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Leading specialists in laboratory and medical
sterilization and decontamination solutions.

LABCLAVE-L AUTOCLAVES

USER MANUAL Part 1 - ALL USERS



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Contents

WARNING	4
1. GENERAL	5
1.1 Scope of User Manual	5
1.2 Classification of User Levels	5
1.3 Overview of Labclave-L Autoclaves	5
1.4 Safety Precautions	6
2. MAIN FEATURES AND OPTIONS	7
2.1 Standard Features	7
2.2 Optional Features	8
2.3 Load Capacities	9
2.4 Cycle Sequence	11
2.5 Typical Cycles	12
3. THE CONTROL SYSTEM	13
3.1 Commands	13
3.2 Process Screens	14
3.3 Menus	14
3.4 Password and batch code screens	15
3.5 Parameter Screens	16
3.6 Warning and Confirmation Screens	17
4. THE CONTROL SYSTEM – DOOR OPERATION	18
4.1 Locks	18
4.2 Door Restrictions	20
5. THE CONTROL SYSTEM - RUNNING A CYCLE	21
5.1 Starting the Cycle	21
5.2 Cycle in Progress	22
5.3 Faults	23
5.4 Cooling Override	25
5.5 Finishing a Cycle	25
5.6 Sample Cycle Printout	26
6. THE CONTROL SYSTEM – OTHER FEATURES	27
6.1 Menu Access Tree for Supervisors and Operators	27
6.2 Initial Access	28
6.3 Data Archiving	28
6.4 View/Print Last Cycle	29
6.5 Set Time/Date	29
6.6 Alarms	29
6.7 Status	30
6.8 User Setup	30
6.9 Cooling Override	31

7.	CARE AND MAINTENANCE	32
7.1	Door Seal	32
7.2	Fitting a Replacement Seal	33
7.3	Cleaning and Draining the Chamber.....	33
7.4	Printer – Instructions of Paper Installation.....	34
7.5	Consumable	35



WARNING

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



- Ensure the water feed, drain and electrical connections to the machine have been fitted before attempting to operate the autoclave.
- Water feed should meet the pressure and conductivity specification required for correct operation of the autoclave.
- 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°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 PPE: heat resistant gloves etc.).
- 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.
- 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.
- Operators, Supervisors and Maintenance Engineers should **NOT** enter the chamber under any circumstances
- This equipment is **NOT** to be used in potentially explosive environments.
- Labclave-L sterilisers should only be used with parts and accessories that are approved/supplied by LTE Scientific Ltd.
- Labclave-L sterilisers should not be used in any other way other than as described in the User Manual.
- Before attempting to carry out any maintenance or repair work on the autoclave, the engineer must ensure it is safe to do so. Ensure autoclave is isolated from electrical, steam, water and compressed air supplies before **ANY** work is carried out. Make sure that chamber, jacket and pipework are not pressurised or under vacuum (by checking mechanical pressure gauges)
- After maintenance/service has been carried out on the autoclave, the service/maintenance engineer will run a test cycle in the presence of the responsible Body to verify that the equipment is a safe state and ready for further use. All maintenance/service work carried out should be documented.
- Decommissioning of Labclave-L machines is to be undertaken by LTE Scientific. Please contact LTE's Service Centre for more information on this.

1. GENERAL

1.1 Scope of User Manual

This manual provides instructions in the use, set-up and maintenance for the Labclave-L autoclaves manufactured by LTE Scientific Ltd ("LTE").

All Labclave-L autoclaves have rectangular chambers with a choice of capacities – 150, 225, 300, 360, 450, 640 and 730 litres.

There is also a choice of steam supply to the chamber:

- Internal steam generator
- Direct steam supply
- In chamber heating

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

1.2 Classification of User Levels

For safety and security, users of Labclave-L autoclaves are classified in four User Levels:

- Operator
- Supervisor
- Maintenance Engineer
- Commissioning Engineer

The User Manual consists of three parts. Part 1 is intended for all User Levels. Part 2 and 3 are reserved for use by Maintenance and Commissioning Engineers, who have a higher User Level allowing them to perform certain functions which cannot be accessed by Operators and Supervisors.

1.3 Overview of Labclave-L Autoclaves

Autoclaves are steam sterilizers which operate by injecting steam under pressure into the chamber or vessel where the load to be sterilized has been placed. Steam is generated by water heated either by an internal generator, customer steam supply or within the chamber. The temperature at which sterilization takes place is pre-programmed, the most common values being 121°C or 134°C, depending on the nature of load to be sterilized.

Control of the Labclave-L autoclave is by means of a touch-screen on the front panel of the autoclave, using an intuitive hierarchical menu system. Different levels of access are built into the system by means of passwords indicating the User Level. The menus only display the options available at the User Level of the current user. Thus a user not trained and authorised for higher-level access cannot accidentally gain access to the more complex functions, such as cycle configuration.

During manufacture, the Labclave-L control system will have been configured to run a standard range of cycles, which can be modified to suit your needs. Therefore the screen illustrations shown in this manual may not match exactly those displayed on your autoclave, although they will be similar.

1.4 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 an overall or lab coat, high temperature gloves and safety glasses to protect hands, arms and eyes when loading or unloading the chamber, since the load temperature may be as high as 100°C
- when moving the autoclave, for example during installation, remember that its weight can make it dangerous if not handled carefully
- 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
- Warning do not operate the Auto door versions of Autoclaves without the drip tray in place as this can cause a foot trap hazard

2. MAIN FEATURES AND OPTIONS

2.1 Standard Features

Labclave-L 'E' Model – Internal Steam Generator

If your site does not have a built-in steam supply, the next option is the “Internal Low Pressure Generator”, which has a second pressure vessel integral to the machine, housing both the heaters and the water supply. The internal heaters generate the steam then the pressure in both the steam generator and the chamber rise until the set temperature is reached.

Only available on Non – Vacuum models without steam jacket

Labclave-L 'D' Model – Direct Steam Supply

This model requires the customer's site to have an accessible steam supply for connection to the autoclave. The advantages of this are that the machine has enhanced cycle times due to the high pressure of most sites' supply, steam jackets are available and the machine(s) can be run from a smaller electric power supply.

Labclave-L 'F' Model – In Chamber Heating

The 'F' model has heaters positioned within the base of the chamber and generates the steam internally within the chamber.

Touchclave 'F' Autoclaves are modular in design, with the various optional features added to the original machine as required.

General

On 'E' and 'F' models the air removal stage is performed by a “Steam Purge” stage where steam and air are forced to the drain of the machine. After sterilization, cooling is achieved by pumping water around the outside of the chamber. Any drying is achieved using the residual heat of the chamber. All 'E' and 'D' models have water jacket cooling and condensate units fitted as standard and must have a mains water supply and drain available which are not demineralised and/or deionised.

2.2 Optional Features

There are five main optional performance-enhancing features than can be added to the machine to improve the speed of the cycle and the range of its functionality.

Constant Standby Generator

On 'E' models, as an alternative to the standard Internal Steam Generator, a high-pressure Constant & Standby Steam Generator may be fitted. This option provides steam on demand and must be fitted if the autoclave is to have either steam jacket or vacuum and air ballast options installed. It reduces cycle times and can support both positive and negative pulsing for air removal.

Constant Standby Generators have a high-power rating so please ensure you have a sufficient supply available for the autoclave to use.

