The intelligent single-loop display controller is suitable for measurement and control of various temperatures, pressures, liquid levels, lengths, etc. It uses a microprocessor for digital calculations and can perform high-precision linear correction on various nonlinear signals.

The intelligent single-loop light column display controller integrates digital measurement display and analog measurement display. It uses a digital LED display to accurately display and control real-time measurement values; at the same time, it uses a high-precision 40-line light column display to clearly and intuitively display real-time measurement values. It is convenient and intuitive to compare with other measurement parameters.

The intelligent single-loop display controller opens the setting interface of the instrument's internal parameters (including input type, operation method, output parameters, communication parameters, etc.) to the user.

The intelligent single-loop controller can switch to input multiple graduation numbers. It uses advanced jumper-free technology. When changing the input graduation number, there is no need to change the jumper or switch. The entire instrument modification process does not require power off. You only need to set the instrument's graduation number and related parameters to complete the change of the input graduation number online.

The intelligent single-loop display controller supports multi-machine communication, has a variety of standard serial two-way communication functions, can choose a variety of communication connection methods (such as RS-232C, RS-485, RS-422, etc.), the communication baud rate is 300~9600bps, and the internal parameters of the instrument can be freely set. It can communicate with various devices with serial input and output (such as computers, programmable controllers, PLCs, etc.) to form an intelligent management system. Equipped with intelligent series data acquisition devices and the all-Chinese Kingview industrial control configuration software based on the WINDOWS'XP platform, it can easily realize the networking management of multiple instruments and the host computer.

Main features:

· Computer digital automatic adjustment with a new concept
· Measurement value zero migration function
· Measurement value gain amplification function
· Cold end compensation value zero migration function
· Cold end compensation value gain amplification function
· Transmitted output value zero migration function
· Transmitted output value gain amplification function

· Clear and definite measurement value display
· High-definition LED quantity display measurement value
· High-brightness light column measurement value display

· Support multi-machine network communication, communication protocol can be freely set
· Unique fully open user self-setting interface
· Input signal type setting
· Measurement value zero point and range setting
· Alarm mode setting
· Output mode setting

· Setting parameters to be permanently retained after power failure and parameter password lock

· Fully digital cold end compensation
· Optional internal cold end compensation of the instrument
· Optional external cold end compensation (suitable for high-precision measurement occasions)

· Multi-specification appearance and structural dimensions
· AC and DC switching power supply mode

I. Input signal and sensor adapter

1. Equipped with standard temperature sensor:

	Graduation number	Resolution ℃	Equipped sensor	Measuring range
Input signal	B	1	Platinum 30 — Platinum 6 Rhodium	400～1800℃
	S	1	Platinum 10 — Platinum	0～1600℃
	K	1	Nickel chromium — Nickel silicon	0～1300℃
	E	1	Nickel chromium — Constantan	0～1000℃
	J	1	Iron — Constantan	0～1200℃
	T	0.1	Copper — Constantan	-199.9～3200℃
	Wre	1	Tungsten 3 — Tungsten 25	0～2300℃
	Pt100	1	R_0=100Ω	-199～650℃
	Pt100	0.1	R_0=100Ω	-199.9～320.0℃
	Cu50	0.1	R_0=50Ω	-50.0～150.0℃

2. Equipped with standard signal transmitter:

	Standard signal variation range	Input impedance	Equipped with transmitter	Measurement range
Input signal	Various mV signals 0～10mA 4～20mA 0～5V 1～5V 30～350Ω	≥10MΩ ≤250Ω ≤250Ω ≥250KΩ ≥250KΩ	Hall transmitter Matched with DDZ-Ⅱ instrument Matched with DDZ-Ⅲ instrument Matched with DDZ-Ⅱ instrument Matched with DDZ-Ⅲ instrument Matched with remote pressure resistor	According to user needs, you can freely set the range: -1999 to 9999 characters

★ Please indicate any special requirements when ordering.

