

# 4 Channels Temperature Controller User Manual

## (GTGX 4 Channels Series)

(Applied to GTGX-4L A Version)



### Features

- Multiple RTD signal types for option, with isolation between signal inputs, able to connect grounding probe.
- With many functions, measured display, control output, RS485 communication, etc.
- Optional many types of PID arithmetic, and with auto-tuning function.
- Using for industrial machinery, machine tools, measuring instruments.
- With limited target value setting function.

Hotline: 400-8866-986

Version code: KKGTX-4L-A01E-A/0-20250529

The instruction explains GTGX series temperature controller settings, connections, name, operation, etc. Please read carefully before you use the temperature controller, and use it correctly based on understanding the content. Please keep it properly for necessary reference.

### I. Safe Caution

#### ⚠ Warning

- 1) When the failure or abnormal of products lead to a major system accidents, please set the proper protection circuit in the external.
- 2) Please don't plug in before completing all the wires. Otherwise it may lead to electric shock, fire, fault.
- 3) Do not use outside the scope of product specification, otherwise it may lead to fire, fault.
- 4) Do not use in places with flammable, explosive gases.
- 5) Do not touch power terminal and other high voltage part when the power on, otherwise there is a risk of electric shock.
- 6) Do not remove, repair and modify this product, otherwise it may lead to electric shock, fire, fault.

#### ⚠ Caution

- 1) The product should not be used in atomic energy equipment and medical devices related to human life.
- 2) The product may occur radio interference when it used at home. Adequate countermeasures should be taken in this case.
- 3) The product gets an electric shock protection through reinforced Insulation. When the product is embedded in the devices and wiring, please subject to the specification of embedded devices.
- 4) In order to prevent surge occurring, proper surge suppression circuits should be set up for all indoor wiring that more than 30m occasions as well as wiring for outdoor.
- 5) The product is produced based on mounting on the disk. In order to avoid users approaching high-voltage parts such as power terminals, please take necessary measures on the end product.
- 6) Be sure to observe the precautions in this manual, otherwise there is a risk of major injuries or accidents.
- 7) Please observe the local regulations when wiring.
- 8) To prevent machine damage and machine failure, please install an appropriate capacity fuse on the connected power lines or larger capacity input and output lines or other ways to protect the circuit.
- 9) Please don't mix metal pieces and wire debris into this product, otherwise it may lead to electric shock, fire, fault.
- 10) Please tighten the screws according to the specified torque, otherwise it may lead to electric shock and fire.
- 11) In order not to hinder the heat dissipation of this product, please do not block the cooling windows around the housing and equipment vents.
- 12) Please do not connect any unused terminal.
- 13) Please be sure to do cleaning after power off, use a dry soft cloth to wipe dirt on the product, and do not use moisture absorbers, otherwise it may lead to deformation and discoloration.
- 14) Please do not knock or rub the panel with rigid thing.
- 15) This manual assumes that the reader has a basic knowledge of electricity, control, computer and communication.
- 16) The examples of illustrations, pictures and data used in this manual are recorded for the convenience of understanding, are not guaranteed to be the results of the operation.
- 17) Regular maintenance is necessary for the safe long-term using. Some parts of this product are subject to a limited life span, and some may change in performance due to years of using.
- 18) Without prior notice, the contents of this manual may be change. We hope there is no loophole, if you have any questions or objections, please contact us.

#### ⚠ Caution of Installation & Connection

##### 1. Installation

- 1) This product is subject to the following environmental standards.  
( IEC61010-1 ) [ Overvoltage category II, class of pollution 2 ]
- 2) Please use the product in the following scope: temperature: 0~50°C  
humidity: 45~85%RH environment condition: indoor Altitude < 2000m

##### 3) Please avoid using in the following places:

Where there is a possibility of condensation due to intense temperature changes. Where generating corrosive or flammable gases. Where subject to direct vibration or potential impact. Where have water, oil, chemicals, some, steam. Where have a lot of dust, salt, metal powder. Where interfered by noise, static electricity and magnetic field. Where directly exposed to air condition flow and heating. Where directly exposed to sunlight. Where heat accumulation may occur due to radiation.

##### 4) Please consider the following points before installation about the installing occasion.

To avoid heat saturation, please open sufficient ventilation space.

Please consider wiring and maintenance environment, and make sure there is more than 50mm space below this product.

Please avoid installing directly above the high heat generating machine.

(E.g. heater, transformer, semiconductor operator, high capacity resistor.)

When the surrounding is higher than 50°C, please use a forced fan or cooling machine. But do not let the cool air blow directly to the product.

For better anti interference performance and security, please try to stay away from high pressure machines, power machines to install.

Do not install with high pressure machine on the same plate.

