# MAIN PARTS OF THE UNIT

NAME

NO.

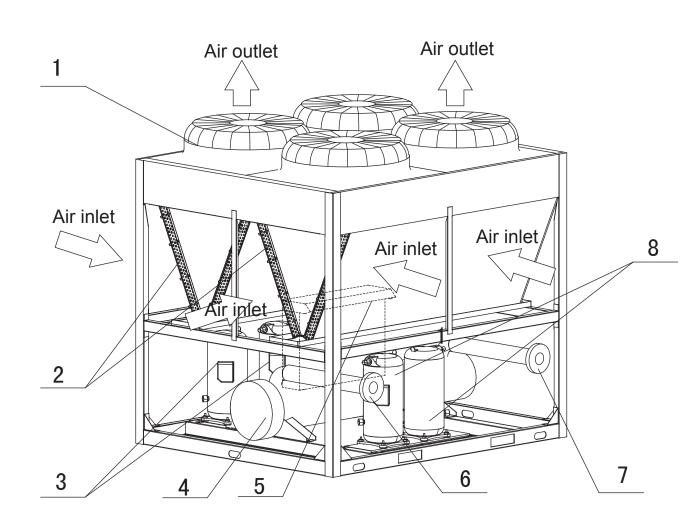
Top cover

5

3.3 Requirements of arrangement space of the unit

3.3.1 Requirements of arrangement space of the unit

lectric control box



Condenser

Water outlet

Compressor

Water inlet

Evaporator

Compressor

OPE	ERATI	SN &	PERF	ORM	ANCE

#### Performance characteristics of the unit

The air-cooled heat pump modular unit is composed of one or more modules. Each module has its own independent electric control unit, and the electric control units of modules conduct information exchange through communication network. The air-cooled heat pump modular unit is characteristics of compact structure and easy transportation and lifting, and in the meanwhile, it also saves facilities, including cooling tower, cooling pump, and so on, for the user, and reduces installation cost. The units provide central air handling devices or terminal equipment with chilled water or hot water. The unit is a completely independent entirety type one, which is designed to be installed outdoors (on the ground or the roof). Each unit includes such main parts as high-efficient and low-noise scroll compressor, air-cooled condenser, shell and tube (or plate) evaporator, micro-computer control center, and so on. These parts are installed on steel structure base, so they are sound and durable. The unit applies Chinese micro-computer control system, which can automatically conduct energy control according to the magnitude of load, to achieve optimal matching and thus actually realizing optimal energy-saving operation. The product is modularized unit, and parallel connection of 16 modules can be realized at most, so the user can adopt module combination according his own demands. The product can be widely applied in air-conditioning engineering of various newly-built and rebuilt industrial and civil buildings, such as restaurant, hotel, apartment, office building, hospital, industrial plant, and so on. The air-cooled heat pump modular unit is the best choice for the place which has high requirement in noise and ambient environment and which is short of water.

## Use conditions of the unit

a. The standard voltage of power supply is 380-400V 3N~ 50Hz, the minimum allowable voltage is 342V, and the maximum voltage is 440\ b. To maintain better performance, please operate the unit under the following outdoor temperature:

Operating range under cooling mode	Operating range under heating mode
10℃~46℃	-10℃~21℃

c. The unit is of outlet water temperature control mode Outlet water temperature control—cooling: minimum temperature 5°C, maximum temperature 17°C; heating: minimum temperature 45℃, maximum temperature 50℃. If low-temperature water outlet unit is required, it should specially be customized.

If the user requires the unit to operate under the outlet water temperature is lower than the minimum setting value mentioned above, be sure to make the requirement to the dealer or our maintenance center, and necessary protective measures should be taken before the unit is used.

CONTENTS	PAGE	Never inspect or service the unit by yourself. Ask a qualified service person to perform this work.
PRECAUTIONS	1	- · · · · · · · · · · · · · · · · · · ·
TRANSPORTATION	2	Do not dispose this product as unsorted municipal waste.Collection of such waste separately for special
INSTALLATION OF THE UNIT	3	treatment is necessary.
WATER SYSTEM INSTALLATION	5	Keep far away from high-frequency equipment.
ELECTRIC WIRING	11	
TRIAL RUN	19	Keep away from the following places: a place where it is full of oil gas; places where salty air
USE	20	surrounding(near the coast); a place where is caustic gas(the
MAINTENANCE AND UPKEEP		sulfide in hotspring). Location in the folling places may cause malfunction or shorten the life span of the manchine.
APPLICABLE MODELS AND MAIN PARAMETERS		· · · · · · · · · · · · · · · · · · ·
ATTACHED DRAWING (I)		In the cace of extremely strong wind, please prevent the air from flowing backwards into the outdoor unit.
ATTACHED DRAWING (II)	32	

1. PRECAUTIONS

To prevent refrigerant leak, contact your dealer. To prevent injury to the user or other people and property When the system is installed and runs in a small room, it is damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In The refrigerant in the air conditioner is safe and normally either case, important safety information is listed which must be read does not leak carefully If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

WARNING Turn off any combustible heating devices, ventilate the Failure to observe a warning may result in death. room, and contact the dealer where you purchased the CAUTION Do not use the air conditioner until a service person confirms

\_ \_ \_ \_ \_ \_ \_ \_

Failure to observe a caution may result injury or damage to the equipment. WARNING

Ask your dealer for installation of the air conditioner. Do not use the air conditioner for other purposes. ncomplete installation performed by yourself may result in a water leakage, electric shock, and fire.

- Ask your dealer for improvement, repair, and maintenance. Before cleaning, be sure to stop the operation, turn the Incomplete improvement, repair, and maintenance may result in breaker off or pull out the supply cord. a water leakage, electric shock, and fire. Otherwise, an electric shock and injury may result. In order to avoid electric shock, fire or injury, or if you
- In order to avoid electric shock or fire, make sure that an detect any abnormality such as smell of fire, turn off the earth leak detector is installed. power supply and call your dealer for instructions. Be sure the air conditioner is grounded.
- Never replace a fuse with that of wrong rated current or In order to avoid electric shock, make sure that the unit is other wires when a fuse blows out. grounded and that the earth wire is not connected to gas or Use of wire or copper wire may cause the unit to break down or water pipe, lightning conductor or telephone earth wire. cause a fire.

In order to avoid injury, do not remove the fan guard of Do not insert fingers, rods or other objects into the air inlet the outdoor unit. or outlet. When the fan is rotating at high speed, it will cause injury

Never use a flammable spray such as hair spray, lacqueror paint near the unit.

It may cause a fire.

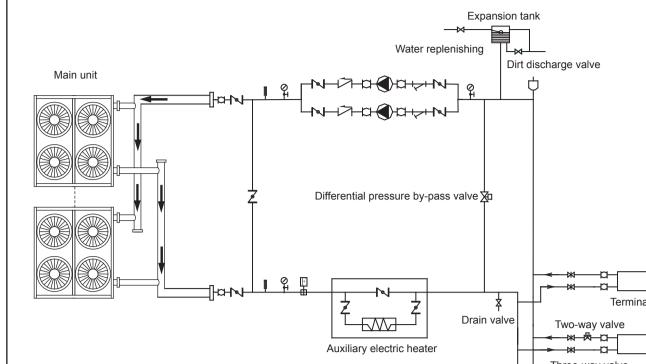
m. The outdoor chilled water pipelines should be wrapped o. The common outlet pipelines of combined units should with an auxiliary heating belt for heat preservation, and the be provided with mixing water temperature sensor. material of the auxiliary heat belt should be PE, EDPM, etc. with thickness of 20mm, to prevent the pipelines from freezing and thus cracking under low temperature. The power

supply of the heating belt should be equipped with an independent fuse. For the water pipeline network including filters and heat n. When the ambient temperature is lower than 2°C, and the

unit will be not used for a long time, water inside the unit should be drained. If the unit is not drained in winter, its • The installation persons or the users must ensure the power supply should not be cut off, and the fan coils in the water system must be provided with three-way valves, to ensure smooth circulation of the water system when the

# 4.2 Connection drawing of pipeline system

anti-freezing pump is started up in winter.



