



BriskONE Temperature Controller

Instruction Manual

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Read and understand this manual before operating or servicing this temperature control system. Failure to understand how to safely operate these controllers could result in an accident causing serious injury or death. Only qualified personnel should operate or service these controllers.

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INTRODUCTION

General Description:

BriskONE is a compact one zone controller which provides excellent temperature control in areas with limited space.

Features:

- * Compact size: 7.6" x 5.0" x 2.5" [194mm x 127mm x 64mm]
- * Provides 15A@120V or 10A@240V output power.
- * Output power protected with fuse.
- * Dual display allows user to view both the process and setpoint temperature simultaneously.
- * Displays either °C or °F.

Additional Features:

- * Fuzzy Logic
- * Self Tuning
- * Heater Break Protection
- * Sensor Break Protection
- * Auto/Manual Control Capability
- * 16 segment Ramp and Soak with adjustable time base

Table 4: List Of Menu Items Located In The Secondary Menu

Display	Description	Default Value
ALLO	Value for low alarm (Only if AL is set for Lo or HiLo.)	32°F or 0°C
ALHi	Value for high alarm (Only if AL is set for Hi or HiLo)	999
Out1	Determines the controlling output for setpoint 1	1tP
tunE	Controls the type of tuning the controller will perform	Self
Prog	Allows the Run/Hold button control the Ramp/Soak	OFF
PSEt	Enables the Ramp/Soak Programming	OFF
StAt	Determines what is displayed in the Primary Menu	OFF
tbAS	Time base for Ramp/Soak	60_S
##ti	Time for the ## segment	*
##SP	Set Point for the ## segment	*
##AL	## segment's alarm event	*
PEnd	Ramp/Soak's ending action	OFF
InPC	Input correction value	0
LPbr	Loop break protection	360

TABLE 5: LIST OF MENU ITEMS LOCATED IN THE PRIMARY MENU

Primary Menu	Display	Description	Default Value
	ti	Total time in current segment (Only if StAt is On)	*
	##ti	Time remaining in ## segment (Only if StAt is On)	*
	##SP	Set point in ## segment (Only if StAt is On)	*
	SP1	Set point for output one (Only if StAt is OFF)	*
	Prog	Runs or holds the Ramp/Soak operation (Only if Prog is On)	OFF

* Value set by the end user.

OPERATION

To begin Operation of the BriskOne Controller, Follow these steps:

1. Plug the input power cord into the controller (see Figure 2 for input power receptacle location). Then connect the other end of power cord into a properly grounded 120VAC or 240VAC outlet.

A BriskONE controller purchased for 120VAC operations can easily be changed for 240VAC operation and vice versa. A 120VAC controller comes equipped with a 120VAC input power cord and a 15Amp fuse. To change the operations to 240VAC, a 240VAC input power cord and 10Amp fuse is required (see page 22 for ordering information).

Note: Before operating the controller, see the “Installation” section for proper location of the controller.

2. Turn the red on/off rocker switch to the “ON” position. Rocker switch will light up.
3. Program the controller with the values needed to properly control the heater (see programming instructions - pages 5-16).
4. Place the thermocouple tip in a location which best reflects the heater's temperature. Depending on the object's shape, during heating there may be spots which are warmer or colder.

If all areas of the object must reach a minimum temperature, then place the thermocouple tip on the coldest spot.

If the temperature of any area of the object cannot go above the temperature setpoint, then place the thermocouple tip on the hottest spot.

If a temperature differential is allowable, then place the thermocouple tip on an area where the temperature is between the hottest and coldest.

5. Plug thermocouple into the controller. Verify that the temperature displayed on the upper display is the actual temperature of the heating system. If not, check to ensure the thermocouple plug was correctly wired and connected to the controller.
6. Plug the power cord for the heater into the controller (see "Installation" section for instructions on how to assemble the plug to the heater cord).

