Technical Manual of PC8001 V1.0

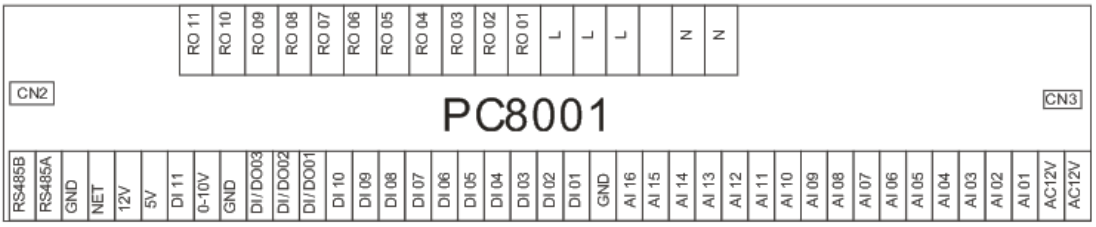
Project description	**Controller info** **1.Controller: 35005-310196 V1.4** **2.Wire controller: 35005-310198 V1.2**
Document version	
First edition	
Last edition	

Change history

Version	Date	Author	Description
V1.0	**2017-3-21**		

1. PCB I/O Ports description

APPENDIX1. Connection of PCB illustration



Connections explanation

NO.	Symbol	Meaning	NO.	Symbol	Meaning
1	L	Live line	27	DI11	System protection signal
2	N	Null line	28	AI 01	Water input temperature input
3	RO 01	Compressor 1 output(220VAC)	29	AI 02	Water output temperature output
4	RO 02	Compressor 2 output(220VAC)	30	AI 03	System 1 fan coil temperature input
5	RO 03	Compressor 3 output(220VAC)	31	AI 04	System 2 fan coil temperature input
6	RO 04	Compressor 4 output(220VAC)	32	AI 05	System 3 fan coil temperature input
7	RO 05	High speed /souce pump output(220VAC)	33	AI 06	System 4 fan coil temperature input
8	RO 06	Low speed output (220VAC)	34	AI 07	Ambient temperature input
9	RO 07	Water pump output(220VAC)	35	AI 08	System 1 antifreeze temperature input
10	RO 08	4-way valve output(220VAC)	36	AI 09	System 2 antifreeze temperature input
11	RO 09	Electric heater output(250VAC)	37	AI 10	System 3 antifreeze temperature input
12	RO 10	Spray valve output(220VAC)	38	AI 11	System 4 antifreeze temperature input
13	RO 11	Alarm system output(220VAC)	39	AI 12	System 1 suction temperature input
14	DI/DO 1	Emergency switch output	40	AI 13	System 2 suction temperature input
15	DI/DO 2	Mode indicator output	41	AI 14	System 3 suction temperature input
16	DI/DO 3	Emergency switch input	42	AI 15	System 4 suction temperature input
17	DI 01	System 1 high pressure protection input	43	AI 16	No use
18	DI 02	System 2 high pressure protection input	44	GND	Connecting to the remote controller
19	DI 03	System 3 high pressure protection input	45	NET	
20	DI 04	System 4 high pressure protection input	46	12V	
21	DI 05	System 1 low pressure protection input	47	RS485A	485 connection
22	DI 06	System 2 low pressure protection input	48	RS485B	
23	DI 07	System 3 low pressure protection input	49	AC12V	12V power input
24	DI 08	System 4 low pressure protection input	50	AC12V	
25	DI 09	Water flow switch protection input	51	CN2	System 1 electric expansion valve output
26	DI 10	Electric heater overload protection input	52	CN3	System 2 electric expansion valve output

APPENDIX2.Connection of PCB illustration

2. Troubleshooting

Code	Failure	Reason	Solution
P01	Water inlet temp. sensor failure	Temp. Sensor is broken	Check or change it
P02	Water outlet temp. sensor failure	Temp. Sensor is broken	Check or change it
P04	Ambient temp. sensor failure	Temp. Sensor is broken	Check or change it
P15	Coil temp. sensor 1 failure	Temp. Sensor is broken	Check or change it
P25	Coil temp. sensor 2 failure	Temp. Sensor is broken	Check or change it
P35	Coil temp. sensor 3 failure	Temp. Sensor is broken	Check or change it
P45	Coil temp. sensor 4 failure	Temp. Sensor is broken	Check or change it
P17	Suction temp. sensor 1 failure	Temp. Sensor is broken	Check or change it
P27	Suction temp. sensor 2 failure	Temp. Sensor is broken	Check or change it
P37	Suction temp. sensor 3 failure	Temp. Sensor is broken	Check or change it
P47	Suction temp. sensor 4 failure	Temp. Sensor is broken	Check or change it
P19	Anti-freeze temp. sensor 1 failure	Temp. Sensor is broken	Check or change it
P29	Anti-freeze temp. sensor 2 failure	Temp. Sensor is broken	Check or change it
P39	Suction temp. sensor 4 failure	Temp. Sensor is broken	Check or change it
P49	Suction temp. sensor 4 failure	Temp. Sensor is broken	Check or change it
P151	Coil inlet temp. sensor 1 failure	Temp. Sensor is broken,H06=2 and H08=1	Check or change it
P251	Coil inlet temp. sensor 2failure	Temp. Sensor is broken,H06=2 and H08=1	Check or change it
P351	Coil inlet temp. sensor 3 failure	Temp. Sensor is broken,H06=2 and H08=1	Check or change it
P451	Coil inlet temp. sensor 4 failure	Temp. Sensor is broken,H06=2 and H08=1	Check or change it
P191	Using side anti-freeze temp. sensor 1 failure	Temp. Sensor is broken,H06=2 and H08=0	Check or change it
P291	Using side anti-freeze temp. sensor 2 failure	Temp. Sensor is broken,H06=2 and H08=0	Check or change it
P391	Using side anti-freeze temp. sensor 3 failure	Temp. Sensor is broken,H06=2 and H08=0	Check or change it
P491	Using side anti-freeze temp. sensor 4 failure	Temp. Sensor is broken,H06=2 and H08=0	Check or change it
E03	Water flow protection	Flow switch is broken	Check or change it
E04	Electric-heater overheat protection	AUX.heat is overheat	Check it's function
E05	System protection	System protection switch is broken	Check or change it
E06	Temp. Difference between inlet and outlet	Temp. Difference>13℃	Temp. Difference<13℃, And power off
E08	Communication failure	Communication failure between wire controller and main board	Check the connection between wire controller and

			main board
E11	High pressure protection 1 (HP1)	HP 1 switch is broken	Check or change it
E21	High pressure protection 2 (HP2)	HP 2 switch is broken	Check or change it
E31	High pressure protection 3 (HP3)	HP 3 switch is broken	Check or change it
E41	High pressure protection 4 (HP4)	HP 4 switch is broken	Check or change it
E12	Low pressure protection 1 (LP1)	LP 1 switch is broken	Check or change it
E22	Low pressure protection 2 (LP2)	LP 2 switch is broken	Check or change it
E32	Low pressure protection 3 (LP3)	LP 3 switch is broken	Check or change it
E42	Low pressure protection 4 (LP4)	LP 4 switch is broken	Check or change it
E17	Anti-freeze protection 1	Anti-freeze temp. 1≤4℃，H06=1	9℃＜Anti-freeze temp. 1
E27	Anti-freeze protection 2	Anti-freeze temp. 2≤4℃，H06=1	9℃＜Anti-freeze temp. 2
E37	Anti-freeze protection 3	Anti-freeze temp. 3≤4℃，H06=1	9℃＜Anti-freeze temp. 1
E47	Anti-freeze protection 4	Anti-freeze temp. 4≤4℃，H06=1	9℃＜Anti-freeze temp. 2
E171	Using side anti-freeze protection 1	Anti-freeze temp. 1≤4℃，H06=2 and H08=0	9℃＜Anti-freeze temp. 1
E271	Using side anti-freeze protection 2	Anti-freeze temp. 2≤4℃，H06=2 and H08=0	9℃＜Anti-freeze temp. 2
E371	Using side anti-freeze protection 3	Anti-freeze temp. 3≤4℃，H06=2 and H08=0	9℃＜Anti-freeze temp. 1
E471	Using side anti-freeze protection 4	Anti-freeze temp. 4≤4℃，H06=2 and H08=0	9℃＜Anti-freeze temp. 2
E172	Heat source side anti-freeze protection 1	Anti-freeze temp. 1≤4℃，H06=2	9℃＜Anti-freeze temp. 1
E272	Heat source side anti-freeze protection 2	Anti-freeze temp. 2≤4℃，H06=2	9℃＜Anti-freeze temp. 2
E372	Heat source side anti-freeze protection 3	Anti-freeze temp. 3≤4℃，H06=2	9℃＜Anti-freeze temp. 1
E472	Heat source side anti-freeze protection 4	Anti-freeze temp. 4≤4℃，H06=2	9℃＜Anti-freeze temp. 2
E19	Anti freeze protection level 1	2 ℃ <inlet temp.≤4 ℃ ,and Ambient temp.≤0℃	8℃≤inlet water temp. 1, or 1＜Ambient temp.
E29	Anti freeze protection level 2	inlet temp.≤2 ℃ , and Ambient temp.≤0℃	15℃≤ inlet water temp. 1, Or 1＜Ambient temp.

3. Parameter

3.1 Parameter table

Parameter and description		Setting value		Unit	Mod bus address
		Code	Setting		
/ Hardware parameter	Enable system 1 high pressure protection S01	/1	YES	/	44701
	Enable system 2 high pressure protection S02	/2	YES	/	44702
	Enable system 3 high pressure protection S03	/3	YES	/	44703
	Enable system 4 high pressure protection S04	/4	YES	/	44704
	Enable system 1 low pressure protection S05	/5	YES	/	44705
	Enable system 2 low pressure protection S06	/6	YES	/	44706
	Enable system 3 low pressure protection S07	/7	YES	/	44707
	Enable system 4 low pressure protection S08	/8	YES	/	44708
	Enable water flow protection S09	/9	YES	/	44709
	Enable AUX.heat Overload protection S10	/10	YES	/	44710
	Enable on/off switch S11	/11	YES	/	44711
	Enable system protection switch S14	/12	NO	/	44712
	Enable Outlet probe T02	/13	YES	/	44713
	Enable system 1 Coil 1 probe T03	/14	YES	/	44714
	Enable system 2 Coil 2 probe T04	/15	YES	/	44715
	Enable system 3 Coil 3 probe T05	/16	YES	/	44716
	Enable system 4 Coil 4 probe T06	/17	YES	/	44717
	Enable Ambient probe T07	/18	YES	/	44718
	Enable system 1 Anti-freeze probe T08	/19	YES	/	44719
	Enable system 2 Anti-freeze probe T09	/20	YES	/	44720
	Enable system 3 Anti-freeze probe T10	/21	YES	/	44721
	Enable system 4 Anti-freeze probe T11	/22	YES	/	44722
	Enable system 1 Suction 1 probe T12	/23	YES	/	44723
	Enable system 2 Suction 2 probe T13	/24	YES	/	44724
	Enable system 3 Suction 3 probe T14	/25	YES	/	44725

	Enable system 4 Suction 4 probe T15	/26	YES	/	44726
	Enable inlet/out differential protection	/27	YES	/	44727
	Enable Cooling mode	/28	YES	/	44728
	Enable Heating mode	/29	YES	/	44729
	Enable AUTO mode	/30	YES	/	44730
	Enable Heating +AUX. heating mode	/31	YES	/	44731
	Enable High demand	/32	YES	/	44732
A Protection parameter	high pressure alarm time delay	A01	10	s	46501
	Low pressure alarm time delay	A02	300	s	46502
	Stop unit ambient temperature	A03	-15℃	5℉	46503
	Anti-freezing setting temperature	A04	5℃	41℉	46504
	Anti-freezing differential protection	A05	5℃	41℉	46505
	Inlet/out differential protection	A06	13℃	55℉	46506
	Start spraying air temperature	A07	35℃	95℉	46507
C Compressor parameter	Minimum on time	C01	120	s	46701
	Minimum off time	C02	180	s	46702
	Delay between starts of the 2 compressors	C03	300	s	46703
	Energy level (0-single/1-double/2-several)	C04	2	/	46704
	Rotation(FIFO/ comp1/ comp2/comp3/comp4)	C05	FIFO	/	46705
d Defrost Parameter	Start defrosting temperature	d01	-7℃	19℉	46801
	End defrost temperature	d02	13℃	55℉	46802
	defrosting cycle	d03	40	Min	46803
	Maximum defrosting time	d04	8	Min	46804
	Minimum defrosting time	d05	3	Min	46805
	Defrost mode(Normal/ Eco/ Auto)	d06	Nor.	/	46806
	Defrost heater control (on/off)	d07	ON	/	46807
	Defrost AUTO set	d08	4℃	39℉	46808
E EEV parameter	EEV 1 mode	E01	Auto	/	46901
	Super heat 1	E02	50℃	122℉	46902
	Initial place 1	E03	350	/	46903
	EEV 2 mode	E04	Auto	/	46904
	Super heat 2	E05	50℃	122℉	46905
	Initial place 2	E06	350	/	46906
	EEV 3 mode	E07	Auto	/	46907
	Super heat 3	E08	50℃	122℉	46908
	Initial place 3	E09	350	/	46909
	EEV 4 mode	E10	Auto	/	46910

