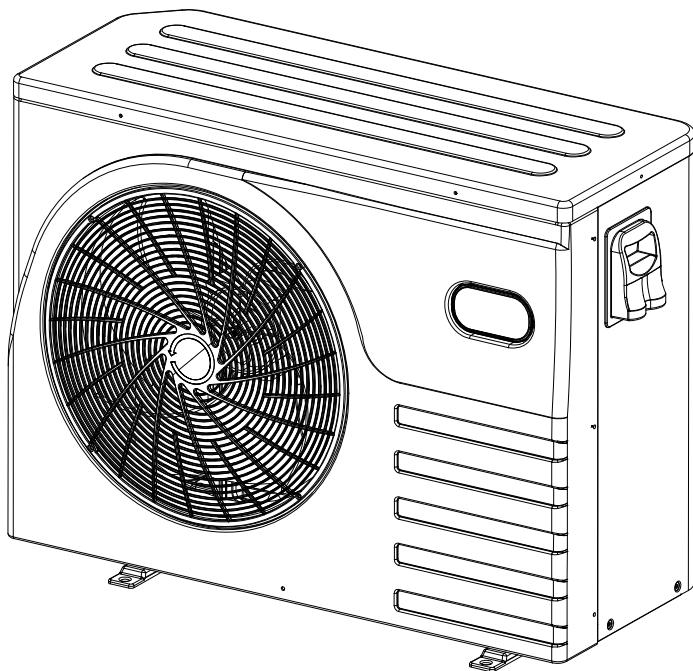


# InverONE

## Owner's Manual



INV1-40EE | INV1-60EE | INV1-80EE



Scan to register your  
product warranty

**GoPool**

## Warranty registration

Thank you for choosing GoPool! Register your product today to activate your warranty and get quick, hassle-free support when you need it.



Scan to register your  
product warranty



**WARNING**

This equipment must be installed and serviced according to the information found in this manual. Improper installation can create hazards which could result in property damage, serious injury or death. Improper installation will void the warranty.

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In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.

The unit can only be repaired by qualified installer centre , personnel or an authorised dealer.

Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

Use genuine standard spare parts only. Failure to comply with these recommendations will invalidate the warranty.

Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, The indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

## **Our heat pump has following characteristics:**

### **01. Durable**

The heat exchanger is made of PVC & Titanium tube which can withstand prolonged exposure to swimming pool water.

### **02. Installation flexibility**

The unit can be installed outdoors.

### **03. Quiet operation**

The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.

### **04. Advanced controlling**

The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the LCD wire controller. Remote controller can be chosen as future option.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The appliance shall be installed in accordance with national wiring regulations.

Do not operate your air conditioner in a wet room such as a bathroom or laundry room.

Before obtaining access to terminals, all supply circuits must be disconnected.

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An all-pole disconnection device which has at least 3mm clearances in all poles , and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Appliance shall be installed, operated and stored in a room with a floor area larger than Xm<sup>2</sup>.

Be aware that refrigerants may not contain an odour.

The installation of pipe-work shall be kept to a minimum X m<sup>2</sup>.

Spaces where refrigerant pipes shall be compliance with national gas regulations.

Servicing shall be performed only as recommended by the manufacturer.

The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.

All working procedure that affets safety means shall only be carried by competent persons.

Transport of equipment containing flammable refrigerants.

Compliance with the transport regulations.

Marking of equipment using signs.

Compliance with local regulations.

Disposal of equipment using flammable refrigerants.

Compliance with national regulations.

Storage of equipment/appliances.

The storage of equipment should be in accordance with the manufacturer's instructions.

Storage of packed (unsold) equipment.

Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.

The maximum number of pieces of equipment permitted to be stored together will be.determined by local regulations.



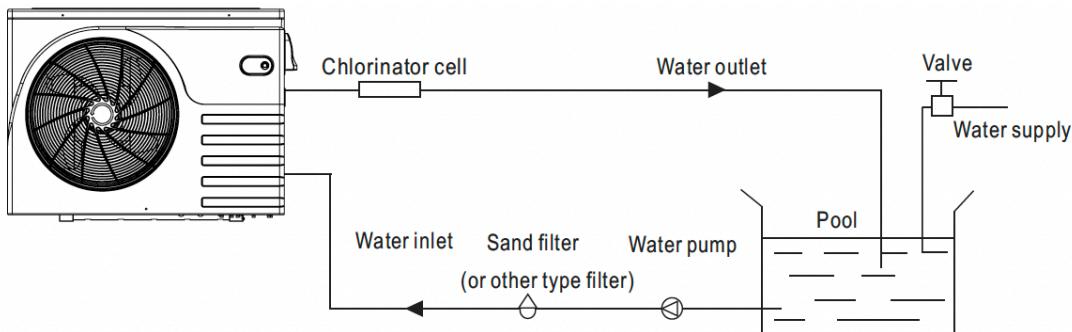
## Caution & Warning

01. The unit can only be repaired by qualified installer centre personnel or an authorised dealer.(for Europe market)
02. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. (for Europe market)  
Children should be supervised to ensure that they do not play with the appliance.
03. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
04. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
05. Directive 2002/96/EC (WEEE): The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
06. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
07. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire can be occur.
08. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
09. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer. (for North America market)
11. Installation must be performed in accordance with the NEC/CEC by authorized person only. (for North America market)
12. USE SUPPLY WIRES SUITABLE FOR 75°C.
13. **Caution:** Single wall heat exchanger, not suitable for potable water connection.

# Installation and Connection



## Installation illustration



### Installation items:

The factory only provides the main unit and the water unit; the other items in the illustration are necessary spare parts for the water system, that provided by users or the installer.

**Attention:** Please follow these steps when using for the first time

01. Open valve and charge water.
02. Make sure that the pump and the water-in pipe have been filled with water.
03. Close the valve and start the unit.

**Attention:** It is necessary that the water-in pipe is higher than the pool surface. The schematic diagram is for reference only. Please check the water inlet/outlet label on the heat pump while plumbing installation.

## Swimming Pool Heat Pumps Location

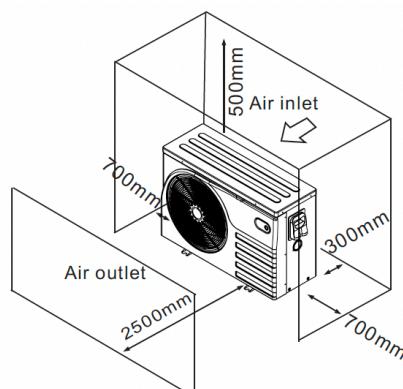
The unit will perform well in any outdoor location provided that the following three factors are presented:

1. Fresh Air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere outdoors. For indoor pools please consult the supplier. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

**DO NOT** place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated.

**DO NOT** place the unit to shrubs which can block air inlet. These locations deny the unit of a continuous source of fresh air which reduces its efficiency and may prevent adequate heat delivery.



# Installation and Connection



## How Close To Your Pool?

Normally, the pool heat pump is installed within 7.5 metres of the pool. The longer the distance from the pool, the greater the heat loss from the piping. For the most part, the piping is buried. Therefore, the heat loss is minimal for runs of up to 15 meters (15 meters to and from the pump = 30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6 kW-hour, (2000BTU) for every 5°C difference in temperature between the pool water and the ground surrounding the pipe, which translates to about 3% to 5% increase in run time.

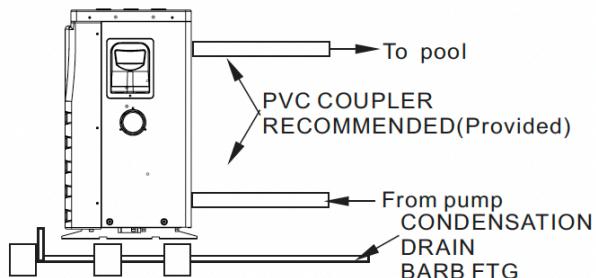
## Swimming Pool Heat Pumps Plumbing

The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing arrangements except bypass (please set the flow rate according to the nameplate). The water pressure drop is less than 10kPa at max. Flow rate. Since there is no residual heat or flame Temperatures, The unit does not need copper heat sink piping. PVC pipe can be run straight into the unit.

**Location:** Connect the unit in the pool pump discharge (return) line downstream of all filter and pool pumps, and upstream of any chlorinators, ozonators or chemical pumps.

Standard model have slip glue fittings which accept 32mm or 50 mm PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 40NB

Give serious consideration to adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of unit for winterizing and to provide easier access should servicing be required.