Pressure gauge 💾 Water flow switch 🕅 Gate valve 🖾 Flexible joint Y-shaped filter | I Thermometer Ocirculating pump 7 Check valve 1 Automatic discharge valve

After a long use, check the unit stand and fitting for damage. If damaged, the unit may fall and result in injury.	■ Endurable temperature during transportation is -25°C~55°C. Such equipment could endure 70°C of the maximum temperature in 24hrs.
To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner.	Do not allow a child to mount on the outdoor unit or avoid placing any object on it. Falling or tumbling may result in injury.
Arrange the drain hose to ensure smooth drainage. Incomplete drainage may cause wetting of the building, furniture etc.	Do not operate the air conditioner when using a room fumigation - type insecticide. Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of
Never expose little children, plants or animals directly to the air flow.	those who are hypersensitive to chemicals.
Adverse influence to little children, animals and plants may result.	Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit. It may cause incomplete combuston or deformation of the
Notice to avoid places where operation noise may easily be spread away or be enhanced.	unit due to the heat.
be opredd dwdy o'r be ennanoed.	Do not install the air conditioner at any place where
Noise can be amplified by anything blocking the air outlet of outdoor unit.	flammable gas may leak out. If the gas leaks out and stays around the air conditioner, a fire may break out.
Choose a proper place that the noise and hot or cold wind blown out of the outdoor unit will not bring inconvenience to your neighbors and not affect the growth or animal or plant.	The appliance is not intended for use by young children or infirm persons withoutsupervision.
Recommending locate and operate the equipment at the	Young children should be supervised to ensure that they do

not play with the appliance. altitude height not exceeded than 1000m.

# 2. TRANSPORTATION

Snow canopy is necessary in sonwfall places on the

■ In the frequent thunderstruck place, lightning proof

actions should be taken.

works of art.

outdoor unit Please consult the local dealer for details

required to keep the concentration of the refrigerant, if by any

chance coming out, below the limit. Otherwise, oxygen in the

room may be affected, resulting in a serious accident.

that the portion where the refrigerant leaks is repaired.

CAUTION

Do not operate the air conditioner with a wet hand.

These fins are sharp and could result in cutting injuries.

WARNING

exchangers, dreg or dirt may seriously damages the heat

quality of chilled water, and de-icing salt mixtures and air

oxidize and corrode steel parts inside the heat exchanger.

should be excluded from the water system, since they may

exchangers and water pipes.

O&I manual

An electric shock may happen.

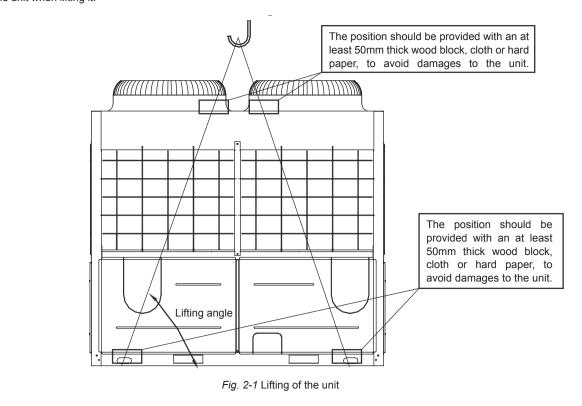
Do not touch the heat exchanger fins.

In order to avoid any quality deterioration, do not use the unit

for cooling precision instruments, food, plants, animals or

Handling of the unit

The angle of inclination should not be more than 15° when carrying the unit, to avoid overturn of the unit. a. Rolling handling: several rolling rods of the same size are placed under the base of the unit, and the length of each rod must be more than the outer frame of the base and suitable for balancing of the unit. b. Lifting: the strength lifting rope (belt) can bear should be 4 times the weight of the unit. Check the lifting hook and ensure that it is firmly attached to the unit, and the lifting angle should be more than 60°. To avoid damages to the unit, the contact position of the unit and lifting rope should be provided with an at least 50mm thick wood block, cloth or hard paper. Any person is not allowed to stand below the unit when lifting it.



# 4.3 Minimum chilled water flow

4.4 Maximum chilled water flow

evaporator flow rate.

The maximum chilled water flow is limited by the permitted

If the system flow is more than the maximum unit flow rate,

For maximum chilled water flow rate

circulatio

◄

Evaporator

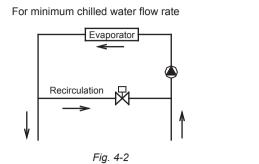
Fig. 4-3

bypass the evaporator as shown in the diagram to obtain a lower

pressure drop in the evaporator. It is provided in the table 4-1

O&I manual

The minimum chilled water flow is shown in the table 4-1 If the system flow is less than the minimum unit flow rate, the evaporator flow can be recirculated, as shown in the diagram



 $\sim \sim \sim \sim$ \_\_\_\_ Error

4.6 Design of the tank in the system

Comfortable type air conditioner

G= cooling capacity×2.6L

G= cooling capacity×7.4L

the following schemes:

Process type cooling

a. kW is the unit for cooling capacity and L is the unit for G

water flow in the formula counting the minimum water flow

b. In certain occasion (especially in manufacture cooling

process), for conforming the system water content require-

ment, it's necessary to mount a tank equipping with a cut-off

baffle at the system to avoid water short-circuit, Please see

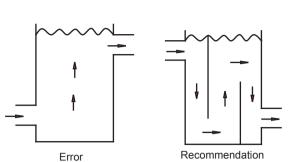


Fig.4-4

#### 4.7 Selection and installation of the pump 4.7.1 Select the pump

4.5 Minimum and Maximum water flow rates a. Select the water-flow of the pump The rated water-flow must no less than the unit rated water-flow;

> in terms of multi-connect the units, that water-flow must no less than total units' rated water-flow. b. Select the left of the pump. H=h1+h2+h3+h4 H: The lift of the pump. h1: Main unit water resistance.

h2: Pump water resistance. h3: Water resistance of the longest water-loop distance, includes: pipe resistance, different valve's resistance, flexible pipe resistance, pipe elbow and three-way resistance, two-way resistance or three-way resistance, as well as filter resistance. H4: the longest terminal resistance.

4.7.2 Installation the pump

a. The pump should be installed at the water inlet pipe, both of which sides must mount the soft connectors for vibration-proof.

b. The backup pump for the system (recommended).

c. Units must with a main unit controls (Please see Fig. 5-3 for the controls wiring diagram).

Switch (For trial run of pump)

Fig.5-3

Overcurrent rela

3.3.1.1 To ensure adequate airflow entering the condenser, the influence of descending airflow caused by the high-rise buildings around upon the unit should be taken into account when installing the unit. static pressure should be less than the static pressure outside the fan. The space between the unit and sunk Left view of the minimum installation space of the unit. 3.3.1.3 If the unit needs to operate in winter, and the installation site may be covered by snow, the unit should be located higher than the snow surface, to ensure that air flows through the coils smoothly.

Input of airflow

Table 3-2

 $\Box$ 

Fig. 3-2

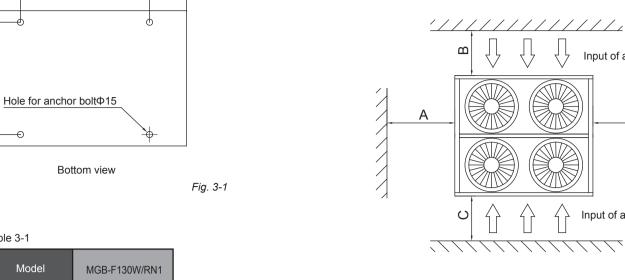
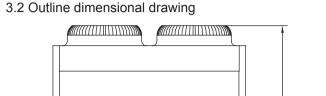


Table 3-1 B (mm 1685 2090 E (mm) 1420 F (mm)

NOTE

Thank you very much for purchasing our air conditioner,

Before using your air conditioner, please read this manual carefully and keep it for future reference.



3. INSTALLATION OF THE UNIT

vibration are required to a certain extent.

coils and copper tube parts of the unit.

of electric components in operation.

and remove any seeper.

installation requirements.

3.1.1 The unit can be installed on the ground or on the

suitable roof, but enough ventilation volume should be

3.1.2 The unit should not be installed where noise and

3.1.3 The installed unit should be sheltered from direct

boiler flues and ambient air which may erode condenser

3.1.4 If the installed unit can be approached by unauthor-

artificial damages and accidental damages, and prevent

the control boxes from being opened leading to exposure

3.1.5 The height of the installation foundation for the unit

required in installation sites, to ensure smooth drainage

3.1.6 In case of installation on the ground, the steel base

of the unit should be located on the concrete foundation,

and the concrete plinth should extend below frozen soil

layer. The foundation of the unit should not be connected

to the foundation of the building, to avoid affecting the

people due to transfer of noise and vibration. The base

of the unit is provided with installation holes, which can

be used to connect the unit and the foundation firmly.

