Module Type
Temperature Humidity Controller

I. Overview:

1. Use high-precision digital temperature and humidity measurement sensors in conjunction with temperature and humidity controllers;
2. With temperature and humidity display, four-channel control output;
3. With PID heating, compressor delay cooling, ONOFF humidification and dehumidification functions;
4. With RS485 communication function.

KKGTH2-A01E-A0-20201015

This manual describes the GTH series temperature and humidity controller settings, wiring, names of various parts, operating methods, etc. Before using this product, please read this manual carefully and use it correctly based on understanding the content. And please keep it properly for reference when needed.
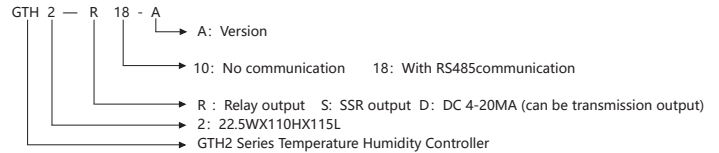
II. Safe Caution

⚠ Warning

1) When the malfunction or abnormality of this product may cause a major accident in the system, please install an appropriate protection circuit outside.

2) Please do not turn on the power supply until all wiring is completed. Otherwise, it may cause electric shock, fire, or malfunction.

3) Do not use it outside the scope of product specifications. Otherwise, it may cause a fire or malfunction.

4) Do not use in places with flammable and explosive gases.

5) Do not touch high voltage parts such as the power supply terminal after power on. Otherwise, it may cause electric shock, fire, or malfunction.

⚠ Caution

1) This product must not be used in atomic energy equipment and medical equipment related to human life.

2) When this product is used in a home environment, radio wave interference may sometimes occur. Adequate countermeasures should be taken at this time.

3) This product protects against electric shock through reinforced insulation. When embedding this product on the equipment and wiring, it is necessary to comply with the specifications of the embedded equipment.

4) In order to prevent surges from occurring in all occasions where the indoor wiring exceeds 30m and where the wiring is outdoors, an appropriate surge suppression circuit must be installed.

5) This product is produced on the premise of being installed on the panel. In order to prevent users from getting close to high voltage parts such as power terminals, please take necessary measures on the final product.

6) Please be sure to follow the precautions in this manual, otherwise there is a danger of serious injury or accident.

7) Please comply with local regulations when wiring.

8) In order to prevent damage to the machine and prevent machine failure, please install a suitable capacity fuse and other methods to protect the circuit on the power cord connected to this product or a larger capacity input and output line.

9) Please do not mix metal pieces and wire scraps into this product, otherwise it may cause electric shock, fire, and malfunction.

10) Please tighten the screws firmly according to the specified torque. If the screws are not tightened completely, it may cause electric shock and fire.

11) In order not to hinder the heat dissipation of this product, please do not block the heat dissipation windows around the case and the equipment vents.

12) Do not connect any wires to the unused terminals of this product.

13) Please clean after the power is off. Please wipe the dirt on the product with a dry soft cloth, and do not use hygroscopic agents, otherwise it may cause deformation and discoloration.

14) Please do not hit or rub the display panel with hard objects.

15) This manual assumes that the reader has basic knowledge of electricity, control, computer and communication.

16) The legends, data examples, and screen examples used in this manual are written in order to facilitate the understanding of the manual, and are not guaranteed to be the result of their actions.

17) In order to use this product safely for a long time, regular maintenance is necessary. Some parts of this product are limited by their lifespan, and some may change due to long-term use.

18) It is possible to change the content of the manual without prior notice. The content of the manual is expected to have no loopholes. If you have any questions or objections, please contact our company.

---

1) This product is used in the following environmental standards.
   (IEC61010-1) [Overvoltage classification II, pollution degree 2]

2) Please use the temperature and humidity controller within the following environment, temperature, humidity and environmental conditions. Temperature: 0 ~ 50℃; Humidity: 45 ~ 85%RH; Environmental conditions: Indoor warranty, the altitude is less than 2000m.

3) Please avoid using in the following places:

Places where condensation may occur due to extreme temperature changes; places where corrosive or flammable gases are generated; places where direct vibration or impact to the product may occur;

Places with water, oil, chemicals, smoke, and steam, places with a lot of dust, salt, metal powder, places with high clutter interference, and places where static electricity, magnetic fields, and noise are prone to occur;

Places directly blown by air-conditioning or heating; places directly exposed to sunlight; places that may accumulate heat due to radiation.