II. Main technical parameters

Input signal	Analog quantity: resistance - standard thermal resistor - Pt100 Cu50 and other remote pressure resistors thermocouples - Standard thermocouples - B, S, K, E, J, T, WRe, etc. current - 0~10mA, 4~20mA, 0~20mA, etc. - input impedance ≤250Ω voltage - 0～5V、1～5Vetc. - input impedance ≥250Ω
Measuring range	-1999~9999 word
Measurement accuracy	0.2%FS ±1word 0.5%FS ±1word
Resolution	1、0.1、0.01 0.001 word
Temperature compensation	0～50
Display mode	• -1999~9999 measured value display • -1999~9999 set value display • 0～100%measured value light column display • LED working status display
Light column accuracy	Light column display accuracy is 2.5%
Control mode	Position ON/OFF with hysteresis

Output signal	analog output	DC0~10mA (load capacity ≤750Ω) DC4~20mA (load capacity ≤500Ω) DC0~5V (load capacity ≤250Ω) DC1~5V (load capacity ≤250Ω)
	Switching output	Relay control output--Relay ON/OFF with hysteresis
		Contact capacity: AC220V/3A; DC24V/6A (resistive load)
		SCR control output--SCR (SCR zero-crossing trigger pulse) output, can trigger SCR: 400V/100A
		Solid-state relay output--SSR (solid-state relay control signal) output, 6~24/30mA (voltage is not adjustable)
	Communication output	Interface mode--standard serial bidirectional communication interface: RS-485, RS-232C, RS-422, etc. Baud rate--300~9600bps internal free setting
	Feed output	DC24V, load capacity ≤30mA
Control mode		1 to 4 limit control can be selected, LED indication. Control mode is relay ON/OFF with hysteresis (users can freely set)
Control accuracy		±1 word
Alarm mode		1~4 limit alarm, LED indication. Control mode: relay ON/OFF with hysteresis (users can freely set)
Alarm accuracy		±1 words
Temperature compensation		0～50℃ digital temperature automatic compensation
Parameter setting		· Panel touch button digital setting · Parameter setting value is permanently retained after power failure · Parameter setting value is password locked
Protection mode		· Input circuit disconnection alarm (thermocouple or resistance input), relay output, LED indication · Input over/under range alarm · Automatic reset for power supply undervoltage · Automatic reset for abnormal operation (Watch dog)
Online communication		The communication protocol is two-wire, three-wire or four-wire (such as RS-485, RS-232C, RS-422, etc.), and can also be specially required by the user. The baud rate of 300-9600bps can be freely set by the internal parameters of the instrument. The interface and the host are photoelectrically isolated, and the communication distance can reach 1.2 kilometers. The system adopts a master-slave communication method. The entire control loop only needs a two (three, four) core cable to communicate with the host computer. The host microcomputer can call the device number set by the user, call the field data of each instrument at any time, and set the internal parameters of the instrument. Equipped with a data collector and industrial control configuration software, multiple instruments can be connected to one or more microcomputers for online communication.
Operating environment		· Ambient temperature 0～50℃ · Relative humidity ≤85 RH · Avoid strong corrosive gases

Power supply voltage	Conventional type: · AC220V + 10 - 15% (50Hz ±2Hz linear power supply) Special type: · AC90~260V - switching power supply · DC24V±2V - switching power supply
Power consumption	· ≤5W (AC220V linear power supply) · ≤4W (AC90V～265V switching power supply) · ≤4W (DC4V power supply)
Structure	Standard snap-in type
Weight	420g (AC220V linear power supply)

III. Operation mode

1. Instrument Panel

1 2 3 4

1--Shift key, mute key 2--Decrease key 3--Increase key 4--Set confirmation key

Note: The mute button will only work if the instrument has the mute function.

Indicator light description:

AH - upper limit alarm

AHH - upper upper limit alarm

AL - lower limit alarm

ALL - lower lower limit alarm

Name	Content	
Operation key	Set / confirmation key	In normal state, press and hold this key for 3 seconds to enter parameter setting state. In setting state, when the PV window displays the parameter prompt symbol, press it once to open the data content of that page. In setting state, when the PV port displays the parameter value, press it once to save the setting data. In setting state, press any key for more than 3 seconds to exit parameter setting state.
	Shift key, mute key	In the setting state, when the PV window displays the parameter setting value, press it once to move the flashing cursor one position to the left (one → ten → one hundred → one thousand → one... cycle).
	Increase key	In the setting state, when the PV window displays the parameter prompt, press once to return to the previous parameter prompt display. In the setting state, when the PV window displays the parameter value, press once to increase the flashing digit value by one.
	Decrease key	In the setting state, when the PV window displays the parameter prompt, press once to display the next parameter prompt. In the setting state, when the PV window displays the parameter value, press once to reduce the flashing digit value by one.
Monitor	PV display of measured value	Displays measured value. In parameter setting state, displays parameter symbol or setting value.
	Measured value bar graph display	Displays the percentage corresponding to the measurement value

Indicator light	AH - upper limit alarm	Lights up when upper limit alarm is ON
	AHH - upper upper limit alarm	Lights up when upper upper limit alarm is ON
	AL - lower limit alarm	Lights up when lower limit alarm is ON
	ALL - lower lower limit alarm	Lights up when lower lower limit alarm is ON

2.Operation mode

The operation is introduced by taking the vertical light column as an example. The operation methods of other models are similar.

