ZNC-TX18 Intelligent Temperature Controller

Mainly applicable media: gas, liquid, oil and other non-solid media.

Mainly applicable occasions: city heating temperature control, automation machinery supporting and other measurement and control fields.

Application: Temperature switches can be widely used in petroleum, chemical, metallurgy, electric power, water supply, and other fields of various gases, liquid temperature measurement and control is the ideal intelligent measurement and control instrument for industrial sites.

Ⅰ. Overview

Intelligent temperature controller is an intelligent control instrument integrating temperature measurement, display and control, featuring simple operation, good shock resistance, high control accuracy, wide temperature controllable range and long service life.

II. Principle of operation

The physical signal is converted into an electrical signal by a PT100 temperature sensor, amplified and processed into a standard analog signal output or a solid state relay output.

III. Product characteristics

➢ Multi-level temperature setting function, can meet a variety of temperature digital control requirements.

➢ The output signal can be switched between normally open or normally closed, and the user can arbitrarily set the output normally open or normally closed signal according to needs.

➢ 4-digit high brightness LED display.

➢ Up to 4-way switching, one-way analog signal combination outputs.

➢ Switching can be set anywhere from zero to full.

IV. Technical parameters

Type	Parametric
Measurement Range	-200~0~400℃
Protection Class	IP65/IP54（standard）
Stability	≤0.1% per year
Display Mode	0.56" digital tube
Medium Temperature	-200℃～400℃
Environmental Temperature	-20℃~70℃
Mounting Threads	G1/4（compact）M20*1.5（standard and explosion-proof）
Accuracy Class	≤0.5%
Supply Voltage	24VDC/220VAC
Display Range	-1999~9999
Relative Humidity	≤80%
Contact Material	stainless steels（304/316）

V. Instrument Selection

Model										Notes
ZNC-TX18	-□	/□	/□	/□	/□	/□	/□	/□	/□	
Meter Type	X									compact
	B									standard
	F									explosion proof
	J									Intelligent (2088 form factor)
Temperature Range		T								-Selectable between 200-400°C
Protection class			F							IP65
			I							IP54（standard）
Insertion length				L						MIN≥50mm（threaded）
Protection tube diameter					S					Φ8
					L					Φ12
					M					Φ16
Output type						01				One switching output
						02				Two switching outputs
						03				Three switching outputs[①]
						04				Four switching outputs[①]
						05				One switching output + Analog signal output
						06				Two switching outputs + Analog signal output
						07				Three switching outputs + Analog signal output[①]

	08			Four switching outputs + Analog signal output[①]	
	09			One switch output + RS485[②]	
	10			Two switching outputs + RS485[②]	
	11			Three switching outputs + RS485[②]	
	12			Four switching outputs + RS485[②]	
Type of power supply		D		DC 24V	
		A		AC 220V[③]	
Connection Method			L1	Screw connection G1/4（M）[④]	
			L2	Screw connection M20*1.5（M）[⑤]	
			L3	Other screw connections, to be specified	
			F	Flange connection (to order)	
Explosion-proof grade				N	Non-explosive
				E	Exde Ⅱ CT6 Gb

Note: ①②: These four outputs can only be used with the explosion-proof type；
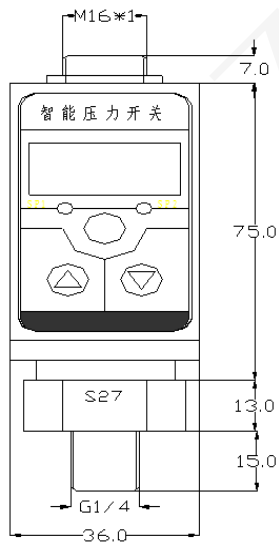
③：AC power is not an option for compact and smart models；

④：G1/4 (M) is the standard thread for the compact version.；

⑤：M20*1.5 (M) is the standard thread for the standard, explosion-proof and intelligent types.

VI. External Dimensions

Insertion depth is variable according to customer requirements and is not reflected in the dimensional drawings.

