

AIR TO WATER HEAT PUMP

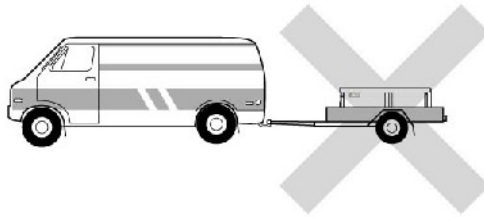
INSTALLATION AND MAINTENANCE MANUAL

The piping connection should be installed according to the local legal laws and regulations as well as the profession standard.

1 Pre-installation

1 Movement and storage

The unit must be moved upside and store at dry area.

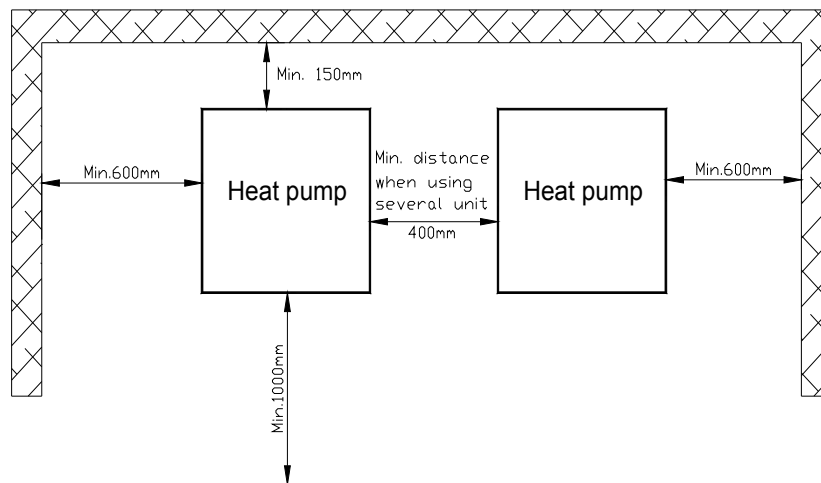


2 Choice of installation place

The unit must be installed on the strong ground, especially on the concrete surface.

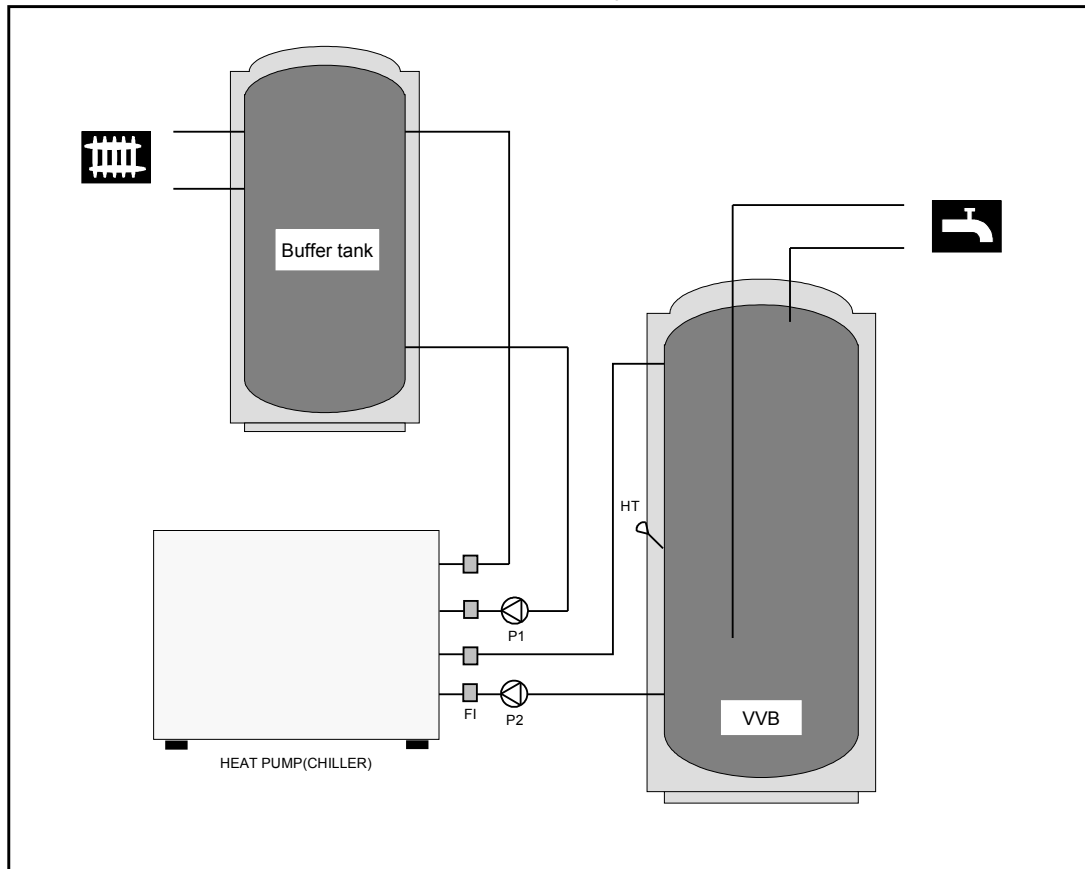
In order to avoid the noise made by the unit. It should be far away from living rooms and others which could not bear noise.

