HH8 Domestic Heat Pump Installation and Operation Manual

code:20111102-0001

8-Maintenance

8.1 Malfunction table

You could determine or remove failures according to the following malfunction table:

Malfunction	Reason	Solution
WATER IN	Temp. Sensor is open or Short circuit.	Check or replace the water inlet temp. Sensor.
WATER OUT	Temp. Sensor is open or Short circuit.	Check or replace the water outlet temp. Sensor.
PIPE TEMP 1	Temp. Sensor is open or Short circuit.	Check or replace the Coil 1temp. Sensor.
PIPE TEMP 2	Temp. Sensor is open or Short circuit.	Check or replace the Coil 2temp. Sensor.
AMBIENT TEMP	Temp. Sensor is open or Short circuit.	Check or replace the ambient temp. Sensor.
TEMP DIFFERENCE PROTECT	Outlet water temperature is too low.	Check the flow volume to see whether it meets the requirements.
TOO COOL FAILURE	Outlet water temperature is too low.	Check the flow volume to see whether it meets the requirements.
FROSTBITE 1 PROTECT	Ambient temperature is too low.	
FROSTBITE 2 PROTECT	Ambient temperature is too low.	
SYSTEM 1 PROTECT	System protection failure of system 1	Check all the protection devices of system 1.
SYSTEM 2 PROTECT	System protection failure of system 2	Check all the protection devices of system 2.
WATER FLOW	1. Water flow volume is not enough. 2.No water in water loop.	Check the flow volume to see the water system is block or not.
POWER PHASE (SYSTEM PROTECT)	Power supply connection failure	Check the power supply connection.
TEMP DIFFERENCE ERROR	Outlet water temperature is too low.	Check the flow volume to see whether it meets the requirements.
FROSTING		
COMMUNICATION FAILURE	Communication failure between remote wire controller and main board	Check the wire connection between remote wire controller and main board.

8.2 You can judge and remove the malfunctions according to the malfunction code display on the PROTECT 300

Display	Name	Reason	Action	Recover (yes or no)	Revolution
1	Refrigerant freezing	Refrigerant temp. too low from tube outlet	Unit stops and alarm	Yes	Reduce refrigerant
2	Refrigerant leakage	Refrigerant temp. before tube inlet too low	Unit stops and alarm	Yes	Increase refrigerant
3	Low pressure	Low pressure switch action	Unit stops and alarm	Yes	Check through the pressure switch and return system
4	Compressor exhaust temp. too high	Compressor exhaust temp.too high	Unit stops and alarm	Yes	Check through the refrigerant system
5	Over-current on compressor	Current through compressor too heavy	Unit stops and alarm	Yes	Check through the power supply for compressor or short circuit
6	High pressure	High pressure switch action	Unit stops and alarm	Yes	Check through the pressure switch and return system
7	Temp. sensor before tube failure	Temp. Sensor open or short circuit	Unit stops and alarm	Yes	Check and renew the sensor
8	Tube outlet temp. sensor failure	Temp. Sensor open or short circuit	Unit stops and alarm	Yes	Check and renew the sensor
9	Exhaust temp. sensor failure	Temp. Sensor open or short circuit	Unit stops and alarm	Yes	Check and renew the sensor
E	Power supply wrong connection	Wrong connection or lack of connection	Unit stops and alarm	Yes	Check the connections

Contents

1-Safety precautions

ELECTRICAL POWER MUST BE SWITCHED OFF BEFORE STARTING ANY WORK ON JUNCTION BOXES

The aim of this manual is to provide instructions for installation, commissioning, operation.

WARNING !
The installation, commissioning and maintenance of these machines should be performed by qualified personnel having a good knowledge of standards and local regulations, as well as experience of this type of equipment.

WARNING !
Any wiring produced on site must comply with local electrical regulations.

WARNING !
Ensure that the electrical supply corresponds to the specification indicated on the unit's maker's plate before proceeding with the connection in accordance with the wiring diagram supplied.

WARNING !
The unit must be EARTHED to avoid any risks caused by insulation defects.

WARNING !
No wiring must come in contact with the heat source or the fan rotating parts.

WARNING !
Preparation for shutting down the unit for a prolonged period if the installation does not contain glycol, the evaporator and the chilled water pipes need to be carefully and completely drained of water.

Take care !
The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Take care !
It is forbidden to start any work on the electrical components without switching off the electrical supply to the unit.

Take care !
It is forbidden to start any work on the electrical components if water or high humidity is present on the installation site.

Take care !
When the unit is being connected, ensure that no impurities are introduced into the pipe work and the water circuits.

Take care !
A mesh filter must be provided on the hydraulic pump and in exchanger water inlets.

The Manufacturer's warranty will not apply if the installation recommendations listed in this manual are not followed.

8-Maintenance

TAKE CARE !
Before proceeding with any intervention on the machine,you must be sure that the electrical supply is switched off.

Servicing and maintaining the units must be carried out by qualified refrigeration technicians.

Repeated triggering of safety and control devices must be thoroughly investigated and corrected before any further re-occurrence.
The simplicity of the cooling circuit isolates it from any problem that might occur during operation. Thus, no work on the cooling circuit is required providing that the unit operates satisfactorily.

However, it is advisable to carry out a certain number of preventive operations in order to maintain the unit in optimum working order.

