

8.1.1 Mapping of registers in the wired controller

The following addresses can use 03H, 06H (write single register), 10H (write multiple register)

Register address	Description	Remarks	
0 (PLC:40001)	Power on or off.	BIT15	Reserved
		BIT14	Reserved
		BIT13	Reserved
		BIT12	Reserved
		BIT11	Reserved
		BIT10	Reserved
		BIT9	Reserved
		BIT8	Reserved
		BIT7	Reserved
		BIT6	Reserved
		BIT5	Reserved
		BIT4	Reserved
		BIT3	0: power off floor heating; 1: power on floor heating;(zone 2) (water flow temperature control)
		BIT2	0: DHW(T5S) power off; 1: DHW(T5S) power on
		BIT1	0: power off floor heating; 1: power on floor heating;(zone 1) (water flow temperature control)
		BIT0	0: power off air conditioner; 1: power on air conditioner; (zone 1) (room temperature control)

1(PLC: 40002)	Setting the mode	1: Auto; 2: Cool; 3: Heat; Others: Invalid	
2(PLC: 40003)	Setting water water temperature T1S	Bit8-Bit15	Water temperature T1s is corresponding to the floor heating.(zone 2)
		Bit0-Bit7	Water temperature T1s is corresponding to the floor heating.(zone 1)
3(PLC: 40004)	Setting air temperature Ts	The room temperature range is between 17°C and 30°C, and is valid when there is Ta. Portocol value=actual value*2	
4(PLC: 40005)	T5s	The water tank temperature range is between 20°C and 75°C.	
5(PLC: 40006)	Function Setting	BIT15	Reserved
		BIT14	Reserved
		BIT13	1: climate curve setting is valid; 0: climate curve setting is invalid. (zone2)
		BIT12	1: climate curve setting is valid; 0: climate curve setting is invalid. (zone1)
		BIT11	DHW pump's running constant-temperature water recycling
		BIT10	ECO mode
		BIT9	Reserved
		BIT8	Holiday home (the status can only be read, not changed)
		BIT7	0: Silent mode level1; 1: Silent mode level2
		BIT6	Silent mode
		BIT5	Holiday away (the status can only be read, but cannot be changed)
		BIT4	Disinfect
		BIT3	Reserved
		BIT2	Reserved
		BIT1	Reserved
		BIT0	Reserved
6 (PLC: 40007)	Curve selection	Bit8-Bit15	Climate Curve 1-9(zone 2)
		Bit0-Bit7	Climate Curve 1-9(zone 1)
7(PLC: 40008)	Forced water heating	0: Invalid 1: Forced on 2: Forced off	TBH is the electric water tank heater. IBH1 and 2 are the hydraulic module's rear electric heater. IBH1 and 2 can be activated together. TBH cannot be activated together with IBH1 and IBH2.
8 (PLC: 40009)	Forced TBH		
9(PLC: 40010)	Forced IBH1		
10(PLC: 40011)	t_SG_MAX	0-24 Hours	
11(PLC: 40012)	T1S	Water temperature T1S is corresponding to the floor heating.(zone 1)	
12(PLC: 40013)	T1S	Water temperature T1S is corresponding to the floor heating.(zone 2)	
13(PLC: 40014)	t_ANTILOCK	Default setting: 5, range: 0~60 S(Available in Sphera A)	
Leaving water temperature T1s setting range instruction: In cooling mode, T1S low temp setting range is 5~25°C;T1S high temp setting range is 18~25°C. In heating mode, T1S low temp setting range is 22~55°C;T1S high temp setting range is 35~70°C.			

8.1.2 When the wired controller is connected to the hydraulic module, the parameters of the whole unit can be checked:

The following address table can only use 03H function code(Read register).

