DC INVERTER SWIMMING POOL HEAT PUMP SERIES USER MANUAL

Please read this manual carefully before using and keep it in a safe place.

ECON

Contents

I. Unit Parameters

1. Appearance

2. Statement

To keep users under safe working condition and property safety, please follow the instructions below.

- Wrong operation may result in injury or damage;
- Please install the unit in compliance with local laws, regulations and standards;
- Confirm power voltage and frequency;
- The unit is only used with grounding sockets;
- Independent switch must be offered with the unit.

3. The following safety factors need to be considered:

- Please read the following warnings before installation;
- Be sure to check the details that need attention, including safety factors;
- After reading the installation instructions, be sure to save them for future reference.

⚠ Warning

- Make sure that the unit is installed safely and reliably.

- If the unit is not secure or not installed, it may cause damage. The minimum support weight required for installation is 21g/mm^2.

- If the unit was installed in a closed area or limited space, please consider the size of room and ventilation to prevent suffocation caused by refrigerant leakage.

- Use a specific wire and fasten it to terminal block so that the connection will prevent pressure from being applied to parts.

- Wrong wiring will cause fire.

Please connect power wire accurately according to wiring diagram on the manual to avoid burnout of the unit or fire.

- Be sure to use correct material during installing.

Wrong parts or wrong materials may result in fire, electric shock, or falling of the unit.

- Install on the ground safely, please read installation instructions.

Improper installation may result in fire, electric shock, falling of the unit, or water leaking.

- Use professional tools for doing electrical work.

If power supply capacity is insufficient or circuit is not completed, it may cause fire or electric shock.

- The unit must have grounding device.

If power supply does not have grounding device, be sure not to connect the unit.

- The unit should be only removed and repaired by professional technician.

Improper movement or maintenance of the unit may cause water leakage, electric shock, or fire.

Please find a professional technician to do.

- Don't unplug or plug power during operation.It may cause fire or electric shock.

- Don't touch or operate the unit when your hands are wet. It may cause fire or electric shock.
- Don't place heaters or other electrical appliances near the power wire.It may cause fire or

electric shock.

☐ The water must not be poured directly from the unit. Do not let water to permeate into the electrical components.

4. ⚠ Warning

☐ **Do not install the unit in a location where there may be flammable gas.**

☐ **If there is flammable gas around the unit, it will cause explosion.**

According to the instruction to carry out drainage system and pipeline work. If drainage system or pipeline is defective, water leakage will occur. And it should be disposed immediately to prevent other household products from getting wet and damage.

☐ **Do not clean the unit while power is on. Turn off power before cleaning the unit. If not it may result in injury from a high-speed fan or electric shock.**

☐ **Stop operating the unit once there is a problem or an fault code.**

Please turn off power and stop running the unit. Otherwise it may cause electric shock or fire.

☐ **Be careful when the unit is not packed or not installed.**

Pay attention to sharp edges and fins of heat exchanger.

☐ **After installation or repair, please confirm refrigerant is not leaking.**

If refrigerant is not enough, the unit will not work properly.

☐ **The installation of external unit must be flat and firm.**

Avoid abnormal vibration and noise.

☐ **Don't put your fingers into fan and evaporator.**

High speed running fan will result in serious injury.

☐ **This device is not designed for people who is physically or mentally weak (including children) and who does not have experience and knowledge of heating and cooling system. Unless it is used under direction and supervision of professional technician, or**

has received training on the using of this unit. Children must use it under supervision of an adult to ensure that they use the unit safely. If power wire is damaged, it must be replaced by a professional technician to avoid danger.

II. System Specification

1. Specification

Model		NE-F50SP/R4INV-PA	NE-F70SP/R4INV-PA	NE-F90SP/R4INV-PA
Ambient Temperature: (DB/WB) 27°C/24.3°C; Water Inlet/Outlet Temperature: 26°C/28°C.				
Heating capacity（kW）		1.5～5.5	1.5～7.2	1.8～9.5
Power input （kW）		0.104～0.84	0.106～1.12	0.124～1.46
COP		14.4～6.55	14.2～6.43	14.5～6.5
Boost mode	Heating capacity（kW）	5.5	7.2	9.5
	COP	6.55	6.43	6.5
Smart mode	Heating capacity（kW）	4.5	5.8	7.8
	COP	7.41	7.53	7.52
Silent mode	Heating capacity（kW）	2.1	2.8	3.5
	COP	12.2	12.5	12.2
Ambient Temperature: (DB/WB) 15°C/12°C; Water Inlet Temperature: 26°C.				
Heating capacity（kW）		1.1～3.9	1.3～5.4	1.5～7.9
Power input （kW）		0.138～0.75	0.168～1.102	0.194～1.491
COP		7.97～5.2	7.74～4.9	7.73～5.3
Boost mode	Heating capacity（kW）	3.9	5.4	7.9
	COP	5.2	4.9	5.3
Smart mode	Heating capacity（kW）	3.1	4.3	6.1
	COP	5.92	5.95	5.95

Silent mode	Heating capacity（kW）	2.2	2.4	2.5
	COP	6.95	6.88	6.92
Ambient Temperature: (DB/WB) 35°C/-; Water Inlet/Outlet Temperature: 30°C/28°				
Cooling capacity（kW）		1.5~3.1	1.7~3.8	1.8~4.9
Power input （kW）		0.208~0.704	0.229~0.854	0.242~1.101
EER		7.2~4.4	7.42~4.45	7.44~4.45
Boost Mode	Cooling Capacity (kW)	3.1	3.8	4.9
	EER	4.4	4.45	4.45
Smart Mode	Cooling Capacity (kW)	2.3	2.92	3.5
	EER	5.64	5.63	5.63
Silent Mode	Cooling Capacity (kW)	1.8	2.18	2.4
	EER	6.97	6.97	6.95
Power supply		220-240V/50Hz		
Max power input (KW)		1.31	1.61	1.75
Max current(A)		5.95	7.32	7.95
Heating temperature range		15°C～40°C		
Running temperature range		-10°C～43°C		
Advised swimming pool size		10m³～20m³	15m³～30m³	20m³～40m³
Refrigerant		R32		
Compressor		MITSUBISHI ELECTRIC (DC inverter)		
Air side heat exchanger		Hydrophilic fin exchanger		
Water side heat exchanger		Titanium tube heat exchanger		

Water flow (m³/h)	2.4	3.1	4.1
Water pressure drop (kPa)	15	17	18
Net dimension LxWxH (mm)	880×353×618		
Water pipe Connection(mm)	Inlet	50		
	Outlet	50		
Net weight （kg)	33	37	39
Noise level dB(A)	37～47	38～48	39～49

The technical specification of our heat pumps is provided for information purpose only. We reserve the right to make change without notice in advance.

1. Noise at 1m, 4m and 10m comply with Directives EN ISO 3741 and EN ISO 354

2. Calculate according to an in-ground private swimming pool covered with bubble

Model		NE-F110SP/R4INV-PA	NE-F150SP/R4INV-PA	NE-F180SP/R4INV-PA
Ambient Temperature: (DB/WB) 27°C/24.3°C; Water Inlet/Outlet Temperature: 26°C/28°C.				
Heating capacity（kW)		2.8～11.5	3.5～15.3	4.35～18
Power input （kW)		0.193～1.79	0.243～2.41	0.306～2.83
COP		14.5～6.4	14.4～6.35	14.2～6.36
Boost mode	Heating capacity （kW)	11.5	15.3	18.0
	COP	6.4	6.35	6.36
Smart mode	Heating capacity （kW)	9.1	11.55	14.01
	COP	7.82	7.68	7.5
Silent mode	Heating capacity	5.5	7.35	8.7

	（kW）			
	COP	11.2	10.62	10

Ambient Temperature: (DB/WB) 15°C/12°C; Water Inlet Temperature: 26°C.

