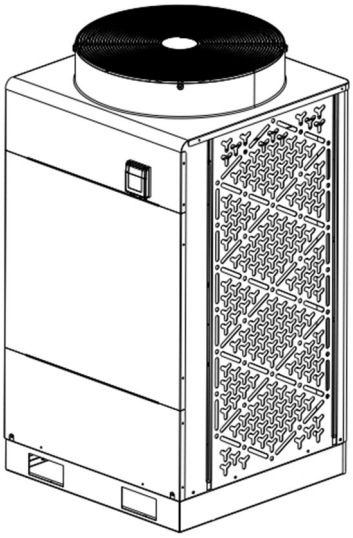
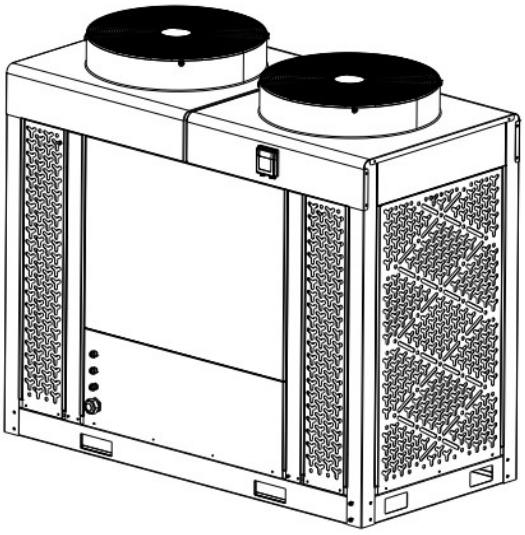
E **SWIMMING POOL HEAT PUMP** **User and service manual**

EXCELLIUM INVERTER HEAT





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www.astralpool.com

A0142CIEXC02

Regulation (EU) n° 517/2014 of 16/04/14 on fluorinated greenhouse gases and repealing Regulation (EC) n° 842/2006

Leak checks

1. Operators of equipment that contains fluorinated greenhouses gases in quantities of 5 tons of CO_2, equivalent or more and not contained in foams shall ensure that the equipment is checked for leaks.

2. For equipment that contains fluorinated greenhouse gases in quantities of 5 tons of CO_2 equivalent or more, but of less than 50 tons of CO_2 equivalent: at least every 12 months.

Picture of the equivalence CO_2

1. Load in kg and Tons amounting CO_2.

Load and Tons amounting CO_2	Frequency of test
From 2 at 30 kg load = from 5 at 50 Tons	Each year

Concerning the Gaz R 410a, 2.39kg amounting at 5 tons of CO_2, commitment to check each year.

Training and certification

1. The operator of the relevant application shall ensure that the relevant personnel have obtained the necessary certification, which implies appropriate knowledge of the applicable regulations and standards as well as the necessary competence in emission prevention and recovery of fluorinated greenhouse gases and handling safety the relevant type and size of equipment.

Record keeping

1. Operators of equipment which is required to be checked for leaks, shall establish and maintain records for each piece of such equipment specifying the following information:

a) The quantity and type of fluorinated greenhouse gases installed;
b) The quantities of fluorinated greenhouse gases added during installation, maintenance or servicing or due to leakage;
c) Whether the quantities of installed fluorinated greenhouse gases have been recycled or reclaimed, including the name and address of the recycling or reclamation facility and, where applicable, the certificate number;
d) The quantity of fluorinated greenhouse gases recovered
e) The identity of the undertaking which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;
f) The dates and results of the checks carried out;
g) If the equipment was decommissioned, the measures taken to recover and dispose of the fluorinated greenhouse gases.

2. The operator shall keep the records for at least five years, undertakings carrying out the activities for operators shall keep copies of the records for at least five years.

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Thank you for using Excellium Inverter swimming pool heat pump for your pool heating, it will heat your pool water and keep the constant temperature when the air ambient temperature is at -12 to 43℃.

ATTENTION: This manual includes all the necessary information for the use and the installation of your heat pump.

- The installer must read the manual and follow the instructions of implementation and maintenance.
- Failure to respect the warnings may cause serious damage to the pool equipment or cause serious injury, even death.
- The installer is responsible for the installation of the product and should follow all the instructions of the manufacturer and the regulations in application. Incorrect installation will invalidate the guarantee.
- The manufacturer declines any responsibility for the damage caused by any third party, object ingression and of the errors due to the installation that do not follow the manual guidelines. Any use that is not as intended by the manufacturer will invalidate the guarantee.
- Keep and pass on these documents for later viewing throughout the appliance's service life.

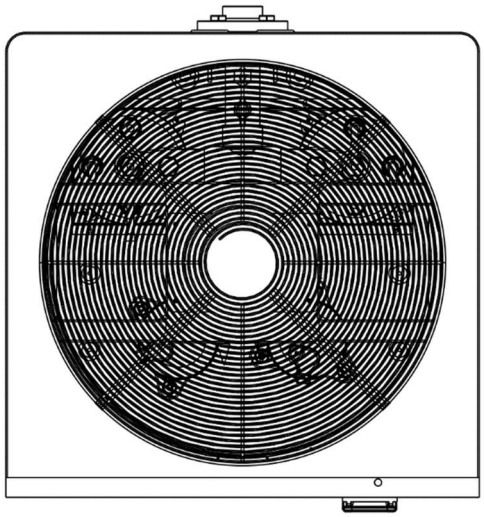
WARNING:

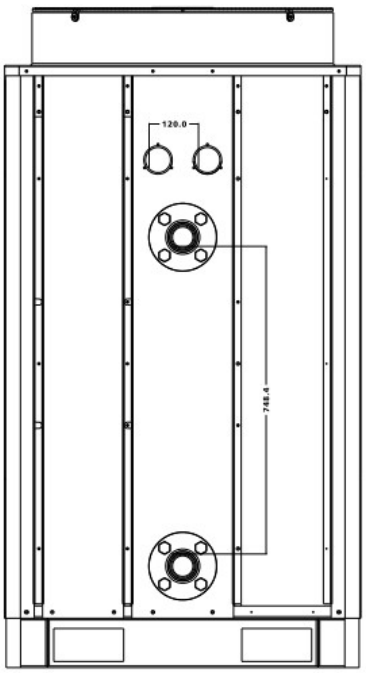
*Please always empty the water in heat pump during winter time or when the ambient temperature drops below 0℃, or else the Titanium exchanger will be damaged because of being frozen, in such case, your warranty will be lost.
*Please always cut the power supply if you want to open the cabinet to reach inside the heat pump, because there is high voltage electricity inside.
*Please well keep the display controller in a dry area, or well close the insulation cover to protect the display controller from being damaged by humidity.