Whole unit parameter mapping address table

1) Running parameters		
Register address	Description	Remarks
100(PLC: 40101)	Operating frequency	Compressor operating frequency in Hz
101(PLC: 40102)	Operating Mode	Outdoor unit's actual operating mode, 2: cooling, 3: heating, 0: off
102(PLC: 40103)	Fan Speed	Fan speed, in r/min
103(PLC: 40104)	PMV openness	Openness of the outdoor unit's electronic expansion valve in P
104(PLC: 40105)	Water inlet temperature	TW_in, unit: °C
105(PLC: 40106)	Water outlet temperature	TW_out, unit: °C
106(PLC: 40107)	T3 Temperature	Condenser temperature, unit: °C
107(PLC: 40108)	T4 Temperature	Outdoor ambient temperature unit: °C
108(PLC: 40109)	Discharge temperature	Compressor discharge temperature Tp unit: °C
109(PLC: 40110)	Suction temperature	Compressor suction temperature Th, unit: °C
110(PLC: 40111)	T1	System total water outlet temperature (behind the auxiliary heater) ,unit: °C
111(PLC: 40112)	Tw2	Zone 2 water flow temperature , unit: °C
112(PLC: 40113)	T2	Refrigerant liquid side temperature, unit: °C
113(PLC: 40114)	T2B	Refrigerant gas side temperature, unit: °C
114(PLC: 40115)	Ta	Room temperature, unit: °C
115(PLC: 40116)	T5	Water tank temperature, unit: °C
116(PLC: 40117)	Pressure 1	Outdoor unit high pressure value, unit: kPa
117(PLC: 40118)	Pressure 2	Outdoor unit low pressure value, unit: kPa
118(PLC: 40119)	Outdoor unit current	Outdoor unit operating current, unit: A
119(PLC: 40120)	Outdoor unit voltage	Outdoor unit voltage, unit: V
120(PLC: 40121)	Tbt1	Tbt1, unit: °C
121(PLC: 40122)	Tbt2	Tbt2, unit: °C
122(PLC: 40123)	Compressor operation time	Compressor operating time in hour
123(PLC: 40124)	Unit capacity	0702 for 200 register is reserved. When it is 071x, data 4-30 means 4-30kW
124(PLC: 40125)	Current fault	Check the code table for detailed fault codes
125(PLC: 40126)	Fault 1	Check the code table for detailed fault codes.
126(PLC: 40127)	Fault 2	
127(PLC: 40128)	Fault 3	

128(PLC: 40129)	Status bit 1	BIT15	Request to send operation parameter, 1: request; 0: not request
		BIT14	Request to send software version, 1: request; 0: not request
		BIT13	Request to send SN code, 1: request; 0: not request
		BIT12	Reserved
		BIT11	EUV 1: free electricity; 0: judge by SG's signal
		BIT10	SG 1: normal electricity; 0: high price electricity (judge when EUV is 0)
		BIT9	Anti-freezing operation for water tank
		BIT8	Solar energy signal input
		BIT7	Cooling mode set by room thermostat
		BIT6	Heating mode set by room thermostat
		BIT5	Outdoor unit test mode mark
		BIT4	Remote On/Off (1: d8)
		BIT3	Oil return
		BIT2	Anti-freezing
		BIT1	Defrosting
		BIT0	Reserved
129(PLC: 40130)	Load output	BIT15	DEFROST
		BIT14	Auxiliary heat source
		BIT13	RUN
		BIT12	ALARM
		BIT11	Solar water pump
		BIT10	HEAT4
		BIT9	SV3
		BIT8	Mixed water pump P_c
		BIT7	Water return water P_d
		BIT6	External water pump P_o
		BIT5	SV2
		BIT4	SV1
		BIT3	Water pump PUMP_I
		BIT2	Electric heater TBH
		BIT1	Electric heater IBH2
		BIT0	Electric heater IBH1
130(PLC: 40131)	Software version	1~99 is the software version of hydronic module	
131(PLC: 40132)	Wired controller version No.	1~99 is the wired controller's version number.	