Heating capacity （kW）		2.21～8.23	2.95～11.15	3.42～13.33
Power input （kW）		0.283～1.614	0.386～2.226	0.453～2.693
COP		7.81～5.1	7.64～5.01	7.55～4.95
Boost mode	Heating capacity （kW）	8.23	10.86	13.33
	COP	5.1	5.01	4.95
Smart mode	Heating capacity （kW）	6.58	8.65	10.55
	COP	5.73	5.72	5.68
Silent mode	Heating capacity （kW）	4.37	5.55	6.72
	COP	6.57	6.55	6.51

Ambient Temperature: (DB/WB) 35°C/-; Water Inlet/Outlet Temperature: 30°C/28°

Cooling capacity （kW）		2.42~6.3	3.35~7.95	4.11~9.82
Power input （kW）		0.327~1.438	0.452~1.811	0.556~2.278
EER		7.4~4.38	7.41~4.39	7.39~4.31
Boost Mode	Cooling Capacity (kW)	6.3	7.95	9.82
	EER	4.38	4.39	4.31
Smart Mode	Cooling Capacity (kW)	4.89	6.45	7.77
	EER	5.42	5.45	5.36
Silent Mode	Cooling Capacity (kW)	3.12	4.15	4.88
	EER	6.69	6.71	6.55
Power supply		220-240V/50Hz		

Max power input(KW)	2.3		3.2	3.9
Max current(A)	10.5		14.5	17.7
Heating temperature range	15°C～40°C			
Running temperature range	-10°C～43°C			
Advised swimming pool size	25m³～50m³		30m³～60m³	35m³～70m³
Refrigerant	R32			
Compressor	MITSUBISHI ELECTRIC (DC inverter)			
Air side heat exchanger	Hydrophilic fin exchanger			
Water side heat exchanger	Titanium tube heat exchanger			
Water flow(m³/h)	4.9		6.6	7.7
Water pressure drop (kPa)	15		18	23
Net dimension LxWxH (mm)	970×398×662			
Water pipe Connection(mm)	Inlet	50		
	Outlet	50		
Net weight （kg)	44		47	52
Noise level dB(A)	41～51		42～52	43～53

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1. Noise at 1 m, at 4 m and at 10 m in accordance with Directives EN ISO 3741 and EN ISO 354

2. Calculate according to an in-ground private swimming pool covered with bubble

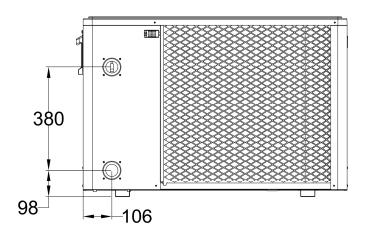| Model		NE-F210SP/R4TINV-PA	NE-F250SP/R4TINV-PA	NE-F280SP/R4TINV-PA
Ambient Temperature: (DB/WB) 27°C/24.3°C; Water Inlet/Outlet Temperature: 26°C/28°C.				
Heating capacity（kW）		4.70~21.1	4.78~25.3	4.95~28.1
Power input （kW）		0.33~3.59	0.33~4.36	0.35~5.1
COP		14.2~5.88	14.48~5.8	14~5.51
Boost mode	Heating capacity（kW）	21.1	25.3	28.1
	COP	5.88	5.8	6.15
Smart mode	Heating capacity（kW）	17.1	20.36	22.61
	COP	7.85	7.38	7.42
Silent mode	Heating capacity（kW）	10.3	12.53	13.91
	COP	10.1	10.8	11.8
Ambient Temperature: (DB/WB) 15°C/12°C; Water Inlet Temperature: 26°C.				
Heating capacity（kW）		3.52~14.07	3.61~16.7	4.05~18.5
Power input （kW）		0.460~2.865	0.476~3.394	0.537~3.737
COP		7.65~4.91	7.58~4.92	7.54~4.95
Boost mode	Heating capacity（kW）	14.07	16.7	18.5
	COP	4.91	4.92	4.95
Smart mode	Heating capacity（kW）	11.13	13.21	14.63
	COP	5.69	5.67	5.72
Silent mode	Heating capacity（kW）	7.09	8.41	9.31
	COP	6.65	6.57	6.51
Ambient Temperature: (DB/WB) 35°C/-; Water Inlet/Outlet Temperature: 30°C/28°				
Cooling capacity（kW）		4.32~10.36	4.52~12.29	4.61~13.61
Power input （kW）		0.586~2.381	0.609~2.799	0.623~3.157
EER		7.37~4.35	7.42~4.39	7.39~4.31
Boost Mode	Cooling Capacity (kW)	10.36	12.29	13.61
	EER	4.35	4.39	4.31
Smart Mode	Cooling Capacity (kW)	8.04	9.53	10.55
	EER	5.26	5.28	5.36
Silent Mode	Cooling Capacity (kW)	5.56	5.88	6.55
	EER	6.55	6.45	6.41
Power supply		380-415V/3Ph/50Hz		
Max power input(KW)		4.1	4.8	5.4
Max current(A)		7.3	8.6	10.2
Heating temperature range		15°C～40°C		
Running temperature range		-10°C～43°C		
Advised swimming pool size		45m³~80m³	55m³~90m³	65m³~100m³
Refrigerant		R32		
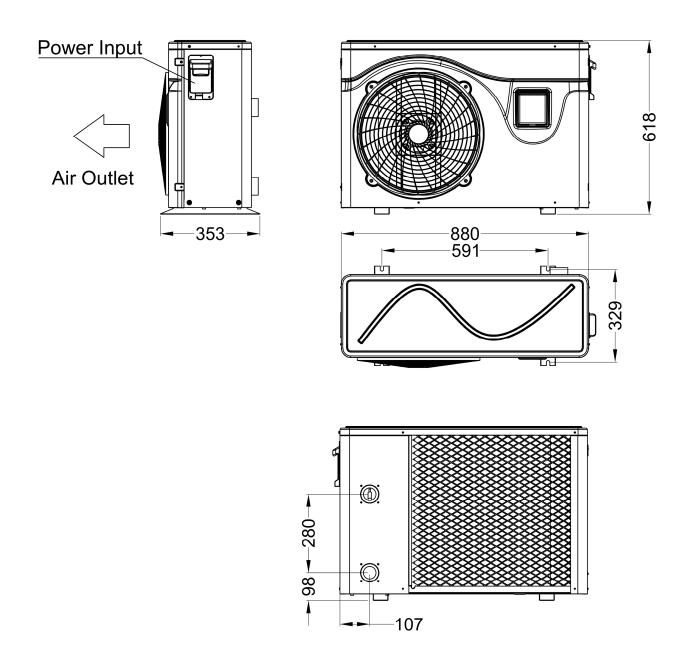
Compressor	MITSUBISHI ELECTRIC (DC inverter)		
Air side heat exchanger	Hydrophilic fin exchanger		
Water side heat exchanger	Titanium tube heat exchanger		
Water flow(m³/h)	9.1	10.8	12
Water pressure drop (kPa)	32	35	38
Net dimension LxWxH (mm)	1100*455*773		
Water pipe connection(mm) Inlet	50		
Water pipe connection(mm) Outlet	50		
Net weight （kg）	75	78	82
Noise level dB(A)	44~55	45~56	47~57