Steam Jacket

Fitting this option will improve the speed of your cycles. The steam jacket is used throughout the cycle to reduce the amount of condensation caused by a cool vessel wall. It speeds up recovery from negative pulses and provides heated insulation for the chamber. If used in conjunction with the Vacuum option, it also provides effective drying of the load at the end of cycle, expanding the functionality of the machine.

Category 3 Effluent Retention

This provides operator safety by filtering all non-condensable gases through a 0.2-micron filter prior to exhaust, whilst returning liquids to the chamber for sterilization. The HEPA filter is fitted inside a stainless-steel housing that is accessible from the rear of the machine. The filter should be checked regularly to ensure performance and safety isn't impaired.

If Category 3 Effluent Retention is to be fitted, the machine must be hard-piped to a drain to allow the water remaining in the chamber at the end of the cycle to be forced down the drain.

Vacuum and Air Ballast

The Vacuum and Air Ballast option adds functionality to the start and end of the cycle, and expands the variety of loads that the machine can deal with. The vacuum can be used for air removal at the start of the cycle as a 'Pre-Vacuum' stage', where a vacuum is drawn in the chamber to a set pressure. With Negative pulsing, steam is injected into the chamber to raise the pressure up to a set point, before the vacuum pump takes the pressure back down to the low set point again. This is repeated for a number of "pulses" until sufficient air has been removed from the load.

In the 'Post - vacuum' stage at the end of sterilizing the air ballast may be used to maintain a pressure in the chamber while it is being cooled rapidly. This prevents liquids from boiling over and sealed loads from rupturing. Then if required a vacuum is drawn in the chamber to dry the load.

If the Vacuum and Air Ballast option is to be fitted, a drain and mains water supply must be available.

Water Jacket

This feature is fitted as standard to 'E' and 'D' models and is available on option on 'F' models. The purpose of this feature is to speed up the cooling stage of the cycle.

2.3 Load Capacities

Model	Pass Through	Steam Source	Capacity (Litres)	Chamber size HxWxD mm	Shelves / Positions	Overall size HxWxD mm	Weight Kg
AL0150	NO	Internal Generator	150	600x500x518	2/16	1870x734x1407	560
AL0225	NO	Internal Generator	225	600x500x749	2/16	1870x734x1552	600
AL0300	NO	Internal Generator	300	600x500x1001	2/16	1870x734x1640	720
AL0330	YES	Internal Generator	330	600x500x1123	2/16	TBC	800
AL0360	NO	Internal Generator	360	700x670x768	2/20	1970x904x1552	760
AL0390	YES	Internal Generator	395	600x500x1318	2/16	TBC	TBC
AL0450	NO	Internal Generator	450	700x670x968	2/20	1970x904x1707	860
AL0450	YES	Internal Generator	450	700x670x968	2/20	TBC	TBC
AL0640	NO	Internal Generator	640	700x670x1368	N/A	1970x904x2107	TBC
AL0640	YES	Internal Generator	640	700x670x1368	N/A	TBC	TBC
AL0730	NO	Internal Generator	730	700x670x1568	N/A	1970x904x2307	TBC
AL0730	YES	Internal Generator	730	700x670x1568	N/A	TBC	TBC

Model	Pass Through	Steam Source	Capacity (Litres)	Chamber size HxWxD mm	Shelves / Positions	Overall size HxWxD mm	Weight Kg
AL0150	NO	Direct Steam	150	600x500x518	2/16	1870x734x1407	TBC
AL0225	NO	Direct Steam	225	600x500x749	2/16	1870x734x1552	TBC
AL0300	NO	Direct Steam	300	600x500x1001	2/16	1870x734x1640	TBC
AL0330	YES	Direct Steam	330	600x500x1123	2/16	TBC	TBC
AL0360	NO	Direct Steam	360	700x670x768	2/20	1970x904x1552	TBC
AL0390	YES	Direct Steam	395	600x500x1318	2/16	TBC	TBC
AL0450	NO	Direct Steam	450	700x670x968	2/20	1970x904x1707	TBC
AL0450	YES	Direct Steam	450	700x670x968	2/20	TBC	TBC
AL0640	NO	Direct Steam	640	700x670x1368	N/A	1970x904x2107	TBC
AL0640	YES	Direct Steam	640	700x670x1368	N/A	TBC	TBC
AL0730	NO	Direct Steam	730	700x670x1568	N/A	1970x904x2307	TBC
AL0730	YES	Direct Steam	730	700x670x1568	N/A	TBC	TBC

Model	Pass Through	Steam Source	Capacity (Litres)	Chamber size HxWxD mm	Shelves / Positions	Overall size HxWxD mm	Weight Kg
AL0150	NO	In Chamber	150	600x500x518	2/16	1870x734x1407	TBC
AL0225	NO	In Chamber	225	600x500x749	2/16	1870x734x1552	TBC
AL0300	NO	In Chamber	300	600x500x1001	2/16	1870x734x1640	TBC

2.4 Cycle Sequence

The main stages of the Sterilising cycle are as follows:

Door Sealing

When the door has been closed you can select the cycle you wish to run and press start. This will cause the door to lock and seal automatically.

Air Removal

If your machine does not have the Vacuum and Air ballast option fitted, "Steam Purge" is the stage used for removing air from the chamber. With a Direct Steam or Constant Standby Generator equipped machine, a valve is opened and steam injected into the chamber. With a standard internal generator, the heaters are switched on and the steam generated as required. The steam is allowed to escape through a valve on top of the chamber, and in so doing carries out the air present in the chamber.

For loads that are more likely to trap air (e.g. plastic discard) then a Vacuum system is recommended. The stages of air removal in this case are "Pre-Vacuum" and "Negative Pulsing". The vacuum has superior air removal, but may increase the overall length of the cycle. This option is only available on machines fitted with a Constant Standby Generator or Direct Steam.

Both Direct Steam and Constant Standby Generator equipped machines are also capable of positive pulsing. In this stage the pressure in the chamber is increased up to a high set point, usually 2000mBA (1 Bar on the gauge). The pressure is then allowed to escape through the vent valve of the machine, taking any air with it, until a low set point of 1200 mBar is achieved. This counts as 1 positive pulse, and the number of positive pulses can be set to any number required until sufficient air is concluded to have been removed from the chamber and load.

Heating up

The autoclave raises its pressure and temperature to the set sterilizing values specified for the cycle. The time taken by this stage depends on the level of the set points and the contents of the load to be sterilized. When the load probe (which should be placed either in the load to be sterilized or in a simulated load device) reports that the sterilizing temperature has been reached the stage will be complete.

Sterilizing

During this stage, the cycle achieves its objective. Whilst the sterilizing temperature can be set for any given cycle at any value between 105°C and 140°C, the values most commonly chosen are 121°C or 134°C, depending on the nature of load to be sterilized (see below). If the printer is fitted, its output during this stage will provide proof that the load has been sterilised. The length of time for sterilization can also be selected by the user, up to a maximum of 4 Hours dependent on the sterilizer type. This can be increased on certain models.

Cooling

Once the sterilizing time is complete we enter the "Cooling" stage.

If Vacuum and Air Ballast is fitted then the machine can be configured to drop the pressure quite rapidly and pull the chamber down into a vacuum condition. This can only be done with certain loads – sealed bottles could explode and liquids boil over. So it is important you choose the correct cycle to run for the load you are sterilizing.

If a water jacket is fitted, it can either activate instantly or be configured to wait until the pressure in the chamber has dropped naturally before starting, in order to prevent the contents of the chamber losing pressure too rapidly.

