INSTALLATION, OPERATION & MAINTENANCE MANUAL

Air Cooled Chiller

Models: MAC060/090/120D4

MOODY INTERNATIONAL CERTIFICATION ISO 9001 Approval

UKAS QUALITY MANAGEMENT No.014 - A

McQuay Air Conditioning

MAC0906-V2

Part No.: M08019320011

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5. Notice

Caution

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

McQuay is not responsible for any unit damage, personal injury or death due to not complying with these requirements.

Warning

Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

Warning

It is not allowed to install the unit in public area.

Warning

A fit Air-switch should be installed in the main electrical wire when the unit connects with electric net system.

Moving machinery and electrical power is hazardous. It may cause severe personal injury or death. Disconnect and lock off the Air-switch or power before servicing equipment.

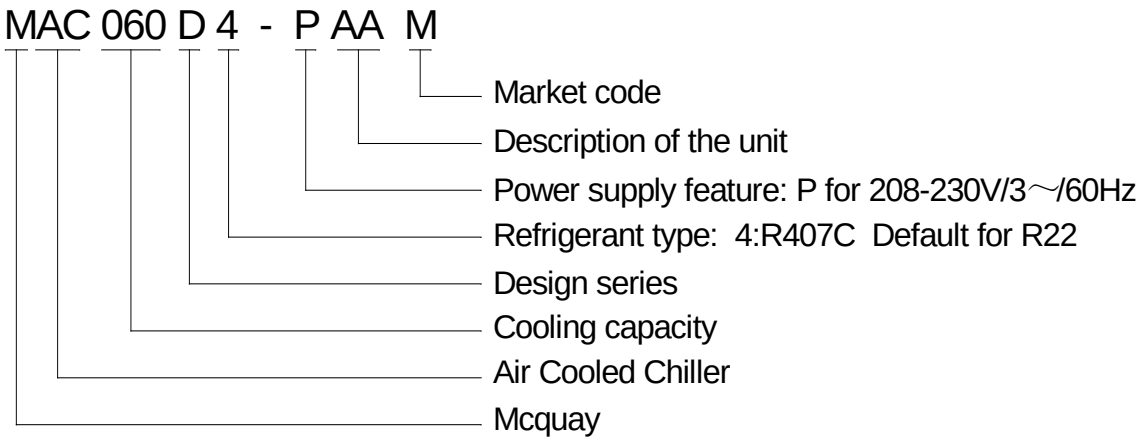
"Bulletin illustrations cover the general appearance of McQuay International products at the time of publication and we reserve the right to make changes in design and construction at any time without notice."

1 Introduction

Introduction

For years, McQuay international has earned a reputation for providing the industry with various highest quality and most technologically advanced air conditioning systems. Now Shenzhen McQuay is proud to introduce the new generation air-cooled chiller-MAC D series. Inherited from the advantage of the earlier product experiences and introduced the most up-to-date technology, the new MAC D series is designed with the always-in-mind concept - to satisfy customers' high efficiency, comfort, safety, intelligence requirements to maximum extent. The unit can be flexibly coupled with multi fan coil units, easily operated with artificial intelligence, additionally combined with indoor top level decoration, these altogether bring you to enjoy the nobility coming from central air conditioning.

Nomenclature



2 Features

Superior Performance

Extensive research work coupled with world leading manufacturing technology has resulted the new design with superb performance and high efficiency.

Stringent quality control and component selection ensure performance and reliability. Major components are rigorously tested and qualified prior to usage in the machine.

Every machine design has passed many hours of rigorous testing to ensure the machine reliability, durability and quality.

Scroll compressor brings much higher energy efficiency. High efficiency heat exchanger ensures strenuous exertion of equipment capacity. Water pump particularly designed for air conditioning engineering is operating steadily with minimum vibration and noise.

These units are designed with double independent refrigerating system, greater energy saving is achieved by only one compressor on duty under part load condition.

Robust Construction with Slim Outlook

Detailed engineering work coupled with extensive market research has resulted the new MAC model come in new mono-block design to yield a compact and robust structure while maintaining the slim outlook. The smaller capacity models MAC060D4 are having side discharge design, while the larger capacity models MAC090/120D4 are having top discharge design.

Simple to Operate

The machine is complete with intelligent microprocessor controller and temperature sensor to automatically control the operation to its optimum condition, making it very simple to operate. All temperature settings are finished before shipment. The only thing for user to do is to start the unit by pressing the ON/OFF button after ensuring unit proper function, then every operation can be automatically performed by the unit itself.

Either wireless remote controller or wired remote controller is ready for choosing to meet satisfactory indoor unit control, both compatible with the unit.

Friendly Installation

The machine has been designed with installation friendly in mind such that no refrigeration charging or copper pipe brazing is required on site.

Threaded fitting is provided for easy water piping connection on site.

Taper threaded fittings target convenient disassembly or assembly.

Expansion chamber, water pump and water pressure differential switch is already equipped in this compact packaged unit. In addition, McQuay provides accessory hydraulic kit with water storage tank, auto water fill valve, auto air vent valve, auto pressure relief valve and strainer integrated in, aiming at ensuring high efficiency and safe operation.

Safety Control

Protection devices such as dual pressure protection and overload protection etc. is provided to ensure unit operating within safety condition range. The microprocessor-based controller automatically directs system on or off by processing the water temperature feedback. If the water temperature falls to unacceptable low point, the controller automatically shut off the system to prevent hydraulic system internal freeze for unit safety operation. Meanwhile, the microprocessor-based controller automatically monitors every component operating status and malfunction, and feedback it to indoor controller to greatly ease the work of status monitor and troubleshooting.

All Weather

The cabinet is made of electro galvanized mild steel sheet, coated with baked polyester power to ensure the units extra durability in all climates against sun, rain, wind corrosion.

Space saving (small footprint) design of the machine eliminates large installation area requirement, no need for equipment room.

The machine uses high quality parts to ensure durability in various climate conditions.

Simple to Maintain

The simple design of the machine allows for maximum serviceability. All components are with reach of the maintenance personnel upon open up of the servicing panel. If emergency shutoff occurs, the microprocessor-based controller will indicates the fault cause to quicken and ease troubleshooting.

General Specification

Compressor

McQuay Mini Chillers are equipped with highly efficient, reliable and silence scroll compressors for MAC060/090/120D4

Air-Cooler Condenser

The air-cooled condenser coil consists of staggered rows of 3/8'' OD seamless copper tube, mechanically expanded into die formed aluminum fins to ensure optimum heat exchange capability.

Condenser Fan Motor

To achieve the high air change requirement, the unit is equipped with high airflow propeller fan. The fan is directly driven by weather proof motor to ensure reliable continuos operation.

Evaporator

The heat exchanger is made of stainless steel plates closely arranged and brazed together to ensure high heat exchange efficiency. The complete heat exchanger is insulated with thermal closed cell nitric rubber foam to give optimum thermal insulation.

Refrigerant Circuit

The refrigerant circuit is brazed and vacuumized in factory before accurately charged with R407C to ensure optimum operating requirement, to ensure flawless continuous operation.

Additional Safety Protection

The units are equipped with intelligently designed safety control to ensure continuous safe operation. Pressure switch and sensor is provided to prevent the compressor damage, resulting from both abnormal high discharge pressure and low pressure due to insufficient gas.

The standard electronic 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.

Pressure difference switch is provided in the unit to protect against lack of water flow.

During abnormal condition, the electronic controller will turn the unit off and the then display the faulty of operation. (Refer to **Troubleshooting** sheet)

Parameter

MODEL			MAC060D4	MAC090D4	MAC120D4
NOMINAL COOLING CAPACITY		W	17500	30000	33500
POWER SUPPLY			208-230V/3～/60Hz		
REFRIGERANT TYPE			R407C		
RATED COOLING POWER INPUT		W	6000	10100	10600
RATED COOLING CURRENT		A	18.8	34.7	35.7
FAN MOTOR	TYPE/DRIVE		Propeller/Direct		
	RATED POWER INPUT	W	360	1000	1000
	RATED CURRENT	A	1.6	3.7	3.7
PUMP	TYPE		Horizontal Multistage End-Suction		
	RATED POWER INPUT	W	1410	1410	1410
	RATED CURRENT	A	3.4	3.4	3.4
	AVAILABLE HEAD	m	20.0	16.5	14.0
WATER FLOW RATE		m^3/h	2.71	4.65	5.19
UNIT WATER PRESSURE DROP		kPa	95.5	100.5	110.0
TOTAL UNIT DIMENSION	HEIGHT(H)	mm	1700	1840	1840
	WIDTH (W)		1212	840	840
	DEPTH (D)		502	990	1290
INSTALLATION WATER PIPE CONNECTION			Rc 1	Rc 1 1/2	
CONDENSER TYPE			Cross Aluminum Finned Seamless Copper Tubes		
EVAPORATOR TYPE			Stainless Steel Brazed Plate Heat Exchanger		
SOUND LEVEL		dB(A)	62	66	66
NET WEIGHT		kg	215	270	312

Notes:

1) All specifications are subjected to change by manufacturer without prior notice.

2) Nominal cooling parameters are based on leaving water temperature 6.7℃, ambient temperature 35℃ and 0.043 l/s per kW water flow factor.