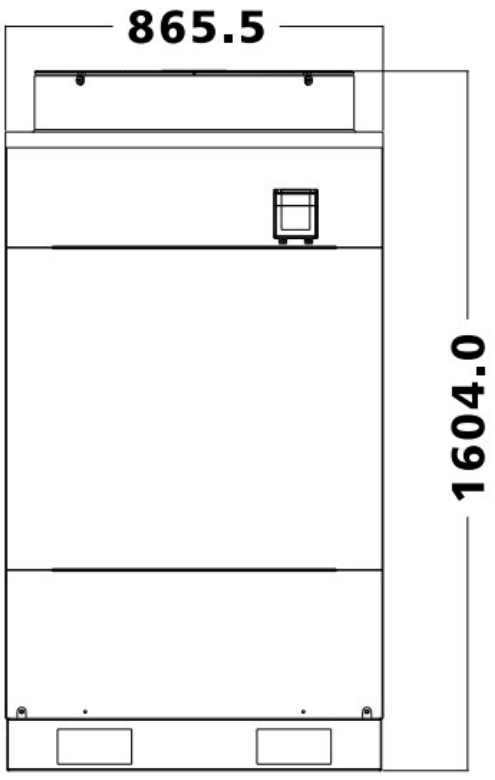
1. Description

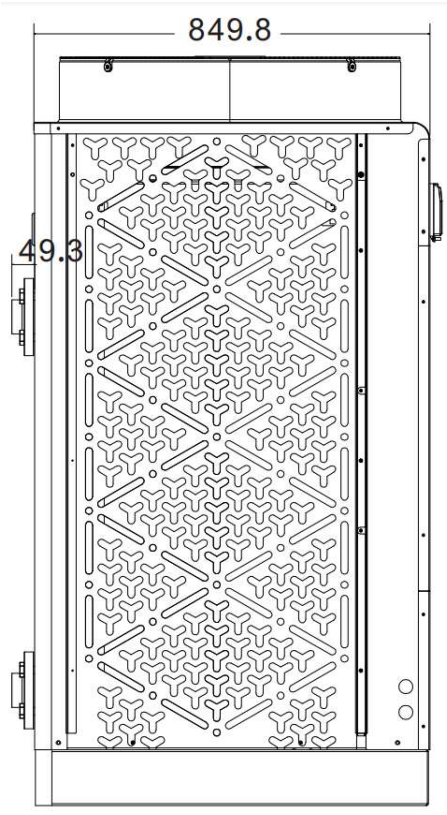
1.1 Dimension

Model: EXC INV 30 / EXC INV 45



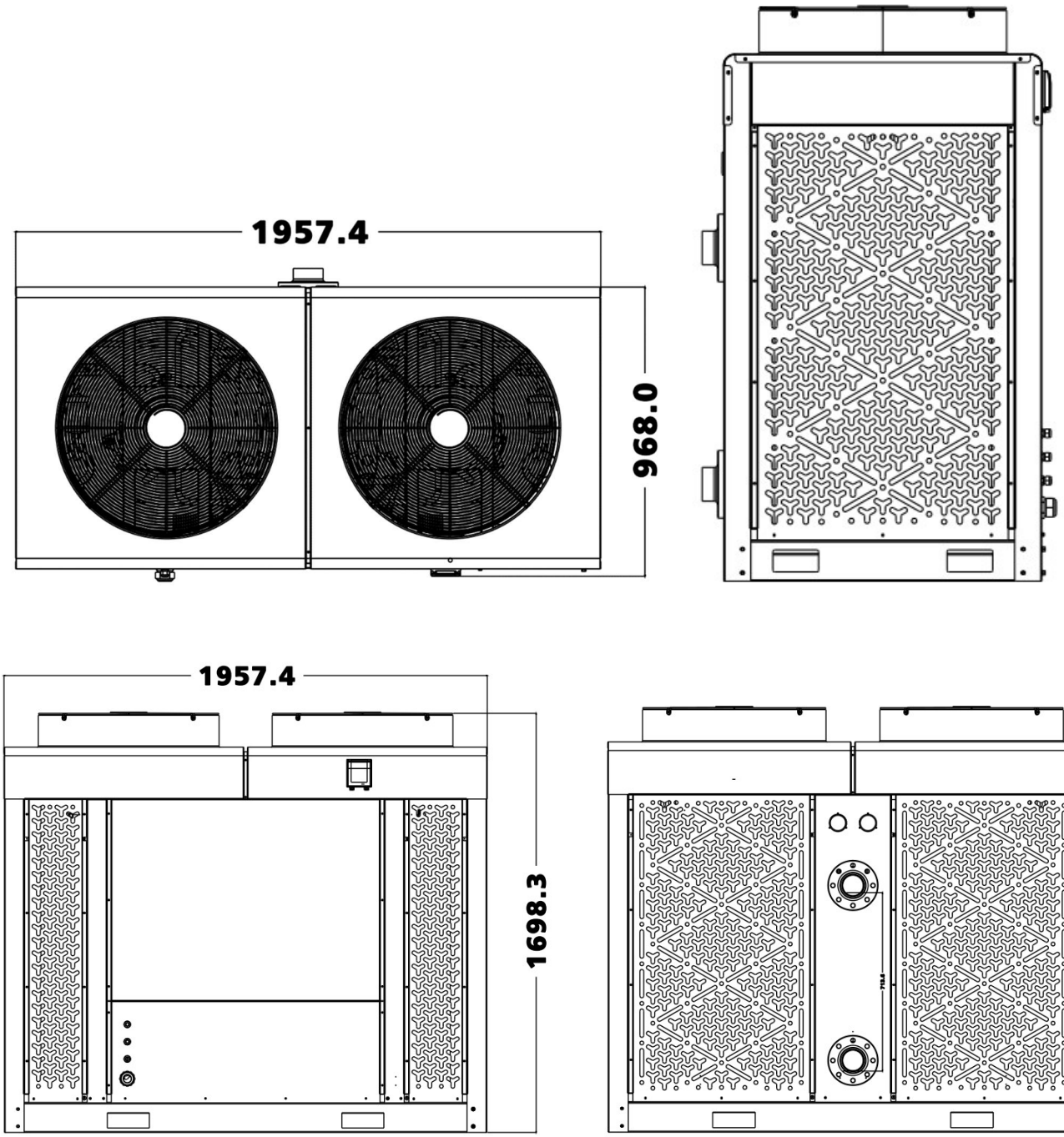






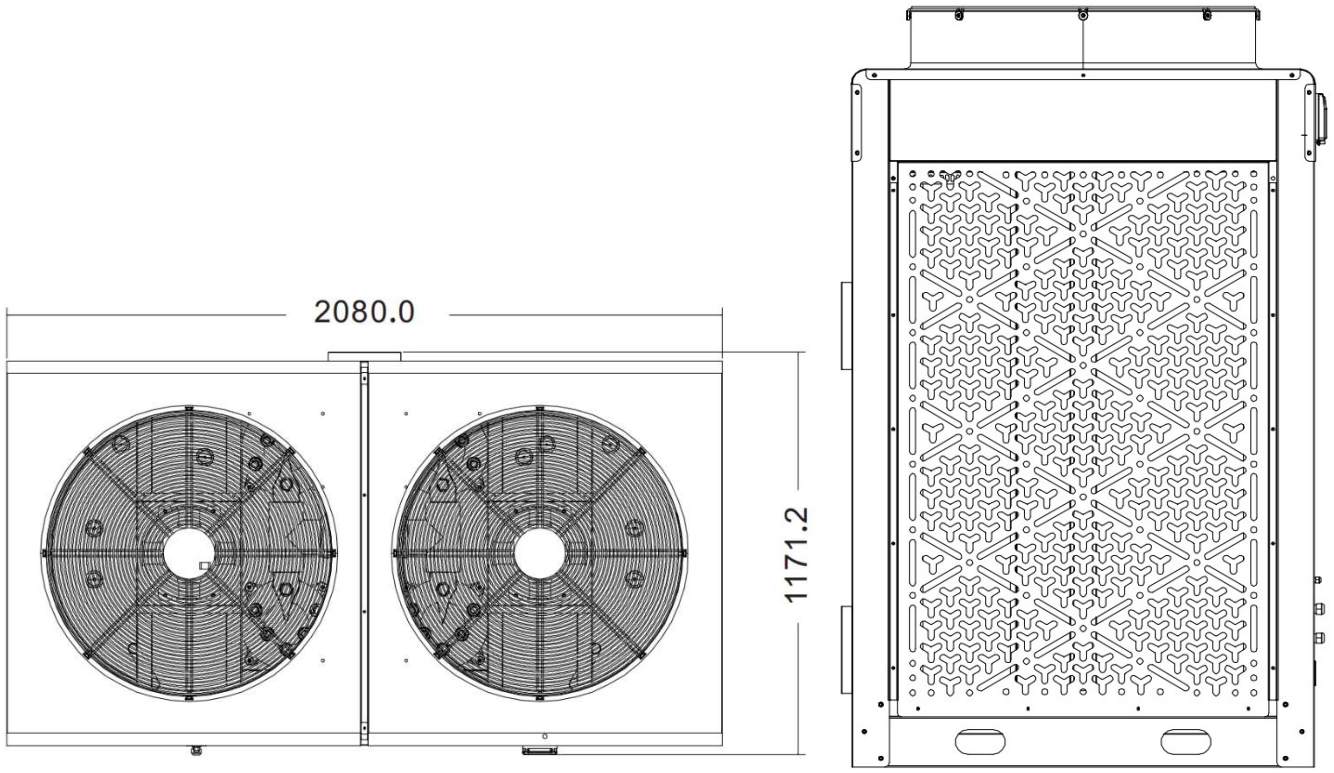
1. Description

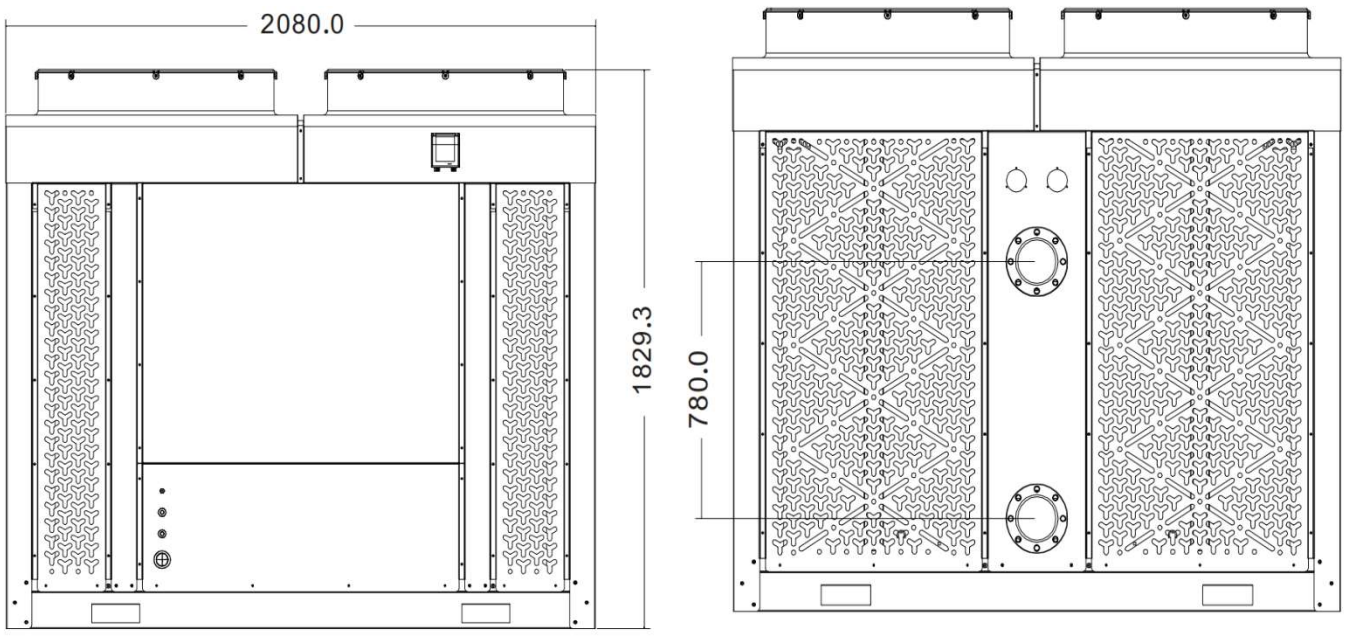
Model: EXC INV 60 / EXC INV 90



1. Description

Model: EXC INV 130





2. Transport advertising

2.1 Delivery of the unit

For the transportation, the heat pumps are fixed on the pallet and covered with a cardboard box.

To protect from any damage, the heat pump must be transferred in its package.
It is the responsibility of the addressee to notify of any damage incurred during delivery within 48 hours.
No responsibility can be taken once the unit has been signed for.

2.2 Stock advice

* The warehouse should be bright, spacious, open, well ventilated, have ventilation equipment and no fire source.

* Heat pumps must be stored and transferred in vertical position in its original packaging. If it is not the case, it cannot be operated until a minimum period of 24H has passed before the unit can have the electrical power turned on.

FORBIDDEN

2.3 Transfer to the final position

* During the unpacking of the product and the transfer from the pallet to the final place of installation, it is necessary to maintain the heat pump in a vertical position.

* Smoking and the use of flames are prohibited near R32 machine.

* Water connection are not to be used as load bearing handles. **The manufacturer would not take the responsibility in case of damage to the water pipes.**

3. Specifications

Technical data Excellium inverter heating pumps

CODE		75397	75398	75399	75400	75401
Model		**EXC INV 30**	**EXC INV 45**	**EXC INV 60**	**EXC INV 90**	**EXC INV 130**
*** Performance at Air 28℃, Water 28℃, Humidity 80%**						
Turbo Heating capacity	kW	45	60	85	130	185
Smart Heating capacity	kW	36	52	68	105	150
Power consumption	kW	8.03-1.63	10.71-2.62	14.66-2.85	22-5.24	33.1-6.27
C.O.P. in Turbo Mode		5.6	5.6	5.8	5.9	5.9
*** Performance at Air 15℃, Water 26℃, Humidity 70%**						
Turbo Heating capacity	kW	30	45	60	95	130
Smart Heating capacity	kW	24	36	48	75	104
Power consumption	kW	6.67-1.25	10.47-2.47	12.5-2.38	23.26-5.49	27.65-5.25
C.O.P. in TURBO Mode		4.5	4.5	4.8	4.8	4.7
*** Performance at Air -10℃, Water 26℃, Humidity 78%**						
Heating capacity	kW	19	25	35	55	75
Power consumption	kW	6.6	8.7	12.1	19	26.7
C.O.P.		2.9	2.9	2.9	2.9	2.8
*** General data**						
Compressor type		Inverter compressor				
Compressor quantity		2	2	2	2	2
Voltage		380~415V / 50Hz /3N~				
Maximum current	A	17.5	22	35	50	78
Rated current	A	14.4	16.5	28	34.5	53
Minimum fuse	A	22	25	42	52	80
Advised pool volume (with pool cover)	m^3	100-140	150-260	180-360	220-520	360-650
Advised water flux	m^3/h	20-28	26-35	37-45	56-70	80-95
Water pressure drop	KPa	30	32	35	38	46
Heat exchanger		Titanium exchanger in PVC				
Water connection	mm	63		90		
Fan quantity		1		2		
Ventilation type		Vertical				
Power input of Fan	W	750		750*2		1100*2
Fan speed	RPM	700-500	800-550	700-500	800-550	800-550
Noise level(10m)	dB(A)	≦40	≦42	≦43	≦44	≦48
Noise level(1m)	dB(A)	41-58	43-62	44-62	46-65	50-68
Refrigerant (R410A)	kg	5.3	6	11	14	19
CO2 equivalent	Tonne	11.07	12.53	22.97	29.23	39.67
Dimension/Weight						
Net weight	kg	290	294	560	590	810
Gross weight	kg	352	356	654	684	919
Net dimension	mm	866*850*1604		1958*968*1699		2080*1172*1830
Packing dimension	mm	1000*980*1820		2100*1100*1900		2230*1270*2040

* Above data are subjects to modification without notice.

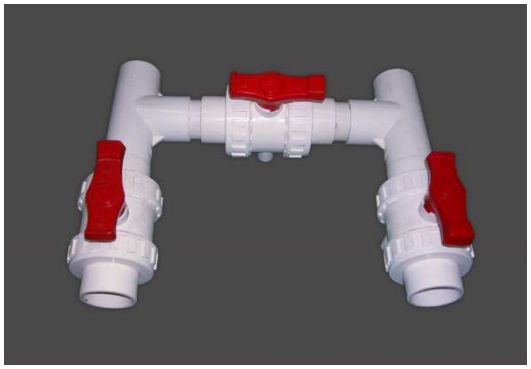
4. Accessories and options

4.1 Accessories list

 Anti-vibration base, 4 pcs	 Draining plug, 2 pcs	 Waterproof box, 1 pc
 Modbus signal wire, 1 pc	 Water drainage pipes, 2 pcs	

4.2 The By-Pass Kit (Not provided)

The By-Pass Kit is the essential accessory for the installation of your heat pump, it is also a tool for the optimization of the heating of the water. The valves allows the optimum flow of water using a manometer to make sure the optimized running of the compressor, see paragraph 5.6 controls of the pressure.



5. Location and connection

ATTENTION:
Please observe the following rules when installing the heat pump:

1. Any addition of chemicals must take place in the piping located **downstream** from the heat pump.
2. Always place the heat pump on a solid foundation and use the included rubber mounts to avoid vibration and noise.
3. Always hold the heat pump upright. If the unit has been held at an angle, wait at least 24 hours before starting the heat pump.

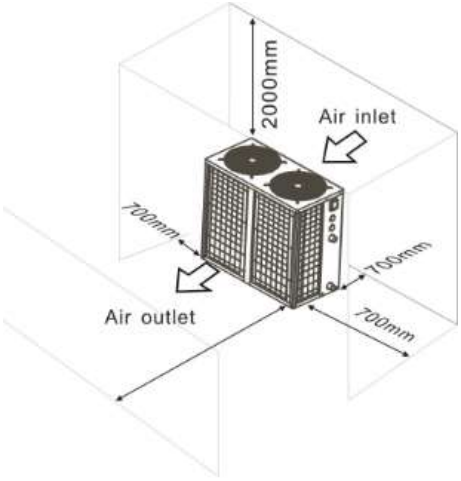
5.1 Heat pump location

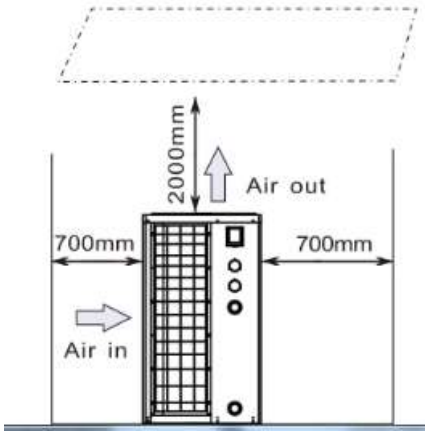
The unit will work properly in any desired location as long as the following 3 items are presented:

1. Fresh air
2. Electricity
3. Swimming pool filters

The unit may installed in virtually any **outdoor** location as long as the specified minimum distances to other objects are maintained (see drawing below). Please consult your installer for installation with an indoor pool. Installation in a windy location does not present any problem at all, unlike the situation with a gas heater (including pilot flame problems).

ATTENTION: Never install the unit in a closed room with a limited air volume in which the air expelled from the unit will be reused, or close to shrubbery that could block the air inlet. Such locations impair the continuous supply of fresh air, resulting in reduced efficiency and possibly preventing sufficient heat output.
See the drawing below for minimum dimensions.