3.1.7 In case of installation on the roof, the roof must

possess enough strength to sustain weight of the unit

and maintenance personnel. The unit can be supported

on concrete foundations or channel steel frames similar

to those used in the unit installation on the ground. The

installation holes of the unit damper, and the channel

steel should possess enough width for installing the

3.1.8 Consult the building contractor, the architectural

designer or other specialists about the cases with special

NOTE

The selected installation site of the unit should facilitate connection

of water pipes and wires, and be free from water inlet of oil fume,

steam or other heat sources. Besides, the noise of the unit and cold

and hot air should not influence the surrounding environment.

load-bearing channel steel must be in alignment with the

should not be less than 300mm, and floor drains are

ized persons, safety measures of isolation should be

taken, such as rail guards. These measures will avoid

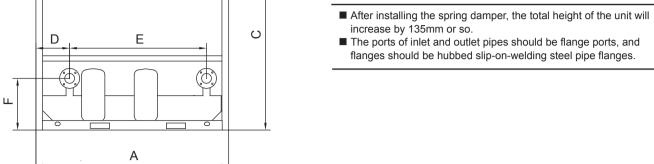
sunlight as much as possible, and be far away from

3.1 Selection of installation sites

ensured in both cases.

**OWNER'S & INSTALLATION MANUAL** 

Air-cooled Modular Chiller



Front view

O&I manual

3.3.1.2 If the unit is installed where the flowing speed of 3.1, and the space between adjacent modular units should not be less than 300mm; the installation can also follow the air is high, such as on the exposed roof, the measures direction B and C as shown in Fig. 3-2, the spaces between the including sunk fence and Persian blinds can be taken, to prevent the turbulent flow from disturbing the air entering unit and the obstacle are given in Table 3-1, and the space between adjacent modular units should not be less than the unit. If the unit needs to be provided with sunk fence. 600mm; the installation can also follow the direction combinathe height of the latter should not be more than that of the former; if Persian blinds are required, the total loss of tion of A and D, and B and C, the spaces between the unit and the obstacle are given in Table 3-1, the space between adjacent modular units in the direction A and D should not be less than 300mm, and the space between adjacent modular fence or Persian blinds should also meet the requirement units in the direction B and C should not be less than 600mm. If the spaces mentioned above cannot be met, the air passing from the unit to the coils may be restricted, or back flow of air

# affected, or the unit may fail to operate. 3.5 Installation foundation

multiple modular units

faults of the unit, the parallel installation of multiple modular

units can follow the direction A and D as shown in Fig. 3-2, the

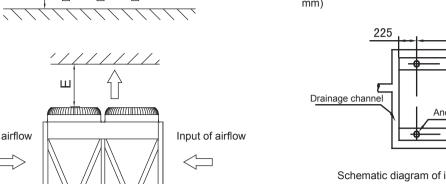
spaces between the unit and the obstacle are given in Table

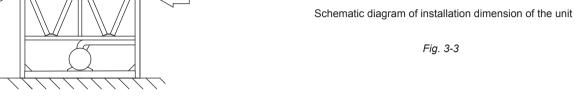
discharge may occur, and the performance of the unit may be

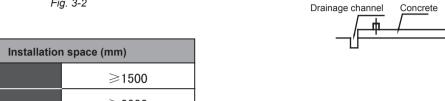
Fig. 3-4

#### a. The unit should be located on the horizontal foundation, the $\frac{1}{2}$ Input of airflow ground floor or the roof which can bear operating weight of the init and the weight of maintenance personnel. Refer to Table 9.1 (Table of applicable models and parameters) for operating b. If the unit is located so high that it is inconvenient for maintenance personnel to conduct maintenance, the suitable scaffold can be provided around the unit. c. The scaffold must be able to bear the weight of maintenance personnel and maintenance facilities. d. The bottom frame of the unit is not allowed to be embedded into the concrete of installation foundation.

 $\land \land \land$  Input of airflow 3.5.1 Location drawing of installation foundation of the unit: (unit: mm)







≥2000 ≥2000 ≥1500

≥8000

#### 3.6 Installation of damping devices 3.4 Space requirements for parallel installation of 3.6.1 Damping devices must be provided between the unit To avoid back flow of the air in the condenser and operational and its foundation

By means of the Φ15mm diameter installation holes on the steel frame of the unit base, the unit can be fastened on the foundation through the spring damper. See Fig.3-3(Schematic diagram of installation dimension of the unit) for details about center distance of the installation holes. The damper does not go with the unit, and the user can select the damper according to the relevant requirements. When the unit is installed on the high roof or the area sensitive to vibration, please consult the relevant persons

# 3.6.2 Installation steps of the damper

before selecting the damper.

operational height is reached.

Step 1. Make sure that the flatness of the concrete foundation is within ±3mm, and then place the unit on the cushion block. Step 2. Raise the unit to the height suitable for installation

of the damping device. c. Remove the clamp nuts of the damper. Step 3. Place the unit on the damper, and align the fixing bolt holes of the damper with the fixing holes on the unit

Fig. 3-5

NOTE

It is recommended that the damper should be fastened on

the foundation with the provided holes. After the unit is

4. WATER SYSTEM INSTALLATION

water pipes

Step 4. Return the clamp nuts of the damper to the fixing electric cabinet through shielded cable (see Electric holes on the unit base, and tighten them into the damper. Step 5. Adjust the operational height of the damper base, pressure of the target flow controller is 1.0MPa, and its and screw down the leveling bolts. Tighten the bolts by interface is 1 inch in diameter. After the pipelines are one circle to ensure equal height adjustment variance of installed, the target flow controller will be set properly the damper. according to the rated water flow of the unit. Step 6. The lock bolts can be tightened after the correct

> d. The pump installed in the water pipeline system should be equipped with starter. The pump will directly press water into the heat exchanger of the water system. Anchor bolt M12

> > e. The pipes and their ports must be independently supported but should not be supported on the unit. f. The pipes and their ports of the heat exchanger should be

CAUTION

• After the unit is in place, chilled water pipes can be laid.

when conducting connection of water pipes.

· Connection requirements of chilled water pipes

otherwise the performance of the unit will decline.

pipeline engineering.

• The relevant installation regulations should be abided with

• The pipelines should be free of any impurity, and all chilled

water pipes must conform to local rules and regulations of

a. All chilled water pipelines should be thoroughly flushed, to

impurity should not be flushed to or into the heat exchanger.

b. Water must enter the heat exchanger through the inlet;

c. The inlet pipe of the evaporator must be provided with a

target flow controller, to realize flow-break protection for the

unit. Both ends of the target flow controller must be supplied

times that of the inlet pipe. The target flow controller must be

installed in strict accordance with "Installation & Regulation

Guide for Target Flow Controller" (Figure 4.3~4.4). The

Controlling Schematic Diagram for details). The working

wires of the target flow controller should be led to the

with horizontal straight pipe sections whose diameter is 5

be free of any impurity, before the unit is operated. Any

easy to disassemble for operation and cleaning, as well as inspection of port pipes of the evaporator. g. The evaporator should be provided with a filter with more

than 40 meshes per inch at site. The filter should be installed near to the inlet port as much as possible, and be under heat preservation. h. The by-pass pipes and by-pass valves as shown in Fig.

4-1 must be mounted for the heat exchanger, to facilitate cleaning of the outside system of water passage before the unit is adjusted. During maintenance, the water passage of the heat exchanger can be cut off without disturbing other heat exchangers.

placed on the foundation, the damper connected with the i. The flexible ports should be adopted between the interface unit should not be moved, and the central clamp nut is not of the heat exchanger and on-site pipeline, to reduce allowed to be tightened before the damper sustains load. transfer of vibration to the building.

> equipped with pressure and temperature instruments, so they need to be purchased by the user.

k. All low positions of the water system should be provided with drainage ports, to drain water in the evaporator and the 4.1 Basic requirements of connection of chilled

of the heat exchanger.

