



## CONTROLLER INSTRUCTIONS

### GREASE BOSS 216 CONTROLLER PROGRAMMING AND CUSTOMISATION

#### Controller

The Crouzet M3 controller is used to control the Grease Boss and includes a real time clock. The controller switches the motors and heaters via relays.

#### Correcting the controller clock and date

Remove the electrical controls cover to access the buttons along the lower edge of the controller.

1. Using the (+) or (-) buttons select the parameter you want to change. The parameter will be highlighted by inverse video.
2. Press the "OK" button to edit that parameter. Increment or decrement the number using the (+) or (-) buttons.
3. Accept the edit by pressing the "OK" button again or abort using the "ESC" button.

#### Default Mode

The Grease Boss is in "Fat Extraction" mode by default with the extraction cycle beginning at 1:30am. When the cycle begins the Grease Boss will heat until reaching the correct temperature at which time the extraction cycle will continue for a period of 2 hours.

#### Controller Set Up Screens

Screen 1 – Setup landing point.

Screen 2 – Input/Output Status screen.

Screen 3a – Access Code entry screen.

Screen 3b – Access Code accepted screen.

Screen 4 – Sensor Calibration screen.

Screen 5 – Heater Control screen.

Screen 6 – Roller Run Range screen.

Screen 7 – Roller Cycle screen.

Screen 8 – No Longer Used

Screen 9 – Motor Run Meter screen.

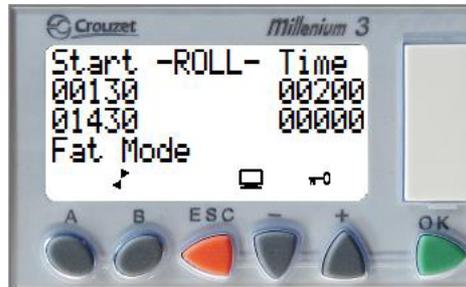
Screen 10 – Fat Mode Selection

Screen 11 – Cycle Start Time and Duration screen.



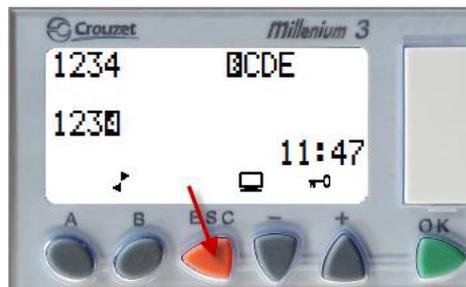
## Entering the Setup Screens

1. Press and hold the "FAULT" button to display Screen 1.



Screen 1

2. To move between screens, press button "A" to advance, and button "B" to reverse. The "ESC" button returns to screen 1.



Screen 2

At any time from any screen if the "ESC" button is pressed and held the Input/Output status is displayed. In the example above, input B is on and output 4 is on. Pressing the "ESC" button to exit and the the screen will revert to screen 1.

## Access Code

Access to subsequent screens is blocked until the correct access code is entered.



Screen 3a

1. To edit the Access Code press the “OK” button to highlight the first number
2. press the (+) or (-) to change the number
3. Press OK again to accept the entry and highlight the next number
4. The access code is -6651. The access will be reset after 10 minutes of inactivity or by pressing the “ESC” button.



Screen 3b

5. Once the correct access code has been loaded you should see the “Open” display.
6. Press “A” to continue to the setup screens.

## Sensor Calibration

The Sensor Calibration screen is used to calibrate the temperature probe(s) by editing the “Calibration Offset” number.



Screen 4

1. To calibrate the controller a 0.25 watt 1% 10k ohm metal oxide resistor is installed between the controller and terminal and the input IB.
2. The NTC probe must NOT be installed during calibration.
3. When the 10k ohm resistor is installed adjust the offset to read 25°C.
4. *Default = 00017.*

## Heater Control

The Heater Control screen sets the heater control band during the time clock ON period. It is **CRITICAL** to set the OFF value higher than the ON value.



Screen 5

1. "Limit HH:MM" is the time limit given for the element to heat the tank to the "Roller Running" temperature before showing an "Element??" fault.
2. When setting this time allowance should be made for the coldest ambient expected.
3. This setting is for the heater element control and does not relate to the roller operating range (see screen 6).
4. Default,
  - a. On when temperature is less than 48°C.
  - b. Off when temperature is greater than 55°C.
  - c. Time limit 1hr:30mins.

## Roller Run Range

The Roller Run Range screen sets allowable operating temperature range for the roller. It is **CRITICAL** to set the MAXIMUM greater than the MINIMUM.