**Condensation:** Since the Heat pump cools down the air about 4 -5°C, water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is very high, this could be as much as several litres an hour. The water will run down the fins into the basepan and drain out through the barbed plastic condensation drain fitting on the side of the basepan. This fitting is designed to accept 20mm clear vinyl tubing which can be pushed on by hand and run to a suitable drain. It is easy to mistake the condensation for a water leak inside the unit.

### NOTE -

A quick way to verify that the water is condensation is to shut off the unit and keep the pool pump running. If the water stops running out of the basepan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if there is no chlorine present, then it's condensation.

# Installation and Connection



## Swimming Pool Heat Pumps Electrical Wiring

### NOTE -

Although the unit heat exchanger is electrically isolated from the rest of the unit, it simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

The unit has a separate molded-in junction box with a standard electrical conduit nipple already in place. Just remove the screws and the front panel, feed your supply lines in through the conduit nipple and wire-nut the electric supply wires to the three connections already in the junction box (four connections if three phase). To complete electrical hookup, connect Heat Pump by electrical conduit, UF cable or other suitable means as specified (as permitted by local electrical authorities) to a dedicated AC power supply branch circuit equipped with the proper circuit breaker, disconnect or time delay fuse protection.

**Disconnect** - A disconnect means (circuit breaker, fused or un-fused switch) should be located within sight of and readily accessible from the unit. This is common practice on commercial and residential air conditioners and heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

## Initial startup of the Unit

### NOTE -

In order for the unit to heat the pool or spa, the filter pump must be running to circulate water through the heat exchanger.

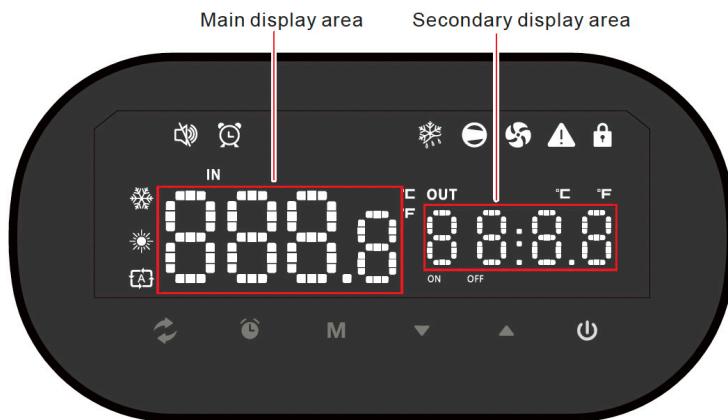
**Start up Procedure** - After installation is completed, you should follow these steps:

01. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.
02. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.
03. After running a few minutes make sure the air leaving the top(side) of the unit is cooler(Between 5-10°C)
04. With the unit operating turn the filter pump off. The unit should also turn off automatically,
05. Allow the unit and pool pump to run 24 hours per day until desired pool water temperature is reached. When the water-in temperature reaches this setting, the unit will slow down for a period of time, if the temperature is maintained for 45 minutes the unit will turn off. The unit will now automatically restart (as long as your pool pump is running) when the pool temperature drops more than 0.2 below set temperature.

**Time Delay:** The unit is equipped with a 3 minute built-in solid state restart delay included to protect control circuit components and to eliminate restart cycling and contactor chatter. This time delay will automatically restart the unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the solid state 3 minute restart delay and prevent the unit from starting until the 5 minute countdown is completed.



## Function of wire controller



## Key and icon function instruction

Key function instruction:

Key	Key name	Key function
	Switch	Switching secondary area display, switching between outlet temperature and time.
	Setting	Press this key to enter the setting interface and confirm saving.
	Mode	Press this key to change the mode and setting the parameter.
	Down	Press this key to select the downward option or decrease the parameter value.
	Up	Press this key to select the upward option or increase the parameter value.
	ON/OFF	Press this key to turn on/off the unit.

# Usage



Icon function instruction:

Icon	Icon name	Icon function
	Mute	Display when timer silent is enabled.
	Timing	Display when timer on/off is enabled.
	Defrosting	Display when Defrosting function is enabled.
	Compressor	Display when compressor is on.
	Fan	Display when fan is on.
	Fault icon	Display when a fault occurs.
	Lock	Display when the screen is locked.
	Cooling	Display at cooling mode.
	Heating	Display at heating mode.
	Auto	Display at auto mode.
	Inlet	Display when the main area displays the inlet water temp.
	Outlet	Display when the axillary area displays the outlet water temp.
	Celsius	Display when the main area or axillary area display degrees Celsius.
	Fahrenheit	Display when the main area or axillary area display degrees Fahrenheit.
ON      OFF	Timer On/Off	Display after the user sets the timer on/off settings, and the function is started.

# Usage



## Turn ON/OFF the unit

When the unit is off, press the key “

When the unit is on, press the key “

### NOTE -

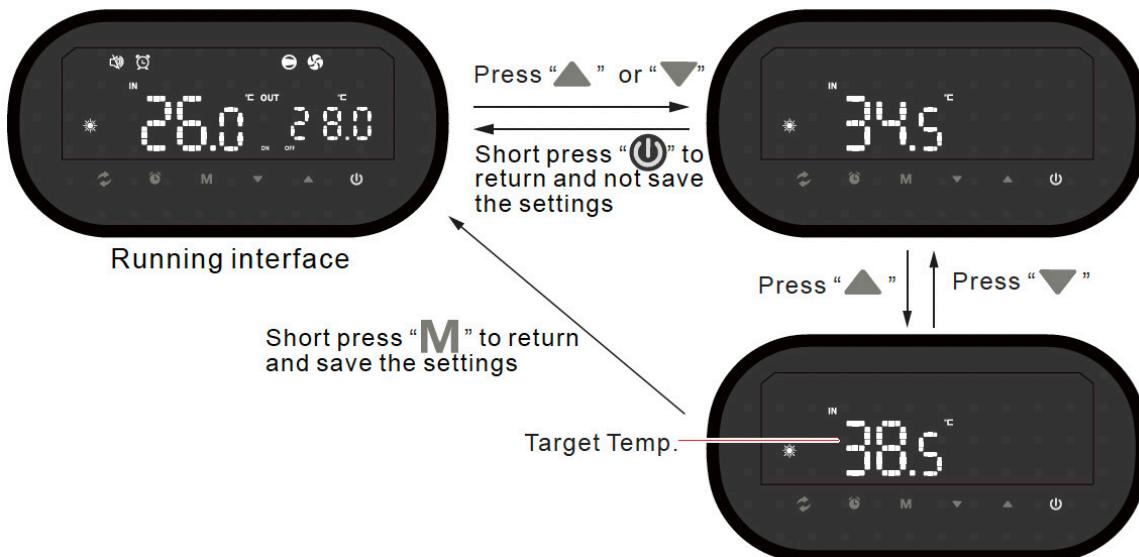
1. Turn on/off the unit can only be conducted in the main interface.

2. If there is no operation for 1 minute, it will display with full screen off, click any key for returning to ON/OFF main interface.