Keep suitable distance between the unit and the building to ensure the normal running and enough maintenance space.



Pipe connections

1 Heat pump (Chiller) + heat recovery



Description

- 1 When cooling, A/C water pump P1 runs, hot water pump P2 runs for daily hot water.
- 2 When heating, only A/C water pump P1 runs.
- 3 When need daily hot water, only hot water pump P2 runs, the daily hot water is priority.
- 4 The daily hot water sensor has already put into the electric box, one side is already connected with the controller, the other side should be put into the daily hot water tank.

2 Pipe connections

Pipe installation must be carried out in accordance with current norms and directives

The heat pump has a max return temperature of approximately 50 °C and an outgoing max temperature from the heat pump of approximately 60 °C

Since the heat pump is not fitted with shutoff valves(AV) these must be fitted outside of the heat pump to facilitate future service

NOTE!

The pipe work must be flushed before the heat pump is connected

Electrical connection

The equipment must not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician

The equipment must be installed via an isolator switch with a minimum breaking gap of 3 mm [Other electrical equipment] except the outdoor temperature sensor and the current transformer are ready connected at the factory

Disconnect the heat pump before insulation testing the house wiring

The heat pump is not reconnectable 1-phase and 3-phase

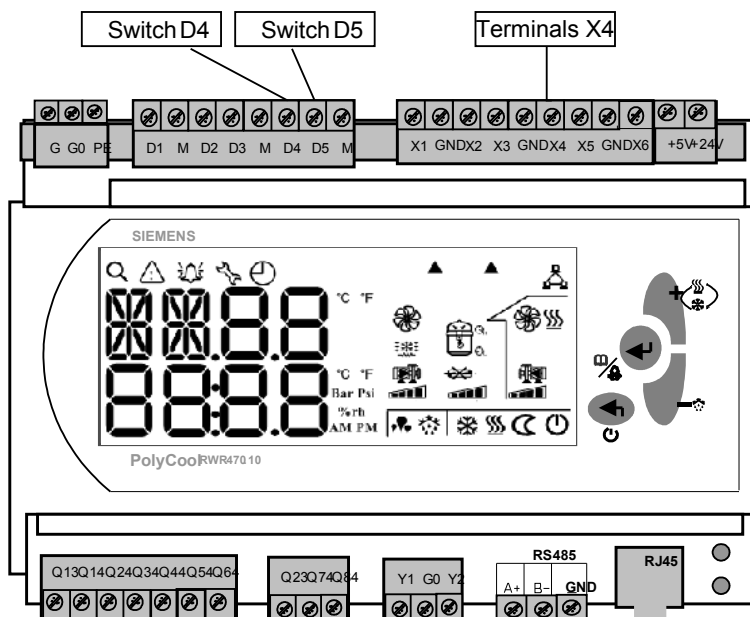
When the building is equipped with an earth-fault breaker the heat pump should be equipped with a separate one

NOTE!

Electrical installation and service must be carried out under the supervision of a qualified electrician [Electrical installation and wiring must be carried out in accordance with the stipulations in force]

1 Power connection

Before connect the power supply, please confirm the unit adopting power. The units export to Europe market are adopted with 230V/1/50Hz (1 phase) and 400V/3/50Hz (3 phase).



