

PID Temperature Controller

ITC-106

User Manual

Version 1.0



INKBIRD

Inkbird Tech. Co., Ltd.

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1. Safety Precautions

- Ensure the product using within the specification.
- Do not touch the terminals at least while power is being supplied. Doing so may occasionally result in injury due to electric shock.
- Do not allow pieces of metal, wire clippings, or fine metallic shaving or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.
- Do not use the product where subject to flammable or explosive gas. Otherwise, injury from explosion may occasionally occur.
- Never disassemble, modify or repair the product or touch any of the internal parts. Electric Shock, fire, or malfunction may occasionally occur.
- If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switch conditions.

2. Specification

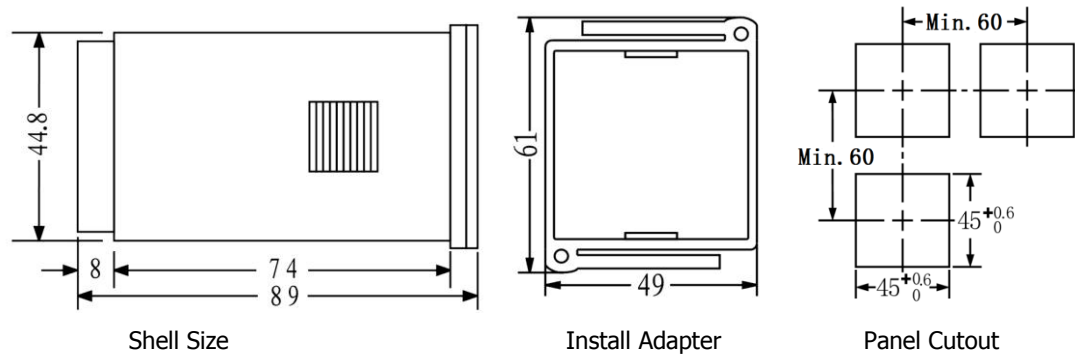
Supply Voltage	AC 100~240V 50/60Hz (model:ITC-106RH, ITC-106VH)
	AC/DC 12~24V 50/60Hz (model:ITC-106RL, ITC-106VL)
	DC 12~24V (model:ITC-106RL, ITC-106VL)
Operating Voltage Range	85~110% of the rated voltage
Power Consumption	5VA (100~240VAC)
	4VA (12~24VAC)
	3W (12~24VDC)
Display Code	PV: displays in red high luminance LED with 9.9mm height of 4 digits
	SV: displays in green high luminance LED with 8.00mm height of 4 digits
Display Accuracy	±0.2%FS 0.1°C/ °F(<1000°C/ °F); 1°C/ °F(≥1000°C/ °F)
Sampling Period	0.5 second
Temperature Compensation	0~50 °C /32~122°F
Control Output	Relay Output: AC 250V 3A (resistive load)
	Voltage Output (for driving SSR): 12VDC, 30mA DC
	Maximum load: 600Ω
	Electrical Life of Relay:100,000 times
Alarm Output	Relay Output: AC 250V 3A (resistive load)
Weight	About 140g
Working Temperature	-10~ 55 °C / 14~ 131 °F(No freeze or condensation)
Working Humidity	RH 35-85%
Storage Temperature	-25~65°C / -13~ 149 °F (No freeze or condensation)

Models and Specification

Model	Control Output	Supply Voltage
ITC-106RL	Relay Output	AC/DC 12~24V
ITC-106VL	SSR Output	AC/DC 12~24V
ITC-106RH	Relay Output	AC 100~240V
ITC-106VH	SSR Output	AC 100~240V