132(PLC: 40133)	Unit target frequency	Hz	
133(PLC: 40134)	DC bus current	Unit: A	
134(PLC: 40135)	DC bus voltage	The actual value/10, unit: V	
135(PLC: 40136)	TF module temperature	Feedback on outdoor unit, unit: °C	
136(PLC: 40137)	Climate curve T1S calculated value 1	The corresponding calculated T1S of zone 1	
137(PLC: 40138)	Climate curve T1S calculated value 2	The corresponding calculated T1S of zone 2	
138(PLC: 40139)	Water flow	The actual value*100, unit: m3/H	
139(PLC: 40140)	Limit scheme of outdoor unit current	Scheme value	
140(PLC: 40141)	Ability of Hyd raulic module	The actual value*100, unit: kW	
141(PLC: 40142)	Tsolar	Tsolar	
142(PLC: 40143)	Quantity of units in parallel	BIT1-BIT15	Respectively represent the online status of slaves unit 1-15
		BIT0	Reserved
143(PLC: 40144)	Higher bits for electricity consumption		
144(PLC: 40145)	Lower bits for electricity consumption		
145(PLC: 40146)	Higher bits for power output		
146(PLC: 40147)	Lower bits for power output		

Note :

1. When Tw2 unavailable, "25" would display in upper unit address 113.
2. When T2B unavailable, the wired controller would display"--" and "25" would display in upper unit address 113.
3. When Ta unavailable, "25" would display in upper unit address 114.
4. When E series without Tbt1、Tbt2, the wired controller would display"--" and "0" would display in upper unit addresses 120 and 121.

The following register address 200-208 can only use 03H(Read register) function code. Register address 209 and follows can use 03H, 06H (write single register), 10H (write multiple register).

2) Parameter setting		
Register address	Description	Remarks
200(PLC: 40201)	Home appliance type	The upper 8 bits are the types of home appliances: Air to water heat pump: 0x07 The middle 4 bits are product codes: 0x1* The lower 4 bits are sub-type: R32: 0x*2
201(PLC: 40202)	Temperature upper limit of T1S cooling	Lower 8 bits are for zone 1. higher 8 bits are for zone 2
202(PLC: 40203)	Temperature lower limit of T1S cooling	Lower 8 bits are for zone 1. higher 8 bits are for zone 2
203(PLC: 40204)	Temperature upper limit of T1S heating	Lower 8 bits are for zone 1. higher 8 bits are for zone 2
204(PLC: 40205)	Temperature lower limit of T1S heating	Lower 8 bits are for zone 1. higher 8 bits are for zone 2
205(PLC: 40206)	Temperature upper limit of TS setting	Protocol value = actual value * 2
206(PLC: 40207)	Temperature lower limit of TS setting	Protocol value = actual value * 2
207(PLC: 40208)	Temperature upper limit of water heating	
208(PLC: 40209)	Temperature lower limit of water heating	
209(PLC: 40210)	PUMP RUNNING TIME	DHW PUMP water return running time. It is five minutes by default and can be adjusted between 5 and 120 min at an interval of 1 min.
210(PLC: 40211)	Parameter setting 1	BIT15 Enable water heating
		BIT14 Supports water tank electric heater TBH(Read-only)
		BIT13 Supports disinfection
		BIT12 DHW PUMP, 1: supported; 0: not supported
		BIT11 Reserved
		BIT10 DHW pump is valid in disinfection mode
		BIT9 Enable cooling
		BIT8 T1S cooling high/low temperature settings(Read-only)
		BIT7 Enable heating
		BIT6 T1S heating high/low temperature settings(Read-only)
		BIT5 PUMPI silent mode, 1: valid, 0: invalid
		BIT4 Supports room temperature Sensor Ta
		BIT3 Supports room thermostat
		BIT2 Room thermostat
		BIT1 Dual Room Thermostat, 0: not supported; 1: supported
		BIT0 0: room cooling/heating first, 1: water heating first

