



ACL

Manufacturing

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ACL TC200 Temperature Controller

WARNING

This manual must be read in its entirety before installation of this burner. Installation must be performed by a qualified technician and must adhere to the standards set by the local regulatory authorities.

ACL is not responsible for the misuse or incorrect application of this product.

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ACL TC200 Temperature Controller



PRODUCT DESCRIPTION

The TC 200 electronic temperature controller is designed for use in Class 1 Div 2 hazardous locations for accurate batch temperature monitoring and control of industrial heating applications.

FEATURES

- CSA certified for Class 1 Div 2 hazardous locations
- 12-24 VDC or 120/240 VAC supply power
- Operational ambient temperature of -40° to +60° Celsius
- TYPE 4X enclosure and 3 membrane push buttons for trouble free operation
- Easy to read four digit seven segment LED display
- Two type K thermocouple inputs for monitoring two separate locations
- LED indication of thermocouple 1 or 2 values displayed
- Dip switch selectable read out in Celsius or Fahrenheit
- Dip switch selectable thermocouple ranges of -60°C to 1100°C or 0°C to 500°C (-75°F to 2012° F or 32° F to 932° F)
- Dip switch adjustable dead band from 2, 3, 5 and 10 degrees C (4, 6, 10 and 20 degrees F)
- Dip switch enable for each thermocouple
- When making dip switch changes, the new switch selection will flash on the display to confirm what setting has been selected
- Two fail safe relay outputs rated at 5 amps and 250 VAC or 30 VDC
- Two 4-20 mA loop powered isolated outputs
- Isolated RS485 port communication (optional)

PRINCIPLE OF OPERATION

The ACL TC 200 Temperature controller provides trouble free monitoring of two separate thermocouple locations which can be utilized for temperature control in process applications such as tanks, line heaters, re-boilers or any other application where accurate temperature monitoring or control is required.

The two temperature set points can be easily adjusted with the three membrane push buttons and easy to read display with LED indication, on the face of the controller. Easy initial set up can be obtained through dip switch selections for various user preferences.

POWER CONNECTION

The ACL TC 200 Temperature Controller is available in 12-24 VDC & 120/240 VAC. Voltage requirements must be specified when ordering. The supply voltage of each unit is clearly marked inside the door on the specification label and on the circuit board beside its respective terminal. Incorrect polarity on 12-24 VDC units may result in damage to circuit board components. The terminal marked ground is for power supply or system ground.

THERMO-COUPLE CONNECTION

The Type K thermocouple(s) are connected to their respective terminals inside the control box labeled T/C1 (+ & -) and T/C2 (+ & -). The customer may supply their own type K thermocouple or use the manufacturers recommended assembly.

4-20 mA CONNECTION

The 4-20 mA output connections are connected to their respective terminals inside the control box labeled 4-20mA 1 (+ & -) and 4-20mA 2 (+ & -). Each output supplies a separate 4-20mA isolated signal for each of the two thermocouples for process control applications.

RELAYS

Switching is provided by a set of dry contacts that fail open, closing on power up when T/C input is enabled and below set point. Contacts open when the actual temperature reaches the desired user defined temperature set point. Each relay has a separate onboard LED for relay position indication. The contacts have a 5 amp-250V AC (30V DC) rating to accommodate a wide range of different applications.

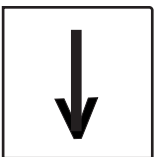
PROGRAMMING SET POINTS



Selects input 1 or 2 on display



Displays and increases temperature set point



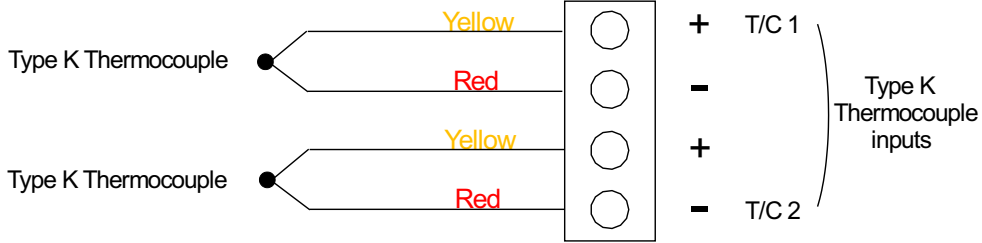
Displays and decreases temperature set point