Drying

Drying is more efficient with the Vacuum and option and an active steam jacket fitted to the machine. The pressure is dropped, where applicable, for a set amount of time so that the load can be vacuum dried as much as possible. With a steam jacket fitted, there is a significant reduction in moisture inside the vessel prior to the drying stage. As this stage relies on the residual heat inside the vessel to dry the load, there can be too much moisture present on the load for effective drying if there is no steam jacket fitted.

2.5 Typical Cycles

The table below shows details of some typical operating cycles, showing set values for different types of load.

OPERATING CYCLE NAME	CYCLE OR LOAD TYPE	STERILIZING TEMPERATURE	STERILIZING TIME	COOLING RATE
MEDIA	Fluid	121°C	15 minutes	40 minutes to 80°C
FLUID DISCARD	Fluid	121°C	15 minutes	40 minutes to 80°C
PLASTIC DISCARD	Plastic Discard	126°C	10 minutes	30 minutes to 80°C
EMPTY GLASSWARE	Empty Glassware	134°C	5 minutes	30 minutes to 80°C
INSTRUMENT	Instruments	134°C	5 minutes	30 minutes to 80°C

The following test cycles are also available through the control system. They can only be carried out when there is no operating cycle in progress.

The LEAK TEST (optional on vacuum models) has two stages:

- Vac – a vacuum is pulled in the chamber.
- Test – the chamber is sealed off.

Each stage is activated alternately by touching the **PUMP** button on the Leak Test screen of the control system. The test ends when the **FINISH** button is touched. The leak test logs time, pressures and temperature at the start and end of each stage, when requested by the operator using the **PRINT/LOG** button.

3. THE CONTROL SYSTEM

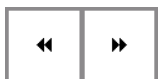
In this section, features and techniques for accessing the various capabilities of the Autoclave and information displayed about the autoclave's state are described.

3.1 Commands

The screens have been designed to have a common and consistent set of displays and commands. The standard buttons and their meanings are:



This button will appear on the top right of the screen. Return to Previous screen.



These Browse buttons will appear where there are multiple sets of screens to browse between.



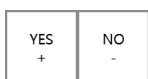
These buttons move Up and Down menu options being displayed



This button is to select or Enter the currently highlighted option.



These buttons move back and forth between parameter values in a set.



These buttons select different options when a parameter value is a multiple-choice option.

3.2 Process Screens

When the autoclave is in standby, the process screen displays information about the current temperatures and pressures and the currently selected cycle.

FABRICS			
Chamber	1008	mBar	MENU
Jacket	1020	mBar	
Vent	018.7	DegC	
Load	016.7	DegC	
Cycle No: -		Date: 03 /10 /25	ALARM
Cycle Time: -		Time: 09 :52	
OPEN		CLOSE	START

When the Autoclave is in cycle, the door control buttons and cycle control area is replaced by a cycle status display.

FABRICS			
Chamber	3149	mBar	MENU
Jacket	1911	mBar	
Vent	135.7	DegC	
Load	135.1	DegC	
Cycle No: 000053		Date: 06 /10 /25	ALARM
Cycle Time: 00 :20 :13		Time: 09 :52	
STERILIZATION		00:00:13	
134.0 DegC 3150 mBar		00:04:47	

In the cycle status display, information about the current stage in progress within the cycle and the stage and cycle times is displayed.

3.3 Menus

The Labclave-L system contains many different menus, which are described in detail later in this manual, however they all share a common format.

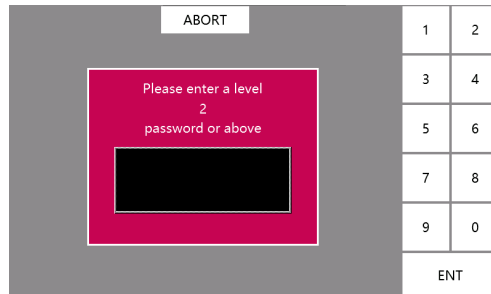
Example:

Main Menu		
► Data Archiving		▲
Set Time/Date		
Alarms		
Status		
User Setup		▼
		⌂

The  and  buttons navigate the menu options. Once the arrow is on the desired option, touch the  button. A menu might have more than one page. Just move the arrow beyond the bottom of a page to change the page. Touching the  button to move back up the menu tree or to the current process screen.

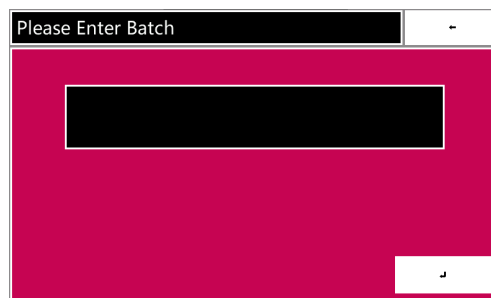
3.4 Password and batch code screens

If a password is required for access to a menu or required to perform a certain operation, this screen will appear.



Enter a valid password using the numeric keypad and touch the Enter key. If an invalid password is entered a warning screen will be displayed.

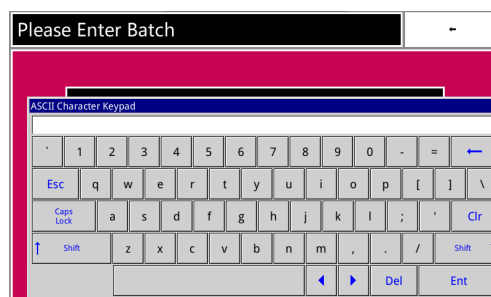
If the cycle requires bar, batch or load codes, press the '**Codes**' button to display the following screen:



If a barcode scanner is attached, simply scan in the barcodes.
Touch the '**Delete**' button to delete the last code entered.

Press and hold the '**Delete**' button to delete all the codes.

If a barcode scanner is not attached or the barcode cannot be scanned, a code can be entered manually. To do this touch the '**Manual**' button to display the following screen:



Touch the Enter button to confirm and go back to the previous screen.

Up to 32 Barcodes can be scanned at one time.

3.5 Parameter Screens

The Labclave-L system uses two types of parameter editing modes, Browse and Sequence.

The Browse mode has both the  and  buttons. These buttons move allow the user to navigate back and forth between each parameter in a set. The browse mode allows a user to select any of the parameters in a cycle.

Examples:

Cycle Parameters							
Active Jacket High							
1950 mBar							
YES +	0	1	2	3	4	5	CLR
NO -	6	7	8	9	.	◀	▶

STERILIZATION							
Sterilize Temp							
134.0 DegC							
YES +	0	1	2	3	4	5	CLR
NO -	6	7	8	9	.	◀	▶

The  and  buttons are used when the parameter is a multi-choice option. Browse through the possible options with these buttons.

Touch the  to leave the editing mode of that particular set of parameters.

The Sequence mode is used when a cycle is started which has variable parameters. The system asks for each parameter in turn. Touch the  button after each parameter has been entered. Once each parameter has been requested, the editing is complete and the cycle start sequence can continue.

Examples:

Automatic Start							
Date							
Tomorrow							
YES +	0	1	2	3	4	5	CLR
NO -	6	7	8	9	.	▶	

Automatic Start							
Time							
07:00							
YES +	0	1	2	3	4	5	CLR
NO -	6	7	8	9	.	▶	

Touch the  in this case to abort the start sequence of the cycle.

3.6 Warning and Confirmation Screens

Warning Screens

Certain interface operations may respond with warning screens. These indicate the operation selected cannot be executed.

Example:



Touch the screen to cancel them and to take the system back to the previous screen.

Confirmation Screens

Certain actions may require that the operator confirm that they wish to proceed with the operation.

