



# VUL-CON™ CONTROL BOX *w/DataLogger-w/oDataLogger*

# INSTRUCTION MANUAL



Check us out at  
[www.asgco.com](http://www.asgco.com)

Customer Service  
**800-344-4000**



24 Hour Emergency  
Service and Parts  
610-821-0210

ASGCO Mfg., Inc.  
730 Bangor Road  
Nazareth, PA 18064  
610-821-0216  
FAX 610-778-8991

# **INSTRUCTION MANUAL EC3-WITH DATALOGGER TEMPERATURE CONTROL PANEL**

This manual was prepared to present the correct methods and procedures of operating and maintaining your TEMPERATURE CONTROL PANEL.

***Read this manual carefully before operating your vulcanizer.***

## Table of Contents

|   |              |
|---|--------------|
| <b>1. RECORD OF PURCHASE.....</b>   | <b>3</b>     |
| <b>2. SAFETY.....</b>   | <b>4</b>     |
| 2.1. Definition of Pictograms.....  | 4            |
| 2.1.1. Electrical Hazard.....   | 4            |
| 2.1.2. Burning Hazard.....  | 4            |
| 2.2. Limitation of use.....   | 4            |
| <b>3. ASSEMBLY.....</b>   | <b>5</b>     |
| 3.1. Unpacking.....   | 5            |
| 3.2. Functional Diagram.....  | 5            |
| 3.3. Supply Cable Assembly.....   | 5            |
| 3.4. Connection Assembly.....   | 5            |
| <b>4. OPERATION.....</b>  | <b>6</b>     |
| 4.1. Temperature Control Settings.....                                    | 6            |
| 4.1.1. Setting the Platen Temperature.....                                | 6            |
| 4.1.2. Setting the Cure Timer.....  |              |
| 4.2. Heating the Vulcanizer.....  | 6            |
| 4.3. Cooling the Vulcanizer.....  | 6            |
| 4.4. Temperature Control.....   | 7            |
| 4.5. Changing Celsius to Fahrenheit.....                                  | 7            |
| <b>5. MAINTENANCE.....</b>  | <b>7</b>     |
| 5.1. Opening the Control Cabinet.....                                     | 7            |
| 5.2. Overload Protection.....   | 7            |
| 5.3. Temperature Calibration.....   | 7            |
| <b>6. TROUBLESHOOTING.....</b>  | <b>8</b>     |
| 6.1. No Display on Temperature Controller.....                            | 8            |
| 6.2. Error Display on Temperature Controller.....                         | 8            |
| 6.3. Platens Not Heating.....   | 8            |
| 6.4. Platens Over Heating.....  | 9            |
| <b>7. ARCHIVING DATA.....</b>   | <b>9</b>     |
| 7.1. Instructions to download software to read data from Data Logger..... | 9            |
| <b>8. PROGRAM UPLOADING.....</b>  | <b>10</b>    |
| <b>9. DIFFERENT SCREEN IN CONTROLLER.....</b>                             | <b>10</b>    |
| <b>10. CHANGING UNIT-CELSIUS TO FAHRENHEIT.....</b>                       | <b>11-12</b> |
| <b>11. CHANGING CONFIGURATION.....</b>                                    | <b>12</b>    |



## 2. SAFETY

Your EC3 Temperature Controller has been designed to provide safe, efficient and trouble-free service. Component design and material selection have been carefully considered to ensure operator safety and our manufacturing procedures provide a consistent, high-quality product.

The material that is presented in this operating manual has been compiled to provide direction for operating personnel so that the maximum effectiveness of the temperature controller can be achieved and so that there is a complete understanding of correct operating procedures.

### PLEASE READ CAREFULLY

The following safety precautions should be read carefully and understood thoroughly before you set-up or operate your temperature controller. Failure to follow these precautions may result in personal injury and/or equipment damage. All operating personnel should be trained in the proper operation of the temperature controller.

The risks associated with operating the temperature controller are identified throughout this manual with pictograms.

