



SPLIT MULTIFUNCTIONAL AIR TO WATER HEAT PUMP

(Heating, Cooling and Domestic Hot Water)



MQD-8
MQD-11
MQD-14
MQD-17
MQD-20
MQD-23



MANUAL OF INSTALLATION,
OPERATION AND MAINTENANCE

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1. INTRODUCTION

The unit purchased by you has been subjected to strict quality control before leaving the factory. It also meets the safety standards of the CE. Do not tamper with the unit, or subject to conditions of work not specified in this manual, you may lose any guarantee on it. The repair and maintenance must be conducted by your service / maintenance installer.

It is the responsibility of the installation company performing the installation in accordance with the characteristics the project, subject to the regulations. Before installing the necessary equipment read this manual, and carry out the directions and observations in it.

The equipment should be installed only by a duly accredited professional.

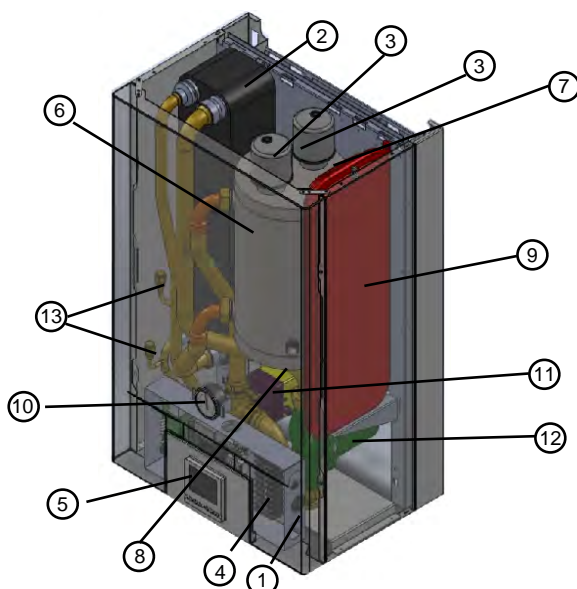
The manufacturer does not respond to any damages and / or indirect, caused by improper installation.

You should check the receiving unit, which is in perfect condition. If otherwise appropriate to make a written complaint to the carrier.



2. DESCRIPTION OF UNIT

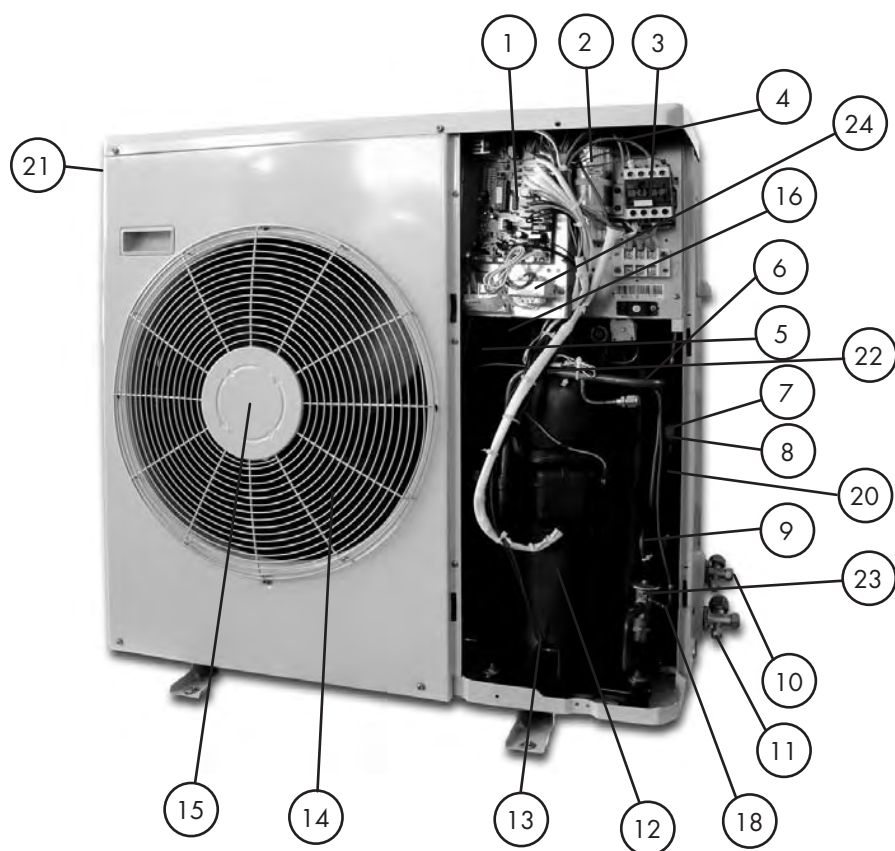
Indoor Hydraulic unit (all models)



Item	Part Name	
1	Electric box	8 Safety valve
2	Plate heat exchanger	9 Expansion tank
3	Electric heater	10 Pressure Gauge
4	Water control PCB	11 Electric 3 way valve
5	Wire controller	12 Water pump
6	Water tank	13 Needle valve
7	Air discharge valve	

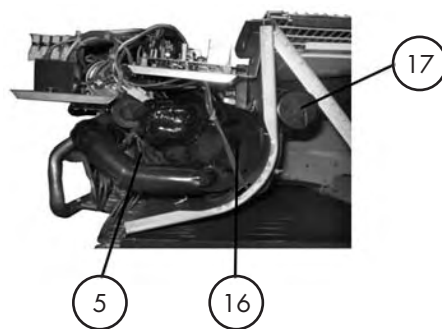
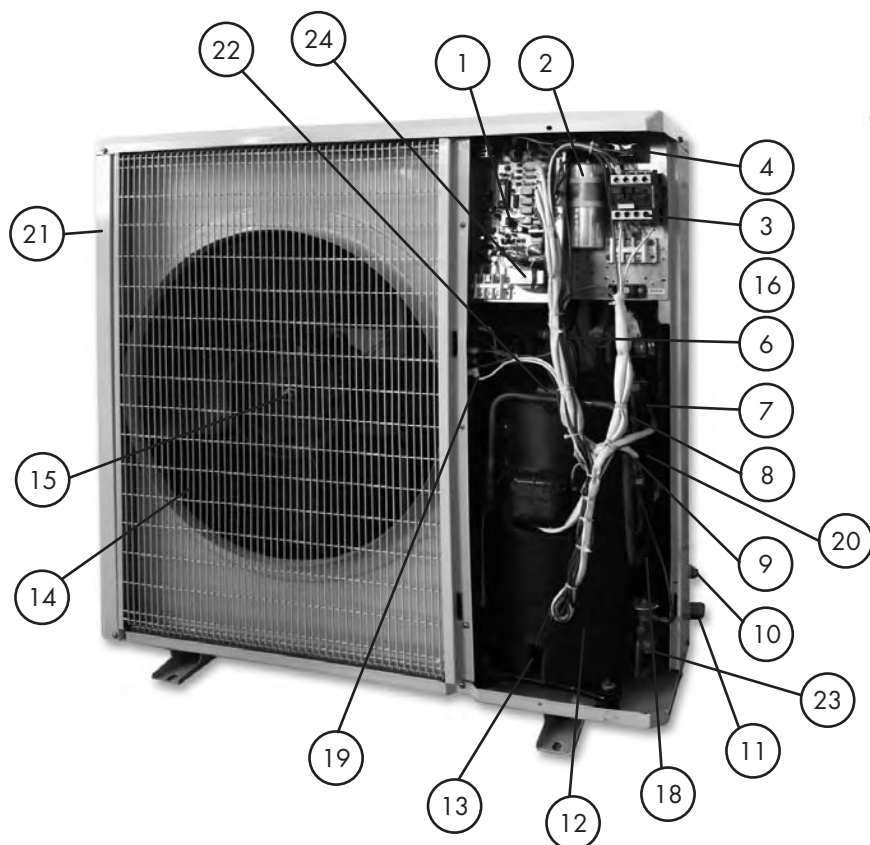
2. DESCRIPTION OF UNIT

Outdoor Unit MQD-11E



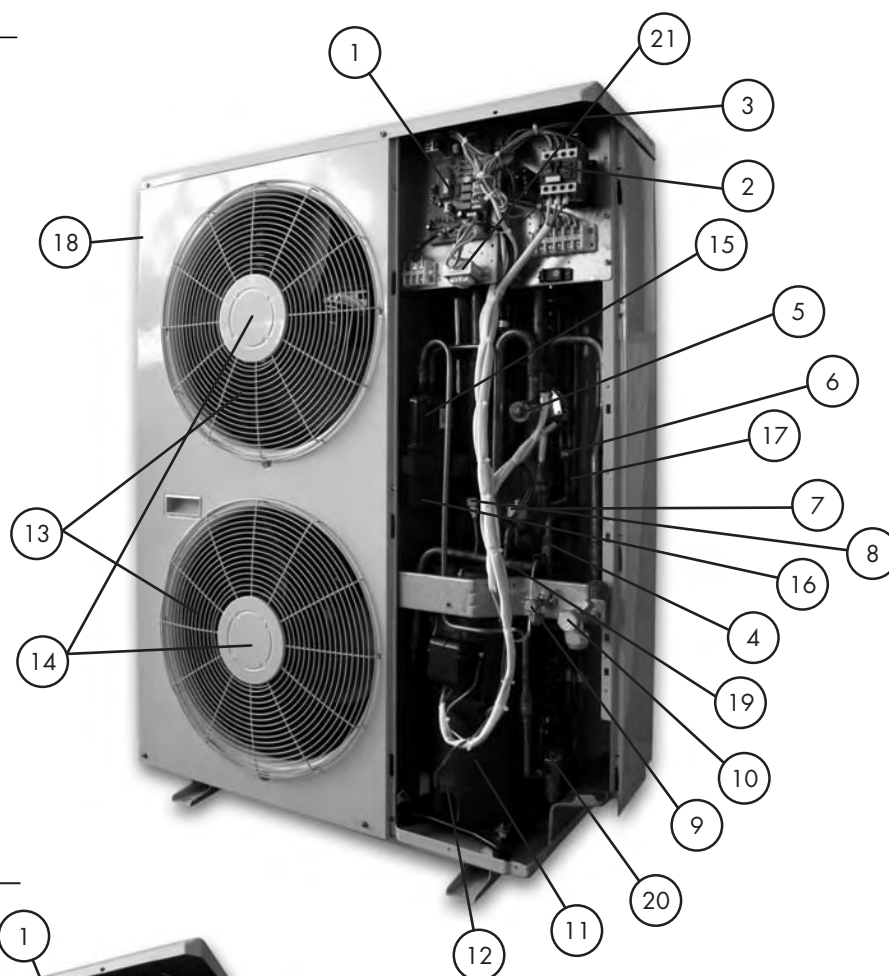
1. Electronic board outdoor
2. Compressor Capacitor
3. Compressor Contactor
4. Condenser fan motor
5. Low Pressure switch
6. 4-way valve
7. Injection Valve
8. Injection pressure (high) switch
9. High pressure switch
10. Liquid service valve
11. Gas service valve
12. Compressor
13. Compressor crankcase
14. Outdoor fan
15. Outdoor Fan Motor
16. Suction accumulator
17. Compressor soft start capacitor
18. Liquid separator
19. Compressor soft starter
20. Defrost sensor
21. Outside air temperature sensor
22. Discharge tube
23. Thermal expansion valve
24. Transformer