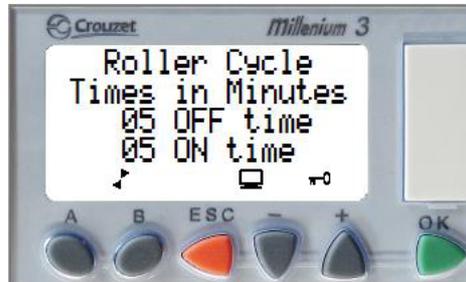


Screen 6

1. If the tank is cooler than "Min Oil" and the Mode is for "Oil" and the selected time period is on, then the heater will come on until the tank warms to greater than "Min Oil" value before enabling the roller and starting the roll time.
2. If the tank is cooler than "Min Fat" and the Mode is for "Fat" and the selected time period is on, then the heater will come on until the tank warms to greater than "Min Fat" value before enabling the roller and starting the roll time.
3. Default,
  - a. Maximum temperature 85°C.
  - b. Minimum Fat temperature 42°C.
  - c. Minimum Oil temperature 2.5°C.

## Roller Cycle

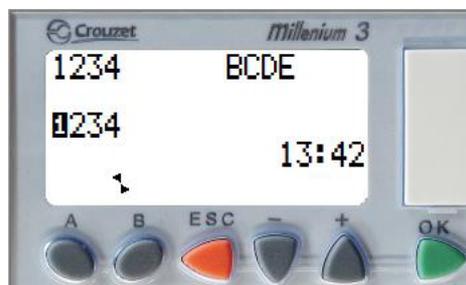
While the temperature is in the Roller Run Range the rollers run and rest on a continuous cycle based on the times set in the Roller Cycle screen. Note: the times are in minutes.



Screen 7

1. Default
  - a. 5 minutes ON.
  - b. 5 minutes OFF.

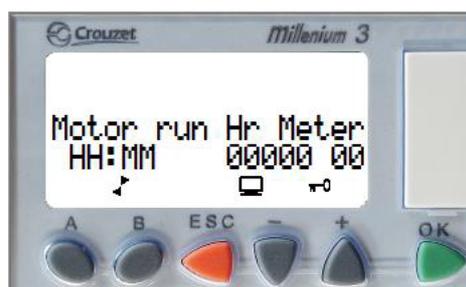
## No Longer Used



Screen 8

## Motor Run Meter

The bottom line of the Motor Run Meter screen displays the elapsed run time in hours and minutes.

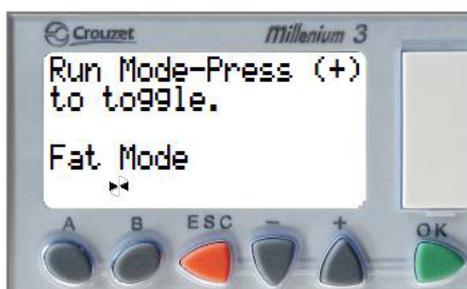


Screen 9

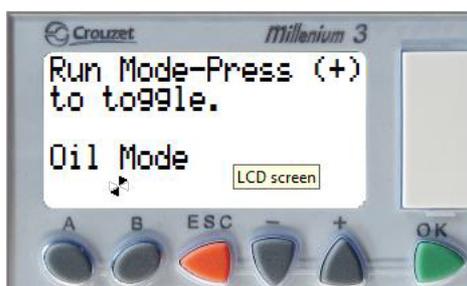
1. The hour meter can be reset to zero when access is allowed and buttons (+) and (-) are pressed together in this screen.
2. The number cannot be edited.

## Fat/Oil Mode Selection

The Fat/Oil Mode Selection screen(s) changed the operation of the Grease Boss between Fat and Oil operating modes.



Screen 10 Fat Mode

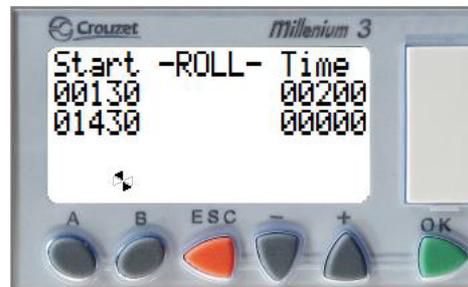


Screen 10 Oil Mode

1. Use the (+) button to change the mode between Fat and Oil.
2. The User can check the mode status by pressing and holding the "FAULT" button.

## Cycle Start Time

This Cycle Start Time screen sets the active cycle(s) start time and duration.



Screen 11

1. One active cycle (00130) is enabled by default, and one other cycle (01430) can be added if required.
2. The second cycle will only become active when the Time duration is greater than 1.
3. The times are in 24-hour format. 0000 through 2359 (23 hrs 59 mins) for the start time and 0000 through 0759 (7 hrs 59 mins) for the run time.
4. Note: The default entry of "00130" and "00200" will start at 1:30am and run the roller for 2:00hrs after the tank is up to temperature.
5. Note: The system will accept a "minute" entry greater than 60. For example, an entry of 0378 will run for 3 hours and 78 minutes for a total of 258 minutes.
6. Note: An entry of "00000" in the "Time" disables the associated time zone.
7. Note: DO NOT ALLOW A CYCLE DURATION TO EXCEED THE NEXT CYCLE START TIME.