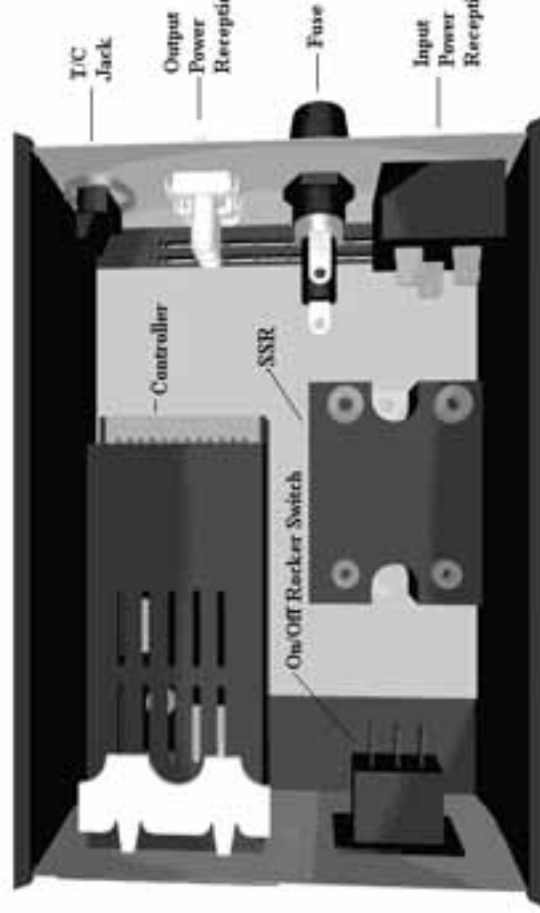


FIGURE 3: LAYOUT OF INTERNAL COMPONENTS

PROGRAMMING: QUICK REFERENCE TABLE

TABLE 3: LIST OF MENU ITEMS LOCATED IN THE SECURE MENU

Secure Menu

Display	Description	Default Value
SECr	Security level	4
Unit	Temperature Units	F
dPt	Decimal point positioning	0
InPt	Input fault timer	0.5
InPb	Input alarm action	Fail
SEnC	Sensor rate of change	OFF
SPL	Lowest allowable value for setpoint.	32°F or 0°C
SPH	Highest allowable value for setpoint.	999
AL	Temperature Alarm setting	Hi
ALt	Temperature Alarm Type	AbS
ALiH	Alarm Inhibit Feature	OFF
ALSt	Alarm Output State	OPEN
ALLP	Alarm Lamp Setting	OFF
ALLb	Alarm Loop Break	OFF

PARTS LIST

Whenever possible, please order all parts by the BriskHeat part number, not by the description. Contact BriskHeat for current pricing and availability.

TABLE 2: LIST OF PARTS

Description	BriskHeat Part #	Quantity
Fuse, 15 A	40030	1
Fuse, 10 A	40030-01	1
Fuse holder	40034-05	1
Power cord,120V	40911	1
Power cord,240V	40911 -01	1
Output Plug	11175	1
Pin, Power	11329-01	2
Pin, Grounding	11177	1
Output Receptacle	11175-01	1
Protective Cap for Output Plug	40914-01	1
Protective Cap for Output Receptacle	40914	1
Socket	11329-03	3
Power Input Inlet	40908	1
Thermocouple Plug "J"	40257	1
Thermocouple Wire Clamp "J"	40257-01	1
Thermocouple Receptacle "J"	40257-10	1
Red Rocker	40044	1
Enclosure	40909	1
Labels	40909-02	1
Rubber Feet	40287	4
Mounting Bracket	20906	1
Description	BriskHeat Part #	Quantity
Crimping Tool	40912-02	1
Insertion Tool	40913-02	1
Power Distribution Cord	consult factory	1
SSR	consult factory	1
Microprocessor	consult factory	1