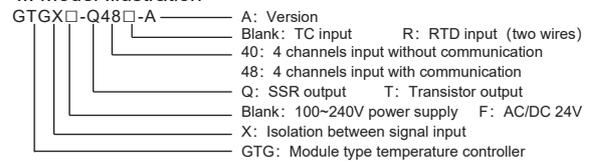
The distance between the product and the power line should be more than 200mm.

Please install the power machine as far as possible.

##### 2. Cable caution:

- 1) Please use specified compensation wire when TC input. Please use insulated TC if the measured device is heated metal. The influence of external resistance is about 0.3 μ V/Ω.
- 2) For RTD input, please use wires with low resistance, and cables (3-wire type) with no resistance difference, parallel wiring, and a single wire resistance should be less than 10Ω.
- 3) To avoid noise interference, please wire the input signal away from the meter cable, power cable, load cable.
- 4) In order to reduce the impact of power cables and load cables, it is recommended to use a noise filter when vulnerable. If using a noise filter, be sure to install it on a grounded disk, and make the wiring shortest between the noise filter output side and power terminal. Do not install fuse and switch on the wiring of noise filter output side, otherwise, it will reduce the effect of filter.
- 5) The time from the input of power to the output is about 5s. Please use a timer relay when using interlocking circuit signals.
- 6) Please use the twisted-pair cable with a shielding layer for the transmission output line. It is necessary to connect the common mode coil at the front end of the signal receiving devices to suppress interference for stable signals.
- 7) Please use a shield-twisted pair as long distance RS485 communication line, and connect the shield on the host side to ensure stable communication.
- 8) This product dose not have a fuse. If needed, please configure according to the rated voltage 250V, rated current 1A. Fuse type: relay fuse
- 9) Please use a suitable slotted screwdriver and wire.  
Terminal distance: 5.0mm  
Screwdriver size: 0.6X3.5 length of slotted screwdriver >130mm  
Recommended tightening torque: 0.5N.m  
Suitable cable: 0.25 ~ 1.65mm single/multiple core cable
- 10) Please do not contact the crimp terminals or exposed sections with adjacent terminals.

### II. Model Illustration



### III. Model Description

No.	Model	Input type		OUT1 ~ OUT4 control output		RS485 communication
		TC	RTD	SSR	Transistor	
1	GTGX□-Q48	●		●		●
2	GTGX□-T48	●			●	●
3	GTGX□-Q40	●		●		
4	GTGX□-T40	●			●	
5	GTGX□-Q48-R		●	●		●
6	GTGX□-T48-R		●		●	●
7	GTGX□-Q40-R		●	●		
8	GTGX□-T40-R		●		●	

### IV. Specifications

#### 1. Electrical parameters:

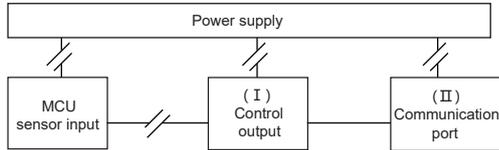
Update display	1 times per second per channel
Power supply	100 ~ 240V AC/DC (85-265V) AC/DC 24V (customize)
Total consumption	< 6VA
Environment	Use indoor, temperature: 0 ~ 50°C no condensation humidity: < 85%RH altitude < 2000m
Storage environment	-10 ~ 60°C, no condensation
SSR output	DC 24V impulse level, load < 20mA each channel
Transistor output	DC 24V DC 100mA each channel
Communication port	RS485 port Modbus-RTU protocol
Insulation impedance	Input, output, power to housing > 20MΩ
ESD	IEC/EN61000-4-2 Contact ±4KV /Air ±8KV perf.Criteria B
Pulse train immunity	IEC/EN61000-4-4 ±2KV perf.Criteria B
Surge immunity	IEC/EN61000-4-5 ±2KV perf.Criteria B
Voltage drop & short interruption immunity	IEC/EN61000-4-29 0% ~ 70% perf.CriGTEria B
Dielectric strength	Between the signal input, output and power supply: 1500VAC 1min Below 60V and between low voltage circuits DC500V 1min
Total weight	About 400g
Shell material	PA66-FR (flame class UL94V-0)
Panel material	PVC film & PEM silicone key
Power-off data protection	10 years, can write data for 1 million times
Safety Standard	IEC61010-1 Overvoltage category II pollution level 2, class II (reinforced insulation)