## Setting temperature

In the running interface, press “

**Attention:** If there is no operation for 5s, system will remember parameter setting and back to the main interface.



### NOTE -

Operation: Press “

Range of temp. variation 0.5°C/1°F

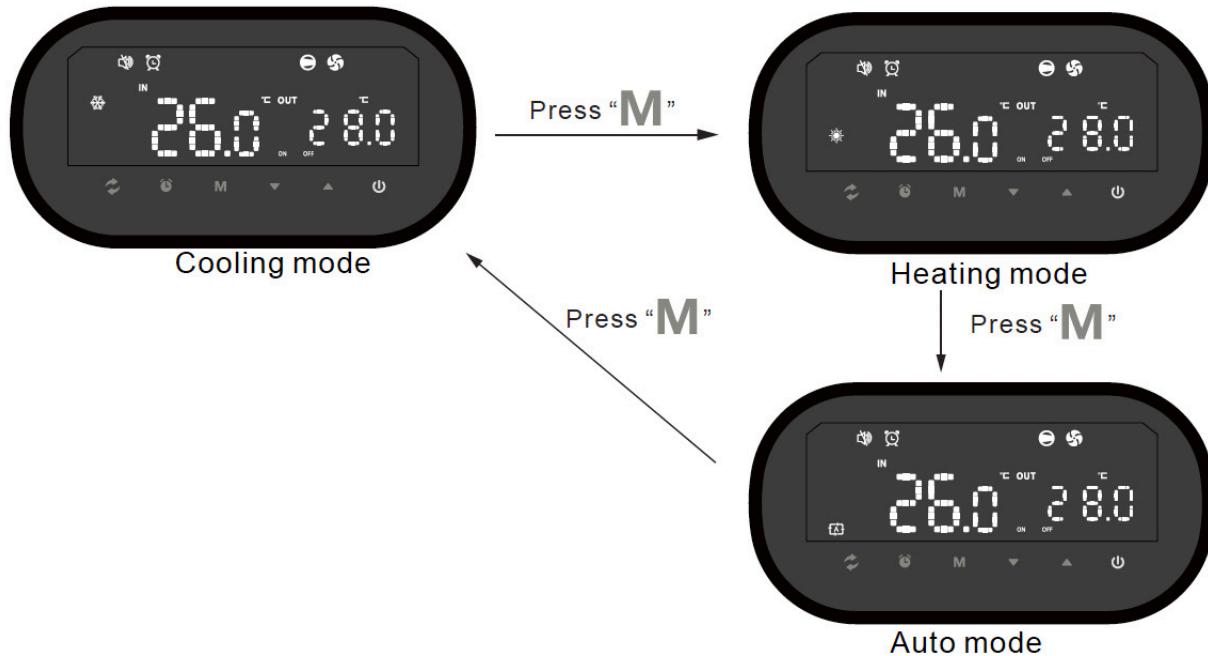


## Mode switch

In the main interface, short press “M” to enter mode setting interface, the current mode icon flashes for 2s (at this point the wire controller does not send a mode change signal to the mainboard), then stops flashing and lights up, the mode change is successful.

**NOTE -**

1. Mode switch operation can only be conducted in the main interface.
2. The modes switching is useless of the unit you buy which is singel-cold/single-heat unit.



# Usage

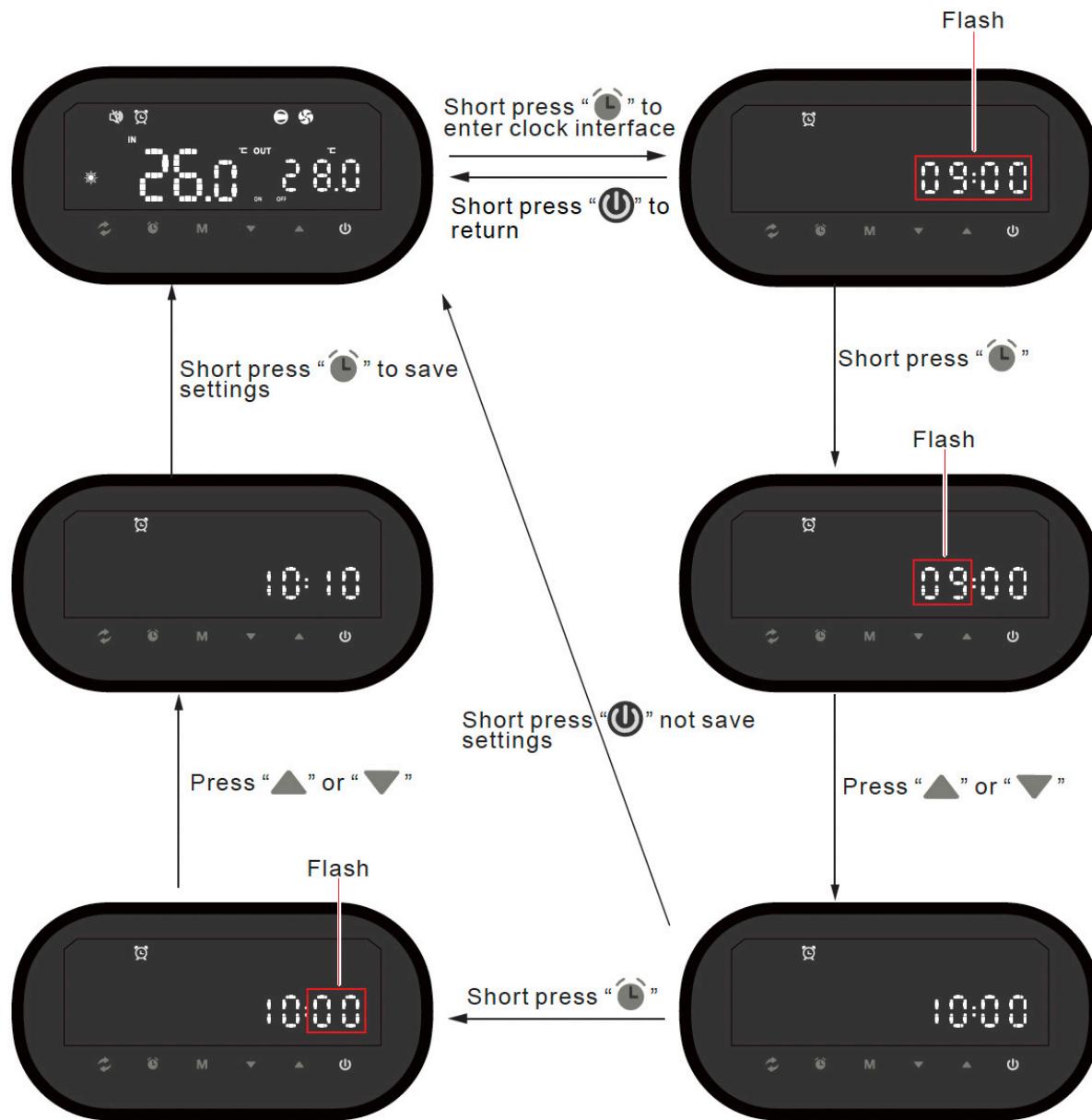


## System time

In the main interface, short press “” to enter system time setting interface, the current time flashes, then short press “” hour digit flashes, press “” to save the setting.

### NOTE -

1. Under the clock setting interface, if short press “”, the change will not be saved and return to the main interface.
2. If there is no operation for 5s, system will remember parameter setting and back to the main interface.