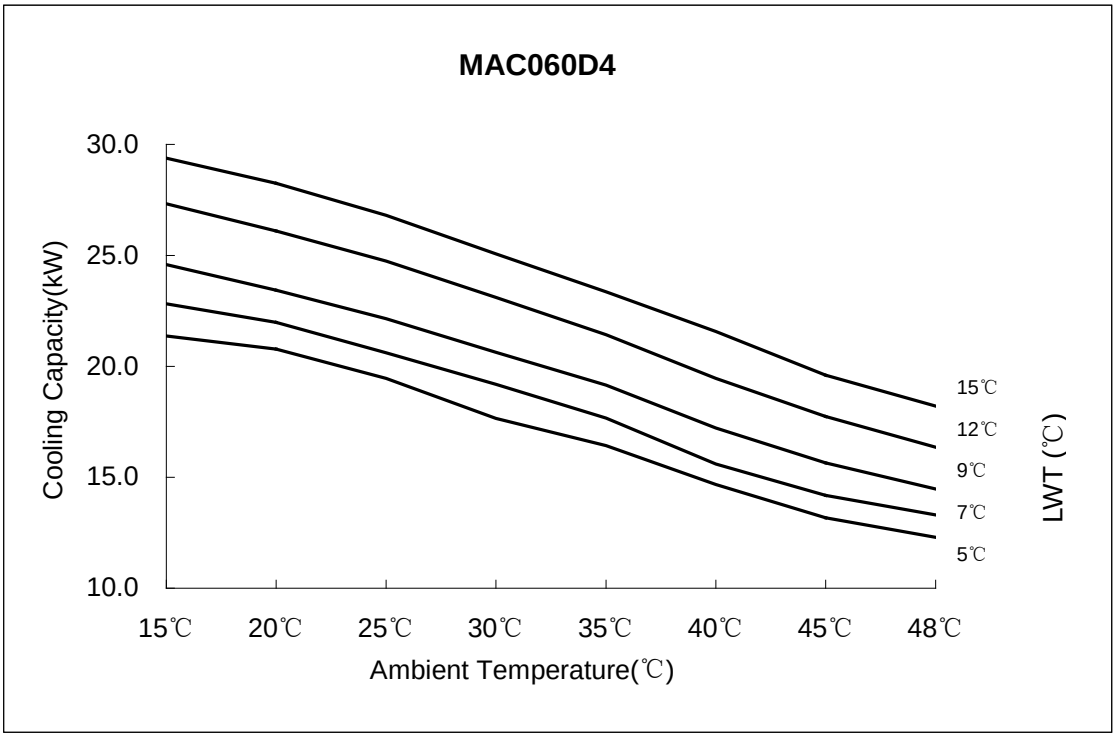
3) Rated cooling power input doesn't include the pump consumption.

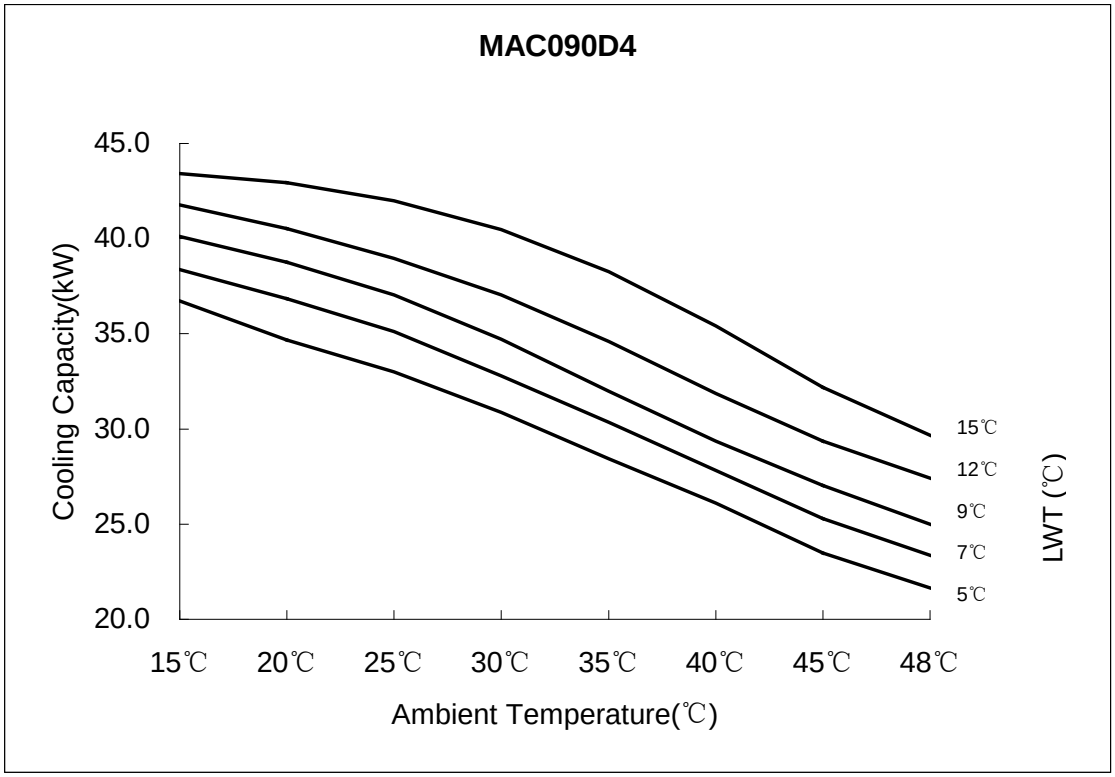
4) Actual performance can be determined by conducting correction after looking up the following charts.

Based on the ambient temperature and required return water temperature, we can locate the corresponding performance factor in these charts, then the corresponding actual cooling (heating) capacity and power input can be determined by using the performance chart.