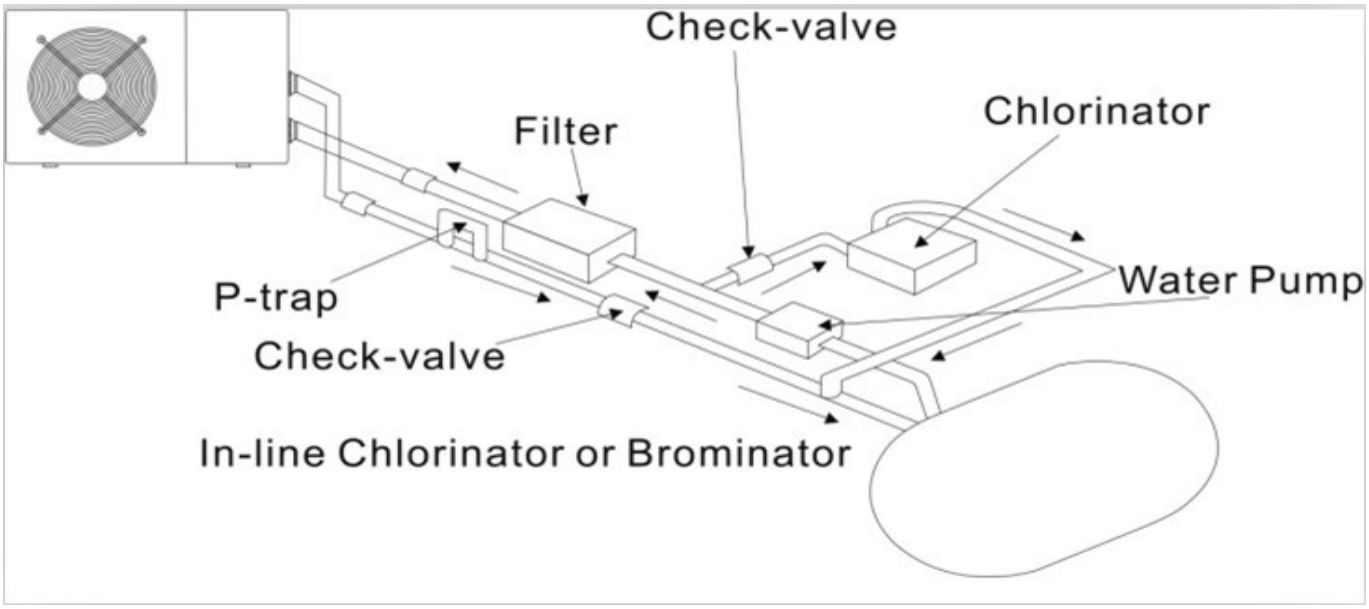




5.2 Check-valve installation

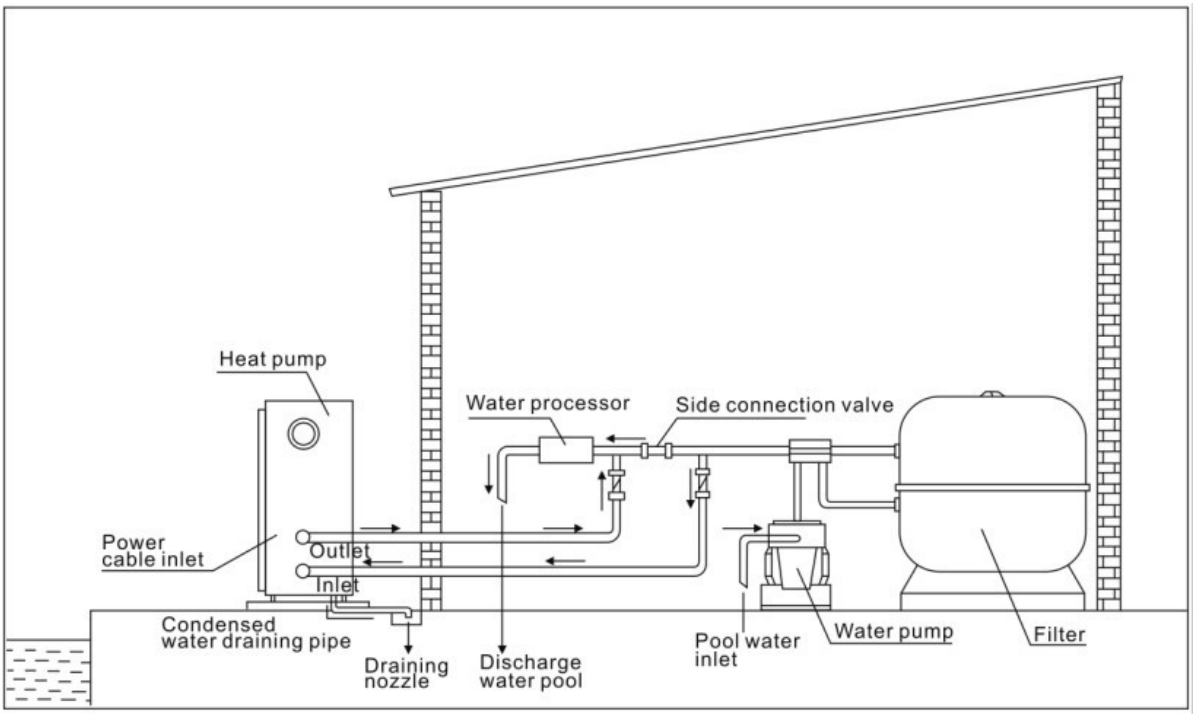
NOTE

Note: If automatic dosing equipment for chlorine and acidity (pH) is used, it is essential to protect the heat pump against excessively high chemical concentrations which may corrode the heat exchanger. For this reason, equipment of this sort must always be fitted in the piping on the **downstream** side of the heat pump, and it is recommended to install a check-valve to prevent reverse flow in the absence of water circulation.
Damage to the heat pump caused by failure to observe this instruction is not covered by the warranty.



5. Location and connection

5.3 Typical arrangement



This arrangement is only an illustrative example.

⚠ NOTE

The factory supplies only the heat pump. All other components, including a by-pass if necessary, must be provided by the user or the installer.

ATTENTION:

To heat the water in the pool (or hot tub), the filter pump must be running to cause the water to circulate through the heat pump. The heat pump will not start up if the water is not circulating.

5.4 Initial operation

After all connections have been made and checked, carry out the following procedures:

1. Switch on the filter pump, check for leaks and verify that water is flowing from and to the swimming pool.

2. **Connect power to the heat pump and press the On/Off button  on the electronic control panel. The unit will start up after the time delay expires (see below).**

3. After a few minutes, check whether the air blowing out of the unit is cooler.

4. When turn off the filter pump, the unit should also turn off automatically, if not, then adjust the flow switch.

5. Allow the heat pump and the filter pump to run 24 hours a day until the desired water temperature is reached. The heat pump will stop running at this point +1℃. After this, it will restart automatically (as long as the filter pump is running) whenever the swimming pool water temperature drops 1 degree below the set temperature.(for example, if you set the temperature 28°C, the heat pump will stop when the temperature at(29°C.While it will restart when the temperature of the water down to27°C)

Depending on the initial temperature of the water in the swimming pool and the air temperature, it may take several days to heat the water to the desired temperature. A good swimming pool cover can dramatically reduce the required length of time.

NOTE

Water Flow Switch:
It is equipped with a flow switch for protecting the HP unit running with adequate water flow rate .It willturn on when the pool pump runs and shut it off when the pump shuts off. If the pool water level higher than 1 m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial start-up.

Time delay - The heat pump has a built-in 3-minute start-up delay to protect the circuitry and avoid excessive contact wear. The unit will restart automatically after this time delay expires. Even a brief power interruption will trigger this time delay and prevent the unit from restarting immediately. Additional power interruptions during this delay period do not affect the 3-minute duration of the delay.

5. Location and connection

5.5 Condensation

The air drawn into the heat pump is cooled by the operation of the heat pump for heating the pool water, which may cause condensation on the fins of the evaporator.

NOTE

The amount of condensation may be as much as several liters per hour at high humidity. The condensate will drain from the bottom of the heat pump. This is sometimes mistakenly regarded as a water leak.

5.6 Pressure gauge display (R410A & R32)

Examine the pressure gauge which indicates the refrigerant gas pressure of the unit, the below table shows the normal value of the gas pressure (R410A & R32) when the machine is in power off or running conditions.

Unit Condition	**Power Off**			
Ambient (℃)	-5~5	5~15	15~25	25~35
Water temp (℃)	/	/	/	/
Pressure gauge (Mpa)	0.59~0.85	0.85~1.18	1.18~1.59	1.59~2.1

Unit Condition	**Running**				
Ambient (℃)	/	/	/	/	/
Water temp (℃)	10~15	15~20	20~25	25~30	30~35
Pressure gauge (Mpa)	1.1~1.6	1.3~1.8	1.5~2.1	1.7~2.4	1.9~2.7

6. Display Controller Operation

6.1. Guide for operation

LCD Controller - Operation

Different symbols meaning

① Heating Mode
② Intuitive information
③ Mode of operation
④ Time
⑤ ON/OFF button
⑥ Setting Button
⑦ Modes Setting Button
⑧ Down Key
⑨ Up Key
⑩ Time Setting
⑪ Modbus

6. Start-up of the Heat Pump

6.2. Initial starting

Connect the power to the heat pump and press On / Off button  on the LCD control panel. The unit will start up after the time delay expires.

Running and standby status to display the Inlet water temperature (See picture below).

6.3 The keys and their operations

6.3.1  button

Press  to start or stop the heat pump unit.

6.3.2  and  button

Water temperature setting:

Press  or  to set the water temperature directly.

Heating mode and Auto mode setting range: 6-41℃
Cooling mode setting range: 6-35℃

Press  and  at the same time will can check water in temperature, water out temperature and setting Temperature, it will turn back to standby status if no operation within 5s.

⚠ **ATTENTION:** The buttons of display will automatically locked if no operation within 30s, press  and  at the same time for 5s can unlock it.

6.3.3 button

Press to change the working modes in Turbo, Smart and Silent. The default mode is Smart Mode.

While you choose the ***Turbo***, the word "**Turbo"** will be lit, the heat pump will operate in 'Full output' only.
Choose the ***Smart***, the word **"Smart"** will be lit, the heat pump will operate in 'Medium and Full output'.
Choose the ***Silent,*** the word **"Silent"** will be lit, heat pump will operate in 'Medium and Small output'.

Operation logic of Auto Mode: **T1 = Water inlet temperature ,**
Tset = set temperature = 28℃.

NO	Condition	Current working Status	Water inlet Temperature	Working mode
1	When the heat pump starts	Startup	T1≤27℃	Heating mode
	When the heat pump is running	Heating mode	T1≥29℃, last for 3 minutes	Standby
		Standby	T1≥30℃	It switches to cooling mode
		Cooling mode	T1=28℃, last for 3 minutes	Standby
		Standby	T1≤27℃, last for 3 minutes	It switches to heating mode
2	When the heat pump starts	Startup	27℃<T1≤29℃	Heating mode
	When the heat pump is running	Heating mode	T1≥29℃, last for 3 minutes	Standby
		Standby	T1≥30℃	It switches to cooling mode
		Cooling mode	T1=28℃, last for 3 minutes	Standby
		Standby	T1≤27℃, last for 3 minutes	It switches to heating mode

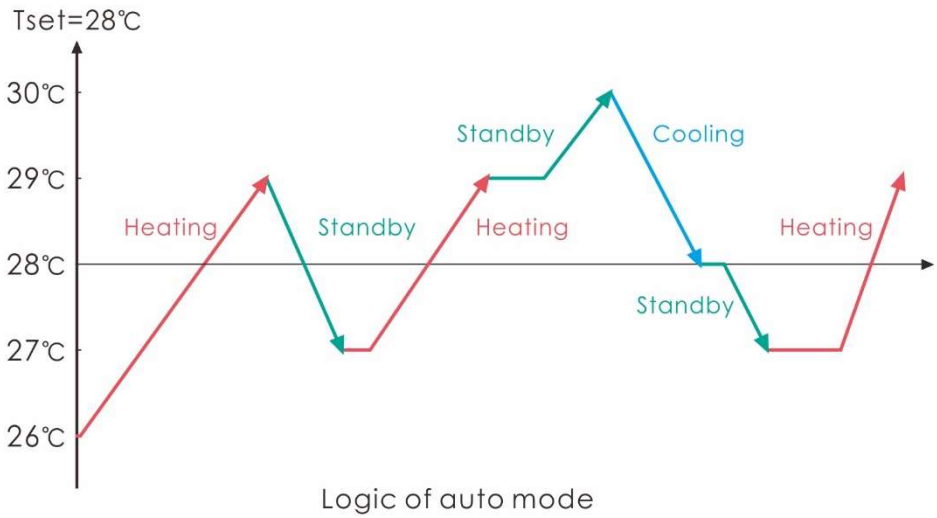
6.3.4 button

Press for 2 seconds to enter level 2 menu, after choose the menu as left side by press or , then press to confirm which the menu will becomes Blue (See picture below).

6.3.5 Heating/Cooling/Auto mode

Select and then press to enter, press or to choose the Heating mode, Cooling mode or Auto mode, then press to confirm your choose. The default mode is Heating mode. Press again will turn back to the level 2 menu.

Logic of auto mode ： T1=Water inlet temperature /Tset= set temperature=28 ℃



Logic of auto mode

6. Start-up of the Heat Pump

6.3.6 Parameter checking

Select and then press enter to check the parameters D0-DB by press or .

Code	Condition	Scope	Remark
1d0/2d0	IPM mould temperature	0-120℃	Real testing value
d1	Inlet water temp.	-9℃～99℃	Real testing value
d2	Outlet water temp.	-9℃～99℃	Real testing value
d3	Ambient temp.	-30℃～70℃	flash if Real value<-9
1d4/2d4	Frequency limitation code	0,1,2,4,8,16	Real testing value
1d5/2d5	Piping temp.	-30℃～70℃	flash if Real value<-9
1d6/2d6	Gas exhaust temperature	0℃～C5℃ (125℃)	Real testing value
1d7/2d7	Step of EEV	0～470	Real testing value
1d8/2d8	Compressor running frequency	0～99Hz	Real testing value
1d9/2d9	Compressor current	0～30A	Triphasé = 00A; Single-phase= Real testing value
1dA	Current fan speed	0-1200 (rpm)	Real testing value
2dA	Current fan speed	0-1200 (rpm)	Real testing value (single fan will show 00rpm)
1dB/2dB	Error code for last time	"---" or All error codes	Real testing value
d12	MOBUS COM	00-05	Setting, Modbus Only
d13	MODBUS ID Address	01-88	Setting, Modbus Only
d14	Product Code	0000-FFFF	Setting, Modbus Only

Remark:

d4: Frequency limitation code,

0: No frequency limit; **1:Coil pipe temperature limit;**

2: Overheating or overcooling frequency limit; **4:Drive Current frequency limit;**

8:Drive voltage frequency limit; **16:Drive high temperature frequency limit**

Note : 1dX is for System 1 ; 2dX is for System 2.

6. Start-up of the Heat Pump

6.3.7 Parameter setting

Press enter to choose P0-P21 by press or , press to enter the setting interface, in which parameter will flash.

Code	Name	Scope	Default	Remark
P00	Mandatory defrosting	0-1	0	0: Default normal operation(auto defrosting) 1: Mandatory defrosting.
P03	Water pump	0-1	0	1:Water pump continues to run after reaching temperature standby. 0:According to the compressor action, temperature standby does not run the pump.
P07	Water inlet temperature compensation value	-9～9	0	Default setting: 0℃
P08	Debug mode	0-1	0	/
P09	Compressor frequency	18-110	50	/
P10	Step of EEV	0-470	350	/
P11	Fan speed	300-1000	500	/
P12	MOBUS COM	00-05	00	Modbus Only（default value after reset）
P13	MODBUS ID Address	01-88	09	Modbus Only（default value after reset）
P14	Restore to factory settings	0-1	0	1-Restore to factory settings， 0- default（restore P0, P1, P2, P3, P5, P6, P7, P8, P9, P10, P11 to factory setting)
P15	Parameter P value for Modbus	E001	0000-FFFF	Depends on the machine(Modbus Only)
P16	Product code	XXXX	/	Depends on the machine
P18	Mode Selection	0-1	0	1—Heating only，0—Heating/Cooling/Auto mode
P19	Mode setting	0-1	1	1—Turbo (For high frequency)， 0—Max (For high frequency)
P20	Environment parameter setting	0-35	7	/

P21	Chinese/English display switch	0-1	0	0=English, 1=Chinese (Restoring the factory parameter setting is invalid for this parameter)

6. Start-up of the Heat Pump

Note:

P08,P09,P10,P11,P19,P20 parameters are only for factory setting.

Code with connect	Parameter P value for Modbus	Description
75397	E001	EXC INV 30
75398	E002	EXC INV 45
75399	E003	EXC INV 60
75400	E004	EXC INV 90
75401	E005	EXC INV 130

Steps to set Parameter P value for Modbus (Modbus Only):

The symbol  on the display is on when the modbus module is connected to the display.

Press  , then press  to choose **P15**, and long press  for 20s to enter the setting interface, in which parameter will flash. Press  or  to set the correct value, finally press  to save settings.

6.3.8 Error code

⚠ ATTENTION: It could be entered by press ⚙ into Fault Description interface only if it found fault (See picture below) when you choose ⚠, otherwise will entered invalid by press ⚙.

6.3.9 Time setting/Timer setting

Select ⏲ and then press ⚙ for 2 times to enter Setting Time Interface to set Timer ON / OFF(See pictures below).

Press ⚙ and then choose Timer ON / OFF by press ⌃ or ⌄, the selected ones will pop up and float. Press ⚙ to choose ON/ OFF then setting the time by press ⌃ or ⌄ and saved the setting by press ⚙. Long press ⚙ for 5s to entered Current time setting interface, you could adjust current time by press ⌃ or ⌄ and saved the setting by press ⚙.

Press ⏻ could turn back to the main interface in any interface of level 2 menu.

⚠ **ATTENTION: The main interface will shown ⏱ if you set the Time ON / OFF, otherwise will not shown.**

6.4 System filtration pilot function

Option 1; P3=0 Filtration pump is related to heat pump operation to start and stop.

Filtration pump starts 60s before compressor, filtration pump start 30s and then the water flow switch detect flow. Before the heat pump enters into Standby mode, the compressor stops first and after 5 minutes filtration pump stops.

