature control in the circuit by closely monitoring and reacting to the input from the water entering temperature, water leaving temperature and ambient air temperature. During normal condition, if the water leaving temperature falls below setting temperature (antifreeze temperature) the unit will be cut off automatically. Flow switch and Power contactor with thermal relays for compressor, fan motor and water pump are providing secondary protection for the unit. Each module is equipped with overload condenser fan motor protection and pump interlock input.


Low pressure switch

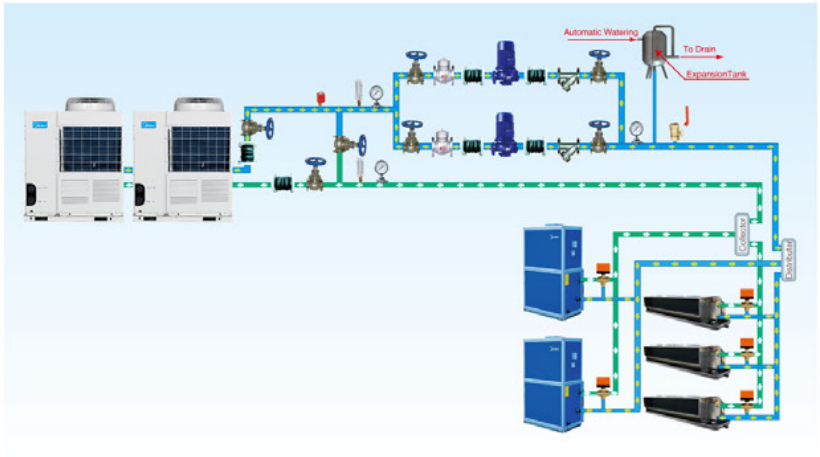

High pressure switch

Three phase power protector

Typical piping

Typical piping

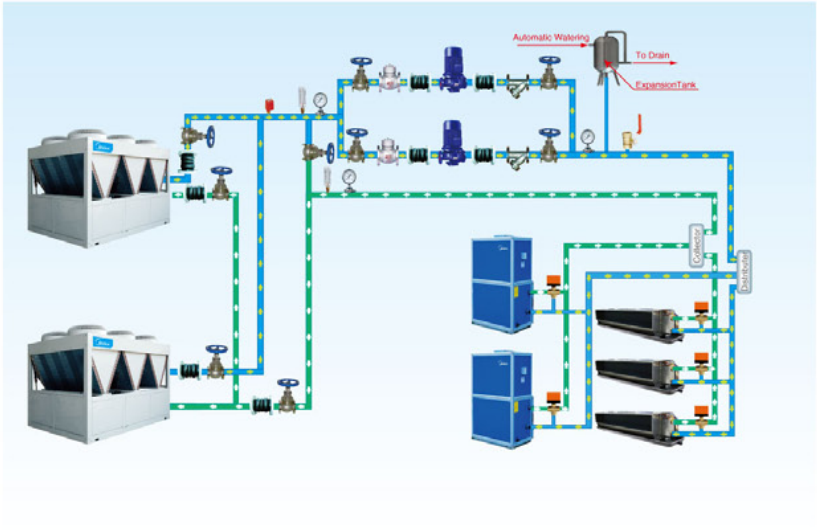
25/30kW module water pipeline sketch drawing



■ The table below describes the symbols.

Symbol	Symbol Explanation	Symbol	Symbol explanation
	Stop Valve		Y-Shaped Filter
	Pressure Gauge		Thermometer
	Water Flow Switch		Water Pump
	3-Way Valve		Check Valve
	Soft Joint		Air Vent

200kW module water pipeline sketch drawing



■ The table below describes the symbols.

Symbol	Symbol Explanation	Symbol	Symbol explanation
	Stop Valve		Y-Shaped Filter
	Pressure Gauge		Thermometer
	Water Flow Switch		Water Pump
	3-Way Valve		Check Valve
	Soft Joint		Air Vent

Electric characteristics

Model	Outdoor Unit				Power Supply		Compressor		OFM	
	Hz	Voltage	Min.	Max.	TOCA	MFA	LRA	RLA	kW	FLA
MGB-F25W/RN1	50	380-415	342	457	21.3	36	74(x2)	9.1(x2)	0.67	3.1
MGB-D25W/RN1	50	380-415	342	457	21.3	36	74(x2)	9.1(x2)	0.67	3.1
MGB-F30W/RN1	50	380-415	342	457	22.6	36	74(x2)	9.1(x2)	0.67	3.1
MGB-D30W/RN1	50	380-415	342	457	22.6	36	74(x2)	9.1(x2)	0.67	3.1
MGB-F55W/RN1	50	380-400	342	440	49.8	100	110(x2)	17.6 (x2)	0.65(x2)	3.0(x2)
MGB-F60W/RN1	50	380-400	342	440	51.7	100	110(x2)	17.6(x2)	0.65(x2)	3.0(x2)
MGB-F65W/RN1	50	380-400	342	440	54.5	100	110(x2)	17.6 (x2)	0.65(x2)	3.0(x2)
MGB-F130W/RN1	50	380-400	342	440	130	200	110(x4)	17.6 (x4)	0.88(x4)	4.0(x4)
MGB-F200W/RN1	50	380-400	342	440	260	350	110(x6)	17.6 (x6)	0.88(x6)	4.0(x6)

Remark:

- TOCA: Total Over-current Amps. (A)
- MFA: Max. Fuse Amps. (A)
- LRA: Locked Rotor Amps. (A)
- RLA: Rated Locked Amps. (A)
- OFM: Outdoor Fan Motor.
- FLA: Full Load Amps. (A)
- kW: Rated Motor Input (kW)

Accessories

Item	Name of accessory	Type	Qty	Shape	Usage
1	Installation and owner's manual	---	1		Installation and using instruction.
2	The total outlet water temperature test kit	LSQWRF65M/A-C.ZL.10	1		Inspection the temperature of total outlet water.
3	Wired controller	KJR -08B/BE	1		Control the system.
4	Water flow switch	WFS-1001-H	1		Anti-freezing protection (Only for 180KW)

Function option

ITEMS	STANDARD	OPTION
Cooling mode	●	
Heating mode	●	
Cooling in low ambient temperature(-10°C)		●
Wire controller	●	
PC based network software control	●	
BMS gateway(Lonworks)		●
BMS gateway(Modbus)		●
Alarm signal output	●	
Remote control(Start/Stop/Mode setting)		●
Set the water delta T		●
Manual reset the alarm		●
Inquire the outlet water temperature and anti-freeze temperature		●
Clock display on the wire controller/Stop setting according to the timer		●

■Any of the option function should be confirmed by the factory before place the order. It is helpful for the factory to do necessary change in the product.