BriskHeat®
Corporation

TTD
Outdoor-Use Digital On/Off
Temperature Controller

Instruction Manual

⚠	Read and understand this material before operating or servicing these heating tapes. Failure to understand how to safely operate these heaters could result in an accident causing serious injury or death. These heaters should only be operated by qualified personnel.

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INTRODUCTION

BriskHeat® TTD Outdoor-Use Digital On/ Off Temperature Controllers are designed for general purpose use in outdoor or indoor environments to control the temperature of small tanks, drums, pipes, or other applications requiring automatic control.

SAVE THESE INSTRUCTIONS!
Additional copies of this manual are available upon request

SAFETY ALERT SYMBOL ⚠

The symbol above is used to call your attention to instructions concerning your personal safety. It points out important safety precautions. It means "**ATTENTION!** Become Alert! Your Personal Safety is involved!" Read the message that follows and be alert to the possibility of personal injury or death.

⚠ DANGER

Immediate hazards which **WILL** result in severe personal injury or death

⚠ WARNING

Hazards or unsafe practices which **COULD** result in severe personal injury or death

⚠ CAUTION

Hazards or unsafe practices which COULD result in minor personal injury or property damage

IMPORTANT SAFETY INSTRUCTIONS

⚠ DANGER

A person who has not read and understood all operating instructions is not qualified to operate this product.

⚠ WARNING

End User Must Comply to the Following:

- Must be mounted vertically for outdoor use
- Only qualified personnel are allowed to connect electrical wiring.
- All electrical wiring must follow local electrical codes and highly recommend following NEC Article 427.
- Final installation / wiring is to be inspected by the authority who has jurisdiction in the area that the heater and temperature controller is installed.
- The end-user is responsible for providing a suitable disconnecting device.
- The end-user is responsible for providing suitable electrical protection device. It is highly recommended that a ground fault circuit breaker is used.

Failure to observe these warnings may result in personal injury or damage to the heater.

⚠ CAUTION

- Inspect all components before use.
- Do not use control and heater if any component is damaged.
- Do not repair damaged or faulty controller.
- Do not crush or apply severe physical stress on any component of controller, including cord assembly.
- Power plug must be plugged into a sheltered outlet.
- Unplug controller when not in use.
- Unplug controller before fuse is changed.
- Do not change the fuse while raining or if water can be splashed into the fuse holder while the cap is off.

Failure to observe these warnings may result in personal injury or damage to the heater.

⚠ DANGER

- Do not immerse or spray any component of the control system with liquid.
- Keep volatile or combustible material away from controller when in use.
- Keep sharp metal objects away from heater.
- Use controller in only appropriate locations

Failure to observe these warnings may result in electric shock, risk of fire, and personal injury.


SPECIFICATIONS

- 120 or 240VAC
- 15 amps
- Digital on/off controller
- Units in °F
- Input power cord 6 feet (1.8m) long with standard plug
  - -120VAC: NEMA 5-15
  - -240VAC: NEMA 6-15
- Output receptacle:
  - IP 67 four-pin (NEMA 6P equivalent)
  [plug assembly included]

- Audible alarm
- Type K thermocouple mini and standard connector input
- Average accuracy of ±1% FS
- Resolution: 1°
- Hysteresis: 5°
- Suitable for outdoor use (must be mounted vertically)
- Operating exposure temperatures: 14 to 131°F (-10 to 55°C)
- Storage exposure temperatures: -4 to 176°F (-20 to 80°C)
- Mounting feet included
- Optional mounting bracket kit ideal for tote tank / IBC applications

Part Number	Volts	Range
TTD175-K120	120	32 to 175°F
TTD175-K240	240	32 to 175°F
TTD500-K120	120	32 to 500°F
TTD500-K240	240	32 to 500°F
TTD999-K120	120	32 to 999°F
TTD999-K240	240	32 to 999°F

