Touchclave Ecotech

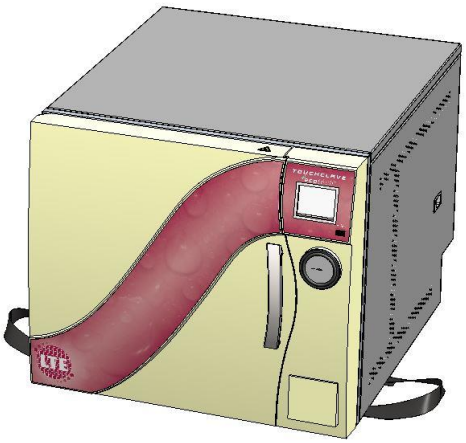
User Manual

Issue C

www.lte-scientific.co.uk

Product information

Product Description: Touchclave Ecotech 40/60 Litre



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Contents

Warning

Before using/ maintaining the autoclave, the user must note the following:

- Machine **MUST** be earthed, protective earth connection for the machine is provided using the 13A plug fitted to the machine.
- Ensure the Water feed, drain and electrical connections to the machine have been fitted to before attempting to operate the autoclave.
- Water feed should meet the pressure and conductivity specification required for correct operation of the autoclave.
- Autoclave should be positioned in such a way that allows easy disconnecting of the device from the electrical supply.
- Autoclave should only be operated and maintained by personnel that have been trained in its operation and safe use. This manual is **NOT** intended as a substitute for such training.
- It is the duty of the Responsible Body (individual or group responsible for the safe use and maintenance of equipment) to ensure that all operators and service/ maintenance engineers required to use/ maintain this equipment are regularly trained in the safe use and maintenance of the autoclave. Records of the training are to be kept accordingly. "LTE Scientific Ltd." are not responsible for such training.
- On completion of a sterilisation cycle the load inside the chamber will potentially be at a temperature as high as 80^{o}C. Operators must therefore ensure that appropriate precautions are made to prevent to prevent risk of injury when removing the load from the chamber (use of heat resistant gloves etc.).
- Do not attempt to autoclave materials that boil below 85^{o}C.
- Ensure correct lifting and moving methods of the load are followed as identified by the Responsible Body/ Lab Manager.
- Do not attempt repair or maintenance of the autoclave with the machine connected to the electrical power supply, machine should be fully disconnected from the electrical power supply before **ANY** attempt to repair or maintain the autoclave is made. Failure to disconnect the autoclave from the electrical power supply could result in electric shock.
- Ensure that the electrical plug is easily identifiable and can easily be reached in order to disconnect the machine from the electrical supply.
- Do not attempt repair or maintenance of the autoclave immediately after a sterilisation cycle has completed. The autoclave should be left to cool down to room temperature before any repair or maintenance task is attempted. Failure to do so could result in injury to the operator/ maintenance engineer.
- This equipment is NOT to be used in potentially explosive environments.
- Touchclave Ecotech should only be used with accessories that are approved by LTE Scientific.
- Touchclave Ecotech should not be used in any other way other than as described in the user manual.
- Electrical Plug and socket should be readily identifiable and easily reached by the operator.

Section 1- General Information

1.1 Installation

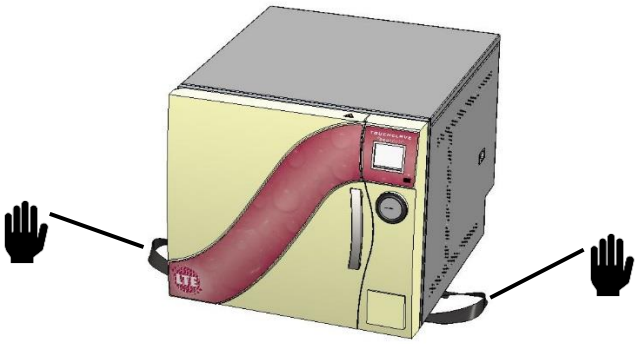
Manual Handing

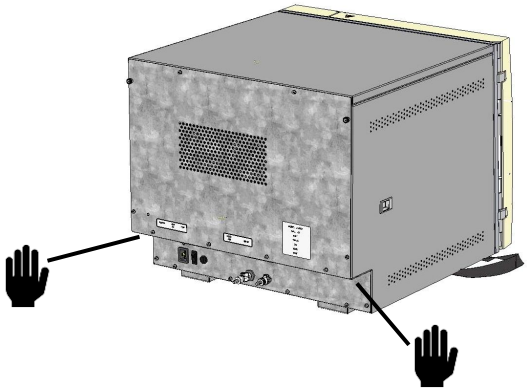
Lifting Straps are provided to aid lifting of the autoclave. Always be sure to follow manual handling guidelines when lifting equipment, ensuring the correct number of people are lifting the autoclave and the correct Personal Protective Equipment (PPE) is worn. The Touchclave Ecotech is a steam steriliser and so contains a pressure vessel making this product is very heavy.

Note: It is the customer's responsibility to ensure that safe manual handling practices are followed when lifting and transporting this product (Touchclave Ecotech).

Lifting Points

Lifting points illustrated using (Hand icon).





Water Feed and Drain Connections

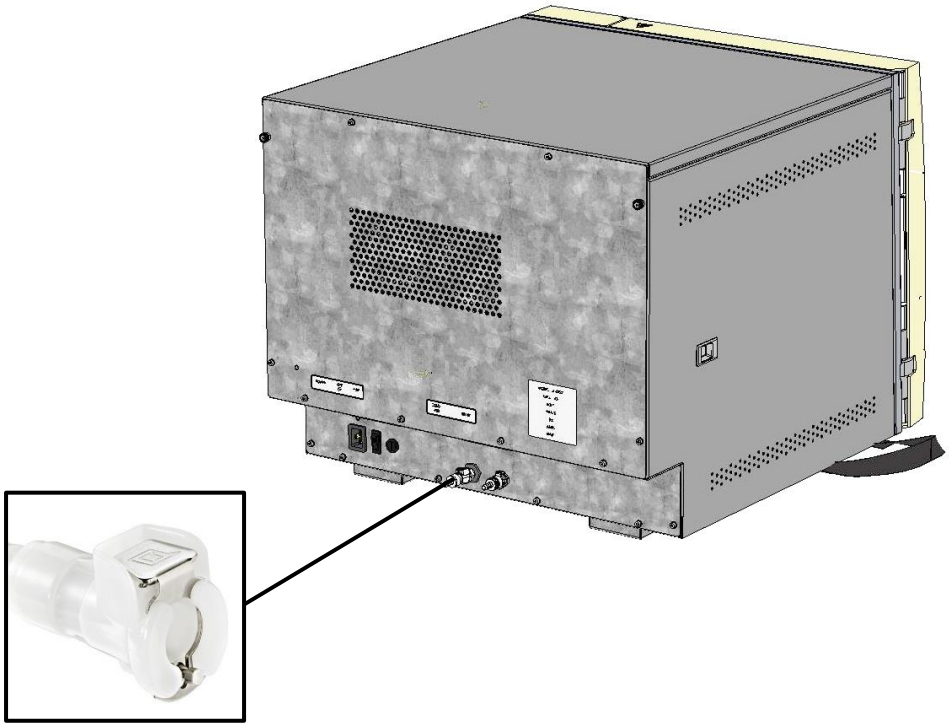
The water feed and drain connections vary depending on the options selected at the time of ordering.

Note: All utility connections to be within 0.5m of the location of the Touchclave Ecotech.

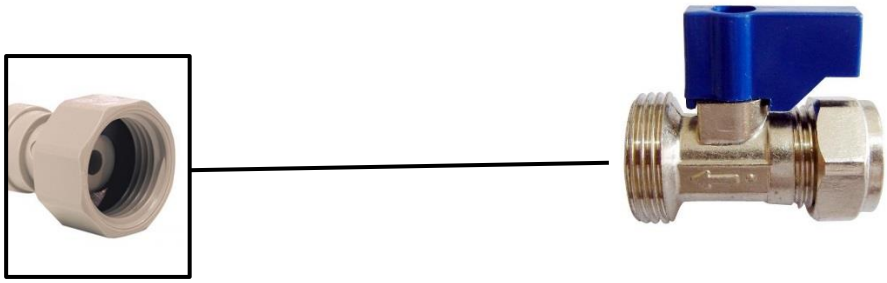
Automatic Water fill and Drain

If the automatic water fill and drain option, this will be connected directly to the mains water supply and drain and will be supplied with a water fill hose assembly and a drain hose assembly.

Water fill hose connections:

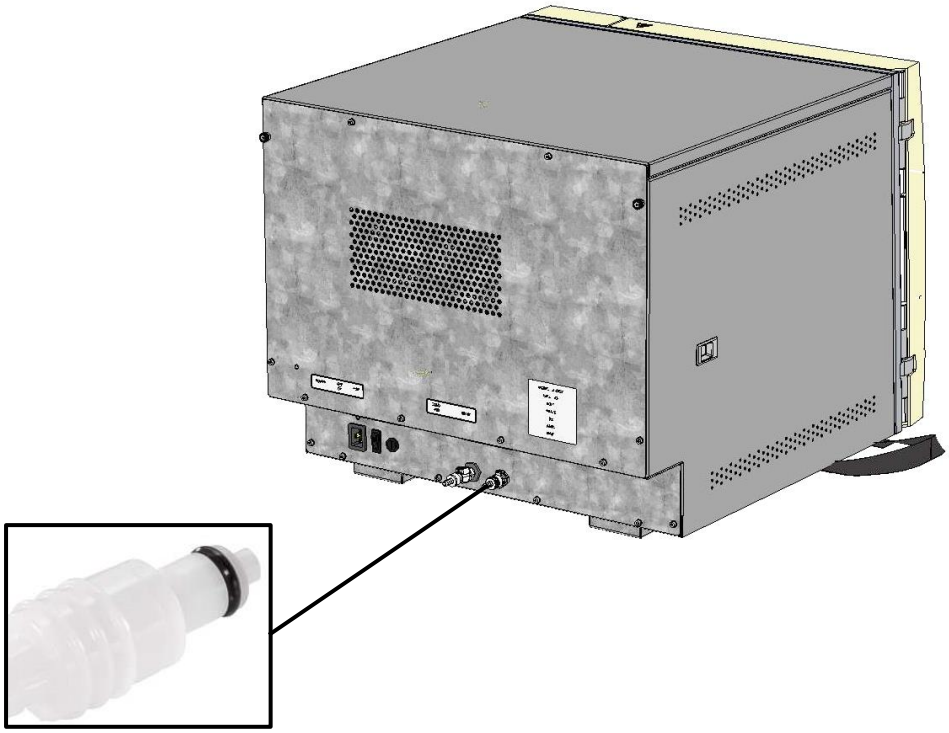


1. Plug Push fit connector into the water fill connector at the rear of the machine, pushing the connector until it “clicks” into position.

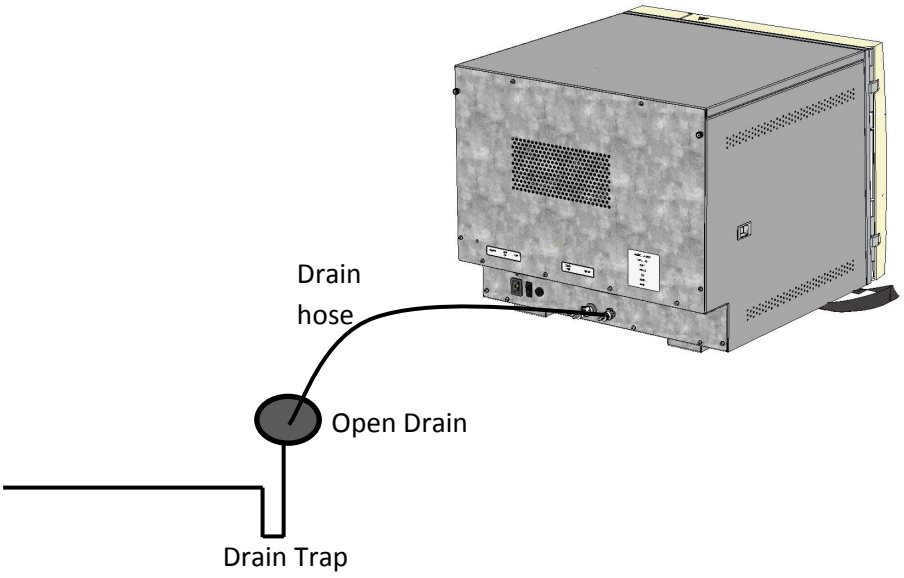


2. Screw the ¾” BSP threaded connector onto the water isolator valve supplying the water to the autoclave.

Drain hose connections:



1. Plug push fit connector into the Drain connector at the rear of the machine.
2. Place end of drain hose into an open drain, ensuring the hose is not submerged into any fluid in the drain and that the drain is fitted with a trap.



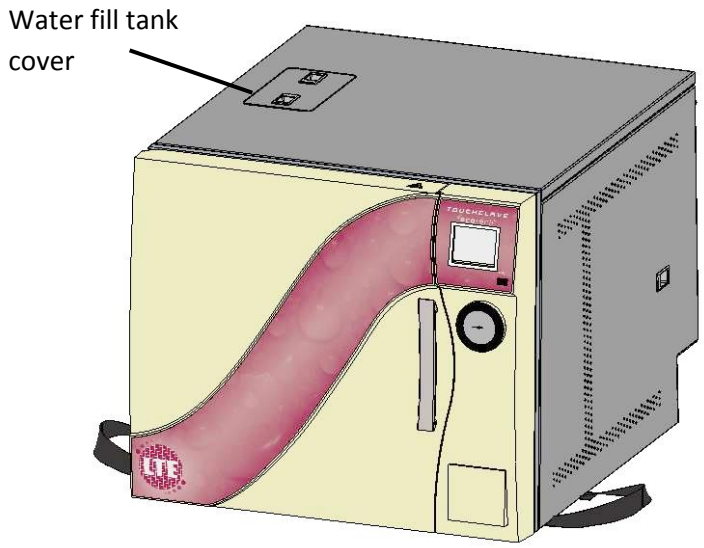
Internal Fill and drain tanks (Optional)

If the Touchclave Ecotech is fitted with internal fill and drain tanks, there is no need for external water or drain connections during operation.

Note: the internal water fill and drain tanks are monitored by the Ecotech control system software and so the machine will feedback to the user if the water tank is empty or the drain tank is full.

Filling the machine:

1. With the Ecotech powered, an audible sound will be transmitted from the machine when the water fill tank is empty and the screen will display “Fill Water Tank”. A cycle cannot be run until the water fill tank has been filled fully with water.