3 Temperature sensor for hot water

The supplied sensor is connected using a two-wire cable to terminal positions X4 on the main board [The sensor is placed in a submerged tube on the accumulator tank]

4 A/C switch

The air conditioner's switch D4 must be ON when it is to be started. An external ON/OFF switch could be connected to start or stop the air conditioner port .

Electrical connection

5 Hot water switch

The hot water switch D5 must be ON if you want to start the hot water function. An external ON/OFF switch could be connected to start or stop the hot water function.

6 Water flow switch

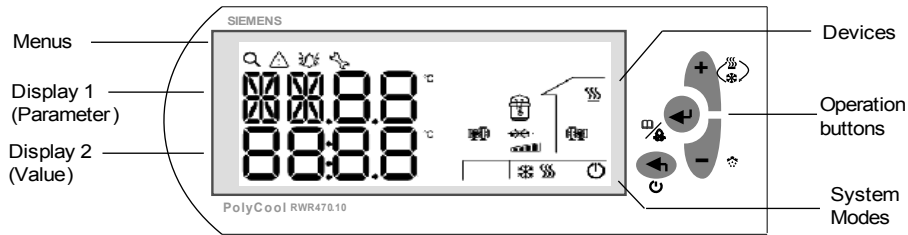
The water flow switch is to check if the water is flowing or not in the pipe system. If it is ON, the water is flowing and the compressor can be started; otherwise, the compressor is prohibited to start. The connection of the water flow switch, please refer to the unit electric diagram.

7 Alarm unit's output

If something gone wrong with the unit, there is alarm signal output. The user could connect a alarm unit (such as indication lighter, alarm bell etc), the detail information, please refer to the unit electric diagram.

Control

1 Controller display (display window & button area)



□ Menu area

Icon	Meaning	Function
	Query/view	Actual values of all temperature
	Warning	Existence of warning, and the latest 10 warnings
	Alarm	Existence of alarm and the latest 20 alarms
	Parameters	Set parameters and values (see also Menu Tree)

□ Operating buttons

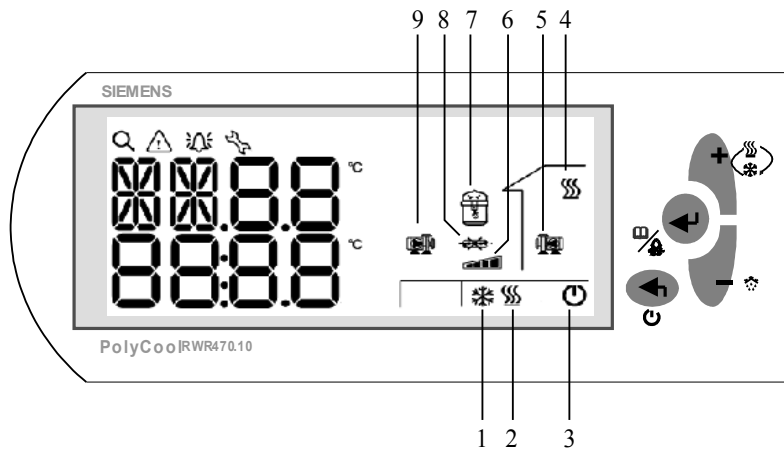
Button	Name	Use
	<Esc>	In Menu /parameter setting mode, press it to return to the previous menu level, or to reject the value entered
	<Enter>	Press down it for more than 2 seconds and release it to enter the Menu mode
		In Menu/parameter setting mode, press it to confirm the selected menu level, or the value entered
		Press it to acknowledge/reset warnings and alarms
	<Plus>	Press it for 2 seconds to activate the System Mode in stop mode
		Or, press it to select the menu level, or to increase the value in Menu/parameter setting mode
	<Minus>	Press it to select the menu level, or to decrease the value in Menu/parameter setting mode

□ Display area

- At normal working mode display 1 shows temperature code display 2 shows this code temperature value
- At manus mode display 1 shows manus code display 2 shows this code value

Control

□ Symbol explanation

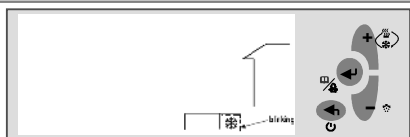


- 1□ Cooling mode
- 2□ Heating mode
- 3□ OFF
- 4□ Hot water mode
- 5□ Indoor side water pump
- 6□ Compressor energy grade
- 7□ Compressor
- 8□ Water flow switch (light on represents the water flow switch alarm)
- 9□ Outdoor side water flow switch

Control

2 Selection of System Modes

Display



Procedures

In stop mode, press the <Plus> button for 2 seconds, and release it to activate the selection of system mode. The currently system mode will start flashing.