Example:



Just touch either the **Yes** or **No** buttons.

4. THE CONTROL SYSTEM – DOOR OPERATION

Door operation is only possible when the Autoclave is out of cycle and no automatic start set
A process screen similar to this one will be visible if no restrictions apply and the door is unlocked.

FABRICS			
Chamber	1008	mBar	 MENU
Jacket	1020	mBar	
Vent	018.7	DegC	
Load	016.7	DegC	
Cycle No: -		Date: 03 /10 /25	 ALARM
Cycle Time: -		Time: 09 :52	
 OPEN		 CLOSE	 000053 START

Touching the '**Open**' button to allow the door to open.

4.1 Locks

Unlocking

Most Autoclave cycles are configured to automatically unlock door(s) during the Air Admission stage and once the cycle has been completed the door release button is displayed. If, however, a cycle is configured to leave the chamber locked at the end of cycle, the following screen is displayed, confirming that the door is locked and that there are no restrictions on opening the door.

FABRICS			
Chamber	1008	mBar	 MENU
Jacket	1025	mBar	
Vent	019.6	DegC	
Load	017.1	DegC	
Cycle No: -		Date: 03 /10 /25	 ALARM
Cycle Time: -		Time: 10 :10	
 UNLOCK		 000053 START	

The '**Unlock**' button starts the unlocking sequence and one of the following screens will appear whilst door unlocking is in progress:

FABRICS			
Chamber	1008	mBar	 MENU
Jacket	1025	mBar	
Vent	019.6	DegC	
Load	017.1	DegC	
Cycle No: -		Date: 03 /10 /25	 ALARM
Cycle Time: -		Time: 10 :11	
Please Wait (Unseal)		 000053 ABORT	

Touch the '**Abort**' button to stop the unlocking sequence.

Locking

Most cycles are also configured with a sealing stage at the beginning of cycle, which locks the door(s).

The machine may have been configured to show a '**Lock**' button when locking was possible. In this case, it will be necessary to lock the door before a cycle may be started. Touching the '**Lock**' button starts the locking sequence. During the door locking operation, a screen similar to this will appear:

FABRICS		
Chamber	1008	mBar
Jacket	1025	mBar
Vent	019.6	DegC
Load	017.1	DegC
Cycle No: -		Date: 03 /10 /25
Cycle Time: -		Time: 10 :09
Please Wait (Seal)		



MENU



ALARM



ABORT

Touch '**Abort**' to stop the locking sequence.

Automatic Powered Doors

Door operation is only possible when the Autoclave is out of cycle and no automatic start set.

Most Autoclave cycles are configured to automatically unlock door(s) during the Air Admission stage and once the cycle has been completed the door release button is displayed.

If, however, a cycle is configured to leave the chamber locked at the end of cycle, the following screen is displayed, confirming that the door is locked and that there are no restrictions on opening the door.

A process screen similar to this one will be visible if no restrictions apply and the door is unlocked.

FABRICS		
Chamber	1008	mBar
Jacket	1020	mBar
Vent	018.7	DegC
Load	016.7	DegC
Cycle No: -		Date: 03 /10 /25
Cycle Time: -		Time: 09 :52
 OPEN		 CLOSE
		 000053 START

Touching the '**OPEN**' button opens the door
Touching the '**CLOSE**' button closes the door

4.2 Door Restrictions

When certain fault conditions or alarm conditions occur, the Labclave-L systems may restrict door control. The reasons for this and the associated screens are described below.

Discard Contamination

Mixed Discard			
Chamber	0891	mBar	 MENU
Jacket	1790	mBar	
Vent	067.3	DegC	
Load	074.3	DegC	
Cycle No:	-	Date: 06 /10 /25	 ALARM
Cycle Time:	-	Time: 12:00	
Contaminated Load			 000058 START

This screen will occur if the chamber is sealed because a discard cycle has failed and the chamber contains contaminated waste. The cycle must be run again and pass before door control is possible.

Chamber Pressure High



If the chamber pressure is above the pre-set maximum for a cycle, then the door will be prevented from opening, even if the cycle has successfully completed sterilization.

Chamber Temperature High



If the chamber temperature is above the pre-set maximum for a cycle, then the door will be prevented from opening, even if the cycle has successfully completed sterilization.

5. THE CONTROL SYSTEM - RUNNING A CYCLE

5.1 Starting the Cycle

After the load has been placed in the chamber, the batch code entered (if required), and the door closed, the autoclave is ready to start a cycle. By touching the **START** button on the standby Process Screen (see section 4.2 above), a sequence of screens is activated to prepare the autoclave to start a cycle. The operator is first asked to nominate the type of cycle which is to be run. Some cycles may be set up to require a password to be entered. At the end of the sequence, a Cycle Start screen similar to the one below appears, allowing the operator to choose between an immediate start by touching the **START** button, or a delayed automatic start by touching the **AUTO** button.

If the cycle requires bar, batch or load codes then the following screen will appear, allowing a review of what codes have been entered. Nothing can be changed at this stage, as the door is closed:

Once the start sequence is complete a screen similar to the one below will appear:

Cycle Start	
Program	Mixed Discard
User	N/A
Cycle No.	000058
Sterilize Time	0600 Sec
Sterilize Temp	126.0 DegC
Sterilize Pressure	2500 mBA
START AUTO	

Manual Start

Touching the '**Start**' button on the 'Cycle Start' screen starts the cycle immediately.

Automatic Start

The automatic start feature allows a cycle to be started at some later time. This can be very useful for enabling a cycle to warm up the Autoclave before production Autoclaving starts or allowing a cycle to run overnight and cool down before unloading in the morning.

Touching the '**Auto**' button on the 'Cycle Start' screen displays the following screen:

Automatic Start	
Date	
Tomorrow	
YES +	0 1 2 3 4 5 CLR
NO -	6 7 8 9 . ▶

Automatic Start	
Time	
07:00	
YES +	0 1 2 3 4 5 CLR
NO -	6 7 8 9 . ▶

Touch the  key after entering each field of the date and time.

Once a new start time and date has been entered, touch the '**Continue**' button to put the system into auto-start mode when following process screen will be shown.

FIXED MEDIA			
Chamber	1008	mBar	
Jacket	1027	mBar	
Vent	019.9	DegC	
Load	017.3	DegC	
Cycle No: 000052		Date: 03 / 10 / 25	
Cycle Time: -		Time: 10 :15	
020 :44 :42			


MENU


ALARM


ABORT

To leave the auto-start mode touch the '**Abort**' button. This operation requires a supervisor's password.

When the specified time arrives, the cycle will start provided that no alarms have been triggered during the waiting period.

5.2 Cycle in Progress

Normal Operation

While the cycle is running a process screen like this one will be displayed:

Diagram illustrating the 'Cycle in Progress' screen layout with annotations:

- Cycle Name:** FABRICS
- Stage Name:** STERILIZATION
- Stage Targets:** 134.0 DegC, 3150 mBar
- Cycle No & Time:** Cycle No: 000053, Cycle Time: 00:20:13
- Local Time:** Date: 06 / 10 / 25, Time: 08 :52
- Time Taken:** 00:00:13
- Time Left:** 00:04:47
- Pressure (mBar Absolute) & Temperatures (°C):** Chamber 3149 mBar, Jacket 1911 mBar, Vent 135.7 DegC, Load 135.1 DegC

Manual Leak Test

During the 'Manual Leak Test' stage the following screen will be visible:

Manual Leak Test		
Chamber	0590	mBar
Jacket	1900	mBar
Vent	072.3	DegC
Load	072.8	DegC
Cycle No: 000060 Date: 06 /10 /25 Cycle Time: 00 02 53 Time: 12 25		
PUMP ON/OFF		
MENU ALARM FINISH		

During this stage the operator can alternate between two sub-stages with the 'Pump On/Off' Button.