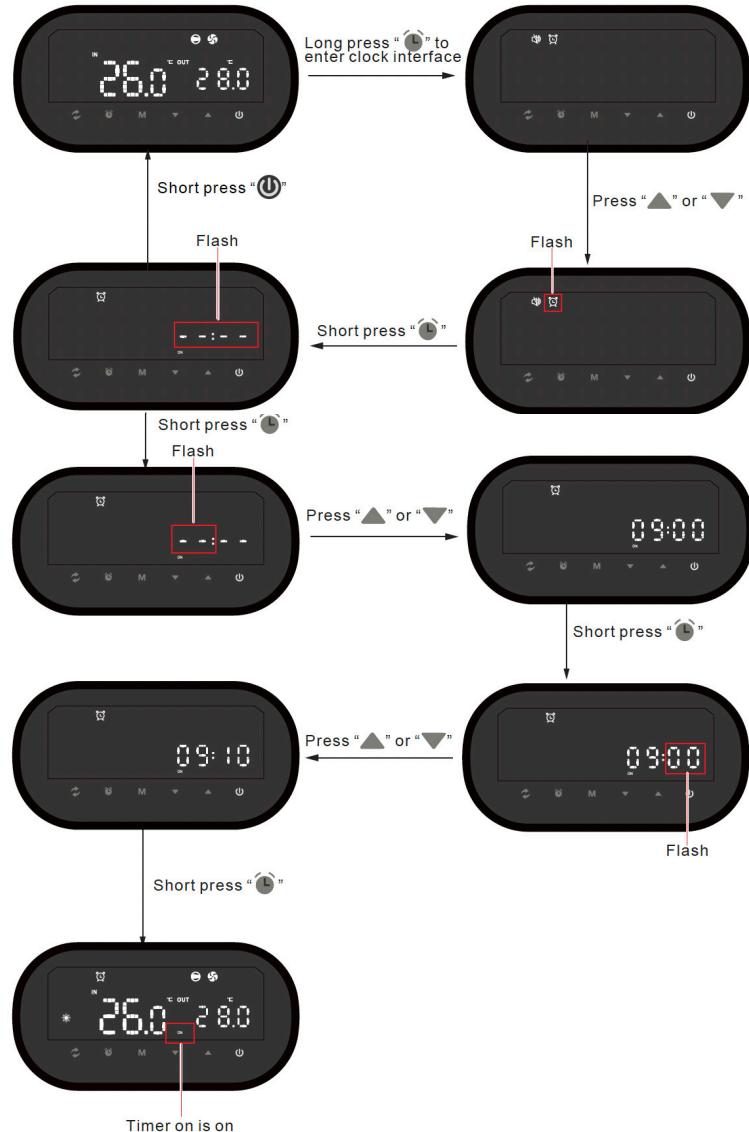
## Timer on/off

In the main interface, long press “

### NOTE -

1. Press “

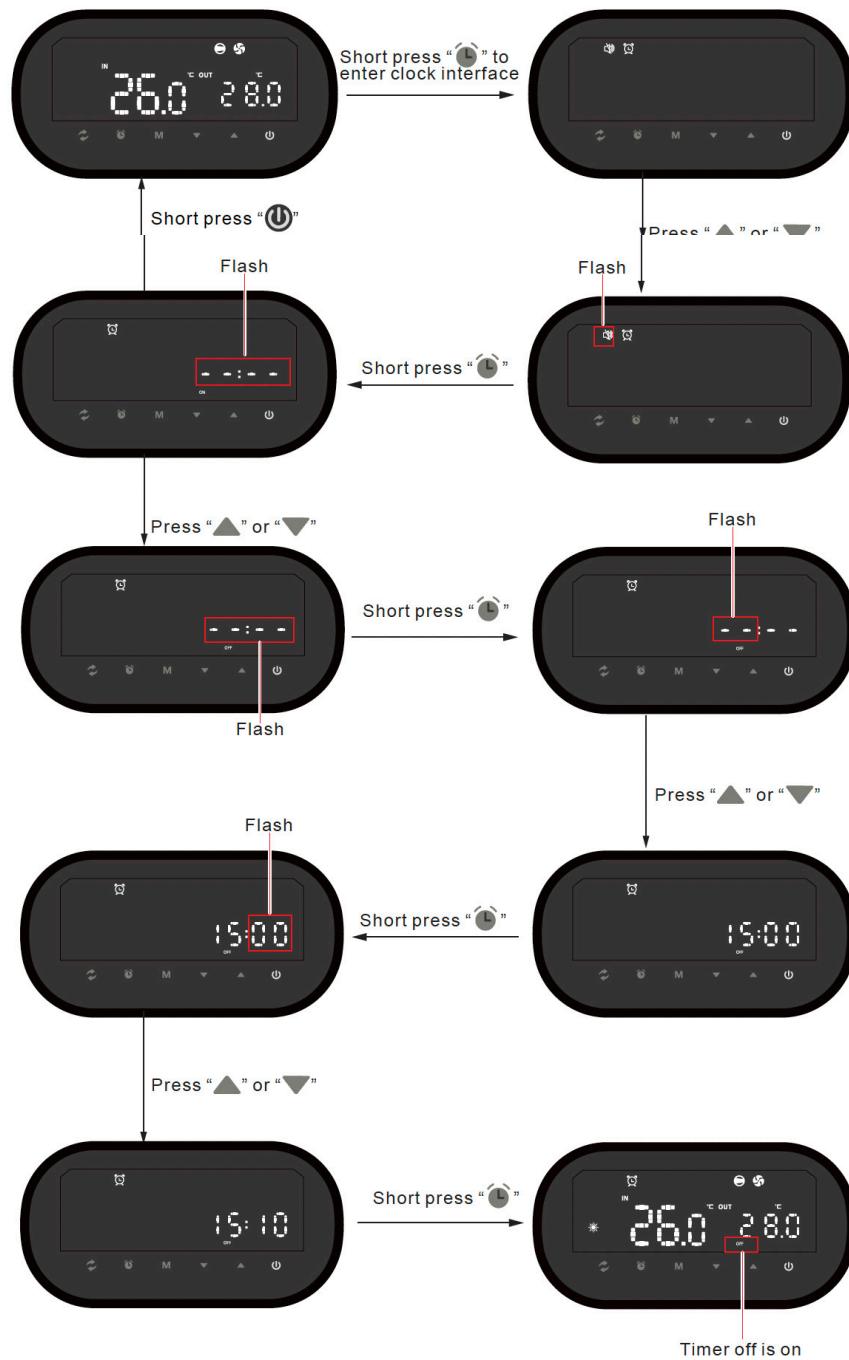
## Timer on setting:



# Usage



Timer off setting:





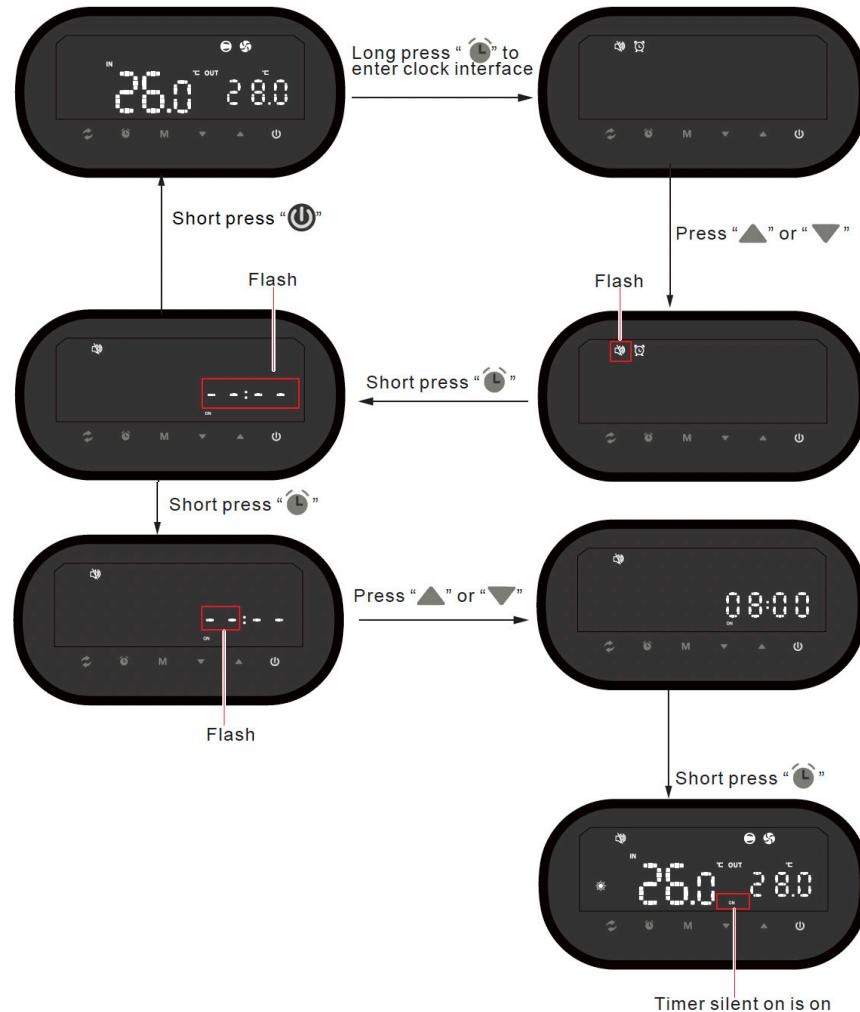
## Timer silent

In the main interface, long press “” for 2s to enter timer function selection interface. Press “” or “” to select the clock and mute icon, when the mute icon is blinking, press the “” to enter the timer silent setting interface, short press “” or “” can switch to check the setting situation of timer silent on and off, when ON blinks, short press “” to enter the interface of hour setting of timer silent ON. Press “” or “” to modify the value of hour position of timer silent on, the precision is 1H; press “” again to enter the interface of minute setting of timer silent ON. Press “” or “” to modify the value of timer on minute, the precision is 10min; short press “” to save the setting. Timer Off operation refers to the setting of Timer on.

### NOTE -

1. Press “” during the timer on setting can cancel the timer on;
2. Press “” during the timer off setting can cancel the timer off;
3. If there is no operation for 20s, system will save the settings and back to the main interface.

