

TPC 1500 TABLE OF CONTENTS

SAFETY GUIDELINES.....1
GENERAL PRODUCT DESCRIPTION.....2
FEATURE DESCRIPTIONS3
CONNECTION GUIDE.....4
MOUNTING LOCATION.....4
BLOCK DIAGRAM.....5
OPERATION6
SPECIFICATIONS.....7
TROUBLESHOOTING.....7
MAINTENANCE.....8
MANUAL REVISIONS PAGE.....9
WARRANTY INFORMATION.....10
DRAWING (MOUNTING HOLES).....11

NOTICE

THE INFORMATION IN THIS MANUAL HAS BEEN CAREFULLY CHECKED AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO RESPONSIBILITY IS ASSUMED FOR INACCURACIES.



SAFETY GUIDELINES

Before operating, maintaining or servicing any integrated thermal system, please read all of the technical and safety literature for your product. Guidelines for setup, operation, and maintenance are outlined in this manual, however please refer to your local electrical code as necessary. Also, see Chapter 6 of the NEC for relevant sections as it applies to mounting locations and hazardous environments.

GENERAL PRODUCT DESCRIPTION

The TPC1500 process air heater system is a 1.5kW Cool Touch heater + state-of-the-art digital controller + flow switch + solid-state relay packaged in a convenient wall-mountable steel enclosure.

This unique product takes the guesswork out of process heating applications which require a moderate amount of wattage and have 120V or 240V power available.

The heater is capable of airflows up to 25 SCFM and can operate in environments up to 120 psig. Maximum output temperature is 371C (700F) depending upon airflow.

Possible applications include:

Automotive Painting
Adhesive Activation
Air Drying
Solder Removal

Heat Staking
Sterilization
Web Drying
Plastic Curing

Metallization
Heat Shrinking
Hopper Drying

FEATURE DESCRIPTIONS

ALARMS

Red alarm status indicator light included on front panel. Using relays, alarm de-energizes heater circuit during fault condition.

LOW AIR FLOW

Yellow alarm status indicator light included on front panel. Using integral flow switch, alarm de-energizes heater circuit during air flow conditions of less than 3 SCFM.

CONTROLS

Each unit includes a microprocessor based process controller. Non-volatile memory within the controller protects against data or configuration loss during power outages. Alarm event defined within controller memory. Alarm indications include process high and signal break.

Controller output signal fires solid state relay (SSR), which controls power to the heater. SSR utilizes zero-cross technology to minimize electric noise levels within the panel. SSR is mounted on a heat sink to dissipate heat away from its base.

INDICATORS

TEMPERATURE CONTROLLER is capable of displaying key pieces of data in operation mode. The main screen includes the process value and the set-point variable. The alarm display shows the status of the event alarm.

SENSOR BREAK – The TEMPERATURE CONTROLLER includes a sensor break or open alarm. This alarm indicates that the Process thermocouple is either open or not connected. The Temperature controller continually monitors the thermocouple input. If the controller detects a thermocouple break, the process value will display **UUUU** or **LLL** and power output will go to zero.

CONNECTION GUIDE

- 1) Connect INLET (supply line from compressed air or nitrogen system) to bottom ½” NPT Male fitting
- 2) Connect EXHAUST to top ½” NPT Male fitting
- 3) Ensure that the AC power switch on the front of the enclosure is OFF
- 4) Connect incoming electrical power to INPUT LINE, INPUT NEUTRAL and AC GROUND at terminal connections on lower right of main Printed Circuit Board inside enclosure.
- 5) Ensure jumpers on main Printed Circuit Board are in proper configuration for 120VAC or 240VAC incoming power.

