

Single /double system online MODBUS protocol

- 1.Communication adopts RS485 bus, asynchronous serial signal 1 start bit, 8 data bits, 1 end bit, no odd-even check.**
- 2.RTU protocol conforming to the standard MODBUS, 16-bit data structure, 16-bit CRC low byte before the upper byte.**
- 3.The unit is address #1, address #0 is the broadcast address**
- 4.The wire controller (touch screen) or central controller is the calling host, the controller is the slave; the slave address is fixed to FFH when using the wire controller; the slave address is decided by dial switch or parameters on the controller when using the central controller.**
- 5. Master-slave communication uses three commands:**

Command 03H (Query 1 or more registers)

Send command: [device address] + [command number 03H] + [start register address high 8 bits] + [low 8 bits] + [high number of read registers 8 bits] + [low 8 bits] + [CRC checker The lower 8 bits of the check] + [High 8 bits of the CRC check]

Device Response: [Device Address] + [Command Number 03H] + [Number of Bytes Returned] + [Data 1] + [Data 2] +...+ [Data n] + [Low 8 bits of CRC checksum] + [High 8 bits of CRC check]

Command 06H (modify a single register)

Send command: [device address] + [command number 06H] + [required register address higher 8 bits] + [low 8-bit] + [lower data upper 8 bits] + [low 8-bit] + [CRC] Low 8 bits of the check] + [High 8 bits of the CRC check]

Device Response: If the command sent by the computer is returned as it is, it will not respond.

Command 10H (modify multiple registers)

Send command: [device address] + [command number 10H] + [start register address high 8 bits] + [low 8 bits] + [high register 8 bits] + [low 8 bits] + [register bytes] + [Data 1 high 8 bits] + [Low 8 bits] +.... + [Data N high 8 bits] + [Low 8 bits] + [Low 8 bits of CRC check] + [High 8 bits of CRC check]

Device Response: [Device Address] + [Command Number 10H] + [Highest starting register address 8 bits] + [Low 8 Bits] + [High Register Number 8 Bits] + [Low 8 Bits] + [Low CRC Checksum] 8 bits] + [High 8 bits of CRC check]

Parameter address (R means the parameter is read-only, RW means the parameter is readable and writable)

Data Address	Data Description	Setting Range	Remarks
RW 0x0000	Control sign		The definition of the flag bit is followed by a description
RW 0x0001	Mode selection	0~4	0: single hot water, 1: single heating, 2: single cooling, 3 :hot water + heating, 4: hot water + cooling, default :1
RW 0x0002	L0 Hot water difference	2℃~18℃	Default 3
RW 0x0003	L1 Hot water setting temperature	20~58℃	Default 55℃
RW 0x0004	L2 Cooling difference	2℃~18℃	Default 5℃
RW 0x0005	L3 Cooling setting temperature	10℃~32℃	Default 12℃
RW 0x0006	L4 Heating difference	2℃~18℃	Default 5℃
RW 0x0007	L5 Heating setting temperature	12℃~99℃	Default 45℃
RW 0x0008	L6 Ambient air temperature below which electric heater is allowed to start	-30℃~35℃	Default 0℃
RW 0x0009	L7 Return water temperature	20℃~80℃	Default 30℃
RW 0x000A	L8 Water tank temperature below which allow to	20℃~80℃	Default 48℃ (20℃: compensate cool water is not limited by water tank temperature)

	compensate cool water		
RW 0x000B	L9 Compressor current setting	0A~48A	Default 0A
RW 0x000C	H2 Ambient air temperature below which heat pump will stop working to protect	-30℃~0℃	Default -26℃
RW 0x000D	H3 Defrost period setting	20min~90min	Default 45min
RW 0x000E	H4 Air HE lowest tube temp below which system will enter defrost	-15℃~-1℃	Default -3℃
RW 0x000F	H5 Longest defrosting time setting	5min~20min	Default 10min
RW 0x0010	H6 Air HE lowest tube temp above which system will quit defrost	1℃~40℃	Default 20℃
RW 0x0011	H7 The temp difference between ambient temp and air HE lowest tube temp higher than which system will enter defrost	0~15℃	Default 8℃
RW 0x0012	H8 Ambient temp below which system will enter defrost	0~20℃	Default 20℃
RW 0x0013	P1 Main expansion valve superheat ratio	2-6	Default 5 Note: Actual use /10
RW 0x0014	P2 Main expansion valve superheat differential coefficient	0-180	Default 1
RW 0x0015	P3 Main expansion adjust	10S-30S	Default 15S