Compact Temperature Controller
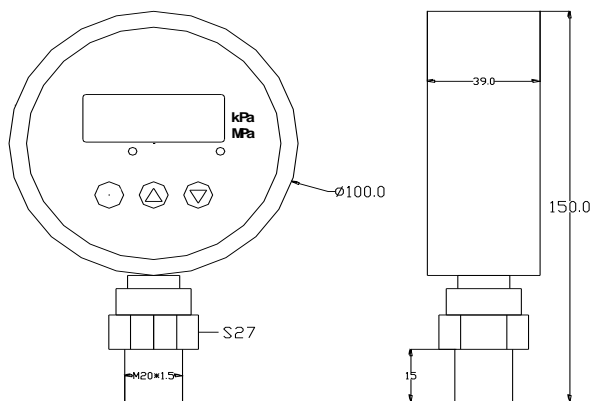
Standard temperature controller (protection class IP54)
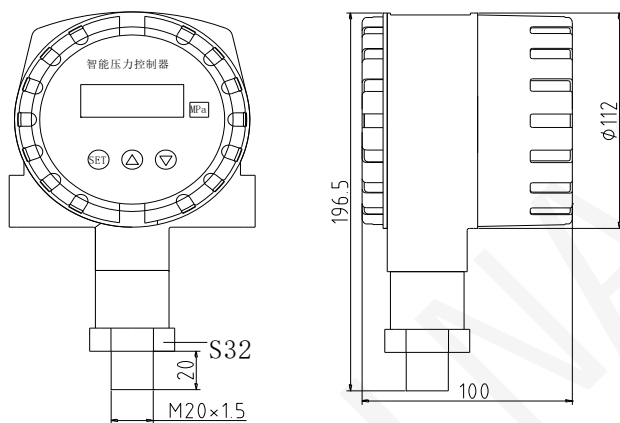
Explosion-proof temperature controller (protection class IP65)

Intelligent temperature controller (protection class IP65)

VII. Instrument Wiring

1. **Electrical connection**

A1. Compact temperature controller (two switching outputs)

1（brown）：power＋   2（white）：power-   3（blue）：switch1   4（black）：switch2
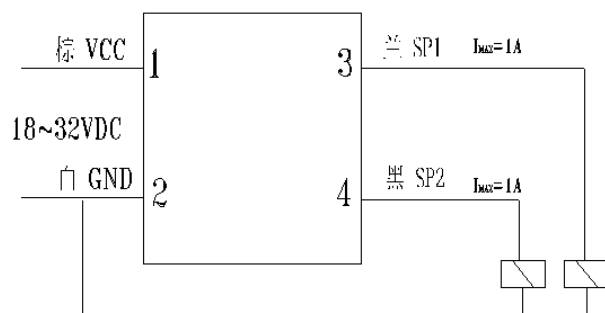
A2. Compact temperature controller (one way switch with one way 4-20mA output)

1（brown）：power＋ 2（white）：power-   output negative 3（blue）：switch1   4（black）：output positive
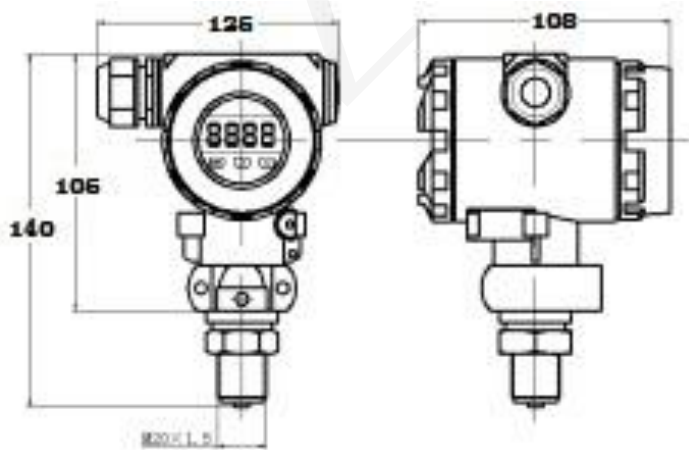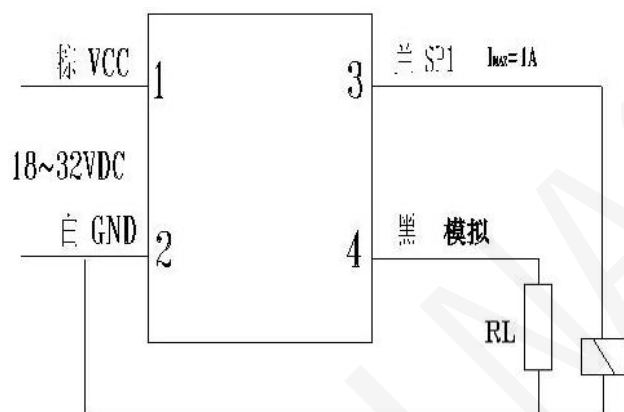

A3. Compact temperature controller (two switching with one 4-20mA output)

1（brown）：power＋   2（white）：power-   output negative   3（blue）：switch1
4（black）：switch2   5（gray）：output positive