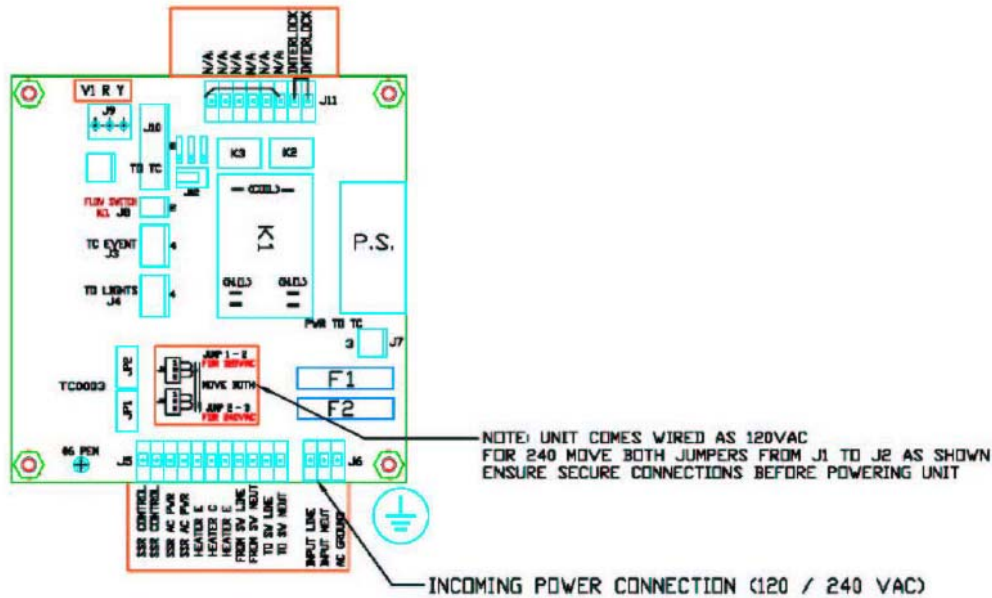


Figure 1: Connection Diagram

MOUNTING LOCATION

Mount the TPC1500 enclosure vertically to an appropriate surface where the ambient temperature is approximately room temperature, to aid in heat dissipation. It should not be located near any other heat producing equipment such as ovens or steam pipes.

WARNING: The unit should be mounted in an area that is not in danger of fire or explosion. Please refer to Chapter 6 of the National Electrical Code for details on hazardous environments.