211(PLC: 40212)	Parameter setting 2	BIT15	ACS(Double water tank control) 1: Yes 0: No (read only)
		BIT14	M1M2 is used for AHS control 1: Yes 0: No
		BIT13	RT_Ta_PCNE(enable Temperature Collection Kit) 1: Yes 0: No
		BIT12	Tbt2 sensor is valid 1: Yes 0: No
		BIT11	Piping length selection 1: >10m 0: <10m
		BIT10	Solar energy input port 1: CN18 0: CN11
		BIT9	Solar energy kit enable 1: Yes 0: No
		BIT8	Define the port, 0=remote ON/OFF; 1=DHW heater
		BIT7	Smart grid, 0=NON; 1=YES
		BIT6	Tw2 sensor enable 0: None 1: Yes
		BIT5	Setting the high/low temperature of cooling mode T1S
		BIT4	Setting the high/low temperature of heating mode T1S
		BIT3	Double zone setting is valid
		BIT2	Ta sensor position 1: IDU 0: HMI
		BIT1	Tbt1 sensor enable 1: Yes 0: No
		BIT0	IBH/AHS installation position 1: buffer tank 0: pipe
212(PLC: 40213)	dT5_On	Default setting: 10° C, range: 1~30° C;	
213(PLC: 40214)	dT1S5	Default setting: 10° C, range: 5~40° C, setting interval: 1° C	
214(PLC: 40215)	T_Interval_DHW	Default setting: 5 min, range: 5~5 min, setting interval: 1 min	
215(PLC: 40216)	T4DHWmax	Default setting: 43°C, range: 35~43°C, setting interval: 1°C	
216(PLC: 40217)	T4DHWmin	Default: -10° C, range: -25~30° C;	
217(PLC: 40218)	t_TBH_delay	Default setting: 30 min, range: 0~240 min, setting interval: 5 min	
218(PLC: 40219)	dT5S_TBH_off	Default setting: 5°C, range: 0~10°C, setting interval: 1°C	
219(PLC: 40220)	T4_TBH_on	Default setting: 5° C, range: -5~50° C;	
220(PLC: 40221)	T5s_DI	Temperature for the disinfection operation, range: 60~70 ° C, default setting: 65°C	

221(PLC: 40222)	t_DI_max	Maximum disinfection duration, range: 90~300 min, default setting: 210 min
222(PLC: 40223)	t_DI_hightemp	Disinfection high temperature duration, range: 5~60 min, default setting: 15 min
223(PLC: 40224)	t_interval_C	Time interval of compressor start-up in cooling mode; range: 5~5 min, default setting: 5 min
224(PLC: 40225)	dT1SC	Default setting: 5°C, range: 2~10°C, setting interval: 1°C
225(PLC: 40226)	dTSC	Default setting: 2°C, range: 1~10°C, setting interval: 1°C
226(PLC: 40227)	T4cmax	Default setting: 52°C, range: 35~52°C, setting interval: 1°C
227(PLC: 40228)	T4cmin	Default setting: 10°C, range: -5~25°C, setting interval: 1°C
228(PLC: 40229)	t_interval_H	Time interval of compressor start-up in the heating mode; range: 5~5 min, default setting: 5 min
229(PLC: 40230)	dT1SH	Default setting: 5° C, range: 2-20° C;
230(PLC: 40231)	dTSH	Default setting: 2°C, range: 1~10°C, setting interval: 1°C
231(PLC: 40232)	T4hmax	Default setting: 25°C, range: 20~35°C, setting interval: 1°C
232(PLC: 40233)	T4hmin	Default setting: -15° C, range: -25-30° C, Setting interval1° C
233(PLC: 40234)	T4_IBH_on	Ambient temperature for enabling the hydraulic module auxiliary electric heating IBH, range: -15~10°C; default setting: -5°C
234(PLC: 40235)	dT1_IBH_on	Temperature return difference for enabling the hydraulic module auxiliary
235(PLC: 40236)	t_IBH_delay	Delay time of enabling the hydraulic module auxiliary electric heating IBH,
237(PLC: 40238)	T4_AHS_on	The trigger ambient temperature for turning on AHS
238(PLC: 40239)	dT1_AHS_on	The temperature difference between the heat pump 's leaving water set temperature (T1S) and the heat
240(PLC: 40241)	t_AHS_delay	Delay time for enabling the external heater AHS, range: 5~120 min; default setting: 30 min

