

# INSTALLATION AND OPERATING INSTRUCTIONS

## TC-2 ELECTRONIC TEMPERATURE CONTROL

### IMPORTANT

1. The TC-2 is designed as an operating control only. If an operating control failure could result in personal injury or loss of property, a separate safety control and/or alarm should be installed.
2. The schematic drawings and other information included in these installation instructions are for the purpose of illustration and general reference only.
3. These instructions do not expand, reduce, modify or alter Steam-Whirl Terms in any way; and no warranty or remedy in favor of the customer or any other person arises out of these instructions.
4. The TC-2 Control has been approved by Underwriter's Laboratories as ULL listed; however, approval does not extend to their use for any other purpose. Steam-Whirl assumes no responsibility for any unconventional application of its control unless such application has been approved in writing by Steam-Whirl.
5. It is the responsibility of the installer and the user to assure that its application and the use of all Steam-Whirl products are in compliance with all federal, state and local requirements, including without any limitation, all requirements imposed under the National Electric Code and any applicable building codes.



### SPECIFICATIONS

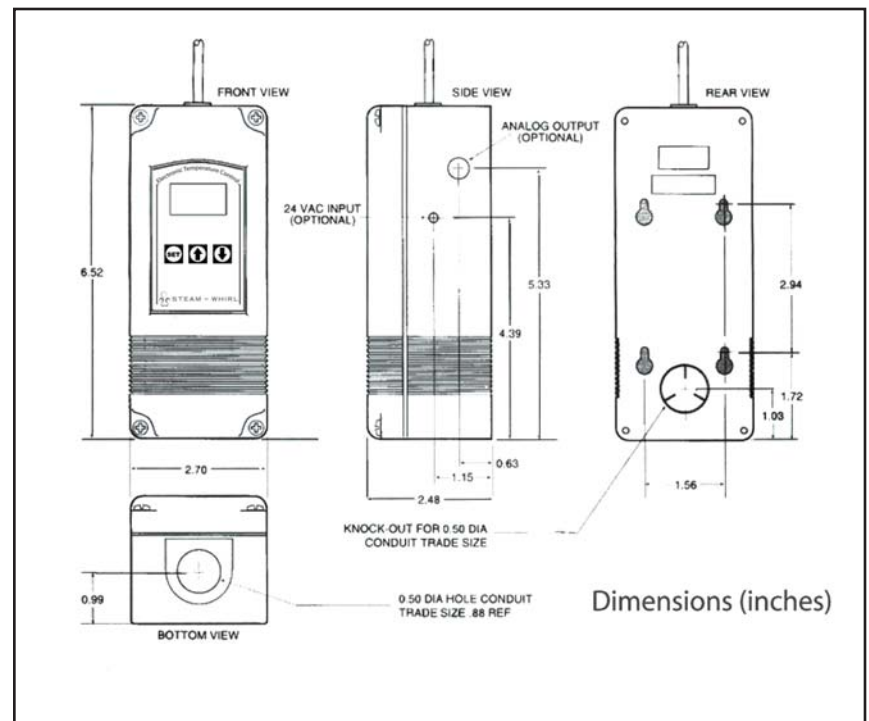
Input Voltage	120 or 208/240 VAC 50/60 Hz
Temperature Range	-30°F to 220°F
Differential Range	1°F to 30°F
Switch Action	SPDT
Temperature Sensor	1.94" long x .25" diameter with 8' Cable

RELAY ELECTRICAL RATINGS	120V	240V
<b>NO CONTACT</b>		
Full-Load amps	16A	8A
Locked rotor amps	96A	48A
Resistive amps	15A	8A
Horsepower	1HP	1HP
<b>NC CONTACT</b>		
Full-load amps	5.8A	2.9A
Locked rotor amps	4.8A	17.4A
Resistive amps	5.8A	2.9A
Horsepower	1/4HP	1/4HP

### CONTROL MOUNTING

Mount the TC-2 to a wall or any flat surface using a combination of any two or more of the slotted holes located on the back of the control case. The control's components are not position sensitive but should be mounted so that they can be easily wired and adjusted. Avoid excessive conditions of moisture, dirt, and corrosive atmosphere.