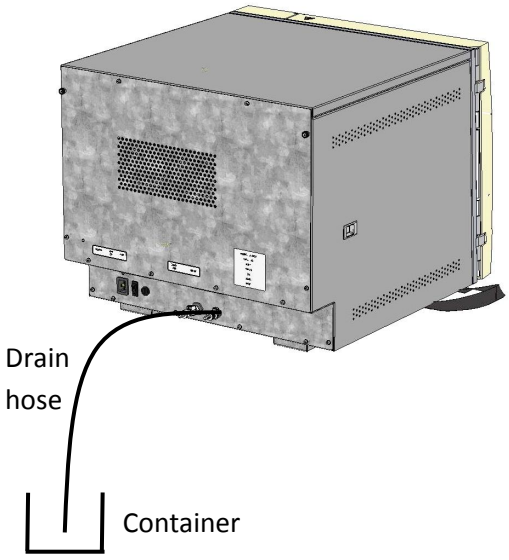


2. Squeeze together latches on the water fill tank cover and remove the cover from the lid.
3. Fill the tank using clean water from a clean container.
4. When tank is full, the audible sound will stop and the machine will display “READY” on the control screen.

Draining the machine:

1. With the Ecotech powered, an audible sound will be transmitted from the machine when the drain tank is full and the screen will display “Empty Drain Tank”. A cycle cannot be run until the drain tank has been emptied fully.
2. Insert the end of the drain hose without a connector into an empty container (Container must have 4L minimum volume and be placed on the floor at a lower level than the machine as drain tank empties using gravity alone).
3. Plug the drain hose push fit connector into the drain connector at the rear of the machine and tank will begin to drain.
4. When the drain tank is empty, the audible sound will stop and the machine will display “READY” on the control screen.

5. Pour contents of the container into a drain and remove drain hose from machine.



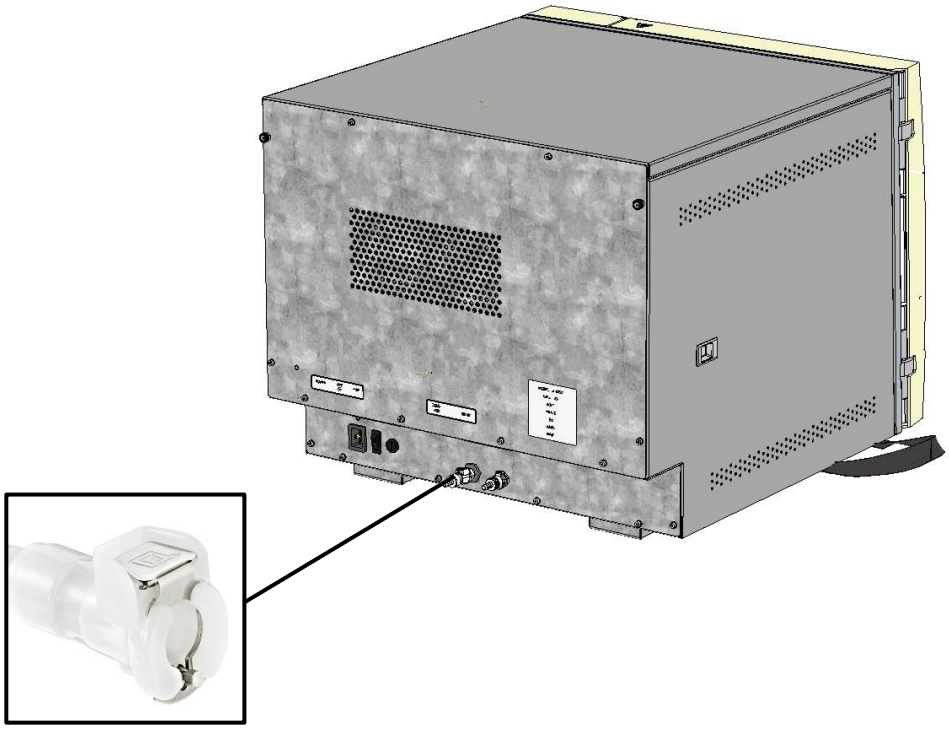
External Fill and drain Containers (Optional)

External fill and drain tanks are used where this is no water supply or drain available to connect the machine to. An external container filled with water is used to supply the machine with water and an external container is used by the machine as a drain.

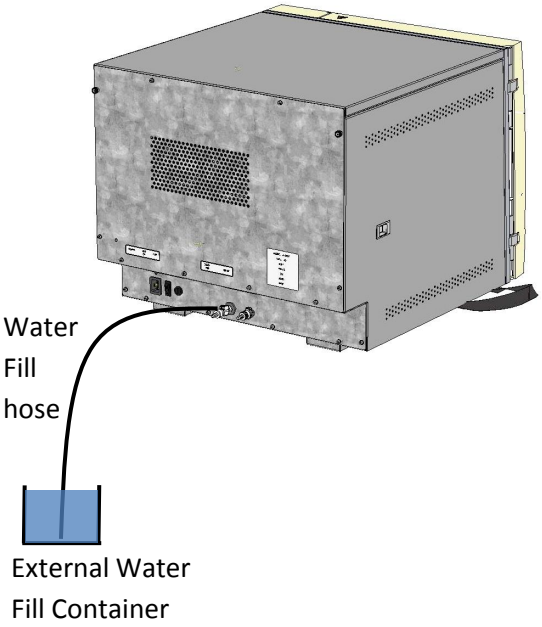
Note: There external tanks are not monitored by the Ecotech control system software and so there is no feedback from the Ecotech to the user on the fluid levels of the external containers. It is the responsibility of the user to ensure that there is sufficient water in the external water fill container and that the drain tank is emptied regularly to prevent this overflowing.

Connecting water fill container:

1. Insert the end of the water fill hose without a connector into the bottom of the water fill container, ensuring that the end of the hose is at the bottom of the container.
2. Plug the end of the water fill hose push fit connector into the water fill connector at the rear of the machine

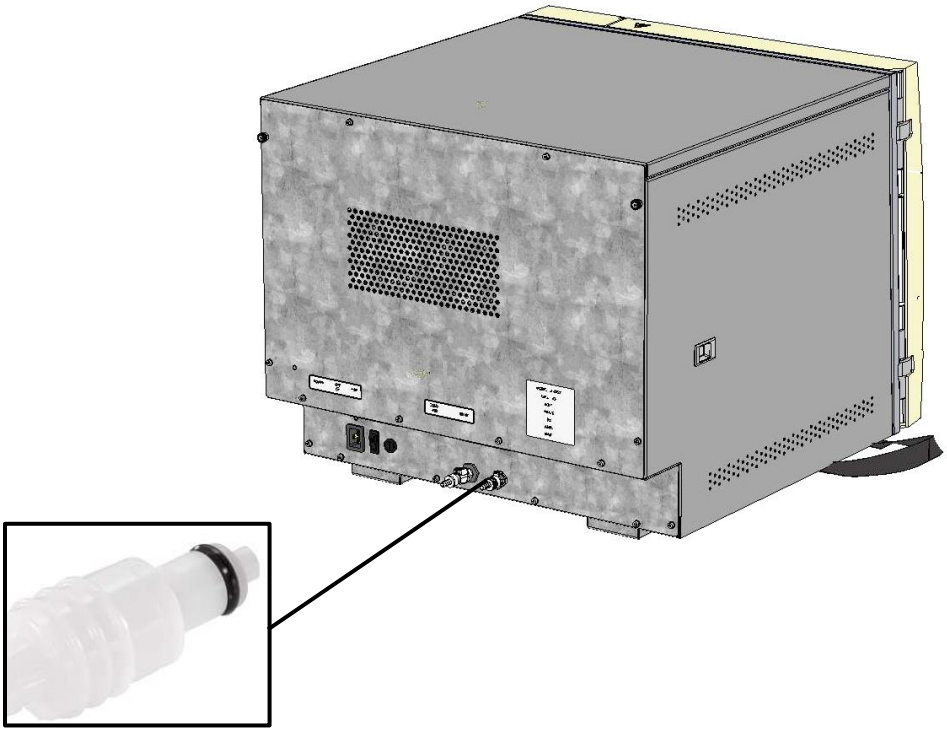


3. Fill water fill external container fully with clean water, ensure this is topped up regularly during operation.

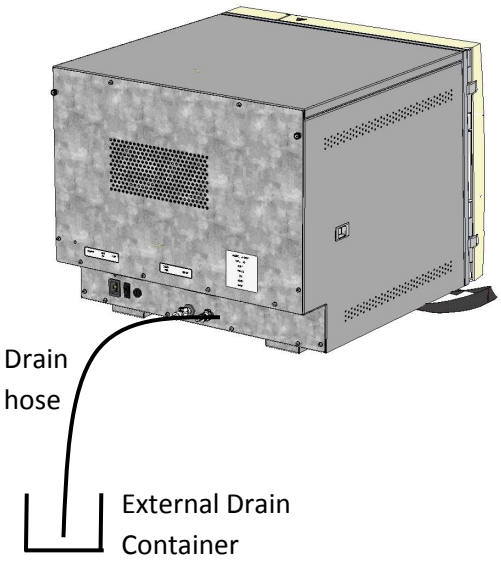


Connecting Drain Container

1. Insert the end of the drain hose without a connector into external drain container.
2. Plug the drain hose push fit connector into the drain connector at the rear of the machine.



3. Machine will drain into drain container during cycles. Ensure external drain container is emptied regularly between cycles as container could overflow.



Electrical Connection

Touchclave Ecotech is supplied with a 2m removable electrical power cable. The cable plugs into the Ecotech using an IEC C19 to C20 connection and into a standard 13A electrical socket (BS1363).

Once the cable is plugged into both the Ecotech and the electrical plug, the machine can be powered on using the power switch at the rear of the machine.

1.2 Scope of User Manual

This User Manual provides instructions for the Touchclave Ecotech autoclave manufactured by LTE Scientific Ltd ("LTE"):

Autoclave users should be given training in the actual application environment. This manual is not intended as a substitute for such training.

1.3 Classification of User Levels

For safety and security, users of Ecotech autoclaves are classified in four User Levels:

- Operator
- Supervisor (requires password)
- Maintenance Engineer (requires password)
- Commissioning Engineer (requires password)

The User Manual does not cover Maintenance or commissioning functions. These are explained in the service manual. The term "user" used in this manual refers to either Operator or Supervisor level user.

1.4 Overview and Intended Use of Touchclave Ecotech

The Ecotech is a steam steriliser that operates by generating saturated steam in a steam generator and subjecting the load to this saturated steam under pressure in order kill micro-organisms present in the chamber and so sterilise the load.

The Touchclave Ecotech operates cycles pre-programmed into the software and these differ depending on the nature of the load, varying in sterilisation temperature (most commonly 121ºC and 134ºC) and length of time the load is at sterilisation temperature/pressure. As the autoclave chamber is a sealed vessel during sterilisation, the pressure of the steam inside the chamber relates to a temperature, the internal conditions are controlled by the autoclave controller.

The autoclave controller has a Resistive Touchscreen display, using this; the operator can run sterilisation cycles and monitor cycle progress. The control system software has an intelligent menu system allowing the user access depending on the level of password they have entered; without an authorised password the autoclave will not allow the user to operate the machine. Functionality is limited depending on what level of password is entered when operating the machine. Since all access levels are password protected and the machine will not operate without an authorised password, a user cannot accidentally gain access to the machine.

The Touchclave Ecotech is a laboratory autoclave tested to BS 2646 and is intended to run sterilisation cycles with loads as detailed in this standard. The Touchclave Ecotech is pre-programmed with cycles that have been validated using independent UKAS calibrated test equipment to verify that the sterilisation temperature and pressure are as shown on the machine. The autoclave is intended to be used as detailed in the user manual and is to be regularly calibrated in order to ensure that the autoclave instrumentation is reading correctly and to ensure that the autoclaved loads are sterile at the end of a cycle.

If the Touchclave Ecotech is not correctly maintained and calibrated then this could lead to loads still being contaminated at the end of the sterilisation cycle- it is the customer's responsibility that the Touchclave Ecotech is routinely maintained and calibrated by trained engineers approved by LTE Scientific Ltd.

The Touchclave Ecotech is **NOT** suitable for use with loads that could be infected with organisms in Hazard Category 3 or 4.

1.5 Safety precautions

Whilst the autoclave has built-in safety devices, their operation may be impaired if the autoclave is not used correctly and in accordance with the instructions. In addition, it is important to observe the following safety rules at all times:

- Wait until the cycle is complete and the machine is cool before attempting to unload
- Beware of residual steam in the chamber and hot surfaces when the door is opened at the end of a cycle
- Wear suitable PPE eyes when loading or unloading the chamber, since the load temperature may be as high as 100ºC
- Ensure that the autoclave is handled in accordance with Heath and Safety guidelines. Consult your site safety officer if applicable.
- Ensure that the earth or ground of the power supply cable is connected to a suitable protective earth supply, and that the supply lines are correctly fused and isolated
- If the plastic bottle for discharge collection has been connected to the autoclave's drain system, then in order to avoid being scalded by hot water or steam:
  - do not try to empty the bottle while a cycle is in operation
  - do not run the autoclave with the drain disconnected from the bottle.

1.6 Maintenance

This Section covers General operator tasks in order to maintain the autoclave on a day to day basis and ensure reliability of the system.

Note: Failure to properly maintain the autoclave will invalidate the warranty.

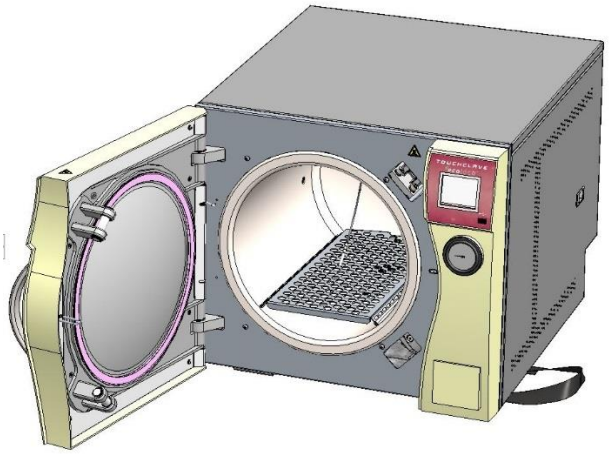
Weekly maintenance

Door and Door Seal

The door seal is vital to the operation of the autoclave and so this must be checked and cleaned on a weekly basis to ensure that the door seals consistently and without any issues. Running a cycle with a damaged door seal or with dirt on the door or door seal could cause steam to leak from the autoclave chamber during the cycle and may cause injury to the operator or damage to equipment.

Door and door seal cleaning

Inner door panel and the door seal should be cleaned with warm water and a non-abrasive cloth, ensuring that the surface of the door seal and inner door are free from any dirt/ residue.



Seal Visual Inspection

Door seal should be visually inspected to ensure surface is smooth and free of debris.