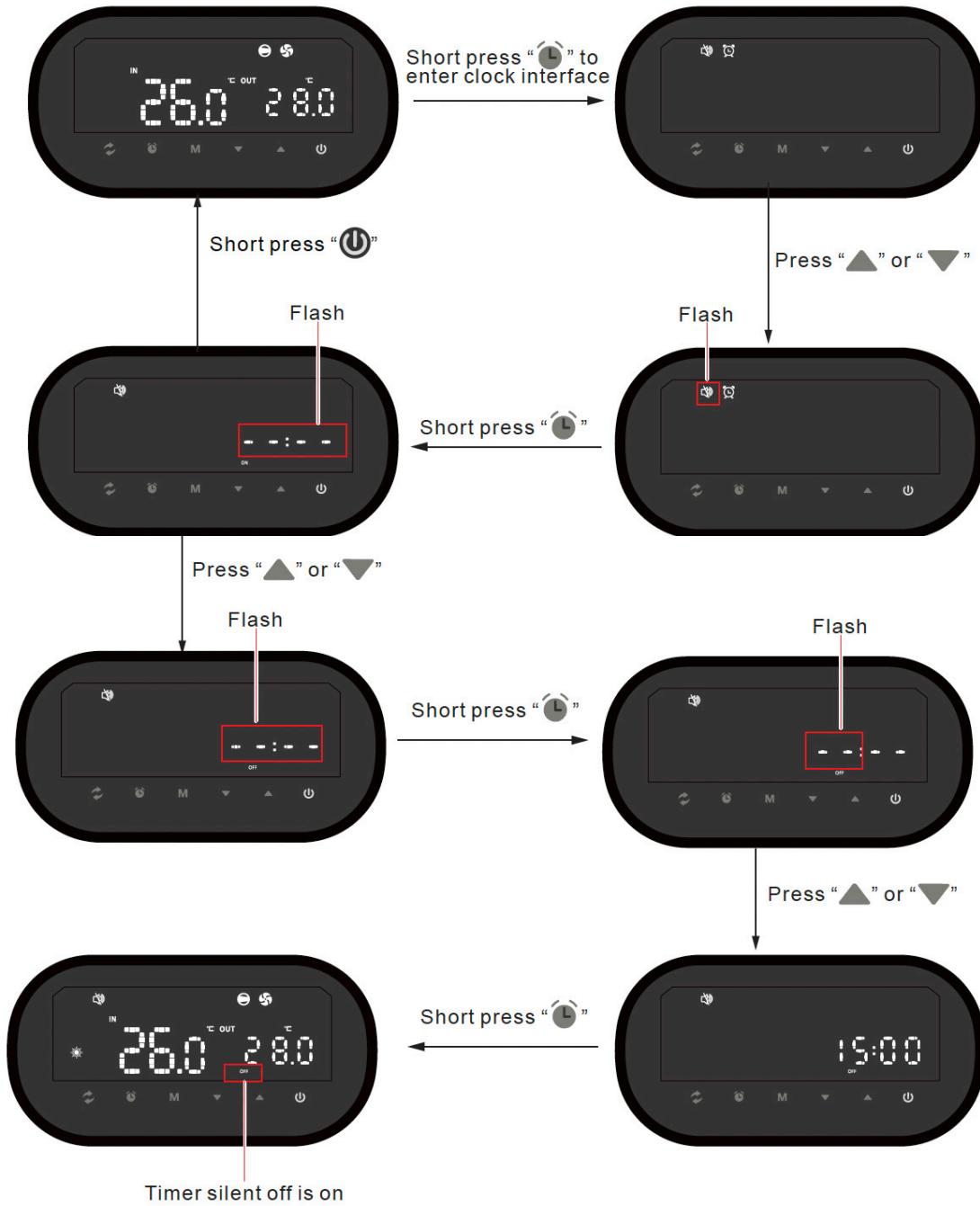
Timer silent on setting:



# Usage



Timer silent off setting:



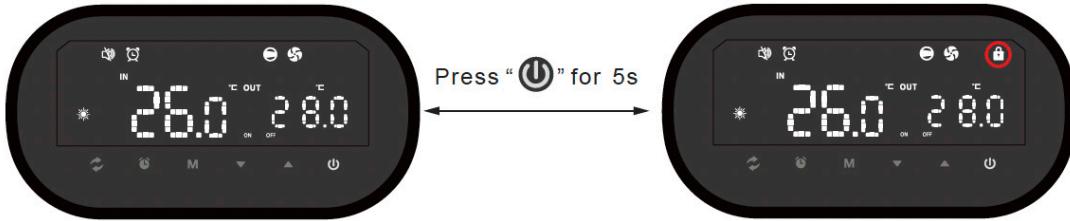


## Keyboard lock

To avoid mis-operations, please lock the controller after completing the setting. In the main interface, pressing “” for 5 seconds to lock the screen. When the keyboard is locked, pressing “” for 5 seconds to unlock the screen.

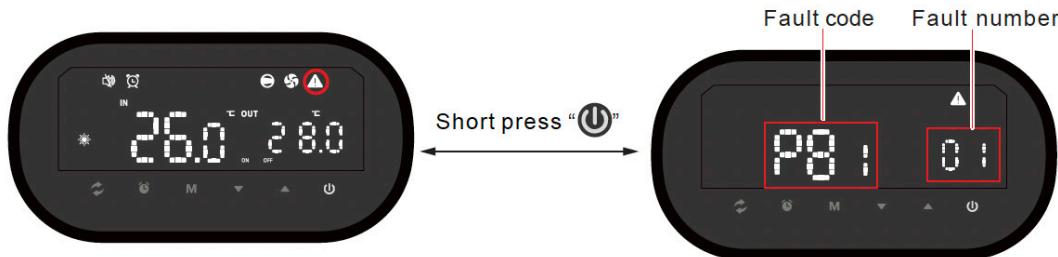
**NOTE -**

1. When the unit is in alarming state, the screen will be unlocked automatically;
2. In the locked state, press any key can still illuminate the screen.



## Malfunction display

There will be malfunction code showing on the controller screen when relative malfunction occurs. If there are more than one malfunction occur at the same time, you can check the current error codes list by pressing “” or “” key. You can refer to the malfunction table to find out the failure cause and solution.

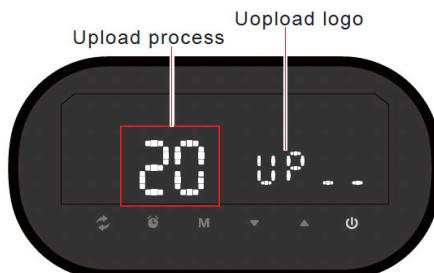


**NOTE -**

1. In the fault interface, press “” to exit and back to the main interface.
2. In the main interface, press “” to enter the fault interface.
3. In the main interface, if there is no operation for 20s, system will back to the fault interface.
4. The fault icon is only flashing in the main interface and fault interface, but not in any other interface.

## Upload display

When the unit is uploading, the wire controller can display the following interface. All buttons are invalid, do not turn off the screen.





## Malfunction table

The common failure cause and solution.

Protect/fault	Fault display	Reason	Elimination methods
Inlet Temp. Sensor Fault	P01	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Outlet Temp. Sensor Fault	P02	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Ambient Temp. Sensor Fault	P04	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Coil 1 Temp. Sensor Fault	P05	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Coil 2 Temp. Sensor Fault	P15	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Suction Temp. Sensor Fault	P07	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Discharge Temp. Sensor Fault	P081	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Exhaust Air over Temp Prot.	P082	The compressor is overload.	Check whether the system of the compressor running normally.
Antifreeze Temp. Sensor Fault	P09	Antifreeze temp. sensor is broken or short circuit.	Check whether the system of the compressor running normally.
Pressure Sensor Fault	PP	The pressure sensor is broken.	Check or change the pressure sensor or pressure.
High Pressure Prot.	E01	The high-pressure switch is broken.	Check the pressure switch and cold circuit.
Low Pressure Prot.	E02	The low-pressure switch is broken.	Check the pressure switch and cold circuit.
Flow Switch Prot.	E03	No water/little water in water system.	Check the pipe water flow and water pump.
Waterway Anti-freezing Prot.	E05	Water temp. or ambient is too low.	Check the water temp. and ambient temp.
Inlet and outlet temp. too big	E06	Water flow is not enough and low differential pressure.	Check the pipe water flow and whether water system is jammed or not.
Anti-freezing Prot.	E07	Water flow is not enough.	Check the pipe water flow and whether water system is jammed or not.
Primary Anti-freezing Prot.	E19	The ambient temp. is low.	Check the ambient temp. sensor.
Secondary Anti-freezing Prot.	E29	The ambient temp. is low.	Check the ambient temp. sensor.
Comp. Overcurrent Prot.	E051	The compressor is overload.	Check whether the system of the compressor running normally.
Communication Fault	E08	Communication failure between wire-controller and mainboard.	Check the wire connection between remote wire-controller and main board.
Communication Fault (speed control module)	E081	Speed control module and main board communication fail.	Check the communication connection.
Low AT Protection	TP	Ambient temp. is too low.	Check the ambient temp. sensor.
EC fan feedback Fault	F051	There is something wrong with fan motor and fan motor stops running.	Check whether fan motor is broken or locked or not.
Fan Motor1 Fault	F031	1. Motor is in locked-rotor state. 2. The wire connection between DC-fan motor module and fan motor is in bad contact.	1. Change a new fan motor 2. Check the wire connection and make sure they are in good contact
Fan Motor2 Fault	F032	1. Motor is in locked-rotor state. 2. The wire connection between DC-fan motor module and fan motor is in bad contact.	1. Change a new fan motor 2. Check the wire connection and make sure they are in good contact