	Super heat 4	E11	50℃	122℉	46911
	Initial place 4	E12	350	/	46912
	Minimum place	E13	100		46913
	Defrost place	E14	350		46914
	Cooling place	E15	350		46915
F Fan parameter	Fan parameter(High/ Low/ Temp./ Time/ 3+4)	F01	High	/	47001
	Coil temperature in high speed fan mode (Cooling)	F02	40℃	104℉	47002
	Coil temperature in low speed fan mode (Cooling)	F03	15℃	59℉	47003
	Coil temperature when the fan stop (Cooling)	F04	10℃	50℉	47004
	Coil temperature in high speed fan mode(Heating)	F05	10℃	50℉	47005
	Coil temperature in low speed fan mode (Heating)	F06	20℃	68℉	47006
	Coil temperature when the fan stop (Heating)	F07	30℃	86℉	47007
	Fan start low speed running time	F08	0	h	47008
	Fan stop low speed running time	F09	8	h	47009
	Fan speed control probe	F11	Coil	/	47010
H System Parameter	Automatic restarting(yes/ no)	H01	Yes	/	47201
	System quantity	H02	4	/	47202
	4-way valve polarity(H-ON/ C-ON)	H03	H-ON	/	47203
	Compressor shut down for normal defrost(yes/no)	H04	Yes	/	47204
	Model(chiller/Hybrid/auxiliary electronic heat/heat only)	H05	Hybrid	/	47205
	Type(0-swimming pool/ 1-air-water/ 2-water-water)	H06	A-W	/	47206
	Class (Slave/ Master)	H07	Master	/	47207
	Coil sensor function for w-w unit (0-deice/1-evap.)	H08	Deice	/	47208
	Physical address	H09	1	/	47209
	Baud rate(1200/2400/4800/9600/19200/38400)	H10	9600	/	47210
	Parity bit (0/ 1/ 2)	H11	0	/	47211
	Stop bit (1/2)	H12	1	/	47212
P Water pump parameter	Water pump mode (Nor./ Stop/ Interval)	P01	Interval	/	48001
	Water pump running cycle	P02	30	Min	48002
	Water pump running time	P03	3	Min	48003
	Delay in switching on the compressor after	P04	1	Min	48004

	switching on the pump				
	Filter (Yes / No)	P05	No	/	48005
	Start filter 1	P06	10	H	48006
	Stop filter 1	P07	12	H	48007
	Start filter 2	P08	15	H	48008
	Stop filter 2	P09	17	H	48009
r Temp. parameter	Inlet water setting temperature (cooling)	r01	27℃	80℉	48201
	Inlet water setting temperature (Heating)	r02	27℃	80℉	48202
	Target setting temperature (Auto mode)	r03	27℃	80℉	48203
	Cooling differential	r04	1℃	34℉	48204
	Cooling stop differential	r05	1℃	34℉	48205
	Heating differential	r06	1℃	34℉	48206
	Heating stop differential	r07	1℃	34℉	48207
	Minimum set point in Cooling	r08	8℃	46℉	48208
	Maximum Cooling set point	r09	35℃	95℉	48209
	Minimum Heating set point	r10	5℃	41℉	48210
	Maximum Heating set point	r11	40℃	104℉	48211
	AUX. heat ΔT6	r12	2℃	36℉	48212
	AUX. heat ambient	r13	15℃	59℉	48213
	AUX. heat Delay	r14	30 min	Min	48214
	AUX. heat without delay	r15	5℃	32℉	48215
	Compensation for indoor/ outdoor	r16	0	/	48216
	Maximum ΔT7	r17	5	41℉	48217
	Cooling compensation constant	r18	-1	/	48218
	Cooling compensation start air temperature	r19	35℃	95℉	48219
	Heating compensation start air temperature	r20	5℃	41℉	48220
	AUX.heat mode(0-heating system/ 1-Sanitary water/ 3-anti-freeze)	r21	Heating system	/	48221
	Ambient temperature to start up anti-freeze heater	r22	3℃	37℉	48222
	Temperature differential to stop anti-freeze heater	r23	3℃	37℉	48223
S Switch state checking	System1 HP	S01	CL/OP		28301
	System2 HP	S02	CL/OP		28302
	System3 HP	S03	CL/OP		28303
	System4 HP	S04	CL/OP		28304
	System1 LP	S05	CL/OP		28303
	System2 LP	S06	CL/OP		28304
	System3 LP	S07	CL/OP		28305
	System4 LP	S08	CL/OP		28306
	Water Flow switch	S09	CL/OP		28307

	AUX.heat overload	S10	CL/OP		28310
	On/Off switch	S11	CL/OP		28311
	Mode switch	S12	CL/OP		28312
	On/Off output	S13	CL/OP		28313
	System protect input	S14	CL/OP		28314
T Temp. checking	Inlet water temp.	T01			28401
	Outlet water temp.	T02			28402
	Coil 1 temperature	T03			28403
	Coil 2 temperature	T04			28404
	Coil 3 temperature	T05			28405
	Coil 4 temperature	T06			28406
	Ambient temperature	T07			28407
	Anti-freeze 1 temperature	T08			28408
	Anti-freeze 2 temperature	T09			28409
	Anti-freeze 3 temperature	T10			28410
	Anti-freeze 4 temperature	T11			28411
	Suction 1 temperature	T12			28412
	Suction 2 temperature	T13			28413
	Suction 3 temperature	T14			28414
	Suction 4 temperature	T15			28415
0 Load output	Compressor 1 output	001			27901
	Compressor 2 output	002			27902
	Compressor 3 output	003			27903
	Compressor 4 output	004			27904
	Fan output (High speed)	005			27905
	Fan output (Low speed)	006			27906
	Circulate pump output	007			27907
	4-way valve output	008			27908
	Heat element output	009			27909
	Spray valve output	010			27910
	Alarm output	011			27911
	Electronic Expansion valve 1 output	012			27912
	Electronic Expansion valve 2 output	013			27913
	Electronic Expansion valve 3 output	014			27914
	Electronic Expansion valve 4 output	015			27915

3.2 Description of the parameters

/—— Hardware parameter：Setting values to relevant hardware from parameter "/ 01" to "/ 32 ".

0=NO, 1=YES

A——Protection parameter

A01——High pressure alarm time delay

Establish the delay time when there is high pressure alarm.

A02——Low pressure alarm time delay

Establish the delay time when there is low pressure alarm.

A03——Stop unit ambient temperature

Establish temperature for stopping the unit.

A04——Anti-freeze setting temperature

This represents the temperature (antifreeze set point) at the evaporator outlet below which an antifreeze alarm is activated.

A05——Anti-freeze differential protection

This represents the delay in the activation of the antifreeze alarm when starting system

A06——in /outlet differential protection setting value

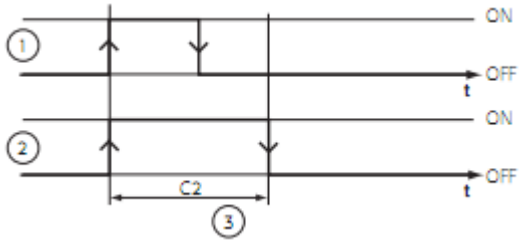
Establishes differential temperature protection for water inlet and outlet

A07——Start spraying air temp.

Establishes ambient temperature when system needing to start up spraying valve.

C——Compressor parameter

C01——This establishes the time that the compressor must remain ON for when started, even if the stop signal is sent.

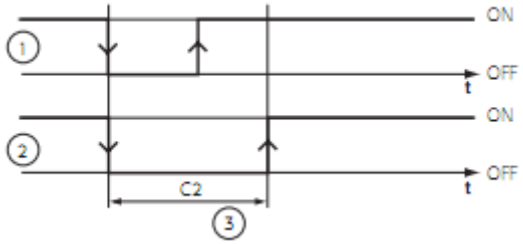


①——signal

②——compressor

③——minimum ON time-interval

C02——this establishes the time that the compressor must remain OFF for when stopped, even if the start signal is sent.



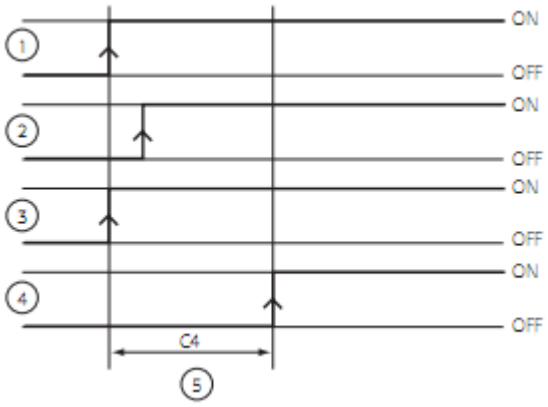
①——signal

②——compressor

③——minimum ON time-interval

Example: Minimum compressor cycle time is 1 min (C01) plus 3 mins(C02)

C03——Start delay between compressors



①——1st signal
②——2nd signal
③——1st compressor
④——2nd compressor
⑤——time delay between two compressors ON

C04——Energy Level

C04=0, system will start up compressors in rotation, count the compressor's running time and record it. When turn off the unit, the system will firstly shut off the compressor that running time is longer; when turn on the system , it will firstly turn on the compressor which running time is shorter.

C04=1, when there is only need one compressor, system will start up compressor 1 firstly;

C04=2, when there is only need one compressor, system will start up compressor 2 firstly;

C04=3, when there is only need one compressor, system will start up compressor 3 firstly;

C04=4, when there is only need one compressor, system will start up compressor 4 firstly;

D——Defrost Parameter

D01——Start defrost temperature

To start defrosting, the condition must be valid for the time d03.

D02——End defrost temperature

Establishes the temperature above which the defrost cycle ends.

D03——Defrosting cycle

Represents delay between two successive defrost cycle. The first time, when coil temperature is lower than D01, there must be valid for the time d03 to start the defrosting.

D04——Maximum defrosting duration

Represents the maximum duration of the defrost cycle (the defrost ends when the maximum duration has been arrived, even if the defrost hasn't finished)

D05——Minimum defrosting duration

Represent the minimum duration of the defrost cycle (the defrost continues even if the value read by the condenser probe exceed the end temperature)

D06——Defrost mode

D06=0: the mode is normal defrost;

D06=1: the mode is economical defrosting; (Four systems can defrosting alone)

D06=2: the mode is auto selection

D07——Defrost AUX.heat control

D07=0: There is no influence to AUX.heat when defrosting;

D07=1: AUX.heat is on during the defrost.

D08——Defrost AUTO set

When ambient temperature ≥ D08, system will use economical mode to defrost (air defrost);

When ambient temperature ＜ D08, system will use normal mode to defrost;

E——EEV parameter

E01——EEV 1 mode

E01=0: EEV 1 is running by manual operation;

E01=1: EEV 1 is running by automatic operation;

E02——Target Super heat 1 (TSH)

E03——Initial position 1

If E01=0, represents expansive valve fix this position always.

If E01=1, represents expansive valve initiation position

The EEV2 action is the same with EEV1's.

E04——EEV 2 mode

E05——Target Super heat 2

E06——Initial position 2

The EEV3 action is the same with EEV1's.

E07——EEV 3 mode

E08——Target Super heat 3 (TSH)

E09——Initial position 3

The EEV 4 action is the same with EEV1's.

E10——EEV 4 mode

E11——Target Super heat 4 (TSH)

E12——Initial position 4

E13——Minimum position

E14——Defrost position

Fix the EEV position during system is defrosting.

E15——Cooling position

Fix the EEV position during system at cooling mode.

F——Fan parameter

Normally, Fan will start up 5s ahead of Compressor and 30s later to close down. When at defrosting, Fan running situation is according to defrosting control.

F01——Fan parameter

F01=0: in low speed fan mode;

F01=1: in high speed fan mode;

F01=2: the fan running modes depend on coil or ambient temperature (F02-F07);

Attention: The temperature probe is decided by F10

F01=3: the fan runs at low speed during F08-F09, the fan runs at high speed during other time;

F01=4: the fan running mode is depend on F02 and F03, fan will at low speed if one condition of fan running low speed mode is met;

F02——Coil or ambient temperature set point for high speed fan mode (Cooling)

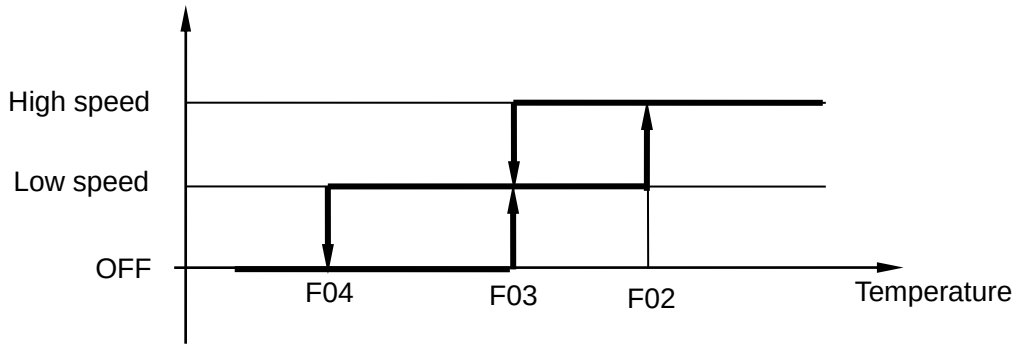
This represents if the temperature above F02, the fan will on high speed (Cooling)

F03——Coil or ambient temperature set point for low speed fan mode (Cooling)

This represents if the temperature below which the fans remain on at low speed (Cooling)

F04——Coil or ambient temperature set point for the fan stop (Cooling)

This represents the temperature in reference to F04 below which the fans are stopped.