Chamber and chamber Drain

Warning: Do not attempt internal chamber cleaning until vessel has cooled to room temperature to avoid potential injury.

Clean the internal chamber

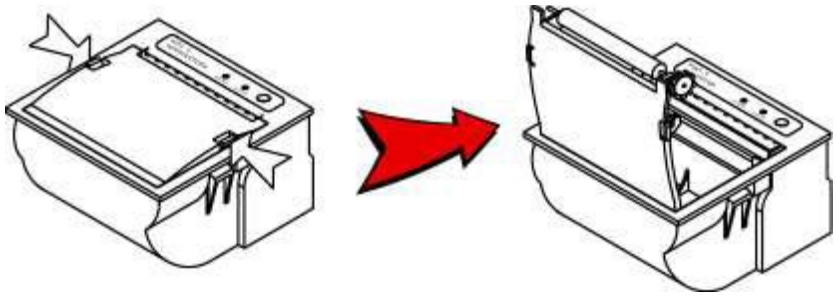
Remove the shelf from the inside of the chamber. Use warm water and a non-abrasive cloth to remove any debris that may have built up in the chamber. Make sure Drain strainer is free from debris.

Printer Maintenance

Replacing Paper Roll

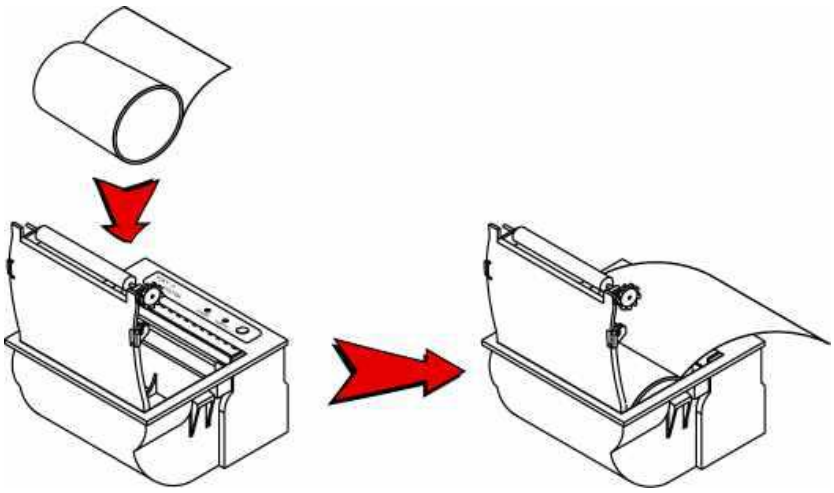
Open Printer Door

Open bottom printer door by applying fingers on both sides of the printer door and pull forwards.

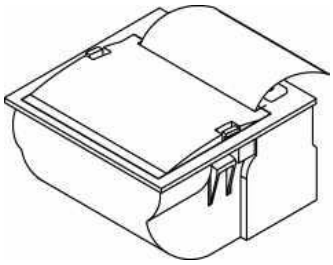


Insert New Paper Roll

Insert new paper roll as shown:



Close Printer Door



Servicing and Calibration

To ensure that the Touchclave Ecotech operates reliably and accurately, it must be serviced at 6 month intervals and calibrated yearly.

For information on Service and Calibration, please contact LTE Scientific service centre:

1.7 Parts

Spare parts are listed in the Service Manual.

ONLY replacement parts supplied by LTE Scientific are to be used. Failure to so could result in damage to the machine.

Section 2- Main Features

2.1 Autoclave features

Embedded Touchscreen Control System

The Ecotech has an embedded control system with a 3.5" resistive touchscreen user interface. The embedded hardware uses two microprocessors with USB type A connection through the front control panel (for archiving data to memory stick), easy to use icon based colour display, intelligent firmware and built in safety features.

Condensate Unit

This air-cooled unit ensures that water from the Condensate Discharge or the Chamber Water Discharge is below 80°C. This is important if plastic drains are used to receive discharges. The Condensate Unit used is a fan-cooled heat exchanger. Cold air is blown over a heat exchanger, reducing the heat from the air/steam/water running through the coils. The resulting warm air is blown out from the side panel of the autoclave.

Automatic Water Fill

This feature uses a direct connection to mains supply water in order to fill the system at the beginning of the cycle. Once a volume of water has been pumped into the system, the autoclave will not require any further water fills until the next cycle and so has minimal water consumption for an autoclave with an integral steam generator.

High Pressure Steam Generator

The Touchclave Ecotech has an integral steam generator that operates at a higher pressure than the autoclave chamber. This ensures that there is optimised space inside the autoclave chamber and provides a cleaner environment (as there are no heating elements inside the chamber).This also makes the vacuum pump (optional) more effective as the load will by significantly drier at the end of a cycle (on drying cycles).

Vacuum System (optional)

This option adds functionality to the start and end of the cycle. It also increases the range of loads that the machine can deal with. The vacuum system is used to ensure efficient air removal at the start of the cycle (known as the "pre-vacuum" stage), when a vacuum is drawn in the chamber to a set pressure.

At the end of a cycle, the vacuum pump is used create a negative pressure in the autoclave chamber while the load is at a high temperature. The negative pressure reduces the boiling point of water and the residual heat in the load causes moisture to evaporate from the load and therefore dries the load.

This is used on certain loads that require drying like fabrics and pipette tips and is known as the "post-vacuum" stage.

Printer (optional)

A thermal printer is used to print cycle data and so creating a hard copy of the cycle data.

Water Tanks (optional)

This option includes a water fill tank and a drain tank, preventing the need for a mains water supply and external drain. The autoclave controller will instruct the user when the water tank requires filling and the drain tank requires emptying ensuring that the autoclave can be used in almost any lab environment.

USB Data Archiving

With this option, all cycles are recorded onto an integral micro SD card. The record of each cycle shows the date, time, batch number, operator identification and all cycle data or failures. The record can be printed via thermal printer (if fitted), or transferred onto a USB stick using the USB port on the front panel of the machine.

2.3 The cycle sequence

The main stages of the sterilising cycle are as follows:

Water fill

Water is pumped into the system from the mains water supply or optional water fill tank at the beginning of the sterilisation cycle. A quantity of water will be taken from the water supply and this will be sufficient for the whole cycle.

Air removal

Depending on the load, the air will be removed from the chamber using 2 methods- Steam Purge or Pre-vacuum.

Steam purge

Steam purge is the standard form of air removal on Touchclave Ecotech autoclaves. Saturated steam is produced in the steam generator and released into the chamber. The chamber vent is fully open and so forces the air from the chamber and replaces this with saturated steam, causing the temperature inside the chamber to increase. The autoclave control system monitors the temperature of the chamber vent and load and uses feedback from these temperature sensors to determine when all air has been removed from the system.

Pre-vacuum (Requires Vacuum system option)

For loads likely to trap air, such as pipette tips, tubing etc. A vacuum system is required to provide effective air removal. During pre-vacuum stage a vacuum is pulled in the autoclave chamber, removing air from load. The pre-vacuum stage completes when the pressure in the chamber has been below a set value for a set period of time.

Heat up

The autoclave raises chamber pressure and temperature to the set sterilising values specified for the cycle. The time taken by this stage depends on the value of the temperature set points and the contents of the load to be sterilized. The load probe should be placed either in the load to be sterilised or in a simulated load device. The stage will be complete when the sterilising temperature and pressure have been reached.

Sterilisation

During this stage, the cycle achieves its objective. The sterilising temperature can be set for any given cycle at any value between 105^0C and 136^0C. If the printer option is fitted, its output during this stage will provide proof that the load has been sterilised. The length of time for sterilisation is set during cycle set-up.

Cooling

LTE Smart Cooling

The final stage is "Cooling", the Touchclave Ecotech circulates condensate in the chamber through a fan cooled heat exchanger and so effectively removes heat from the chamber.

Air ballast (Air Ballast optional)

Air ballasting is a method of preventing fluid loss for media loads, chamber pressure is maintained during cooling by pumping air into the chamber.

Drying (requires Vacuum system option)

Drying requires the vacuum system option and is only used on certain load types. A vacuum is pulled after the sterilisation stage of the cycle and so removes moisture from the chamber and load, the rapid decrease in chamber pressure on the hot, moist load will cause the moisture to flash off and so dries the load.

Note: The load may not be fully dry at the end of the drying stage, but will have a significant amount of moisture removed compared with a cycle that does not have a drying stage.

2.4 Typical cycles

Though the Touchclave Ecotech is a fully programmable autoclave, the table below shows details of some typical operating cycles, showing set values for different types of load.

Note: Cycle development may be required to optimise cycle performance and effectiveness. Contact LTE Service Centre for more information on cycle development.

Standard Cycles

OPERATING CYCLE NAME	CYCLE OR LOAD TYPE	STERILIZING TEMPERATURE	STERILIZING TIME
MEDIA	Fluid	121°C	15 minutes
FLUID DISCARD	Fluid	134°C	5 minutes
PLASTIC DISCARD	Plastic Discard	134°C	5 minutes
EMPTY GLASSWARE	Empty Glassware	134°C	5 minutes
MELT/FREE STEAM	Melt/ Free Steam	105°C	30 minutes
INSTRUMENT	Instruments	134°C	5 minutes

2.5 Technical Specification

Electrical

Electrical supply voltage (RMS)/ Frequency: 240V AC/ 50Hz

Electrical supply current: 12.5A (Maximum)

Environmental

Altitude: 2000m (Maximum)

Ambient temperature: 5 - 40°C

Ambient Relative Humidity: 20 – 80% (non-condensing)

Over Pressure Protection

The Touchclave Ecotech is protected against over pressure conditions by mechanical Safety Relief Valves. The steam generator and autoclave chamber are both fitted with a Safety Relief Valve set at the following pressures:

Steam Generator: 3.8 Bar G

Autoclave Chamber: 2.62 Bar G

Water Supply

Water Hardness: < 50ppm $CaCO_3$

Ingress Protection

Touchclave Ecotech has no protection to water or dust ingress.

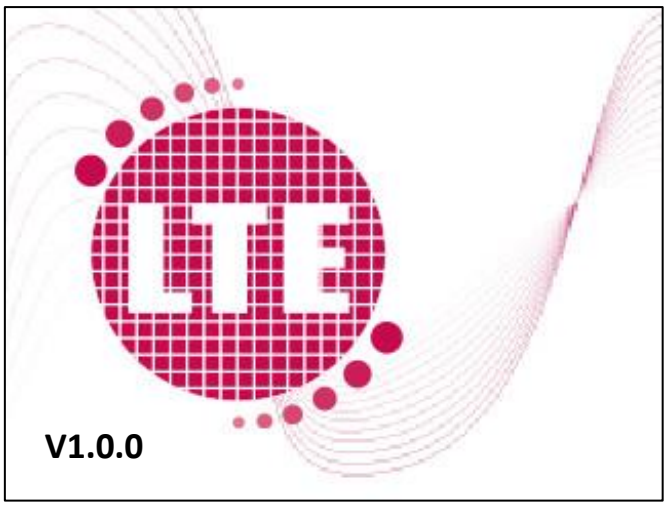
DO NOT use outdoors or in wet or dusty environments.

Section 3- Control System Basic Screens

Note: All screens shown for illustrative purposes only

3.1 Power up/ Idle Screen

Upon initial power-up of the machine, the following screen will be displayed on the Touchscreen. Press anywhere on the Touchscreen display to move onto home.



Note: Version number depends on software version and so may vary from image shown.

This screen will also be displayed if the touchscreen has not been touched for a period of time and acts as a screensaver.

3.2 Process Screen

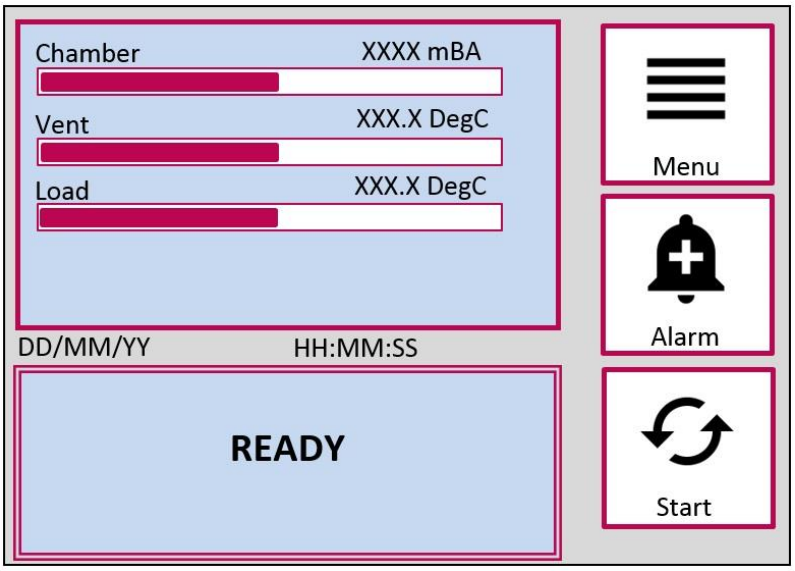
When in standby, the autoclave is out of cycle and with the control system awaiting commands from the user to run a cycle.

Process screen displays chamber conditions- Absolute Chamber pressure, Load PT100 temperature probe temperature and Vent PT100 temperature probe temperature. A button is displayed allowing user to either lock or unlock the chamber door- depending on the state the door is currently in.

Buttons are also available on this screen to view any active alarms, enter the menu and to start a cycle (note- user will have to input authorised password to start cycle, enter menu or acknowledge any alarms).

Current Time is also displayed on process screen.

Door can be locked or unlocked without password entry.

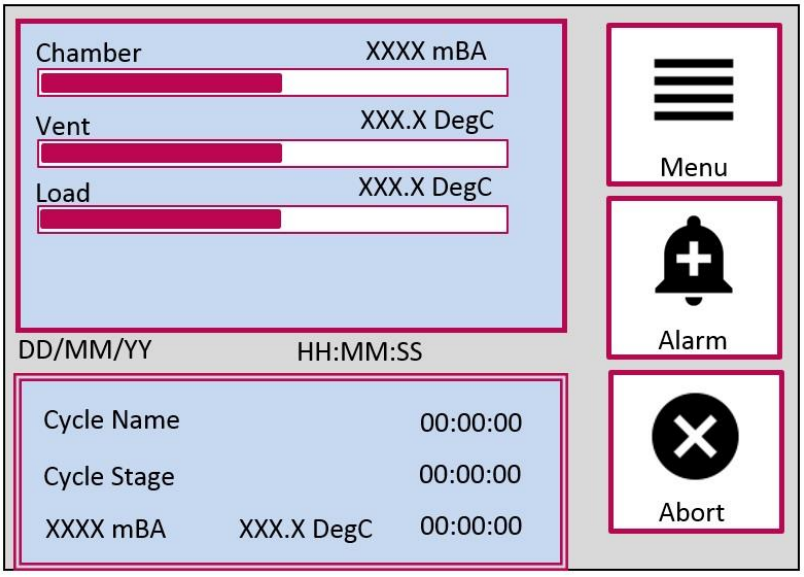


3.3 Process Screen- In Cycle

When the autoclave is running a cycle, the door will be locked and secured.