## 2. Measurement signal parameters

Input type	Symbol	Measurement range	Resolution	Accuracy	Input impedance	Parameter code	
TC	K	K1	-50 ~ 1200	1°C	0.5%F.S±3digits	>500kΩ	0
		K2	-50.0 ~ 999.9	0.2°C	0.5%F.S±1°C	>500kΩ	16
	J	J1	0 ~ 1200	1°C	0.5%F.S±3digits	>500kΩ	1
		J2	0.0 ~ 999.9	0.2°C	0.5%F.S±1°C	>500kΩ	17
	E	E1	0 ~ 850	1°C	0.5%F.S±3digits	>500kΩ	2
		E2	0 ~ 850	0.3°C	0.5%F.S±1°C	>500kΩ	18
	T	T1	-50 ~ 400	1°C	0.5%F.S±3°C	>500kΩ	3
		T2	-50 ~ 400	0.4°C	0.5%F.S±3°C	>500kΩ	19
	B	b	250 ~ 1800	1°C	1%F.S±2°C	>500kΩ	4
	R	r	-10 ~ 1700	1°C	1%F.S±2°C	>500kΩ	5
	S	s	-10 ~ 1600	1°C	1%F.S±2°C	>500kΩ	6
	N	N1	-50 ~ 1200	1°C	0.5%F.S±1°C	>500kΩ	7
N2		-50.0 ~ 999.9	0.2°C	0.5%F.S±1°C	>500kΩ	20	
0 ~ 50mV	0.1	-1999 ~ 9999	12 bit	0.5%F.S±3digits	>500kΩ	12	
RTD	PT100	PT1	-200 ~ 600	0.2°C	0.5%F.S±0.3°C	0.2mA	8
		PT2	-200 ~ 600	1°C	0.5%F.S±3digits	0.2mA	21
	JPT100	JPT1	-200 ~ 500	0.2°C	0.5%F.S±0.3°C	0.2mA	9
		JPT2	-200 ~ 500	1°C	0.5%F.S±3digits	0.2mA	22
	CU50	CU51	-50 ~ 150	0.2°C	0.5%F.S±3°C	0.2mA	10
		CU52	-50 ~ 150	1°C	0.5%F.S±3°C	0.2mA	23
	CU100	CU101	-50 ~ 150	0.2°C	0.5%F.S±1°C	0.2mA	11
		CU102	-50 ~ 150	1°C	0.5%F.S±3digits	0.2mA	24
	0 ~ 400Ω	r	-1999 ~ 9999	12 bit	0.5%F.S±3digits	0.2mA	13

Note: the RTD input is a 2 wire type without wire resistance compensation. The length of the sensor wire should not exceed 5 meters and the wire resistance value should not exceed 0.3 ohm. Otherwise, the measurement accuracy will be affected.

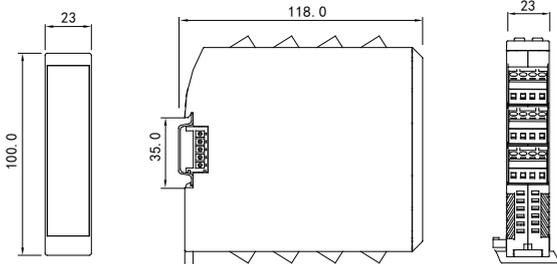
## 3. Isolation mode diagram



“//”: means isolation

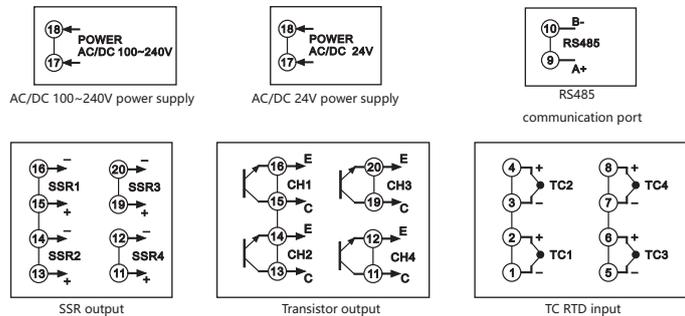
Note: when the control is SSR output between (I) and (II), the default is no isolation, isolation needs to be customized.

## V. Dimensions and installation size

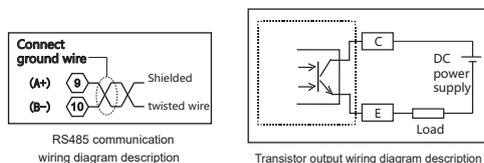


## VI. Connection diagram

### 1. Wiring diagram description



### 2. Example of partial wiring diagram



In case of any change, please subject to the wiring diagram on the actual equipment housing.