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1. Noise at 1 m, at 4 m and at 10 m in accordance with Directives EN ISO 3741 and EN ISO 354
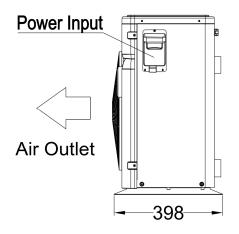
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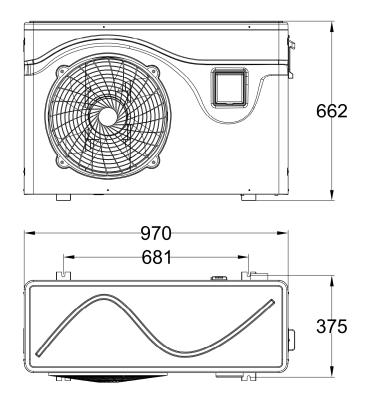
2. Unit Dimensions
Model: NE-F50SP/R4INV-PA , NE-F70SP/R4INV-PA, NE-F90SP/R4INV-PA
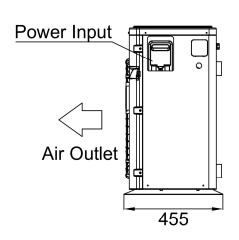
Power Input

Air Outlet

353

618

880

591

329

280

98

107

Model: NE-F110SP/R4INV-PA,   NE-F150SP/R4INV-PA,   NE-F180SP/R4INV-PA

Power Input

Air Outlet

398

662

970

681

375

380

98

106

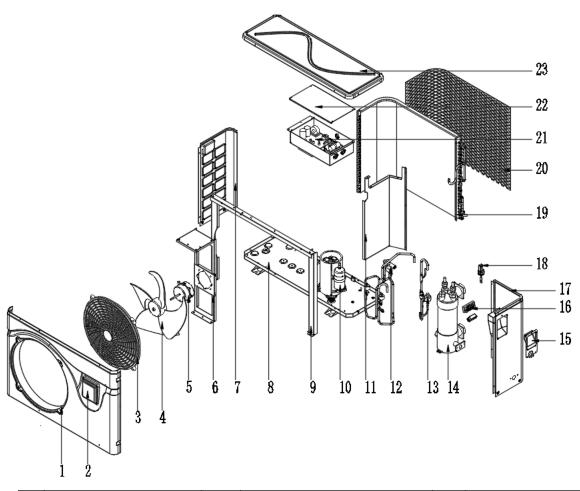Model: NE-F210SP/R4TINV-PA,   NE-F250SP/R4TINV-PA,   NE-F280SP/R4TINV-PA

Power Input

Air Outlet

455

1100

773

223   653

455

470

108

121
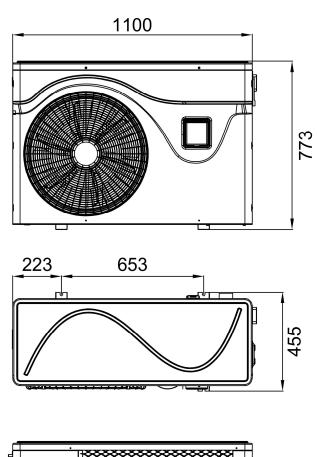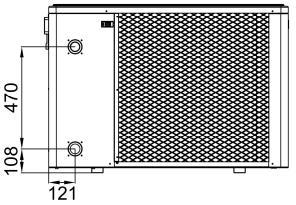
3. **Explosion View**

1	Front plate	9	Framework	17	Right plate
2	Controller box	10	Compressor	18	Water flow switch
3	Fan motor cover	11	Middle plate	19	Evaporator
4	Fan	12	Four-way valve	20	Protection net
5	Motor	13	Throttle valve	21	Inverter PC board
6	Motor support	14	Titanium heat exchanger	22	Electrical box
7	Left plate	15	Handle	23	Top cover
8	Chassis component	16	Cable port		

III. Installation Instructions

WARNING: Installation must be carried out by a qualified engineer.

This section is provided for information purpose only and must be checked and adapted if necessary according to actual installation condition.

1. Pre-Requirements

Needed equipment for installation of heat pump:

Suitable power supply cable for unit's power.

A by-pass kit and an assembly of PVC tube, stripper, PVC adhesive and sandpaper.

A set of wall plug and expansion screw.

We recommend to use flexible PVC pipe in order to reduce transmission of vibration.

Suitable fastening studs may be used to raise unit.

2. Location

Please comply with the following rules about heat pump location choosing.

1. The unit's location must be convenient for operation and maintenance in the future.

2. It must be installed and fixed on flat concrete floor. The floor is stable to support the weight of the unit.

3. A water drainage device must be provided close to the unit in order to protect the area where it is installed.

4. If necessary, mounting pads could be used to support the weight of unit.

5. Confirm the unit is under well-ventilated condition; air outlet port is not facing to the windows of nearby buildings and the outlet air can not be returned. In addition, provide enough space around the unit for repair and maintenance.

6. The unit must not be installed in an area exposed to oil, flammable gases, corrosive products, sulphurous compounds or close to high frequency equipment.

7. To prevent mud splashes, do not install the unit near road or track.

8. To avoid noise to neighbours, please make sure the unit is installed in less noise sensitivity area or good sound isolation area.
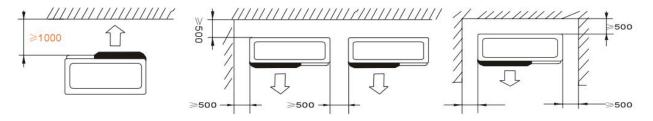
9. Keep the unit as far as possible away from children.
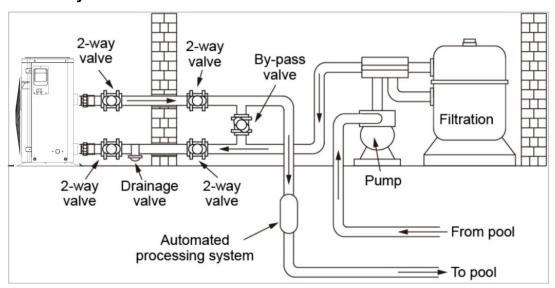
10. Installation space

Unit: mm

Anything could not be placed within at least 1m in front of heat pump.

Leave at least 500mm of empty space around the sides and rear of heat pump.

Do not put any stuff on or in front of heat pump!
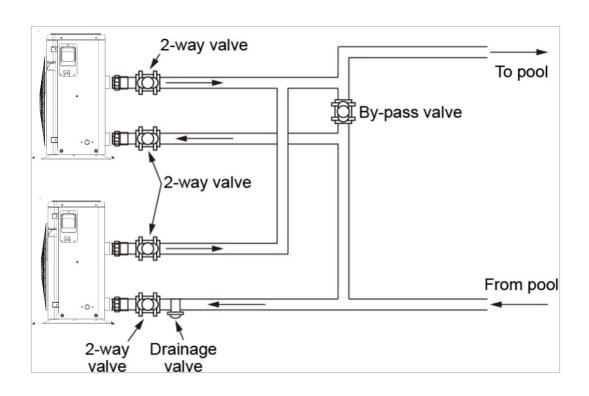
3. Installation Layout

The heat pump is connected to a filtration circuit with a by-pass valve. The by-pass valve should be half-opened (throttled), while all the other valves should be completely opened. We suggest to half open by-pass valve to avoid excessive pressure on heat pump.