4) For installation occasions, please consider the following points before installation.

In order not to saturate the heat, please open enough ventilation space.

Considering the wiring and maintenance environment, please ensure that there is more than 50mm of space above and below the product.

Please avoid installing it directly to machines that generate a lot of heat (such as heaters, transformers, semiconductor operators, large-capacity resistors).

When the surrounding environment is above 50℃, please use a forced fan or cooler to cool. But do not let the cooled air blow directly to the product.

In order to improve anti-interference performance and safety, please try to install it away from high-voltage equipment and power equipment.

Do not install the high-voltage machine and this product in the same disk.

The distance between this product and the power line should be greater than 200mm.

Please install the power machine as far apart as possible.

1) The temperature and humidity sensor and the temperature and humidity controller must be used together, and the connecting wire must be connected correctly according to the wiring diagram.

2) The temperature and humidity sensor is a digital I2C data transmission method. In order to improve reliability, the cable length must be within 3m.

3) In order to avoid the influence of noise interference, please keep the input signal away from the power line of the instrument, power line and load line for wiring.

4) In order to reduce the influence of the power cord and the heavy-load power cord on the product, it is recommended to use a noise filter in a situation that is easily affected. If using

The noise filter, please be sure to install it on a grounded panel, and make the wiring between the output side of the noise filter and the power terminal the shortest;

Install fuses and switches on the wiring on the output side of the filter, otherwise the effect of the filter will be reduced.

5) When this product is powered on, it takes about 5 seconds to output. If there is a signal using an interlocking circuit, please use a delay relay.

6) Please try to use shielded twisted-pair cable for the transmission output line; ensure that the signal is reliable and stable.

7) Please use shielded twisted pair for long-distance RS485 communication line, and ground the shielding layer on the host side, and add 120Ω terminal matching as appropriate resistance to ensure reliable and stable communication.

8) This product does not have a fuse; if necessary, please configure it according to the rated voltage of 250V and rated current of 1A. The type of fuse: time-delay fuse.

9) Please use suitable screw force and suitable crimp terminals.

Terminal screw size: M3X8 (with 6.8X6.8 square seat), Recommended tightening torque: 0.4N.m

Suitable wire: 0.25 ~ 1.65mm single wire or multi-core flexible wire

10) Please do not touch the crimping terminal or bare wire part with the adjacent terminal.

III. Model Illustration:

```
GTH 2 — R 18 - A
              └─→ A: Version
           └─────→ 10: No communication    18: With RS485communication
        └────────→ R：Relay output  S: SSR output  D: DC 4-20MA (can be transmission output)
      └──────────→ 2: 22.5WX110HX115L
   └─────────────→ GTH2 Series Temperature Humidity Controller
```
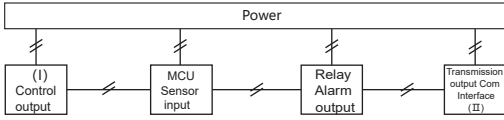
IV. Main Parameters

1) Electrical parameters

Sampling rate	0.5, 1, 2, 4, 10 times per second select from MPS menu
Relay capacity	AC 250V /2A lifespan of rated load ＞100,000 times
Power supply	AC/DC 100 ~ 240V (85-265V)
Power consumption	＜ 6VA
Environment	Temperature of indoor: 0 ~ 50℃ no condensation, Humidity：＜85%RH, altitude＜2000m
Storage environment	-10 ~ 60℃, no condensation
SSR output	DC 24V pulse level, load<30mA
Current output	DC 4 ~ 20mA load＜500Ω, temperature drift 250PPM
Communication port	RS485 port Modbus-RTU procotol, max input 30 units
Insulation resistance	Input, output, power cabinet ＞ 20MΩ
ESD	IEC/EN61000-4-2 Contact ±4KV /Air ±8KV perf.Criteria B
Pulse traip anti-interference	IEC/EN61000-4-4 ±2KV perf.Criteria B
Surge immunity	IEC/EN61000-4-5 ±2KV perf.Criteria B
Voltage drop & short interrption immunity	IEC/EN61000-4-29 0% ~ 70% perf.Criteria B
Dielectric strength	Signal input & output & power 2000VAC 1min,below 60Vlow votage circuit between DC500V ,1min
Total weight	about 400g
Shell material	PA66-FR(Flame Class UL94V-0)
Front mask material	PVC film and PEM silicone key
Power-off data protection	10 years, times of writing: 1 million times
Panel protection level	IP65(IEC60529)
Safety Standard	IEC61010-1 overvoltage catagory Ⅱ, pollution level 2, level Ⅱ (Enhanced insulation)