Controller Key Functions

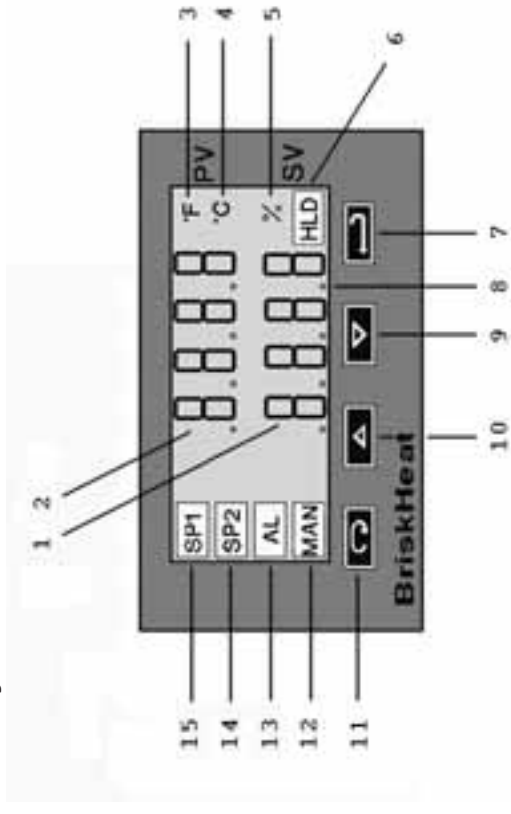


FIGURE 4: DUAL DISPLAY CONTROLLER

- Setpoint Display:** Displays the SV (setpoint value). The SV is the setpoint entered by the operator.
- Process Display:** Displays the PV (process value). The PV is the actual temperature of the system being controlled.
- °F Lamp:** Lit when the temperatures displayed are in degrees Fahrenheit.
- °C Lamp:** Lit when the temperatures displayed are in degrees Celsius.
- Percent Lamp:** Lit when controller is programmed to display percentage of output power.
- Hold Lamp:** Lit when Ramp/Soak program functions are suspended.
- ENTER:** Pressing ENTER stores the value or the item changes. If not pressed, the previously stored value or item will be retained. The display will flash once when ENTER is pressed.

8. This decimal point flashes when **SELF-TUNE** is operating.
9. **ARROW**: Decrements a value, changes a menu item, or selects the item to OFF. The minimum value obtainable is -1999 regardless of the decimal point placement.
10. **UP ARROW**: Increments a value, changes a menu item, or selects the item to ON. Maximum value attainable is 9999 regardless of the decimal point placement.
11. **INDEX**: Pressing the INDEX key advances the display to the next menu item. Also used in conjunction with other keys.
12. **Manual Indicator**: Lit when output of control is being manually adjusted.
13. **Alarm Indicator**: Lit when a fault condition exists.
14. **Setpoint 2 Lamp**: Lit when the SV displayed relates to setpoint 2.
15. **Setpoint 1 Lamp**: Lit when the SV displayed relates to setpoint 1.

Key Combinations

- * **UP ARROW & ENTER**: Pressing these keys simultaneously brings up the Secondary Menu starting at the alarm, tune, or cycle item (depending on the programming). Pressing these keys for 5 seconds will bring up the Secure Menu.
- * **INDEX & DOWN ARROW**: Pressing these keys simultaneously will allow backing up one menu item, or if at the first menu item, they will cause the display to return to the Primary Menu. If an alarm condition has occurred, then these keys may be used to reset the alarm. To reset an alarm press and hold both keys for three seconds.
- * **INDEX & ENTER**: Pressing these keys simultaneously and holding them for 5 seconds allows recovery from the various error messages.

TROUBLESHOOTING

Before calling for assistance, please review this troubleshooting guide. If, after consulting the guide, you are still unable to identify the problem or if you need additional assistance then Please contact BriskHeat.

Problem	Solution
CONTROLLER DOES NOT TURN ON	Plug is disconnected from outlet. Push plug firmly into outlet. Power switch is not on. Turn switch to on position. Controller has not correctly booted. Wait approximately 5 seconds after turning on controller. Fuse has blown. Replace fuse. Incorrect voltage supply. Supply correct voltage. Setpoint is too low. Increase the setpoint value.
NO TEMPERATURE INCREASE	Controller parameters are set improperly. Review operating procedures and reset parameters. Fuse has blown. Replace fuse. SSR is defective. Test and replace SSR.
DISPLAY SHOWS FAIL TEST	Internal diagnostics has detected a failure. If FAIL TEST followed by FACT dFlt , then memory may be corrupted. Press ENTER and DOWN ARROW to start factory default procedure. If FAIL TEST followed by rEt FACt, then an unrecoverable error has occurred. Return controller to the factory for service.
DISPLAY SHOWS CHEC SP1, CHEC SP2, CHEC 1SP, ... CHEC 16SP	SP1, SP2, #SP1 or #SP is set outside the setpoint low or high boundary limits (SPL or SPH). Correct SP1 , etc. or program new values for SPL or SPH .
DISPLAY SHOWS OPEN InP	OPEN InP means thermocouple is open. Correct or replace the sensor. To reset, use the INDEX and ENTER keys.
DISPLAY SHOWS LOOP bAd	The sensor may be defective, heater fuse open, heater open, or the output power to device is bad. Correct or replace any element in the control loop that may have failed. Reset the control by pressing INDEX and ENTER keys, or index to Lpbr and press ENTER .