# Usage



Frequency conversion board fault table:

Protect/fault	Fault display	Reason	Elimination methods
Drv1 MOP alarm	F01	MOP drive alarm.	Recovery after the 150s.
Inverter offline	F02	Frequency conversion board and mainboard communication failure.	Check the communication connection.
IPM protection	F03	IPM modular protection.	Recovery after the 150s.
Comp. Driver Failure	F04	Lack of phase, step or drive hardware damage.	Check the measuring voltage , check frequency conversion board hardware.
DC Fan Fault	F05	Motor current feedback open circuit or short circuit.	Check whether current return wires connected motor.
IPM Overcurrent	F06	IPM Input current is large.	Check and adjust the current measurement.
Inv. DC Overvoltage	F07	DC bus voltage>Dc bus over-voltage protection value.	Check the input voltage measurement.
Inv. DC Lessvoltage	F08	DC bus voltage<Dc bus over-voltage protection value.	Check the input voltage measurement.
Inv. Input Lessvolt.	F09	The input voltage is low,causing the inpuccurrent is high.	Check the input voltage measurement.
Inv. Input O vervolt.	F10	The input voltage is too high,more than outage protection current RMS.	Check the input voltage measurement.
Inv. Sampling Volt.	F11	The input voltage sampling fault.	Check and adjust the current measurement.
Comm. Err DSP-PFC	F12	DSP and PFC connect fault.	Check the communication connection.
Input Over Cur.	F26	The equipment load is too large.	Check whether the unit is overloaded.
PFC fault	F27	The PFC circuit protection.	Check the PFC switch tube short circuit or not.
IPM Overheating	F15	The IPM module is overheat.	Check and adjust the current measurement.
Weak Magnetic Warn	F16	Compressor magnetic force is not enough.	Restart the unit after multiple power failures, if the fault still exists, replace the compressor.
Inv. Input Out Phase	F17	The input voltage lost phase.	Check and measure the voltage adjustment.
IPM Sampling Cur.	F18	IPM sampling electricity is fault.	Check and adjust the current measurement.
Inv. Temp. Probe Fail	F19	The temp. sensor is broken or short circuit.	Check or change the temp. sensor.
Inverter Overheating	F20	The transducer is overheat.	Check and adjust the current measurement.
Inv. Overheating Warn	F22	Transducer temperature is too high.	Check and adjust the current measurement.
Comp. Over Cur. Warn	F23	Compressor electricity is large.	The compressor over-current protection.
Input Over Cur. Warn	F24	Input current is too large.	Check and adjust the current measurement.
EEPROM Error Warn	F25	MCU error.	Check whether the chip is damaged,replace the chip.
V15V over/undervoltage fault	F28	The V15V is overload or undervoltage.	Check the V15V input voltage in range 13.5v~16.5v or not.

# Usage

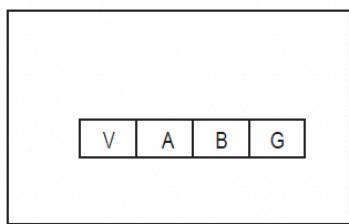


## Parameter list

Meaning	Default	Remarks
Set-point of cooling mode target temp.	27°C	Adjustable
Set-point of heating mode target temp.	27°C	Adjustable
Set-point of auto mode target temp.	27°C	Adjustable

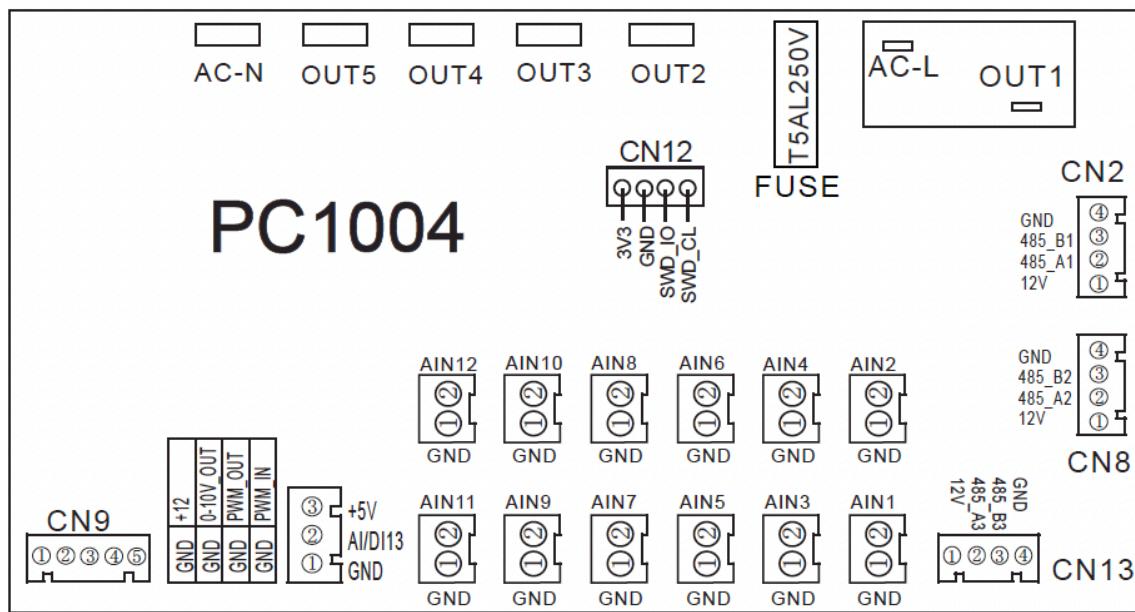
## Interface drawing

Wire control interface diagram and definition



Sign	Meaning
12V	12V(power+)
485A	485A
485B	485B
GND	GND(power-)

Controller interface diagram and definition (82400771)





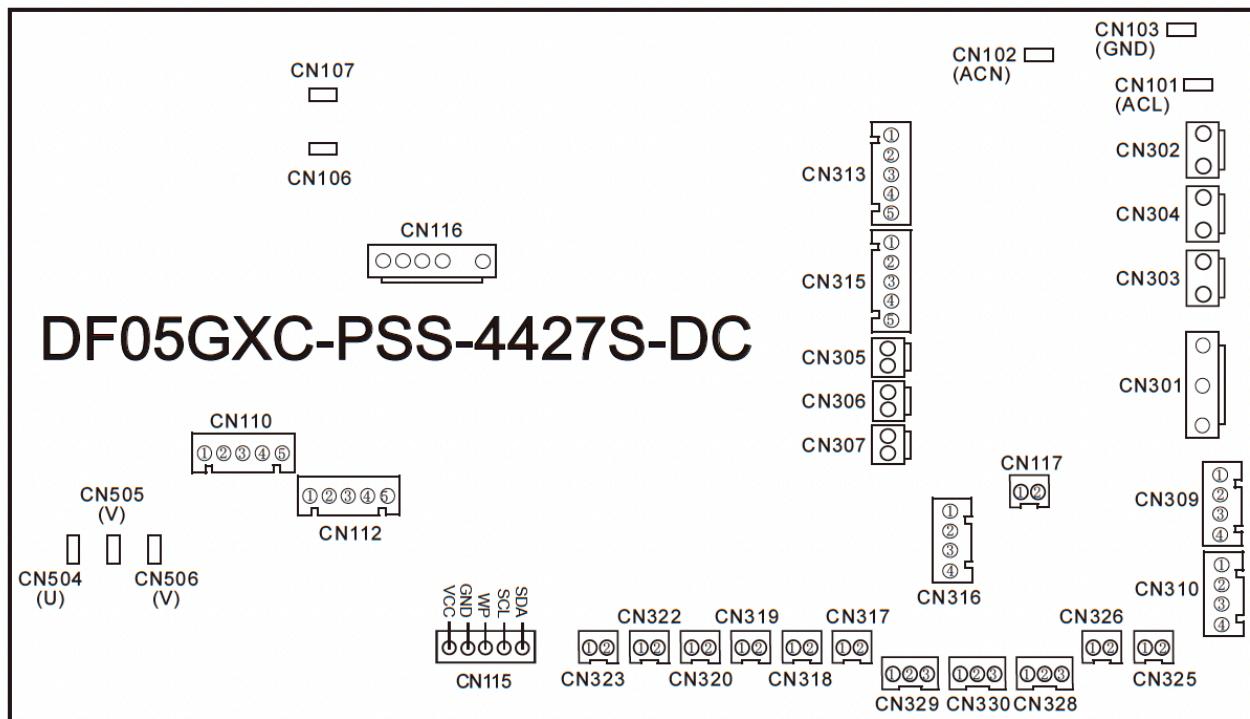
Main board of the input and output interface instructions below