It is imperative that by-pass is placed after water pump and filtration. By-pass path usually consists of 3 valves. That makes it possible to adjust water flow which passes through heat pump and isolates heat pump completely from any maintenance without affecting flow of filtration cycle.

The filter must be cleaned regularly to ensure that water in the system is clean and avoid blocking of filter. It is necessary that drainage valve is fixed on the lower water pipe. If the unit is not running during winter months, please disconnect power supply and let out drain water from unit through drainage valve. If ambient temperature of running unit is below 0℃, please keep water pump running.
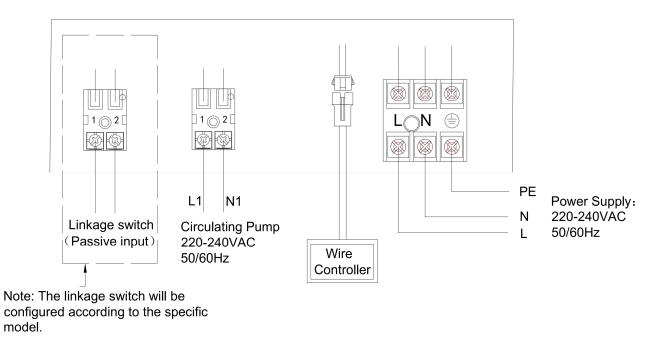
4. Parallel Installation for 2 Units

5. Electrical Connection

| Model	Power Supply Wires		
	Electricity Supply	Cable Diameter	Specification
NE-F50SP/R4INV-PA	220-240V/50Hz	3×2.5mm	AWG 14
NE-F70SP/R4INV-PA		3×2.5mm	AWG 14
NE-F90SP/R4INV-PA		3×2.5mm	AWG 14
NE-F110SP/R4INV-PA		3×2.5mm	AWG 14
NE-F150SP/R4INV-PA		3×2.5mm	AWG 14
NE-F180SP/R4INV-PA		3×4.0mm	AWG 12
NE-F210SP/R4TINV-PA	380-415V/3Ph/50Hz	3×4.0mm	AWG 12
NE-F250SP/R4TINV-PA		3×4.0mm	AWG 12
NE-F280SP/R4TINV-PA		3×4.0mm	AWG 12
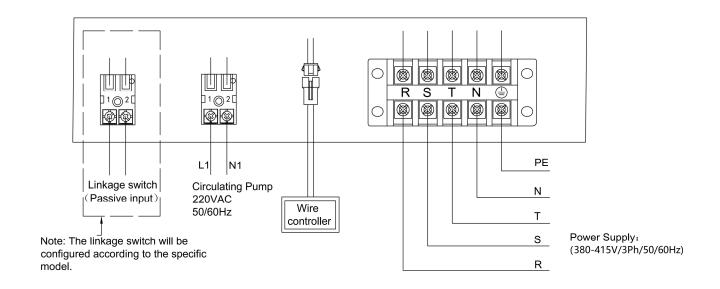
⚠ **WARNING: Power supply of heat pump must be disconnected before any operation.**

 Please comply with the following instruction to connect heat pump.

 Step 1: Detach electrical side panel by a screwdriver to access electrical terminal block.

 Step 2: Insert cable into heat pump unit port.

 Step 3: Connect power supply cable to terminal block according to the diagram below.

NE-F50SP/R4INV-PA, NE-F70SP/R4INV-PA, NE-F90SP/R4INV-PA, NE-F110SP/R4INV-PA,

NE-F150SP/R4INV-PA, NE-F180SP/R4INV-PA

Linkage switch
（Passive input）

Circulating Pump
220-240VAC
50/60Hz

L1 N1

Wire
Controller

L N

PE

Power Supply：
N   220-240VAC
L   50/60Hz

Note: The linkage switch will be
configured according to the specific
model.

NE-F210SP/R4TINV-PA, NE-F250SP/R4TINV-PA, NE-F280SP/R4TINV-PA

Linkage switch
（Passive input）

Circulating Pump
220VAC
50/60Hz

L1 N1

Wire
controller

R S T N

PE

N

T

S   Power Supply：
(380-415V/3Ph/50/60Hz)
R

Note: The linkage switch will be
configured according to the specific
model.

IV. Running Test

1. Inspection Before Running Test

a. Running test can begin after completing all installation;

b. Before running test, confirm below items and write √ in block;

- ⬜ Correct unit installation □
- ⬜ Power supply voltage is the same as unit rated voltage □
- ⬜ Correct piping and wiring □
- ⬜ Air inlet & outlet port of unit is unblocked □
- ⬜ Drainage and venting is unblocked and no water leaking □
- ⬜ Leakage protector is working □
- ⬜ Piping insulation is working □
- ⬜ Ground wire is connected correctly □

c. All wiring and piping should be connected well and carefully checked, then fill water tank with water before power is switched on;

d. Emptying all air within pipes and water tank, press "on-off" button on control panel to run the unit at setting temperature;

e. Items need to be checked during running test:

- ⬜ During the first running, unit current is normal or not;
- ⬜ Each function button on control panel is normal or not;
- ⬜ Display screen is normal or not;
- ⬜ Are there any leakage in the whole heating circulation system;
- ⬜ Condensate drain is normal or not;
- ⬜ Are there any abnormal sound or vibration during running?

2. Control Function Description

2.1 Operation Description

 Control Panel Diagram

 Basic Icons

1. When in heating mode, icon shows ;

2. When in Cooling mode, icon shows ;

3. When in defrosting mode, twinkling icon shows 。

   When off status, the display shows the current time

 Key Operating Instruction

1) " " **On/Off Key:**

    When in other interface, press shortly, will go back to the homepage.

    In the homepage, press this key to turn on/off

    In the homepage, press this key for 5 seconds to set the timers, when 'hour' is flashing, you

    can set hour of "Timer on", the corresponding icon of "Timer on" flashes, press " , " to

set hour. Then, press key " " shortly to set minute of "Timer on", press " , " to set minute. After finishing setting, press key "Mode"to set hour of "Timer off", the corresponding icon of "Timer off" flashes, press " , " to change the value. After setting finished, press key " " shortly to set minute of "Timer off", press " , " to set minute. After setting, press key " " and return to the homepage, if the relative light is on, it means that the corresponding timer is set successfully.

Timer Cancel

 When the "Timer on"and "Timer off" is the same, timer will be canceled.

 At the interface of setting "Timer on" or "Timer off", press key " " for 5seconds, "Timer on"or "Timer off" can be canceled individually.

 When the relative light is off, it means this timer is canceled.

2) " " Mode Key：

 When the heat pump is on, pressing this key shortly can shift different modes: heating mode, cooling mode.

 When the heat pump is off, press this key shortly to set the time, 4 nixie tubes are twinkling, at this time, press key " " shortly to set the hour, press key " , "to change the hour. Then press key " " shortly again to set the minute. When finishing, press key " "to return to the homepage.

3) " "Plus Key

 When the heat pump is on, in the homepage, press this key to increase the target temperature.

 When it's in manual frequency mode, in the home page, press this key to increase the target frequency.

4) " "Minus Key

 When the heat pump is on, in the homepage, press this key to decrease the target temperature.