Press <Plus> or <Minus> to select the desired system mode, and then press <Enter > to confirm.

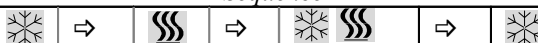
If the current system is heating only (when SF01=2) or cooling only (when SF01=0), the selection of system modes is disable.

If the current system is heating & cooling (when SF01=1), the full sequence of selecting the system modes will be as follows.

Activity

Sequence

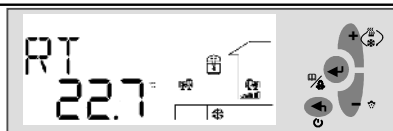
Press <Plus>



appear at the same time, it is auto mode, the actual running mode is decided by ST18 and ST19.

3 Viewing temperature

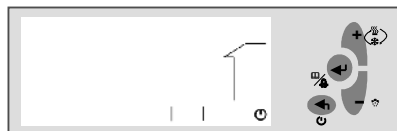
Display



Procedures

In normal working mode, press <plus> or <minus> to look into the temperature.

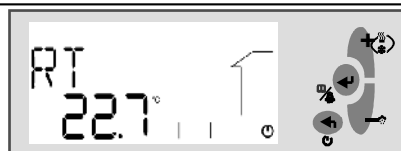
Display



Procedures

In stop mode, press the <Enter> button for 2 seconds and release it to enter the Menu mode.

By default, the Query icon is blinking, waiting for further instructions.



Press the <Enter> button to enter the query mode.

press <plus> or <minus> to look into the temperature.

Code	Describe
RT	Inlet water temperature of indoor side
ST	Outlet water temperature of indoor side
OT	Atmospheric temperature of outdoor
HT	Hot water temperature
CT	Condenser temperature
ET	Evaporating temperature

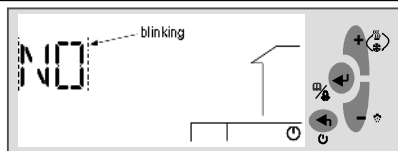
Control



4 Changing Set points (for end users)


Display

Procedures

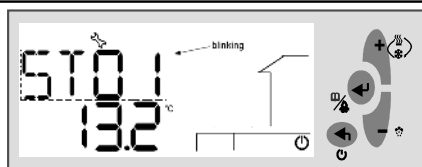
In stop mode, press <Enter> for 2 seconds and release it to activate the Menu mode.



When the  icon is blinking, press <Plus> or <Minus> to navigate to the  menu, and then press <Enter> to proceed.

Contents under the  Parameter Menu may vary with the privilege right of the user.

- For end users, select “NO,” and press <Enter > to proceed.
- For service men and factory users, select “EU” or “ID”,and press <Enter> to input the 4-digit password .



For end users, parameters in the “ST” group will by default be displayed. Press <Plus> and <Minus> to navigate to the parameter and press<Enter> to continue.



Or, continuously press <Esc> to exit out of the current level and back to the desired menu level.


5 Accessing the Parameter Menu

Display

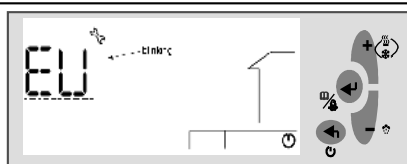
Procedures

In Stop mode, press <Enter> for 2 seconds and release it to activate the Menu mode.

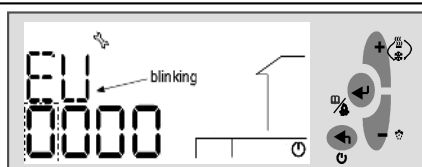
When the  icon is blinking, press <Plus> or <Minus> to navigate to the  menu, and then press <Enter> to proceed.

Contents under the  menu may vary with the privilege right of the user.