Number	Sign	Meaning
01	OUT1	Compressor (output 220-230VAC)
02	OUT2	Water pump (output 220-230VAC)
03	OUT3	4-way valve (output 220-230VAC)
04	OUT4	High speed of fan (output 220-230VAC)
05	OUT5	Low speed of fan (output 220-230VAC)/Chassis heating belt
06	AC-L	Live wire (input 220-230VAC)
07	AC-N	Neutral wire (input 220-230VAC)
08	AIN1	Emergency switch (input)/SW1
09	AIN2	Water flow switch (input)
10	AIN3	System low pressure (input)
11	AIN4	System high pressure (input)
12	AIN5	System suction temperature (input)
13	AIN6	Water input temperature (input)
14	AIN7	Water output temperature (input)
15	AIN8	Coil 1 temperature (input)
16	AIN9	Ambient temperature (input)
17	AIN10	Mode switch/ SW2
18	AIN11	Master-slave machine switch/Antifreeze temperature(input)
19	AIN12	System exhaust temperature (input)
20	AIN13	Compressor current detection/Pressure sensor(input)
21	PWM_IN	Master-slave machine switch/Feedback signal of EC fan (input)
22	PWM_OUT	AC fan control (output)
23	0_10V_OUT	EC fan control (output)
24	+5V	+5V (output)
25	+12V	+12V (output)
26	CN2	Frequency conversation board communications
27	CN8	WIFI/5 inch color display communication port/ DC fan speed regulation module
28	CN9	Electronic expansion valve
29	CN12	Program port
30	CN13	Centralized control communication port

# Usage



Controller interface diagram and definition (82400282)



# Usage



Main board of the input and output interface instructions below

Number	Sign	Meaning
01	CN504-5/6(U/V/W)	Compressor
02	CN110	Drive debug port
03	CN112	Driver program port
04	CN116	DC fan
05	CN106 CN107	Resistance
06	CN313	Electronic expansion valve
07	CN315	Electronic expansion valve (Reserved)
08	CN305	Water flow switch
09	CN306	System high pressure
10	CN307	System low pressure
11	CN102	Neutral wire
12	CN103	Grounding
13	CN101	Live wire
14	CN302	Crankshaft heating belt
15	CN304	4-way valve
16	CN303	Water pump
17	CN301	AC fan(H)/Chassis heating belt( L)
18	CN117	Reserved
19	CN316	Program port
20	CN309	Color line controller communication/Wifi /AC transformer/Flow meter
21	CN310	The port for centralized control
22	CN325	Water input temperature
23	CN326	Water output temperature
24	CN328	Low pressure sensor
25	CN330	Reserved
26	CN329	Water flow meter(Reserved)
27	CN317	System fan coil temperature
28	CN318	System exhaust temperature
29	CN319	Ambient temperature
30	CN320	System suction temperature
31	CN322	SW2
32	CN323	SW1
33	CN115	EEPROM program port

# Maintenance and inspection

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01. Check the water supply device and the release often. You should avoid the condition of no water or air entering into system, as this will influence unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of the dirty or clogged filter.

02. The area around the unit should be dry, clean and well ventilated. Clean the side heating exchanger regularly to maintain good heat exchange as conserve energy .

03. The operation pressure of the refrigerant system should only be serviced by a certified technician.

04. Check the power supply and cable connection often. Should the unit begin to operate abnormally, switch it off and contact the qualified technician.

05. Discharge all water in the water pump and water system, so that freezing of the water in the pump or water system does not occur. You should discharge the water at the bottom of water pump if the unit will not be used for an extended period of time. You should check the unit thoroughly and fill the system with water fully before using it for the first time.

06. Checks to the area:

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system. prolonged period of no usage.

07. Work procedure:

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

08. Work procedure:

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

09. General work area:

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

10. General work area:

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

11. Checking for presence of refrigerant:

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

# Maintenance and inspection

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## 12. Presence of fire extinguisher:

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO<sub>2</sub> fire extinguisher adjacent to the charging area.

## 13. No ignition sources:

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

## 14. Ventilated area:

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. prolonged period of no usage.

## 15. Checks to the area:

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system. prolonged period of no usage.

## 16. Checks to the refrigeration equipment:

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

The charge size is in accordance with the room size within which the refrigerant containing parts are installed;

The ventilation machinery and outlets are operating adequately and are not obstructed;

If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

# Maintenance and inspection



## 17. Checks to electrical devices:

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- That there is continuity of earth bonding.

## 18. Repairs to sealed components:

1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

## 19. Ensure that apparatus is mounted securely:

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

### NOTE -

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to.

## 20. Repair to intrinsically safe components:

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

## 21. Cabling:

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

## 22. Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

# Maintenance and inspection



## 23. Leak detection methods:

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

## 24. Removal and evacuation:

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- Open the circuit by cutting or brazing.

25. The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be «flushed» with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system.

When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available working on them.

## 26. Labelling:

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.



## 27. Recovery:

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.

Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shutoff valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

## 28. Decommissioning:

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure ensure that:

- Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- All personal protective equipment is available and being used correctly;
- The recovery process is supervised at all times by a competent person;
- Recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with manufacturer's instructions.

h) Do not overfill cylinders. (No more than 80 % volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

# Maintenance and inspection

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j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

## 29. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

## 30. The safety wire model is 5\*20\_5A/250VAC, And must meet the explosion-proof requirements.

# Appendix



## Cable specification

### (1) Single phase unit

Nameplate max. current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2×1.5mm <sup>2</sup>	1.5mm <sup>2</sup>	20A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
10~16A	2×2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	32A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
16~25A	2×4mm <sup>2</sup>	4mm <sup>2</sup>	40A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
25~32A	2×6mm <sup>2</sup>	6mm <sup>2</sup>	40A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
32~40A	2×10mm <sup>2</sup>	10mm <sup>2</sup>	63A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
40~63A	2×16mm <sup>2</sup>	16mm <sup>2</sup>	80A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
63~75A	2×25mm <sup>2</sup>	25mm <sup>2</sup>	100A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
75~101A	2×25mm <sup>2</sup>	25mm <sup>2</sup>	125A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
101~123A	2×35mm <sup>2</sup>	35mm <sup>2</sup>	160A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
123~148A	2×50mm <sup>2</sup>	50mm <sup>2</sup>	225A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
148~186A	2×70mm <sup>2</sup>	70mm <sup>2</sup>	250A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
186~224A	2×95mm <sup>2</sup>	95mm <sup>2</sup>	280A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>

### (2) Three phase unit

Nameplate max. current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3×1.5mm <sup>2</sup>	1.5mm <sup>2</sup>	20A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
10~16A	3×2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	32A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
16~25A	3×4mm <sup>2</sup>	4mm <sup>2</sup>	40A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
25~32A	3×6mm <sup>2</sup>	6mm <sup>2</sup>	40A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
32~40A	3×10mm <sup>2</sup>	10mm <sup>2</sup>	63A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
40~63A	3×16mm <sup>2</sup>	16mm <sup>2</sup>	80A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
63~75A	3×25mm <sup>2</sup>	25mm <sup>2</sup>	100A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
75~101A	3×25mm <sup>2</sup>	25mm <sup>2</sup>	125A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
101~123A	3×35mm <sup>2</sup>	35mm <sup>2</sup>	160A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
123~148A	3×50mm <sup>2</sup>	50mm <sup>2</sup>	225A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
148~186A	3×70mm <sup>2</sup>	70mm <sup>2</sup>	250A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>
186~224A	3×95mm <sup>2</sup>	95mm <sup>2</sup>	280A	30mA less than 0.1 sec	n×0.5mm <sup>2</sup>

When the unit will be installed at outdoor, please use the cable which can withstand UV.

