User Manual for the TE02 Guide-Rail Type Simple Thermostat

--V1.1

Applicable to the following models:

TE02-1

TE02-2

Preface

1. The product has undergone a comprehensive quality inspection before shipment. You can use the selection code to check the product appearance and accessory count to ensure the delivered product is free from errors, damage, or shortages.

2. The product comes with a 12-month warranty from the date of purchase. However, any malfunction caused by the following reasons will incur a charge for repair even during the warranty period.

① Issues arising from incorrect operation or unauthorized self-repair or modification.

② Problems caused by the use of instruments beyond the specified standard requirements.

③ Damage resulting from depreciation after purchase or during transportation.

④ Damage caused by earthquakes, fires, wind and water disasters, lightning strikes, abnormal voltages, or other natural disasters and their accompanying factors.

Catalogue

Chapter 1 Product Overview

1.1 Product Model: TE02-1 (AC220V input), TE02-2 (DC24V input)

1.2 Product Name: Rail-type Simple Thermostat

1.3 Product Appearance

TE02-1

TE02-2

1.4 Product Features

① Simplicity: The operation is straightforward; the PV value and SV value are displayed immediately upon power-on. Press the SET button once to initiate SV value modification, and the thermostat can be activated with a single step.

② Two control modes: On/off control and PID control (without self-tuning function).

③ Optional heating or cooling mode: Heating mode – when temperature falls below the set value, output is activated to start heating; Cooling mode – when temperature exceeds the set value, output is activated to start cooling.

④ Alarms for overheating, low temperature, low voltage, and NTC wire breakage.

⑤ Features one alarm signal output channel.

⑥ Includes timer mode and power-saving mode functions.

Chapter 2 Precautions

① Do not touch the terminals while the device is powered on, as this may cause electric shock.

② Do not use this product in environments containing flammable or explosive gases. Otherwise, an explosion may cause minor injuries.

③ Do not disassemble, modify, or repair this product, nor come into contact with any internal components. Otherwise, it may result in electric shock, fire, or unintended machine operation.

④ To remove stains from the panel, use a soft cloth or cotton paper.

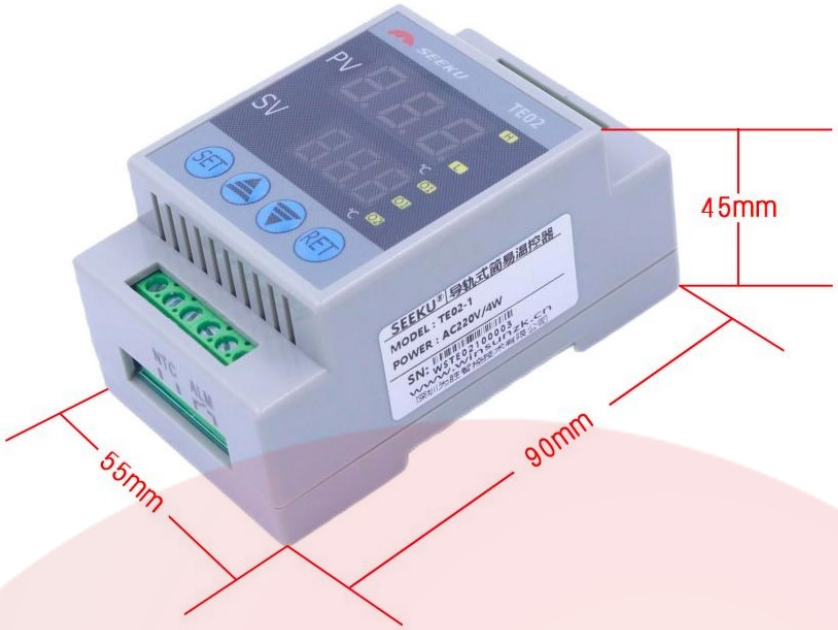
⑤ The display screen is prone to scratches; avoid wiping or touching it with hard objects.