- For end users, select “NO” and press <Enter > to proceed.
- For service men and factory users, select “EU” or “ID”and press <Enter>. Input the 4-digit password when the following screen is displayed



Press <Enter> to confirm and continue to input the password.



Password is required for the service man (EU)and factory users(ID).

To input password, follow the instructions below:

- When the digit is blinking, press <Plus>/<Minus> to select the value. Then, press <Enter> to confirm, and proceed to the next digit.
- Or, press <Esc> at any time to cancel the input and return to the previous blinking digit.
- Repeat steps above to input other three numbers.
- After inputting the password, press <Enter> to confirm, and proceed to setting parameter values.

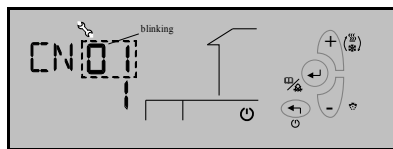
Control

6 Adjusting Parameter Values

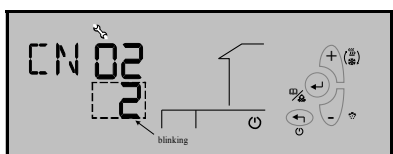
Display

Procedures

After inputting password and enter into the parameter setting mode.



Press <Plus> or <Minus> to select the parameter code, and press <Enter> to confirm.



The default value of the parameter will start flashing, allowing you to make a change. Press <Plus> or <Minus> to increase or decrease the value, and press <Enter> to confirm.

Continuously press <Esc> to exit out of the current level and back to the desired menu level.

Compressor Settings

Parameter	Descriptions	Default	Min.	Max.	Unit	Res.	Privilege
CM01	Compressor minimum ON time	180	1	1000	Sec	1	1
CM02	Compressor minimum OFF time	180	1	1000	Sec	1	1
CM03	Start Delay between two compressors	10	0	100	Sec	1	1
CM04	Shut down delay between two compressors	30	0	1000	Sec	1	1
CM05	Compressor ON delay (outdoor pump ON)	10	0	150	Sec	1	1
CM06	The number of compressors	2	1	2	-	1	2
CM07	The direction indicator of four-way valves(1 or 0 indicates heating mode)	1	0	1			1
CM08	Compressor consecutive running time for discard	30000	0	50000	Hr	10	1

Condenser Settings

Parameter	Descriptions	Default	Min	Max	Unit	Res.	Privilege
CN01	Outdoor pump ON delay (indoor pump ON)	10	0	150	Sec	1	1
CN02	Outdoor pump ON delay (compressor OFF)	10	0	150	Sec	1	1
CN03	Control mode 0= fix fan speed 1= two fan speed	0	0	1	-	1	1
CN04	Adjustable outdoor temperature band of fan speed at cooling	25	15	50	□	0.1	1
CN05	Adjustable outdoor temperature band of fan speed at heating	20	0	30	□	0.1	1
CN06	Adjustable outdoor temperature band of fan speed at hot water mode	25	15	30	□	0.1	1

Evaporator Settings

Parameter	Descriptions	Default	Min.	Max.	Unit	Res.	Privilege
EV01	Control Mode 0=pump with circulate continuously 1= The water pump with the compressor ON/ OFF but ON/ OFF	0	0	1	-	1	1
EV02	Indoor reference sensor: - 0=RT (return temperature sensor) - 1=ST (supply temperature sensor)	0	0	1	-	1	1
EV03	indoor pump Off delay (compressor OFF)	60	CN02	1000	Sec	1	1

Special Functions

Parameter	Descriptions	Default	Min.	Max.	Unit	Res.	Privi-lege
SF01	System mode - 0=Cooling only - 1=Heating & Cooling - 2=Heating only	2	0	2	-	1	2
SF02	Temperature point to prohibite heat pump works	-10	-20	20	□	0.1	1
SF03	Temperature scope to prohibite heat pump works	2	1	10	□	0.1	1
SF04	The compensates function of heating temperature - 0=Disabled - 1=Enabled	1	0	1	-	1	1
SF05	Heat Recovery function - 0=Disabled - 1=Enabled	0	0	1	-	1	2
SF06	Outside temperature point for antifreeze turned on	2	0	10		1	1
SF07	Outside temperature scope for antifreeze turned off	1	1	10		1	1
SF08	Temperature point of inlet/outlet water for antifreeze turned on	3	1	10		1	1
SF09	Temperature point of inlet/outlet water for antifreeze turned off	3	1	10		1	1