(1) Correct wiring

After the instrument is inserted into the dial, please refer to the wiring diagram that comes with the instrument to connect the input, output and power lines, and please confirm that they are correct.

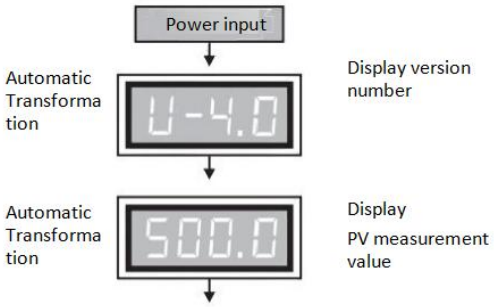
(2) Power on the instrument

This instrument has no power switch, and it will enter the working state when the power is connected.

(3) Display of instrument equipment number and version number

After the instrument is powered on, the instrument equipment number and version number can be confirmed immediately.

After the self-test is completed, the instrument automatically enters the working state, PV displays the current measurement value, and the light column displays the percentage corresponding to the current measurement value.



Control parameter (primary parameter) setting

A. Types of control parameters:

When the instrument is in the PV measurement value display state, press the SET key and the instrument will enter the control parameter setting state. Each press of the decrease key will change the parameters in the following order. (After one cycle, it will return to the initial item.)

The setting parameters are shown in the following table:

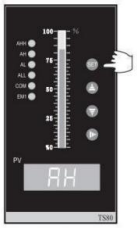
Sign	Name	Setting range	Description	Factory preset value
RH	Upper limit alarm value	-1999~9999	Display the alarm setting value for the upper limit alarm	50 or 50.0
dH	Upper limit alarm hysteresis	0~9999	Display the hysteresis value of the upper limit alarm	02 or 2.0
RL	Lower limit alarm value	-1999~9999	Display the alarm setting value for the lower limit alarm	50 or 50.0
dL	Lower limit alarm hysteresis	0~9999	Display the hysteresis value of the lower limit alarm	02 or 2.0
RHH	Upper upper limit alarm value	-1999~9999	Display the alarm setting value for the upper upper limit alarm	50 or 50.0
dHH	Upper upper limit alarm hysteresis	0~9999	Display the hysteresis value of the upper upper limit alarm	02 or 2.0
RLL	Lower lower limit alarm value	-1999~9999	Display the alarm setting value for the lower lower limit alarm	50 or 50.0
dLL	Lower lower limit alarm hysteresis	0~9999	Display the hysteresis value of the lower lower limit alarm	02 or 2.0
PR55	Password parameter item	PASS=555	Enter the secondary parameter setting	00

★When setting the instrument parameters, the PV display is used as the parameter symbol display and the setting value display. Each parameter setting process is completed in two steps. That is, the PV first displays the parameter symbol, and then displays the specific parameter value corresponding to the meaning of the symbol.

★Depending on the instrument specifications, there are parameters that are not displayed, please pay attention.

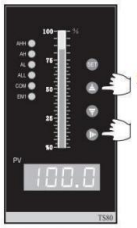
B. Parameter setting method

The following uses a vertical light column meter as an example to explain the parameter setting method and process (the upper limit alarm target value is set to 100°C)

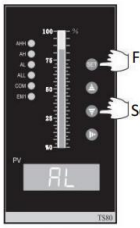


When PV displays the measured value, press the SET key, and the screen displays the upper limit alarm parameter symbol: AH

When PV displays AH, press the SET key, and PV displays the set value of the upper limit alarm setting parameter



When PV displays the first alarm setting value, first press the shift key to 5, then press the increase key to 100.0



Press the SET key to confirm the parameter setting value, and the first alarm parameter setting is completed. Press the minus key to enter the next parameter setting

★Use the above method to continue to set other parameters separately.

