Smart Temperature Controller

I. Overview

TB FUTURE T30 temperature controller is a smart control unit specially developed for industrial electric heating blankets. It is used to collect the temperature, adjust the signal of the sensor in the heating blanket and convert it into a digital signal to provide users with the current value and change process of various parameters on site in time, so as to control various functions of the heating blanket temperature.

- Sound alarm on turn on and first heat

- Ramp up instant heat on turn on

- Sound alarm when temperature exceeds 150°C

- Easy to operate buttons that can be used while in gloves.

- Rigid military grade black box controller with clear white surface display

- Power on neon light safety indicator

- Easy user interface beginner-friendly design

- 3m UL cold (insulated) plug

2. FEATURES

TECHNICAL DATA

• Smart temperature set point

• Count down timer mode

• Digital display

• Interchangeable heater socket for use with any size TB Future heating solutions

• The controller can control max power rating 7000W Heating product, allowing flexibility and industrial usage.

• Built in lock function to avoid tamper

• 230v (50-60hz, uk plug) & 110v (50hz, us plug) options available.

• Over-voltage features that turn off controller immediately-thermal protection feature that cut off power when the temperature control system fails

• System automatically cuts off to protect the 220V thermostat and heating product when accidentally connected to 380V power supply

TECHNICAL DATA

Classification Non-Hazardous

Sensor fault E1 Digital display

IP Rating IP54

Compatible with TB Future Heating Solutions

Safety Alarm

Performance indicators

Dimensions: 156*88*63mm

Power supply voltage: AC220V (±15%, 50Hz)

Power consumption: 3W

Power rating: 7000W

Environmental temperature: 0~50°C

Relative humidity: less than 85% in non-corrosive gas environment

Input signal: NTC-3950 thermistor
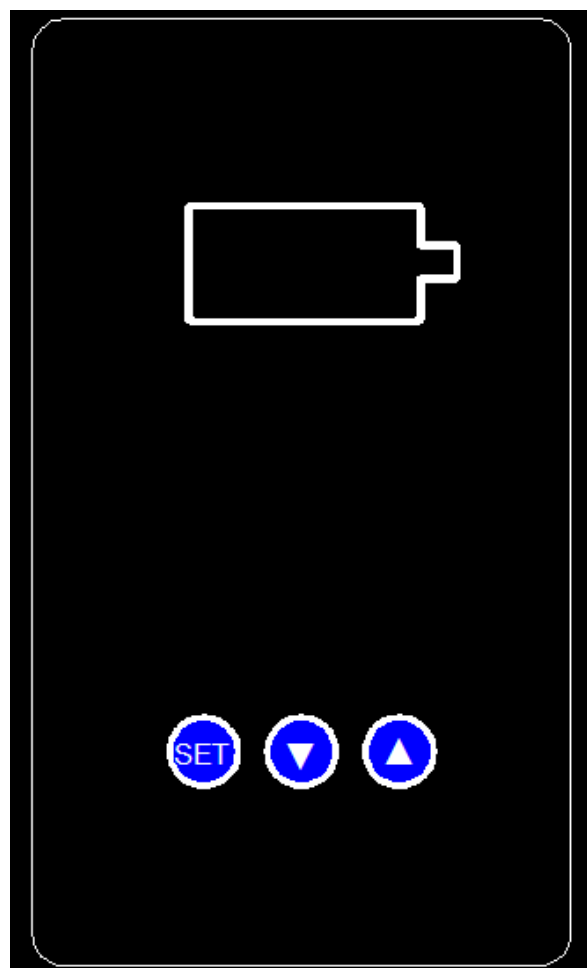
Display range: 0~150°C

Resolution: 1°C

Function [SET] key: used to select the window page and set different attribute values

Add key: [▲] Used to set the heating threshold

Reduce key [▼]: Used to set the heating threshold

3. Instrument surface panel description

1. PV/SV: Measurement/value display window
2. OUT: Output display lamp
3. SET: Set button
4. DOWN: Data reduction key
5. UP: Data increment key

4. Instrument use and operation

1. Measurement status

The instrument should be correctly wired and powered on after checking without error. The instrument enters the measurement ▼▲value display state, and ▲the ▼panel displays the current measurement value at this time. You can long press or enter the setting threshold state "SP" to set different thresholds.

2. Instrument operation and setting

When the instrument is in normal operation, hold down the 'SET' key for 1 second to enter the parameter menu setup mode. In this mode, pressing the 'SET' key sequentially will display the following menus: LOC, Hb, SC, SPL, SPH, E, HP, HI, Hd. When the LOC menu appears, input the password 38 to access the full parameter menu setup. For detailed settings, see below:

parameter	Parameter meaning	Set the scope	Windows	remarks
Hb	time	0-999	0	time control
SC	temperature compensation	-20-20	0	degree-day：℃
SPL	Temperature lower limit	0-180	30	Set the lower limit of the temperature

SPH	Upper temperature limit	0-180	90	Upper limit of temperature setting
E	Sensor type	1	1	NTC-3950
HP	coeffcient of proportionality	0-100	45	HP=0 is the position error control
HI	integration time	0-999	10	HI=0 is PD control
Hd	rate time	0-999	10	Hd = 0 is PI control When HP=0, dv is the hysteresis value
ITv	Integration of scores	0-999	30	
STv	control cycle	0-999	50	
Tv	Output period	0-999	20	
AHv	Upper limit of bias	0-999	3	
ALv	lower limit of vairiation	0-999	2	
TS1	Section 1 starting temperature	0-999	25	
TE1	End temperature of section 1	0-999	80	
TC1	Phase 1 time	0-999	55	minute
TS2	Section 2 starting temperature	0-999	80	
TE2	End temperature of section 2	0-999	80	
TC2	Two periods of time	0-999	60	minute

TS3	Section 3 starting temperature	0-999	80	
TE3	End temperature of section 3	0-999	120	
TC3	Three stages of time	0-999	40	minute
TS4	Paragraph 4 starting temperature	0-999	120	
TE4	End temperature of section 4	0-999	120	
TC4	Phase 4 time	0-999	60	minute
…				
TS6	Start temperature of section 6	0-999	0	
TE6	End temperature of section 6	0-999	0	
TC6	Six days	0-999	0	

HP: is the proportional coefficient, which accelerates the system response. Too large is easy to cause system overshoot and oscillation. The larger the P value, the faster the system response and the higher the overshoot;

HI: It is the integral time. To eliminate static difference, the greater the integral time, the weaker the integral action; conversely, the stronger the integral action.

Hd: Differentiation time, differentiation control can accelerate the response speed of large inertia system and weaken the overshoot trend.

Curve segment control method: Write the initial temperature to TS1. The curve segment function starts automatically, and the corresponding values will be written to the setting register according to the curve settings. After the curve ends, TS1 will automatically return to 0. The condition for the end of the curve is that when the curve exceeds 6 segments or the next time interval is set to 0, the controller considers the curve operation to be finished.

Precautions

1. This instrument is a precision electronic product, which should not be disassembled or changed at will during use. The temperature range shall not be adjusted at will without the consent of the company.
2. Keep away from explosives and contact the instrument with steam and liquid during use.
3. If the consequences are caused by improper use, TB Future shall not be held responsible for any consequences.