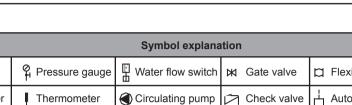
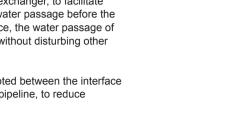


Fig. 4-1

Stop valve



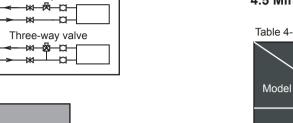
j. To facilitate maintenance, the inlet and outlet pipes should be provided with thermometer or manometer. The unit is not

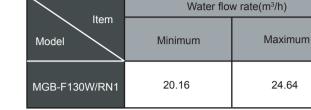
system completely; and all high positions should be supplied with discharge valves, to facilitate expelling air from the pipeline. The discharge valves and drainage ports should not be under heat preservation, to facilitate maintenance.

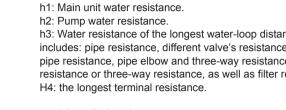
> I. All possible water pipes in the system to be chilled should be under heat preservation, including inlet pipes and flanges

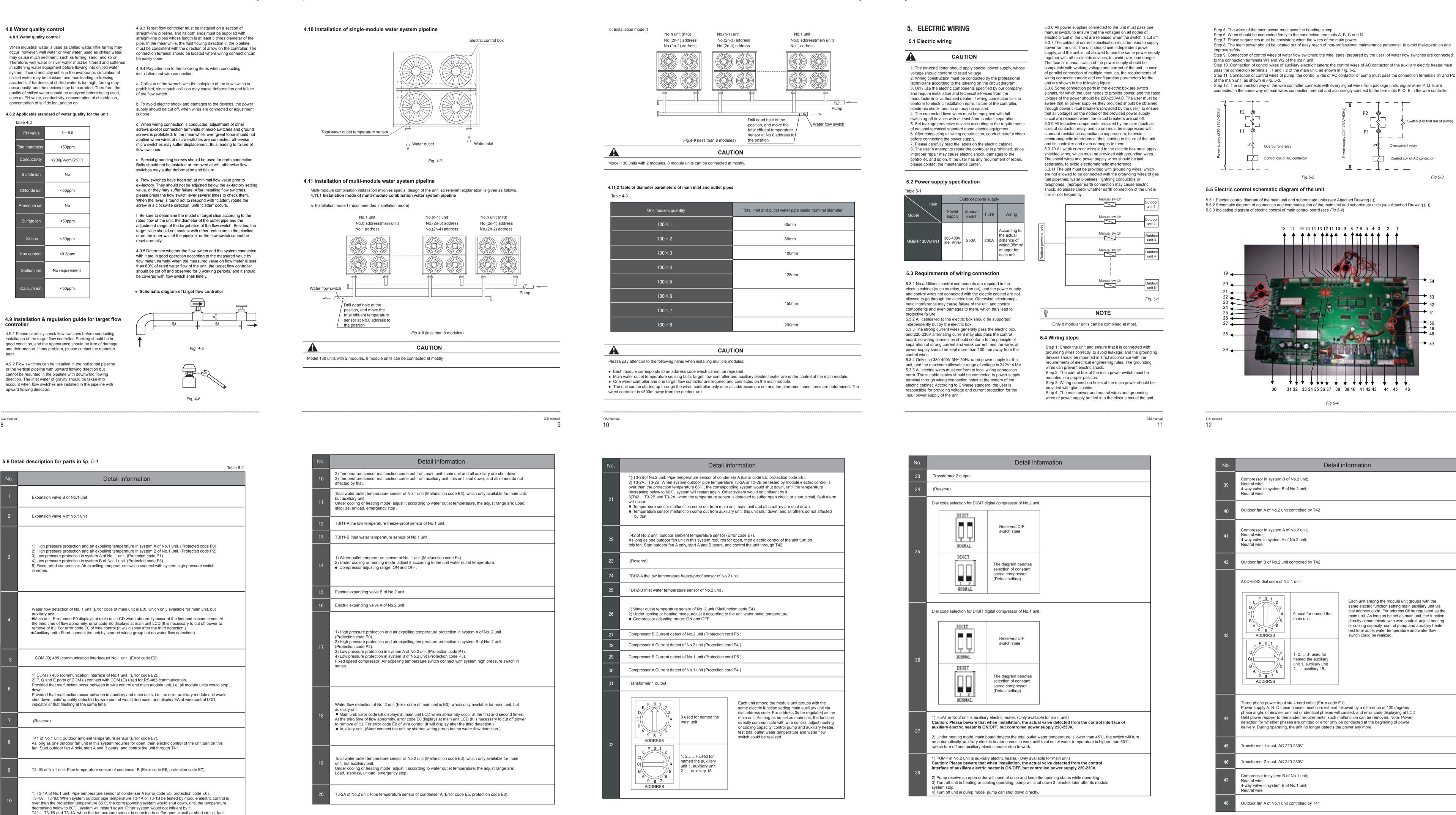
O&I manual

Three-way valve 









O&I manual

O&I manual

16

O&I manual

Press the key again until all

modes are showed (i.e. Cooling,

# Detail information

	Compressor in system B of No.1 unit;
49	Neutral wire;
10	4-way valve in system B of No.1 unit;
	Neutral wire.

alarm will occur.

# Outdoor fan B of No.1 unit controlled by T41

) HEAT in No.1 unit is auxiliary electric heater. (Only available for main unit) Caution: Please beware that when installation, the actual valve detected from the control interface of auxiliary electric heater is ON/OFF, but controlled power supply 220-230V.

2) Under heating mode, main board detects the total outlet water temperature is lower than 45°C, the switch will turn matically, auxiliary electric heater comes to work until total outlet water temperature is higher than 50  $^\circ$ C switch turn off and auxiliary electric heater stop to work.

#### ) PUMP in No.1 unit is auxiliary electric heater. (Only available for main unit) Caution: Please beware that when installation, the actual valve detected from the control interface of auxiliary electric heater is ON/OFF, but controlled power supply 220-230V.

Pump receive an open order will open at once and keep the opening status while operating. Turn off unit in heating or cooling operating, pump will shut down 2 minutes later after its module vstem stop 4) Turn off unit in pump mode, pump can shut down directly.

53	(Reserve)
54	(Reserve)

# CAUTION

1. Faults When the main unit suffers faults, the main unit stops operating, and all other units also stop running; When the subordinate unit suffers faults, only the unit stops operating, and other units are not affected. 2. Protection

When the main unit is under protection, only the unit stops operating, and other units keep running; When the subordinate unit is under protection, only the unit stops operating, and other units are not affected.

O&I manual

# 7.4 Control and protection function of unit

7.4.1 The unit has the following protection functions 1) Current cut-off protection 2) Power supply phase sequence protection 3) Protection for over-low suction pressure 4) Protection for compressor overcurrent 5) Protection for compressor overload

