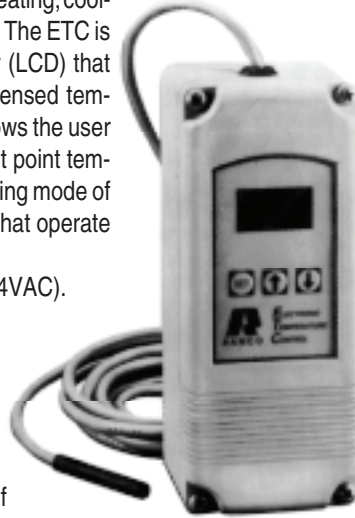


# ETC TWO STAGE ELECTRONIC TEMPERATURE CONTROL

## PRODUCT DESCRIPTION

The Ranco ETC is a microprocessor-based family of electronic temperature controls, designed to provide on/off control for commercial heating, cooling, air conditioning and refrigeration. The ETC is equipped with a liquid crystal display (LCD) that provides a constant readout of the sensed temperature, and a touch keypad that allows the user to easily and accurately select the set point temperature, differential and heating/cooling mode of the operation. Models are available that operate on either line voltage (120/208/240 VAC) or low voltage (24VAC).



## APPLICATIONS

With its wide temperature setpoint range and selectable heating or cooling modes, the ETC can be used for a wide variety of applications including multiple compressor control, two stage heating, ventilation control, automatic changeover, condenser fan cycling, space and return air temperature control, water cooled condensers and control with alarm function.

## FEATURES

- Wide setpoint temperature range (-30°F to 220°F) and differential adjustment (1°F to 30°F).
- Simple keypad programming of setpoint temperature, differential and cooling/heating modes.
- Two individually programmable stages for heating and/or cooling.
- LCD readout of sensor temperature, control settings, relay status and onboard diagnostics.
- Remote temperature sensing up to 400 feet.
- Two SPDT output relays.
- User-selectable Fahrenheit/Celsius scales.
- Lockout switch to prevent tampering by unauthorized personnel.
- Choice of line voltage and low voltage models available.
- Optional 0 to 10 volt analog output available for remote temperature indication.

## SPECIFICATIONS

Input Voltage	120 or 208/240 VAC (24 VAC optional), 50/60 Hz
Temperature Range	-30°F to 220°F
Differential Range	1°F to 30°F
Switch Action	SPDT
Sensor	Thermistor, 1.94 in. long x 0.25 in. diameter with 8 ft. cable
Power Consumption	120/208/240 VAC : 100 milliamps 24 VAC : 2-6 VAC

## Relay Electrical Ratings

	120V	208/240V
<b>NO Contact</b>		
Full-load amps	9.8 A	4.9 A
Locked rotor amps	58.8 A	29.4 A
Resistive amps	9.8 A	4.9 A
Horsepower	1/2 hp	1/2 hp
<b>NC Contact</b>		
Full-load amps	5.8 A	2.9 A
Locked rotor amps	34.8 A	17.4 A
Resistive amps	5.8 A	2.9 A
Horsepower	1/4 hp	1/4 hp

Pilot Duty: 125 VA at 120/208/240 VAC

### Control Ambient Temperature

Operating	-20°F to 140°F (-29°C to 60°C)
Storage	-40°F to 176°F (-40°C to 80°C)
Ambient Humidity	0 to 95%, RH, Non-condensing
0 to 10 V Output Impedance	1K
Enclosure	NEMA 1, Plastic
Agency Approvals	UL Listed, File E94419, Guide XAPX CSA Certified, File LR68340, Class 4813 02

## ETC ORDERING INFORMATION

Code Number	Input Voltage	No. of Stages	0 - 10 V Output
ETC-211000-000	120/240	2	No
ETC-211100-000	120/240	2	Yes
ETC-212000-000	24	2	No
ETC-212100-000	24	2	Yes

## OPERATION

### Liquid Crystal Display (LCD)

The LCD display provides a constant readout of the sensor temperature and indicates if either of the two output relays is energized. When the **S1** annunciator is constantly illuminated during operation, the Stage 1 relay is energized. Likewise, when the **S2** annunciator is constantly illuminated during operation, the Stage 2 relay is energized. The display is also used in conjunction with the keypad to allow the user to adjust the setpoint temperatures, differentials and heating/cooling modes for each stage.

### Control Setup

The temperature setpoint refers to the temperature at which the normally open (NO) contacts of the output relay will open. Determine the loads to be controlled and the operating modes required for each stage, cooling or heating.

- When the cooling mode is chosen, the differential is above the setpoint. The relay will de-energize as the temperature falls to the setpoint.
- When the heating mode is chosen, the differential is below the setpoint. The relay will de-energize as the temperature rises to the setpoint.

The ETC two stage control can be set up for two stages of heating, two stages of cooling or one stage cooling plus one stage heating. Refer to Figures 1, 2 and 3 for a visual representations of different control setups.

# TROUBLESHOOTING ERROR MESSAGES

Step	Annunciator	Description	Display
1	F or C	Fahrenheit or Celsius Scale	
2	S1 (blinking)	Stage 1 Setpoint Temperature	
3	DIF 1 (blinking)	Stage 1 Differential Temperature	
4	C1/H1	Stage 1 Cooling or Heating Mode	
5	S2 (blinking)	Stage 2 Setpoint Temperature	
6	DIF 2 (blinking)	Stage 2 Differential Temperature	
7	C2/H2	Stage 2 Cooling or Heating Mode	

## Display Messages

- E1-** Appears when either the up **i** or down **m** key is pressed when not in the 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 a 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°F and 220°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 the control.

# INSTALLATION INSTRUCTIONS

## IMPORTANT

1. All ETC series controls are designed as operating controls 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 the Ranco Terms in any way; and no warranty or remedy in favor of the customer or any other person arises out of these instructions.
4. Ranco ETC controls have been approved by Underwriters' Laboratories as UL Listed; however, approval does not extend to their use for any other purpose. Ranco assumes no responsibility for any unconventional application of its control unless such application has been approved in writing by Ranco.
5. It is the responsibility of the installer and the user to assure that his or its application and use of all Ranco 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.

## Lockout Switch

The ETC 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. (see Figure 4). To disable the keypad, slide the switch to the left **LOCK** position. To enable the keypad, slide the switch to the right **UNLOCK** position. All ETC controls are shipped with this switch in the **UNLOCK** position.

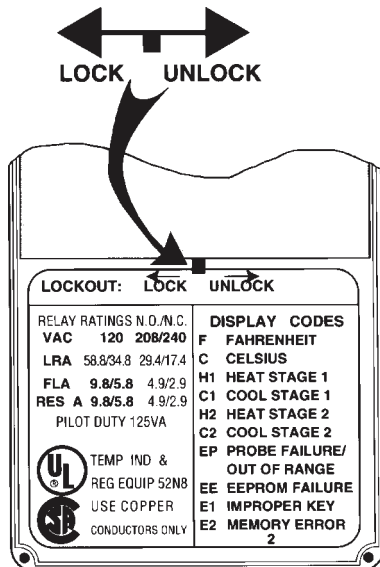


Figure 4: Lockout Switch