Menu and alarm button will remain displayed for user to enter menu or view/ acknowledge any active alarms.

Chamber, vent and load values will be displayed as in the standby screen. Cycle Name, Cycle stage and pressure and temperature targets for the stage (if applicable) are displayed along with a timer for each. This is illustrated below:

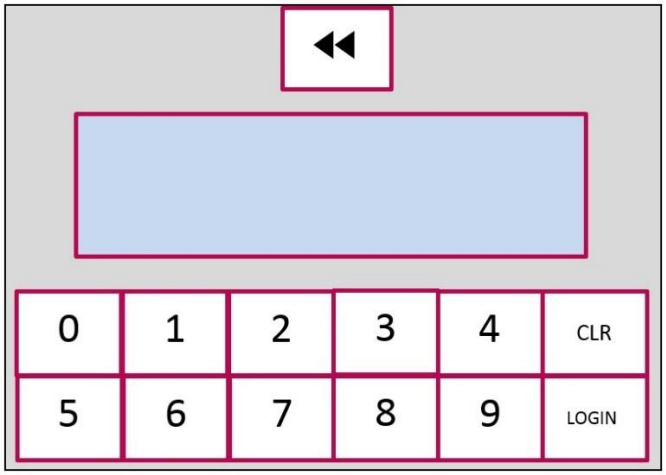


3.4 Password Entry Screen

The control system is programmed to only allow use of the autoclave for users with authorised Password. In order for the user to gain access to the autoclave, user must enter password and user level into the Password entry screen.

Screen gives arrow buttons to select user level- Operator, Supervisor, Maintenance Engineer or Commissioning Engineer.

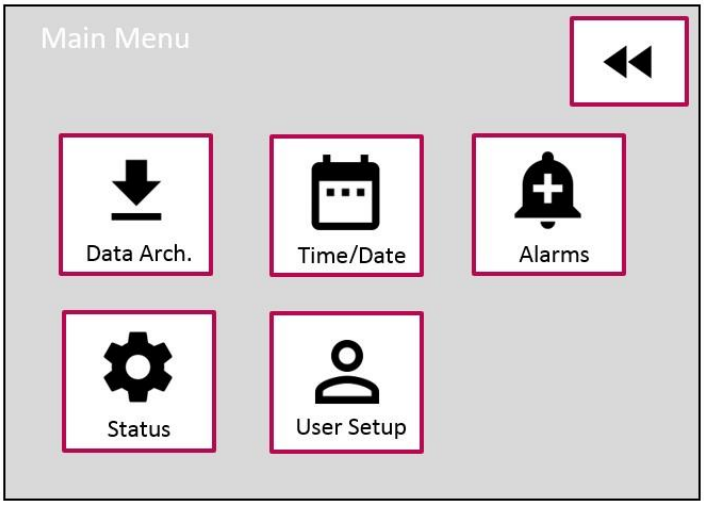
Buttons displaying numbers 0-9 are given to allow user to enter 4-digit password, Clear button allows user to delete numbers entered in the event of incorrectly entering password, login button allows user to log in after password entry. Abort button is also displayed should the user want to abort the login process.



3.5 Menu Screen

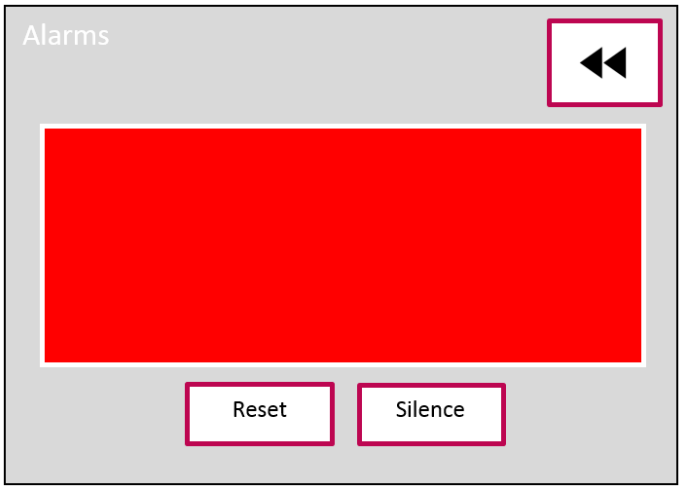
Menu screen is available for supervisor level login or higher.

Maintenance Engineer and Commissioning Engineer level menu is covered in the Touchclave Ecotech Service manual. Supervisor menu has buttons which allow the user to archive cycle data, set the time and date, enter alarm screen, see the machine status and access the user setup. These are covered in detail in Section 5- Supervisor Menu.



3.6 Alarm Screen

If there are alarms active during a cycle, a sounder will alert the user and the Alarm icon will turn Red on the process screen to alert the user that there is a problem. On pressing the alarm icon, the alarm screen will be displayed. The alarm screen will display the alarms that are active and give the user the option to silence the audible alert, once the alarm condition has been resolved the alarm can be reset by entering a supervisor passcode.



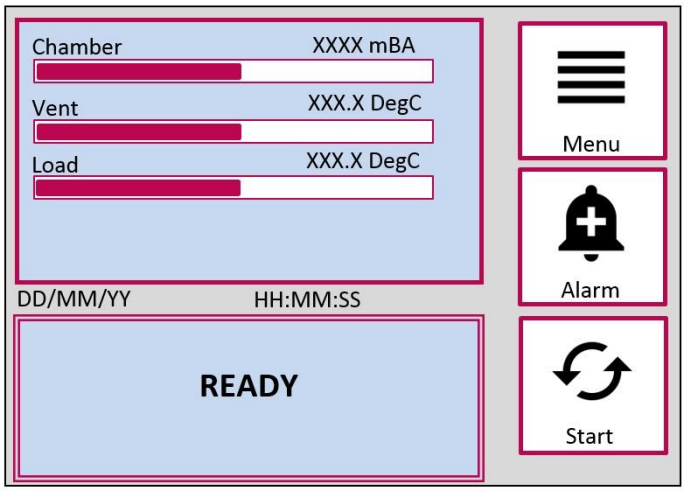
Section 4- Running a Cycle

Note: All screens/ images shown are for illustrative purposes only

4.1 Starting a cycle

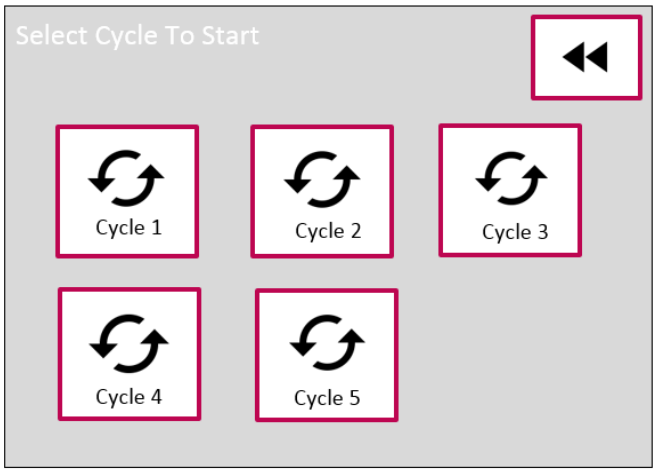
Close Chamber door

Load the autoclave and close the chamber door to the latched position (note: door does not sit flush to the front face of the autoclave in this position, this is OK as the locks will pull the door in when the cycle begins).



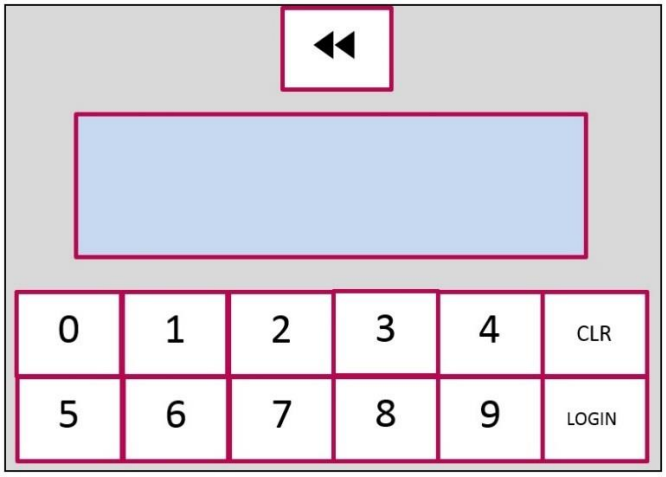
Select Cycle

Press the start icon and the



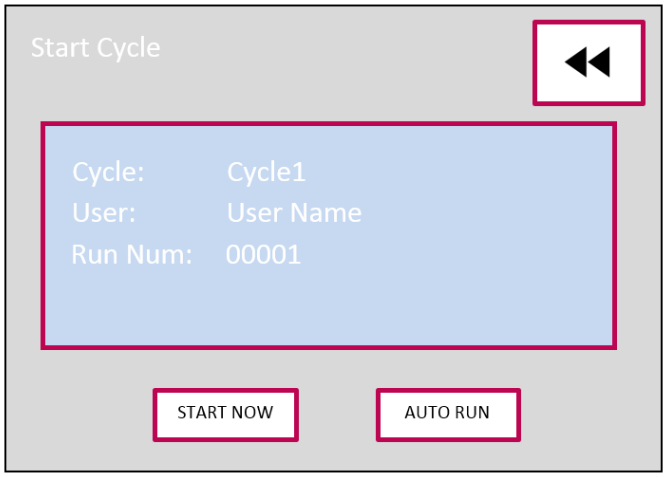
Enter Password

If the cycle is password protected, password entry screen will be displayed. Enter authorised password and login in for the ability to confirm cycle.



Start Cycle

Cycle overview will be displayed and user must confirm the cycle by pressing “Start Now” button for autoclave to begin sterilisation cycle.

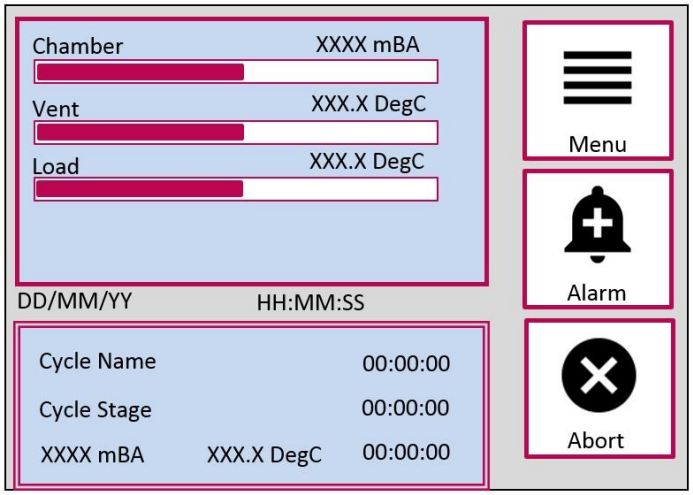


Auto Run

Pressing the “Auto Run” button on the Start Cycle screen will allow the user to set a time and date for the cycle to start, the autoclave will then automatically begin the cycle at this time.

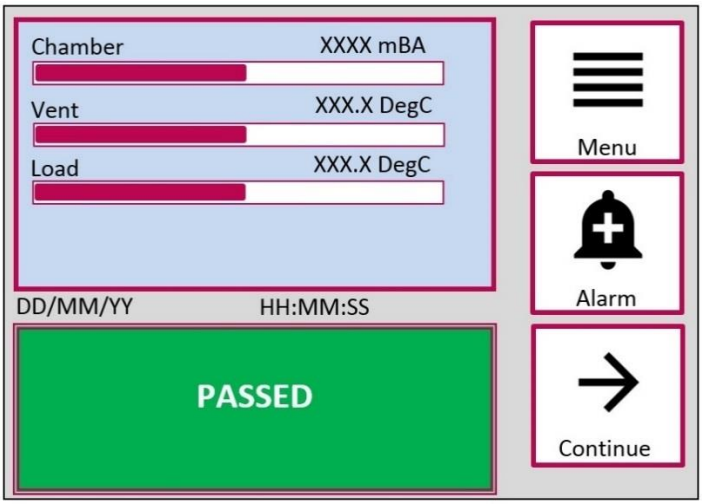
4.2 Cycle in progress

The process screen is displayed during the cycle showing current instrumentation readings, stage of the cycle and relevant timers and pressure/ temp targets. This screen provides user with all relevant cycle information (as detailed in section 3.3).



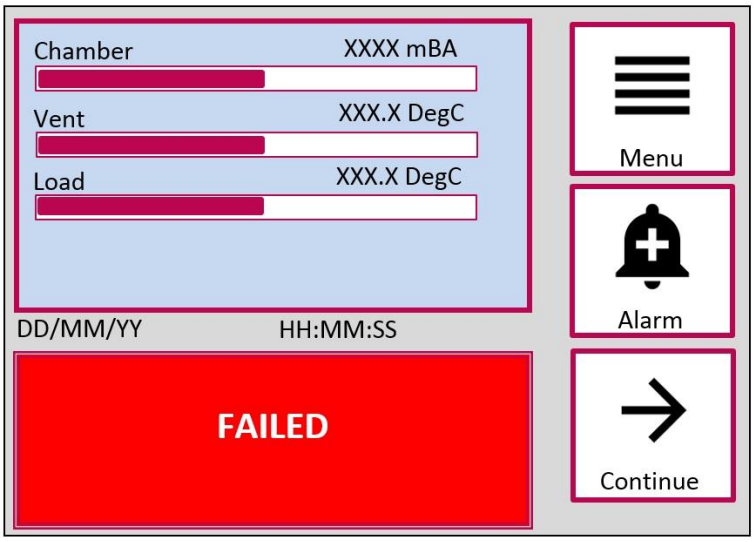
4.3 End of cycle- Cycle Passed

At the end of the cycle, the Touchscreen will display if the cycle passed or failed. If the cycle has passed, this will be displayed on the screen. The user can remove the load from the autoclave at this point by pressing the “Continue” button. The user may have to login to remove the load, if so the login screen will be displayed and the door will unlock on entering an authorised password.



4.4 End of cycle- Cycle Failed

If the cycle has failed and is not a discard cycle, then the failed screen will be displayed. Pressing the “Continue” button, the user will be required to input a level 2 or above password for control system to allow user to remove the load from the machine.



4.6 Sample printout (requires printer option)

Cycle data is printed as the cycle progresses from the thermal printer on the machine control panel. An example of a typical printout is shown below; the printout forms a hard copy of the cycle data.