# 7.5 Troubleshooting

6) Anti-freezing protection

Error	Possible reason	Detect and settle measure
	Air or other non-condensing gas still in the system	Discharge gas from fluorin charging inlet. Re-vacuum the system if necessary.
Over high air	Fins in the condenser are dirty or foreign substance blocking fins.	Clean condenser fins.
discharge pressure (Cooling operation)	Insufficient chilling air volume or condenser fan error	Check and repair the condenser fan, recover the normal operation
	Excessive high air suction pressure	See "Excessive high air suction pressure"
	Excessive refrigerant charging volume	Discharge the excessive refrigerant
	Over high ambient temperature	Check ambient temperature
Over low air	Over cool air in the side of air heat exchanger	Check ambient temperature
discharge pressure (Cooling operation)	Refrigerant leakage or insufficient r efrigerant volume	Test leakage or charge sufficient refrigerant to the system
	Excessive low air suction pressure	See "Excessive low air suction pressure"
Over high air suction pressure	Excessive refrigerant charging volume	Discharge the excessive refrigerant
(Cooling operation)	Over high temperature in chilling water inlet	Check thermal insulation layer of water pipe and the specification of this layer
	Insufficient water flow volume	Check temperature difference at water inlet and outlet, and adjust the water flow volume
Over low air suction pressure	Over low temperature in chilling water inlet and outlet	Check and installation state
(Cooling operation)	Refrigerant leakage or insufficient refrigerant volume	Test leakage or charge sufficient refrigerant to the system
	Incrustant in evaporator	Eliminate incrustant
	Insufficient water flow	Check temperature difference at water inlet and outlet, and adjust the water flow volume
Over high air discharge pressure	Air or other non-condensing gas still in the system	Discharge gas from fluorin charging inlet. Re-vacuum the system if necessary.
(Heating operation)	Incrustant in water side of heat exchanger	Eliminate incrustant
	Over high temperature in chilling water inlet	Check water temperature
	Excessive high air suction pressure	See "Excessive high air suction pressure"
Over low air	Over low temperature of chilling water	Check chilling water temperature
discharge pressure (Heating operation)	Refrigerant leakage or insufficient refrigerant volume	Test leakage or charge sufficient refrigerant to the system
	Excessive low air suction pressure	See "Excessive low air suction pressure"
Over high air suction pressure	Over heat air in the side of air heat exchanger	Check ambient temperature around it
(Heating operation)	Excessive refrigerant charging volume	Discharge the excessive refrigerant
Over low air	Insufficient refrigerant charging volume	Charge sufficient refrigerant to the system
suction pressure	Insufficient air flow volume	Check fan rotating direction
(Heating operation)	Air loop short-circuit	Reason about remove air short-circuit
	Insufficient frost-removal operation	Error comes out from 4-way valve or thermal resistor. Replace a new one if necessary
Compressor stops ecause of freeze-proof	Insufficient chilling water flow volume	Error comes from pump or flow-type water volume control. Check and repair or replace a new one.
rotection (Cooling	Gas still in water loop	Discharge air
peration)	Thermal resistor error	Upon error have been confirmed, please replace a new one.
Compressor stops because	Over high air expelling pressure	See "Over high air expelling pressure"

7) Protection for over-high discharge pressure

7.4.2 The unit also has other control functions:

difference

1) Manual test function

2) Plug and play system

8) Protection for outlet and inlet water temperature

3) RS-485/RS232 Standard serial communication port.

# O&I manual 23

# 6. TRIAL RUN

Checking item

O&I manual

6.1 Points for attention prior to trial run 6.1.1 After the water system pipeline is flushed several times, please make sure that the purity of water meets the requirements; the system is re-filled with water and drained, and the pump is started up, then make sure that water flow and the pressure at the outlet meet the requirements. 6.1.2 The unit is connected to the main power 12 hours before being started up, to supply power to the heating belt and pre-heat the compressor. Inadequate pre-heating may cause damages to the compressor. 6.1.3 Setting of the wired controller. See details of the manual concerning setting contents of the controller, including such basic settings as refrigerating and heating mode, manual adjustment and automatic adjustment mode and pump mode. Under normal circumstances, the parameters are set around standard operating conditions for trial run, and extreme working conditions should be prevented as much as

6.1.4 Carefully adjust the target flow controller on the water system or the inlet stop valve of the unit, to make the water flow of the system be 90% of the water flow specified in Table 7-1. 6.2 Check item table after installation Table 6-1

Checking item	Description	Yes	No
	Units are fixed mounting on level base.		
	Ventilating space for heat exchanger at the air side is meeting for requirement		
Vhether installing site	Maintenance space is meeting for requirement.		
s meet for requirements	Noise and vibration is meeting for requirement.		
	Sun radiation and rain or snow proof measures are meeting for requirements.		
	External physical is meeting for requirement.		
	Pipe diameter is meeting for requirement		
	The length of system is meeting for requirement		
	Water discharge is meeting for requirement		
Vhether water system	Water quality control is meeting for requirement		
	Flexible tube's interface is meeting for requirement		
s meeting for equirements	Pressure control is meeting for requirement		
	Thermal insulation is meeting for requirement		
	Wire capacity is meeting for requirement		
	Switch capacity is meeting for requirement		
	Fuse capacity is meeting for requirement		
	Voltage and frequency are meeting for requirement		
	Connecting tightly between wires		
Vhether electric wiring	Operation control device is meeting for requirement		
system is meeting for equirements	Safety device is meeting for requirement		
	Chained control is meeting for requirement		
	Phase sequence of power supply is meeting for requirement		

## 6.3 Trial run

pre-heat the compressor.

supply needs to be cut off, the unit should be connected to the

power supply 12 hours prior to re-starting of the unit, to

6.3.1 Start up the controller and check whether the unit displays a • The target flow controller must be installed correctly. The fault code. If a fault occurs, remove the fault first, and start the wires of the target flow controller must be connected according unit according to the operating method in the "unit control to electric control schematic diagram, or the faults caused by instruction", after determining that there is no fault existing in the water breaking while the unit is in operation should be the user's responsibility 6.3.2 Conduct trial run for 30 min. When the influent and effluent • Do not re-start the unit within 10 min after the unit is shut temperature becomes stabilized, adjust the water flow to nominal down during trial run. value, to ensure normal operation of the unit. • When the unit is used frequently, do not cut off the power 6.3.3 After the unit is shut down, it should be put into operation 10 supply after the unit is shut down; otherwise the compressor min later, to avoid frequent start-up of the unit. In the end, check cannot be heated, thus leading to its damages. whether the unit meets the requirements according to the • If the unit is not in service for a long time, and the power

# CAUTION

contents in Table 9.1.

• The unit can control start-up and shut-down of the unit, so should not be controlled by the unit. Do not start up the unit before draining the water system completely

7. USE

O&I manual

Table 8-1

8.1.2 Failure information and code

E1 Power phase sequence error

E2 Communication error

In case the unit runs under abnormal condition, failure

protection code will display on both control panel and wired

controller, and the indicator on the wired controller will flash

with 5Hz. The display codes are shown in the following table:

E0 Water flow detection error (The third time)

E3 Total water outlet temperature sensor error

E4 Outlet water temperature sensor in heat exchanger error

E5 Pipe temperature sensor in condenser A error

E6 Pipe temperature sensor in condenser B error

E7 Outdoor ambient temperature sensor error or power supply protection

E9 Water flow detection error (The first and second times)

EA Main unit detect that auxiliary unit's quantity have decreased

EC Wire control did not found out any on-line module unit

P0 High pressure or air discharge temperature protection error in system A

P2 High pressure or air discharge temperature protection in system B

P6 Condenser high temperature protection in system A

A Low ambient temperature drive-up protection

System freeze-proof protection

PE Low-temperature protection of heat exchanger

Eb Freeze-proof temperature sensor 1 in heat exchanger error

Ed 1-hour consecutive 3-times PE protection

Inlet water temperature sensor error

P1 Low pressure protection System A

P3 Low pressure protection System B

P4 Current protection in system A

P5 Current protection in system B

(Reserved failure code)

(Reserved failure code)

(Reserved failure code)

F1 Wire controller failure

Reason

20

O&I manual

Detect and settle measure

Hi-voltage or Lo-voltage, signal phase Confirm voltage not higher or lower than the rated voltage 20V

eplace a new one

uction pressure

Replace a new filter

See "Over high air expelling pressure" and "Over high air suction pressure

Confirm resistors at motor are connected corresponding to terminals

onfirm voltage not higher or lower than the rated voltage 20V

neck the integrated temperature sensor after motor is cool down.

Reference to mention in above the parts of air suction and discharge pressure error

See "Over high air expelling pressure" and "excessive low air

If the switch is defective, please replace a new one.

See "Excessive low air suction pressure"

Adjust refrigerant charge volume

Check the wring of control system

Replace damaged assembly

Error signal delivered from wire controllerFind out the error type and carry out the corresponding measure to settle4-way valve or thermal resistor errorCheck the running state. Replace a new one if necessary.Air loop short-circuitSettle the short-circuit of air discharge

Display Query data

Fault

Display units and load

Display operation status

ong connection of phase sequence Re-connect and adjust the any 2 wires among 3 phases

Check water system

Replace a new compressor

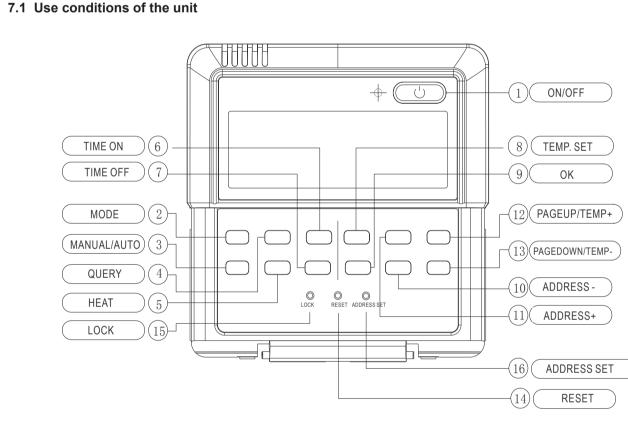


Fig.7-1

# 7.2 Operating instructions of buttons

① Startup/shutdown button Under power-off state, press the button, the startup indicator lamp is turned on, and the wired controller enters power-on state, and in the meanwhile, such information as temperature value, timing, Press this button for address decrease when setting wired and so on is set. Under power-on state, press the button, the startup indicator lamp is turned off, and in the meanwhile, the information of shutdown is sent.