User Settings

Parameter	Descriptions	Default	Min.	Max.	Unit	Res	Privilege
ST01	Set point of compressors in cooling mode (End User)	12	ST11	ST12	°C	0.1	0
ST01	Setpoint of compressors in cooling mode (End User)	12	ST11	ST12	°C/	0.1	0
ST02	Setpoint of compressors in heating mode (End User)	40	ST13	ST14	°C/	0.1	0
ST03	Adjustable temperature band of compressor in Cooling mode	1	0	10	°C	0.1	0
ST04	Adjustable temperature band of compressor in Heating mode	1	0	10	°C	0.1	0
ST05	Setting temperature for heating temperature compensate function	20	0	30	°C	0.1	0
ST06	compensate factor for heating temperature compensate function	6	0	30	-	0.1	0
ST07	Temperature Scope of outside when the boiler started	0	-10	20	°C	0.1	0
ST08	Setpoint of outside temperature when the boiler started	5	1	20	°C	0.1	0
ST09	Setpoint of hotwater temperature in the life	50	ST15	ST16	°C	0.1	0
ST10	band of hotwater temperature in the life	3	1	10	°C	0.1	0
ST11	minimum setpoint in cooling	10	0	ST12	°C	0.1	0
ST12	maximum setpoint in cooling	40	ST11	60	°C	0.1	0
ST13	minimum setpoint in heating	20	0	ST14	°C	0.1	1
ST14	maximum setpoint in heating	55	ST13	80	°C	0.1	1

ST15	minimum setpoint of hotwater temperature in the life	20	0	ST16	°C	0.1	1
ST16	maximum setpoint of hotwater temperature in the life	55	ST15	80	°C	0.1	1
ST17	band of adjusting time	30	1	1000	Sec	1	0
ST18	Setpoint of running mode	25	15	30	°C	0.1	0
ST19	Temperature Scope of running mode	5	1	10	°C	0.1	0

Defrost Settings

Parameter	Descriptions	Default	Min.	Max.	Unit	Res.	Privilege
DF01	Fan defrost - 0=Disabled - 1=Enabled (when outdoor temperature \geq DF02)	1	0	1	-	1	1
DF02	Setpoint of outdoor temperature when fan defrost (When outdoor temperature \geq the setpoint and DF01=1, adopt fan defrost)	5.0	1.0	10.0	°C	0.1	1
DF03	Setpoint of outdoor temperature	10.0	3.0	20.0	°C	0.1	1
DF04	Setpoint of defrost temperature difference (outdoor temperature-coil temperature)	10	5	20	°C	0.1	1
DF05	Running time <input type="checkbox"/> compressor continuous running time when coil temperature \leq DF04	5	1	60	Min	1	1
DF06	Minimum defrost interval	30	15	60	Min	1	1
DF07	Compressor transfers delay from OFF to ON before defrost, from heating to cooling	10	6	180	Sec	1	1
DF08	Compressor transfers delay from OFF to ON after defrost, from heating to cooling	10	6	180	Sec	1	1
DF09	Coil temperature when quite from defrost	5	1	20	°C	0.1	1
DF10	Defrost time (from compressor ON)	300	1	1000	Sec	1	1
DF11	Minimum air conditioner's keep temperature	15	10	40	°C	0.1	1

Alarm Settings

Parameter	Descriptions	Default	Min.	Max.	Unit	Res.	Privilege
AL01	Protecting Set point for low outlet water temperature	3	1	10	°C	1	1
AL02	Band of low outlet water temperature	2	1	10	°C	1	1
AL03	Protecting Set point for high outlet water temperature	55	1	100	°C	1	1
AL04	Band of high outlet water temperature	15	1	20	°C	1	1
AL05	Feedback Delay for water current switch	10	1	100	Sec	1	1
AL06	total alarm number within 24 hours in low pressure (Over this limit, alarm "AL18" will be reported.)	4	1	10	-	1	1
AL07	total alarm number within 24 hours in high pressure (Over this limit, alarm "AL19" will be reported.)	6	1	10	-	1	1
AL08	Protecting Set point for low evaporator temperature	-2	-10	10	°C	0.1	1
AL09	Time rang during which low pressure will be ignored when compressor ON.	300	0	1000	Sec.	10	1

Control

7 Heating compensation curve SF04=1

The control temperature for heating mode has two methods: fix and changeable temperature. The fix temperature is a fixed value and directly set by the end user from the set area. The changeable temperature is determined by values of ST05, ST06 and the tested outdoor temperature by the controller.