	period		
RW 0x0016	P4 Main circuit target superheat	-10℃-10℃	Default 2℃
RW 0x0017	P6 Main circuit expansion valve degree when defrosting(or by hand)	8-50P	Default 40P Note:Actual use X10
RW 0x0018	P7 Auxiliary expansion valve outlet gas ratio	2-6	Default 2 Note:Actual use/10
RW 0x0019	P8 Auxiliary expansion valve outlet gas differential coefficient	1-180	Default 1
RW 0x001A	P9 Auxiliary expansion valve superheat ratio	2-6	Default 2 Note:Actual use /10
RW 0x001B	P10 Auxiliary expansion valve superheat differential coefficient	0-180	Default 1
RW 0x001C	P11 Gas injection expansion valve adjust period	10s-20s	Default 12s
RW 0x001D	P12 Auxiliary expansion valve target outlet gas temp	90℃-120℃	Default 90℃
RW 0x001E	P13Auxiliary expansion valve close temp	40℃-70℃	Default 60℃
RW 0x001F	P14 Spray circuit target superheat	-10℃-10℃	Default 5℃
RW 0x0020	P16 Auxiliary circuit expansion valve manual steps	4-50P	Default 8 Note:Actual use X10
RW 0x0021	P17 Auxiliary circuit expansion valve fixed open	0-50P	Default 20 Note:Actual use X10

	degree when cooling		
RW 0x0022	P18 Superheat degree when cooling	-2℃-15℃	Default 2℃
RW 0x0023	P19 Auxiliary circuit expansion valve open degree when defrosting	8-50P	Default 8 Note:Actual use X10
RW 0x0024	P20 Main circuit expansion valve lower limit	2-20P	Default 8 Note:Actual use X10
RW 0x0025	F1 Upper limit of hot water tank temp setting	20℃～99℃	Default60℃
RW 0x0026	F3 Temp difference of displaying temp and real temp of hot water tank	-5℃～15℃	Default 2℃
RW 0x0027	FF Limited weeks after which heat pump will not allowed work	0～99 Week	Default 0 The unit is “week” “0”means not time limited
RW 0x0028	Timer flag		he definition of the flag bit is followed by a description
RW 0x0029	Frist period time ON Hour	00~23	Default 00
RW 0x002A	Frist period time ON Minute	00~59	Default 00
RW 0x002B	Frist period time OFF Hour	00~23	Default 00
RW 0x002C	Frist period time OFF Minute	00~59	Default 00
RW 0x002D	Second period time ON Hour	00~23	Default 00
RW 0x002E	Second period time ON Minute	00~59	Default 00
RW 0x002F	Second period time OFF	00~23	Default 00

	Hour		
RW 0x0030	Second period time OFF Minute	00~59	Default 00
RW 0x0031	Third period time ON Hour(Reserved)	00~23	Default 00
RW 0x0032	Third period time ON Minute(Reserved)	00~59	Default 00
RW 0x0033	Third period time OFF Hour(Reserved)	00~23	Default 00
RW 0x0034	Third period time OFF Minute(Reserved)	00~59	Default 00
RW 0x0035	Fourth period time ON Hour(Reserved)	00~23	Default 00
RW 0x0036	Fourth period time ON Minute(Reserved)	00~59	Default 00
RW 0x0037	Fourth period time OFF Hour(Reserved)	00~23	Default 00
RW 0x0038	Fourth period time OFF Minute(Reserved)	00~59	Default 00
RW 0x0039	Fifth period time ON Hour(Reserved)	00~23	Default 00
RW 0x003A	Fifth period time ON Minute(Reserved)	00~59	Default 00
RW 0x003B	Fifth period time OFF Hour(Reserved)	00~23	Default 00
RW 0x003C	Fifth period time OFF Minute(Reserved)	00~59	Default 00
RW 0x003D	Self-defined parameter A	-30℃~99℃	Default -12℃
RW 0x003E	Self-defined parameter B	0~48	Default 13
RW 0x003F	Self-defined parameter C	0~48	Default 6

RW 0x0040	Main line expansion valve target exhaust temperature	80-110	Default 95°C
RW 0x0041	Parameters Reserved		
RW 0x0042	Parameters Reserved		
RW 0x0043	Parameters Reserved		
RW 0x0044	Parameters Reserved		
RW 0x0045	Parameters Reserved		
RW 0x0046	Parameters Reserved		
R 0x0047	Error code		Error code difinition according to heat pump controller manual, 0XFFmeans no error
R 0x0048	Output flag 1		
R 0x0049	Output flag 2		
R 0x004A	Status flag 1		
R 0x004B	Status flag 2		
R 0x004C	Error flag 1(Reserved)		
R 0x004D	Error flag 2(Reserved)		
R 0x004E	Error flag 3(Reserved)		
R 0x004F	Error flag 4(Reserved)		
R 0x0050	Error flag 5(Reserved)		
R 0x0051	Water tank temperature		
R 0x0052	Outlet water temperature		
R 0x0053	Air heat exchanger tube coil temp		
R 0x0054	Compressor inlet gas temp		
R 0x0055	Compressor outlet gas temp		
R 0x0056	Ambient air temp		
R 0x0057	Economic heat exchanger inlet 1 temp		