★Please note during operation:

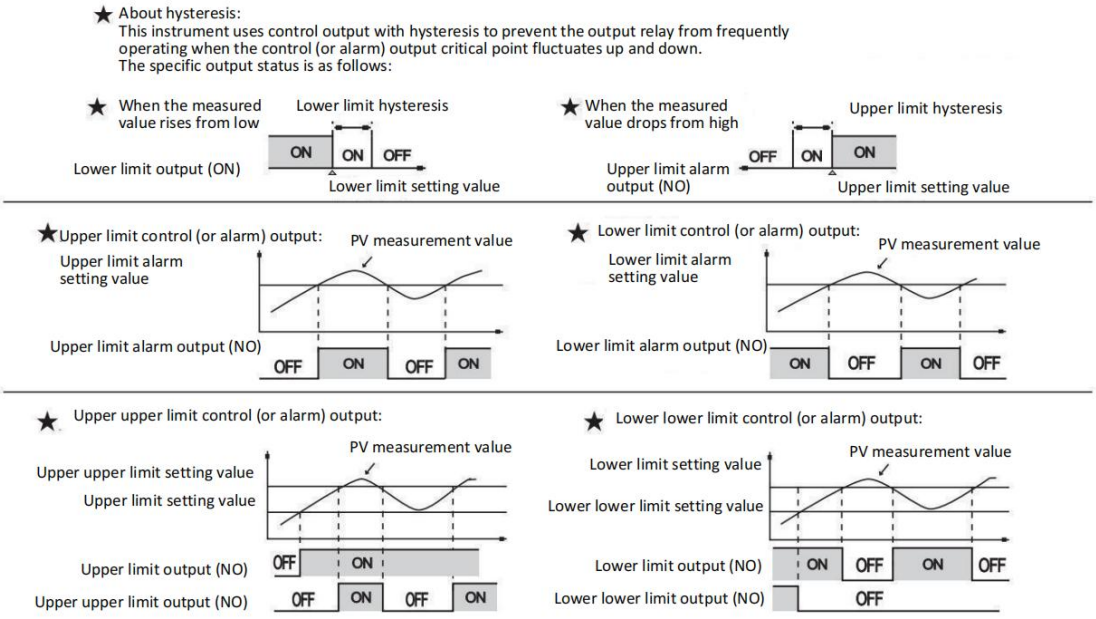
After changing the setting parameter, press the SET key to confirm and save the value.

To make the setting value negative, press the setting value reduction key to reduce the setting value to zero, and continue to press the key, and a negative value will appear on the display. Once the parameter is set, it will be saved forever after power failure.

3. Return to the work status

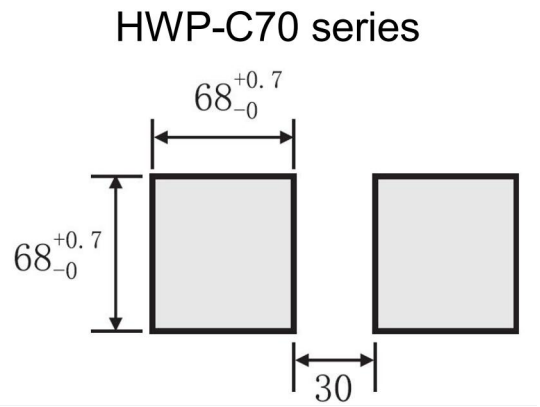
Manual return: In the instrument parameter setting mode, press and hold the SET key for 5 seconds and the instrument will automatically return to the real-time measurement state.