241(PLC: 40242)	t_DHWHP_max	Longest duration of water heating by the heat pump, range: 10~600 min, default setting: 90 min;
242(PLC: 40243)	t_DHWHP_restrict	Duration of limited water heating by the heat pump, range: 10~600 min, default setting: 30 min;
243(PLC: 40244)	T4autocmin	Default setting: 25°C, range: 20~29°C, setting interval: 1°C
244(PLC: 40245)	T4autohmax	Default setting: 17°C, range: 10~17°C, setting interval: 1°C
245(PLC: 40246)	T1S_H.A_H	Default setting: 25°C, range: 20~25°C, setting interval: 1°C
246(PLC: 40247)	T5S_H.A_DHW	In the holiday mode, setting of T1 in the water heating mode, range: 20~25°C, default setting: 25°C
247(PLC: 40248)	PER_START ratio	Range10-100, default setting10.Setting interval10
248(PLC: 40249)	TIME_ADJUST	Range1-60 default setting5
249(PLC: 40250)	dTbt2	Rrange0-50 default setting15
250(P LC: 40251)	IBH1 power	Range0-200, default setting0, unit: 100W
251(PLC: 40252)	IBH2 power	Range0-200, default setting0, unit: 100W
252(P LC: 40253)	TBH power	Range0-200, default setting0,unit: 100W
253(PLC: 40254)	Comfort parameter	Reserved, wrong address is reported whe n this register is queried
254(P LC: 40255)	Comfort parameter	Reserved, wrong address is reported whe n this register is queried
255(PLC: 40256)	t_DRYUP	Temperature rise day number, range: 4~15 days, default setting: 8 days
256(PLC: 40257)	t_HIGHPEAK	Drying day number, range: 3~7 days, default setting: 5 days
257(PLC: 40258)	t_DRYD	Temperature drop day number, range: 4~15 days, default setting: 5 days
258(PLC: 40259)	T_DRYPEAK	Highest drying temperature, range: 30~55°C, default setting: 45°C
259(PLC: 40260)	t_firstFH	Running time of floor heating for the first time, default setting: 72 hrs, range: 48-96 hrs
260(PLC: 40261)	T1S (first floor heating)	T1S of floor heating for the first time, range: 25~35°C, default setting: 25°C

261(PLC: 40262)	T1SetC1	Parameter of the ninth temperature curves for cooling mode, range: 5~25°C, default setting: 10°C
262(PLC: 40263)	T1SetC2	Parameter of the ninth temperature curves for cooling mode, range: 5~25°C, default setting: 16°C
263(PLC: 40264)	T4C1	Parameter of the ninth temperature curves for cooling mode, range: (-5) ~46°C, default setting: 35°C
264(PLC: 40265)	T4C2	Parameter of the ninth temperature curves for cooling mode, range: (-5) ~46°C, default setting: 25°C
265(PLC: 40266)	T1SetH1	Parameter of the ninth temperature curves for heating mode, range: 25~65°C, default setting: 35°C
266(PLC: 40267)	T1SetH2	Parameter of the ninth temperature curves for heating mode, range: 25~65°C, default setting: 28°C
267(PLC: 40268)	T4H1	Parameter of the ninth temperature curves for heating mode, range: (-25) ~35°C, default setting: -5°C
268(PLC: 40269)	T4H2	Parameter of the ninth temperature curves for heating mode, range: (-25) ~35°C, default setting: 7°C
269(PLC: 40270)	POWER INPUT LIMITATION	The type of power input limitation, 0=NON, 1~8=type 1~8, default: 0
270(PLC: 40271)	HB: t_T4_FRESH_C	Range: 0.5~6 hour, setting interval: 0.5 hour, sending value=actual value*2
	LB: t_T4_FRESH_H	Range: 0.5~6 hour, setting interval: 0.5 hour, sending value=actual value*2
271(PLC: 40272)	T_PUMPI_DELAY	Range: 0.5~20 hour, setting interval: 0.5 hour, sending value=actual value*2
272(PLC: 40273)	EMISSION TYPE	Bit12-15: The type of zone 2 end for cooling mode
		Bit8-11: The type of zone 1 end for cooling mode
		Bit4-7: The type of zone 2 end for heating mode
		Bit0-3: The type of zone 1 end for heating mode