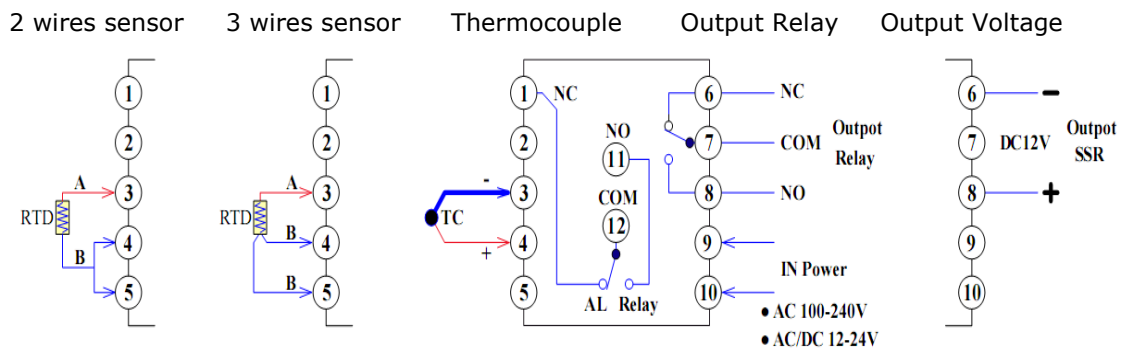
3. Dimension and Installing

Size Diagram (Unit: mm)



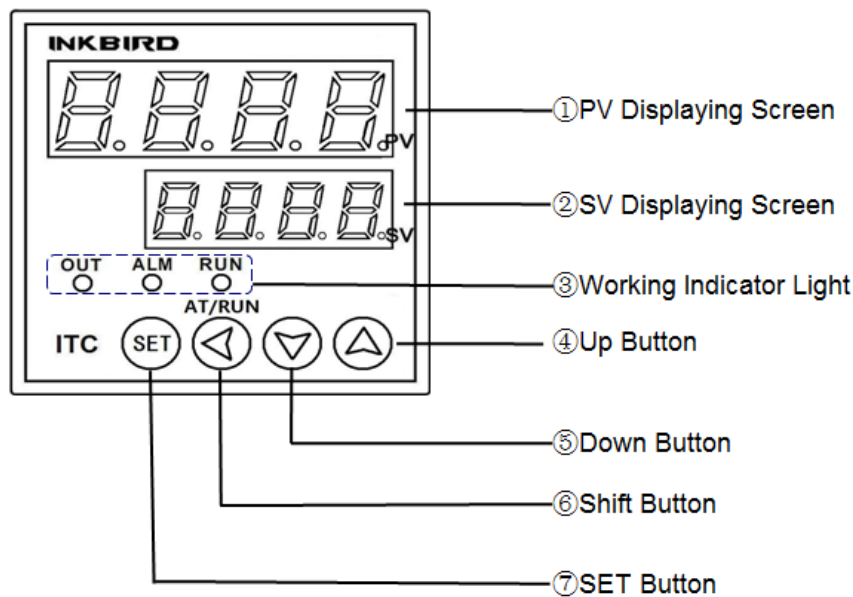
- Insert the temperature controller into the hole in the panel, put the adapter from the back and push it to button and make it clasp for temporarily fastening. Be sure there is no gap among the controller, panel and the adapter and then fasten the two screws on the adapter with the torque of 0.29N to 0.39N.
- Be sure the ambient temperature is within the stated working range in the manual, especially when there are two or more temperature controllers installed.

4. Wiring Diagram



- Power Connection: #9 and #10 terminals are for power connecting, which its supply voltage should be match the item model.
- **Platinum Resistance Sensor Connection:**
Three wires sensor: connected the #3 terminal with the red wire, the other two blue wires should be separately connected to the #4 and #5 terminals.
And the sensor with two wires (e.g. PT100) should be separately connected to the #3 and #5 terminals, the #4 and #5 terminals must be connected with the wire.
- **Thermocouple Connection(e.g. K sensor):** #3 terminal is connected to the positive pole(Red) and the #4 terminal is connected to the negative pole(Blue).

5. Panel Instruction



① **PV Displaying Screen:** Displaying the measuring value or the setting parameters.

② **SV Displaying Screen:** Displaying the setting value or the set parameters readout.

③ Working Indicator Light

OUT: Control Output Indicating

ALM: Alarm Output Indicating

RUN: Manual Operation Indicating

④ **UP Button:** when setting the value, pressing the up button can be increase the value that would be added rapidly by keeping press this button.

⑤ **DOWN Button:** when setting the value, pressing the down button can be decrease the value that would be reduced rapidly by keeping press this button.

⑥ **SHIFT Button:** when setting the value or parameters,

A, pressing this button to switch to the required value position.