F05——Coil or ambient temperature set point for high speed fan mode (Heating)

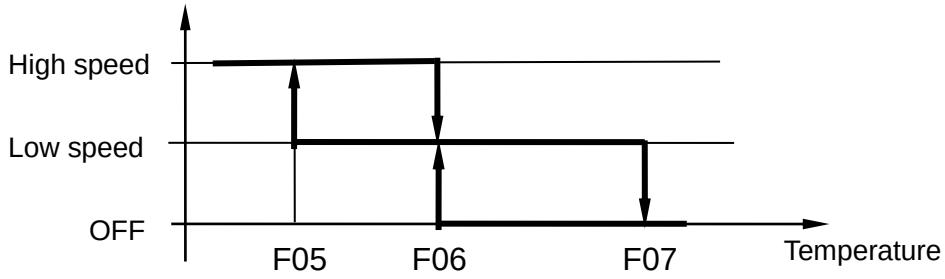
This represents the temperature above which the fans remain on at high speed (Heating)

F06——Coil or ambient temperature set point for low speed fan mode (Heating)

This represents the temperature below which the fans remain on at low speed (Heating)

F07——Coil or ambient temperature set point for the fan stop (Heating)

This represents the temperature in reference to F07 below which the fans are stopped.



F08——Fan start low speed running time (Just for F01=3)

F09——Fan stop low speed running time (Just for F01=3)

F10——Fan speed control temp.

When F10=0, Fan speed is decided by coil temperature;

When F10=1, Fan speed is decided by ambient temperature. At this time, F02-F07 are also according to ambient temp. But not coil temperature.

Attention:

1）When H06=0/1, Fan-high-speed port has output when Fan is at high speed. And vise versa. (For single system, Fan-high-speed port and low-speed port can not get output at the same time)

2) When H06=2, It is water to water heat pump, Fan-high-speed port is used as water pump at heat source and all the F parameters is invalid.

H——System Parameter

H01——Automatic restart

H01=0: disable automatic restart; H01=1: enable automatic restart

H02——System quantity

H02=3: Three systems; H02=4: Four systems;

H03——4-way valve polarity

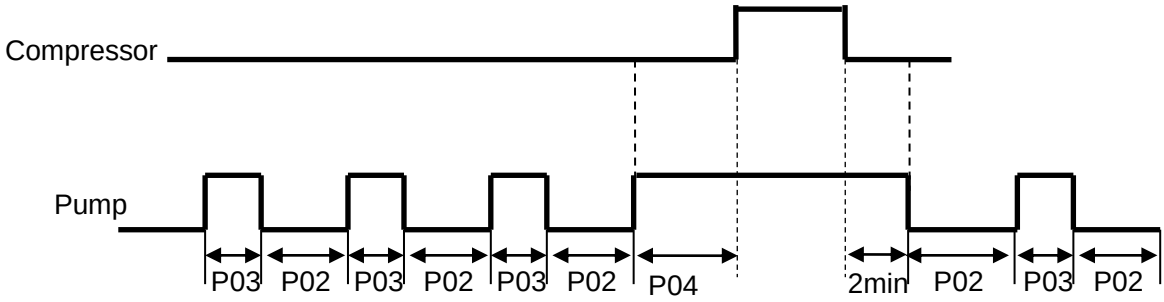
H03=0: when system in heating mode, 4-way valve is power on;

H03=1: when system in heating mode, 4-way valve is power off.

H04——4-way valve control when defrosting
H04=0: 4-way valve is action after compressor has shut off;
H04=1: 4-way valve can action when compressor is running;
H05——Model (cooling only/heating & cooling/auxiliary AUX.heat heating/heating only)
H05=0: only cooling;
H05=1: heating, cooling and automatic; (there is no AUX.heat heating)
H05=2: auxiliary AUX.heat heating; (there is no automatic)
H05=3: only heating.
H06——Type
H06=0: swimming pool; (there are heating, cooling, automatic modes)
H06=1: Air to water heat pump; (there are heating, cooling, AUX.heat heating modes)
H06=2: Water to water heat pump. (there are heating, cooling, AUX.heat heating modes)
Attention: When H06=2: system has no defrosting, the coil temperature is used as Anti-freezing or evaporation temperature, the fan-high port is used as pump port in heat source side, and the fan-low port is disabled.
H07——Class
H07=0: when /11=0, system is operated by controller;
When /10=1, system is operated by controller and emergency switch.
H07=1: system is operated by remote signal, controller can only read parameter and check switches alarming state;
H08——Coil sensor function
This parameter is just for water to water heat pump.
H08=0, coil sensor is used as anti-freeze temperature;
H08=1, coil sensor is used as evaporation temperature.
Attention: 1) H06=2 and H08=0, coil temperature of all systems are used as anti-freeze temperature.
2) H06=2 and H08=1, coil temperature of all systems are used as evaporation temperature.
3) H06≠2, H08 parameter is disabled.
H09——Modbus address
H10——Baud rate（1200*2n）（n=0、1、2、3、4、5）
H11——Parity bit
H11=0, There is no parity bit;
H12=1, the parity bit is odd number;
H13=2, the parity bit is even number.
H12——Stop bit
P——Water pump parameters
P01——Water pump mode
P01=0, water pump will always on except on standby or alarm.
P01=1, water pump will operate depend on compressor, and has 2 minutes delay after the compressor has stopped;
P01=2, water pump will be started and stopped at regular intervals after compressor stop. Depend on P02 and P03.
P02——Water pump start interval time

P03——minimum on time that the pump remains on.

P04——the time of pump advance compressor to start up.



P05——Pump filter

Pump filter: when compressor has stopped, pump will run during p05-p06/p07-p08;

P05=0, NO; P05=1, YES.

P06——the time to start filter 1

P07——the time to stop filter 1

P08——the time to start filter 2

P09——the time to stop filter 2

R——Temperature parameter

R01——Cooling set point

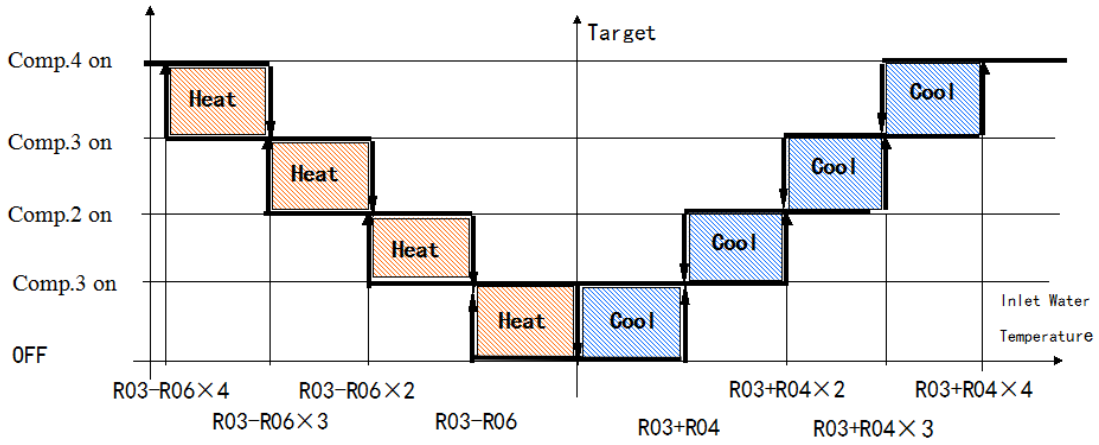
Inlet water setting temperature (Cooling)

R02——Heating set point

Inlet water setting temperature (Heating)

R03——AUTO set point (Auto mode)

The setting target temperature of automatic mode.

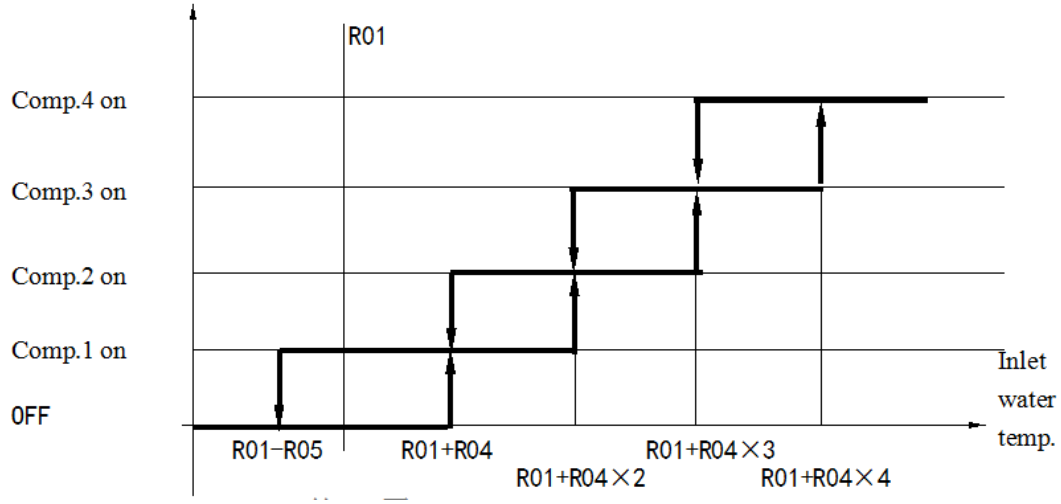


R04——Start differential of cooling

This represents the difference between R01 and start cooling point.

R05——Stop differential of cooling

This represents the difference between R01 and stop cooling point.



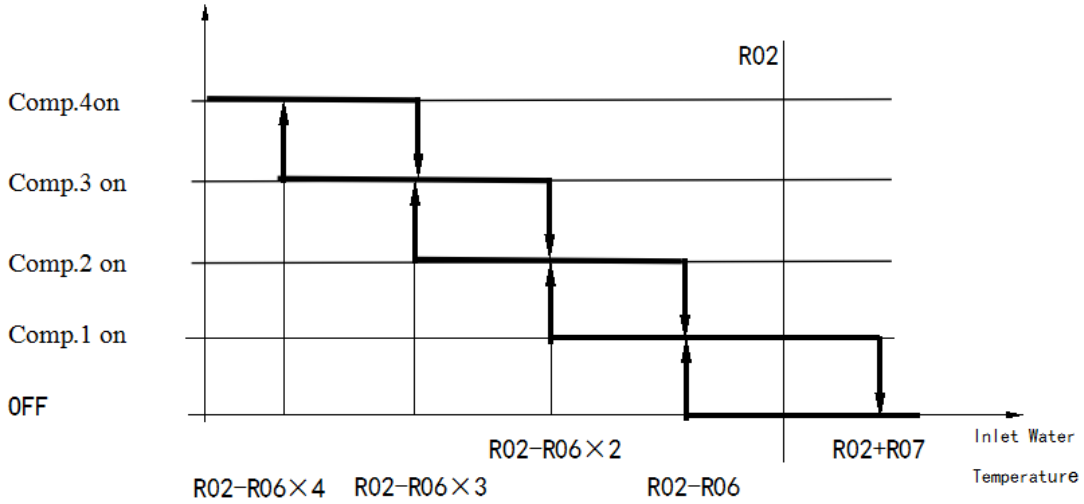
Example: If R01=12, R04=3, R05=1, the compressor will start at 15 c and stop at 11 c

R06——Start differential of heating

This represents the difference between R02 and start heating point.

R07——Stop differential of heating

This represents the difference between R02 and stop heating point.



R08——Minimum set point in Cooling

Establish the minimum limit for setting the Cooling set point

R09——Maximum Cooling set point

Establishes the maximum limit for setting the Cooling set point

R10——Minimum Heating set point

Establish the minimum limit for setting the Heating set point

R11——Maximum Heating set point

Establish the maximum limit for setting the Heating set point

R12——AUX.heat ΔT6

This represents the temperature differential in the activation for the AUX.heat

R13——AUX.heat Ambient

Establish ambient temperature for starting up AUX.heat.

R14——AUX.heat delay

This represents the delay in the activation of the AUX.heat

R15——AUX.heat Force

This represents ambient temperature in the activation of the AUX.heat when without delay.

R16——Compensation (interior/ exterior temperature adjustment)

Establish whether there is compensation function for system or not. This function for adjust setting temperature in cooling or heating mode according to outdoor temperature.