- Vac – A Vacuum is pulled in the chamber.
- Test – The chamber is totally sealed off.

The stage ends when the 'Finish' Button is pressed.

The stage logs time, pressures and temperature at the start and end of these sub-stages and when manually requested by the 'Print Log' button.

5.3 Faults

If an alarm condition occurs the control will signal on the display and a fail message will appear on the control screen. To see what the problem is and to clear the fault, press the alarm button on the display. You will then be taken directly to a menu like this, where the fault will be indicated in the list and the "Reset" button will clear the fault from the list once the alarm has been resolved. The "log" button will list all faults that have occurred whilst the machine has been switched on. Once the machine has been powered down however, the log will have been cleared.

Alarms List
LOG RESET

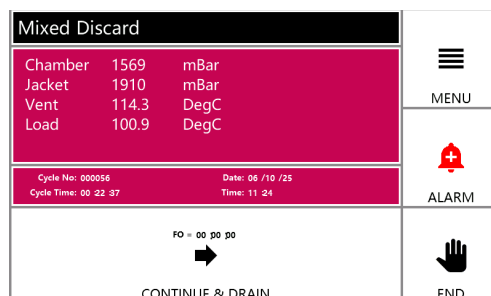
Resetting of alarms is only possible out-of-cycle. Only a supervisor can clear alarms.

Faults In Non Discard Cycles

Any alarms that occur during a cycle are fatal to the operation of the cycle, as the integrity of the cycle has probably been compromised. All alarm conditions (other than engineering override) will cause the cycle to change to its pre-determined fault sequence of stages. The purpose of doing this is to abort the cycle in the safest possible way. All cycles during which an alarm condition has occurred will be marked as failed cycles.

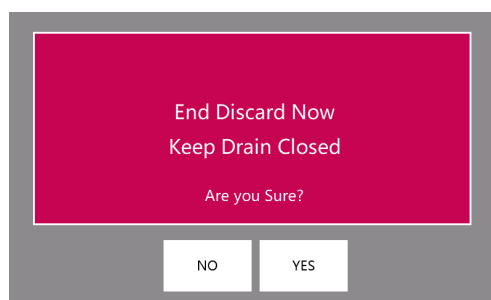
Faults In Discard Cycles

If the load has not been through a complete sterilization stage in a discard cycle before it fails, it is assumed, for Health and Safety reasons, that there is contaminated discard in the chamber. In this case the Autoclave stops the current stage and jumps to the 'Discard Hold' stage, which uses the following process screen:



Selecting End

Choose this option if you feel the load has not been sterilised sufficiently. This will display the following screen:



Saying **Yes** to this confirmation will end the cycle immediately and move to the 'Failed' Screen. The chamber will remain sealed. Door Control will not be available and it will be impossible to select a different cycle. To clear this problem, run the discard cycle again. Once this has completed successfully, normal control will be available.

Selecting Dump

Choose this option if you believe the load to have been sterilised sufficiently and wish to be able to open the chamber. This will display the following screen.



Saying Yes to this confirmation will require a Supervisor or above level password. If a valid password is entered, the cycle will go through the pre-determined fault stages of the cycle as if it was not a discard cycle, dumping the effluent down the drain and completing the cycle with door control available.

5.4 Cooling Override

It is possible to shorten the overall cycle time by accessing the Cooling Override through the menu, which can bring the cooling stage to an end after the temperature has reduced to below 100°C (rather than the normal 80°C). If the Cooling Override is used, care must be taken to ensure that the temperature inside the chamber is safe for the load when it is suddenly exposed to ambient air temperature. It is recommended that the user draws up a procedure for use of the Cooling Override function, and that its availability is limited to supervisors.

5.5 Finishing a Cycle

At the end of the cycle the autoclave will show either 'Pass' or 'Fail' screen.

FABRICS			
Chamber	1027	mBar	MENU
Jacket	1263	mBar	
Vent	064.0	DegC	
Load	073.4	DegC	
Cycle No: 000053 Date: 06 /10 /25			ALARM
Cycle Time: 00 :32 :35 Time: 09 :11			
PASSED			CONTINUE

FABRICS			
Chamber	1027	mBar	MENU
Jacket	1020	mBar	
Vent	054.0	DegC	
Load	088.2	DegC	
Cycle No: 000054 Date: 06 /10 /25			ALARM
Cycle Time: 00 :10 :22 Time: 09 :45			
FAILED			CONTINUE

If Cooling Override has been used the text '**Cooling Override Used**' will flash below the result.

If the cycle has passed and cooling override has not been used, touch the continue button to go straight to door control.

If the cycle has failed or cooling override has been used, touch the '**Continue**' to be prompted for a supervisor or above level password. Upon entering a valid password, door control should be available and the errors will be cleared unless they are still valid.

If Cooling Override was used, it is the user's responsibility to ensure that the current temperature inside the chamber is safe for the load within when rapidly exposed to ambient air. If any doubt exists, then local procedures for this situation should be observed or a supervisor's assistance should be sought before proceeding.

