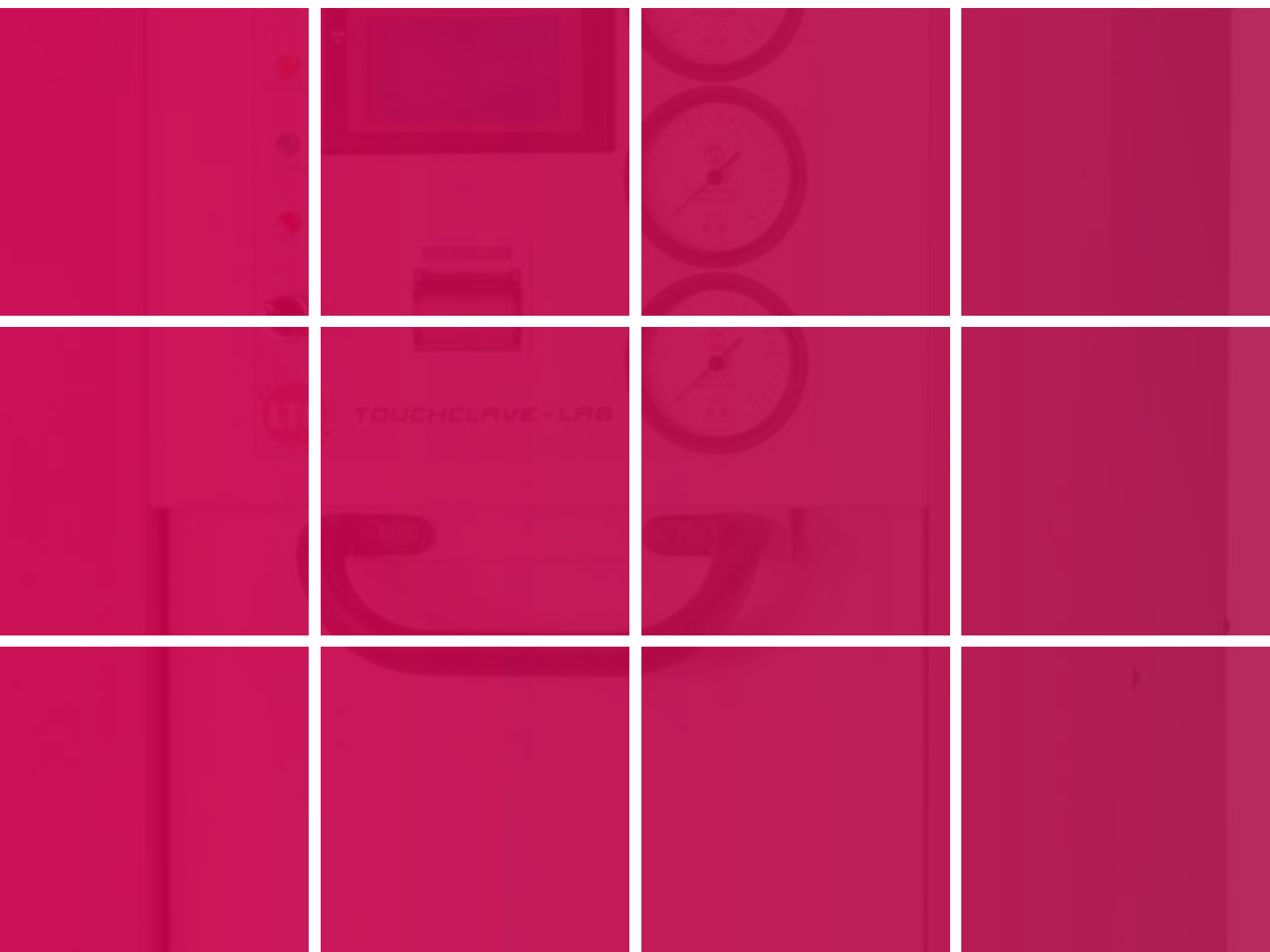




Laboratory Autoclaves

Square section autoclaves from 150 to 1050-litres



About LTE Scientific

LTE Scientific Ltd is a leading designer and manufacturer of sterilizing autoclaves and other laboratory and medical processing equipment. From its UK base near Manchester, LTE products are sold all over the world to customers in the healthcare, research, pharmaceutical, biotech, food, agriculture, water and other sectors.