	Condition	Example	Water pump working logic	
Heating mode	P3=0, T1≥Tset-0.5℃, last for 30 minutes	P3=0, T1≥27.5℃, last for 30 minutes	1. Then it enters into standby mode for 1 hour (It will not restart except turn it on manually.)	2. After 1 hour, the filtration pump will restart for 5 minutes. If the T1≤27℃, the heat pump will start to work until T1≥27.5℃ and last for 30 minutes to go into standby
Cooling mode	P3=0, T1≤Tset+0.5℃, last for 30 minutes	P3=0, T1≤28.5℃, last for 30 minutes	1. Then it enters into standby mode for 1 hour (It will not restart except turn it on manually.)	2. After 1 hour, the filtration pump will restart for 5 minutes. If it tests T1≥29℃, the heat pump will start to work until T1≤28.5℃ and last for 30 minutes to go into standby

Option 2; P3=1 Filtration pump is always on, P2=0 the timer function is no active

Under condition P3=1, whenT1≥Tset+1℃(T1≥29℃) last for 3 minutes, heat pump will be in standby, while filtration pump is always on.

Under option 2, with activation of the timer; P2=1 to start and stop the filtration pump according the programming of the P4 (time), P5 (timer ON) and P6 (timer OFF)

Condition for the heat pump start, timer ON actives;

When the timer reaches **the set time of TIMER ON**, the filtration pump will start and after 5 minutes the heat pump start. The heat pump stays in stop if the water in temperature is ≥ Tset+1℃, before the TIMER OFF, the filtration is still activated.

Condition to stop the heat pump, timer OFF actives;

When the timer reaches the set time of the TIMER OFF, the heat pump will stop and after 5 minutes the filtration pump stops.

If heat pump is turned ON/OFF manually, the filtration pump will start and stop accordingly.

NOTE :

Tset = Tseting water temperature

For example : Tset = 28℃ Tseting water temperature in your pool heat pump

Tset-0.5 = less 0.5℃ than Tseting temperature, Tset- 0.5 = 28-0.5=27.5℃

Tset+0.5= more 1℃ than Tseting temperature, Tset+ 0.5 = 28+0.5=28.5℃

6. Start-up of the Heat Pump

6.5 Heating operation logic

Working status		Working mode	Water in temperature-T1	For example, water in temperature-T1	Heat pump working level
1	Start-up of heat pump	When you select the "Smart working mode "	T1< Tset-1	T1< 27℃	Powerful mode-frequency F9
2			Tset-1≦T1 < Tset	27℃≦T1 <28℃	Frequency： F9 -F8-F7,...,-F2
3			Tset≦ T1 <Tset+ 1	28℃≦ T1 <29℃	Silent mode-frequency F2
4			T1≧Tset+1	T1≧29℃	HP will be in Standby, stop working until the water temperature drops to less 28℃.
5		When you select the "Silent working mode".	T1< Tset	T1< 28℃	Smart mode -frequency F5.
6			Tset≦T1 < Tset+1	28℃≦T1 < 29℃	Silent mode-frequency F2/F1.
7			T1≧Tset+1	T1≧29℃	HP will be in Standby, stop working until the water temperature drops to less 28℃.
8		When you select the "Powerful working mode."	T1<Tset+1	T1<29℃	Powerful mode-frequency F10/F9
9			T1≧ Tset+1	T1≧29℃	HP will be in Standby, stop working until the water temperature drops to less 28℃.
10	Re-start to heat water in standby status	When HP is working at " Smart mode"	T1≧Tset	T1≧28℃	Standby
11			Tset＞T1≧Tset-1	28℃＞T1≧27℃	Silent-frequency F2
12			Tset-1＞T1≧Tset-2	27℃＞T1≧26℃	Frequency： F2 -F3-F4,...,-F9
13			<Tset-2	<26℃	Powerful-frequency F9
14		When HP is working at " Silent mode"	≧Tset	≧28℃	Standby
15			Tset＞T1≧Tset-1	28℃＞T1≧27℃	Silent mode-frequency F2/F1
16			T1<Tset-1	T1<27℃	Smart -frequency F5
17		When HP is working at " Powerful mode"	T1<Tset-1	T1<27℃	Powerful -frequency F10/F9

6.6 Cooling operation logic

Working status		Working mode	Water in temperature	For example, water in temperature	Heat pump working level
1	Start-up of heat pump	When you select the "Smart working mode "	T1≦Tset-1	T1≦27℃	Standby.
2			Tset-1<T1 ≦Tset	27℃< T1 ≦ 28℃	Silent mode-frequency F2
3			Tset<T1≦Tset+1	28< T1 ≦29℃	frequency： F9 -F8-F7,...,- F2
4			T1≧Tset+1	T1≧29℃	Powerful mode-F9
5		When you select the "Silent working mode".	T1≦Tset-1	≦27℃	Standby
6			Tset-1<T1 ≦Tset	27℃< T1≦28℃	Silent mode - frequency F2/F1
7			T1>Tset	T1>28℃	Smart mode -frequency F5
8		When you select the "Powerful working mode."	T1>Tset-1	T1>27℃	Powerful mode-frequency F10/F9
9			T1≦Tset-1	T1≦27℃	Standby
10	Re-start to cool water in standby status	Smart	T1≦Tset-1	T1≦27℃	Standby
11			Tset ≦T1 <Tset+1	28 ≦T1 <29℃	Silent- frequency F2
12			Tset+1 ≦T1 <Tset+2	29 ≦T1 <30℃	Frequency: F2 -F3-F4,...,- F9
13			T1≧Tset+2	T1≧30℃	Powerful mode -frequency F9
14		Silent	Tset<T1≦Tset+1	28< T1≦29℃	Silent mode-frequency F2/F1
15			T1＞Tset+1	T1＞29℃	Smart mode-frequency F5
16		Powerful	T1＞Tset+1	T1＞29℃	Powerful mode-frequency F10/F9
17			T1≦Tset-1	T1≦27℃	Standby

7. Troubleshooting

7.1 Error code displays on controller

Malfunction	Error code	Reason	Solution
Inlet water temperature sensor failure	PP01	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensors.
Outlet water temperature sensor failure	PP02	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensor.
Heating piping sensor failure	1PP03/ 2PP03	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensor.
Backup (return air) sensor failure	PP04	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensor.
Ambient temperature sensor failure	PP05	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensors.
Exhaust piping sensor failure	1PP06/ 2PP06	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor. 2. Re-fix the wiring of the sensors.
Antifreeze protection in Winter	PP07	Ambient temperature or water inlet temperature is too low	1. Check inlet water temperature & outlet water temperature . 2. Normal protection.
Low ambient temperature protection	PP08	1. Out of the normal operating ambient temperature for this machine by checking outlet water temperature 2. Outlet water temperature sensor abnormality	1. Stop using, beyond the scope of using. 2.Change the sensor.
Piping temperature too high protective under cooling mode	1PP10/ 2PP10	1. Ambient temperature or the water temperature is too high in cooling mode 2. Refrigeration system is abnormal 3. Pipe temperature sensor failure	1. Check the ambient temperature. 2. Check refrigeration system. 3. Change the pipe temperature sensor.
Over low protection for outlet water temperature in cooling mode T2	PP11	1. Low water flow 2. Outlet water temperature sensor abnormal 3. The differences of outlet water temperature and set temperature is **7**℃ or above in cooling mode	1. Check filtration pump and waterway system. 2. Change outlet water temperature sensor. 3. Change the setting temperature.

7. Troubleshooting

Malfunction	Error code	Reason	Solution
High pressure failure	1EE01/ 2EE01	1. Ambient temperature is too high 2. Water temperature is too high 3. Water flow is too low 4. Fan motor speed is abnormal or fan motor is damaged under cooling mode 5. Gas system jammed 6. High pressure wire is loose or damaged 7. Too much refrigerant	1. Choose the silent mode. 2. Check the water flow or filtration pump. 3. Check the fan motor under cooling mode, replace a new one if it is abnormal. 4. Check and repair the refrigerating system. 5. Reconnect the high pressure wire or replace a new high pressure switch. 6. Check and repair the refrigerating system.
Low pressure failure	1EE02/ 2EE02	1. EEV has blocked or pipe system is jammed 2. Fan motor speed is abnormal or fan motor is damaged under heating mode 3. Gas leakage 4. Low pressure wire is loose or damaged	1.Check the EEV and piping system, check the motor. 2. Check the fan motor under heating mode, replace a new one if it is abnormal 3. Check refrigeration system or check the pressure value through the high-pressure gauge. 4. Reconnect the low pressure wire or replace a new low pressure switch.
Water flow failure	EE03	1. The wiring of water flow switch is loose or water flow switch damaged 2. No / Insufficient water flow	1. Check the wiring of water flow switch or change a new one. 2. Check the filtration pump or the waterway system if there has air or jammed inside.
Over heating protection for water temperature in heating mode T2	EE04	1. Low water flow 2. Water flow switch is stuck and the water supply stops 3. Outlet water temperature sensor is abnormal 4. The difference of outlet water temperature and set temperature is 7℃ or above in heating mode	1. Check the water flow switch if it works well. 2. Check the filtration pump or the waterway system if there has air or jammed inside. 3. Check outlet water temperature sensor or replace a new one. 4. Change the setting temperature.
Exhaust too high protection T6	1EE05/ 2EE05	1. Lack of gas 2. Low water flow 3. Piping system has been blocked 4. Exhaust temperature sensor failure 5. Ambient temperature is too high	1. Check the pressure gauge, please fill with some gas if it is lack of gas. 2. Check the filtration pump or the waterway system if there has air or jammed inside. 3. Check the piping system if there was any blocked. 4. Change a new exhaust temperature sensor. 5. Check whether the current ambient temperature & water temperature are beyond the running temperature of the machine.

7. Troubleshooting

Malfunction	Error code	Reason	Solution
Controller failure	EE06	1. Signal is not in a good connected or damaged 2. Controller failure	1. Stop the power supply and restart. 2. Re-connect the signal wire or replace a new one. 3. Replace a new controller.
Compressor current protection	1EE07/ 2EE07	1. The compressor current is too large instantaneously 2. Wrong connection for compressor phase sequence 3. Compressor accumulations of liquid and oil lead to the current becomes larger 4. Compressor or driver board damaged 5. The water flow is abnormal 6. Power fluctuations within a short time	1. Check if the power in the normal range 2. Check the compressor 3. Check the compressor phase 4. Check the phase sequence connection 5. Check the waterway system and filtration pump 6. Check mains power input
Communication failure between controller and main board	EE08	1. Signal wire is not in a good connected or damaged 2. Controller failure 3. Driving failure	1. Stop the power supply and restart. Re-connect the signal wire or replace a new one. 2. Check the controller or replace a new one. 3. Check the driving system or update it. 4. Check the driving system or update it.
Communication failure between Main control board and Driving board	1EE09/ 2EE09	1. Poor connection of communication wire 2. PCB failure 3. The wire is damaged	1. Stop the power supply and restart. 2. Reconnect the communication wire or replace a new one. 3. Check the wires according to the electric diagram. 4. Replace a new PCB.
VDC voltage too high protection	1EE10/ 2EE10	1. Line voltage is too high 2. Driver board is damaged.	1. Check whether the power supply is normal. 2. Change driver board or main board.
IPM module protection	1EE11/ 2EE11	1. Data mistake 2. Wrong compressor phase connection 3. Compressor liquid and oil accumulation lead to the current becomes larger 4.Poor heat dissipation of drive module or high ambient temperature 5. Compressor or driver board damaged	1. Program error, turn off electricity supply and restart after 3 minutes. 2. Check compressor sequence connection. 3. Check the pressure of system by pressure gauge. 4. Check if the ambient and water temperature is over high. 5. If it is the refrigeration system failure, send it to the service center. 6. Change the driver board.
VDC voltage too low protection	1EE12/ 2EE12	1. Mother line voltage is too low 2. Driver board is damaged.	1. Check if the power supply is in the normal range. 2. Change the driver board.

7. Troubleshooting

Malfunction	Error code	Reason	Solution
Input current over high protection	1EE13/ 2EE13	1. The compressor current is too large momentary 2. The water flow is abnormal 3. Power fluctuations within a short time 4. Wrong reactor	1. Check the compressor if it works normally. 2. Check the waterway system. 3. Check if the power is in the normal range. 4. Check if the reactor is used correctly.
IPM module thermal circuit is abnormal	1EE14/ 2EE14	1. Output abnormity of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken	1. Check if the motor speed is too low or fan motor is damaged, replace it by a new one. 2. Replace a new driver board. 3. Change the fan blade if it is broken.
IPM module temperature too high protection	1EE15/ 2EE15	1. Output exception of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4.The screw on driver board is loose	1. Check the main board or replace the driver board. 2. Check if the motor speed is too low or fan motor is damaged, replace it by a new one if any failure. 3. Change the fan blade if it is broken. 4. Check the screws on driver board.
PFC module protection	1EE16/ 2EE16	1. Output exception of PFC module 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4. Input voltage leap, input power is abnormal	1.Check the main board or replace the driver board. 2. Check if the motor speed is too low or fan motor is damaged, replace it by a new one. 3. Change the fan blade if it is broken. 4. Check the input voltage.
DC fan motor failure	EE17	1. DC motor is damaged 2. For the tri-phase check if the neutral is connected 3. Main board is damaged 4. The fan blade is stuck	1. Detect the DC motor for mono phase machine, replace a new one if any failure. 2. Check the wire connection for tri-phase machine. 3. Check the boards, replace a new driver board or main board if any failure. 4. Check if there is any barrier in front of the fan blade and remove it.
PFC module thermal circuit is abnormal	1EE18/ 2EE18	The driver board is damaged	1. Check if the motor speed is too low or the fan motor is damaged, replace it by a new one. 2. Change a new driver board.
PFC module high temperature protection	1EE19/ 2EE19	1. PFC module thermal circuit output abnormal 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4. The screws on the driver board are not tight	1. Check the main board or replace the driver board. 2. Check if the motor speed is too low or the fan motor is damaged, replace it by a new one if any failure. 3. Change the fan blade if it is broken. 4. Check the screws on the driver board.