4. Control (or alarm) output status

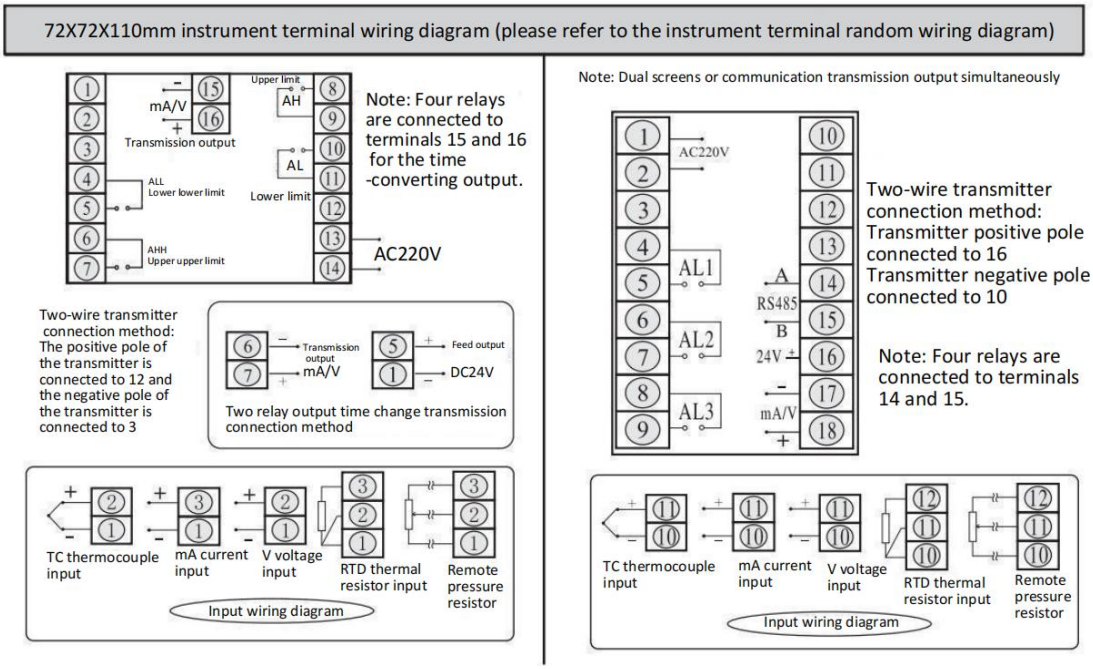


III. Installation and Usage

Mounting(mm)



Wiring diagram



Notes on wiring

(1) To avoid the influence of noise interference, please keep the input signal line as far away from the instrument power line, power supply line, load line and other wiring as possible.

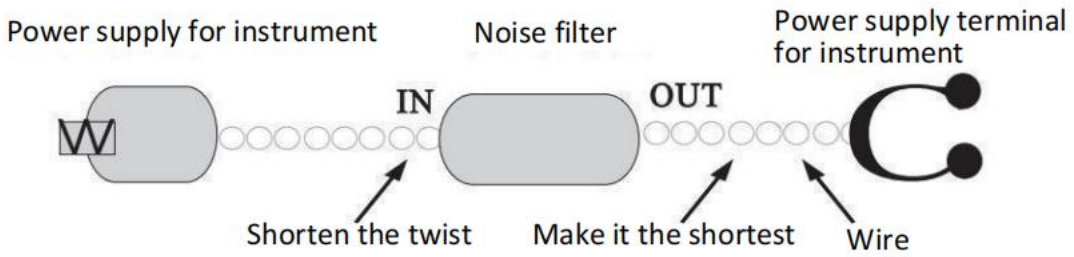
(2) Please try to avoid the influence of noise interference from the power supply when wiring the instrument power line. If there is a noise source nearby and the instrument is likely to be affected by noise interference, please use an interference filter.

★ If the filter cannot achieve a good effect, please refer to the filter frequency, characteristics, etc. in detail to select.

★ To reduce the adverse effects of interference and other adverse effects of the instrument power wiring, please shorten the twisting pitch. The shorter the twisting pitch, the more effective it is.

★ The filter must be installed on a well-grounded instrument panel, etc., and the distance between the filter output side and the instrument power terminal should be as short as possible. Note: If the distance between the output side and the instrument power terminal is increased, the filter effect will not be obtained.

★ If a fuse is installed on the wiring on the output side of the noise filter, the filter effect will not be obtained.



(3) Please use wires that comply with the Electrical Appliances and Materials Management Act for wiring (use wires with a nominal cross-sectional area of about 1.25~2.0mm^2 for instrument grounding, and ground them at the shortest distance).

(4) It takes 2~3 seconds for the contact output to prepare when the power is turned on. If it is used as an external connection circuit or other signal, it is better to use a delay relay.