2) Temperature and humidity sensor parameters

|	
Power supply	minimum 3.3V, maximum 5.5V
Measurement range	Physical range: -40.0 ~125.0℃, safety range: -40.0 ~80℃, resolution 0.1℃
Measurement range	0.0 ~ 100.0%RH；resolution 0.1%RH
Temperature accuracy	within 0.0 ~ 80.0℃, typical value: ±0.2℃　max：±0.4℃
Humidity accuracy	within 0.0 ~ 90.0%RH, typical value：±2%RH　max：±2.5%RH
Wire length	Standard: 2m；max lead length with the controller is less than 3 meters

3) Isolated mode chart:

```
┌─────────────────────────────────────────────────────────────┐
│                          Power                                │
└─────────────────────────────────────────────────────────────┘
  │        │            │              │                │
 ═╪═      ═╪═          ═╪═            ═╪═              ═╪═
┌──────┐  ┌──────────┐  ┌──────────┐  ┌──────────────────┐
│ (Ⅰ)  │  │   MCU    │  │  Relay   │  │ Transmission     │
│Control│  │ Sensor  │  │  Alarm   │  │ output Com       │
│output │  │ input   │  │  output  │  │ Interface (Ⅱ)    │
└──────┘  └──────────┘  └──────────┘  └──────────────────┘
```

" ⧄ "：means isolated

Remark：between (Ⅰ) and (Ⅱ),when SSR output, it's unisolated; when Relay output, it's isolated.

V. Name of universal panel
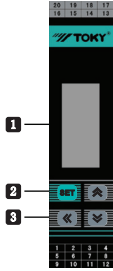
No	Symbol	Name	Function
1	OUT1	T.OP1 indicator	Heating output indicator, light up when the output is ON
	AL1	T.OP2 indicator	Cooling output indicator, light up when the output is ON
	OUT2	H.OP1 indicator	Humidification output indicator, light up when the output is ON
	AL2	H.OP2 indicator	Dehumidification output indicator, light up when the output is ON
	OUT	Control indicator	Lihgt ON when control output, light OFF when stop control output
	AT	AT indicator	Heating PID self-tuning indicator, when it's on, it's in the setting state
	Upper row	Temperature display	Temperature measurement value or parameter code display window
	Bottom row	Humidity display	Humidity measurement value or parameter code display window
2	SET	SET function key	Menu key/Confirm key, used to enter or exit, confirm or save parameter modification mode
3	≪	Shift /AT Key	Activation /Shift /AT auto-tuning key, long press in measurement control mode to enter or exit PID auto-tuning
4	≪	Add key /R/S	Add key，In measurement control mode, long press to enter RUN or stop mode switching
5	≫	Reduce key	Reduce key