SOME OF THE OTHER PRODUCTS AVAILABLE FROM LTE SCIENTIFIC

Economy Drying Cabinet – 1000L



Touchclave - ecotech™



Lyotrap, Acrylic Drying Chamber & 8-Port Manifold Lid



OP Series Ovens

LTE'S SQUARE SECTION LABORATORY AUTOCLAVES – AN INTRODUCTION

LTE offers a number of Laboratory Autoclave ranges for general purpose sterilizing applications.

This brochure deals specifically with LTE's square section chamber ranges, which are available with capacities from 150 to 1050-litres.

Touchclave-Lab K	Chamber sizes from 150 - 450 litres	Page 4
Touchclave-Lab F	Chamber sizes from 150 - 450 litres	Page 5
Touchclave Systems-MP	Chamber sizes from 435 - 1050 litres (15 to 36 cu.ft.)	Page 8
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Control System explained		Page 11

Touchclave Systems-MP autoclaves can also be custom-built in chamber sizes up to 10,000 litres.

LTE also manufactures a range of cylindrical chamber laboratory autoclaves and porous load autoclaves designed for central sterilizing departments in hospitals and other critical processing applications. Details are contained in separate brochures.

Which Autoclave is Right For Me?

Choosing the right autoclave and, more importantly, the options that can be fitted to it is extremely important and varies depending on application and throughput. You need to ensure that your autoclave is optimised for the load types you intend to process. To help you with this process, we offer a data sheet entitled '**A Straightforward Guide to Choosing your Autoclave**', which can be downloaded from our web-site or requested from our sales office.

If you require more information on the products in this brochure, or would like details on any other product in our range, please visit our website or contact our sales office on **+44 (0)1457 876221**.

RAISING THE STANDARD

All pressure vessels from LTE fully comply with the specific requirements of the latest European Pressure Equipment Directive 2014/68/EU and are supplied with a 10-year/10000 cycle construction warranty as standard (details on request). In addition, all LTE autoclaves are built to meet many national and International Standards.

Below are some of the applicable standards and codes

ISO9001:2008	GAMP5*
ISO17025/UKAS*	PD5500
BS2646	PED 2014/68/EU
BS3970*	HSE Note PM73
BS6759 (safety valves)	EMC 2014/30/EU
EN13445	LVD 2014/35/EU
HTM2010*	EN61010-1-2010
EN285*	EN55011
PM60*	EN61000-4
21CFR11*	EN13485

Those standards marked * may require the fitting of options or additional documentation/testing in order to comply.

Touchclave-Lab 'K' Series

INTEGRAL STEAM GENERATOR/DIRECT STEAM

The Touchclave-Lab 'K' Series is LTE's top-line range of mid-sized rectangular chambered general purpose autoclaves, available in 5 sizes from 150 - 450 litre capacities, with pass-through versions also available from 300 litres and above.

A wide range of features are included in the 'K' Series as standard to enhance machine performance and cycle efficiency. These include:

- 8-program touchscreen control system
- Internal data archiving
- Water jacketed chamber for exceptional cooling efficiency
- Water conservation system and exhaust condensate
- Load-sensed process timer
- Pneumatically operated door lock and sealing system
- Integral silent air compressor

In addition, a wide range of options are available for the Touchclave-Lab range to suit individual customer requirements. See pages 6/7 to see what other options you may need.

'K' Series models are designed to operate using either a steam generator situated beneath the chamber, or via the customers own direct steam supply. This arrangement maximises the usable chamber volume and provides a clean, unencumbered chamber, free from heaters and water.

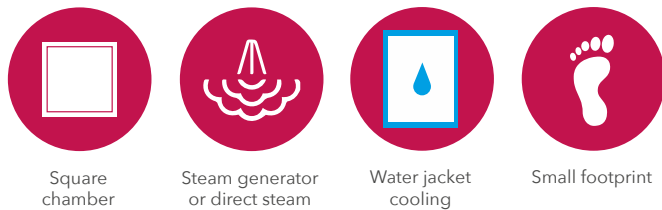
Unless the door is properly closed and locked, the cycle cannot be started.