These operations essentially consist of standard checks (checking operating temperature settings, checking voltages and currents, checking water flow and temperatures, etc...) and should be carried out every 6 months and after the unit has been out of service for prolonged period (during the winter).

PREPARATION FOR SHUTTING DOWN THE UNIT FOR A PROLONGED PERIOD

The following recommendations should be taken intoconsideration:
After stopping the compressor, stop the circulation pump.
If the installation does not contain glycol, the evaporator and the chilled water pipes need to be carefully and completely drained of water.

FAN BEARINGS
The fan bearings are of the¡greased for life¡type. These bearings require no greasing. However, check every 6 months, that there is no abnormal wear on these moving parts.

ELECTRICAL TERMINALS
However, check the screw terminal block every 6 months.

CONDENSER COILS
The condenser coils do not require any special maintenance,except when they are clogged by paper or any other foreign bodies. In corrosive atmospheres, provide for suitable protection. Cleaning is by washing with detergent and water at low pressure, and then rinsing with clean water.

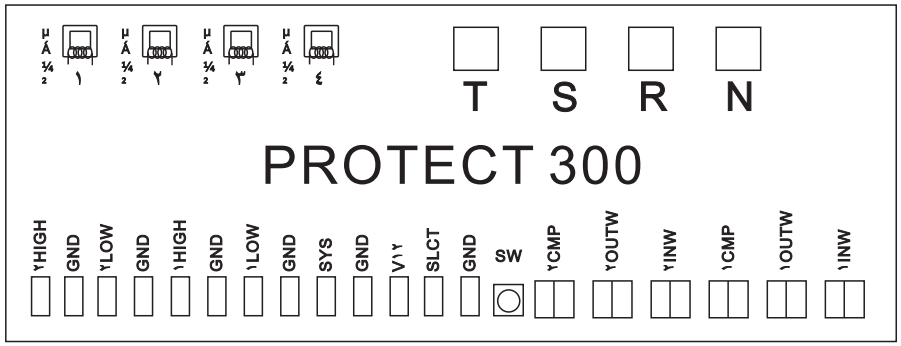
EVAPORATOR
The direct expansion evaporator comprises a tube in tube exchanger . These evaporators require no specific maintenance, but a mesh filter (mesh < 1 mm) must be fitted on the evaporator chilled water inlet in order to prevent the ingress of impurities which could clog the evaporator.

EXPANSION
The capillary expansion device requires no specific maintenance.

PUMP
The pump requires no specific maintenance.

7-I/O Port

6.2 Connection of PCB illustration



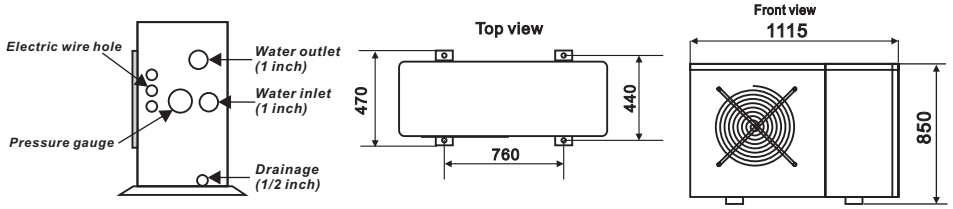
Connections explanation:

NO.	SYMBOL	MEANING
1	HINGH2 GND	High pressure protection for system2（normal close）
2	LOW2 GND	Low pressure protection for system2£normal close£
3	HINGH1 GND	High pressure protection for system1£normal close£
4	LOW1 GND	Low pressure protection for system1£normal close£
5	SYS GND 12V	Protection signal
6	SW	Current setting(handest)
7	CMP2	Exhausting temp. Of compressor2
8	OUTW2	Tube temp. Of system 2
9	INW2	Tube temp. Of system 2
10	CMP1	Exhausting temp. Of compressor1
11	OUTW1	Tube temp. Of system 1
12	INW1	Tube temp. Of system 1

2-Description

2.1 DIMENSIONS

Models :HH8



2-Description

2.2 INSPECTION AND STORAGE

On receiving the equipment, all the elements should be checked with the packing list to ensure that no items are missing.

All units should be carefully inspected on receipt for any possible damage.

In the event of shipping damage, inform the shipping company and lodge a complaint by registered letter with acknowledgement of receipt. The manufacturer is not liable for physical damage to the unit after acceptance.

WARNING !

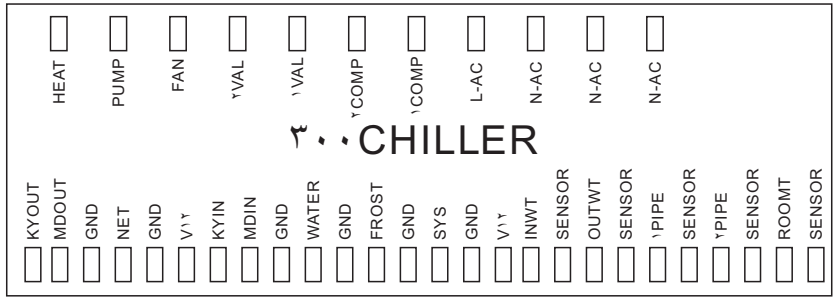
The sharp edges and surfaces of the coils can cause injury. Avoid contact with them.