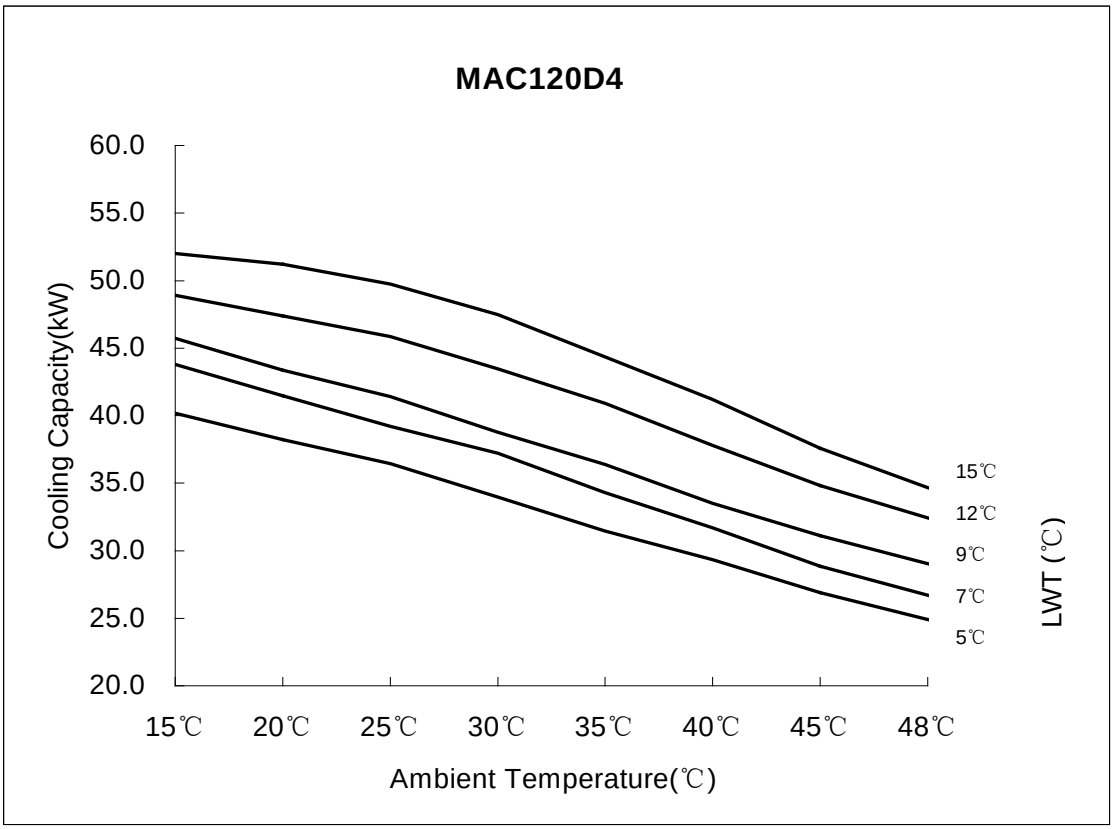
Performance Chart

Cooling Capacity Performance Chart

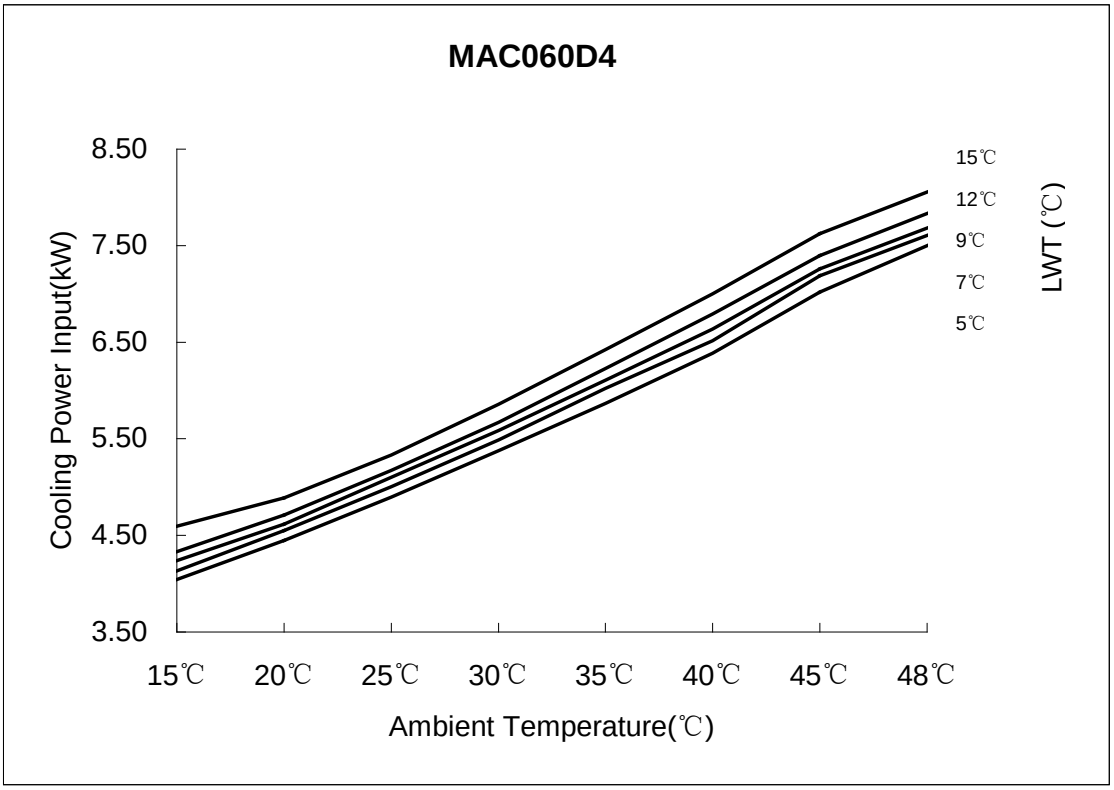




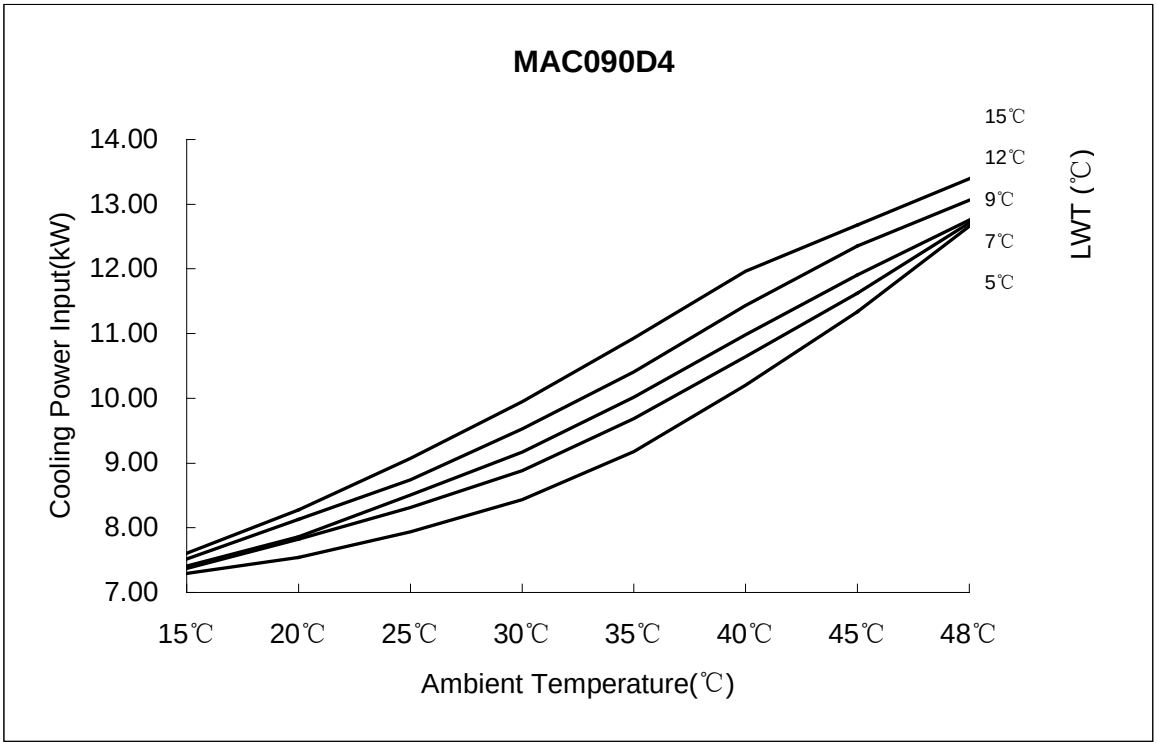
LWT : Leaving Water Temperature

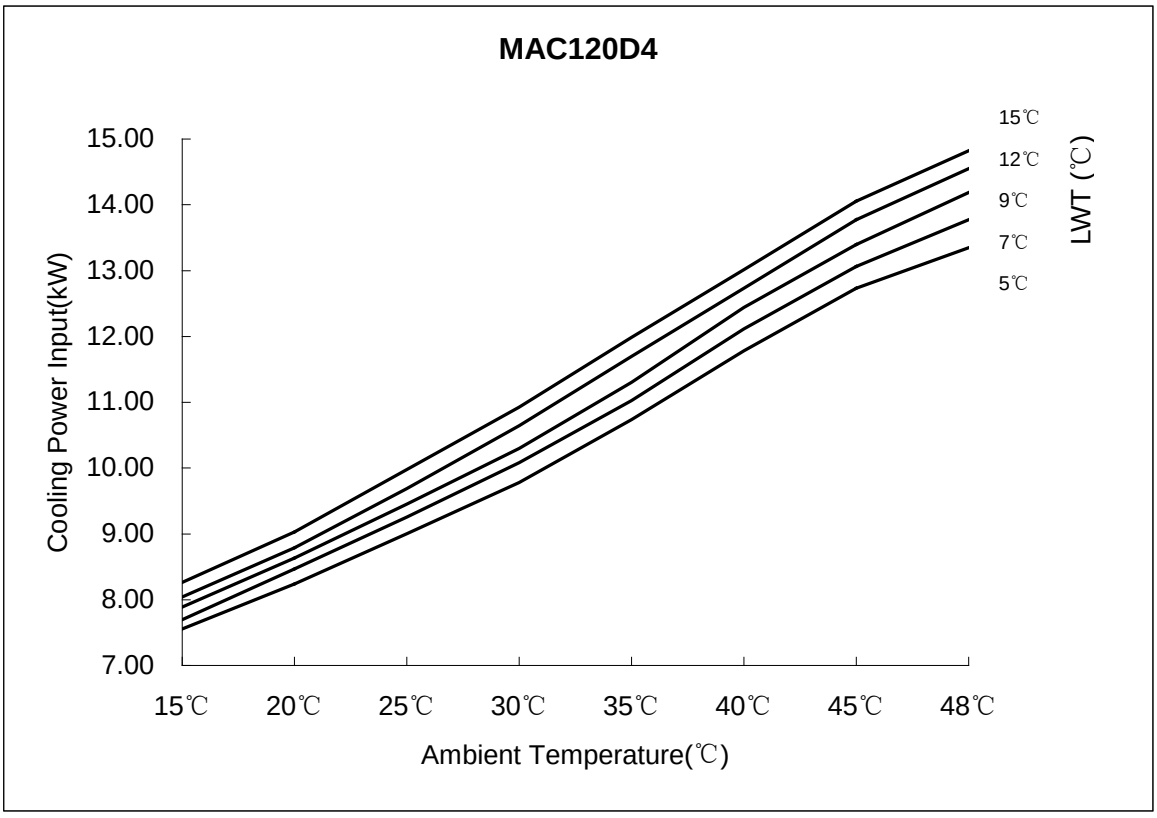


Cooling Power Input Char



LWT : Leaving Water Temperature





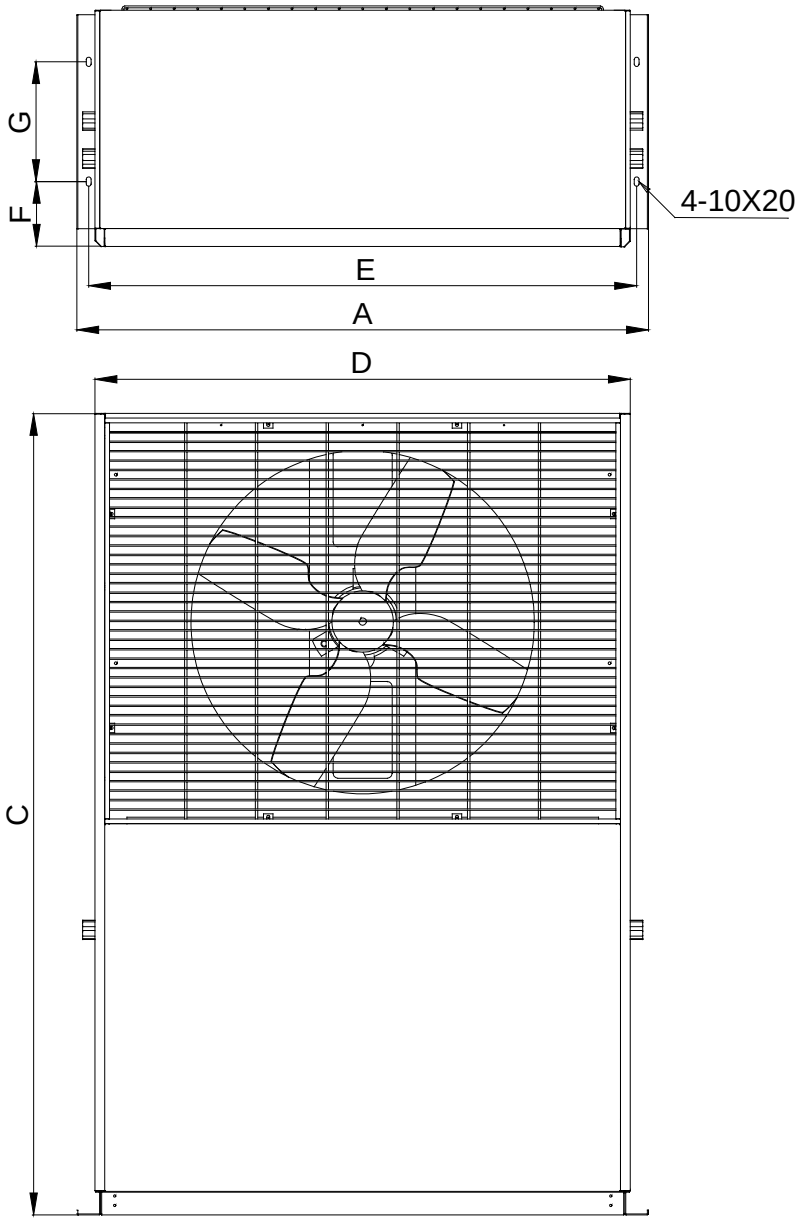
LWT : Leaving Water Temperature

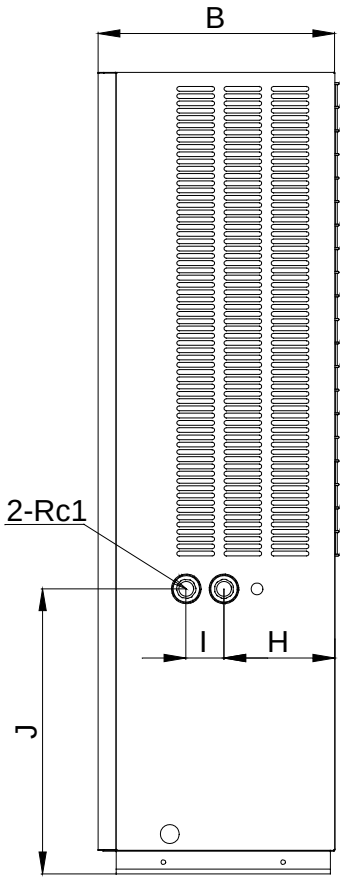
Notes:

The charts above show the unit performance characteristic in relationship with variable ambient temperature and leaving water temperature. Please notice that there are some little