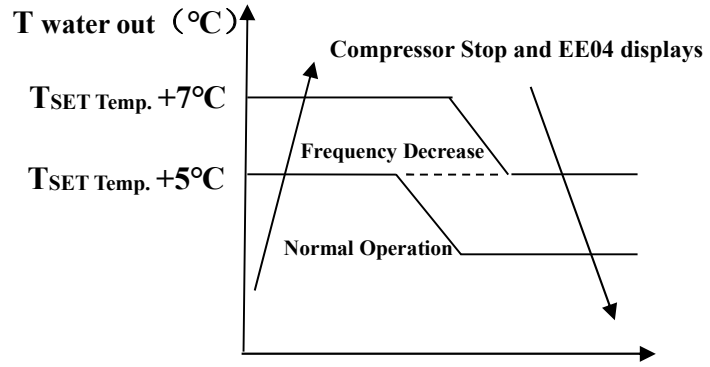
7. Troubleshooting

Malfunction	Error code	Reason	Solution
Input power failure	1EE20/ 2EE20	The supply voltage fluctuates too much	Check whether the voltage is stable.
Software control abnormal	1EE21/ 2EE21	1. Compressor runs out of step 2. Wrong program 3. Impurity inside compressor causes the unstable rotate speed	1. Check the main board or change a new one. 2. Update the correct program. 3. Check the refrigeration system.
Current detection circuit failure	1EE22/ 2EE22	1. Voltage signal abnormal 2. Driver board is damaged 3. Main board failure	1. Change a new main board. 2. Change a new driver board.
Compressor start failure	1EE23/ 2EE23	1. Main board is damaged 2. Compressor wiring error or poor contact or unconnected 3. Liquid accumulation inside 4. Wrong phase connection for compressor	1. Check the main board or change a new one. 2. Check the compressor wiring according to the circuit diagram. 3. Check the compressor or change a new one.
Ambient Temperature device failure on Driver board	1EE24/ 2EE24	Ambient Temperature device failure	Change the driver board or main board.
Compressor phase failure	1EE25/ 2EE25	Compressors U, V, W are just connected to one phase or two phases	Check the actual wiring according to the circuit diagram.
Four-way valve reversal failure	1EE26/ 2EE26	1. Four-way valve reversal failure 2. Lack of refrigerant (no detect when **TH2** or **TH1** malfunction)	1. Switch to Cooling mode to check the 4-way valve if it has been reversed correctly. 2. Change a new 4-way valve. 3. Fill with gas.
EEPROM data read malfunction	EE27	1. Wrong EEPROM data in the program or failed input of EEPROM data 2. Main board failure	1. Re-enter correct EEPROM data. 2. Change a new main board.
The inter-chip communication failure on the main control board	EE28	Main board failure	1. Stop electricity supply and restart it. 2. Change a new main board.

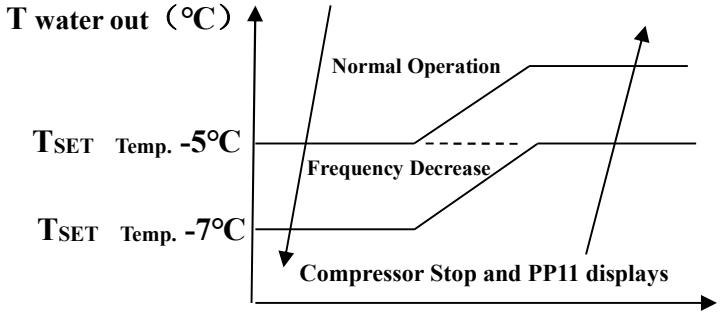
Remarks:

1. In heating mode, if the water out temperature is over 7℃ higher than the setting temperature, the controller displays EE04 for water over-heating protection.
2. In cooling mode, if the water out temperature is over 7℃ lower than the set temperature, the controller displays PP11 for water over-cooling protection.

7. Troubleshooting



EE04 Water Overheating Protection



PP11 Water Overcooling Protection

For example below:

Mode	Water out temperature	Setting temperature	Condition	Malfunction
Heating mode	**36℃**	**29℃**	Tout - Tset ≧7℃	EE04 Overheating protection for water temperature
Cooling mode	**23℃**	**30℃**	Tset - Tout ≧7℃	PP11 Too low protection for water temperature

7. Troubleshooting

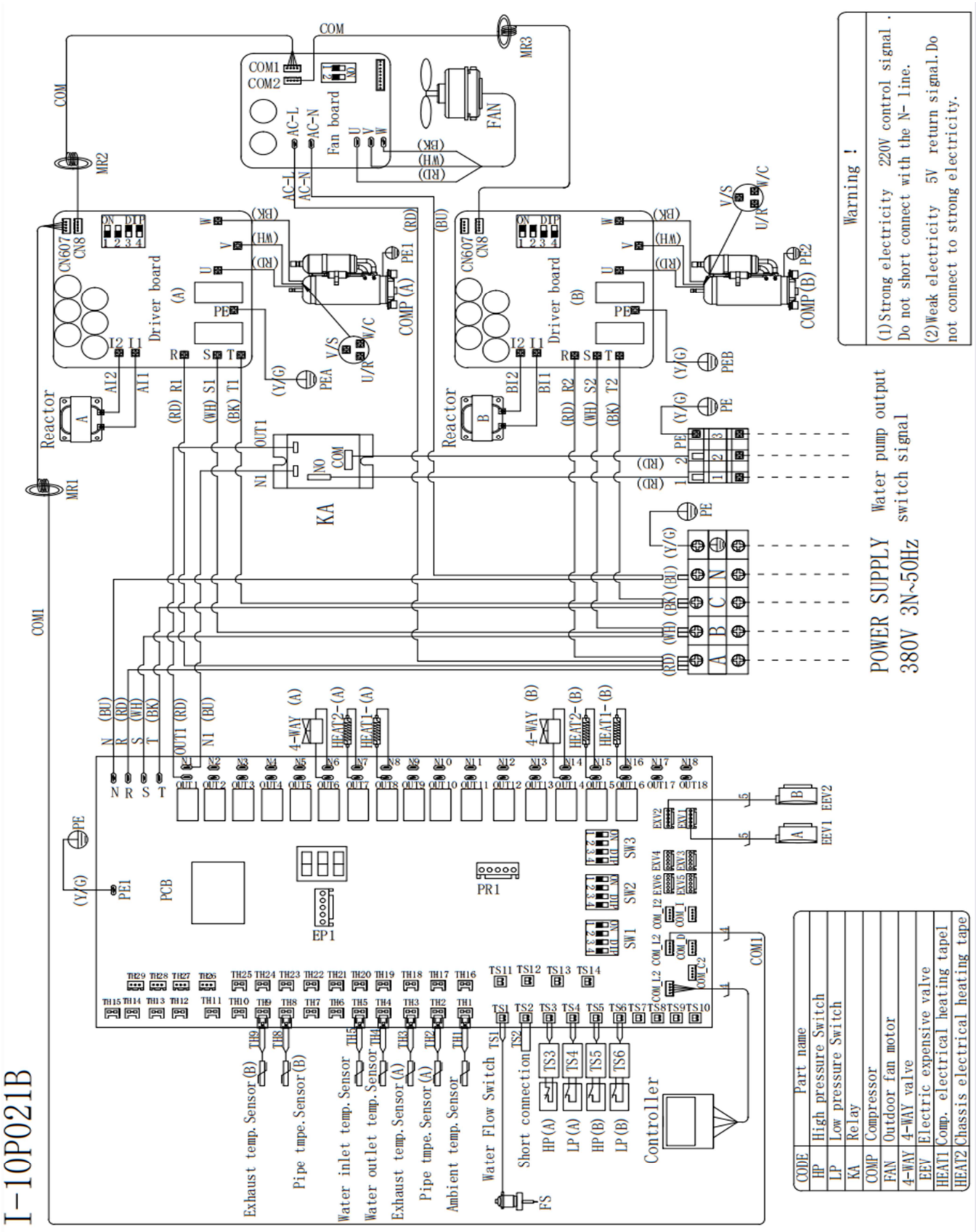
7.2 Other Malfunctions and Solutions (No display on LED wire controller)

Malfunctions	Observing	Reasons	Solution
Heat pump is not running	LED wire controller no display	No power supply.	Check cable and circuit breaker if it is connected.
	LED wire controller displays the actual time	Heat pump under standby status.	Startup heat pump to run.
	LED wire controller displays the actual water temperature	1. Water temperature is reaching to the setting value, HP under constant temperature status. 2. Heat pump just starting to run. 3. Under defrosting.	1. Verify the water temperature setting. 2. Startup heat pump after a few minutes. 3. LED wire controller should display " Defrosting ".
Water temperature is cooling when HP runs under heating mode	LED wire controller displays actual water temperature and no error code displays	1. Choose the wrong mode. 2. Figures show defects. 3. Controller defect.	1. Adjust the mode to proper running. 2. Replace the defected LED wire controller, and then check the status after changing the running mode, verifying the water inlet & outlet temperature. 3. Replace or repair the heat pump unit.
Short running	LED displays actual water temperature, no error code displays.	1. Fan NO running. 2. Air ventilation is not enough. 3. Refrigerant is not enough.	1. Check the cable connections between the motor and fan, if necessary, it needs to be replaced. 2. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 3 Replace or repair the heat pump unit.
water stains	Water stains on heat pump unit.	1. Concreting. 2. Water leakage.	1. No action. 2. Check the titanium heat exchanger carefully if it is any defected.
Too much ice on evaporator	Too much ice on evaporator.		1. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 2. Replace or repair the heat pump unit.

8. Electrical Wiring

8.1 Swimming pool heat pump wiring diagram

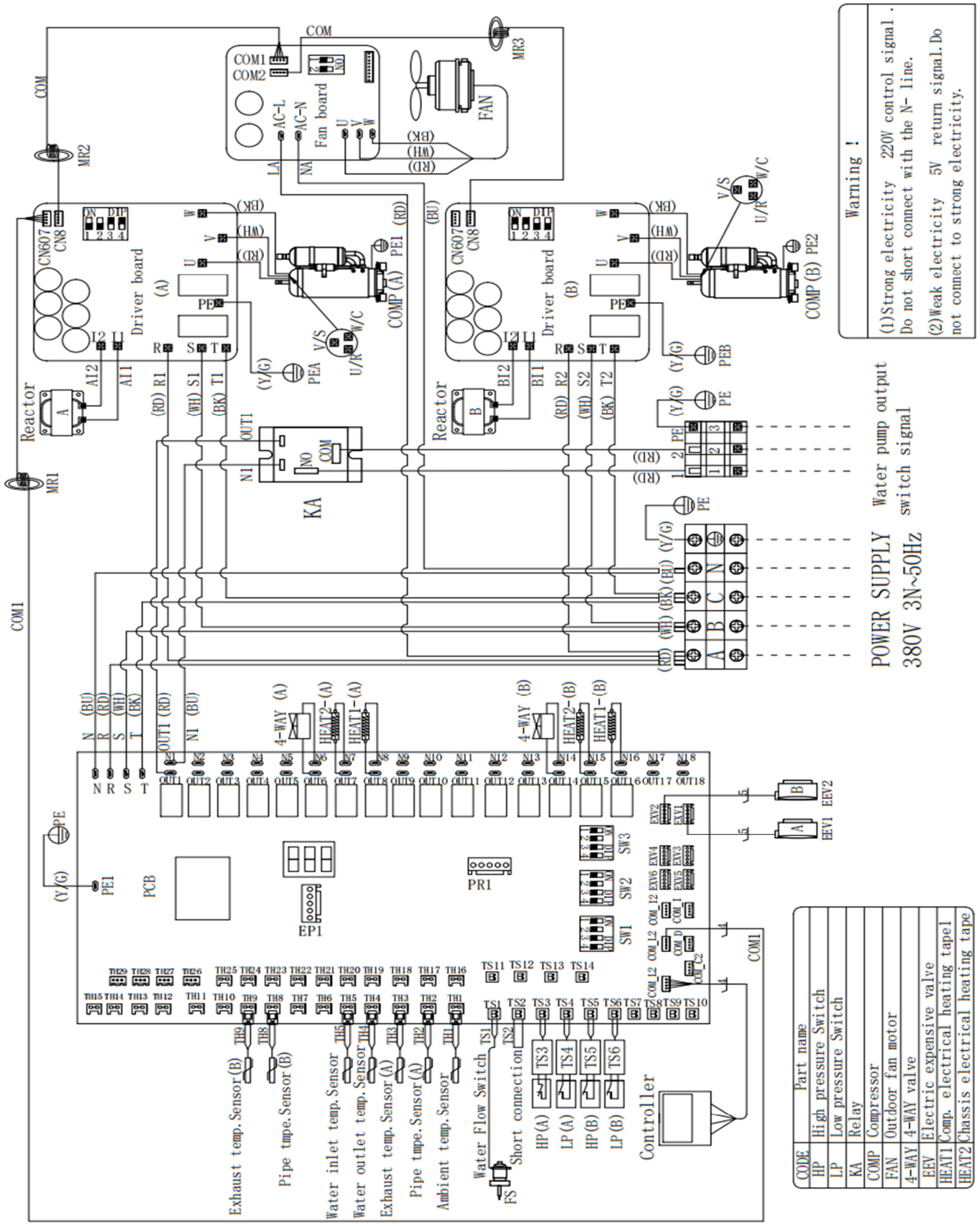
EXC INV 30



CODE	Part name
HP	High pressure Switch
LP	Low pressure Switch
KA	Relay
COMP	Compressor
FAN	Outdoor fan motor
4-WAY	4-WAY valve
EEV	Electric expensive valve
HEAT1	Comp. electrical heating tapel
HEAT2	Chassis electrical heating tape