At the end of the cycle, the door will not be released until both temperature and pressure have reached safe pre-set levels.

All models incorporate an easy-glide vertical sliding door and have been designed to have a small footprint. A power door can be fitted as an option.



Touchclave-Lab with optional Power-Door



Square chamber

Steam generator or direct steam

Water jacket cooling

Small footprint

Touchclave-Lab 'F' Series

IN-CHAMBER HEATING

Designed to offer a rectangular chamber and a high level of standard features at a more affordable price, our Touchclave-Lab 'F' Series represents excellent value for money.

The 'F' Series is available in 5 sizes from 150 to 450 litres and boasts the following standard features.

- 8-program touchscreen control system
- Internal data archiving
- Pneumatically operated door lock and sealing system
- Load-sensed process timer
- Integral silent air compressor

In addition, a wide range of options are available for the Touchclave-Lab range to suit individual customer requirements. See pages 6/7 to see what other options you may need.

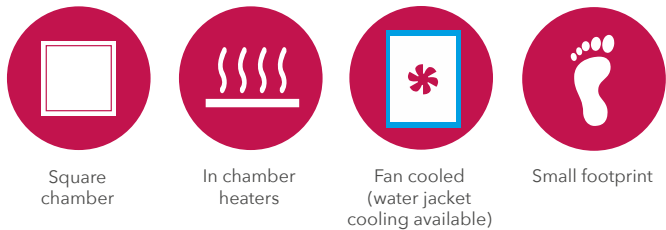
Submerged heaters within the chamber generate steam. The chamber water can be topped up and drained periodically, either manually or automatically.

Sensors within the chamber prevent the cycle from starting or continuing if there is insufficient water.

Unless the door is properly closed and locked, the cycle cannot be started.

At the end of the cycle, the door will not be released until both temperature and pressure have reached safe pre-set levels.

All models incorporate an easy-glide vertical sliding door and have been designed to have a small footprint. A power door can be fitted as an option.



Square chamber

In chamber heaters

Fan cooled (water jacket cooling available)

Small footprint

Touchclave-Lab Technical Information

TECHNICAL AND ORDERING INFORMATION

Model	Chamber litres	Steam Generation	Chamber dims, mm HWD	Overall dims, mm HWD	Weight, kg	Shelves/ positions
TC/150/F	150	In-Chamber	600 x 500 x 500	1825 x 720 x 1220	490	2/4
TC/150/KE	150	Integral Steam Generator	600 x 500 x 500	1825 x 720 x 1220	530	2/4
TC/150/KS	150	Direct Steam Supply	600 x 500 x 500	1825 x 720 x 1220	480	2/4
TC/200/F	200	In-Chamber	600 x 500 x 660	1825 x 720 x 1370	510	2/4
TC/200/KE	200	Integral Steam Generator	600 x 500 x 660	1825 x 720 x 1370	560	2/4
TC/200/KS	200	Direct Steam Supply	600 x 500 x 660	1825 x 720 x 1370	500	2/4
TC/300/F	300	In-Chamber	600 x 500 x 1000	1825 x 720 x 1370	540	2/4^
TC/300/KE	300	Integral Steam Generator	600 x 500 x 1000	1825 x 720 x 1370	680	2/4^
TC/300/KS	300	Direct Steam Supply	600 x 500 x 1000	1825 x 720 x 1370	630	2/4^
TC/360/F	360	In-Chamber	600 x 600 x 1000	1825 x 820 x 1370	660	2/4^
TC/360/KE	360	Integral Steam Generator	600 x 600 x 1000	1825 x 820 x 1370	720	2/4^
TC/360/KS	360	Direct Steam Supply	600 x 600 x 1000	1825 x 820 x 1370	650	2/4^
TC/450/F	450	In-Chamber	600 x 600 x 1250	1825 x 820 x 1620	760	2/4^
TC/450/KE	450	Integral Steam Generator	600 x 600 x 1250	1825 x 820 x 1620	820	2/4^
TC/450/KS	450	Direct Steam Supply	600 x 600 x 1250	1825 x 820 x 1620	750	2/4^