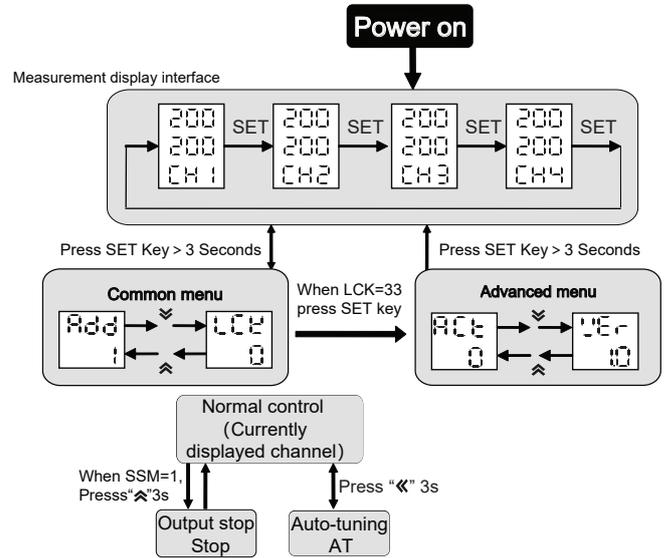
## VII. Panel description

No.	Symbol	Name	Function Description
1	SET	SET function key	Menu key / Confirm key for entering or exiting parameter modification mode, or confirming to save the modified parameters and switch channels.
2	◀	Shift /AT key	Activation key / Shift key / AT auto-tuning key, long press to enter or exit auto-tuning under the measurement control mode.
3	▶	Add key /R/S	Add key / menu up key, long press to switch RUN/STOP mode under the measurement control mode.
4	⏪	Decrease key / Next Menu key	

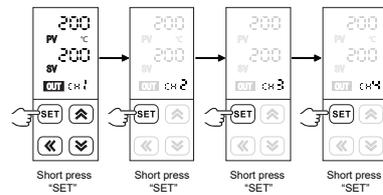
No.	Symbol	Name	Function Description
5	PV	PV	Process value, display measurement value/menu symbol
	SV	SV	Set value, display set value/menu parameter
	CH	CH	Input channel indication window
	OUT	OUT	OUT indication, output is on when there is display, off when there is no display.
	AT	AT	AT indication, it indicates auto-tuning with display, and indicates no auto-tuning or auto-tuning is complete with no display.
	°C °F	°C °F	Temperature unit symbol

## VIII. Operation Process and Menu Illustration

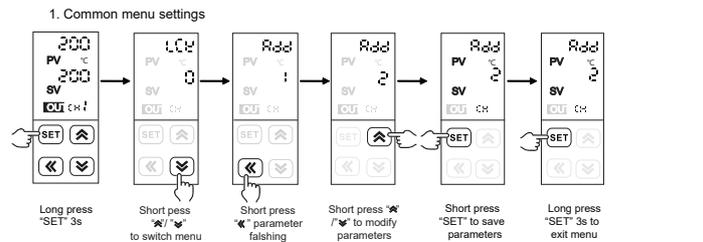
### 1. Operation flow chart



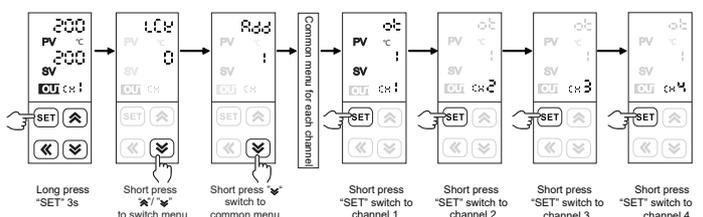
### 2. Channel switching flow chart

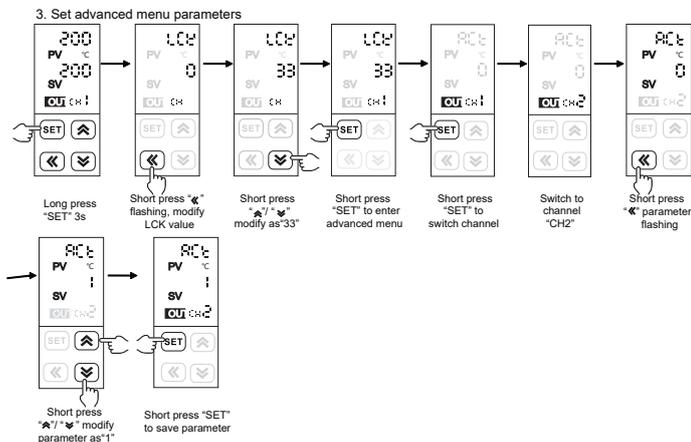


### 3. Parameter modification flow chart



### 2. Setting menu parameters for different channels





- In normal measurement control mode, long press the "SET" key more than 3s to enter the menu parameter viewing mode, short press "SET" key to switch the display channel, CH indication window displays channel number, and the panel displays parameter correspond to the channel number.
- In the menu viewing mode, short press the "▲" or "▼" key to check the common menu parameters circularly.
- In the menu viewing mode, short press the "◀" key to flash the viewing menu parameter value and enter the parameter modification mode, each short press can move one bit to the left, over and over.
- In the parameter modification mode, press the "▲" or "▼" key once to increase or decrease the flashing data bit by one.
- In the parameter modification mode, after the parameter is modified, short press the "SET" key to save the modified parameter, then long press "SET" key again to exit the menu viewing mode.
- In normal measurement control mode, long press the "◀" key more than 3s to enter the PID auto-tuning state.
- In the normal measurement control mode, long press the "▲" key more than 3s to enter or exit the running/stop mode, the stop mode SV window displays "STOP".