2.3 HANDLING THE UNIT

Take care to avoid any sharp movements during the unloading and moving of the unit. Do not push or pull it by any other means than its base. Place a safety wedge between the unit base and the fork lift truck to avoid damaging the unit's structure and casing. Wedge required along the entire length of the unit.

7-I/O Port

7.1 Connection of PCB illustration



Connections explanation£

No.	symbol	meaning
1	HEAT	Auxiliary electrical heating£220VAC£
2	PUMP	Water pump£220VAC£
3	FAN	Fan motor£220VAC£
4	VAL2	Solenoid valve £220VAC£
5	VAL1	4way valve of system1£220VAC£
6	COMP2	Compressor of system2£220VAC£
7	COMP1	Compressor of system1£220VAC£
8	AC-L	Fire wire
9	AC-N	Neutral Wire
10	KYOUT GND	On/Off switch
11	MDOUT GND	Mode
12	NET GND 12V	Wire controller
13	KYIN	On/Off Switch(input)
14	MDIN	Model(input)
15	WATER GND	Flow switch (input)(normal close)
16	FROST GND	Defrost signal
17	SYS GND 12V	System protection(normal close)
18	ROOMT	Ambient temp.(input)
19	PIPE2	Temp. Of fan coil2(input)
20	PIPE1	Temp. Of fan coil11(input)
21	OUTWT	Water out temp.(output)
22	INTWT	Water in temp.(output)

6.3 Parameter table

Please set the parameters according to the table below.

Parameter	Meaning	Default	Remarks
0	COOL TEMP(Set value for cooling)	١٢→	Adjusted
1	HEAT TEMP(Set value for heating)	٤٠→	Adjusted
2	DEF.CYC(Turnround of dehumidifying under heating mode£frost£)	MIN٤٥	Adjusted
3	DEF.IN(Defrosting start temperature)	-٧→	Adjusted
4	DEF.OUT(Terms of exit defrost under heating model)	١٣→	Adjusted
5	DEF.TIME(Time of exit defrost under heating mode)	MIN٨	Adjusted
6	SYSTEM(System quantity)	١/٢	Adjusted
7	SAVE(Automatic restarting)	NO/YES	Adjusted
8	TYPE(Model(cooling only/heat pump/ auxiliary electrical heating/hot water£)	C/H	Adjusted
9	PUMP(Water pump model)	NORMAL	Adjusted

Note£Parameter? ? ?
modified by the professionals.

:Remark*

:Parameter ٦

;Unit with single system :١

.Unit with double system :٢

Parameter ٧:

NO: Unit can not restart automatically;

.Unit can restart automatically: YES

Parameter ٨:

;Unit only with the cooling function: C

;Unit with all the heat pump function: H/C

;Unit with auxiliary electrical heating: E/H/C

.Unit with only heating function produced by heat pump: H

Parameter ٩:

NORMAL: Water pump is always on;

s earlier than the compressor and shut٦٠Water pump will start : SPECIAL

.s later than the compressor٣٠down

3.1 ELECTRICAL SPECIFICATION

Unit Model		HH8
Cooling Capacity	kW	7.1
	Btu/h	24200
Heating Capacity	kW	8.2
	Btu/h	28000
Cooling Power Input	kW	2.5
Heating Power Input	kW	2.0
Running Current(Cooling/Heating)	A	10.9/ 8.7
Power Supply		230V ~/50Hz
Compressor Quantity		1
Compressor		Rotary
Fan Quantity		1
Fan Power Input	W	120
Fan rotate speed	RPM	850
Noise	dB(A)	56
Water Pump Input	kW	0.2
Water head	m	8
Water Connection	inch	1
Water Flow Volume	m^3/h	1.4
Water Pressure Drop	kPa	17
Capacity Of Water Storage	L	23
Unit Net Dimensions(L/W/H)	mm	See the drawing of the units
Unit Shipping Dimensions(L/W/H)	mm	See package label
Net Weight	kg	See nameplate
Shipping Weight	kg	See package label

Cooling: Ambient temperature:35¡/24¡,Inter/outlet water temperature:12¡/7¡

Heating: Ambient temperature:7¡/6¡,Inter/outlet water temperature:30¡/35¡

(Above information just for your reference, Please subject to nameplate on the unit)

4-Installation

4.1 Installation location

The units are air cooled. Because of this, they must be installed outdoors in an area with sufficient clearance to provide free air circulation through the condenser coil. Any free air circulation restrictions will reduce the air flow, decrease the cooling capacity, increase the power input and, in certain cases, prevent the group from operating by excess condensation pressure.

It is prohibited to connect the helicoid fan units to duct networks because of the pressure drops created by such networks. In the event that the unit is located in an area exposed to high wind, avoid the wind striking the fan surfaces directly. The arrows show the direction of air circulation through the unit (refer to diagram opposite).