## Service Checks

Tests should only be carried out by a qualified service person. Before carrying out any service checks ensure that the appliance has a current Electrical Safety Tag. If an electrical fault is suspected, then use a PAT to carry out an Earth Continuity and Earth Leakage test.

### Push Button Indicators Operational Check

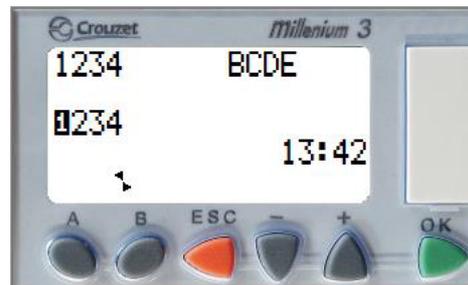
The push button indicators are accessible to the user for testing the heater or roller and for resetting any fault message. Whenever the tank lid is lifted the tank will not run until the lid has been replaced and the "FAULT" button has been pressed to reset the system.

The indicator will light up whenever the "ROLLER", "HEATER", or "PUMP" is running. The indicator is driven from the associated relay. The "FAULT" indicator is driven directly by the controller.

The buttons and indicators run at 24vDC and are not intended as a field service item. The indicators are LED based. The buttons are a momentary action only and do not latch.

The Push Button Indicators can be functionally checked from the controller.

1. Press the controller ESC button and the respective buttons above to see the following display.



Screen 2

2. The upper numbers 1234 should highlight when the relevant button is pressed. i.e. 1=FAULT, 2=ROLLER, 3=HEATER, 4=PUMP

### Emptying the Tank with Pump Function (if fitted)

The pump will only run continuously during the 5-hour period after an extraction cycle. However, the 5-hour pump enablement period can be initiated by starting and stopping an extraction cycle manually.

1. Start the cycle by pressing and holding the "FAULT" button and the "ROLLER" button at the same time for 10 seconds.
2. Stop the cycle by pressing and holding the "FAULT" button and the "HEATER" button at the same time for 10 seconds
3. The manual start/stop of the extraction cycle will enable the pump functionality for the following 5 hours.

## Temperature Sensor Check

The sensor can be found attached directly to the side of the tank under the controller mounting bracket.

### Initial Test with the power on

1. Place your reference thermometer inside the tank at about the same depth as the tank temperature sensor (about 1/3 from the bottom) and compare the reading on the controller display.
2. The readings should be within 6°C. A variation may exist if there are temperature differentials within the water. Mix the tank water and recheck.
3. The temperature sensor is a NTC thermistor with a nominal resistance of 10k ohms at 25 C and can be measured with a standard multi-meter on the ohms range.

### Second test with the power off.

1. Remove the thermistor connection from terminal "IE" on the controller and measure the ohm reading between the removed wire and tank earth or controller (+)
2. Place your reference thermometer inside the tank at about the same depth as the tank temperature sensor (about 1/3 from the bottom). Typical readings should be close to the following:
  - a. 0°C 32,000 ohms
  - b. 10°C 20,000 ohms
  - c. 20°C 12,500 ohms
  - d. 30°C 8,110 ohms
  - e. 40°C 5,400 ohms
3. A failed sensor is most likely to exhibit a short circuit or an open circuit (100k ohm or greater).
4. Check for a loose connection that could give erratic readings and possible FAULT messages such as "TOO HOT" or "Sensor Hi".
  - a. The "TOO HOT" message should only show if the tank is near boiling or greater than 85°C
  - b. The "Sensor Hi" message suggests an open circuit or bad connection.
  - c. The "Sensor Lo" message suggests a short circuit or failed sensor.

## Heater Element Check

The heater is used to heat the tank in FAT mode. To check which mode the tank is operating in press the "FAULT" button and see the displayed mode. The heater is a 2kW mineral insulated immersion type screwed through the side of the tank and found under the controller bracket.

1. The element can be turned on for testing for up to 5 seconds at any time by pressing the "HEAT" button (even if the lid is open). Do not test the element dry. It must be covered with water or may be damaged.
2. If the heater is working you should be able to detect the increase in heat.
3. Check the current draw from the element.
  - a. Normal operation should be 8.7 amps.
  - b. If it is more than 9.5 amps the element is suspect.
  - c. If it less than 7.5 amps the element is suspect.
  - d. Check to see if a 1kW element has been fitted in error.