differences between the performance of actual manufactured unit and that obtained using these charts.

Outlines and Dimensions

Model: MAC060D4

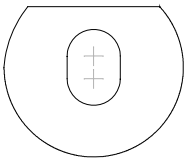




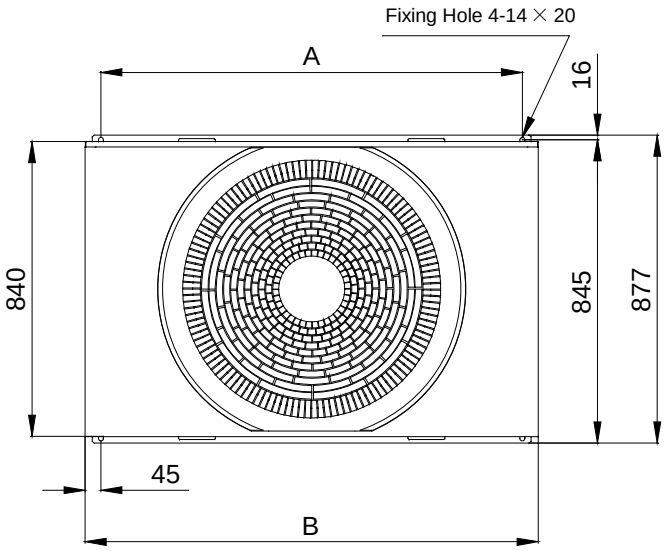
UNIT: mm

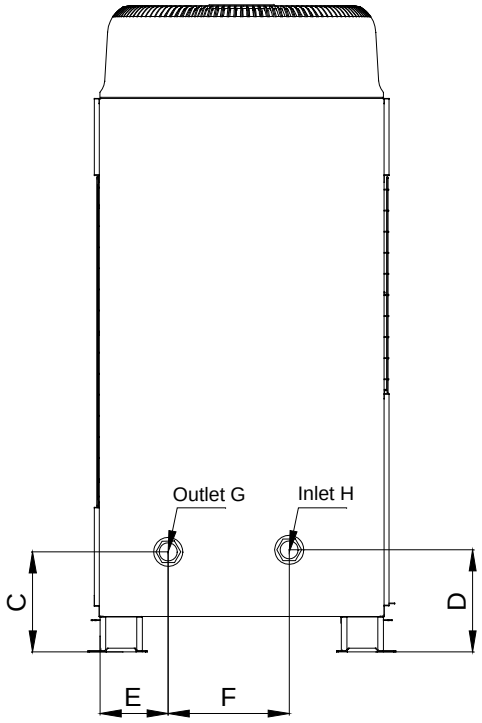
Model	A	B	C	D	E	F	G	H	I	J
MAC060D4	1212	502	1700	1135	1162	132	254	235	80	604.5

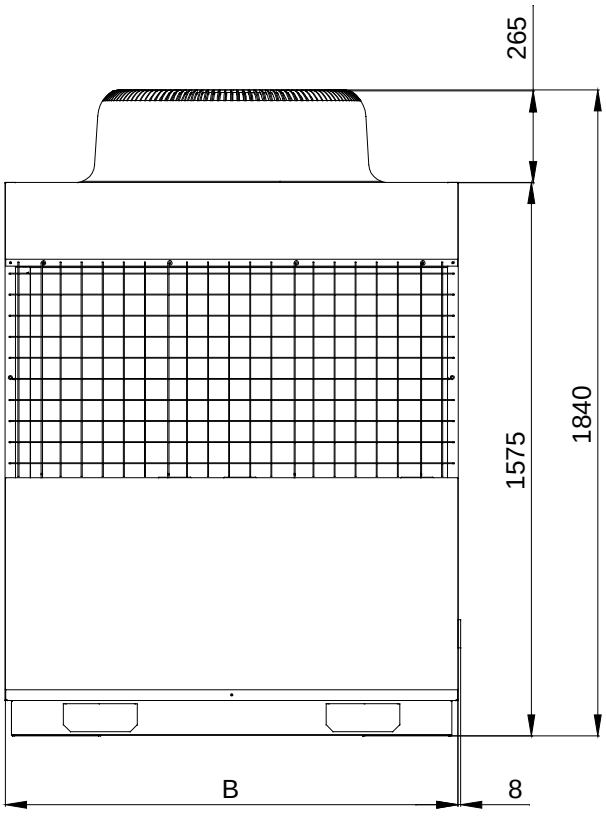
Model: MAC090D4



4-14× 20 Fixing Hole Zoom





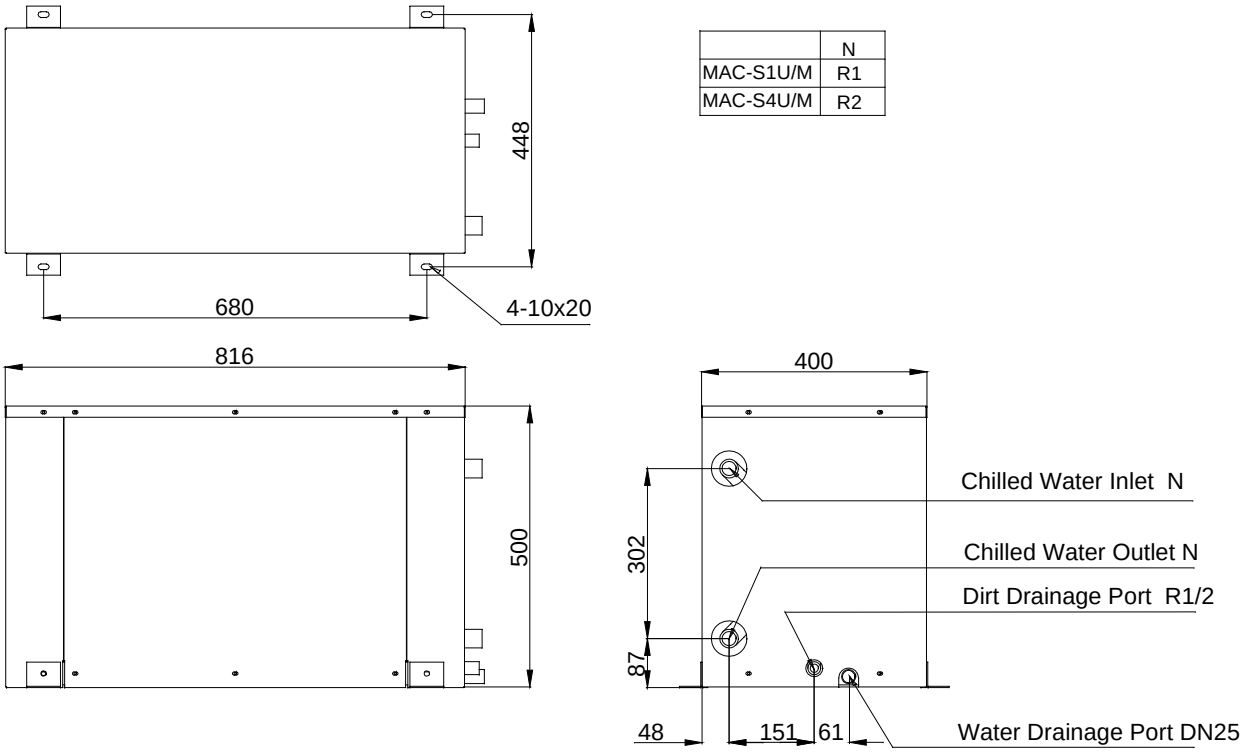


UNIT: mm

Model	A	B	C	D	E	F	G	H
MAC090D4	900	990	180	215	285	271	Rc1-1/2	Rc1-1/2
MAC120D4	1200	1290	180	215	286	267	Rc1-1/2	Rc1-1/2

