BriskHeat® Corporation

TT Table Top Temperature Controller

Instruction Manual

⚠	You must read and understand this manual before installing, operating, or servicing this product. Failure to understand these instructions could result in an accident causing serious injury or death. Keep these instructions for future reference.

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INTRODUCTION

Thank you for selecting the BriskHeat® TT Table Top Controller for your temperature control needs. For successful operation of this system, read and understand these instructions prior to use. The complete Operations Manual for programming the controller, document 40524-04, can be accessed as a Resource on our website, www.BriskHeat.com.

For additional information concerning this, or other BriskHeat® products, please contact your local BriskHeat® distributor or contact us toll free (U.S. / Canada only) at 1-800-848-7673 or 614-294-3376.

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 that **COULD** result in severe personal injury or death.

CAUTION

Hazards or unsafe practices that **COULD** result in minor personal injury or property damage.

SAVE THESE INSTRUCTIONS!

Additional copies of this manual are available upon request.

IMPORTANT SAFETY INSTRUCTIONS

⚠ DANGER

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

⚠ DANGER

- Do not immerse or spray controller with liquid.
- Keep volatile or combustible material away from controller when in use.
- Use controller only in approved locations.
- Keep sharp metal objects away from controller.
- The operator is not to open the enclosure. Only a trained service person may open the enclosure.
- Disconnect the power cord before opening the enclosure. Turning off the power switch leaves dangerous voltage levels accessible to the service person.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment can be impaired.

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

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.
- Unplug controller when not in use.
- Only use power cords provided by BriskHeat®

Failure to observe these warnings may result in personal injury or damage to the product and/or property.

⚠ WARNING

End User Must Comply With the Following:

- Only qualified personnel are allowed to connect electrical wiring.
- All electrical wiring must follow local electrical codes and highly recommend following NEC Article 427.
- The person who performs the final installation / wiring must be qualified for this work.
- 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.
- If a Protective Earth Conductor must be removed during service, it must be replaced.

Failure to observe these warnings may result in personal injury or damage to the product and/or property.

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SPECIFICATIONS

- 1922ºF (1050ºC) maximum temperature control
- 12-step ramp / soak control
- 4 color display in 3 lines showing set-point, actual temperature and program message
- Actual and set-point temperatures programmable to display as ºC or ºF
- 4 program storage memory
- 2 levels of password protections
- Available with optional Type-J high-limit thermocouple
- 11-segment bar graph indicator
- Automatic and manual control capability
- Alarms: 4 visual and audible per output configured from 10 different options
- Sample rate of 60 ms or 120 ms
- Accuracy: +/- 0.2% with sampling time of 60 ms
- Input Voltage: Universal 100-240 VAC, 50-60 Hz
- Load Capacity: 30 amp with circuit breaker protection
- Sensor Input: Standard or mini Type-J thermocouple
- Temperature range during operation: 14°F to 131°F (-10°C to 55°C)
- Output cord receptacle: NEMA L15-30R (compatible with "C" style plug, 11270)
- Power cord: 6-foot (1.8 m) lead with bare wires (30 amp plug required).

STORAGE

Avoid storing the controller in places where:

- The ambient temperature may reach beyond the range of -4°F to 158°F (-20°C to 70°C)
- The humidity conditions may go beyond 20 to 85% at non-condensing temperatures

⚠ WARNING

Read and understand this entire manual before operating this temperature controller.

VOLTAGE:

100 - 240VAC

SYSTEM SETUP

Power Input

The TT Table Top controller can be powered by 100-240 VAC.

Starting Up

Assure that the circuit breaker is turned on. With power supplied to the controller, turn on the red main power switch. The main power switch will illuminate.

Heater Cord Attachment

Locate the surface mount connector on the back of the temperature controller. Align the heater cord connector with the heater power surface mount connector and insert. The zone heater cord connectors are keyed to prevent improper connections. The locking ring must then be turned to the right 1/2 turn to lock the cord into place. As the locking ring is turned, the cord will insert an additional amount. The heater cord must be fully inserted and locked for proper operation.