Inserting the Pins into the Plug:

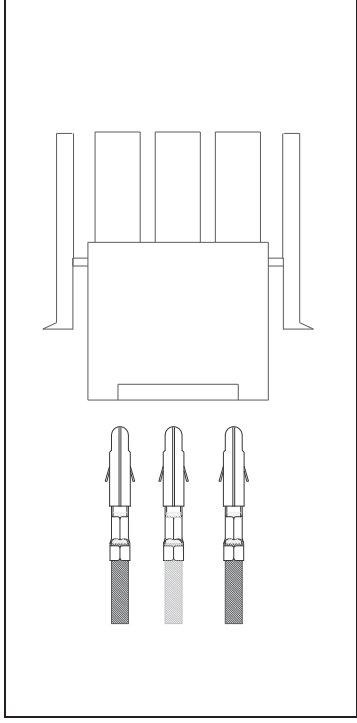


FIGURE 8: DIAGRAM OF PIN INSERTION INTO PLUG

5. Insert the wired pins into the back of the plug. Push the pins in until they cannot be pushed in any further. The grounding pin must be inserted into the center position of the plug. (To order an insertion tool see page 24).

Connecting/Disconnecting the Plug and Receptacle:

6. Align the plug prongs with the receptacles. The plug and receptacle should snap together easily. Do not force the connection. If the plug does not easily connect to the receptacle, check to ensure the flatten sides of the top and bottom prongs of the plug match the receptacle's.
7. To disconnect the plug from the receptacle, push down on the levers located on the sides of the plug, and pull gently.

Programming Instructions

The controller's Programming is divided up into three menus:

Primary Menu Secondary Menu Secure Menu

Within each menu are menu items. Each of the menu items pertains to a parameter of the controller.

To enter and move from menu item to menu item within the

Primary Menu:

- * Press the **UP ARROW** and **ENTER** keys.
- * Press **INDEX** to advance through the menu items.
- * Simultaneously, press **INDEX** and **DOWN ARROW** keys to back up one menu item.
- * Press **UP ARROW** or **DOWN ARROW** to change the value in the display.
- * Press **ENTER** to retain the value.

To enter and move from menu item to menu item within the

Secondary Menu:

- * Press the **UP ARROW** and **ENTER** keys.
- * Press **INDEX** to advance through the menu items.
- * Simultaneously, press **INDEX** and **DOWN ARROW** keys to back up one menu item.
- * Press **UP ARROW** or **DOWN ARROW** to change the value in the display.
- * Press **ENTER** to retain the value.

To enter and move from menu item to menu item within the

Secure Menu:

- * Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
- * Press **INDEX** to advance through the menu items.
- * Simultaneously, press **INDEX** and **DOWN ARROW** keys to back up one menu item.
- * Press **UP ARROW** or **DOWN ARROW** to change the value in the display.
- * Press **ENTER** to retain the value.

Security

The security code is located in the Secure Menu. The Code locks out programming access to specific menus. To access the locked out menus the security level must be changed. To change the security level, the correct password must be entered into the **SECr** menu item.

1. Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
2. The menu item **SECr** should be the first to appear. The value shown is the current security level.
3. Change the security level, by using the **UP ARROW** and **DOWN ARROW** keys to change the value in the upper display until the password of the desired security level is shown.
4. Press the **ENTER** key to retain the value. The display will blink, and the new security level will be shown in the upper display.

Refer to the following table for the correct value to enter for the security level desired.

Note: The passwords cannot be altered.