VI. Operation process and menu description
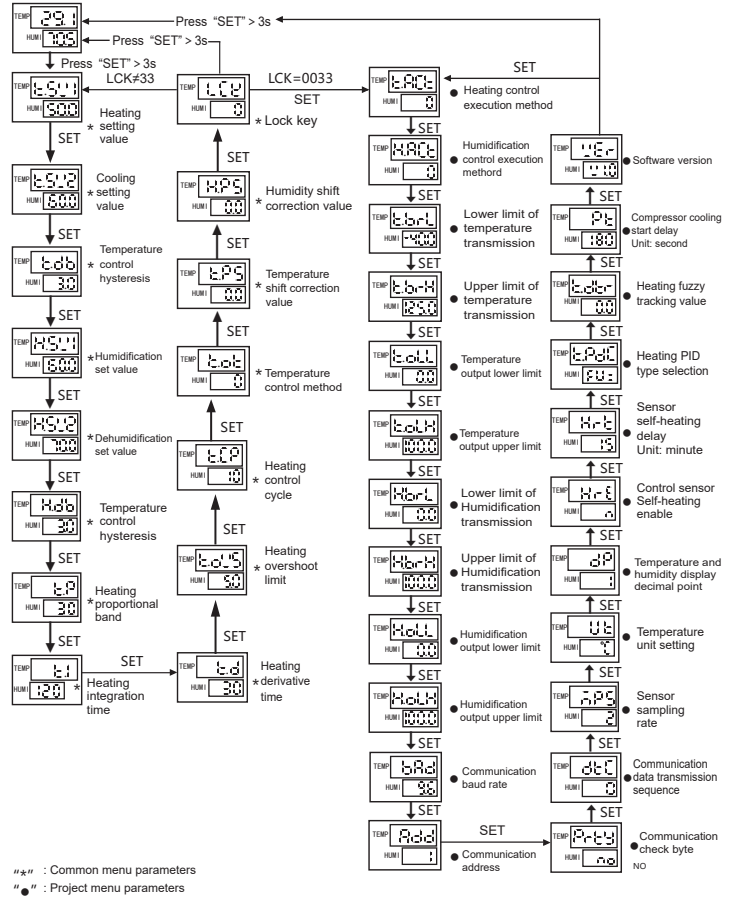
"*"：Common menu parameters

"●"：Project menu parameters

a. After power on, in the normal measurement control mode, long press the "SET" key for more than 3 seconds to enter the menu parameter view mode.

b. In the menu view mode, each short press of the "SET" key can cycle to view common menu parameters.

c. In the menu view mode, short press the "≪" key to flash the viewed menu parameter value to enter the parameter modification mode, and each short press can move one position to the left; this cycle is repeated.

d. In the parameter modification mode, each short press of the "≪" or "≫" button can increase or decrease the flashing data bit by one.

e. In the parameter modification mode, after the parameters are modified, short press "SET" to confirm and save the modified parameters, and exit to the menu view mode.

f. In the normal measurement control mode, long press the "≪" key for more than 3 seconds to enter the heating PID auto-tuning state. The TEMP display value should be smaller than the T.SV1 value during auto-tuning.

h. In the normal measurement control mode, long press the "≪" key for more than 3 seconds to enter or exit the run or stop mode.
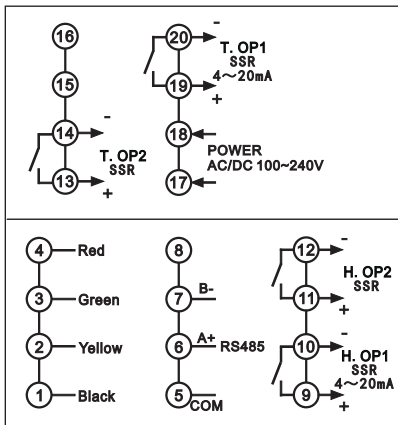
2) Menu Explanation：

No	Name	Explaination	Setting Range	Factory Setting
1	TEMP(℃)	Display the measured temperature value, unit ℃ or ℉		
2	HUMI(%RH)	Display the measured humidity value, unit %RH		
3	T.SV1	Heating setting value, when OT=0 or P=0, that is, when ONOFF control is not PID control mode, TEMP <T.SV1-T.DB starts heating output; when TEMP≥T.SV1, heating stops. When it is PID control heating mode, this value is PID control target given value.	-40.0 ~ 125.0 or -40.0 ~ 257.0	50.0
4	T.SV2	Refrigeration setting value, the refrigeration mode has compressor refrigeration and ONOFF refrigeration. When the compressor refrigeration mode is TEMP≥T.SV2, the refrigeration output is started after the PT delay time expires, and when it is ONOFF, the refrigeration output is started directly. Stop refrigeration output when TEMP<T.SV2-T.DB.	-40.0 ~ 125.0 or -40.0 ~ 257.0	60.0
5	T.DB	Temperature control hysteresis, used in conjunction with temperature control. Note: When this value is negative, it will be treated as an absolute value.	-30.0 ~ 30.0	3.0
6	H.SV1	Humidification setting value, humidification control is ONOFF working mode; When HUMI<H.SV1-H.DB, start the humidification output, and stop when HUMI≥H.SV1.	0.0 ~ 100.0	60.0
7	H.SV2	Dehumidification setting value, dehumidification control is ONOFF working mode; Start dehumidification output when HUMI≥H.SV2, Stop dehumidification output when HUMI<H.SV2-H.DB.	0.0 ~ 100.0	70.0
8	H.DB	Humidity control hysteresis, used in conjunction with humidity control. Note: When this value is negative, it will be measured as an absolute value.	-30.0 ~ 30.0	3.0
9	T.P	Heating proportional band, the smaller the setting value, the faster the system heating, otherwise the slower, increasing the proportional band can reduce the oscillation, but will increase the control deviation, reducing the proportional band can reduce the control deviation, but will cause oscillation.	0 ~ 9999	30
10	T.I	Heating integral time, the smaller the value, the stronger the integral action, the more it tends to eliminate the deviation from the set value, if the integral action is too weak, the deviation may not be eliminated	0 ~ 9999	120
11	T.D	Heating the derivative time, reducing the derivative action to a suitable value can prevent system oscillation, the larger the value, the stronger the derivative action.	0 ~ 9999	30