B, Pressing this button can be shift to the submenu from the main menu.

C, Pressing this button can be freely switch to another mode from manual or the automatic operation.

⑦ **SET Button:** Pressing this button can read the value of control output and the set temperature. Hold and press this SET button for 3s or more can be enter into the parameters settings mode.

6. Setting Parameters

6.1 Sensor Type and Measuring Range

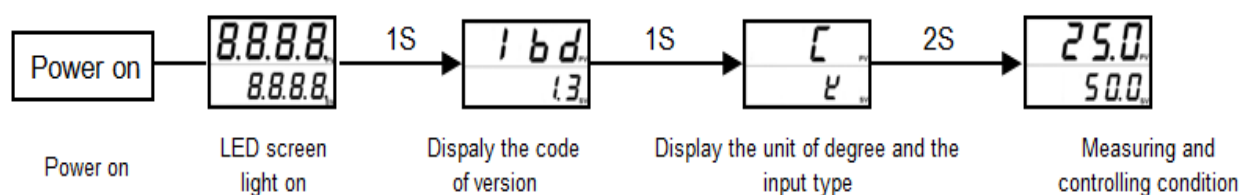
Sensor Type	Input	Code	Measuring Range	
Platinum Resistor	Pt100	Pt	-200~600 (°C)	-300~1100(°F)
	Cu50	Cu50	-50~150 (°C)	-100~300(°F)
Thermocouple	K	K	-50~1300 (°C)	-100~2300(°F)
	S	S	-50~1700 (°C)	-100~3000(°F)
	Wre	Wre	0~2300 (°C)	0~4000(°F)
	T	T	-200~400 (°C)	-300~750(°F)
	E	E	0~1000 (°C)	0~1800(°F)
	J	J	0~1000 (°C)	0~1800(°F)
	B	B	0~1800 (°C)	0~3200(°F)
	N	N	0~1000 (°C)	0~1800(°F)

Remarks:

- The faulty input sensor is the "K" type.
- If select the wrong input sensor, the measuring temperature will be incorrect and may exceed the measuring range with displaying "**orAL**", control output off.

6.2 Operation Guide

6.21 Boot screen display



6.22 Enter the settings menu

Under measuring and controlling condition, press ▲/▼ to set the temperature value, press and hold the "SET" button for 2 seconds to enter into the parameters settings mode.

6.23 Sensor Input Type Setting:

Set the sensor input type as required(the faulty is the "K" type), the temperature need to calibrated for there will be deviation due to the sensor and the operating environment.

6.24 Output Parameters Setting:

The recommended control mode for the first use is the PID control(default settings of PID control), please select the self-tuning mode when the controlling temperature cannot reach the desired value after it worked over time with the stable controlled temperature.

Under the self-tuning mode, the temperature will exceed the set value and activate the alarm. The exceeding temperature value is related to the heating system but it will return to normal after finished the self-tuning. If the temperature control requirement is undemanding, please select the ON/OFF control mode which its range of temperature controlling is depended on the dF(hysteresis). As below is the setting and the calculation:

The low temperature point=SV setting value-dF

The high temperature point=SV setting value+dF.

※ dF(hysteresis) can be worked both on alarm setting and ON/OFF control mode.