^ Shelves on these models are fitted with a no-tip auto-stop function and can be pulled out upto half-way

MODELS AND OPTIONS/ACCESSORIES

K Models

Capacity/Steam Generation Method	150-litres		200-litres		300-litres		360-litres		450-litres	
	Integral steam generator	Direct steam	Integral steam generator	Direct steam	Integral steam generator	Direct steam	Integral steam generator	Direct steam	Integral steam generator	Direct steam
Standard	TC/150/KE1	TC/150/KS6	TC/200/KE1	TC/200/KS6	TC/300/KE1	TC/300/KS6	TC/360/KE1	TC/360/KS6	TC/450/KE1	TC/450/KS6
Enhancement Packages										
Pre/post vacuum system (50mbarA) and (for KE models) constant standby steam generator	TC/150/KE3	TC/150/KS7	TC/200/KE3	TC/200/KS7	TC/300/KE3	TC/300/KS7	TC/360/KE3	TC/360/KS7	TC/450/KE3	TC/450/KS7
Pre/post vacuum system (50mbarA) with steam jacket and (for KE models) constant standby steam generator	TC/150/KE5	TC/150/KS9	TC/200/KE5	TC/200/KS9	TC/300/KE5	TC/300/KS9	TC/360/KE5	TC/360/KS9	TC/450/KE5	TC/450/KS9

F Models

Capacity/Steam Generation Method	150-litres	200-litres	300-litres	360-litres	450-litres
	In-Chamber Heaters				
Standard	TC/150/F1	TC/200/F1	TC/300/F1	TC/360/F1	TC/450/F1
Enhancement Packages					
Standard-Plus (includes automatic water fill and condensate unit)	TC/150/F7	TC/200/F7	TC/300/F7	TC/360/F7	TC/450/F7
Standard Plus with pre/post vacuum system (50mbarA)	TC/150/F6	TC/200/F6	TC/300/F6	TC/360/F6	TC/450/F6
Standard Plus with water jacket	TC/150/F4	TC/200/F4	TC/300/F4	TC/360/F4	TC/450/F4
Standard-Plus with pre/post vacuum system (50mbarA) and water jacket	TC/150/F2	TC/200/F2	TC/300/F2	TC/360/F2	TC/450/F2

Model	Accessories
TC/ESB/01	Emergency Stop Button*
TC/AIR/01	Air Ballast System (using customer's compressed air supply)*
TC/AIR/02	Air Ballast System (with uprated internal air compressor)*
TC/AFP/01	Upgrade of Standard Load Probe to Armour-Flex Probe
TC/FIL/01	Cat. 3 Effluent Retention including 0.2 micron filter*
TC/PWR/01	Pneumatic Powered Door with Safety Edge and E-Stop*
TC/ALR/01	Automatic Leak-Rate Cycle*
TC/PAS/01	Pass-through Chamber (300-Litre models only)*
TC/PAS/02	Pass-through Chamber (360 & 450 Litre models only)*
TC/INK/01	Ink Printer
TC/TDP/01	Thermal Paper Printer
TC/GCR/01	Independent Graphic Recorder
TC/RDA/--	Remote Data Archiving - Various options: USB/Ethernet/Wifi (excluding PC)*
TC/VOL/01	Conversion to 60Hz power supply for non-Vacuum models*
TC/VOL/02	Conversion to 60Hz power supply for Vacuum models*

Items marked * are factory fit options

Various baskets and discard boxes are available. Please contact LTE for further details.

A range of other options can be ordered through our sales office including loading and carriage trolleys, stainless steel panel-work and chart recorders

TOUCHCLAVE-LAB SITE SERVICES

Water

Potable water with a maximum hardness of 50ppm CaCO3 is acceptable. Otherwise check with LTE for suitability. For automatic water fill/permanently piped versions, connection is via a 15mm diameter water inlet.

Drain

For ‘F’ models fitted with auto-drain and/or vacuum, and all ‘K’ models a 100mm drain is required. A drain is not required on standard ‘F’ models although we would always recommend connection where possible. See site services sheet for full details.