### 2.1. Definition of Pictograms



**Electrical Hazard**



**Burning Hazard**



#### 2.1.1. Electrical Hazard

1. A qualified electrician should perform all maintenance of the electrical components of the temperature controller.
2. All of the electrical components contain live circuits. Do not open or service any of the electrical equipment without disconnecting the main power supply.
3. Incorrect voltage and phase may result in component damage and create a fire hazard.
4. Equipment power supplies must be properly grounded or a severe shocking hazard may result.
5. Avoid using equipment in wet surroundings or a severe shocking hazard may result.
6. If any cable or connectors are damaged, they must be replaced or a fire and shock hazard may result.



#### 2.1.2. Burning Hazard

There is not a burning hazard with the temperature controller itself, however, improper use or component failure could result in the vulcanizer overheating. Always use an EC3 temperature controller when operating the vulcanizer and never leave the vulcanizer operating while unattended.

### 2.2. Limitation of use

This equipment has been designed to control the temperature of an SUPPLIER conveyor belt vulcanizer. The process of vulcanizing is done by applying a combination of heat and pressure on the product for a certain period of time. The temperature controller operates within a range of 0 °C to 190 °C (32 °F- 374 °F) though a maximum of 325°F (163 °C) is recommended for long life of heating element and platen insulation. Refer to the vulcanizer manual for platen limitations. An EC3 temperature controller must be used with vulcanizer and the vulcanizer should never be allowed to operate while unattended. Other use is not allowed without the written permission of SUPPLIER.

## 3. ASSEMBLY

### 3.1. Unpacking

Carefully unpack temperature control panel from the crate and inspect for damage. Any damages or shortages should be reported to the carrier and / or supplier.

### 3.2. Functional Diagram

### 3.3. Supply Cable Assembly

**Safety:** Ensure the voltage, phase and cycle on the temperature controller serial plate are the same as the power supply.

Figure 1 Functional Diagram



1. The power supply cable with your temperature controller is fix on one end and open at other or with plug and junction box for multiple platen system. The customer must supply a connector for the other end or the cable can be connected directly to a power supply.

2. When connecting the power supply cable, ensure the green wire is connected to ground.

### 3.4. Connection Assembly



**Safety:** Ensure the voltage, phase and cycle on the temperature controller serial plate are the same as the power supply. Switch the top and bottom platen controller to the OFF position.

1. Connect the platen cables to the temperature controller and the vulcanizer. Press the plugs firmly into the receptacles, making sure that they are inserted to the full depth of the receptacle. Rotate the latches to secure the plugs. When removing the plugs, ensure the controllers are switched off and pull the connector out straight or damage to the pins may result.
2. Connect the temperature control panel to a power supply at the voltage indicated on the serial plate and in the record of purchase. The controllers should indicate the actual platen temperature and the set point temperature.

## 4. OPERATION

The temperature control panel has single temperature controllers, one for the top platen bottom platen. Temperature controller displays the actual platen temperature of top and bottom platen, and the set point of top and bottom platen which is the desired temperature. This controller also display cure time, elapsed cure time and actual pressure.

### 4.1. Temperature Control Settings

In temperature controller keys are: HOME KEY, ENTER KEY, DOWN KEY, UP KEY.

#### 4.1.1. Setting Platen Temperature

To set the required temperature of top and bottom platen. Go to platen process overview. Press the ENTER BUTTON, then by  $\wedge$  or  $\vee$  key go to required change, enter the set point and say yes for required set point. This can be changed anytime but should be done before beginning to heat.

#### 4.1.2. Setting the cure timer

Go to cure time, select it and raise or lower by up and down key. Finally push enter key to set the time. Time format is in Hours: min: Second.

The timer displays a COUNTING of time after reaching set temperature of top and bottom platen.

Figure 2



Home Enter Down Up



### 4.2. Heating the Vulcanizer

**Safety:** Never heat the vulcanizer unattached.

**Important:** There should be no cooling water in the platen or the temperature will be uneven.

1. The vulcanizer should be pressurized to at least 5 psi (0.3 kg/sq.cm) before heating.
2. Turn the selector switch to the 'A' (AUTO) position to begin heating the vulcanizer. The platen temperature indicator value will begin to increase as the platen temperature rises.