Outdoor Unit MQD-14E

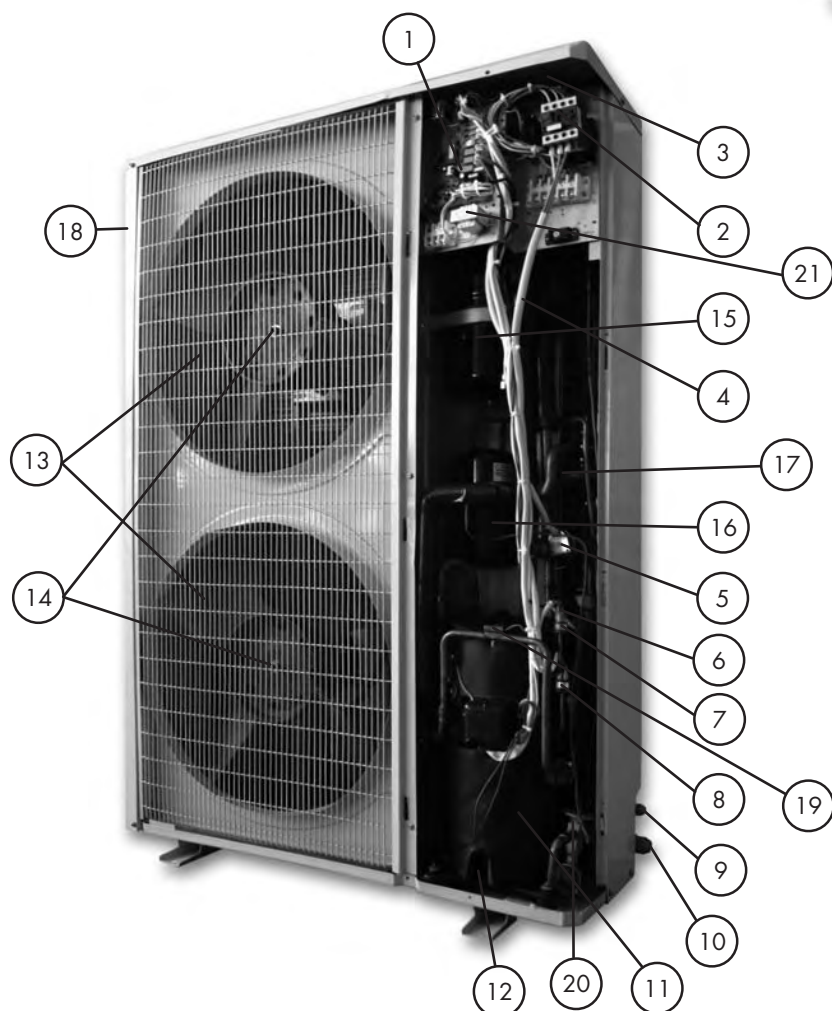


2. DESCRIPTION OF UNIT

Outdoor Unit MQD-17E



Outdoor UnitMQD-20E



1. Electronic board outside
2. Compressor Contactor
3. Condenser fan motor
4. Low Pressure switch
5. 4-way valve + coil
6. Injection valve +coil
7. Injection pressure (high) switch
8. High pressure
9. Liquid service valve
10. Gas service valve
11. Compressor
12. Compressor crankcase
13. Outdoor fan
14. Outdoor Fan Motor
15. Suction accumulator
16. Liquid separator
17. Defrost sensor
18. Outside air temperature sensor
19. Discharge tube
20. Thermal expansion valve
21. Transformer

3. TECHNICAL DATA

TECNICAL CHARACTERS			MQD-8	MQD-11	MQD-14	MQD-17	MQD-20	MQD-23	
Heating	Capacity Nominal	KW	8.42	10.3	14.2	16.5	19.5	22.7	
	Consumption Nominal	KW	1.98	2.45	3.45	3.92	4.33	5.2	
	COP	W/W	4.25	4.2	4.12	4.21	4.5	4.37	
Cooling	Capacity Nominal	KW	7.96	10.6	14.5	17.1	19.8	23	
	Consumption Nominal	KW	2.45	3.21	4.46	5.21	5.11	6.05	
	EER	W/W	3.25	3.3	3.25	3.28	3.87	3.8	
D.H.W.	Capacity Nominal	KW	7.8	9.56	12.9	15.8	17.75	21	
	Consumption Nominal	KW	2.2	2.45	3.49	4.05	4.57	5.52	
	COP	W/W	3.55	3.9	3.7	3.9	3.88	3.8	
Power supply		V/Ph/Hz	230/1/50				400/3/50		
Gas line		Inch	5/8”	5/8”	3/4”				
Liquid line		Inch	3/8”						
Compressor type			Rotary		Scroll				
Refrigerant type			R-410A						
Refrigerant charging volume		Kg.	1.9	2.4	2.95	4.50	4.6	5.2	
Inner water tank		Litre	12						
Pressure max climate		Bar	7						
Climate expansion tank		Litre	6						
Climate output		mm	25						
DHW water output		mm	25						
Tap water/Climate/DHW water input		mm	25						
DHW/Climate safety valve		mm	15						
Drain valve		mm	15						
Unit Dimension		Indoor unit	mm						
(HeightxWeightxLength)		Outdoor unit	mm	830x700x300	860x870x325	960x970x345	1260x970x345	1460x970x345	1497x1090x383
PackedDimensions		Indoor unit	mm						
(HeightxWeightxLength)		Outdoor unit	mm	955x860x395	980x985x415	1080x1085x465	1390x1085x465	1590x1085x465	1630x1210x503
Net weight	Indoor unit	Kg.	52	54	55	56	57	59	
	Outdoor unit	Kg.	52	75	100	120	130		
Packedweight	Indoor unit	Kg.	58	60	61	62	63	64	
	Outdoor unit	Kg.	62	85	112	135	147		
Noise level	Indoor unit	dB(A)	28						
	Outdoor unit	dB(A)	43	48	49	51	52	58	
Maxpipe length		m	50						
Max height difference		m	30						
Minwater flow		L/S	0.38	0.5	0.7	0.8	0.9	1	

NOTES:

* Capacities and consumption based on the following conditions:

- Heating: Temperature inlet / outlet water 30/35 ° C. Temperature wet / dry air 6 ° C / 7 ° C.
- Cooling: Temperature inlet / outlet water 23/18 ° C. Dry air temperature 35 ° C.
- DHW: Outlet water temperature 45 ° C. Temperature wet / dry air 6 ° C / 7 ° C.

* Refrigerant charge is valid for a line length of 5 meters.

* The net weight of the indoor unit does not include the weight of accumulated water in it.

* The sound pressure level is measured at 5 meters from the unit.

3.ELECTRICS DATA

Electrical consumption

TECNICAL CHARACTERS		MQD-8	MQD-14	MQD-17	MQD-20	MQD-23
Operating Voltage	V/Ph/Hz	230/1/50	230/1/50	230/1/50	380/3/50	380/3/50
Voltage min	V	205	205	205	360	360
Voltage max	V	253	253	253	440	440
Consume						
Nominal Cooling *	kW	2.45	4.5	4.82	5.2	6.05
	A	10.86	19.57	20.96	7.9	9.19
Nominal Heating **	kW	1.98	3.55	3.67	4.15	5.2
	A	8.78	15.43	15.96	6.31	7.9
Nominal Domestic hot water ***	kW	2.2	3.49	4.05	4.57	5.52
	A	9.76	15.17	17.61	6.94	8.39
Max Cooling	kW	3.3	5.63	6.03	6.5	7.56
	A	14.64	24.48	26.22	9.88	11.49
Max Heating	kW	3.06	5.33	5.51	6.23	7.8
	A	13.59	23.17	23.96	9.47	11.85
Max D.H.W..	kW	2.51	4.47	5.18	5.85	7.07
	A	11.14	19.43	22.52	8.89	10.74

NOTE:

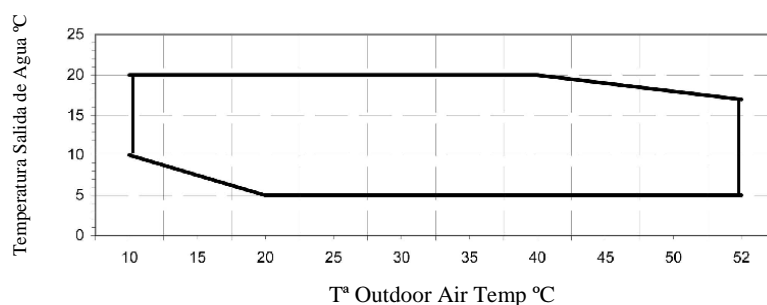
* Temp. Input / Output water 23/18 °C. Outdoor air temp. dry bulb 35 °C.

** Temp. Input / Output water 30/35 °C. Wet / dry air temp 6 °C / 7 °C.

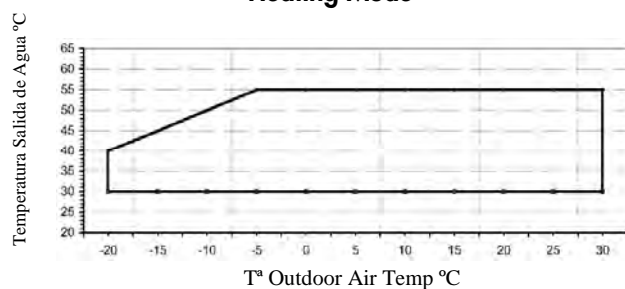
*** Temp. water outlet 45 °C. Wet / dry air temp 6 °C / 7 °C.

OPERATING LIMITS

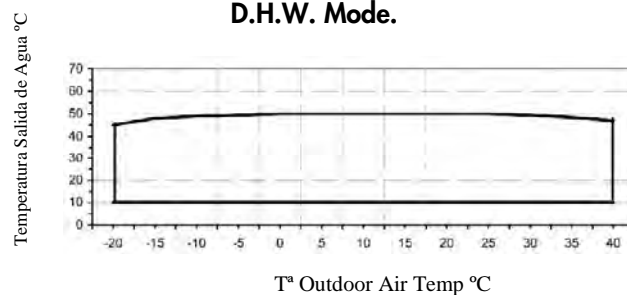
Operating Limits Cooling Mode



Operating Limits Heating Mode

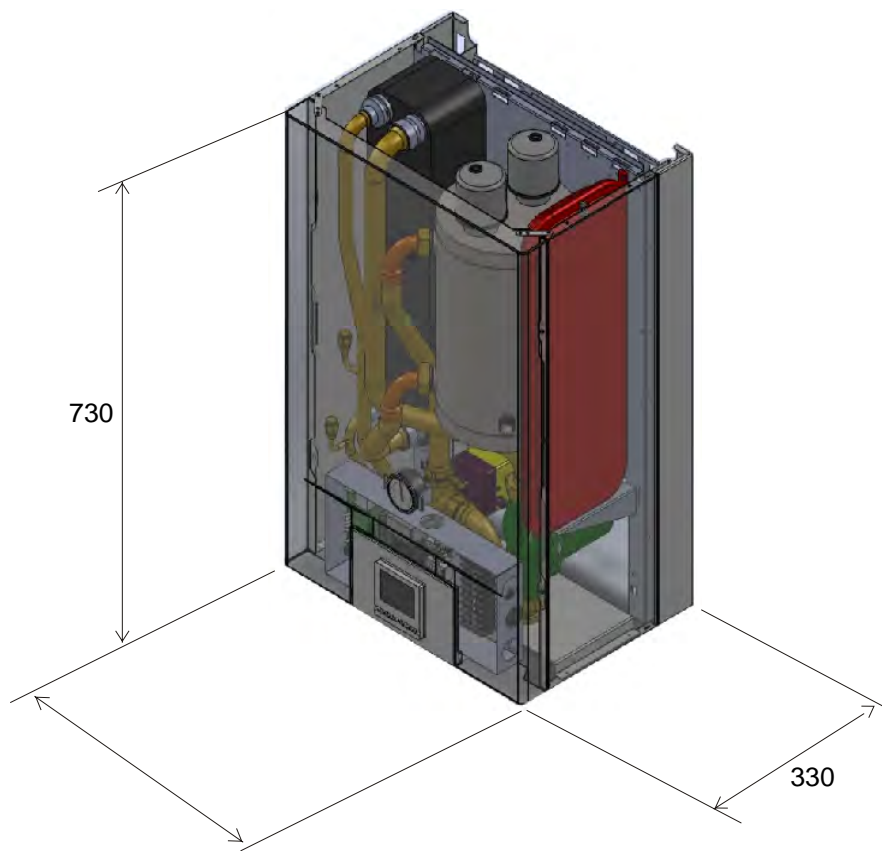


Operating Limits D.H.W. Mode.