12	T.OVS	Heating overshoot limit. During PID control, when TEMP (measured value)> T.SV1 (set value) + T.OVS (overshoot), the output is forcibly closed; Note: the smaller the value, the smaller PID adjustment range, the poorer control stability. Please set an appropriate value according to the actual situation.	0 ~ 100.0	5.0
13	T.CP	Heating control cycle, 1 is SSR control output, 4~255 is relay control output. Unit: second	1 ~ 200	10
14	T.OT	Temperature control method: 0: ON/OFF heating and cooling; 1: PID control heating and ONOFF cooling; 2: PID heating compressor cooling control	0 ~ 2	0
15	T.PS	Temperature translation correction value, display value = actual measurement value + translation correction value	-30.0 ~ 30.0	0.0
16	H.PS	Humidity translation correction value, display value = actual measurement value + translation correction value	-30.0 ~ 30.0	0.0
17	LCK	Password lock function: 010: The menu setting value can only be viewed and cannot be modified. Set to 0033 during the menu viewing process to enter the engineering parameter menu.	0 ~ 9999	0
18	T.ACT	Heating control execution mode, 0: relay or SSR output control; 1: reserved; 2: 4~20mA regulated output, please set according to the selected instrument configuration; 3: change 4~20mA to transmission output.	0 ~ 3	0
19	H.ACT	Humidification control execution mode: 0: relay or SSR output control; 1, 2 reserved; 3: 4-20mA transmission output.	0 ~ 3	0
20	T.BRL	The lower limit of the temperature transmission range, Note: when this value is bigger than the upper limit of the transmission range, it is the reverse transmission output.	Refer to T.SV1	-40.0
21	T.BRH	The upper limit of the temperature transmission range, Note: when this value is less than the lower limit of the transmission range, it is the reverse transmission output.	Refer to T.SV1	125.0
22	T.OLL	Heating output limit lower limit, limit the output lower current amplitude, the setting value must be less than the upper limit setting.	-5.0 ~ 100.0	0.0
23	T.OLH	Heating output limit upper limit, limit the output upper limit current amplitude, the setting value must be bigger than the lower limit setting.	0.0 ~ 105.0	100.0
24	H.BRL	The lower limit of the humidity transmission range, Note: when this value is bigger than the upper limit of the transmission range, it is the reverse transmission output.	0.0~100.0	0.0
25	H.BRH	The upper limit of the humidity transmission range, Note: when this value is less than the lower limit of the transmission range, it is the reverse transmission output.	0.0~100.0	100.0
26	H.OLL	Humidity output limit lower limit, limit the output lower limit current amplitude, and the set value must be less than the upper limit setting.	-5.0~100.0	0.0
27	H.OLH	Humidity output limit upper limit, limit the output upper limit current amplitude, the setting value must be bigger than the lower limit setting.	0.0~105.0	100.0
28	BAD	RS485 communication filter rate: 0: 4800; 1: 9600; 2: 19200	0 ~ 2	9.6
29	ADD	Communication address	0 ~ 255	1
30	PRTY	Communication check bit setting, 0: NO no check, 1: ODD odd check, 2: EVEN even parity.	0 ~ 2	NO