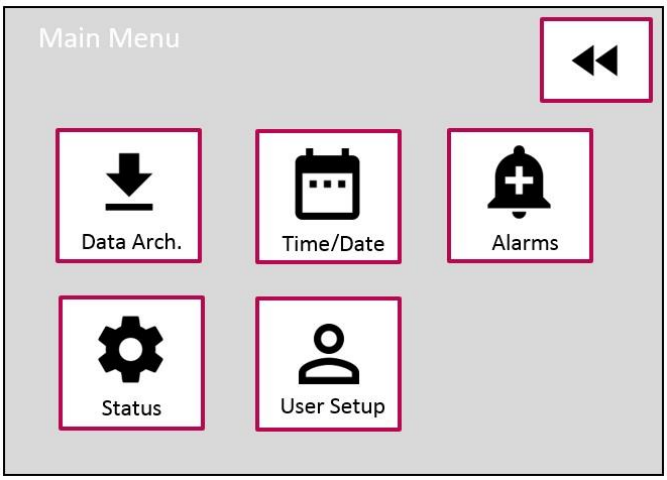
```
LTE Scientific Ltd
L123456
Touchclave EcoTECH

   Report    :- Cycle
   Program   :- 126:10
   Operator  :- N/A
   Cycle No. :- 00030
   Prog No.  :- 03
   Date      :- 10/11/16
   Start Time:- 10:15
   Steri Temp:- N/I
   Steri Time:- N/I


Time      Cham  Vent  Load
H:M:S     mBar  oC    oC

Door Sealing
00:00:00  0970  11.1  15.4
00:00:07  0981  11.0  15.4
Water Fill
00:00:07  0981  11.0  15.4
00:01:27  0951  10.9  15.2
Steam Purge
00:01:27  0951  10.9  15.2
00:19:28  0973  96.9  99.7
Heatup
00:19:28  0973  96.9  99.7
00:36:56  2454  126.0  126.8
Stabilisation
00:36:56  2454  126.0  126.8
00:37:56  2505  126.9  127.9
Sterilisation
00:37:56  2505  126.9  127.9
00:47:55  2514  126.9  127.9
Cooling
00:47:55  2514  126.9  127.9
01:02:55  0934  30.8  58.5
Draining
01:02:55  0934  30.8  58.5
01:03:55  0876  30.5  56.5
Air Equalisation
01:03:55  0876  30.5  56.5
01:05:15  0966  31.4  54.8

   Cycle No. :- 00031
   Errors    :- No
   Warnings  :- No
   Result    :- Passed
   Cycle Time:- 01:05:15
   Approved  :- N/A

Cycle Complete

LTE SCIENTIFIC LTD
GREENBRIDGE LANE
GREENFIELD
OLDHAM
LTE SERVICE CALL
Tel:01457-876221
```

Section 5- Supervisor Menu

Note: All screens/ images shown are for illustrative purposes only

Supervisor access password will be given at time of delivery. If this code is lost, please contact LTE Service Centre, quoting the machine serial number for supervisor level password

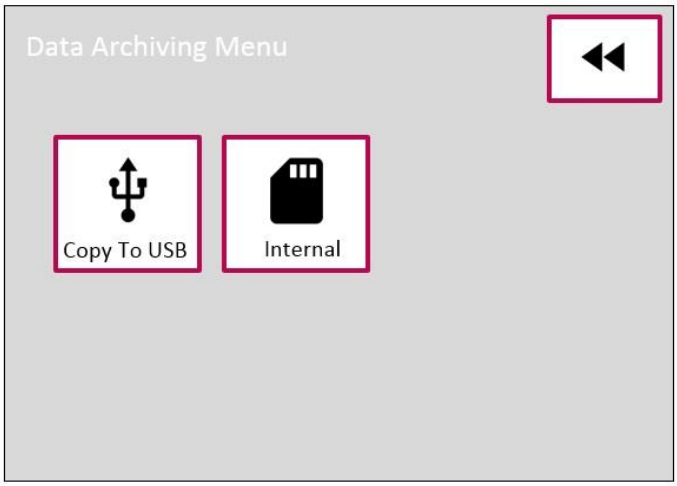
Pressing the “Menu” button on the process screen and entering a Level 2 password will allow user to access the Supervisor Menu. Supervisor Menu screen shown below:



5.1 Data Archiving

The data archiving menu will allow the user to save the machine cycle data onto a USB memory stick using the USB Type A port on the front panel of the Ecotech. The user can also see how much internal memory is left to store cycle data.

Select the data archiving icon on the supervisor menu to display the data archiving screen.

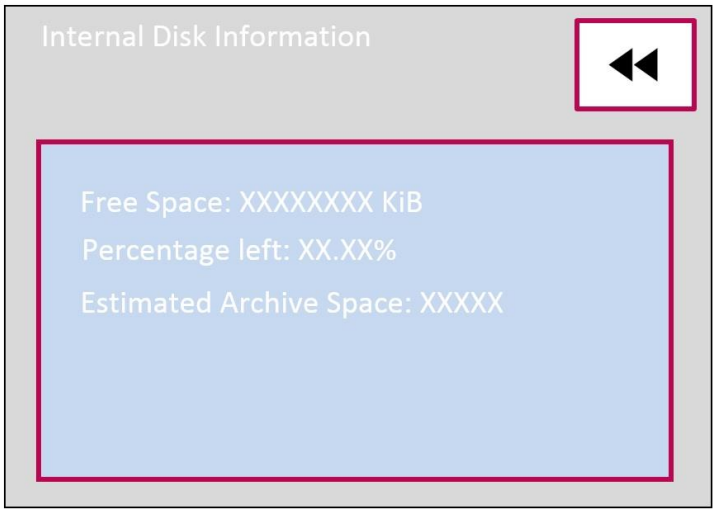


Copy To USB

USB Data archiving is covered in Section 7- Remote Data Archiving

Internal

Selecting the “internal” icon on the Data archiving menu will display the internal disk space on the control system.



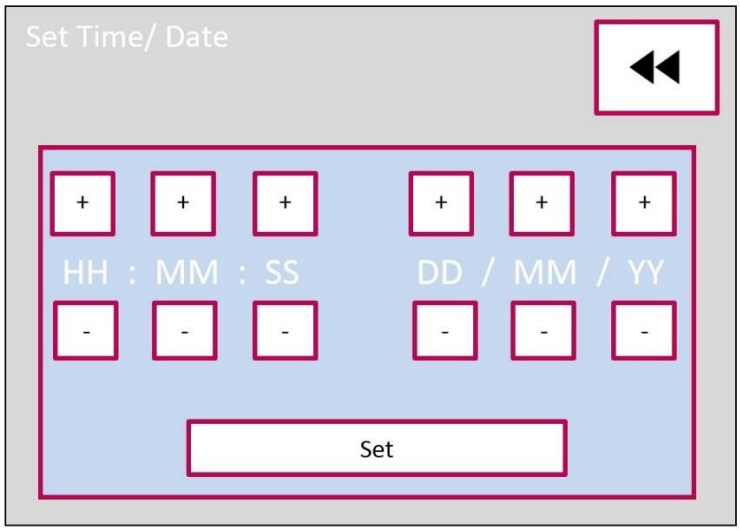
“Free Space” indicates the number of KiB of storage free on the control system internal memory.

“Percentage left” is the percentage of the internal storage memory left to store cycle data.

“Estimated Archive Space” is the estimated number of cycles that the control system can fit on the internal memory.

5.2 Time/ Date

Pressing the “Time/Date” icon on the supervisor menu screen will allow the user to set the time and date on the control system.

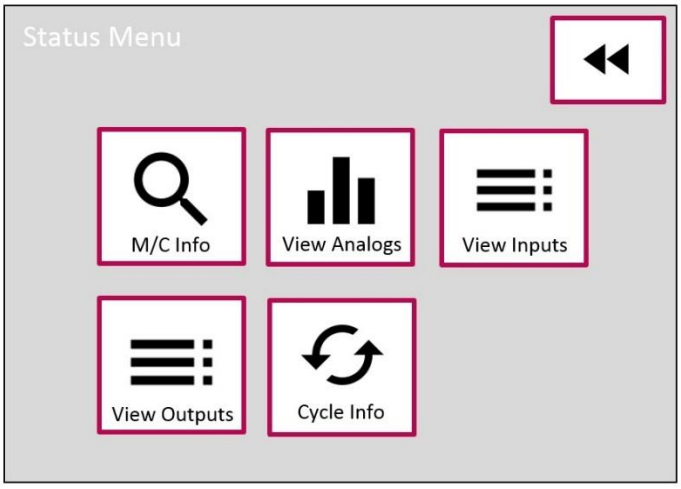


5.3 Alarms

See 3.6 Alarm Screen.

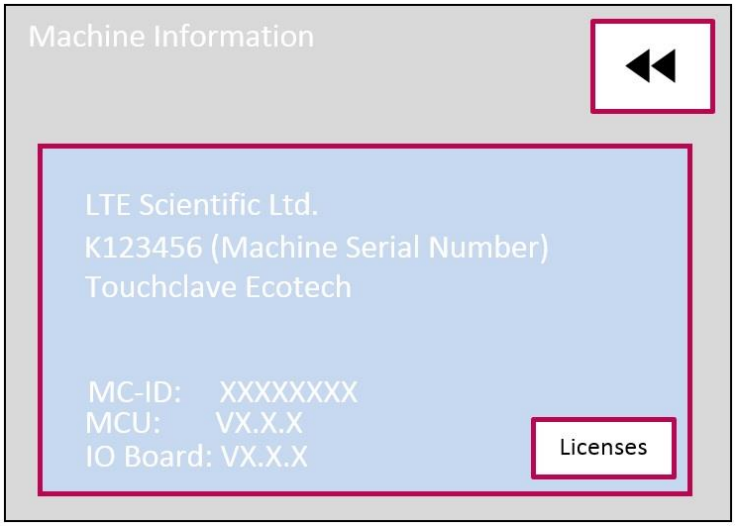
5.4 Status

The Status Menu allows the user to view the machine information, Analog inputs, Digital inputs, outputs and cycle information.



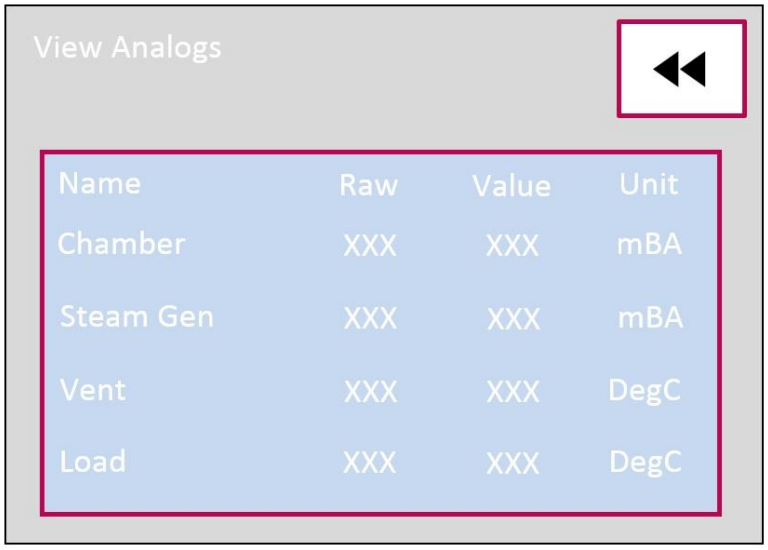
M/C Info

Machine information displays the Serial number of the machine, the machine type, the machine ID code and the control system firmware versions for the MCU and IO board.



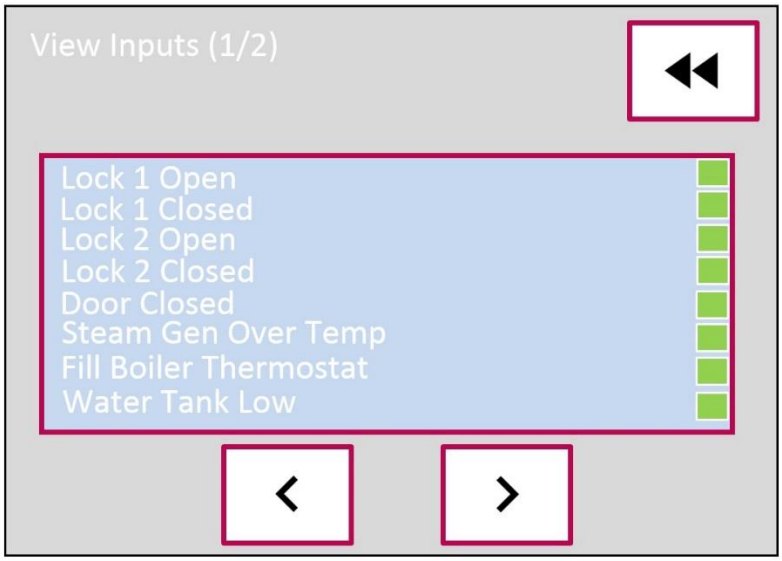
View Analogs

Selecting “View Analogs” will list the Analog sensor readings for the Chamber Pressure transducer, Steam Generator pressure transducer, Vent PT100 temperature probe and Load PT100 temperature probe.



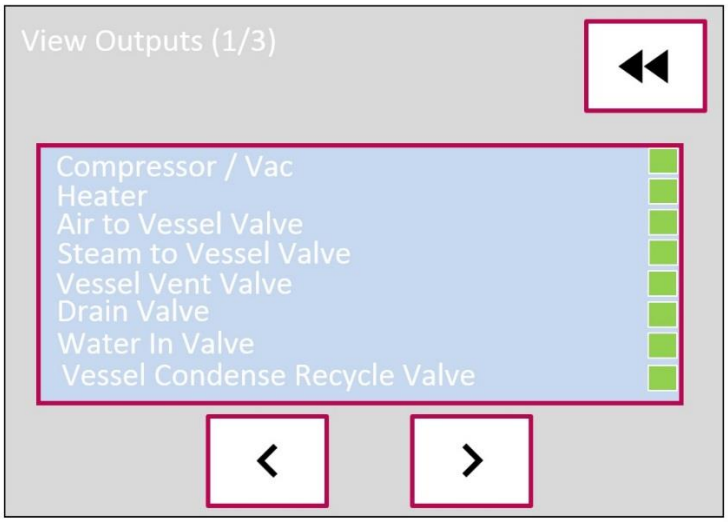
View Inputs

Selecting “View Inputs” will display a list of digital inputs and their current state, the input state is given by an indicator with green indicating that the Input signal is being received by the control system. Arrow buttons allow user to navigate through Input list.


View Inputs (1/2)
Lock 1 Open
Lock 1 Closed
Lock 2 Open
Lock 2 Closed
Door Closed
Steam Gen Over Temp
Fill Boiler Thermostat
Water Tank Low

View Outputs

The View Output screen displays the outputs that are currently active on the machine, like with the "View Inputs" screen, a green indicator represents an active output. Arrow buttons allow user to navigate through the output list.



