PLASTIC **P**ROCESS **E**QUIPMENT, **I**NC.

MICRO PRECISION SERIES

QTC-15

QTC15
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.
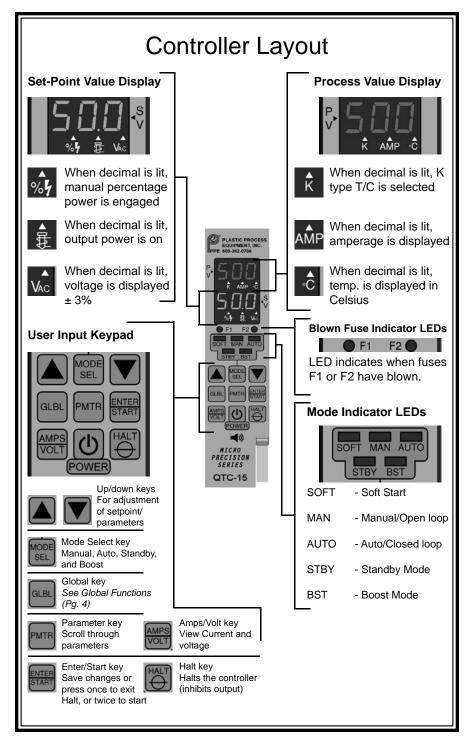
Warranty does not cover: card edge contacts, fuses, or triacs.

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.

Liability

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, output power is on

When decimal is lit, voltage is displayed ± 3%

Process Value Display

When decimal is lit, K type T/C is selected

When decimal is lit, amperage is displayed

When decimal is lit, temp. is displayed in Celsius

User Input Keypad

PLASTIC PROCESS EQUIPMENT, INC.
PPE 800-362-0706

MICRO PRECISION SERIES

QTC-15

Up/down keys For adjustment of setpoint/ parameters

Mode Select key Manual, Auto, Standby, and Boost

Global key *See Global Functions (Pg. 4)*

Parameter key Scroll through parameters

Amps/Volt key View Current and voltage

Enter/Start key Save changes or press once to exit Halt, or twice to start

Halt key Halts the controller (inhibits output)

Blown Fuse Indicator LEDs

F1   F2

LED indicates when fuses F1 or F2 have blown.

Mode Indicator LEDs

SOFT   - Soft Start

MAN   - Manual/Open loop

AUTO   - Auto/Closed loop

STBY   - Standby Mode

BST   - Boost Mode

3

Basic Operation Procedures

The QTC15 temperature controller is ready to run from factory settings.

Global Functions:
GLOBAL FUNCTIONS allow individual controller parameters or modes to be sent to the system or groups of controllers. Group setup is configurable in parameter (P01). Up to 4 groups can be set.

GLOBAL POWER ON/OFF: power on or off all controllers from any controller.
Key sequence: *GLBL*, *POWER*, then *ENTER/START*
Note*: If a controller is manually powered off, the function is disabled until powered back on manually.

GLOBAL SETPOINT/PARAMETERS: Adjust setpoint or parameters on a single unit, and send the settings to all controllers.
Key sequence: *GLBL*, *PMTR*, then *ENTER/START*

GLOBAL MODE CHANGE: Change the mode on a single unit, then change mode system wide or within a group. (e.g. STANDBY or BOOST)
Key sequence: *GLBL*, *MODE*, then *ENTER/START*

GLOBAL CURRENT/VOLTAGE VIEW: View current and voltage on all controllers in the system.
Key sequence: *GLBL*, *AMPS/VOLT*, then *ENTER/START*

Notes*: If changes need to be made to individual controllers, just apply changes and press *ENTER*.

Basic Operations:
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 P20), 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 (P21).

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.

NOTES*: 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 (P19)

MANUAL-STANDBY - controller goes to the preset % power set in parameter (P18).

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 (P16).

MANUAL-BOOST - controller goes to the preset % power set in parameter (P17).

Controller will remain in BOOST mode until preset time has elapsed, set in parameter (P15).

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 THF, TSH, or HIA, the controller must be powered off, then on, to clear the error once the issue has been corrected. Refer to Pg. 11 for error codes.

Special Functions:
Even Temperature Rise: controllers will follow the slowest rising temperature in the system. Even temperature rise is an active procedure, so fluctuation will occur during rise.

Thermocouple Slaving at Startup: At startup, in the event of a thermocouple break, the controller will slave from a controller in the same group.

Live-Swap: In the event of a controller change-out, the new controller will automatically inherit the parameters and settings of the previous controller.
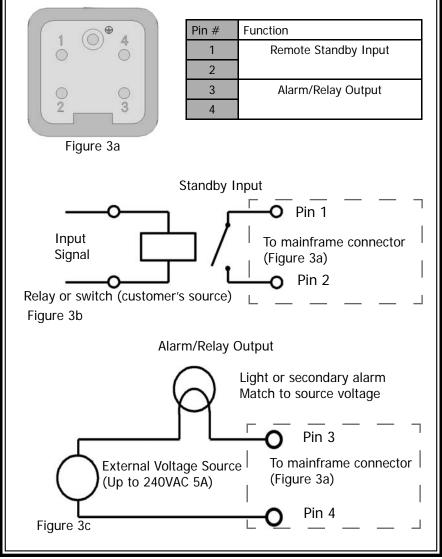
External Alarm Output: Relay for external alarm or light. Pinout on page: 7

Remote Standby Input: Switch input for system standby. Pinout on page: 7

QMF Mainframe

Mainframes come with communication and interface board with siren, which enables global functions, grouping, thermocouple slaving, even temperature rise, and Live Swap features. External alarm relay, and remote standby interface connector is located at the rear of the mainframe. Figures 3 a, b, and c below shows connector and external wiring circuits needed for these functions.

