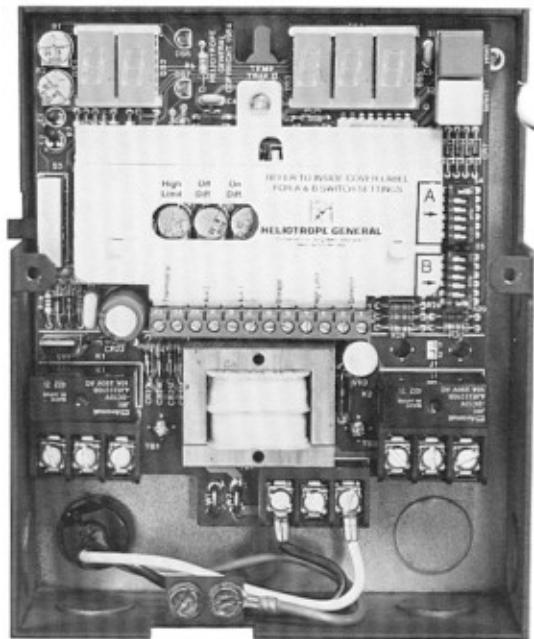


# TempTrak II

## Description of Features and Options

The many features and options available on the Temp-Trak® II make it easy to install and adaptable to a variety of solar system applications. A series of microswitches internal to the control allow the installer to select the various features and options available.

- **Five station user display** —  
Station 1. Collector temperature  
Station 2. Storage high limit temperature.  
(Station 2 can be used as an auxiliary sensor location if high limit cut-off is not used)  
Station 3. Storage temperature  
Station 4. Auxiliary sensor location  
Station 5. Auxiliary sensor location
- **Adjustable "ON" and "OFF" differential** — The "ON" and "OFF" differentials are both adjustable from 0° - 50°F. With the control in the SET-UP mode, the digital display will indicate the exact differential setting. This allows precise adjustment of the differentials to meet precise settings often needed on individual solar systems. No guesswork involved.
- **Selection of storage high limit function** — A field adjustable high limit is standard from 80° to 215°F. If high limit is desired, the digital display will indicate the precise temperature setting. There are two methods to obtain storage high limit. One, the storage high limit sensor on Station 2 can be placed in the upper portion of the storage tank to obtain the most exact high temperature reading. A second method is to use the storage temperature sensor as the high limit sensor.
- **USER mode and SET-UP mode** — When the control is in the SET-UP mode, accomplished through the use of an internal microswitch, the control will display the "ON" and "OFF" differentials and the high limit setting. When the control is in the USER mode, only the sensor temperatures are displayed, thereby avoiding user confusion.
- **Selection of freeze protection options** — The control provides for field selection of freeze protection desired: recirculation; drain dump; drain back; closed loop or no freeze protection. The collector differential sensors also function as a freeze sensor. In addition, one or more FS-5 switching sensors are required for recirculation or drain dump freeze protection to provide redundancy. A relay expansion kit (REK-90001) is available which allows the field insertion of a second relay (to the single relay model) for a drain dump valve or simultaneous relay operation.
- **Selection of 5K or 10K thermistor sensors** — Sensor input may be 5K or 10K in any combination. All sensor connections at the control are made to an internal terminal strip.
- **Selection of relay options** — High voltage terminal strip allows for the field selection of NO relay, NC relay or NO/NC relay.
- **Field replaceable circuit board** — Should a control fail, the circuit board is



easily replaceable in the field through the removal of three screws. Removal of the control from its mounted location is not necessary.

- **Mounting the control** — The control is easily mounted using two keyhole slots for screws in the back plate for permanent attachment to a wall or other vertical surface. A two part hanger bracket assembly to provide secure mounting is provided with line cord models allowing the control to be easily removed without disassembly.

## Model Selection

Temp-Trak® II is available in the following four basic models: controls come with standard sensor packs or may be ordered without sensors.

- **TTII - 80000** — Hardwire model with one relay output. Will accept relay expansion kit providing drain dump valve or simultaneous relay operation.
- **TTII - 90000** — Line cord and receptacle model with one relay output. Will accept relay expansion kit providing drain dump valve or simultaneous relay operation.
- **TTII - 80100** — Hardwire model with two relay outputs for drain dump valve or simultaneous relay operation.
- **TTII - 90100** — Line cord and two receptacle model with two relay outputs

for drain dump valve or simultaneous relay operation.

- **REK - 90001** — Relay Expansion Kit. Plugs into the circuit board models TTII-80000 or TTII-90000 providing them with a second relay capability for drain dump valve or simultaneous relay operation.