**Safety:** The platen will begin to get hot.

3. Stem thermometers should be inserted into the hole in the platen edge as a secondary means of monitoring the temperature. The temperature will not necessarily read the same as the temperature controller because of differences in calibration.
4. When the temperature approaches the set point, the contactor will switch on and off to maintain set value temperature. The timer will begin counting cure temperature of both platen is reached.
5. After the cure time has elapsed, power will be shut off to the platens and the alarm will sound.
6. Turn the switches to off position to stop the heating and alarm/buzzer. Switch the timer reset button to reset time for next cycle..

### 4.3. Cooling the Vulcanizer

If cooling is required turn the platen switches to 'O' (OFF). This switches the power to the platens off but the temperature display will remain on so the temperature can be monitored.

#### 4.4. Temperature Control

1. Temperature control is effected by a P.I.D. (Proportional Integral Derivative) solid state temperature controller which senses the resistance change in an RTD (Resistance Temperature Device) probe in each platen. The controller should maintain temperature at the set point  $\pm 3^{\circ}\text{F}$  ( $2^{\circ}\text{C}$ ) at  $300^{\circ}\text{F}$  ( $150^{\circ}\text{C}$ ).
2. The temperature controller incorporates a proportioning circuit that causes the platens to reach set point temperature in a minimum of time with less than  $2^{\circ}\text{F}$  ( $1.1^{\circ}\text{C}$ ) of temperature overshoot. In operation, the controllers will begin cycling off and on slightly below set point. During this initial cycling period, the temperature will continue to rise to the set point as indicated by the temperature controllers. This early cycling is a normal function of the controller and should not be reset, otherwise excessive temperatures will occur.
3. The parameters can be adjusted so that set point is reached in the fastest possible time (straight line heating) but this will cause the temperature to overshoot the set point by several degrees. Alternatively, the parameters can be adjusted so there is zero overshoot but the rate of heating will decrease as the set point is reached. If you wish to fine tune your controller in either of these ways contact **SUPPLIER** for advice.

#### 4.5. Changing Celsius to Fahrenheit ( "C" to "F" ) see page 11-12

1. Login to "**Engineer**" with Default Password "**100**"
2. Go to "**Channel**" Select Channel "**1**"
3. Select "**Main**" Go to "**Range Units**"
4. Select "**C**" or "**F**"
5. Please follow the same procedure for Channel "**2**"

*\*\*While changing from Celsius to Fahrenheit Kindly Change the Temperature High Range according to your belt type.*

### 5. MAINTENANCE

#### 5.1. Opening the Control Cabinet

To access the circuits in the control box, a Phillips head/Flat head screwdriver is required.

**Safety:** Disconnect the power supply.

1. Remove the screws from the top panel.
2. Remove the top panel to access the circuits.

#### 5.2. Overload Protection

The control circuit is protected with a fuse mounted on the front panel of the cabinet.

The platens are protected with MCB.

The control cabinet must be opened to inspect the circuits.

#### 5.3. Temperature Calibration

After replacing a temperature controller, a platen temperature sensor or a platen-heating element the temperature controller should be calibrated to achieve the best performance. Failure to calibrate the controller with the vulcanizer will result in temperature over shoot and the temperature control will be less precise.

**Note:** The temperature controller is a snap in module that can be replaced without any tools, and is a recommended spare part. If you have ordered a spare controller, it will be factory set to an average value that will control your platen reasonably well. Accurate calibration should still be done as follows. An external means of checking the platen temperature is required. A portable temperature test meter with at least two leads is best to conduct the calibration tests. An approved type may be purchased from **SUPPLIER**.

1. Install a section of belting large enough to cover the platen area.
2. Install the temperature meter sensors above and below the belting approximately 8" (200 mm) in from the platen electrical connector. Cut a groove in the belting to prevent damage to both sensors and platens.
3. Assemble the vulcanizer and pressurize to 5 psi (0.3 kg/cm<sup>2</sup>) maximum.