Alarm/Relay Output & Remote Standby Input Connector

Pin #	Function
1	Remote Standby Input
2	
3	Alarm/Relay Output
4	

Figure 3a

Standby Input

Input Signal

Relay or switch (customer's source)

Pin 1

To mainframe connector (Figure 3a)

Pin 2

Figure 3b

Alarm/Relay Output

Light or secondary alarm
Match to source voltage

External Voltage Source
(Up to 240VAC 5A)

Pin 3

To mainframe connector (Figure 3a)

Pin 4

Figure 3c

QTC15 Parameters

#	Parameters	Defaults
P01	Group - (1 - 4)	1
P02	Global Key Function Enable - (YES or NO)	YES
P03	Even Temperature Rise - (YES or NO)	YES
P04	Thermocouple Slaving - (YES or NO)	YES
P05	Auto Power On - (YES or NO)	YES
P06	Control Type - Power Control Type Phase or Burst mode (PH or BT)	PH
P07	Over Current Limit - (1 - 21) Amps	16
P08	Celsius or Fahrenheit (°C or °F)	F
P09	Thermocouple Type - (J or K)	J
P10	Over-temp. Alarm Limit - (8° - 30° Fahrenheit), (6° - 17° Celsius)	30
P11	Under-temp. Alarm Limit - (5° - 30° Fahrenheit), (5° - 17° Celsius)	30
P12	T/C Pinched - (1 - 250) seconds or (000 = disabled)	60
P13	Open TRIAC, Heater, or Fuse - (1 - 240) seconds or (000 = disabled)	30
P14	APO Enable - (YES or NO)	YES
P15	Boost Time Setting - (5 - 999) seconds	30
P16	Boost Temp. - (5° - 250° Fahrenheit), (5° - 120° Celsius)	75
P17	Manual Boost Power - (5 - 100%)	25
P18	Manual Standby Power - (5 - 100%)	10
P19	Standby Temp. - (50° - 350° Fahrenheit), (50° - 175° Celsius)	250
P20	Soft Start Time - (0 - 20) minutes	5
P21	Soft Start Lock - (YES or NO)	YES
P22	Audible Alarm - (YES or NO)	YES
P23	Siren Enable LOCAL (per module) - (YES or NO)	YES
P24	Siren Enable GLOBAL - (YES or NO)	YES
P25	Frequency (Hertz) DISPLAY ONLY	
P26	Address - DISPLAY ONLY	
P27	Tune Stabilization - (50 - 100)	60
P28	Keypad Lock - (YES or NO)	NO

Parameter Description

P01) Group - Set controller for specified group 1 - 4.

P02) Global Key Function Enable - Enable/disable global functions.

P03) Even Temperature Rise - Controllers follow slowest rising temperature in the system.

P04) Thermocouple Slaving at Startup - At startup, in the event of a thermo-couple break and controllers are below 140 °F, the controller will slave from a controller in the same group.

P05) Auto Power On - After a power outage, controller will automatically power up upon the return of power if enabled.

P06) Control Type - Power output type (PH or BT)
  - PH – half cycle phase mode
  - BT – burst cycle mode

P07) Over Current Limit Detection - Maxiumum amperage controller will al-low for load (Over Current Condition (HIA)). Recommended for user to adjust to heater current +10% for better protection.

P08) Select degrees Celsius (°C) or Fahrenheit (°F).

P09) T/C Type - Select thermocouple types J or K.

P10) Over-temp. Alarm Limit - Alarm when process temp. is over setpoint value as set in parameter.

P11) Under-temp. Alarm Limit - Alarm when process temp. is under setpoint value as set in parameter.

P12) 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)

P13) Open TRIAC/Heater/Fuse - Time, in seconds, that the controller will take to detect an open TRIAC, open heater, open wire, or fuse. (No current and no rise in temperature)

P14) 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.

P15) Boost Time setting - Time (in seconds) desired for boost mode.

Parameter Description (c)

P16) Auto Mode Boost Temp. - Boost temperature over setpoint. (Boost temp. + setpoint)

P17) Manual Mode Boost Power - Manual percentage power output during boost mode for a set time (P15).

P18) Manual Mode Standby Power - Manual percentage power output during standby mode.

P19) Auto Mode Standby temp. - Standby/idle setpoint value.

P20) Soft-Start Time - Time duration, in minutes, that the controller is in Soft-Start. (Bake Out)

P21) Soft-Start Lock - Prevents users from changing mode while in soft-start.

P22) Audible Alarm Enable/Disable - controller audible alarm.

P23) Local Siren Enable/Disable - siren alarm for the individual controller.

P24) Global Siren Enable/Disable - siren alarm global.

P25) Frequency - AC line frequency (Display only).

P26) Zone Address - Controller zone location in mainframe (Display only).

P27) 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).

P28) Keypad Lock -
YES: Disables all keys, except for the *PMTR* key, to prevent unwanted changes.
NO: All keys enabled.

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.
THF	Open TRIAC/Heater/Fuse	TRIAC, heater, or fuse (F3) is open.
TSH	TRIAC/Heater Shorted	TRIAC or heater shorted. (100% power output)
HIA	Over Current Detection	Load has exceeded the amperage set in parameters.
APO	Average Power Output	Thermocouple is open and APO is currently running.
GLO	Global Function	Global key has been pressed.

NOTE*:
Fuse F1 and F2 - Use only ABC15

Fuse F3 - Use only GBB15

FUSE TYPE:

F1 ABC15

F3 GBB15

F2 ABC15

TC+
TC-
ANTI-ARC
HEATER OUTPUT
AC INPUT
HEATER OUTPUT
AC INPUT
GROUND