This function is selected by SF04, when SF04=0, it is fix temperature; when SF04=1, it is changeable temperature.

The following curve will show the detail of changeable mode when ST05=20



Set the heating compensation coefficient ST06 is 5,

When outdoor temperature is 5, the control temperature is 28;

When outdoor temperature is -10, the control temperature is 35;


When outdoor temperature is -20, the control temperature is 40;


With the drop of the outdoor temperature, the control temperature become higher and higher to meet the large heating requirement.

With the increase of the outdoor temperature, the control temperature become lower and lower, so that the heat pump works under low pressure to keep low energy consumption.

Warning and alarm

1 Warning Management

When a warning is detected, the corresponding warning code will be displayed on the LCD. The warning icon  will flash simultaneously.

Only the latest 10 warnings will be kept under the  menu.

Upon power failure of the controller, the warning logs will be erased and recounted

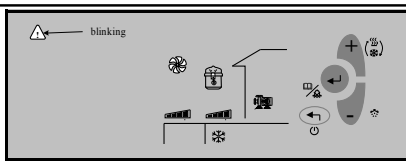
<i>Codes</i>	<i>Meaning</i>
WN01	Indoor side anti-freeze at winter



● Viewing Warning Logs

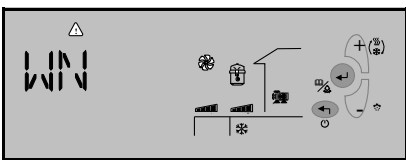
Display

Procedures

Press down <Enter> for 2 seconds and release it to activate the Menu mode.



When the  icon is flashing, press <Plus>/<Minus> to navigate to the  menu, and then press <Enter> to confirm.



Two letters “WN” will be displayed on the LCD, continuously flashing. Press <Enter> again to view the last 10 warning codes generated, if any. If no warning is generated, the word “NoNE” will be displayed.

Continuously press <Exit> to exit out of the current level, and back to the normal running mode.


Warning and alarm

2 Alarm Management

Alarms in PolyCool470.10 are divided into two groups: auto reset alarms and manual reset alarms.


For an auto reset alarm, users are not required to acknowledge and reset it. The corresponding device will be automatically restarted once the alarm status disappears.

Once a manual reset alarm is detected, the system will be stopped. Users need acknowledge and reset it, and also manually restart the corresponding device after the fault status is cleared.

When an alarm is detected, the corresponding device icon (if any) and the  icon will continuously flash. An alarm code will be displayed on the screen.

If more than one alarm is detected, the alarm codes will be displayed successively on the LCD screen until the alarm status disappears, or until they are manually acknowledged or reset (only for manual reset alarms).

If the system detects warnings and alarms at the same time, the warning codes will NOT be displayed on the LCD.

The latest 20 normal alarms and manual reset alarms generated in total are separately kept under the auto reset alarm (AR) and manual reset alarm (MR) categories in the  menu.

● Auto Reset Alarms

The following are codes for auto reset alarms with their meanings.

<i>Codes</i>	<i>Meaning</i>
AL01	Compressor low pressure (DI2)
AL02	Compressor high pressure (DI3)
AL03	Low inside supply water temperature protection (when less than AL01 in cooling mode)
AL04	Low outside supply water temperature protection (when less than AL01 in heating mode)
AL05	Inside supply temperature is over the high limit in heating mode (when over than AL03 in heating mode)

● Manual Reset Alarms

The following are codes for manual reset alarms with their meanings.