Electrical

See Table Below. Prices based on 220/240V (1-Phase) and 380/440V (3-Phase), 50Hz. For other voltages/frequencies, see options or check with LTE.

	Power Requirements	
	Non-Vacuum Models	Vacuum Models
TC/150/F	3-Phase, 20A/phase N+E	3-Phase, 25A/phase
TC/150/KE	3-Phase, 25A/phase N+E	3-Phase, 50A/phase N+E
TC/200/F	3-Phase, 25A/phase N+E	3-Phase, 30A/phase N+E
TC/200/KE	3-Phase, 25A/phase N+E	3-Phase, 50A/phase N+E
TC/300/F	3-Phase, 35A/phase N+E	3-Phase, 45A/phase N+E
TC/300/KE	3-Phase, 50A/phase N+E	3-Phase, 63A/phase N+E
TC/360/F	3-phase, 45A/phase N+E	3-phase, 45A/phase N+E
TC/360/KE	3-Phase, 63A/phase N+E	3-Phase, 63A/phase N+E
TC/450/F	3-Phase, 63A/phase N+E	3-Phase, 63A/phase N+E
TC/450/KE*	3-Phase, 63A/phase N+E	3-Phase, 63A/phase N+E
All KS Models	1-Phase, 13A	3-Phase, 16A/phase N+E

*Due to this model being fitted with a high pressure steam generator, the safety vents from the steam generator must terminate outside

Touchclave Systems-MP

DIRECT STEAM/STEAM GENERATOR

LTE Touchclave Systems Autoclaves provide versatility, clear and easy to use operator controls, comprehensive data retrieval options, and excellent levels of sterility assurance.

Our MP range of general purpose rectangular chambered sterilizers are available in eight standard sizes and sixteen models from 435 to 1052 litres. Larger sized units up to 10,000 litres can also be provided. All models can be configured for either single entry or pass-through. All Touchclave Systems models are fitted with a wide selection of features as standard, all designed to ensure optimum performance. These include:

- Automatic sliding doors with safety edge and auto-retract system. Floating door seals are employed as standard
- Pre/post vacuum system which employs a high efficiency liquid ring vacuum pump
- Air ballast system for fast and safe processing of fluids
- Water jacket for exceptional cooling efficiency
- Steam jacket for optimum drying performance
- 8-program user-friendly touchscreen control system (expandable to 20 programs if required - see page 11 for details)
- Internal data archiving with 5000 cycle capacity- see page 11 for details
- Thermal or impact printer which provides all cycle details and operational data

Touchclave Systems MP models are all designed to work from the customers central steam supply. Alternatively they can be supplied with electrically heated integral or stand alone steam generators.

Touchclave Systems are available with a wide range of options, allowing you to build up the machine specification to meet your individual needs. For example all models can be configured for high security applications which usually involves the fitting of effluent retention and a bio seal if pass-through. Where there is a clean steam requirement, Touchclave Systems sterilizers can be supplied with polished chambers, stainless steel pipework and clean steam generators.



Touchclave Systems-MP Technical Information

TECHNICAL AND ORDERING INFORMATION

All Touchclave Systems-MP models include a thermal printer, pre/post vacuum (<50mbarA) and air ballast as standard.

All models are designed for direct steam. Steam generators are detailed below if required.