Connecting the Heater's Wire to the Pins:

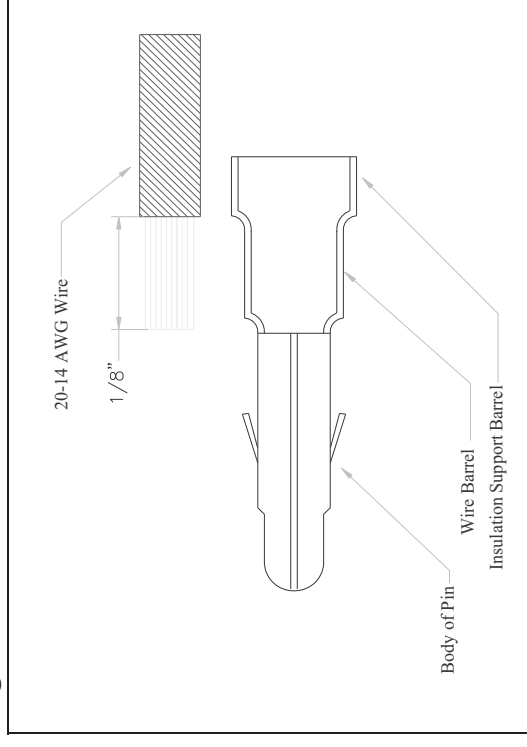


FIGURE 7: DIAGRAM OF PIN AND STRIPPED WIRE

1. For heater's power leads use the bronze pins. If the heater has a ground wire, then use the silver pin for the ground wire.
2. Strip off enough insulation to uncover the length of wire needed to fit the pin's wire barrel (approximately 1/8").
3. Use a crimp tool to crimp the insulation support barrel to the insulated wire. (To order a crimp tool see page 24).
4. Crimp the wire barrel around the uninsulated wire.



FIGURE 5: MOUNTING BRACKET



FIGURE 6: CONTROLLER WITHIN BRACKET

TABLE 1: SECURITY LEVELS AND PASSWORDS

Menu	Security Level Status	Security Level Value	Password To Enter
Primary	Locked	1	1110
Secondary	Locked		
Secure	Locked		
Primary	Unlocked	2	1101
Secondary	Locked		
Secure	Locked		
Primary	Unlocked	3	1011
Secondary	Unlocked		
Secure	Locked		
Primary	Unlocked	4	111
Secondary	Unlocked		
Secure	Unlocked		

Temperature Unit

1. Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
2. Press the **INDEX** key until **Unit** is shown on the lower display.
3. Change the unit of measurement, by using the **UP ARROW** and **DOWN ARROW** keys to select C (Celsius) or F (Fahrenheit).
4. Press the **ENTER** key to retain the value.

Setpoint Range

Menu Items **SPL** and **SPH** limit the value that may be entered for the setpoint

1. Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
2. Press the **INDEX** key until **SPL** is shown on the lower display. **SPL** is the lowest allowable value that the set point may be entered in as.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. Press **ENTER** to retain the value.

5. Press the **INDEX** key until **SPH** is shown on the lower display. **SPH** is the highest allowable value that the set point may be entered in as.
6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. Press **ENTER** to retain the value.

Note: **SPL** and **SPH** only limit what value may be entered for the setpoint. These values are not used in the actual control of the heater.

Setpoint

1. Press **INDEX** to the advance to **SP1**.
2. Use the **UP ARROW** and **DOWN ARROW** keys to change the value until the desired setpoint is displayed.
3. Press **ENTER** to retain that value.

Note: For entering the set point while in the Ramp/Soak mode, see Ramp/Soak instructions on page 15.

Method of Control

1. Press the **UP ARROW** and **ENTER** keys simultaneously.
2. Press the **INDEX** key until **Out1** is shown on the lower display.
 - Menu item **Out1** designates the control method to be used by the controller. There are essentially two selections to choose from:
 - **ONOF** allows the controller to simple on/off mode. This setting forces the controller to turn off at the setpoint, and turn on at the setpoint plus the differential (**SP_d**).
 - **##tP** sets the controller to time proportioning control. The available 1 second steps range from **1tP** to **80tP**. A value of **1tP** is recommended for solid state outputs. For mechanical outputs, the longest possible time should be selected without causing the process to wander.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. Press **ENTER** to retain that value.
5. If **ONOF** is selected under the **Out1** menu item, press the **INDEX** key until **SP_d** is shown on the lower display. **SP_d** is the Set Point On-OFF Differential (hysteresis), which should be negative for a heating process.

INSTALLATION

The following procedure should be used when installing the BriskONE temperature controller.