## 6. TROUBLESHOOTING

This controller has many capabilities other than those used for the EC3 Temperature Control Panel. Adjust only those settings described above. Other adjustments may result in the control box being inoperable. For detailed instruction of the EURO THERM controller. A qualified electrician should do any electrical circuit work.

### 6.1. No Display on Temperature Controller

| Fault                               | Correction   |
|-------------------------------------|--|
| 1. Power supply faulty.             | 1. Check the supply cables and correct the power supply. |
| 2. Control circuit fuse has opened. | 2. Replace control circuit fuse.                         |

### 6.2. Error Display on Temperature Controller

| Fault   | Correction   |
|---|--|
| 1. Loose connection in cable or platen connector. | 1. Remove electrical connector insert from housing and tighten all connections.  |
| 2. RTD temperature sensor faulty                  | 2. Measure the resistance between pins 4-5 and 4-6 on the platen electrical connector. Depending on the platen temperature, the resistance should be between 100-170 Ohms. Replace probe as described in the vulcanizer manual. The leads should be protected from moisture by using a small amount of silicone in the back of the insert terminal to seal the connection. |

### 6.3. Platens Not Heating

| Fault   | Correction  |
|---|---|
| 1. Power supply faulty.                           | 1. Check power supply.  |
| 2. Platen switch set to 'O' (off).                | 2. Turn platen switch to 'A' (AUTO).  |
| 3. Temperature set improperly.                    | 3. Ensure that controller set point is correct  |
| 4. No continuity between power supply and platen. | 4. Check power supply and fuses (inside panel) and cable connections.   |
| 5. Loose connection in control panel.             | 5. Disconnect power supply, remove control box cover and check for loose wire connections.  |
| 6. Faulty temperature controller.                 | 6. Refer to Omron instruction manual.   |
| 7. Loose connection in cable or platen connector. | 7. Remove electrical connector insert from housing and tighten all connections. The leads should be protected from moisture by using a small amount of silicone in the back of the insert terminal to seal the connection.  |
| 8. Faulty RTD temperature sensor.                 | 8. Measure the resistance between pins 4-5 and 4-6 on the platen electrical receptacle. Depending on the platen temperature, the resistance should be between 100-170 Ohms. Replace probe as described in the vulcanizer manual. The leads should be protected from moisture by using a small amount of silicone in the back of the insert terminal to seal the connection. |

### 6.3. Platens Not Heating...continue

| Fault                      | Correction   |
|----------------------------|--|
| 9. Faulty heating element. | 9. Measure the resistance between pins 1-2, 2-3, and 1-3 on the platen electrical receptacle. Compare the reading with the value in your Record of Purchase, Element Resistance, Coils Connected. If the values are not close and the wires and connections are good, the element must be replaced. The leads should be protected from moisture by using a small amount of silicone in the back of the insert terminal to seal the connection. |

### 6.4. Platens Over Heating

| Fault                             | Correction  |
|-----------------------------------|---|
| 1. Temperature set improperly     | 1. Ensure that controller set point is correct.   |
| 2. Faulty temperature controller  | 2. Refer to controller instruction manual.  |
| 3. Faulty RTD temperature sensor. | 3. Measure the resistance between pins 4-5 and 4-6 on the platen electrical receptacle. Depending on the platen temperature, the resistance should be between 100-170 Ohms. |

## 7. CONTROL BOX WITH DATA LOGGER ONLY: ARCHIVING DATA

This controller has memory to save historical data.

Procedure to archive the historical data thru USB PORT.

1. Insert (2.0gb or less) USB into data logger port.
2. Go to access menu.
3. In access menu select **“Operator”**.
4. Then go to Demand Archiving
5. In demand archiving menu, select archive to USB.
6. Then select Archive such as last hour, last day, last week or All.
7. It will show archiving. Be sure the USB is insert in USB port.

