PLASTIC PROCESS EQUIPMENT, INC.

BTC15
Temperature Controller
Operation Manual

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Warranty

This product is guaranteed to be free from defects in materials and workmanship for a period of two years from the date of delivery. If the unit should malfunction, it must be returned to the factory for evaluation. Upon examination, if the unit is found to be defective, at our option, it will be repaired or replaced at no cost to the customer.

Warranty does not cover: contact points, fuses, or triacs.

Warranty is null and void when: Signs of abuse or tampering are found, incorrect fuse type is used, application of High Voltage rated over the system's required specifications, or application of High Voltage to thermocouple inputs.

PPE accepts no responsibility or liablity for the APPLICATION by the customer of temperature controllers. This liability is assumed by the customer. Upon inspection, if the returned product does not meet our warranty requirements, customer may be subject to a reasonable service charge. There are no warranties, expressed or implied, for temperature controllers except as stated herein. In no event shall PPE be liable for consequential, incidental, or special damages beyond our control. The buyer's sole remedy for any breach of this agreement shall not exceed the purchase price paid by the buyer to PPE.

Controller Layout

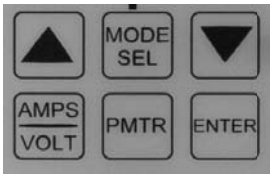
Set-Point Value Display

When decimal is lit, manual percentage power is engaged

When decimal is lit, voltage is displayed ± 3%

When decimal is lit, temp. is displayed in Celsius

User Input Keypad



Up/down keys
For adjustment of setpoint/ parameters

Mode Select key
Manual, Auto, Standby, and Boost

Amps/Volt key
View Current and voltage

Parameter key
Scroll through parameters

Enter key
Save changes

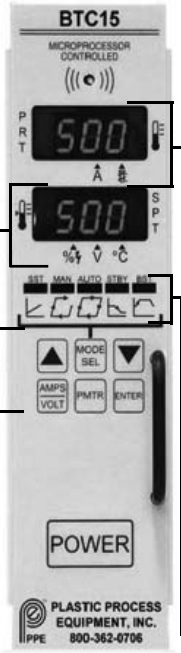


Figure 1

Process Value Display

When decimal is lit, amperage is displayed

When decimal is lit, output power is on

Mode Indicator LEDs

SOFT - Soft Start

MAN - Manual/Open loop

AUTO - Auto/Closed loop

STBY - Standby Mode

BST - Boost Mode

Basic Operation Procedures

The BTC15 temperature controller is ready to run from factory settings.

Basic Operation:

Turn power on by pressing the *POWER* button.

SOFT START mode: The controller will start in SOFT START mode if the process value is below 212° F or 100° C. After the SOFT START duration time (parameter P16), the controller will go into AUTO mode (factory default).

Note*: MODE changes cannot be made during SOFT START mode unless the lock is disabled in parameter (P17).

SETPOINT CHANGE: To change the setpoint value, use the *UP* and *DOWN* keys to select the desired temperature then press *ENTER*. The minimum and maximum values for temperature and setpoint are 32° - 999° Fahrenheit (5° - 650° Celsius).

Mode:
There are 4 running modes available: manual (open loop), automatic (closed loop), standby (idle), and boost. A solid lit LED indicates the mode the controller is in.

To change mode:
Press the *MODE SELECT* key until the blinking LED is over the desired mode, then press the *ENTER* key. A solid lit LED will indicate the current running mode.

Note*: To exit the mode function with no changes, press the *MODE SELECT* then the *UP* or *DOWN* key.

Siren will momentarily sound when status changes occur (e.g. when BOOST is enabled).

ENTER must be pressed after any adjustment (such as setpoint, parameter, or mode) is made to store new information.

Standby and Boost:
The controller has two configurations for standby and boost modes: auto or manual.

Standby:
AUTO-STANDBY - controller goes to the preset standby set-point temperature set in parameter (P15)

MANUAL-STANDBY - controller goes to the preset % power set in parameter (P14).

The controller will remain in STANDBY mode until it is manually changed to another mode, or by pressing *MODE SELECT* then *UP* or *DOWN*.

Boost:
AUTO-BOOST - controller goes to the preset BOOST set-point temperature set in parameter (P12).

MANUAL-BOOST - controller goes to the preset % power set in parameter (P13).

Controller will remain in BOOST mode until preset time has elapsed, set in parameter (P11).

Parameter Changes:
1. Press the *PMTR* key until the desired parameter is reached. (List of parameters is available on page 8).

2. Press the *UP* or *DOWN* key to change the options for the selected parameter.

3. When complete, press the *ENTER* key to store to memory. (Changes can be made to all parameters before pressing *ENTER*).

To exit at any time, press the *ENTER* key.

Error Reset:
Upon detection of TOH, TSH, or HIA, the controller must be powered off, then on, to clear the error once the issue has been corrected. Refer to Pg. 8 for error codes.