② Mode selection button: Under power-off state, press the button to select operating mode of the unit. Under power-on state, the button is invalid. Mode switching sequence is as follows: 

(12) (13) Page-up and Page-down button (temperature + -) ③ Manual/auto button: To increase or decrease the number of units operation. To spot Press the button, to select "auto mode" or "manual mode". When selecting manual mode, the number of the units to be started up increase or decrease the set temperature in the temperature can be increased or decreased through "page up (temperature +)" setting page. To adjust the time of ON/OFF timer. and "page down (temperature -)".

#### (14) Reset button (built-in) Press this button with a small round stick of 1mm diameter to

10 Address decrease

(11) Address increase

Press the button under Spot check display state to select the

previous modular unit to display its operation state data. If it

comes to 0# modular unit, select 15# unit after pressing the

controller address and press this button to change the wired

Press the button under Spot check display state to select the

to 15# modular unit, select 0# unit after pressing the button.

controller address and press this button to change the wired

setting is needed as the default address has been set as "0"

before the wired controller leaves the factory.

Press this button for address increase when setting wired

controller address into 15 when the address is 0.

next modular unit to display its operation state data. If it comes

controller address into 0 when the address is 15.

Press the button, to inquire state information of No.0 to 15 outdoor cancel the current setting, and the wired controller enters reset units (the default is state information of No.0 unit) and enter state and return to default setting. inquiry state. After entering inquiry state, inquire the information of the former unit or the following unit through "address increase" 15 Lock button (built-in) and "address decrease". After a certain outdoor unit is selected, Press this button with a small round stick of 1mm diameter to state information of the outdoor unit can be inquired through "page lock the current setting, and press this button once more to up" and "page down". The inquiry sequence is outlet water cancel the lock. temperature—outdoor pipe temperature T3—outdoor ambient temperatures—current of the compressor A—current of the 6 Address setting button (built-in, reserved function) compressor B-fault-protection-outlet water temperature.... After this button is pressed, the wired controller address is set Because there are many outdoor fault and protection codes, the through "address increase" and "address decrease", with wired wired controller only displays the fault information and the controller address range "0~15", parallel connection for 16 protection information with highest priority, when query is wired controllers at most conducted on fault and protection information. This function is only applicable to the parallel connection of multiple wired controllers. In case of single wired controller, no

(5) Auxiliary electric heat button (reserved function) Press this button under heating mode to start the Forced Start function of auxiliary electric heater and the LCD will show the corresponding icon. Press this button once more to switch off the function. This button is invalid under other modes. This function is invalid for air cooling modular unit.

## 6 7 Timer function

Once "Timer On" button is pressed, the hour and minute of On-Timer flash with 2HZ and do not flash when they are adjusted; flashing continues 2 seconds after adjustment is stopped. Press "Timer On" once to adjust the setting hour, which flashes with 2HZ. Adjust the hour by pressing "Page-up (temperature+)" and Page-down (temperature-)", and press "Timer" once more to adjust the setting minute, which flashes with 2HZ, and then adjust the minute by pressing "Page-up (temperature+)" and Page-down (temperature-)". If no adjustment is made 8 seconds after entering the time setting state, the time setting state will be off and the set time will be the current set time. Press "Timer Off" button to set the Switch time off in the above way. Extended press on "Timer On" can cancel the time setting of Timer On, and the same is true for "Timer Off".

(8) Temperature setting button To set the total outlet water temperature under refrigerating and heating modes, and the temperature of water cabinet or water tank under heating water mode.

OK button Press OK button after operation is finished and the wired controller will send the order to the main engine.

> 8.1.7 Care and maintenance Maintenance of main parts Close attention should be paid to the discharge and suction

pressure during the running process. Find out reasons and eliminate the failure if abnormality is found. Control and protect the equipment. See to it that no random adjustment be made on the set points on site. Regularly check whether the electric connection is loose, and whether there is bad contact at the contact point caused by

c. The first page of data display Down area displays the number of online units, and the second page displays the number of startup

8.1.6 Query display

running units

data of this modular unit.

O&I manual

26

higher than 70°C, it is displayed as 70°C. If there is no effective date, it displays "——" and indication point  ${f C}$  is on. Current display is used for displaying modular unit system A compressor current IA or system B compressor current IB, with

allowable display scope 0A~99A. If it is higher than 99A, it is displayed as 99A. If there is no effective date, it displays "-----"

Load rate display is used for displaying the total load rate of unit system or the modular unit system A compressor, with allowable display scope 0%~100%; the load rate of the fixed speed compressor is only 0% (shutdown) or 100%(startup).

d. Failure display Condenser high temperature protection in system E It is used for displaying the total failure warning date of unit or that of modular unit, with failure display scope E0~EF, E indicating failure, 0~F indicating failure code. "E-" is displayed P9 Protection of outlet and inlet water temperature difference when there is no failure and indication point # is on at the same

8.1.3 Ordinary displayed data

there is no display

is unlocked.

a.Temperature display

b. Current display

and indication point  $\mathbb{A}$  is on.

c. Load rate display

a. Ordinary displayed data are displayed in all display pages.

one modular unit is under running operation, there will be a

dynamic display of 📗 . If the system is under OFF state,

c. If the communication with the main unit modular unit is

failure state of main unit communication connection.

displays, otherwise there is no display.

8.1.4 Treatment of display data

normal, it displays 🖛 . There will be no display under the

d. If it is under the host computer network control, Network ON

e. If it is under wired controller locked or button locked state, it

The data display area is divided into Up area and Down area,

Temperature display is used for displaying the total outlet water

condenser pipe temperature T3B of system B, outdoor environ-

allowable data display scope -15  $^\circ\!\mathrm{C}\!\sim\!70\,^\circ\!\mathrm{C}.$  If the temperature is

temperature of unit system, outlet water temperature of heat

exchanger, condenser pipe temperature T3A of system A,

mental temperature T4, and setting temperature Ts, with

with two groups of two-digit half 7-segment digital display,

displays 📡 the lock mark. There will be no display after the lock

b. If the unit system is under running state, i.e. one or more than

e. Protection display It is used for displaying the total system protection data of unit or the system protection data of modular unit, with protection display scope P0~PF, P indicating system protection, 0~F indicating protection code. "P-" is displayed when there is no failure and indication point # is on at the same time. f. Unit number display

It is used for displaying the address number of the currently selected modular unit, with display scope 0~15 and indication point # is on at the same time.

g. Display of online unit number and startup unit number They are used for displaying the total online modular units of the whole unit system and the number of the modular unit under running state, respectively, with display scope 0~16. Any time when the spot check page is entered to display or change modular unit, it is needed to wait for the up-to-date data of the modular unit received and selected by wired controller. Before receiving the data, the wired controller only displays "-----" on the data display Up area, and the down area displays the address

> oxidation and debris etc., and take timely measures if necessary. Frequently check the work voltage, current and phase balance. Check the reliability of the electric elements in time. Ineffective and unreliable elements should be replaced in time.

> > 8.1.8 Water quality inspection and dirt remove a. According to the local water quality, please inspect the water regularly. We recommended you to respect it a half year a time

> > > and change the circulate water two years a time. b. After long-time operation, calcium oxide or other minerals will be settled in the heat transfer surface of the water-side heat exchanger. These substances will affect the heat transfer performance when there is too much scale in the heat transfer surface and sequentially cause that electricity consumption increases and the discharge pressure is too high (or suction pressure too low). Organic acids such as formic acid, citric acid and acetic acid may be used to clean the scale. But in no way should cleaning agent containing fluoroacetic acid or fluoride should be used as the water-side heat exchange is made from stainless steel and is easy to be eroded to cause refrigerant leakage. Pay attention to the following aspects during the cleaning

> > > > and scale-removing process: • Water-side heat exchanger should be done be professionals. Please contact the local air-conditioner customer service center. Clean the pipe and heat exchanger with clean water after cleaning agent is used. Conduct water treatment to prevent water system from being eroded or re-absorption of scale.