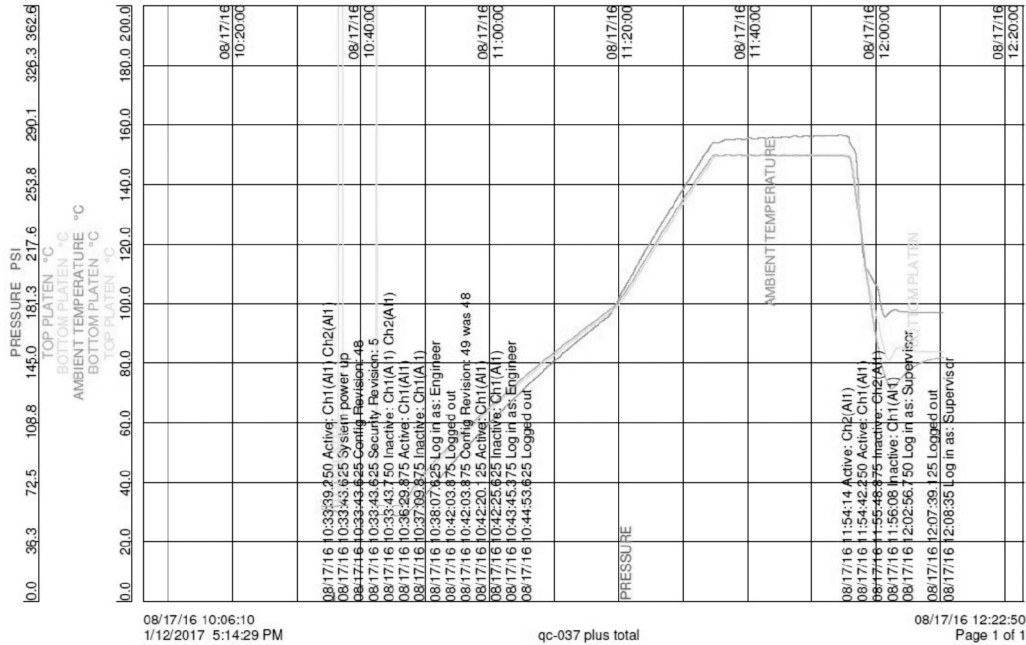
When it complete take out the USB to see the data in computer.

Please be sure to logout after archiving data.

### 7.1. Instructions to download software needed to read Data Logger information from Vul-Con Control Box on PC

- Go to [www.eurotherm.com](http://www.eurotherm.com)
- Select Downloads
- Scroll until “6000 Series Tools Installer V5.7
- Download this program
- Create your name for a folder to store install
- Choose all Defaults when prompted
- Look in your all programs section for the “Review Quick Start” program
- Create shortcut and locate on your toolbar or desktop if you chose
- Insert Thumb Drive which has the downloaded information from the Vul-Con™ Control Box into your computer USB drive
- Open the Review Quick Start program
- File>New Quick Start>from removeable media
- Choose source of USB
- Choose Default “ALL”