Parameters

#	Parameters	Defaults
P01	Auto Power On - (YES or NO)	YES
P02	Control Type - Power Control Type Phase or Burst mode (PH or BT)	PH
P03	Over Current Limit - (1 - 21) Amps	16
P04	Celsius or Fahrenheit (°C or °F)	F
P05	Thermocouple Type - (J or K)	J
P06	Over-temp. Alarm Limit - (8° - 30° Fahrenheit), (6° - 17° Celsius)	30
P07	Under-temp. Alarm Limit - (5° - 30° Fahrenheit), (5° - 17° Celsius)	30
P08	T/C Pinched - (1 - 250) seconds or (000 = disabled)	60
P09	Open TRIAC, Heater - (1 - 240) seconds or (000 = disabled)	30
P10	APO Enable - (YES or NO)	YES
P11	Boost Time Setting - (5 - 999) seconds	30
P12	Boost Temperature - (5° - 250° Fahrenheit), (5° - 120° Celsius)	75
P13	Manual Boost Power - (5 - 100%)	25%
P14	Manual Standby Power - (5 - 100%)	10%
P15	Standby Temperature - (50° - 350° Fahrenheit), (50° - 175° Celsius)	250
P16	Soft Start Time - (0 - 20) minutes	5
P17	Soft Start Lock - (YES or NO)	YES
P18	Audible Alarm - (YES or NO)	YES
P19	Keypad Lock - (YES or NO)	NO
P20	Frequency (Hertz) DISPLAY ONLY	
P21	Tune Stabilization - (50 - 100)	60

Parameter Description

P01) Auto Power On - After a power outage, controller will automatically power up upon the return of power if enabled.

P02) Control Type - Power output type (PH or BT)

- PH – half cycle phase mode
- BT – burst cycle mode

P03) Over Current Limit Detection - Maxiumum amperage controller will allow for load (Over Current Condition (HIA)). Recommended for user to adjust to heater current +10% for better protection.

Parameter Description (c)

P04) Select degrees Celsius (°C) or Fahrenheit (°F).

P05) T/C Type - Select thermocouple types J or K.

P06) Over-temp. Alarm Limit - Alarm when process temp. is over setpoint value as set in parameter.

P07) Under-temp. Alarm Limit - Alarm when process temp. is under setpoint value as set in parameter.

P08) T/C Pinched - Time, in seconds, that the controller will take to detect a pinched or shorted thermocouple. (There is current, no rise in temperature)

P09) Open TRIAC/Heater - Time, in seconds, that the controller will take to detect an open TRIAC, open heater, or open wire. (No current and no rise in temperature)

P10) APO Enable - In the event of a T/C break and the controller is at set point, the controller uses the last average output power (APO) to maintain temperature. (Automatic Bumpless Transfer). T/C must be repaired as soon as possible.

P11) Boost Time setting - Time (in seconds) desired for boost mode.

P12) Auto Mode Boost Temp. - Boost temperature over setpoint. (Boost temp. + set-point)

P13) Manual Mode Boost Power - Manual percentage power output during boost mode for a set time (P15).

P14) Manual Mode Standby Power - Manual percentage power output during standby mode.

P15) Auto Mode Standby temp. - Standby/idle setpoint value.

P16) Soft-Start Time - Time duration, in minutes, that the controller is in Soft-Start. (Bake Out)

P17) Soft-Start Lock - Prevents users from changing mode while in soft-start.

P18) Audible Alarm Enable/Disable - controller audible alarm.

P19) Keypad Lock - **YES:** Disables all keys, except for the *PMTR* key, to prevent unwanted changes. **NO:** All keys enabled.

P20) Frequency - AC line frequency (Display only).

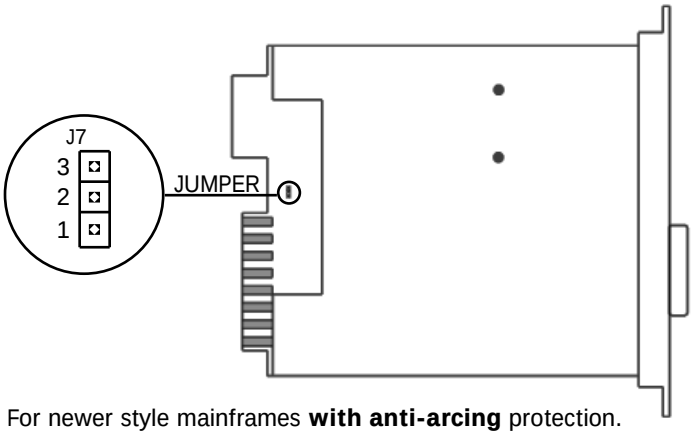
P21) Tuning Stabilization - Adjustment for heaters with lagging thermocouple or low mass (quick heat dissipation heaters). If there is fluctuation of temperature, adjust higher (recommended maximum of 75).

Display Codes

Display Codes: Displayed on PRT (process temperature display)

Display Code	Description	Explaination
Hi	High Temperature	Process temp. over setpoint value.
Lo	Low Temperature	Process temp. under setpoint value.
OTC	Open Thermocouple	Thermocouple is open or break.
RTC	Reverse Thermo-couple	Thermocouple wire reversed.
PTC	Pinched Thermo-couple	Thermocouple has been shorted/ pinched.
TOH	Open TRIAC/Heater	TRIAC, heater is open.
TSH	TRIAC/Heater Shorted	TRIAC or heater shorted. (100% power output)
HIA	Over Current Detec-tion	Load has exceeded the amperage set in parameters.
APO	Average Power Output	Thermocouple is open and APO is currently running.

NOTE: Power off controller before removing or inserting into mainframe



Pin 1 & 2 - For newer style mainframes **with anti-arcing** protection.
Pin 2 & 3 - For older style mainframes **without anti-arcing** protection.

Anti-Arcing Protection: Jumper J7 is to prevent damage to the contact points of the controller when removed from the mainframe while power is still on. J7 is set to pins 1 & 2 by factory default. If the controller is placed in an older mainframe without anti-arcing protection, place jumper on pins 2 & 3. If jumper is placed incorrectly, a TOH error may occur (NO POWER OUPUT).