5.6 Sample Cycle Printout

The following is a sample of a printout for all cycles except the leak test

```

C/NAME
J8987
KESTREL 1

Report :- Cycle
Program :- EMPTY GLASSWARE
Operator :- N/A
Cycle No. :- 000015
Prog No. :- 03
Date :- 29/08/07
Start Time:- 11:23
Steril Temp:- 136.0 oC
Steril Time:- 00:15:00

Time      Chan Vent Load
H:M:S    after oC  oC

DOOR SEALING
00:00:00 1028 021 3 028 2
00:00:06 1028 021 4 028 2
STEAM PURGE
00:00:06 1028 021 4 028 2
00:18:09 1438 108 0 130 9
HEATUP
00:18:09 1438 108 0 130 9
00:34:33 3263 137 7 136 0
STABILISATION
00:34:33 3263 137 7 136 0
00:35:32 3261 137 5 136 2
STERILISATION
00:35:32 3261 137 5 136 2
00:36:32 3278 137 3 136 4
00:37:32 3252 137 5 136 5
00:38:32 3244 137 6 136 6
00:39:32 3264 137 6 136 7
00:40:32 3261 137 7 136 8
00:41:32 3228 137 4 136 9
00:42:32 3256 137 6 136 9
00:43:32 3225 137 4 136 9
00:44:32 3255 137 7 136 9
00:45:32 3234 137 4 137 0
00:46:32 3228 137 4 137 0
00:47:32 3262 137 7 137 0
00:48:32 3224 137 4 137 1
00:49:32 3263 137 6 137 0
00:50:32 3227 137 5 137 0
00:50:32 3227 137 5 137 0
COOLING
00:50:32 3227 137 5 137 0
01:28:14 1023 043 4 080 0
AIR ADMISSION
01:28:14 1023 043 4 080 0
01:28:43 1021 043 0 079 7

Vent Above Sterilize Temp :- 00:27:25
Load Above Sterilize Temp :- 00:17:25
FD Achieved :- 14:22:25

Cycle No :- 000015
Errors :- No
Warnings :- No
Result :- Passed
Cycle Time:- 01:28:43
Approved :- N/A

Cycle Complete

Operator :-

LTE SCIENTIFIC
GREENBRIDGE LANE
GREEN FELD
ALJHWA
LTE SERVICE CALL
Tel:-01467-676221

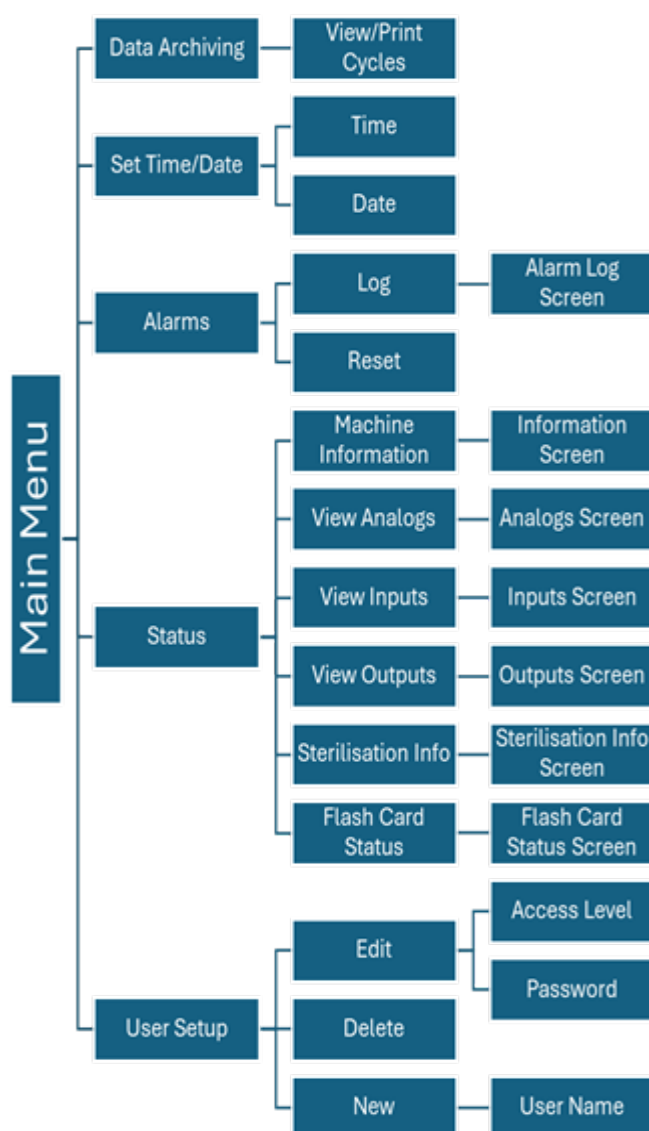
```

6. THE CONTROL SYSTEM – OTHER FEATURES

6.1 Menu Access Tree for Supervisors and Operators

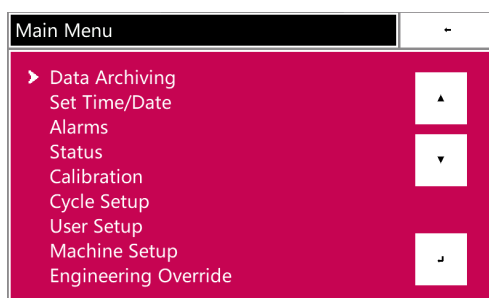
Access to the menu at Operator Level is limited to locking and unlocking the door, selecting a cycle to run, starting a cycle, and viewing alarms.

A person with Supervisor Level or higher status has wider access to the main menu. The access tree is set out below. Highlighted areas are only present in the menu if the applicable option has been fitted to the autoclave. The main functions are described later in this section.



6.2 Initial Access

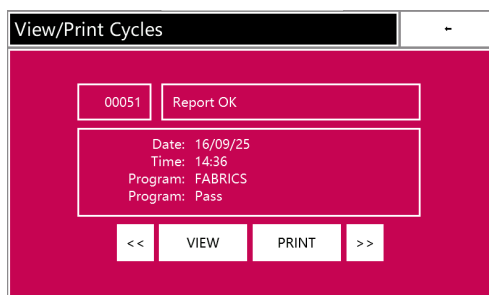
Access to the main menu is not required for operating the autoclave and is normally limited to a person with supervisor or higher status. Touching the **MENU** button on the Process Screen leads to the Password Screen to gain access to the main menu. Depending on the authorisation allowed by the password and the current operating mode of the autoclave, a range of functions will appear on the 'main menu' screen. A typical menu screen is shown below.



The main functions accessible through the menu are described in more detail below.

6.3 Data Archiving

If the system includes the Data Archiving option, it can be accessed when there is no cycle running. Data Archiving, which allows detailed cycle records to be kept, is useful for reference purposes, and may help the user to determine the best cycle for a given load. When Data Archiving is accessed on the main menu by touching the **↩** command, the following screen will appear:



Data archiving allows a detailed cycle record to be maintained for the Autoclave. This is useful for reference and cross reference purposes as well as helping you; the user to determine the best cycles for given loads.

View/Print Cycles When this function is selected, the user can browse rapidly between the cycles recorded in the archiving system using the **◀** and **▶** buttons. When a cycle is selected, its details appear on the screen and the data in the archive will be verified. When the screen shows 'Report OK', as shown in the example below on the left, the **VIEW** button will display the data on the screen and the **PRINT** button will print it if a printer is fitted to the autoclave.

Flash Card Status When this function is selected, the status of the Data Archiving system will be displayed as on the screen below on the right. If remote archiving is available, the value for 'Awaiting Transfer' will normally be close to zero, unless there is a transfer communication problem. The value for 'Free Space' shows how close the card is to needing to be replaced. Flash card status is located in the status menu.

Flash Card Status	
Archive Quantity	36
Awaiting Transfer	36
Free Space	19964
Logon Record Quantity	116
Awaiting Transfer	116
Free Space	4884

6.4 View/Print Last Cycle

If the system does not include the Data Archiving option, this function will appear in the menu when there is no cycle running. It is useful for fault finding or replacement of a printout. It is important to remember that, when a new cycle is started, the 'last cycle' information is permanently deleted from the system's memory.

6.5 Set Time/Date

Selection of this function allows the system clock to be set using the screens. The browse buttons are used to move between the date and time screens.

Set Time/Date							
Time							
10:25:14							
YES +	0	1	2	3	4	5	CLR
NO -	6	7	8	9	.	◀	▶

6.6 Alarms

This function calls up the Alarm List screen (illustrated in the preceding section). The Reset button is only used when no cycle is running.

6.7 Status

By selecting Status, a list of the following information display screens appears.

Machine Information	Displays the type and version of the autoclave, and its software version.
View Analogs	Displays the analog inputs to the control system – vent, load, keep warm (if fitted), temperature channels, jacket pressure (if fitted), chamber pressure. The raw data are displayed by signal direct from the sensor, together with the calibration-adjusted figures.
View Inputs	Shows the condition of key inputs required to run a cycle, such as water level or door status, as monitored by the sensors and switches of the system.
View Outputs	Shows the condition of various outputs whilst running a cycle, such as valves or pumps, in order to assist with identifying faults or problems.
Sterilization Info	Displays the F0 value (a measure of sterilization) for the last cycle. This Information can be useful for improving cycle times.

6.8 User Setup

This function is used to nominate users of the autoclave, using the menu screen below.