The TC-2 has provisions for 1/2" conduit connections. The conduit hub should be secured to the conduit before securing the hub to the plastic housing of the control. When using the conduit entry in the rear of the case, a standard plug should be inserted into the conduit hole in the bottom. Caution should be exercised not to damage the control circuit board or wiring when installing a conduit connector.

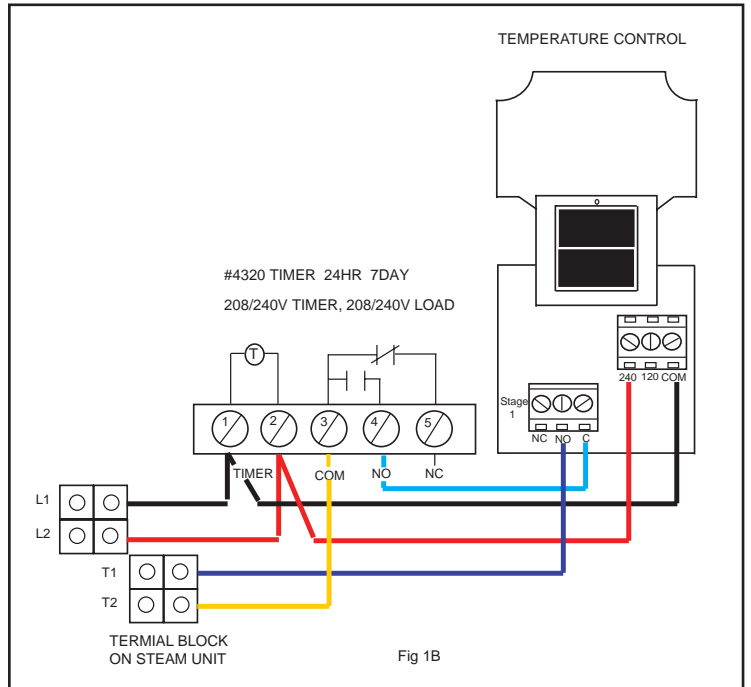
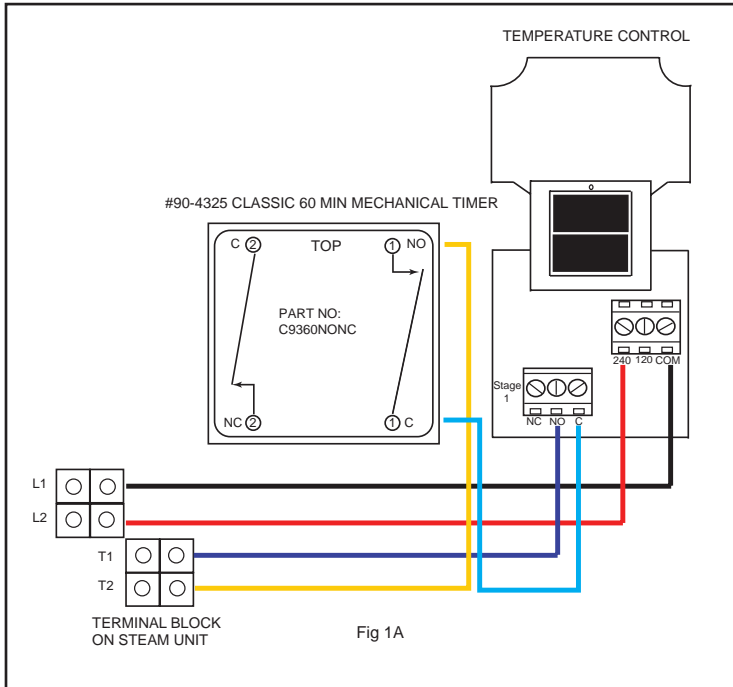


## CONTROL WIRING

- All wiring should conform to the National Electric Code and local regulations.
- The total electrical load must not exceed the maximum rating of the control.
- Use of copper conductors only.
- Electrical leads should not be taut; allow slack for temperature change and vibration.

### Input and Output Wiring

For typical 240V wiring refer to Fig. 1A and 1B . All connections are made to the power (lower) circuit board.