## 2) Common Menu Illustration

Hide parameters according to model

No.	Symbol	Name	Illustration	Setting range	Factory setting
1		PV	Measurement display value, it will flash or display LLLL/HHHH when the value overflows the range. Unit: °C/°F/no unit	Refer to measurement signal table	None
2		SV	Control item set value Unit: °C/°F/no unit	SLL~SLH	
3		CH	Channel number display window	1~F	
4	LCK	LCK	Lock function: 0001: SV value can not be changed 0010: menu set value can be read only 0033: enter project menu 0123: restore the factory setting	0~9999	0
5	ADD	ADD	Communication address of this device	1~247	1
6	BAD	BAD	RS485 communication baud rate 4.8 (0): 4800 9.6 (1): 960 19.2 (2): 19200 38.4 (3): 38400	0~3	1
7	PRTY	PRTY	Communication parity check setting 0: NO 1: ODD 2: EVEN	0~2	0
8	DATC	DATC	Communication data transmission sequence and response delay settings: 000 1st bit: function reserved 2nd bit: byte sequence exchange 3rd bit: function reserved	Refer to COM protocol ③	0
9	OT	OT	Control mode 0: ON/OFF heating control 1: PID heating 2: ON/OFF cooling control 3: Reversed 4: Over temperature cooling output 5: PID cooling	0~5	1
10	P	P	Proportional band, the smaller the value is, the faster the system responds. Otherwise, it will be slower. Increasing the band can reduce oscillations but increase control deviations, while decreasing can reduce control deviations but cause oscillations. Unit: corresponding measured value	0~9999	30
11	I	I	Integration time, the smaller the value, the stronger the effect, the more it tends to eliminate the deviation from the set value. Otherwise, it may not work. Unit: s	0~9999	120
12	D	D	Differential time, reducing differential action to a suitable value to prevent system oscillation. The larger the value, the stronger the action. Unit: s	0~9999	30
13	A-M	A-M	Auto/manual control AUTO(0): auto control MAN(1): manual control	AUTO~AM	AUTO
14	CP	CP	Main control cycle 1: SSR control output 4-200: relay control output Unit: s	1~200	1
15	DB	DB	ON/OFF control hysteresis (negative hysteresis control)/cooling control & compression mechanism cold control dead zone. Please change the parameter according to the decimal point position when changing the INP setting.	0~1000	5
16	INP	INP	Optional input measurement signal type, refer to input signal parameters table. Note: Please change corresponding parameters after selecting the signal.	Refer to measurement signal table	K1
17	PS	PS	Amend value display value= actual measured value + amend value	-1000 ~ 1000	0

## 2) Advanced Menu

18	ACT	ACT	Control execution mode 0~1: SSR output / transistor output	0~1	0
19	DP	DP	Decimal point setting is effective only under the linear signal input	0~3	0
20	DTR	DTR	PV fuzzy tracking value, setting this value properly on some occasions can get a more stable control display value, this value is unrelated to actual measured value. Note: after setting this value, when the alarm setting value is equal with SV set value, alarm output operation is subject to actual measured value. Set as 0 to close this function. The temperature input unit: Fahrenheit/Celsius. The linear signal input unit: Engineering digits	0.0~2.0 0~20	1.0
21	SSM	SSM	Press the key on the panel to switch the RUN / STOP 0: prohibited 1: Open this setting is Only related to panel operation, not communication.	0 ~ 1	0
22	SLL	SLL	Lower limit of the target SV range.	FL~FH	
23	SLH	SLH	High limit of the target SV range.	FL~FH	
24	FL	FL	Lower limit of the measurement range. This value must be smaller than the high limit.	Refer to measurement signal table	
25	FH	FH	High limit of the measurement range. This value must be larger than the lower limit.		