4.DIMENSIONS

Indoor Unit (all models)

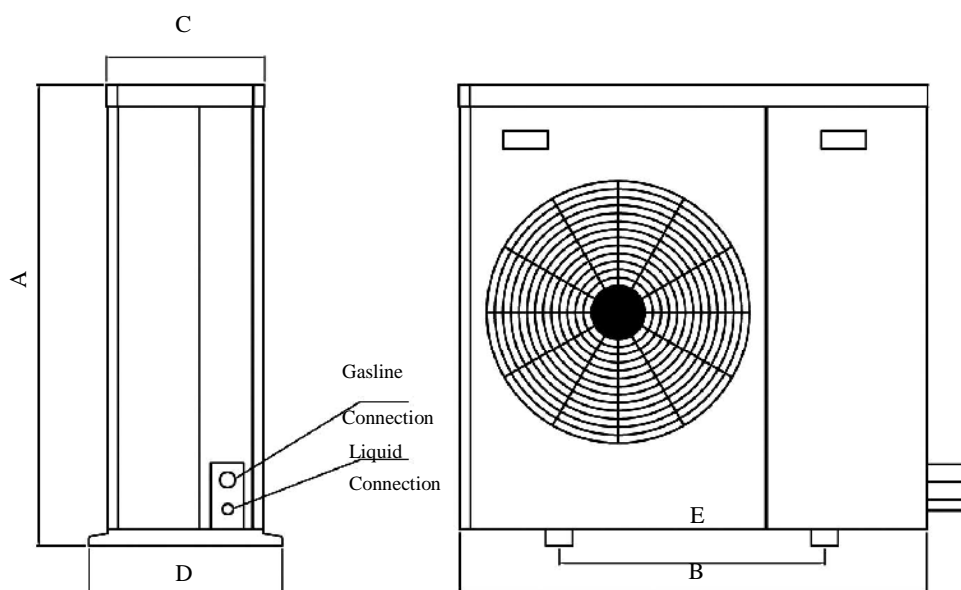


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NOTA:

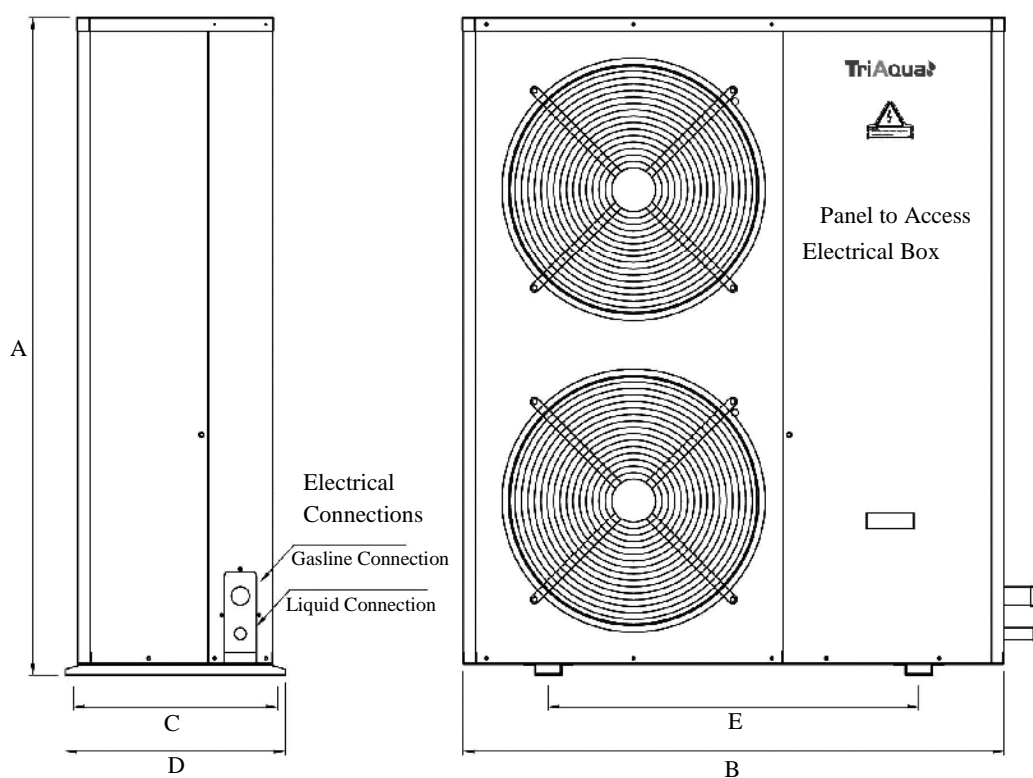
Dimensions in mm.

Outdoor unit MQD-8E/MQD-14E



4. DIMENSIONES

Outdoor unit MQD-17E /MQD-20E



MODEL	DIMENSIONS (in mm)				
	A	B	C	D	E
MQD-8	830	700	300	350	450
MQD-14	960	970	345	415	640
MQD-17	1.260	970	345	415	640
MQD-20	1.460	970	345	415	640

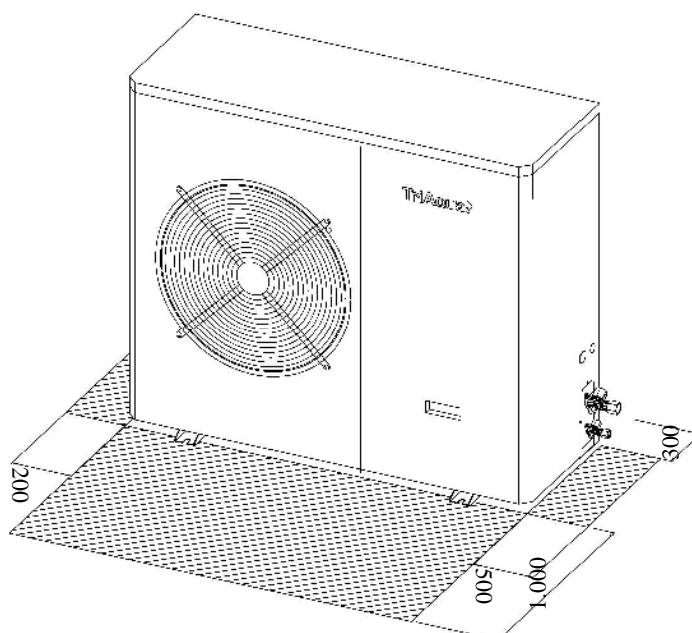
5.SERVICE AREA

The following is the minimum space needed to carry out the tasks of service and maintenance of the units.

Outdoor Unit (all models)

NOTE:

Dimensions in mm.



6.INSTALLATION

6.1 SAFETY CONSIDERATIONS

Here are a series of recommendations to follow for proper installation of the unit.

Installation, repair and maintenance of these units must be made with caution because the presence of electrical, electronic and circuit pressure system refrigerant. Only trained and qualified personnel should perform all installation, adjustment and maintenance unit.

The manufacturer declines all liability for negligence and breach of safety standards described below:

- Work in total safety, free from obstacles and clean environment.
- Comply with regulations.
- Before commissioning of the unit, excellent condition confirm the same and its components.
- Wear safety goggles and gloves while working. Use quenching cloth during operations welding.
- Put in place strong units that can support the weight bearing and allow the right posterior maintaining it.
- Use the specified cables and make a proper connection at the terminals.
- Make a separate attack unit.
- Check the supply voltage corresponds to the plate.
- Perform the corresponding ground.
- Perform the work safely install hydraulic and drainage pipes as shown of this manual.
- During operation of the drive circuit part5s refrigerant. (compressor line download) can reach temperatures. above 70 ° C. Take special care when accessing the inside the unit.
- The unit can work in environments "normal" residential, commercial or light industry. The unit can not be installed in explosive atmosphere environment. For applications Special should consult the manufacturer.

Very Important!

Before starting the installation or maintenance operations of the unit disconnect switch general power. Electrical shock can cause personal injury.

MOST IMPORTANT!

1. Make sure it is not in cooling mode during first operation or test running, until you make sure the air conditioning water pump is working properly and water circuit is recycling soothly.
2. Recommand to test the water pump working condition and water circuit directly before switch on the heat pump.
3. Select a big enough water pump for the air conditioning water circuit.
4. Always keep the electricity connnection with the heat pump to enable inner antifreeze function wich is valid with electrcity supply.

6.INSTALLATION

6.2 Location of units

Inspect units of receipt to verify any damage or damage during transport. If the unit is damaged you must file a claim immediately to the company who made the shipment.

Interior Location of Unit

The indoor unit is designed for installation inside the housing. For this, the inner cabinet has the same action at its base that a common household. It also has the possibility of adjust its height due to small height-adjustable feet.

When installed inside the unit must be left open the door area access, being necessary to leave the spaces described in paragraph 7 (Service Areas).



Location of Outdoor Unit

The outdoor unit must be placed in proper orientation to climatic characteristics of the region where it is installed.

It should be positioned so that air circulation is free and well avoid recirculation effects detrimental to performance.

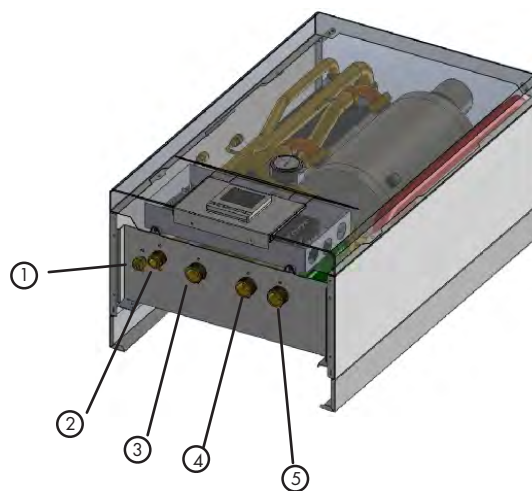
When installing the outdoor unit must be left free the front of the unit, which is necessary to leave the spaces described in paragraph 7 (Service).



6.3 Hydraulic connections

All hydraulic connections are labeled as shown in Figures 1 and 2:

1. Refrigerant Liquid valve
2. Refrigerant gas valve
3. Air conditioning water outlet
4. Domestic hot water outlet
5. Water inlet



6. INSTALLATION

It is necessary to conduct the outlet safety valves of the tank to drain

Hydraulic Circuit Connection

Water Pump

There is one water pump build inside of our heat pump indoor unit, but the installer need to calculate water flow required and to overcome the pressure drop during installation machine.

