The TMP-1 is a compact, self-contained temperature controller module designed for both heating and cooling applications. This versatile module offers precise temperature control at an economical price point.

Package Contents

- TMP-1 Temperature Controller Module
- Temperature sensor probe (45cm/18" length)

Key Features

- 3-digit LED temperature display
- Dual operation modes (heating or cooling)
- Configurable parameters (temperature setpoint, hysteresis, delay)
- Waterproof NTC temperature sensor
    - Range: -30°C to +110°C (-22°F to 230°F)
    - Accuracy: 0.1°C
- Relay specifications:
    - AC rating: 120VAC @ 10A
    - DC rating: 14VDC @ 10A
- Operating voltage: 12VDC

Functional Description

The module monitors and displays temperature while controlling power to electrical equipment based on temperature thresholds. The single output relay can be configured to switch ON or OFF as temperature crosses user-defined setpoints. Additional features include adjustable temperature hysteresis, activation delay, and operational limits.

The built-in microcontroller (STM8S or equivalent) enables configuration via the display and three pushbuttons. All settings are stored in non-volatile memory and persist through power cycles.

Temperature Sensor

The module uses a high-accuracy waterproof NTC 10K Thermistor. While the standard sensor cable is 45cm (18"), it can be extended through splicing if needed.

Power Requirements

The module requires 12VDC power, supplied through the screw terminal block. Compatible power sources include AC adapters or similar DC power supplies.

Display and Controls

LED Display

- Type: 3-digit, 0.28" red 7-segment display
- Default display: Current temperature
- Error indication: "LLL" displayed when sensor is disconnected
- Display timeout: Returns to temperature display after 5 seconds of inactivity

Control Buttons

- SET:
    - Short press: Set trigger temperature
    - Long press: Enter parameter setting mode
- (+): Increment value
- (-): Decrement value

Parameter Configuration

Setting Trigger Temperature

1. Press SET button (display will flash)
2. Use (+)/(-) buttons to adjust temperature
3. Press SET to save or wait 5-8 seconds for auto-save

Advanced Parameters

Access: Long press SET button for 3 seconds to enter parameter mode

Parameters:

1. P0 - Operation Mode
    - C (default): Cool mode - relay energizes at setpoint
    - H: Heat mode - relay de-energizes at setpoint
2. P1 - Hysteresis
    - Default: 2.0°C
    - Range: 0.0°C to user-defined
    - Purpose: Prevents relay oscillation around setpoint
3. P2 - Maximum Temperature

    - Default: 110°C
    - Purpose: Upper limit safety threshold
4. P3 - Minimum Temperature
    - Default: -30°C
    - Purpose: Lower limit safety threshold
5. P4 - Temperature Correction
    - Default: 0.0°C
    - Purpose: Calibration offset adjustment
6. P5 - Delay Timer
    - Default: 0 minutes
    - Range: 0-10 minutes
    - Purpose: Activation delay after threshold
7. P6 - High Temperature Alarm
    - Default: OFF
    - Temperature range: 0-110°C
    - Function: Deactivates relay and displays "HHH" above setpoint

Physical Connections

Temperature Sensor Connection

- Connector type: 1×2 XH2.54 white connector
- Keyed design (non-polarized)

Power and Control Terminal Block (1×4)

1. GND: Power supply ground
2. +12V: Power input
3. K1: Relay contact 1
4. K0: Relay contact 2

Note: Relay contacts are non-polarized and suitable for both AC and DC loads.