## 7. CONTROL BOX WITH DATA LOGGER ONLY: ARCHIVING DATA...continue

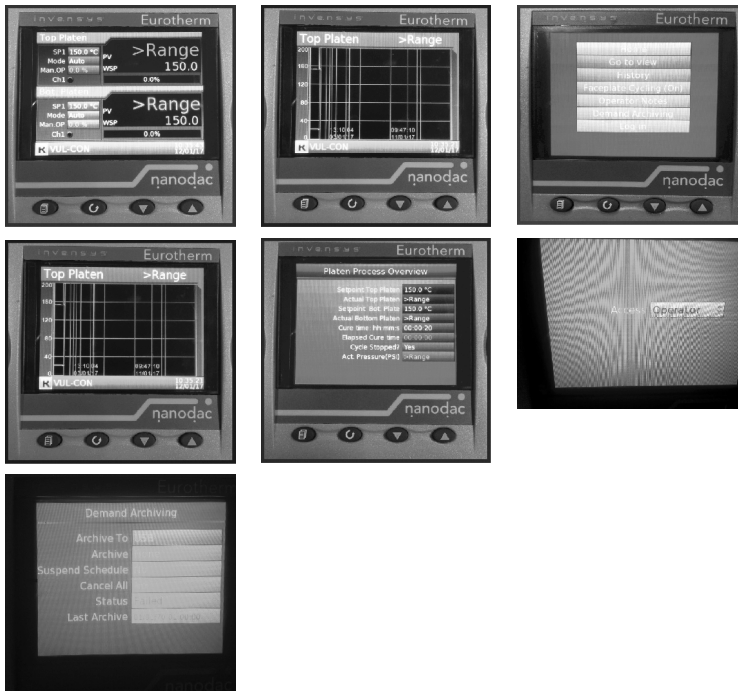


## 8. ADDING PROGRAM THRU COMMUNICATION PORT

Backup or new program can be added in controller using communication port.

## 9. DIFFERENT SCREENS ON CONTROLLER/DATALOGGER

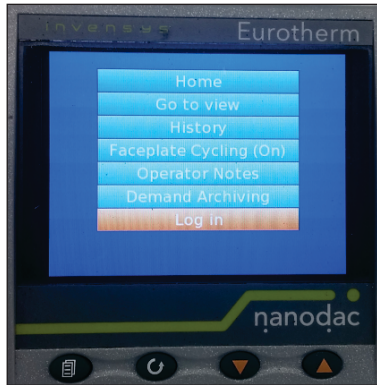
Different screens on controller/datalogger



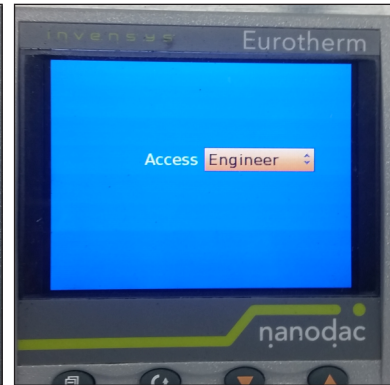
## 10. CHANGING UNIT-CELSIUS TO FAHRENHEIT