1. Choose an appropriate location with the following:
 - Proximity to a suitable power supply.
 - Appropriate clearances (for example: clearance to allow easy installation of connectors).
 - Ambient temperature does not go beyond the range of -10 to +55 °C (+14 to 131 °F).
 - Humidity conditions do not go beyond 0 to 90% up to 40 °C non-condensing, 10 to 50% at 55 °C non-condensing
2. If the temperature controller is not to be mounted, then:
 - The controller's resting surface must be stable and easy to access for inspection.

If the temperature controller is to be mounted, then:

- Make sure the mounting location is easily accessible for the user.

How to Mount the Temperature Controller:

1. Open the bracket accessory packet. (Available as an extra option. See page 24 for ordering information). Notice that the bracket can be attached from the top or the bottom.
2. Mount the bracket. A minimum of two bolts must be used to mount the bracket. (See Figure 5).
3. Place the Controller inside the Mounted Bracket. Make sure the vents of the enclosure are not covered and that the rubber feet are located in the holes provided by the bracket.
4. Close the bracket and tighten the closure screw securely.

24. If **StAt** is **On**, three menu items will appear in the Primary Menu.
 - **ti** is the time remaining for the current segment.
 - **##ti** is the total time for segment **##**.
 - **##SP** is the target set point for segment **##**.
25. If **Prog**, in Secondary Menu, is **OFF**, then **Prog** will not appear in Primary Menu. **Prog** is the Ramp/Soak Run/Holds function
 - **run** means the Ramp/Soak is in operation.
 - **OFF** holds the Ramp/Soak program.

26. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
27. After a value is selected, press **ENTER** to retain that value.

Setting Fuzzy Logic Parameters

1. Press the **UP ARROW** and **ENTER** keys to enter the Secondary Menu.
2. Press the **INDEX** key until **Fint** appears on the display. **Fint** determines the amount of impact fuzzy logic will have on the output, and can be 0 to 100%. 0% is **OFF**.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. After a value is selected, press **ENTER** to retain that value.
The following menu items will not appear if Fint is set to 0%.

5. Press the **INDEX** key until **Fbnd** appears on the display. **Fbnd** is the bandwidth of the fuzzy logic, and can be set at 0 to 4000. The units depend on what value the menu item **Unit** is set for. Set **Fbnd** equal to PID proportional band for best results.
6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. After a value is selected, press **ENTER** to retain that value.
8. Press the **INDEX** key until **FrTE** appears on the display. **FrTE** is the fuzzy logic's rate of change with a range of 0.00 to 99.99 counts/second. For best initial setting, find the count/second change of process value near setpoint 1 with output on. Multiply this value by 3 and set **FrTE** to this value.
9. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
10. After a value is selected, press **ENTER** to retain that value.

6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. Press **ENTER** to retain that value.

Setting the Alarm

1. Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
2. Press the **INDEX** key until **AL** is shown on the lower display.

AL is the temperature alarm function. Five different options are available for this menu item.

- **OFF** Alarm is disabled.
 - **Lo** Low Alarm only.
 - **Hi** High Alarm only.
 - **HiLo** High and Low alarm shares the same alarm output.
 - **Evt** Alarm is controlled by the Ramp/Soak program function
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
 4. Press **ENTER** to retain that value.

If **OFF** is selected for the value for **AL**, the following menu items will not appear.

5. Press the **INDEX** key until **ALT** appears on the display. **ALT** is the menu item that selects the temperature alarm type. There are two values to choose from.
 - **AbS** Absolute Alarm may be set anywhere between 0-1600 and is independent from **SP1**.
 - **dE** Deviation Alarm is dependent on **SP1**, and alarms when the process temperature is beyond acceptable limits enter in **ALLo** and **ALHi**.
6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. After a value is selected, press **ENTER** to retain that value.
8. Press the **INDEX** key until **ALHi** is shown on the lower display. **ALHi** is the alarm inhibit menu item.

- **On** The alarm action is suspended until the process temperature first enters a non-alarm condition.
 - **OFF** Turns the alarm inhibit off.
9. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
 10. After a value is selected, press **ENTER** to retain that value.
 11. Press the **INDEX** key until **ALSt** appears on the display.

ALSt is the alarm output state menu item. BriskONE's design requires **ALSt** be set to **OPEN**.