Cont'd

No.	Symbol	Name	Illustration	Setting range	Factory setting
26	FT	FT	PV digital filter coefficient. The larger the value, the stronger the effect.	0 ~ 255	10
27	PT	PT	Compressor start-up delay time Unit: s	0 ~ 9999	0
28	PDC	PDC	PID type selection 0 (FUZ): advanced fuzzy PID algorithm 1 (STD): ordinary PID algorithm	FUZ/STD	FUZ
29	UNIT	UNIT	Temperature unit setting: °C; Celsius °F: Fahrenheit Note: this unit setting is for temperature measurement signals only.	(25)°C (26)°F	(25)°C
30	PRS	PRS	Parameter reserve position setting: 0 (EEP): EEPROM with power-off protection 1 (RAM): RAM without power-off protection Description of parameter storage address setting: EEP&RAM EEP: the setting parameters are written into EEPROM and can be permanently saved after power off. It is generally used for factory setting parameters, it would be damaged by too much writing for the limited writing times of EEPROM. RAM: the parameters are stored in RAM without writing limit and will not be damaged by frequent writing. The parameter setting will not be saved after power-off, and will be restored to the parameters saved in EEPROM by the manufacturer after power on. It is usually used for parameters frequent writing when communicating with the upper computer PLC. Usage: setting this parameter as EEP, then modify PRS as RAM, after the factory has finished to debug the equipment, setting and saving parameters in EEPROM. Delivering the device to user, preventing mistaken modification or long-term communication writing data from damaging EEPROM.	EEP /RAM	EEP
31	RSS	RSS	RUN/STOP reserve position: 0 (EEP): EEPROM with power off protection 1(RAM): RAM without power off protection. Usage: if it requires the meter to be in STOP mode when power on, set RSS as EEP firstly, then set "start stop operation" = STOP. This setting parameter will be saved for long term. Then set RSS as RAM. When using it, the upper computer will operate start/stop to the instrument, which all stored in RAM. The instrument still enters STOP mode after power on.	EEP /RAM	EEP
32	DN	DN	Display the number of channels, indicating the number of measurement channels actually used.	1~4	4
33	DNS	DNS	Display the starting channel number, indicates the number of channel 1 in multi-machine application. E.g. when DNS=3 CH3~CH6 represents 1~4 channels respectively	1~12	1
34	DNT	DNT	Channel cycle display time 0: cancelling automatic cycle Unit: s	0~99	4
35	BLT	BLT	Backlight delay setting, backlight is always bright when set as 0, otherwise the backlight is off after the delay. Unit: minute	0~10	5
36	VER	VER	Software version	--	--

## IX. Key function operation

### 1. Monitoring mode operation (RUN/STOP)

- SSM menu should be set on opening to operate panel, otherwise it can only be operated through communication.
- Under the measure mode, long press "▲" key to enter the STOP mode, SV window will display "STOP", the main control output will stop or keep the minimum output.
- Under STOP mode, long press "▲" key to exit STOP mode, short press "◀" key to modify SV value.
- Under STOP mode, alarm output and analog output work normally.

### 2. PID auto-tuning operation:

- Please switch off the control output load power or set the meter as STOP mode before operating auto-tuning.
- PV is required to meet the conditions before auto-tuning: PV should much less than SV under PID heating control. PV should much greater than SV under PID cooling control.
- Please set a proper alarm value or eliminate the alarm condition before auto-tuning, in case being affected by alarm output when auto-tuning.
- Set the PID type and SV value, the factory default is fuzzy PID control.
- Set as PID control. Please set the output to a proper range if there are OLL & OLH output limits, factory default is OLL=0%, OLH=100%.
- Exit STOP mode, or switch on the load Power, and long press "◀" key immediately to enter auto-tuning mode, then the AT indicator lights on.
- The auto-tuning process takes time, in order not to affect the results, please do not modify parameters or power-off.
- When AT indicator lights off, it exits auto-tuning mode automatically, PID parameters will be updated automatically, and then the meter will control automatically and exactly.
- Long pressing "◀" key, measuring beyond the range, switching to STOP mode, power-off, etc., the above will all abort auto-tuning process.
- Note: when there is an output limit operation, the best PID parameters are sometimes not available even in auto-tuning mode.
- Experienced users can set a proper PID parameter according to their experience.

## X. Methods of simple fault

Display info	The exclusion method
LLLL/HHHH	Check whether the input is disconnected, check the FH value and FL value, determine whether the working environment temperature is normal, check whether the input signal is selected correctly.

## XI. Communication protocol

The device uses Modbus RTU communication protocol for RS485 half-duplex communication, read function number 0x03, write function number 0x10 or 0x06, adopting 16-bit CRC verification, the device does not return check error.

Data frame format:

Start bit	Data bit	Stop bit	Check bit
1	8	1	Settings in the PRTY menu

Communication abnormal handling:

For abnormal response, set the function number as the highest bit 1. E.g. if the function number requested by the host is 0x03, the corresponding function number returned by the slave should be 0x83.

Error type code:

0x01 ---Illegal function: The function number sent by the host is not supported by the device.  
0x02 --- Illegal address: The register address specified by the host exceeds the allowable range of the device address.

The communication cycle:

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

1. Read the register

E.g., the host reads the integer SV1 (SV= 200), and the address code of SV1 is 0x200C, the register number is 48205, because SV1 is an integer (2 bytes) and occupies 1 data register. 200 converts from a decimal integer to a hexadecimal integer is 0x00C8.