⑥ Do not use hard objects such as screwdrivers or writing pens to operate the panel buttons.

Chapter 3 Product Specifications

Power supply voltage	220VAC(TE02-1)、24VDC（TE02-2）
Shell size	90*55*45 mm
Weight	100g
Operating temperature	0-50℃（No icing allowed. Condensation.）
Display mode	A large red digital display with a black background
Alarm indication	On the main interface, the digital display within the SV window flashes to show the alarm code.
Alarm function	Overtemperature alarm, low temperature alarm, NTC wire break alarm, low battery voltage alarm
Alarm output	Relay 10A 250VAC
Temperature measurement accuracy	±1℃
Temperature measurement range	-50~120℃
Accuracy class	0.6%F.S
Input type	NTC 10K 3950
Output type	Relay 10A 250VAC

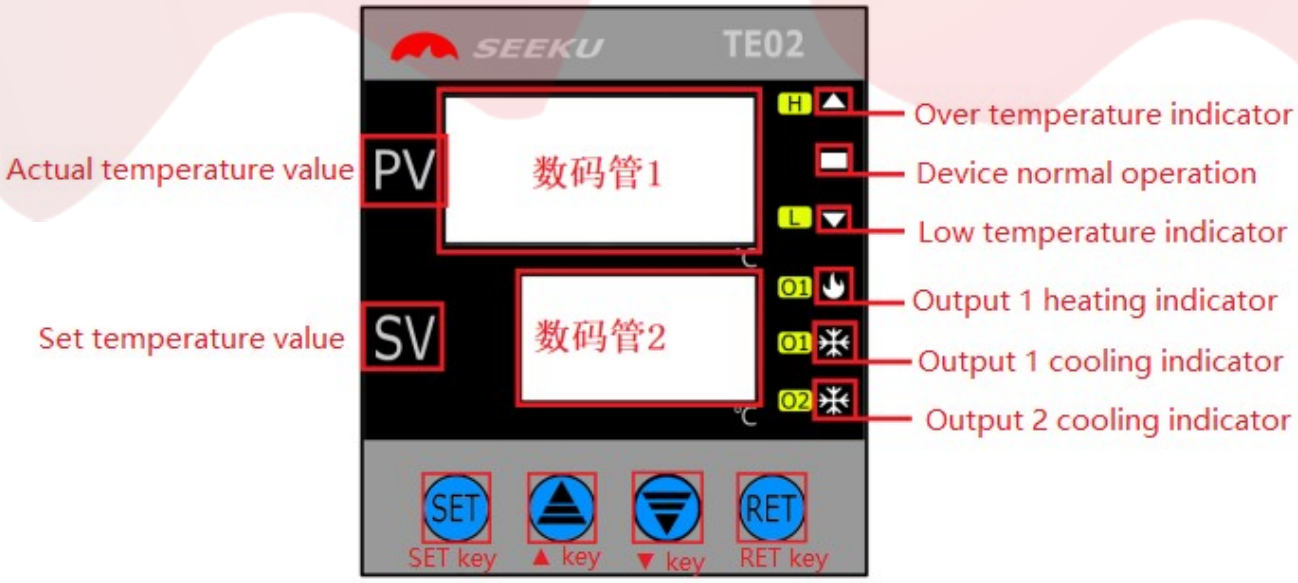
Chapter 4 External dimensions



Taking TE02-1 as an example, the two models have the same dimensions.