Edit My Details	By selecting this function, the screen displays User Name, together with the Level (for allowing access to certain parts of the control system) and Password of the User. Touching the CHANGE button allows a User who is currently logged on to the system to change the Password, but not the Level. Touching the RENAME button allows the User to be re-named.
Edit Other Users	This function displays details of Users who have a lower Level than the User who is currently logged on to the system. Touching the CHANGE button allows the current User to change the Password and Level of a lower-level User, provided that the new Level is no higher than that of the current User. Touching the RENAME button allows the current User to re-name a lower-level User. Touching the DELETE button allows the current User to remove a lower-level User.
New User	When a new User's name is entered using the keypad, the system will display the 'Edit Other Users' screen to allow the new User's details to be entered.

6.9 Cooling Override

This function is only available during the cooling stage of the cycle, after a pre-set minimum cooling time has elapsed. Only Users at supervisor Level may use it. When selected, the following screen appears, with a warning message:



By touching the **YES** button, the autoclave will move to the next stage in the cycle. When the cycle has finished, the User will be warned that this function was used and will not be permitted to move on to door control until the User's password has been entered. Door control will continue to be restricted until the temperature is below the temperatures specified in the cycle parameters.

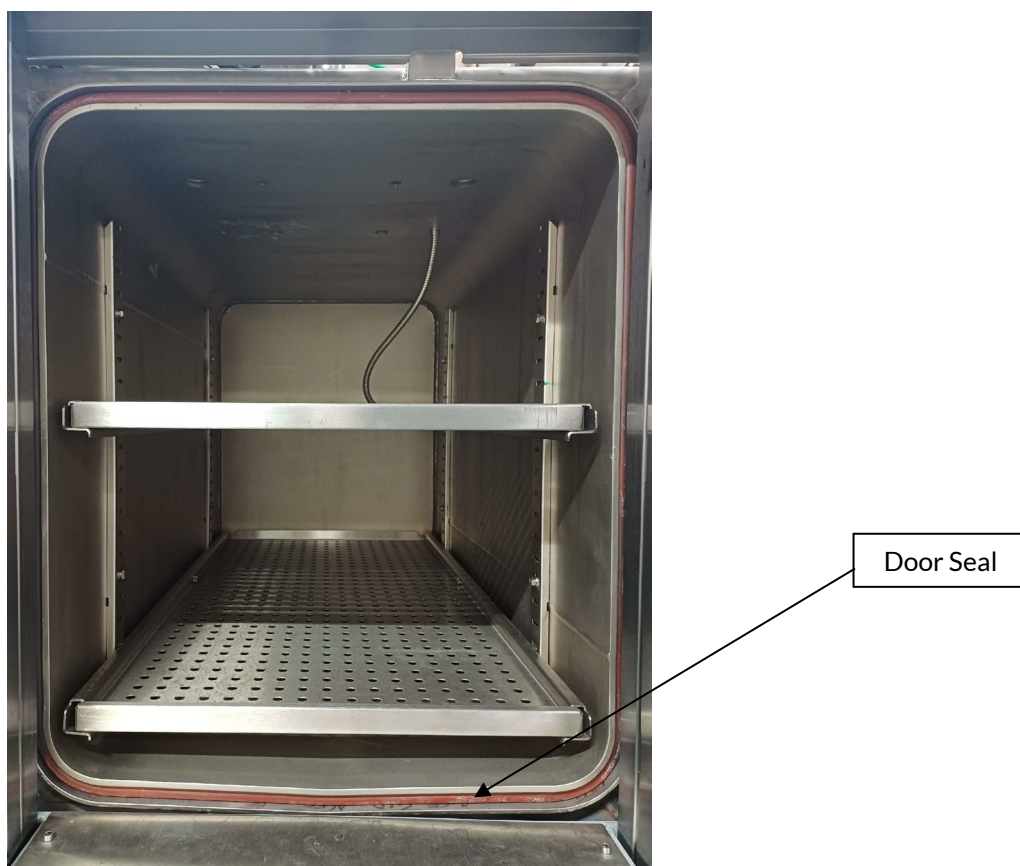
7. CARE AND MAINTENANCE

Labclave-L autoclaves are designed to be easy to maintain. Simple preventive maintenance, as described in this section, will assist in achieving this objective, whilst prolonging the life and reliability of the autoclave.

7.1 Door Seal

Labclave-L autoclaves use a “floating seal” system. The seal sits in a groove on the front of the chamber. When the door is shut and locked, air is then applied behind the seal to ensure full sealing. If the seal has been damaged, it will not be able to seal fully, in which case the autoclave should not be run. If a cycle is run with a damaged door seal, there is a risk that steam will escape from the chamber, causing damage to the equipment or injury to the operator.

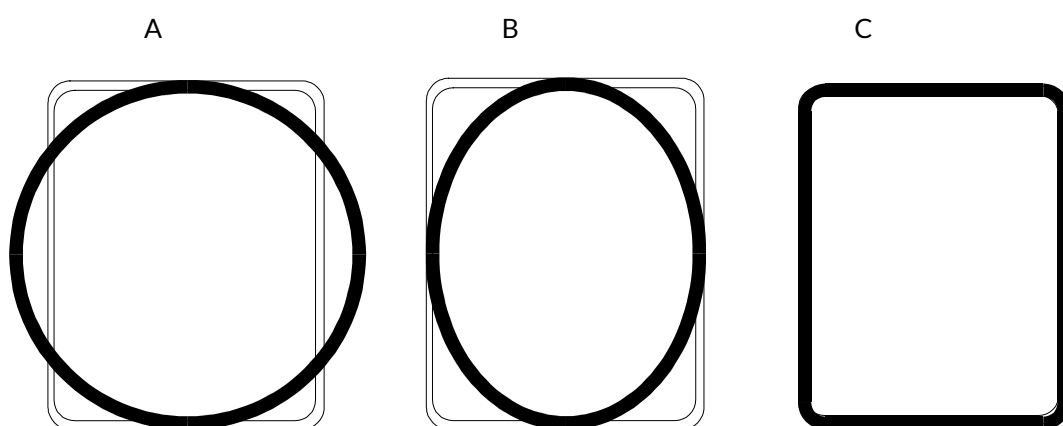
Therefore the seal should be checked frequently for any damage and, if necessary, replaced. The seal and the door face should be cleaned at frequent intervals, and certainly not less than once a month, to ensure the efficiency of the seal and to prolong its useful life.



7.2 Fitting a Replacement Seal

Seals should only be replaced by trained supervisors or engineers. When the old seal has been removed, the new seal is pressed into the circular groove. Pressure should first be applied to the seal at the top of the chamber opening, and then at the bottom, whilst ensuring that both sides of the seal are equidistant from the centre of the chamber. Then the two sides of the seal should be pressed into the groove, whilst ensuring that the all parts of the seal are equidistant from the centre of the chamber. Finally any excess seal should be pressed firmly in to the groove.

Any attempt to fit the seal in one movement, or to stretch the seal, may result in a poor fit and should be avoided. A poorly fitted seal can result in a malfunction when the door has been closed.



Press the top of the seal into the seal groove, and then press the bottom of the seal into the groove, ensuring that there are equal amounts of excess seal at each of the two sides (A).

Press the left and the right hand sides into the groove, ensuring that there are equal amounts of excess seal at each of the four corners (B).

Fit the remaining excess seal into the groove by starting in the centre of the excess sections at the four corners, and then working outwards (C).

7.3 Cleaning and Draining the Chamber

In chamber heating 'F' models chamber draining requires the use of the 'Engineering' area of the control system and therefore should only be carried out by a competent engineer with a high level access code.