When it's in manual frequency mode, in the home page, press this key to decrease the target frequency.

5) " " **"POWERFUL" Key**

—When the heat pump is on, press this key shortly to enter into powerful mode.

6) " " **"SMART" Key**

 When the heat pump is on, press this key shortly to enter into smart mode

7) " " **"SILENT" Key**

 When the heat pump is on, press this key to enter into silent mode

 Long press key " " for 5 seconds, and enter into the unit parameter inquiry interface, press key " , " to check the parameters, press key " "to exit parameter query.

Code	Description	Display Range
01	Water inlet temp.	-30~99℃
02	Water outlet temp.	-30~99℃
03	Ambient temp.	-30~99℃
04	Exhaust temp.	0~125℃
05	Suction temp.	-30~99℃
06	Outer coil temp.	-30~99℃
07	Inner coil temp.	-30~99℃
08	Main EEV opening	0-480
09	EVI EEV opening	0-480
10(A)	Compressor current	
11(B)	Radiator temp.	
12(C)	DC bus voltage	
13(D)	Compressor actual rotate speed	
14(E)	DC fan motor 1 actual rotate speed	
15(F)	DC fan motor 2 actual rotate speed	

8) Enforced Defrosting

 When the conditions of entering enforced defrosting are met, press"⬆"and"⬇"at the same time for 5 seconds, then it enter into enforced defrosting mode.

 When entering into defrosting, heating mode icon" ⬤☀ "appears. When exiting from defrosting, mode icon recover to normal display.

9) Manual Electric Heating

 In the main interface, press "⏻" and" 🌙 "simultaneously for 5 seconds to manually turn on/off electric heating.

10) Recover to Factory Default

 By button operation: After entering into user parameters mode, the current parameter is return temperature, press keys" 🌙 "+" 🔁 "at the same time for 5 seconds and wired controller recovers to factory default. At this time, buzzer will alarm twice continuously, and all parameters recover to factory default.

11) System parameter setting

 Long Press "⏻" + "M" for 5 seconds to enter the password entry state, press the "⬆" or "⬇" to input password . Press "M" again to switch the password bit. After entering the last password, press" M" to confirm the password. Inputting the password "0814" to enter the system parameter setting .

 Enter the password "8866", enter the frequency check state. The original "hour" shows "target frequency", and the original "minute" shows "operation frequency".

2.2   System Parameter:

Code	Parameter Name	Set Range	Factory Setting
1	Return Difference for Target Water Temp.	1~18℃(2~36℉)	1℃(2℉)
2	Set Temp. in Cooling Mode	8℃~35℃(46~95℉)	27℃(81℉)
3	Set Temp. in Heating Mode	5℃~40℃(41~104℉)	27℃(81℉)
4	Compensation Value of Inlet Water Temp.	-5℃~15℃(-9~30℉)	0℃(0℉)
5	Defrosting Cycle	20MIN~90MIN	45MIN
6	Defrosting Start Temp.	-9℃~-1℃(16~30℉)	-3℃(27℉)
7	Defrosting Time	5MIN~20MIN	8MIN
8	Temp.to Exit Defrosting	1℃~40℃(33~104℉)	15℃(59℉)
9	Difference between Ambient Temp. and Coil Temp. to Start Defrosting	0℃~15℃(0~30℉)	5℃(10℉)
10	Ambient Temp.to Start Defrosting	0℃~20℃(32~68℉)	17℃(63℉)
11	Working Cycle of EEV	20S~90S	25S
12	Degree of Superheat in Smart/ Powerful Mode	-5℃~10℃(-9~20℉)	Depends on Actual Model
13	Exhaust Temp. for Modifying EEV	70℃~125℃(158~257℉)	95℃(203℉)
14	Opening of EEV during Defrosting (Set Value*10=Actual Steps)	2~45	Depends on Actual Model
15	Min. Steps of EEV (Set Value*10=Actual Steps)	5~15	10
16	Working Mode of EEV	0 Manual/1 Auto	1
17	Manual Steps of EEV (Set Value*10=Actual Steps)	2~45	35

18	Superheat Degree in Cooling Mode	-5℃~10℃(-9~20℉)	Depends on Actual Model
19	Reserved	/	/
20	Working Mode of EEV for Cooling	0=Water Temperature 1=Supercooling	0
21	Working Mode of Water Pump When Reaching Target Temperature Reached	1= Non Stop/2= Stop 3=Intermittent	3
22	Working Mode of Fan	0=Auto/ 1= Manual	0
23	Manual Control Speed of Fan (Set Value*10=Actual Speed)	0-99 (Set Value*10=Actual Speed)	80(Set Value*10=Actual Speed)
24	Ambient Temp. to Start Auxiliary Electric Heater	-20℃~20℃	0℃（32℉）
25	Auxiliary Heating Function in Defrosting　Mode	0: No 1: Yes	1
26	Low temperature protection value	-20℃~0℃(-22~32℉)	-20℃（-4℉）

Note: In the above table, the actual value of the electronic expansion valve and the air speed is 10 times of the parameter displayed value. For example, when the P20 defrost expansion valve opening degree shows 30, the actual value at this time is 300 steps. When P30 fan manual rotation speed shows 80, the actual value at this time is 800.

When the parameter value is ≤ -20, the display bit is not enough, only the value will be displayed, and the "-" sign is omitted. If the parameter code 26 is-20, the display will be 2620.

Frequency parameter

Code	Name	Range	Initial
F1	Frequency set_1	20~120Hz	
F2	Frequency set_2	20~120Hz	
F3	Frequency set_3	20~120Hz	
F4	Frequency set_4	20~120Hz	
F5	Frequency set_5	20~120Hz	
F6	Frequency set_6	20~120Hz	

F7	Frequency set_7	20~120Hz	
F8	Frequency set_8	20~120Hz	
F9	Frequency set_9	20~120Hz	
10	Frequency set_10	20~120Hz	
11	Frequency set_11	20~120Hz	
12	Frequency set_12	20~120Hz	
13	Frequency set_13	20~120Hz	
14	Frequency set_14	20~120Hz	
15	Frequency set_15	20~120Hz	
16	Frequency set_16	20~120Hz	
17	Frequency set_17	20~120Hz	
18	Frequency set_18	20~120Hz	
19	DC fan speed_1	0~99 (*10)	According to the actual model
20	DC fan speed_2	0~99 (*10)	According to the actual model
21	DC fan speed_3	0~99 (*10)	According to the actual model
22	DC fan speed_4	0~99 (*10)	According to the actual model
23	DC fan speed_5	0~99 (*10)	According to the actual model
24	DC fan speed_6	0~99 (*10)	According to the actual model
25	Silent mode superheat	-5~10℃	According to the actual model
26	Model selection	0:Heating & Cooling 1:Heating ONLY 2:Cooling ONLY	0
27	Constant temp. superheat	-5~10℃	According to the actual model
B	Exhaust temp. set_F11	50~125℃	95℃(203℉) According to the actual model
C	Exhaust temp. set_F12	50~125℃	100℃(212℉) According to the actual model
D	Exhaust temp. set_F13	50~125℃	105℃(221℉) According to the actual model
E	Exhaust temp. set_F14	50~125℃	110℃(230℉) According to the actual model
F	Exhaust temp. set_F15	80~125℃	115℃(239℉) According to the actual model

In the above table, when the serial number reaches F10, the serial number only shows the number, that is, 10. For example, 1080 is displayed as F10 in the query of parameter.