VI. Type table

LED digital series display controller type table

Part number	Code	Description
	□ □ □□－□ □－□□－ □ □ － □ □	New series
Appearance features	C S	Horizontal/vertical light bar display instrument Horizontal display instrument Vertical display instrument
Appearance dimensions	1 4 7 8 9	48X48mm 96X48mm(horizontal)48X96mm(vertical) 72X72mm 160X80mm(horizontal)80X1680mm((vertical) 96X96mm
Control function	01 03 04	Measurement display Dual limit control Four limit control or four limit alarm output (Note 2)
Communication method	□	See "Communication mode"
Output method	□	See "Instrument output mode"
Input type	□□	See "Input type selection code"
First alarm method	N H L	No alarm (can be omitted) Upper limit control/alarm (four limit control/alarm 2H Note 2) Lower limit control/alarm (four limit control/alarm 2L Note 2)
Second alarm method	N H L	No alarm (can be omitted) Upper limit control/alarm (four limit control alarm 2H Note 2) Lower limit control/alarm (four limit control alarm 2L Note 2)

Feed output		P		DC24V feed output
Additional functions		B		DC24V feed output Buzzer alarm function available when relay output is used Can be silenced (can be omitted if this function is not available)
Power supply mode			W T	DC24V power supply AC90-265V power supply (switching power supply) AC220V power supply (linear power supply can be omitted)

★ In the above model spectrum, all types of instruments can realize all the above functions. Due to the limited wiring terminals, please refer to the wiring diagram when ordering. For special orders, please refer to the random wiring diagram. (The instrument shall be subject to the random wiring diagram)

★ Instrument communication interface mode

Communication code	0	2	4	8	9
Interface mode	No communication	RS-232C	RS-422	RS-485	Special specifications

★ Instrument output mode

Selection code	0	1	2	3	4	5	6
Output mode	No output	Relay	4-20mA	0-10mA	1-5V	0-5V	Special specifications

★ Input type code (different from input signal setting, input signal setting see P12)

★ For special models or requirements, please provide the graduation number or reference standard, and explain when ordering

★ Full-switching instruments cannot switch selection code 18, that is, input type and frequency 0~3000Hz, and cannot switch selection code 12.0~10V

★ Alarm output mode:

VII. Secondary parameter setting

Warning! Non-engineering personnel are not allowed to enter and modify the secondary parameters, otherwise, it will cause instrument control errors!

In the primary parameter setting state of the instrument, after changing PASS=555, press the SET key for 1 second, and the instrument will enter the secondary parameter setting. In the secondary parameter modification state, each press of the decrease key will change in the following order (after a tour, it will return to the original item).

The secondary parameters of the instrument are listed as follows:

Parameter	Name	Setting range	Description
Sn	Input the graduation number	0～22	Set the input graduation type (Note 1)
dOt	Decimal point	dOt=0	No decimal point
		dOt=1	Decimal point in tens (display XXX.X)
		dOt=2	Decimal point in hundreds (display XX.XX)
		dOt=3	Decimal point in thousands (display X.XXX)
PUL	Lower limit of measurement range	-999—9900	Set the lower limit of the input signal measurement range
PUH	Upper limit of measurement range	-900—9999	Set the upper limit of the input signal measurement range
Pbi A	Display input zero migration	Full scale	Set the migration amount of the input zero point
F ILt	Filter coefficient	0.100～0.900	The setting cannot exceed 0.900, otherwise the instrument will fail
bI	Display input range ratio	0～1.999	Set the display input range magnification ratio

Parameter	Name	Setting range (word)	Description
OU-A	First transmitter output	OU-A=1(0~10mA) OU-A=3(0~20mA) OU-A=2(4~20mA)	Corresponding to the measured value for linear output
OU-L	Transmitter/light column range upper and lower limits	Full scale	For specific instruments
OU-H	Transmitter/light column range upper and lower limits	Full scale	For specific instruments
PH	Upper limit alarm type	Hundreds: 0 Monitor PV Tens: 0 Relay normally closed; 1 Relay normally open contact Ones: 0 Disable alarm; 1 High alarm; 2 Low alarm	Normal factory setting is 0001
PL	Lower limit alarm type	Definition is the same as PH item	Normal factory setting is 0002
PHH	Upper upper limit alarm type	Definition is the same as PH item	Normal factory setting is 0001
PLL	Lower lower limit alarm type	Definition is the same as PH item	Normal factory setting is 0002
InPH	Non-standard signal input maximum value	10～100mV；10～400Ω；2～300Hz	Normal factory setting is 100.0
InPL	Non-standard signal input minimum value	0～90mV；0～390Ω；0～2998Hz	Normal factory setting is 0.0
bAUd	Communication baud rate	0=1200bps 1=2400bps 2=4800bps 3=9600bps	Speed during communication
Id	Communication address	1～64	

★ Note 1: Input the graduation number to set the parameter table

Code	Input type	Measurement range
00	S	0~1600℃
01	R	0~1600℃
02	B	200~1800℃
03	K	0~1300℃
04	N	0~1300℃
05	E	0~800℃
06	J	0~650℃
07	T	-200~400℃