Please check the wiring diagram with the unit for the water pump electricity connection.

Important: A small pump may cause a malfunction or even a fault irreparable.

Air Conditioning Water Pump Selection

There is one built in water pump(C1) for both DHW and air conditioning. But additional water pump for DHW(C2) and water pump for air conditioning(C3) can be applied according to actual installation.

The selection of air conditioning water pump out of the unit should take based on the flow rates of cooling and heating,internal drop unit (see graph) and the drop of the facility.

It is important keep enough water flow to ensure the heat pump optimized COP and keep the whole system safe.

Calculation of nominal water flow:

$$Q_{\text{water}} (\text{l/h}) = \text{Cooling Capacity} * 0.86 (\text{Kcal/h}) / \Delta T (^\circ\text{C})$$

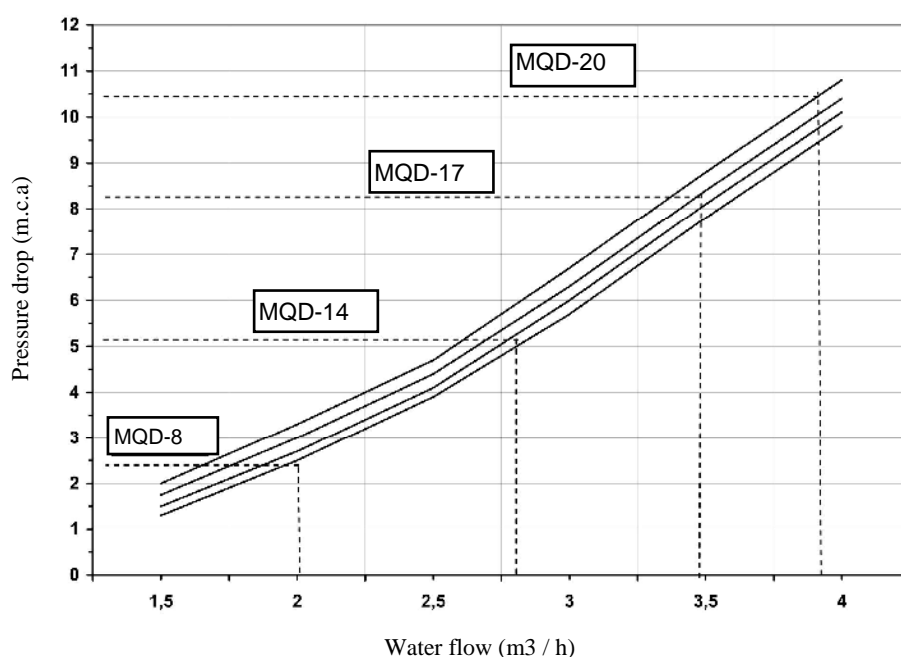
$$\text{As } \Delta T = (T_{\text{first exit water temp}} - \text{water return Temp}) \quad T = 5^\circ\text{C}$$

Example: Model MQD-14

$$Q_{\text{water}} = (14,600 \text{ W} * 0.86) \text{ Kcal/h} / 5^\circ\text{C} = 2500 \text{ l/h}$$

IMPORTANT: The temperature difference in air conditioning heat exchanger should be 5 °C approx.A high temperature difference can cause a malfunction of the unit and even irreparable damage to it.

Tritherma air conditioning Pressure Drop in Hydraulic Circuit



1 m.c.a = 10 Kpa

The graph indicates the pressure drop of cooling water circuit of the unit (components inside the unit).

6. INSTALLATION

Water Flow Switch

A water flow switch must be installed outside the unit for air conditioning operation to avoid any damage to the unit. The control should be connect to IN5 of indoor unit control board.

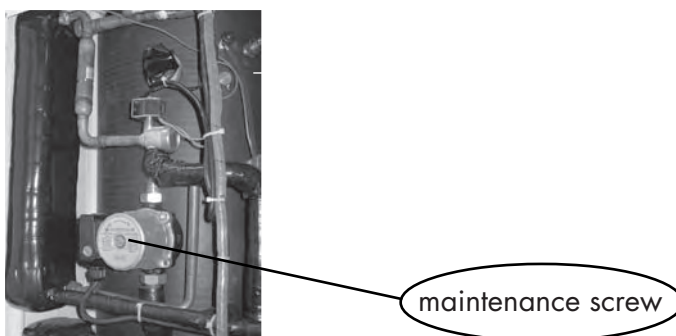
Important: The water shortage in cooling operation could cause irreparable damage to the unit.

Filling and pressure testing for Hydraulic Circuit

- * A water regulation valve(Normally 1.5-2.5 bar) must be installed before tap water go into the heat pump inlet.

The DHW water tank must be with coil heat exchanger inside, so the tank water is clean and seperated with heat pump hydraulic recycle.

- * Check the correct rotation of water pump axis after uncover the maintenance screw with a scew driver.



After all connection is finished, connect the power supply, NOT SWITCHING ON THE UNIT.

- Open air discharge valve of inner water tank on the top and open air discharge valves of all fan coils. The water pump maintenance screw can also be loosed to purge air.
- Open the tap water and let the tap water go into the heat pump hydraulic recycle.
- Close air discharge valve when water comes out continuously.

Switch the inner 3 way valve to fill water for both side :

In order to avoid compressor running, firstly set both Domestic hot water target temp and air conditioning heating temp to 10 centigrade.

Turn on the unit and choose **H** mode, after **H**ide air is purged completely and filled with water, choose air conditioning heating mode to fill the air conditioning side.

- Set target water temp back after complete installation and check everything ok

.Before assure the water pump is working well and water flow is correct, Put the unit in HEATING mode.

- Open a point of hot water consumption to flush the system.
- Check the water pressure gauge installed in the control panel of indoor unit, it must be between 1 and 2.5 bar (normal 1.5 bar) for properoperation.
- Ensure that all secondary facility is found with water pressure and completely purged of air. The existence of air in the air conditioning circuit can cause irreparable damage unit.For this reason, air discharge valve should be installed in the highest part of the hydraulic circuit to remove all air from the system.

6.INSTALLATION

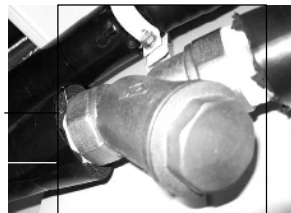
- It is recommended to connect the air conditioning water pump directly to the electricity, ie, turn on water pump only for air conditioning circuit for some time, to eliminate the existence of such air circuit.

Attention!

Do not connect the unit for operation of the pump. When connecting the unit and not the water pump independently, it could cause irreparable damage in the unit.

- A mesh water filter must be installed outside before the water return to the plate heat exchanger as show Figure 7 whose mission is to retain dust or dirt which might remain in the cooling circuit of the house.

Figure 7



Attention!

The dirt from the installation may cause irreparable damage to the unit.

- Once the connections and filling, and prior to starting the unit, it is recommended operating the air conditioning circuit pump for a while, to retain the mesh filter particles and impurities that could be installed. To this should be wired air conditioning pump directly to the network.
- Once that is done, and the pump stopped, it should close the stopcocks of input and output on the water circuit drain water tank through the drain valve and clean the filter. Then fill again the circuit.
- To ensure that no dirt on the circuit, should make this operation as often as necessary.
- Having ensure that the air cooling circuit is clean, insert glycol, if necessary, approximately 20% -30% for cold area.

Attention!

During cold climate area, inserting Glycol is necessary to make sure the heat pump won't be damaged during electricity accident. Keep always electricity connection to ensure auto antifreeze.
If the heat pump won't be used for a long time, please drain the system water out.

- Should perform periodic reviews, including cleaning the filter and to ensure that there is no dirt inside the water circuit. Especially in the first installation.

6.INSTALLATION

6.4 ELECTRICAL CONNECTIONS

Before any electrical installation work to ensure that the main switch is disconnected

General Recommendations

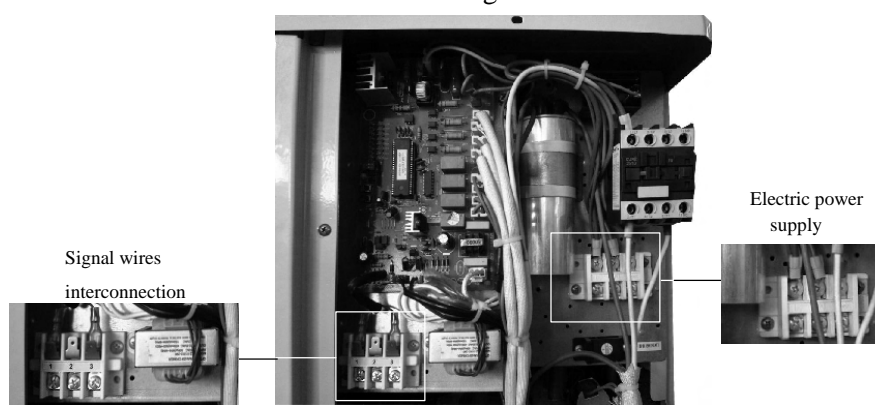
- The installer must protect the power line drive disconnecting devices automatic magneto-thermal switch and circuit breaker suitable for installation in accordance with the legislation.
- The power to the unit must be within a range of voltage (see table consumption electric page 8).
- It should pay special attention to the connection of ground wire. The ground wire must be of a length slightly larger than the cable phases.

Preliminary operations

In the outdoor unit:

- Remove the access panel to the control panel located on the front side of the unit.
- Check that the network characteristics match the data on the nameplate of the unit.
- Perform power and interconnection between the interior and exterior units through the 2 presses on the side of the unit.

Figure 8



- Ensure that power cords have the correct section for the total consumption unit. See table below.

In the indoor unit:

Unscrewing the unit control box, moving outward through support guides, so we have access to the terminals of the unit .

Power supply (connection and interconnection between units)

Checking Wiring diagram with the unit before connection

Before commissioning of the unit must perform the following connections:

- Mains supply (outdoor unit), Figure 8.
- Interconnection between the outer and inner drive, figures 8.

MODEL	Outdoor Power SUPPLY	Indoor power SUPPLY	COMMUNICATION
MQD-8	3 x 4 mm	3 x 4 mm	<u>SIGNAL</u> (no polarity) 2 x 0,5 mm
MQD-14	3 x 4 mm	3 x 4 mm	2 x 0,5 mm (no polarity)
MQD-17	5 x 6 mm	3 x 4 mm	2 x 0,5 mm (no polarity)
MQD-20			

*The power to the indoor unit can proceed directly network or coming from the outdoor unit.