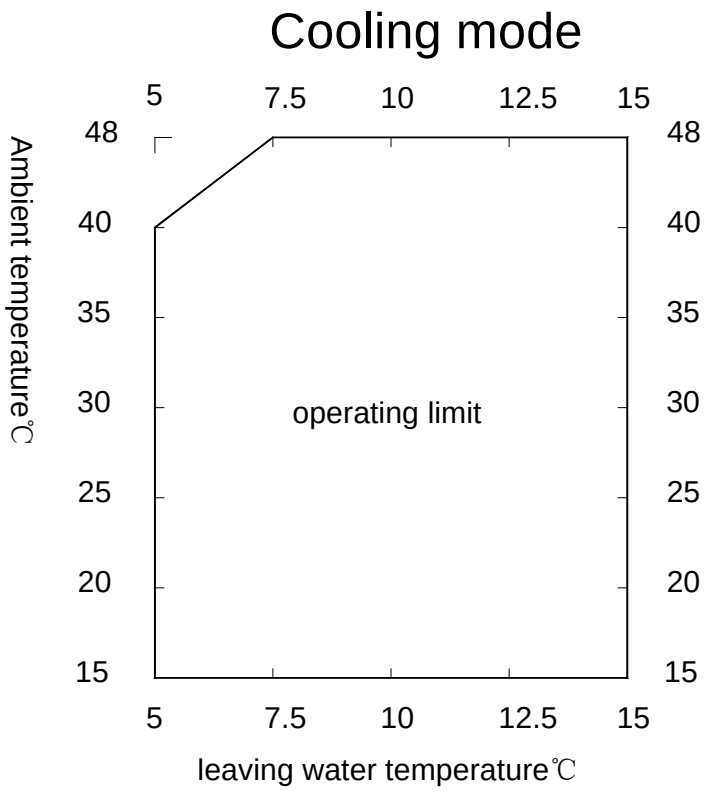
Accessory Hydraulic Kit

Accessory hydraulic kit consists of 40L capacity stainless steel water storage tank, 8L volume water expansion chamber, safety valve, dirt drainage valve, and auto air vent valve etc.



	N
MAC-S1U/M	R1
MAC-S4U/M	R2

Operation Limit



3 Installation

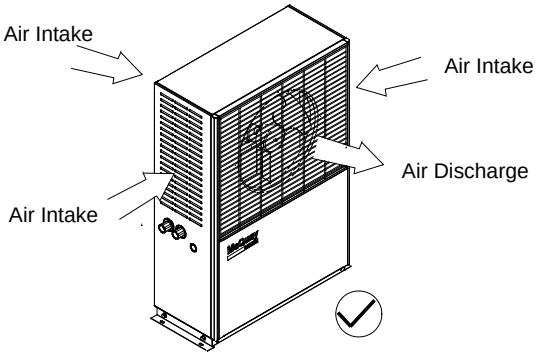
Unit Installation

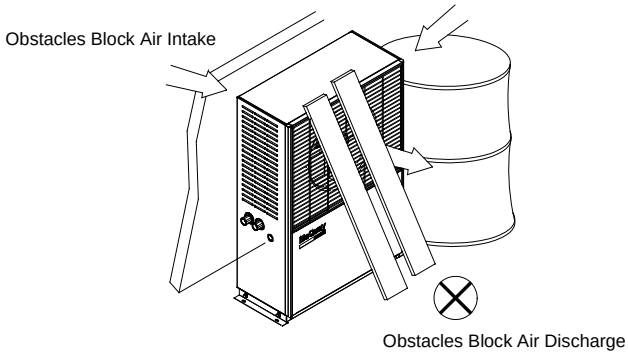
The chiller must be installed by qualified company or personnel, which is authorized by McQuay, and the installation must satisfy all the following requirements.

Location

In order to achieve maximum capacity, the location selection should fulfill the following requirements:

1) The location must be well ventilated, so that air can be drawn in and discharge out efficiently.



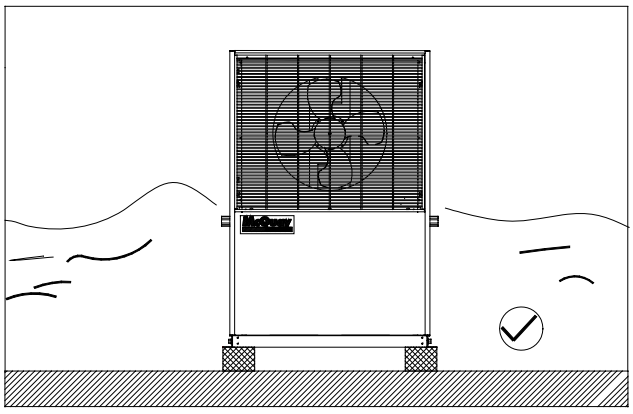


2) Install the unit in such a way that the hot air discharge cannot be drawn in again by itself or other units.

3) Ensure that there is no obstruction to airflow into or out of the unit. Remove obstacles which blocking intake or discharge the air if exist.

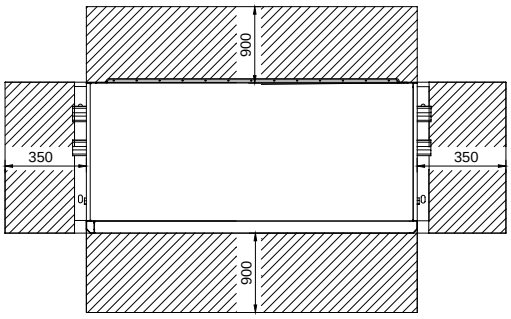
4) If good ventilation cannot be guaranteed when unit being installed indoors, it is advisable to induce discharge air from air outlet to outdoors by installing duct which is as short as possible.

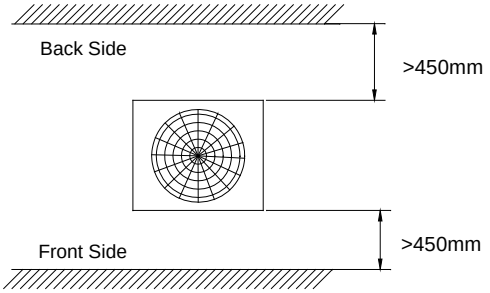
5) Support unit base up to create a space above foundation for ensuring free water drainage, and the stable foundation with level surface must be sufficiently durable against the unit weight.

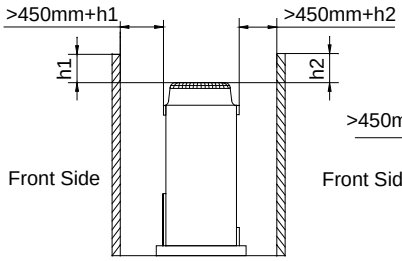


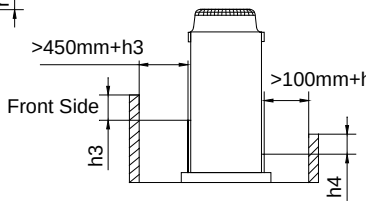
6) The location must not be susceptible to dust or oil to avoid condenser coil being choked by the contaminant. As the general safety precaution, it is advised that no flammable danger gas should be located near to the unit.

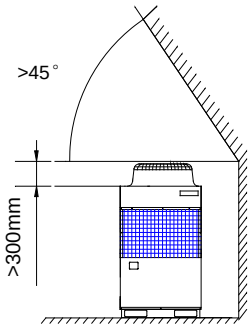
7) It is advised to have sufficient clearance around the unit for proper condenser air flow and to facilitate access for maintenance.(see clearance shown in figure below)

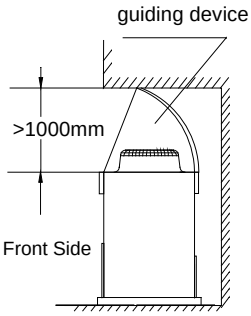










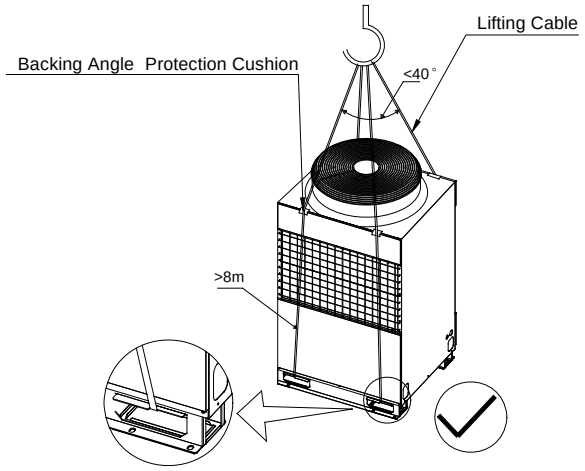


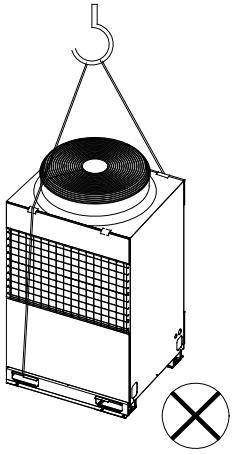
Delivery and Lifting

When transporting the unit, it is advisable to use forklift or crane to do this work. Only the wooden skid base is allowed be served as the weight-supporter.

When hoisting, please keep the unit stable and without slope, meanwhile, be sure to avoid lifting ropes contact with side heat exchanger, panel and unit's top part.

After installation location is confirmed, remove the package base by unfastening the bolts.

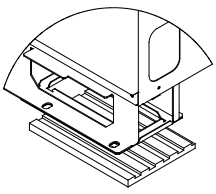




Mounting

When mounting, please use foundation bolts or expansion bolts to fasten the unit with foundation supporting legs.

It is advisable to pad the unit bottom against vibration by using vibration absorption rubber.