2.3 Trouble shooting

system protection/ error indication

Error code	Error description	Solutions
Er 03	Water flow protection	Check water flow /switch, change the switch if necessary
Er 04	Winter anti-freezing	Water pump will run automatically for first grade antifreeze

Er 05	High pressure Protection	Measure the pressure value when heat pump is heating(cooling), if it's higher than 44.0 bar, it means heat pump has got really higher pressure protection: 1. Detect EEV step, low pressure and suction temp; 2. Detect the inlet/outlet water temp,; 3. Maybe there is some air in the refrigeration system; 4.Clean the water exchanger or water filter
Er 09	Communication failure between Display and PCB	1. Check if the communication connection wire between display and PCB is well . Change or mend the wire if necessary . 2. Check the PCB or display. If damaged, Change the corresponding part .
Er 10	Communication failure of frequency conversion module(alarm when communication between display and PCB is good)	Change PCB.
Er 12	High exhaust temp protection	1. Replace the compressor exhaust temperature sensor. 2. Reconnect or clean compressor exhaust temperature sensor and wrap it with insulation tape. 3.Replace the controller or PC Board.
Er 15	Water inlet temperature failure	Check the connection, change the sensor if necessary
Er 16	External coil temperature failure	Check the connection, change the sensor if necessary

Er 18	Exhaust temperature failure	Check the connection, change the sensor if necessary
Er 19	DC fan motor failure	1. Check DC fan motor. Change it if damaged. 2. Check output port of DC fan motor on PCB. Change the PCB if there is no output.
Er 20	Abnormal protection of frequency conversion module	Solve it according to the subsidiary error codes in the following table.
Er 21	Ambient temperature failure	Check the connection, change the sensor if necessary
Er 22	DC fan 2 failure	Check the connection, change the sensor if necessary
Er 23	Low outlet water temp protection when cooling	Check the water flow and water system,mend it if necessary
Er 27	Water outlet temperature failure	Check the connection, change the sensor if necessary
Er 28	CT over current protection	
Er 29	Suction temperature failure	Check the connection, change the sensor if necessary
Er 32	High outlet water temperature protection when heating	Check the water flow and water system,mend it if necessary
Er 33	High temp. protection of external coil	
Er 42	Internal coil temperature failure	Check the connection, change the sensor if necessary

E20 fault will display the following error codes at the same time, the error codes will switch every 3 seconds. Among them, error codes 1-128 appear in priority. When error codes 1-128 don't appear, then it will show error codes 257-384 . If two or more error codes appear at the same time, then display error codes accumulation. For example, 16 and 32 occur at the same time, it will show 48.

Error Code	Name	Description	Solution suggestion
1	IPM over-current	There is something wrong with IPM module	Replace inverter module
2	Compressor synchronization is abnormal	Compressor failure	Replace compressor
4	reserved	--	--
8	Compressor output phase absence	Compressor wiring is disconnected or the connection is poor	Check compressor input wiring
16	Low DC bus voltage	Input voltage is too low , PFC module failure,	Check the input voltage, replace inverter module
32	High DC bus voltage	Input voltage is too high, PFC Module failure	Replace inverter module
64	Radiator over temperature	Fan motor failure, air duct blockage	Check fan motor, air duct
128	Radiator temperature failure	Radiator sensor is damaged	Replace inverter module
257	Communication failure	Inverter module doesn't receive message from main controller	Check the connection between main controller and inverter module
258	AC Input phase absence	Input phase is absent (Three phase module is effective)	Check input circuit
260	AC Input over-current	Input three phase imbalance (three phase module is effective)	Check input three-phase voltage
264	Low voltage of AC Input	Input voltage is too low	Check input voltage
272	High pressure protection	Reserved	

288	IPM over-temperature protection	Fan motor failure, air duct blocked	Check fan motor and air duct
320	High compressor peak current	1.Compressor current is too high. 2.The driver program doesn't match with compressor	Replace inverter module
384	PFC module over-temperature	Temperature of PFC Module is too high	

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

Malfunctions	Observation	Reasons	Solution
Heat pump is not running	LED wire controller shows nothing	No power supply	Check whether cable and circuit breaker are 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 set value, heat pump under constant temperature status 2. Heat pump just starts to run 3. Under defrosting	1. Verify water temperature setting 2. Startup heat pump after a few minutes 3. LED wire controller should display "Defrosting"

Water temperature is cooling when heat pump runs under heating mode	LED wire controller displays actual water temperature and no error code displays	1. Chose the wrong mode 2. Figures show defects 3. Controller defect	1. Adjust the mode 2. Replace the defect LED wire controller, and then check the status after changing the running mode, verifying the water inlet and outlet temperature 3. Replace or repair the heat pump
Short running	LED displays actual water temperature, no error code displays	1. Fan NOT running 2. Not enough air ventilation 3.Not enough refrigerant	1. Check the cable connections between the motor and fan, if necessary, they should be replaced 2. Check the location of the heat pump, and eliminate all obstacles to assure a good air ventilation 3 Replace or repair the heat pump
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 shows any defects
Too much ice on evaporator	Too much ice on evaporator		1. Check the location of heat pump, and eliminate all obstacles to assure a good air ventilation 2. Replace or repair the heat pump

V. Maintenance

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

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

(3) Discharge the water from the bottom of the water pump if the heat pump will stop running for a long time (specially in winter).

(4) On any other moment, check the water flow to confirm there is enough water before the unit starts to run again.

(5) After the unit is conditioned in winter, it is preferred to cover the unit with the special winter heat pump cover.

VI. Wi-Fi Module and APP User Manual

1. Display

" "Network distribution button: long press 3S to enter the default network distribution mode;After powering on for 10 seconds, you can press the button for 5 consecutive seconds within 5 seconds to enter the compatible network mode.

" " power indication: when power is on, " " corresponds to the lower indicator light;

" " WIFI status: After WIFI is connected, " " corresponding to the lower indicator light is always on;

" " communication instructions: when entering the default distribution network, " " flashes quickly corresponding to the lower indicator;
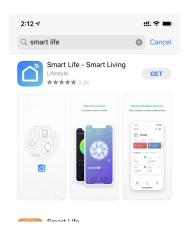
When entering compatible distribution network, " " flashes slowly corresponding to the lower indicator light;

After the distribution network connection is successful, the corresponding indicator light below " " represents the main control power on and off status.

2. Wi-Fi Function

2.1 Software Installation

Method 1: Search"Smart life" in your APP store ,install " ".Click "GET" to install.

 Method 2: Scan the QR code below.