Chapter 5 Panel Description

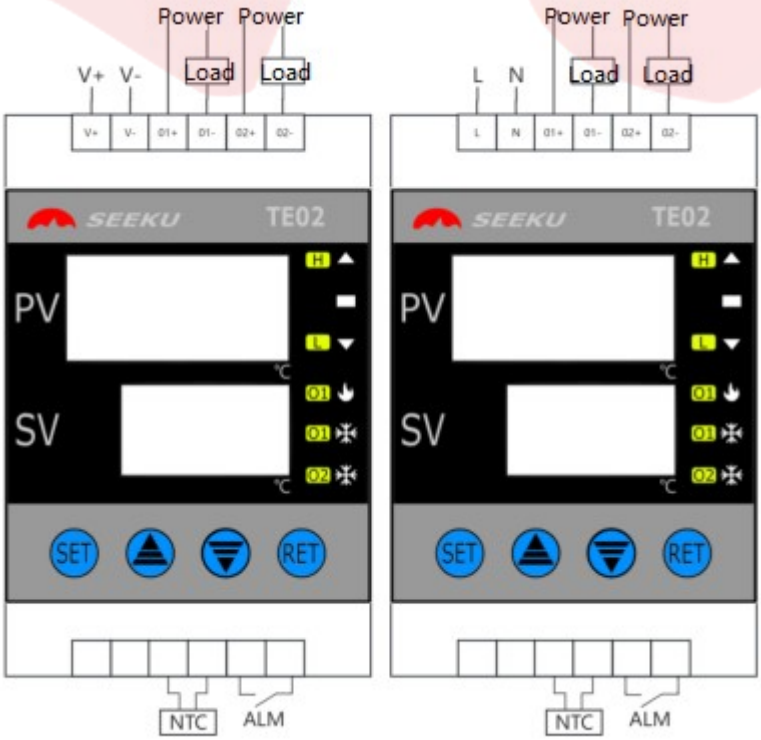
5.1 Panel Image Area Introduction



5.2 Introduction to Each Section of the Panel

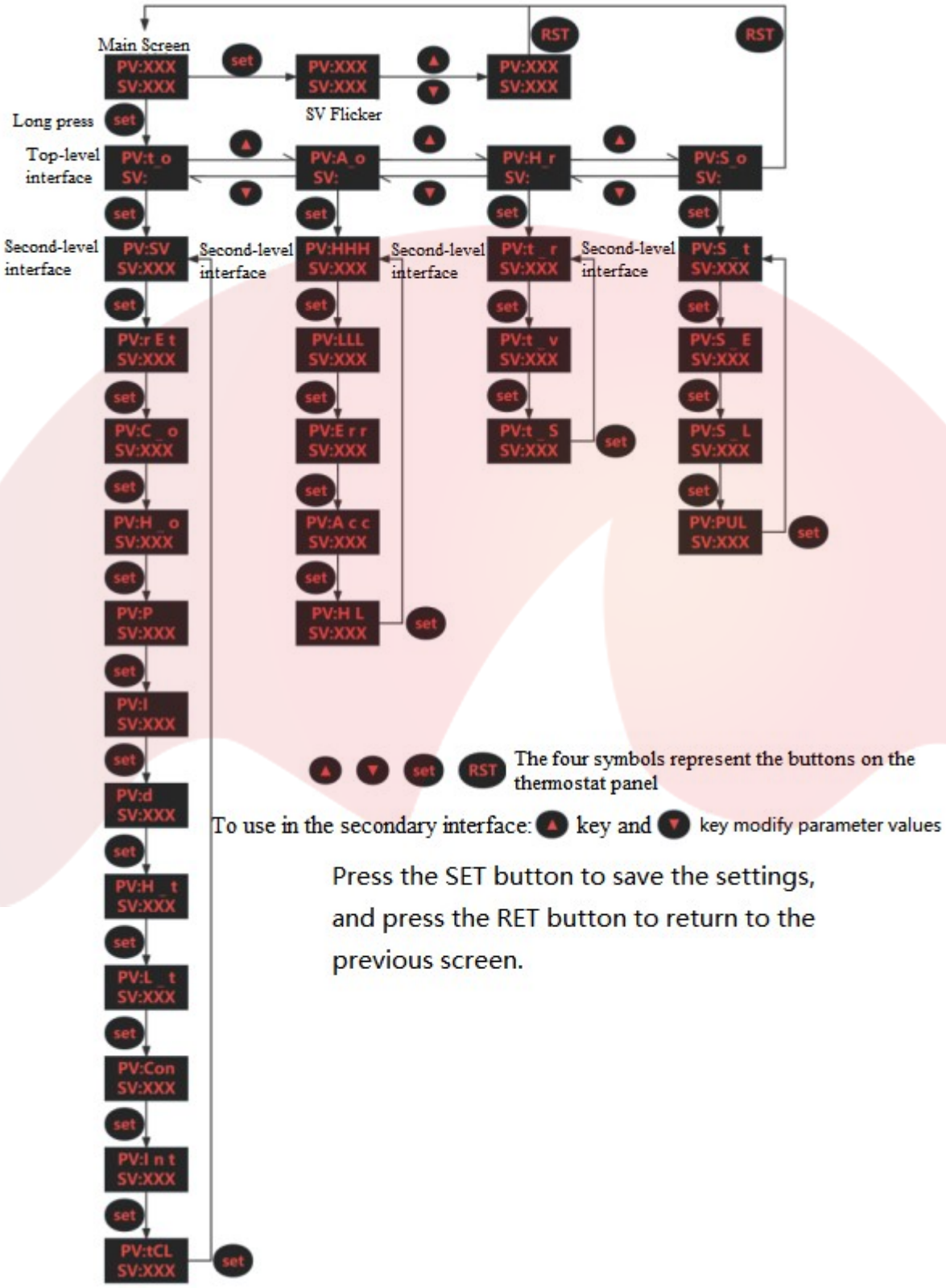
1. Digital display 1: Display content:
   ① Display the measured value (PV)
   ② In parameter setting mode, display the parameter name
   ③ When an alarm occurs, the alarm code flashes (effective only on the main interface)
2. Digital display 2: Display content:
   ① Display the set value (SV)
   ② In parameter setting mode, display the parameter value
3. SET key
   ① On the main interface, a short press changes the SV value, while a long press navigates to the first-level interface;
   ② In the first-level interface, a press enters the second-level interface;
   ③ In the second-level interface, switch between configured parameters; any parameter changes will be saved immediately.
4. ▲ key、▼ key
   ① When setting parameters, use the ▲ and ▼ keys to modify parameter values; long press to accelerate parameter value changes;
   ② On the primary interface, change the parameter type.
5. RET button: Return to the previous interface