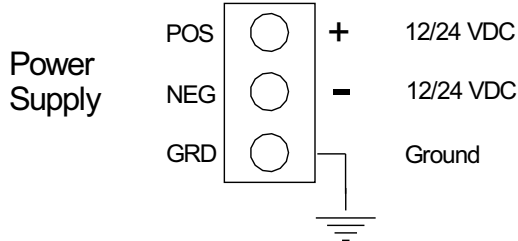
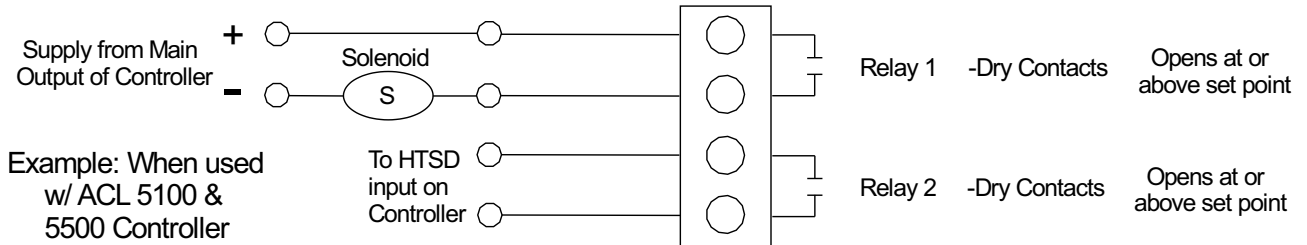
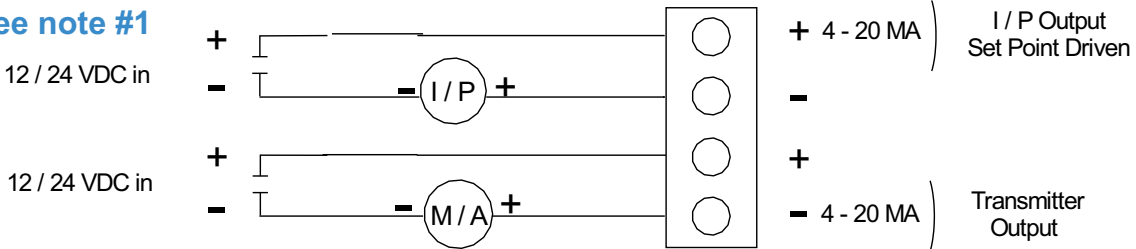
If left with no buttons pushed the display will revert back to show the actual thermocouple temperature reading according to the LED indication.

Display will show (----) when T/C is not enabled through the designated dip switch setting or (OPEN) if T/C is not connected or if its damaged.