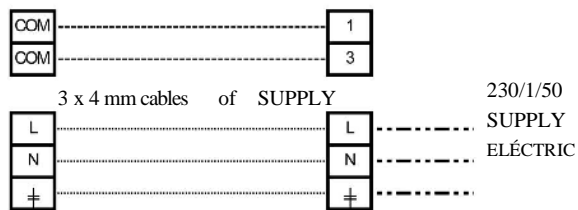
6.INSTALLATION

Model:MQD-8/14

INDOOR UNIT

OUTDOOR UNIT

2 communication cables no polarity

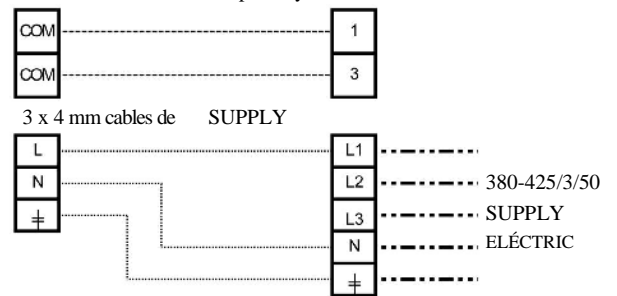


Model:MQD-17/20

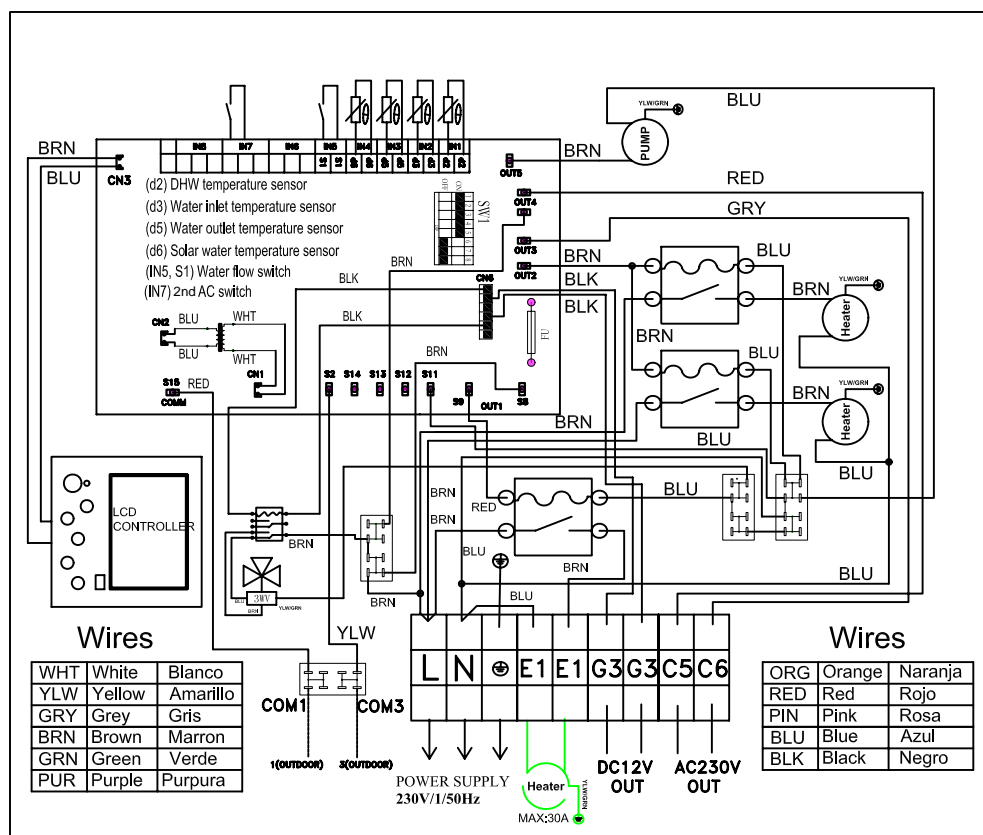
INDOOR UNIT

OUTDOOR UNIT

2 communication cables no polarity



Indoor Wiring Diagram



2nd AC Switch Usage (Connect to IN7)

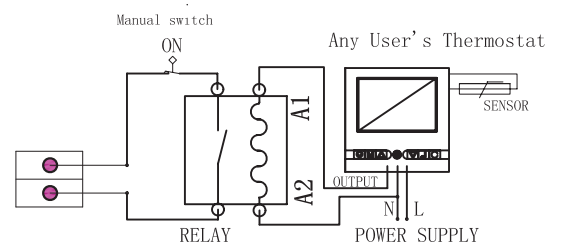
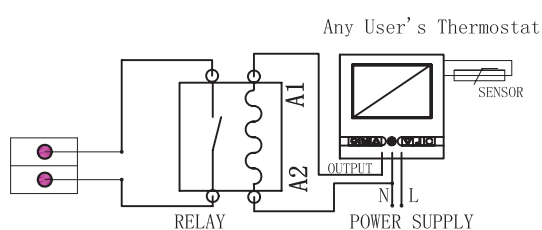
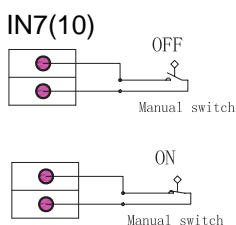
The 2nd switch function enable our heat pump to be controlled by any additional user's thermostat or remote switches for convenient control.

Function: When 2nd switch is off, the heat pump AC mode will run on standby mode no matter the AC water temp reach target or not. When 2nd switch is on, the heat pump will run according to set temp.

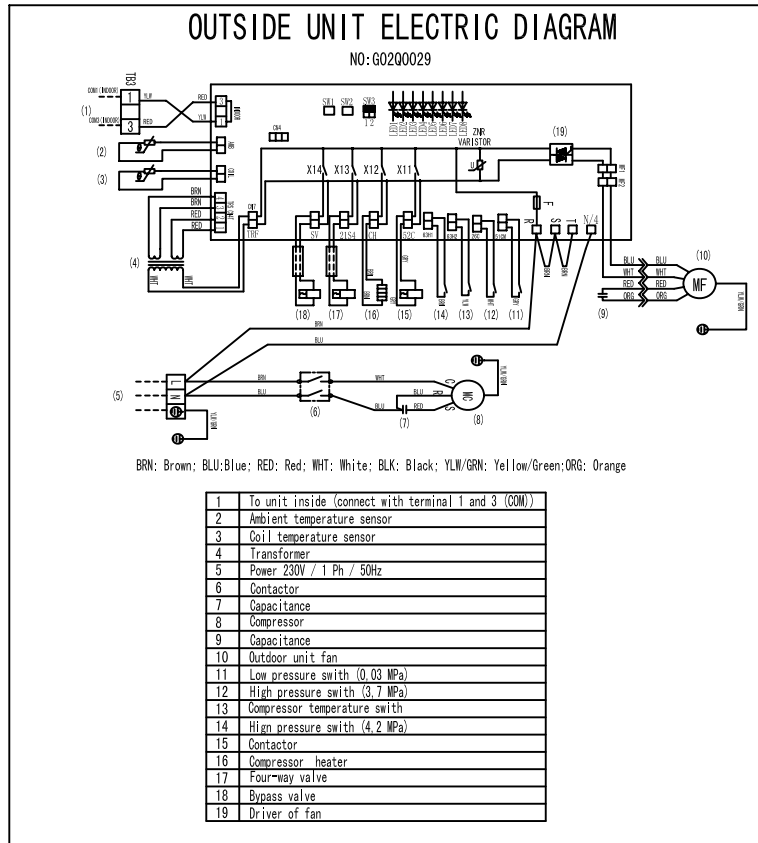
A. Connected to manual switch

B.Connected to any user's thermostat

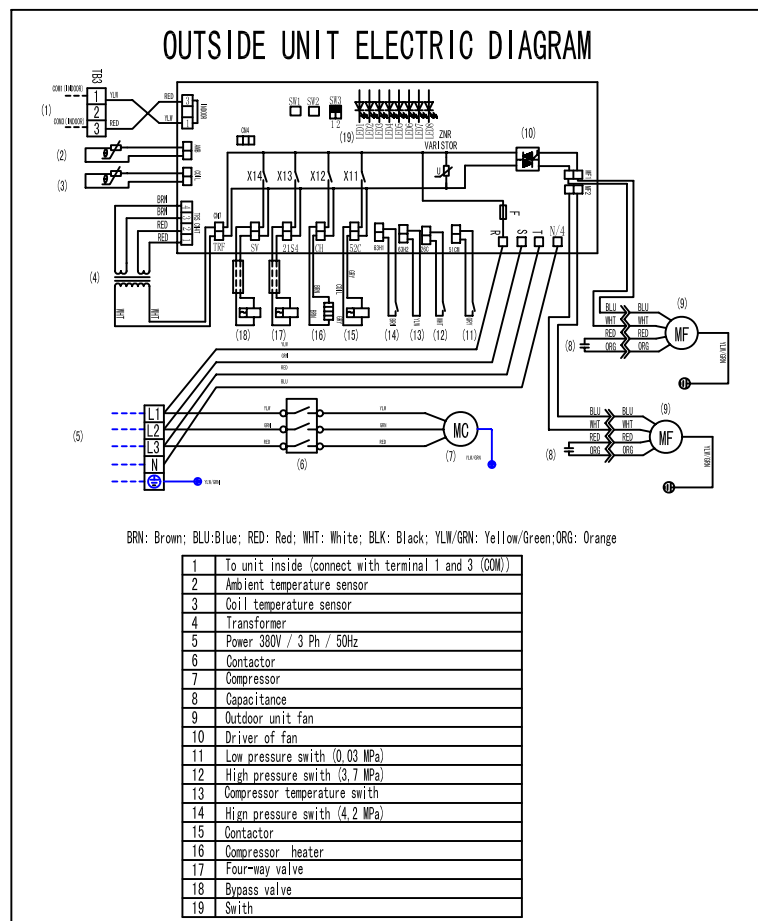
C.Connected to both manual switch together with any user's thermostat



Outdoor Unit 1 phase



Outdoor Unit 3 phases



6.5 REFRIGERANT SYSTEM CONNECTIONS

General considerations

The interconnection lines refrigerant is as follows:

- The indoor unit has identified the taking of gas and liquid, with stickers identifying, the follows:

Gas line: Gas (coolant) / Gas (refrigerant)

Liquid line: liquid (coolant) / Liquid (refrigerant)

- All refrigerant connections, as well as water, are threaded.
- You have to isolate the lines to avoid condensation and heat loss.
- Once you have installed the lines, to empty into the circuit refrigerant indoor unit until a -1 Kg/cm² pressure for at least 2 hours.
- The discharge circuit refrigerant and refrigerant charge can be made through service valves located on the right side of the outdoor unit
- Check for leaks in the circuit refrigerant.



Connection between indoor and outdoor units

In indoor unit:

indoor unit (see paragraph 6.Dimensionses scheme) and since the connections are made .

The indoor unit comes with a dry nitrogen load incorporated. The refrigerant lines of the units interior are a series of adapters and nuts to ensure proper seal until use.