<i>Codes</i>	<i>Meaning</i>
AL17	Flow switch alarm after the delay (AL05)
AL18	Alarm number of compressor low pressure within 24 hours is over the limit (AL06)
AL19	Alarm number of compressor high pressure within 24 hours is over the limit (AL07)
AL20	Low evaporator temperature protection (AL08)

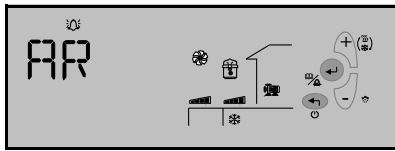
Warning and alarm


● Viewing Alarm Logs

Display

Procedures

Press down <Enter> for 2 seconds, and release it to activate the Menu mode.



Press <Plus> or <Minus> to navigate to the menu, and then press <Enter> to confirm. 

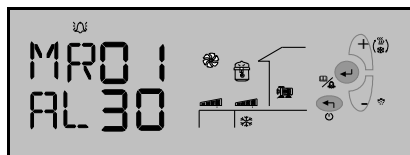
By default, auto reset alarm “AR” will be displayed on the LCD, flashing.

To view auto reset alarms generated, press <Enter> to continue when “AR” is displayed.

To view manual reset alarms, press <Minus> or <Plus> to navigate to the “MR” group, and then press <Enter> to continue.

By default, the first manual reset alarm “MR01” will be displayed as follows. Press <Enter> to view the first manual reset alarm code.

Or, press <Minus> or <Plus> to view other numbered alarms, and press <Enter> to view the specific code.



If no alarm is generated, the word “NoNE” will be displayed.

Continuously press <Exit> to exit out of the current level, and back to the normal running mode.


MR01 and AR01 are respectively the latest information of manual reset alarm and auto reset alarm.

Acknowledging and Resetting Manual Reset Alarms

Any alarm detected by the system, either an auto reset alarm or a manual reset alarm, will be displayed on the LCD. However, only manual reset alarms require user’s acknowledgement and reset.

To do this, follow the steps below:

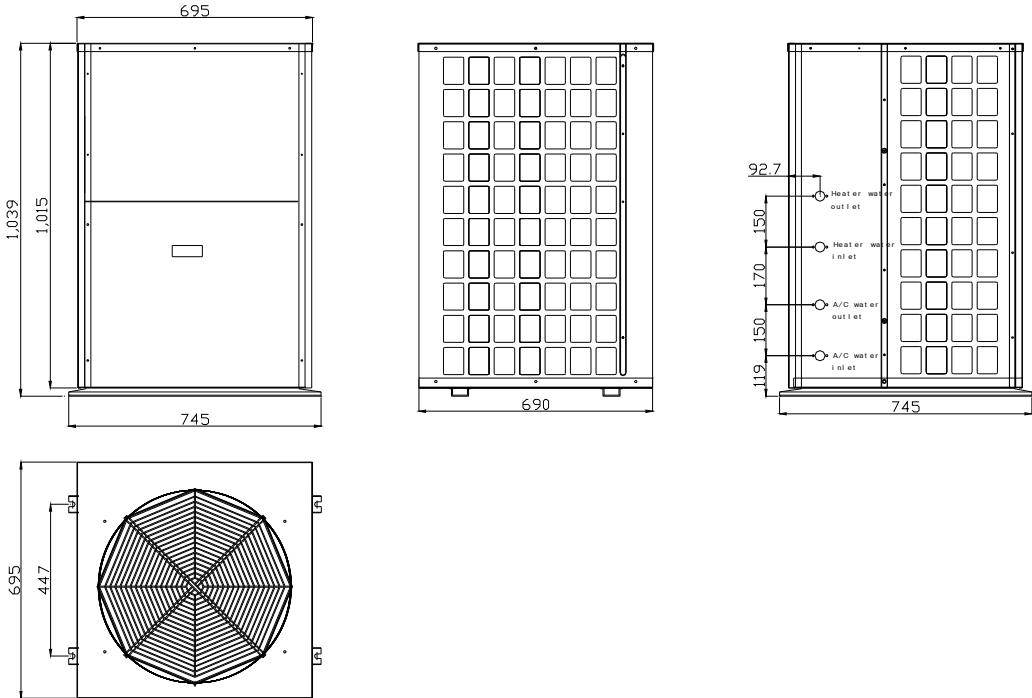
Press <Enter> to acknowledge the alarm.

If the alarm status is cleared, the corresponding device icon and alarm icon  that are flashing will accordingly disappear.

Restart the system, as appropriate.

Dimensions

1 LSQ10R1/R



2 LSQ15R1/R