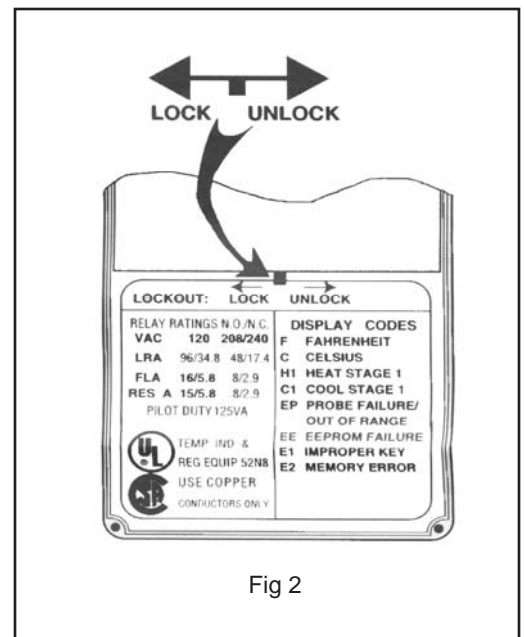
## SENSOR MOUNTING

For space sensing, mount the sensor where it will be unaffected by heat/cool discharge or radiated heat sources. Spot sensing requires the sensor to be in good contact with the surface being sensed.

## LOCKOUT SWITCH

The Steam-Whirl TC-2 Electronic Control is provided with a lockout switch to prevent tampering by unauthorized personnel. When placed in the **LOCK** position, the keypad is disabled and no changes to the settings can be made. When placed in the **UNLOCK** position, the keypad will function normally.

To access the lockout switch, disconnect the power supply and open the control. The switch is located on the inside cover about 2 inches above the bottom. Refer to Fig. 2. To disable the keypad, slide the switch to the left **LOCK** position. To enable the keypad, slide the switch to the right **UNLOCK POSITION**. The Steam-Whirl TC-2 Temperature Control is shipped with this switch in the UNLOCK position.



## PROGRAMMING STEPS and DISPLAY

The TC-2 can be programmed in four simple steps using the LCD display and the three keys on the face of the control. Recommended set point S1 - 110° and D1 - 10°

1. To start programming, press the **SET** key once to access the Fahrenheit/Celsius mode. The display will show the current status, either **F** for degrees Fahrenheit or **C** for degrees Celsius. Then press either the “UP” or “DOWN” arrow key to toggle between the **F** or **C** designation.
2. Press the **SET** key again to access the setpoint. The LCD will display the current setpoint and the **S1** annunciator will be blinking on and off to indicate that the control is in the setpoint mode. Then press either the “UP” key to increase or the “DOWN” key to decrease the setpoint to the desired temperature.
3. Press the **SET** key again to access the differential. The LCD will display the current differential and the **DIF 1** annunciator will be blinking on and off to indicate that the control is in the differential mode. Then press either the “UP” key to increase or the “DOWN” key to decrease the differential to the desired setting.
4. Press the **SET** key again to access the cooling or heating mode. The LCD will display the current mode, either **C1** for cooling or **H1** for heating. Then press either the “UP” or “DOWN” key to toggle between the **C1** or **H1** designation. Press the **SET** key once more and programming is complete.

Step	Annunciator	Description	Display		
1	F or C	Fahrenheit or Celsius Scale	<table border="1"><tr><td>F</td></tr></table>	F	
F					
2	<b>S1</b> (blinking)	Setpoint Temperature	<table border="1"><tr><td>S1</td><td>110</td></tr></table>	S1	110
S1	110				
3	<b>D1</b> (blinking)	Differential Temperature	<table border="1"><tr><td>DIF1</td><td>10</td></tr></table>	DIF1	10
DIF1	10				
4	<b>C1/H1</b>	Cooling or Heating Mode	<table border="1"><tr><td>C1</td></tr></table>	C1	
C1					

**NOTE:** The TC-2 will automatically end programming if no keys are depressed for a period of thirty seconds. Any settings that have been input to the control will be accepted at that point. Reprogramming is not necessary after power outages or disconnects unless different control settings are required.

## TROUBLESHOOTING ERROR MESSAGES

**E1** - Appears when either the “UP” or “DOWN” arrow key is pressed when not in programming mode.

**To correct:** If the E1 message appears even when no keys are being pressed, replace the control.

**E2** - Appears if the control settings are not properly stored in memory.

**To correct:** Check all settings and correct if necessary.

**EP** - Appears when the probe is open, shorted or sensing temperature that is out of range.

**To correct:** Check to see if the sensed temperature is out of range. If not, check for probe damage by comparing it to a known ambient temperature between -30 degrees F and 220 degrees F. Replace the probe if necessary.