In OUTDOOR UNIT:

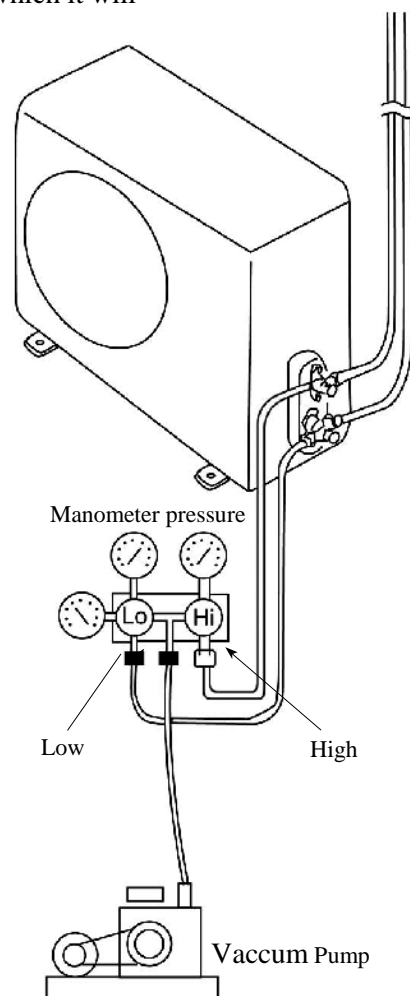
The outdoor unit is shipped with a load of R - 410A applies to a line length maximum equivalent of 5 meters. For lengths over 5 meters is necessary to add load according to the table in paragraph 6.7

6.INSTALLATION

6.6 CONDUCT OF VACUUM REFRIGERANT SYSTEM INSTALLATION

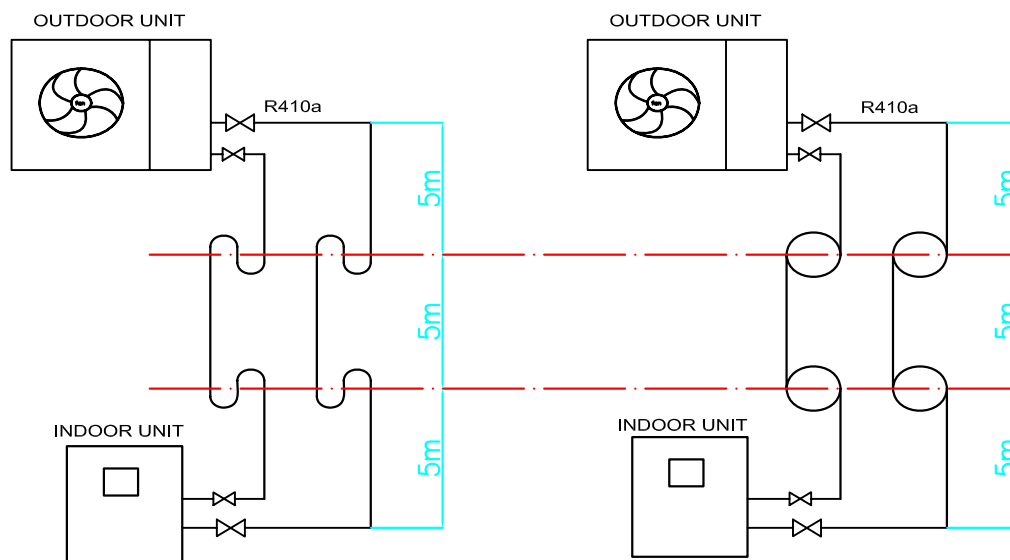
Once the connection refrigerant system between indoor and outdoor, and once it has been found tightness of this connection, we proceed to the realization of the vacuum in the unit to which it will the following process:

- With the outdoor unit's service valves closed (as the unit is delivered from the factory), remove the plugs of these service valves.
- Connect the pressure gauge connection in the following way:
 - Make the low pressure gauge connection to the gas service valve.
 - Make the high pressure gauge connection to the liquid service valve.
 - Make the centre bridge of the gauge connection to the vacuum pump.
- keep the pump running and open the valves of the bridge of gauges, so that we ensure the refrigerant circuit system depression by both refrigerant lines and the indoor unit.
- Perform a vacuum to ensure that the gauge indicates 1 bar.
- Once the vacuum to turn off the bridge of gauges and off the vacuum pump, making sure that pressure is maintained vacuum for at least 15 minutes.
- If pressure is not stable means there is a leak in the circuit, so you need to locate and remedy it. Once cured repeat the above steps.
- If vacuum pressure is stable (it may already be done when necessary refrigerant charge) disconnecting the bridge gauge of the vacuum pump first, and keep the bridge gauge closed ends connected to the valves or service lines, as appropriate for each model.
- The outdoor unit is shipped with a charge of refrigerant R-410A is valid for a length of line maximum equivalent of 5 meters.
- Perform opening the service valves.
- For superior line lengths to 5 meters, recharge the unit as shown in table recharge refrigerant.



NOTE:

1. -To recover all the refrigerant charge in the outdoor unit for maintenance, just to shut off the liquid valve. Operate the heat pump in cooling mode. After the pressure is reduced to 0 Pa, shut off the gas valve.
2. - If the outdoor unit is more than 5 meter higher than indoor unit, please make a "U" shape or "O" shape for every 5 meter.



6.INSTALLATION

6.7 REFRIGERANT CHARGE (R-410A)

The outdoor unit incorporates the refrigerant charge (R410A) necessary for the proper functioning of the unit to a length of interconnecting pipe 5 meters.

If the interconnection line is greater than 5 meters, we should make a refrigerant addition according to the following table:

Additional refrigerant charge (g / m)

DIÁMETER	3/8"	5/8"	3/4"
LÍQUID	60	-	-
GAS	-	8	10

NOTE:

- Enter the refrigerant charge in liquid phase.

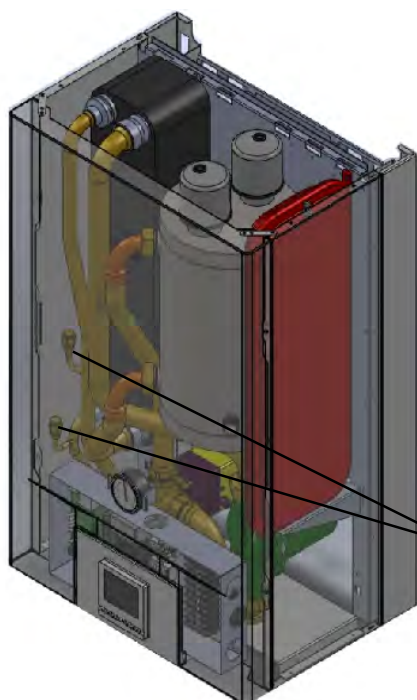
6.8 PRESSURE MEASUREMENT LOCATION

OUTDOOR UNIT

In the outdoor unit has two pressure connections (suction and compressor discharge), through which pressure can be measured evaporation and condensation of the system in any three functions (DHW, Heating and Refrigeration).

INDOOR UNIT

Indoor unit incorporates two pressure taps, which DHW and heating mode with high pressure measured, and cooling mode with low pressure.



High or low pressure, depending
Operating mode



7.STARTING UP

7.1 CHECK TO BE PERFORMED BEFORE STARTING UP

- Confirm that the power is in accordance with the nameplate of the unit and been conducted according to current regulations.
- Ensure that all electrical connections are well made and according to wiring diagram.
- Check the air conditioning filter is clean water.
- Check that the deposits of inertia of climate and the accumulation of DHW are filled with water and has made the corresponding vent through the manual traps.
- Check the setting pressure filling group. This pressure must always be less than 2.5 Bar
- Check that all door panels are properly mounted with screws for you.
- Check that all valves of the hydraulic system of air conditioning are open.
- The operation and use of electronic control is explained in Chapter 12. Electronic Controller.

7.2 POWER CHECK

After performing the electrical installation manual for installation and connection electrical, check the following:

- Check the firmness of the attachment of power cables and switching in both the outdoor unit and the inside.
- Activate the differential electrical circuit breaker of the unit.
- Check that the tension in the outdoor unit is located between the indicated value range in the table in paragraph 4 (electrical data). If you were outside these values should not be starting the unit.

7.3 TEMPERATURES SELECTION

- The unit is operated through electronic controller multiprocessor.
- To start the unit press the Start / Stop for 1 second.
- You can select the following modes:
 - Hot water. The unit produces only DHW
 - Water heating and cooling. The priority is to satisfy the demand for DHW when such demand is satisfied, we continued with the production of cold water for cooling.
 - Hot water and heating. The priority is to satisfy the demand for DHW when such demand is satisfied, we continued with the production of hot water for heating.
- Changing temperatures.
- The unit is shipped with a set point temperature selected by default.
- Modify and adapt these temperatures to the installation of side we have: soil heating, fan coil, etc..
 - In extreme weather conditions may be appropriate to amend these

7.4 OPERATION IN MODE D.H.W.(Domestic hot water)

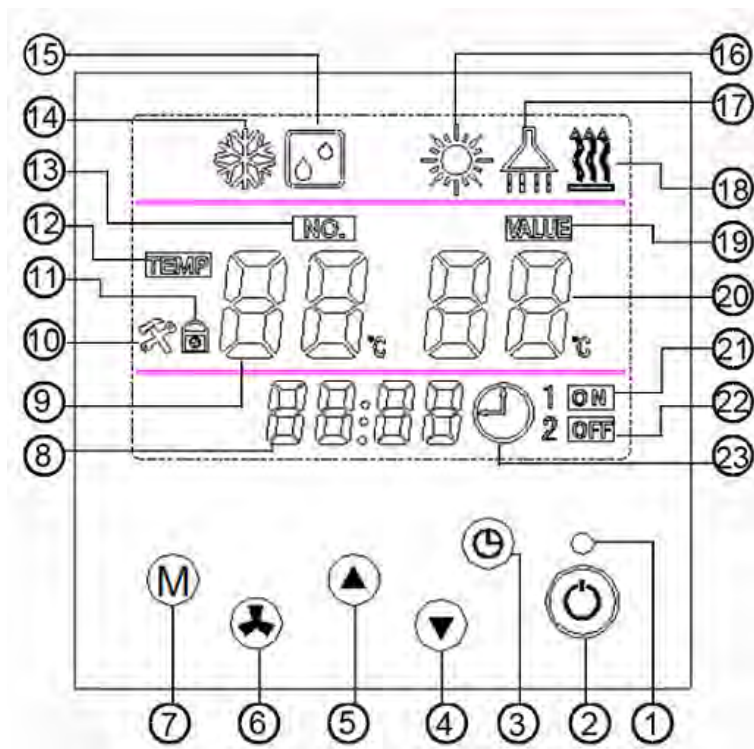
- Enable the operation of the unit in DHW, as indicated in paragraph 12 of this manual.
- Once enabled mode, the unit will start to reach set temperature and stop after gain the set temperature.
- Check the pump rotation DHW.
- In the first implementation of the unit, you should consume DHW to the temperature of selected accumulation.

9.5 OPERATION MODE AIR CONDITIONING

- Enable the operation of the unit heating or cooling mode, as shown in paragraph 12 of this manual.
the unit will start and send hot or cold water (depending on heating or cooling)
- After you enable the selected mode, and whenever the unit is not working hal and DHW mode, the unit will start and send hot or cold water (depending on heating or cooling of the secondary cooling circuit to achieve the set temperature)
- Once you have obtained this temperature, the unit will stop, but the cooling water pump continue in operation.
- In operation for heating and cooling, check the water temperature drop ($-T^a$ return). This jump should be about 5 °C.

8 . 1 Wire controller

Wire controller contains a LCD and 6 operational keys (as show below). It can keep memory when power off and be a timer.



8. 2. Key functions

(1)Double-colored indicator light: when standby, blue light on; when compressor worked, red light on; when breakdown happened, red light on. For more details, please check fault code sheet.

(2)Key “on/off” : power on /power off.

(3)Key “time adjusting”: adjust clock or set time.

(4)Key “down”: it’s a combined key to decrease numerical value, continuous press, then continuous decrease; short press, then decrease by 1.

(5)Key “up”: it’s a combined key also, but opposite to down key. Continuous press, then continuous increase; short press, then increase by 1.

(6)Key “confirm”: confirm previous operations

(7)Key “mode”: operational mode’s switch. It’s a combined key also.