R17——Maximum ΔT7

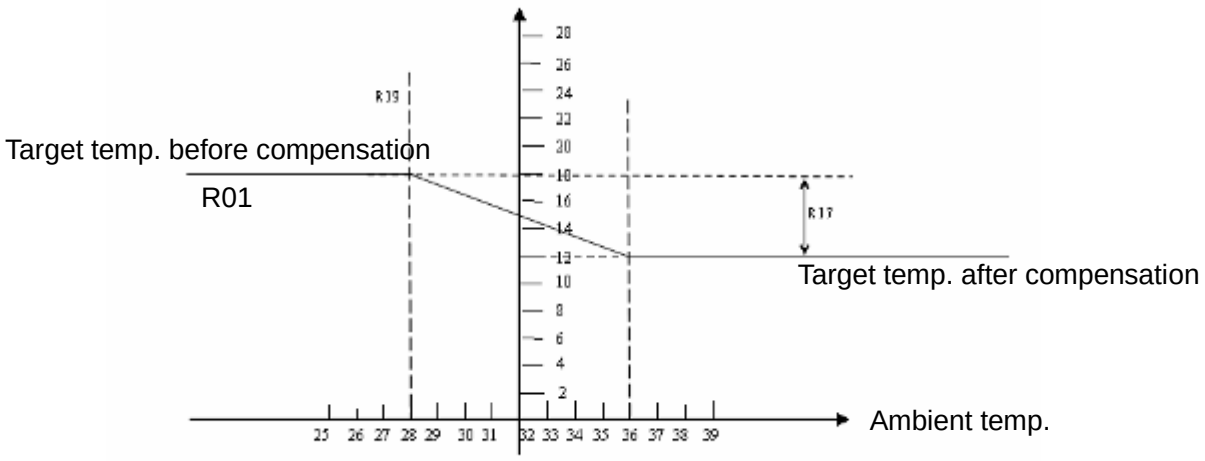
Indicates the maximum deviation from the set point beyond which compensation is stopped.

R18——Compensation constant

Sets the coefficient that controls the compensation algorithm

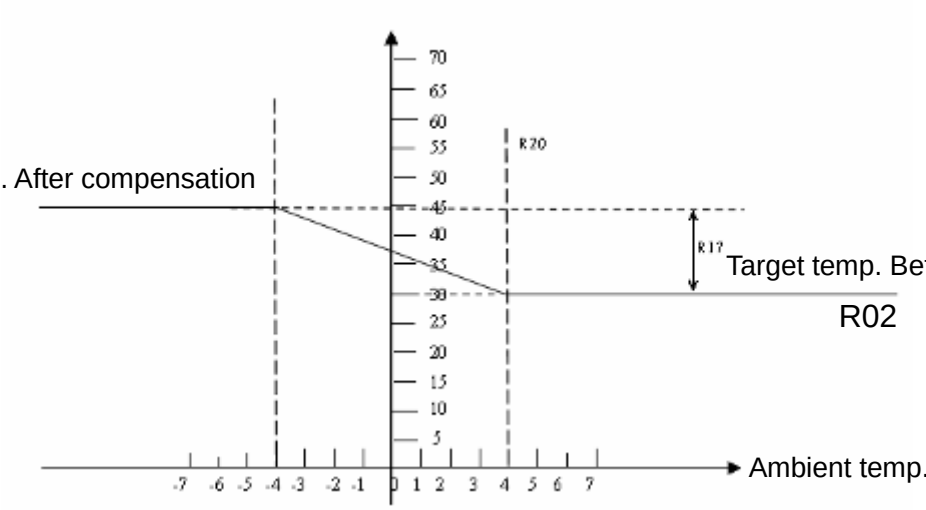
R19——Cooling compensation start air temp.

Sets the temperature above which the compensation function starts (cooling).



R20——Heating compensation start air temp.

Sets the temperature below which the compensation function starts (Heating).



R21——AUX.heat mode

R26=0, hydraulic AUX.heat

R26=1, tank AUX.heat

R26=2, anti-freeze heater band

R22——the ambient temperature for start up anti-freeze heater band

R23——the temperature differential to stop anti-freeze heater band

When ambient temperature≤ R22, anti-freeze heater band will be started up;

When ambient temperature>≥R22 + R23, anti-freeze heater band will be stopped;

Appendix

NTC R-T Table （R25=5KΩ　B25/50=3470K）

T(℃)	R(KΩ)		T(℃)	R(KΩ)		T(℃)	R(KΩ)
-30.0	63.7306		14.0	7.7643		58.0	1.5636
-29.0	60.3223		15.0	7.4506		59.0	1.5142
-28.0	57.1180		16.0	7.1513		60.0	1.4666
-27.0	54.1043		17.0	6.8658		61.0	1.4206
-26.0	51.2686		18.0	6.5934		62.0	1.3763
-25.0	48.5994		19.0	6.3333		63.0	1.3336
-24.0	46.0860		20.0	6.0850		64.0	1.2923
-23.0	43.7182		21.0	5.8479		65.0	1.2526
-22.0	41.4868		22.0	5.6213		66.0	1.2142
-21.0	39.3832		23.0	5.4048		67.0	1.1771
-20.0	37.3992		24.0	5.1978		68.0	1.1413
-19.0	35.5274		25.0	5.0000		69.0	1.1068
-18.0	33.7607		26.0	4.8108		70.0	1.0734
-17.0	32.0927		27.0	4.6298		71.0	1.0412
-16.0	30.5172		28.0	4.4566		72.0	1.0100
-15.0	29.0286		29.0	4.2909		73.0	0.9800
-14.0	27.6216		30.0	4.1323		74.0	0.9509
-13.0	26.2913		31.0	3.9804		75.0	0.9228
-12.0	25.0330		32.0	3.8349		76.0	0.8957
-11.0	23.8424		33.0	3.6955		77.0	0.8695
-10.0	22.7155		34.0	3.5620		78.0	0.8441
-9.0	21.6486		35.0	3.4340		79.0	0.8196
-8.0	20.6380		36.0	3.3113		80.0	0.7959
-7.0	19.6806		37.0	3.1937		81.0	0.7730
-6.0	18.7732		38.0	3.0809		82.0	0.7508
-5.0	17.9129		39.0	2.9727		83.0	0.7293
-4.0	17.0970		40.0	2.8688		84.0	0.7086
-3.0	16.3230		41.0	2.7692		85.0	0.6885
-2.0	15.5886		42.0	2.6735		86.0	0.6690
-1.0	14.8913		43.0	2.5816		87.0	0.6502
0.0	14.2293		44.0	2.4934		88.0	0.6320
1.0	13.6017		45.0	2.4087		89.0	0.6144
2.0	13.0057		46.0	2.3273		90.0	0.5973
3.0	12.4393		47.0	2.2491		91.0	0.5808
4.0	11.9011		48.0	2.1739		92.0	0.5647
5.0	11.3894		49.0	2.1016		93.0	0.5492
6.0	10.9028		50.0	2.0321		94.0	0.5342
7.0	10.4399		51.0	1.9656		95.0	0.5196

8.0	9.9995		52.0	1.9015		96.0	0.5055
9.0	9.5802		53.0	1.8399		97.0	0.4919
10.0	9.1810		54.0	1.7804		98.0	0.4786
11.0	8.8008		55.0	1.7232		99.0	0.4658
12.0	8.4385		56.0	1.6680		100.0	0.4533
13.0	8.0934		57.0	1.6149			

1) When there is some malfunction, test resistance value by multimeter, and compare the practical temperature with the above table, then you will know whether this NCT resistance is OK or not.

2) Generally, from above table, you can know the temperature by testing NTC resistance value.

Appendix II

NTC R-T Table （R25=50.000KΩ B25/50=3950K）

(Appendix II is for NTC resistance of exhaust temperature.)

T(℃)	R(KΩ)		T(℃)	R(KΩ)		T(℃)	R(KΩ)		T(℃)	R(KΩ)
-40.0	2009.2		0.0	168.10		40.0	26.507		80.0	6.3515
-39.0	1869.0		1.0	159.46		41.0	25.464		81.0	6.1541
-38.0	1739.6		2.0	151.32		42.0	24.468		82.0	5.9639
-37.0	1620.2		3.0	143.66		43.0	23.517		83.0	5.7805
-36.0	1509.8		4.0	136.43		44.0	22.608		84.0	5.6037
-35.0	1407.8		5.0	129.62		45.0	21.740		85.0	5.4333
-34.0	1313.5		6.0	123.19		46.0	20.911		86.0	5.2690
-33.0	1226.2		7.0	117.12		47.0	20.118		87.0	5.1105
-32.0	1145.3		8.0	111.39		48.0	19.359		88.0	4.9576
-31.0	1070.4		9.0	105.98		49.0	18.634		89.0	4.8104
-30.0	1001.0		10.0	100.87		50.0	17.940		90.0	4.6678
-29.0	936.58		11.0	96.040		51.0	17.276		91.0	4.5304
-28.0	876.76		12.0	91.470		52.0	16.641		92.0	4.3978
-27.0	821.21		13.0	87.148		53.0	16.032		93.0	4.2690
-26.0	769.58		14.0	83.057		54.0	15.450		94.0	4.1462
-25.0	721.58		15.0	79.185		55.0	14.892		95.0	4.0268
-24.0	676.92		16.0	75.519		56.0	14.357		96.0	3.9114
-23.0	635.35		17.0	72.045		57.0	13.845		97.0	3.8000
-22.0	596.63		18.0	68.754		58.0	13.353		98.0	3.6923
-21.0	560.55		19.0	65.634		59.0	12.882		99.0	3.5887
-20.0	526.92		20.0	62.676		60.0	12.430		100.0	3.4876

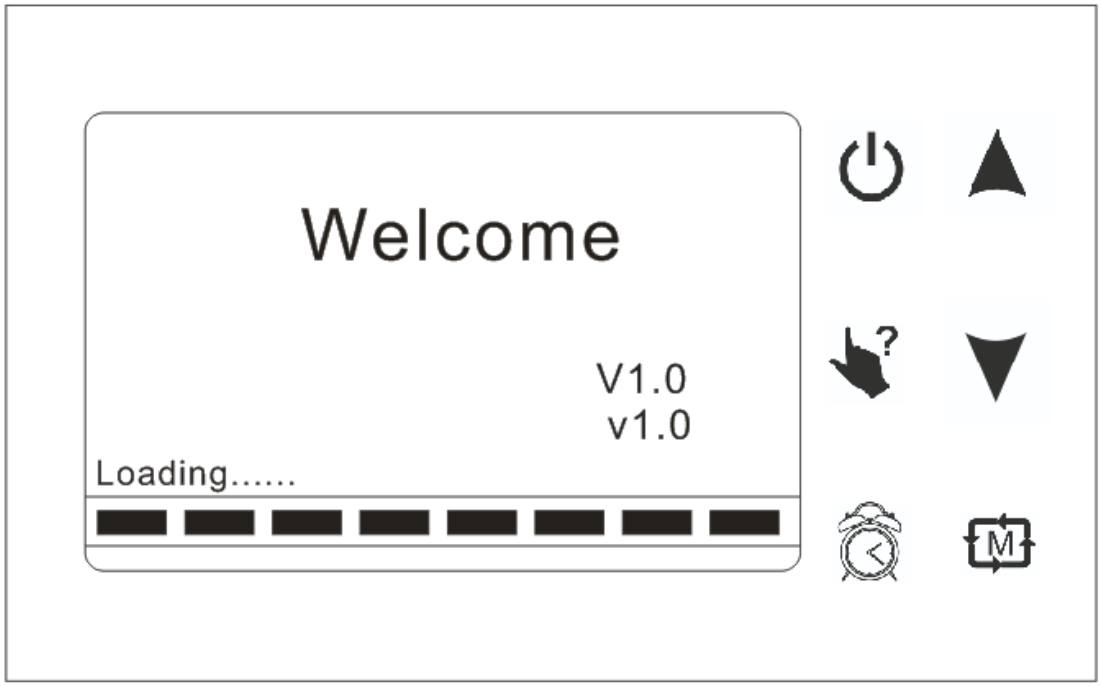
-19.0	495.54		21.0	59.870		61.0	11.997		101.0	3.3903
-18.0	466.26		22.0	57.207		62.0	11.581		102.0	3.2978
-17.0	438.91		23.0	54.679		63.0	11.182		103.0	3.2052
-16.0	413.37		24.0	52.279		64.0	10.799		104.0	3.1172
-15.0	367.69		25.0	50.000		65.0	10.431		105.0	3.0320
-14.0	367.16		26.0	47.834		66.0	10.078		106.0	2.9497
-13.0	346.26		27.0	45.775		67.0	9.7393		107.0	2.8699
-12.0	326.70		28.0	43.818		68.0	9.4134		108.0	2.7927
-11.0	308.38		29.0	41.956		69.0	9.1002		109.0	2.7180
-10.0	291.22		30.0	40.185		70.0	8.7991		110.0	2.6457
-9.0	275.13		31.0	38.500		71.0	8.5096		111.0	2.5756
-8.0	260.05		32.0	36.896		72.0	8.2313		112.0	2.5077
-7.0	245.89		33.0	35.368		73.0	7.9637		113.0	2.4420
-6.0	232.60		34.0	33.913		74.0	7.7061		114.0	2.3783
-5.0	220.13		35.0	32.527		75.0	7.4584		115.0	2.3166
-4.0	208.40		36.0	31.206		76.0	7.2199		116.0	2.2568
-3.0	197.38		37.0	29.947		77.0	6.9904		117.0	2.1989
-2.0	187.02		38.0	28.746		78.0	6.7694		118.0	2.1427
-1.0	177.27		39.0	27.600		79.0	6.5566		119.0	2.0882
									120.0	2.0354

1) When there is some malfunction, test resistance value by multimeter, and compare the practical temperature with the above table, then you will know whether this NCT resistance is OK or not.