Chapter 6 Attended Mode



Chapter 7 Menu Settings and Parameter Description

7.1 Menu Settings



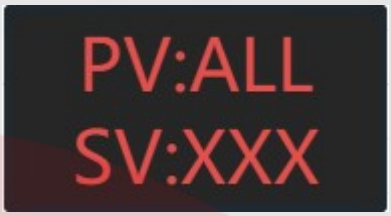
7.2 Parameter Declaration

Primary Interface	Secondary Interface	Parameter Name	Parameter Range	Parameter Default Value	Parameter Declaration
t_o	SV	Temperature setting value	-55~120	60	The temperature desired by the prosecution
	ret	Return difference	0.1~30.0	5	Target temperature deviation or dead zone
	C_o	control model	0~1	0	0: PID 1: On/off control ***Appendix 1**
	H_o	Heating mode	0~2	0	0: Heating mode 1: Cooling mode 2: Heating and cooling mode
	P	p	0~99.9	6	Proportional parameter
	I	i	0~999	30	Integration parameter
	D	d	0~999	15	Differential parameter
	H_t	Maximum temperature	-55~120	120	Limit the maximum SV temperature ***Appendix 2**
	L_t	Minimum temperature	-55~120	-55	Set the minimum temperature for SV
	Con	PID control cycle	0~99.9	6	PID loop control cycle
	Int	Initialization parameter	0~1	0	0: Not enabled 1: Initialize all parameters
	tCL	Temperature correction	-99.9 ~ 99.9	0	Display PV value = measured value + temperature calibration value
A_o	HHH	Overtemperature alarm value	0~999	50	When PV exceeds SV + the overtemperature alarm threshold, the digital display triggers an alarm.
	LLL	Low temperature alarm value	0~999	50	When PV falls below the SV low-temperature alarm threshold, the digital display triggers an alarm. Note: The low-temperature alarm becomes effective only after PV

					reaches the SV value upon power-on.
	Err	NTC breakage	0~1	1	0: Normal connection 1: Connection lost
	Acc	Alarm disabling	0~1	0	0: Control remains unchanged after alarm 1: Output stops after alarm
	HL	Over temperature and low temperature indicator	0~999	2	0–999: When PV exceeds SV + this parameter, the overtemperature indicator light turns on; when PV is below SV – this parameter, the low-temperature indicator light turns on; when PV falls within SV ± this parameter range, the normal indicator light turns on.
H_r	t_r	Timed mode	0~3	0	0: None 1: Cycle 2: Timed startup 3: Timed shutdown
	t_v	Scheduled startup time	0~999（min）	1	Parameters for cyclic and scheduled startup
	t_S	Timed shutdown time	0~999（min）	1	Parameters for cyclic and scheduled shutdown
	S_t	Show dimming time	0~999（min）	0	The digital display shows a dim status when no operation is performed; it is inactive when the value is 0.
S_o	S_E	Screen-off time	0~999（min）	0	The digital display shows no operation arrival time when off; it is not enabled when the value is 0.
	S_L	Button lock time	0~999（min）	0	There is no operation arrival time lock button; it is not enabled when the value is 0.
	PUL	Low-voltage battery detection	0~1	0	When the power source is a battery, the input voltage is <21V, triggering the digital display alarm.

Chapter 8 Common Abnormalities and Their Management

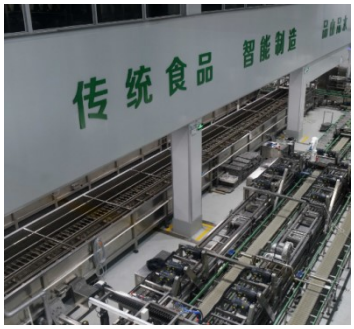
1.Alarm Display :

Digital display	 Overtemperature alarm	 Lowtemperature alarm
Digital display	 NTC line break alarm	 Battery low-voltage alarm

2. **Err：** If the measurement value section on the main interface flashes with the Err indicator, it indicates a broken NTC temperature sensing wire. Check whether the NTC socket is properly connected or replace the NTC sensing wire.

3. **PUL：** When the input power source is a battery, if the "PUL" indicator flashes in the measurement section of the main interface, it indicates low battery voltage and requires charging.

Chapter 9 Application Scenarios

	
Warehouse temperature detection alarm	Process Technology in the Food Industry
	
Environmental Monitoring of Agricultural Greenhouses	Laboratory and freezer temperature and humidity monitoring
	
Temperature monitoring of daily heating equipment	Textile printing and dyeing process: oven heating

Appendix 1 Parameter Declaration

① On/Off Control:

In cooling mode: When the measured temperature is ≥ the setpoint, the relay closes and the cooler starts;

When the measured temperature is ≤ the setpoint minus the hysteresis value, the relay opens and the cooler shuts off.

In heating mode: When the measured temperature is ≤ the setpoint, the relay closes and the heater starts;

When the measured temperature is ≥ the setpoint + hysteresis, the relay opens and the heater shuts off.

② PID Control

The thermostat defaults to PID control mode. Users can freely adjust the three PID parameters based on desired temperature control performance. The device lacks built-in PID self-tuning functionality; for accurate PID values, first use the PID self-tuning device (T01/T10 series) to verify the settings before applying them to the device.

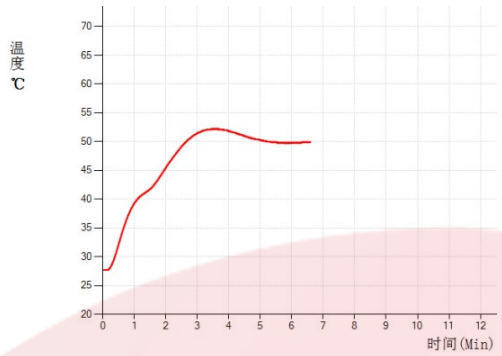
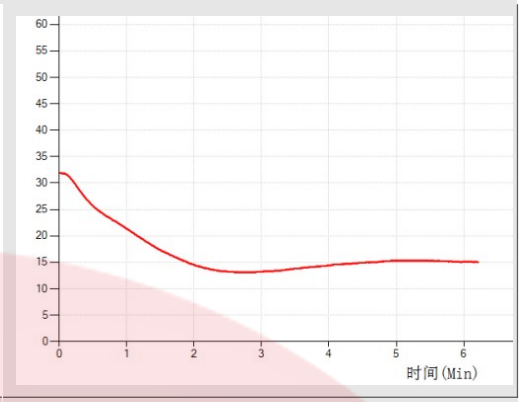
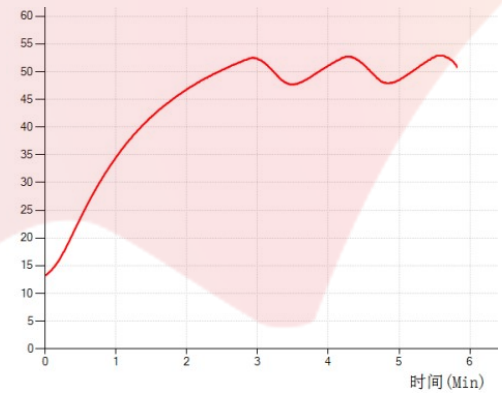
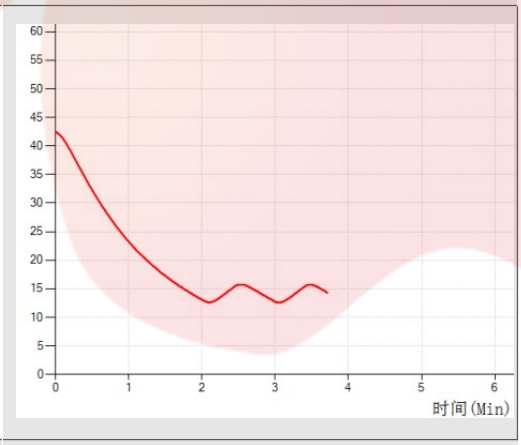
③ Maximum and Minimum Temperatures:

These limit the maximum and minimum values of the SV setting. For example, if the maximum temperature is 60°C, the SV value cannot exceed 60°C.

④ Operating Mode: (The default operating mode is None)

Scheduled Startup Mode	1. Start a countdown based on the scheduled power-on time.
	2. The countdown begins; the thermostat output turns off, and the digital display shows "OFF".
	3. The countdown ends, the thermostat output returns to normal, and the digital display shows properly.
Scheduled Shutdown Mode	1. Start a countdown based on the scheduled shutdown time.
	2. The countdown begins; the thermostat outputs normally, and the digital display shows correctly.
	3. When the countdown ends, the thermostat output turns off and the digital display shows "OFF".
Loop Mode	The loop executes functions for both the startup mode and shutdown mode periods.

Appendix 2 Example of a temperature control curve

Control Model	PID Control: Proportional parameter: 6; Integral parameter: 30; Derivative parameter: 15	
Temperature Curve		
Control Parameters	PID heating, overshoot of 2.2°C, temperature stability within ±0.5°C	PID cooling, overshoot of 1.9°C, temperature stability within ±0.5°C
Control Model	**On/Off Control Mode**	
Temperature Curve		
Control Parameters	Intermittent heating control, hysteresis 2°C, fluctuation 5°C	On-off cooling control, setpoint deviation 2°C, fluctuation 2.8°C