## Sensor Selection

Standard thermistor sensors:

- **SAS-3 (3K)** — 3,000 Ohm at 25°C. Copper lug housing may be screw attached to flat surface or clamp attached to pipe.
- **SAS-10 (10K)** — 10,000 Ohm at 25°C. Packaged same as SAS-3

Special thermistor sensor packages:  
(All available in 316L 10K)

- **BP-50** — Brass plug. ½ inch MPT brass plug with thermistor inside. Can be used in ½ inch threaded fittings.
- **RBP-50** — Same as BP-50 with threads on opposite end.
- **IS-2.5** — Brass Immersion Sensor. ½ inch MPT, 2 inch deep immersion plug. Can be used in large diameter pipe or non-

pressurized tanks where a ½ inch threaded fitting is possible.

Switching Sensor:

- **FS-5** — Sensor opens with lowering temperatures at 44°F (± 4°F) and closed with rising temperatures at the opening temperature plus 5°F (± 2°F). Used in addition to the collector thermistor sensor for redundant freeze detection for freeze recirculation or freeze drain dump.

## Specifications

Overall Dimensions: 5 7/8" x 7" x 2 1/2"

Temperature Input Range: -30° to 300°F

Sensor Elements: 3,000 or 10,000 Ohm at 25°C NTC thermistor Fenwall curve 16 or equivalent

Sensor Voltage: 1.2 VDC

Max. Power Consumption: 5 Watts at 120 VAC

Output Relay Ratings:

1/3 HP inductive @ 120 VAC

10 Amp resistive @ 120 VAC

Operating Ambient Temperature: 32° to 140°F

Accuracy: Temp-Trak II ± 1.0°F; Sensor ± 0.6°F

Supply Voltage: 120 VAC standard

12 VDC or VAC optional

240 VAC optional



**HELIOTROPE  
GENERAL**

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(800) 552-8838/Outside CA (800)854-2674

# TempTrak II<sup>®</sup>

The name means **reliability.**

**HELIOTROPE  
GENERAL**  
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Spring Valley, CA 91977  
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## DIFFERENTIAL TEMPERATURE THERMOSTAT

The Temp Trak II controller is a differential temperature thermostat designed specifically to regulate a solar system's operation and display the temperature of the sensor's locations. Its basic function is to monitor collector and storage temperatures and to automatically turn a circulation pump or blower ON or OFF at the appropriate temperature differentials. Freeze protection of the collector is a selectable option. The Temp Trak II is a microprocessor based controller with the differential settings, and the storage high limit setting, adjustable with extreme precision utilizing the digital display. The storage high limit can utilize the differential sensor which is located at the bottom of the storage tank or a separate sensor can be mounted at the top of the storage tank for this high limit off function. Additionally, three other locations can be temperature monitored by the use of three extra sensors.

### SET-UP

When the control is in the SET-UP mode, accomplished through the use of an internal switch, the control will display the "ON" and "OFF" differentials and the HIGH LIMIT setting. When the control is in the USER mode, only the sensor temperatures are displayed, thereby avoiding user confusion. The Temp Trak II is very user friendly and is easily programmed.

### SENSORS

Thermistor type sensors are 10,000 Ohm at 25°C. The SAS-10 is the standard sensor which is in a copper housing and can be screw attached or clamp attached to pipe. BP-50 is a brass plug with a 1/2" male pipe thread. RBP-50 is also a 1/2" male pipe thread but with the leads reversed from the BP-50 and is used at the end of a dip tube for insertion into a tank or other storage medium. IS-2.5 is a 1/2" male pipe thread and is two inches long for deeper insertion of the sensor. A switching sensor for redundant freeze recirculation protection is also available. The FS-5 is normally closed and opens when lowering temperatures reach 42°F (±4°F). Upon rising temperature the sensor again closes at 52°F.

### SPECIFICATIONS

Overall Dimensions: 5 7/8" x 7" x 2 1/2"  
Temperature Input Range: -30° to 300°F  
Sensor Voltage: 1.2VDC  
Maximum Power Consumption: 5 Watts at 120VAC  
Output Relay Rating: 1/3HP inductive at 120VAC  
Operating Ambient Temperature: 32° to 140°F

### QUALITY CONTROL AND WARRANTY

Extreme emphasis is placed on quality control at Heliotrope General. There are a number of quality control steps in the manufacturing of every Temp Trak II controller, from verification of component specifications from outside sources, to numerous in-process inspections and then final inspection of the control before it is finally packaged for shipment.

As a direct result of this quality control emphasis, all Temp Trak II controls carry a ten-year limited warranty. During the first year, repair of defective merchandise will be made at no charge. For years 2 through 5, repair will be made for a service fee not to exceed 25% of the current list price and for years 6 through 10, the fee will not exceed 50% of the current list price. Ask for a copy of the warranty for full details.



The SAS-10 standard thermistor type sensor is colored black for identification purposes and is lifetime guaranteed. Return a defective black colored SAS-10 and receive a replacement free of charge.

### ORDERING INFORMATION

TTII-80000 - Hard wired model  
TTII-90000 - Line cord with outlet model

### COMMUNICATION

We encourage your comments. Our customers are the most valuable part of our organization and we want you to let us know what you like or don't like about our products or service. Only this way can we do a better job. Send your notes to me, Sam Dawson, President.

Call toll-free (800) 552-8838