Host request (read multiple registers)							
1	2	3	4	5	6	7	8
Device add	Function code	High start add	Low start add	Data byte length high bit	Data byte length low bit	※CRC code low bit	※CRC code high bit
0x01	0x03	0x20	0x0C	0x00	0x01	0x4F	0xC9

Slave normal response (read multiple registers)						
1	2	3	4	5	6	7
Device add	Function code	Quantity of data bytes	Data high bit	Data low bit	※CRC code low bit	※CRC code high bit
0x01	0x03	0x02	0x01	0xF4	0xB9	0xD2

Function code abnormal response (e.g. host request address is 0x2510)

Slave abnormal response (read multiple registers)				
1	2	3	4	5
Device add	Function code	Error code	※CRC code low bit	※CRC code high bit
0x01	0x83	0x02	0xC0	0xF1

2. Write the register

E.g., Host writes integer SV1 (SV=200). The add code of SV1 is 0x200C, the register number is 48205, because SV is integer (2 byte), occupies 1 data register. 200 converts from a decimal integer to a hexadecimal integer is 0x00C8.

Host request (write multi-register)										
1	2	3	4	5	6	7	8	9	10	11
Meter add	Function code	Start add high bit	Start add low bit	Data byte length high bit	Data byte length low bit	Data byte length	Data high bit	Data low bit	※CRC code low bit	※CRC code high bit
0x01	0x10	0x20	0x0C	0x00	0x01	0x02	0x00	0xC8	0x86	0xC8

Slave normal answer (write multi-register)							
1	2	3	4	5	6	7	8
Meter add	Function code	High start add	Low start add	Data byte length high bit	Data byte length low bit	※CRC code low bit	※CRC code high bit
0x01	0x10	0x20	0x0C	0x00	0x01	0xCA	0xA0

Host writes single register SV (SV = 200)

Host request (write single-register)							
1	2	3	4	5	6	7	8
Device add	Function no.	Add high bit	Add low bit	Data high bit	Data low bit	※CRC code low bit	※CRC code high bit
0x01	0x06	0x20	0x0C	0x00	0xC8	0x43	0x9F

Slave normal answer (write single-register)							
1	2	3	4	5	6	7	8
Device add	Function no.	Add high bit	Add low bit	Data high bit	Data low bit	※CRC code low bit	※CRC code high bit
0x01	0x06	0x20	0x0C	0x01	0xC8	0x43	0x9F

Data address error response (E.g. Host request the address index is 0x2510)

Slave abnormal response (write multiple registers)				
1	2	3	5	6
Device add	Function no.	Error code	※CRC code low bit	※CRC code high bit
0x01	0x90	0x03	0x0C	0x01

Parameter address mapping table

NO.	Add (register number ①)	Parameter name	Parameter description	Register quantity	Read/write	Note
1	0x2000~0x2003(48193~48196)	PV1~PV4	Measure value	1	R	
2	0x2004~0x2007(48197~48200)	STA1~STA4	Status value	1	R	②
3	0x2008~0x200B(48201~48204)	MV1~MV4	PID output value	1	R/W	
4	0x200C~0x200F(48205~48208)	SV1~SV4	Set value	1	R/W	
5	0x2010~0x2013(48209~48212)	RSA1~RSA4	Power switch	1	R/W	⑥
6	0x2014~0x2017(48213~48216)	SSM1~SSM4	Panel R/S switch	1	R/W	
7	0x2018~0x201B(48217~48220)	SLL1~SLL4	Set value low limit	1	R/W	
8	0x201C~0x201F(48221~48224)	SLH1~SLH4	Set value high limit	1	R/W	
Reserve						
9	0x2100~0x2103(48449~48452)	INP1~INP4	Input type	1	R/W	
10	0x2104~0x2107(48453~48456)	FL1~FL4	Display low limit	1	R/W	
11	0x2108~0x210B(48457~48460)	FH1~FH4	Display high limit	1	R/W	
12	0x210C~0x210F(48461~48464)	DP1~DP4	Decimal point	1	R/W	
13	0x2110~0x2113(48465~48468)	PS1~PS4	Translation correction value	1	R/W	
14	0x2114~0x2117(48469~48472)	FT1~FT4	Display filter coefficient	1	R/W	
15	0x2118~0x211B(48473~48476)	DTR1~DTR4	Display tracking value	1	R/W	
Reserve						
16	0x212C~0x212F(48493~48496)	UNIT1~UNIT4	Display unit	1	R/W	
17	0x2130~0x2133(48497~48500)	PRS1~PRS4	Parameters saving add	1	R/W	
18	0x2134~0x2137(48501~48504)	RSS1~RSS4	RUN/STOP saving add	1	R/W	
19	0x2138(48505)	DN	Display channel quantity	1	R/W	
20	0x2139(48506)	DNS	Display starting channel number	1	R/W	
21	0x213A(48507)	DNT	Channel cycle display time	1	R/W	
22	0x213B(48508)	BLT	Backlight delay time	1	R/W	
Reserve						
23	0x2200~0x2203(48705~48708)	AL11~AL14	Alarm value	1	R/W	
24	0x2204~0x2207(48709~48712)	AD11~AD14	Alarm mode	1	R/W	④