MODELS AND OPTIONS/ACCESSORIES

Catalogue No.	Chamber litres/cu.ft	Door Movement	Chamber dims, mm HWD	Overall dims, mm HWD*	Weight, kg
Single Entry Models					
UCF15	435/15	Vertical	660 x 660 x 1000	1800 x 1270 x 1890	875
UCF20	545/20	Vertical	660 x 660 x 1250	1800 x 1270 x 2240	950
SCF21	636/21	Horizontal	965 x 660 x 1000	1762 x 1880 x 2030	950
UCF26	740/26	Vertical	660 x 660 x 1700	1865 x 1270 x 2510	1150
SCF28	796/28	Horizontal	965 x 660 x 1250	1762 x 1880 x 2280	1200
UCF31	870/31	Vertical	660 x 660 x 2000	1865 x 1270 x 2810	1350
SCF36	1052/36	Horizontal	1100 x 660 x 1450	1762 x 1880 x 2430	1400
Pass-Through (dual door) Models					
2UCF15	435/15	Vertical	660 x 660 x 1000	1800 x 1250 x 1420	875
2UCF20	545/20	Vertical	660 x 660 x 1250	1800 x 1270 x 1720	950
2SCF21	636/21	Horizontal	965 x 660 x 1000	1762 x 1880 x 1560	950
2UCF26	740/26	Vertical	660 x 660 x 1700	1865 x 1480 x 2030	1150
2SCF28	796/28	Horizontal	965 x 660 x 1250	1762 x 1880 x 1810	1200
2UCF31	870/31	Vertical	660 x 660 x 2000	1865 x 1480 x 2330	1350
2SCF36	1052/36	Horizontal	1100 x 660 x 1450	1762 x 1880 x 1960	1400

Operating Range - 105 to 137°C (0-2.3bar)

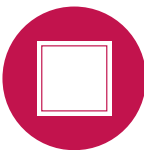
* All external dimensions are approximate. Systems-MP models can usually be adapted to meet site-specific conditions.

A wide range of accessories and options can be fitted to Touchclave Systems Autoclaves, some of which are detailed below:

Loading Equipment - LTE offers a wide range of loading equipment, from standard carriage/loading trolleys, through to Remeda semi and fully automatic loading systems. Our Remeda system can also be tailored to retro-fit on to all brands of autoclave.

Steam Generators - Dependant on size, quantity and duty, LTE offers a wide range of electrically heated or gas-fired generators. In addition, clean generators are available on all models. Contact LTE for further details and pricing.

Recorders - A wide range of recording options are available. This includes independent graphic recorders, or LTE's auto-comparison system, which compares machine and independent data, and provides a single printout, with any anomalies highlighted. Additionally, various 21CFR11 compliant options are also available.



Square chamber



Direct steam or steam generator



Water and steam jacket



Vacuum and air ballast

Popular Options Explained

When choosing your autoclave, careful consideration needs to be given to the options you may need in order to optimise the autoclave's performance and safety. Below, we briefly explain the purpose of the more popular options.

VACUUM. Provides efficient air removal at the beginning of the cycle, ensuring that steam will penetrate deep into the load and not be affected by trapped air pockets. Vacuum air removal is considerably faster than gravity systems. During the cooling stage, vacuum can be used to help dissipate heat from the load and in some cases can aid in the removal of some moisture from the load - standard on Touchclave Systems-MP models.

AIR BALLAST. Fluid loads, especially sealed container, normally need to be cooled slowly in order to prevent breakage or volume loss. Air ballast provides an over pressure in the chamber during cooling which allows the fluids to be cooled faster and with a greatly reduced risk of breakage or volume loss – standard on Touchclave Systems-MP models.

WATER JACKET COOLING SYSTEM. Speeds up the cooling stage of the sterilization cycle - standard on all Touch-clave-Lab 'K' Series and Systems-MP models.

STEAM JACKET. This feature is standard on Touchclave Systems-MP models and can be added to Touchclave-Lab 'K' Series models when fitted with vacuum. The steam jacket keeps the chamber hot in between cycles, and assists during the drying stage by flashing-off residual water in or around the load. This options is required where dry loads are required.

MODEM LINK. This is a useful feature which allows real time information to be viewed by our technical and service team, thus minimizing potential down time.

EXHAUST CONDENSATE UNIT. A re-circulating exhaust condensate unit is fitted on all Touchclave Systems-MP and Touchclave Lab 'K' models, enabling discharge water temperatures to be kept below 70°C to avoid damage to plastic pipes and the environment. On vacuum models this feature also serves to protect the vacuum pump from live steam. Condensate units can be optionally fitted to Touchclave 'F' models.

EFFLUENT RETENTION. Used when processing potential or known P3 pathogens. 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, ensuring that nothing is exhausted without first being either filtered or sterilized.

Control System

Touchclave-Lab and Systems MP sterilizers are equipped with a control system which incorporates a powerful PLC combined with an easy to use touch-screen through which all commands, real-time cycle data, program data and alarms are inputted and displayed. The screen allows users to see the cycle status easily – even from a distance.