 In case of using cleaning agent, adjust the density of the agent, cleaning time and temperature according to the scale settlement • After pickling is completed, neutralization treatment needs to be done on the waste liquid. Contact relevant company for treating

the treated waste liquid. Protection equipments (such as goggles, gloves, mask and shoes) must be used during the cleaning process to avoid breathing in or contacting the agent as the cleaning agent and neutralization agent is corrosive to eyes, skins and nasal mucosa.

e. Starting from the eighth page, the data display Up area displays 8.1.9 Winter shutdown the failure code of the current modular unit. One failure code may be displayed at most by turning page. In case of exceeding one For shutdown in winter, the surface of the unit outside and inside should be cleaned and dried. Cover the unit to prevent dust. Open failure, the following ones will not be displayed. If there is no failure, only one page of failure code displays "E-" and the next discharge water valve to discharge the stored water in the clean page begins to display protection code. water system to prevent freezing accident (it is preferable to inject f. After all the failure codes of the data display Up are displayed, antifreezer in the pipe).

8.1.10 Replacing parts Parts to be replaced should be the ones provided by our company. Never replace any part with different part. g. After all the pages of spot check data are displayed, continue to 8.1.11 First startup after shutdown press page-down button to display the first page, and press page-up from the first page to display the last page. h. Select the modular unit address number of spot check by pressing "address decrease" or "address increase" button to after long-time shutdown: inquire the running state data of different modular units.

Any time when the spot check page is entered to display or change Clean water pipe system. modular unit, it is needed to wait for the up-to-date data of the modular unit received and selected by wired controller. Before receiving the data, the wired controller only displays "-----" on the 4) Fix connections of all wires. data display Up area, and the down area displays the address number of the modular unit. No page can be turned, which

Thoroughly check and clean the unit. 5) It is a must to electrify the machine before startup. continues until the wired controller receives the communication

In case of freezing at the water-side heat exchanger interval

intended mode. Heating and Pump modes.) Press "Manual/Auto" key. enter to manual settings mode. Press "ADD +" and "ADD Press "Manual/Auto" key -" keys to select how enters into Auto settings. many unit is launch into Running module would running. adjust the system by self. Press "OK" key to save the settings. Unit will run after press "ON/OFF" key 3 minutes later. Turn off the unit

Turn on the unit

Power up to module unit and initially deliver

Press "mode settings" key to set the

power to wire control.

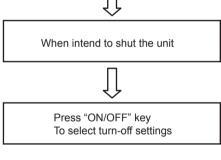


Fig.7-2

O&I manual 22

O&I manual

7.3 ON/OFF

Follow the following diagram for system ON/OFF

## 8.1.12 Refrigeration system

Determine whether refrigerant is needed by checking the value of suction and discharge pressure and check whether there is a leakage. Air tight test must be made if there is a leakage or parts of refrigerating system is to be replaced. Take different measures in the following two different conditions from refrigerant injection. 1) Total leakage of refrigerant. In case of such situation, leakage detection must be made on the pressurized nitrogen used for the system. If repair welding is needed, welding cannot be made until all the gas in the system is discharged. Before injecting refrigerant, the whole refrigeration system must be completely dry and of vacuum pumping. • Connect vacuum pumping pipe at the fluoride nozzle at

• When the degree of vacuum is reached, inject refrigerant into nameplate and the table of main technical parameters. Refrigerwater circulate and start up the unit for injection. Make the low 2) Refrigerant supplement. Connect refrigerant injection bottle on the fluoride nozzle at low-pressure side and connect pressure gauge at low pressure side. • Make chilled water circulate and start up unit, and make the

low pressure control switch short circuit if necessary. Slowly inject refrigerant into the system and check suction and discharge pressure.

# CAUTION

• Connection must be renewed after injection is completed. Never inject oxygen, acetylene or other flammable or poisonous gas to the refrigeration system at leakage detection and air tight test. Only pressurized nitrogen or refrigerant can be used.

# 8.1.13 Disassembling compressor

Follow the following procedures if compressor needs to be disassembled: Cut off the power supply of unit. 2) Remove power source connection wire of compressor. 3) Remove suction and discharge pipes of compressor. 4) Remove fastening screw of compressor. 5) Move the compressor.

# 8.1.14 Auxiliary electric heater

When the ambient temperature is lower than 2°C, the heating efficiency decreases with the decline of the outdoor temperature. In order to make the air-cooled heat pump stably run in a relatively cold region and supplement some heat lost due to de-frosting. When the lowest ambient temperature in the user's region in winter is within 0°C~10°C, the user may consider to use auxiliary electric heater. Please refer to relevant professionals for the power of auxiliary electric heater.

# 8.1.15 System antifreezing

channel, severe damage may be caused, i.e. heat exchange may be broken and appears leakage. This damage of frost crack is not within the warranty scope, so attention must be paid to antifreez-

Table 8-3 Model<sup>.</sup>

Outdoor

temperature

Compresso

of air-side heat exchanger

Temperature of chilled water or hot water

hot water pump

Operation time: Startup (

Indoor temperature

Dry bulb

Wet bulb

High pressure MPa

MPa

Low pressure

Voltage

Current

Inlet (dry bulb)

Outlet (dry bulb)

Inlet

Outlet

Current of cooling water pump or

Mode

Table 7-1

Error

essor stops

se of integr rature sens

air discharge

mpressor stops ause of Lo.-pres

Possible reason

Over high air expelling pressure and

Short circuit comes out from motor or

Over high air expelling pressure or

essive low air suction pressure

ter in front (or rear) of expanding

ssive low air suction pressure

iquid refrigerant flows into compressor

ol circuit without power though

oltage or lo-voltage protection

/ater system error and flow type

ume controller short connectior

Display operation mode

n Online units Qty.

Fig.8-1

T3A T3B

Display time-on/off

coils in contactor are burnt out

om evaporator result in liquid slugging.

overcurrent relay trip up, fuse burnt out Replace damaged assembly

king screws at panel are loosen Fix up all assemblies

suction pressure

phase unbalance

nnecting interface

ponent error

-voltage switch error

Aging of compressor

8. MAINTENANCE AND UPKEEP

Auto Manu

8.1 Failure of wired controller and its reason

8.1.1 LCD Diagram of Wired Controller

lve is blocked

ercurrent assembly error

Over high or over low voltage

number of the modular unit. No page can be turned, which continues until the wired controller receives the communication data of this modular unit. 8.1.5 Main page display

#### Main page display consists of several pages and the total number of pages is not fixed. a. The default display is the first page; other pages are displayed by pressing page-up/down button circularly. b. The first page of data display Up area displays the total outlet water temperature, and then the total outlet water temperature and the heat exchanger outlet water temperature are displayed according to the page number circularly and in turn.

d. The first page of data display Down area shows the total load rate of compressor and the fourth page displays the address corresponding to unit number. e. When all the pages of the main page data are displayed, continue to press page-down button to display the first page, and press page-up from the first page to display the last page.

Query page data consist of several pages and the total number of pages is not fixed. a. Upon entering the spot check page display for the first time, the default selected 0# modular unit displays the state data of the first

# b. Contents in other pages are displayed circularly by pressing the page-up/down button.

c. Pages 1-7 of data display Up area show condenser pipe temperature of system A. condenser pipe temperature of system B. T4 temperature value, TS temperature value, compressor current of system A, compressor current of system B, and outlet water temperature of heat exchanger.

d. The first page of data display Down area displays the unit

# protection code is displayed. One protection code at most may be displayed by turning page. In case of exceeding one protection code, the following ones will not be displayed. If there is no protection, only one page of protection code displays "P-", and the next page begins to display the contents of the first page.