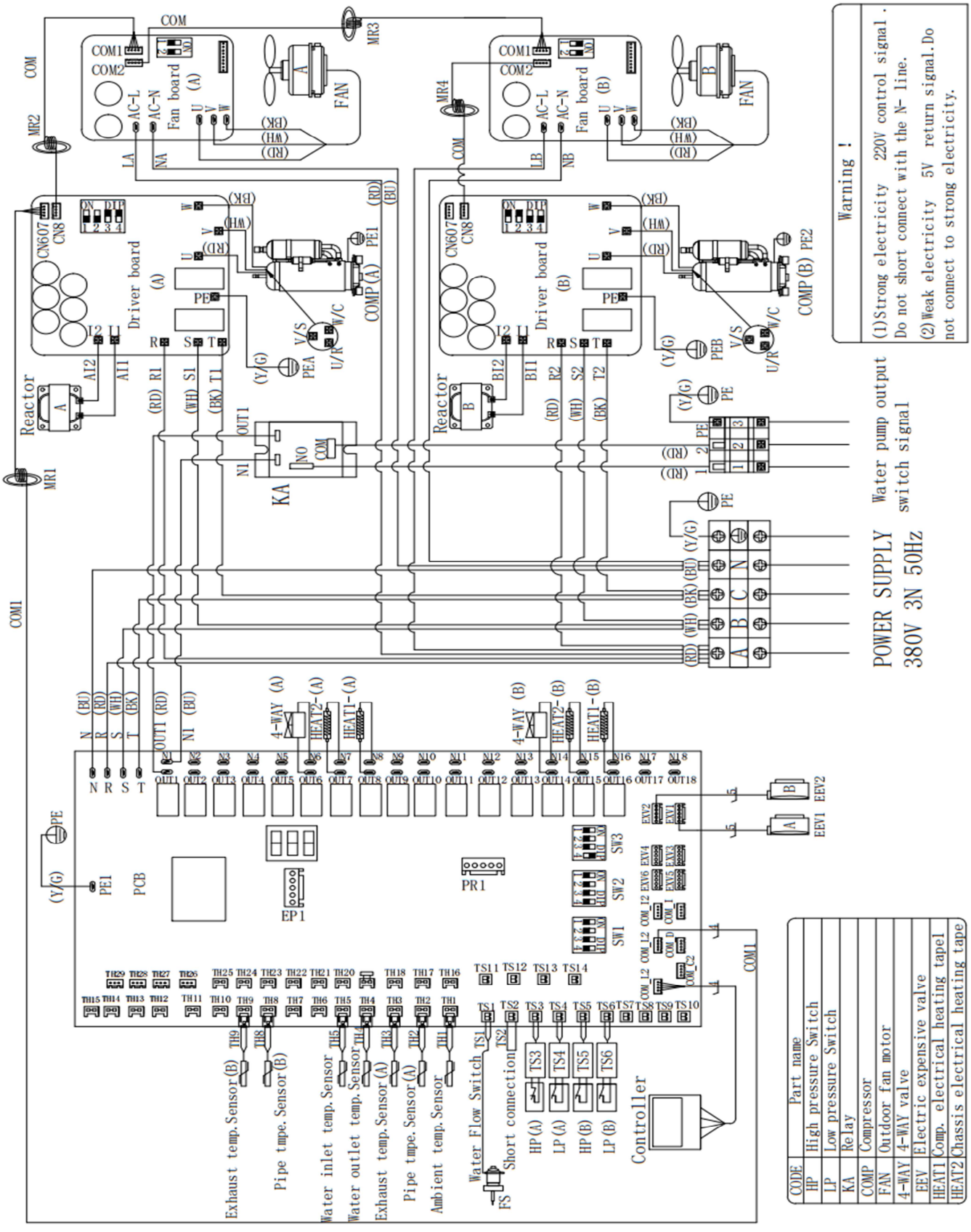
8. Electrical Wiring

EXC INV 45



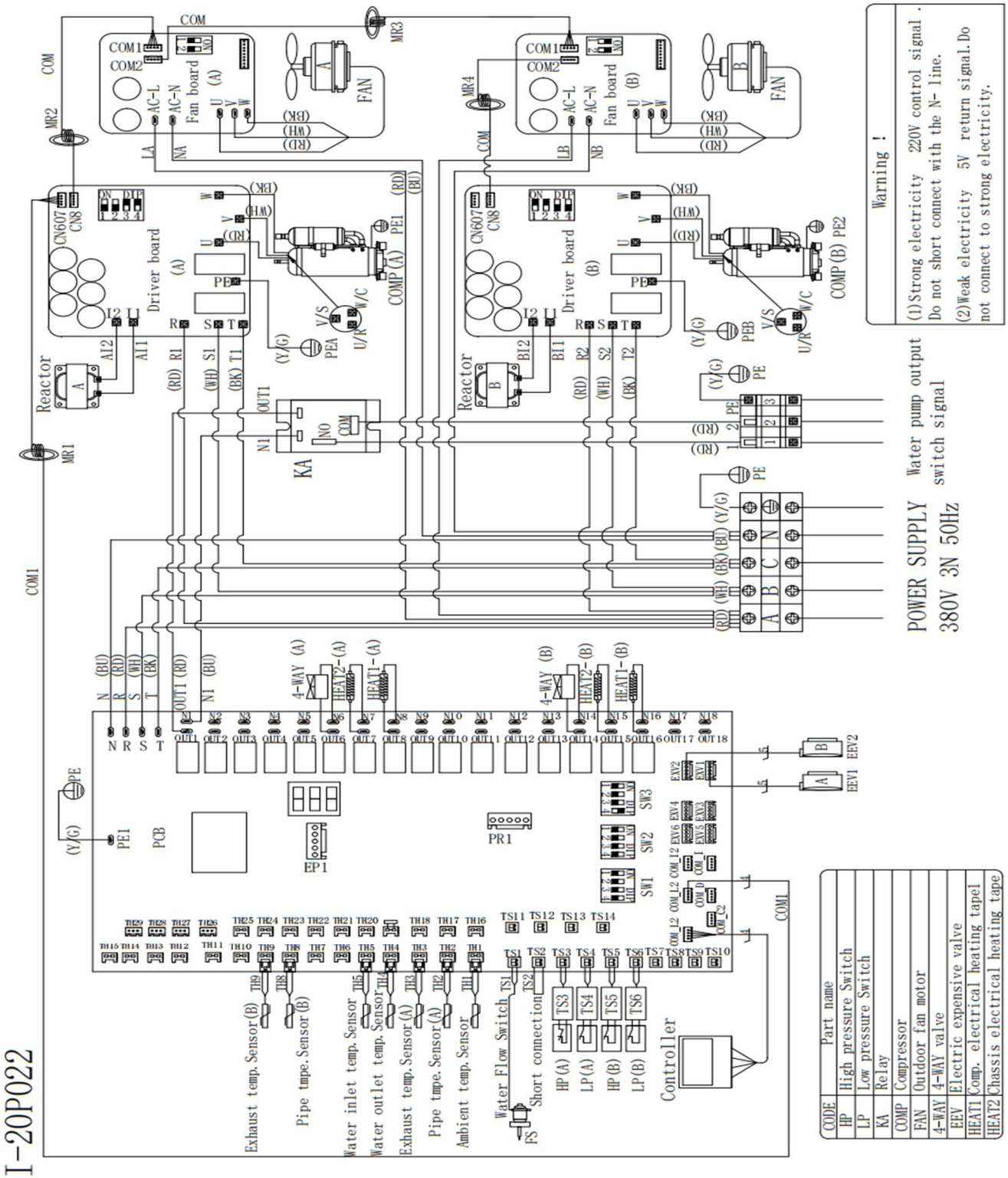
8. Electrical Wiring

EXC INV 60



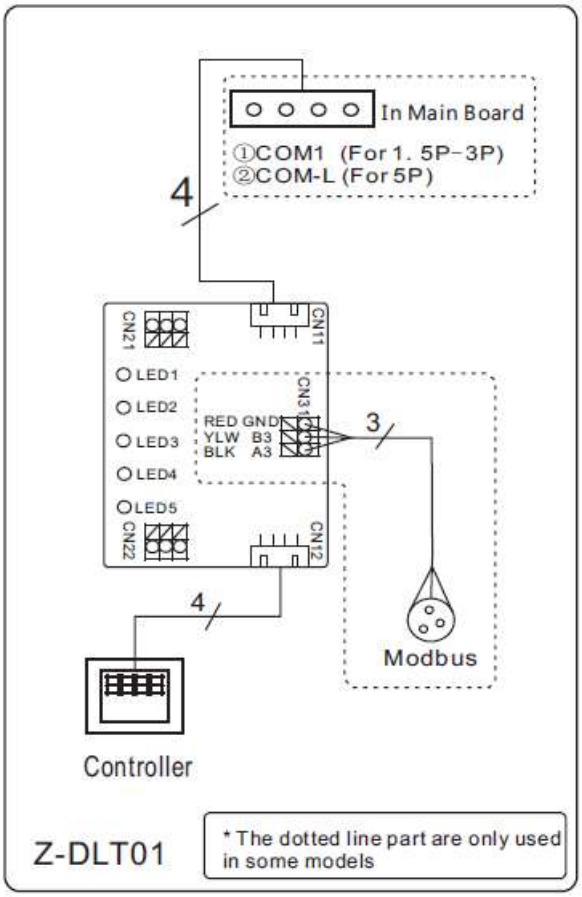
8. Electrical Wiring

EXC INV 90/EXC INV 130



Note: Above electrical wiring diagram only for your reference, please subject machine posted the wiring diagram.

8.2 Connection to Modbus PCB



* Above electrical wiring diagram only for your reference, please subject machine posted the wiring diagram.

8.3 Electrical connection

The power supply for the heat pump must come, preferably, from an exclusive circuit with regulatory protection components (30mA differential protection) and a magneto-thermal switch.

- The electrical installation must be carried out by a specialized professional (electrician) in accordance with the standards and regulations in force in the country of installation.
- The heat pump circuit must be connected to a safety earth circuit at the terminal block.
- The cables must be properly installed to prevent interference.
- The pump is intended for connection to a general power supply with earth connection.
- Section of the cable; This section is indicative and should be checked and adapted according to the needs and conditions of use.
- The tolerance of acceptable voltage variation is +/- 10% during operation.

8. Electrical Wiring

The connections must be dimensioned according to the power of the device and the state of installation.

Models	Circuit breaker	Maximum length of the wire			
		2,5 mm²	4 mm²	6 mm²	10 mm²
EXC INV 30	22A	40 m	65 m	97 m	161 m
EXC INV 45	25 A	35 m	56 m	85 m	141 m
EXC INV 60	42 A	/	33 m	50 m	83 m
EXC INV 90	52 A	/	/	40 m	67 m
EXC INV 130	80 A	/	/	/	44 m

⚠ **These values are given as a guideline, only an authorized electrician can determine the values corresponding to your installation.**
The electric cable must be equipped with a ground connection and with a circuit breaker with differential 30mA.

8.4 Installation of the display deportee (option)

Photo(1) Photo(2) Photo(3) Photo(4)

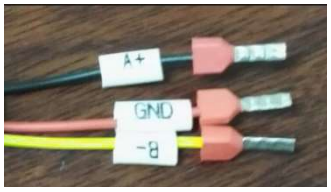


- The end with plug connects with the control panel (photo1)
- The other end of the signal wire. (photo2)
- Open the cover of the terminal box and pass through it the cable of the remote screen.(photo3)
- Insert the wiring into the designated position on the Modbus Module. (photo4)

8.5 Installation of the Modbus/Fluidra Connect Signal Wire

Photo(5) Photo(6) Photo(7) Photo(8)



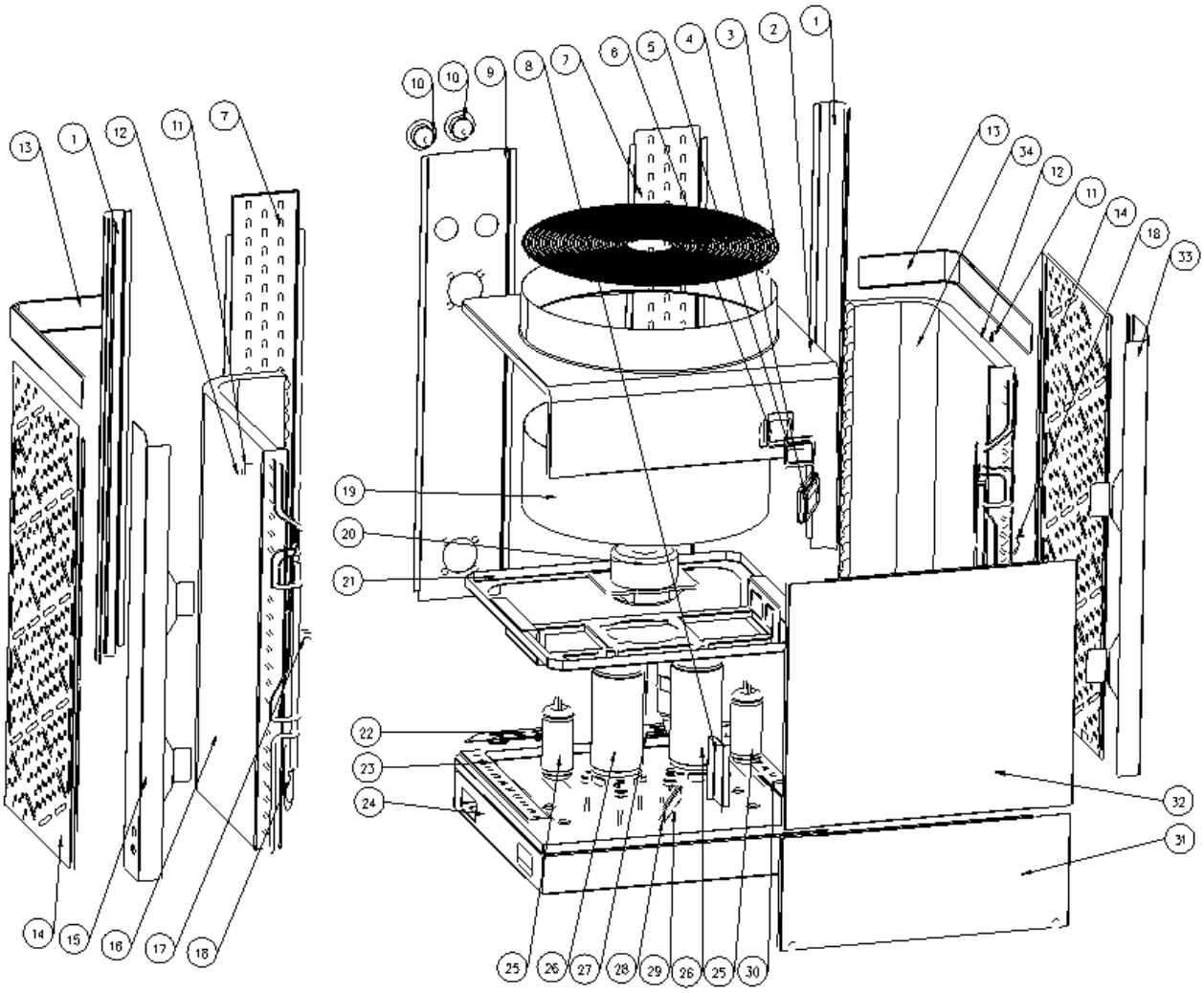



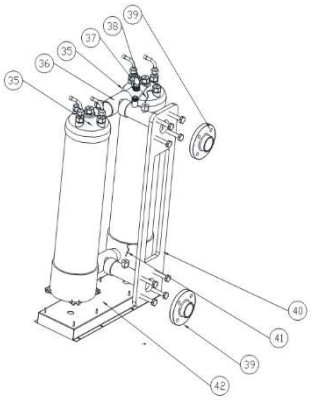
- Open the cover of the terminal box (photo5)
- Take the Modbus/Fluidra Connect signal wire from the accessories (photo6) and put the round end of the signal wire into the signal wire from Modbus/Fluidra Connect Module. (photo 7)
- Three wire terminal :“A+” ,“B- ”, “GND” (Photo 8)