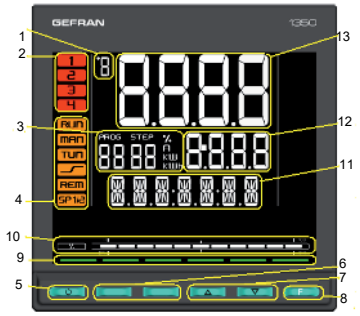
Sensor Attachment

The TT Table Top Controller uses Type J thermocouples for temperature input. The unique thermocouple jacks of the controller allow for the use of both mini and standard style thermocouple plugs.

Both style thermocouple plugs are polarized to prevent improper connections.

Connect thermocouple sensor as required

CONTROLLER DISPLAY AND KEYS



1. Temperature unit of measurement or number of program running.
2. State of outputs OUT1, OUT2, OUT3, OUT4.
3. Displays program number, step number, unit of measurement (%, A, kW, kWh).
4. Controller function states:
   - RUN = setpoint programmer active;
   - _/- = setpoint ramp active;
   - TUN = PID parameters tuning active;
5. Work mode key (hold temp.) in standard mode. A function can be assigned via parameter but1. The key is active only when the display shows the process variable.
6. Key function configurable with parameters but2 and but3. The keys are active only when the display shows the process variable.
7. Up/down keys: raise/lower the value of the parameter displayed on the SV or PV display.
8. F key: lets you navigate among controller menus and parameters. Confirms the parameter value and selects the next parameter.
9. Key pressed signals.
10. Displays percentage of power or current, configurable with parameter bArG.
11. F display: parameters, diagnostics and alarm messages. Configurable with parameter dS.F (default = setpoint).
12. SV display: parameter values. Configurable with para- meter dS.SP (default = setpoint).
13. PV display: process variable.

Four (4) keys are used for navigating the menus and submenus and for changing parameters and confirming choices. Their function depends on the context and on how long they are pressed. L/R is used for the Auto-tuning; * is not programmed.

The navigation functions assigned to the keys are:

F -At first power-on, scrolls the fast configuration menu; otherwise, the user configuration menu (Setpoint, Alarm limits, Control output, etc.).
Each time you press the key, the value of the displayed parameter is confirmed and you go to the next menu item.
Keep the key pressed for more than 2 seconds to enter the Programming/ Configuration menu.

⏻ -Each time you press the key, you return to the previous menu item or to the higher menu level, as appropriate.
Keep the key pressed for more than 2 seconds to return to the Main menu.

▽ -Press the key to enter a submenu or to reduce the value of the displayed parameter, as appropriate. Keep the key pressed to progressively increase the speed of reduction of the displayed parameter.

△ -Press the key to raise the value of the displayed parameter.
Keep the key pressed to progressively increase the speed of raising the displayed parameter.

Programming Tips

Press the ▽ arrow to put a program on hold.

Press the ▽ △ arrows together to end a program.

Change the Alarm Configuration/Type

1. Press and hold the “F” key until PASS1 (Password 1) is on the screen. Using the arrow keys, adjust to 1.
2. Press and release the “F” key until ALARM (Alarm Configuration) is on the screen.
3. Press the arrow key to select the number of the alarm you wish to configure, 1-4.
4. Press and release the “F” key until A.r.x (Absolute/Relative Definition). “X” refers to the Alarm number selected in #3 above. Use the arrow key to select either ABSLT for an Absolute Temperature Alarm or RELAT for a Temperature Deviation Alarm.

Change Controller from PID to ON/OFF

1. Press and hold the “F” key until **PASS1** (Password 1) is on the screen. Using the arrow keys, adjust to 1.
2. Press and release the “F” key until **PID** (PID Configuration) is on the screen.
3. Press and release the DOWN arrow until **S.TUNE** (Self Tuning Enable) is on the screen.
4. Press and release the “F” key until **CNTR** (Type of Control) is on the screen. Using the arrow keys, adjust to H.ONOF
5. Press and release the “F” key to accept the new value.
6. Press and hold the Work Mode key until the Home screen appears.