# Appendix



Comparison table of refrigerant saturation temperature

Pressure (MPa)	Temperature (R410A)(°C)	Temperature (R32)(°C)
0	-51.3	-52.5
0.3	-20	-20
0.5	-9	-9
0.8	4	3.5
1	11	10
1.3	19	18
1.5	24	23
1.8	31	29.5
2	35	33.3
2.3	39	38.7
2.5	43	42
2.8	47	46.5
3	51	49.5
3.3	55	53.5
3.5	57	56
3.8	61	60
4	64	62
4.5	70	67.5
5	74	72.5
5.5	80	77.4

# Specification



## Performance data of Swimming Pool Heat Pump Unit

REFRIGERANT: R410A

UNIT	INV1-40EE	INV1-60EE	INV1-80EE
Heating capacity (80°F air, 80°F water, 80% Humidity)	4.63~10.40 kW 15800-35500 Btu/h	7.00~17.58 kW 23900-60000 Btu/h	7.91~23.15 kW 27000-79000 Btu/h
Heating Power Input	0.33-1.89 kW	0.50-3.45 kW	0.57-4.37 kW
COP	14.00-5.50	14.00-5.10	14.00-5.30
Heating capacity (80°F air, 80°F water, 63% Humidity)	4.54-9.76 kW 15500-33300 Btu/h	6.77-17.00 kW 23100-58000 Btu/h	7.42-21.69 kW 25300-74000 Btu/h
Heating Power Input	0.36-1.84 kW	0.54-3.40 kW	0.59-4.17 kW
COP	12.50-5.30	12.50-5.00	12.50-5.20
Heating capacity (50°F air, 80°F water, 63% Humidity)	2.23-6.57 kW 7600-22400 Btu/h	4.31-10.52 kW 14700-35900 Btu/h	5.39-14.65 kW 18400-50000 Btu/h
Heating Power Input	0.50-1.68 kW	0.74-2.63 kW	0.90-3.57 kW
COP	4.50-3.90	5.80-4.00	6.00-4.10
Power Supply	208-230V/1N~/60Hz	208-230V/1N~/60Hz	208-230V/1N~/60Hz
Compressor Quantity	1	1	1
Compressor	Rotary	Rotary	Rotary
Fan Number	1	1	1
Noise	43-50 dB(A)	43-54 dB(A)	49-56 dB(A)
Water Connection	48.3 mm	48.3 mm	48.3 mm
Water Flow Volume	4.7 m³/h	5.9 m³/h	10.0 m³/h
Water Pressure Drop(max)	2.7 kPa	7.8 kPa	11.0 kPa
Unit Net Dimensions(L/W/H)	See the drawing of the units		
Unit Ship Dimensions(L/W/H)	See package label		
Net Weight	see nameplate		
Shipping Weight	see package label		

Operating range:

Ambient temperature: 19 - 109°F

Water temperature: 48 - 104°F

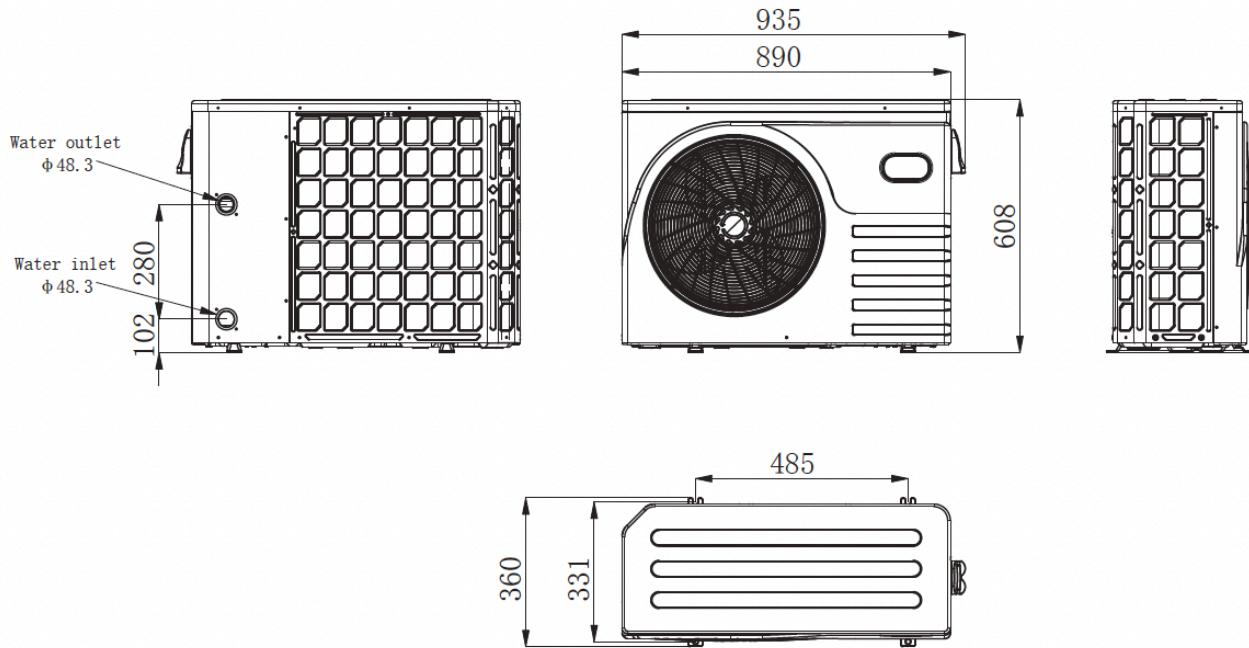
# Specification



## The dimensions for Swimming Pool Heat Pump Unit

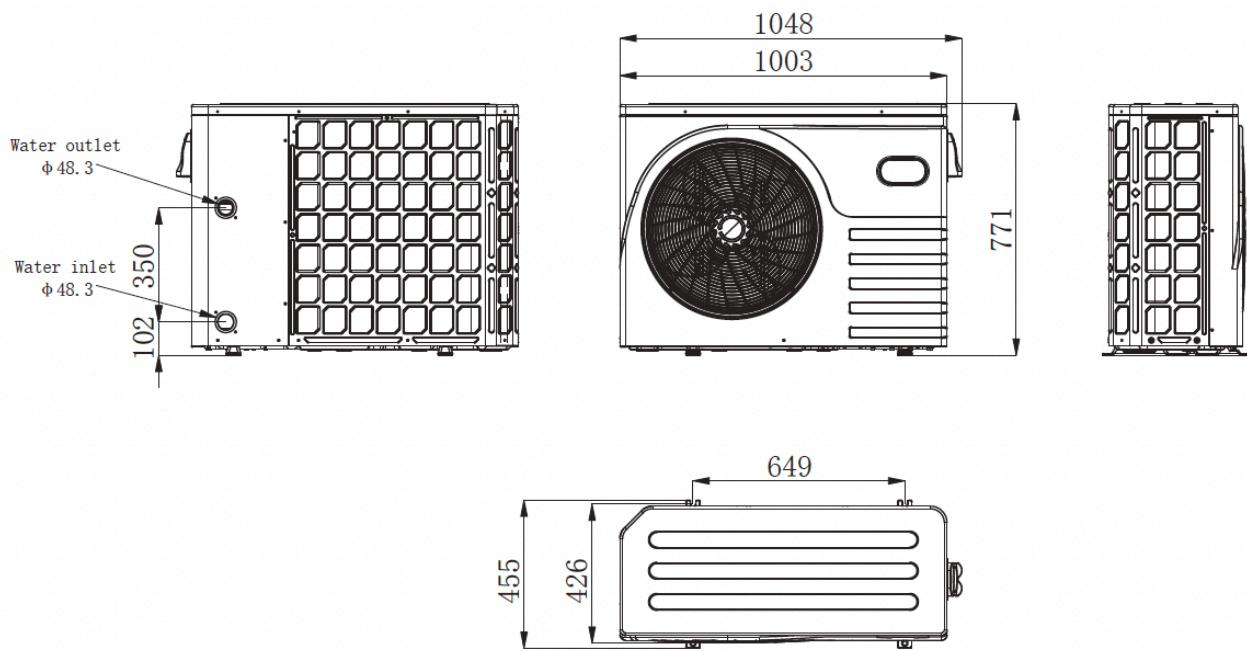
Model: INV1-40EE

Unit: mm



Model: INV1-60EE, INV1-80EE

Unit: mm



# GoPool

Need parts or accessories ?  
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