8. 3. Icon Meaning

NO.	Icon meaning	NO.	Icon meaning	NO.	Icon meaning
8	Clock display	9	Returned AC Temp.	10	Maintain icon
11	Lock icon	12	Temperature icon (Reserved)	13	Parameter number icon
14	AC Cooling icon	15	Sterilization icon	16	AC heating icon
17	Sanitary hot water icon	18	Water/ground source display	19	Parameter icon
20	Domestic Hot Water temp	21	Timer on icon	22	Timer off icon
20	Sterilization days display	21	Sterilization on display	22	Sterilization off display
23	Clock icon				

9 . 1 Switch the unit On and off


To start the unit, press and hold the On/Off key for one second

To stop the unit, press and hold the On/Off key for one second

9 . 2 Mode switch (5 modes in total)

A. Under mode standby or On, press the M key repeatedly, the following icons will flash by recycling.

AC cooling -> AC heating -> DHW(Domestic hot water)-> AC cooling + DHW ->AC heating + DHW

When selected a mode, press  button to confirm, then the icon will be solid, heat pump will perform as selected.

B. When in mode AC cooling +DHW or AC heating & DHW, DHW heating will be the priority.

C. When select DHW mode, only hot water system working, no air conditioner working.






D. When select air conditioner mode, only air conditioner system working, no sanitary hot water system working.

E. Sterilization is independent and auto-operated. You can change parameter according to need.

9 .3 Procedures of setting parameter change





















A. When in settled mode, the unit will operate in accordance with the factory default temperature or last modified temperature.

B. Modification method for settled temperature

In the on / standby mode, press key M and  for 3 seconds, the current operating mode light will flash; by press the M key, you can switch modes in the following order: Cooling / heating / hot water / sterilization; press  to confirm the mode and press key  or  to setting value, then press key  to confirm, then exit and save current changes;










if didn't press key  to confirm, it will exit the parameter modification automatically 15 seconds later. Previous Changes will not be saved.

Detailed settings as follows:






NO.	Meaning	Settled temperature range	Default temperature	operation for modify settled parameters
1	AC cooling returned water temp	10°C ~ 25°C	12°C	M+  → M →  →  or  → 
2	AC Heating returned water temp	10°C ~ 55°C	45°C	M+  → M →  →  or  → 
3	sanitary hot water heating	(AU) 10°C ~ 60°C	50°C	M+  → M →  →  or  → 
4	Legionella Anti-bacteria	60°C ~ 70°C	65°C	M+  → M →  →  or  → 

C. Time setting procedure for health sterilization





Only in sanitary hot water mode, health sterilization will work. If sanitary hot water mode off, health sterilization will fail to work.

In on or standby mode, first, press key M and  for 3 seconds, second, press key M ,15 icon appears, then press the  or  to set sterilization temperature, press key  to confirm, the number of days will flash and show the original or default value 7 (that means 7 days), press key  or  to increase or decrease the number of days at predetermined intervals, the minimum of 7 days, maximum of no more than 99 days, after that ,press key  to confirm. At this time, "ON" character appears, "hour" appears and flashes, show the original setting or the default value (default value 01 means it will start at 1:00 am), followed by press key  or  to modify

9. UNIT OPERATION

(0-23) ,after that, press key  to confirm, then the new time start running. "ON" character disappears, "OFF" character appears, "minute" value flashes and shows the original or default value (default value is 10), followed by press key  or  to change (minimum is 10, maximum no more than 99), after that press key  to confirm and exit change mode. If didn't press key  to confirm, machine will exit change mode automatically after 15 seconds. But settings did right now will become invalid.

9.4 Time adjustment

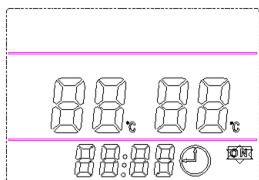
Press key ,time "hour" value will flash, then press key  or ,the value will increase or decrease. Press key and keep, the value will increase or decrease constantly as you want. After Settle down, please press key  to confirm, then exit from time adjusting mode.






9.5 Time setting

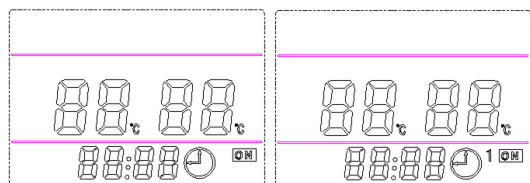
You can set one time to start and one time to off. And select one time working or cyclic working.

A、settled time on method:

(1) Press  for 3 seconds and come to time setting,  will flash as show below.



(2) Press key  or  to modify time value, and press  to confirm. This setting only valid for one time. If you want time setting to work cyclic, please press key  after time setting, then press key  to confirm.

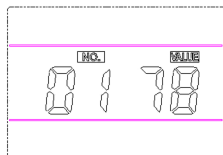


B、Timing off method are the same as timing on method.

C、Please press key  for 3 seconds and come to timing mode, press  to cancel time setting.

9.6 Parameter Checking and setting

Please press key M+ for 3 seconds and enter to parameter setting mode as show below.



"01" is parameter code, "78" is parameter values.

Other items' parameters meaning are the same with above picture showed.

Note:

1. Press  for 5 seconds, it will reset all parameter to factory default value. Indoor unit need power off and power on again

Usage of 14. Function parameter: (As per solar application 1)

when this parameter is 1, when air conditioning heating run, it will compare solar water tank temp with air conditioning returned water temp, when solar water tank temp is 5 or more degree higher than air conditioning returned temp, the 3-way valve G3 electricity supply will be on; when solar water tank temp - air conditioning returned temp is less than 2 centigrade, G3 electricity supply will be off. This function is to use solar to preheat for room heating and DHW tank water.

When this parameter is 0, G3 is seasonal switch valve, when the heat pump is working for heating, G3 is on, when heat pump is working for cooling, G3 is off.

Normally use one 3-way valve with 3 wires. 2 wires are always connected with electricity supply and 1 signal wire is connected with heat pump G3 terminal port to enable function.

9 . UNIT OPERATION

Parameter list:

NO.	Name	range/meaning	default	status	remark
00	power off auto restart	0: not restart; 1: Auto restart	1	check/set	
01	hot water temp return differential	2~15℃, minus return differential	2℃	check/set	
02	air conditioning return differential	2~15℃, minus return differential	2℃	check/set	
03	defrost start temp.	-20~5℃	0℃	check/set	
04	water source anti-freeze temp.	-20~5℃	2℃	check/set	
05	antifreeze exist temp.	-5℃~5℃	5℃	check/set	
06	defrost exist temp.	10~35℃	30℃	check/set	
07	Defrost duration time	15~99 mins	30	check/set	
08	Interval between 2 defrosts	15~99 mins	35	check/set	
09	ambient temp of DHW backup electrical heater start	-20~20℃	0℃	check/set	
10	ambient temp of AC backup electrical heater start	-20~20℃	0℃	check/set	
14	3 way valve function parameter	0: G3 is seasonal switch valve; 1: G3 is solar pre-heat valve;	0	check/set	
26	AC water pump working mode	0: continous running 1: stop when reach target temp 2: Run 1 minute for each 15 minutes after reach target temp	0	check/set	

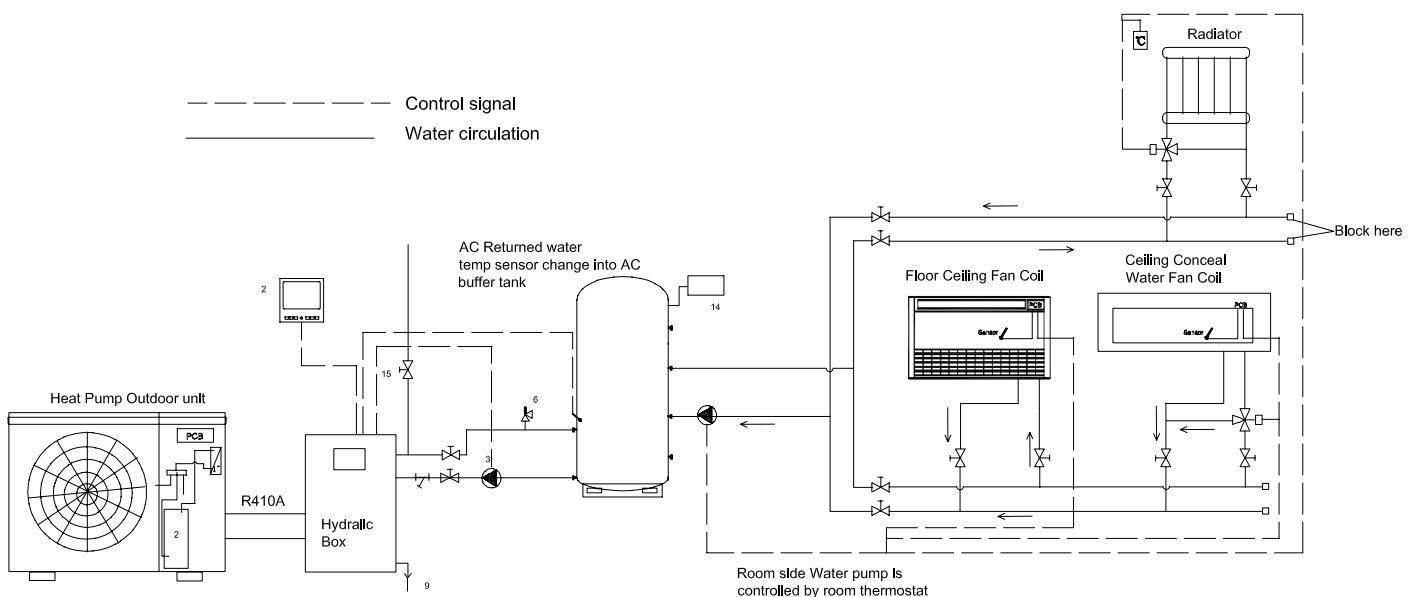
3. Usage of Parameter 26: AC water pump working mode

If no AC buffer tank, The Parameter 26 better to be set to 0, then AC water pump will work continously to keep the AC loop water temp always equivalent.

If with AC buffer tank, the parameter 26 can be set to 1, but the AC inlet water temp must be changed to insert to AC buffer tank as reference below.

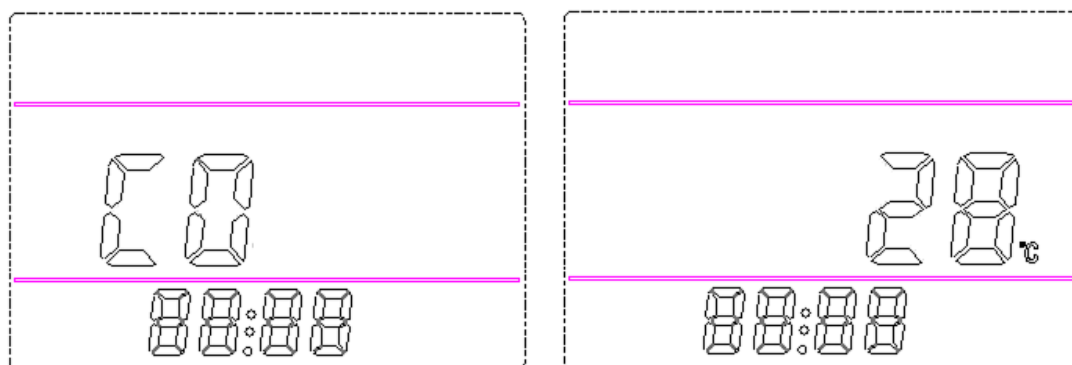
Application with AC water pump stop when reach target temp

- 1.Set parameter 26 to 1. Must change the AC inlet water temp sensor(6)IN2 into buffer tank.(ref to wiring diagram).
- 2.Must add AC buffer tank and 2 water pumps at both side of the buffer tank. The room side water pump is controlled by room thermostat. Heat pump side water pump is controlled by heat pump C4 or C6.
- 3.Must use brine not pure water at both side of the buffer tank.