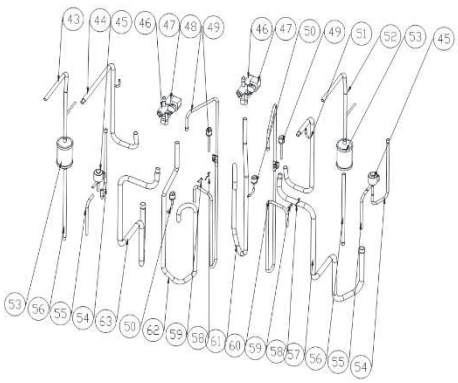
9. Exploded Diagram

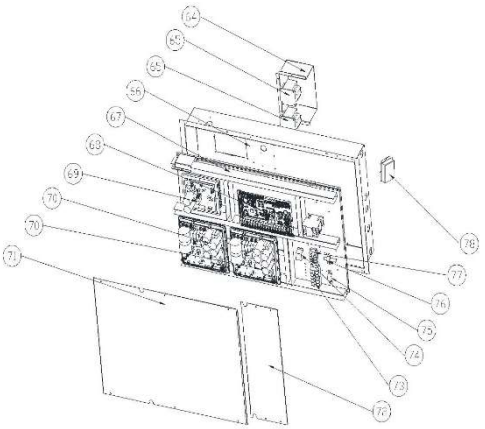
9.1 Exploded Diagram

Model: EXC INV 30/EXC INV 45









9. Exploded Diagram

9.2 Spare parts list EXC INV 30

No	ERP	Name	No	ERP	Name
1	108810069	Pillar	40	/	PVC fixing board
2	108810074	Top cover	41	117110012	Water inlet temp. sensor TH6
3	108010155	Fan grill	42	108810007	Exchanger bracket
4	113712007	Waterproof box	43	113170084	Dehydrator filter pipe
5	117020281	Controller	44	113030224	4-way valve to exchanger
6	133030011	Waterproof controller box	45	119000022	EEV
7	108810082	Back net	46	121000028	4 way valve
8	108810105	Electric control box fixing plate	47	121000038	Four-way valve coil
9	108810107	Back panel	48	113010466	Discharge pipe
10	106000011	Pressure gauge	49	112100030-3	High pressure switch
11	133020010	Ambient temp. sensor clip	50	112100046-4	Low pressure switch
12	117110020	Ambient temp. sensor TH1	51	113030225	4-way valve to exchanger
13	108810080	Wind shield	52	113170085	Dehydrator filter pipe
14	108810079	Side net	53	120000066	Filter
15	108810077	Side Panel	54	113080140	EEV to distribution piping
16	103000390	Evaporator	55	113120071	Pipe from storage tank to EEV
17	136020005	Rubber fixed block	56	113130050	Pipe to dehydrator filter
18	117110021	Exhaust temp. sensor TH3	57	113060221	Tube
19	132000035	Fan blade	58	117110004	Pipe temp. sensor TH2
20	112000092	Fan motor	59	113190001	Clip
21	108810073	Fan motor bracket	60	113010466	Discharge pipe
22	108810008	Evaporator pad	61	113020711	Gas return piping
23	108810010	Evaporator pad	62	113020710	Gas return piping
24	108810068	Base tray	63	113060222	Tube
25	105000004	Liquid storage tank	64	108810047	Waterproof box
26	101000198	Compressor	65	117230002	Reactor
27	108810034	Evaporator pad	66	108810075	Electric box
28	108010107	Needle valve support	67	108810106	Electric box board
29	120000034	Gas valve	68	117250018	PCB
30	108810035	Evaporator pad	69	117140024	Fan motor driver board
31	108810070	Front panel 1	70	117140024	Fan motor driver board
32	108810071	Front panel 2	71	108810083	Electric box cover 1
33	108810078	Side Panel	72	108810084	Electric box cover 2
34	103000391	Evaporator	73	115000005	5-ways terminal power block
35	102041163	Titanium heat exchanger	74	142000038	Relay
36	/	Three-way PVC tube	75	108010085	Clip
37	117110011	Water outlet temp. sensor TH5	76	108010086	Clip
38	116000092	Water flow switch	77	115000023	3-ways terminal block
39	/	Water flange	78	108810048	Waterproof box

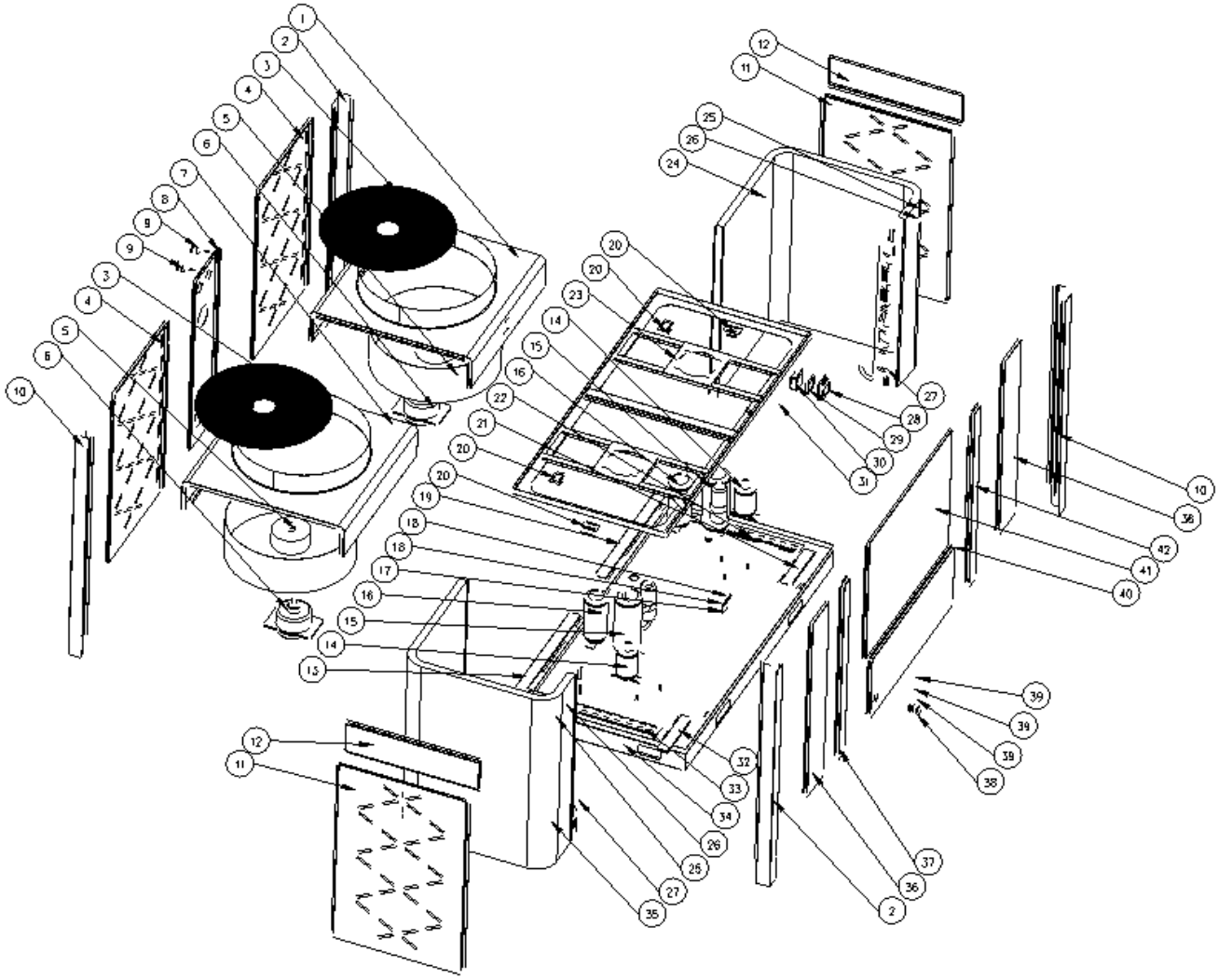
9. Exploded Diagram

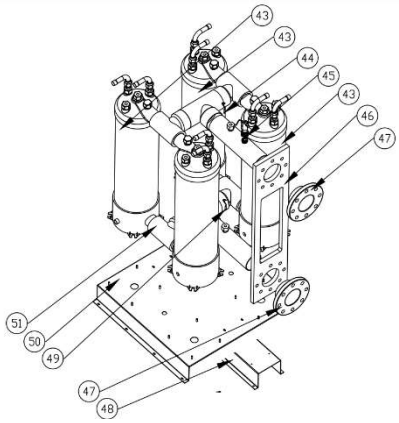
9.3 Spare parts list EXC INV 45

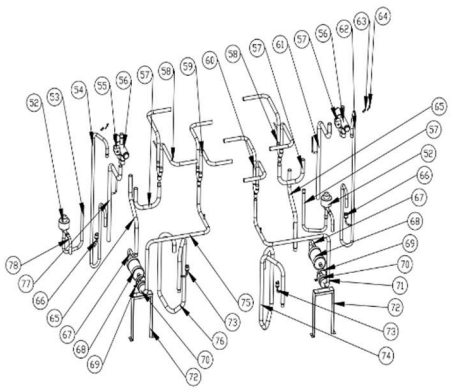
No	ERP	Name	No	ERP	Name
1	108810069	Pillar	40	/	PVC fixing board
2	108810074	Top cover	41	117110012	Water inlet temp. sensor TH6
3	108010150	Fan grill	42	108810007	Exchanger bracket
4	113712007	Waterproof box	43	113170048	Dehydrator filter pipe
5	117020281	Controller	44	113030143	4-way valve to exchanger
6	133030011	Waterproof controller box	45	119000022	EEV
7	108810082	Back net	46	121000028	4 way valve
8	108810081	Electric controller box support panel	47	121000038	Four-way valve coil
9	108810072	Back panel	48	113010456	Discharge pipe 1
10	106000011	Pressure gauge	49	112100030-3	High pressure switch
11	133020010	Ambient temp. sensor clip	50	112100046-4	Low pressure switch
12	117110020	Ambient temp. sensor TH1	51	113030144	4-way valve to exchanger
13	108810080	Wind shield	52	113170049	Dehydrator filter pipe
14	108810079	Side net	53	120000066	Filter
15	108810077	Side Panel	54	113080101	EEV to distribution piping
16	103000374	Evaporator	55	113120068	Pipe from storage tank to EEV
17	136020005	Rubber fixed block	56	113130048	Pipe to dehydrator filter
18	117110021	Exhaust temp. sensor TH3	57	113060154	Tube
19	132000035	Fan blade	58	117110004	Pipe temp. sensor TH2
20	112000092	Fan motor	59	113190001	Clip
21	108810073	Fan motor bracket	60	113010457	Discharge pipe 2
22	108810008	Evaporator pad	61	113020696	Gas return piping 2
23	108810010	Evaporator pad	62	113020695	Gas return piping 1
24	108810068	Base tray	63	113060153	Tube
25	105000015	Liquid storage tank	64	108810047	Waterproof box
26	101000149	Compressor	65	117230002	Reactor
27	108810034	Evaporator pad	66	108810075	Electric box
28	108010107	Needle valve support	67	108810076	Electric box board
29	120000034	Gas valve	68	117250018	PCB
30	108810035	Evaporator pad	69	117140024	Fan motor driver board
31	108810070	Front panel 1	70	117140025	Driver board
32	108810071	Front panel 2	71	108810083	Electric box cover 1
33	108810078	Side Panel	72	108810084	Electric box cover 2
34	103000375	Evaporator	73	115000005	5-ways terminal power block
35	102040818	Titanium heat exchanger	74	142000038	Relay
36	/	Three-way PVC tube	75	108010085	Clip
37	117110011	Water outlet temp. sensor TH5	76	108010086	Clip
38	116000092	Water flow switch	77	115000023	3-ways terminal block
39	/	Water flange			

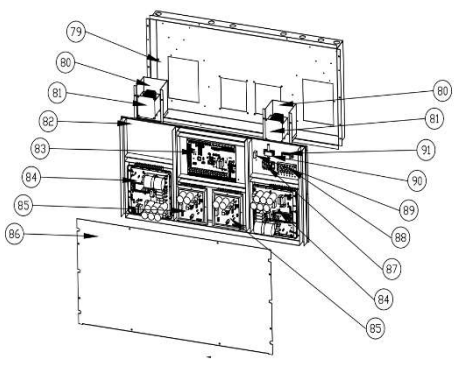
9. Exploded Diagram

9.4 Model: EXC INV 60/EXC INV 90









9. Exploded Diagram

9.5 Spare parts list EXC INV 60

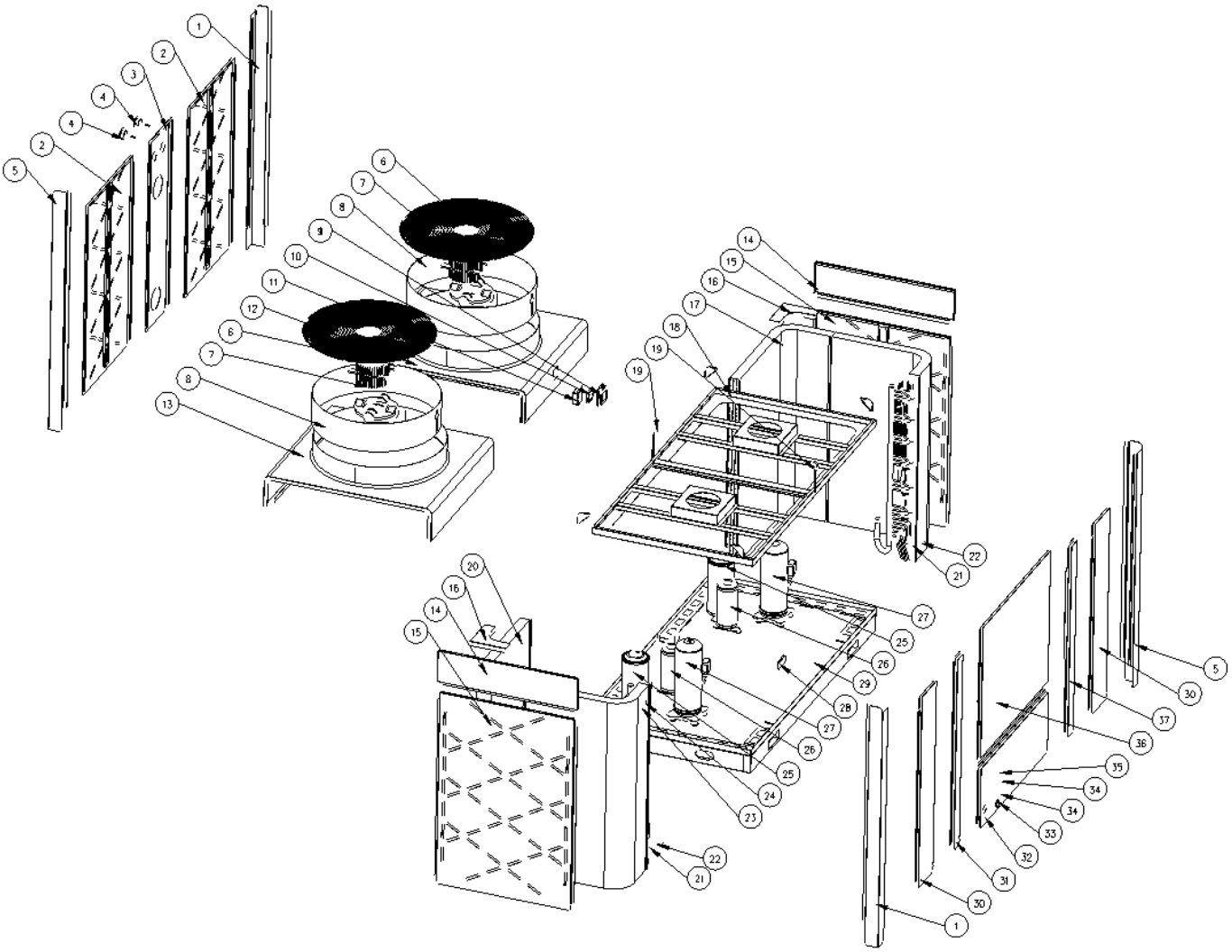
No.	ERP	Name	No.	ERP	Name
1	108930034	Top cover	47	102050057	Water flange
2	108930031	Pillar	48	108930026	Exchanger bracket support
3	108010155	Fan grill	49	117110012	Water inlet temp. sensor TH6
4	108930038	Back panel	50	108930025	Exchanger bracket
5	132000035	Fan blade	51	/	Three-way PVC tube
6	112000092	Fan motor	52	119000077	EEV
7	108930035	Top cover	53	113080141	EEV to distribution piping
8	108930012	Pillar	54	113010468	Discharge pipe
9	106000011	Pressure gauge	55	121000013	Four-way valve coil
10	108930032	Pillar	56	121000041	4 way valve
11	108930037	Side Panel	57	113030181	4-way valve to exchanger
12	108930021	Wind shield	58	113420251	Outlet tube to exchanger
13	108930002	Evaporator pad	59	113420249	Inlet tube to exchanger
14	105000012	3P Vapor liquid separator	60	113420250	Inlet tube to exchanger
15	101000165	Compressor	61	113060186	Tube
16	105000015	Liquid storage tank	62	113010469	Discharge pipe
17	108010107	Needle valve support	63	113190001	Clip
18	120000034	Gas valve	64	117110004	Pipe temp. sensor TH2
19	108930003	Evaporator pad	65	113470011	Tube for four-way valve to
20	108930039	Evaporator stuck board	66	112100030-3	High pressure switch
21	108930004	Evaporator pad	67	113120072	Pipe from storage tank to EEV
22	108930005	Evaporator pad	68	120000003	Filter
23	108930033	Fan motor bracket	69	108930029	Clamp
24	103000392	Evaporator	70	136020032	Rubber block
25	117110020	Ambient temp. sensor TH1	71	113170059	Dehydrator filter pipe
26	133020010	Ambient temp. sensor clip	72	108930028	Tube support
27	117110021	Exhaust temp. sensor TH3	73	112100046-4	Low pressure switch
28	113712007	Waterproof box	74	113020714	Gas return piping
29	117020281	Controller	75	113170060	Dehydrator filter pipe
30	133030011	Waterproof controller box	76	113020715	Gas return piping
31	110000008	Cable connector	77	113060187	Tube
32	108930006	Evaporator pad	78	113130051	Pipe to dehydrator filter
33	108930007	Evaporator pad	79	108930068	Electric box
34	108930030	Base tray	80	108930027	Reactor cover
35	103000393	Evaporator	81	117230002	Reactor
36	108930036	Front panel	82	108930015	Electric box board
37	108930010	Pillar	83	117250018	PCB
38	110000050	Cable connector	84	117140025	Driver board
39	110000048	Cable connector	85	117140024	Fan motor driver board
40	108930020	Maintenance panel	86	108930016	Electric box cover
41	108930019	Maintenance panel	87	115000027	3-ways terminal block
42	108930011	Pillar	88	115000005	5-ways terminal power block
43	102041170	Titanium heat exchanger	89	142000038	Relay
44	117110011	Water outlet temp. sensor TH5	90	108010085	Clip
45	116000092	Water flow switch	91	108010086	Clip
46	/	PVC fixing board			

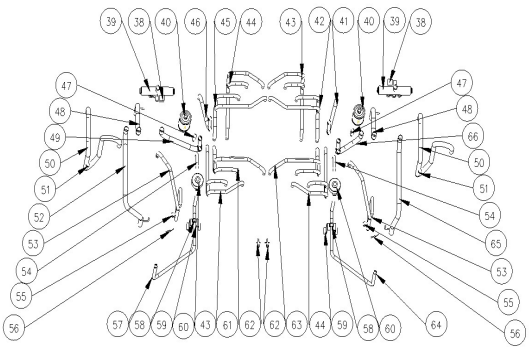
9.6 Spare parts list EXC INV 90

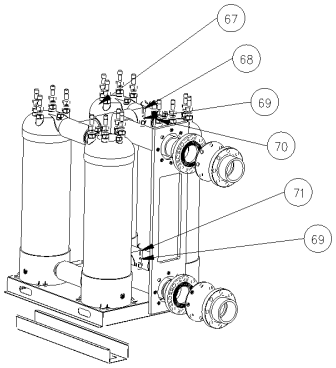
No.	ERP	Name	No.	ERP	Name
1	108930034	Top cover	47	102050057	Water flange
2	108930031	Pillar	48	108930026	Exchanger bracket support
3	108010150	Fan grill	49	117110012	Water inlet temp. sensor TH6
4	108930038	Back panel	50	108930025	Exchanger bracket
5	132000035	Fan blade	51	/	Three-way PVC tube
6	112000092	Fan motor	52	119000072	EEV
7	108930035	Top cover	53	113260003	EEV to distribution piping
8	108930012	Pillar	54	113020612	Discharge pipe
9	106000011	Pressure gauge	55	121000013	Four-way valve coil
10	108930032	Pillar	56	121000041	4 way valve
11	108930037	Side Panel	57	113030181	4-way valve to exchanger
12	108930021	Wind shield	58	113420251	Outlet tube to exchanger
13	108930002	Evaporator pad	59	113420249	Inlet tube to exchanger
14	105000013	Vapor liquid separator	60	113420250	Inlet tube to exchanger
15	101000254	Compressor	61	113060187	Tube
16	105000016	Liquid storage tank	62	113020613	Discharge pipe
17	108010107	Needle valve support	63	113190001	Clip
18	120000034	Gas valve	64	117110004	Pipe temp. sensor TH2
19	108930004	Evaporator pad	65	113470006	Tube for four-way valve to
20	108930039	Evaporator stuck board	66	112100030-3	High pressure switch
21	108930005	Evaporator pad	67	113120052	Pipe from storage tank to EEV
22	108930006	Evaporator pad	68	120000003	Filter
23	108930033	Fan motor bracket	69	108930029	Clamp
24	103000372	Evaporator	70	136020032	Rubber block
25	117110020	Ambient temp. sensor TH1	71	113170060	Dehydrator filter pipe
26	133020010	Ambient temp. sensor clip	72	108930028	Tube support
27	117110021	Exhaust temp. sensor TH3	73	112100046-4	Low pressure switch
28	113712007	Waterproof box	74	113020567	Gas return piping
29	117020281	Controller	75	113170059	Dehydrator filter pipe
30	133030011	Waterproof controller box	76	113020566	Gas return piping
31	110000008	Cable connector	77	113060186	Tube
32	108930007	Evaporator pad	78	113130038	Pipe to dehydrator filter
33	108930003	Evaporator pad	79	108930014	Electric box
34	108930030	Base tray	80	108930027	Reactor cover
35	103000373	Evaporator	81	117230007	Reactor
36	108930036	Front panel	82	108930015	Electric box board
37	108930010	Pillar	83	117250018	PCB
38	110000050	Cable connector	84	117140028	Driver board
39	110000048	Cable connector	85	117140024	Fan motor driver board
40	108930020	Maintenance panel	86	108930016	Electric box cover
41	108930019	Maintenance panel	87	115000027	3-ways terminal block
42	108930011	Pillar	88	115000005	5-ways terminal power block
43	117020355	Titanium heat exchanger	89	142000038	Relay
44	117110011	Water outlet temp. sensor TH5	90	108010085	Clip
45	116000092	Water flow switch	91	108010086	Clip
46	/	PVC fixing board			

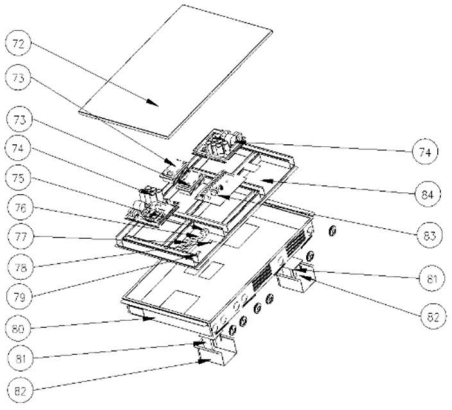
9. Exploded Diagram

9.7 Model: EXC INV 130









9. Exploded Diagram

9.8 Spare parts list EXC INV 130

No.	ERP	Name	No.	ERP	Name
1	180100002	Pillar	43	113170087	1#Dehydrator filter pipe 2
2	180100020	Back panel	44	113170088	1#Dehydrator filter pipe 3
3	180100009	Pillar	45	113030301	1#4-way valve to exchanger 2
4	106000011	Pressure gauge	46	113170086	1#Dehydrator filter pipe 1
5	180100003	Pillar	47	113130053	Pipe to dehydrator filter
6	108010158	Fan grill	48	113160024	Tube for four-way valve to separator
7	112000106	DC Fan motor	49	113030300	1#4-way valve to exchanger 1
8	132000044	Fan blade	50	113020720	Gas return piping
9	113712007	Waterproof box	51	112100046-	Low pressure switch
10	117020281	Controller	52	113060227	1#Tube
11	133030011	Waterproof controller box	53	113010474	Discharge pipe
12	180100014	Top cover 1	54	113120074	Pipe from storage tank to EEV
13	180100015	Top cover 2	55	112100030-	High pressure switch
14	180100010	Wind shield	56	117110004	Pipe temp. sensor TH2
15	180100021	Side Panel	57	113080142	1#EEV to distribution piping
16	180100005	Evaporator stuck board	58	180100004	Tube support
17	103000402	1#Evaporator	59	136020199	Buckle
18	180100006	Fan motor bracket	60	119000078	EEV
19	180100016	Top cover connecting panel	61	113030302	1#4-way valve to exchanger 3
20	103000403	2#Evaporator	62	120000105	Gas valve
21	113190007	Clip	63	113030305	2#4-way valve to exchanger 3
22	117110021	Exhaust temp. sensor TH3	64	113080143	2#EEV to distribution piping
23	117110020	Ambient temp. sensor TH1	65	113060228	2#Tube
24	133020010	Ambient temp. sensor clip	66	113030303	2#4-way valve to exchanger 1
25	105000017	Vapor liquid separator	67	102041193	Titanium heat exchanger
26	105000018	Liquid storage tank	68	117110011	Water outlet temp. sensor TH5
27	101000272	Compressor	69	108010025	Titanium exchanger temperature sensor clip
28	108010107	Needle valve support	70	116000092	Water flow switch
29	180100001	Base tray	71	117110012	Water inlet temp. sensor TH6
30	180100019	Front panel	72	180100013	Electric box cover
31	180100007	Pillar	73	117140037	Fan motor driver board
32	180100017	Maintenance panel	74	117140036	Driver board
33	136020131	Ring	75	142000038	Relay
34	110000048	Cable connector	76	115000027	3-ways terminal block
35	110000036	Cable connector	77	115000069	5-ways terminal power block
36	180100018	Maintenance panel	78	108010085	Clip
37	180100008	Pillar	79	108010086	Clip
38	121000027	Four-way valve coil	80	180100011	Electric box
39	121000042	4 way valve	81	117230007	Reactor
40	120000106	Filter	82	108930057	Reactor cover
41	113170089	2#Dehydrator filter pipe 1	83	117250018	PCB
42	113030304	2#4-way valve to exchanger 2	84	180100012	Electric box board

10. Maintenance

Warning!
-Before any maintenance work on the appliance, you must cut the electricity supply as there is a risk of electric shock which may cause material damage, serious injury or even death.
- It is recommended that the appliance undergo general servicing at least on a yearly basis to ensure its proper operation, maintain performance levels and prevent any possible failures. These operations are carried out at the user's expense, by a qualified technician.
for maintenance to be carried out by a qualified technician.
-For maintenance to be carried out by a qualified technician, please read the safety instructions in the first pages provided in the chapters of maintenance before performing any of the maintenance operations described below.

(1) You should check the water supply system regularly to avoid the air entering the system and occurrence of low water flow, because it would reduce the performance and reliability of HP unit.

(2) Clean your pools and filtration system regularly to avoid the damage of the unit as a result of the dirty of clogged filter.

(3) You should discharge the water from bottom of water pump if HP unit will stop running for a long time (especially during the winter season).

(4) In another way, you should check the unit is water fully before the unit start to run again.

(5) After the unit is conditioned for the winter season, he is preconizing to cover the heat pump with special winter heat pump.

(6) When the unit is running, there is all the time a little water discharge under the unit.

EN GUARANTEE CERTIFICATE 1 GENERAL TERMS

1.1 In accordance with these provisions, the seller guarantees that the product corresponding to this guarantee ("the Product") is in perfect condition at the time of delivery.

1.2 The Guarantee Term for the Product is two (2) years from the time it is delivered to the purchaser.

1.3 In the event of any defect in the Product that is notified by the purchaser to the seller during the Guarantee Term, the seller will be obliged to repair or replace the Product, at his own cost and wherever he deems suitable, unless this is impossible or unreasonable.

1.4 If it is not possible to repair or replace the Product, the purchaser may ask for a proportional reduction in the price or, if the defect is sufficiently significant, the termination of the sales contract.

1.5 The replaced or repaired parts under this guarantee, will not extend the guarantee period of the original Product, but will have a separate guarantee.

1.6 In order for this guarantee to come into effect, the purchaser must provide proof of the date of purchase and delivery of the Product.

1.7 If, after six months from the delivery of the Product to the purchaser, he notifies a defect in the Product, the purchaser must provide proof of the origin and existence of the alleged defect.

1.8 This Guarantee Certificate is issued without prejudice to the rights corresponding to consumers under national regulations.

2 INDIVIDUAL TERMS

2.1 This guarantee covers the products referred to in this manual.

2.2 This Guarantee Certificate will only be applicable in European Union countries.

2.3 For this guarantee to be effective, the purchaser must strictly follow the Manufacturer's instructions included in the documentation provided with the Product, in cases where it is applicable according to the range and model of the Product.

2.4 When a time schedule is specified for the replacement, maintenance or cleaning of certain parts or components of the Product, the guarantee will only be valid if this time schedule has been followed.

3 LIMITATIONS

3.1 This guarantee will only be applicable to sales made to consumers, understanding by "consumer", a person who purchases the Product for purposes not related to his professional activities.

3.2 The normal wear resulting from using the product is not guaranteed. With respect to expendable or consumable parts, components and/or materials, such as batteries, light bulbs, etc. the stipulations in the documentation provided with the Product, will apply.

3.3 The guarantee does not cover those cases when the Product; (I) has been handled incorrectly; (II) has been repaired, serviced or handled by non- authorised people or (III) has been repaired or serviced not using original parts. In cases where the defect of the Product is a result of incorrect installation or start-up, this guarantee will only apply when said installation or start-up is included in the sales contract of the Product and has been conducted by the seller or under his responsibility.