BLOCK DIAGRAM

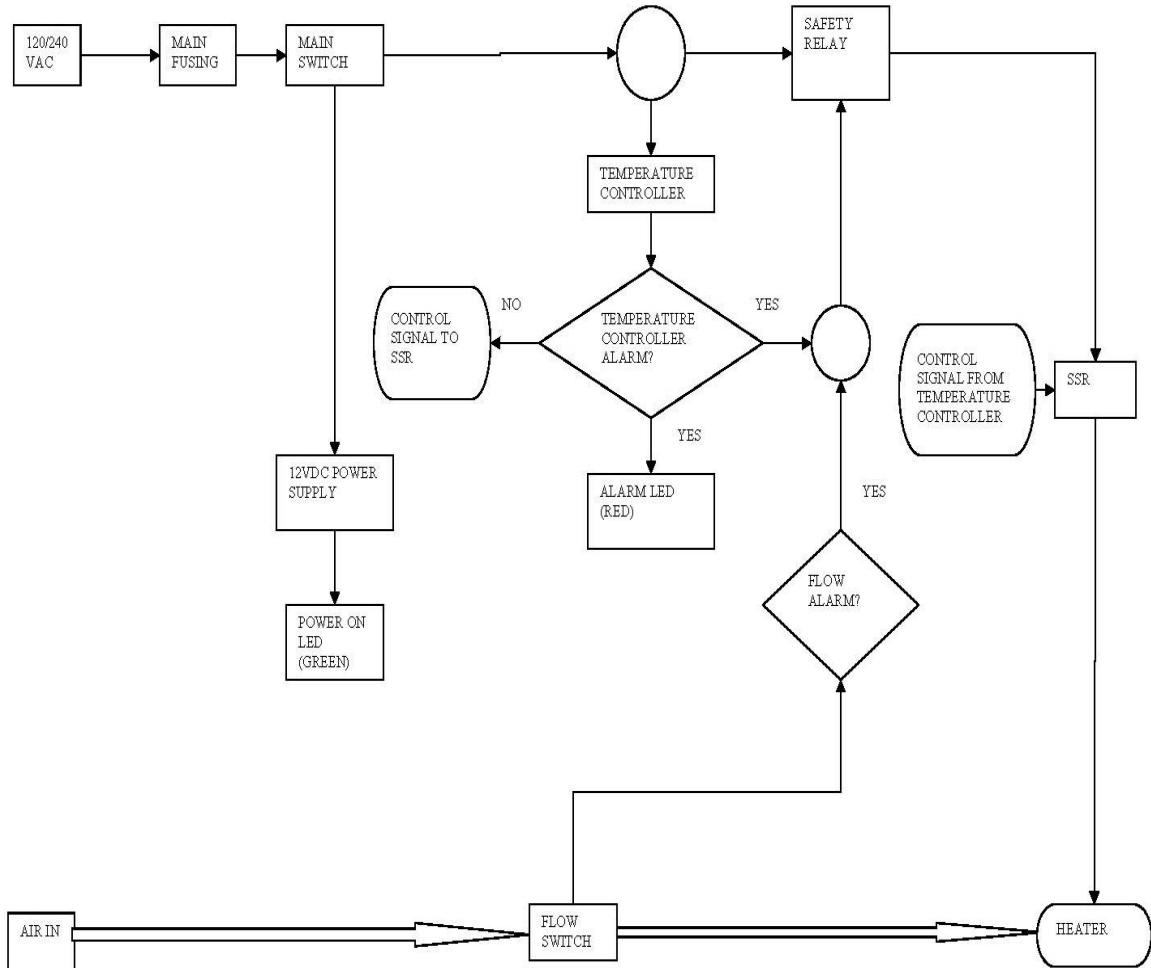



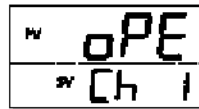
Figure 2: Functional Block Diagram


OPERATION

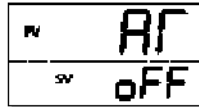
1. *After* airflow through the heater is established, energize electrical supply lines and rock the AC power switch to ON. The controller and heater will come ON (unless the SV is below room temperature).
2. Enter the Set Value (SV) of the heater by pressing the **▲** UP ARROW or decreased by pressing the **▼** DOWN ARROW.
3. To ensure accurate control, it is recommended the heater be allowed to stabilize by operating at or near process temperature for approximately 10-15 minutes before initiating AUTO TUNE cycle.

To activate the AUTO TUNE feature:

1. Press and hold  SELECT key to display channel menu of the setting mode, then use **▲** UP ARROW or **▼** DOWN ARROW keys to display "oPE Ch 1".





2. Press and hold  SELECT key, then use the **▲** UP ARROW or **▼** DOWN ARROW to select AT "Af".



3. Press  SELECT key, then use the **▲** UP ARROW or **▼** DOWN ARROW to display "on" when bottom part of display begins to blink.



4. Press  SELECT key to confirm the setting.
5. Press the  AM key to return to PV/SV display of operation mode. While the unit is self tuning the right hand decimal point will blink on the lower display. When the self tune is complete the blinking will stop.

NOTE: The auto tune process can take several minutes.

SPECIFICATIONS

SPECIFICATIONS	
Incoming Power	120 VAC @ 15 amps, 50-60 Hz
Maximum Heater Rating	1500W, 120 VAC, 1Ø
Maximum Operating Pressure	120 PSIG
Inlet Air Connection	1/2" NPT Male
Exit Air Connection	1/2" NPT Male
Enclosure	17.62" L X 10.38" W X 5.50" H
Enclosure Material	Painted Steel
Heater Material	Stainless Steel
Weight	23 lbs
Alarms	High Temperature Alarm, No flow
Temperature Stability	+/- 1.5% of Control Setpoint
Maximum Airflow	25 SCFM
Air Filtration	40 microns at exhaust
Thermal Feedback	Type 'K' Thermocouple
Process Control	PID
Output Temperature Range	65°F - 220°F

Figure 3: Specifications and Operating Range

TROUBLESHOOTING

There is no heat output, what could be the problem?

First, check power at unit. If power is on, there could be several reasons for no heat output. Check the following:

1. Blown Fuse
2. Air not supplied to unit.
3. Temperature set point is below input air temperature
4. Safety stat on exhaust of heater within unit open.
5. Heater resistance – if heater resistance @ leads open, replace heater (see maintenance).

Blown fuses must be replaced with the same type. If possible, try to determine the cause of the failure to prevent future problems.