6.25 PID Parameters Setting:

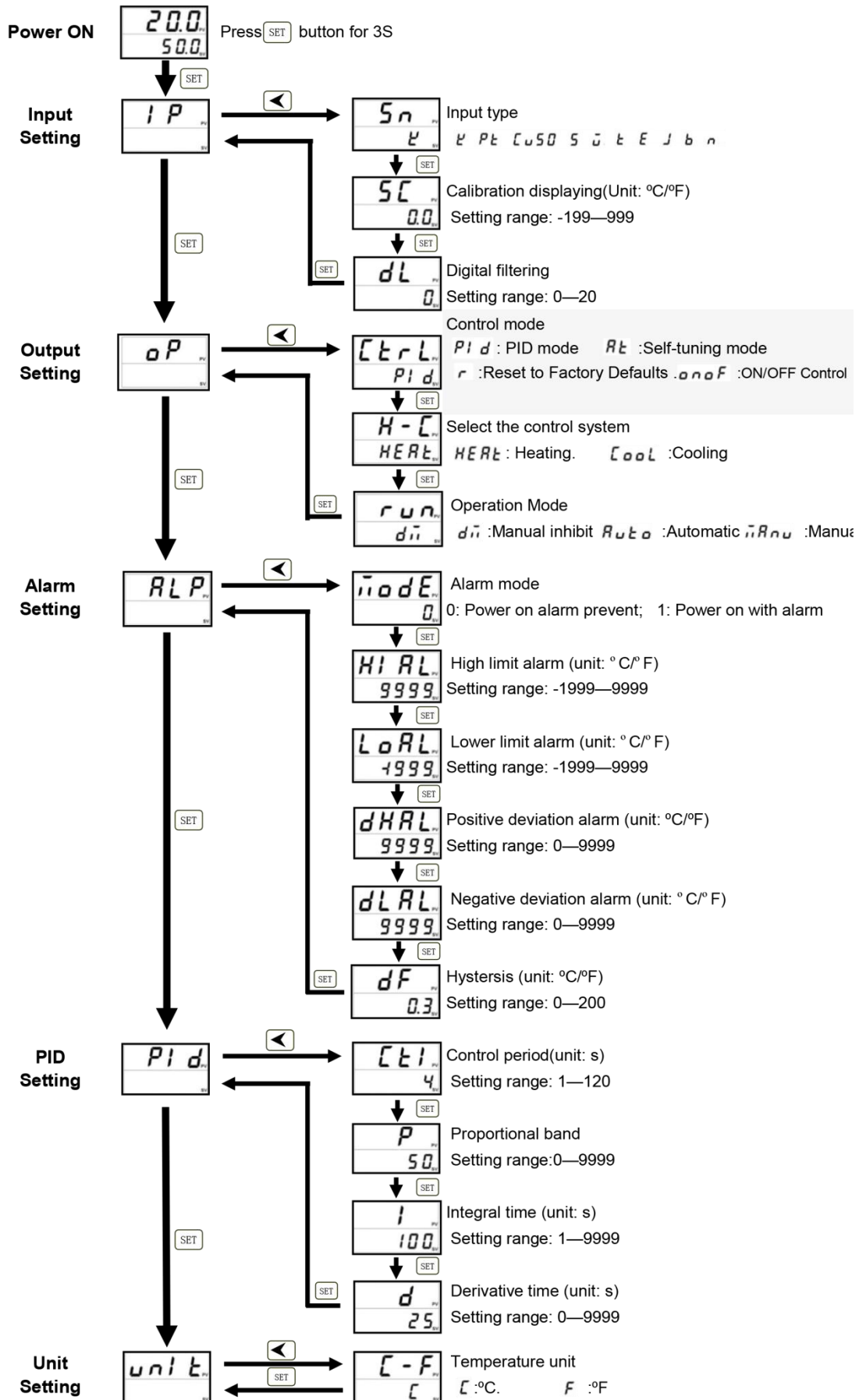
SSR control output: the control period(CtrL) can be set within 4 seconds(default 2 seconds);

Relay control output: The control period (CtrL) should be set to longer time(the normal is 18s) that would prolong the work life of the relay.

6.26 Setup Flow Chart:

(Please check next page)

Setup Flow Chart



7. Technical Assistance and Warranty

7.1 Technical Assistance

If you have any problems installing or using this thermostat, please carefully and thoroughly review the instruction manual. If you require assistance, please write us to cs@ink-bird.com. We will reply your emails in 24 hours from Monday through Saturday.

You can also visit our web site www.ink-bird.com to find the answers of the common technical questions.

7.2 Warranty

INKBIRD TECH. C.L. warrants this thermostat for one years from the date of purchase when operated under normal condition by the original purchaser (not transferable), against defects caused by INKBIRD's workmanship or materials. This warranty is limited to the repair or replacement, at INKBIRD's discretion, of all or part of the thermostat. The original receipt is required for warranty purposes.

INKBIRD is not responsible for injury property damage or other consequential damages or damages of third parties arising directly from an actual or alleged in mater of workmanship of the product.

There are no representations, warranties, or conditions, express or implied, statutory or otherwise, other than herein contained in the sale of goods act or any other statue.

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