R 0x0058	Economic heat exchanger outlet 1 temp		
R 0x0059	Floor heating return water temp		
R 0x005A	After throttling 1 temp		
R 0x005B	Compressor 1 current		
R 0x005C	Air heat exchanger tube coil 2 temp		
R 0x005D	Compressor 2 outlet gas temp		
R 0x005E	Compressor 2 inlet gas temp		
R 0x005F	After throttling 2 temp		
R 0x0060	Economic heat exchanger inlet 2 temp		0XFF Indicates no error (reserved)
R 0x0061	Economic heat exchanger outlet 2 temp		
R 0x0062	Compressor 2 current		
R 0x0063	History error codes record 1		
R 0x0064	History error codes record2		
R 0x0065	History error codes record3		
R 0x0066	History error codes record4		
R 0x0067	History error codes record5		
R 0x0068	History error codes record6		

R 0x0069	Unit type		
R 0x006A	Main Circuit 1 Electric expansion valve open degree		*10
R 0x006B	Auxiliary Circuit 1 Electric expansion valve open degree		*10
R 0x006C	Main Circuit 2 Electric expansion valve open degree		*10
R 0x006D	Auxiliary Circuit 2 Electric expansion valve open degree		*10
R 0x006E	Status flag3		
R 0x006F	A/C(floor heating) outlet temp		
R 0x0070	User Hot water return temp		
R 0x0071	Status reserved		
R 0x0072	Status reserved		

Control flag

bit 0 : 0 ON/10 FF Default :0

bit 1 : 0 Water tank electric heater installation position on water tank/1Water tank electric heater installation position on tube
Default:1

bit 2 : 0 Forced electric heater off /1 Forced electric heater off Default:0

bit 3 : Self-defined parameter D Default :0

bit 4 : 0 Main circuit electronic expansion valve manual/1Main road electronic expansion valve automatic Default:1

bit 5 : 0 Auxiliary Circuit Electric expansion valve manual /1 Auxiliary Circuit Electric expansion valve manual Default:1

bit 6 : 0 Constant temperature water pump continues to open/1 Constant temperature water pump stop Default:0

bit 7 : 0 Defrosting compressor stop/1 Defrosting compressor on Default:0
Timer flag

bit 0 : 0 Period 1 Time OFF/1 Period 1 Time ON Default:0

bit 1 : 0 Period 2 Time OFF/1 Period 2 Time ON Default:0

bit 2 : Reserved

bit 3 : Reserved

bit 4 : Reserved

bit 5 : Reserved

bit 6 : Reserved

bit 7 : Reserved

Output flag 1

bit 0 : Compressor 1

bit 1 : Outside fan motor

bit 2 : 4-way valve

bit 3 : Hot water pump

bit 4 : Water tank electric heater

bit 5 : 3-way valve

bit 6 : A/C(floor heating) electric heater

bit 7 : Filling valve

Output flag 2

bit 0 : Crankcase heater

bit 1 : Bottom electric heater

bit 2 : A/C(floor heating) water pump

bit 3 : Return valve

bit 4 : Compressor2

bit 5 : Reserved

bit 6 : Reserved
bit 7 : Reserved

Status flag 1

bit 0 : Defrosting
bit 1 : 0 Cooling demand switch ON/1 Cooling demand switch OFF
bit 2 : 0 Emergency switch ON/1 Emergency switch OFF
bit 3 : 0 Heating demand switch ON/1 Heating demand switch ON
bit 4 : 0 Single phase/1 Three phase
bit 5 : 0 Hot water flow switch connected/1 Hot water flow switch disconnected
bit 6 : 0 A/C flow switch connected/1 A/C flow switch disconnected
bit 7 : Reserved

Status flag 2

bit 0 : 0 Low water level switch ON /1 Low water level switch OFF
bit 1 : 0 High water level switch ON /1 High water level switch OFF
bit 2 : 0 Middle water level switch ON /1 Middle water level switch OFF

bit 3 : Hot water side First-class antifreeze
bit 4 : Hot water side Secondary antifreeze
bit 5 : A/C side First-class antifreeze
bit 6 : A/C side Secondary antifreeze
bit 7 : Reserved

Status flag 3

bit 0 : 0 High pressure 1 switch connected /1 High pressure 1 switch disconnected
bit 1 : 0 High pressure 2 switch connected /1 High pressure 2 switch disconnected
bit 2 : 0 Low pressure 1 switch connected /1 Low pressure 1 switch disconnected
bit 3 : 0 Low pressure 2 switch connected /1 Low pressure 2 switch disconnected

bit 4 : Reserved

bit 5 : Reserved

bit 6 : Reserved

bit 7 : Reserved