9 .7 Machine operational status Checking

Press both key M and ▼ for 3 seconds, then entered machine status form. Show as below.



“C0” is part or parameter NO. , “28” stands for parameter. Parameter 0 means system on, 1 means system off. For more detail, please check form below.

Press M+ ▼ for 3 seconds to search and check parameters .

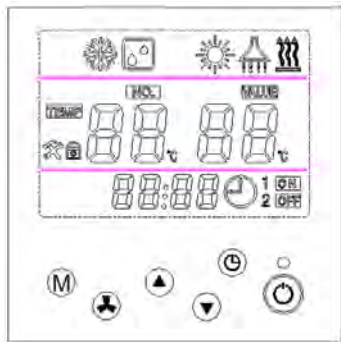
NO.	NAME	Range/Meaning	Default	Status	Remark
00	external pipe temperature	-9~79°C	no	Check	
01	exhausted air temperature	1 (Off) ; 0 (on)	no	Check	
02	Ambient temp.	-9~79°C	no	Check	
03	AC out water temp .	-9~79°C	no	Check	
04	water source inlet temp.	-9~79°C	no	N/A	
05	water source outlet temp.	-9~79°C	no	N/A	
06	power switch status	1 (heating and cooling) ; 0 (heating only)	no	Check	
07	power switch status	0 (air source) ; 1 (water source)	no	Check	
08	power switch status	1 (DHW invalid) ; 0 (DHW valid)	no	Check	
09	power switch status	0 (G1valid) ; 1 (G1 invalid)	no	Check	
10	high pressure switch status	1 (off) ; 0 (on)	no	Check	
11	The second high pressure switch status	0 (off) ; 1 (on)	no	Check	
12	Low pressure switch status	1 (off) ; 0 (on)	no	Check	
13	Inside water flow controller	1 (off) ; 0 (on)	no	Check	
14	outside water flow controller	0 (off) ; 1 (on)	no	Check	
15	defrost		no	Check	
16	AC antifreeze		no	Check	
17	System antifreeze		no	Check	
18	Compressor	1:on ; 0:off	no	Check	
19	Outside fan	1:on ; 0:off	no	Check	
20	crankcase heater	1:on ; 0:off	no	Check	
21	4-way valve	1:on ; 0:off	no	Check	
22	Bypass valve	1:on ; 0:off	no	Check	
23	Solenoid valve 1	1:on ; 0:off	no	Check	
24	Solenoid valve 2	1:on ; 0:off	no	Check	
25	Solenoid valve 3	1:on ; 0:off	no	Check	
26	Electric heater 1	1:on ; 0:off	no	Check	
27	Electric heater 2	1:on ; 0:off	no	Check	

9. UNIT OPERATION

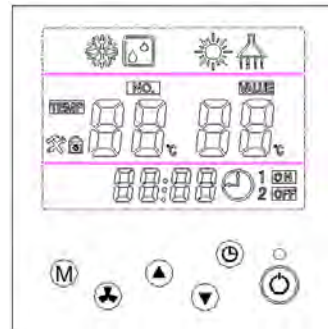
28	C4 water pump	1:on ; 0:off	no	Check	
29	C5 water pump	1:on ; 0:off	no	Check	
30	C6 water pump	1:on ; 0:off	no	Check	
31	Function parameter	0-99 (total days since last setting)	no	Check	no
32	settled heating temp.		no	Check	
33	settled cooling temp.		no	Check	
34	settled DHW temp.		no	Check	
35	Settled sterilization temp.		no	Check	

9.8 Displays for different kinds of modes

(1) tritherma water/ground source heat pumps icons

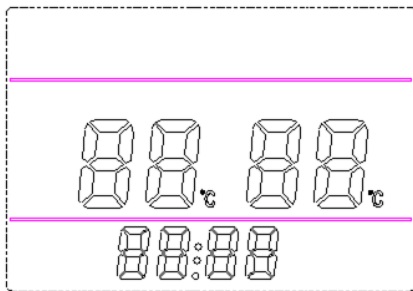


(2) air source heat pumps icons:



(3) powered off display

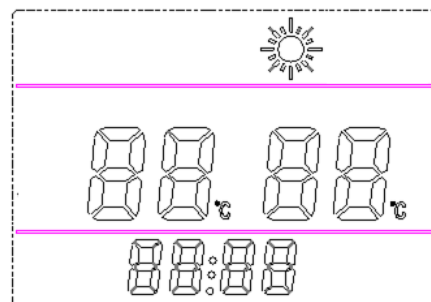
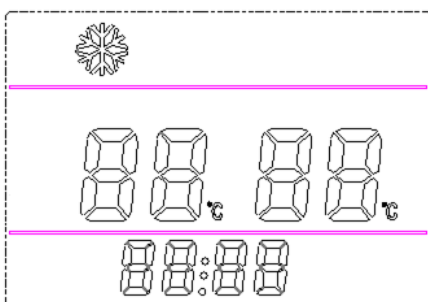
(water source heat pump has water source Icon. If it has timer on/off setting, there is timer icon to indicate.)



(4) AC cooling display

(5) heating display

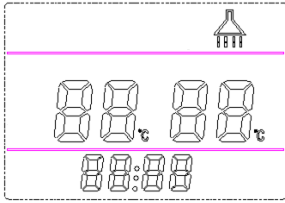
(water source heat pump has water source Icon. If it has timer on/off setting, there is timer icon to indicate.)



9. UNIT OPERATION

(6) sanitary hot water display

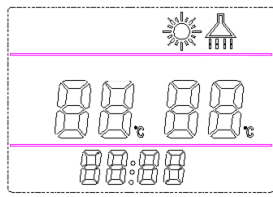
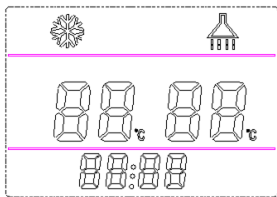
(water source heat pump has water source Icon. If it has timer on/off setting, there is timer icon to indicate.)



(7) AC cooling and sanitary hot water display

(8) AC heating and sanitary hot water display

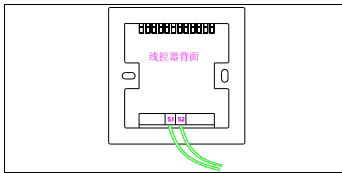
(water source heat pump has water source Icon. If it has timer on/off setting, there is timer icon to indicate.)



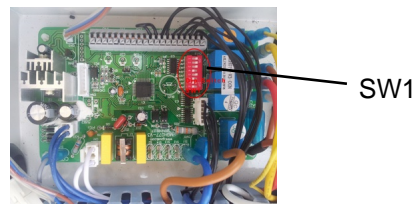
9.9 way of communication

Non-polarity double wire, maximum running length is 100 meters and point to point connected.

Back view of wired controller showed below.



9.10 Function Selection Switch: SW1



(after change, need be repowered to enable the change)

SW1-8	OFF: cooling valid; ON: cooling invalid
SW1-7	OFF: heating valid; ON: heating invalid
SW1-6	OFF: DHW valid; ON: DHW invalid
SW1-5	OFF: G1 valid; ON: G1 invalid
SW1-4	OFF: inverter outdoor model; ON: on/off outdoor model
SW1-3	reserved
SW1-2	reserved
SW1-1	OFF: geothermal; ON: air source

10.TROUBLE SHOOTING

When Error happened, air conditioner temperature location will display "P" or "E", hot water temperature location will display fault code, such as "01", then press key ▼, you can inquire all Errors at the same time. Meaning for fault code please check function book.

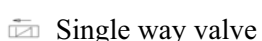
Display "Ex" or "Px". For example: E2. P5. Out door LED Light will flash as fill show below.

Error Meaning	Error Code	Outdoor unit LED light display	Error Display
Compressor over heat	E1	Flash 1 time , interval 5seconds	Depend on outdoor unit
ambient temp. sensor Error	E2	Flash 2 times , interval 5 seconds	Depend on outdoor unit
Pipe temp. sensor Error	E3	Flash 3 times , interval 5 seconds	Depend on outdoor unit
Return water temp. sensor	E4		Compressor Stop
AC out water temp. sensor	E5		Compressor Stop
AC Antifreeze protect	E9		Compressor Stop
DHW temp. sensor	E6		Compressor Stop
DHW antifreeze protect	EA		Compressor Stop
Solar water temp. sensor	E7		Compressor Stop
Coil over heating protection	E8	Flash 4 times , interval 5seconds	Depend on outdoor unit
high pressure protection	P1	Flash 6 times , interval 5seconds	Depend on outdoor unit
Low pressure protection	P2	Flash 7 times , interval 5seconds	Depend on outdoor unit
Communication Error	P 9	Flash 10 times , interval 5seconds	
Over current protection	P4		Depend on outdoor unit
indoor unit water circle Error	P5		Compressor Stop
outdoor unit water circle Error	P6		Depend on outdoor unit
Outdoor Missing Phase	P7 (whole system OFF)	Flash 8 times , interval 5 seconds	Depend on outdoor unit
Outdoor wrong phase	P8 (whole system OFF)	Flash 9 times , interval 5seconds	Depend on outdoor unit

Application 1(Most Energy Saving Connection)

Automatic solar assistant Fuzzy Logic control program built inside to save cost the mostly.

- So the heat pump can have a good rest in sunny day to save cost and work more in cloudy day. Especially excellent for floor heating together with hot water application.**



12.MAINTENANCE

Before any maintenance or cleaning of the unit make sure the switch is off and no power to it

Routine maintenance

This section is intended for end users and is very important to maintain regular operation of the unit over time. A few operations, carried out regularly can prevent serious intervention by the staff.

Necessary operations do not require particular expertise and are summarized in simple controls of some components of the unit.

- Clean outdoor coil, the skin must be able to get through maximum heat exchange. Therefore, it is always necessary to keep its surface free of dust and dirt that could be deposited by the action of the fans..
 - With a brush to remove all foreign objects such as paper, leaves, etc, who are on the surface of the outdoor coil..
 - Clean the aluminum surface of the outdoor unit, eg a vacuum cleaner
 - Check that all fins are not damaged or bent.
- Control water flow defrost: During winter operation, occurs from time to time the defrosting of the outdoor coil. You need to check that the drain is not blocked. If drainage is not correct, with cold temperatures, it could form a layer of ice on the base, which would compromise the functioning of the whole system.

Periodic Maintenance

We recommend a regular maintenance by qualified personnel

Here are some checks to be performed:

DHW circuit

- Check direction of rotation of the DHW pump, and the possible presence of air on the pump.
- Check that the pressure of condensation and evaporation in this mode are accurate at all times, depending on the temperature of DHW and outdoor air temperature.
- Check the power consumption (Amps) of the unit operating conditions at that time.
- Check that the unit in this mode to achieve the temperature selection.
- Check that when the temperature drops to DHW temperature selection, the unit starts to operate in this mode.
- Check and clean tap water inlet water filter

Air Conditioning Circuit

- Check direction of rotation of the pump air conditioning, as well as the possible existence of air in the system.
- Check that the pressure of condensation and evaporation in this mode are accurate at all times, depending on the temperature of cooling water flow and outside air temperature.
- Check the temperature drop in cooling water, is within the recommended range. If not, check: water pump, air in the water circuit, dirt in the water system, etc) .
- Check the power consumption (Amps) of the unit operating conditions at that time.
- Check that the unit in this mode to achieve the temperature selection.
- Check that when the temperature drops to air conditioning temperature selection, the unit starts to operate in this mode.
- Check and clean air conditioning water filter