This versatile system gives users a choice of selecting from a menu of load-specific cycles or developing/editing their own cycle profile. 8 cycles can be stored into the memory as standard, and optional memory expansion is available to increase the number of available cycles to 20.

To aid traceability there is a facility to input operator ID and Batch information at this stage. There is also a facility to program a delayed cycle start, which is useful for maximising the use of the sterilizer.

A multi-level password system which prevents unauthorized access to control and service screens without suitable clearance.

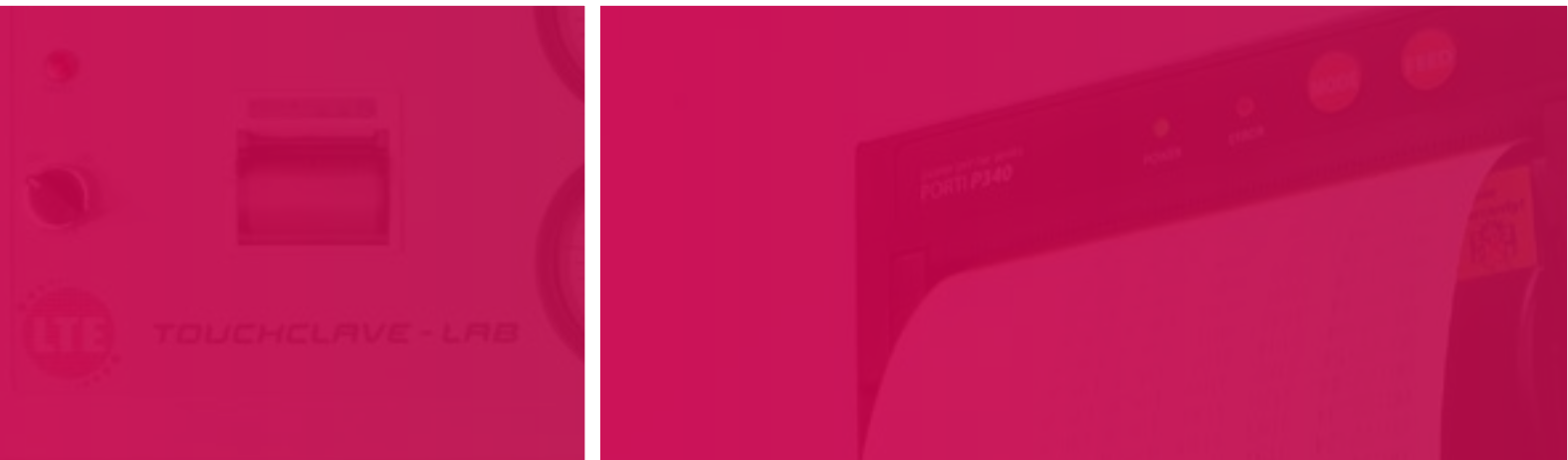
A range of printers and recorders are available for those who require a hard copy of cycle data in addition to the data archiving.

Touchclave Touch Screen Systems incorporate a self-diagnostic system which will highlight any abnormality in the cycle. As an option, a modem can be fitted to the control system which will allow our technical team to view real-time cycle data from a remote location, enabling us in many cases to advise quickly on operational issues, thus minimising possible down-time.

DATA ARCHIVING

All Touchclave-Lab and Systems-MP models are equipped with automatic electronic data archiving. This comprises of an internal data storage facility which allows up to 5000 cycles to be stored on a single flash-card.

As a further enhancement, a remote cycle data archiving facility via USB, ethernet or WIFI, can be added so that all cycle data, including any fault or alarm conditions, can be downloaded to a PC and permanently recorded. All archive data is 'checksum' protected.





Ask about LTE Scientific's other products & services

- Thermal Products
- Environmental Rooms & Chambers
- Service
- Training

If you require more information on the products in this brochure, or would like details on any other product in our range, please visit our website or contact our sales office on **+44 (0)1457 876221**.

LTE Service Centre provides after-sale care on a wide range of autoclaves and laboratory equipment.



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