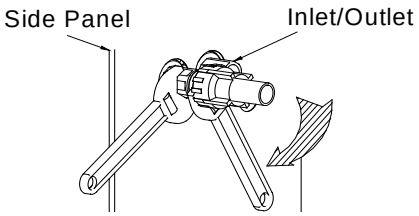


Water System Installation

Chilled water piping must be insulated and waterproof to avoid performance loss and moisture condensing on it.

To guarantee the chilled water quality, the water strainer shipped with unit must be installed on the chilled water inlet pipe.

When performing water pipe connection, use gripping pliers to fix the unit connections to avoid the reserved connections on unit being directly suffered from revolving torque when fastening.



Air vent valve should be installed at highest points on chilled water piping system, see detailed information in “chilled water system installation schematic diagram”. After completing chilled water piping, carry out leak detection and 0.4MPa pressure test to ensure having no mistake, then fully fill water in system, open air vent valve, purge all the air trapped in the piping system, after that shut off the air vent valve. Water drainage valve should be installed at lowest points on chilled water piping system.

In order to achieve the unit long-life operation, it is recommended to give first priority to new type plastic water pipe such as PP-R, PVC, never use galvanized steel pipe when choosing the material of water pipe.

Caution

The accessory strainer shipped with unit must be installed on water in pipe, otherwise failure of the unit may be caused.
The unit should be connected with the water supply system through the automatic feeder that is the unit accessory. The pressure of the water supply system must be more than 1.5 bar and less than 6 bar.

Caution

If the chiller is operated with very oily, salty or acidic water, these substances may lead to capacity drop. Be sure to use clean water when filling in the water circuit to avoid heavy corrosion and choking of the system.

Caution

Don’t use the water pump equipped in unit to clean piping. If using the pump to clean is required, you can fill clean water in system at water in side, meanwhile make the pump running, please conduct 30-minute pump operation, then clean the strainer.

Limit to the water volume of the chiller

⚠ Caution

If the system water volume is less than required water volume (Vmin) while the chiller is operating, it will result in frequent ON/OFF

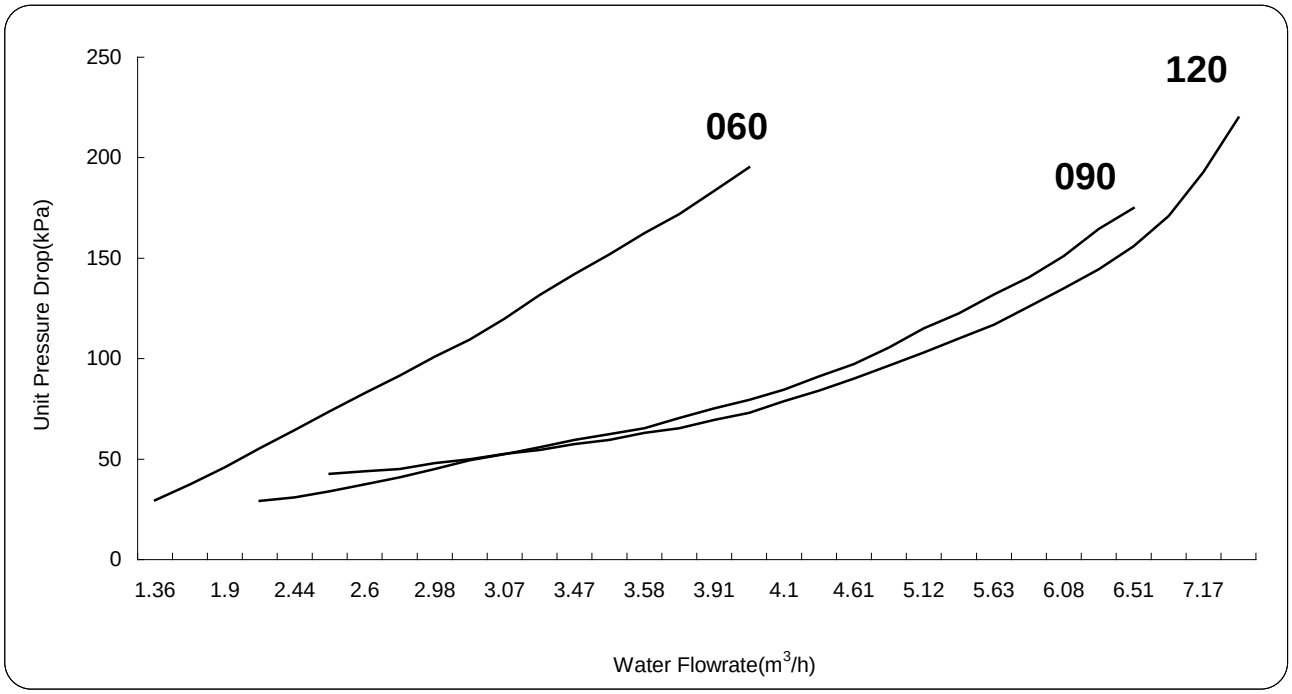
Vmin is referred to the below table：

Item	Model	Setting EWT(℃)	Vmin(l)
1	MAC060D4	14	151
		13	188
		12	251
		11	376
		10	753
2	MAC090D4	14	86
		13	99
		12	117
		11	143
		10	184
3	MAC120D4	14	96
		13	111
		12	131
		11	160
		10	206

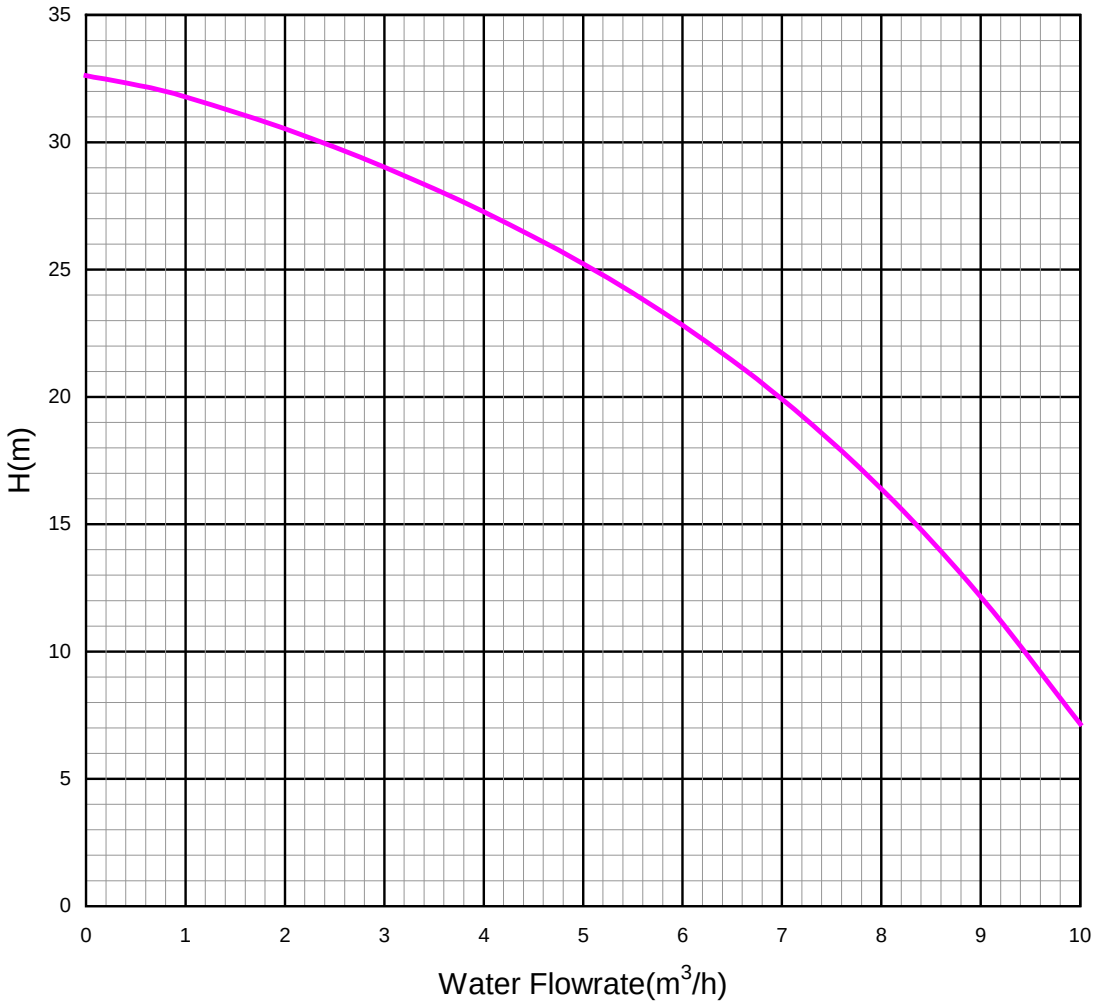
Notice：

1. The total water volume of the entire hydraulic system includes the water in main pipe, water tank and terminal equipment, in which the 2-way valve is open.
2. If the water volume (V) while the unit is running is less than Vmin, it's recommended to install a water tank of (Vmin-V)L, or it will cause the unit frequent ON/OFF
3. The Vmin in the table is calculated based on nominal cooling water flow and 5℃ anti-freeze. If the water flow and anti-freeze temperature change, related Vmin will change.
4. The table is applied for the water volume selection of normal chiller, not for the chiller under low leaving water temperature with glycol.