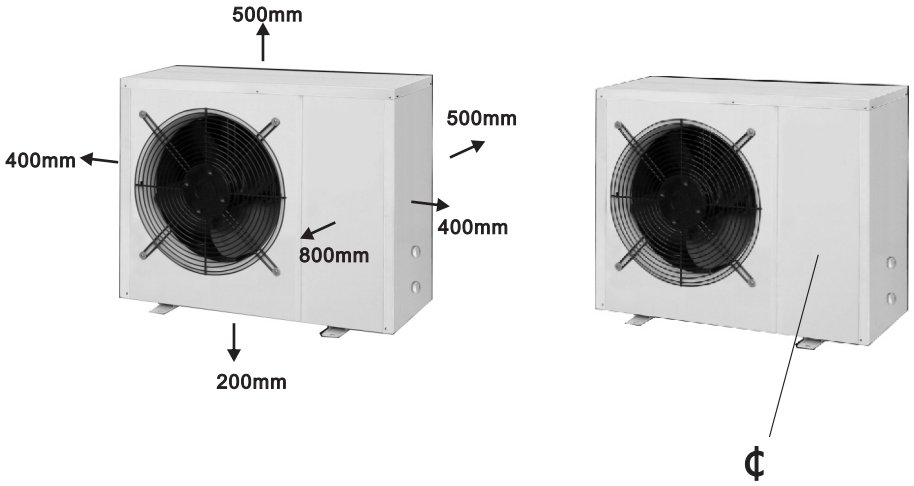
4.2 Fitting the unit

After installation, all sides of the unit must be accessible for regular maintenance operations.Removal of Panel 1 provides access to the electrical junction box, the compressor and the cooling circuit.

Note:

Panel 1 is removable independently of the other panels and enables the unit to be run maintaining its normal operating characteristics. To disengage the panel after removal, extract the controller and its support bracket .

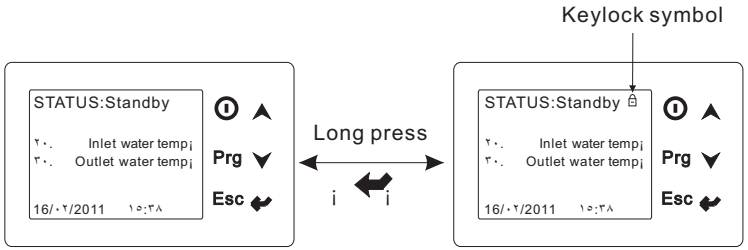
When siting the unit, take care to leave sufficient free space all around it for carrying out maintenance. The minimum free distances are shown and must be adhered to, both for ensuring correction operation and for providing access.



6-Usage

6.2.6 Keyboard locking

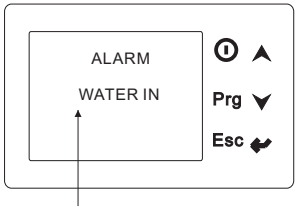
To avoid any faulty operations by others, please lock the keyboard after finishing settings. In the ON/OFF state, press¡ ¡till the screen shows the keylock symbol as blow. Under such condition, you cannot change any settings on the unit.In the locking state, press ¡ ¡ till the keylock symbol dismissed and now you can make any modifications to the unit by pressing the key board.



Note: When the keyboard is locked before power supply is cut, the keyboard will be unlocked automatically as you reset the unit when it is power on.

2.7 Malfunction

If there is something wrong with the unit, the system will display malfunction code according to the fault reasons.
Refer to malfunction table for any code meanings.



There is something wrong with the temperature sensor of inlet water .

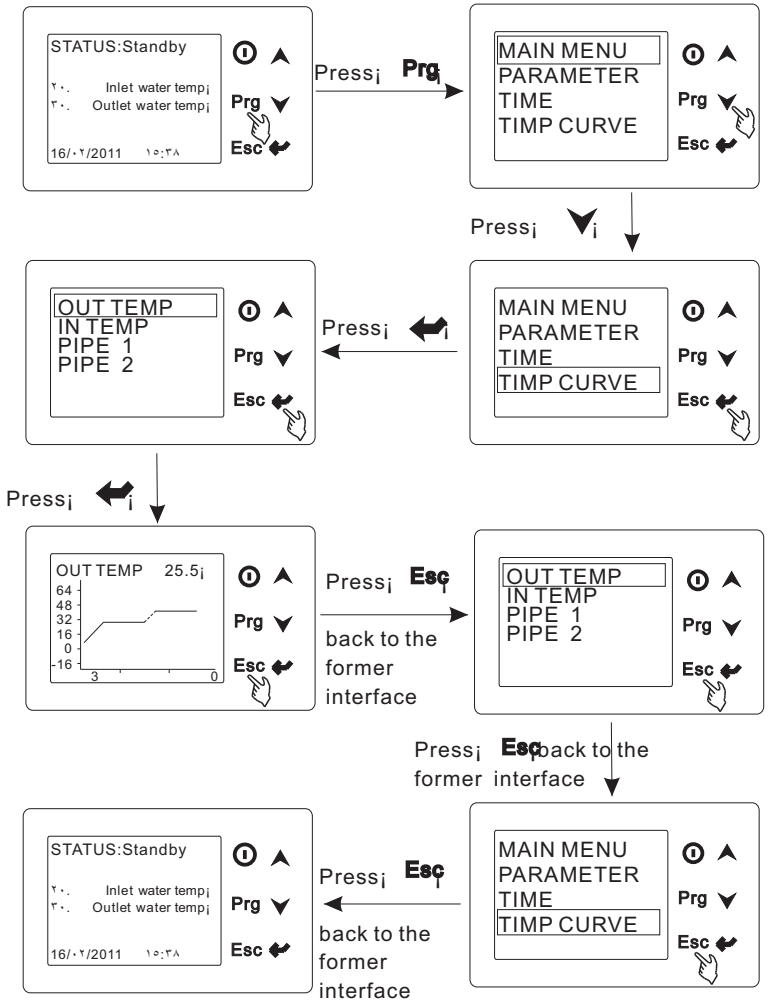
6-Usage

6.2.5 TEMP CURVE

You can check temperature curves of water inlet, water outlet, coil 1, coil 2, coil 3 and coil 4.