PRODUCT VIEWS

Front View
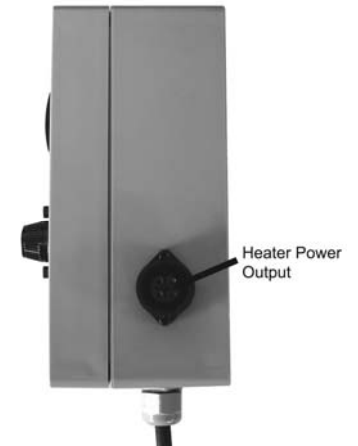
Side View

Bottom View

INSTALLATION OF MALE OUTPUT PLUG TO HEATER

Tools Needed
1/8" flathead screwdriver
Wire stripper

STEP 1: Lead Wire Preparation
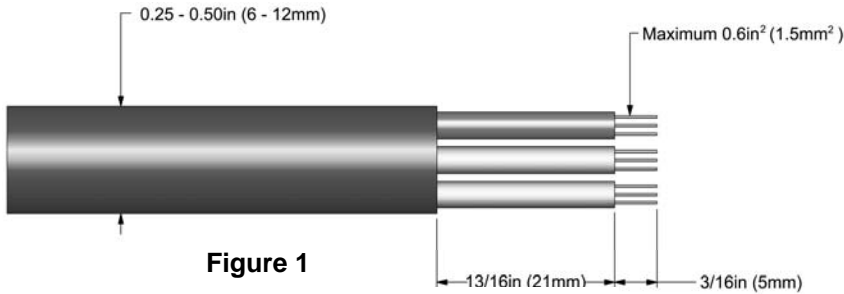Refer to Figure 1. Verify lead wire dimensions are within tolerances.

0.25 - 0.50in (6 - 12mm)

Maximum 0.6in^2 (1.5mm^2)

13/16in (21mm)   3/16in (5mm)

Figure 1

A   B   C   D

Figure 2

STEP 2: Assemble Plug
Verify that you have all components. Refer to Figure 2. Part "B" is a rubber grommet. Select the correct size based on diameter of lead wire. See Figure 3. Slide part "B" into part "C". Attach part "A" to part "C". Slide lead wires through partial plug assembly.
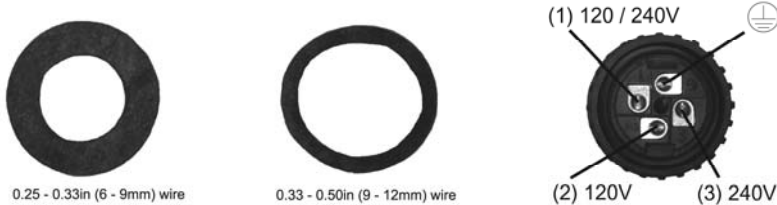
0.25 - 0.33in (6 - 9mm) wire

0.33 - 0.50in (9 - 12mm) wire

Figure 3: "B"

(1) 120 / 240V

(2) 120V   (3) 240V

Figure 4

STEP 3: Connect Lead Wires to Pins
Using a 1/8" flathead screwdriver, tighten correct lead wire with correct pin on part "D". Refer to Figure 4.
    120V: Pin 1 and 2 are for the power leads. Pin is for the ground lead.
    240V: Pin 1 and 3 are for the power leads. Pin is for the ground lead.

STEP 4: Finish Plug Assembly
Attach part "D" to part "C" and tighten. Tighten part "A" to part "C".

INSTALLATION / OPERATING INSTRUCTIONS

⚠ WARNING	VOLTAGE
Read and understand this entire manual before operating this controller.	**120VAC; 240VAC**

Plug heater into the controller and the controller into its power source. Plug thermocouple into thermocouple jack. For proper temperature control, place the thermocouple sensing tip so that it touches the edge of the heater.

- Sensor must be in close proximity to the heater to prevent overheating.
- If heater is installed on a vertical surface, place sensor directly on lower edge of heating blanket since heat naturally rises.
- Secure with one strip of aluminum adhesive tape.

Mount controller using mounting feet. For IBC / tote tank heating applications, attach controller to IBC / tote tank using optional hanging bracket kit. Push illuminated power button "ON". Refer to "Programming Instructions" for how to program controller.

PROGRAMMING INSTRUCTIONS

out   °F
125

Setting the SP

- Set point (SP) is the only parameter the user can access without code protection.
- Press SET and the SP text will appear on the display.
- Press SET again and the real value is shown on the display
- The value can then be modified with the UP and DOWN arrows.
- Press SET to enter any new values.
- Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit programming mode.

Parameters

	Description	Units	Range
SP	Set Point	Degrees	r1 to r2
r0	Differential or Hysteresis	Degrees	1 to 99º
r1	Low Value Set Point	Degrees	0 to 999º
r2	Higher Value Set Point	Degrees	0 to 999º
d0	Heating or Cooling Control	Option	Ht/Co
c0	Min. Stop Time for Load	Minutes	0 to 59
c2	Load Status During Probe Error	0/1	Off/On
P1	Ambient Probe Adjustment	Degrees	-30° to +30º
P5	Ambient Probe Type	Option	J, K, S
P6	Probe Response	Numeric	0 to 3
H5	Parameter Access Code	Numeric	0 to 255(factor set 0)
A0	Alarm 1 Hysteresis	Degrees	1 to 999º
A1	Alarm 1 Threshold	Degrees	0 to 999º
A2	Alarm 1 Exclusion Time	Seconds	0 to 999º
A3	Alarm 1 Configuration	Option	Off, Lo, Hi
A4	Alarm 2 Hysteresis	Degrees	1 to 999º
A5	Alarm 2 Threshold	Degrees	0 to 999º
A6	Alarm 2 Exclusion Time	Seconds	0 to 999º
A7	Alarm Configuration	Option	Off, Lo, Hi