Unit Water Pressure Drop



Water Pump Performance Chart

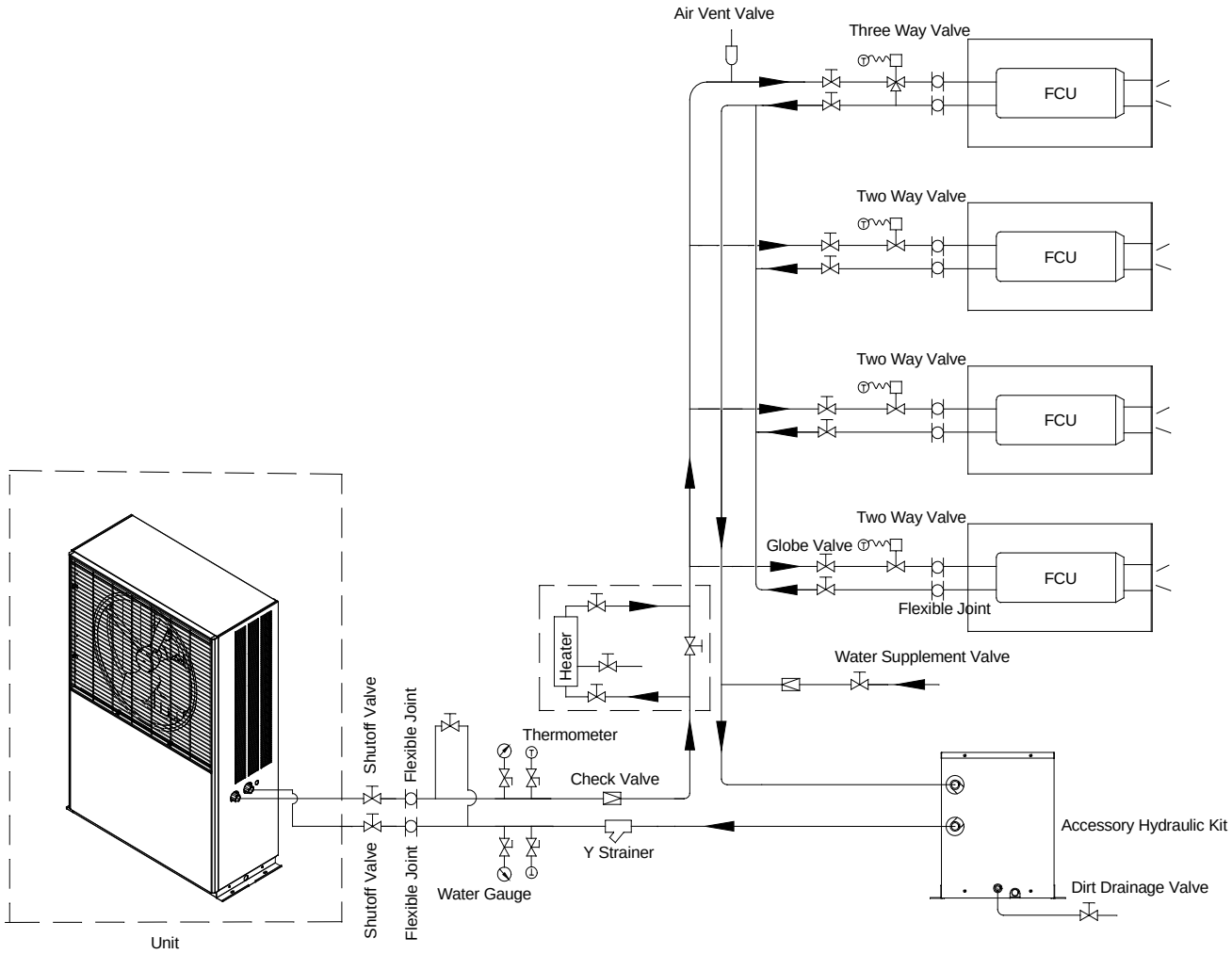


Hydraulic System

When installing the MAC unit, using closed water system is strongly recommended by McQuay, and please refer to the schematic diagram below.

In order to ensure energy saving and system safe operation, McQuay has provided hydraulic system accessories, including insulated stainless steel water storage tank, safety valve, dirt drainage valve, auto air vent valve, Y-shaped strainer and automatic water fill valve etc.

Auxiliary heater in the diagram below is available for option, please choose either type of auxiliary electric heater or auxiliary gas heater. If you have the demand, please contact with local McQuay sales representation, and install it according to below diagram, if you have no need of this option, the components in dotted line box can be omitted.



Notes

The design, construction and acceptance check of the hydraulic system should respectively refer to and comply with the corresponding manual, code and standard.

Power Connection

Laws and regulations concerning electrical wiring work vary by country. Therefore, work should basically be performed according to the regulations of each country.

Before power connection, make sure that your local power supply type accords with the unit nameplate.

Please use suitable size dedicated wire to power this unit. The connections must be made secured without tension the terminals.

All electric work must be performed by licensed technician be according to local regulations and the instructions given in this catalogue.

The unit must be properly earth connected. Do not connect the earth wire to gas pipe, city water pipe or telephone wire, improper earth connection may cause electrical shock.

Please mount electric leak protection breaker to avoid electric shock.
Please ensure correct phase sequence, make L1, L2, L3 correspond with R, S, T on terminal block respectively, otherwise the system cannot be started and the controller has no display.

Every wire should be firmly connected without tension to the cables and terminals.

All cables should not contact with refrigerating piping and moveable components such as compressor and fan motor etc.

⚠ Caution

At emergency (if you smell something burning), stop operation and turn the power source switch off, ask for your dealer's instruction. Continuing the operation without eliminating the emergency state may cause a machine trouble, fire, or electrical shock.
Don't extend your fingers or other foreign pieces such as stick into unit air outlet, otherwise the unit could be damaged or you could be injured.

Electrical Data

Model		MAC060D4	MAC090D4	MAC120D4
Power Supply		208-230V/3~/60Hz		
Max. Input (W)		8500	14200	14750
Max. Current (A)		24.9	45.0	45.5
Power Cable	Cross Section Area (mm²)	6	10	10
	Q.T.Y	4		

Electrical Connection For Auxiliary Electric Heater

If auxiliary electric heater or auxiliary gas heater installation is required, please do installation after thoroughly reading corresponding manual. Carry out the electrical connection according to the circuit diagram in unit electrical box so that achieved their automatic on/off governed by the unit controller. In addition, contact with local McQuay service representative for performing trail startup.

4 Servicing and Maintenance

Servicing

Service and maintenance are to be performed only by qualified personnel who are well trained with refrigeration engineering. Before restart the unit, do a thorough check and analysis of the unit safety control component.

The optimum design of the refrigerating system eliminates the possibility of problems being occurred during normal operation. There is no need to conduct any maintenance to refrigerant piping if the unit is under normal running.

McQuay designers have given full consideration to make servicing convenient during unit development. After opening service panel, both servicing and maintenance can be easily carried out.

Under normal environment, the only work needed is checking the return air way and cleaning the heat exchange surface regularly at month or season interval decided on operating condition.

If the surrounding is very dirty or oily, for maintaining superior performance and sufficient capacity, please ask specialized personnel to do regular cleaning of heat exchanger.

Maintenance

For keeping consistent performance and durability with safe, effective and long-life operation, always conduct proper and regular maintenance to the unit.

For long period of operation time, the heat exchanger will become dirty impairing its effectiveness and reducing the performance of the air conditioner. Consult your local dealer on the cleaning of the heat exchanger.

No main maintenance or servicing needed for the internal water circuit unless the water pump is failure. It is advised that regular check on the strainer should be conducted and replaced the water strainer if the strainer is dirty or clogged.

Always check the water level in the system, for the target of protecting the moving components in the hydraulic kit from overheating, excessive wearing and water freeze.

All the chilled water in the hydraulic system must be drained out completely during unit shutdown in winter, to avoid water piping damage due to freeze.

Troubleshooting and Solutions

Troubleshooting Displayed on controller and Descriptions

Item	Code	Description	Item	Code	Description
1	16	compressor overload	10	33	discharge temperature too high
		fan overload	11	40	TH1 malfunction
2	18	water pump malfunction	12	41	TH2 malfunction
3	19	lack of water flow	13	42	TH3 malfunction
4	20	high pressure malfunction	14	43	TH4 malfunction
5	21	low pressure malfunction	15	45	TH6 malfunction
6	25	EWT/LWT too low	16	46	TH7 malfunction
			17	47	TH8 malfunction
7	27	ambient temp too high/low	18	49	TH10 malfunction
			19	51	TH12 malfunction
8	29	super heat less than 2 protection	20	53	low pressure sensor malfunction
9	32	suction temperature too high	21	F6	communication failure

Troubleshooting Displayed on PCB and Chiller Operating Status

Below is the code and its denotation.

Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation	Code	Denotation
0	0/O	2	2	4	4	6	6	8	8	A	A	C	C	E	E	H	H	n	N	r	R	U	U
1	1	3	3	5	5	7	7	9	9	b	B	d	D	F	F	L	L	P	P	t	T	y	Y

Code and operating status LED panel

Code	Description	Code	Description
NULL	NULL: stand-by	CSP	CSP: Cooling mode stop process
rESt	REST: Re-set	Er 30	ER30: Normal malfunction
CSt	CST: Cooling mode start process		
COOL	COOL: Cooling mode		

Error code and Description

Error Code	Description	Error Code	Description	Error Code	Description
ECXX	-------	ER30	-------	ER45	TH6 malfunction
ER16	compressor overload	ER31	-------	ER46	TH7 malfunction
	fan overload	ER32	suction temperature too high	ER47	TH8 malfunction
ER18	pump overload	ER33	discharge temperature too high	ER48	————
ER19	lack of water flow	ER34	Reserved	ER49	TH10 malfunction
ER20	high pressure malfunction	ER35	Reserved	ER50	————
ER21	low pressure malfunction	ER36	Reserved	ER51	TH12 malfunction
ER22	-------	ER37	Reserved	ER52	————
ER23	-------	ER38	Reserved	ER53	low pressure sensor malfunction
ER24	-------	ER39	Reserved	ER54	Reserved
ER25	EWT/LWT too low	ER40	TH1 malfunction	ER55	Reserved
ER26	-------	ER41	TH2 malfunction	EC78	————
ER27	ambient temperature too high/low	ER42	TH3 malfunction		
ER28	-------	ER43	TH4 malfunction		
ER29	super heat too low protection	ER44	————		

Reasons for Malfunction Generating and Solutions

Item	Error Code	Description	Reasons	Solutions
1	F6 (controller)	communication problem between thermostat and PCB	1. communication cable is A/B connected opposite	check communication cable connection
			2. communication cable is loose	
			3. communication cable and power cable is crossed	re-do the wiring to avoid power cable and communication cable close; use shield twisted cable
			4. if PCB is power on	check PCB
			5. if communication distance is too long	use shield twisted cable short JP7 on PCB
			6. Check by monitoring software if there's communication between software and thermostat	change a new PCB or remove R44 in the controller.
			7. PCB communication port failure	change
			8. thermostat communication port failure	change
			9. Address setting wrong	re-set S2 on master unit PCB
2	ER16 (LED)	compressor overload	Compressor running current too high, overload protection works	check if current overload setting is correct according to the wiring diagram
				check if compressor resistance is normal
		fan overload	fun running current too high, overload protection works	check if current overload setting is correct according to the wiring diagram
				check if fan resistance is normal
3	ER18 (LED)	pump overload	pump running current too high, overload protection works	check if pump current overload setting is correct according to the wiring diagram
				Check if pump resistance is normal
4	ER19 (LED)	pressure differential gauge failure	1. pump selection is small	change pump
			2. strainer is block	clean strainer
			3. hydraulic system is not air vent enough	pump down
			4. pressure differential gauge is block	maintain or change water pressure differential gauge
			5. pressure differential gauge failure	change water pressure differential gauge
			6. hydraulic system has too much WPD, not balance	optimize hydraulic system
			7. other components is blocked in hydraulic system	check and maintain

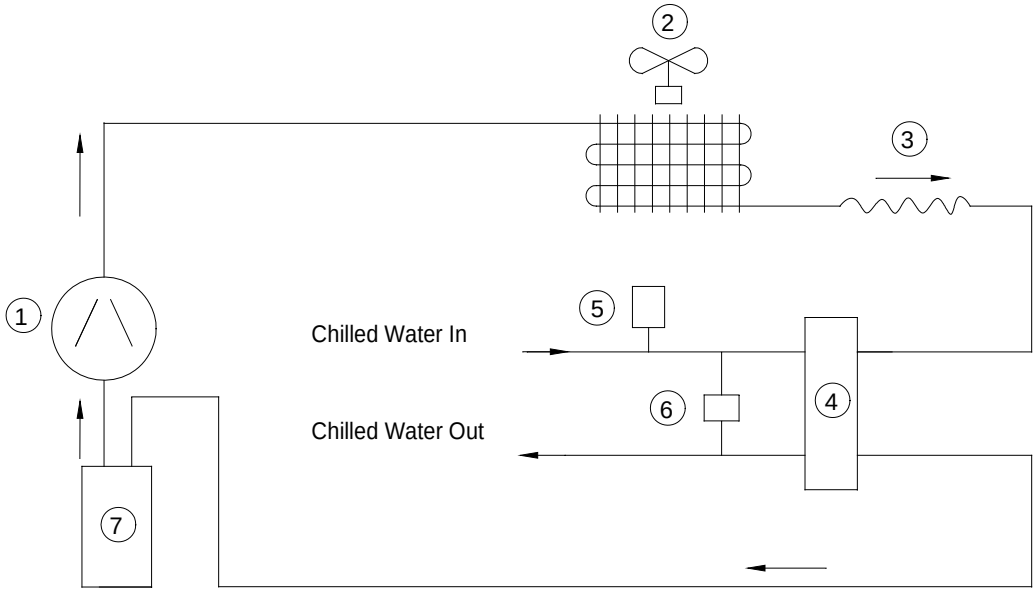
Item	Error Code	Description	Reasons	Solutions
5	ER20 (LED)	high pressure malfunction	1. motor is damaged(cooling)	Change motor;
			2. air is short circuit (cooling)	improve condenser air circulation;
			3. heat exchanger is dirty (cooling)	clean condenser
			4. refrigerant side filter is dirty	check and replace
			5. ambient temperature is too high (cooling)	power off
			6. too much refrigerant charge	discharge some refrigerant
			7. PCB high pressure output failure	change PCB
			8. voltage switch failure	change pressure switch
6	ER21 (LED)	low pressure malfunction	1. leakage or lack of refrigerant	check leakage and charge
			2. PCB low pressure output failure.	change PCB
			3. low pressure sensor failure	change pressure sensor switch
			2. EWT/LWT too low under cooling mode	
			3. discharge temperature too high for 3 times	
			4. fan overload for 3 times	
			5. high pressure malfunction for 3 times	
			6. water differential gauge witched off	
7	ER25 (LED)	EWT/LWT too low	1. EWT setting too low	re-set EWT
			2. lack of water flow; water temperature difference too high	check hydraulic system
			2. electric heater short circuit	change electric heater
8	ER27 (LED)	ambient temperature too high/low	1. temperature sensor is broken	change
			2. beyond the operating limit	power off
9	ER29 (LED)	over heat lower than 2 for 5 minutes	1. Low pressure/temperature sensor is broken	change
			2. EXV failure	change EXV
10	ER32 (LED)	suction temperature too high (over 40℃)	discharge temperature too high so compressor self-protection	check suction/discharge pressure and power input check if ambient condition is normal check if there is mode transform

Item	Error Code	Description	Reasons	Solutions
11	ER33 (LED)	discharge temperature too high	1. motor failure(cooling)	Change fan motor; Improve terminal equipment air circulation; Clean condenser
			2. return air short circuit (cooling)	
			3. condenser is dirty (cooling)	
			4. EWT is too high	re-set EWT by service personal
			5. lack of refrigerant or leakage	charge refrigerant
12	ER40 (LED)	TH1 failure	1. Comp.1 discharge temperature sensor disconnect	check TH1 resistance/ change
			2. PCB failure	change PCB
13	ER41 (LED)	TH2 failure	1. Comp 2 discharge temperature sensor disconnect	check TH2 resistance/ change
			2. PCB failure	change PCB
14	ER42 (LED)	TH3 failure	1. mid- coil temperature sensor disconnect	check TH3 resistance/ change
			2. PCB failure	change PCB
15	ER43 (LED)	TH4 failure	1. condenser inlet temperature sensor disconnect	check TH4 resistance/ change
			2. condenser inlet temperature beyond 120℃	Refer to item 11
			3. PCB failure	change PCB
16	ER45 (LED)	TH6 failure	1. EWT sensor disconnect/short circuit	check TH6 resistance/ change
			2. PCB failure	change PCB
17	ER46 (LED)	TH7 failure	1. LWT sensor disconnect/short circuit	check TH7 resistance/ change
			2. PCB failure	change PCB
18	ER47 (LED)	TH8 failure	1. ambient temperature sensor disconnect/short circuit	check TH8 resistance/ change
			2. PCB failure	change PCB
19	ER49 (LED)	TH10 failure	1. condenser outlet temperature disconnect/short circuit	check TH10 resistance/ change
			2. PCB failure	change PCB
20	ER51 (LED)	TH12 failure	1. suction temperature sensor disconnect/short circuit	check TH12 resistance/ change
			2. PCB failure	change PCB
21	ER53 (LED)	low pressure sensor failure	1. low pressure sensor phase wrong	re-do the wiring
			2. low pressure sensor is broken/disconnect/short circuit	change low pressure sensor cable
			3. PCB failure	change PCB

Note: For trouble elimination, we recommend service personnel to bring a 10K resistance (25℃)。 If there is sensor failure, connect the resistance with PCB temperature port to find out the solution.

Schematic Diagram

MAC060D4 (MAC090/120D4 is two compressors paralleled)



LEGEND

Refrigerant Fow Direction

1.Compressor	2.Heat Exchanger Fan	3.Throttle Device
4.Bphe	5.Water Pump	6.Difference Pressure Switch
7.Accumulator		

5 Notice

Inspection

As soon as the unit is received, it should be inspected for any damage that may have occurred in transit. If damage is evident, it should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing at once.

Concealed damage must be reported within 15 days of receipt of shipment. Check shipment against the bill of lading to verify that all items were delivered. Any shortages should be noted on the delivery receipt, and a claim filed immediately.

Instruction for use

1) Suitable room temperature setting

It is advisable to comfort every one in the conditioned space, so the temperature setting shouldn't be too high or too low.

It is recommended that the setting should be within the range of from 26℃ to 28℃ when cooling, from 18℃ to 23℃ when heating.

2) Winter anti-freeze of chilled water circulating in the hydraulic system

All the chilled water in the hydraulic system must be drained out completely during unit shutdown in winter, to avoid water piping damage due to freeze.

3) Make sure the air side ventilation is good.

These obstacles may cause performance deficiency or shutdown of the air conditioner.

4) Antirust

Please take antirust measures and regularly remove rust when using water pipe vulnerable to rust to connect chilled water system

5) Conducting regular chilled water maintenance, this contributes to ensure safe, high efficiency and consistent operation.

6) Only clean water is suitable to fill in system, in addition, install the high efficiency water strainer, which is provided by McQuay, on the upstream pipe to unit water inlet

7) Special attention to winter antifreeze

During long period shutdown in winter, the water in system must be completely drained out. Please refer to the diagram below and the labels stuck on unit.

Add proper quantity anti-freezer such as ethylene glycol into the hydraulic system if the unit is not on duty for short time.