The following preparations should be made for re-startup of unit

3) Check pump, control valve and other equipments of water pipe

the water in the water system should be drained. 2) Water pipe may be frozen when the chilled water target flow controller and anti-freezing temperature senor become ineffective at running, therefore, the target flow controller must be connected in accordance with the connection diagram. 3) Frost crack may happen to water-side heat exchanger at maintenance when refrigerant is injected to the unit or is discharged for repair. Pipe freezing is likely to happen any time when the pressure of refrigerant is below 0.4Mpa. Therefore, the water in the heat exchanger must be kept

O&I manual

1) If the unit that is shutdown for standby is placed in an

environment where the outdoor temperature is lower than 2°C

# flowing or be thoroughly discharged.

• Remove air from the system pipe with vacuum pump. The vacuum pumping lasts for above 3 hours. Confirm that the indication pressure in dial gauge is within the specified scope. the refrigeration system with refrigerant bottle. Appropriate amount of refrigerant for injection has been indicated on the ant must be injected from the low pressure side of system. • The injection amount of refrigerant will be affected by the ambient temperature. If the required amount has not been reached but no more injection can be done, make the chilled pressure switch temporarily short circuit if necessary.

# **RECORD TABLE OF TEST RUN AND MAINTENANCE**

Upon error have been confirmed, please replace a new one.

essure switch error

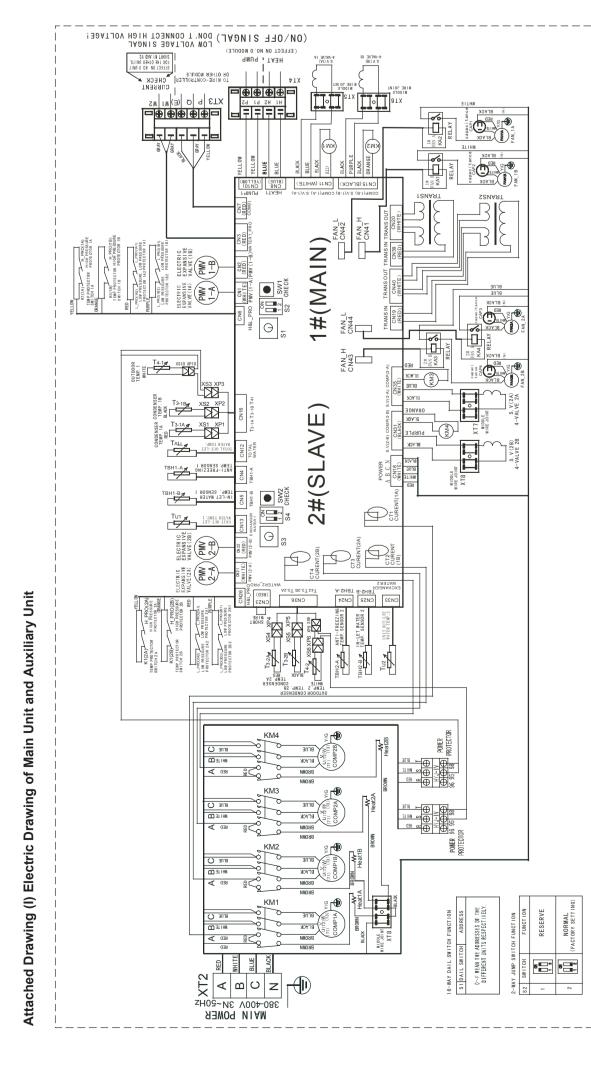
able 8-2	
Model: C	Code labeled on the unit:
Customer name and address:	Date:
1. Whether there is sufficient water flow passing v	waterside heat exchanger? ( )
2. Whether leakage detection has been made on	all the water pipe? ( )
3. Whether pump, fan and motor are lubricated?	( )
4. Whether unit has been through 30-minute oper	ation? ()
5. Check temperature of chilled water or hot wate	r
Inlet ( ) Outlet ( )	
6. check air temperature of air-side heat exchang	er:
Inlet ( ) Outlet ( )	
7. Check refrigerant suction temperature and sup	erheating temperature:
Refrigerant suction temperature: ( ) ( ) (	()()()
Superheating temperature: ( )( )(	)()()
8. Check pressure:	
Discharge pressure: ( ) ( ) ( ) ( ) (	)
Suction pressure: $()()()()()()$	
9. Check running current: ( ) ( ) ( ) ( ) ( ) (	)
10. Whether unit has been through refrigerant lea	kage test? ( )
11. Whether unit inside and outside is cleared?	( )
12. Whether there is noise on all the panels of un	it? ( )
13. Check whether the main power source conne	ction is correct. ( )

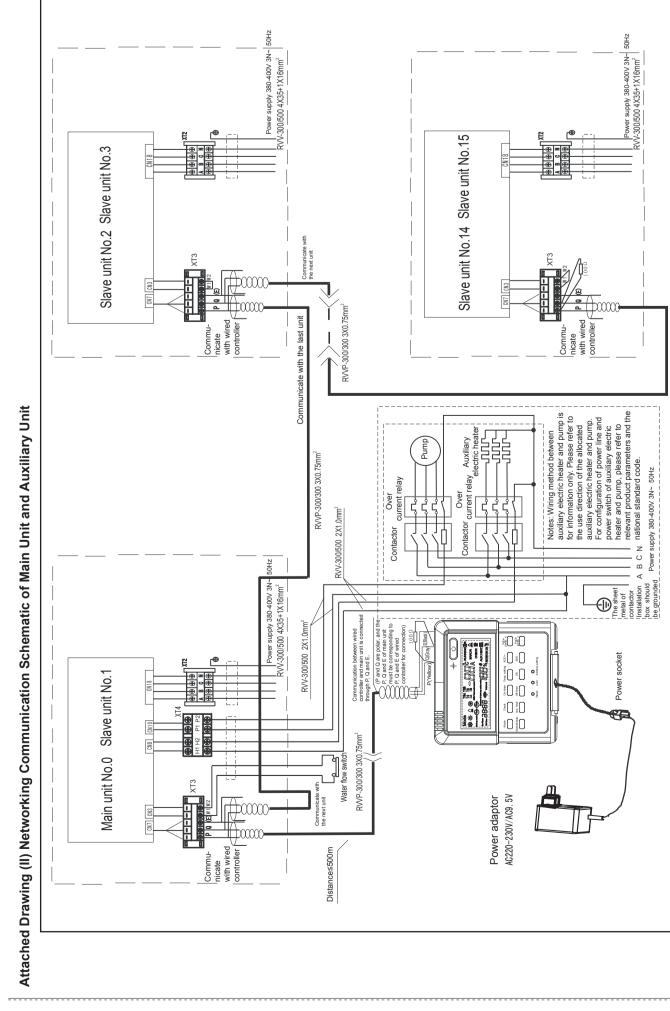
RECORD	TABLE	<b>OF</b>	ROUTINE	RUNNIN



Мс	odel	MGB-F130W/RN1
Cooling capacity	kW	130
Heating capacity	kW	138
Standard cooling input	kW	40.8
Cooling standard current	A	73.0
Standard heating input	kW	43.0
Heating standard current	А	74.4
Power s	upply	380-400V 3N $\sim$ 50Hz
Operation	control	Control of wired controller, manual/auto startup, runni display, failure alert etc.
Safety c	levice	High or low pressure switch, freeze-proof device, water flo controller, Overcurrent device, power phase sequence de
	Туре	R410A
Refrigerant	Chargeing volume kg	7.0×4
	Waterflow volume m <sup>3</sup> /h	22.4
	Hydraulic resistance lose kPa	25
Water pipe system	Water side heat exchanger	Shell & tube type heat exchanger
	Max. pressure MPa	1.0
	Inlet and outlet pipe dia.	65mm (Inside nominal diameter)
	Туре	Fin coil model
Air side heat exchanger	Air flow volume ${ m m}^{3}/{ m h}$	48 000
	L mm	2000
Outline dimension	W mm	1685
	H mm	2090
N.W. of the unit	kg	1150
Operation Weight	kg	1270
Packing dimension	L×W×H mm	2080×1755×2240

Notes: the above data is measured base on the following working condition. Cooling mode under nominal working condition: water flow 0.172m<sup>3</sup>/(h•kW), outlet water temperature of chilled water 7°C, air inlet temperature of condenser 35°C. Heating mode under nominal working condition: water flow 0.172m<sup>3</sup>/(h•kW), outlet water temperature of hot water 45℃, air inlet temperature of condenser DB/WB 7/6℃.





O&I manual 32

O&I manua

31

O&I manual 28

O&I manual 30

O&I manual

29

Version:MDV10IU-003bW