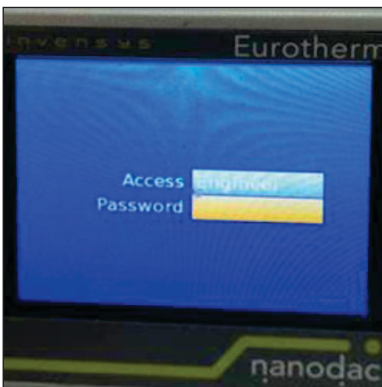
1. Home



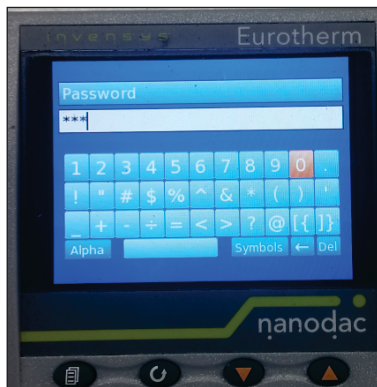
2. Log in



3. Engineer

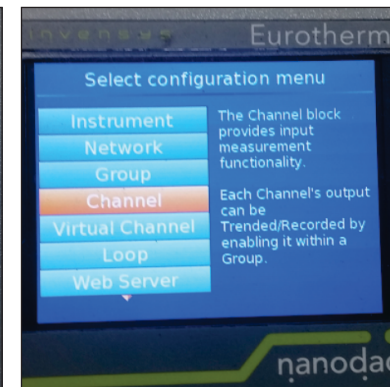


4. Password

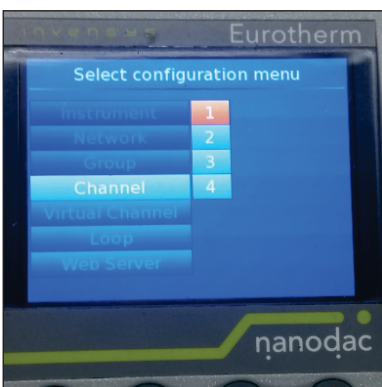


5. Password: **ASGCO100**

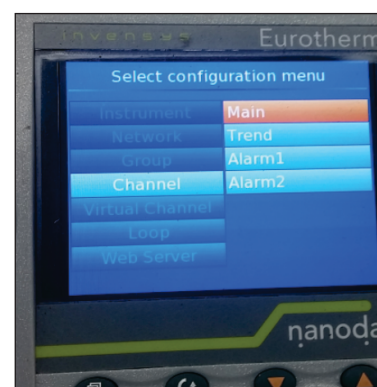
*\*Please see important message below*



6. Go to Channel



7. Select Channel 1

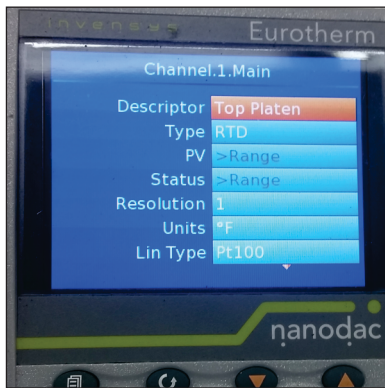


8. Select Main

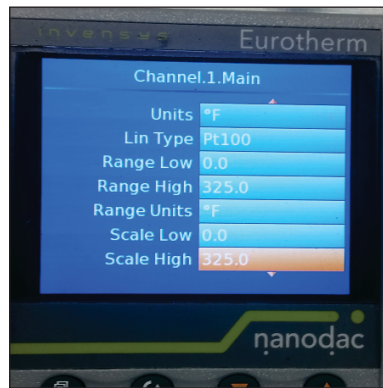
*\*Control boxes supplied after 9/1/2022 will have the engineering password of “**ASGCO100**” in capital letters password is case sensitive.*

*Older units have the simple password of “**100**” for the engineering password.*

## 10. CHANGING UNIT-CELSIUS TO FAHRENHEIT....



9. Select **Top Platen**

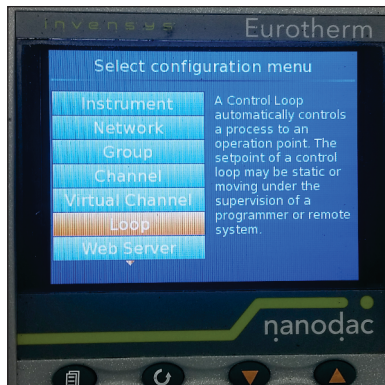


10. Scroll Down to **Range Units**  
 11. Change “°C” to “°F”  
 12. After making changes go back to **Select Configuration Menu** select **Chanel - 2**, repeat the same procedure.

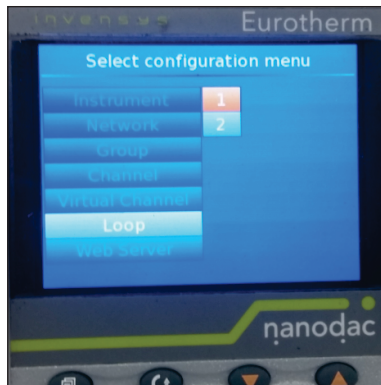
### Note

Unit is originally set in **Range Units °C** and **Range High 200°** when changing **Range Units to °F** change **Range High to 375°**

## 11. CHANNEL CONFIGURATION



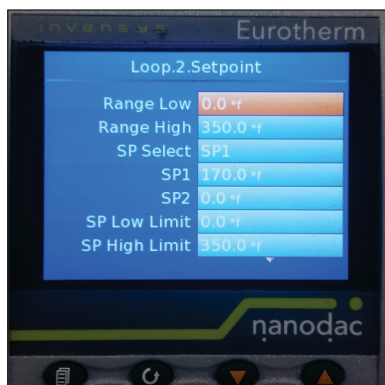
1. Go to **Select Configuration Menu** select **Loop**



2. Select **1**



3. Select **Setpoint**



4. Go to **Range High** set the cook limit to be set **10 degrees higher** then your cook temp. Then back out and do the same for **Channel 2**. Then log out.