If **ALSt** is set to **CLOSE**, then press **UP ARROW** and **DOWN ARROW** keys until the value shown is **OPEN**. Press **ENTER** to retain that value

12. Press the **INDEX** key until **ALLP** appears on the display. **ALLP** is the alarm lamp. BriskONE's design requires **ALLP** be set to **OFF**.

If **ALLP** is set to **On**, the press **UP ARROW** and **DOWN ARROW** keys until the value shown is **OFF**. Press **ENTER** to retain that value.

13. Press the **INDEX** key until **ALLb** appears on the display. **ALLb** is the alarm loop break menu item.

- **On** The controller will alarm if no change has been detected by the sensor under full output conditions for a period of time.
 - **OFF** The controller will not alarm.
14. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
 15. Press **ENTER** to retain that value.
 16. The next two menu items are located in the Secondary Menu. Their appearance depends on the values entered in the menu items above. To return to the Primary Menu, wait 30 seconds, or for a faster response, press the **UP ARROW** and **ENTER** keys followed by pressing the **DOWN ARROW** and **INDEX** keys.
 17. Press the **UP ARROW** and **ENTER** keys simultaneously to enter the Secondary Menu.
 18. Press the **INDEX** key until **ALLo** appears on the display. **ALLo** is the low limit alarm and will only appear, if **AL** has a value of **Lo** or **HiLo**.

14. Press the **INDEX** key until **1ti** appears on the display. **1ti** is the time for the first segment with a range of **0** to **9999**. The units will depend on what was entered in **tbAS**.
15. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
16. After a value is selected, press **ENTER** to retain that value.
17. Press the **INDEX** key until **1SP** appears on the display. **1SP** is the first segment's Set Point.
18. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
19. After a value is selected, press **ENTER** to retain that value.
20. Press the **INDEX** key until **1AL** appears on the display. **1AL** is the first segment's alarm event.

- **On** activates the alarm during segment 1's time.
- **OFF** deactivates the alarm during segment 1's time.

21. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
22. After a value is selected, press **ENTER** to retain that value.

The following items appear at the end of the 16 segment program in the Secondary Menu.

23. Press the **INDEX** key until **PEnd** appears on the display. **PEnd** is the program's end action.
 - **Hold** keeps the temperature at the present set point.
 - **OFF** turns off the output at the end of the program.
 - **LOOP** repeats the program starting at **1ti**. If the program is to repeat, the last segments must return the process to the same condition when the program started.
 - **SP1** reverts to the **SP1** (Primary Menu) value.

The next two menu items can be found in the Primary Menu. Their appearance will be dependent on which values were entered in the menu items above.

- To return to the Primary Menu, wait 30 seconds, or for a faster response, press the **UP ARROW** and **ENTER** keys followed by pressing the **DOWN ARROW** and **INDEX** keys.

5. Press the **INDEX** key until **PSEt** appears on the display. **PSEt** enables the rest of the menu items that are used in programming the Ramp/Soak.
 - **On** enables Ramp/Soak programming. **PSEt** must be in this position to start programming the Ramp/Soak features.
 - **OFF** skips Ramp/Soak programming.
6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. After a value is selected, press **ENTER** to retain that value.
8. Press the **INDEX** key until **StAr** appears on the display. **StAr** controls how the Primary Menu will display the Ramp/Soak parameters.
 - **OFF** allows the Primary Menu to operate normally.
 - **On** alters the Primary Menu to display the following items.
 - #####/tj is time remaining in segment.
 - #####/##ti is the total time in active segment.
 - #####/##SP is the target set point for the segment.
9. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
10. After a value is selected, press **ENTER** to retain that value.
11. Press the **INDEX** key until **tbAS** appears on the display. **tbAS** is the Ramp/Soak time unit measurement.
 - **1_S** is the time base in 1 second increments.
 - **60_S** is the time base in 1 minute increments.
12. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
13. After a value is selected, press **ENTER** to retain that value.

The following items are located in the secondary menu after **tbAS**, and are the parameters for the 16 segments of the Ramp/Soak. To save space, only the descriptions for the first segment will be listed. The number at the beginning of the display represents the segment of the Ramp/Soak.

19. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
20. Press **ENTER** to retain that value.
21. Press the **INDEX** key until **ALHi** appears on the display. **ALHi** is the high limit alarm and will only appear, if AL has a value of Hi or **HiLo**.
22. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
23. Press **ENTER** to retain that value.

Sensor Break Alarm Action

1. Hold the **UP ARROW** and **ENTER** simultaneously for five seconds to enter the secure menu.
2. Press the **INDEX** key until **InPt** appears on the display. **InPt** is the input fault timer. When the input is out of range, shorted, or open, the timer will start. **OFF** or a range from **0.1** to **540.0** minutes can be selected.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. After a value is selected, press **ENTER** to retain that value.
5. Press the **INDEX** key until **InPb** appears on the display. **InPb** determines the action the controller will perform, when the **InPt** timer runs out. If **InPt** has a value of **OFF**, **InPb** will not be displayed. There are three options for this menu item:
 - **FAIL** Output is disabled.
 - **AVE** The output will hold at the last known average percentage of output.
 - **PrE** The output will maintain a preprogrammed percentage of output as specified in **PrE1** and **PrE2**.

If **PrE** is selected, the following menu item will appear.

- **PrE1** Select 0 to 100% for Set Point 1

6. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
7. After a value is selected, press **ENTER** to retain that value.

Loop Break Protection

1. Press the **UP ARROW** and **ENTER** keys to enter the Secondary Menu.
2. Press the **INDEX** key until **LPbr** appears on the display. If, during the operation, the output is at its minimum or maximum, and the input has moved less than 5°F (3°C) over the time specified in **LPbr**, the **LOOP BAD** message will appear. If ALLb is **On**, then this condition will cause an alarm. **LPbr** has a range **1** to **9999** seconds, or **OFF**.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. Press **ENTER** to retain that value.

Tuning

1. Press the **UP ARROW** and **ENTER** keys to enter the Secondary Menu.
2. Press the **INDEX** key until **tun** appears on the display. **tun** is where the type of tuning choice is selected. There are five options to choose from.
 - **SELF** allows the controller to evaluate the process and select its own PID values to maintain good control. This is the recommended choice since all systems react differently. If **SELF** is selected, the following two menu items will appear.
 - **Lern** -- select **YES** or **no**.
YES starts the learning process, and finishes by reverting to **no**.
 - no** will keep the present variables.
 - **dfAC** is the damping factor that sets the ratio of Rate to Reset for the **SELF** mode. For a fast response process, the value should be lowered. For a slower process, the value should be increased.
- **Pid** allows manual adjustment of PID values. This option should only be selected if the end user has an understanding of how a PID system works. If **Pid** is selected, the following menu items will appear.
 - **Pb1** is the proportional band. Select **1** to **9999**.
 - **rES** is the automatic reset time. Select **OFF**, **0.1** to **99.9** minutes. Select **OFF** to switch to **OFFS**.

- **OFFS** is the manual offset correction. Select **OFF**, **0.01** to **99.9%**. Select **OFF** to switch to **rES**.
 - **rE** is the rate.
- **SLO** presets PID values for a slow response process on a default system.
 - **nor** presets the PID values for a normal response process on a default system.
 - **FAST** presets PID values for a fast response process on a default system.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
 4. After a value is selected, press **ENTER** to retain that value.

Input Calibration

1. Press the **UP ARROW** and **ENTER** keys to enter the Secondary Menu.
2. Press the **INDEX** key until **InPC** appears on the display. **InPC** allows the input value to be changed to agree with an external reference or to compensate for sensor error. **InPC** can have a value of ± 500 . (The units depend on which value was entered in the **Unit** menu item.)
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. After a value is selected, press **ENTER** to retain that value.

Ramp/Soak Feature

1. Press the **UP ARROW** and **ENTER** keys to enter the Secondary Menu.
2. Press the **INDEX** key until **Prog** appears on the display. **Prog** is a Ramp/Soak feature that allows the process to be started.
 - **On** allows the Programmed Ramp/Soak function to be started by the Run/Hold key on the control front panel. This option can only be selected after the parameters of the Ramp/Soak operation are entered.
 - **OFF** turns Ramp/Soak function off and resets program to beginning.
3. Use the **UP ARROW** and **DOWN ARROW** keys to change the value.
4. Press **ENTER** to retain that value.