At main interface, press ¡ **Prg** ¡ to enter menu interface, then press ¡ ¡ to select TEMP CURVE and ¡ ¡ to enter this interface. Choose parameters and press ¡ ¡ to check it.

Esc



4-Installation

WARNING !

The grille is intended to protect operators from risks of injury from the exchanger during handling and installation operations.

However, it can create a risk of clogging with frost or ice on heat pump machines installed in cold or mountainous regions and exposed to the elements.

To avoid such a risk, a shelter must be provided, or the protective grille can simply be removed.

5-Hydraulic connections

5.1 Hydraulic connection

In choosing and installing water pipes, current local safety rules and precautions must be consulting and respected.

Recommendations:

The pipe circuits must be designed with a minimum of bends, and by reducing as far as possible the number of changes in height, in order to provide the best cost installation and guarantee the best performance.

The pipe network must include:

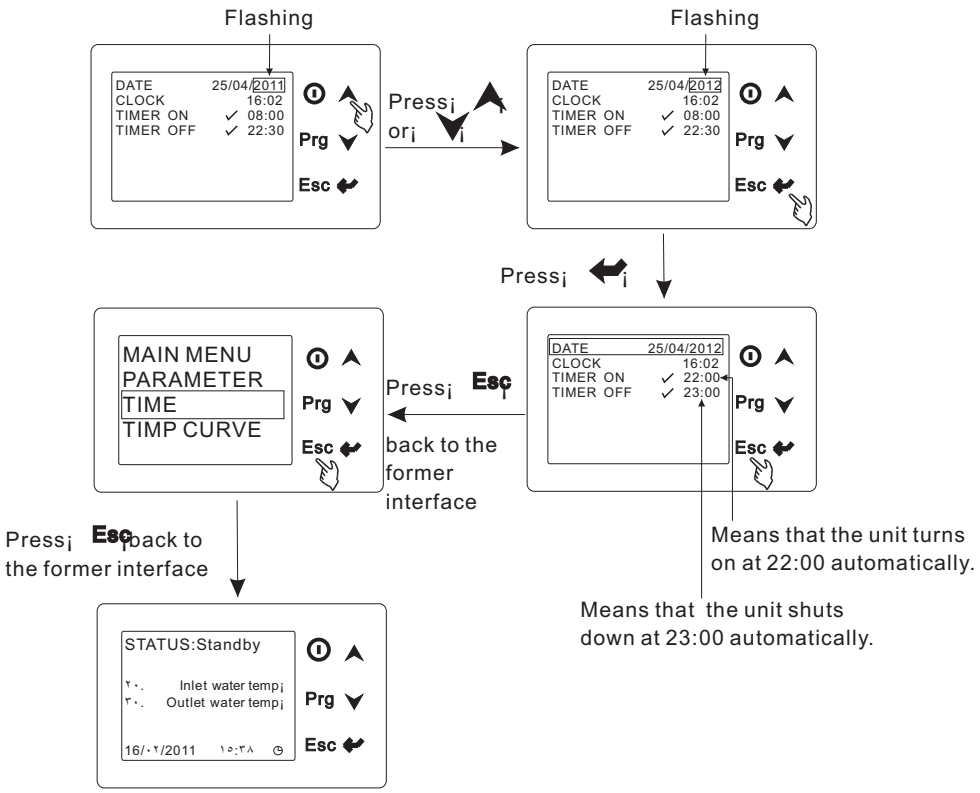
1. A device to eliminate vibrations (e.g. connecting hoses) on all pipes connected to the unit in order to reduce vibration and noise transmission to the building.
2. Stop cocks to isolate the hydraulic circuit during maintenance.
3. Automatic or manual bleed valves at the highest points on the chilled water circuit.
4. An adequate system to maintain water pressure in the circuit (expansion tank or pressure regulating valve).
5. Thermometers and pressure gauges installed on the exchanger inlet and outlet. They will facilitate regular checks and maintenance.
6. To avoid any risk of foreign bodies entering the system and to maintain optimum performance, it is strongly advised to install the water filter accessory on the machine¡s inlet .

WARNING !

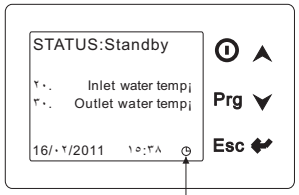
The evaporator is equipped with a heating mattress (automatically controlled by the main controller) to prevent any ice intake during periods of low outside temperature. When the unit is not running in the winter, it is necessary to leave the power supply connected for this protection system to function.

The water filter / stop cock assembly is to be connected to the machine inlet, taking care to keep the water filter mesh towards the bottom.