B. Standard temperature controller (two switching outputs)

C. Explosion-proof temperature controller (four switching outputs + one analog signal output)
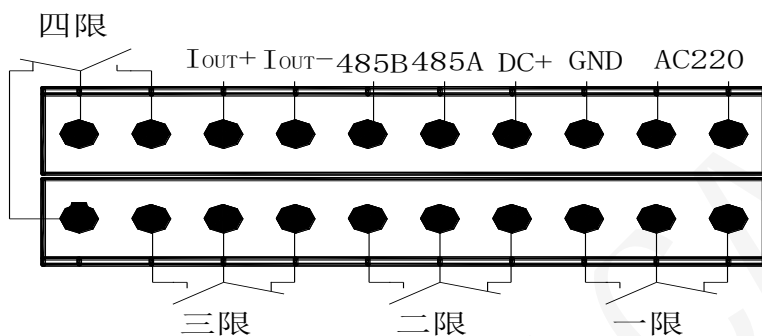
D. Intelligent temperature controller (two switching with one 4-20mA output)

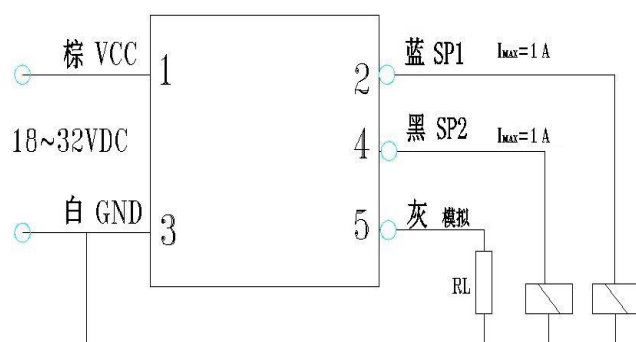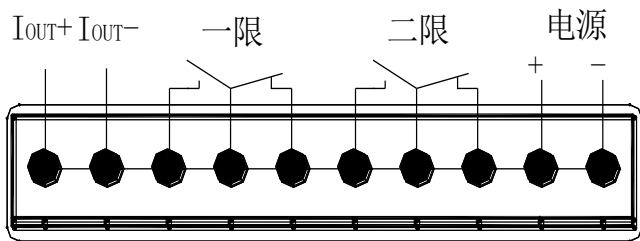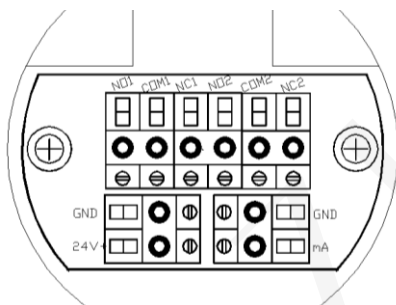| Terminal Marking	Electrical Significance
24V+	Switching Power Supply DC 24V+
GND	Switching Power Supply DC GND
mA	Current output，Output 4-20mA to GND
NO1	Switch 1 normally open
COM1	Switch 1 Common port
NC1	Switch 1 normally closed
NO2	Switch 2 normally open
COM2	Switch 2 Common port
NC2	Switch 2 normally closed

2. Wiring Precautions

The following should be observed to prevent the effects of electromagnetic interference:

➢ Keep wire connections as short as possible, use shielded wire.

➢ Avoid direct proximity to user devices or wiring of appliances and electronic devices that cause interference as much as possible.

➢ If mounted with miniature hose, housing must be separately grounded

3、Setting function

A. Switching output

Intelligent temperature switches have two or more switching outputs. Each switching output can be programmed with 1 temperature switching point and a set of on-off delay values. The corresponding outputs will switch when the switching point's closing value is reached and will revert when the temperature drops below the release value.

B. Analog Output

According to the model specification, one 4～20mA analog signal output can be added in addition to multiple switching outputs.

C. Basic form set switching points
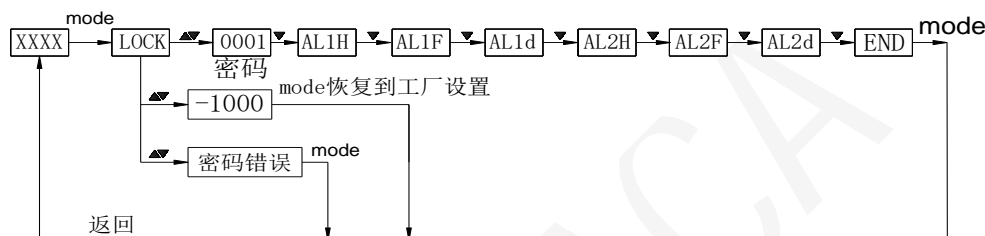
代号：

AL1H This value is the switch 1 closing value (when the temperature reaches this point, it is close and the indicator light is on)

AL1F This value is the release value for switch 1 (when the temperature reaches this value, switch 1 is disconnected and the indicator goes out).

AL1D This value is the switch 1 action delay (the number of seconds that must be waited for before switching) with a minimum unit of 0.01 seconds.