Cycle Info

The Cycle information screen will display the accumulative F_0 value as the cycle progresses.

Section 6- Alarms

All the System alarms are detailed in this section with a brief description of what each alarm means. For troubleshooting of alarms see Service Manual.

Purge Timeout

Steam purge stage has failed to achieve the load and vent probe temperatures required to move on to the next stage of the cycle in the time period set in the controller software.

Heatup Timeout

Heatup stage has failed to achieve the vent and load probe temperatures required to move on to the next stage of the cycle in the time period set in the controller software.

Stabilisation Timeout

Stabilisation stage has failed due to vent and load temperature probe temperatures not remaining in the band set in software for a time period set in controller software.

Cooling Timeout

Cooling stage has failed to achieve the load and vent temperature probe temperatures to move on the next stage of the cycle in the time period set in the controller software.

Under Temp

Either the vent or load probe temperature has fallen below the sterilisation temperature.

Over Temp

Either the Vent or Load probe temperature has gone above the sterilisation temperature.

Power Failure

Power was lost to the machine while in the middle of a cycle.

Chamber Transducer Fail

Chamber pressure transducer is not reading correctly.

Steam Gen Transducer Fail

Steam generator transducer is not reading correctly.

Vent Probe Fail

Vent temperature Probe is not reading correctly.

Load Probe Fail

Load temperature Probe is not reading correctly.

Heater Over Temp

An over-temp thermostat on the element has tripped.

Cycle Aborted

Cycle was aborted with a menu operation while in the middle of a cycle.

Steam Purge Over Pressure

Chamber pressure has become too high during Steam purge stage.

Pre Vac Timeout

Pre Vac stage has failed due to chamber pressure not reaching the value set in software in the time period set in controller software.

Draining Timeout

Draining stage has failed to complete in the time period set in the controller software.

Drying Timeout

Drying stage has failed to complete in the time period set in the controller software.

Air Equalisation Timeout

Air equalisation stage has failed to complete in the time period set in the controller software.

Water Fill Timeout

Boiler level has not been achieved in the time period set in the controller software.

Archive Failure

Flash card cycle data Failed to Archive.

Engineering Override Used

Engineering override was used during a cycle (Engineering Override can only be used by maintenance engineer or above).

Chamber Over pressure

The Chamber pressure has exceeded the maximum value for the given stage.

Sterilisation Over Temp

Temperature of one or more of the temperature probes has gone above the upper limit during sterilisation.

Sterilisation Under Temp

Temperature of one or more of the temperature probes has gone under the lower limit during sterilisation.

Pump Overload

Water pump electrical current draw has exceeded threshold level set in the control system software.

Section 7- Remote Data Archiving

Remote Data Archiving (RDA) is the process of extracting cycle data from the Touchclave Ecotech and storing this data on a remote PC or network. RDA provides the user with a digital record of each sterilisation cycle that has been run on the autoclave.

7.1 Extracting Cycle Data

Cycle data is extracted from the machine and saved onto a USB memory stick.

RDA requires a supervisor level password or higher.

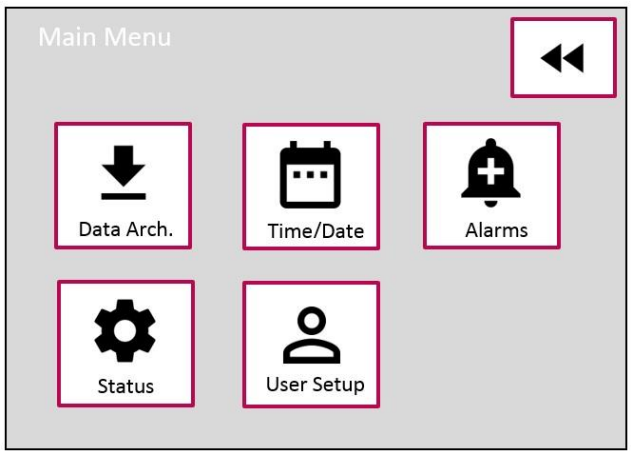
Insert USB Stick into USB Port

Insert the USB memory stick into the USB port on the front control panel of the Ecotech as shown below:

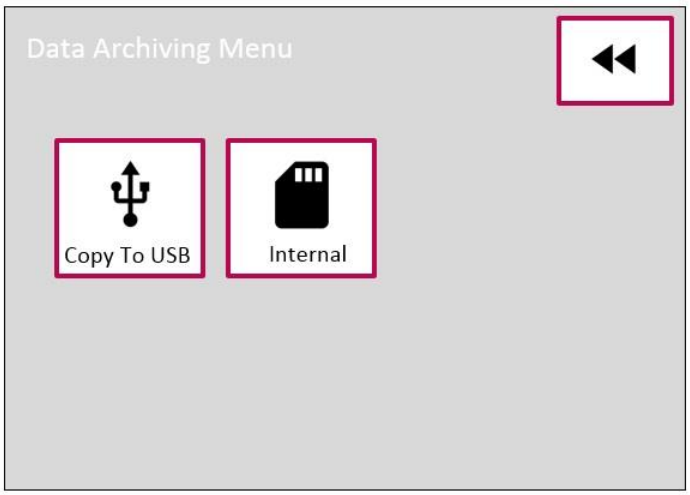
Access the Data Archiving Menu

On the process screen, select the “Menu” icon and enter a supervisor level password (or higher).

Once the main menu is displayed, select the “Data Archiving” icon

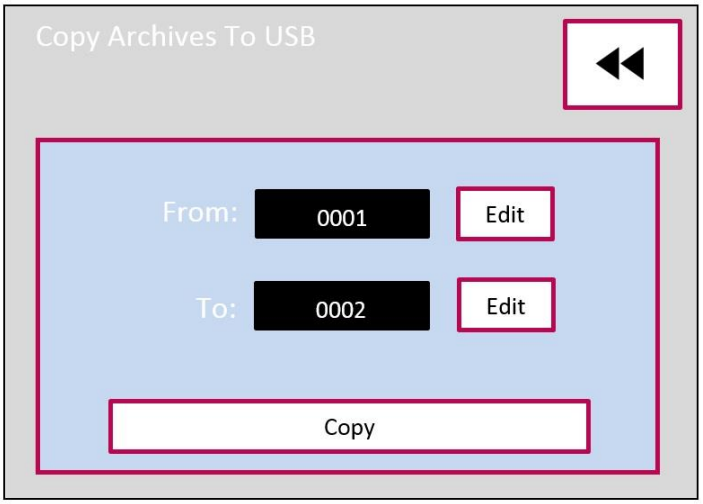


The Data Archiving Menu will now be displayed:



Copy to USB

select the Copy to USB icon and the Copy Archived To USB screen will be displayed:



“From” is the first cycle in the range that can be selected to archive, pressing the “Edit” button on this line allows the user to select the first cycle number in the range to be archived. “To” is the last cycle in the range selected to be archived, pressing the “Edit” button on this line allows the user to select the final cycle number in the range to be archived.

Once the range of cycle s to be archived has been selected, pressing the “Copy” button will transfer the cycles onto the USB memory stick.

“Please Wait…” will be displayed on the screen while the data is transferred from the control system to the memory stick. Once this is completed “Please Wait…” will no longer be displayed on the screen and the USB memory stick can safely be removed from the autoclave.

Warning: Do NOT attempt to remove the USB memory stick while "Please Wait…" message is displayed on the screen. Removing the memory stick while data is transferring could damage the memory stick and cause loss of data.

7.2 Transfer Cycle Data To PC

Cycles are viewed, organised and stored using LTE Ecotech Tools software.

Install Ecotech Tools on PC and open the "Ecotech Archives" program.

Ecotech Archives

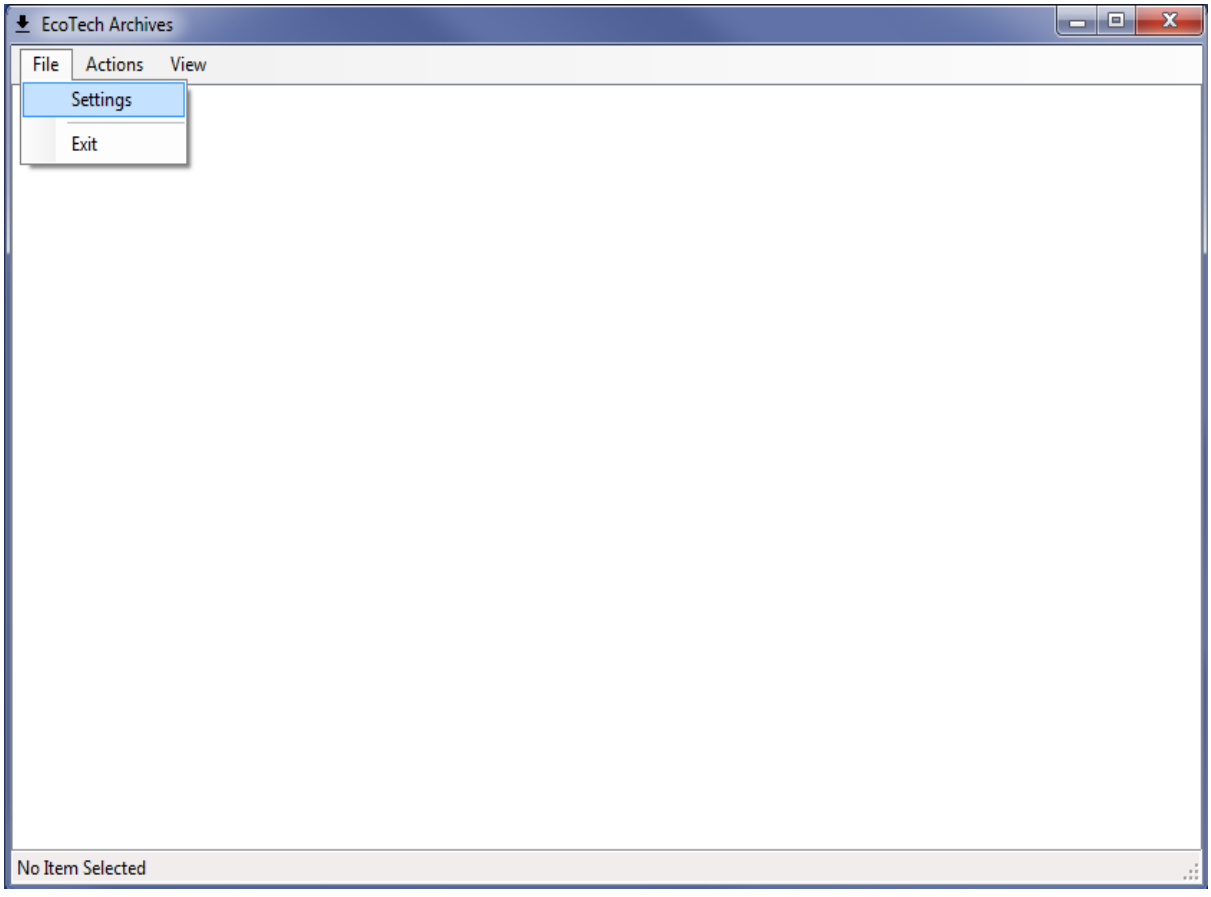
Ecotech Archives is a software package developed by LTE Scientific that allows users to archive data from multiple TC Ecotech machines and view cycle data from each machine. A detailed report is given of each cycle that has been run on each machine and so provides a vital platform for Touchclave Ecotech data storage.

Machine Setup

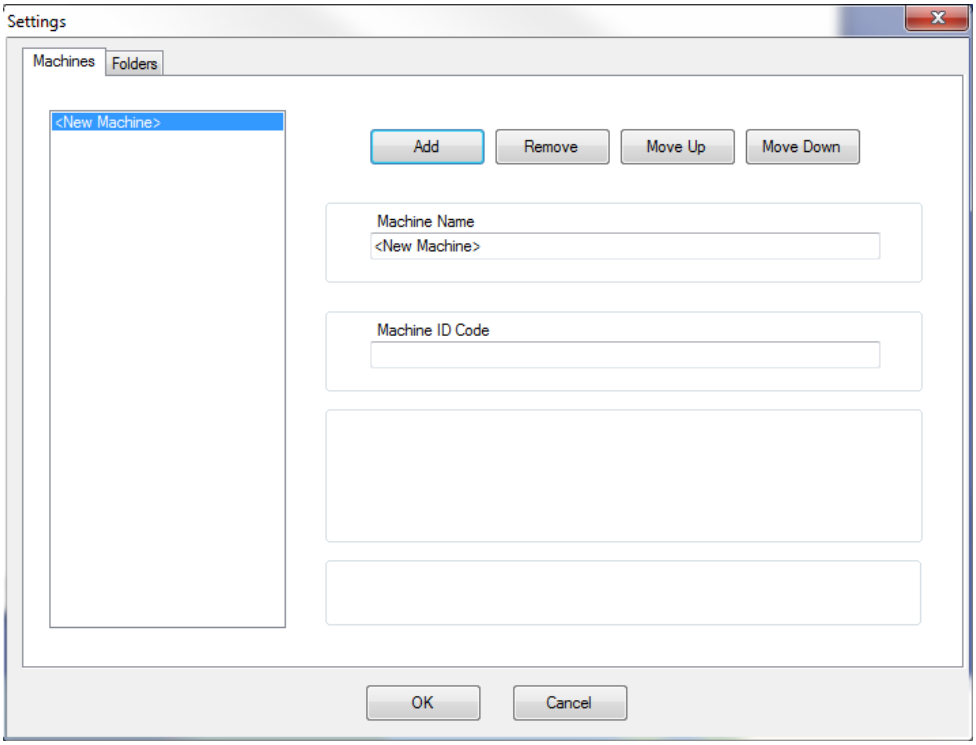
Note: Machine Setup will only be required the first time the software is used.

In order to upload machine data, the machine must be set up in the software.