Code	Input type	Measurement range
08	Pt100	-200~850℃
09	Cu50	-50~150℃
10	0~5V	-999~9999
11	1~5V	-999~9999
12	0~10V	-999~9999
13	0~10mA	-999~9999
14	0~20mA	-999~9999
15	4~20mA	-999~9999

Code	Input type	Measurement range
16	mV non-standard signal	0~100mV
17	Resistance R non-standard signal	0~400Ω
18	Frequency non-standard signal	0~3000Hz
19	0~5V square root	-999~9999
20	1~5V square root	-999~9999
21	0~10mA square root	-999~9999
22	4~20mA square root	-999~9999
23	Full switching input	

★ Note 1: Codes 12 and 18 cannot be switched

★ Note 2: Display input migration and amplification:

During regular calibration, Pb1R and KK1 can be adjusted to change the display error of the measured value.

The calculation formula of Pb1R and KK1 is:

KK1 = preset range ÷ display range × original KK1

Pb1R = set display range lower limit - actual display range lower limit × KK1 + original Pb1

For example: Preset range = 500 Display range = 495 Original KK1 = 1.000

Kk1=500÷(495×1)
=500÷495
≈1.01

★ Note 3: obl/obh

★ Note 3: obl/obh

★ Description of parameters and functions

● Regarding the settings of non-standard signal input I nPH、I nPL

This item needs to be set only when MV, linear resistance and frequency input are used. When other standard signal inputs are used: I nPH=100.0 I nPL=0.0

● About the setting of filter coefficient FILt

The instrument is commonly used in interference mode 0.100~0.900. It can not only distinguish and suppress general interference sources in the system, but also suppress low-frequency disturbances accompanying the measurement signal (0.100 has the weakest suppression ability but the fastest speed, 0.900 has the strongest suppression ability but the slowest speed).
When the input signal is a thermocouple, thermal resistor or Cu50, the value should be within the range of 0.500~0.900. The filter coefficient setting value cannot exceed 0.900, otherwise the instrument will make mistakes.

VIII. Fault indication & corrective measures:

PV window display	Error	General reason
n-Sn	Invalid input type setting	The set code is not in the input type table
n-XX	Negative square root	The set range is incorrect
-OH-	Thermal resistance is greater than the scale value	Thermocouple input circuit is open
-OL-	Thermal resistance is less than the scale value	Thermocouple compensation circuit is open
-bH-	Thermoelectric potential is greater than the scale value	Thermocouple input circuit is open
-bL-	Thermoelectric potential is less than the scale value	Thermocouple compensation circuit is open
-XX-	Positive exceeds the upper limit of the display range by 5%	The input signal is too large
-LL-	Negative exceeds the lower limit of the display range by 5%	The input signal is too small

-OH- The ohm value input by the thermal resistor is greater than the scale value or the resistance is cut off or the wire is broken; the set decimal position does not match, and the value of dOt should be 0~1.

-OL- The ohm value of the thermal resistor input is less than the scale value or the compensation circuit is broken

-bH- The thermoelectric potential input by the thermal resistor is greater than the scale value or the couple or wire is broken; the decimal position is not set correctly, and the value of dOt should be 0 to 1.

For measurements above 1000 degrees, the decimal point dOt should be set to 0; for measurements below 1000 degrees, the decimal point value should be 0 to 1.

-bL- The thermoelectric potential of the thermocouple input is smaller than the scale value or the compensation circuit is broken; the cold end compensation is not connected to terminal ①.

-HH- This prompt appears when the currently displayed measured value exceeds the upper limit of the display range (PUH) by 5%.

-LL- This prompt appears when the displayed measured value exceeds the display range lower limit (PUL) by 5%.

IX. Additional Notes

1. Communication and printing agreement (attached separately)

2. Maintenance and warranty

(1) Since the long-term stability of the instrument has been taken into consideration in the design, the instrument does not require special maintenance under normal use. If damage occurs due to product quality problems during normal operation, the instrument will be repaired, replaced, or returned within 18 months after sale, and we are willing to provide users with relevant technical services.

(2) If the instrument fails or requires changes to input signals and ranges, please contact our technical service department or the nearest agent in a timely manner.

3. Random documents and attachments

(1) Intelligent single-loop series instrument

(2) Intelligent single-loop series instrument operating instructions

(3) Product certificate