Creating A Ramp/Soak Program

Programming note: Up to 12 different Steps can be created. Up to four (4) Programs can be stored with each comprised of 1 to 12 continuous steps. For example Program 1 can start with Step 1 and end at Step 2. Program 2 can start at Step 3 and end at Step 5. Program 3 can start with Step 1 and end at Step 5. To maintain continuity of Steps within a program, more that one Step can contain the same values to time and temperature. If a Step is revised, the new Step values, as modified will retain in all Programs containing that step.

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1. Press and hold the “F” key until **PASS1** (INSERT PASS1) is displayed on the screen. Use the UP Arrow to change the number to 1.
2. Press and release the “F” key until **PR.OPT** (PROGRAMMER CONFIGURATION) is displayed. Use Arrow to select the Program number to create. 1 – 4 are the options for Program label.
3. Press and release “F” until **FI.STP** (FIRST STEP OF PROGRAM) is displayed. Using Arrows, adjust to “1”. This is the first step of the program.
4. Press and release “F” until **LA.STP** (LAST STEP OF PROGRAM) is displayed. Use Arrows to adjust to the number of steps in the program being created. In the example, this will be “2”.
5. Press and release “F” to display **STRT** (RESTART TYPE AFTER POWER ON). Use arrow keys to select the desired option. **FI.STP** restarts program at the first step of the program, basing the Setpoint on the PV and considering the **RST.SP** option.; **ST.STR** restarts the program at the condition when power was lost; **RSRCH** restarts the program at the beginning of the Step being run when power was lost.
6. Press and release “F” to display **RST.SP** (CONTROL TYPE AFTER RESET). Use arrow keys to select OFF or ON. If **OFF** is selected, there is no true reset, but rather the program continues based on the Setpoint (SV) at the time of power off. If **ON** is selected, the Setpoint becomes the value of the Process Variable (PV).
7. Press and release Work Mode key until **PR.OPT** (PROGRAMMER CONFIGURATION) is on the screen
8. Press and release “F” until **PR.STP** (STEP DEFINITION) is displayed. This is where you define the values of steps used in programs. Use the arrow key to select 1 – 12.
9. Press and release F to accept the Step to be defined. **SET** (SETPOINT) should be on the display. Use the Arrow key to program the first set point temperature. (If you want to hold the temperature at ambient, program that temperature here.)
10. Press and release “F” to see **RAMP.T** (RAMP TIME) Use the Arrow key to set the ramp time from what will be the current temperature to reach the temperature defined in Step 9. (0.20 for a 20 minute hold.)
11. Press and release “F” to display the **HOLD.T.** (HOLD TIME) Use the Arrow keys to set the amount of time to hold at the new temperature. (If no hold time is required, set to 0.00).
12. Press “F” to accept. This completes programming of Step 1 of the program.
13. Press and release the Work Mode key to return to the **PR.STP** (STEP DEFINITION). Repeat steps 8 through 12 using the next Setpoint temperature.

Example: If the second step is to program a ramp from ambient (assume 80°F) to 360°F, the values would be as below:

***PR.STP** “2”*
***SET** “360”*
***RAMP.T** 0.56 (56 minutes based on 5°F per minute)*
***HOLD.T** 0.35 (35 minutes)*

This example assumes the program ends when the 35 minute hold is complete. There is no control on the cool down.