27	DTC	Communication data transmission sequence is set to 000; the first and three functions are reserved, and the second is byte order exchange.	See the communication protocol	0
28	MPS	The sensor sampling speed is : 0:0.5 times, 1:1 times, 2:2 times, 3:4 times, 4:10 times.	0 ~ 4	2
29	UT	Temperature unit setting: 25: Celsius, 26: Fahrenheit, Note: This unit setting is only for temperature measurement signals.	C/F	℃
30	DP	Temperature and humidity decimal point setting, keep decimal places.	0 ~ 1	1
31	HRE	Control the sensor self-heating enable, when set to Y, the sensor starts to self-heat.	N/Y	N
32	HRT	Sensor self-heating delay time, unit: minute.	0 ~ 200	15
33	T.PDC	Heating PID type: 0: FUZ fuzzy control PID, 1: STD standard PID control.	FUZ/STD	FUZ
34	T.DTR	Heating fuzzy tracking value. Set this value appropriately in some occasions to obtain a more stable control display value, which has nothing to do with the actual measured value. Note: After this value is set, when the set value is equal to the TEMP set value, the output execution is subject to the actual measurement value. Set to 0 to turn off this feature. The temperature input unit is: Fahrenheit or Celsius.	0 ~ 2.0	0.0
35	PT	Compressor refrigeration start delay time, unit: second	0 ~ 9999	180
36	VER	Temperature and humidity controller with software version	--	--

VII. Key function operation

1. Run or stop mode operation

1) In the measurement mode, long press the "⊼" key to enter the stop mode; the corresponding RUN indicator is off. Similarly, long press the "⊼" key to enter the running mode.

2) All outputs perform work according to the specified requirements in running mode, and all outputs will stop working in stop mode.

2. PID parameter determination and self-tuning operation:

1) The default factory settings of the PID parameters are usually not suitable for use occasions; in order to obtain more suitable PID parameters, please use the self-tuning function.

2) Since the controller will perform control output soon after the power is turned on, in order not to affect the self-tuning effect, you can first set the product to stop mode; or temporarily disconnect the control output load power supply. No matter how you operate, please ensure that the T.SV1 value is bigger than the current TEMP value and the larger the drop, the better.

3) Set the PID type and T.SV1 value; the factory setting is with fuzzy PID.

4) Set to PID control. When it is 4-20mA output, set the OLL and OLH output limiter to the appropriate range; the factory setting is OLL=0%, OLH=100%.

5) When the TEMP<H.SV1 value is at normal room temperature, exit the stop mode and turn on the load power supply, and immediately press the "≪" key to enter the auto-tuning mode, and the AT indicator will light up.

6) The auto-tuning will take a certain amount of time. In order not to affect the auto-tuning result, please do not modify the parameters or power off in the auto-tuning mode.
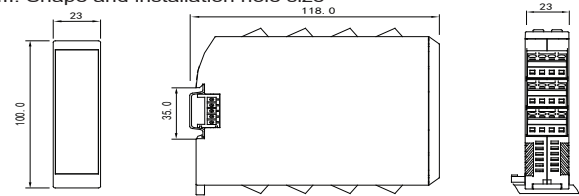
7) After the AT light is off, the auto-tuning mode will be automatically exited, and the PID parameters will be automatically updated, and then it will be automatically and accurately controlled.

8) During the auto-tuning process, you can press and hold the "≪" key, the measurement will stop if the measurement is out of range, the display is abnormal, the switch to the stop state, and the power is off.

9) Note: In the case of output limiting operation output, sometimes the best PID parameters cannot be obtained even if auto-tuning is performed.

10) Experienced users can also set reasonable PID parameters based on experience.

VIII. Shape and installation hole size

IX. Wiring Diagram

X. How to deal with simple faults

Display info	Method
Err/HHHH	The sensor is wrong or exceeds the measuring range; check whether the input is disconnected; or whether the sensor is damaged. Determine whether the temperature and humidity of the measured environment are within the measuring range of the sensor.

XI. Communication protocol

The controller uses Modbus RTU communication protocol to carry out RS485 half-duplex communication, read function number 0x03, write function number 0x10 or 0x06, and use 16-bit CRC check. The controller does not return check errors.