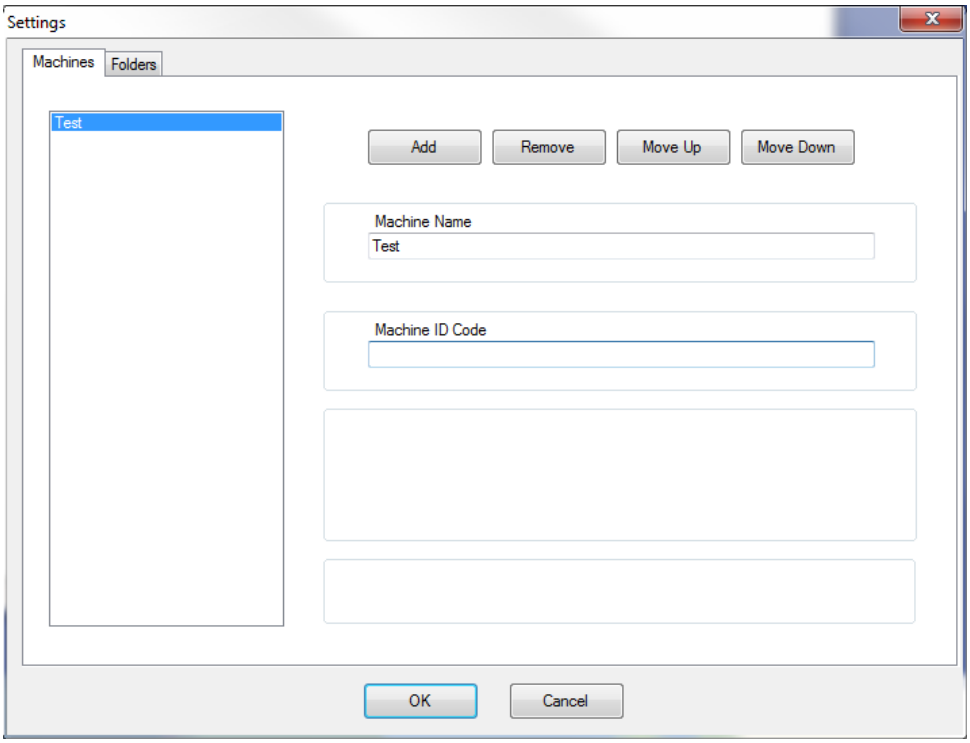
1. Select "File"
2. Select "Settings"



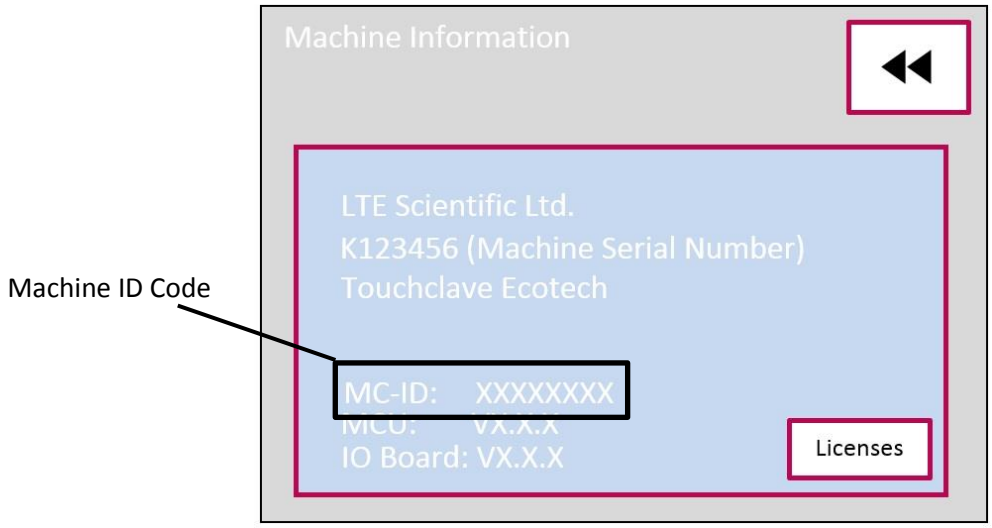
3. Setting window will now be displayed. Select “Add”



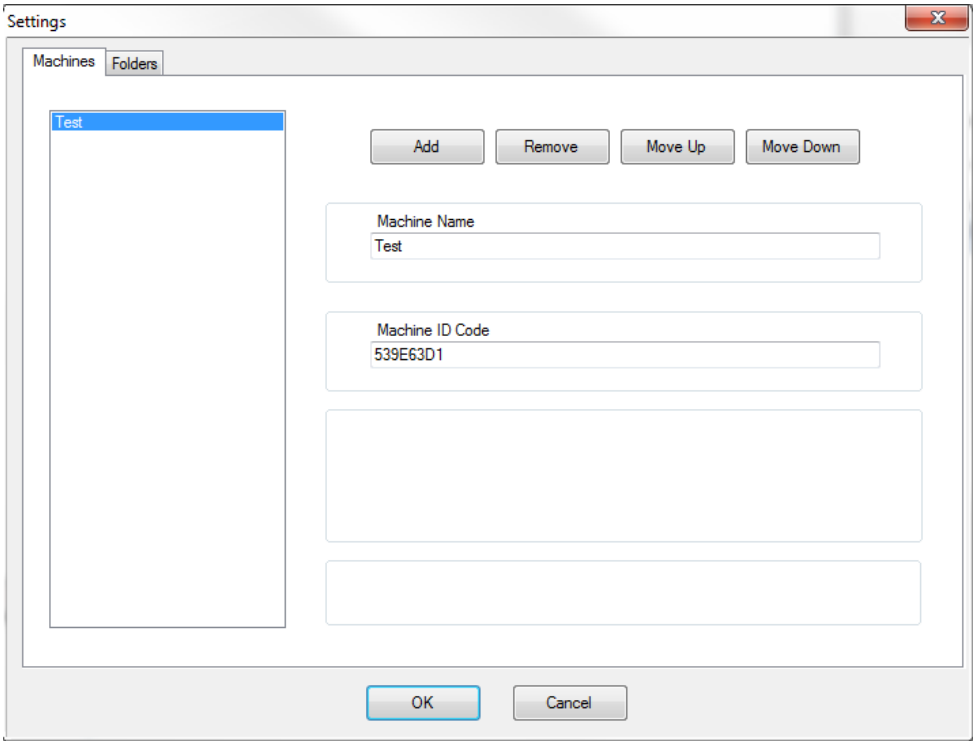
4. Under “Machine Name” give the machine a name, this could be the machine serial number or any name that provides an easy reference. In this example “Test” has been used.



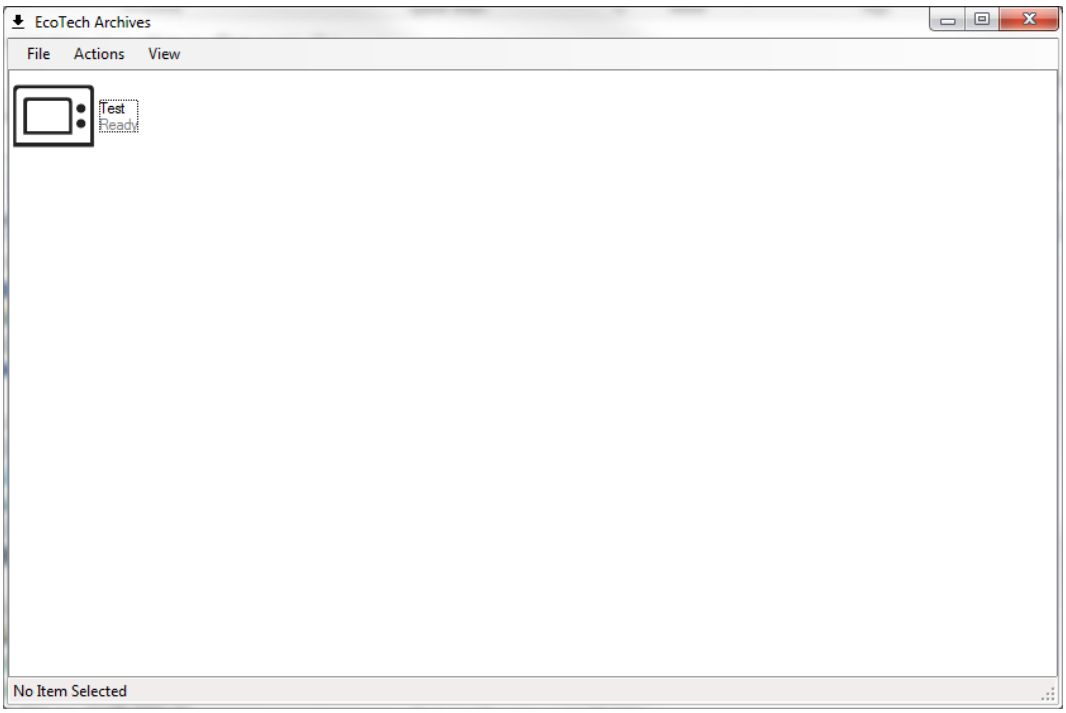
5. Each Touchclave Ecotech machine has a unique machine ID code machine code is given in the M/C info screen in the Status Menu, see M/C Info



6. Get the Machine ID code from the Touchclave Ecotech and enter this code under “Machine ID Code” on the Ecotech Archives settings as it appears on the Machine information screen, example shown below:



7. Press “OK”
8. Machine will now appear on the Ecotech Archives window

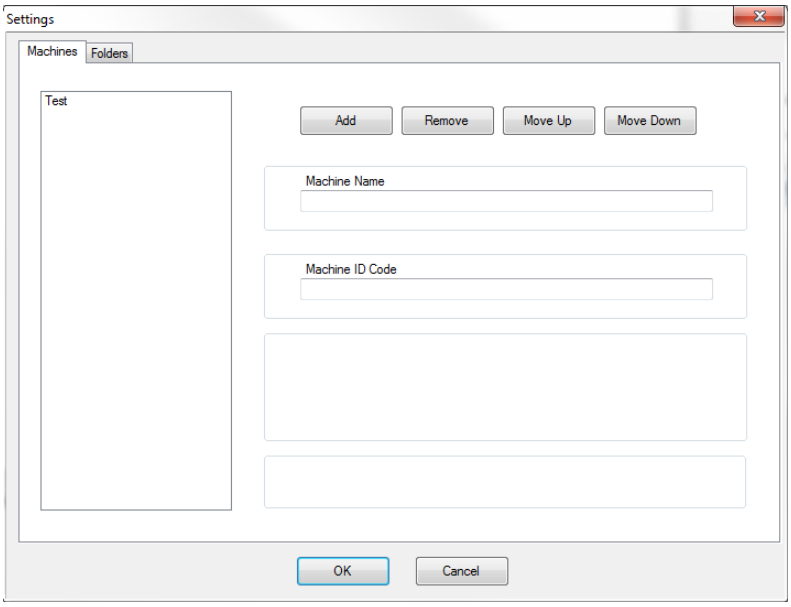


Directory Setup

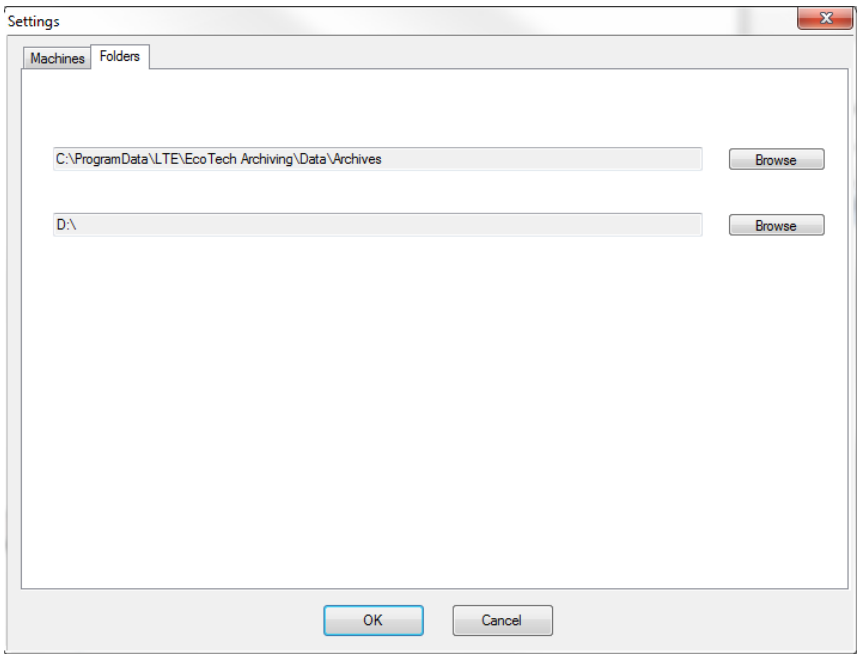
Note: Directory Setup will only be required the first time the software is used on PC or if USB memory stick used for RDA is changed.

The directories must be setup to allow the user to store the archives in a specific location and also set up the directory where the archive data is taken from.

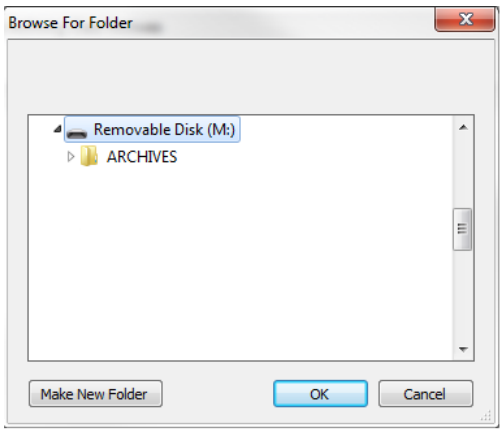
1. Select “File”
2. Select “Settings” to display the settings window:



3. Select the “Folders” tab



4. Directories will be displayed. The first Directory is where the archive files are stored when they are transferred from the USB memory stick to the PC. Pressing the “Browse” button next to this directory will allow the user to select a specific destination they wish the archives to be stores. If the PC is connected to a network, a folder can be created on a network drive so that these are accessible to anyone with access to that network.
5. Select “Browse” button on the second directory and select the USB memory stick drive from the list without selecting any sub folders and select “OK”.

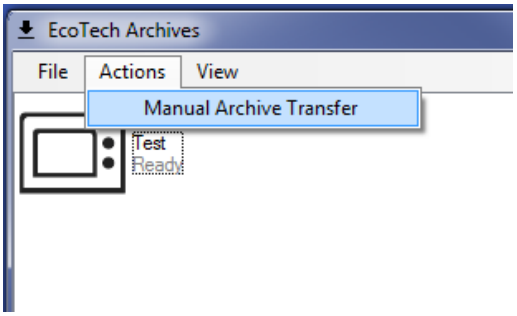


6. Select “OK” on the Setting window.

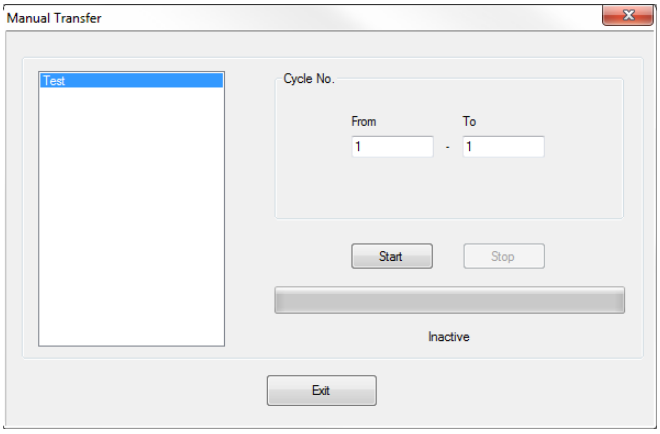
Transfer Cycle Data

Once the Machine and relevant directories have been setup, data can now be transferred from the USB memory stick to the PC.

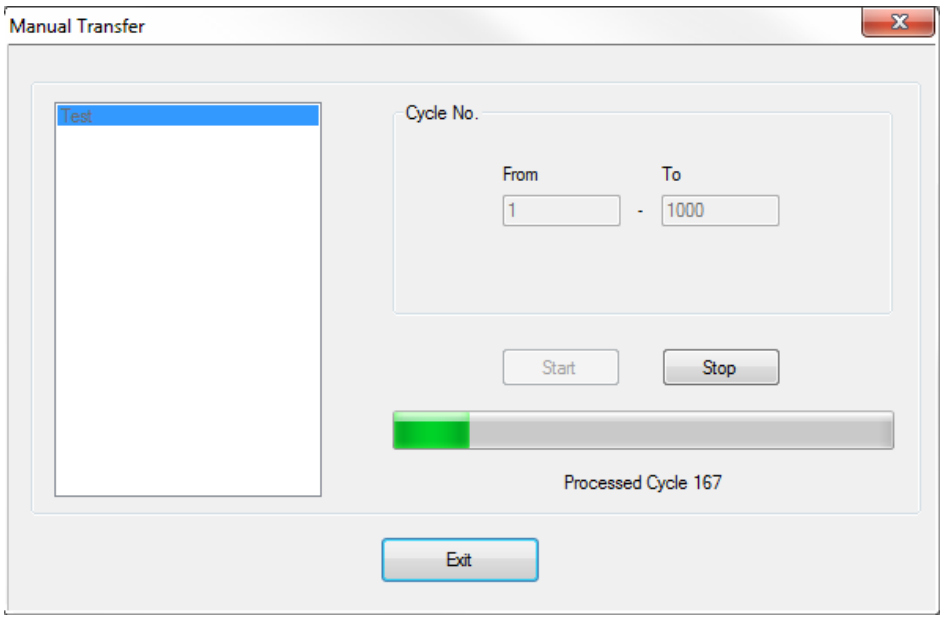
1. Select “Actions”
2. Select “Manual Archive Transfer”



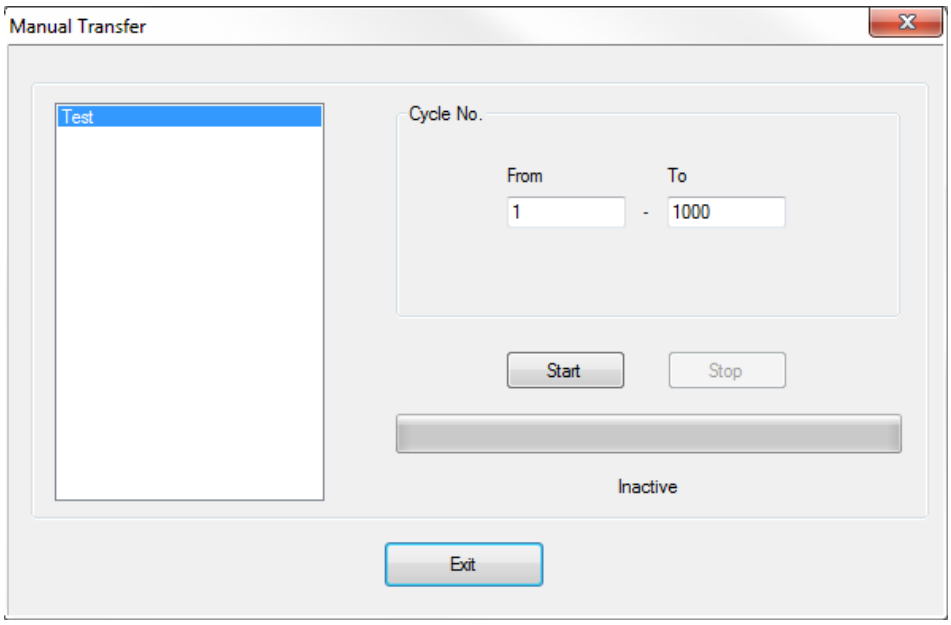
3. On Manual Transfer window, Select the machine from the Left hand list so this is highlighted in blue.



4. In the “From” field, type the cycle number of the first cycle to be archived
5. In the “To” field, type the cycle number of the last cycle to be archived (if you do not know this, but would like to archive all the cycles up to the final cycle that has run, type a high value into this field, for example “1000”)
6. Press “Start”
7. USB data will now be transferred and green progress bar will indicate transfer progress.



8. Once transfer is complete, Progress bar will show “Inactive” once again

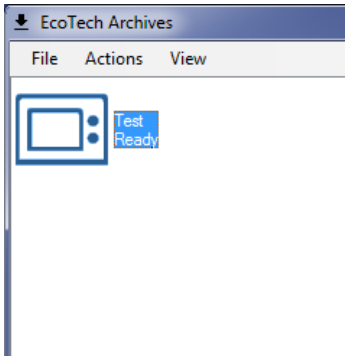


9. Select “Exit” on Manual Transfer window.

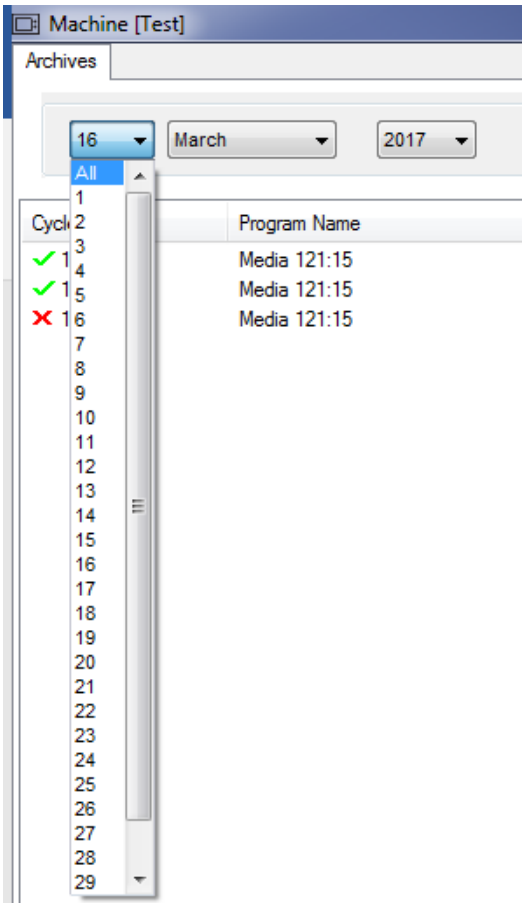
View Cycle Data

With the data successful transferred to PC or network, cycle data can now be viewed.

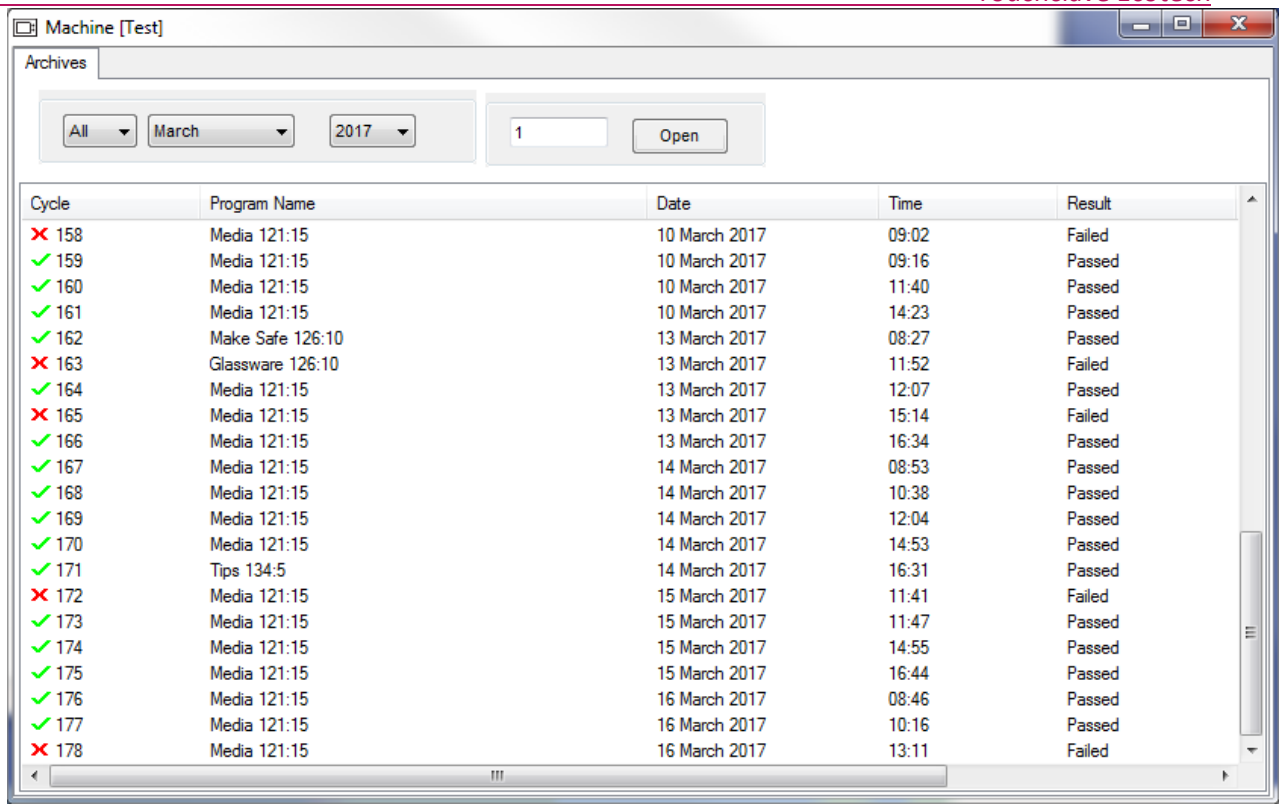
1. Double click on the machine icon of the relevant Ecotech on the Ecotech Archives menu



2. The cycles are sorted into date order of when the cycle was run. The date is selected in the top left hand corner of the Machine Archive window using the drop down menus. Selecting “All” in the day drop down menu will allow the user to search by month and year:

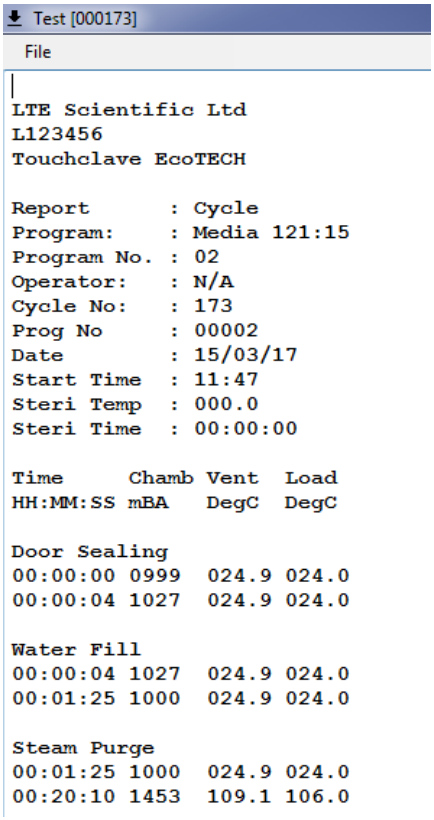


3. The cycles will be displayed and have a green tick to indicate that the cycle passed or a red cross to indicate that the cycle failed, illustrated below:



Cycle	Program Name	Date	Time	Result
✗ 158	Media 121:15	10 March 2017	09:02	Failed
✓ 159	Media 121:15	10 March 2017	09:16	Passed
✓ 160	Media 121:15	10 March 2017	11:40	Passed
✓ 161	Media 121:15	10 March 2017	14:23	Passed
✓ 162	Make Safe 126:10	13 March 2017	08:27	Passed
✗ 163	Glassware 126:10	13 March 2017	11:52	Failed
✓ 164	Media 121:15	13 March 2017	12:07	Passed
✗ 165	Media 121:15	13 March 2017	15:14	Failed
✓ 166	Media 121:15	13 March 2017	16:34	Passed
✓ 167	Media 121:15	14 March 2017	08:53	Passed
✓ 168	Media 121:15	14 March 2017	10:38	Passed
✓ 169	Media 121:15	14 March 2017	12:04	Passed
✓ 170	Media 121:15	14 March 2017	14:53	Passed
✓ 171	Tips 134:5	14 March 2017	16:31	Passed
✗ 172	Media 121:15	15 March 2017	11:41	Failed
✓ 173	Media 121:15	15 March 2017	11:47	Passed
✓ 174	Media 121:15	15 March 2017	14:55	Passed
✓ 175	Media 121:15	15 March 2017	16:44	Passed
✓ 176	Media 121:15	16 March 2017	08:46	Passed
✓ 177	Media 121:15	16 March 2017	10:16	Passed
✗ 178	Media 121:15	16 March 2017	13:11	Failed

4. Double clicking on a cycle will allow the user to see a detailed report of the cycle, which is in the format of a printout, example shown below:



```
Heatup
00:20:10 1453  109.1 106.0
00:29:30 2176  121.9 121.0

Stabilisation
00:29:30 2176  121.9 121.0
00:33:48 2180  121.9 121.3

Sterilisation
00:33:48 2180  121.9 121.3
00:34:48 2178  121.9 121.3
00:35:48 2130  121.6 121.3
00:36:48 2174  121.9 121.4
00:37:48 2180  121.9 121.4
00:38:48 2199  121.8 121.5
00:39:48 2205  121.9 121.5
00:40:48 2139  121.7 121.5
00:41:48 2191  121.8 121.6
00:42:48 2195  121.8 121.6
00:43:48 2180  121.9 121.6
00:44:48 2192  121.8 121.6
00:45:48 2196  121.8 121.7
00:46:48 2180  121.9 121.7
00:47:48 2180  121.8 121.7
00:48:48 2197  121.8 121.7
00:48:48 2199  121.8 121.7
```

```
Cooling
00:48:48 2199  121.8 121.7
01:18:48 1032  036.8 061.2

Draining
01:18:48 1032  036.8 061.2
01:19:48 0969  036.7 060.3

Air Equalisation
01:19:48 0969  036.7 060.3
01:20:48 1008  040.2 059.3


Cycle No:    : 173
Errors       : No
Result       : Passed
CycleTime    : 01:20:48
Approved     : N/A

Cycle Complete


LTE SCIENTIFIC
GREENBRIDGE LANE
GREENFIELD
OLDHAM
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```