

# **Excess Temperature Controller Reference Manual**

**Tempress<sup>®</sup> Systems, Inc.**  
ETC manual  
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# 1.Excess Temperature Controller

## 1.1 Introduction

The Excess Temperature Controller (ETC) is a safety component that monitors the actual temperature and prevents over temperature during the process. It takes over the temperature management from the Digital Temperature Controller (DTC) and brings the furnace temperature to a safe level. One ETC's can control 2 tubes.

In the following paragraphs the function of all buttons will be explained and the adjustment of the ETC (or Digitric 500) will be described step by step.

## 1.2 ETC Description



Figure 1-1 ETC

### Load Zone T1

There are 3 Zones: Load, Center and Source Zone T1 stands for Tube 1, T2 for Tube 2, etc.

PV 1874.0 °C

PV stands for the Process Value. It is the actual measured value. The value 1874.0°C stands for a missing/broken couple. (R-Type) K-Type couple will give a value of 1543°C

AL1

Setpoint maximum temperature for the Loadzone

AL2

Setpoint max. temperature for the Center Zone

AL3

Setpoint max. temperature for the Source Zone



Selected Tube

1 2 3 4

These numbers displays the Tubes that are in Alarm.

In **Figure 1-1**. (Tubes 1 & 2 are in alarm).



This button can be used to reset the alarms. If the ETC is configured as latching, use this button to activate the ETC again.



These buttons are to select the (maximum) temperature.



Tube selection button



Zone selection button

### 1.2.1 Maximum temperature adjustment

When there is no TC connected or the TC is broken, the ETC will display a value of 1874.0°C in case an R-type TC is used. For K-type couple there will be a value displayed of 1543°C.

In Figure 1-1, the Tubes 1 and 2 are both in Alarm. Tubes 3 and 4 are not in Alarm.

#### Step 1.

Make sure the right Tube is selected.

Use the **LOOP** button to select the right tube.



The big number 1 or 2 will change.

Push the button (more then once), to select the right Tube.

#### Step 2.

Make sure the right Zone is selected.

To select the right zone use the **IND** button.



In the screen the zone indication will change. Load Zone, Center Zone or Source Zone.

Push the button (more then once), to select the right Zone.

#### Step 3.

To change the temperature, use the arrow buttons, up or down.

- Pressed once : temperature will change 0,1°C each time the button is pressed
- Keep it pressed : temperature will change more rapidly

### 1.2.2 Configure the number of Tubes

According to the number of tubes and the kind of process the diffusion system contains, the ETC have to be configured for 1, 2, 3 or 4 tubes. For a system with only lowtemp elements 1 ETC is sufficient for a maximum of 4 tubes. For High temp elements a maximum of 2 tubes can be connected to 1 ETC. The ETC contains 3 definable zones per tube:

- Load Zone      First zone from loadside
- Center Zone    Second (or middle) zone from the loadside
- Source Zone    Last zone from the loadside

### 1.2.2.1 Low temp configuration

To configure the right number of tubes see drawing 703200-01 (M510 E-drawings).

1. Check board number 5 for the correct interconnection between contact 1 and 3:
  - 1-3 open = 1,2, 3 Tubes
  - 1-3 closed = 4 Tubes

#### 3 or 4 Tubes

The ETC for 3 Tubes contains the same program as the 4 Tubes configuration. The only difference is the interconnection on board nr. 5.

#### 1 or 2 Tubes

When there is only one process tube available, and the alarm from the other tube may not be displayed, just interconnect the TC inputs on the TC-board.

### 1.2.2.2 High temp configuration

To configure the right number of tubes see drawing 703275-01(-02) (M510 E-drawings). For high temp elements a maximum of 2 tubes can be connected to 1 ETC.

1. For tube 1 and 2, check board number 5 for the correct interconnection between contact 1 and 3
  - 1-3 open = tube 2 only
  - 1-3 closed = tube 1 and 2
2. For tube 2 and 3, check board number 5 (drawing 703275-02) for the correct interconnection between contact 1 and 3
  - 1-3 open = tube 3 only
  - 1-3 closed = tube 3 and 4

### 1.2.3 How to secure the ETC

To secure the ETC for program changes by not authorized personnel, an interconnection can be set on board nr. 5 (see the appropriate drawing) as follows:

- 1-4 open = Not secured
- 1-4 closed = Secured, the most important and destructive menus are not accessible anymore. The option Master Reset is hereby also secured. If this option is selected, the ETC will reset it self, and the program is gone.