2) Generally, from above table, you can know the temperature by testing NTC resistance value.

4. Wire controller

4.1 Function of wire controller



Button	Name	Function
	ON/OFF	Press this button to start up/shut off the unit, cancel current operation or back to upper interface.
	HELP	Press this button to check button function or system state.
	MODE	Press this button to change the current mode, page up or confirm current operation.
	CLOCK	Press the button to set the clock,the timer on or timer off
	Up	Press this key to select the upward option or increase the parameter value.
	Down	Press this key to select the downward option or decrease the parameter value.

4.2 Usage of wire controller

4.2.1 The way to use 

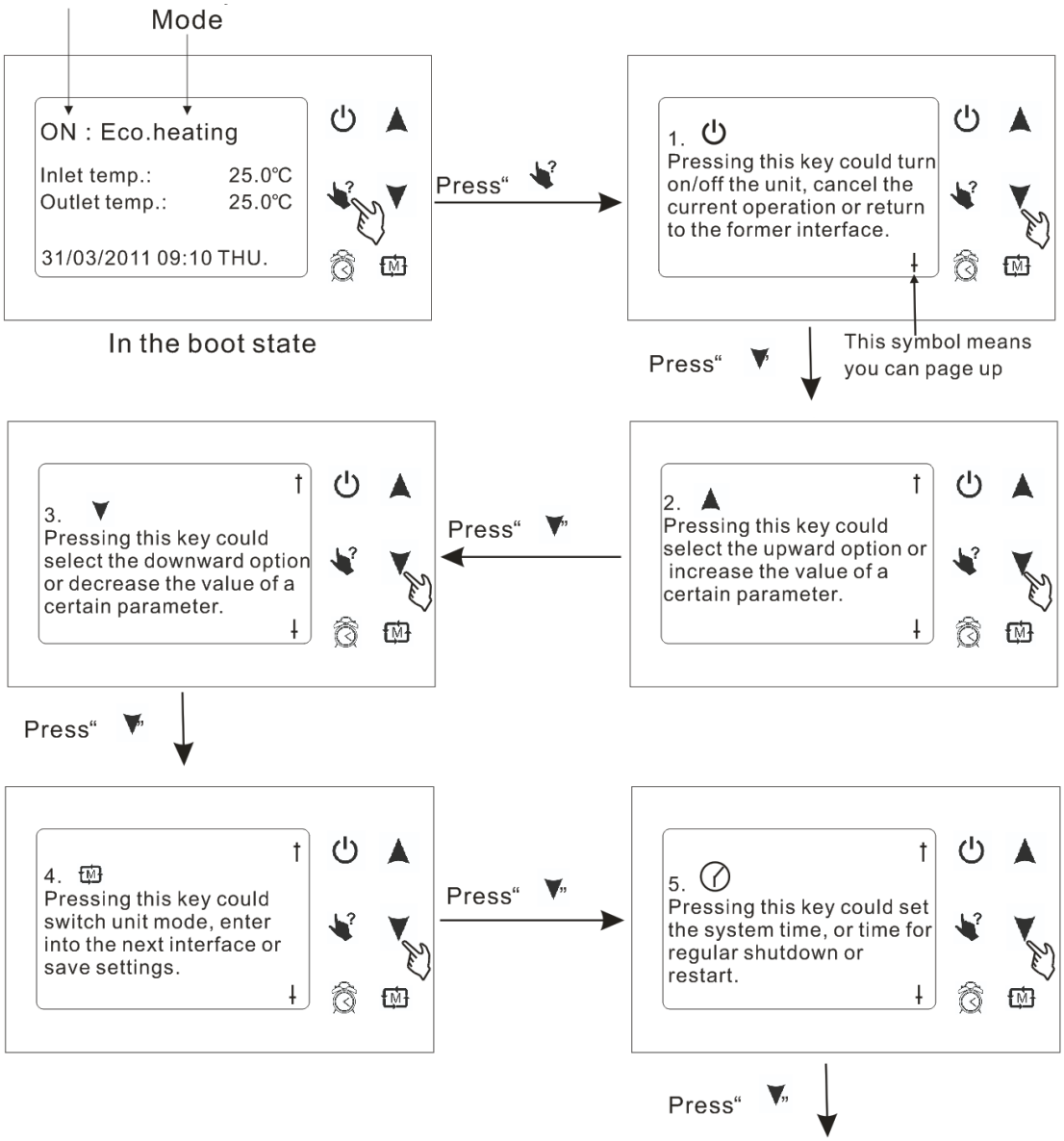
You can use “ ” at any interface, it will show relevant button function of current interface.

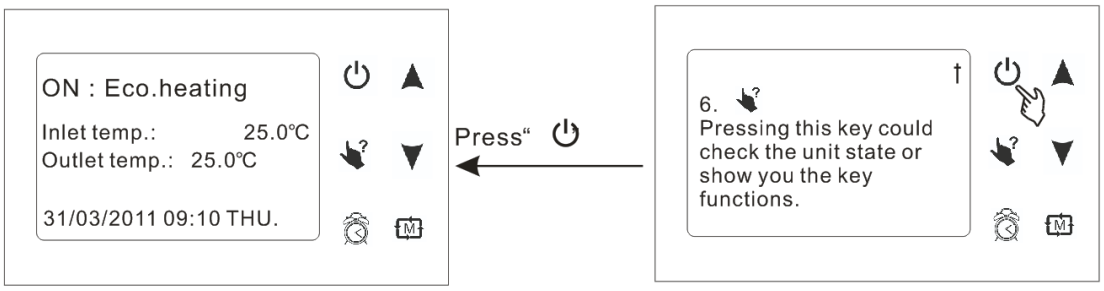
You can press “⏻” to exit the "help" interface.

For example：

Press “ ” at main interface, system will show all button function; Press “ ” at clock interface, system will show “▲” 、 “▼” 、 “ ” and “⏻” button function.

Both are OK when system show ON or OFF

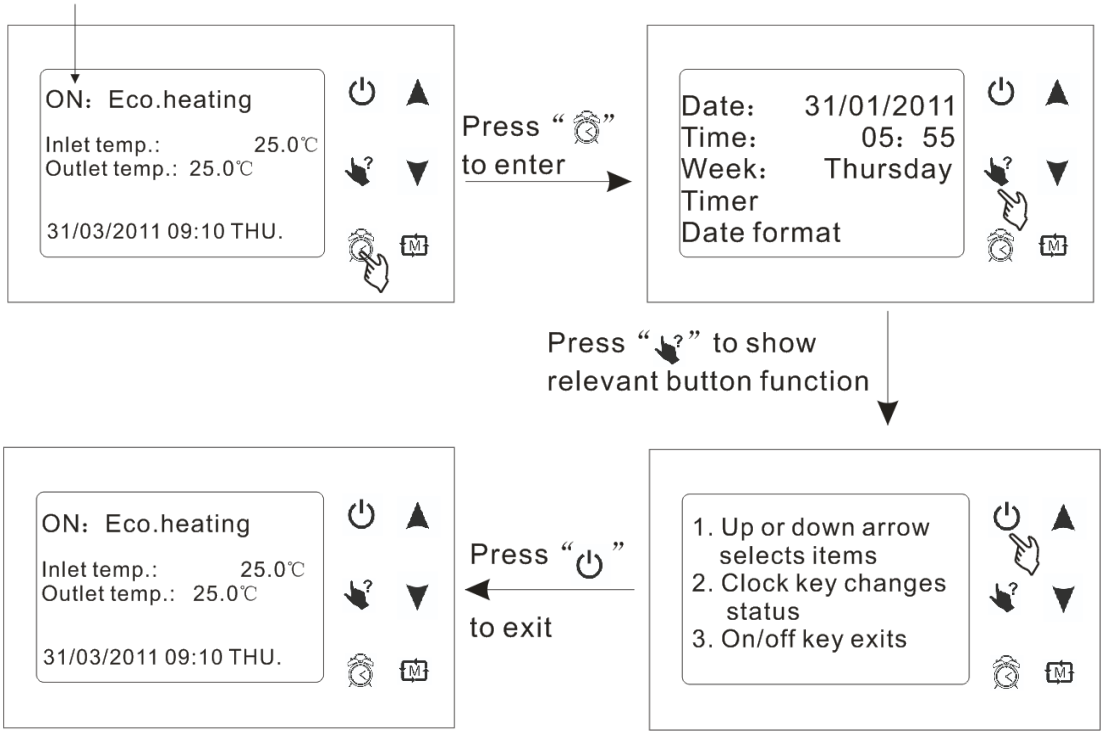




In the boot state

Press "?" at clock interface, the screen shows as follow:

Both are OK when system shows ON or OFF



4.2.2 Starting up and shutting down

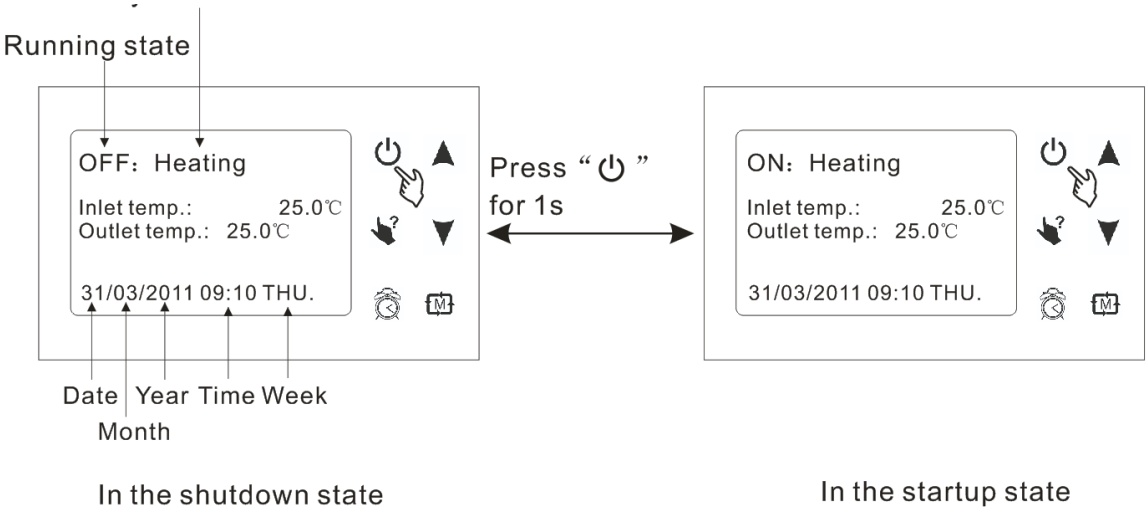
Press "⏻" in the shutdown state for 1s to start up the system;

Press "⏻" in the startup state for 1s to shut down the system.

For example：

MODE

（By actual state）



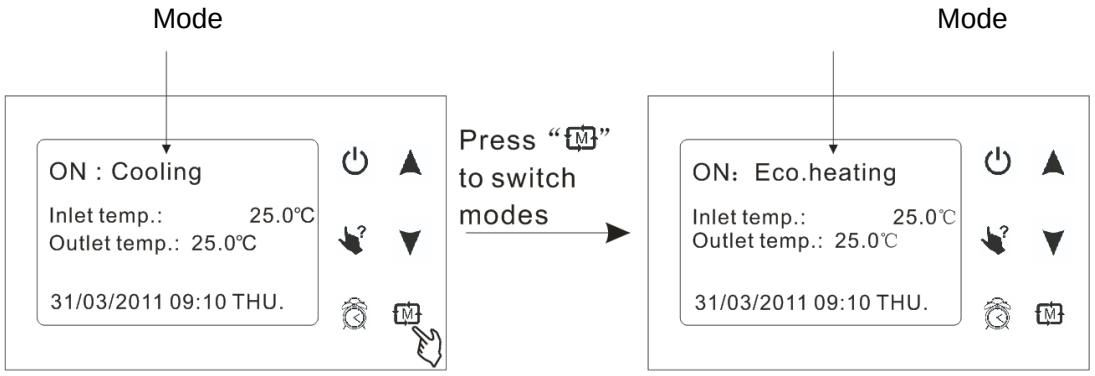
4.3 The operation of mode switching

At main interface, you can switch modes of cooling, economic heating, heating, rapid heating by pressing “M”. Or switch modes of cooling, economic heating and automatic.

The different unit gets different mode types.

Attention：the operation of mode is invalid when the unit you buy is cooling only or heating only.