14. Press and hold the Work Mode key to return to the Home screen after all steps have been programmed.

Running a Ramp/Soak Program

1. From the Home screen, press and release the “F” key until **PROGR** (Actual Program) is on the screen. Using the arrow keys, display the number of the program you wish to run.
2. Press and release the “F” key until **STEP** (Programmer Actual Step) is on the screen. Using the arrow keys, enter the Step number of the program you wish to start (usually 1).
3. Press and release the “F” key until **P.SET.P** (PROGRAMMER SETPOINT) is on the screen. Using the arrow keys, adjust the value to the setpoint temperature at the start of the program. This is usually the ambient temperature or current PV (process value).
4. Press and release the “F” key until **ALRM1** (ALARM SETPOINT) is displayed. Use arrows to adjust the alarm value.
5. Press and hold the Work Mode key until the Home screen appears.
6. Press and release the “F” key until **00:00/READY** is on the screen.
7. Press and hold the UP arrow until **RUN** stops flashing on the left side of the control module display. Your program is now running.

Changing units from °C to °F or from °F to °C

1. Press and hold the “F” key until **PASS1** (Password 1) is on the screen. Using the arrow keys, adjust to 1.
2. Press and release the “F” key until **I.MAIN** (Main Input Configuration) is on the screen.
3. Press and release the DOWN arrow until **tYPE** (Thermocouple Type) is on the screen.
4. Press and release the “F” key until **UNIT** (Unit of Measure) is on the screen. Using arrow key adjust to C or F.
5. Press and release the “F” key to accept the value.
6. Press and hold the work mode key until the process value appears on screen.

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Parameters

	Description	Units	Range	Configured Value
SETP	Programming Local Setpoint	Degrees °F	32° - 800°	100°
SETP1	Setpoint 1	Degrees °F	32° - 800°	200°
SETP2	Setpoint 2	Degrees °F	32° - 800°	300°
SETP3	Setpoint 3	Degrees °F	32° - 800°	400°
ALRM1	Alarm Setpoint 1	Degrees °F	0° - 9999°	10°
ALRM2	Alarm Setpoint 2	Degrees °F	32° - 800°	392°
ALRM3	Alarm Setpoint 3	Degrees °F	32° - 800°	400°
PROG STA-TUS	Programmer Function Status	Options	-	RUN=off; READY=on; END=off; HBB=off; RAMP=off
SEGME	Programmer actual segment	Option	-	RAMP=in ramp
P.SETP	Programmer actual setpoint	Degrees °F	32° - 800°	32°
UNIT	Unit of measure	Temperature Units	°C - °F	°F
LO. SCL	Main input low limit	Degrees °F	32° - 1832º	32°
HI.SCL	Main input high limit	Degrees °F	32° - 1832º	800°
OF.SCL	Main input offset	Degrees °F	-999° - 999°	1°
LO.SP	Low limit for setpoint	Degrees °F	32° - 800°	32°
HI.SP	High limit for setpoint	Degrees °F	32° - 800°	800°
LO.AL	Low limit for absolute alarm	Degrees °F	-1999° - 9999°	32°
HI.AL	High limit for absolute alarm	Degrees °F	32° - 9999°	800°
A.R._1	Absolute/Relative definition	Option	-	RELAT = Relative
N.S._1	Normal/Symmetrical definition	Option	-	SYMMT= Sym-metrical
POWER_2	Output power on Output 2	Percent (%)	0 - 100.0	100.0
F.OU.R_3	Reference signal Output 3	Option	-	None
F.OU.R_4	Reference signal Output 4	Option	-	None
CY.TIM_1	Cycle time of Output 1	Option	0.0 - 20.0	2.0
ALRM.N	Number of enabled alarms	Numeric	0 - 4	1
BUT.1	Key 1 function	Option	-	HOLD=Input Hold
BUT.2	Key 2 function L/R	Option	-	A.TUNE = Auto-tuning

WARRANTY INFORMATION

BriskHeat warrants to the original purchaser of this product for the period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever comes first. BriskHeat's obligation and the exclusive remedy under this warranty shall be limited to the repair or replacement, at BriskHeat's option, of any parts of the product which may prove defective under prescribed use and service following BriskHeat's examination, is determined by BriskHeat to be defective. The complete details of the warranty can be found online at www.BriskHeat.com or by contacting us at 1-800-848-7673 (toll free, U.S. / Canada) or 1-614-294-3376 (worldwide).

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