2.2   Software startup

 After installation,click " " on your desktop to start up Smart Life.
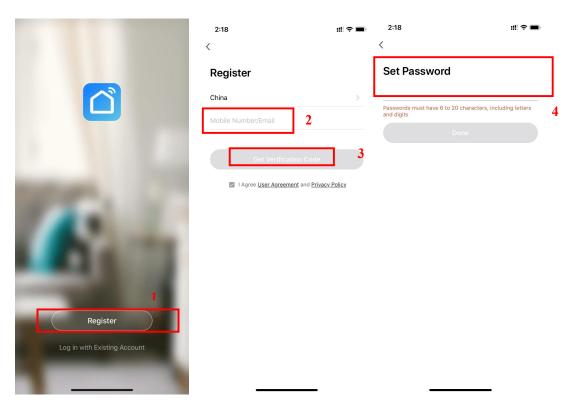
Smart Life
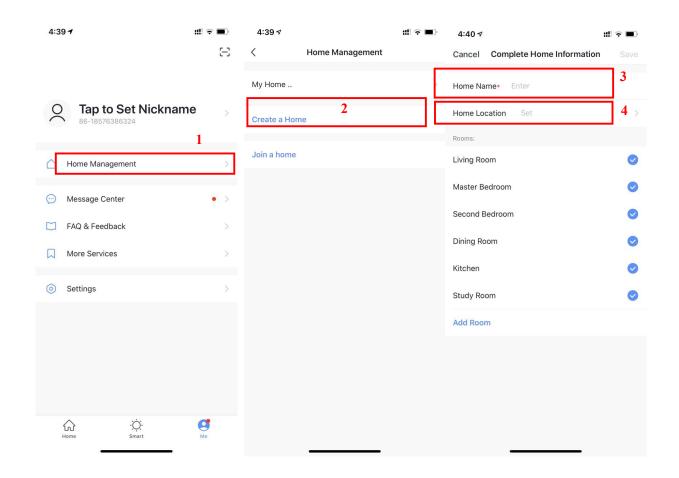
2.3   Software registration and configuration

2.3.1   Registration

 Users don't have account can click "Register" to create an account:Register $\longrightarrow$ Enter your phone number $\longrightarrow$ Get Verification Code $\longrightarrow$ Enter Verification Code $\longrightarrow$ Set Code,
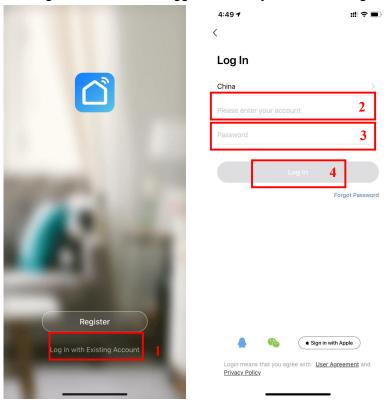
⬜   After registration, you need to Create a Home:Create a Home ⟶ Set Home Name ⟶ Set Home Location ⟶ Add Rooms.
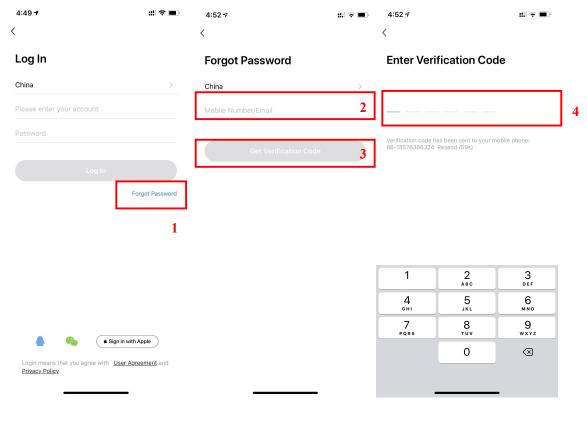
2.3.2   Account ID+ Password Login
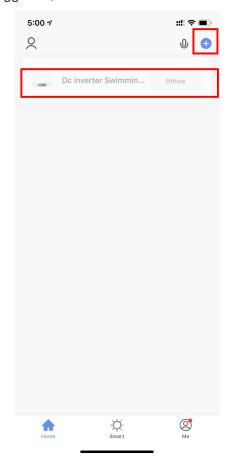
 Existing accounts can be logged in directly, in the following order.

If you forget your password you can choose to login with your verification code and select "Forget Password" ：Enter your phone number ⟶ Get verification code .

🗆 After creating a home or logged in,enter the main interface of APP.

Note：

Click the device to check the status，and you can set the operating mode，ON/OFF, timer.

Click "＋" to add devices.

2.3.3 WIFI Module configuration steps：
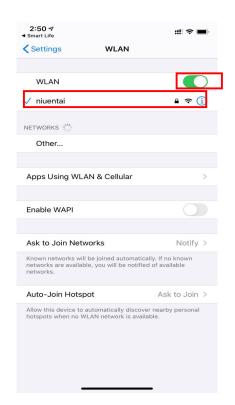
🗆 **Method 1(**Intelligent distribution network mode**)：**

🗆 **Step 1：**

🗆 When power is on, if there is no distribution network, it will automatically connect through the default distribution network by default.At this moment,the indicator light under " 🔄 " flashes rapidly(2 times per second),mobile phone can connect it.

🗆 Manually enter the intelligent distribution network mode:10s after power on,long press on " 🔄 " for 3s to enter the intelligent distribution network mode,the indicator light under " 🔄 " flashes rapidly(2 times per second),mobile phone can connect it.

🗆 **Step 2：**

🗆 Turn on the phone's WIFI function and connect to the WIFI hotspot. The WIFI hotspot must be able to connect to the Internet normally；

 Step 3：
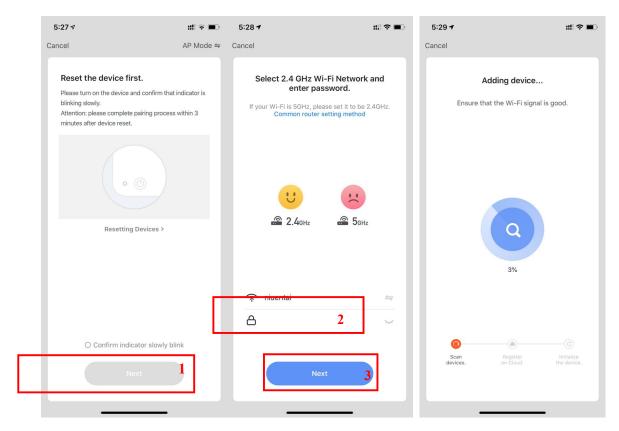
 Open the "smart life" APP, log in into the main interface, click on the top right corner "✚" or "add equipment" of the interface, enter the equipment type selection, the "Large Home Appliances" ,select "Smart Heat Pump" equipment and add equipment into the interface.

 Step 4：
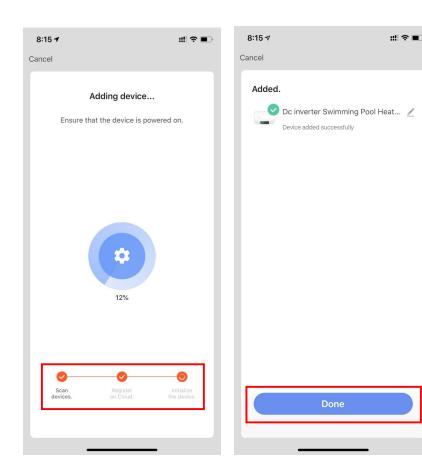
 After selecting **"Smart Heat Pump"**, enter the interface of "Add Equipment", and confirm

that the line controller has selected the intelligent network distribution mode. After the

indicator light under "⊗" flashes rapidly , click" Confirm indicator rapidly blink ".