6-Usage



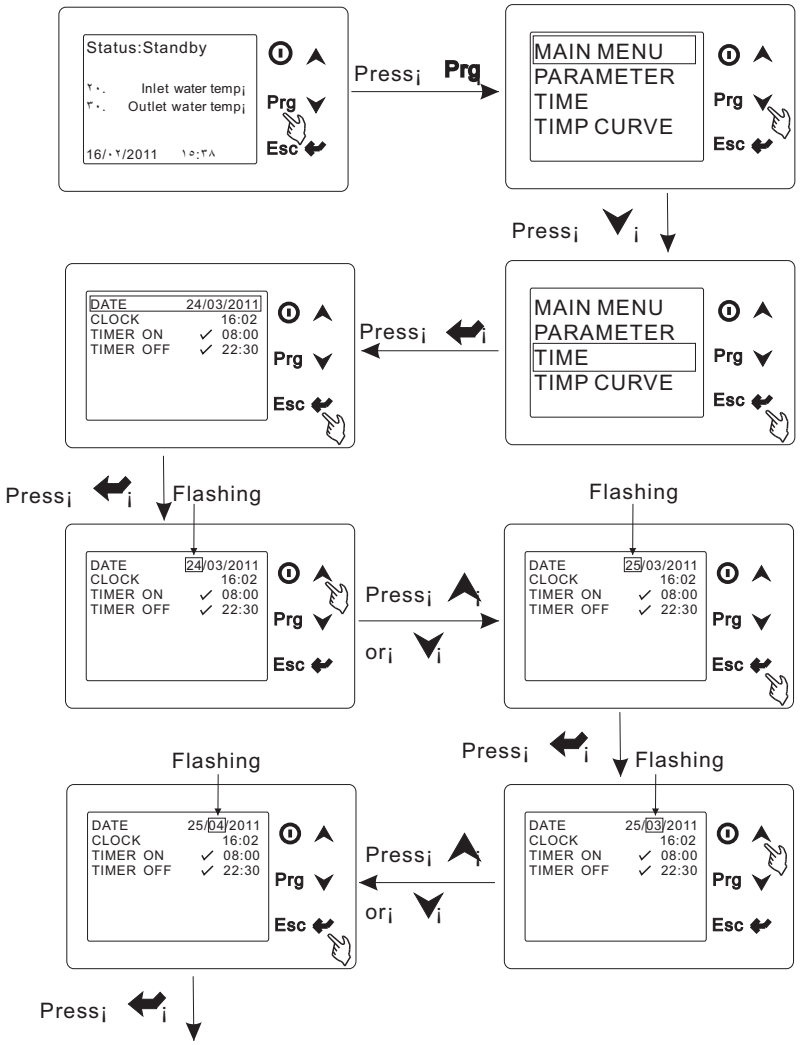
Note: When there is a ¡ ×¡shows in Time on and Time off option as shown above, it means that the unit will not turn on or shut down automatically. When there is a clock icon shown as blow, it means that the timer restart or shutdown is set.



6-Usage

6.2.4 Time setting

press, OFF state/In the ON¡ Prg ¡ Press. and you will see the Timer option¡ ¡then press, to choose the Timer option¡ ¡Use. to enter into the time setting interface¡ ¡£up£or¡ ¡£down£Press. to choose the value that you need to modify¡ ¡Press. and the target numb er is flashing¡ ¡£increase£or¡ ¡£decrease£Press. for changing the value¡ ¡Press. t o save the setting ¡ ¡to return to former interface without any modification.



5-Hydraulic connections

5.2 Connection of the chilled water loop

Check, before connecting the unit, that the installation is leak free and clean.
Install, manually controlled isolating valves (not provided) with a diameter corresponding to the diameter of the main pipework on the Water Inlet and Outlet connection of the unit without needing to the drain installation.
It is also recommended to install valves of the water supply lines and on the return of
each terminal treatment unit so to allow work on each appliance without affecting other parts of the installation. These valves allow also to adjust the flow arriving at each terminal units.
It is important to verify that the pressure in the water supply network is adequate to fill the installation.

5.3 Draining

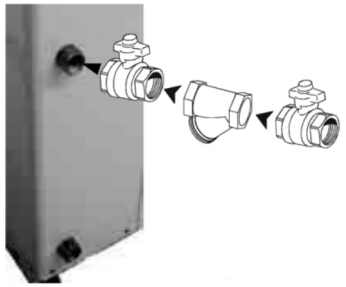
Units are equipped with couplings to fill and drain the hydraulic circuit according to standards in force.
The water should come from a distribution network, either to the unit directly, or to any other point on the circuit linking the terminal units together.

5.4 Terminal insulation

In order to proper keep power consumption lox and to comply with standards in force, all chilled water pipes must be insulated.
For appropriate insulation with a conductivity of 0,04 W/mK a radial thickness of 25 to 30 mm is required.

5.5 Starting operation

The installation being finished, the water circuit should be filled, until the service pressure is reached which should not exceed 2,5 bar .
Check that the air purge valves are open .
Air in the circuit should be completely expelled for proper operation.
Once the hydraulic circuit is correctly filled,
the filling valve should be closed.



WARNING !

It is not the manufacturer¡s policy to issue recommendations relating to water treatment. The user or the owner is responsible for contacting a specialised
water treatment enterprise. However, water treatment is a very critical subject and special consideration should be given to it to ensure that water treatment is properly carried out to avoid problems linking to fluid circulation. A clogged hydraulic circuit will systematically lead to premature wear in the machine¡s components.

WARNING !

Take care not to damage the hydraulic connections by over-tightening. A second wrench is required to compensate for tightening torque.
The use of a counter wrench is necessary for tightening the valves.

5.6 Safety differential pressostat

A safety differential pressostat is fitted as standard on the water inlet pipe into the evaporator in order to ensure adequate water flow to the evaporator before starting the unit.
It acts both in the event of partial blockage (starting to take in ice) and in the event of a drop in water flow due to pump failure. This is the machine's main protection device.