Data frame format

Start bit	Data bit	Stop bit	Check bit
1	8	1	Set in PRTY menu

Handling of abnormal communication conditions:

When abnormal response, set the highest position of the function number to 1. For example, if the function number requested by the master is 0x03, the corresponding item of the function number returned by the slave is 0x83.

Error type code:

0x01---Illegal function: The function number sent by the host is not supported by the instrument.

0x02---Illegal address: The register address specified by the host exceeds the allowable range of the instrument parameter address.

0x03---Illegal value: The write data value sent by the host exceeds the allowable range of the instrument.

Communication cycle:

The communication cycle refers to the time from the completion of the master data request to the completion of the data return from the slave. That is: communication cycle = request data sending time + slave response time + response delay time + response return time. Take the 9600 baud rate as an example: the single measurement data communication cycle is not less than 250ms.

1. Read multiple registers

Example: The host reads the integer T.SV1 (the given value is 50.0)

The address code of T.SV1 is 0x2003, because T.SV1 is an integer (2 bytes) and occupies 1 data register.

The memory code of the decimal integer 50.0X10=500 is 0x01F4.

Host request (read multiple registers)							
1	2	3	4	5	6	7	8
Controller Add	Function code	Start Add high byte	Start Add low byte	Data byte high byte	Data byte low byte	※CRC low byte	※CRC high byte
0x01	0x03	0x20	0x03	0x00	0x01	0x7F	0xCA

Slave responds normally (Read multi-register)						
1	2	3	4	5	6	7
Controller Add	Function code	Data byte number	Data high byte	Data low byte	※CRC low byte	※CRC high byte
0x01	0x03	0x02	0x01	0XF4	0XB8	0X53

Function number abnormal response: (for example, the host request address is 0x2010)

Abnormal response from slave (read multiple registers)				
1	2	3	8	9
Controller Add	Function code	Error code	※CRC low byte	※CRC high byte
0x01	0x83	0x02	0XC0	0XF1

2. Write multiple registers

Example: The host writes an integer H.SV1 (given value 50.0)

The address code of H.SV1 is 0x2003, because SV is an integer (2 bytes) and occupies 1 data register.

The hexadecimal memory code of the decimal integer 50.0X10=500 is 0x01F4.

Host request (write multiple registers)										
1	2	3	4	5	6	7	8	9	10	11
Controller Add	Function code	Start Add high byte	Start Add low byte	Data byte high byte	Data byte low byte	Data byte length	Data high byte	Data low byte	※CRC low byte	※CRC high byte
0x01	0x10	0x20	0x03	0x00	0x01	0x02	0x01	0xF4	0x87	0xB6

The slave responds normally (write multiple registers)							
1	2	3	4	5	6	7	8
Controller Add	Function code	Start Add high byte	Start Add low byte	Data byte high byte	Data byte low byte	※CRC low byte	※CRC high byte
0x01	0x10	0x20	0x03	0x00	0x01	0xFA	0x09

Host write single register SV (set value 150)

Host request (write single register)

1	2	3	4	5	6	7	8
Controller Add	Function Code	Add High Byte	Add Low Byte	Data byte high byte	Data low byte	※CRC low byte	※CRC high byte
0x01	0x06	0x20	0x03	0x01	0xF4	0x72	0x1D

The slave responds normally (write single register)

1	2	3	4	5	6	7	8
Controller Add	Function Code	Add High Byte	Add Low Byte	Data byte high byte	Data low byte	※CRC low byte	※CRC high byte
0x01	0x06	0x20	0x03	0x01	0xF4	0x72	0x1D

Data location error response (for example: the host request write address index is 0x200F)

Abnormal response from slave (read multiple registers)

1	2	3	8	9
Controller Add	Function Code	Error Code	※CRC low byte	※CRC high byte
0x01	0x90	0x03	0X0C	0x01