8.1.3 Error code

Unit	Register address	Content	Remarks
E0	1	Water flow fault(E8 displayed 3 times)	
E1	2	Phase loss or neutral wire and live wire are connected	Only applies to 3-phase models
E2	3	Communication fault between controller and hydraulic	
E3	4	Final outlet water temp. sensor(T1) fault	Sensor T1
E4	5	Water tank temp. sensor(T5) fault	Sensor T5
E5	6	The condenser outlet refrigerant temperature sensor(T3)	Sensor T3
E6	7	The ambient temperature sensor(T4) fault	Sensor T4
E7	8	Buffer tank up temp. sensor(Tbt1) fault	Sensor Tbt1
E8	9	Water flow failure	
E9	10	Compressor suction temp. sensor (Th) fault	Sensor Th
EA	11	Compressor discharge temp. sensor (Tp) fault	Sensor Tp
Eb	12	Solar temp. sensor(Tsolar) fault	
Ec	13	The balance tank low temp. sensor(Tbt2) fault	Sensor Tbt2
Ed	14	The plate exchanger water inlet temp. sensor(Tw_in) fault	Sensor Tw_in
EE	15	The main control board of hydraulic module EEPROM	
P0	20	Low pressure protection	
P1	21	High pressure protection	
P3	23	Compressor overcurrent protection	
P4	24	Compressor discharge temp. too high protection	
P5	25	High temperature difference protection between water inlet and water outlet of the plate heat exchanger	
P6	26	Inverter module protection	Displayed on user interface when any of L0, L1, L2, L4,L5, L7, L8 or L9 occur
Pb	31	Anti-freeze mode protection	
Pd	33	High temperature protection of refrigerant outlet temp. of condenser	
PP	38	Water inlet temperature is higher than water outlet in heating mode	
H0	39	Communication fault between main control board of hydraulic module and main control board PCB B	
H1	40	Communication fault between inverter module PCB A and main control board PCB B	
H2	41	The plate exchanger refrigerant outlet(liquid pipe) temp. sensor(T2) fault	Sensor T2
H3	42	The plate exchanger refrigerant outlet(gas pipe) temp. sensor(T2B) fault	Sensor T2B
H4	43	Three times L0/L1 protection	
H5	44	Room temp. sensor(Ta) fault	Sensor Ta
H6	45	DC fan motor fault	
H7	46	Main circuit voltage protection fault	

Unit	Register address	Content	Remarks
H8	47	Pressure sensor fault	
H9	48	Zone 2 water flow temp. sensor(Tw2) fault	Sensor TW2
HA	49	The plate heat exchanger water outlet temperature sensor(Tw_out) fault	Sensor Tw_out
Hb	50	3 times PP protection and Tw_out<7℃	
Hd	52	Communication fault between master unit and slave unit(in parallel)	
HE	53	Communication fault between main board of hydraulic module and Ta/room thermostat transfer PCB	
HF	54	Inverter module board EE PROM fault	
HH	55	H6 display 10 times in 120 minutes	
HP	57	Low pressure protection (Pe<0.6) occurred 3 times in 1 hour in cooling mode	
C7	65	High temp. protection of inverter module	
bH	112	PED PCB fault	
F1	116	DC bus low voltage protection	
L0	134	DC compressor inverter module fault	
L1	135	DC bus low voltage protection(from inverter module mostly when compressor running)	
L2	136	DC bus high voltage protection from DC driver	
L4	138	MCE fault	
L5	139	Zero speed protection	
L7	141	Phase sequence fault	
L8	142	Compressor frequency variation greater than 15Hz within one second protection	
L9	143	Actual compressor frequency differs from target frequency by more than 15Hz protection	