5.7 Hydraulic module

The hydraulic module requires no special maintenance. Fitting a mesh filter (accessory) on the unit inlet is strongly advised (refer to 5.1)

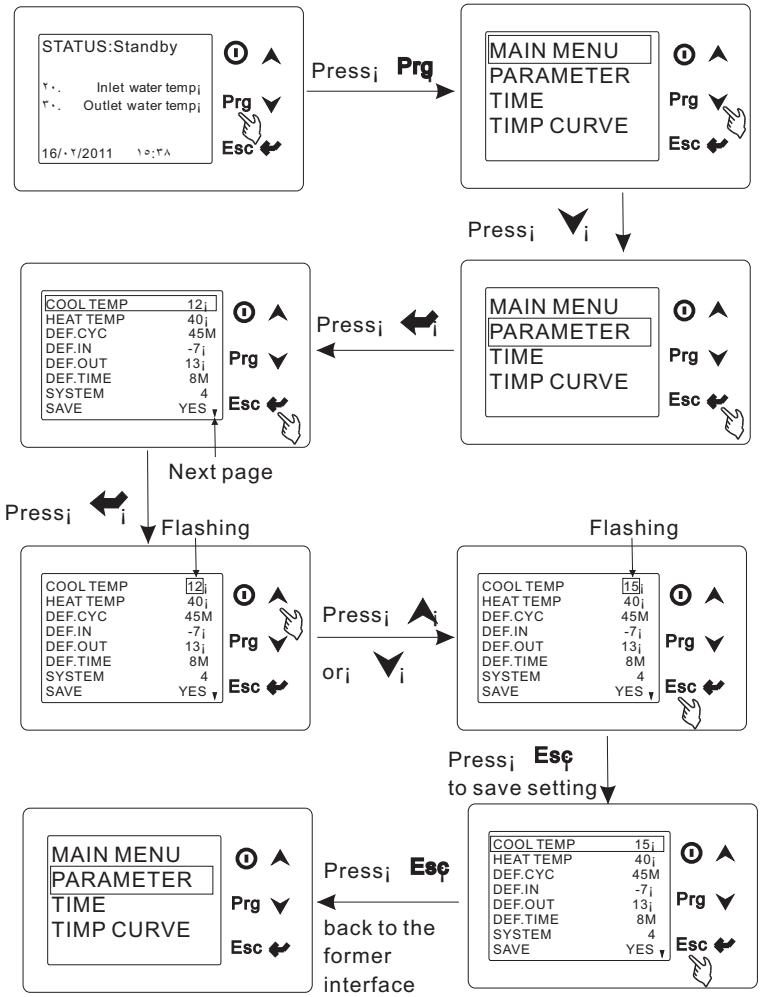
Comment: Ensure that all of the various components are protected against freezing caused by the outside temperature. In the event of any accidental power failure,ensure that account is taken of ice protection requirements.

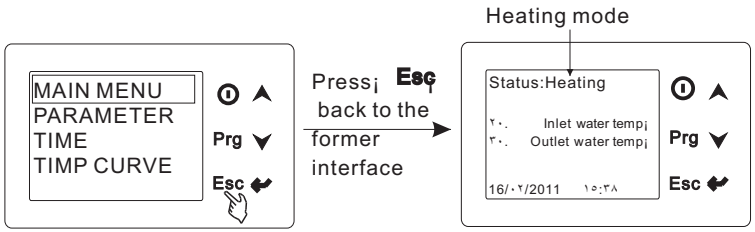
WARNING !

In all air conditioning installations with chilled water distribution, the entire network must be dimensioned to provide a volume of 15 litres per kW of installed capacity.

6.2.3 Parameter setting

In OFF state, you could enter into the option selection interface by pressing the key ¡**Prg**¡. Press¡ ¡to find out the Parameter option, then press¡ ¡to go to parameter setting. Choose the value you want to change by pressing the key ¡ ¡and the number stands for the value will be flashing. Modify the value by using the key¡ ¡(increase)or¡ ¡(decrease). Press ¡ ¡once to **Esc** your setting and twice for returning back to the former interface.
For example£