**EE** - Appears if the EEPROM data has been corrupted.

**To correct:** This condition cannot be field repaired. Replace the control.

**CL** - Appears if calibration mode has been entered.

**To correct:** Remove power to the control for at least five seconds. Reapply power. If the CL message still appears, replace control.

## WARRANTY

Steam-Whirl Products warrants its products to be free of defects in workmanship and material, under normal use and maintenance, for a period of (6) years from the date of original purchase.

Steam-Whirl Products liability under this warranty shall be limited to repair or replacement of products that have been determined to be defective by an agent or representative of Steam-Whirl Products. If repair or replacement cannot be made on the premises by such agent or representative then upon verification of defect in either materials or workmanship upon delivery of the product to the attention of:

Technical Service  
STEAM-WHIRL PRODUCTS  
3775 W Teco Ave #5  
Las Vegas, NV 89118-6827  
800-232-7832

Products being sent to the service facility are to be packed in a well padded box. Include name, return address and daytime phone number along with a short description of problems. Mail or ship the unit, prepaid, to the above address.

If the product is returned for a defect other than in materials or workmanship a reasonable charge will be made for parts, labor and shipping.

This warranty shall be void and/or does not cover the following:

- 1) Charges for parts or labor incurred before delivery of product to the address above.
- 2) Any damage or defect caused by the installer, service company, user or any other person.
- 3) Installation is not in accordance with the installation instructions provided with the product and/or installation by a person other than a licensed electrician or plumber.
- 4) Deterioration due to normal wear and tear.
- 5) Misuse, accident, incorrect operation, lack of proper maintenance, acts of God.
- 6) Chemical corrosion.
- 7) Alteration of product in any way.
- 8) Exposed to outside weather conditions or temperatures.
- 9) Damage incurred in transit. The user or installer must examine the product immediately on delivery, before installation and report any damage to the carrier and the seller.
- 10) Shipping costs to or from warranty service facility unless required by applicable law.
- 11) Repair or replacement of any installation materials including, but not limited to, tiles, marble, etc or costs relating to obtaining access for repair, removal or reinstallation of the product or a replacement product.

It is the responsibility of the user, installer or contractor to provide access for service and removal of the product, if necessary. Steam-Whirl Products is not responsible for any costs relating to access to the product or its removal.

The dealer, distributor and/or installer is responsible for knowing the applicable building codes and the dealer and/or distributor should notify the installer of same or confirm that the installer is aware of the applicable building codes. Building codes vary from location to location and Steam-Whirl Products cannot be responsible for knowledge of such codes.

No other company or person has any authority to make any warranties or representations concerning Steam-Whirl Products or the products. Accordingly, Steam-Whirl Products is not responsible for any such warranties or representations.

Steam-Whirl Products has not made and does not make any warranty, either expressed or implied, about the condition, merchantability, design or operation of the product or its fitness for any particular use or purpose, or the quality of the materials or workmanship in the product or any other representation or warranty beyond the terms of this warranty

Steam-Whirl Products shall not be liable for the user's incidental or consequential damages. User acknowledges that the price of the product would be higher if Steam-Whirl Products were liable for consequential or incidental damages.

Some states do not allow the exclusion or limitation, in whole or in part, of warranties or the exclusion of consequential or incidental damages, therefore the above limitation or exclusions may not be applicable to you.

Steam-Whirl Products warranty obligation shall be discharged upon tender of repair or replacement. User's refusal to accept the tender terminates Steam-Whirl Products's warranty obligation

### CAUTION

To prevent possible electrical shock or equipment damage, disconnect electrical power to the unit before and during installation. **DO NOT** restore electrical power to the unit until the control is properly installed and the cover is assembled. **DO NOT** locate the control in an explosive atmosphere as a safety hazard can result due to possible spark generation in the control. Control is not to be located in areas of significant moisture, dirt or dust or in a corrosive atmosphere. Use the control in such environments may result in injury or damage to the persons or property (or both) and are likely to shorten the control life.

**STEAM-WHIRL PRODUCTS assumes no responsibility for any such use.**