AL2H This value is the switch 2 closing value (when the temperature reaches this point, close, indicator light on)

AL2F This value is the switch 2 release value (disconnected when the temperature reaches this point, the indicator light goes out)

AL2D This value is the switch 2 action delay (the number of seconds that must be waited for before switching) with a minimum unit of 0.01 seconds.

Note: The switching point is determined by the closing value and release value configuration, when the closing value is greater than the release value, it is the upper limit alarm output (normally open function), and when the closing value is less than the release value, it is the lower limit alarm output (normally closed function), and the difference between the closing value and the release value is the return difference of the switching point.

Setting example: To set switch point 1 as the upper limit alarm output (normally open function) to absorb and disconnect at 100℃ and less than 95℃, with a switching delay of 3 seconds; switch point 2 as the lower limit alarm output (normally closed function) to disconnect at 200℃ and absorb and disconnect at less than 195℃, with a switching delay of 1 second:

Access to the menu: Settings

AL1H=100   AL1F=95   ALID=3.00

AL2H=195 AL2F=200 AL2D=1.00

●Press "mode".

●Show "LOCK" (prompts for password)

●Press ▲ or ▼ to enter the code "1".

●Press "mode" to confirm.

●Press ▲ or ▼ to scroll up or down for menu selection (AL1H, AL1F, AL1D, AL2H, AL2F, AL2D, END)

●Press "mode" to enter the selected menu.

●Press ▲ or ▼ to change the setting

●Press "mode" to confirm, and then use ▲ or ▼ to select other menus for modification if necessary.

●Select "END" menu after modification, press "mode" key to confirm save and exit.

●If no key is pressed for 30 seconds, the setting state is automatically exited, but the modified data is not saved.

Note 1: Press the mode key in the measurement state, "LOCK" is displayed to prompt for mode password, press ▲ or ▼ to input password "1", press the mode key to confirm to enter the menu, and use ▲ or ▼ to switch. The menu is a cycle structure, you can turn up and down. In the "END" menu, press mode key to save and exit. Data viewing is achieved by mode key, modification is achieved by ▲ or ▼ key, to confirm, please press mode key again.
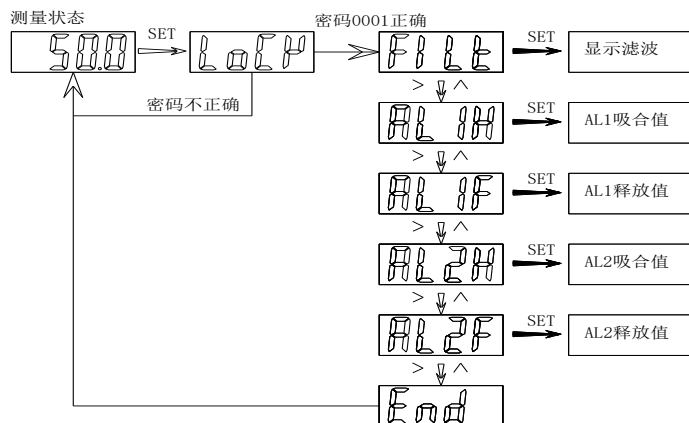
Note 2: There is no AL1D and AL2D in the setting process of standard and explosion-proof models, the rest of the steps are the same as above.

C. Intelligent Setting of Switch Points
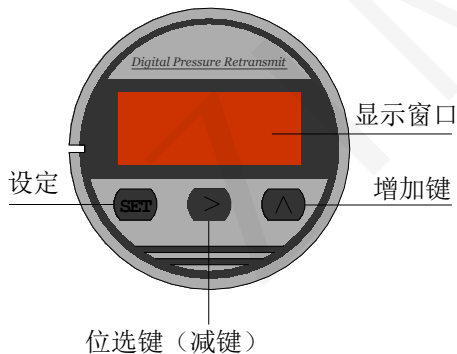
The panel has 4 digital tubes and 3 keys, SET for setup, SUB for bit selection and ADD for increase.

1. Switch point setting process:

FILT This value is the display filter coefficient.

AL1H This value is the switch 1 (AL1/SP1) suction value.

AL1F This value is the release value for switch 1 (AL1/SP1)

AL2H This value is the switch 2 (AL2/SP2) absorption value.

AL2F This value is the switch 2 (AL2/SP2) release value

END Save Exit

Note: If AL1H>AL1F, this SP1 is upper limit alarm mode, if AL1H<AL1F, this SP1 is lower limit alarm mode, if AL1H=AL1F, this SP1 is off. Return difference = Abs (AL1H-AL1F). SP2 setting is the same as SP1.

2.Zero clearing：

In the zero position temperature state, press and hold the selection key, which is the middle most key, for 3-4 seconds to clear the zero. Performing the zero operation again will return to the factory calibration state. The factory default zero value is 0.