Meter parameter address mapping table

No	Add table	Variable name	No of registers	Numerical magnification	Read and write allowed	Remark
1	0x2000	TEMP Measured value	1	0.1/1	R	Determined by DP
2	0x2001	HUMI Measured value	1	0.1/1	R	Determined by DP
3	0x2002	TEMP and HUMI decimal point setting DP	1	1	R/W	
4	0x2003	Heating set value T.SV1	1	0.1	R/W	
5	0x2004	Cooling set value T.SV2	1	0.1	R/W	
6	0x2005	Temperature control return difference T.DB	1	0.1	R/W	
7	0x2006	Humidification set value H.SV1	1	0.1	R/W	
8	0x2007	Dehumidification set value H.SV2	1	0.1	R/W	
9	0x2008	Humidity control hysteresis H.DB	1	0.1	R/W	
10	0x2009	Temperature shift correction T.PS	1	0.1	R/W	
11	0x200A	Humidity shift correction H.PS	1	0.1	R/W	
12	0x200B	Temperature transmitter lower limit set value T.BRL	1	0.1	R/W	
13	0x200C	Temperature transmitter upper limit set value T.BRL	1	0.1	R/W	
14	0x200D	Temperature control output lower limit T.OLL	1	0.1	R/W	

Controller parameter address mapping table

No	Add table	Variable name	No of registers	Numerical magnification	Read and write allowed	Remark
15	0x200E	Temperature control output upper limit T.OLH	1	0.1	R/W	
16	0x210F	Humidity transmission value lower limit H.BRL	1	0.1	R/W	
17	0x2010	Humidity transmission value upper limit H.BRH	1	0.1	R/W	
18	0x2011	Humidity output amplitude lower limit H.OLL	1	0.1	R/W	
19	0x2012	Humidity output amplitude upper limit H.OLH	1	0.1	R/W	
		Reserved				
20	0x2100	Heating proportional coefficient T.P	1	1	R/W	
21	0x2101	Heating integration time T.I	1	1	R/W	
22	0x2102	Heating differential time T.D	1	1	R/W	
23	0x2103	Heating overshoot limit T.OVS	1	0.1	R/W	
24	0x2104	Heating control cycle T.CP	1	1	R/W	
25	0x2105	Temperature control method T.OT	1	1	R/W	Remark
26	0x2106	Heating control execution mode T.ACT	1	1	R/W	
27	0x2107	Humidification control execution mode H.ACT	1	1	R/W	
28	0x2108	Start stop operation	1	1	R/W	1：RUN 2：STOP 3：Start auto tuning 4：Stop auto tuning
29	0x2109	Temperature unit setting UNIT	1	1	R/W	
30	0x210A	Sensor sampling speed MPSL	1	1	R/W	
31	0x210B	Sensor self-heating enable HRE	1	1	R/W	
32	0x210C	Sensor self-heating delay time HRT	1	1	R/W	
33	0x210D	Compressor refrigeration delay time PT	1	1	R/W	
34	0x210E	Communication address ADD	1	1	R/W	
35	0x210F	Communication filter rate BAD	1	1	R	
36	0x2110	Communication data transmission sequence DTC	1	1	R	Remark②
37	0x2111	Communication check bit setting PRTY	1	1	R	
38	0x2112	Heating PID type T.PDC	1	1	R	
39	0x2113	Heating fuzzy tracking value T.DTR	1	0.1	R	
40	0x2114	Password lock function LCK	1	1	R	
41	0x2115	Temperature and humidity controller status STATUS	1	1	R	Remark①
42	0x2116	Temperature and humidity controller name NAME	1	1	R	

Remark①：Output status indication

D7	D6	D5	D4	D3	D2	D1	D0
	ERR	RUN	AT	H.OP2	H.OP1	T.OP2	T.OP1

Remark②：DTCDTC communication data transmission sequence and response delay description

DTC： □ □ □ —— Reserved
—— Byte transmission sequence: when it is 0, the sequence is 1, 2; when it is 1, the sequence is 2, 1
—— Reserved

※16-bit CRC check code to obtain C program

```c
unsigned int Get_CRC(uchar *pBuf, uchar num)
{
    unsigned i,j;
    unsigned int wCrc = 0xFFFF;
    for(i=0; i<num; i++)
    {
        wCrc ^= (unsigned int)(pBuf[i]);
        for(j=0; j<8; j++)
        {
            if(wCrc & 1){wCrc >>= 1; wCrc ^= 0xA001; }
            else
                wCrc >>= 1;
        }
    }
        return wCrc;
}
```