Cont'd

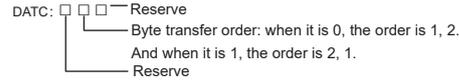
No.	Address (register number ①)	Parameter name	Parameter Description	Register quantity	Read/write	Note
25	0x2208~0x220B(48713~48716)	HY11~HY14	Alarm hysteresis	1	R/W	
26	0x220C~0x220F(48717~48720)	AE11~AE14	Alarm extended mode	1	R/W	⑤
Reserve						
27	0x2300~0x2303(48961~48964)	OT1~OT4	Control method	1	R/W	
28	0x2304~0x2307(48965~48968)	P1~P4	Proportional band	1	R/W	
29	0x2308~0x230B(48969~48972)	I1~I4	Integration time	1	R/W	
30	0x230C~0x230F(48973~48976)	D1~D4	Differential time	1	R/W	
31	0x2310~0x2313(48977~48980)	CP1~CP4	Control period	1	R/W	
32	0x2314~0x2317(48981~48984)	DB1~DB2	Bit control hysteresis	1	R/W	
33	0x2318~0x231B(48985~48988)	AM1~AM4	Auto/Manual switch	1	R/W	
Reserve						
34	0x2324~0x2327(48997~49000)	ACT1~ACT4	Output type	1	R/W	
35	0x2328~0x232B(49001~49004)	PT1~PT4	Cooling start delay	1	R/W	
36	0x232C~0x232F(49005~49008)	PDC1~PDC4	PID Type	1	R/W	
Reserve						
37	0x2500(49473)	ADD	Communication add	1	R/W	
38	0x2501(49474)	BAD	Communication baud	1	R	
39	0x2502(49475)	PRTY	Check bit selection	1	R	
40	0x2503(49476)	DATC	Data transmission sequence	1	R	③
41	0x2504(49477)	LCK	Password lock function	1	R	
42	0x2505(49478)	NAME	Meter name	1	R	

① The register number is the address converted to decimal, plus 1 and then added the register identification code 4 in front.  
E.g. The register number of the data address 0x2000 is 8192 + 1 = 8193 and then added 4 in front, that is, the register number 48193. Related applications can be referred to Siemens S7-200 PLC.

② Channel status indication.  
When the data bit is 1, it means execution. When it is 0, it means not executed

D7	D6	D5	D4	D3	D2	D1	D0
----	HHHH	LLLL	----	----	----	AL1	OUT1

③ DATC communication data transmission sequence description



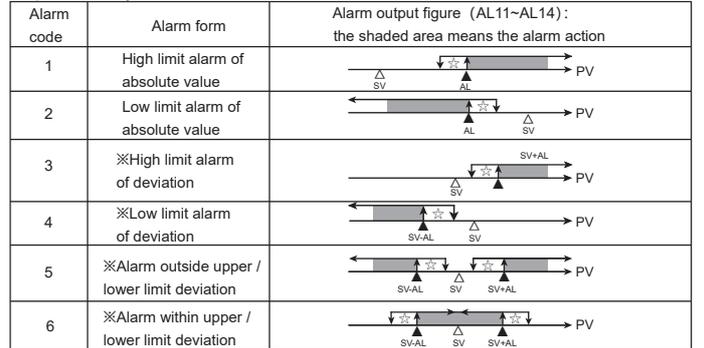
※ Using 16-bit CRC check code to get C program

```

unsigned int Get_CRC(unsigned char *pBuf, unsigned char num)
{
    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;
}
    
```

④ Alarm parameters and output logic diagram

Explanation of symbols: "☆" means HY, "▲" means alarm value, "Δ" means SV value



※When the alarm value with deviation alarm is set to a negative number, it is treated as an absolute value.

⑤ Alarm extension function table

	AE11~AE14 value	Alarm handling when it displays HHHH/LLLL	Note
Power on, no alarm inhibition	0	Alarm status remains the same	Output as long as the alarm conditions are met
	1	Alarm forced output	
Power on, alarm inhibition	2	Alarm forced close	Do not output before the PV value reaches the SV for the first time.
	3	Alarm status remains the same	
	4	Alarm forced output	
	5	Alarm forced close	

⑥: 0: Running 1: Stopping 2: Auto-tuning

XII Version and revision history

Date	Version	Modification
2025.05.29	A/0 version	1st edition