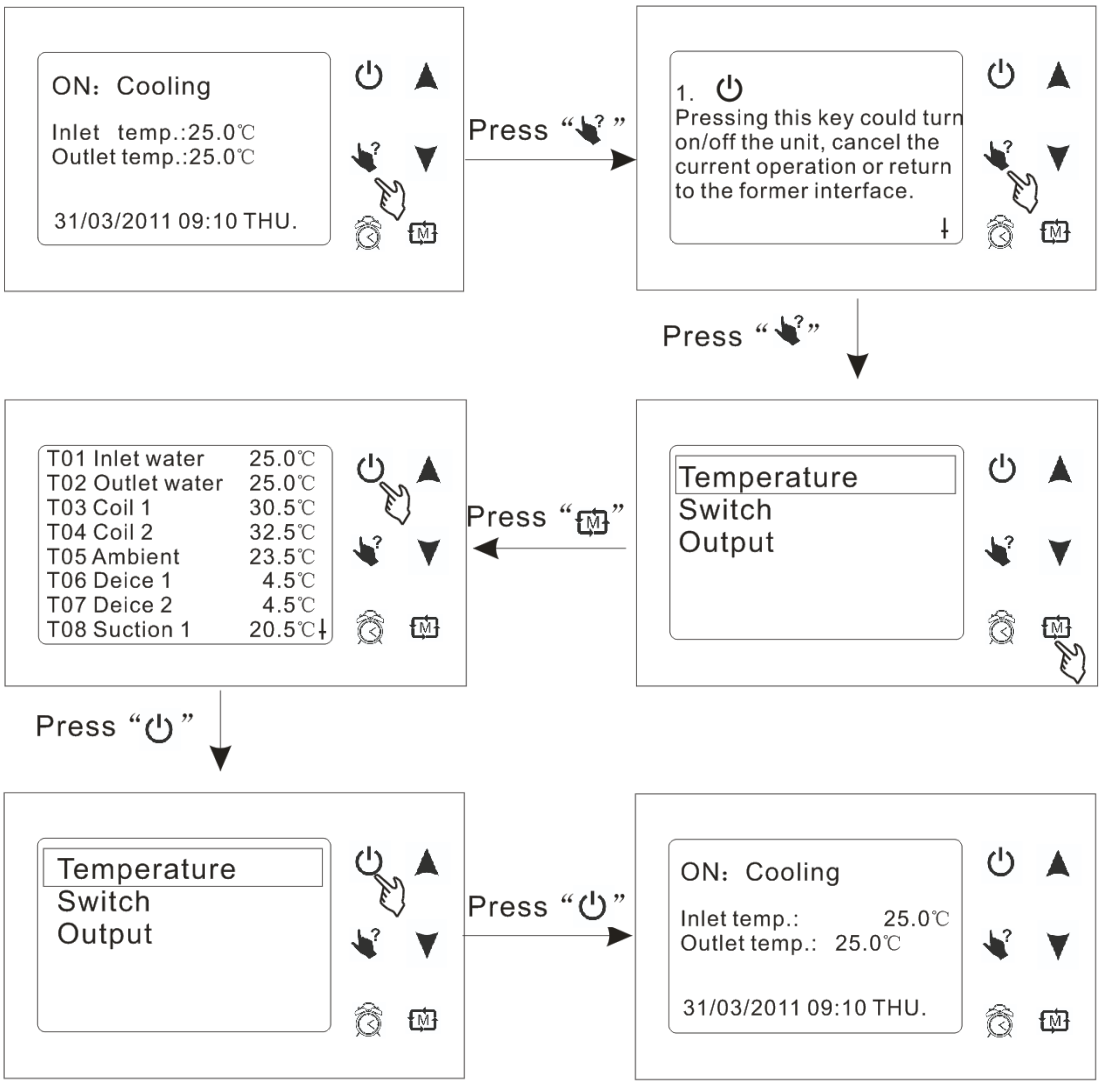
For example：



4.4 The operation of system state checking

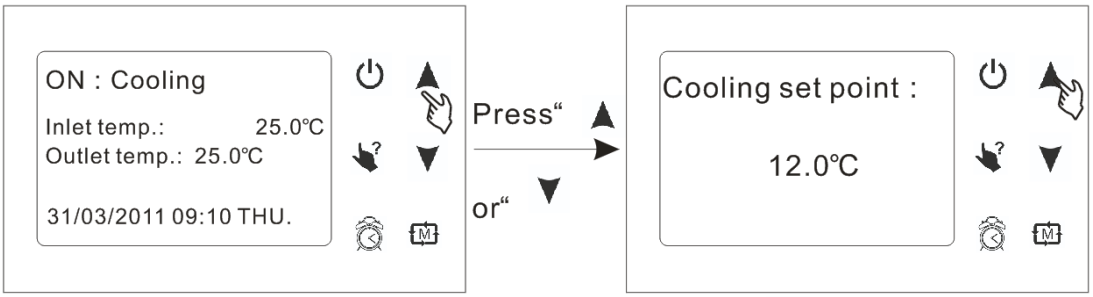
At any interface, you can enter system working state by pressing“ ”twice, press“ ” （pageup）or “ ”（pagedown）to select the needing parameter, press“M”to enter, and press“ ⏻”to exit.

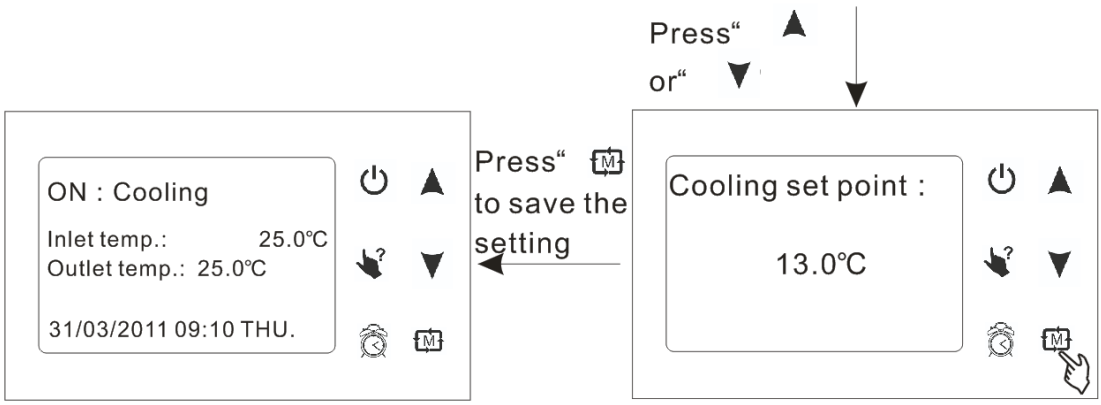
For example：



4.5 The operation of parameter setting

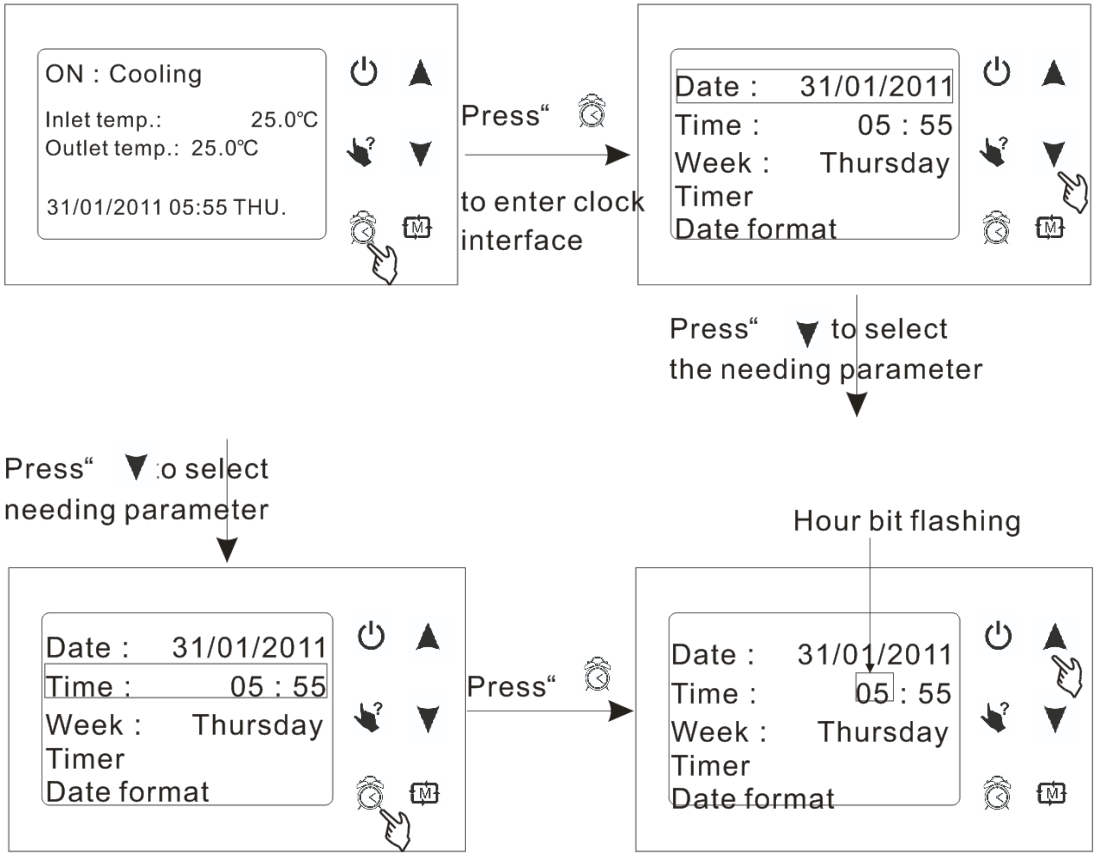
At main interface, press"▲"or"▼"to enter parameter setting interface, press "▲"（increasing）or"▼"（decreasing）can change parameter value, press"M"to save the setting and exit . Press"⏻"can not save the setting but exit.（You can refer to parameter table to set relevant temperature.）

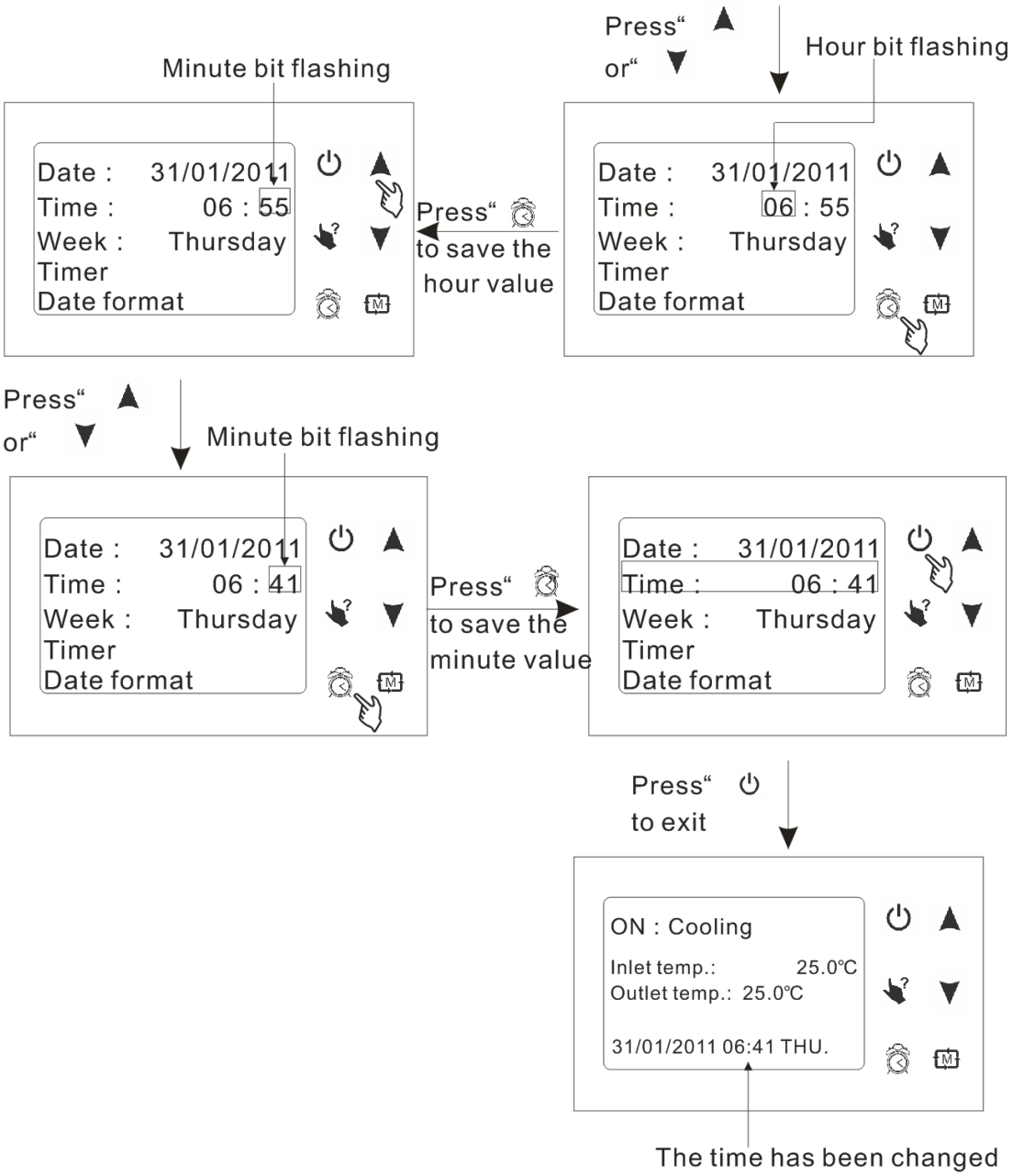




4.6 The operation of clock setting

At main interface, press“”to enter clock setting interface, select the needing parameter and press“ ” , at this time, parameter value flashing, press“ ”(increasing)or“ ”(Decreasing) can change parameter value, then press“ ”to save, press“ ”can cancel the setting or back to the main interface.（“timer setting”refer to timer operation）