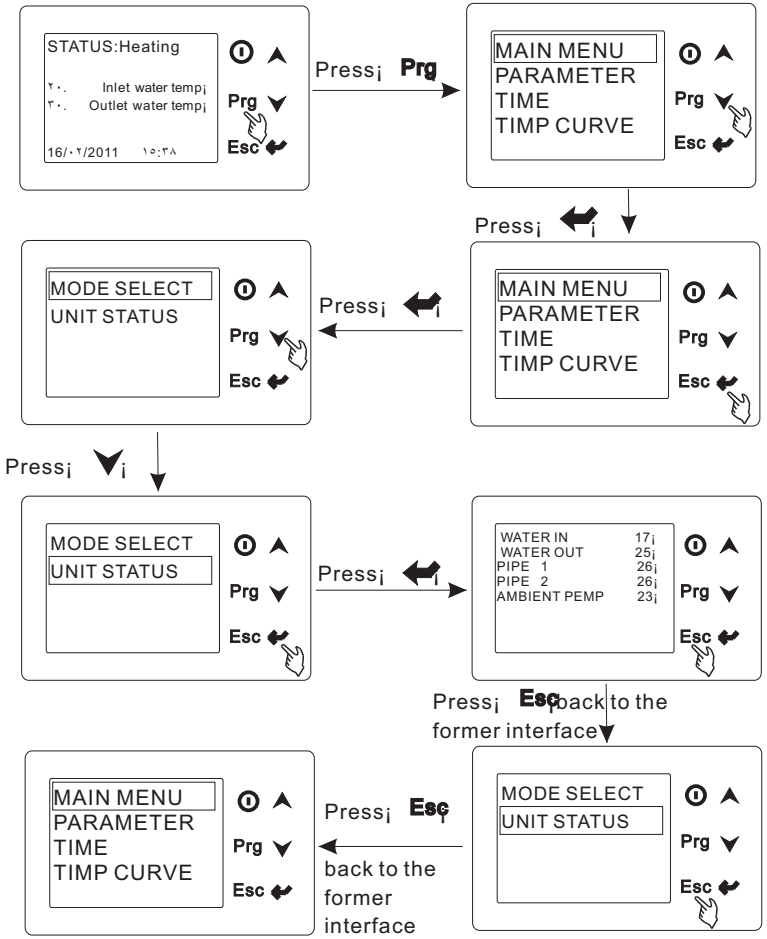




(2)State of unit

In ON/OFF state, you can find the MENU option by pressing the key ¡ Prg Press¡ to go to menu interface. Press¡ ¡for changing unit status. Press ¡ ¡to check the unit state and press ¡ ¡ to return back to the former interface.

For example:



6.1-Electrical connection

Before starting any electrical connection, check that the electrical supply corresponds to the specification indicated on the unit's maker's plate and to the unit's electrical characteristics table.

Important: It is the responsibility of the installer to provide circuit breaker protection, corresponding to the machine's capacity (refer to the unit electrical characteristics table), near to the machine.

Connection to the electrical network must comply with current electrical standards.

To carry out electrical connection:

■ Open the inspection panel which allows access to the junction box. To remove the inspection panel, extract the controller from its support bracket .

■ Thread the power supply cable through the cable guide provided on the unit .

WARNING !

On site wiring must be carried out in accordance with the wiring diagram affixed to the unit's junction box.

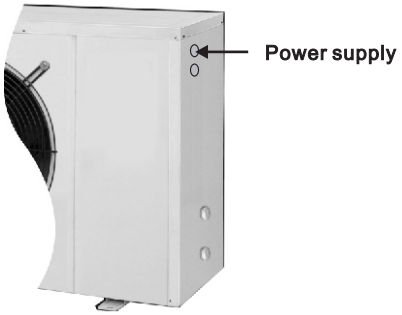
The power cables for general power supply to the unit must have a copper core, and be dimensioned in accordance with current IEC standards.

The unit must be earthed via a terminal block provided inside the junction box.

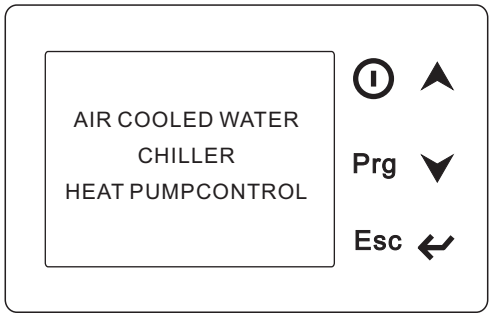
The supply voltage must not vary by more than 10%.Imbalance between the phases must not be greater than 3%

All the connections are made on screw terminals.

The wires should be stripped back 10 mm.



6.1 Function of wire controller

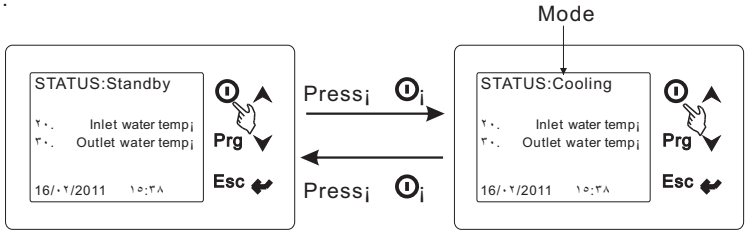


Key	Key name	Key function
⏻	ON/OFF	Press this key to turn on or turn off the unit
Prg	Menu	In ON/OFFstate, press this key to enter into menu interface.
↵	Enter	Function ١: Enter next interface. Function ٢: Change parameter value. The number stands for the value will be flashing if it is changeable.
▲	Up	Press this key to select the upward option or increase the parameter value.
▼	Down	Press this key to select the downward option or decrease the parameter value.
Esc	Escape	Function ١: Return to the former interface. Function ٢: Save the settings when they are finished.

6.2 Usage of wire controller

6.2.1 Turn ON/OFF the unit

When the unit is off, press the key ⏻ , then the unit is turned on, and vice versa.



Standby interface Running interface

6.2.2MAIN MENU

(1)MODE SELECT

you can find the MENU option by pressing the key, OFF state/In ON Prg." Press ↵ then p ress, to go to menu interface ↵ Now you can select the operation mode for the unit by pressing. for mode select interface ↵. Press Esc ce to save your setting and twice for returning back to the former interface.£the AUX HEATING mode is invalid, he at-If the unit systemis without electrical.t be changed'COOL or HEAT mode can, heat-only or electrical-If the unit system is cool.£