Parameter Descriptions

SP= Set Point-Desired Regulation Temperature

r0= Differential or Hysteresis

r1= Lower Set Point Limit

r2= Higher Set Point Limit

d0= Heating or Cooling Control-regulation cycles only performed, neither defrosting nor continuous cycles exist. **Heating:** To choose heating control: Set d0=Ht (The output is active when TS1 (temperature of ambient probe) is less than or equal to set point.) TS1<=SP. It then disconnects when TS1>=SP-r0. **Cooling:** To choose cooling control: Set d0=Co (The output is activated when TS1>=SP+r0.) The display will switch off when TS1<=SP.

c0= Minimum Time Between Start to Stop

c2= Load Status during Probe Error. In the event of an open or short-circuited probe, the unit will connect or disconnect the load as defined by this parameter.

P1= Ambient Probe Calibration. Offset degrees to adjust ambient probe. If the probe is not placed in the exact point that is to be measured, use a standard thermometer and adjust the difference with parameter.

P5= Ambient Probe Type. Select between J, K, or S type thermocouple.

P6= Probe Response Rate (0 = 8 sec, 1 = 4 sec, 2 = 2 sec, 3 = 1 sec.)

H5= Access to Probe Parameters.

A0= Alarm 1 Hysteresis. The differential associated with A1 parameter.

A1= Alarm 1 Threshold. Number of degrees to the working set point that initiates an alarm condition.

A2= Alarm 1 Exclusion Time. The amount of time the alarm is disabled from instrument activation.

A3= Alarm 1 Configuration. Determines the alarm type: A3=0 alarm is disabled; A3=1 alarm is activated if the ambient temperature >=SP+A1 and deactivated if <+SP+A1-A0; A3=2 alarm is activated if the ambient temperature <=SP+A1 and deactivated if >+SP+A1-A0.

Parameter Descriptions (continued)

A4= Alarm 2 Hysteresis. The differential associated with A5 parameter.
A5=Alarm 2 Threshold. Number of degrees to the working set point that initiates an alarm condition.
A6= Alarm 2 Exclusion Time. The amount of time the alarm is disabled from instrument activation
A7= Alarm 2 configuration. Determines the alarm type: A7=0 alarm is disabled; A7=1 alarm is activated if the ambient temperature >=SP+A5 and deactivated if <+SP+A5-A4=2 alarm is active if the ambient temperature <=SP+A5 and deactivated if >+SP+A5-A4.

Access to all code protected parameters

- Press SET for 8 seconds. The access code value 00 is shown on the display. (Unit comes with code set at 00 from factory).

- With the UP and DOWN arrows, set code to 118. Press SET.

- Move to the desired parameter with the UP and DOWN keys.

- Press SET to view the value on the display.

- The value can be modified with the UP and DOWN arrows.

- Press SET to enter the value and exit to text parameter.

- Repeat until all necessary parameters are modified.

- Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit programming mode.

Indicators

Buzzer—In the event of alarm or error condition, the internal buzzer is activated. To   silence the buzzer, press and hold the SET and DOWN keys.

LED Indications—OUT – This indicates the load is connected. The system waits for the programmed minimum stop time of the load.

Display Messages— In normal operation, the probe temperature will be shown on the display. In case of alarm or error, the following messages will be shown:

ER= Memory Error

--= Short-Circuit Probe Error (output determined by c2)

oo= Open Probe Error (output determined by c2)

TROUBLESHOOTING GUIDE

Please read this guide prior to contacting BriskHeat®. This guide is designed to answer the most commonly asked questions. If you are unable to identify the problem or need additional assistance, please contact your local distributor or BriskHeat® at **1-800-848-7673 (U.S. & Canada)**, 1-**614-294-3376 (World wide)**, or **bhtsales1@briskheat.com**.

Controller does not function

1. Check fuse: Unplug the unit from its power source. Remove the fuse and check its continuity. If the fuse is defective, replace it with an Class CC 15 amp fuse. Fuses may be obtained from most electrical supply houses.

2. Check fuse position: Fuse is position specific. Ensure nipple of fuse is facing down away from fuse cap.

3. Check power source: Using a voltmeter, test the power source and assure correct voltage is present.

4. Check thermocouple: Using a thermocouple meter, test the sensor to assure proper function.

Notes:

WARRANTY INFORMATION

BriskHeat® warrants to the original purchaser for the period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever comes first. Contact factory at 1-800-848-7673 (toll free, U.S. / Canada) or 614-294-3376 for complete details.

BriskHeat®

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