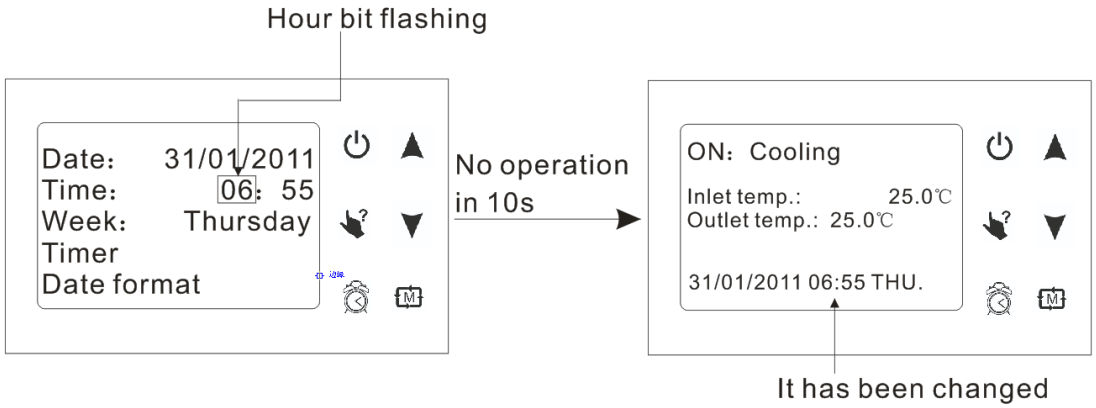


Tips：The setting of date and week is the same with clock;

If there is no operation in 10s, system will remember parameter setting automatic

and back to the main interface.,

As follow ：



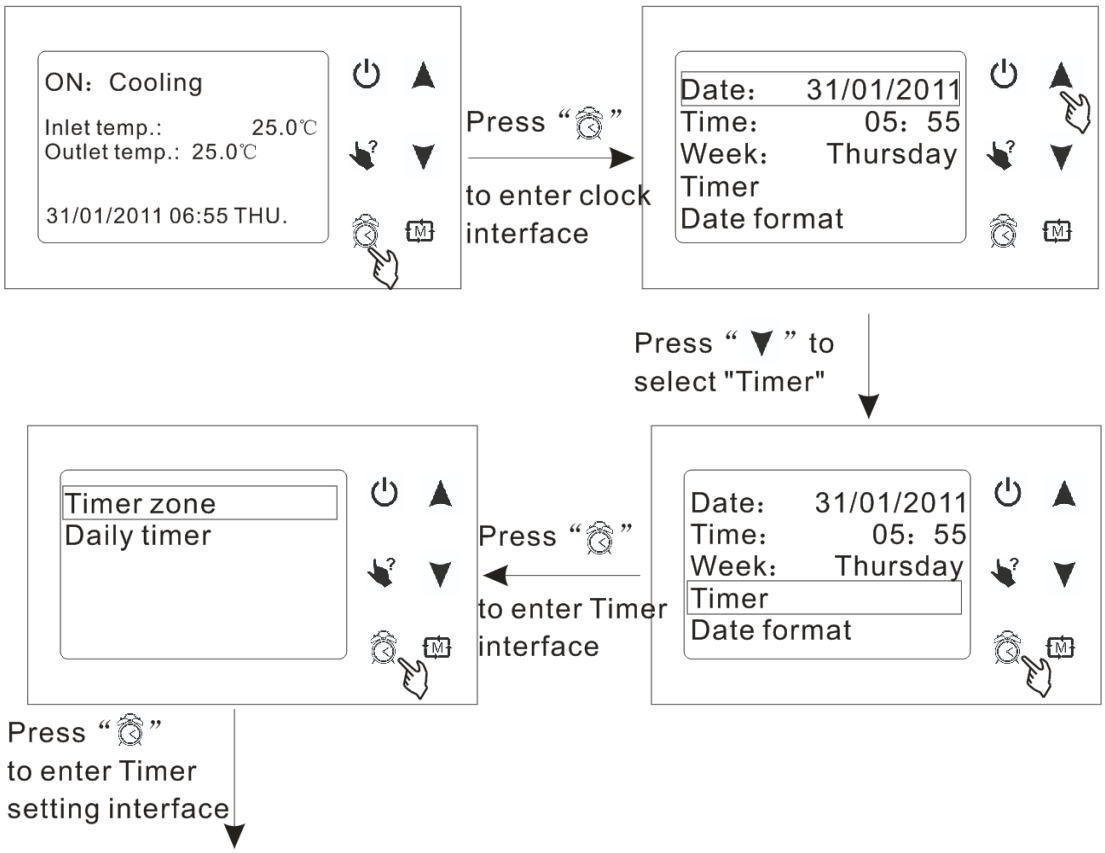
4.7 The operation of timer setting

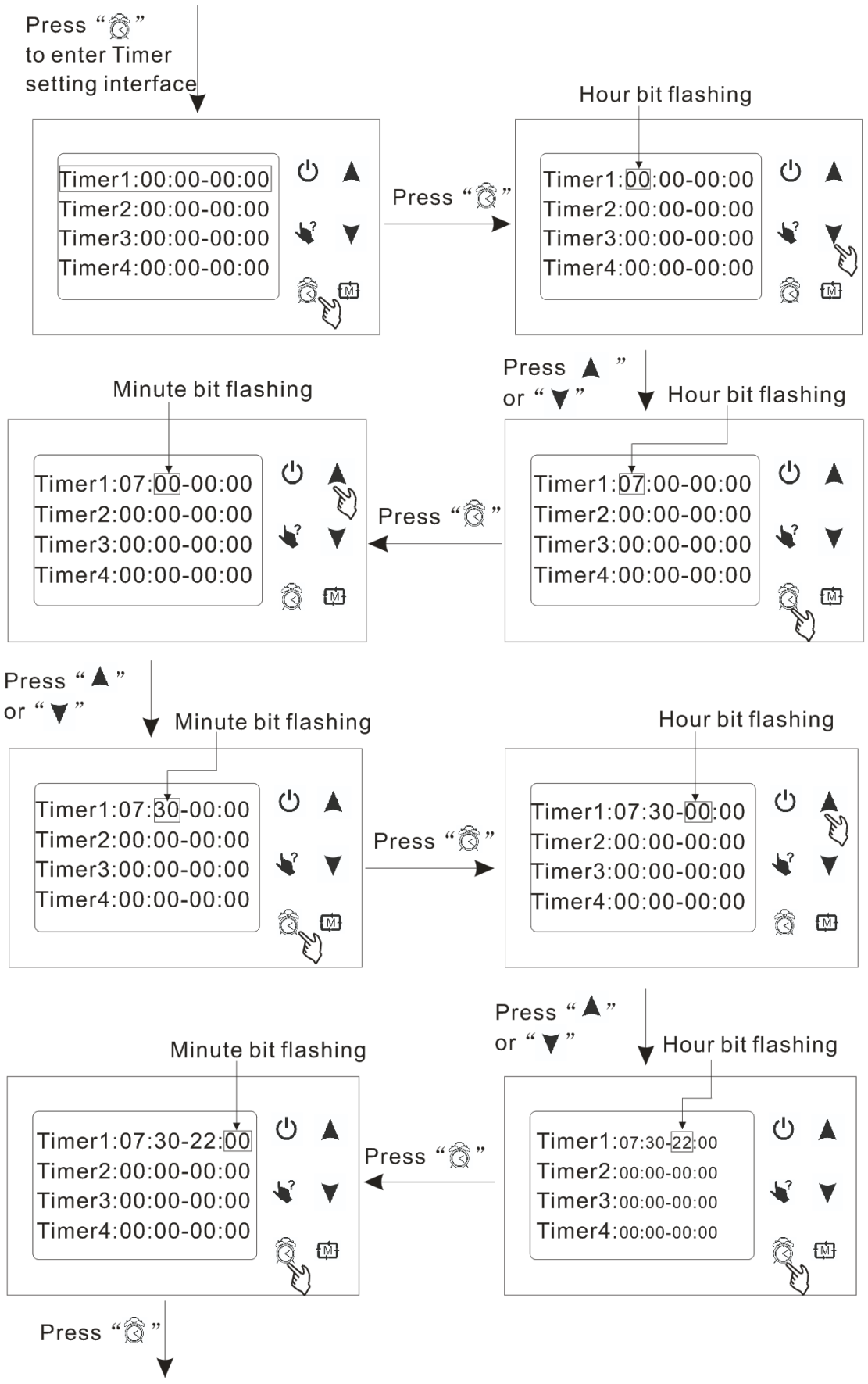
You can set four timer on and timer off according to you needing.

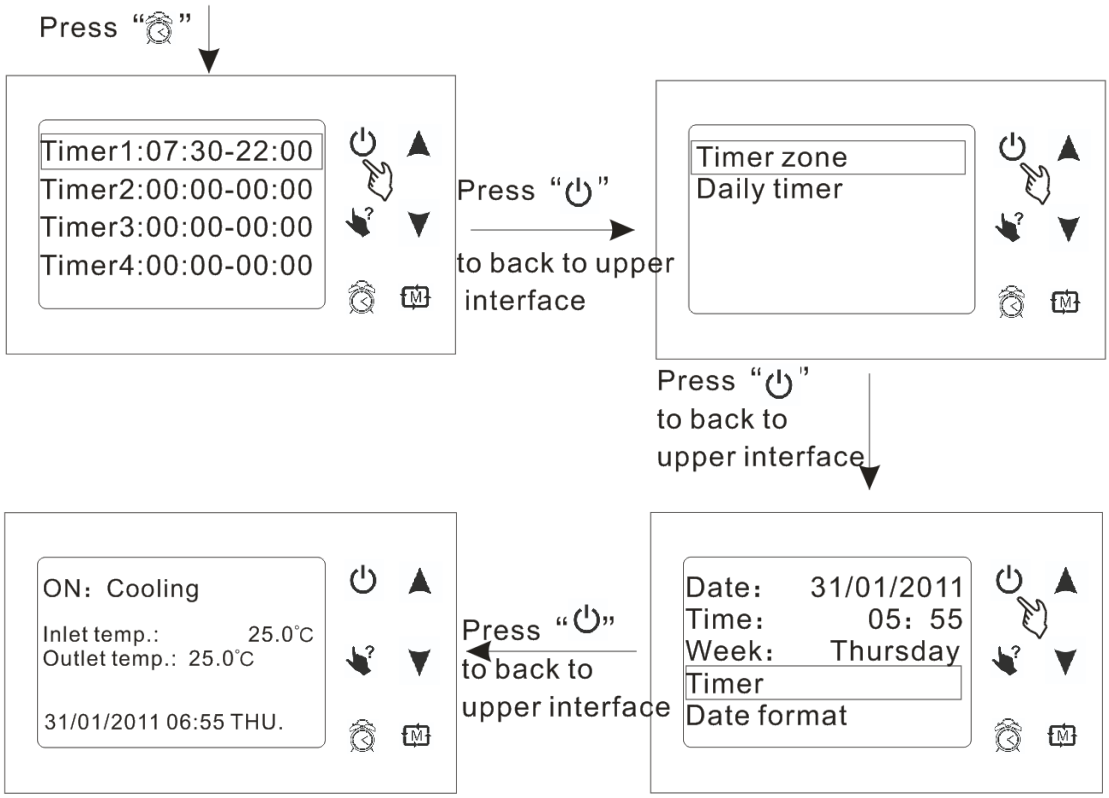
At main interface, press“ ”to enter timer setting, press“ ”to select“Timer”, then press“ ”to enter timer setting interface,（timer setting：you can set four timer on and timer off, and the time you set can from Monday to Sunday.）， the operation is the same with clock setting.