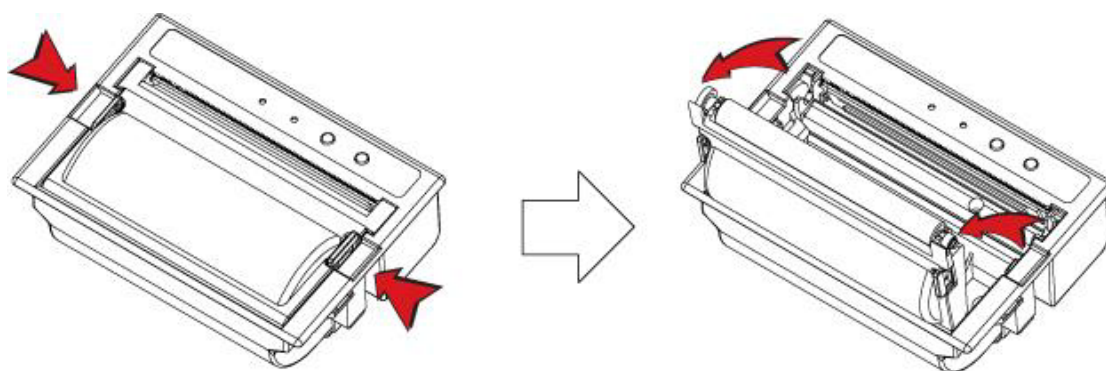
KE and KS models do not require chamber draining as water is not held in the vessel. The internal generator will require maintenance periodically in order to de scale the vessel but this again is an engineering function and not covered by this manual

7.4 Printer – Instructions of Paper Installation

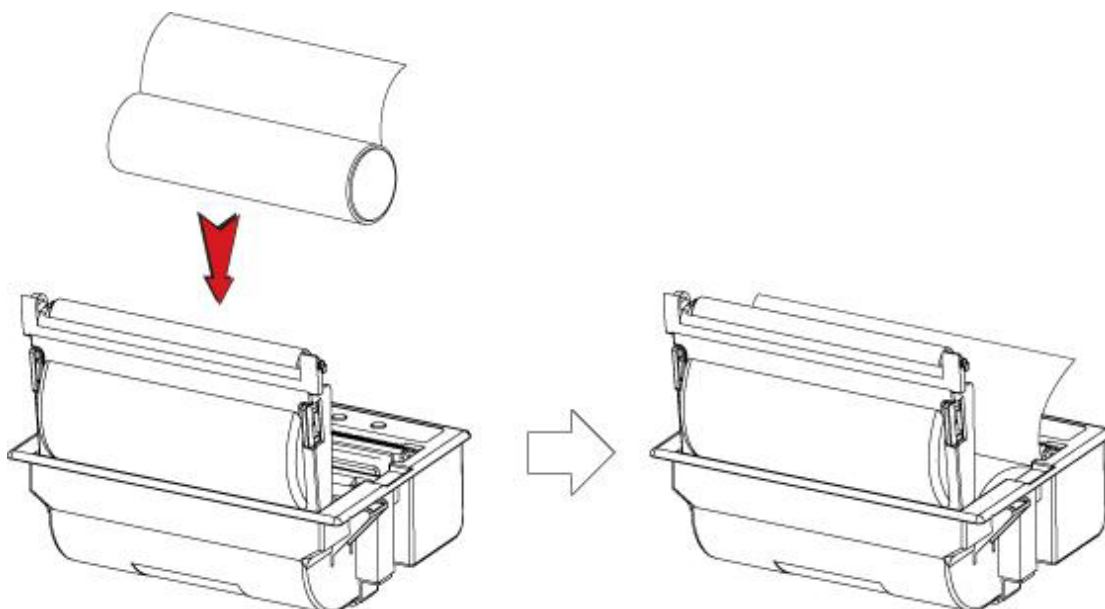
Porti-P340 Printer

Note: It is important to use paper rolls that meet the specifications. Do not use paper rolls that have the paper glued to the core because the printer cannot detect the paper end correctly.

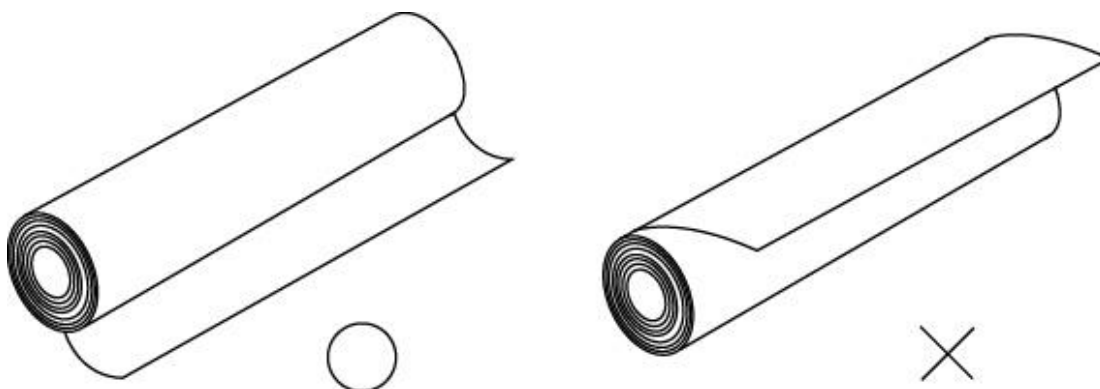
1. Make sure that the printer is not receiving data; otherwise data may be lost.
2. Open the paper roll cover by applying your fingers on both sides of the printer, push up when the lock is released as shown in the drawing below.



3. Remove the used paper roll core if there is one.
4. Insert the paper roll as shown below.

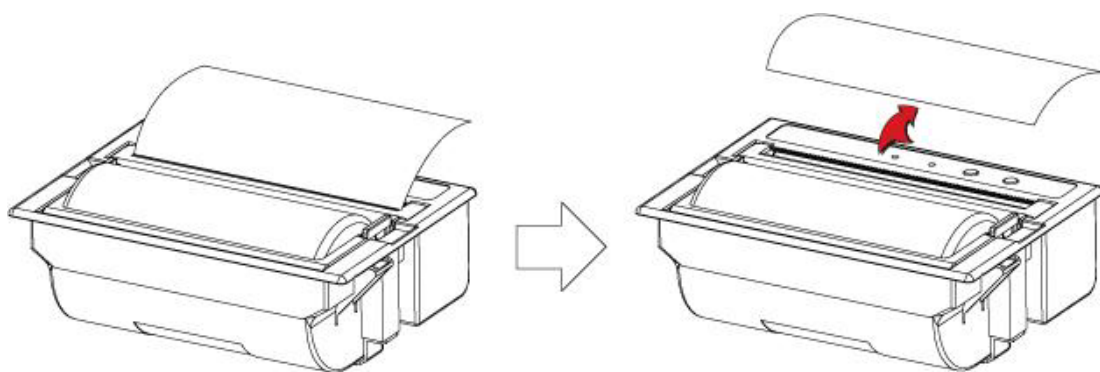


5. Be sure to note the correct direction that the paper comes off the roll.



6. Pull out a small amount of paper and then close the cover as shown.

7. Tear off the paper.



7.5 Consumable

The table below lists the main parts which will need to be replaced from time to time. They can all be ordered from the manufacturer, LTE Scientific Ltd., or from an authorized distributor. It is advisable to keep a stock of such parts in order to avoid interruptions in the operation of the autoclave.

Part no.	Quantity	Description	Availability
710211	1	Air Inlet Filter	Ex stock
3451679	1	Door Seal 500x600	Ex stock
3451649	1	Door seal 670x700	Ex stock
251932	1	Porti-P340 Printer Roll	Ex stock