- Enter the WIFI connection interface, enter the WIFI password of the mobile phone (it must be the same as the WIFI of the mobile phone), click "Next", and then directly enter the connected state of the device

- **Step 5：**
  - When "Scan devices","Register on Cloud","Initialize the device" are all completed,connection succeed.
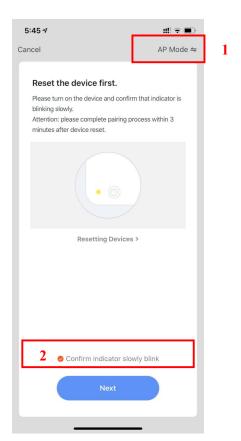
- **Method 2**（Compatible with network configuration mode）：

  - **Step 1**
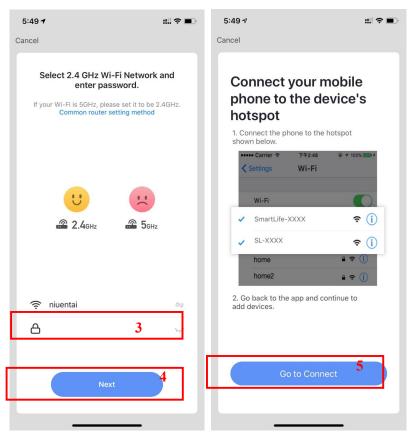
    - Manually enter compatible network mode:10s after power on,click " ⟳ " 5 times within 5s to enter compatible with network configuration mode.The indicator under " ⬦ " flashes slowly(1 time every 3s),mobile phone can connect it；

  - **Step 2&3 are the same** with intelligent distribution network **above.**

  - **Step 4：**
    - After entering the add device interface, click "AP Mode" in the upper right corner; Enter the AP mode to add the device interface, confirm that the compatible network distribution mode has been selected (" ⬦ "icon flashes), and click"Confirm indicator rapidly blink".
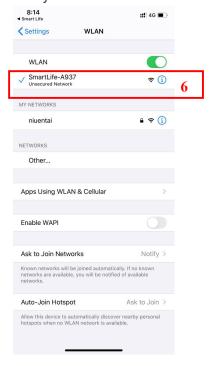
☐ The interface of WiFi connection will pop up, enter the WiFi password of the mobile phone (it must be the same as the WiFi of the mobile phone), click "Next", "Connect your mobile phone to the device's hotspot" will pop up,　and click "Go to Connect".；

Enter the mobile phone WiFi connection interface, find the "SmartLife_XXXX" connection, and the APP will automatically enter the device connection state.
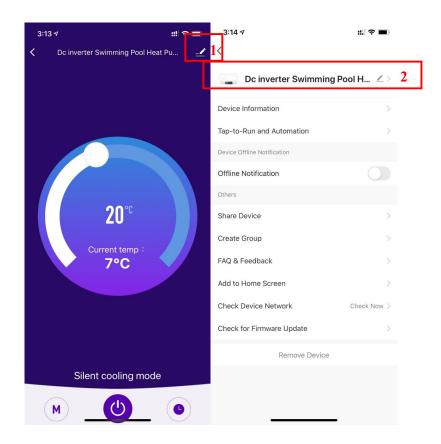

 Step 5 is the same with intelligent distribution network **above.**
  Note：If the connection is failed, please enter the compatible network mode manually and reconnect according to the above steps.

2.4 Software function operation

 After the device is bound successfully,enter the operation interface of "Smart heat pump"(Device name, modifiable)
 In the main interface of "Smart Life",click "Smart heat pump" to enter the operation interface.
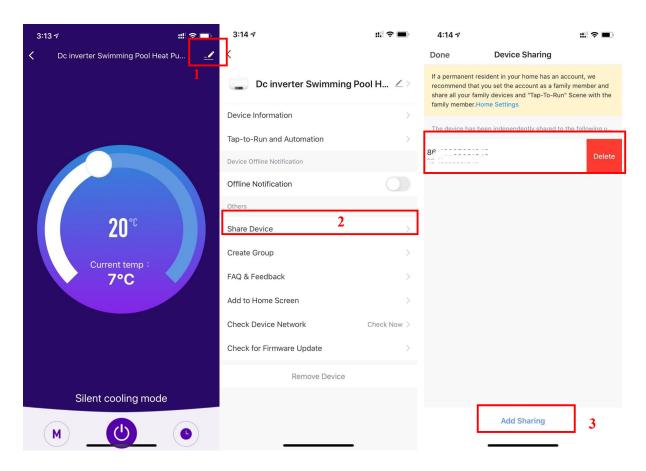
1. Back
2. More: You can change device name, select device installation location, check networking status, add Shared users, create device cluster, view device information, and more.
3. Setting temperature adjustment: The white circle slides counterclockwise to reduce the temperature, but clockwise to increase the temperature.
4. Target temperature
5. Current temperature
6. Mode switching: Click to select the mode to be switched.
7. ON/OFF
8. Timing: Click to add timing off/on time.
   - Modify device name
      - Click in the following order to enter device details , and click "Device Name" to rename the device.
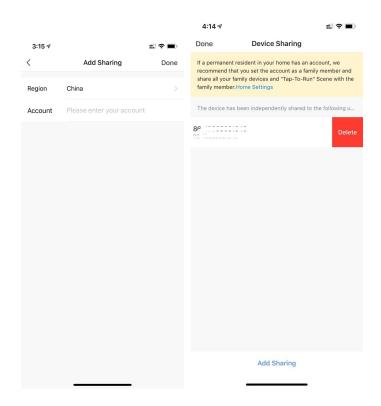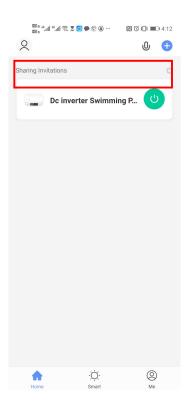
⬜ **Device sharing**

⬜ To share a bound device, the user should do so in the following order.

⬜ After successful sharing, the list will be added to show the person Shared

⬜ **If you want to delete the account you shared to,** cross the selected account to the left,and delete it.

⬜ The user interface is as follows

　　Enter the account of the Shared, click "Done", and the share success list shows the newly added account of the Shared.
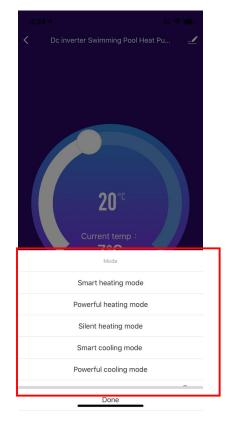
The interface of the person to be Shared is as follows. The received shared device is displayed. Click it to operate and control the device.

 Mode settings

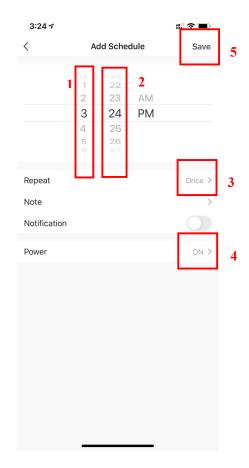 click" " on the main interface to switch modes,select what you need.

timer setting

 Click " " on the main interface to enter timer setting interface，as shown below,click to add timer.

 After entering timer setting,swipe up/down to set timer,set up repeat weeks and on/off,then click "save" to save your settings as follows.

①   Hours
②   Minutes
③   Set the repetition
④   Set power ON/OFF
⑤   Save your modification

2.5   Device removal

     By Wi-Fi module

         When you need to remove the device, long press on" " for 3s to removed the device and enter intelligent distribution mode again. The indicator light under" " flashes rapidly for 3min，The network can be rematched ,or quit it if no operation within 3 minutes.

     By APP

         Click " " on the top right corner of the main interface to enter the device details interface, and click "device removal" to enter intelligent distribution mode. Indicator light under" " flashes rapidly for 3min，The network can be reconfigured within 3 minutes, and the network can be quit if it is not connected within 3 minutes. The specific operations are shown as follows.