For example：

A. Timer setting

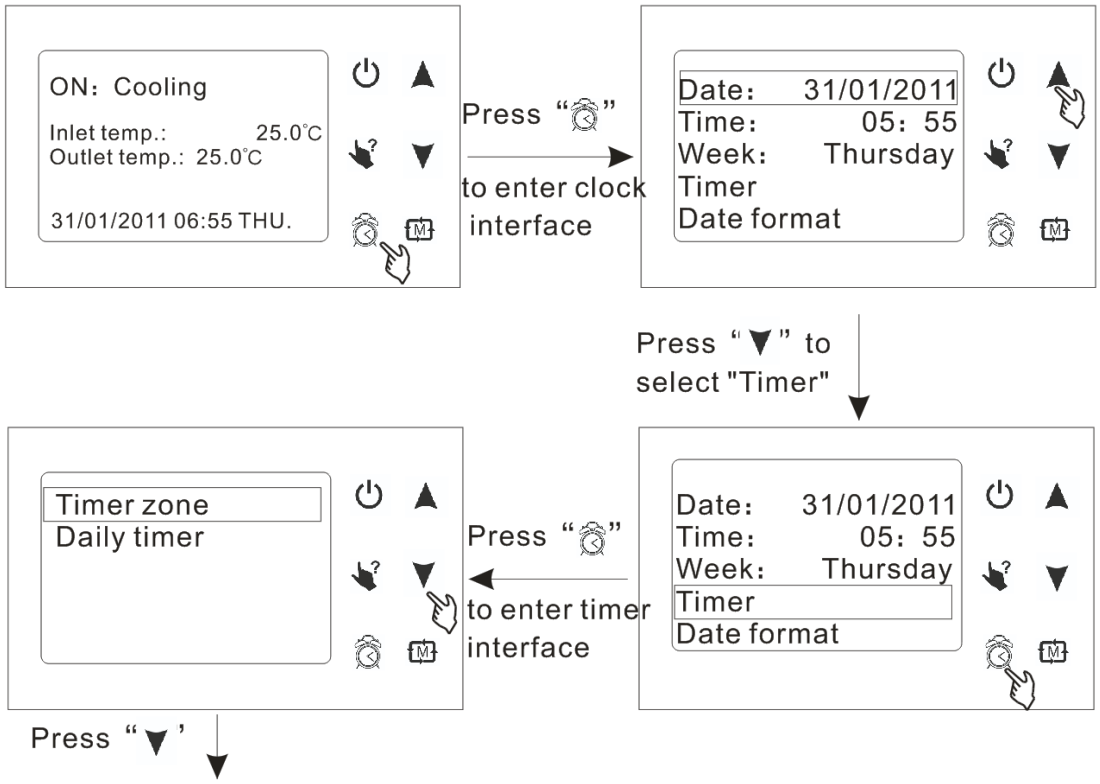


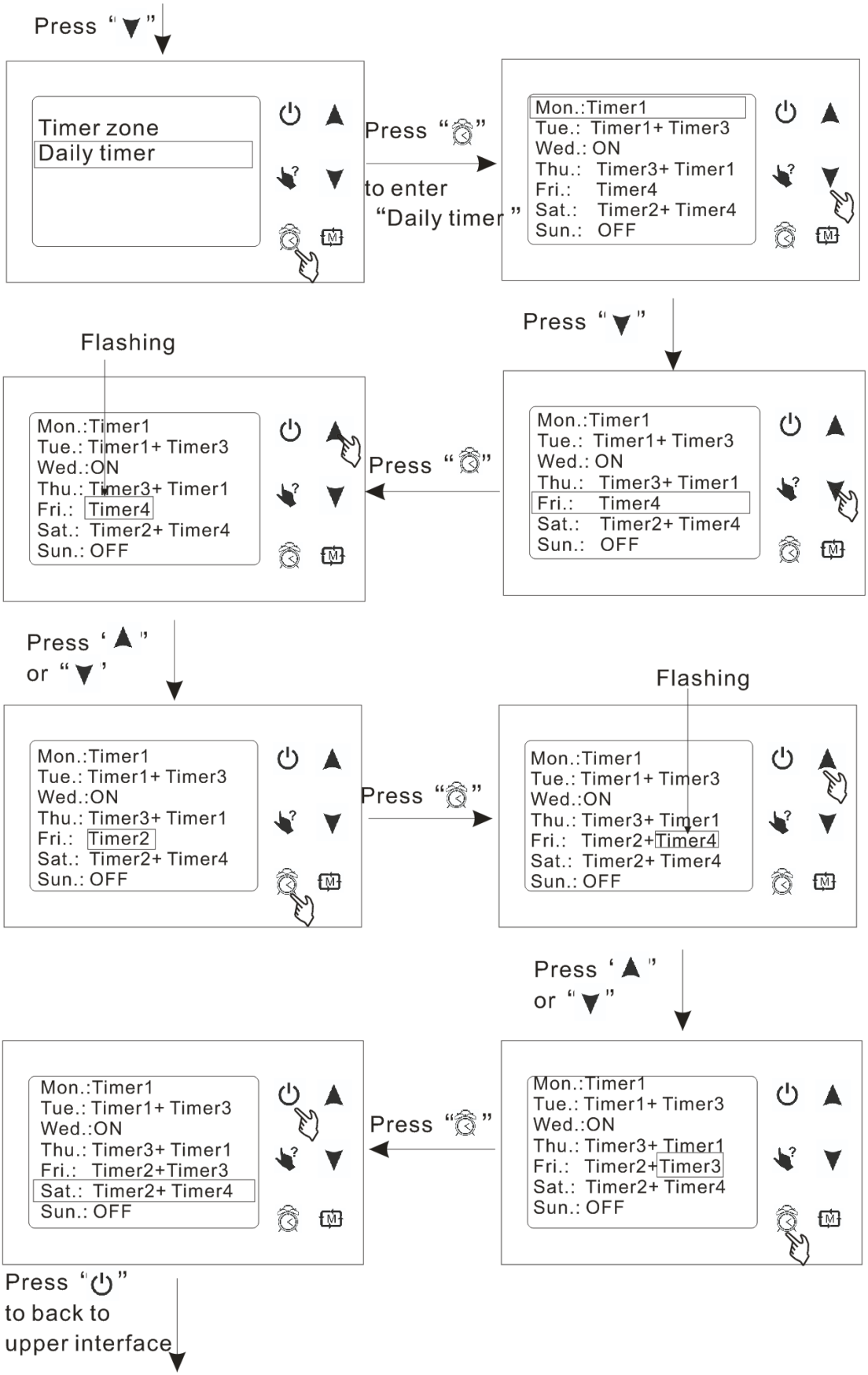

Press "⏰" to enter Timer setting interface
Timer1:00:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏰"
Hour bit flashing
Timer1:00:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "▲" or "▼"
Hour bit flashing
Timer1:07:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏰"
Minute bit flashing
Timer1:07:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "▲" or "▼"
Minute bit flashing
Timer1:07:30-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏰"
Hour bit flashing
Timer1:07:30-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "▲" or "▼"
Hour bit flashing
Timer1:07:30-22:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏰"
Minute bit flashing
Timer1:07:30-22:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏰"

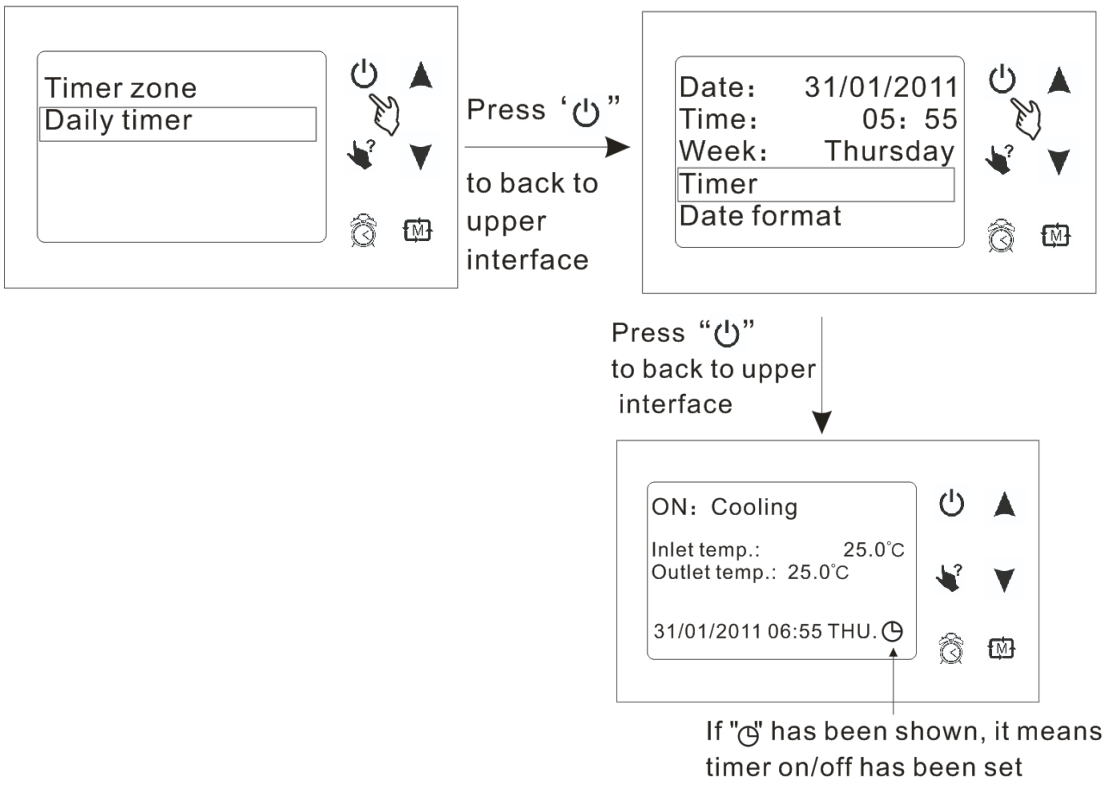


Tips：1) The operation of Timer2, Timer3, Timer4 is the same with Timer1;
2) Timer1 :07:30-22:00 means system starts up at 7:30, and shut down at 22:00 automaticly;
3) If there is no operation in 10s, system will memory parameter setting automaticly.

B. The operation of daily timer




Press "▼"
Timer zone
Daily timer
Press "⏰"
to enter
"Daily timer"
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.: ON
Thu.: Timer3+ Timer1
Fri.: Timer4
Sat.: Timer2+ Timer4
Sun.: OFF
Press "▼"
Flashing
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.:ON
Thu.: Timer3+ Timer1
Fri.: Timer4
Sat.: Timer2+ Timer4
Sun.: OFF
Press "⏰"
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.: ON
Thu.: Timer3+ Timer1
Fri.: Timer4
Sat.: Timer2+ Timer4
Sun.: OFF
Press "▲" or "▼"
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.:ON
Thu.: Timer3+ Timer1
Fri.: Timer2
Sat.: Timer2+ Timer4
Sun.: OFF
Press "⏰"
Flashing
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.:ON
Thu.: Timer3+ Timer1
Fri.: Timer2+Timer4
Sat.: Timer2+ Timer4
Sun.: OFF
Press "▲" or "▼"
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.:ON
Thu.: Timer3+ Timer1
Fri.: Timer2+Timer3
Sat.: Timer2+ Timer4
Sun.: OFF
Press "⏰"
Mon.:Timer1
Tue.: Timer1+ Timer3
Wed.:ON
Thu.: Timer3+ Timer1
Fri.: Timer2+Timer3
Sat.: Timer2+ Timer4
Sun.: OFF
Press "⏻"
to back to
upper interface



Tips: The Timer operations of Monday,Tuesday,Wednesday,Thursday,Saturday,Sunday is the same with Friday.

Monday: OFF:means Monday Timer hasn’t been set, and the running state is the same with Sunday at 24:00,for example,if system is running at 24:00 on Sunday, then it will be running the whole day on Monday,and vice versa;

Wednesday: ON: means system will be running the whole day on Wednesday

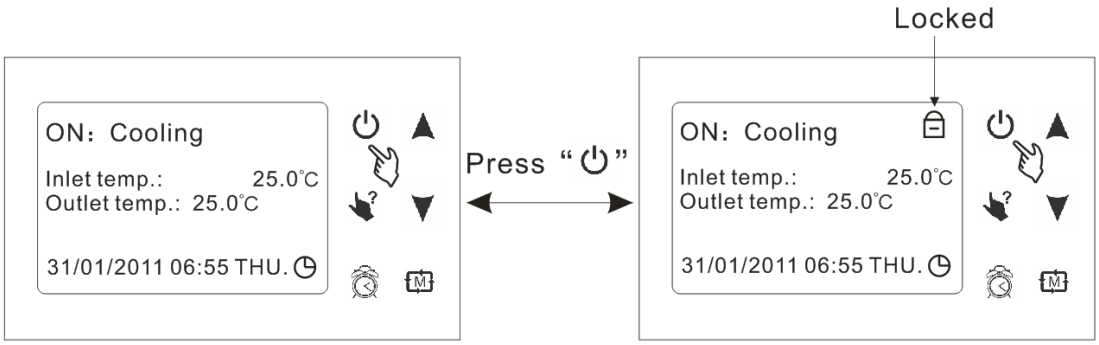
Thursday: OFF: means system will be off the whole day on Thursday;

Saturday: OFF: Timer1+Timer2 :means the time to start up and to shut down is according to Timer1 and Timer2.

If there is no operation in 10s,system will memory the parameter setting automatically and back to main interface.

4.8 Keyboard lock

To avoid mis-operations,please lock the controller after parameter setting. At the main interface,pressing “⏻” for 5 seconds,the keyboard will be locked. When the keyboard is locked,pressing “⏻” for 5 seconds,the keyboard will be unlocked.



NOTES:

When the unit is in alarming state,the key lock an be removed automatically.

4.9 Malfunction display

There will be malfunction code showing on the controller screen when relative malfunction occurs.

You can refer to the malfunction table to find out the failure cause and solution.

For example: