

Inkbird ITC-100VH

Inkbird ITC-100VH Digital PID Temperature Controller Instruction Manual

Model: ITC-100VH

INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your Inkbird ITC-100VH Digital PID Temperature Controller. Please read this manual thoroughly before use to ensure proper function and safety.

SAFETY INFORMATION

- Ensure all wiring is performed by a qualified professional and adheres to local electrical codes.
- Disconnect power before performing any wiring or maintenance.
- Do not operate the device in environments with excessive moisture, dust, or corrosive gases.
- The device operates on AC 100-240V. Verify your power supply matches this requirement.
- The heat sink must be properly installed to dissipate heat from the Solid State Relay (SSR).

PACKAGE CONTENTS

The standard package includes:

- 1 x Inkbird ITC-100VH PID Temperature Controller
- 1 x 25A Solid State Relay (SSR-25 DA)
- 1 x K-Type Thermocouple
- 1 x White Heat Sink



Image: The complete kit including the PID controller, solid state relay, K-type thermocouple, and heat sink.

PRODUCT OVERVIEW

Front Panel



Image: Front view of the ITC-100VH controller, showing the digital display for Process Value (PV) and Set Value (SV), output indicators (OUT, AL1, AL2, RUN), and control buttons (ITC, SET, AT/RUN, Up, Down).

- **PV (Process Value):** Displays the current measured temperature. (Red LED)
- **SV (Set Value):** Displays the target temperature or parameter setting. (Green LED)
- **OUT Indicator:** Illuminates when the control output is active.
- **AL1/AL2 Indicators:** Illuminates when alarm 1 or alarm 2 is active.
- **RUN Indicator:** Illuminates when the controller is in operation.
- **ITC Button:** Used to enter parameter setting mode.
- **SET Button:** Used to confirm settings or cycle through parameters.
- **AT/RUN Button:** Used to initiate auto-tuning or start/stop operation.
- **Up/Down Arrows:** Used to adjust values.

Rear Terminals



Image: Rear view of the ITC-100VH controller, showing the screw terminals for power input, sensor input, and control outputs.

Solid State Relay (SSR)



Image: Close-up of the Inkbird SSR-25 DA Solid State Relay, showing input (3-32VDC) and load (24-380VAC) terminals.

K-Type Thermocouple



Image: K-Type Thermocouple with a metal probe, braided cable, and red/blue spade connectors for wiring.

Heat Sink



Image: Aluminum heat sink with fins, designed to dissipate heat from the Solid State Relay.

SPECIFICATIONS

Feature	Specification
Power Supply Voltage	AC 100-240V, 50/60Hz
Operating Voltage Range	85-110% Rated voltage
Power Consumption	Approx. 5VA
Display Accuracy	$\pm 0.2\%FS$ 0.1°C (<1000°C); 1°C ($\geq 1000^\circ C$)
Sampling Period	0.5 seconds
Temperature Compensation	0-50°C
Output	1 x SSR output (DC 12V, 30mA), 1 x Relay Alarm Output (AC250V 3A)

Feature	Specification
Environmental Conditions	-10 to 55°C, 35-85% RH (non-condensing)
Storage Temperature	-25 to 65°C (non-condensing)
Data Storage	10 years
Cutout Size	45mm x 45mm
K-Type Thermocouple Range	0-400°C
K-Type Thermocouple Cable Length	2m (6.6ft)
SSR Load Voltage	24-380VAC
SSR Load Current	25A
SSR Input Voltage	DC 3-32V
Heat Sink Dimensions	Roof: 50x60mm, Foot: 80x50mm, Height: 50mm

SETUP AND INSTALLATION

Mounting the Controller

The ITC-100VH controller is designed for flush mounting.

1. Cut a square opening of 45mm x 45mm in your panel.
2. Insert the controller into the opening.
3. Secure the controller using the provided mounting brackets from the rear.



Image: A white plastic mounting bracket used to secure the PID controller into a panel cutout.

Wiring Diagram

Refer to the wiring diagram below for proper connections. Ensure all connections are secure and correct before applying power. Incorrect wiring can damage the device or cause safety hazards.



Image: Detailed wiring diagram showing connections for power supply, K-type thermocouple, and the solid state relay (SSR) to the ITC-100VH controller.

- **Power Input (Terminals 1 & 2):** Connect AC 100-240V power supply.
- **Thermocouple Input (Terminals 9 & 10):** Connect the K-type thermocouple. Ensure correct polarity (red to positive, blue to negative if applicable, or follow markings on the thermocouple).
- **SSR Output (Terminals 4 & 5):** Connect the DC 12V output from the controller to the input terminals (3-32VDC) of the Solid State Relay.
- **Alarm Output (Terminals 6 & 7):** Connect external alarm device if required.
- **SSR Load Connections:** Connect your heating element or load to the load terminals (24-380VAC) of the SSR.

Heat Sink Installation

The heat sink is essential for the proper operation and longevity of the Solid State Relay.

1. Apply a thin layer of thermal paste (not included) between the SSR and the heat sink for optimal heat transfer.
2. Mount the SSR securely to the heat sink using screws.
3. Ensure adequate airflow around the heat sink to prevent overheating.

OPERATING INSTRUCTIONS

Initial Power-Up

After completing all wiring, apply power to the controller. The PV display will show the current temperature, and the SV display will show the default set temperature.

Setting the Target Temperature (SV)

1. Press the **SET** button once. The SV display will flash.
2. Use the **Up** and **Down** arrow buttons to adjust the target temperature.
3. Press the **SET** button again to confirm the new value and exit the setting mode.

Parameter Settings

To access advanced parameters:

1. Press and hold the **SET** button for approximately 3 seconds until the first parameter code appears on the PV display.
2. Use the **Up** and **Down** arrow buttons to navigate through the parameter codes.
3. Press **SET** to view the value of the selected parameter.
4. Use the **Up** and **Down** arrow buttons to change the parameter value.
5. Press **SET** to confirm the new value.
6. To exit parameter setting mode, press and hold the **SET** button for 3 seconds, or wait for 30 seconds of inactivity.

Refer to the detailed parameter list in the full user manual for specific parameter codes and their functions (e.g., P, I, D values, alarm types, input sensor type).

Auto-Tuning Function

The auto-tuning function helps the controller optimize its PID parameters for your specific heating system, improving temperature stability and accuracy.

1. Set your desired target temperature (SV).
2. Press and hold the **AT/RUN** button for approximately 3 seconds. The **AT** indicator will flash, indicating auto-tuning is in progress.
3. The controller will cycle the output to determine the optimal PID values. This process may take some time, depending on your system's thermal characteristics.
4. Once auto-tuning is complete, the **AT** indicator will stop flashing, and the controller will operate with the newly calculated PID parameters.

Note: During auto-tuning, the temperature may overshoot or undershoot the set value. This is normal behavior.

MAINTENANCE

- Keep the controller clean and free from dust. Use a soft, dry cloth for cleaning.
- Regularly inspect wiring connections for tightness and signs of wear or corrosion.
- Ensure the heat sink for the SSR is free from obstructions and has adequate ventilation.
- Avoid exposing the device to direct sunlight, high temperatures, or excessive humidity.

TROUBLESHOOTING

Display shows "HHHH" or "LLLL"

This indicates a sensor error. Check the K-type thermocouple connection for proper polarity and ensure it is not damaged or open-circuited.

Temperature reading is inaccurate

Verify the thermocouple is correctly installed and making good contact with the measurement point. Check for electromagnetic interference. Consider performing auto-tuning.

Controller not heating/cooling

Check power supply to the controller and the load. Verify SSR wiring and functionality. Ensure the set temperature (SV) is correctly configured relative to the current temperature (PV) and control mode.

Temperature fluctuates widely

This may indicate incorrect PID parameters. Perform the auto-tuning function. Ensure the heating element and sensor are appropriately sized for the application.

WARRANTY AND SUPPORT

Inkbird products typically come with a standard manufacturer's warranty. For specific warranty terms, technical support, or service inquiries, please refer to the official Inkbird website or contact their customer service directly. Keep your purchase receipt for warranty claims.