Terminal Layout for Temperature Control



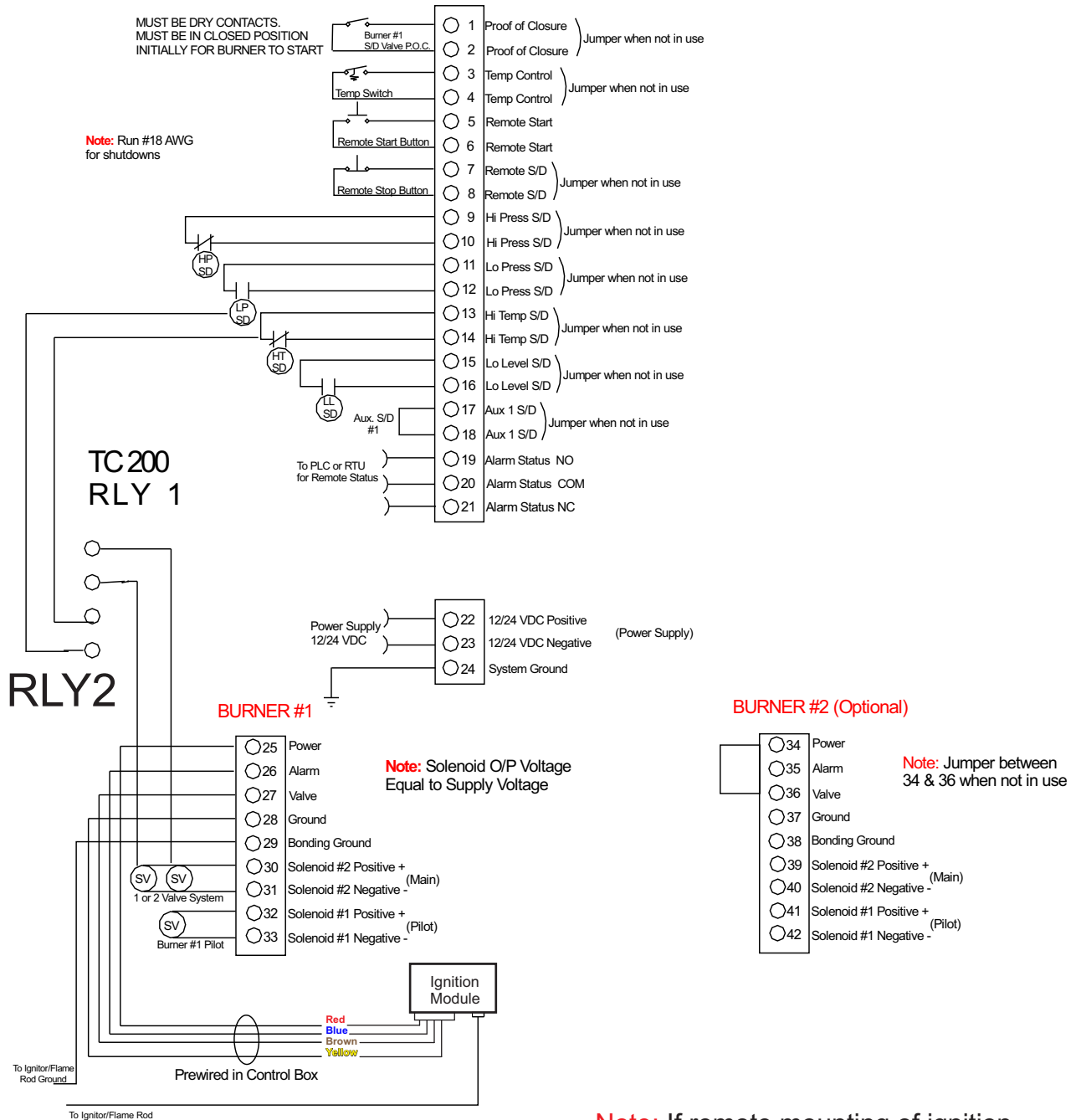
See note #1



Note #1 4-20mA (1) may be programmed to provide 4-20mA from setpoint. See 4-20mA output specifications.

ACL 5500 Combustion Safety Control Example

ACL 5500 12/24 VDC 1 Burner System



Note: If remote mounting of ignition module is preferred, the ACL 5000R remote mount kit is available upon request

Dip Switch Option Chart

Board LEDs	On	SW8	Off
T/C #2 Range	High	SW7	Low
T/C #2 Enable	On	SW6	Off
T/C #1 Range	High	SW5	Low
T/C #1 Enable	On	SW4	Off
Deadband (see chart)	On	SW3	Off
Deadband (see chart)	On	SW2	Off
Display Units	Deg C	SW1	Deg F

High	Minus 60 to 1100 degrees C
	Minus 76 to 2012 degrees F
Low	0 to 500 degrees C
	Minus 32 to 932 degrees F

Deadband Adjustment

SW3	off	off	on	on
SW2	off	on	off	on
Deg C	2	3	5	10
Deg F	4	6	10	20

Switch #8

Selects board LEDs on or off
Display will not show anything for this switch setting change

Switch #7

Selects range for thermocouple #2
Display will show - R2 H or R2 L

Switch #6

Selects thermocouple #2 enable
Display will show - 2 ON or 2 OFF

Switch #5

Selects range for thermocouple #1

Switch #4

Selects thermocouple #1 enable
Display will show - 1 ON or 1 OFF

Switch #3 and #2

Selects deadband
Display will show 2 C, 3 C, 5 C, 10 C or 4 F, 5 F, 10 F, 20 F

Switch #1

Selects Celsius or Fahrenheit
Display will show - U C or U F

4-20 MA OUTPUT SPECIFICATIONS

High Range (-60 to 1100 degrees Celsius) or (-76 to 2012 degrees Fahrenheit)

Thermocouple disabled	Output = 3.5 mA
Thermocouple fault (i.e. Open)	Output = 22 mA
Temperature equal to -60 C	Output = 4.0 mA
Temperature equal to 1100 C	Output = 20 mA

Temperature between the limits is directly proportional to the output signal

Low Range (0 to 500 degrees Celsius) or (0 to 932 degrees Fahrenheit)

Thermocouple disabled	Output = 3.5 mA
Thermocouple fault (i.e. Open)	Output = 22 mA
Temperature equal to 0 C	Output = 4.0 mA
Temperature equal to 500 C	Output = 20 mA

Temperature between the limits is directly proportional to the output signal

(Optional) Output for 4-20mA (1) Deadband set at 10 Celsius

Thermocouple disabled	Output = 3.5 mA
Thermocouple opened	Output = 22 mA
Below setpoint 95 C	Output = 20 mA
Set point 100 C	Output = 12 mA
Above setpoint 105 C	Output = 4 mA



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Limited Warranty

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any product which is found to be defective in such workmanship or material will be repaired or replaced by Seller for a period of one year from purchase date. Warranty of such items do not include shipping, installation or set-up.

Liability Statement

ACL Manufacturing Inc. Shall not be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss of expenses of any nature incurred by the buyer or any third party.

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