If the thermostat at the end of the heater opens, allow the unit to cool, push the reset button between the quick connects on the thermostat.

MAINTENANCE

Keep the unit in a dry location. The enclosure is rated for NEMA 1 indoor use only.

If the heater needs to be removed, first make sure the air supply has been locked off. Ensure the power to the unit has been turned off and that the heater, tubing, and fittings are cool enough to touch. Only then should the heater be removed. Contact Farnam Custom Products for a replacement heater.



TPC1500 OPERATOR MANUAL

REVISIONS PAGE

Revision #
Rev 01

Eng. #
TPC1500

Revision Made
Origination

LIMITED WARRANTY

WARRANTY: FARNAM WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

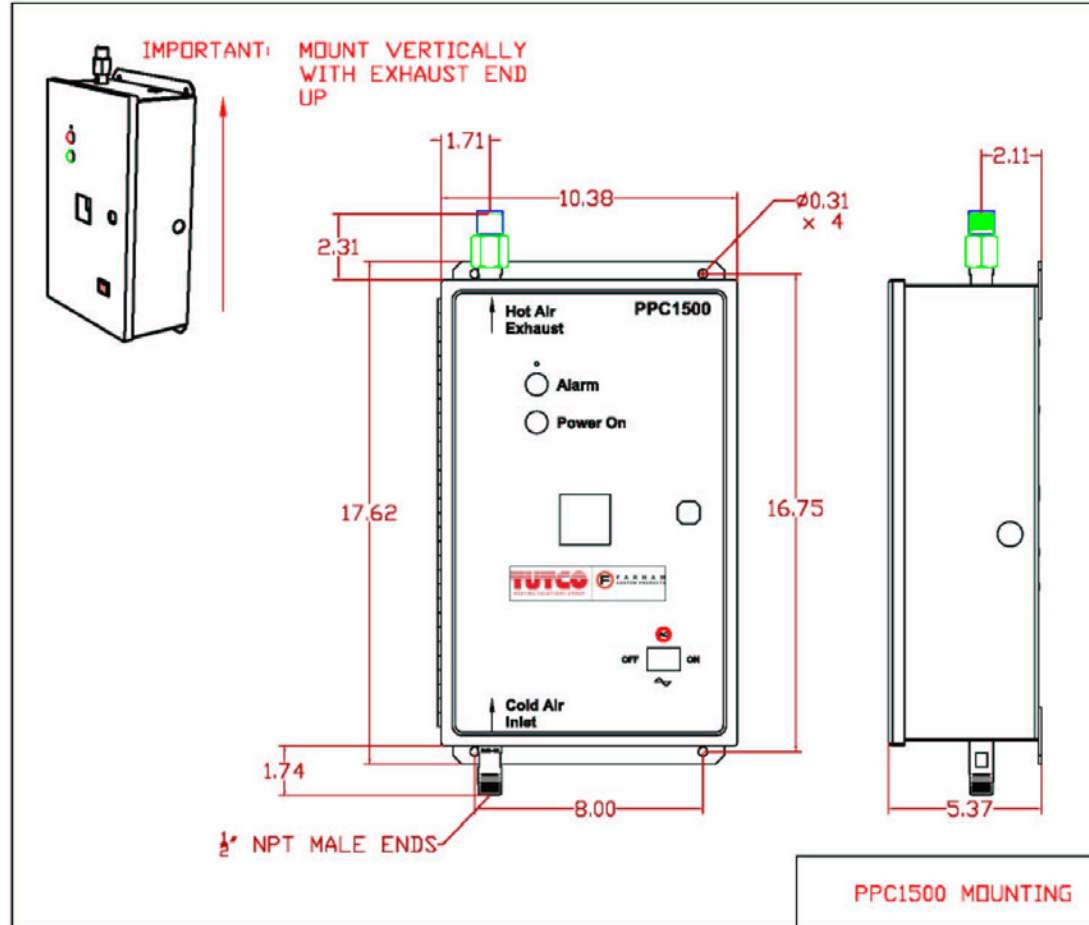
EXCLUSIONS: THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

FARNAM IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **FARNAM**, THE REFUND OF THE PURCHASE PRICE.

TPC1500 OPERATOR MANUAL





TPC1500 OPERATOR MANUAL